CITY OF ANAMOSA

CITY COUNCIL AGENDA – REGULAR SESSION

MONDAY, JANUARY 22, 2024 – 6:00 P.M.
ANAMOSA LIBRARY & LEARNING CENTER
600 EAST 1ST STREET, ANAMOSA, IA 52205

Zoom Meeting Link (Viewing Only)	Join by Telephone
https://us02web.zoom.us/j/8012629567	+1 312 626 6799 US
Meeting ID: 801 262 9567	Meeting ID: 801 262 9567
Passcode: Anamosa	Passcode: 4952698

To address the City Council, please wait for the Mayor to open the floor for public comment on an agenda item.
Before speaking, approach the podium, provide your name and address, and limit comments to five (5) minutes per agenda item.
Profane, obscene, or slanderous language will not be permitted.

1.0) Roll Call
2.0) Pledge of Allegiance
3.0) Consent Agenda (Review & Approve):
- **a)** Minutes from January 8, 2024 – Regular Session
- **b)** Current bills

4.0) Public Hearings: (None)
5.0) Proclamations: (None)
6.0) Postponed Items: (None)
7.0) Council Action Items:
- **7.1) Presentations –** Hotel/Motel Grant Program Application Reviews/Presentations
- **7.2) Project Status Update –** Snyder & Associates
- **7.3) Resolution 2024-04 –** Approving Plans & Specifications for the WWTP Improvements Project. **Roll Call.**
- **7.4) Resolution 2024-05 –** Rescinding the Sale and Conveyance of Parcel 2010-69, part of Lot 15, Anamosa Commercial Park Second Addition, Anamosa, IA, also identified as Auditor's Parcel No. 0535476009. **Roll Call.**
- **7.5) Resolution 2024-06 –** Resolution Setting the Date for a Public Hearing on the Proposed Sale of City Owned Real Estate Pursuant to Section 364.7 of the Iowa Code. **Roll Call.**
- **7.6) Discussion & Possible Action** – Proposal to acquire 8' Industrial Snowblower (Shane Brown, Streets Dept.)
- **7.7) Discussion & Possible Action –** Proposal to acquire 2023 Bobcat UV34 (Steve Agnitsch, Public Utilities Dept.)
- **7.8) Review & Approve (Consent Agenda) –** Pay requests, totaling $8,739.08.
  - ***a)*** From HR Green, in the amount of $312.00, for GIS Services.
  - ***b)*** From Martin Gardner Architecture, in the amount of $1,425.00, for Phase 2 of the Anamosa Downtown Revitalization Project Phase.
  - ***c)*** From Snyder & Associates, in the amount of $7,002.08, for Phase 2 of the 2nd Street Lift Station Improvements Project.

8.0) City Administrator's Report
9.0) Mayor and Council Reports
- **9.1)** Mayor's report
- **9.2)** Council reports

10.0) Public Comment for Items Not on The Agenda
11.0) Adjournment

STATEMENT OF COUNCIL PROCEEDINGS
January 8, 2024

The City Council of the City of Anamosa met in Regular Session January 8, 2024, at the Anamosa Library & Learning Center at 6:00 p.m. with Mayor Rod Smith presiding. The following Council Members were present: Rich Crump, Kay Smith, Brooke Gombert, Dan Smith, Theresa Tuetken and Todd Weimer. Absent: None. Also, present were Jeremiah Hoyt, City Administrator and Penny Lode, City Clerk.

Mayor Rod Smith called the meeting to order at 6:00 p.m. Roll call was taken with a quorum present.

Motion by Crump, seconded by Tuetken approving consent agenda items: Minutes of 12/26/23 Regular Session, Current bills, and Liquor Licenses. Ayes: all. Nays: none. Motion carried.

Mayor Smith read Proclamation for Human Trafficking Prevention & Awareness Month.

Motion by K. Smith, seconded by Crump approving Resolution 2024-01 approving and setting dates for the Regular City Council meetings in Calendar Year 2024. Roll vote. Ayes: Gombert, D. Smith, K. Smith, Tuetken, Weimer, Crump. Nays: none. Motion carried.

Motion by Crump, seconded by Gombert approving Resolution 2024-02 approving the hiring and setting salary for the position of part-time Lawrence Community Center Front Desk for Fiscal Year ending June 30,2024. Roll vote. Ayes: D. Smith, K. Smith, Tuetken, Weimer, Crump, Gombert. Nays: none. Motion carried.

Motion by K. Smith, seconded by Crump approving Resolution 2024-03 designating the official publication newspaper and alternative official publication newspaper for the City of Anamosa. Roll vote. Ayes: Tuetken, Weimer, Crump, Gombert, D. Smith, K. Smith. Nays: none. Motion carried.

Motion by Crump, seconded by Tuetken approving the Board and Committee appointments for Calendar Year 2024 as recommended by Mayor Rod Smith. Ayes: all. Nays: none. Motion carried.

Motion by Crump, seconded by Gombert approving the application by Jenson Arnold to join the Anamosa Volunteer Fire Department. Ayes: all. Nays: none. Motion carried.

Motion by Crump, seconded by D. Smith approving consent agenda pay requests: Snyder & Associates - $14,426.48, Snyder & Associates - $5,206.00. Ayes: all. Nays: none. Motion carried.

Meeting adjourned at 6:25 p.m.

_____
Rod Smith, Mayor

ATTEST:

_____
Penny K. Lode, City Clerk

City of Anamosa, IA

Expense Approval Report
By Fund

Payment Dates 1/9/2024 - 1/22/2024

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
Fund: 001 - GENERAL FUND					
Department: 000 - 000					
COLLECTION SERVICES CENTE	INV0001173	01/19/2024	COLLECTION SERVICES	001-000-2204	257.55
CITY OF ANAMOSA	INV0001174	01/19/2024	FLEXIBLE - CHILDCARE	001-000-2204	96.15
CITY OF ANAMOSA	INV0001175	01/19/2024	FLEX - MEDICAL	001-000-2204	123.23
IPERS COLLECTIONS	INV0001176	01/19/2024	IPERS	001-000-2203	8,043.66
IPERS COLLECTIONS	INV0001177	01/19/2024	IPERS	001-000-2203	3,036.85
941 TAX EFT PAYMENT	INV0001178	01/19/2024	MEDICARE TAX	001-000-2206	2,086.18
941 TAX EFT PAYMENT	INV0001179	01/19/2024	SOCIAL SECURITY TAX	001-000-2202	8,920.16
941 TAX EFT PAYMENT	INV0001180	01/19/2024	FEDERAL TAX	001-000-2200	5,136.33
TREASURER STATE OF IOWA	INV0001181	01/19/2024	STATE TAX	001-000-2201	2,398.22
				Department 000 - 000 Total:	**30,098.33**
Department: 110 - POLICE					
EMC INSURANCE	010124	01/22/2024	WORK COMP DEDUCTIBLE	001-110-6429	498.05
JONES COUNTY ENGINEER	011124	01/22/2024	FUEL	001-110-6551	116.60
MAQUOKETA VALLEY ELECTRI	011524-PD	01/22/2024	PHONE/INTERNET	001-110-6373	149.52
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	001-110-6155	55.50
VISA	010124-JH	01/17/2024	AMERICINN	001-110-6448	448.00
VISA	010124-JH	01/17/2024	AMAZON	001-110-6535	321.54
VISA	010124-JH	01/17/2024	KUM & GO	001-110-6551	23.56
VISA	123123-EW	01/17/2024	AMAZON	001-110-6504	395.99
VISA	123123-EW	01/17/2024	WALMART	001-110-6535	22.98
VISA	123123-EW	01/17/2024	DOLLAR GENERAL	001-110-6535	90.25
VISA	123123-EW	01/17/2024	HOTELS,COM	001-110-6537	1,312.68
VISA	123123-EW	01/17/2024	FAREWAY	001-110-6553	47.95
VISA	CM0000140	01/18/2024	BEST BUY RETURNS	001-110-6504	-650.54
				Department 110 - POLICE Total:	**2,832.08**
Department: 210 - ROADS, BRIDGES, SIDEWALKS					
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	001-210-6181	227.20
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	001-210-6155	37.00
				Department 210 - ROADS, BRIDGES, SIDEWALKS Total:	**264.20**
Department: 290 - SOLID WASTE					
JONES COUNTY SOLID WASTE	14508	01/22/2024	LANDFILL ASSESSMENT	001-290-6460	5,254.65
				Department 290 - SOLID WASTE Total:	**5,254.65**
Department: 450 - CEMETERY FUND					
HENRY/TROY	277546	01/22/2024	BURIALS	001-450-4553	350.00
				Department 450 - CEMETERY FUND Total:	**350.00**
Department: 610 - CITY COUNCIL					
ANAMOSA CHAMBER OF CO	010224	01/22/2024	AGENCY REQUEST	001-610-6479	7,000.00
STOREY KENWORTHY	PINV1145725	01/22/2024	COUNCIL NAMEPLATES	001-610-6514	14.92
				Department 610 - CITY COUNCIL Total:	**7,014.92**
Department: 622 - SUPPORT ADMINISTRATION					
MAQUOKETA VALLEY ELECTRI	011524	01/22/2024	ELECTRIC	001-622-6454	264.18
WOODWARD COMMUNITY M	122347098	01/22/2024	PUBLICATIONS	001-622-6414	159.05
AMAZON CAPITAL SERVICES	1LR4-3YJM-P3KV	01/22/2024	SUPPLIES	001-622-6535	62.97
STOREY KENWORTHY	PINV1144943	01/22/2024	STAMPER	001-622-6535	57.33
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	001-622-6155	27.75
VISA	123123-PL	01/17/2024	ZOOM	001-622-6430	15.99
				Department 622 - SUPPORT ADMINISTRATION Total:	**587.27**
Department: 640 - CITY ATTORNEY					
LYNCH DALLAS, P.C.	215551	01/22/2024	ATTORNEY FEES	001-640-6455	643.50
				Department 640 - CITY ATTORNEY Total:	**643.50**

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
Department: 650 - CITY HALL					
TYLER TECHNOLOGIES, INC	025-450281	01/22/2024	PAYMENT PROCESS FEES	001-650-6455	315.00
ENCOMPASS	14475	01/22/2024	COMPUTER IT	001-650-6455	5,150.00
				Department 650 - CITY HALL Total:	**5,465.00**
				Fund 001 - GENERAL FUND Total:	**52,509.95**
Fund: 015 - FIRE SERVICE					
Department: 150 - FIRE DEPARTMENT					
MEDIACOM	010724	01/22/2024	INTERNET	015-150-6373	111.19
JONES COUNTY ENGINEER	011124	01/22/2024	FUEL	015-150-6551	150.99
DELANCEY ELECTRIC CO.	5368	01/22/2024	AIR COMPRESSOR	015-150-6474	1,000.00
BARNES/CHUCK	123123	01/19/2024	FIRE STIPEND	015-150-6069	431.25
MINER JR/MIKE	123123	01/19/2024	FIRE STIPEND	D15-150-6069	143.75
SWISHER/JEFF	123123	01/19/2024	FIRE STIPEND	015-150-6069	631.25
KEPPEL/VALERIE	123123	01/19/2024	FIRE STIPEND	015-150-6069	156.25
SNOW/JERIMIAH	123123	01/19/2024	FIRE STIPEND	015-150-6069	250.00
WICKHAM/AUSTIN	123123	01/19/2024	FIRE STIPEND	015-150-6069	675.00
STRUBE/KYLE	123123	01/19/2024	FIRE STIPEND	015-150-6069	150.00
DANIEL POIRIER	123123	01/19/2024	FIRE STIPEND	015-150-6069	87.50
SIEFKER/JUSTIN	123123	01/19/2024	FIRE STIPEND	015-150-6069	237.50
RUHL/KALLIE	123123	01/19/2024	FIRE STIPEND	015-150-6069	62.50
MCGREEVY/MICHAEL	123123	12/31/2023	FIRE STIPEND	015-150-6069	868.75
FRANK/DANIEL	123123	01/19/2024	FIRE STIPEND	015-150-6069	975.00
MINER/CHRIS	123123	01/19/2024	FIRE STIPEND	015-150-6069	518.75
LILLY/RONALD	123123	01/19/2024	FIRE STIPEND	015-150-6069	756.25
BALENTINE/CARTER	123123	01/19/2024	FIRE STIPEND	015-150-6069	468.75
EDWARDS/ROBERT	123123	01/19/2024	FIRE STIPEND	015-150-6069	818.75
BUCK/JUSTIN	123123	01/19/2024	FIRE STIPEND	015-150-6069	287.50
NORTON/SPENCER	123123	01/19/2024	FIRE STIPEND	015-150-6069	456.25
MCNAMARA/MATT	123123	01/19/2024	FIRE STIPEND	015-150-6069	175.00
BARNES/JASON	123123	01/19/2024	FIRE STIPEND	015-150-6069	156.25
CARSON/DAVID	123123	01/19/2024	FIRE STIPEND	015-150-6069	131.25
KULA/DYLAN	123123	01/19/2024	FIRE STIPEND	015-150-6069	218.25
PAULSON/KEITH	123123	01/19/2024	FIRE STIPEND	015-150-6069	162.50
KOOB/WESLEY	123123	01/19/2024	FIRE STIPEND	015-150-6069	725.00
CAMPBELL/TOM	123123	01/19/2024	FIRE STIPEND	015-150-6069	212.50
SNOW/JASON	123123	01/19/2024	FIRE STIPEND	015-150-6069	412.50
LUDWIG/LOGAN	123123	01/19/2024	FIRE STIPEND	015-150-6069	62.50
				Department 150 - FIRE DEPARTMENT Total:	**11,492.93**
				Fund 015 - FIRE SERVICE Total:	**11,492.93**
Fund: 041 - LIBRARY FUND					
Department: 410 - LIBRARY					
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	041-410-6155	27.75
VISA	010924	01/19/2024	WALMART	041-410-6535	45.96
VISA	010924	01/19/2024	WALMART	041-410-6537	64.04
EDWARDS SANITATION	106924	01/19/2024	TRASH SERVICE	041-410-6475	47.50
BOOK SYSTEMS, INC	137119	01/19/2024	ANNUAL HOSTING	041-410-6455	995.00
AMAZON CAPITAL SERVICES	167W-CNQW-6T7V	01/19/2024	SUPPLIES	041-410-6501	11.69
AMAZON CAPITAL SERVICES	1DW1-GXJ7-CVJX	01/19/2024	SUPPLIES	041-410-6502	11.18
AMAZON CAPITAL SERVICES	1DW1-GXJ7-CVJX	01/19/2024	SUPPLIES	041-410-6537	26.69
AMAZON CAPITAL SERVICES	1L3F-9KPW-YYDG	01/19/2024	SUPPLIES	041-410-6501	154.11
AMAZON CAPITAL SERVICES	1L3F-9KPW-YYDG	01/19/2D24	SUPPLIES	041-410-6535	13.99
AMAZON CAPITAL SERVICES	1L3F-9KPW-YYDG	01/19/2D24	SUPPLIES	041-410-6537	9.99
BAKER & TAYLOR	2037991782	01/19/2024	BOOKS	041-410-6501	25.56
BAKER & TAYLOR	2037996398	01/19/2024	BOOKS	041-410-6501	383.45
BAKER & TAYLOR	2038008595	01/19/2024	BOOKS	041-410-6501	350.44
CENTER POINT LARGE PRINT	2067214	01/19/2024	BOOKS	041-410-6501	50.00
JOHNSON CONTROLS	23846031	01/19/2024	FIRE PROTECTION	041-410-6455	2,798.15

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
DEMCO	7412498	01/19/2024	SUPPLIES	041-410-6531	109.20
				Department 410 - LIBRARY Total:	**5,124.70**
				Fund 041 - LIBRARY FUND Total:	**5,124.70**
Fund: 043 - PARKS & RECREATION					
Department: 430 - RECREATION					
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	043-430-6522	184.72
WEBER STONE COMPANY	0202502-IN	01/22/2024	SAWED SPEC ORDER	043-430-6475	245.00
UNITY POINT HEALTH	1111523	01/22/2024	PRE-EMPLOYMENT PHYSICAL	043-430-6412	25.00
FAREWAY STORES, INC.	123123	01/22/2024	SUPPLIES	043-430-6490	64.15
WENDLING QUARRIES	990948	01/22/2024	LIMEFILL	043-430-6471	36.41
VISA	123123-CY	01/17/2024	IOWA PARKS & REC ASSOC	043-430-6210	360.00
VISA	123123-CY	01/17/2024	USA PICKLEBALL	043-430-6471	35.00
VISA	123123-CY	01/17/2024	WALMART	043-430-6535	17.91
VISA	123123-PL	01/17/2024	WEST MUSIC	043-430-6490	150.00
VISA	123123-PL	01/17/2024	WALMART	043-430-6490	170.32
VISA	123123-PL	01/17/2024	WALMART	043-430-6490	62.75
				Department 430 - RECREATION Total:	**1,351.26**
				Fund 043 - PARKS & RECREATION Total:	**1,351.26**
Fund: 046 - LAWRENCE COMMUNITY CENTER FUND					
Department: 460 - LAWRENCE COMMMUNITY CENTER					
MAQUOKETA VALLEY ELECTRI	011524-LCC	01/22/2024	PHONE/INTERNET	046-460-6373	149.95
CENTRAL IOWA DISTRIBUTIN	02000166	01/22/2024	JANITORIAL	046-460-6541	418.00
CENTRAL IOWA DISTRIBUTIN	02000364	01/22/2024	JANITORIAL	046-460-6540	188.00
ALL SECURE	035189	01/22/2024	FIRE ALARM MONITORING	046-460-6452	75.00
FAREWAY STORES, INC.	123123	01/22/2024	SUPPLIES	046-460-6541	120.88
NELSON ELECTRIC	181748	01/22/2024	REPLACEMENT LAMPS RACQ	046-460-6475	892.38
PUSH PEDAL PULL	374532	01/22/2024	SERVICE	046-460-6470	140.00
ATLANTIC COCA-COLA	4341176	01/22/2024	VENDING MERCH	046-460-6546	220.33
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	046-460-6155	9.25
VISA	123123-CY	01/17/2024	USPS	046-460-6508	66.00
VISA	123123-CY	01/17/2024	WALMART	046-460-6541	31.29
VISA	123123-CY	01/17/2024	AMAZON	046-460-6542	81.31
				Department 460 - LAWRENCE COMMMUNITY CENTER Total:	**2,392.39**
				Fund 046 - LAWRENCE COMMUNITY CENTER FUND Total:	**2,392.39**
Fund: 110 - ROAD USE TAX					
Department: 211 - Public Services - community betterment					
CENTURYLINK	011024-ST	01/22/2024	PHONE	110-211-6373	66.04
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	110-211-6474	102.41
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	110-211-6530	56.84
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	110-211-6553	296.42
ZACH'S TOOLS LLC	0118243689	01/22/2024	SCREWDRIVER	110-211-6553	16.40
ACME TOOLS	12264057	01/22/2024	DRILL REPAIR	110-211-6553	56.99
IOWA ASSOC. OF MUNICIPAL	29150	01/22/2024	SAFETY TRAINING	110-211-6450	1,628.75
ARNOLD MOTOR SUPPLY, LLP	55NV001895	01/22/2024	GROMMET	110-211-6553	63.90
ARNOLD MOTOR SUPPLY, LLP	55NV001916	01/22/2024	GROMMET	110-211-6553	12.78
ARNOLD MOTOR SUPPLY, LLP	55NV001978	01/22/2024	AIR BRAKE	110-211-6474	48.15
ARNOLD MOTOR SUPPLY, LLP	55NV002138	01/22/2024	ANTI GEL	110-211-6553	179.88
ARNOLD MOTOR SUPPLY, LLP	55NV002142	01/22/2024	ANTI-FREEZE	110-211-6553	17.04
KROMMINGA MOTORS	79964M	01/22/2024	SKIDLOADER PARTS	110-211-6470	11.22
LINN CO-OP OIL CO.	885704	01/22/2024	FUEL	110-211-6551	180.97
LINN CO-OP OIL CO.	885705	01/22/2024	FUEL	110-211-6551	812.75
LINN CO-OP OIL CO.	885736	01/22/2024	FUEL	110-211-6551	949.56
LINN CO-OP OIL CO.	885766	01/22/2024	FUEL	110-211-6551	1,412.57
VISA	123123-SB	01/17/2024	WALMART	110-211-6535	87.00
				Department 211 - Public Services - community betterment Total:	**5,999.67**
				Fund 110 - ROAD USE TAX Total:	**5,999.67**

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
Fund: 121 - LOCAL OPTION TAX 35%					
Department: 210 - ROADS, BRIDGES, SIDEWALKS					
TREY ELECTRIC CORP	11718	01/22/2024	STREET LIGHTS	121-210-6371	378.00
TREY ELECTRIC CORP	11719	01/22/2024	STREET LIGHTS	121-210-6371	260.00
				Department 210 - ROADS, BRIDGES, SIDEWALKS Total:	**638.00**
				Fund 121 - LOCAL OPTION TAX 35% Total:	**638.00**
Fund: 122 - LOCAL OPTION TAX 65%					
Department: 210 - ROADS, BRIDGES, SIDEWALKS					
MAQUOKETA VALLEY ELECTRI	010824	01/22/2024	ELECTRIC	122-210-6372	54.54
				Department 210 - ROADS, BRIDGES, SIDEWALKS Total:	**54.54**
Department: 410 - LIBRARY					
VISA	123123-ER	01/17/2024	EXCALIBERPC	122-410-6722	1,398.00
VISA	010924	01/19/2024	HOSTGATOR	122-410-6725	359.64
VISA	010924	01/19/2024	HOSTGATOR	122-410-6725	19.99
VISA	010924	01/19/2024	WIX	122-410-6725	14.95
LEAF	1S890277	01/19/2024	INSTALLATION	122-410-6727	96.00
MIDWEST TAPE LLC	504859599	01/19/2024	BOOKS	122-410-6725	102.27
				Department 410 - LIBRARY Total:	**1,990.85**
				Fund 122 - LOCAL OPTION TAX 65% Total:	**2,045.39**
Fund: 331 - DOWNTOWN PROJECTS/PROGRAMS					
Department: 602 - 602					
ECICOG	10333	01/22/2024	DOWNTOWN FACADE PHASE	331-602-6490	1,875.00
				Department 602 - 602 Total:	**1,875.00**
				Fund 331 - DOWNTOWN PROJECTS/PROGRAMS Total:	**1,875.00**
Fund: 600 - WATER FUND					
Department: 810 - 810					
MAQUOKETA VALLEY ELECTRI	011524-WP	01/22/2024	INTERNET	600-810-6373	139.85
MUNICIPAL SUPPLY, INC.	089646S-IN	01/22/2024	SMART POINTS	600-810-6504	9,450.00
WATER SOLUTIONS UNLIMITE	120263	01/22/2024	CHEMICALS	600-810-6501	2,447.93
AMAZON CAPITAL SERVICES	1LY1-NHKH-3P4H	01/22/2024	DOOR REMOTES	600-810-6504	174.92
KIECK'S	24-01-0040	01/22/2024	UNIFORMS	600-810-6181	120.00
IOWA ASSOC. OF MUNICIPAL	29150	01/22/2024	SAFETY TRAINING	600-810-6450	1,628.76
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	600-810-6155	27.75
US POSTMASTER	011624	01/16/2024	REG BILLING POSTAGE	600-810-6531	365.55
VISA	123123-RY	01/17/2024	WALMART	600-810-6535	34.78
				Department 810 - 810 Total:	**14,389.54**
				Fund 600 - WATER FUND Total:	**14,389.54**
Fund: 610 - WASTEWATER FUND					
Department: 815 - 815					
BLACK HILLS ENERGY	010424	01/22/2024	GAS UTILITY	610-815-6370	588.83
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	610-815-6474	3.98
JOHN DEERE FINANCIAL	011424	01/22/2024	THEISENS	610-815-6504	134.99
MUNICIPAL SUPPLY, INC.	0896465-IN	01/22/2024	SMART POINTS	610-815-6504	9,450.00
FAREWAY STORES, INC.	123123	01/22/2024	SUPPLIES	610-815-6530	31.92
KIECK'S	24-01-0039	01/22/2024	UNIFORMS	610-815-6181	319.88
IOWA ASSOC. OF MUNICIPAL	29150	01/22/2024	SAFETY TRAINING	610-815-6450	1,628.76
BANOWETZ LUMBER COMPA	30386	01/22/2024	HARDWARE	610-815-6553	15.78
HAWKEYE ELECTRICAL CONTR	50898	01/22/2024	UFD FOR HEADWORKS	610-815-6470	6,770.08
HAWKEYE ELECTRICAL CONTR	51603	01/22/2024	ELECTRIC REPAIRS	610-815-6780	2,655.80
HAWKEYE ELECTRICAL CONTR	51668	01/22/2024	ELECTRIC REPAIRS	610-815-6554	223.88
ARNOLD MOTOR SUPPLY, LLP	55NV002150	01/22/2024	ANTIFREEZE	610-815-6470	32.62
MID-IOWA SOLID WASTE	59996	01/22/2024	JETTER NOZZLE	610-815-6504	692.71
CHEMSEARCH	8519916	01/22/2024	CHEMICALS	610-815-6501	165.00
LINN COUNTY, FRIEND OF CO	885765	01/22/2024	6108156551	610-815-6551	1,222.73
HOUSBY HEAVY EQUIPMENT	XA202000038-01	01/22/2024	LOADER REPAIRS	610-815-6470	42.53
HOUSBY HEAVY EQUIPMENT	XA202000228-01	01/22/2024	LOADER REPAIRS	610-815-6470	597.68
AUXIANT	011424	01/22/2024	SELF FUND INSURANCE ADMI	610-815-6155	18.50

Vendor Name	Payable Number	Post Date	Description (Item)	Account Number	Amount
US POSTMASTER	011624	01/16/2024	REG BILLING POSTAGE	610-815-6531	365.55
VISA	123123-SA	01/17/2024	DNR	610-815-6553	104.04
				Department 815 - 815 Total:	25,065.26
				Fund 610 - WASTEWATER FUND Total:	25,065.26
				Grand Total:	122,884.09

Report Summary

Fund Summary

Fund	Expense Amount	Payment Amount
001 - GENERAL FUND	52,509.95	32,246.98
015 - FIRE SERVICE	11,492.93	10,230.75
041 - LIBRARY FUND	5,124.70	5,124.70
043 - PARKS & RECREATION	1,351.26	795.98
046 - LAWRENCE COMMUNITY CENTER FUND	2,392.39	187.85
110 - ROAD USE TAX	5,999.67	87.00
121 - LOCAL OPTION TAX 35%	638.00	0.00
122 - LOCAL OPTION TAX 65%	2,045.39	1,990.85
331 - DOWNTOWN PROJECTS/PROGRAMS	1,875.00	0.00
600 - WATER FUND	14,389.54	428.08
610 - WASTEWATER FUND	25,065.26	488.09
Grand Total:	**122,884.09**	**51,580.28**

Account Summary

Account Number	Account Name	Expense Amount	Payment Amount
001-000-2200	FIT HOLDING	5,136.33	5,136.33
001-000-2201	SIT HOLDING	2,398.22	2,398.22
001-000-2202	FICA HOLDING	8,920.16	8,920.16
001-000-2203	IPERS HOLDING	11,080.51	11,080.51
001-000-2204	PEDC HOLDING	476.93	476.93
001-000-2206	MEDICARE HOLDING	2,086.18	2,086.18
001-110-6155	SELF FUNDED HEALTH IN	55.50	55.50
001-110-6373	UTILITIES, TELEPHONE	149.52	0.00
001-110-6429	WORK COMP DEDUC	498.05	0.00
001-110-6448	LODGING	448.00	448.00
001-110-6504	EQUIPMENT, SMALL	-254.55	-254.55
001-110-6535	SUPPLIES, OFFICE	434.77	434.77
001-110-6537	ICERT	1,312.68	1,312.68
001-110-6551	VEHICLE FUEL EXPENSES	140.16	23.56
001-110-6553	MISCELLANEOUS EXPEN	47.95	47.95
001-210-6155	SELF FUNDED HEALTH IN	37.00	37.00
001-210-6181	ALLOWANCE, UNIFORM	227.20	0.00
001-290-6460	LANDFILL ASSESSMENT	5,254.65	0.00
001-450-4553	BURIAL CHARGES	350.00	0.00
001-610-6479	CONTRBUTIONS TO OUT	7,000.00	0.00
001-610-6514	CONTINGENCY, COUNCIL	14.92	0.00
001-622-6155	SELF FUNDED HEALTH IN	27.75	27.75
001-622-6414	PUBLIC NOTICES	159.05	0.00
001-622-6430	MEMBERSHIP DUES & S	15.99	15.99
001-622-6454	MAINT. CONTRACT PAGE	264.18	0.00
001-622-6535	SUPPLIES/NONCAP EQUI	120.30	0.00
001-640-6455	CONTRACTS, GEN. CITY	643.50	0.00
001-650-6455	CONTRACTS, GEN. CITY	5,465.00	0.00
015-150-6069	CALL/MEETING STIPEND	10,230.75	10,230.75
015-150-6373	UTILITIES, TELEPHONE	111.19	0.00
015-150-6474	MAINTENANCE, VEHICLE	1,000.00	0.00
015-150-6551	VEHICLE FUEL EXPENSES	150.99	0.00
041-410-6155	SELF FUNDED HEALTH IN	27.75	27.75
041-410-6455	GENERAL CONTRACTS	3,793.15	3,793.15
041-410-6475	MAINTENANCE, BLDGS	47.50	47.50
041-410-6501	BOOKS AND PERIODOCA	975.25	975.25
041-410-6502	ADULT PROGRAM SUPPL	11.18	11.18
041-410-6531	SUPPLIES, LIBRARY	109.20	109.20
041-410-6535	SUPPLIES, OFFICE	59.95	59.95
041-410-6537	SUPPLIES,CHILDRENS PR	100.72	100.72
043-430-6210	MEMBERSHIP DUES & S	360.00	360.00
043-430-6412	MEDICAL PHYSICALS	25.00	0.00

Account Summary

Account Number	Account Name	Expense Amount	Payment Amount
043-430-6471	MAINTENANCE, RECREA	71.41	35.00
043-430-6475	MAINTENANCE, BLDGS	245.00	0.00
043-430-6490	EVENT EXPENSES	447.22	383.07
043-430-6522	EQUIPMENT, MAINTENA	184.72	0.00
043-430-6535	SUPPLIES, OFFICE	17.91	17.91
046-460-6155	SELF FUNDED HEALTH IN	9.25	9.25
046-460-6373	UTILITIES, TELEPHONE	149.95	0.00
046-460-6452	CONTRCT,MAINT. BLDGS	75.00	0.00
046-460-6470	MAINTENANCE, EQUIP	140.00	0.00
046-460-6475	MAINTENANCE, BLDGS	892.38	0.00
046-460-6508	SUPPLIES, POSTAGE	66.00	66.00
046-460-6540	SUPPLIES, BLDGS. & GR	188.00	0.00
046-460-6541	SUPPLIES, JANITORIAL M	570.17	31.29
046-460-6542	SUPPLIES, MISCELLANEO	81.31	81.31
046-460-6546	MERCHANDISE FOR RES	220.33	0.00
110-211-6373	UTILITIES, TELEPHONE	66.04	0.00
110-211-6450	SAFETY COUNCIL	1,628.75	0.00
110-211-6470	MAINTENANCE, EQUIP	11.22	0.00
110-211-6474	MAINTENANCE, VEHICLE	150.56	0.00
110-211-6530	SUPPLIES, OPERATIONS	56.84	0.00
110-211-6535	SUPPLIES, OFFICE	87.00	87.00
110-211-6551	VEHICLE FUEL EXPENSES	3,355.85	0.00
110-211-6553	MISCELLANEOUS SUPPLI	643.41	0.00
121-210-6371	STREET LIGHTS ELECTRIC	638.00	0.00
122-210-6372	ELECTRIC UTILITIES, ST LI	54.54	0.00
122-410-6722	OPERATIONS EQUIPMEN	1,398.00	1,398.00
122-410-6725	EQUIPMENT	496.85	496.85
122-410-6727	MAINTENANCE EQUIPM	96.00	96.00
331-602-6490	PROFESSIONAL SERVICE	1,875.00	0.00
600-810-6155	SELF FUNDED HEALTH IN	27.75	27.75
600-810-6181	ALLOWANCE, UNIFORM	120.00	0.00
600-810-6373	UTILITIES, TELEPHONE	139.85	0.00
600-810-6450	SAFETY COUNCIL EXPEN	1,628.76	0.00
600-810-6501	CHEMICALS	2,447.93	0.00
600-810-6504	EQUIPMENT, SMALL	9,624.92	0.00
600-810-6531	SUPPLIES, BILLING	365.55	365.55
600-810-6535	SUPPLIES, OFFICE	34.78	34.78
610-815-6155	SELF FUNDED HEALTH IN	18.50	18.50
610-815-6181	ALLOWANCE, UNIFORM	319.88	0.00
610-815-6370	UTILITIES, GAS	588.83	0.00
610-815-6450	SAFETY COUNCIL EXPEN	1,628.76	0.00
610-815-6470	MAINTENANCE, EQUIP	7,442.91	0.00
610-815-6474	MAINTENANCE, VEHICLE	3.98	0.00
610-815-6501	CHEMICALS	165.00	0.00
610-815-6504	EQUIPMENT, SMALL	10,277.70	0.00
610-815-6530	OPERATIONS SUPPLIES	31.92	0.00
610-815-6531	SUPPLIES, BILLING	365.55	365.55
610-815-6551	FUEL EXPENSE	1,222.73	0.00
610-815-6553	MISCELLANEOUS EXPEN	119.82	104.04
610-815-6554	MAINTENANCE, GENERA	223.88	0.00
610-815-6780	WASTEWATER TREATME	2,655.80	0.00
	Grand Total:	**122,884.09**	**51,580.28**

Project Account Summary

Project Account Key		Expense Amount	Payment Amount
None		122,884.09	51,580.28
	Grand Total:	**122,884.09**	**51,580.28**

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Jones County Economic Development

TAX ID NUMBER:

ORGANIZATION ADDRESS: 107 S. Ford Street
STREET ADDRESS

Anamosa | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-490-7446 | director@jonescountydevelopment.com
PHONE NUMBER | EMAIL ADDRESS

APPLICANT'S NAME: Lumsden | Derek |
LAST | FIRST | M.I.

WHAT IS THE MISSION OF YOUR ORGANIZATION?

N/A

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$
EQUIPMENT/MATERIALS/SUPPLIES	$
MARKETING/ADVERTISING	$
PROFESSIONAL SERVICES	$
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$
FOOD PURCHASED (NOT FOR RESALE)	$
TRAVEL & LODGING	$
OTHER	$
TOTAL ESTIMATED EXPENSES	$

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
ADMISSION/FEES	$
GRANTS	$
DONATIONS	$
OTHER	$
TOTAL INCOME	$

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 15,000.00

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☑
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☑
- OTHER (SPECIFY PURPOSE BELOW) ☐

SIGNATURE OF ORGANIZATION REPRESENTATIVE

DATE

PRINTED NAME

TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24
Notes:			
Amount awarded by City Council:	$	Date of Award:	

Non-Restricted Income Sources	2023 Projected Income	2023 Actual Income	2024 Projected Income	2024 Actual Income
Jones County Supervisors	$50,000	50,000	$50,000	
City of Anamosa	$15,000	$15,000	$15,000	
City of Monticello	$15,000	$15,000	$15,000	
City of Cascade	$2,000	$2,000	$2,000	
Other Public Investment	$500	$500	$500	
Private Membership Investment	$35,000	$24,300	$35,000	
Miscellaneous	$0	$3,971.17	$500	
Total Non-Restricted Income	**$117,500**	**$ 110,771.17**	**$118,000**	
Restricted Income Sources				
In-kind Office Space in Anamosa	$4,000	$4,000	$4,000	
In-kind Office Space in Monticello	$4,000	$4,000	$4,000	
Total Restricted Income	**$8,000**	**$8,000**	**$8,000**	

Restricted Expenses	2023 Projected Expenses	2023 Actual Expenses	2024 Projected Expenses	2024 Actual Expenses
Employee Salary and Expense	$85,000	$81,073.16	$86,000	
Cell Phone	$1,500	$1,010.50	$1,100	
Accounting Services	$2,000	$1,836	$2,000	
Insurance	$2,000	$1,822	$2,000	
Website	$500	$301.80	$500	
Office Supplies	$1,000	$881.89	$1,000	
Advertising	$6,000	$7,727	$6,000	
Event Committee	$3,000	$1,092.86	$2,000	
Postage	$1,600	$660.00	$990	
Dues & Memberships	$7,000	$6,450.70	$7,000	
In-County Mileage	$1,500	$664.02	$1,500	
Out of County Mileage	$2,000	$1,279.08	$2,000	
Workshops/Conferences	$3,000	$4,014.41	$3,000	
YP Memberships	$1,000	$350	$500	
Finance Committee	$0	$0.00	$0	
Membership Committee	$0	$0.00	$0	
Ag Advisory Committee	$0	$0.00	$500	
Strategic Planning Committee	$0	$0.00	$500	
Miscellaneous	$500	$3,656.73	$500	
Total Non-Restricted Expense	**$117,600**	**$112,820.15**	**$117,090**	
Restricted Expenses				
In-kind Office Space in Anamosa	$4,000	$4,000	$4,000	
In-kind Office Space in Monticello	$4,000	$4,000	$4,000	
Total Restricted Expenses	**$8,000**	$8,000	$8,000	
NON-RESTRICTED INCOME AFTER NON-RESTRICTED EXPENSE	**$900**	**($2,048.98)**	**$910**	

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: ANAMOSA CHAMBER of COMMERCE

TAX ID NUMBER:

ORGANIZATION ADDRESS: 203 E. MAIN STREET
STREET ADDRESS

ANAMOSA | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-462-4879 director@anamosachamber.org
PHONE NUMBER | EMAIL ADDRESS

APPLICANT'S NAME: LAWTON | BLAIR |
LAST | FIRST | M.I.

WHAT IS THE MISSION OF YOUR ORGANIZATION?

N/A - SEE ATTACHED

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$
EQUIPMENT/MATERIALS/SUPPLIES	$
MARKETING/ADVERTISING	$
PROFESSIONAL SERVICES	$
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$
FOOD PURCHASED (NOT FOR RESALE)	$
TRAVEL & LODGING	$
OTHER	$
TOTAL ESTIMATED EXPENSES	$

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
ADMISSION/FEES	$
GRANTS	$
DONATIONS	$
OTHER	$
TOTAL INCOME	$

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 14,000.00

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☑
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☑
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☑
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☑
- OTHER (SPECIFY PURPOSE BELOW) ☑

N/A - See Attached

SIGNATURE OF ORGANIZATION REPRESENTATIVE

DATE

PRINTED NAME

TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24
Notes:			
Amount awarded by City Council:	$	Date of Award:	

Outside Agency Funding Request
Application and Financial Reporting Form

City of Anamosa
107 S Ford Street
Anamosa, IA 52205

Amount of Request: $14,000

Agency: Anamosa Chamber of Commerce
Mailing Address: 203 E Main St
City, State, Zip: Anamosa, IA 52205
Contact Person: Blair Lawton
Email: director@anamosachamber.org
Phone: 319-462-4879

Presented On:
Incorporation Date:

Non-Profit Certification: 501c6

Deadline for submittal to City Hall: January 15th. (If the 15th falls on a weekend the application due date is the following Monday).

The application and accompanying budget has been considered and approved for submission by the requesting agency's Board of Directors on Jan 8 of 2024.

Signatures:

Treasurer

Chairperson
or other authorized person

Agency: Anamosa Chamber of Commerce

Basic Program Information:

1. What's the agency's mission?
   To foster economic and social growth in Anamosa through advocating for small businesses and the workforce's perks of living in Anamosa.

2. What specific programs/services does the agency normally provide?
   Community events, economic development, business advertisement

3. What are the normal fund-raising activities of this agency?
   proceeds from local events, vendor fees, sponsorships, and membership dues

4. To what particular use(s) will any City funds directed to this Agency be put?
   Employee wages, building rent, event costs

5. The monies allocated to this agency last year (if any) were used for the following:
   Supplemented community event costs, Executive Director salary, rent, insurance.

Agency: Anamosa Chamber of Commerce

Receipts and expenses information (Budget)
An audit can be requested by the City of Anamosa if needed.
This table may be used or Financial Statements may be attached

Salaries of Employees				
		2022	2023	2024
Title	FTE/PTE	Last Year	Present Year	Next Year
Director	1-FTE	26,712.23 (1/2 yr)	50,000	50,000
Total		26,712	50,000	50,000

* Director was employed since 7/15/22

	Last Year	Present Year
Revenues (All Sources)	2022	2023
Allocation from the City of Anamosa	0	11,000
Contributions	0	0
Legacies and bequests	0	0
Allocated by Jones County	0	0
Fees and Grants from Government Agencies	0	1,172
Membership Dues	18,076	22,235
Program Services Fees, Etc.	31,483	57,478
Sales of Materials	0	0
Investment Income	0	0
Miscellaneous Income	0	0
Total Revenues	49,559	91,885

Expenditures	2022	2023
Salaries	26,712	39,860.58
Employee Benefits	0	0
Payroll Taxes, Etc.	6,677.06	11,910.69
Supplies	See Misc	See Misc
Office Rent/Lease	4,300	5,200
Equipment	0	0
Travel/Conference/Meetings	0	0
Specific Assistance to Individuals	0	0
Membership Dues	550	275.75
Awards and Grants	0	310
Miscellaneous	21,784.64	51,664.89
Total Expenses	60,123.70	104,027.91
Excess/Deficit	-10,564.70	-12,142.91
Restricted Funds Balance	57,091	44,948.20

* Misc Expenses are mainly comprised of:

Pumpkinfest Expenses

Annual Meeting

Reindeer Run

Golf Tournaments

Parades/Holiday Events

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Jones County Tourism

TAX ID NUMBER:

ORGANIZATION ADDRESS: 124 E. Main Street
STREET ADDRESS

Anamosa | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-462-4101 director@travelJonescounty.com
PHONE NUMBER | EMAIL ADDRESS

APPLICANT'S NAME: Weaver | Kaileen | M.I.
LAST | FIRST

WHAT IS THE MISSION OF YOUR ORGANIZATION?

N/A

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$
EQUIPMENT/MATERIALS/SUPPLIES	$
MARKETING/ADVERTISING	$
PROFESSIONAL SERVICES	$
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$
FOOD PURCHASED (NOT FOR RESALE)	$
TRAVEL & LODGING	$
OTHER	$
TOTAL ESTIMATED EXPENSES	$

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
ADMISSION/FEES	$
GRANTS	$
DONATIONS	$
OTHER	$
TOTAL INCOME	$

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 12,000.00

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☑
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐
- OTHER (SPECIFY PURPOSE BELOW) ☐

N/A

SIGNATURE OF ORGANIZATION REPRESENTATIVE — DATE

PRINTED NAME — TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24
Notes:			
Amount awarded by City Council:	$	Date of Award:	

	Jones County Tourism		
	2024 Budget		
Income	2023 Budget	2023 YTD	2024 Budget
Memberships, City Per Capita	$ 3,045.00	$ 2,890.60	$3,045
Memberships	$ 2,870.00	$ 2,885.00	$2,885
Jones County Supervisors	$ 16,000.00	$ 16,000.00	$16,000
Anamosa Hotel-Motel Tax	$ 12,000.00		$12,000
Other Hotel/Motel tax	$ 350.00	$ 3,424.57	$3,000
Oter income		$ 82.50	$0
Total Income	$ 34,265.00	$ 25,282.67	$36,930
Carryover funds (estmate)			
Expenses			
Payroll; Payroll, Employ Tax,W/H *	$ 23,188.20	$ 19,325.00	$24,000
Travel/Training	$ 200.00	$ -	$1,000
Sub Total	$ 23,388.20	$ 19,325.00	$25,000
Advertising, Marketing	$ 7,000.00	$ 2,698.94	$5,000
Web Page Host & mains	$ 715.00	$ 668.50	$730
Accounting Expense -1	$ 1,200.00	$ 846.00	$1,200
Membership in others	$ 450.00	$ 205.00	$450
Sub Total	$ 9,365.00	$ 4,418.44	$7,380
Office Expense			
Phone	$ 370.00	$ 362.89	$370
Insurance	$ 687.00	$ 681.00	$700
Rent, Building & Internet	$ 2,100.00	$ 1,750.00	$2,100
Postage	$ 150.00	$ 133.20	$150
Office Equipment	$ 50.00	$ 61.53	$100
Misc Office (ink, paper, Ect.)	$ 150.00	$ 133.63	$150
Misc. Expense	$ 100.00	$ 55.00	$100
Sub Total	$ 3,607.00	$ 3,177.25	$3,670
Total Expense	$ 36,560.20	$ 26,920.69	$36,050
Income After Expenses			$880
Savings Income $3,655.89			

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: ANAMOSA ROTARY CLUB

TAX ID NUMBER: _____

ORGANIZATION ADDRESS: N/A
STREET ADDRESS

ANAMOSA | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-329-6591 | daily.vj@gmail.com
PHONE NUMBER | EMAIL ADDRESS

APPLICANT'S NAME: DAILY | VAL | _____
LAST | FIRST | M.I.

WHAT IS THE MISSION OF YOUR ORGANIZATION?

SEE ATTACHED

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$
EQUIPMENT/MATERIALS/SUPPLIES	$
MARKETING/ADVERTISING	$
PROFESSIONAL SERVICES	$
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$
FOOD PURCHASED (NOT FOR RESALE)	$
TRAVEL & LODGING	$
OTHER	$
TOTAL ESTIMATED EXPENSES	$

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
ADMISSION/FEES	$
GRANTS	$
DONATIONS	$
OTHER	$
TOTAL INCOME	$

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 3,000

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☒
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☒
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐
- OTHER (SPECIFY PURPOSE BELOW) ☐

SIGNATURE OF ORGANIZATION REPRESENTATIVE — DATE

PRINTED NAME — TITLE

Copied By J. Hoyt - See Attached

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24
Notes:			
Amount awarded by City Council:	$	Date of Award:	

Anamosa

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Anamosa Rotary Club

TAX ID NUMBER:

ORGANIZATION ADDRESS:

STREET ADDRESS

CITY STATE ZIP CODE

CONTACT INFORMATION: 319.329.6591 daily.vj@gmail.com

PHONE NUMBER EMAIL ADDRESS

APPLICANT'S NAME: Val Daily

LAST FIRST M.I. WHAT IS THE MISSION OF YOUR ORGANIZATION?

The mission of Rotary International is *"Service Above Self"*. As a local chapter, we work diligently to embody that mission and have a long history of service to our community.

The mission or purpose of providing fireworks in Anamosa is an opportunity to bring our community together, provide entertainment and to bring families to our community. We intentionally schedule the event on July 3 to bring new faces to town which brings tourism dollars to Anamosa.

Anamosa's fireworks event is extremely well attended. The participation of children's games before the show along with the festival atmosphere, with concessions and "tailgating" makes for a great family event.

We are willing to provide the history of how the local Rotary club has inherited sponsoring this community event if necessary.

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES $ EQUIPMENT/MATERIALS/SUPPLIES **$ 8,006.00**

MARKETING/ADVERTISING **$ 514.00**

PROFESSIONAL SERVICES $

OFFICE & EQUIPMENT RENT/LEASE $ HONORARIA OR FEES **$ 250.00**

FOOD PURCHASED (NOT FOR RESALE) $

TRAVEL & LODGING $

TOTAL ESTIMATED EXPENSES **$ 8,770.00**

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION **On an average year donations – $5,500.00**

City of Anamosa $3,000.00

TOTAL INCOME **$8,500.00**

We have consistently garnered donations of $5,500 from individuals and businesses and typically pick up between $500 - $1,000 the night of the fireworks by "passing the hat". This number fluctuates every year with no ability to predict this anticipated income.

Anamosa

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$3,000

PUBLIC PURPOSE FOR REQUESTED FUNDS

PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA X

PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA X

PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐

PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐

OTHER (SPECIFY PURPOSE BELOW) ☐

We have many on-going costs to be included, although they are not always annual. We typically replace firing tubes (in 2022 the cost was $381) and these costs are unknown until after each year's event. We spent $1,000 more for the display in 2023 than 2022 and already expect a 5-10% increase in the cost of fireworks. Mr. Hardersen's training is in a 3-year cycle.

SIGNATURE OF ORGANIZATION REPRESENTATIVE DATE

Valerie J Daily

Valerie J Daily

PRINTED NAME TITLE

Anamosa Rotary Presidi

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Application received/reviewed by the City Administrator: ☐ Yes ☐ No Date of Receipt/Review: Documentation

approved for Council submission: ☐ Yes ☐ No Date of Council Review: Notes:

Amount awarded by City Council: $ Date of Award:

Anamosa

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Grant Wood Art Festival Inc. (aka Grant Wood Art Gallery)

TAX ID NUMBER: 064878

ORGANIZATION ADDRESS: 124 E. Main St.
STREET ADDRESS

Anamosa | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: (319) 470-3337 | gpkensh@gmail.com
PHONE NUMBER | EMAIL ADDRESS

APPLICANT'S NAME: Sperfslage | William | E.
LAST | FIRST | M.I.

WHAT IS THE MISSION OF YOUR ORGANIZATION?

"Promoting an appreciation of the arts and preserving the heritage of Grant Wood and the Stone City - Anamosa historic area."

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$ ~~0~~
EQUIPMENT/MATERIALS/SUPPLIES	$ 246.00
MARKETING/ADVERTISING	$ 400.00
PROFESSIONAL SERVICES (website)	$ 239.40
OFFICE & EQUIPMENT ~~RENT/LEASE~~ (Maint + Repair)	$ 500.00
~~HONORARIA OR~~ FEES (Insurance	$ 2,552.00
FOOD PURCHASED (NOT FOR RESALE)	$ ~~0~~
TRAVEL & LODGING	$ 450.00
OTHER (Utilities)	$ 4,037.21
TOTAL ESTIMATED EXPENSES	$ 8,424.61

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	Tourism Office Rent	$ 2,100.00
INDIVIDUAL/ORGANIZATION		$
INDIVIDUAL/ORGANIZATION		$
ADMISSION/FEES		$
GRANTS		$
DONATIONS + Sale of memorabilia		$ 1,500.00
OTHER		$
TOTAL INCOME		$ 3,600.00

Anamosa

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 5,000.00

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☒
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐
- OTHER (SPECIFY PURPOSE BELOW) ☒

As noted in our Mission Statement we work to promote the Grant Wood legacy and its historic significance to the Anamosa area. In doing so, we attract many visitors to the area which has a positive impact on local businesses.

William F. Sperfslage
SIGNATURE OF ORGANIZATION REPRESENTATIVE

1/17/2024
DATE

William F. Sperfslage
PRINTED NAME

Board Chair
TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24
Notes:			
Amount awarded by City Council:	$	Date of Award:	

GRANT WOOD ART GALLERY

January 17, 2024

Mr. Jeremiah Hoyt
City Administrator
107 S. Ford St.
Anamosa, IA 52205

Dear Mr. Hoyt,

I am writing this letter on behalf of the Grant Wood Art Gallery Board of Directors to formally request our approved FY '24 funding from the Hotel/Motel funds. In review of Council Resolution 2023-05, our requested amount was $6,500, which I believe was approved by the City Council at that time. We are requesting disbursement of that amount.

If there are any follow-up questions or concerns regarding this matter, please do not hesitate to contact me and I will be happy to discuss it.

Kind Regards,

William Sperfslage
GWAG Board President

Anamosa

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Anamosa Festivals

TAX ID NUMBER: 26-3913375

ORGANIZATION ADDRESS: PO Box 13
STREET ADDRESS

Anamosa | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319 558 8296 (PHONE NUMBER) | angela@wapsi-ins.com (EMAIL ADDRESS)

APPLICANT'S NAME: Winekauf (LAST) | Angela (FIRST) | (M.I.)

WHAT IS THE MISSION OF YOUR ORGANIZATION?

Charitable purpose of promoting civic pride, historic preservation, & cultural development for the community of Anamosa, IA

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$
EQUIPMENT/MATERIALS/SUPPLIES	$
MARKETING/ADVERTISING	$ 70.00
PROFESSIONAL SERVICES/Insurance	$ 1400.00
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$ 70.00
FOOD PURCHASED (NOT FOR RESALE)	$
TRAVEL & LODGING	$
OTHER	$
TOTAL ESTIMATED EXPENSES	$ 1540.00

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION		$
INDIVIDUAL/ORGANIZATION		$
INDIVIDUAL/ORGANIZATION		$
ADMISSION/FEES		$
GRANTS		$
DONATIONS		$
OTHER		$
TOTAL INCOME		$ 0

Anamosa

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 2000

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐
- OTHER (SPECIFY PURPOSE BELOW) ☐

Offset over head expenses so we do not have to charge a fee to organizations that use our services.

2023 Projects:
Pumpkinfest, Finalization of Rotary Grant / City of Anamosa sidwalk project at Wapsi Ana Park, Anamosa Chamber of Commerce grant

Angela Winekauf
SIGNATURE OF ORGANIZATION REPRESENTATIVE

1-17-24
DATE

Angela Winekauf
PRINTED NAME

President
TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24

Notes:

Amount awarded by City Council: $ _____ Date of Award: _____

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Jones County Senior Center

TAX ID NUMBER: 42-6004230

ORGANIZATION ADDRESS: 112 N. Ford St.
STREET ADDRESS

Anamosa | Ia | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-462-4484 (PHONE NUMBER) | lisa.tallman@jonescountyiowa.gov (EMAIL ADDRESS)

APPLICANT'S NAME: Tallman (LAST) | Lisa (FIRST) | C (M.I.)

WHAT IS THE MISSION OF YOUR ORGANIZATION?

The mission of the Jones County Senior Center is to provide proper nutrition, activities, educational and health programs for seniors throughout Jones County. Home delivered meal services provide at risk frail older adults the ability to maintain their independence and improve quality of life while staying in their own homes as long as possible. Congregate meal services offer older adults healthy nutrition and the ability to socialize and remain active in the community.

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$ 119,624
EQUIPMENT/MATERIALS/SUPPLIES	$ 19,740
MARKETING/ADVERTISING	$ 500
PROFESSIONAL SERVICES	$
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$
FOOD PURCHASED (NOT FOR RESALE)	$ 75,604
TRAVEL & LODGING	$ 20,214
OTHER	$ 28,304
TOTAL ESTIMATED EXPENSES	$ 343,986

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	Heritage AAA Federal Funding	$ 93,335
INDIVIDUAL/ORGANIZATION	Managed Care Organizations State Funding	$ 25,728
INDIVIDUAL/ORGANIZATION	Voluntary Contributions	$ 114,299
ADMISSION/FEES		$
GRANTS		$
DONATIONS	Dining Dollars & Individual Donations	$ 19,700
OTHER	County and Cities Support	$ 90,924
	TOTAL INCOME	$ 343,986

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$5727

PUBLIC PURPOSE FOR REQUESTED FUNDS

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐
- OTHER (SPECIFY PURPOSE BELOW) ☒

This amount is based upon anticipated meals served in Anamosa for FY 24/25.
By providing home delivered meals to seniors in Anamosa, we not only enhance their quality of life but also enable them to remain in their own home and community.
This is also true for those that come to our dining rooms. We offer the ability to age in place.

Lisa Tallman
SIGNATURE OF ORGANIZATION REPRESENTATIVE

1/16/24
DATE

Lisa Tallman
PRINTED NAME

Director
TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24
Notes:			
Amount awarded by City Council:	$	Date of Award:	

Jones County Senior Center
112 North Ford St.
Anamosa, Iowa 52205
(319) 462-4484

January 16, 2024

Jeremiah Hoyt, City Administrator
City of Anamosa
107 S. Ford St.
Anamosa, Ia. 52205

RE: Request for financial support for operating costs of the Jones County Senior Dining Program for the fiscal year 2025 (July 1, 2024-June 30, 2025).

I am writing to you on behalf of the Jones County Senior Dining Center, which is requesting financial support in the amount of $5727.00; this will be used for premise cost –heat, lights, water etc. This amount was based on the number of meals served in Anamosa this last fiscal year and is based on a percentage of what the Program needs to help provide services to our seniors.
Meals are also served in Monticello, Olin, Oxford Junction and Wyoming; therefore we will be requesting funds from them as well.
Since we are a county wide program we will be requesting funds from the Board of Supervisors too.

The operation of the Jones County Senior Center benefits senior's throughout the county. Seniors receive nutritious noon meals in addition to the opportunity for socialization and education. Frail homebound seniors in the county receive nutritious meals delivered to their homes and are monitored on a regular basis.

We need your continued support to maintain nutritious meal options with an increasingly growing senior population.

We appreciate your assistance with funding for the program. If at any time you have any questions or concerns please contact Lisa Tallman at 462-4484.

Sincerely,

Lisa Tallman

Lisa Tallman, Program Director
Jones County Senior Center

Anamosa

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: Jones County Safe and Healthy Youth Coalition

TAX ID NUMBER: 45-3460055

ORGANIZATION ADDRESS: 110 S. Williams St.
STREET ADDRESS

Anamosa | IA | 52205
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-462-4327 x661 | jhusmann@asac.us
PHONE NUMBER | EMAIL ADDRESS

APPLICANT'S NAME: Husmann | Jennifer | L
LAST | FIRST | M.I.

WHAT IS THE MISSION OF YOUR ORGANIZATION?

Engaging our communities in efforts to promote mental wellness and reduce substance use by creating and maintaining a safe and healthy environment for youth and adults in Jones County.

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$ 24,237
EQUIPMENT/MATERIALS/SUPPLIES	$ 300
MARKETING/ADVERTISING	$ 1,691
PROFESSIONAL SERVICES	$ ---
OFFICE & EQUIPMENT RENT/LEASE	$ 1,506
HONORARIA OR FEES	$ 530
FOOD PURCHASED (NOT FOR RESALE)	$ 1,230
TRAVEL & LODGING	$ 250
OTHER	$ ---
TOTAL ESTIMATED EXPENSES	$ 29,744

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	Jones County, Iowa	$ 10,000
INDIVIDUAL/ORGANIZATION	City of Monticello	$ 3,000
INDIVIDUAL/ORGANIZATION	Cities of Olin, Cascade, Wyoming, Martelle, Morley	$ 1,350
ADMISSION/FEES		$ ---
GRANTS	JCSHYC Endowment (other small grants will be sought)	$ 2,540
DONATIONS	fundraisers, individual donations	$ 5,200
OTHER	will use fundraised money saved or decrease FTE if needed	$
	TOTAL INCOME	$ 22,090

Anamosa

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 3,000

PUBLIC PURPOSE FOR REQUESTED FUNDS

PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA	☒
PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA	☐
PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES	☐
PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES	☐
OTHER (SPECIFY PURPOSE BELOW)	☒

The Jones County Safe & Healthy Youth Coalition promotes safe and healthy alternative recreational activities for youth and families as part of our comprehensive efforts to reduce youth substance use in Anamosa and the rest of Jones County. Besides hosting/sponsoring some of these activities ourselves, we also work hard to promote the healthy and safe activities there are to do in the Anamosa area. We have helped with the Anamosa National Night Out events, as well as Better Together community block parties in the past and held our Natural High 5K at Wapsipinicon Park. We promote & have our youth help with evening & weekend fun activities that are happening like Trunk or Treat and other celebrations, and center our positive marketing campaigns shared at the schools and in the community with all the great things to do in life instead of drugs (sports, music, drama, etc.). Our youth have participated in leadership and team building activities at Camp Courageous' ropes course and other activities like just fishing at Central Park together. The Coalition promotes families taking time to have healthy fun together in the community too. The Coalition promotes local businesses when developing activities, paying for their facilities when possible. Speakers hired stay in local hotels. We are a part of the Chamber and support the businesses when purchasing food for events and lunch meetings. We promote the local businesses who pass compliance checks, pledge to reduce stigma, and host safe activities for youth.

Jennifer Husmann — SIGNATURE OF ORGANIZATION REPRESENTATIVE

1/12/24 — DATE

Jennifer Husmann — PRINTED NAME

Project Coordinator — TITLE

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Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/16/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24

Notes:

Amount awarded by City Council: $ _____ Date of Award: _____

Jones County Safe and Healthy Youth Coalition
110 S. Williams St.
Anamosa, Iowa 52205
(319) 462-4327 x661
www.jonescountycoalition.org

December 2023

Dear Anamosa City Council,

We would like to say once again how thankful we are for the generous support of our Coalition efforts! The partnership of so many across the county helps us sustain good outcomes for our youth. The Coalition does many of our Coalition activities in Anamosa as you can see with pictures on the accomplishment sheet attached.

*When the Coalition began working on underage drinking 19 years ago, 52% of Jones County's 11th graders reported binge drinking, according to the Jones County Iowa Youth Survey (IYS). In the latest IYS, 8% reported binge drinking.
*Other drug prevention was added to the Coalition work 15 years ago. Marijuana use also decreased from 16% to 5% and prescription drug misuse decreased from 9% to 1%. After a grant focused on meth prevention was received in '18, less than 1% of 11th graders reported using meth in '21, compared to a decade before when 2% reported using.
*While youth smoking decreased greatly, youth vaping skyrocketed in 2018, with 23% of 11th graders reported vaping, erasing the gains made with tobacco/nicotine prevention in the prior two decades. Thankfully, 11th grade vaping decreased back to 11% in the last survey. That is still way too many kids vaping.

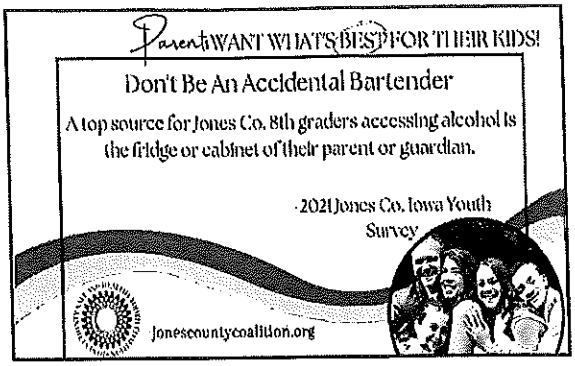
After seeing a drastic increase in suicide ideation for both our middle and high school students over the past several years, the Coalition officially added mental wellness promotion to our mission statement in 2022.
*Suicide ideation decreased between '18 and '21, but 25% (1 in 4) of 11th graders still reported thinking about suicide, and 11% even made a plan to do so. *About one in five 6th graders and a third of 8th and 11th graders reported feeling sad or hopeless. A goal of the new Coalition Resilience Action Plan developed in early 2023, was to get student advocacy groups started again in two of the three school districts that didn't have them. With the support of the Coalition, a middle school/high school student advocacy group called **HOPE** was started at Midland in May. The youth named the group themselves. HOPE stands for "Helping Others Persevere Every day!" They are already doing amazing things this school year!

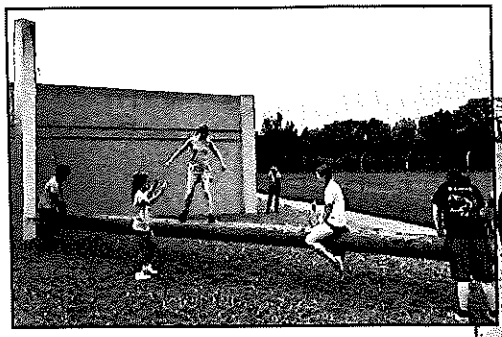
Please help us continue our youth prevention efforts. The Coalition could not have continued our efforts this year without all the local support. We received another small grant this fall to build a Resiliency Zone for youth in Jones County for youth and families. We are in the second year of a small 4-year grant to reduce underage drinking. We need the community support to sustain our efforts. **We are again requesting $3000 at this time to be used to continue our work with the county's youth** through our youth advisory committee, BEASTS (Being Excellent and Staying Totally Safe) and support to build and sustain the other student advocacy groups. BEASTS not only advises the Coalition on trends and ideas on what actions to take to meet the needs of youth, but they also create marketing campaigns for youth and participate in many other coalition activities. In the long run, the preventative work of the Coalition saves money in our communities. We have **had Anamosa students involved in BEASTS, but they need their own high school group again and that is a priority for** us this year.

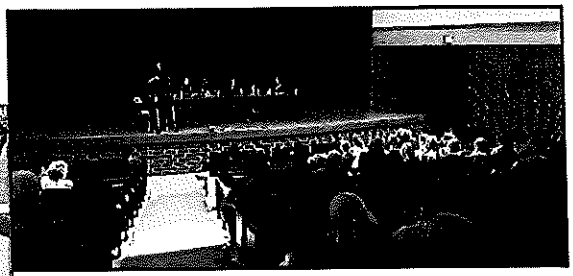
Please join us in supporting this life-saving work. We are striving to protect the most vital resource in our community, our youth. If you would like more information or to have a presentation at an upcoming meeting, please feel free to contact me or Jennifer Husmann at 319-462-4327 x661. We thank you again for your time and support.

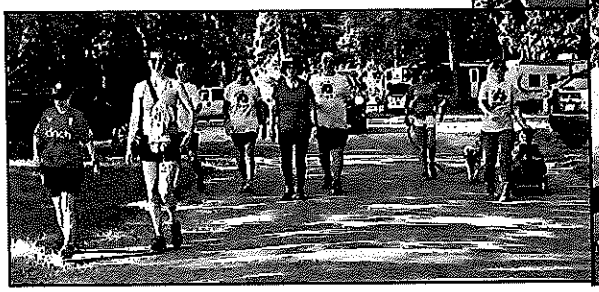
Sincerely,

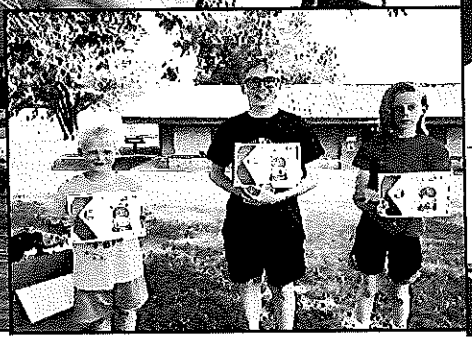
Nick Brokaw, President of the Jones County Safe and Healthy Youth Coalition











Just a few of our accomplishments this past year

- Youth Advisory group, BEASTS (Being Excellent and Staying Totally Safe) helped with creating a new underage drinking campaign for youth, worked on another natural high campaign, as well as participated in Christmas City in Wyoming, the Coalition Garage Sale and Purse Sale Fundraisers, Trunk or Treat, and more!
- A new student advocacy group at Midland Middle/High School was formed with support from the Coalition. The group is called HOPE (Helping Others Persevere Everyday). They chalked the walk during May Mental Health Awareness Month and held an event this fall, "Spike Out the Stigma" with resources for youth during a school volleyball game.
- Monticello HS SODA group members participated in coalition panels on mental health and substance use, the state prevention conference, county compliance checks, and more great work to help their school peers and community.
- Coalition members helped plan the National Night Out (NNO) events with the Anamosa PD including a health fair, meal, face painting, and games, and participated at the Cascade's NNO too.
- A Project SAFE event was held at Monticello High School with panel of youth & experts on Mental Health Suicide Awareness & Prevention. A similar event, "Talk. We Hear You." was held at the Anamosa High School, including an alcohol and drug prevention panel with meals, resource fairs, and four college scholarships awarded.
- BEASTS members attended the Iowa Alliance of Coalitions for Change Leadership Reaction Ropes Course at Camp Dodge with youth from across the state.
- "What's Your Natural High? 5K event was held, promoting healthy activities to enjoy life to the fullest.
- Two New Underage Drinking Prevention campaigns for parents were developed and promoted with local data and messages as well as the national campaign, "Talk. They Hear You." utilizing social media, a billboard, clear bags to take to fairs/concerts, and new postcards to distribute at community events and places throughout the community.
- Ten Responsible Beverage Service trainings were held in Anamosa and Monticello, as well as QPR (Question, Persuade, and Refer- Suicide Prevention) trainings.

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

ORGANIZATION NAME: IOWA STATE UNIVERSITY EXTENSION / JONES COUNTY EXTENSION

TAX ID NUMBER:

ORGANIZATION ADDRESS: 800 N. MAPLE ST. PO Box 26
STREET ADDRESS

MONTICELLO | IA | 52310
CITY | STATE | ZIP CODE

CONTACT INFORMATION: 319-465-3224 (PHONE NUMBER) | luckstea@iastate.edu (EMAIL ADDRESS)

APPLICANT'S NAME: LUCKSTEAD (LAST) | JACKI (FIRST) | (M.I.)

WHAT IS THE MISSION OF YOUR ORGANIZATION?

N/A - See Attached Letter

TOTAL ESTIMATED EXPENSES BY CATEGORY

SALARY/WAGES	$
EQUIPMENT/MATERIALS/SUPPLIES	$
MARKETING/ADVERTISING	$
PROFESSIONAL SERVICES	$
OFFICE & EQUIPMENT RENT/LEASE	$
HONORARIA OR FEES	$
FOOD PURCHASED (NOT FOR RESALE)	$
TRAVEL & LODGING	$
OTHER	$
TOTAL ESTIMATED EXPENSES	$

INCOME FROM OTHER SOURCES

INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
INDIVIDUAL/ORGANIZATION	$
ADMISSION/FEES	$
GRANTS	$
DONATIONS	$
OTHER	$
TOTAL INCOME	$

Anamosa
IOWA

Hotel/Motel Grant Application – 2024/2025

FUNDS REQUESTED FROM THE CITY OF ANAMOSA HOTEL/MOTEL GRANT PROGRAM:	$ 500.00

PUBLIC PURPOSE FOR REQUESTED FUNDS:

- PROMOTE RECREATION WITHIN THE CITY OF ANAMOSA ☑
- PROMOTE TOURISM WITHIN THE CITY OF ANAMOSA ☐
- PROMOTE ECONOMIC DEVELOPMENT – NEW BUSINESSES ☐
- PROMOTE ECONOMIC DEVELOPMENT – EXISTING BUSINESSES ☐
- OTHER (SPECIFY PURPOSE BELOW) ☑

SEE ATTACHED LETTER

SIGNATURE OF ORGANIZATION REPRESENTATIVE — DATE

PRINTED NAME — TITLE

Copied by [illegible]

For office use only

Application received/reviewed by the City Administrator:	☑ Yes ☐ No	Date of Receipt/Review:	01/17/24
Documentation approved for Council submission:	☑ Yes ☐ No	Date of Council Review:	01/22/24

Notes:

Amount awarded by City Council: $ _____ Date of Award: _____

IOWA STATE UNIVERSITY
University Extension

Jones County Extension
800 N. Maple St., PO Box 28
Monticello, IA 52310
319 465-3224
319 465-3312 fax

December 13, 2023

Anamosa City Hall
Attn: Michon Jackson
107 S. Ford Street
Anamosa, Iowa 52205

Dear Council Members,

Jones County Extension & Outreach is proud to be able to offer opportunities for Jones County youth that spark curiosity and engage critical thinking. We will be offering Summer Discovery Camps for youth, Kindergarten through 5th grade. Summer Discovery Camp 2024 will have the theme "Growing in the Garden!"

Iowa State University Extension and Outreach has offered Summer Discovery Camps in Jones County since 2006. Jones County Extension and Outreach staff lead youth to have the opportunity to experience a high-quality learning environment. Summer Discovery Camp will be 2 days, 9-3, in each community in Jones County. Youth will bring their own lunch, 2 snack times will be provided.

Jones County Extension & Outreach is committed to providing STEM opportunities to our youth at a reasonable price. Summer Discovery camps registration will be $30 per youth in summer 2024. Registration fees contribute to the cost of the camp supplies, snacks, staff, and mileage.

Salary cost: 2 summer staff = $300/per 20 youth
Supply cost: = $ 338/per 20 youth
$ 639.00/per 20 youth

Total /per participant = $38.34

We are requesting funding, $500, from the City of Anamosa to assist with the cost of this program.

Thank you for your consideration of funding this program. Summer Discovery camps are offered during the month of June in various locations throughout Jones County. The schedule of Summer Discovery Camps has not yet been determined.

Thank you for your support for Summer Discovery Camps in Anamosa.

Sincerely,
Jacki Luckstead
Jacki Luckstead
Youth Program Specialist
Iowa State University Extension

Memorandum

To: City of Anamosa **Date:** January 17, 2024

From: Snyder & Associates, Inc.

RE: Monthly Engineer Update

WWTP Flow Equalization Basin

The City is awaiting the potential award of CDBG funding to supplement this project.

Potential Letting Schedule

Tentative CDBG Award	January 2024
Tentative CDBG Authorization to Bid	June 2024
File Plans, Specs, and Form of Contract	June 2024
Bid Letting	July 2024

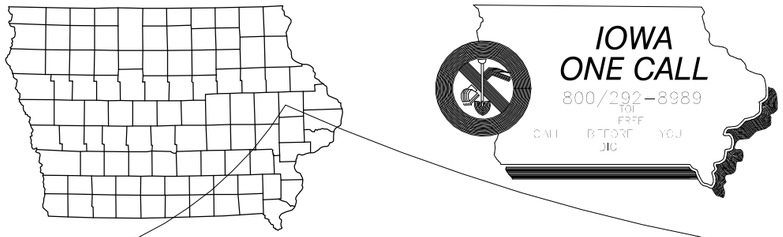
2nd Street Lift Station – Phase 2

This project construction remains on hold until Spring.

Old Dubuque Road Extension and Roundabout

The project is completed and close-out documentation with DOT is on-going. A final change order is still being worked out with the contractor to rectify the final constructed quantities.

WASTEWATER TREATMENT PLANT IMPROVEMENTS
ANAMOSA, IOWA
2023



CITY OFFICIALS

MAYOR	ROD SMITH
CITY ADMINISTRATOR	JEREMIAH HOYT
CITY CLERK	PENNY LODE
WASTEWATER SUPERINTENDENT	STEVE AGNITSCH

CITY COUNCIL

KAY SMITH
BROOKE GOMBERT
TERESA TUETKEN
RICH CRUMP
JEFF STOUT
ALAN ZUMBACH

GENERAL NOTES

1. UTILITY FACILITIES SHOWN ARE FROM LOCATES OR RECORDS PROVIDED BY OTHERS AND SHALL BE CONSIDERED APPROXIMATE. OTHER UTILITIES MAY EXIST, EITHER IN SERVICE OR ABANDONED, AND THEIR LOCATION MAY NOT BE PRESENTLY KNOWN OR IDENTIFIED ON THE DRAWINGS. THE ENGINEER MAKES NO GUARANTEE THAT THE UTILITIES SHOWN COMPRISE ALL UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE ENGINEER FURTHER DOES NOT WARRANT THAT THE UTILITIES SHOWN ARE IN THE LOCATION INDICATED. THE CONTRACTOR SHALL DETERMINE THE EXACT LOCATION OF ALL UTILITIES LOCATED WITHIN THE CONSTRUCTION AREA BY ANY MEANS NECESSARY TO AVOID DAMAGE. DAMAGE TO UTILITIES AND/OR CONSTRUCTION DELAYS DUE TO THE CONTRACTOR'S ACTIONS SHALL BE REPAIRED OR REPLACED WITHOUT COST TO THE OWNER OR ENGINEER. PAST WASTEWATER PLANT DRAWINGS MAY BE MADE AVAILABLE UPON REQUEST. WHERE EXISTING UTILITY FACILITIES ARE SHOWN IN THE PLANS OR ENCOUNTERED WITHIN THE CONSTRUCTION AREA, THE CONTRACTOR SHALL NOTIFY UTILITY COMPANY PRIOR TO BEGINNING CONSTRUCTION ACTIVITIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR NOTIFYING UTILITIES AND CONDUCTING WORK NEAR UTILITY FACILITIES.
2. CONTRACTOR SHALL RELOCATE ALL UTILITIES AS REQUIRED FOR INSTALLATION OF PROPOSED STRUCTURES AND PIPING.
3. CONTRACTOR SHALL BE RESPONSIBLE TO FIELD VERIFY EXISTING LOCATIONS FOR PROCESS PIPING AND UTILITIES.
4. REMOVALS OF ABANDONED UTILITIES THAT ARE SHOWN ON THE PLANS AND ENCOUNTERED DURING TRENCH EXCAVATION SHALL BE INCIDENTAL AND SHALL BE COMPLETED BY THE CONTRACTOR.

* SELECT PLAN SHEETS WERE PRODUCED IN COLOR AND SHOULD BE PRINTED AS SUCH TO AVOID MISREPRESENTATIONS OR MISUNDERSTANDINGS.

LICENSED PROFESSIONAL ENGINEER
JONATHAN D. CONTAG
P26824
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

12/7/2023
JONATHAN D. CONTAG — Date
License Number P26824
My license renewal date is December 31, 2024
Pages or sheets covered by this seal:
Drawings 00.T000 thru 00.T002, 00.P001 thru 60.P100

LICENSED PROFESSIONAL ENGINEER
MICHAEL R. SHIMKUS
P23490
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

12/7/2023
MICHAEL R. SHIMKUS, P.E. — Date
License Number P23490
My license renewal date is December 31, 2023
Pages or sheets covered by this seal:
Drawings 00.S001 thru 60.S300

LICENSED PROFESSIONAL ENGINEER
ROBERT FLAAEN
P18803
IOWA

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

12/7/2023
ROBERT FLAAEN, P.E. — Date
License Number P18803
My license renewal date is December 31, 2023
Pages or sheets covered by this seal:
Drawings 00.EM001 thru 60.EM101, 00.I001 thru 40.I101

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MASON CITY, IA 50402
PHONE: (641)-423-8271
WWW.WHKS.COM

WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

TITLE

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

00.T000

- QUICK COUPLING
- DRAIN
- CAP
- NEEDLE VALVE
- PLUG VALVE
- CHECK VALVE
- PINCH VALVE
- BALL VALVE
- DIAPHRAM VALVE
- UNION
- ORIFACE PLATE
- GLOBE VALVE
- KNIFE GATE VALVE
- GATE VALVE
- PRESSURE REDUCING VALVE
- PRESSURE RELIEF VALVE
- MAGNETIC FLOW METER
- ROTO METER
- ROTOMETER
- HEAT EXCHANGER
- FLUME
- WEIR
- VENTURI TUBE
- RUPTURE DISK
- CENTRIFUGAL PUMP
- RECIRCULATION PUMP
- FAN
- MOTOR

PROCESS SCHEMATIC SYMBOLS

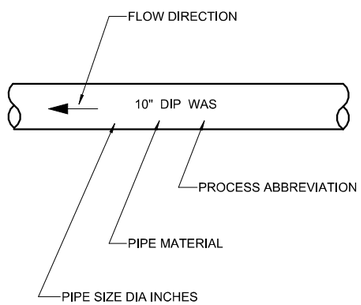
ALP	AIR - LOW PRESSURE
AHP	AIR - HIGH PRESSURE
BWS	BACK WASH SUPPLY
BYP	BYPASS
D	DRAIN
DS	DIGESTED SLUDGE
FCE	FINAL CLARIFIER EFFLUENT
FCI	FINAL CLARIFIER INFLUENT
FE	FILTER EFFLUENT
FEQ	FLOW EQUALIZATION
FM	FORCE MAIN
EQI	EQUALIZATION INFLUENT
EQR	EQUALIZATION RETURN
GR	GRIT
GRS	GRIT SUPPLY
GTS	GRAVITY THICKENED SLUDGE
NPW	NON-POTABLE WATER
OF	OVERFLOW
PCI	PRIMARY CLARIFIER INFLUENT
PD	PROCESS DRAIN
PE	PRIMARY EFFLUENT
PI	PRIMARY INFLUENT
PLE	PLANT EFFLUENT
PLI	PLANT INFLUENT
PSD	PRIMARY SLUDGE
RAS	RETURN ACTIVATED SLUDGE
RWW	RAW WASTEWATER
SAN	SANITARY
SCE	SOLIDS CONTACT EFFLUENT
SCI	SOLIDS CONTACT INFLUENT
SE	SECONDARY EFFLUENT
SI	SECONDARY INFLUENT
SL	SLUDGE
SPN	SUPERNATANT
V	VENT
WAS	WASTE ACTIVATED SLUDGE

PROCESS ABBREVIATIONS

SYMBOL	VALVE TYPE	ABBREVIATION
	BALL VALVE	BV
	BUTTERFLY VALVE	BFV
	CHECK VALVE	CV
	GATE VALVE	GV
	MAGNETIC FLOW METER	MM
	PLUG VALVE	PV

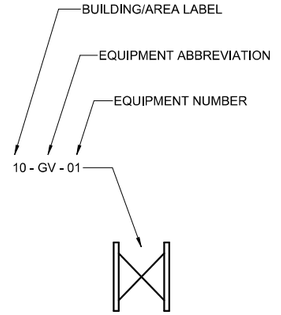
EQIUPMENT SYMBOLS AND ABBREVIATIONS

EXAMPLE:



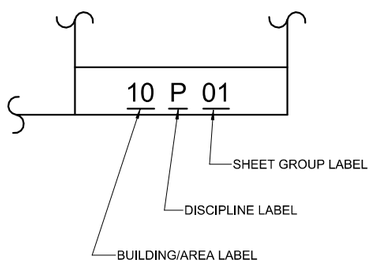
PIPE LABELS

EXAMPLE:



VALVE AND EQUIPMENT LABELS

EXAMPLE:



SHEET NUMBERING SYSTEM

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MASON CITY, IA 50402
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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

SYMBOLS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

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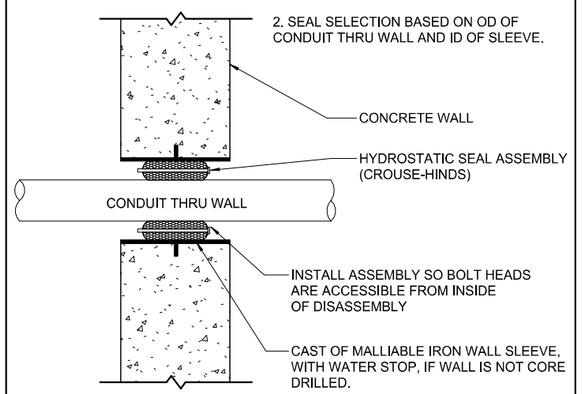
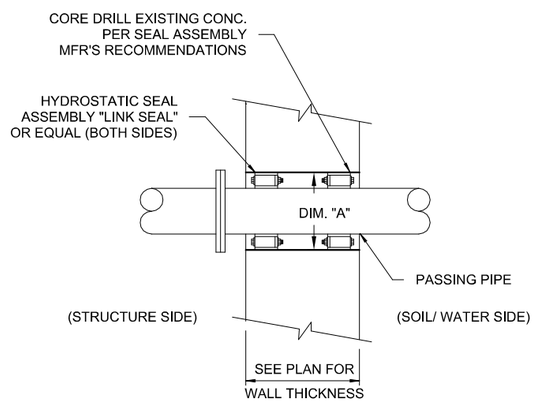
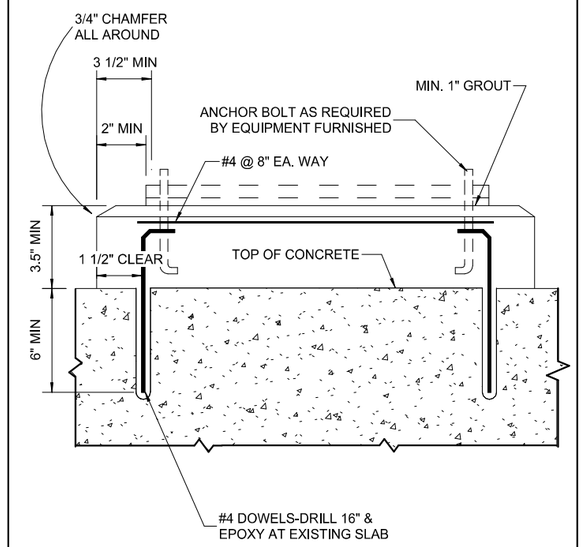


whks	CONDUIT EXTERIOR WALL PENETRATION	REVISED: 07/25/23 SHEET: 1 OF 1 PLATE NO.: 5x36



whks	LINK SEAL DETAIL	REVISED: 07/05/23 SHEET: 1 OF 1 PLATE NO.: 5x18



whks	EQUIPMENT BASE DETAIL	REVISED: 07/05/23 SHEET: 1 OF 1 PLATE NO.: 5x7

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

MISC PROCESS DETAILS

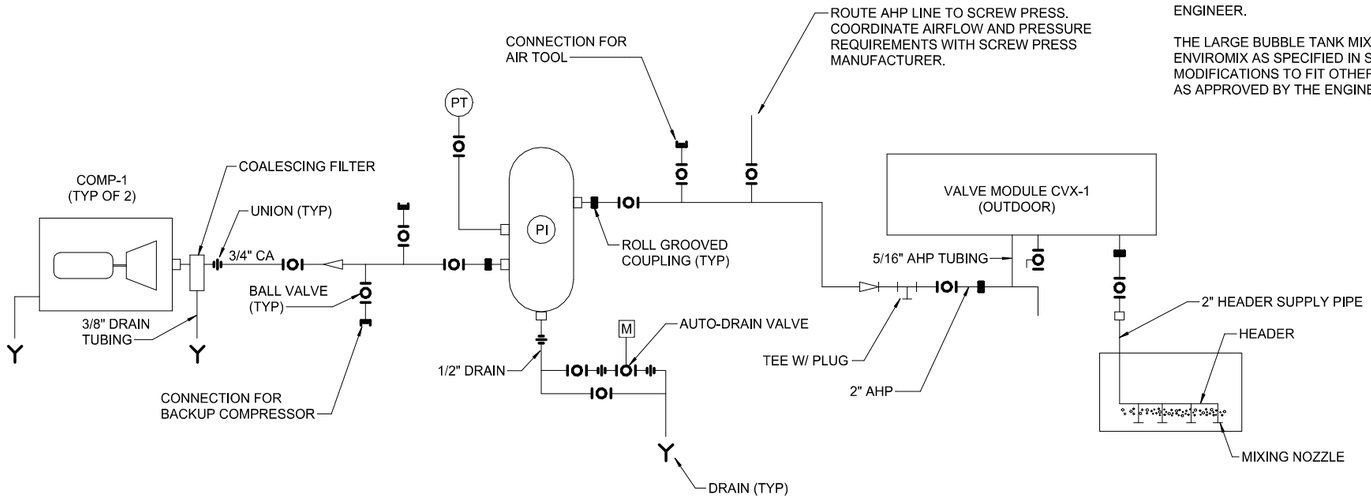
PROJECT NUMBER	**9433.1**
DATE	**12/07/2023**
DRAWN BY	**JAK**
DESIGN BY	**JDC**
CHECKED BY	**KG**

00.T002

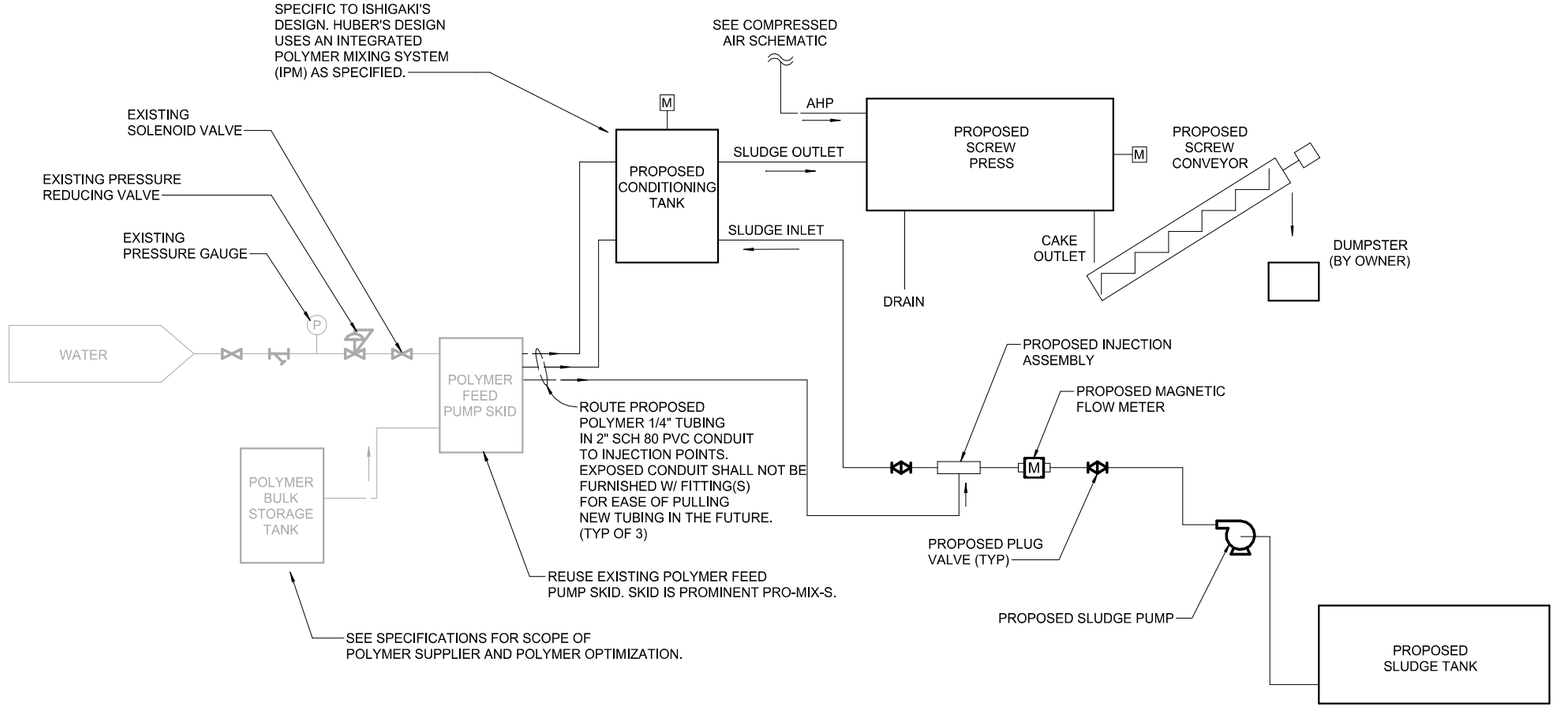
NOTES:

THE SCREW PRESS EQUIPMENT LAYOUT SHOWN HEREIN IS BASED ON MANU FACTURERS AS SPECIFIED IN SECTION 11150. ANY PIPING AND/OR EQUIPMENT MODIFICATIONS TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.

THE LARGE BUBBLE TANK MIXING EQUIPMENT LAYOUT SHOWN HEREIN IS BASED ON ENVIROMIX AS SPECIFIED IN SECTION 11400. ANY PIPING AND/OR EQUIPMENT MODIFICATIONS TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.



COMPRESSED AIR SCHEMATIC



SLUDGE AND POLYMER FEED SCHEMATIC

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

SCHEMATIC

PROJECT NUMBER	9433.1
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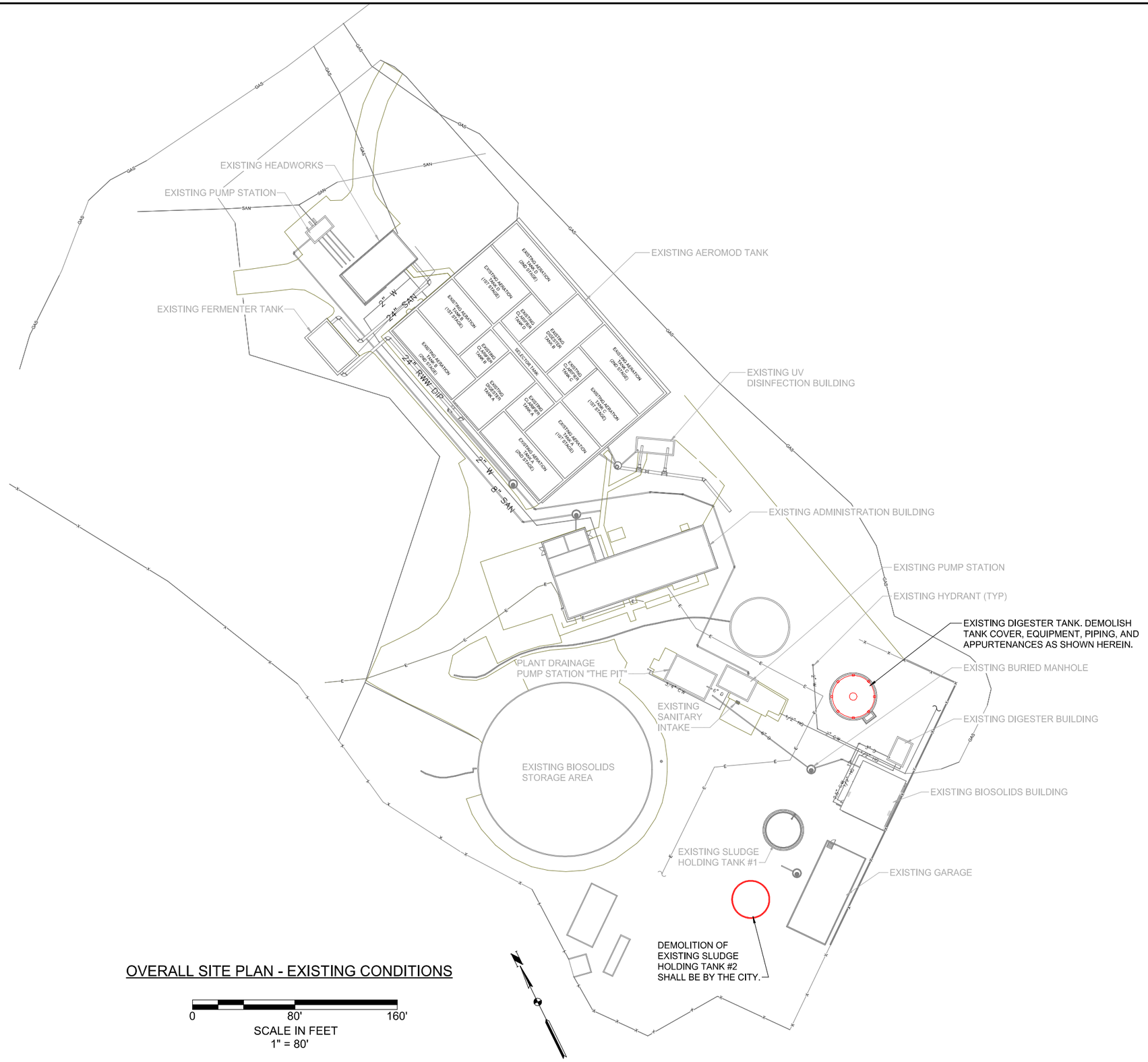

OVERALL SITE PLAN - EXISTING CONDITIONS

0 80' 160'

SCALE IN FEET
1" = 80'

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WASTEWATER TREATMENT PLANT

ANAMOSA, IOWA

CITY OF ANAMOSA

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING OVERALL SITE PLAN CONDITIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

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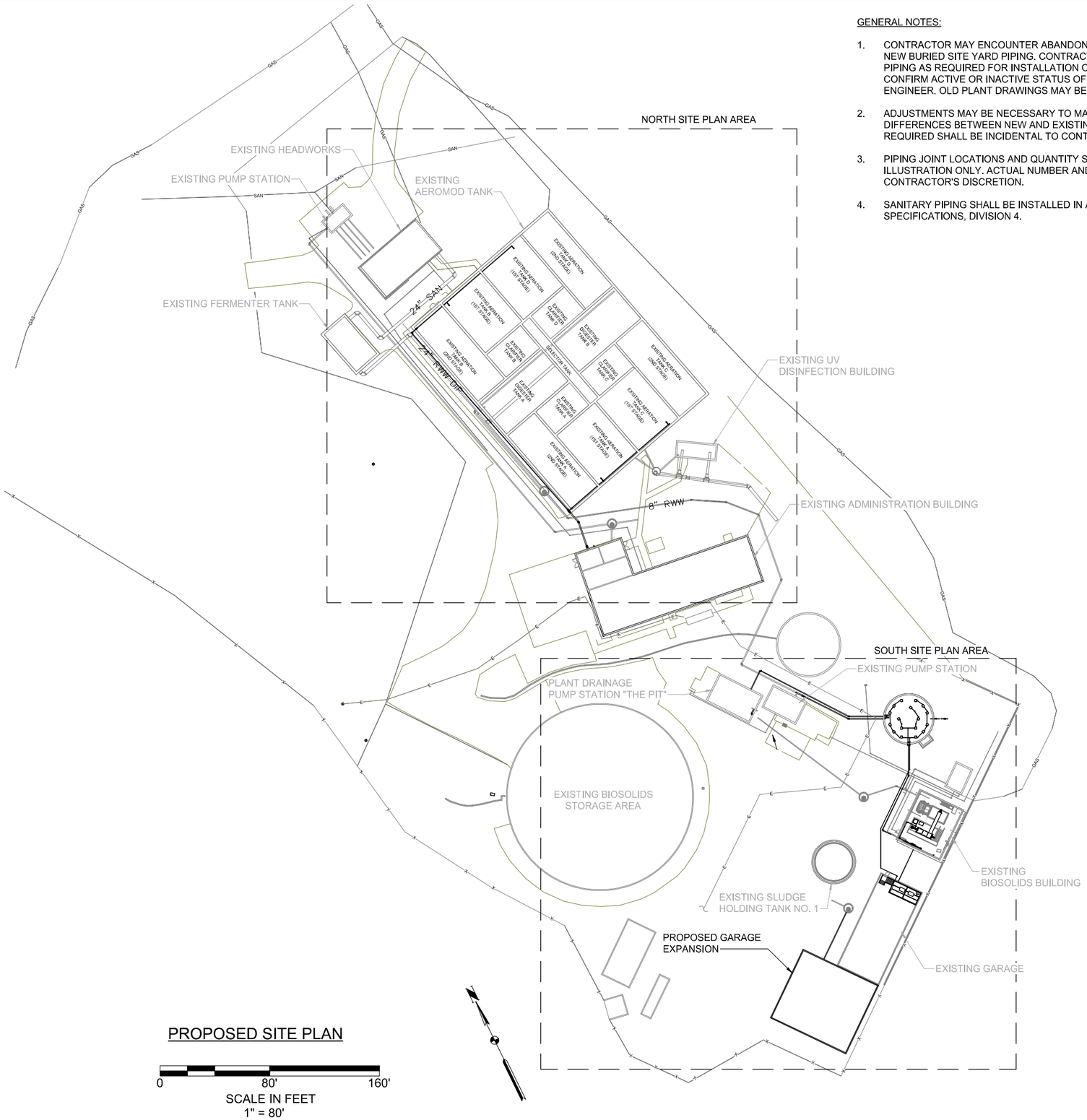

PROPOSED SITE PLAN

0 80' 160'

SCALE IN FEET
1" = 80'

GENERAL NOTES:

1. CONTRACTOR MAY ENCOUNTER ABANDONED PIPING DURING INSTALLATION OF NEW BURIED SITE YARD PIPING. CONTRACTOR SHALL DEMOLISH ABANDONED PIPING AS REQUIRED FOR INSTALLATION OF YARD PIPING. CONTRACTOR SHALL CONFIRM ACTIVE OR INACTIVE STATUS OF ALL EXISTING BURIED PIPING WITH ENGINEER. OLD PLANT DRAWINGS MAY BE AVAILABLE TO BIDDERS.
2. ADJUSTMENTS MAY BE NECESSARY TO MAKE UP ANY LOCATION OR ELEVATION DIFFERENCES BETWEEN NEW AND EXISTING PIPING. ANY ADDITIONAL FITTINGS REQUIRED SHALL BE INCIDENTAL TO CONTRUCTION.
3. PIPING JOINT LOCATIONS AND QUANTITY SHOWN ARE APPROXIMAE AND ARE FOR ILLUSTRATION ONLY. ACTUAL NUMBER AND LOCATION OF PIPING JOINTS SHALL BE AT CONTRACTOR'S DISCRETION.
4. SANITARY PIPING SHALL BE INSTALLED IN ACCORDANCE WITH SUDAS SPECIFICATIONS, DIVISION 4.

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WASTEWATER TREATMENT PLANT
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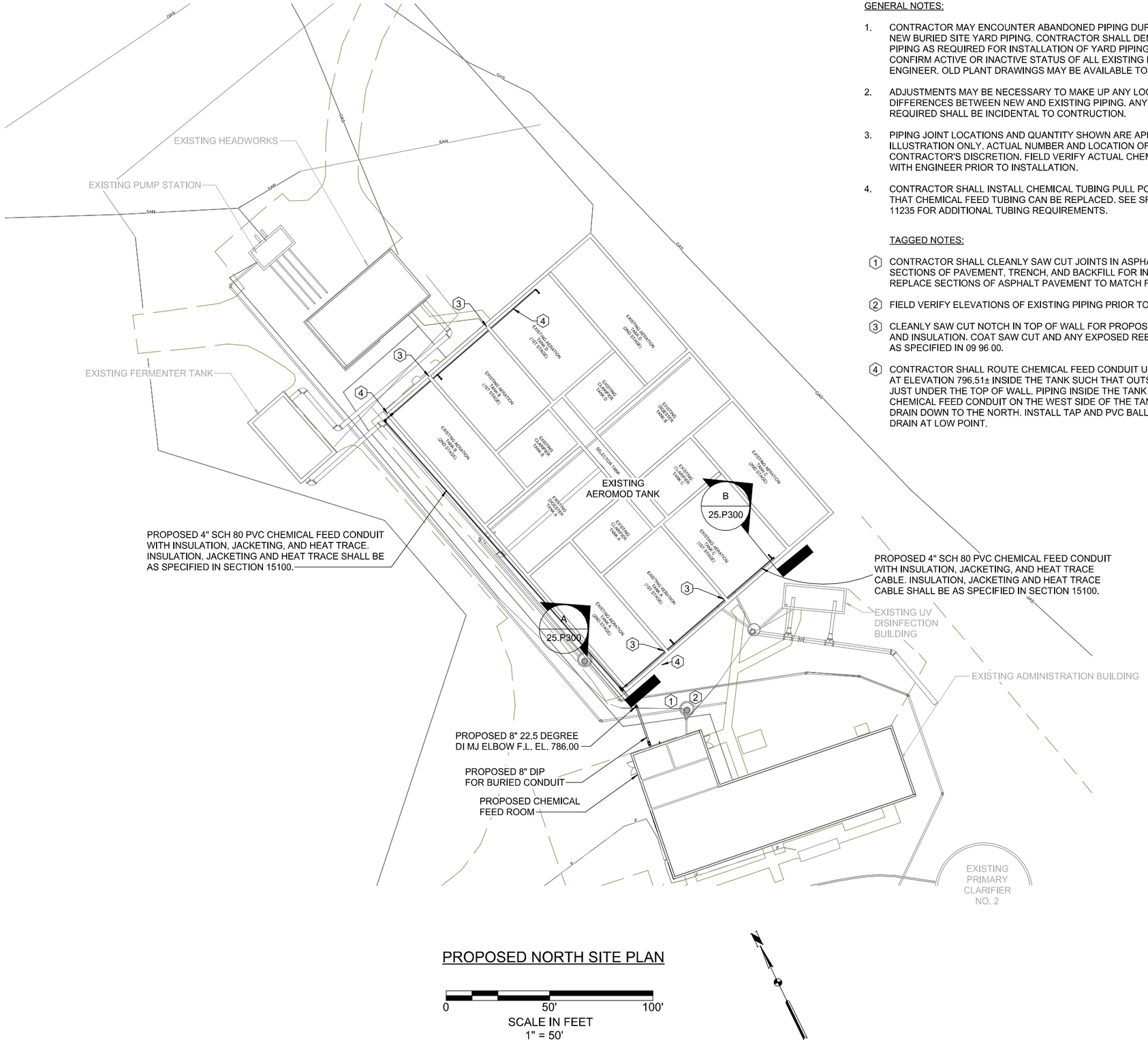
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED SITE PLAN

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

00.P101



PROPOSED NORTH SITE PLAN

0 50' 100'

SCALE IN FEET
1" = 50'

GENERAL NOTES:

1. CONTRACTOR MAY ENCOUNTER ABANDONED PIPING DURING INSTALLATION OF NEW BURIED SITE YARD PIPING. CONTRACTOR SHALL DEMOLISH ABANDONED PIPING AS REQUIRED FOR INSTALLATION OF YARD PIPING. CONTRACTOR SHALL CONFIRM ACTIVE OR INACTIVE STATUS OF ALL EXISTING BURIED PIPING WITH ENGINEER. OLD PLANT DRAWINGS MAY BE AVAILABLE TO BIDDERS.
2. ADJUSTMENTS MAY BE NECESSARY TO MAKE UP ANY LOCATION OR ELEVATION DIFFERENCES BETWEEN NEW AND EXISTING PIPING. ANY ADDITIONAL FITTINGS REQUIRED SHALL BE INCIDENTAL TO CONTRUCTION.
3. PIPING JOINT LOCATIONS AND QUANTITY SHOWN ARE APPROXIMAE AND ARE FOR ILLUSTRATION ONLY. ACTUAL NUMBER AND LOCATION OF PIPING JOINTS SHALL BE AT CONTRACTOR'S DISCRETION. FIELD VERIFY ACTUAL CHEMICAL FEED PIPE ROUTING WITH ENGINEER PRIOR TO INSTALLATION.
4. CONTRACTOR SHALL INSTALL CHEMICAL TUBING PULL POINTS EVERY 35 FT SUCH THAT CHEMICAL FEED TUBING CAN BE REPLACED. SEE SPECIFICATION SECTION 11235 FOR ADDITIONAL TUBING REQUIREMENTS.

TAGGED NOTES:

1. CONTRACTOR SHALL CLEANLY SAW CUT JOINTS IN ASPHALT PAVEMENT, REMOVE SECTIONS OF PAVEMENT, TRENCH, AND BACKFILL FOR INSTALLATION OF BURIED DIP, REPLACE SECTIONS OF ASPHALT PAVEMENT TO MATCH FLUSH WITH EXISTING.
2. FIELD VERIFY ELEVATIONS OF EXISTING PIPING PRIOR TO INSTALLING NEW PIPING.
3. CLEANLY SAW CUT NOTCH IN TOP OF WALL FOR PROPOSED 4" CHEMICAL FEED PIPING AND INSULATION. COAT SAW CUT AND ANY EXPOSED REBAR WITH COATING PRODUCT AS SPECIFIED IN 09 96 00.
4. CONTRACTOR SHALL ROUTE CHEMICAL FEED CONDUIT UP AND OVER WALL AND RUN AT ELEVATION 796.51± INSIDE THE TANK SUCH THAT OUTSIDE EDGE OF INSULATION JUST UNDER THE TOP OF WALL. PIPING INSIDE THE TANK SHALL BE RUN FLAT. CHEMICAL FEED CONDUIT ON THE WEST SIDE OF THE TANK SHALL BE SLOPED TO DRAIN DOWN TO THE NORTH. INSTALL TAP AND PVC BALL VALVE FOR CONDENATE DRAIN AT LOW POINT.

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED NORTH SITE PLAN

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

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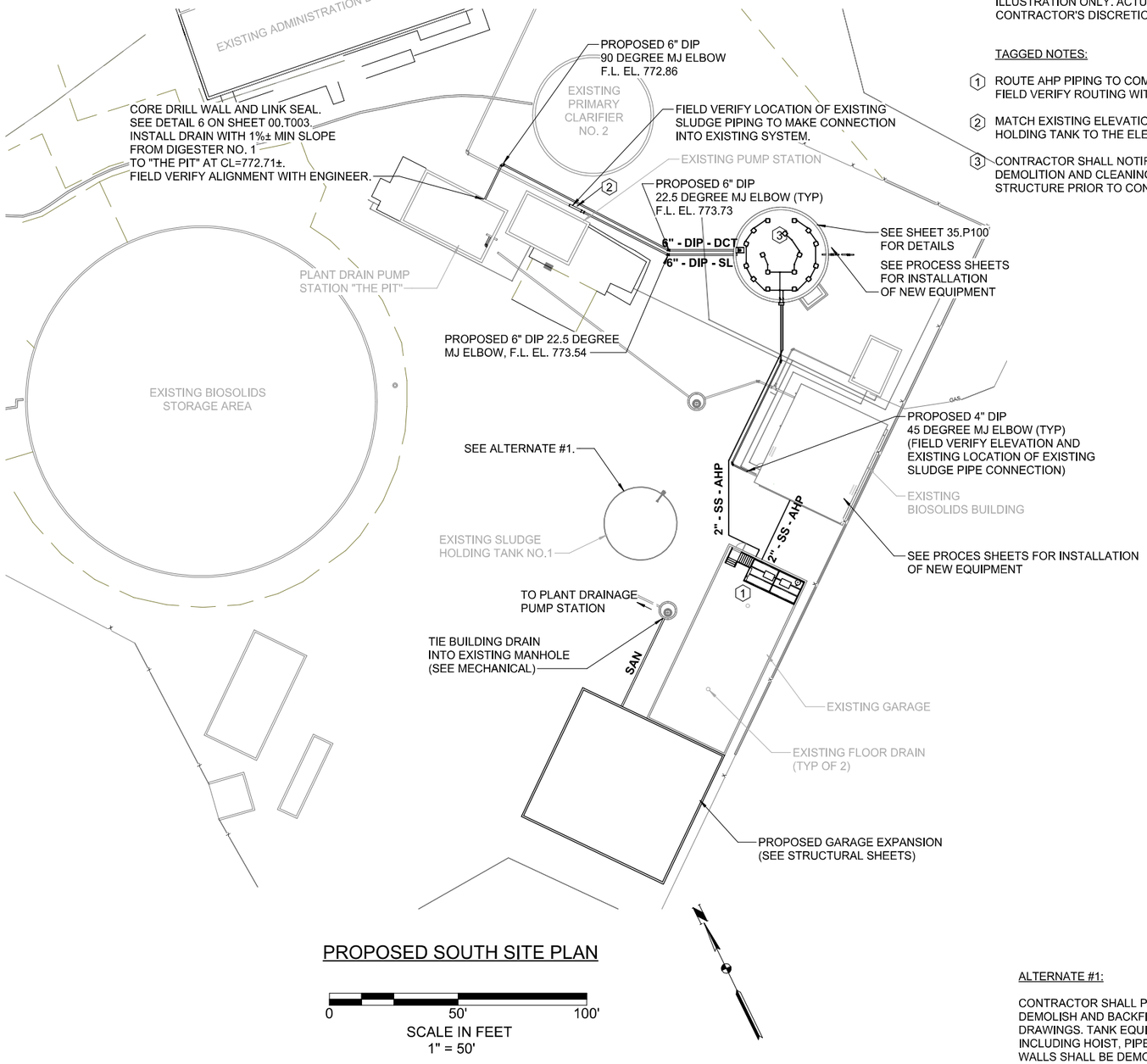

PROPOSED SOUTH SITE PLAN

0 50' 100'

SCALE IN FEET
1" = 50'

GENERAL NOTES:

1. CONTRACTOR MAY ENCOUNTER ABANDONED PIPING DURING INSTALLATION OF NEW BURIED SITE YARD PIPING. CONTRACTOR SHALL DEMOLISH ABANDONED PIPING AS REQUIRED FOR INSTALLATION OF YARD PIPING. CONTRACTOR SHALL CONFIRM ACTIVE OR INACTIVE STATUS OF ALL EXISTING BURIED PIPING WITH ENGINEER. OLD PLANT DRAWINGS MAY BE AVAILABLE TO BIDDERS.
2. ADJUSTMENTS MAY BE NECESSARY TO MAKE UP ANY LOCATION OR ELEVATION DIFFERENCES BETWEEN NEW AND EXISTING PIPING. ANY ADDITIONAL FITTINGS REQUIRED SHALL BE INCIDENTAL TO CONTRUCTION.
3. PIPING JOINT LOCATIONS AND QUANTITY SHOWN ARE APPROXIMAE AND ARE FOR ILLUSTRATION ONLY. ACTUAL NUMBER AND LOCATION OF PIPING JOINTS SHALL BE AT CONTRACTOR'S DISCRETION.

TAGGED NOTES:

(1) ROUTE AHP PIPING TO COMPRESSED AIR SYSTEM CONDUIT ALONG WALLS. FIELD VERIFY ROUTING WITH ENGINEER.

(2) MATCH EXISTING ELEVATION AND SLOPE PIPE DOWN TO PROPOSED SLUDGE HOLDING TANK TO THE ELEVATION AS NOTED ON THE DRAWINGS.

(3) CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY UPON COMPLETION OF DEMOLITION AND CLEANING OF THE OLD DIGESTER TANK TO OBSERVE TANK STRUCTURE PRIOR TO CONTINUING WORK.

ALTERNATE #1:

CONTRACTOR SHALL PROVIDE A LUMP SUM PRICE ON THE PROPOSAL FORM TO DEMOLISH AND BACKFILL THE SLUDGE HOLDING TANK #1 AS NOTED ON THE DRAWINGS. TANK EQUIPMENT SHALL BE REMOVED AND DISPOSED OF INCLUDING HOIST, PIPE/FITTINGS, PUMP, GUIDERAILS, HANDRAILS, ETC. TANK WALLS SHALL BE DEMOLISHED TO 7 FT BELOW GRADE.

TOP OF WALL IS 781.50 +/- AND TOP OF SLAB IS 769.00 +/-. NINE (9) EQUALLY SPACED 18" +/- DIAMETER HOLES SHALL BE CORED/DRILLED THROUGH TANK SLAB PRIOR TO BACKFILLING. BACKFILL AND COMPACTION SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS.

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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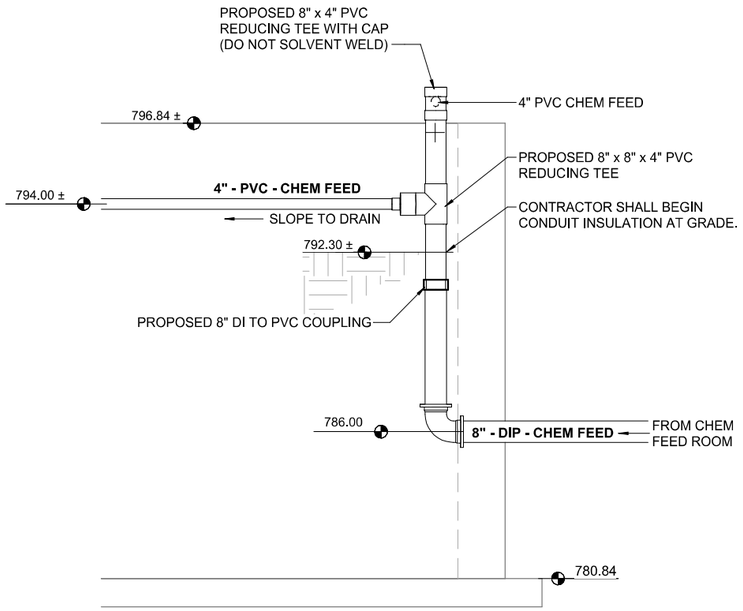
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED SOUTH SITE PLAN

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

00.P103

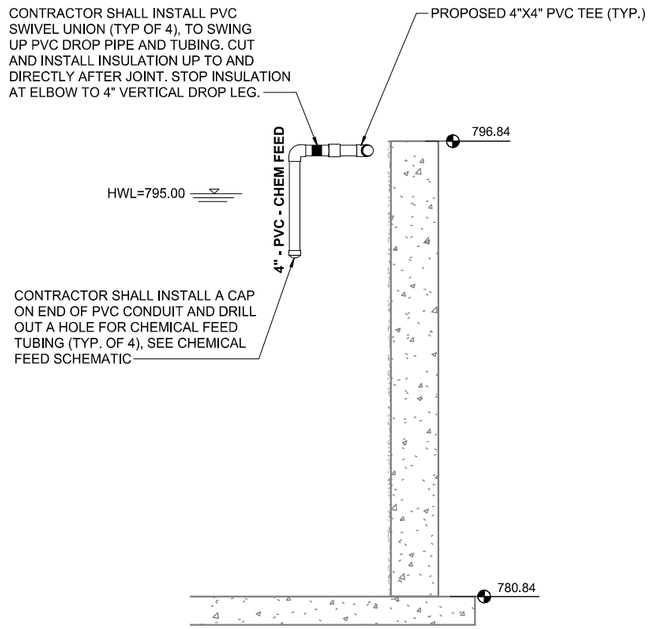


A
00.P102

SECTION A

0 4' 8' 12'

SCALE IN FEET
3/16" = 1'



B
00.P102

SECTION B (TYP OF 4)

0 4' 8' 12'

SCALE IN FEET
3/16" = 1'

SHEET NOTES:

1. ALL PVC PIPE AND FITTINGS ABOVE GRADE SHALL BE SCHEDULE 80 PVC UNLESS OTHERWISE NOTED.
2. CONTRACTOR SHALL SUPPORT ALL PVC PIPING ALONG WALLS OF TANK.
3. ALL ABOVE GRADE PVC CONDUIT SHALL BE INSULATED, JACKETED, AND HEAT TRACE CABLE. SEE SPECIFICATIONS.
4. SOLVENT WELD ALL PVC JOINTS UNLESS OTHERWISE NOTED.
5. CONTRACTOR SHALL ROUTE CHEMICAL FEED CONDUIT TO AVOID CONFLICTS WITH EXISTING AIR PIPING AND PANELS. SEE PHOTOS THIS SHEET. ROUTING OF CHEMICAL FEED CONDUIT SHALL NOT INTERFERE WITH PLANT OPERATIONS AND MAINTENANCE.

PHOTO 1 - NORTH SIDE OF AEROMAD TANK

PHOTO 2 - NORTHWEST SIDE OF AEROMOD TANK

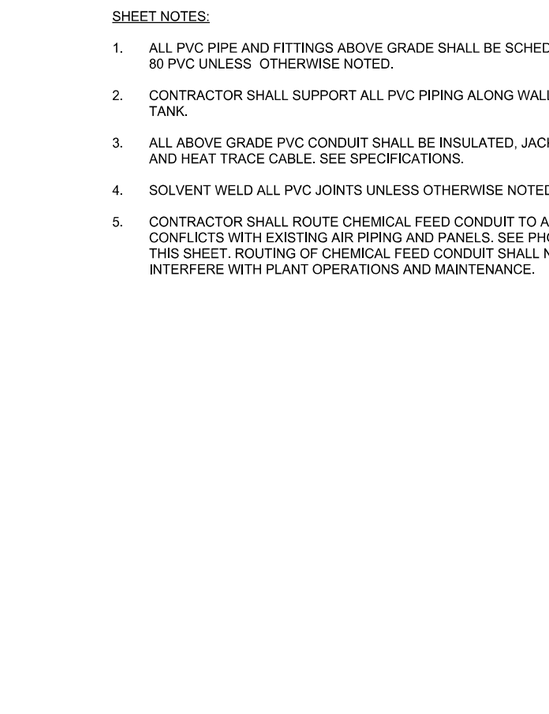


PHOTO 3 - SOUTH SIDE OF AEROMOD TANK

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED CHEMICAL FEED SECTIONS

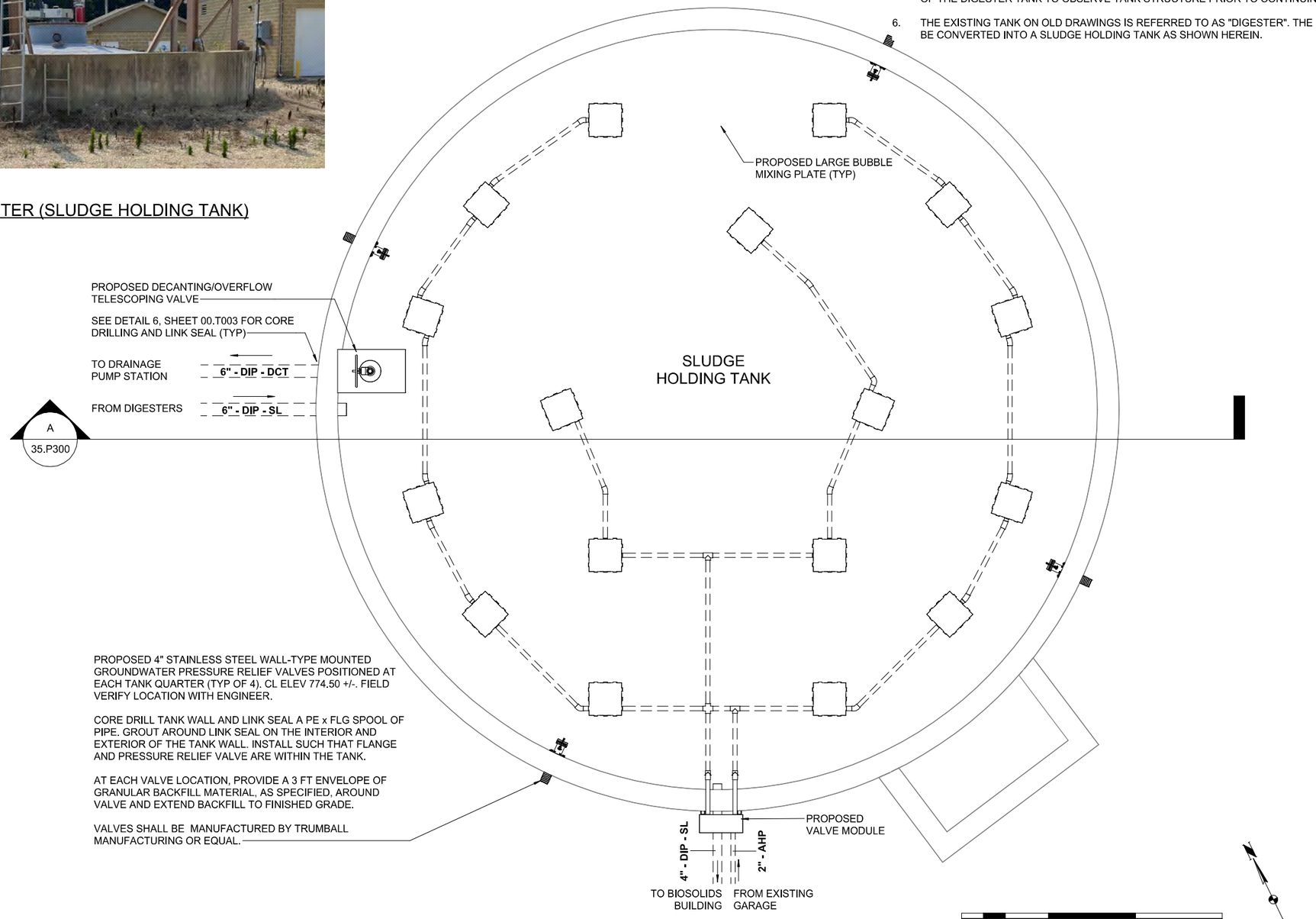
PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

25.P300

DIGESTER (SLUDGE HOLDING TANK)

SHEET NOTES:

1. CONTRACTOR SHALL DEWATER AND CLEAN OUT TANK FLOOR PRIOR TO INSTALLATION OF PROCESS EQUIPMENT AS SHOWN ON THE DRAWINGS HEREIN. SEE SPECIFICATIONS.
2. TANK MIXING EQUIPMENT SHOWN HEREIN IS BASED ON ENVIROMIX. ANY MIXING SYSTEM CHANGES SHALL BE REDESIGNED AT NO ADDITIONAL COST TO THE OWNER.
3. DEMOLISH EXISTING PIPING, CONNECTIONS, SLUDGE PUMP, SLUDGE MIXER AND APPURTENANCES.
4. DIGESTER TANK IS OUT OF SERVICE AND ABANDONED. CONTRACTOR SHALL DEMOLISH THE DIGESTER COVER, GAS PIPING, SLUDGE PIPING, EXISTING MIXING EQUIPMENT, AND APPURTENANCES INSIDE THE TANK. CONTRACTOR SHALL SEAL ALL EXISTING PIPING PENETRATIONS INSIDE THE TANK. PROTECT THE DIGESTER WALLS AND SLAB DURING DEMOLITION ACTIVITIES. PAST PROJECT DRAWINGS MAY BE AVAILABLE TO BIDDERS. SEE PHOTO THIS SHEET.
5. CONTRACTOR SHALL NOTIFY ENGINEER IMMEDIATELY UPON COMPLETION OF DEMOLITION AND CLEANING OF THE DIGESTER TANK TO OBSERVE TANK STRUCTURE PRIOR TO CONTINUING WORK.
6. THE EXISTING TANK ON OLD DRAWINGS IS REFERRED TO AS "DIGESTER". THE OLD DIGESTER TANK SHALL BE CONVERTED INTO A SLUDGE HOLDING TANK AS SHOWN HEREIN.



EXISTING SLUDGE HOLDING TANK

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

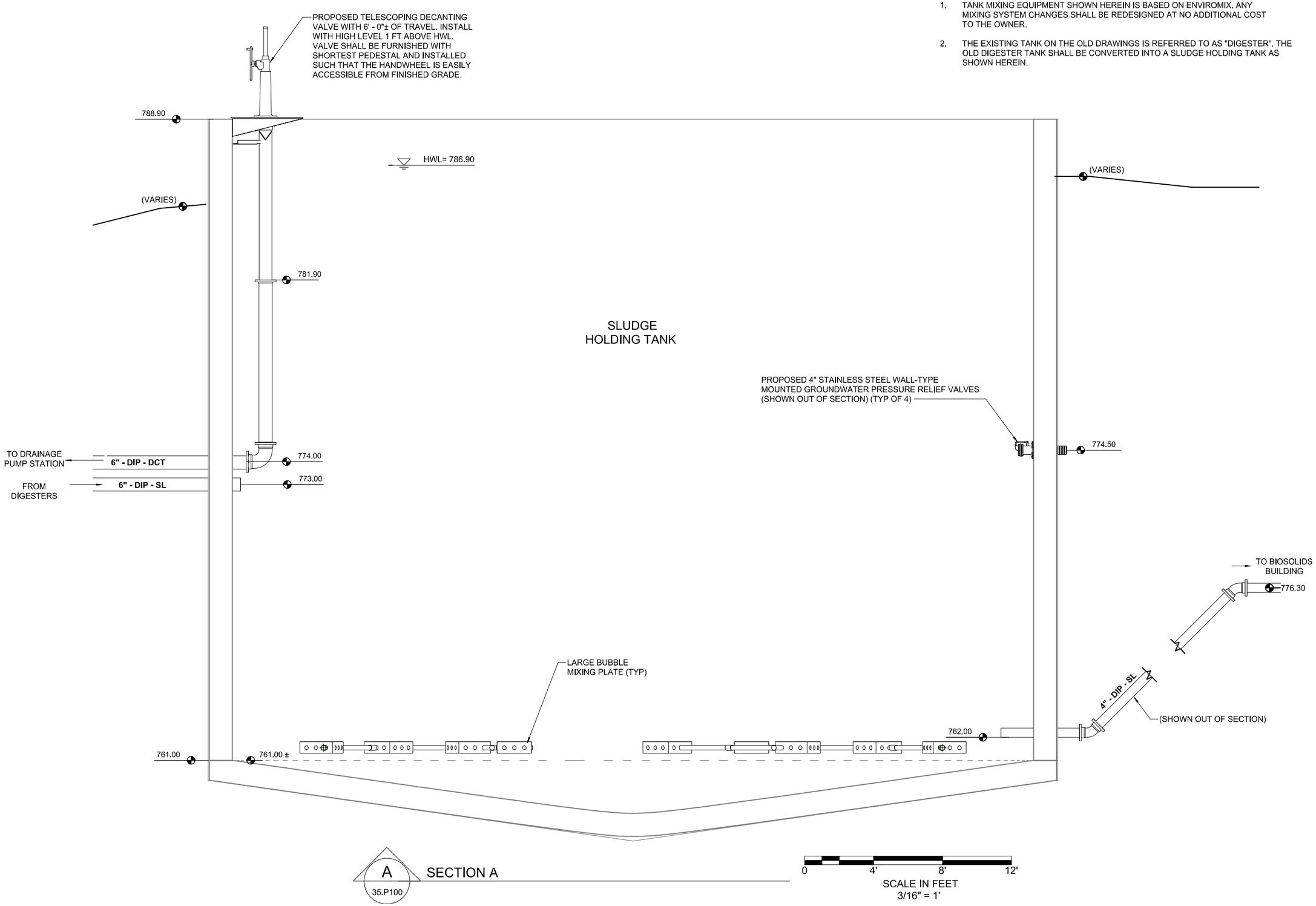
EXISTING SLUDGE HOLDING TANK

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

35.P100

SHEET NOTES:

1. TANK MIXING EQUIPMENT SHOWN HEREIN IS BASED ON ENVIROMIX. ANY MIXING SYSTEM CHANGES SHALL BE REDESIGNED AT NO ADDITIONAL COST TO THE OWNER.
2. THE EXISTING TANK ON THE OLD DRAWINGS IS REFERRED TO AS "DIGESTER". THE OLD DIGESTER TANK SHALL BE CONVERTED INTO A SLUDGE HOLDING TANK AS SHOWN HEREIN.



A
35.P100
SECTION A

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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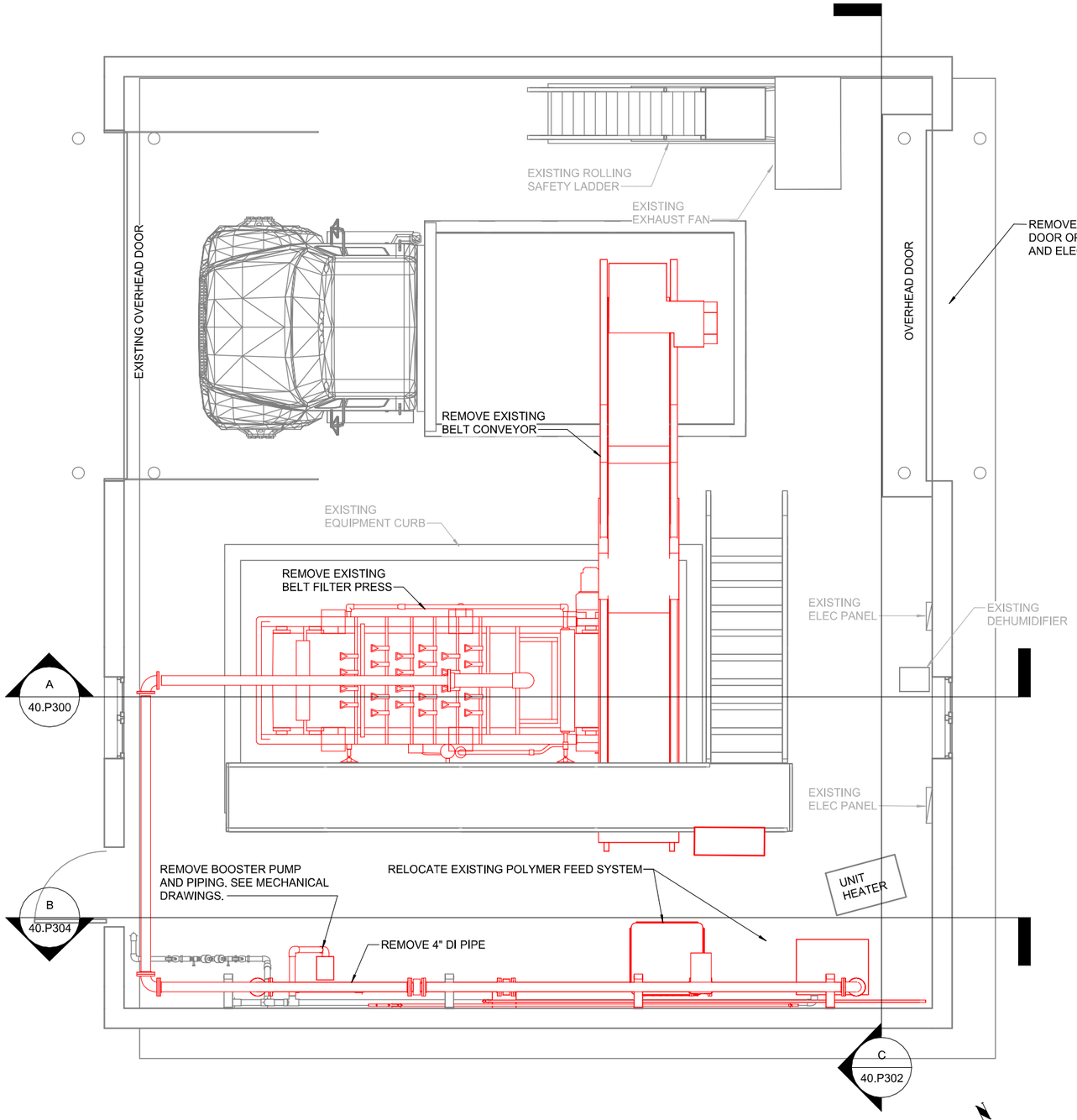
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED SLUDGE HOLDING TANK - SECTION

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

35.P300



EXISTING BIOSOLIDS HANDLING BUILDING

0 4' 8' 12'

SCALE IN FEET
3/16" = 1'

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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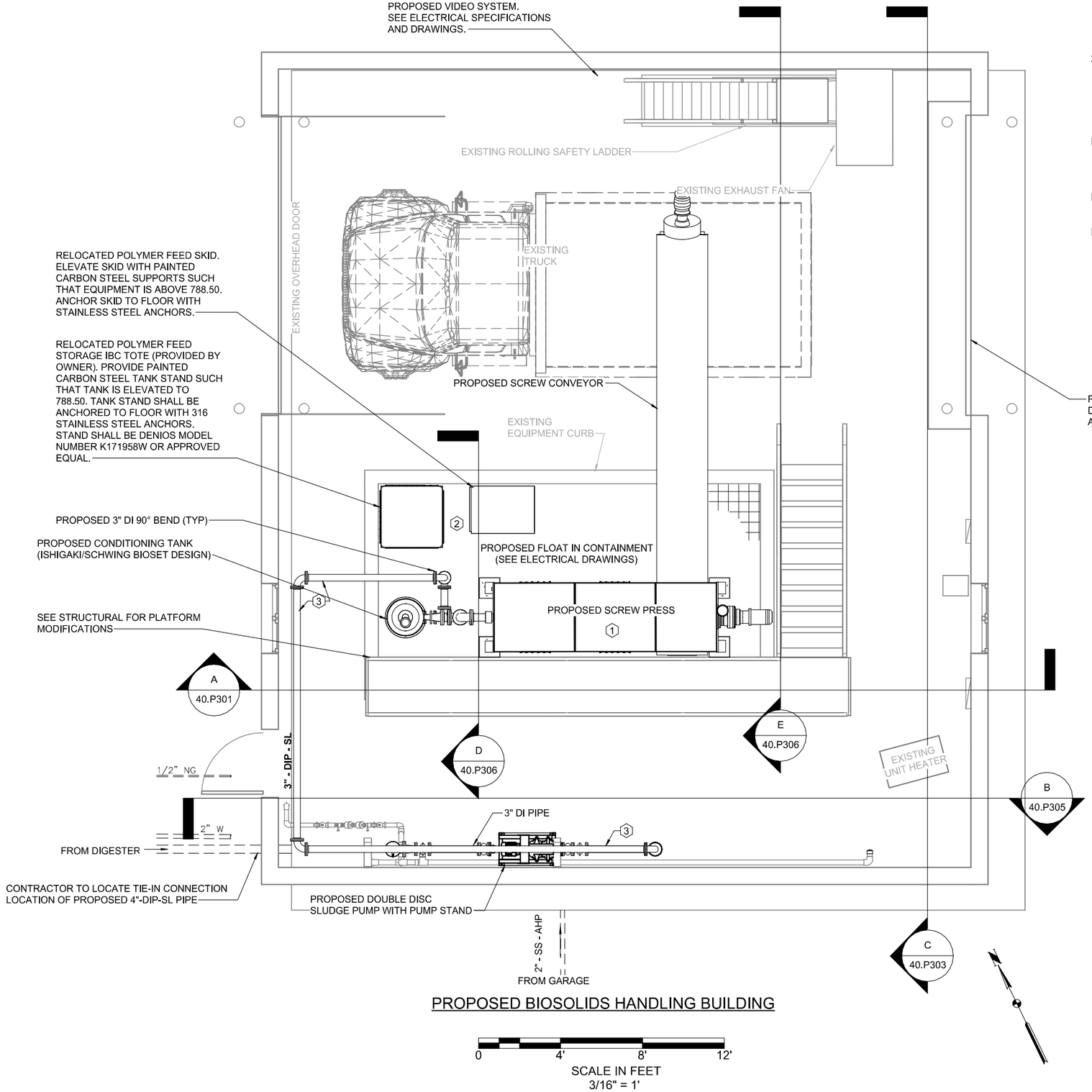
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING BIOSOLIDS HANDLING BUILDING

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P100



PROPOSED BIOSOLIDS HANDLING BUILDING

SHEET NOTES:

1. THE SCREW PRESS EQUIPMENT LAYOUT SHOWN HEREIN IS BASED ON MANUFACTURERS AS SPECIFIED IN SECTION 11500. ANY PIPING AND/OR EQUIPMENT MODIFICATIONS TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.
2. INSTALLATION OF SCREW PRESS AND SCREW CONVEYOR SHALL ENABLE CITY STAFF TO PULL THE SLUDGE TRUCK THROUGH THE BIOSOLIDS BUILDING OVERHEAD DOORS WITH ADEQUATE CLEARANCES BETWEEN EQUIPMENT AND THE SLUDGE TRUCK AS SHOWN ON THE DRAWINGS.

TAGGED NOTES:

1. CONTRACTOR SHALL COORDINATE SLUDGE INLET AND DRAIN OUTLET PIPE SIZES AND CAKE DISCHARGE OPENING SIZES WITH THE SELECTED SCREW PRESS AND CONVEYOR EQUIPMENT MANUFACTURER. ANY PIPING MODIFICATIONS FOR DIFFERENT MANUFACTURERS SHALL BE AT THE CONTRACTOR'S EXPENSE.
2. ROUTE CHEMICAL FEED TUBING AND CONDUIT ALONG WALLS AND CEILING TO INJECTION POINTS (TYP OF 3). FIELD VERIFY ROUTING WITH ENGINEER
3. CONTRACTOR SHALL FURNISH AND INSTALL ALL PIPE SUPPORTS AS REQUIRED AND AS SPECIFIED IN SECTION 15100.

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
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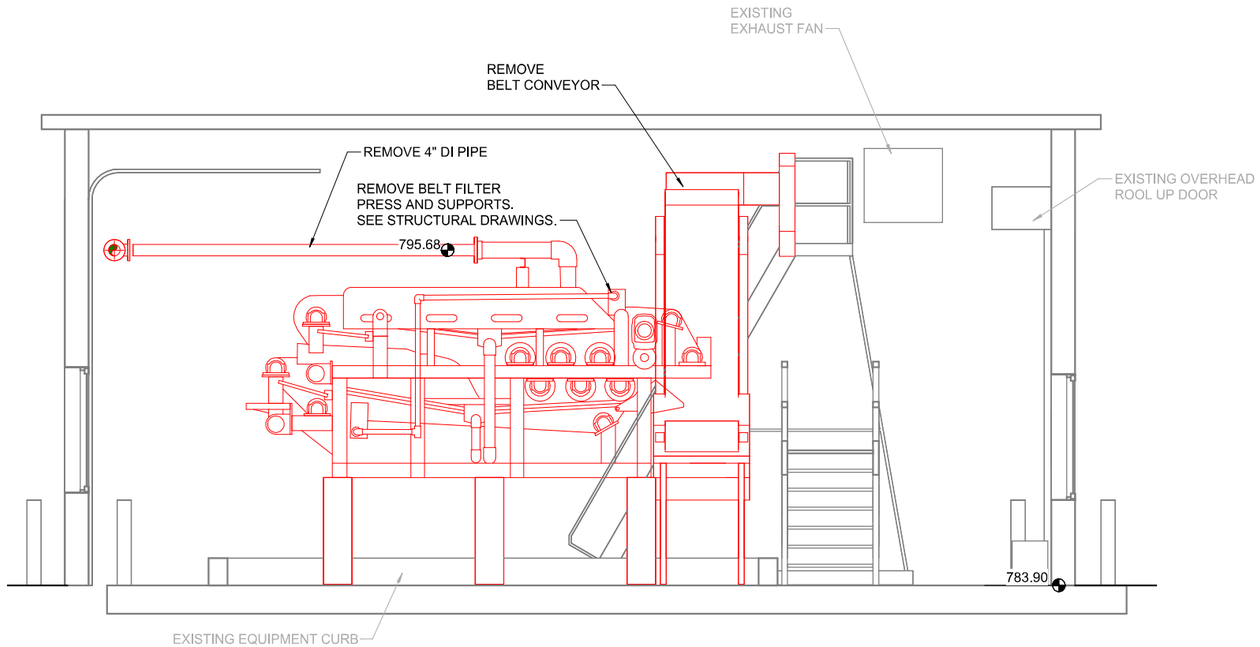
WASTEWATER TREATMENT PLANT
ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED BIOSOLIDS HANDLING BUILDING

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P101



A
40.P100
SECTION A

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P300

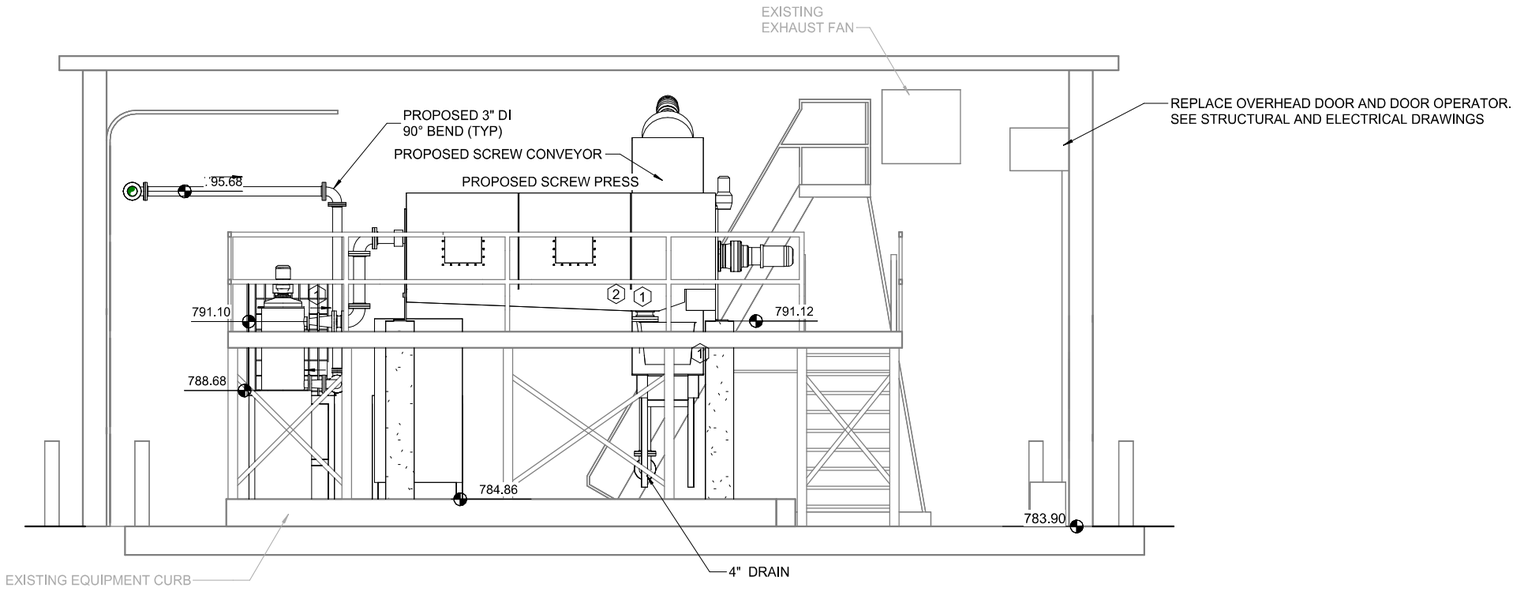
SHEET NOTES:

1. THE SCREW PRESS EQUIPMENT LAYOUT SHOWN HEREIN IS BASED ON MANUFACTURERS AS SPECIFIED IN SECTION 11500. ANY PIPING AND/OR EQUIPMENT MODIFICATIONS TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.

TAGGED NOTES:

(1) CONTRACTOR SHALL COORDINATE SLUDGE INLET AND DRAIN OUTLET PIPE SIZES AND CAKE DISCHARGE OPENING SIZES WITH THE SELECTED SCREW PRESS AND CONVEYOR EQUIPMENT MANUFACTURER. ANY PIPING MODIFICATIONS FOR DIFFERENT MANUFACTURERS SHALL BE AT THE CONTRACTOR'S EXPENSE.

(2) CONTRACTOR SHALL ROUTE SCREW PRESS DRAIN TO EXISTING FLOOR DRAIN. PROVIDE A MINIMUM 6" AIR GAP.



A
40.P101
SECTION A

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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MASON CITY, IA 50402
PHONE: (641)-423-8271
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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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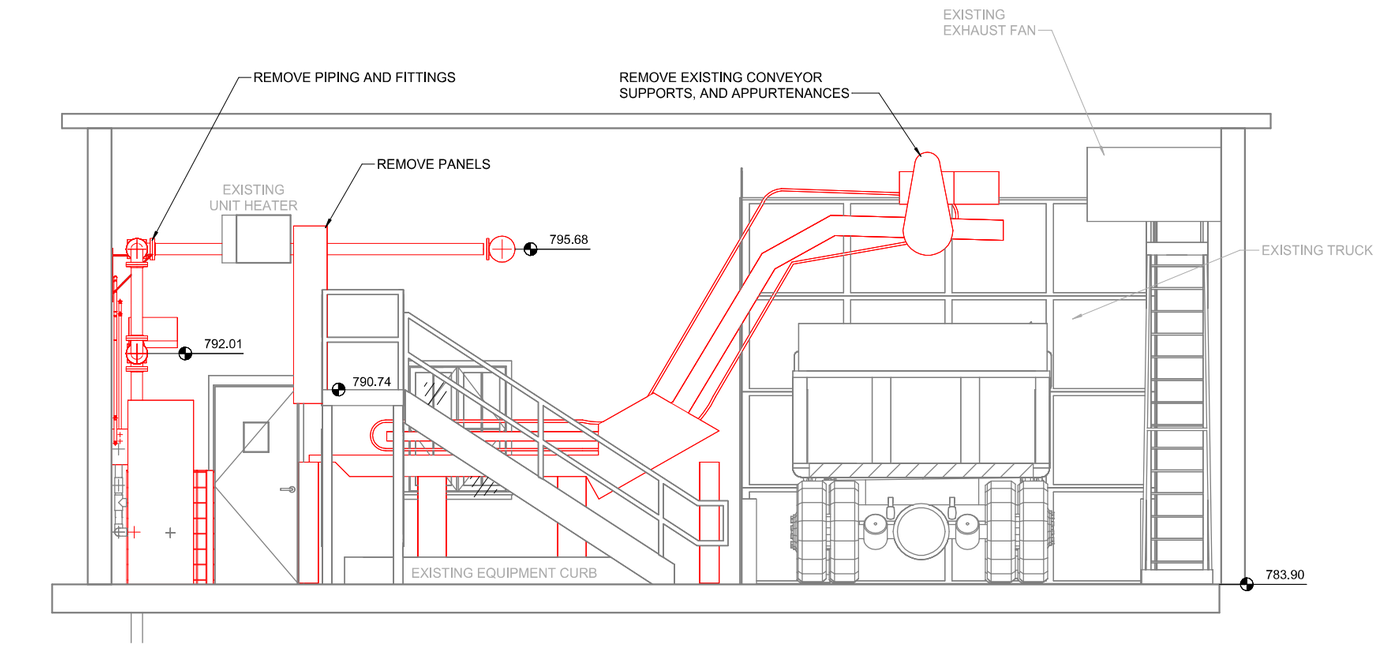
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P301



C
40.P100
SECTION C

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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1412 6th STREET SW, PO BOX 1467
MASON CITY, IA 50402
PHONE: (641)-423-8271
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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P302

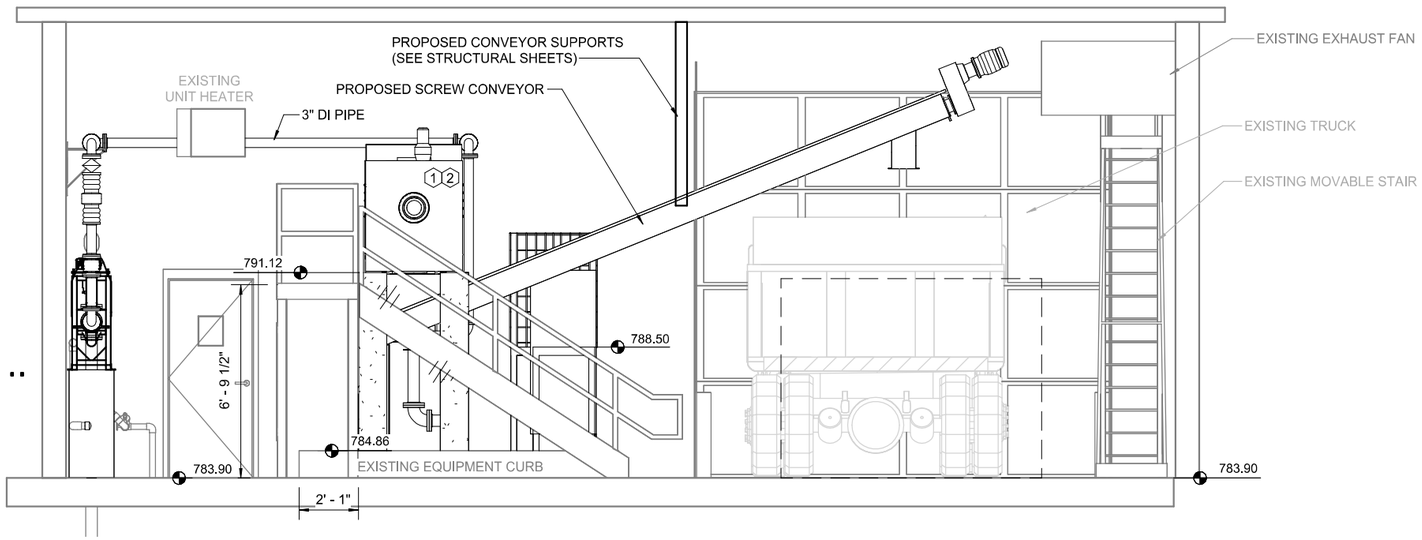
SHEET NOTES:

1. THE SCREW PRESS EQUIPMENT LAYOUT SHOWN HEREIN IS BASED ON MANUFACUTRERS AS SPECIFIED IN SECTION 11500. ANY PIPING AND/OR EQUIPMENT MODIFICATIONS TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.

TAGGED NOTES:

(1) CONTRACTOR SHALL COORDINATE SLUDGE INLET AND DRAIN OUTLET PIPE SIZES AND CAKE DISCHARGE OPENING SIZES WITH THE SELECTED SCREW PRESS AND CONVEYOR EQUIPMENT MANUFACTURER. ANY PIPING MODIFICATIONS FOR DIFFERENT MANUFACTURERS SHALL BE AT THE CONTRACTOR'S EXPENSE.

(2) CONTRACTOR SHALL ROUTE SCREW PRESS DRAIN TO EXISTING FLOOR DRAIN. PROVIDE A MINIMUM 6" AIR GAP.



C
40.P101
SECTION C

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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MASON CITY, IA 50402
PHONE: (641)-423-8271
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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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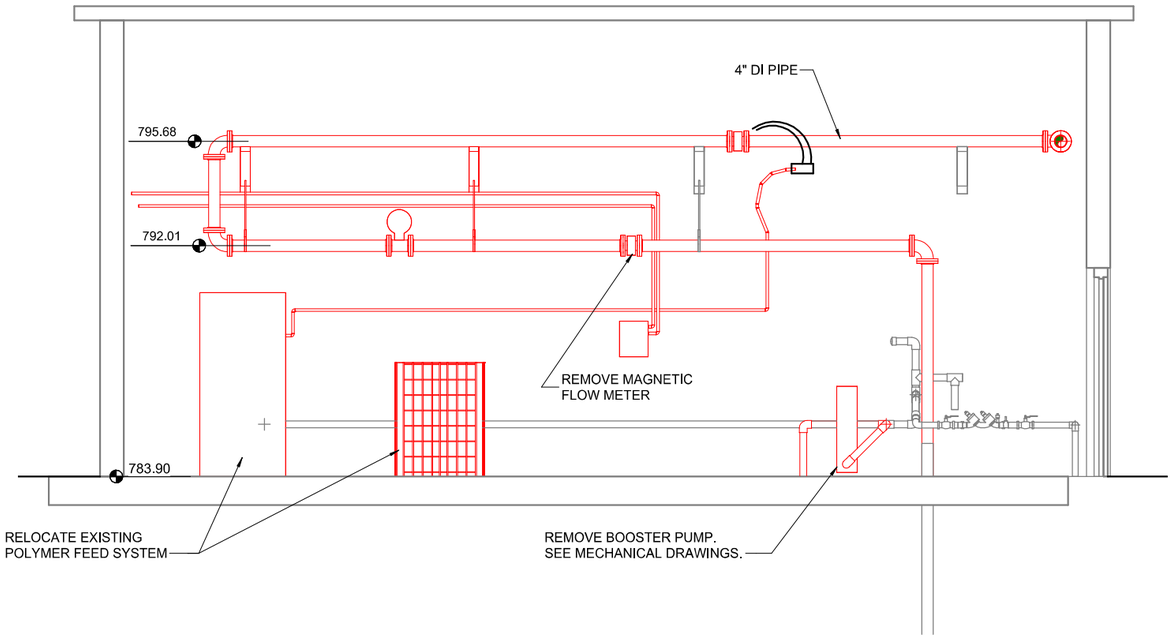
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P303



B
40.P100
SECTION B

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

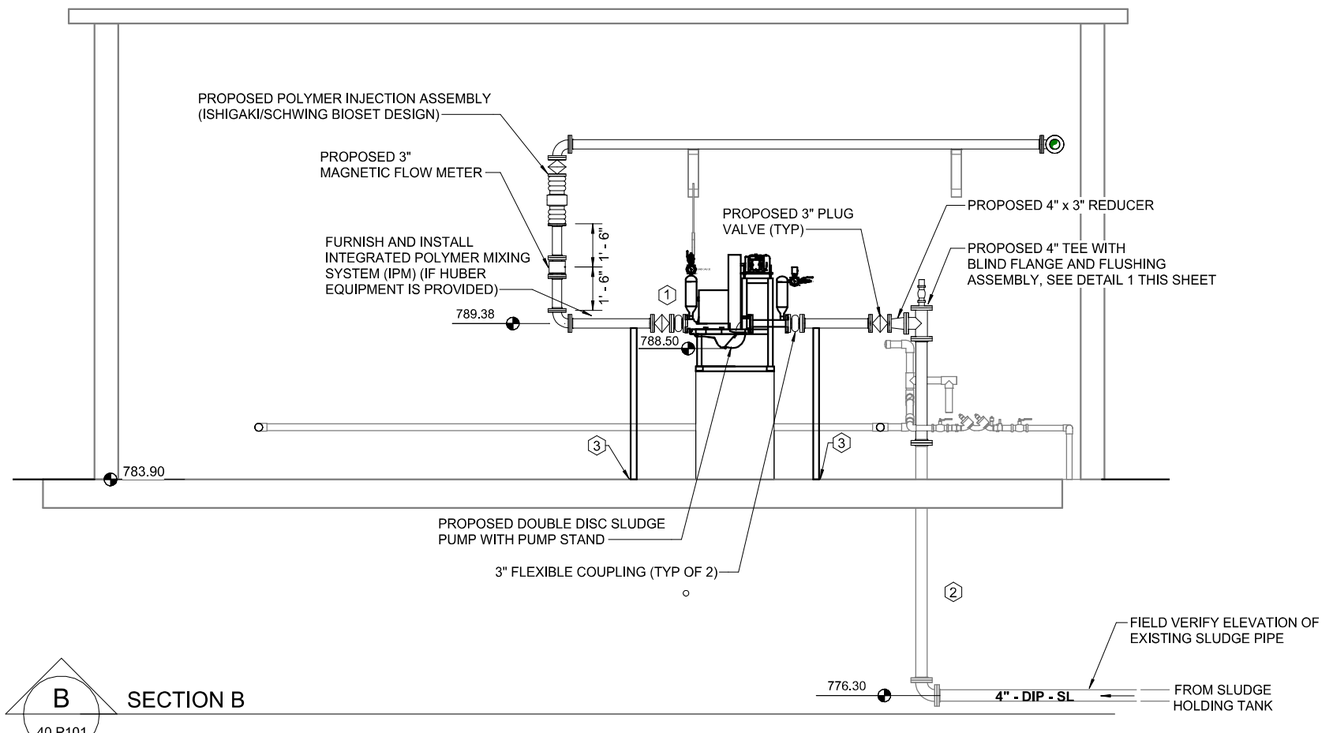
40.P304

SHEET NOTES:

1. THE SCREW PRESS EQUIPMENT LAYOUT SHOWN HEREIN IS BASED ON MANUFACTURERS AS SPECIFIED IN SECTION 11500. ANY PIPING AND/OR EQUIPMENT MODIFICATIONS TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.

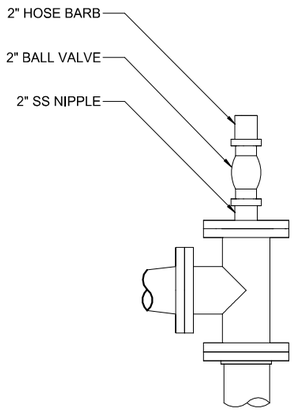
TAGGED NOTES:

1. CONTRACTOR SHALL PROVIDE SUPPORTS ON BOTH UP AND DOWNSTREAM SIDES OF THE MAGNETIC FLOW METER SUCH THAT FROM METER MAY EASILY BE REMOVED FROM SERVICE.
2. CONTRACTOR SHALL INSTALL NEW SLUDGE YARD PIPING UP UNTIL 5 FT FROM THE BIOSOLIDS HANDLING BUILDING.
3. CONTRACTOR SHALL FURNISH AND INSTALL PIPE SUPPORT BEFORE AND AFTER PUMP AS REQUIRED BY THE PUMP MANUFACTURER.



B
40.P101
SECTION B

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'



1 FLUSHING ASSEMBLY DETAIL
NO SCALE

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
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WASTEWATER TREATMENT PLANT
ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
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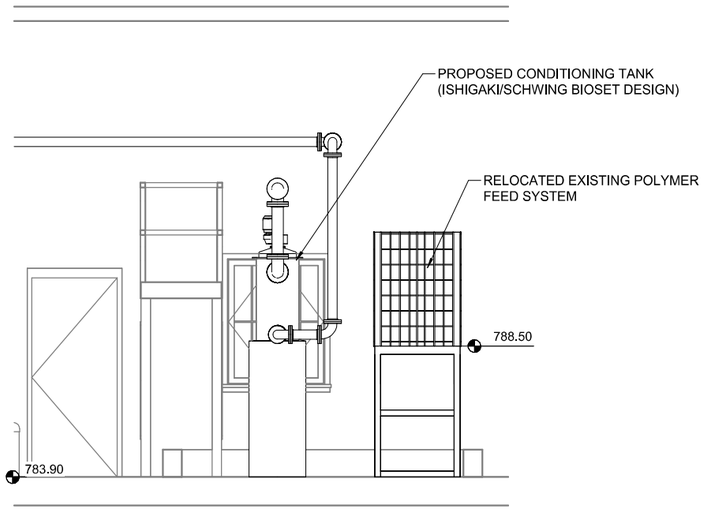
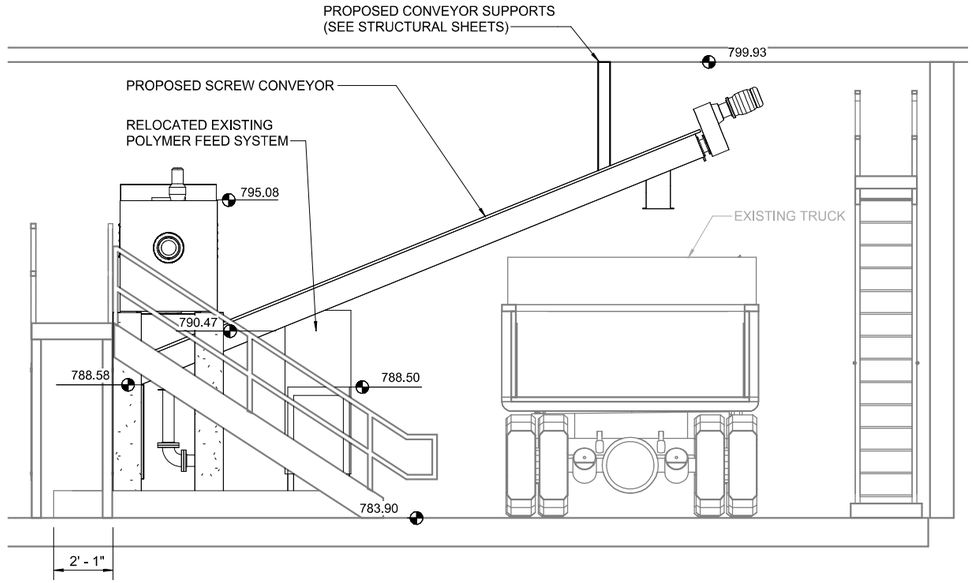
40.P305



D SECTION D
40.P101

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'



E SECTION E
40.P101

0 4' 8' 12'
SCALE IN FEET
3/16" = 1'

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MASON CITY, IA 50402
PHONE: (641)-423-8271
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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

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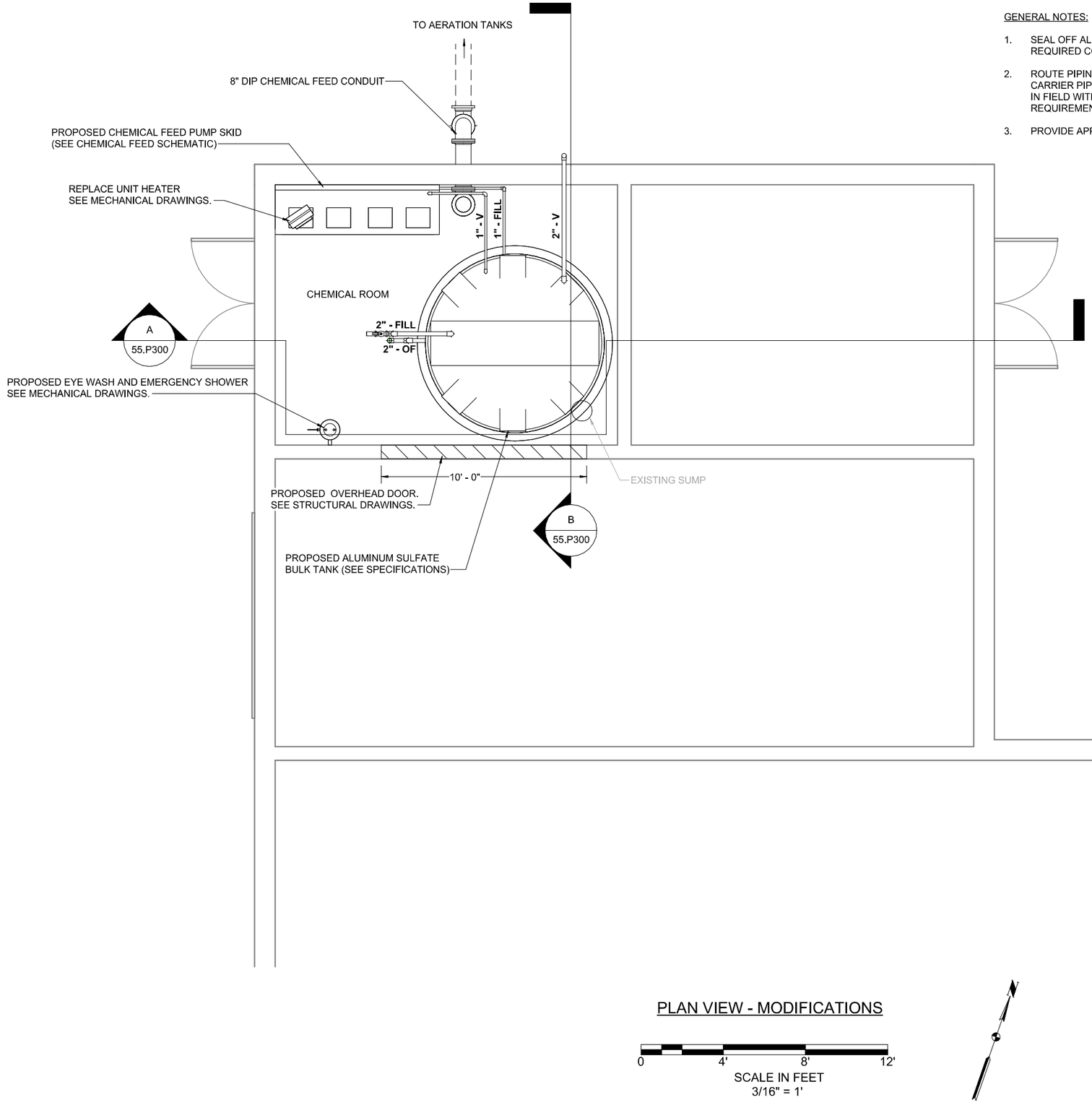
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

PROPOSED BIOSOLIDS HANDLING BUILDING SECTIONS

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

40.P306



GENERAL NOTES:

1. SEAL OFF ALL WALL PENETRATIONS IN CHEMICAL ROOM IN ACCORDANCE WITH ALL REQUIRED CODES AND REGULATIONS.
2. ROUTE PIPING FROM CHEMICAL TANKS TO CHEMICAL FEED PUMPS AND CHEMICAL CARRIER PIPE ALONG CEILINGS AND WALLS. ACTUAL ROUTING TO BE DETERMINED IN FIELD WITH ENGINEER. SEE CHEMICAL FEED CHEMICAL FOR ADDITIONAL REQUIREMENTS.
3. PROVIDE APPROPRIATE TANK LABELING WITH THE CHEMICAL BEING CONTAINED.

PLAN VIEW - MODIFICATIONS

0 4' 8' 12'

SCALE IN FEET
3/16" = 1'

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WASTEWATER TREATMENT PLANT
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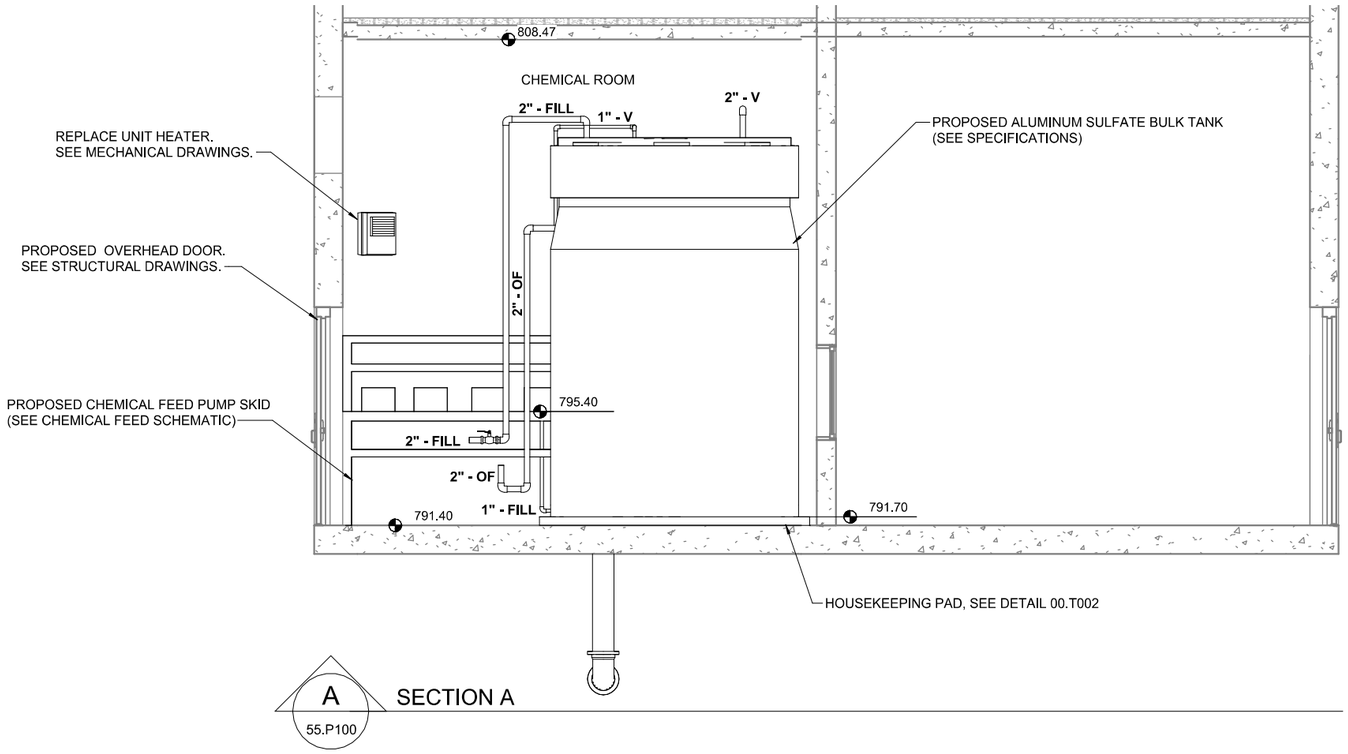
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

ADMINISTRATION BUILDING MODIFICATIONS

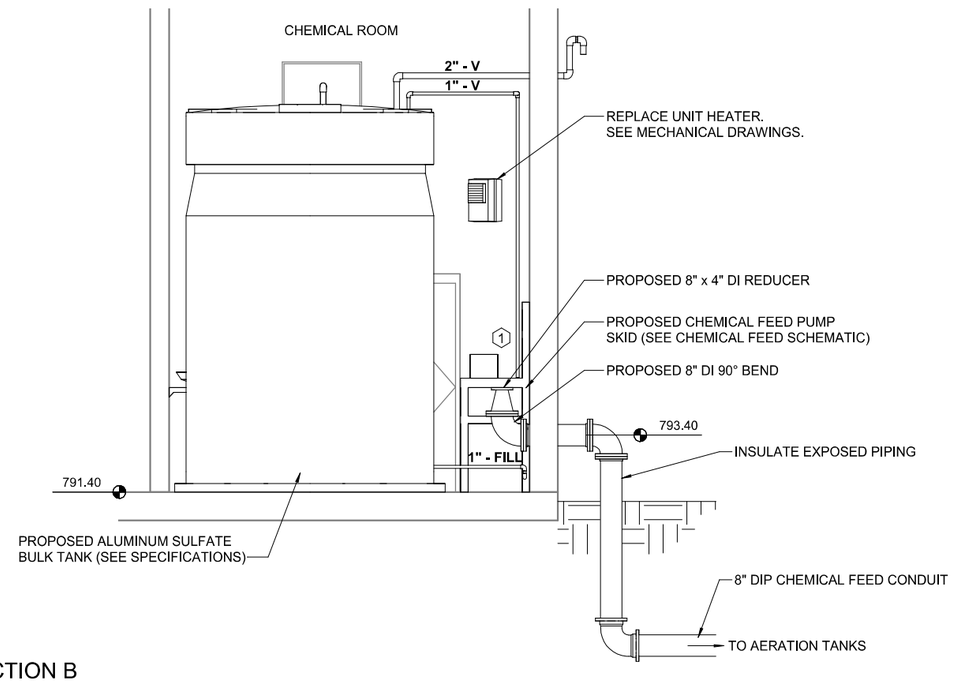
PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

55.P100



A
55.P100

SECTION A



B
55.P100

SECTION B

TAGGED NOTES:

1. CONTRACTOR SHALL SEAL OFF AROUND CHEMICAL FEED TUBING WITH FLEXIBLE PUTTY MATERIAL. SEE SPECIFICATION SECTION 11235 FOR COLORED TUBING REQUIREMENTS.

0 4' 8' 12'

SCALE IN FEET
3/16" = 1'

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MASON CITY, IA 50402
PHONE: (641)-423-8271
WWW.WHKS.COM

WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
2		
3		
4		
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

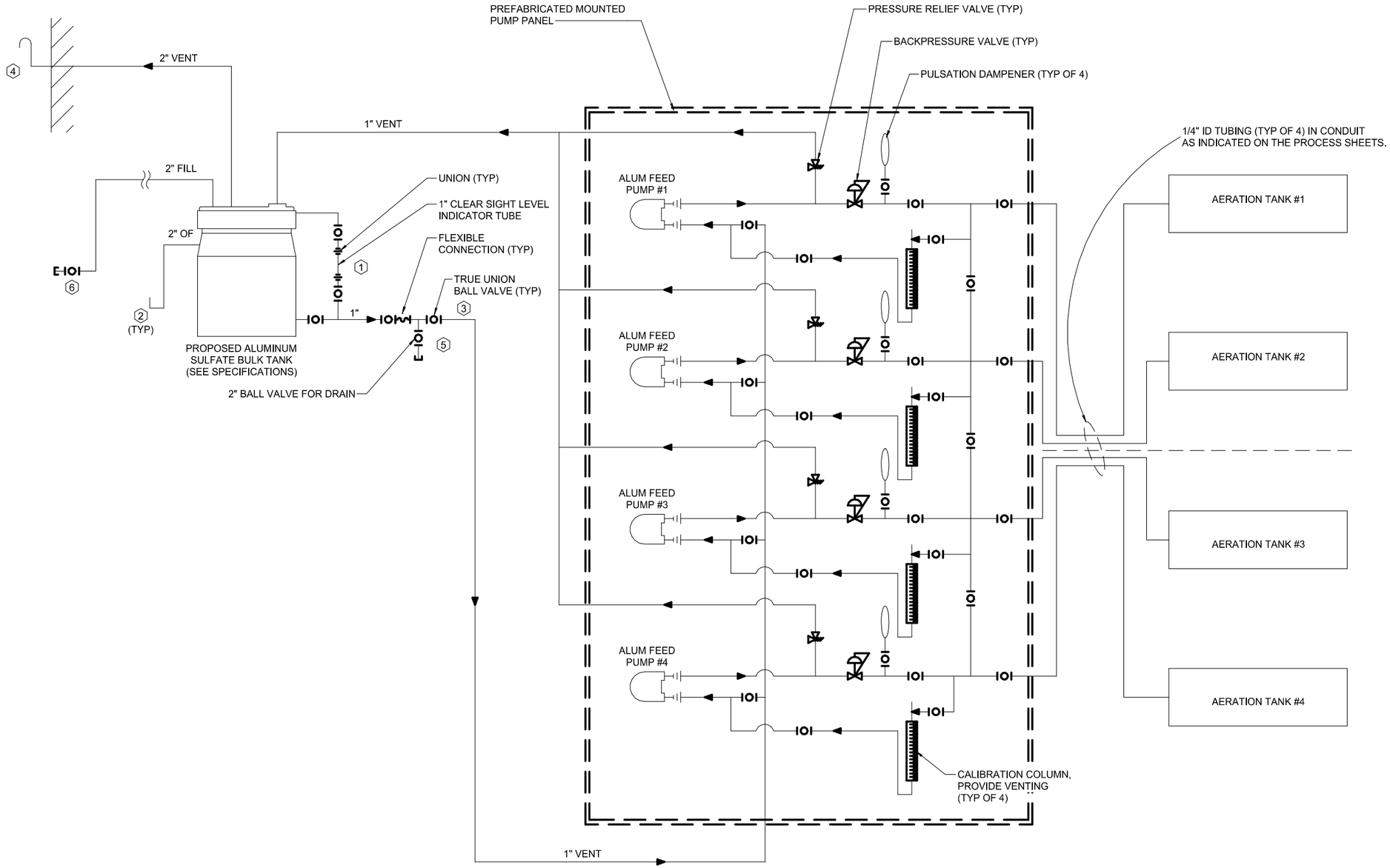
ADMINISTRATION BUILDING MODIFICATIONS SECTION

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

55.P300

TAGGED NOTES:

1. FURNISH AND INSTALL SIGHT GAUGE LEVEL ASSEMBLY. SEE SPECIFICATIONS.
2. TRAP WITH 6" RISER @ 2'-0" ABOVE FLOOR. FILL WITH WATER.
3. ALL PIPE, FITTINGS, AND VALVES SHALL BE SCHEDULE 80 PVC UNLESS NOTED OTHERWISE. SOLVENT CEMENT SHALL BE APPROVED FOR USE WITH THE SPECIFIC CHEMICALS BEING USED, AND SHALL BE ISP 724 OR APPROVED EQUIVALENT.
4. EXTEND AND SEAL OFF VENT THROUGH WALL. TERMINATE WITH INVERTED "U" COVERED WITH MESH 316 SS SCREEN. PAINT EXTERIOR PIPING TO MATCH BUILDING.
5. CONTRACTOR SHALL PROVIDE MISCELLANEOUS FITTINGS AS REQUIRED FOR A COMPLETE SYSTEM.
6. INSTALL FILL STATION NEXT TO EXTERIOR WALL DOOR IN CHEMICAL ROOMS 3'-0" AFF. PROVIDE VALVE AND CAM LOCK FITTING.



CHEMICAL FEED SCHEMATIC

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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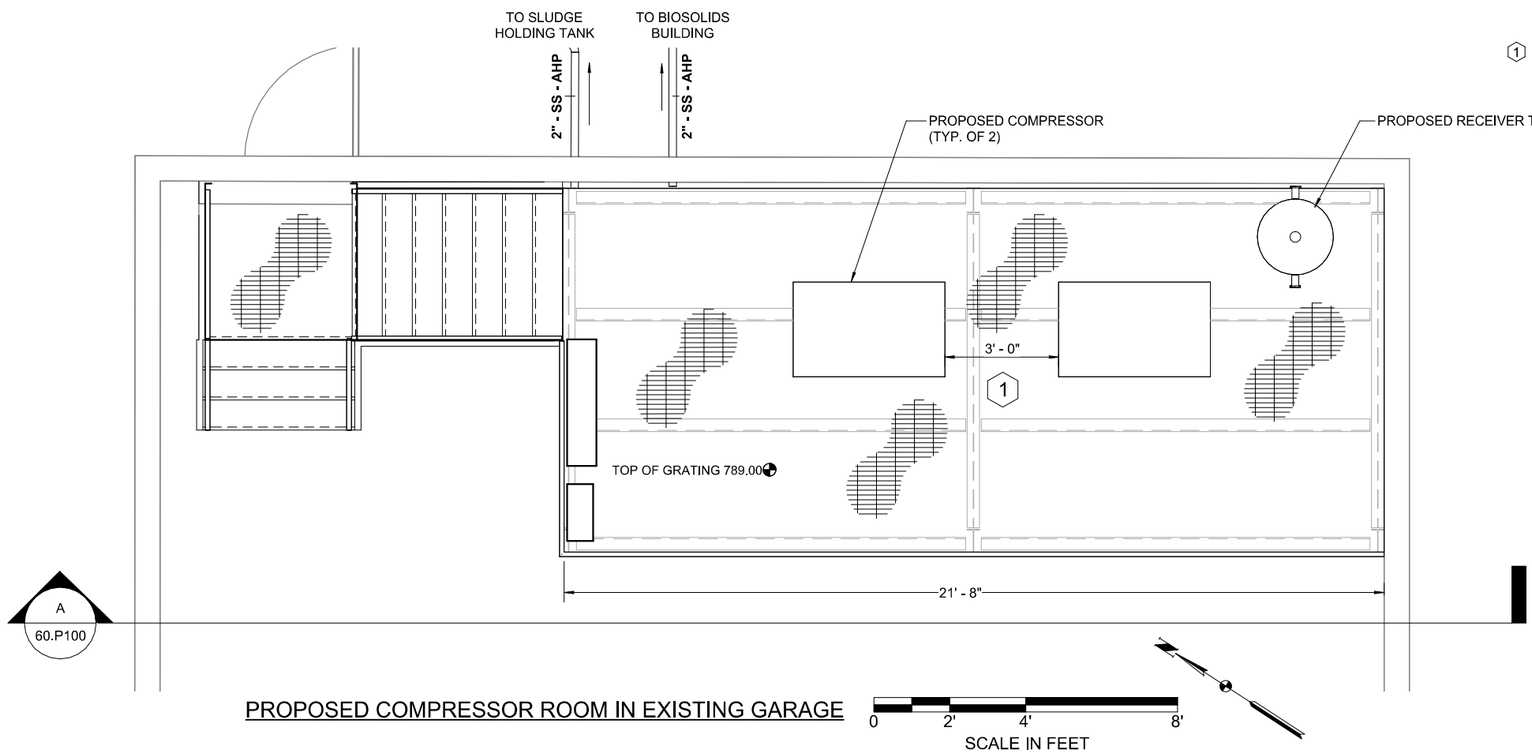
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

ADMINISTRATION BUILDING CHEMICAL FEED SCHEMATIC

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

55.P600



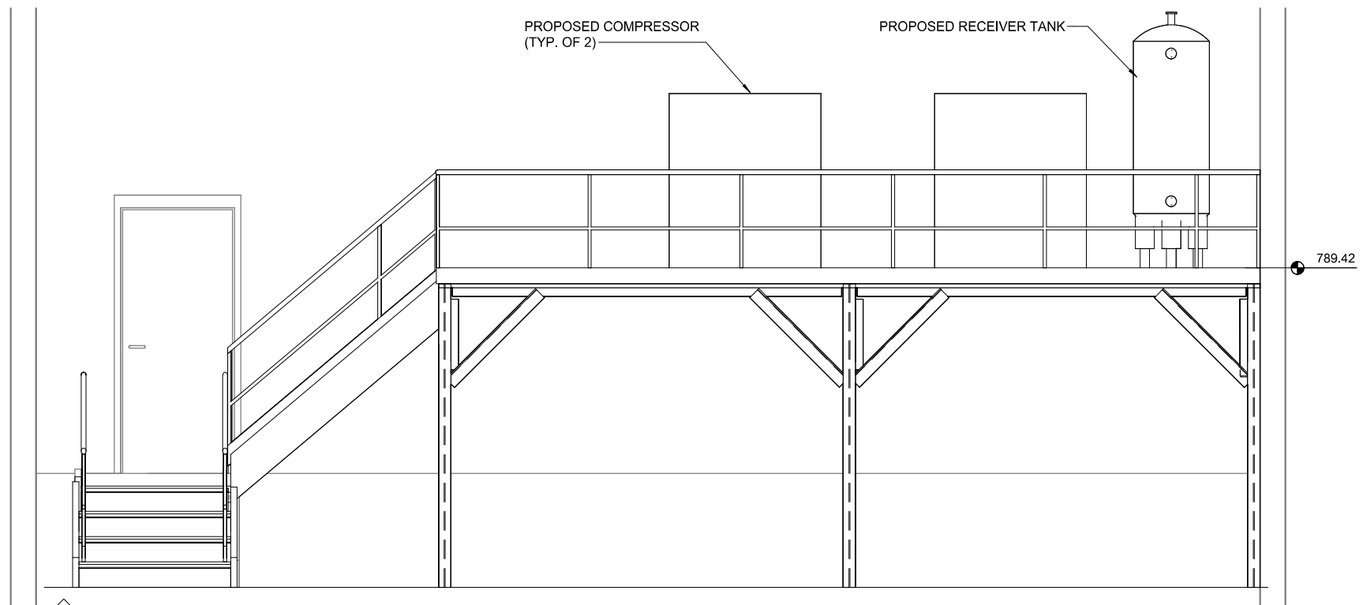
PROPOSED COMPRESSOR ROOM IN EXISTING GARAGE

0 2' 4' 8'

SCALE IN FEET
1/4" = 1'

TAGGED NOTES:

1. ROUTE AHP PIPING TO COMPRESSED AIR SYSTEM CONDUIT ALONG WALLS. FIELD VERIFY ROUTING WITH ENGINEER



SECTION A

0 2' 4' 8'

SCALE IN FEET
1/4" = 1'

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING GARAGE

PROJECT NUMBER	9433.1
DATE	12/07/2023
DRAWN BY	JAK
DESIGN BY	JDC
CHECKED BY	KG

60.P100

GENERAL CONDITION AND STATEMENTS

A. THESE NOTES PERTAIN TO MINOR STRUCTRAL MODIFICATIONS IN PORTIONS OF TH BIOSOLIDS HANDLING BUILDING, THE PLANT DRAIN PUMP STATION, THE ADMINISTRATION BUILDING AND EXPANSION OF AN EXISTING GARAGE STRUCTURE.
B. THESE NOTES SHALL APPLY UNLESS OTHERWISE INDICATED BY DRAWINGS. PROJECT SPECIFICATIONS ARE SUPPLEMENTED BY THESE GENERAL NOTES. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS. NOTES AND DETAILS ON THE STRUCTURAL DRAWINGS SHALL TAKE PRECEDENCE OVER THE GENERAL NOTES AND TYPICAL DETAILS.
C. STRUCTURAL DRAWINGS INDICATE TYPICAL AND CERTAIN SPECIFIC CONDITIONS ONLY. SHOP DRAWINGS SHALL DETAIL ALL CONDITIONS IN ACCORDANCE WITH PROJECT DOCUMENTS INCLUDING DRAWINGS, NOTES, AND SPECIFICATIONS.
D. THE USE OR REPRODUCTION OF THESE CONTRACT DRAWINGS BY ANY CONTRACTOR, SUB-CONTRACTOR, ERECTOR, FABRICATOR, OR MATERIAL SUPPLIER IN LIEU OF PREPARATION OF SHOP DRAWINGS SIGNIFIES THEIR ACCEPTANCE OF ALL INFORMATION SHOWN AS CORRECT, AND OBLIGATES HIMSELF TO ANY JOB EXPENSE, REAL OR IMPLIED, ARISING DUE TO ANY ERRORS THAT MAY OCCUR HEREON.
E. DO NOT SCALE FOR DIMENSIONS NOT SHOWN ON DRAWINGS. SEND WRITTEN REQUEST FOR INFORMATION TO THE ARCHITECT OR ENGINEER FOR DIMENSIONS NOT PROVIDED. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS IN THE FIELD PRIOR TO THE FABRICATION OF ANY STRUCTURAL COMPONENTS.
F. THE STRUCTURE SHOWN ON THESE DRAWINGS IS STRUCTURALLY SOUND ONLY IN ITS COMPLETED FORM. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR STRUCTURAL STABILITY THROUGH DEMOLITION, ERECTIONS, AND CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR THE STABILITY OF ADJACENT FOUNDATIONS DURING CONSTRUCTION. ANY TEMPORARY BRACING OR SHORING SHALL BE DESIGNED BY, AND AT THE EXPENSE OF, THE CONTRACTOR. THE CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL TEMPORARY BRACING UNTIL THE CONTRACTOR DETERMINES IT IS SAFE TO REMOVE SAID BRACING.
G. CONTRACTOR IS RESPONSIBLE FOR PROVIDING ALL EQUIPMENT, LABOR, AND MATERIALS REQUIRED TO COMPLETE THE WORK SHOWN UNLESS NOTED OTHERWISE.
H. CONTRACTOR SHALL CONSIDER THERMAL EFFECTS DURING CONSTRUCTION AND ERECTION SEQUENCES.
I. DETAILS, TYPICAL DETAILS, SECTIONS, TYPICAL SECTIONS, AND NOTES SHOWN SHALL APPLY FOR ALL LIKE OR SIMILAR WORK UNLESS NOTED OTHERWISE. CONTRACTOR IS RESPONSIBLE FOR UNDERSTANDING THE REQUIRED SCOPE OF WORK, INTERPRETING THE PROJECT DOCUMENTS, AND SUBMITTING A WRITTEN REQUEST FOR INFORMATION TO THE ENGINEER REGARDING CLARIFICATION OF, OR THE APPLICABILITY OF, ANY DETAIL, TYPICAL DETAIL, SECTION, TYPICAL SECTION, OR NOTE NECESSARY TO PERFORM REQUIRED WORK.
J. THE CONTRACTOR SHALL COMPARE STRUCTURAL DRAWINGS WITH MECHANICAL, ELECTRICAL, AND PROCESS DRAWINGS AND REPORT ANY DISCREPANCY OR INTERFERENCE PROBLEM TO THE ARCHITECT AND STRUCTURAL ENGINEER OF RECORD PRIOR TO FABRICATION OR INSTALLATION OF STRUCTURAL MEMBERS.
K. THE CONTRACTOR IS RESPONSIBLE FOR COORDINATING THE REQUIREMENTS OF ALL CONTRACT DOCUMENTS INCLUDING, BUT NOT LIMITED TO, ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PROCESS DRAWINGS AND SPECIFICATIONS.
L. CONTRACTOR SHALL LOCATE ALL UNDERGROUND UTILITIES AND MITIGATE ANY INTERFERENCE BETWEEN, OR DAMAGE TO, THE PROPOSED STRUCTURE AND/OR UTILITY, PRIOR TO BEGINNING WORK.
M. THESE STRUCTURAL DRAWINGS HAVE BEEN PREPARED IN ACCORDANCE WITH THE 2018 INTERNATIONAL BUILDING CODE.
N. IN CASE OF CONFLICT, THE MOST STRINGENT REQUIREMENT SHALL GOVERN.

EXISTING CONDITIONS:

A. THE CONTRACTOR SHALL SURVEY THE EXISTING SITE TO DETERMINE THAT ALL STRUCTURES AS INDICATED IN THE DRAWINGS ARE FEASIBLE AND PRACTICAL AND SHALL REPORT ANY DISCREPANCIES OR UNUSUAL CONDITIONS TO THE ENGINEER. FIELD DIMENSION NEW STRUCTURAL ELEMENTS PRIOR TO THE SUBMISSION OF SHOP DRAWINGS.

DESIGN LOADING INFORMATION

GENERAL INFORMATION
RISK CATEGORY II

DESIGN LIVE LOADS:
ROOF: 20 PSF
ROOF MECHANICAL: 5 PSF
TYPICAL FLOOR: 40 PSF

DESIGN DEAD LOADS:
ROOF: 15 PSF

SOIL LOADS:
$P_{ACTIVE:}$ 50 PCF
AT REST SOIL PRESSURE: 68 PCF
$P_{PASSIVE:}$ 200 PCF
FRICTION COEFFICIENT: 0.35
NET ALLOWABLE BEARING PRESSURE: 1500PSF

SNOW LOADS:
GROUND SNOW LOAD: P_g=25 PSF
FLAT ROOF SNOW LOAD: P_f = 20 PSF
IMPORTANCE FACTOR: I_s = 1.0
THERMAL FACTOR C_t = 1.1

WIND LOADS:
WIND LOADS IN ACCORDANCE WITH ASCE7-16
BASIC WIND SPEED: V = 109MPH
WIND DIRECTIONALITY FACTOR: K_d = .85
EXPOSURE: C
TOPOGRAPHIC FACTOR: K_{zt} = 1
GROUND ELEVATION FACTOR: K_e = 1
GUST-EFFECT FACTOR: G = .85
ENCLOSURE CLASSIFICATION: ENCLOSED
INTERNAL PRESSURE COEFFICIENT: GC_{pi} = 0.18

ALL BUILDING COMPONENTS AND CLADDING ELEMENTS ARE TO BE DESIGNED BY THE MANUFACURERS' ENGINEER FOR WIND LOADING BASED ON THE APPLICABLE BUILDING CODE.

SECTION 1. SOILS, SUBSURFACE CONDITIONS, AND DEMOLITION

A. FROST PROTECTION: MINIMUM FOOTING DEPTH IS 42 IN BELOW FINISHED GRADE.
B. ALL FOOTINGS SHALL BEAR ON ORIGINAL UNDISTURBED SOIL, WHERE POSSIBLE.
C. SEE ARCHITECTURAL DRAWINGS FOR UNDER FLOOR DRAINS IF REQUIRED.
D. TOP OF FOOTING ELEVATIONS SHOWN MAY REQUIRE ADJUSTMENT AT THE TIME OF EXCAVATION TO MEET SOIL CONDITIONS. CONTACT STRUCTURAL ENGINEER OF RECORD FOR EVALUATION OF ANY FOUNDATION/FOOTING ADJUSTMENTS.
E. BACKFILLING OF WALLS AND PIERS SHALL BE PLACED SUCH THAT SYMMETRICAL LOADING SHALL BE MAINTAINED ON BOTH SIDES. WHERE DESIGN CONDITIONS REQUIRE BACKFILLING EACH SIDE TO UNEQUAL HEIGHTS, THEN WALLS OR PIERS SHALL BE FIRMLY SHORED IN POSITION, AND SHORES SHALL REMAIN UNTIL FLOORS OR OTHER PERMANENT BRACING ELEMENTS ARE PLACED AND PROPERLY SET TO PROVIDE FULL SUPPORT.
F. PROVIDE POSITIVE DRAINAGE AWAY FROM THE BUILDING AREA, BOTH DURING CONSTRUCTION AND PERMANENTLY. DO NOT ALLOW STORED EXCAVATION MATERIAL TO DISRUPT PROPER DRAINAGE OF AREA.
G. CONTRACTOR IS RESPONSIBLE FOR THE STABILITY OF EXCAVATIONS UNTIL PROPERLY BACKFILLED. DEWATER EXCAVATIONS AND REMOVE ANY WET MATERIAL PRIOR TO THE PLACING OF CONCRETE WORK. POUR A 3" TO 4" MUD MAT OF LEAN CONCRETE IN THE BOTTOM OF A FOOTING EXCAVATIONS THAT WILL BE EXPOSED TO RAIN OR REMAIN OPEN OVERNIGHT.
H. HEAVY EQUIPMENT FOR SPREADING AND COMPACTING BACKFILL SHALL NOT BE OPERATED CLOSER TO WALL, GRADE BEAM, ETC., THAN A DISTANCE EQUAL TO THE HEIGHT OF BACKFILL ABOVE TOP OF WALL FOOTING OR BOTTOM OF GRADE BEAM, ETC. THE AREA REMAINING SHALL BE COMPACTED BY HAND TAMPERS.
I. CONTRACTOR SHALL COMPACT BACKFILL SUPPORTING SLABS ON GRADE TO PREVENT THE CREATION OF VOIDS DUE TO SETTLEMENT.
J. USE EXCAVATED MATERIAL AS BACKFILL IF ACCEPTABLE TO TESTING AGENCY. IF EXCAVATED BACKFILL MATERIAL IS NOT AVAILABLE, USE SELECT FILL MATERIAL ACCEPTABLE TO TESTING AGENCY.

EROSION CONTROL

A. CONTRACTOR IS RESPONSIBLE FOR PROVIDING TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES TO PREVENT THE DISCHARGE OF SOIL AND/OR SOIL-BEARING FLUID FROM THE PROJECT SITE.

BACKFILL

A. UNLESS SPECIFIED OTHERWISE, ALL BACKFILL SHALL BE GRANULAR MATERIAL AND COMPACTED TO 95 PERCENT OF STANDARD PROCTOR DENSITY (ASTM 698). COMPACTION SHALL BE PERFORMED USING HAND-OPERATED TAMPERS AND A MAXIMUM OF 6" LIFTS. ENSURE MOISTURE LIMITS ARE BETWEEN 3% UNDER OPTIMUM MOISTURE TO NO MORE THAN THE OPTIMUM MOISTURE CONTENT.

SECTION 2. CONCRETE

A. STRUCTURAL CONCRETE SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE REQUIREMENTS OF CHAPTER 19 OF THE IBC, ACI 318 (AS MODIFIED BY THE IBC), AND ANY OTHER APPLICABLE LOCAL BUILDING CODES.
B. UNLESS NOTED OTHERWISE, ALL CONCRETE SHALL BE STANDARD WEIGHT 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS. ALL SLAB ON GRADE CONCRETE SHALL BE STANDARD WEIGHT 3,500 PSI COMPRESSIVE STRENGTH AT 28 DAYS. ONLY CONCRETE PERMANENTLY EXPOSED TO FREEZING SHALL BE AIR ENTRAINED (5.5% ± 1 1/2 % AIR CONTENT).
C. MIX DESIGNS FOR EACH TYPE OF CONCRETE SPECIFIED SHALL BE SUBMITTED FOR APPROVAL. ADMIXTURES, CURING COMPOUNDS AND HARDENERS WHICH ARE INTENDED FOR USE ARE TO BE SUBMITTED FOR APPROVAL.
D. MATURITY METHOD
1. IN LIEU OF ESTABLISHING CONCRETE STRENGTH THROUGH SAMPLING AND CYLINDER BREAKS, CONTRACTOR SHALL BE PERMITTED TO ESTIMATE CONCRETE STRENGTH DEVELOPMENT USING THE MATURITY METHOD PER ASTM C1074 AND THE ACI PRC 228.1. CONTRACTOR SHALL SUBMIT A PROPOSED MONITORING PLAN (INCLUDING SENSOR LOCATIONS, NUMBERS, AND TYPES) FOR APPROVAL.
E. TESTING LABORATORY SHALL SAMPLE AND TEST CONCRETE AS FOLLOWS:
1. SAMPLING:
a. GENERAL: IN ACCORDANCE WITH ASTM C31.
b. NO.: 4 CYLINDERS FOR EACH 50 CUBIC YARDS, 5000 SQUARE FEET OF SURFACE AREA, OR EACH PLACEMENT OF EACH MIX DESIGN OF CONCRETE PLACED IN ANY ONE DAY.
c. DESIGNATION: LABEL EACH CYLINDER IN EACH SET OF 4 CYLINDERS WITH AN ALPHANUMERIC DESIGNATION, E.G., THE FIRST SET SHALL BE NUMBERED 1A, 1B, 1C, AND 1D.
2. TESTING:
a. SLUMP: IN ACCORDANCE WITH ASTM C 143, TO BE TAKEN WHEN EACH SET OF CYLINDERS IS MADE.
b. AIR CONTENT: IN ACCORDANCE WITH ASTM C231
c. COMPRESSIVE STRENGTH: IN ACCORDANCE WITH ASTM C 39. BREAK ONE CYLINDER AT 7 DAYS, 2 AT 28 DAYS, AND HOLD ONE IN RESERVE. EACH PAIR OF BREAKS FROM EACH SET OF CYLINDERS WILL BE CONSIDERED ONE TEST.
d. TEST REPORTS SHALL BE AVAILABLE AT JOBSITE.
F. PROVIDE CONSTRUCTION JOINTS, INSERTS, SLEEVES, DOWELS, ANCHORS, ETC., AS SHOWN. ITEMS INSTALLED PER MANUFACTURER'S INSTRUCTIONS AND ACCORDING TO USUAL ACCEPTED STANDARDS OF THE TRADE. ANCHOR RODS PER ASTM F1554 GRADE 36 AS SHOWN.
G. REINFORCING BARS SHALL CONFORM WITH ASTM A 615. ALL BARS SHALL BE GRADE 60.
H. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 82 AND A 185 WITH MINIMUM YIELD STRENGTH OF 65 KSI.
I. GROUT MINIMUM COMPRESSIVE STRENGTH SHALL BE 6,000 PSI. GROUT SHALL BE NON-SHRINK, NON-METALLIC, AND SHALL NOT CONTAIN GYPSUM.
J. COVER FOR REINFORCING:
CONCRETE CAST AGAINST AND PERMANENTLY IN CONTACT WITH THE GROUND: 3"
CONCRETE EXPOSED TO WEATHER OR IN CONTACT WITH GROUND
NO. 6 THROUGH NO. 18 BARS: 2"
NO. 5 BAR, W31 OR D31 WIRE, AND SMALLER: 1 1/2"

CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND
SLABS, JOISTS, AND WALLS:
NO. 14 AND NO. 18 BARS: 1 1/2"
NO. 11 BAR AND SMALLER: 3/4"

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

STRUCTURAL GENERAL NOTES

PROJECT NUMBER	9433.1
DATE	12/07/23
DRAWN BY	JAK/TLE
DESIGN BY	TLE/KAR
CHECKED BY	MRS

00.S001

K. REINFORCING STEEL:

DEVELOPMENT LENGTH AND SPLICES, TENSION:

TENSION DEVELOPMENT LENGTH, (ld), INCHES			
BAR SIZE (fy = 60ksi)	CONCRETE STRENGTH (f'c)		
	3000 PSI	4000 PSI	5000 PSI
#3	17	15	13
#4	22	19	17
#5	28	24	22
#6	33	29	26
#7	48	42	38
#8	55	48	43
#9	62	54	48
#10	70	61	54
#11	78	67	60

TENSION SPLICE LENGTH, (lst), INCHES			
BAR SIZE (fy = 60ksi)	CONCRETE STRENGTH (f'c)		
	3000 PSI	4000 PSI	5000 PSI
#3	22	19	17
#4	29	25	23
#5	36	31	28
#6	43	37	34
#7	63	54	49
#8	72	62	56
#9	81	70	63
#10	91	79	71
#11	101	87	78

1. REFER TO "HOOKED REINFORCEMENT TENSION DEVELOPMENT LENGTH SCHEDULE IN CONCRETE" WHEN THE STRAIGHT DEVELOPMENT LENGTH IN TENSION CANNOT BE ACCOMMODATED IN THE CONCRETE SECTION.
2. ALWAYS USE TENSION DEVELOPMENT LENGTH AND TENSION LAP SPLICE LENGTH VALUES, UNLESS THE PLANS OR DETAILS SPECIFICALLY NOTE COMPRESSION LENGTH IS ALLOWED.
3. TABULATED DEVELOPMENT AND LAP SPLICE LENGTHS ARE BASED ON REINFORCING STEEL YIELD STRENGTH F_y = 60 KSI, NORMAL WEIGHT CONCRETE, AND CLASS B LAPS.
4. TOP BARS ARE DEFINED AS HORIZONTAL BARS WITH MORE THAN 12 INCHES OF FRESH CONCRETE IN THE MEMBER BELOW THE BARS TO BE DEVELOPED OR SPLICED. TOP BAR FACTOR APPLIED TO BARS IN WALLS.
5. WHEN DIFFERENT BAR DIAMETERS ARE SPLICED, USE THE LARGER OF THE BAR LAP SPLICE LENGTHS.
6. ALL TABULATED VALUES ARE MINIMUM LENGTHS, IN CASE OF CONFLICT WITH PLANS, SECTIONS, OR DETAILS, USE THE LONGER LENGTH.
7. d_b = DOWEL BAR DIAMETER
8. l_d = DEVELOPMENT LENGTH
9. MULTIPLY ALL TABULATED LENGTHS BY THE FOLLOWING FACTORS WHERE APPLICABLE. NOTE THAT FACTORS ARE CUMULATIVE (E.G.: 1.30 x 1.50 = 1.95):
   - A. LIGHT WEIGHT CONCRETE: 1.30
   - B. 3 OR LESS BUNDLED BARS: 1.20
   - C. 4 OR MORE BUNDLED BARS: 1.33
   - D. CLASS A LAP SPLICE: 0.77
   - E. CLEAR SPACING LESS THAN $2d_b$ AND CLEAR COVER LESS THAN d_b: 0.77
10. WELD AND/OR MECHANICAL SPLICES MAY BE USED IF APPROVED BY THE STRUCTURAL ENGINEER OF RECORD PROVIDED THAT THE SPLICE IS CAPABLE OF DEVELOPING AT LEAST 125% OF THE MATERIAL. SEND PROCEDURES AND INSTALLATION INSTRUCTIONS TO THE ENGINEER FOR REVIEW AS A SHOP DRAWING SUBMISSION.
11. USE MECHANICAL COUPLERS FOR #14 AND LARGER BARS.
12. LAP SPLICES IN CONCRETE MASONRY SHALL BE AS SPECIFIED IN SECTION 5.
13. SPLICES OF HORIZONTAL REINFORCEMENT IN WALLS SHALL BE STAGGERED 24" MINIMUM.
14. SPLICES IN WALLS CONTAINING TWO LAYERS OF REINFORCEMENT SHALL NOT OCCUR IN THE SAME LOCATION.
15. WELDED WIRE FABRIC SHALL HAVE A MINIMUM SPLICE LENGTH OF 6" AND A MINIMUM OF TWO CROSS WIRES OVERLAPPED. WWF LARGER THAN 6X6-W6XW6 SHALL HAVE SPLICES CALCULATED PER ACI REQUIREMENTS.
16. DEVELOPMENT LENGTH, HOOKED BARS:

TENSION DEVELOPMENT LENGTH, (ld), INCHES FOR HOOKED BARS			
BAR SIZE (fy = 60ksi)	CONCRETE STRENGTH (f'c)		
	3000 PSI	4000 PSI	5000 PSI
#3	9	8	7
#4	11	10	9
#5	14	12	11
#6	17	15	13
#7	20	17	15
#8	22	19	17
#9	25	22	20

17. POST INSTALLED REINFORCING:
    - A. ALL POST INSTALLED REINFORCING SHALL BE SET IN HILTI RE 500 V3 OR APPROVED EQUAL EPOXY ADHESIVE ANCHORAGE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE AS NOTED IN THESE PLANS.
18. PLACE AND SECURE REINFORCEMENT TO MAINTAIN THE PROPER DISTANCE AND CLEARANCE BETWEEN PARALLEL BARS AND BETWEEN BARS AND CONCRETE FORMS
19. PROVIDE VERTICAL STEEL WITH METAL SPREADERS TO ENSURE STEEL IS PROPERLY CENTERED IN THE FORMS.
20. HORIZONTAL WALL BARS SHALL CONTINUE THROUGH PILASTERS, COLUMNS, AND INTERSECTING WALLS. REFER TO TYPICAL DETAILS FOR ADDITIONAL INFORMATION AND REQUIREMENTS.
21. HORIZONTAL REINFORCEMENT SHALL BE SUPPORTED AT PROPER HEIGHT IN CONCRETE PADS, CHAIRS, OR TRANSVERSE STEEL BARS.
22. MINIMUM 4" CONCRETE SLAB ON GRADE WITH WWF 6X6-W2.1XW2.1 OVER VAPOR BARRIERS, OVER A MINIMUM OF 6 " COMPACTABLE, TRIMMABLE, GRANULAR FILL, IS TYPICAL UNLESS NOTED OTHERWISE ON DRAWINGS OR GEOTECHNICAL REPORT. UNLESS NOTED OTHERWISE INSTALL WWF 1 ½" FROM TOP OF SLABS ON GRADE OR AT MID-DEPTH OF SLAB AT CONSTRUCTION JOINTS.
23. CONSTRUCTION OR CONTROL JOINTS SHALL BE PROVIDED IN SLABS ON GRADE AT A MAXIMUM SPACING OF 12'-0. SAW CUT CONTROL JOINTS SHALL BE MADE AS SOON AS SLAB WILL SAFELY SUPPORT MEN AND EQUIPMENT AND THE SLAB WILL NOT BE DAMAGED BY EQUIPMENT. CONTROL JOINT LAYOUT SHOULD MAINTAIN AN APPROXIMATE ASPECT RATIO OF 1:1.
24. CONSTRUCTION OR CONTROL JOINTS SHALL BE PROVIDED IN CONCRETE WALLS AT 50'-0 MAXIMUM SPACING.
25. WHERE NEW CONCRETE IS PLACED AGAINST EXISTING CONCRETE, THE EXISTING CONCRETE SURFACE SHALL BE CLEANED AND ROUGHENED TO A MINIMUM OF ¼" AMPLITUDE.
26. ALL EXPOSED EDGES OF CONCRETE MEMBERS SHALL BE CHAMFERED ¾" UNLESS NOTED OTHERWISE.
27. DRIP EDGE GROOVES, ½" DEEP, SHALL BE PROVIDED ON THE BOTTOM FACE OF ELEVATED EXTERIOR SLABS AT A MAXIMUM OF 3" FROM THE OVERHANGING EDGE.
28. ADDITIONAL REINFORCING MAY BE PERMITTED FOR EASE OF CONSTRUCTABILITY. ADDITIONAL REINFORCING SHALL BE AT CONTRACTORS EXPENSE AND WILL REQUIRE SUBMITTAL OF SHOP DRAWINGS FOR APPROVAL. THIS ADDITIONAL REINFORCING SHALL BE SPECIFICALLY CALLED OUT ON SHOP DRAWINGS.

SECTION 4. STRUCTURAL STEEL

A. W-SHAPES:
   1. ASTM A36 STEEL (FY = 36 KSI MINIMUM)
   2. ASTM A992 STEEL (FY = 50 KSI MINIMUM)
   3. ADD WEB STIFFENERS WHERE INDICATED
B. C-SHAPES:
   1. ASTM A36 STEEL (FY = 36 KSI MINIMUM)
   2. ASTM A992 STEEL (FY = 50 KSI MINIMUM)
C. PLATE STEEL AND OTHER SHAPES: ASTM A36 STEEL (FY = 36 KSI MINIMUM)
D. HSS: ASTM A500 GR. B STEEL (FY =46 KSI MINIMUM)
E. L-SHAPES - SINGLE ANGLES: ASTM A36 STEEL (FY =36 KSI MINIMUM)
F. THREADED ROD (NON-ANCHOR BOLT): ASTM A36
   1. UNLESS NOTED OTHERWISE, CONTRACTOR MAY CONNECT SHORTER THREADED ROD SECTIONS TO CREATE THE FINAL PLAN LENGTH. ANY CONNECTOR USED TO JOIN THREADED ROD SECTIONS SHALL HAVE A MANUFACTURER APPROVED ALLOWABLE TENSION CAPACITY EQUAL TO OR GREATER THAN THE FULL TENSION CAPACITY OF THE THREADED ROD SECTIONS BEING JOINED. CONNECTORS SHALL ALSO HAVE A MECHANISM TO PREVENT LOOSENING OF ROD SECTIONS DUE TO VIBRATION. CONNECTORS SHALL BE INSTALLED IN ACCORDANCE WITH ALL MANUFACTURER REQUIREMENTS.
   2. ANY END CONNECTORS (E.G. CLEVIS, PIN, ETC.) SHALL HAVE A MANUFACTURER APPROVED ALLOWABLE TENSION CAPACITY EQUAL TO OR GREATER THAN THE FULL TENSION CAPACITY OF THE THREADED ROD SECTIONS BEING JOINED AND SHALL BE INSTALLED IN ACCORDANCE WITH ALL MANUFACTURER'S REQUIREMENTS.
G. STRUCTURAL STEEL DETAILING, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE THIRTEENTH EDITION OF THE "MANUAL OF STEEL CONSTRUCTION" OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION AND SHALL CONFORM TO THE LATEST OSHA REQUIREMENTS. SHOP DRAWINGS SHALL GIVE COMPLETE WELDING INFORMATION, BOTH SHOP AND FIELD, USING AWS SYMBOLS.
H. SUBMIT SHOP DRAWINGS FOR FABRICATION AND ERECTION OF ALL STEEL MEMBERS IN ACCORDANCE WITH AISC STANDARDS NOTED ABOVE.
I. MATERIALS REQUIREMENTS, U.N.O.:
   1. WELDED CONNECTIONS SHALL BE MADE WITH E70 ELECTRODES, UNLESS OTHERWISE RECOMMENDED BY AWS OR CALLED OUT ON DRAWINGS.
   2. WELDING ELECTRODES SHALL CONFORM TO AWS A5.1 OR A5.5 E-70XX. (LOW-HYDROGEN FOR SMAW WELDING). ALL WELDING PROCEDURES SHALL BE LOW-HYDROGEN PROCESSES. ELECTRODES SHALL BE STORED AFTER OPENING TO MAINTAIN HYDROGEN CONTENT.
   3. BOLTS ARE TO BE 3/4" DIAMETER HIGH STRENGTH BOLTS CONFORMING TO ASTM A325, ASTM A490, ASTM F1852, OR ASTM F2280, U.N.O.
   4. COMPRESSIBLE-WASHER-TYPE DIRECT TENSION INDICATOR DEVICES (DTI'S) SHALL CONFORM TO ASTM F959, AND SHALL BE BY J&M TURNER, INC., OR APPROVED EQUIVALENT. TWIST-OFF- TYOE TENSION CONTROL BOLTS (TCB'S) SHALL CONFORM TO ASTM F1852.
   5. ANCHOR RODS SHALL CONFORM TO ASTM F1554, FY=36KSI EXCEPT AT MOMENT OR BRACED FRAMES. U.N.O. ANCHOR RODS AT MOMENT OR BRACED FRAMES SHALL CONFORM TO ASTM F1554, FY=55KSI UNLESS A HIGHER GRADE IS SPECIFIED.
   6. GROUT BELOW BASE PLATES SHALL BE NONSHRINK, HIGH STRENGTH, NONMETALLIC GROUT, WITH A MINIMUM (28) DAY COMPRESSIVE STRENGTH OF 6,000 PSI.
   7. SHEAR STUDS AND HEADED CONCRETE ANCHORS SHALL CONFORM TO ASTM A108 FOR LOW CARBON STEEL WITH A MINIMUM YIELD STRENGTH OF 50,000 PSI AND SHALL BE AUTO END WELDED USING APPROPRIATE EQUIPMENT.
J. BOLTED CONNECTIONS
   1. BOLTED CONNECTIONS SHALL BE ASSEMBLED AND INSPECTED IN ACCORDANCE WITH RCSC-2014 (SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325, ASTM A490, ASTM F1852, OR ASTM F2280 BOLTS).
   2. CONNECTIONS SHOULD BE DESIGNED AS BOLTED UNLESS NOTED OTHERWISE.
   3. ALL BOLTS DESIGNATED "SLIP CRITICAL" OR "FULLY TIGHTENED" SHALL BE TIGHTENED TO THE MINIMUM PRETENSION VALUE SHOWN IN TABLE J3.1 OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (13TH EDITION). IN ADDITION, CONNECTIONS DESIGNATED "SLIP CRITICAL" SHALL HAVE PROPERLY PREPARED FAYING SURFACES TO MEET CLASS A SURFACE CONDITION, U.N.O. "SLIP CRITICAL" CONNECTIONS SHALL INCLUDE ALL BOLTS IN MOMENT CONNECTIONS. "FULLY TIGHTENED' CONNECTIONS SHALL INCLUDE ALL BOLTS LOADED IN DIRECT TENSION (SUCH AS HANGERS). BRACED FRAME CONNECTIONS, AND MEMBERS THAT ARE PART OF THE MAIN LATERAL RESISTING SYSTEM. DIRECT TENSION INDICATOR (DTI) WASHERS OR TENSION CONTROL BOLTS (TCB'S) SHALL BE USED AT THESE CONDITIONS. ALL OTHER BOLTS SHALL BE, AT MINIMUM, SNUG TIGHT.
   4. SNUG-TIGHT BOLTS SHALL BE INSTALLED PER THE REQUIREMENTS OF RCSC-2014 SECTION 8.1 WHICH INCLUDES:
      - a. "THE SNUG TIGHTENED CONDITION IS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PLIES INTO FIRM CONTACT.
      - b. "MORE THAN ONE CYCLE THROUGH THE BOLT PATTERN MAY BE REQUIRED TO ACHIEVE THE SNUG-TIGHTENED JOINT."
   5. SHOP ATTACHED BOLTS SHALL BE DESIGNED TO RESIST PRETENSIONED LOADS.
   6. ALL BOLTED CONNECTIONS SHALL USE WASHERS AS SPECIFIED IN SECTION 6 OF THE RCSC-2009. CLIPPED WASHERS SHALL BE USED ADJACENT TO THE K-AREA OF STEEL MEMBERS AS NECESSARY.
   7. TWIST-OFF TENSION CONTROLLED (TC) BOLTS SHALL BE INSTALLED AND TIGHTENED THE SAME DAY THEY ARE REMOVED FORM SEALED MANUFACTURER'S PACKAGING OR FROM PROTECTED STORAGE AS DEFINED IN SECTION 2.2 OF THE RCSC-2009. TC BOLTS WITHOUT THE PROPER STORAGE SHALL NOT BE USED UNLESS RELUBRICATED BY THE MANUFACTURER.
K . ALL STRUCTURAL STEEL SHALL BE GALVANIZED UNLESS NOTED OTHERWISE.

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

STRUCTURAL GENERAL NOTES

PROJECT NUMBER	9433.1
DATE	12/07/23
DRAWN BY	JAK/TLE
DESIGN BY	TLE/KAR
CHECKED BY	MRS

00.S002

SECTION 4. STRUCTURAL STEEL

L. WELDED CONNECTIONS
   1. WELDED CONNECTIONS SHALL CONFORM TO AWS D1.1-04, STRUCTURAL WELDING CODE BY THE AMERICAN WELDING SOCIETY.
   2. FIELD WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF AWS D1.1 INCLUDING THE REQUIREMENTS FOR WELDER CERTIFICATION.
      A. SURFACE REQUIREMENTS: BLAST CLEAN OR GRIND CONTACT SURFACES PRIOR TO WELDING TO REMOVE ANY CONDITION THAT COULD REDUCE WELD STRENGTH SUCH AS MILL SCALE, PAINT, GALVANIZING, GREASE, OIL, PITTING, IRREGULARITIES, ETC.
      B. WELDMENT PIECES SHALL BE BROUGHT INTO CLOSE CONTACT. ANY SEPARATION GREATER THAN 1/16 INCH REQUIRES AN INCREASE IN THE FILLET WELD LEG EQUAL TO THE SEPARATION DISTANCE. DO NOT EXCEED 3/16 INCH SEPARATION DISTANCE. FOR HEAVY SECTIONS 3 INCHES OR GREATER THE MAXIMUM SEPARATION DISTANCE MAY BE INCREASED TO 5/16 INCH.
      C. FIELD WELDING WILL BE PROTECTED FROM THE ELEMENTS AND PERFORMED WITHIN AWS TEMPERATURE RANGE REQUIREMENTS.
      D. WET ELECTRODES SHALL BE DISCARDED.
   3. TACK WELDS AND CONSTRUCTION AID WELDS SHALL BE MADE IN FULL ACCORDANCE WITH AWS D1.1 SECTION 5.18

M. STEEL QUALITY CONTROL:
   1. WELDER QUALIFICATIONS: QUALIFY WELDING PROCESSES AND WELDING OPERATORS IN ACCORDANCE WITH AWS STANDARD QUALIFICATION PROCEDURES. OPERATORS SHALL CARRY PROOF OF QUALIFICATIONS ON THEIR PERSONS INCLUDING AT THE TIME OF INSPECTION AND SHALL FURNISH A COPY TO THE PROJECT SUPERINTENDENT FOR HIS RECORD.
   2. TEST REPORTS: (2) COPIES, PLUS THE NUMBER CONTRACTOR WANTS RETURNED (5) MAX. TOTAL, OF STEEL PRODUCER'S REPORT OF MILL ANALYSIS AND TENSILE AND BEND TESTS FOR STRUCTURAL STEEL AND BOLTS MADE NO MORE THAN (60) DAYS BEFORE SHIPMENT.
   3. CERTIFICATES: TESTING LABORATORY'S CERTIFICATE THAT STRUCTURAL STEEL HAS BEEN FURNISHED AND INSTALLED IN ACCORDANCE WITH CONTRACT DOCUMENTS. TESTING LABORATORY SHALL INSPECT CONNECTIONS IN ACCORDANCE WITH REFERENCES AS FOLLOWS. COPIES OF TEST RESULTS AND INSPECTION REPORTS SHALL BE SENT DIRECTLY TO THE ENGINEER.
      a. WELDED CONNECTIONS SHALL CONFORM TO AWS D1.1-04, STRUCTURAL WELDING CODE BY AMERICAN WELDING SOCIETY. TESTING AGENCY SHALL INSPECT ALL COMPLETE PENETRATION WELDS AND ALL BUTT WELDS MADE BY FABRICATOR PERFORM ULTRASONIC OR RADIOGRAPHIC INSPECTIONS OF ALL FULL PENETRATION WELDS MADE IN THE FIELD. IF THE FABRICATOR USES THE FULL VALUE FOR FILLET WELDS, AS SPECIFIED IN THE REFERENCES, INSPECT 15% OF THESE WELDS. VISUALLY INSPECT ALL (100%) FIELD WELDS.
      b. BOLTED CONNECTORS: INSPECT AT LEAST 10% OF ALL "SLIP CRITICAL" OR "FULLY TIGHTENED" HIGH STRENGTH BOLTS WHICH ARE WELL SCATTERED THROUGHOUT THE STRUCTURE. IF LESS THAN 95% OF THE TESTED BOLTS MEET DESIGN TENSION OR IF ANY BOLT IS LESS THAN 85% OF DESIGN TENSION, THEN ALL BOLTS SHALL BE REWORKED. INSPECT 50% OF ALL REWORKED BOLTS, REPEAT THIS PROCESS UNTIL THE ABOVE REQUIREMENTS ARE MET. DIRECT TENSION INDICATORS OR TENSION CONTROL BOLTS MAY BE USED TO TEST 100% OF ALL "SLIP CRITICAL" OR "FULLY TIGHTENED" HIGH STRENGTH BOLTS.
      c. VISUALLY INSPECT 100% OF STEEL DECK ATTACHMENT FOLLOWING COMPLETION OF DECK PLACEMENT AND ATTACHMENT.
      d. 100% OF SHEAR STUDS AND HEADED CONCRETE ANCHORS SHALL BE VISUALLY INSPECTED. PERFORM BEND TEST ON RANDOM MEMBER AT START OF EACH SHIFT.

N. STEEL ERECTOR SHALL FIELD VERIFY CORRECTNESS OF FOUNDATION, ANCHOR BOLTS, OR OTHER EXISTING WORK AFFECTING THE STEEL BEFORE STARTING ERECTION.

O. FABRICATOR SHALL DESIGN ALL CONNECTIONS NOT SPECIFICALLY DETAILED ON DRAWINGS. REGARDLESS OF PROVISION TO THE CONTRARY IN THE AISC CODE OF STANDARD PRACTICE FOR BUILDINGS AND BRIDGES, ALL CONNECTIONS DESIGNED BY FABRICATOR SHALL BE HIS RESPONSIBILITY AND REVIEW OF SHOP DRAWINGS BY THE ENGINEER SHALL NOT RELIEVE FABRICATOR OF THIS RESPONSIBILITY.

P. UNLESS OTHERWISE NOTED, ALL BEAM CONNECTIONS SHALL BE STANDARD FRAMED OR SEATED END CONNECTIONS AS SHOWN IN PART 10 OF THE AISC MANUAL OF STEEL CONSTRUCTION (THIRTEENTH EDITION). FOR BEAM-TO-BEAM CONNECTIONS: SINGLE-PLATE SHEAR CONNECTIONS AS SHOWN IN PART 10 OF THE AISC MANUAL OF STEEL CONSTRUCTION (THIRTEENTH EDITION) ARE ONLY ALLOWED UP TO 20K OF DESIGN END REACTION. FOR BEAM-TO-COLUMN CONNECTIONS: SINGLE-PLATE SHEAR CONNECTIONS AS SHOWN IN PART 10 OF THE AISC MANUAL OF STEEL CONSTRUCTION (THIRTEENTH EDITION) ARE ONLY ALLOWED UP TO 50K OF DESIGN END REACTION. ALSO, SINGLE-PLATE SHEAR CONNECTION (FOR BOTH: BEAM-TO-BEAM & FOR BEAM-TO-COLUMN CONNECTIONS) SHALL NOT HAVE MORE THAN ONE VERTICAL ROW OF BOLTS. UNLESS REACTIONS ARE NOTED ON THE DRAWINGS, FOR NON-COMPOSITE BEAMS, CONNECTIONS SHALL DEVELOP AT LEAST ONE-HALF OF THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAM. UNLESS REACTIONS ARE NOTED ON THE DRAWINGS, FOR COMPOSITE BEAMS, CONNECTIONS SHALL DEVELOP AT LEAST THREE-QUARTER OF THE TOTAL UNIFORM LOAD CAPACITY OF THE BEAM. CONNECTIONS SHALL BE DESIGNED AS BEARING-TYPE CONNECTIONS WITH THREADS IN THE SHEAR PLANE, UNLESS OTHERWISE NOTED. IN NO CASE SHALL THE LENGTH OF FRAMED CONNECTIONS BE LESS THAN ONE-HALF THE "T" DISTANCE OF THE BEAM WEB.

MINIMUM SHEAR CAPACITY (FACTORED LOADS)

SHAPE	SHEAR CAPACITY	SHAPE	SHEAR CAPACITY
W8	20 KIPS	W24	105 KIPS
W10	25 KIPS	W27	110 KIPS
W12	30 KIPS	W30	130 KIPS
W14	40 KIPS	W33	150 KIPS
W16	55 KIPS	W36	160 KIPS
W18	75 KIPS		
W21	90 KIPS		

Any connection reactions exceeding the above minimum shear capacities are noted, in kips, in a box at either end of the member on the structural framing plans or are otherwise detailed in the plans. No connection shall use less than 2 rows of bolts unless noted otherwise. All connections shall satisfy the requirements of the AISC and OSHA.

Q. MINIMUM WELD SIZE SHALL BE 3/16" UNLESS OTHERWISE NOTED. WHERE NOT NOTED OTHERWISE, WELD SHALL BE ALL AROUND. INCREASE WELD SIZE TO MEET AISC REQUIREMENTS.

R. SINGLE SHEAR PLATES SHALL BE 3/8" MINIMUM THICKNESS.

S. THE GENERAL CONTRACTOR SHALL VERIFY THE REQUIRED CAMBER IN THE FIELD PRIOR TO ERECTION OF EACH MEMBER. ANY MILL CAMBER SHALL BE PLACED UP.

T. SPLICING OF STRUCTURAL STEEL MEMBERS IS PROHIBITED WITHOUT PRIOR APPROVAL OF THE ENGINEER AS TO LOCATION AND TYPE OF SPLICE TO BE MADE. ANY MEMBER HAVING A SPLICE NOT SHOWN AND DETAILED ON SHOP DRAWINGS WILL BE REJECTED.

U. STRUCTURAL STEEL SHALL BE PUNCHED FOR WOOD BLOCKING AND NAILERS IN ACCORDANCE WITH ARCHITECTURAL DETAILS OR AS SHOWN ON DRAWINGS.

V. THIS STRUCTURE IS NOT DESIGNED FOR EACH COLUMN LINE BENT TO RESIST LATERAL FORCES FROM WIND OR SEISMIC LOADS. THIS STRUCTURE DEPENDS ON THE DIAPHRAGM AND BRACING MEMBERS SHOWN. THE CONTRACTOR IS TO PROVIDE LATERAL BRACING IN EACH DIRECTION DURING THE ERECTION PHASE. SUCH BRACING SHALL REMAIN IN PLACE UNTIL ALL DIAPHRAGM AND LATERAL BRACING ELEMENTS ARE IN PLACE IN THEIR ENTIRETY AND HAVE BEEN APPROVED BY THE STRUCTURAL ENGINEER.

W. RAILINGS, POSTS AND CONNECTIONS SHALL BE CAPABLE OF RESISTING A HORIZONTAL LOADING OF 50 PLF APPLIED AT TOP RAIL OR A CONCENTRATED LOAD OF 200 POUNDS, WITHOUT EXCEEDING ALLOWABLE STRESSES INCREASED BY ONE-THIRD. GUARDRAIL POSTS SHALL BE 1 1/2 INCH DIAMETER (1.9-INCH OUTSIDE DIAMETER) SCHEDULE 40 STANDARD STEEL PIPE, U.N.O., WITH A MAXIMUM SPACING OF 4'-0".

X. ALL STRUCTURAL STEEL EXCEPT FOR GALVANIZED STEEL AND THAT IN CONTACT WITH FRESH CONCRETE SHALL RECEIVE ONE SHOP COAT OF THE FABRICATOR'S STANDARD GRAY PRIMER. BOLTED AND WELDED CONNECTIONS EXCEPT GALVANIZED CONNECTIONS AND THOSE IN CONTACT WITH FRESH CONCRETE SHALL BE PAINTED WITH THE SAME GRAY PRIMER FOLLOWING APPROVAL OF THE CONNECTION BY THE TESTING AGENCY. TOUCH UP GALVANIZED CONNECTIONS WITH A ZINC RICH GALVANIZING PAINT. ALL EXTERIOR STEEL TO BE HOT-DIPPED GALVANIZED.

SECTION 5. STRUCTURAL STEEL- STAINLESS

A. STAINLESS STEEL PLATE STEEL AND OTHER SHAPES: ASTM A480/A480M OR ASTM A276 - TYPE S304L (FY = 25 KSI MINIMUM)

B. STAINLESS STEEL HOLLOW SECTIONS (HSS): ASTM A554 -TYPE S304L

C. STRUCTURAL STEEL DETAILING, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE THIRTEENTH EDITION OF THE "MANUAL OF STEEL CONSTRUCTION - STEEL DESIGN GUIDE 27 STRUCTURAL STAINLESS STEEL" OF THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION AND SHALL CONFORM TO THE LATEST OSHA REQUIREMENTS. SHOP DRAWINGS SHALL GIVE COMPLETE WELDING INFORMATION, BOTH SHOP AND FIELD, USING AWS SYMBOLS.
   1. WELDED CONNECTIONS SHALL BE MADE WITH ER308/308L WELDING WIRE OR OF OTHER APPROVED GRADE APPROPRIATE FOR WELDING S304L STEEL, UNLESS OTHERWISE RECOMMENDED BY AWS OR CALLED OUT ON DRAWINGS.
   2. WELDING ELECTRODES SHALL CONFORM TO AWS D1.6/D1.6M-2017:STRUCTURAL WELDING CODE - STAINLESS STEEL.
   3. BOLTS ARE TO BE 3/4" DIAMETER HIGH STRENGTH BOLTS CONFORMING TO ASTM F593-22 STANDARD SPECIFICATION FOR STAINLESS STEEL BOLTS, HEX CAP SCREWS, AND STUDS, U.N.O.

D. BOLTED CONNECTIONS
   1. ALL BOLTS DESIGNATED "SLIP CRITICAL" OR "FULLY TIGHTENED" SHALL BE TIGHTENED TO THE MINIMUM PRETENSION VALUE SHOWN IN TABLE J3.1 OF THE AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (13TH EDITION). IN ADDITION, CONNECTIONS DESIGNATED "SLIP CRITICAL" SHALL HAVE PROPERLY PREPARED FAYING SURFACES TO MEET CLASS A SURFACE CONDITION, U.N.O. "SLIP CRITICAL" CONNECTIONS SHALL INCLUDE ALL BOLTS IN MOMENT CONNECTIONS. "FULLY TIGHTENED' CONNECTIONS SHALL INCLUDE ALL BOLTS LOADED IN DIRECT TENSION (SUCH AS HANGERS). BRACED FRAME CONNECTIONS, AND MEMBERS THAT ARE PART OF THE MAIN LATERAL RESISTING SYSTEM. DIRECT TENSION INDICATOR (DTI) WASHERS OR TENSION CONTROL BOLTS (TCB'S) SHALL BE USED AT THESE CONDITIONS. ALL OTHER BOLTS SHALL BE, AT MINIMUM, SNUG TIGHT.
   2. SNUG-TIGHT BOLTS SHALL BE INSTALLED PER THE REQUIREMENTS OF RCSC-2014 SECTION 8.1 WHICH INCLUDES:
      a. "THE SNUG TIGHTENED CONDITION IS THE TIGHTNESS THAT IS ATTAINED WITH A FEW IMPACTS OF AN IMPACT WRENCH OR THE FULL EFFORT OF AN IRONWORKER USING AN ORDINARY SPUD WRENCH TO BRING THE PLIES INTO FIRM CONTACT.
      b. "MORE THAN ONE CYCLE THROUGH THE BOLT PATTERN MAY BE REQUIRED TO ACHIEVE THE SNUG-TIGHTENED JOINT."
   3. SHOP ATTACHED BOLTS SHALL BE DESIGNED TO RESIST PRETENSIONED LOADS.
   4. ALL BOLTED CONNECTIONS SHALL USE WASHERS APPROPRIATE FOR USE WITH SPECIFIED BOLT GRADE. CLIPPED WASHERS SHALL BE USED ADJACENT TO THE K-AREA OF STEEL MEMBERS AS NECESSARY.

E. WELDED CONNECTIONS
   1. WELDED CONNECTIONS SHALL CONFORM TO SHALL CONFORM TO AWS D1.6/D1.6M-2017:STRUCTURAL WELDING CODE - STAINLESS STEEL BY THE AMERICAN WELDING SOCIETY.
   2. FIELD WELDING SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF AWS D1.6/D1.6M-2017:STRUCTURAL WELDING CODE - STAINLESS STEEL INCLUDING THE REQUIREMENTS FOR WELDER CERTIFICATION.
      a. FIELD WELDING WILL BE PROTECTED FROM THE ELEMENTS AND PERFORMED WITHIN AWS TEMPERATURE RANGE REQUIREMENTS.
      b. WET ELECTRODES SHALL BE DISCARDED.
   3. TACK WELDS AND CONSTRUCTION AID WELDS SHALL BE MADE IN FULL ACCORDANCE WITH AWS D1.6/D1.6M-2017:STRUCTURAL WELDING CODE - STAINLESS STEEL

F. STEEL QUALITY CONTROL:
   1. WELDER QUALIFICATIONS: QUALIFY WELDING PROCESSES AND WELDING OPERATORS IN ACCORDANCE WITH AWS STANDARD QUALIFICATION PROCEDURES. OPERATORS SHALL CARRY PROOF OF QUALIFICATIONS ON THEIR PERSONS INCLUDING AT THE TIME OF INSPECTION AND SHALL FURNISH A COPY TO THE PROJECT SUPERINTENDENT FOR HIS RECORD.

G. FABRICATOR SHALL DESIGN ALL CONNECTIONS NOT SPECIFICALLY DETAILED ON DRAWINGS. REGARDLESS OF PROVISION TO THE CONTRARY

H. MINIMUM WELD SIZE SHALL BE 3/16" UNLESS OTHERWISE NOTED. WHERE NOT NOTED OTHERWISE, WELD SHALL BE ALL AROUND. INCREASE WELD SIZE TO MEET AISC REQUIREMENTS.

SECTION 6. ANCHOR BOLTS AND DOWELS

A. SEE DRAWINGS FOR ANCHOR BOLT SIZE AND LAYOUT

B. ANCHOR BOLTS SHALL BE A MINIMUM OF 6" FROM EDGE OF CONCRETE, U.N.O.

C. POST INSTALLED REINFORCING (E.G. DOWELS):
   1. ALL POST INSTALLED REINFORCING SHALL BE SET IN HILTI RE-500V3 OR APPROVED EQUAL EPOXY ADHESIVE ANCHORAGE SYSTEM IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE AS NOTED IN THESE PLANS.
      a. DEFORMED REINFORCING BARS SHALL CONFORM WITH ASTM A615. ALL BARS SHALL BE GRADE 60.

D. THREADED ANCHOR RODS: SHALL MEET THE MATERIAL REQUIREMENTS OF ASTM F1554 GR. 36. A. MINIMUM OF 7 ½" EMBEDMENT USING THE HILTI HIT-HY 200 ADHESIVE ANCHORING SYSTEM, EQUIVALENT OR BETTER. ALL ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S INSTRUCTIONS.

E. MECHANICAL ANCHORS: AS CALLED OUT, EQUIVALENT OR BETTER, INSTALLED PER MANUFACTURER'S REQUIREMENTS.

F. WOOD FRAMED WALLS – ANCHORAGE TO FOUNDATIONS
   1. SIZE AND SPACING: ALL EXTERIOR AND SHEAR WALLS MINIMUM 5/8" CIP THREADED ANCHORS (SIMPSON STRONG-TIE SSTB20, EQUIVALENT OR BETTER) WITH BEARING PLATES AT 60" O.C. MAX, 14" MIN. EMBED INTO CONCRETE FOOTINGS OR WALLS AT 60" O.C. U.N.O. ONE ANCHOR BOLT SHALL BE LOCATED A MAXIMUM OF 12", AND A MINIMUM OF 5", AWAY FROM THE END OF SILL PLATES. SILL PLATES UNDER WALLS LESS THAN 4'-0 LONG MUST BE CONTINUOUS.
   2. BEARING PLATES AND HOLE SIZES: ANCHOR BOLTS ALONG EXTERIOR AND SHEAR WALLS SHALL BE INSTALLED WITH 3" SQUARE PLATES WASHERS WITH 1/4" MINIMUM THICKNESS. THE DIAMETER OF THE PLATE WASHER HOLE MAY BE UP TO 3/16" LARGER THAN THE DIAMETER OF THE ANCHOR BOLT. THE EDGE OF PLATE WASHERS SHALL BE 1/2" MAX FROM THE INSIDE FACE OF SHEAR PANELS. PLATE WASHER ARE PERMITTED TO BE DIAGONALLY SLOTTED WITH A MAXIMUM SLOT LENGTH OF 1 3/4" PROVIDED A STANDARD CUT WASHER IS PLACED BETWEEN THE PLATE WASHER AND THE NUT.
   3. ANCHOR BOLTS FOR INTERIOR NON-SHEAR WALLS MAY BE POST-INSTALLED SCREW-TYPE ANCHORS (SIMPSON STRONG-TIE TITEN HD CONCRETE SCREWS, EQUIVALENT OR BETTER) WITH A MINIMUM INTERIOR DIAMETER OF 1/4" AND 1 1/2" EMBEDMENT INSTALLED AT 72" MAXIMUM SPACING AND LOCATED A MAXIMUM OF 12", AND A MINIMUM OF 5", AWAY FROM THE END OF SILL PLATES, U.N.O.

G. WOOD FRAMED WALLS - ANCHORAGE TO PRECAST CONCRETE
   1. FOR ALL WALLS INSTALLED ON TOP OF PRECAST HOLLOWCORE, PLANK, BEAM, OR OTHER MEMBERS SHALL HAVE ANCHORS INSTALLED. ANCHOR TYPE, LOCATION, AND EMBEDMENT DEPTH SHALL BE COORDINATED WITH PRECAST MANUFACTURER AND FOLLOW ALL MANUFACTURER'S REQUIREMENTS.

H. ALL HOLDOWNS AND ANCHORS SHALL BE INSTALLED ACCORDING TO THE MOST CURRENT MANUFACTURER'S SPECIFICATIONS AND REQUIREMENTS AND SHALL BE TIED IN PLACE PRIOR TO FOUNDATION INSPECTION. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO LOCATE THESE ANCHORS IN THE EXACT LOCATION.

I. CAST-IN-PLACE ANCHOR BOLTS FOR STEEL BASEPLATES SHALL BE SET IN PLACE USING TEMPLATES.

SECTION 7. STAIRS, LANDINGS, RAILINGS, WALKWAYS AND PLATFORMS

A. STAIRS AND PLATFORM SUPPORTS SHALL BE OF GALVANIZED STEEL, ALUMINUM OR STAINLESS STEEL AS SPECIFIED ON DRAWINGS. SEE PLANS FOR STAIR LOCATIONS, DIMENSIONS, MATERIALS, LOCATIONS, AND ADDITIONAL INFORMATION.

B. RAILINGS, WALKWAYS, AND PLATFORMS AND GRATING SHALL BE OF GALVANIZED STEEL, ALUMINUM OR STAINLESS STEEL AS SPECIFIED ON DRAWING.

C. MANUFACTURER SHALL BE RESPONSIBLE FOR MEETING THE CODE REQUIREMENTS FOR ALL RAILINGS, TREADS, AND OTHER ITEMS INCLUDED IN THEIR SHOP DRAWING.

D. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR STAIR, LANDING, RAILING, WALKWAY, AND PLATFORM ASSEMBLIES. SHOP DRAWINGS SHALL DETAIL ALL MEMBERS AND CONNECTIONS. SHOP DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE IN WHICH THE PROJECT WILL BE CONSTRUCTED. SHOP DRAWINGS SHALL INDICATE ALL CONNECTIONS TO BUILDING STRUCTURE, INCLUDING CONNECTORS EMBEDDED IN CONCRETE OR ATTACHED TO CMU.

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

STRUCTURAL GENERAL NOTES

PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

00.S003

SECTION 7. STAIRS, LANDINGS, RAILINGS, WALKWAYS AND PLATFORMS

A. STAIRS AND PLATFORM SUPPORTS SHALL BE OF GALVANIZED STEEL, ALUMINUM OR STAINLESS STEEL AS SPECIFIED ON DRAWINGS. SEE PLANS FOR STAIR LOCATIONS, DIMENSIONS, MATERIALS, LOCATIONS, AND ADDITIONAL INFORMATION.
B. RAILINGS, WALKWAYS, AND PLATFORMS AND GRATING SHALL BE OF GALVANIZED STEEL, ALUMINUM OR STAINLESS STEEL AS SPECIFIED ON DRAWING.
C. MANUFACTURER SHALL BE RESPONSIBLE FOR MEETING THE CODE REQUIREMENTS FOR ALL RAILINGS, TREADS, AND OTHER ITEMS INCLUDED IN THEIR SHOP DRAWING.
D. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND CALCULATIONS FOR STAIR, LANDING, RAILING, WALKWAY, AND PLATFORM ASSEMBLIES. SHOP DRAWINGS SHALL DETAIL ALL MEMBERS AND CONNECTIONS. SHOP DRAWINGS AND CALCULATIONS SHALL BE SIGNED AND SEALED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE IN WHICH THE PROJECT WILL BE CONSTRUCTED. SHOP DRAWINGS SHALL INDICATE ALL CONNECTIONS TO BUILDING STRUCTURE, INCLUDING CONNECTORS EMBEDDED IN CONCRETE OR ATTACHED TO CMU.
E. GRATING SHALL BE CONSTRUCTED OF STRAIGHT PARALLEL BEARING "I' BEAMS.
F. GRATING SHALL SAFELY SUSTAIN A UNIFORM DISTRIBUTED LOAD OF 100 LBS PER SQUARE FOOT ON A 72-INCH SPAN AND DEFLECT NO MORE THAN 0.30 INCH AND SHALL SAFELY SUSTAIN A CONCENTRATED LOAD OF 300 LBS PER FOOT OF WIDTH ON A 72-INCH SPAN AND DEFLECT NO MORE THAN 0,25 INCH. GRATING SECTIONS SHALL PROVIDE A 20%-40% OPEN AREA.
G. RECESSES SHALL BE 1/4-INCH ALUMINUM ANGLE FRAMES, SIZED AS REQUIRED FOR THE GRATING. FRAMES SHALL HAVE MITERED AND WELDED CORNERS.
H. GRATING SHALL BE BANDED AROUND ALL EDGES.
I. ALUMINUM GRATING SHALL BE GRAY IN COLOR AND PROVIDE A NON-SLIP TOP SURFACE.
J. GRATING SHALL CONFORM TO USB SECTION 2304, TABLE NO. 23-A AND THE APPROPRIATE PORTIONS OF THE OSHA REGULATIONS, SECTIONS 1910.22 AND 1910.23.
K. GRATING SHALL BE FURNISHED WITH STAINLESS STEEL HOLD-DOWN CLIPS.

SECTION 8. TIMBER

A. TIMBER ROOF TRUSS LOADING
   1. TOP CHORD:
      a. LL = 20 PSF
      b. DL = 15 PSF
   2. BOTTOM CHORD :
      a. DL = 10 PSF
B. ALL MULTIPLE STUD POSTS, ISOLATED OR WITHIN WALLS, SHALL BE #2 S-P-F OR BETTER.
C. ALL 2X6 AND 2X8 WOOD JOISTS AND BEAMS TO BE #2 S-P-F OR BETTER. 2X10 AND 2X12 WOOD JOISTS AND BEAMS SHALL BE #2 SOUTHERN PINE. 2X4 AND 2X6 WOOD STUDS SHALL BE #2 S-P-F OR BETTER.
D. S-P-F (SOUTH) SHALL NOT BE SUBSTITUTED FOR S-P-F
E. ANY WOOD THAT IS TO REMAIN EXPOSED TO WEATHER, BELOW THE DESIGNATED FLOOD PROTECTION LEVEL, OR IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-TREATED SOUTHREN PINE SELECT STRUCTURAL, U.N.O. ON PLAN.
F. ANY WOOD TO BE USED AS A FOUNDATION ELEMENT OR EMBEDDED IN SOIL SHALL BE PRESSURE TREATED WITH PRESERVATIVES AND RATED FOR USE AS A PERMANENT WOOD FOUNDATION
G. ALL TRUSSES SHALL BE CONNECTED TO SUPPORTING WALLS OR BEAMS WITH SIMPSON STRONG-**LSTA24**, EQUIVALENT OR BETTER STRAPS INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.
H. CONNECTOR PLATES SHALL BE DESIGNED IN ACCORDANCE WITH T.P.I. SPECIFICATIONS. ALLOWABLE STRESS INCREASE FOR SHORT TERM LOADING SHALL BE 25%. SEE MECHANICAL DRAWINGS AND ROOF PLAN FOR EQUIPMENT WEIGHTS, LOCATIONS AND ACCESS PATHS IN ROOF TRUSSES.
I. ROOF DECK SHALL BE 5/8" PLYWOOD OR APA RATED SHEATHING NAILED WITH 8D NAILS AT 6" O.C. AT ALL PANEL EDGES AND AT 12" O.C. TO INTERMEDIATE FRAMING MEMBERS.
J. EXTERIOR WALL SHEATHING SHALL BE A MINIMUM OF 7/16" PLYWOOD OR OSB FASTENED TO SUPPORT MEMBERS AT A MAXIMUM SPACING OF 12" O.C. FOR INTERIOR SUPPORTS AND 6" O.C. AT PANEL EDGES WITH 6D COMMON NAILS.
K. SPLICES IN BUILT-UP COLUMNS SHALL BE A MINIMUM OF 32" AWAY FROM ANY OTHER SPLICE IN THE COLUMN AS WELL AS 48" AWAY FROM THE END OF THE BUILT-UP COLUMN. CONTRACTOR SHALL USE THE LONGEST POSSIBLE MEMBERS TO MINIMIZE THE NUMBER OF SPLICES.
L. ANY LOADS SUSPENDED FROM TRUSSES MUST BE APPLIED TO EACH TRUSS UNIFORMLY. SPACING OF HANGERS NOT TO EXCEED 2'-0" O.C., IN ANY DIRECTION.
M. ALL FASTENERS USED IN PRESERVATIVE-TREATED WOOD SHALL HAVE COATING TYPES AND WEIGHTS IN ACCORDANCE WITH THE TREATED WOOD OR CONNECTOR MANUFACTURER'S RECOMMENDATIONS. IN THE ABSENCE OF THESE RECOMMENDATIONS, A MINIMUM OF ASTM A653, TYPE G185 ZINC-COATED GALVANIZED STEEL, OR EQUIVALENT, SHALL BE USED.
N. PROPER ERECTION BRACING SHALL BE INSTALLED TO HOLD THE TRUSSES TRUE AND PLUMB AND IN SAFE CONDITION UNTIL PERMANENT TRUSS BRACING AND BRIDGING CAN BE SOLIDLY NAILED IN PLACE TO FORM A STRUCTURALLY SOUND FRAMING SYSTEM. ALL ERECTION AND PERMANENT BRACING SHALL BE INSTALLED AND ALL COMPONENTS PERMANENTLY FASTENED BEFORE THE APPLICATION OF ANY LOADS TO THE TRUSSES. ALL BRACING SHALL BE DESIGNED BY MANUFACTURER AND INDICATED ON SHOP DRAWINGS. ALL PREFABRICATED WOOD TRUSSES ARE TO BE INSTALLED IN ACCORDANCE WITH BRACING WOOD TRUSSES COMMENTARY, HANDLING AND ERECTING WOOD TRUSSES, AS PUBLISHED BY THE TRUSS PLATE INSTITUTE. DESIGN OF ROOF TRUSSES SHALL BE PERFORMED BY A LICENSED STRUCTURAL ENGINEER IN THE STATE IN WHICH PROJECT WILL BE CONSTRUCTED. DESIGN CALCULATIONS SHALL BE SUBMITTED TO STRUCTURAL ENGINEER OF RECORD FOR APPROVAL PRIOR TO FABRICATION. THESE CALCULATIONS SHALL BE SEALED BY THE DESIGN ENGINEER.
O. ALL FACE/FACE BEAM, JOIST, AND RAFTER CONNECTIONS SHALL BE MADE WITH PREMANUFACTURED BEAM AND JOIST HANGERS. ALL WOOD TO WOOD CONNECTIONS SHALL EMPLOY METAL ANCHORS. NO TOE OR END NAILING SHALL BE PERMITTED.
P. NAIL MULTIPLE PLY BEAMS WITH TWO ROWS 16D NAILS AT 12" O.C. TOP AND BOTTOM. BOLT 3 AND 4 PLY LVL MEMBERS WITH 2 ROWS 1/2" DIAMETER THRU-BOLTS AT 24" O.C. (STAGGER AT 12" O.C). SPLICES ARE NOT PERMITTED IN ANY PLY BETWEEN SUPPORTS.
Q. PROVIDE WOOD FASTENING PER MINIMUM FASTENING SCHEDULE, CHAPTER 23 OF THE IBC, OR AS NOTED ON DRAWINGS.
R. MULTIPLE STUD POSTS WITH (2) OR MORE STUDS SHALL BE NAILED TOGETHER WITH EACH STUD NAILED TO THE ADJACENT STUD W/(2) ROWS 16D NAILS AT 12"O.C. STAGGERED AT 6"O.C.
S. STUDS OR JOISTS SHALL NOT BE CUT TO INSTALL PLUMBING OR WIRING UNLESS METAL OR WOOD SIDE PIECES ARE PROVIDED TO STRENGTHEN THE MEMBER.
T. LAMINATED VENEER LUMBER (LVL) AND PARALLEL STRAND LUMBER (PSL) TO HAVE FB = 2600 PSI MIN., E = 1900 KSI MIN. LAMINATED STRAND LUMBER (LSL) TO HAVE FB = 1700 PSI MIN., E = 1300 KSI MIN.
U. ALL EXTERIOR, INTERIOR LOAD BEARING, AND SHEARWALLS TO BE ANCHORED TO SLAB WITH ANCHOR BOLTS OR EPOXY ADHESIVE ANCHORS PER DRAWINGS. OTHER WALLS (WALLS NOT ON THICKENED SLABS) MAY BE ANCHORED USING POWER DRIVEN FASTENERS.
W. ALL WALL DOUBLE TOP PLATES, SHALL BE LAPPED AT CORNERS AND INTERSECTIONS AND FASTENED PER IBC FASTENING SCHEDULE. ALL DOUBLE PLATE END JOINTS SHALL BE OFFSET AT LEAST 24". DOUBLE PLATES TO BE FASTENED TOGETHER PER IBC FASTENING SCHEDULE.

SECTION 9. CLADDING - METAL ROOFING AND WALL SYSTEM

A. METAL WALL AND ROOF SYSTEMS WITH EXPOSED FASTENERS SHALL BE 26-GAUGE PREPAINTED GALVALUME SHEET MBCI PBR OR PBU PANEL SYSTEMS (EQUIVALENT OR BETTER) INSTALLED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
B. SAMPLES FOR VERIFICATION: CONTRACTOR SHALL PROVIDE OWNER WITH MANUFACTURER'S STANDARD PROFILE AND COLOR CHARTS FOR INITIAL SELECTION. CONTRACTOR SHALL THEN PROVIDE OWNER WITH 12-INCH-LONG SECTIONS OF EACH METAL PANEL PROFILE AND ALSO PROVIDE COLOR CHIPS VERIFYING COLOR SELECTION FOR FINAL APPROVAL.
C. PANELS SHALL BE 36" WIDE CORRUGATED GALVALUME PANELS RATED FOR THE MAXIMUM SPANS SHOWN ON THE PLANS. CONTRACTOR SHALL USE THE LONGEST PANEL LENGTHS POSSIBLE TO MINIMIZE THE NUMBER OF LAP JOINTS.
D. CONTRACTOR SHALL PROVIDE ALL FASTENERS, SEALANTS, ACCESSORIES, AND FLASHING NECESSARY TO PROVIDE A WEATHERTIGHT BUILDING CLADDING SYSTEM IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND REQUIREMENTS.
E. ACCESSORIES
   1. GENERAL: PROVIDE COMPLETE METAL PANEL ASSEMBLY INCORPORATING BASE, CORNER, AND OPENING TRIMS AND MISCELLANEOUS FLASHINGS, IN MANUFACTURER'S STANDARD PROFILES. PROVIDE REQUIRED FASTENERS, CLOSURE STRIPS, SUPPORT PLATES, AND SEALANTS AS INDICATED IN MANUFACTURER'S WRITTEN INSTRUCTIONS.
   2. FLASHING AND TRIM: MATCH MATERIAL, THICKNESS, AND FINISH OF METAL PANEL FACE SHEET. FABRICATE TRIM AND FLASHINGS IN LONGEST PRACTICAL LENGTHS
   3. VENTILATION: CONTRACTOR SHALL PROVIDE VENTED EAVES AND RIDGE CAP AS RECOMMENDED BY MANUFACTURER OF PROPOSED ROOF INSULATION SYSTEM.
   4. PANEL FASTENERS: SELF-TAPPING SCREWS AND OTHER ACCEPTABLE FASTENERS RECOMMENDED BY METAL PANEL MANUFACTURER.
      1. EXPOSED FASTENERS: LONG LIFE FASTENERS WITH EPDM OR NEOPRENE GASKETS, WITH HEADS MATCHING COLOR OF METAL PANELS BY MEANS OF FACTORY-APPLIED COATING.
   5. JOINT SEALERS: MANUFACTURER'S STANDARD OR RECOMMENDED LIQUID AND PREFORMED SEALERS AND TAPES, AND AS FOLLOWS:
      1. TAPE SEALERS: MANUFACTURER'S STANDARD NON-CURING BUTYL TAPE, AAMA 809.2.
F. METAL ROOFING LAPS SHALL BE SEALED WITH LAP SEALANT SPECIFIED BY MANUFACTURER FOR FLAT ROOF APPLICATIONS.
G. METAL GUTTERS, WHEN SPECIFIED, SHALL BE MANUFACTURER APPROVED FOR USE WITH CLADDING COMPONENTS AND SHALL MATCH MATERIAL, THICKNESS, AND FINISH.

DOOR SCHEDULE

OPENING NUMBER	DOOR							FRAME						REMARKS
				SIZES		ROUGH...		TYP E			DETAILS			
	TYPE	COUNT	MATERIAL	W	H	W	H		MATERIAL	DEPTH	HEAD	JAMB	SILL	
D1	FLUSH	1	HM	3'-0"	6'-8"	3'-4"	6'-10"		HM	5-3/4"	-/-	-/-	-/-	
D2	-	1	INS STL	SEE REMARKS	SEE REMARKS	*	*	OVERHEAD DOOR OPERATOR			-/-	-/-	-/-	MATCH DIMENSIONS TO EXISTING OPENING SIZE
D3	O.H. COIL	1	INS STL	10'-0"	14'-0"	*	*				-/-	-/-	-/-	
D4	-	3	INS STL	14'-0"	16'-0"	*	*	OVERHEAD DOOR...			-/-	-/-	-/-	-

* FOLLOW OVERHEAD DOOR MANUFACTURER'S RECOMMENDATIONS FOR ROUGH OPENING DIMENSIONS

SCHEDULE ABBREVIATION KEY

HM - METAL DOORS AND FRAMES AS SPECIFIED IN SECTION "METAL DOORS & FRAMES"

INS STL - INSULATED OVER-HEAD SECTIONAL DOOR AS SPECIFIED IN SECTION "OVERHEAD DOORS"

Minimum Fastening Schedule

See IBC Table 2304.9.1 for additional information

Connection	Fastener	Number Or Spacing
Joist to band joist, face nail	16d common	3
Joist to sill or girder, toe nail	8d common	3
Bridging to joist, toe nail each end	8d common	2
Ledger strip, face nail	16d common	3 @ each joist
1x6 or less subfloor to each joist face nail	8d common	2
Over 1x6 subfloor to each joist face nail	8d common	3
2-inch subfloor to joist or girder, blind and face	16d common	2
Nail sole plate to stud, end nail	16d common	16" O.C.
Top or sole plate to stud, end nail	16d common	2
Stud to sole plate, toe nail	8d common	4
Double studs, face nail	10d common	24" O.C.
Double top plates, face nail	16d common	16" O.C.
Top plates, lap and intersections, face nail	---	(2) 16d or (3) 10d common
Continuous header, two pieces	16d common	16" O.C. along each edge
Ceiling joists to plate, toe nail	8d common	3
Continuous header to stud, toe nail	8d common	4
Ceiling joists, lap over partitions, face nail	16d common	3
Ceiling joists to parallel rafters, face nail	16d common	3
Rafter to plate, toe nail	8d common	3
1-inch brace to each stud and plate, face nail	8d common	2
1x8 or less sheathing to each bearing, face nail	8d common	2
Over 1x8 sheathing to each bearing, face nail	8d common	3
Built-up corner studs	16d common	24" O.C.
Built-up girders and beams, of three members	20d common	32" O.C. at top and bottom and staggered 2 ends and at each splice
Multiple stud posts, jack & full height assemblies	10d common	24" O.C.
2-inch planks	16d common	2 each bearing
Studs to sole plate, end nail	16d common	2 each end

Connection	Fastener	Number Or Spacing
Wood structural panel & wall sheathing		
15/32", 1/2"	6d common, annular or spiral thread	6" O.C. edges and 12" O.C. intermediate
19/32", 3/4"	8d common or 6d annular or spiral thread	6" O.C. edges and 12" O.C. intermediate
7/8" - 1 1/4"	10d common or 8d annular or spiral thread	6" O.C. edges and 6" O.C. intermediate
Gypsum wall board		
1/2"	1 1/2" drywall nail 1 1/4" type S or W screws	
5/8"	1 1/2" drywall nail 1 5/8" type S or W screws	7" O.C. on ceiling and 7" O.C. on walls

Note: (U.N.O. in wood notes or drawings)
1. Drywall nails shall conform to ASTM-C514
2. Corrosion-Resistant nails spaced 6" O.C. at edge and 8" O.C. at intermediate supports. Nails shall have a minimum edge distance of 3/8".
3. Use annular or spiral thread nails for combination subfloor/underlayment. Nail must be of sufficient length to accommodate thickness of siding and sheathing if used, and allow minimum stud penetration of 1 1/2".

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
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WASTEWATER TREATMENT PLANT

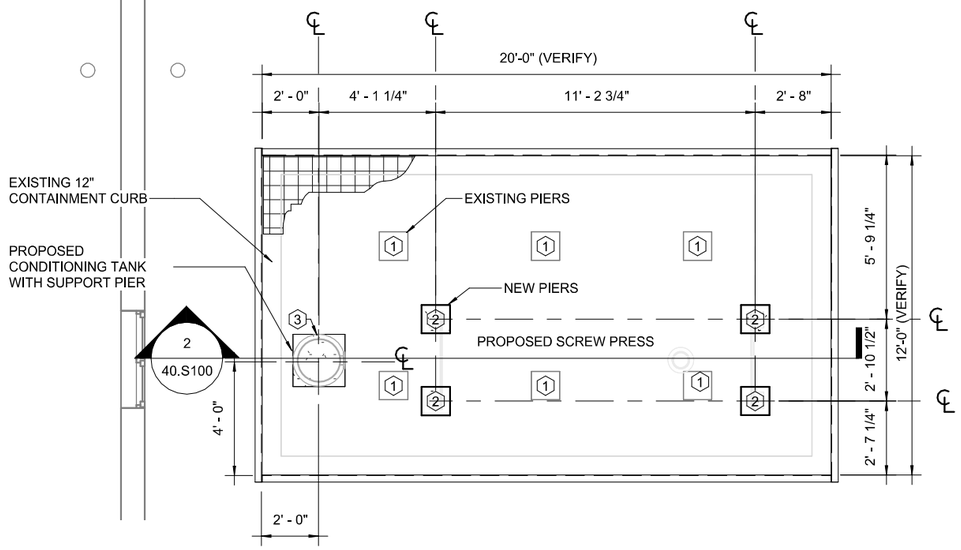
ANAMOSA WWTP
ANAMOSA, IOWA

STRUCTURAL GENERAL NOTES

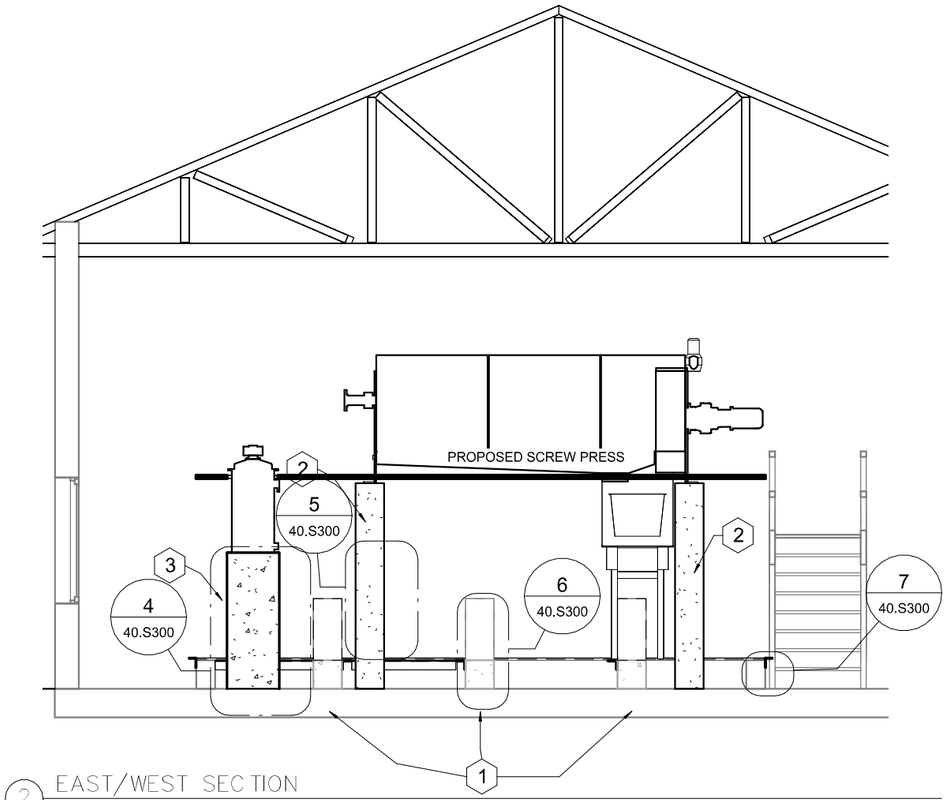
PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

00.S004

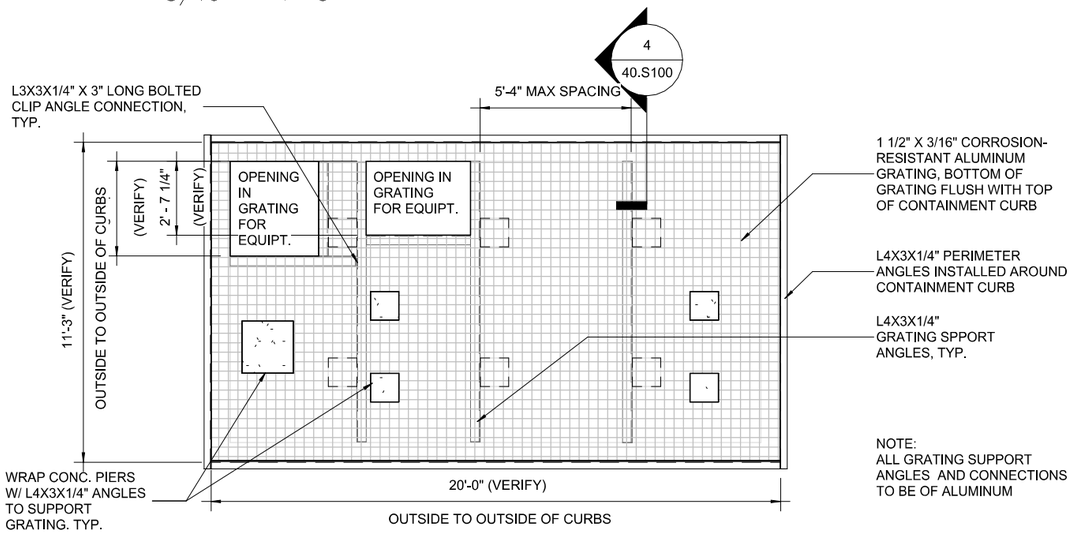
D2
REPLACE OVERHEAD DOOR AND
DOOR OPERATOR. SEE DOOR SCHEDULE
AND ELECTRICAL SHEETS.



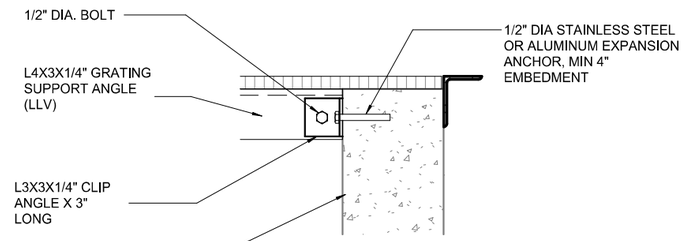
1 PROPOSED BIOSOLIDS CONTAINMENT AREA FLOOR PLAN
3/16" = 1'-0"



2 EAST/WEST SECTION
3/16" = 1'-0"



3 PROPOSED BIOSOLIDS HANDLING BLDG GRATING AND FRAMING PLAN
3/16" = 1'-0"



4 ANGLE CONNECTION
1" = 1'-0"

TAGGED NOTES: SEE SHEET 40.S300 FOR ADDITIONAL INFORMATION

1. EXISTING SUPPORT PIER MODIFICATION: SAWCUT AND REMOVE PORTION ABOVE ELEVATION OF THE TOP OF THE EXISTING CONTAINMENT CURB. COAT PORTION OF EXPOSED REBAR WITH CORROSION-RESISTANT PAINT.
2. NEW 12" X 12" SCREW PRESS SUPPORT PIERS. VERIFY LOCATIONS AND ELEVATIONS WITH EQUIPMENT MANUFACTURER.
3. NEW 22" X 22" CONDITIONING TANK SUPPORT PIER. VERIFY LOCATION AND ELEVATION WITH TANK MANUFACTURER

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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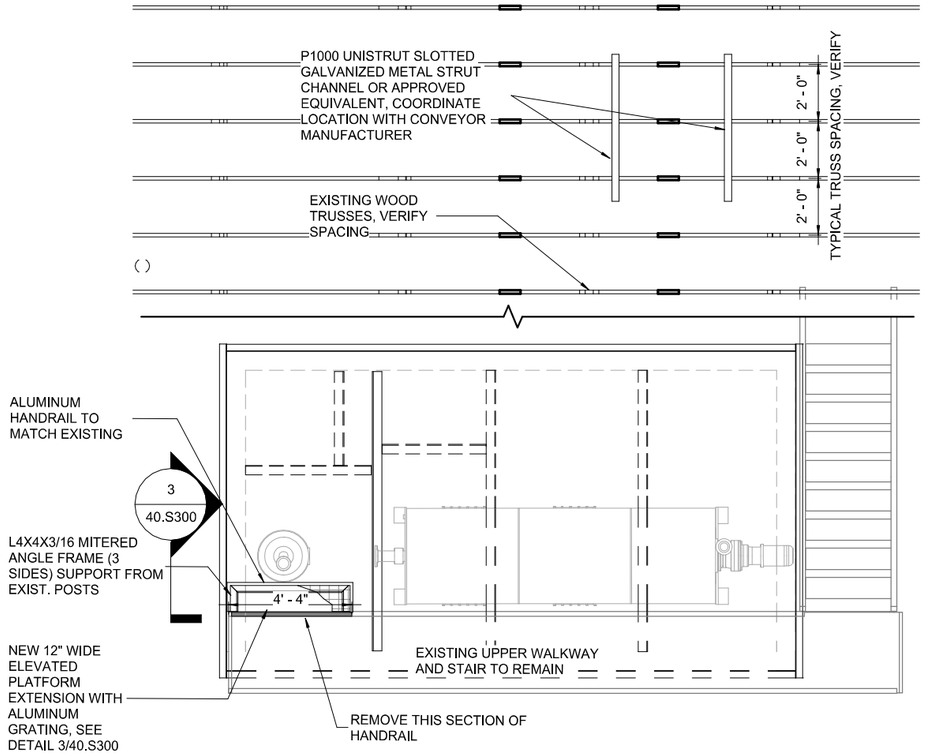
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

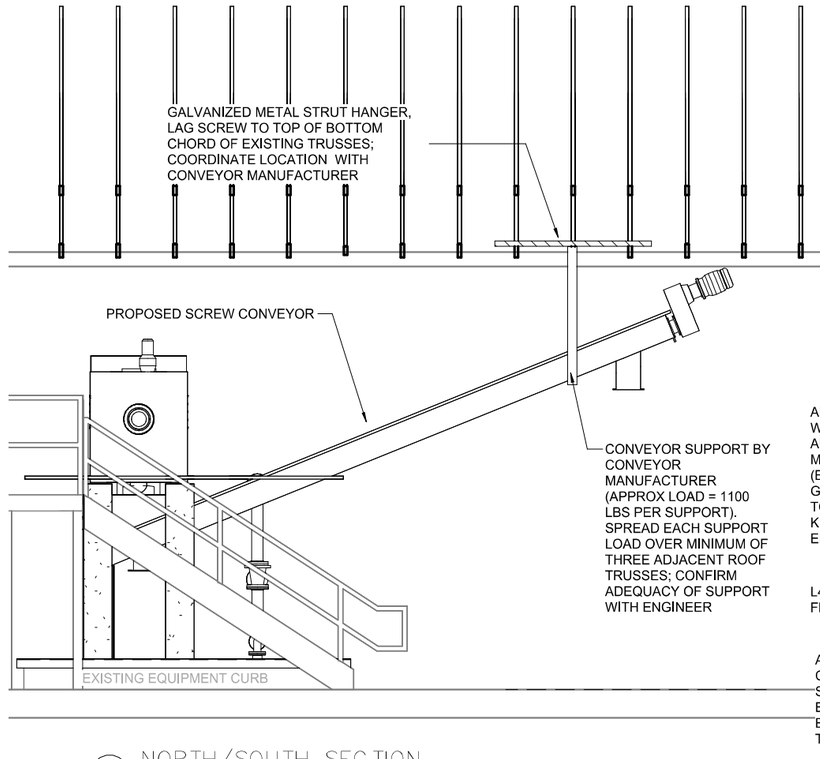
BIOSOLIDS HANDLING BUILDING - STRUCTURAL PLANS

PROJECT NUMBER	9433.1
DATE	12/07/23
DRAWN BY	JAK/TLE
DESIGN BY	TLE/KAR
CHECKED BY	MRS

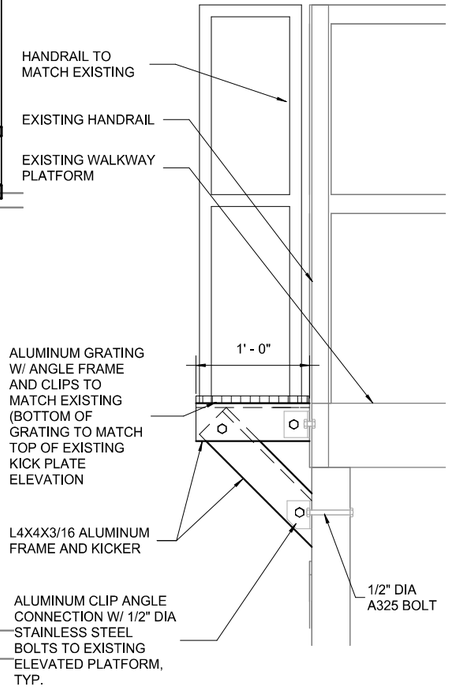
40.S100



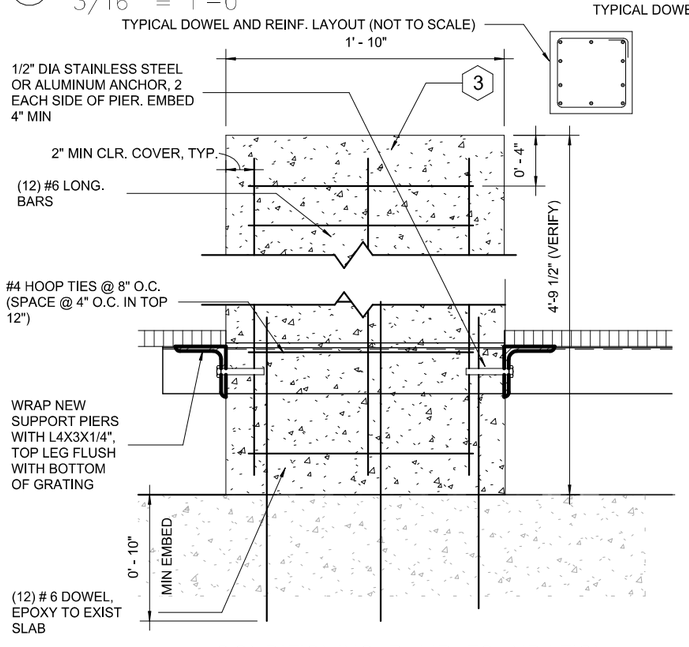
1 BIOSOLIDS HANDLING BLDG ROOF AND UPPER LEVEL FRAMING PLAN
3/16" = 1'-0"



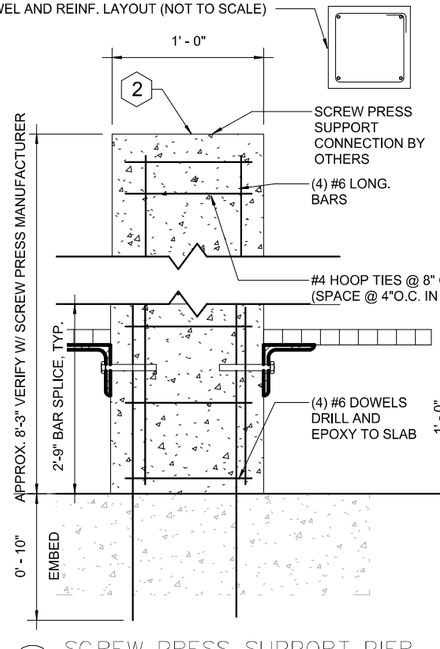
2 NORTH/SOUTH SECTION
3/16" = 1'-0"



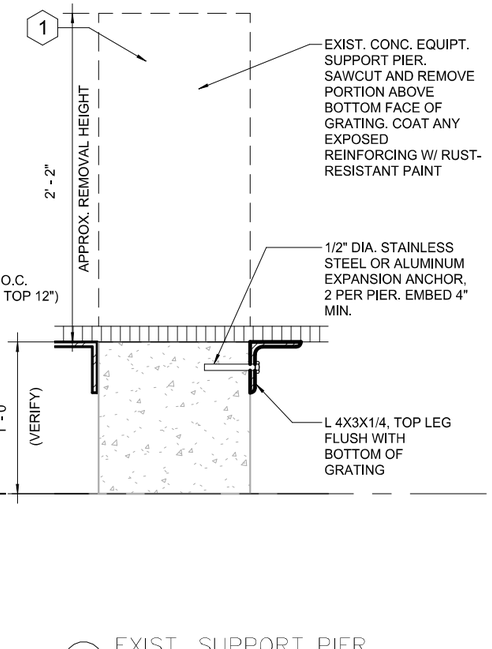
3 GRATING SECTION
3/4" = 1'-0"



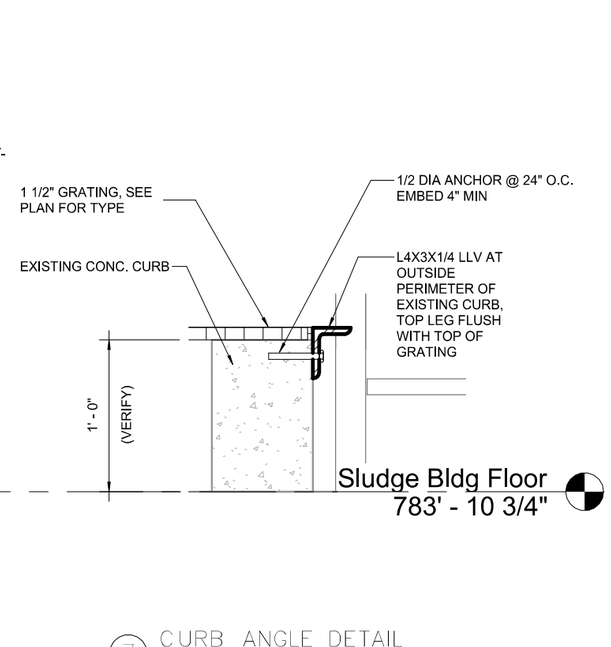
4 CONDITIONING PUMP FOUNDATION
1" = 1'-0"



5 SCREW PRESS SUPPORT PIER
1" = 1'-0"



6 EXIST. SUPPORT PIER
1" = 1'-0"



7 CURB ANGLE DETAIL
1" = 1'-0"

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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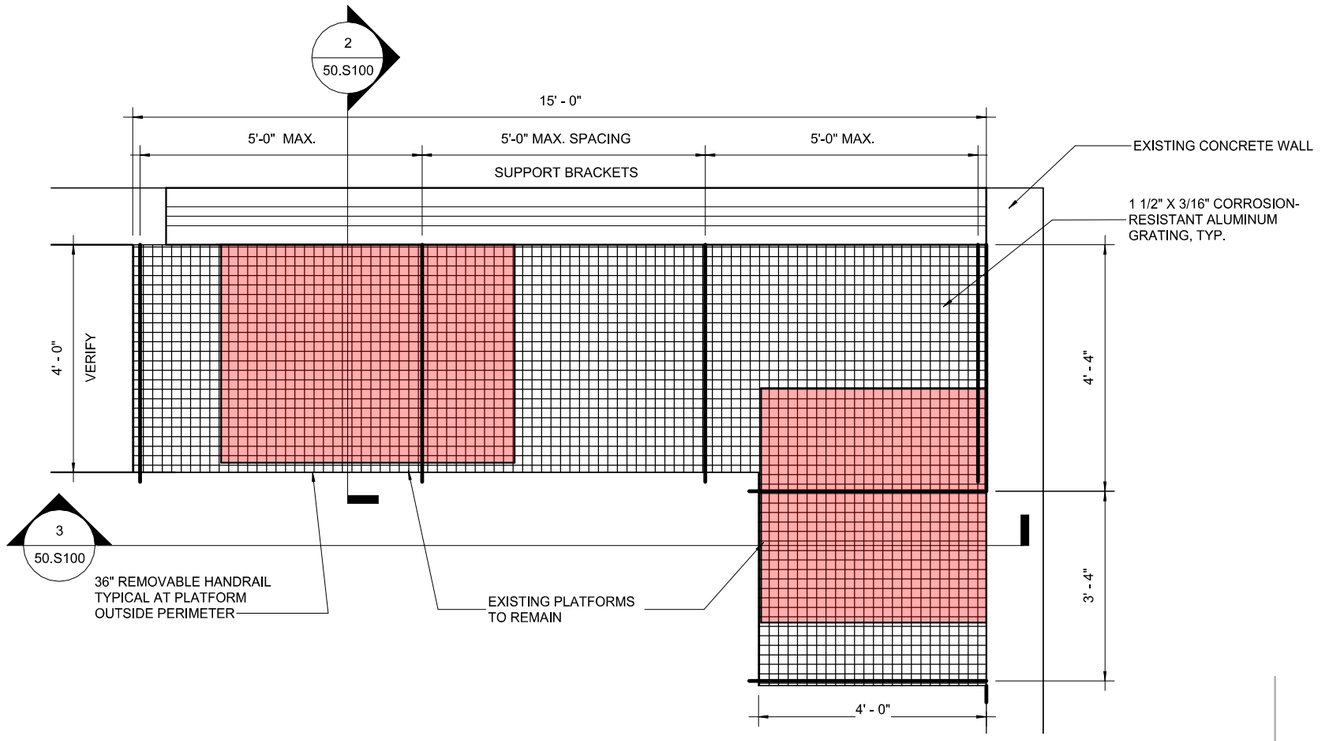
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

BIOSOLIDS HANDLING BUILDING - SECTIONS AND DETAILS

PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

40.S300

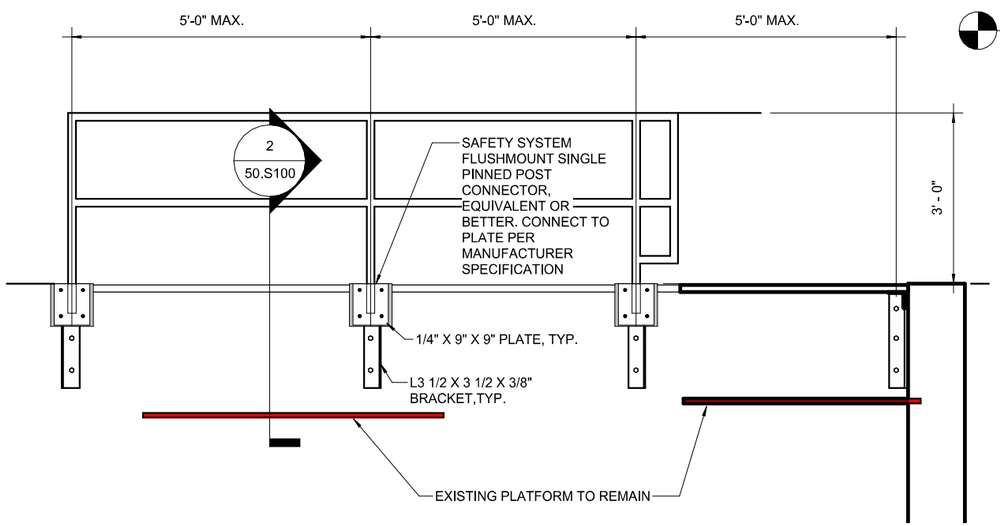


1 PUMP STATION WALKWAY PLAN
3/8" = 1'-0"

NOTES:

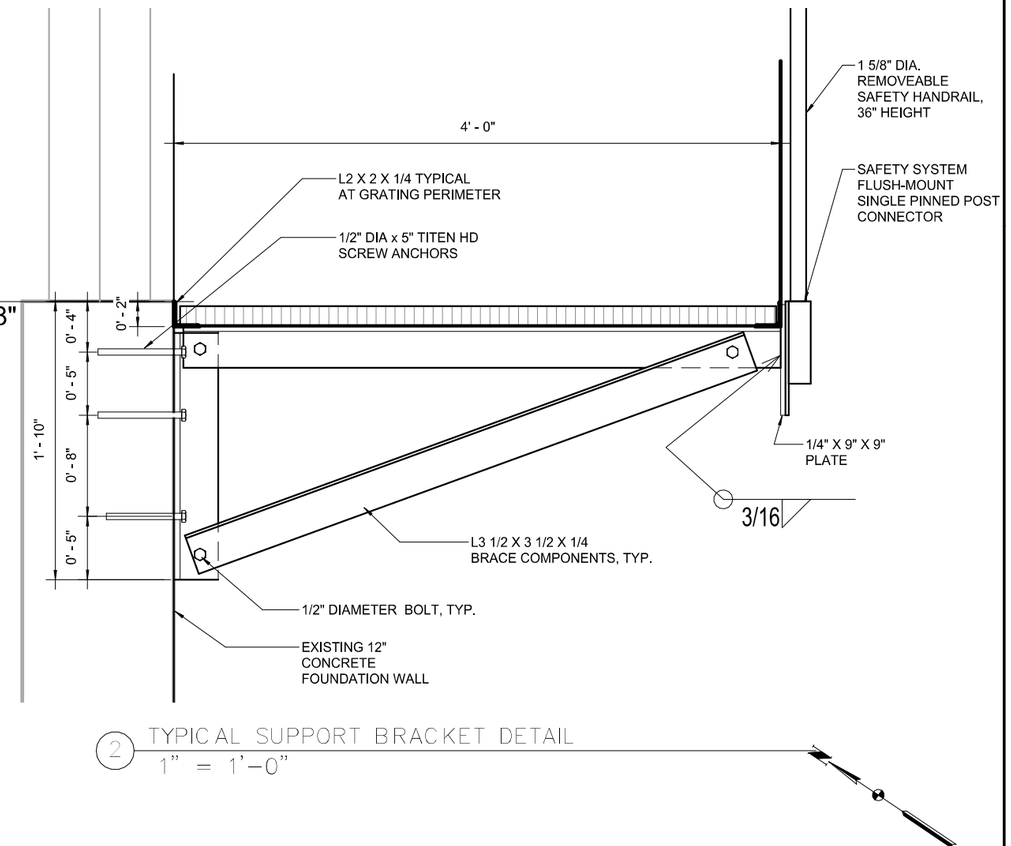
CONTRACTOR SHALL ADD SECTIONS OF GUIDERAIL FOR THE TWO (2) PUMPS AND MIXER SUCH THAT THE GUIDERAILS EXTEND UP AND ARE FLUSH WITH THE TOP OF THE NEW PLATFORM. ADD GUIDERAIL SUPPORT EXTENSIONS OFF NEW PLATFORM. CONFIRM GUIDERAIL REQUIREMENTS AND INSTALLATION WITH PUMP AND MIXER MANUFACTURERS.

GRATING SUPPORT MEMBERS AND CONNECTORS TO BE OF STAINLESS STEEL



3 EAST WALKWAY
3/8" = 1'-0"

T.O.WALL
779' - 10 5/8"



2 TYPICAL SUPPORT BRACKET DETAIL
1" = 1'-0"

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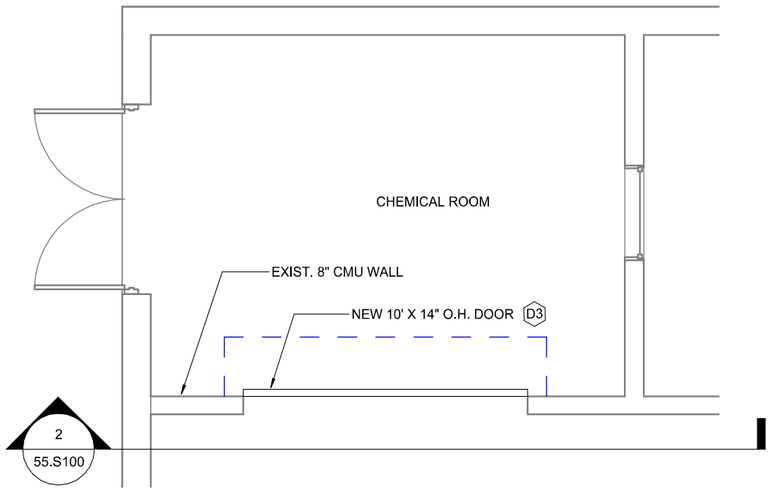
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

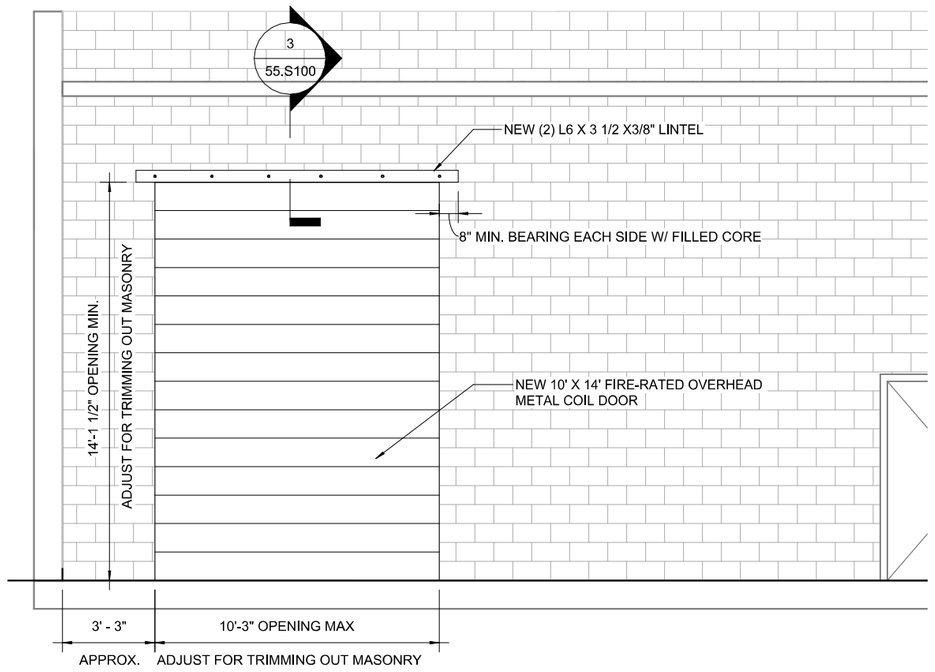
PLANT DRAIN PUMP STATION MODIFICATION

PROJECT NUMBER	9433.1
DATE	12/07/23
DRAWN BY	JAK/TLE
DESIGN BY	TLE/KAR
CHECKED BY	MRS

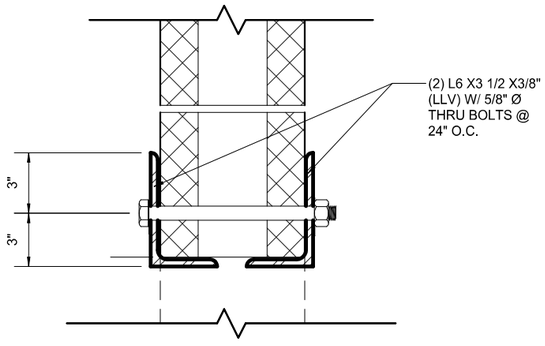
50.S100



1 ADMINISTRATION BLDG NEW DOOR OPENING
3/16" = 1'-0"



2 CHEMICAL ROOM – SOUTH WALL PROPOSED
3/16" = 1'-0"



REMOVE BLOCK BELOW AFTER INSTALLATION

3 NEW LINTEL DETAIL
1 1/2" = 1'-0"

0 6" 1' 1'-6"
SCALE IN FEET
1 1/2" = 1'

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
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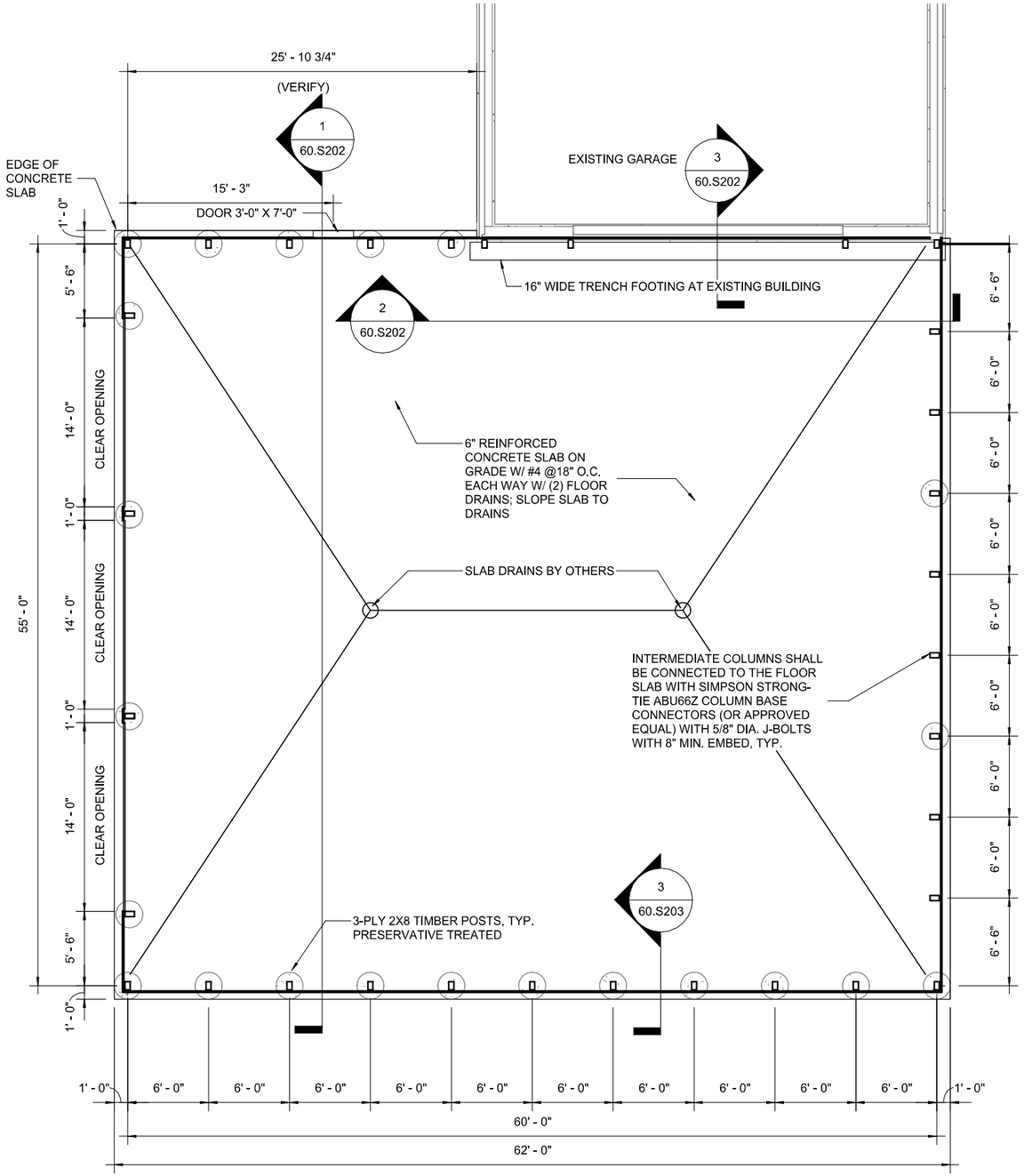
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

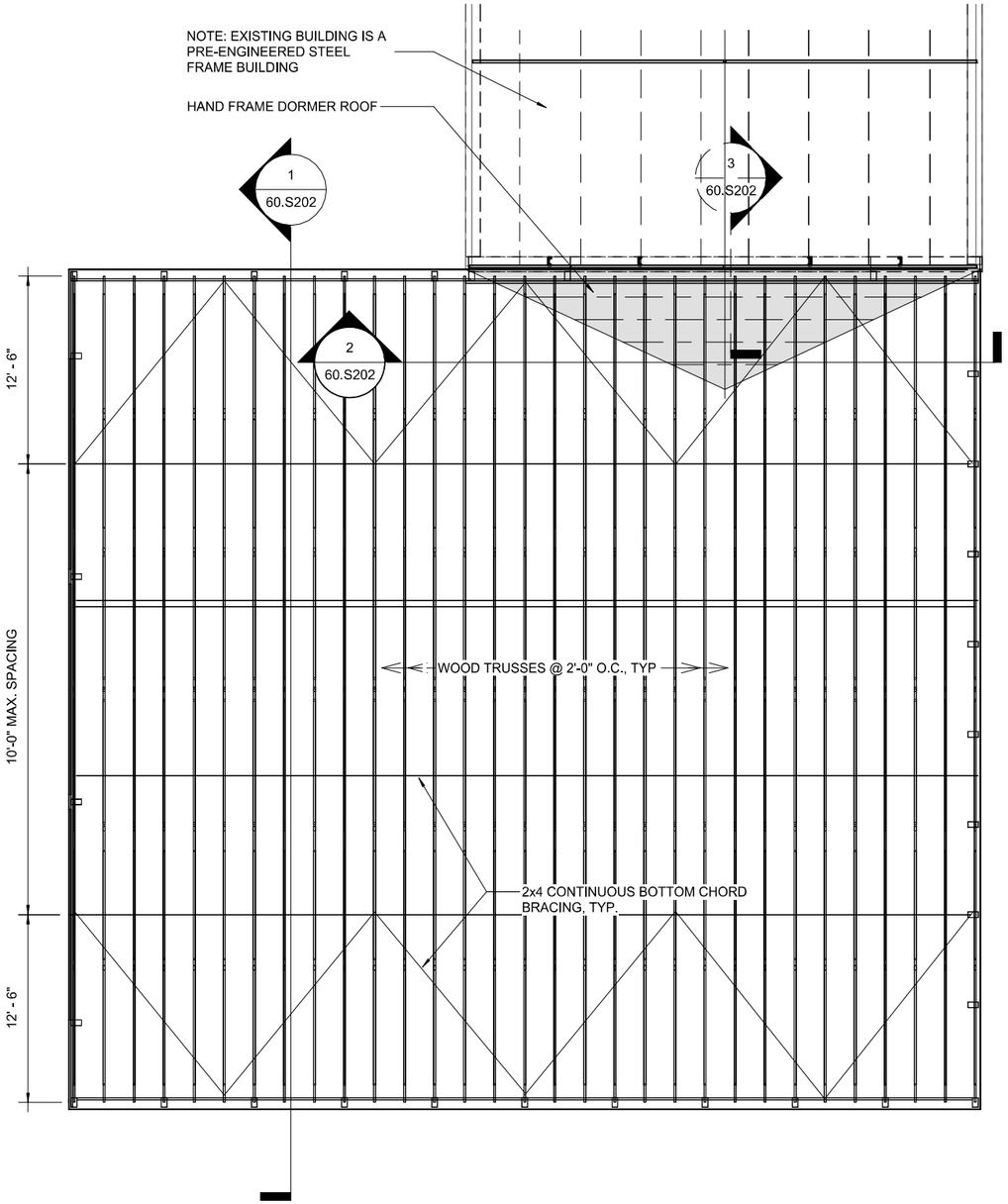
ADMINISTRATION BUILDING MODIFICATION

PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

55.S100



1 GARAGE EXPANSION – FOUNDATION PLAN
1" = 10'–0"



2 GARAGE EXPANSION – ROOF FRAMING PLAN
1" = 10'–0"

0 10' 20'
SCALE IN FEET
1" = 10'

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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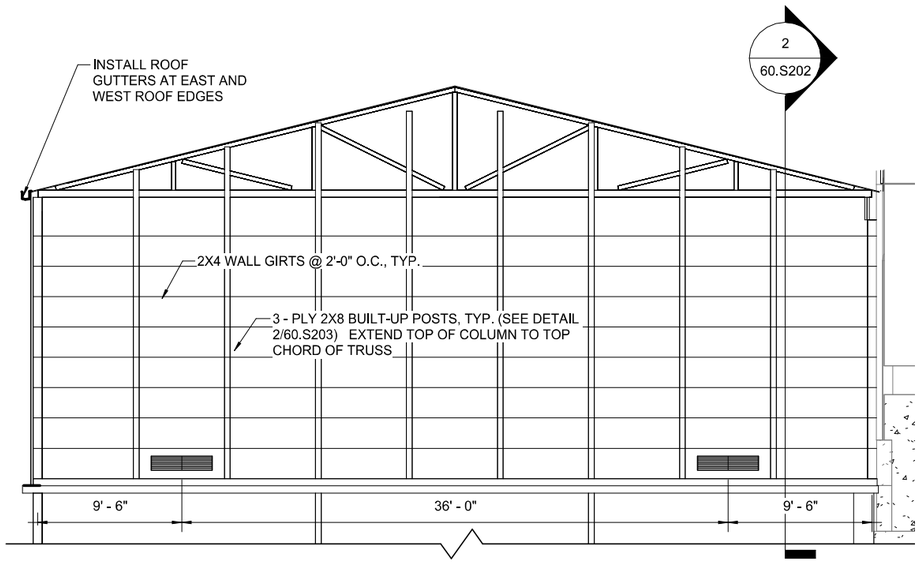
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

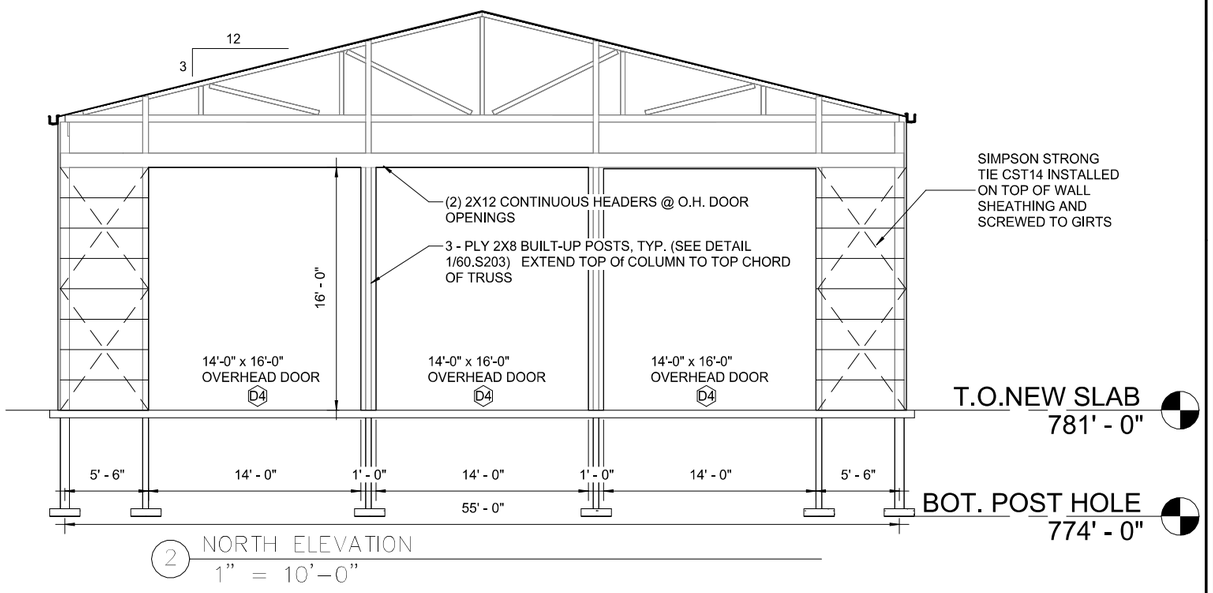
GARAGE EXPANSION - STRUCTURAL PLANS

PROJECT NUMBER	9433.1
DATE	12/07/23
DRAWN BY	JAK/TLE
DESIGN BY	TLE/KAR
CHECKED BY	MRS

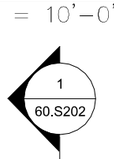
60.S100

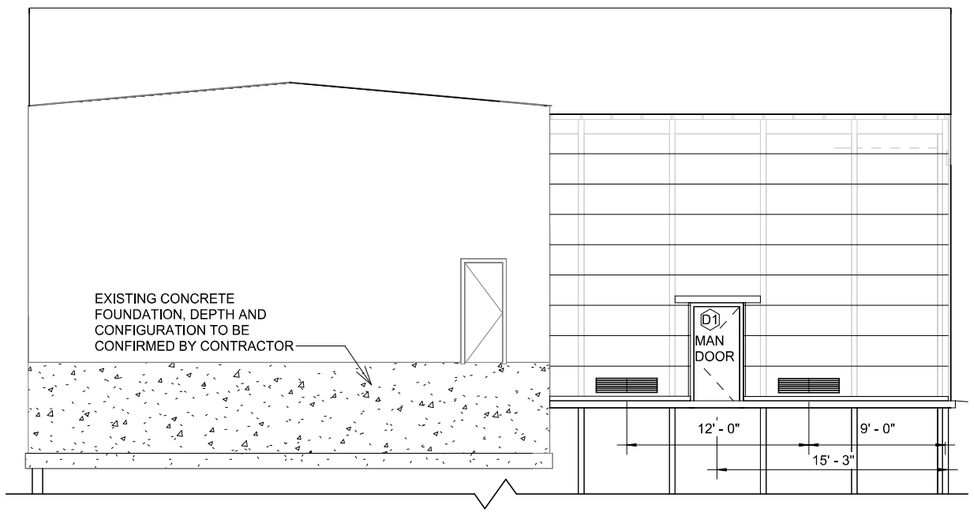


1 SOUTH ELEVATION
1" = 10'-0"

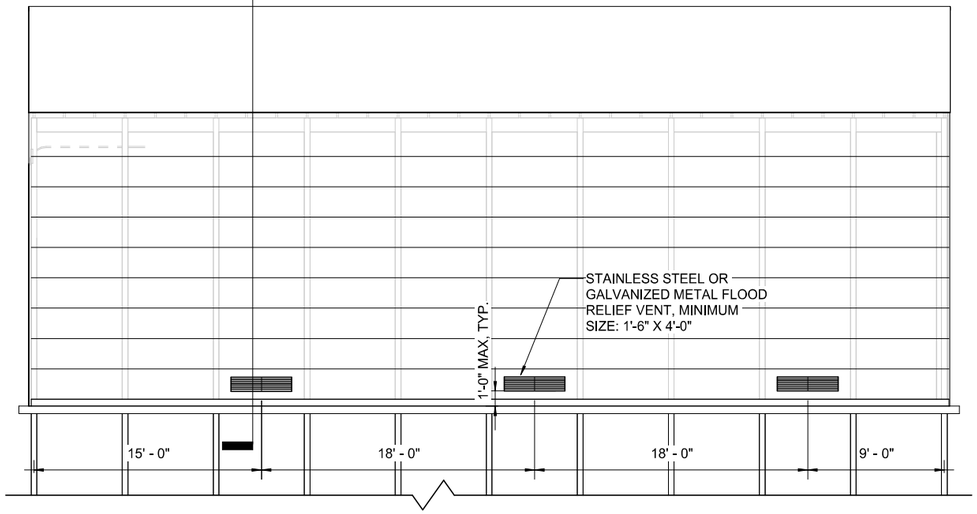


2 NORTH ELEVATION
1" = 10'-0"





3 EAST ELEVATION
1" = 10'-0"



4 WEST ELEVATION
1" = 10'-0"

NOTE:
METAL WALL CLADDING AND METAL ROOFING TO MATCH EXISITNG METAL ROOFING AND SIDING, FLASH AND SEAL TO EXISITNG

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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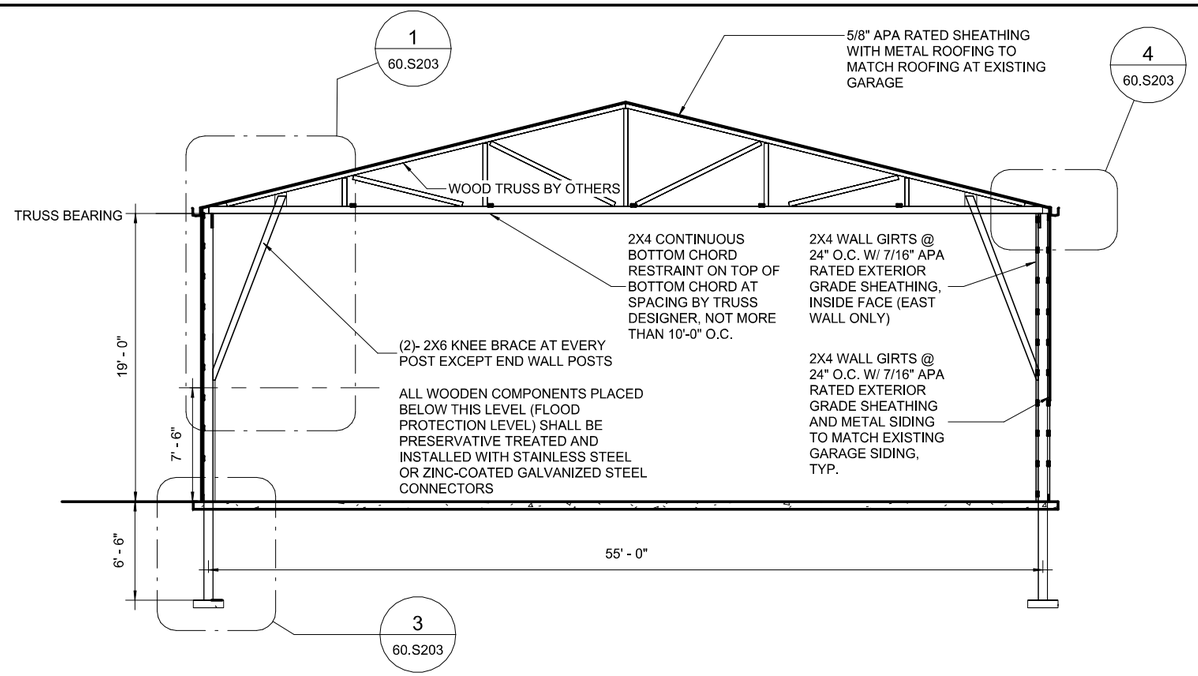
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

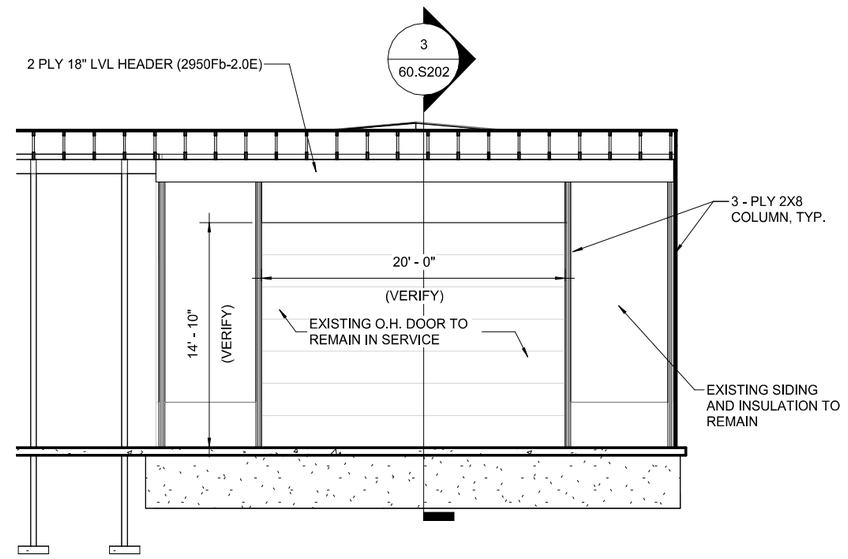
GARAGE EXPANSION - STRUCTURAL ELEVATIONS

PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

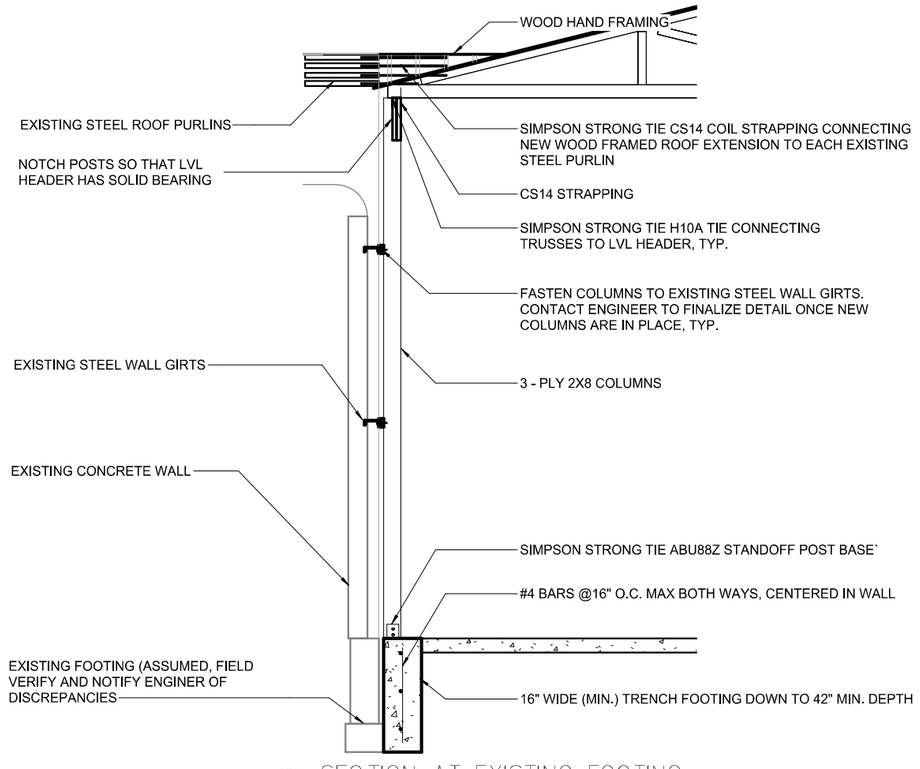
60.S201



1 GARAGE EXPANSION –E/W SECTION
1" = 10'–0"



2 GARAGE EXPANSION – AT EXIST.
1" = 10'–0"



3 SECTION AT EXISTING FOOTING
3/16" = 1'–0"

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WASTEWATER TREATMENT PLANT
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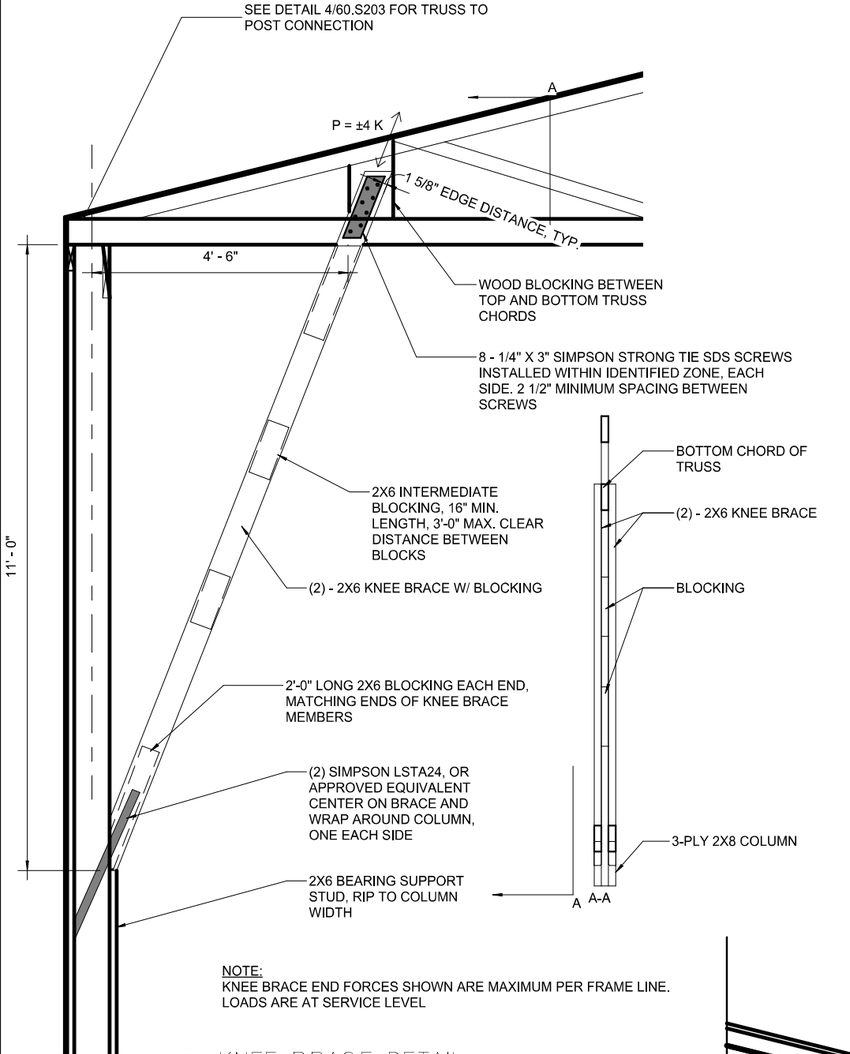
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

GARAGE EXPANSION - STRUCTURAL SECTIONS

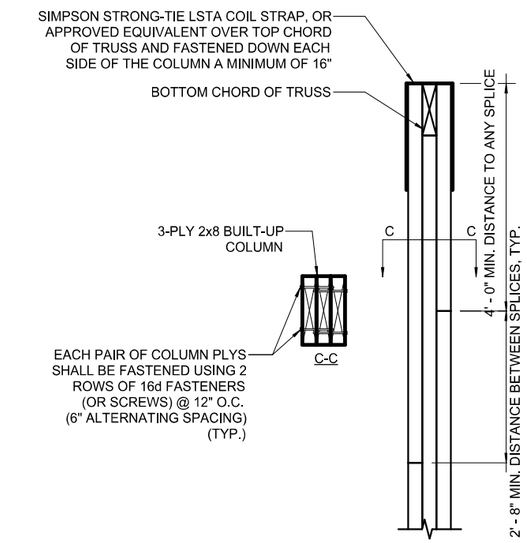
PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

60.S202

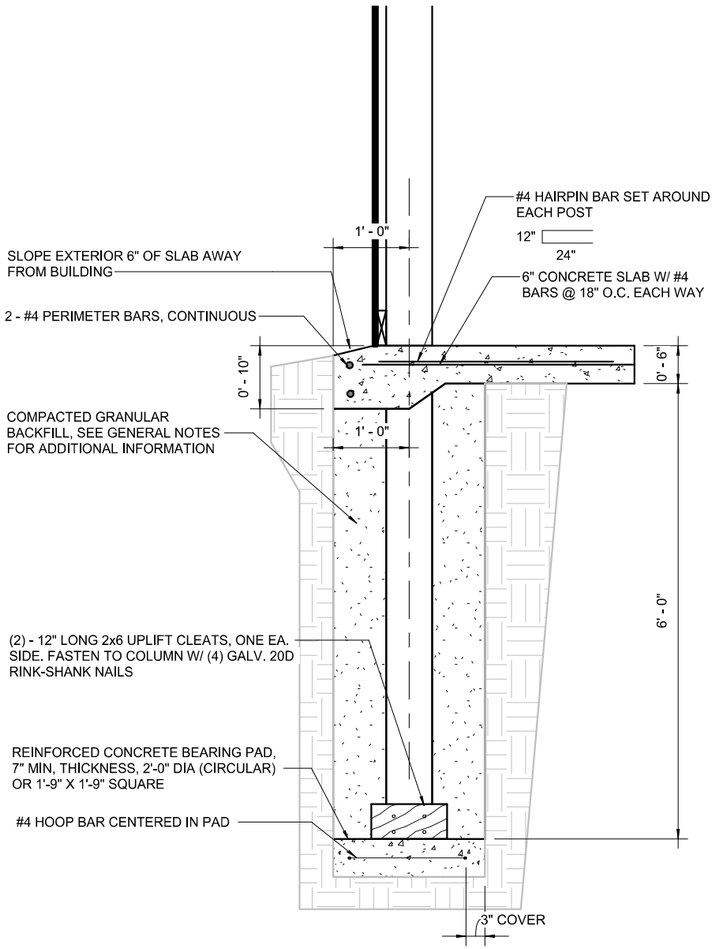


NOTE:
KNEE BRACE END FORCES SHOWN ARE MAXIMUM PER FRAME LINE.
LOADS ARE AT SERVICE LEVEL

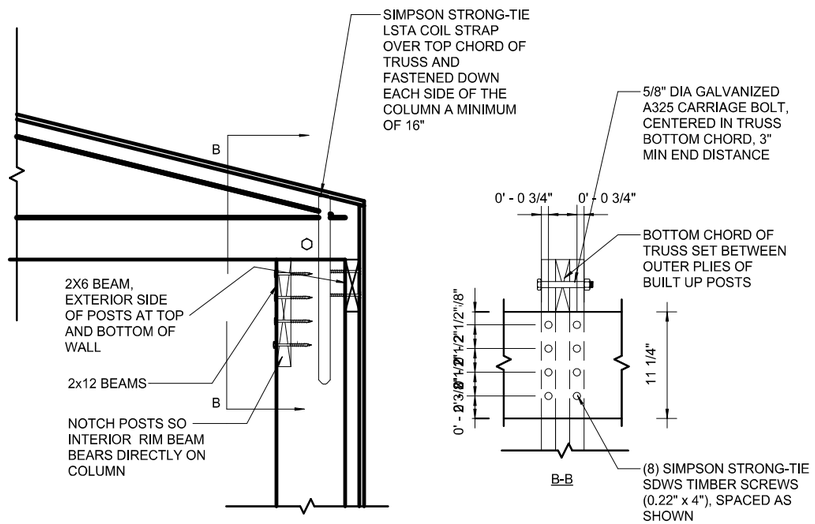
1 KNEE BRACE DETAIL
3/8" = 1'-0"



2 BUILT-UP COLUMN
3/4" = 1'-0"



3 TYPICAL COLUMN
1/2" = 1'-0"



4 TYPICAL TRUSS/POST CONNECTION
3/4" = 1'-0"

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WASTEWATER TREATMENT PLANT
ANAMOSA, IOWA
CITY OF ANAMOSA

DRAWING LOG

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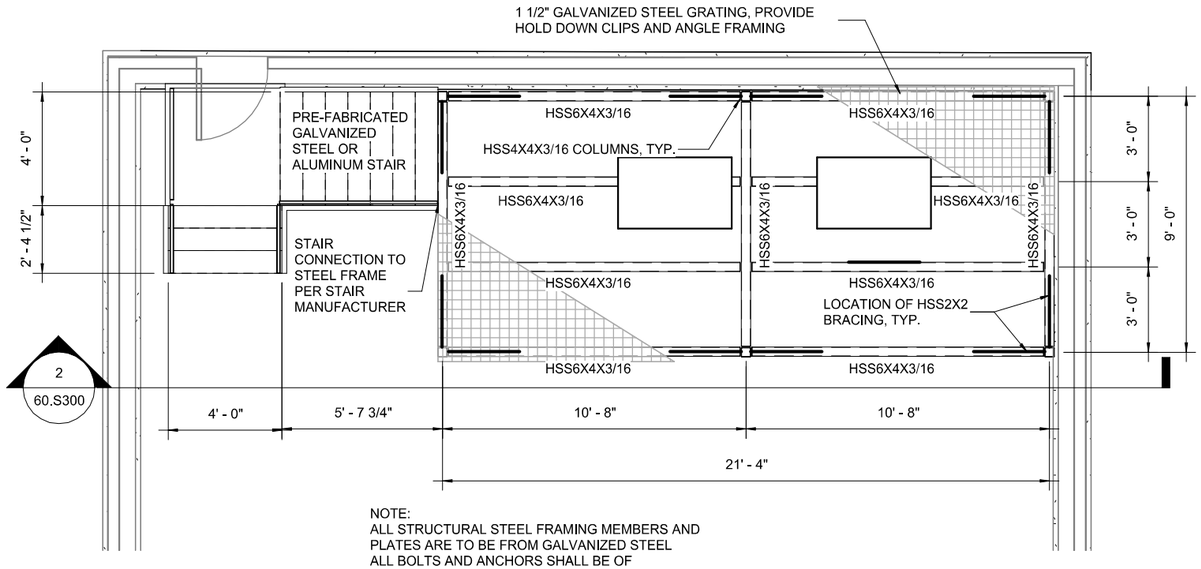
WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

GARAGE EXPANSION - STRUCTURAL DETAILS

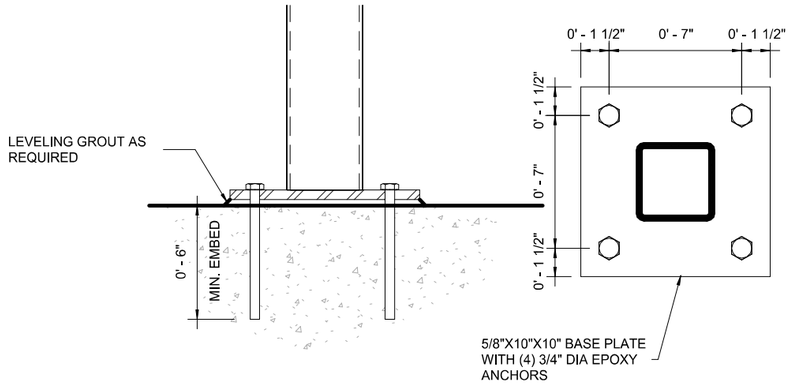
PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

60.S203

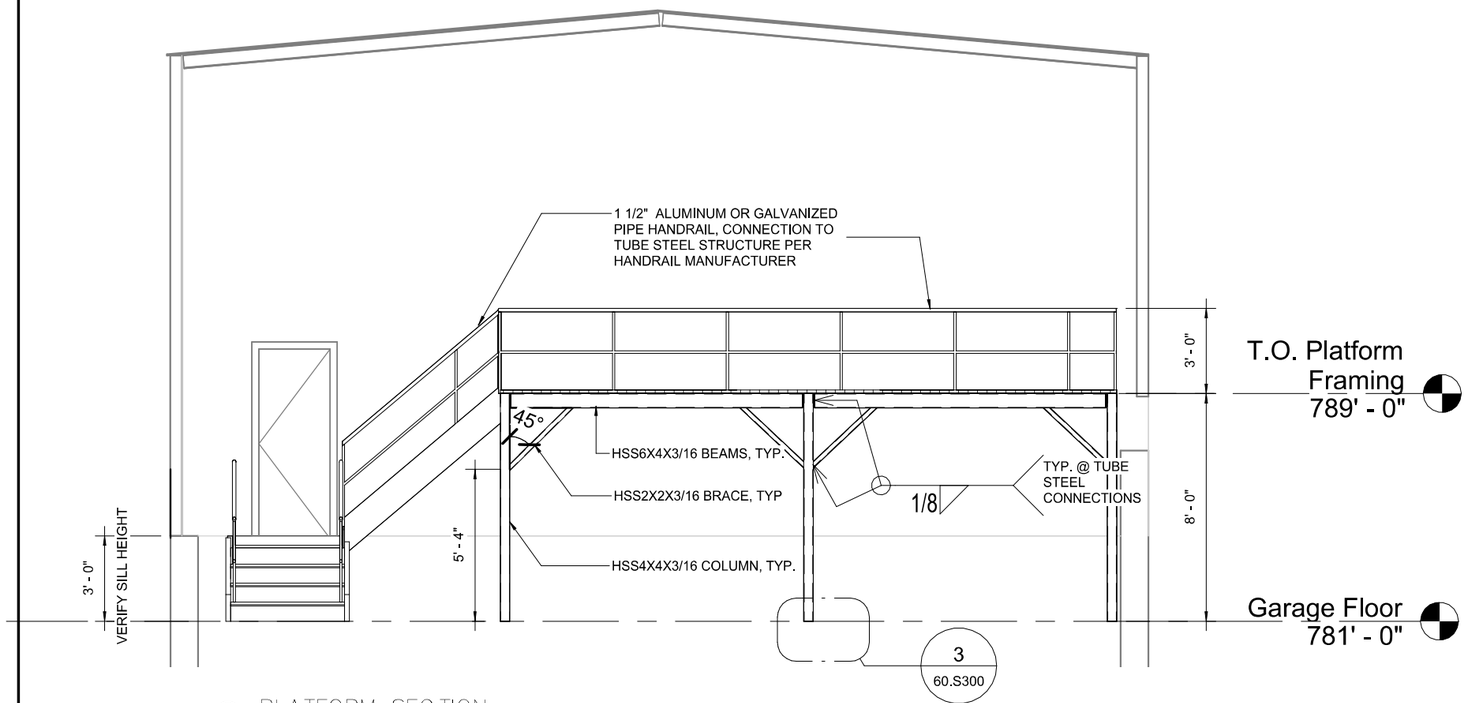


NOTE:
ALL STRUCTURAL STEEL FRAMING MEMBERS AND PLATES ARE TO BE FROM GALVANIZED STEEL
ALL BOLTS AND ANCHORS SHALL BE OF GALVANIZED OR STAINLESS STEEL

1 EXISITNG GARAGE – PLATFORM
3/16" = 1'–0"



3 BASE PLATE
1 1/2" = 1'–0"



2 PLATFORM SECTION
3/16" = 1'–0"

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WASTEWATER TREATMENT PLANT
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WASTEWATER TREATMENT PLANT

ANAMOSA WWTP
ANAMOSA, IOWA

EXISTING GARAGE MODIFICATIONS

PROJECT NUMBER	**9433.1**
DATE	12/07/23
DRAWN BY	**JAK/TLE**
DESIGN BY	**TLE/KAR**
CHECKED BY	**MRS**

60.S300

ELECTRICAL SYMBOLS

2.4KV-480Y/277 3PH, 60HZ 1500KVA — TRANSFORMER WITH PRIMARY AND SECONDARY VOLTAGE, PRIMARY AND SECONDARY CONNECTIONS AND KVA RATING AS NOTED

HP — MOTOR LOAD, SIZE INDICATED

800A 600A — FUSED DISCONNECT SWITCH. SWITCH RATING AND FUSE SIZE SHOWN

400 — CIRCUIT BREAKER, THERMAL MAGNETIC TRIP SHOWN, 3 POLE UNLESS OTHERWISE INDICATED

600A — FUSE - RATING INDICATED

800A — SWITCH - CURRENT RATING INDICATED, 3 POLE UNLESS OTHERWISE INDICATED

GROUND

GROUND ROD

NON-FUSED DISCONNECT SWITCH

30 — FUSED DISCONNECT SWITCH, SIZE AS INDICATED

J — DEVICE, EQUIPMENT OR INSTRUMENT CONNECTION POINT

X S# — WALL MOUNT LIGHT FIXTURE OF TYPE X FROM SWITCH OR CONTROL TYPE DENOTED BY S#. PHOTOCELL CONTROL DENOTED WITH "PC".

T S C — LIGHTING FIXTURE OF TYPE T, CONTROLLED BY SWITCH S, AND POWERED BY CIRCUIT C. EMERGENCY POWERED DENOTED WITH "E". PHOTOCELL CONTROL DENOTED WITH "PC".

T S# (X) — LIGHTING FIXTURE OF TYPE T, CONTROL BY SWITCH S#, ON CIRCUIT(X). EMERGENCY POWERED DENOTED BY "E".

$S_{\#_X}$ — SWITCH WHERE # IS THE DESIGNATOR. X REPRESENTS TYPE AS FOLLOWS:
- 2 TWO POLE
- 3 THREE WAY
- XP EXPLOSION PROOF
- WP WATER PROOF

DUPLEX RECEPTACLE 120 V, CIRCUIT (X). MULTIPLE GANG DENOTED BY (#G), NOT SHOWN FOR SINGLE GANG. EXPLOSION PROOF DENOTED BY "XP". WEATHER PROOF DENOTED BY "WP". GROUND FAULT INTERRUPTER DENOTED BY "GFI".

LOCAL CONTROL PANEL WITH CONTROL DEVICES AS SHOWN AND SPECIFIED

NORMALLY OPEN CONTACT

NORMALLY CLOSED CONTACT

REMOTE DEVICE

PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY OPEN

PUSH-BUTTON SWITCH, MOMENTARY CONTACT, NORMALLY CLOSED

OFF / HAND / AUTO — XOO, OOX — SELECTOR SWITCH, MAINTAINED CONTACT, X IDENTIFIES POSITION OF SWITCH WHEN CONTACT IS CLOSED

PRESSURE SWITCH, OPEN ON RISING PRESSURE, CLOSE ON FALLING PRESSURE

PRESSURE SWITCH, CLOSE ON RISING PRESSURE, OPEN ON FALLING PRESSURE

FLOAT SWITCH, OPEN ON RISING LEVEL, CLOSE ON FALLING LEVEL

FLOAT SWITCH, CLOSE ON RISING LEVEL, OPEN ON FALLING LEVEL

TEMPERATURE SWITCH, OPEN ON RISING TEMPERATURE, CLOSE ON FALLING TEMPERATURE

TEMPERATURE SWITCH, CLOSE ON RISING TEMPERATURE, OPEN ON FALLING TEMPERATURE

FLOW SWITCH, OPEN ON INCREASING FLOW, CLOSE ON DECREASING FLOW

FLOW SWITCH, CLOSE ON INCREASING FLOW, OPEN ON DECREASING FLOW

LIMIT SWITCH, NORMALLY OPEN

LIMIT SWITCH, NORMALLY CLOSED

16000-38 — DETAIL CALL OUT

LOC [CIR] — CIRCUIT CALLOUT
LOC = FINAL CIRUIT LOCATION/TERM POINT
[CIR] = CIRCUIT ID, WHERE APPLICABLE, DENOTED BY BRACKETS [ ]. SEE CIRCUIT SCHEDULES.

HVAC SYMBOLS:

FS — FIRE SMOKE DAMPER

FD — FIRE DAMPER

VD — VOLUME DAMPER

BD — BACK DRAFT DAMPER

P — PNEUMATIC DAMPER

M — ELECTRIC DAMPER

MANUAL BUTTERFLY DAMPER

NS — SMOKE DETECTOR

T(X) — THERMOSTAT

S(X) — SENSOR

SUPPLY/ OUTDOOR AIR DUCT

RETURN/ RELIEF/ EXHAUST DUCT

SUPPLY/ OUTDOOR AIR DUCT UP

SUPPLY/ OUTDOOR AIR DUCT DOWN

RETURN/ RELIEF/ EXHAUST DUCT UP

RETURN/ RELIEF/ EXHAUST DUCT DOWN

INTERNALLY LINED DUCT W/ SOUND INSULATION

SUPPLY/ OUTDOOR AIR DUCT UP/DOWN

RETURN/ RELIEF/ EXHAUST DUCT UP/DOWN

POINT OF CONNECTION TO EXISTING

POSITIVE AIR FLOW

NEGATIVE AIR FLOW

DUCT TO BE REMOVED

PIPE TO BE REMOVED

EXISTING DUCT TO REMAIN

EXISTING PIPE TO REMAIN

GENERAL REQUIREMENTS

1. **BOLD DESIGNATES NEW OR MODIFIED.** HIDDEN LINES DESIGNATED ABOVE OR BELOW SHOWN FLOOR.
2. THIS IS A STANDARD LEGEND SHEET, SOME SYMBOLS MAY APPEAR ON THIS DRAWING AND NOT ON THE PLANS. FOR ABBREVIATIONS OF OTHER DIVISIONS, SEE OTHER LEGENDS.
3. THE INFORMATION SHOWN ON THE FOLLOWING DRAWINGS HAS BEEN TAKEN FROM PREVIOUS PLAN DOCUMENTS. ACTUAL CONSTRUCTION OF FACILITIES MAY VARY FROM THAT SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ACTUAL CONDITIONS.
4. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING AND NEW ELEVATIONS, DIMENSIONS, PIPING ITEMS, EQUIPMENT LOCATIONS, ETC. AS REQUIRED PRIOR TO ORDERING NEW EQUIPMENT OR ITEMS, AND PRIOR TO STARTING WORK. NEW EQUIPMENT, ITEMS AND WORK SHALL BE BASED ON FIELD MEASUREMENTS AND VERIFICATION. ALL COSTS FOR THIS WORK SHALL BE INCLUDED IN CONTRACTOR'S BID
5. SEE OTHER SHEETS WITHIN THIS PLAN SET, INCLUDING SHEETS OTHER TRADES, FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS. COORDINATE WORK WITH OTHER TRADES INVOLVED.
6. WHERE SHOWN, CONDUIT ROUTING AND EQUIPMENT LOCATIONS ARE FOR ILLUSTRATIVE PURPOSES AND DO NOT IMPLY ACTUAL INSTALLATION LOCATION AND ROUTING. CONTRACTOR SHALL FIELD DETERMINE AND LOCATE ALL LOCATIONS. ALL UNDERGROUND CONDUITS SHALL BE FIELD DETERMINED AND LOCATION AND ROUTING SHALL BE COORDINATED WITH EXISTING UTILITES AND OTHER TRADES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ROUTING ALL CONDUITS NOT SHOWN ON THE PLANS. THIS SHALL INCLUDE ALL CONDUITS SHOWN ON THE ONE-LINES AND INDICATED ON THE PLAN DRAWINGS. CONDUITS SHALL BE ROUTED AS DEFINED IN THE SPECIFICATIONS. REUSE EXISTING CONDUIT AND CONDUCTORS WHERE NOTED AND APPLICABLE. DO NOT ROUTE CONDUITS THROUGH OR UNDER EQUIPMENT ACCESS AND OTHER OPENINGS IN FLOOR AND CEILING. DO NOT INSTALL CONDUITS ACROSS SKYLIGHTS, WINDOW OR GLASS BLOCK WALLS, ETC. DO NOT INSTALL CONDUITS UNDER REMOVABLE GRATINGS.
7. IF EQUIPMENT SUPPLIED BY MANUFACTURER HAS A LARGER LOAD THAN VALUE SHOWN, THE CABLE, CONDUIT, AND ELECTRICAL EQUIPMENT SHALL BE ENLARGED, AS REQUIRED, TO ACCOMMODATE THE HIGHER VALUE.
8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FURNISHING PROPERLY SIZED STARTER OVERLOADS FOR EQUIPMENT FURNISHED.
9. IN GENERAL, LIGHTING, RECEPTACLE, AND OTHER LIGHTING AND POWER PANEL CIRCUITS DESIGNATED ON THE FLOOR PLANS AND ON PANEL SCHEDULES ARE NOT SHOWN ON THE ONE LINES OR DETAILED IN CIRCUIT SCHEDULES. CONDUCTORS AND CONDUIT SHALL BE SIZED ACCORDING TO THE RESPECTIVE OVERCURRENT DEVICE AND ACCORDING TO THE NATIONAL ELECTRIC CODE. CONDUCTORS FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS PANELBOARD CIRCUITS SHALL BE MINIMUM NO. 12 AWG FOR CIRCUIT LENGTHS LESS THAT 75 FEET AND NO. 10 AWG FOR LENGTHS GREATER THAN 75 FEET. CONDUIT FOR LIGHTING, RECEPTACLES, AND MISCELLANEOUS PANELBOARD CIRCUITS SHALL BE MINIMUM 3/4".
10. IN AREAS WHERE THERE ARE OVERHEAD BRIDGE CRANES, HOISTS, ETC., NO CONDUITS OD DUCTWORK SHALL BE RUN OVERHEAD THAT WILL INTERFERE WITH THE OPERATION OF THE EQUIPMENT.
11. CONDUIT SIZES DETERMINED BY CONTRACTOR PER NEC REQUIREMENTS, UNLESS OTHERWISE NOTED. CONDUIT SHALL NOT BE SMALLER THAN 3/4" EXCEPT FOR FINAL CONNECTION TO EQUIPMENT. WHERE SPECIFIED, WIRE AND CONDUIT SIZES GIVEN ARE MINIMUM SIZES, WIRE AND CONDUIT SIZES MAY BE INCREASED AS REQUIRED BY CONTRACTOR BUT IN NO CASE SHALL BE SMALLER THAN THE DESIGNATED SIZES NOTED IN THE DRAWINGS AND SPECIFICATIONS. IF WIRE SIZES ARE INCREASED, INCREASE CONDUIT SIZES ACCORDINGLY TO COMPLY WITH THE NATIONAL ELECTRIC CODE.
12. WHERE NOTED, CIRCUIT NUMBERS ARE USED FOR DESIGN INTENT. CONTRACTOR SHALL VERIFY AND DETERMINE EXACT CIRCUIT NUMBERS IN FIELD.
13. APPLICATION OF INSTALLATION DETAILS PROVIDED IN THESE DRAWINGS MAY NOT BE INDICATED THROUGHOUT THE DRAWINGS BUT SHALL BE REVIEWED AND APPLIED AS APPLICABLE BY CONTRACTOR.
14. CONTRACTOR SHALL COORDINATE WITH EQUIPMENT SUPPLIED IN OTHER SECTIONS FOR INSTALLATION AND CONNECTION BY DIVISION 16 FOR CIRCUIT AND POWER REQUIREMENTS. FIELD VERIFY LOCATION OF ALL EQUIPMENT.
15. DRAWINGS DO NOT IDENTIFY ALL ANCILLARY DEVICES SUCH AS HANGERS, SUPPORTS, ETC. CONTRACTOR SHALL PROVIDE ALL ANCILLARY EQUIPMENT AND COMPONENTS REQUIRED FOR A COMPLETE INSTALLATION.
16. DRAWINGS DO NOT IDENTIFY ALL GROUNDING CONNECTIONS. CONTRACTOR SHALL PROVIDE ALL GROUNDING CONDUCTORS AND TERMINATIONS AS REQUIRED BY NEC.
17. ALL ELECTRICAL DISCONNECTS, CONTROL STATIONS, AND CONTROL PANELS PROVIDED AND INSTALLED BY SYSTEMS INTEGRATOR OR ELECTRICAL CONTRATOR UNLESS OTHERWISE NOTED.

ABBREVIATIONS

A	AMPERES	GND	GROUND	PH	PHASE
AA	AIR TO AIR	HH	HANDHOLE	PLC	PROGRAMMABLE LOGIC CONTROLLER
AF	AMP FRAME	HO	HAND-OFF	PMP	POWER MONITOR PANEL
AFF	ABOVE FINISHED FLOOR	HOA	HAND-OFF-AUTO	PMR	PHASE MONITOR RELAY
AFG	ABOVE FINISHED GRADE	HOAR	HAND-OFF-AUTO-REMOTE	PNL	PANEL
AM	AMP-METER	HOR	HAND-OFF-REMOTE	PR	PAIR
ANLG	ANALOG	HP	HORSEPOWER	PS	PRESSURE SWITCH
ATS	AUTOMATIC TRANSFER SWITCH	HS	HAND SWITCH	PT	POTENTIAL TRANSFORMER,PRESSURE TRANSMITTER
BC	BARE COPPER	IC	INTERRUPTING CAPACITY	PVC	POLYVINYL CHLORIDE (CONDUIT)
BFG	BELOW FINISHED GRADE	INCAND	INCANDESCENT	PWR	POWER
BRKR	BREAKER	INST	INSTANTANEOUS	RCPT	RECEPTACLE
C	CONDUIT, CONTACTOR	J, J-BOX	JUNCTION BOX	REQD	REQUIRED
CB	CIRCUIT BREAKER	K	KEY INTERLOCK	RGS	RIGID GALVANIZED STEEL (CONDUIT)
CCTV	CLOSED CIRCUIT TV	L	LIGHTING CONTACTOR, LOW SPEED	RS	RIGID STEEL (CONDUIT)
CKT	CIRCUIT	LP	LIGHTING PANELBOARD	RST	RESET TIMER
CP	CONTROL PANEL	LOS	LOCKOUT STOP PUSHBUTTON	RVAT	REDUCED VOLTAGE AUTOTRANSFORMER
CPT	CONTROL POWER TRANSFORMER	LR	LATCHING RELAY	RVNR	REDUCED VOLTAGE NON-REVERSING
CR	CONTROL RELAY	LS	LIMIT SWITCH, LEVEL SWITCH	SA	SURGE ARRESTOR
CRS	COATED RIGID STEEL (CONDUIT)	LT	LEVEL TRANSMITTER	SCCR	SHORT CIRCUIT CURRENT RATING
CS	CURRENT SWITCH, CONTROL STATION	LT FLEX	LIQUID TIGHT FLEX (CONDUIT)	S/N	SOLID NEUTRAL
CT	CURRENT TRANSFORMER	LTS	LIGHTS	SPD	SPEED
DC	DIRECT CURRENT	M	MAGNETIC CONTACTOR COIL	STP	SHIELDED TWISTED PAIR
DCC	DISTRIBUTION CONTROL CENTER	MCC	MOTOR CONTROL CENTER	SV	SOLENOID VALVE
DH	DEHUMIDIFIER	MD	MOTORIZED DAMPER	SW	SWITCH
DISC	DISCRETE	MH	MANHOLE	T	THERMOSTAT
DPM	DIGITAL POWER METER	MLO	MAIN LUGS ONLY	TC	TIME CLOSE
EXST	EXISTING	MS	MOTOR STARTER	TD	TEMPERATURE DETECTOR RELAY
FCV	FLOW CONTROL VALVE	MSC	MANUFACTURER SUPPLIED CABLE	TDR	TIME DELAY RELAY
FDR	FEEDER	MTD	MOUNTED	TJB	TERMINAL JUNCTION BOX
F	FUSE	N	NEUTRAL	TO	TIME OPEN
FE	FLOW ELEMENT	N/A	NOT APPLICABLE	TS	TEMPERATURE SWITCH
FLR	FLOOR	NC	NORMALLY CLOSED	TST	TWISTED SHIELDED PAIR
FLUOR	FLUORESCENT	NEC	NATIONAL ELECTRIC CODE	TT	TEMPERATURE TRANSMITTER
FR	FORWARD-REVERSE	NO	NORMALLY OPEN	TYP	TYPICAL
FS	FLOW SWITCH	NP	NAMEPLATE	UH	UNIT HEATER
FT	FLOW TRANSMITTER	OC	ON CENTER, OPEN-CLOSE	UPS	UNINTERRUPTIBLE POWER SUPPLY
FUT	FUTURE	OCA	OPEN-CLOSE-AUTO	V	VOLT
FV	FLOW VALVE	OH	OVERHEAD DOOR	VC	VALVE CONTROL
FVNR	FULL VOLTAGE NON-REVERSING	OHDO	OVERHEAD DOOR OPENER	VM	VOLTMETER
FVR	FULL VOLTAGE REVERSING	OL	OVERLOAD RELAY	W	WATT
G	GROUND	OO	ON-OFF	WM	WATTMETER
GALV	GALVANIZED	OOA	ON-OFF-AUTO	WP	WEATHERPROOF
GDS	GENERATOR DOCKING STATION	PB	PULL BOX, PUSH BUTTON	XFMR	TRANSFORMER
GFCI	GROUND FAULT CIRCUIT INTERRUPTER	PP	POWER PANELBOARD	XP	EXPLOSION PROOF
GFR	GROUND FAULT RELAY	PC	PHOTOCELL		

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
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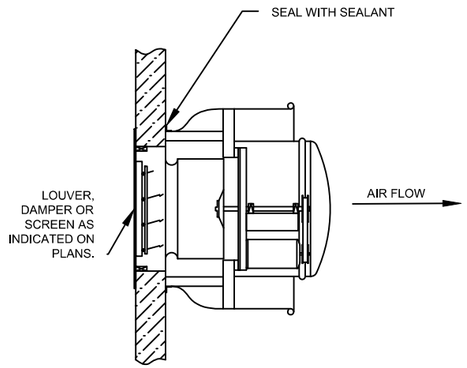
ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

ELECTRICAL/ MECHANICAL INDEX

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

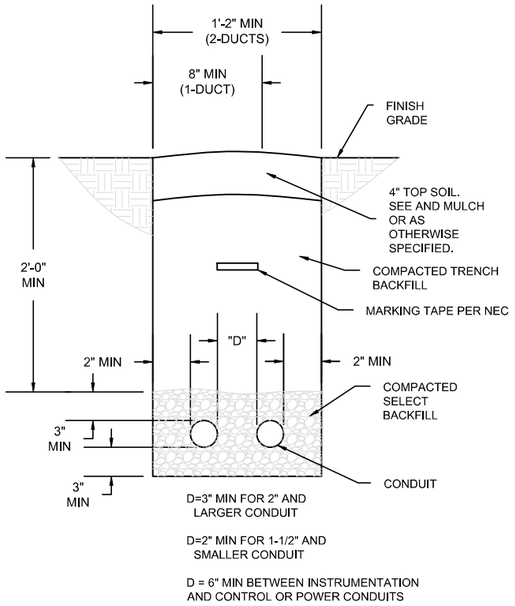
00.EM001



WALL MOUNTED EXHAUST FAN

DETAIL E26012

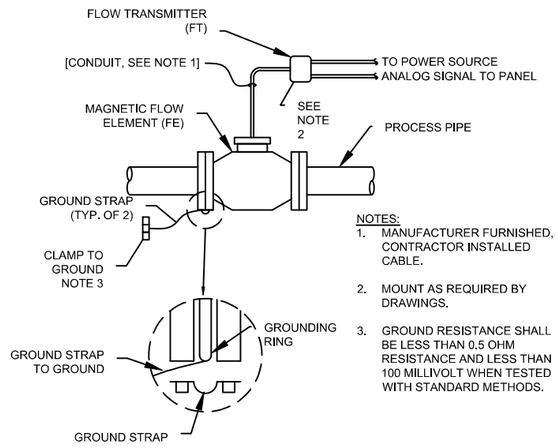
NO SCALE



TRENCH AND CONDUIT PLACEMENT

DETAIL E26006

NO SCALE



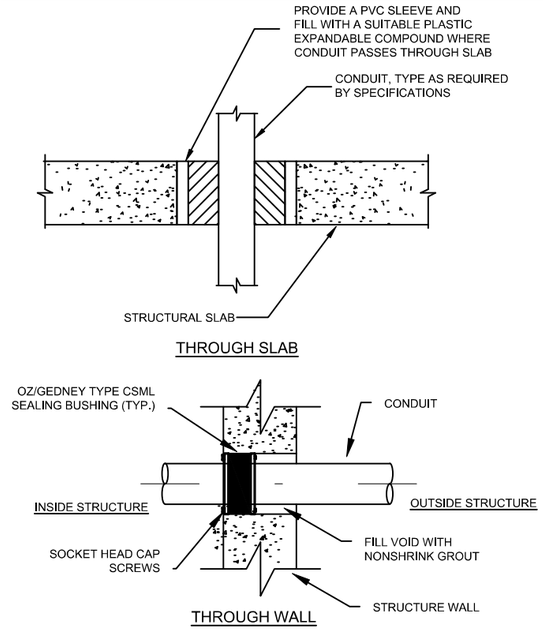
NOTES:

1. MANUFACTURER FURNISHED, CONTRACTOR INSTALLED CABLE.
2. MOUNT AS REQUIRED BY DRAWINGS.
3. GROUND RESISTANCE SHALL BE LESS THAN 0.5 OHM RESISTANCE AND LESS THAN 100 MILLIVOLT WHEN TESTED WITH STANDARD METHODS.

FLOW, MAGNETIC ELEMENT AND TRANSMITTER

DETAIL E26007

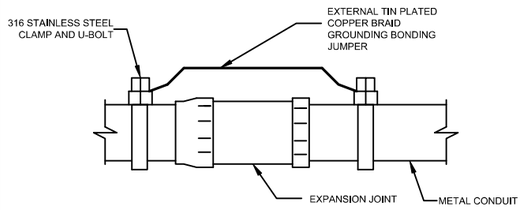
NO SCALE



CONDUIT PENETRATIONS

DETAIL E26012

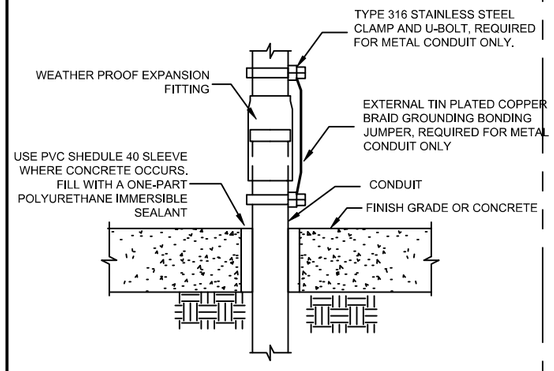
NO SCALE



CONDUIT EXPANSION JOINT

DETAIL E26009

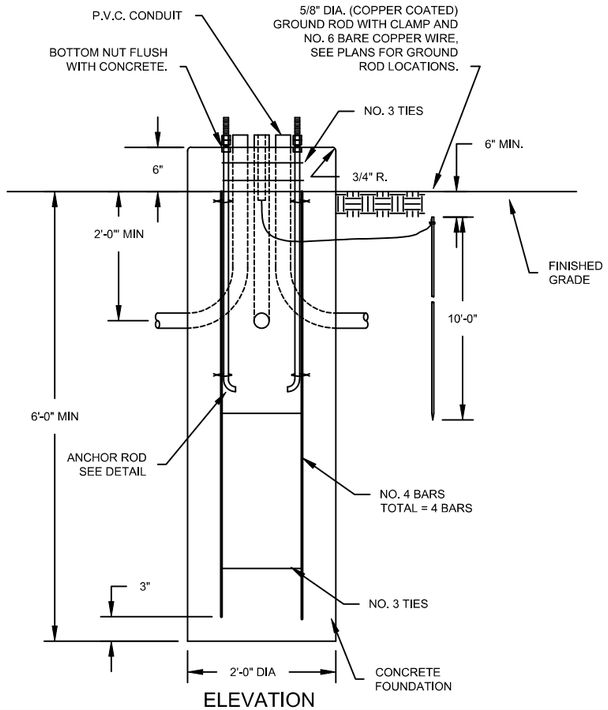
NO SCALE



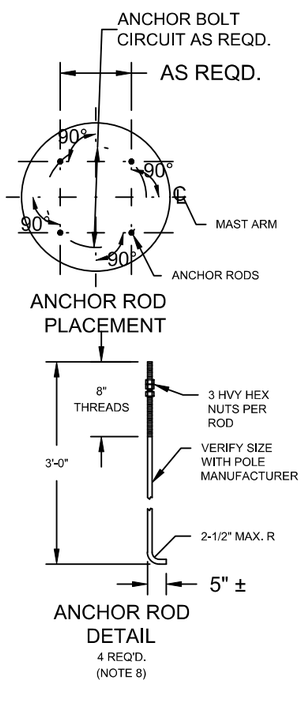
EXPANSION FITTING FOR SOIL MOVEMENT

DETAIL E26011

NO SCALE



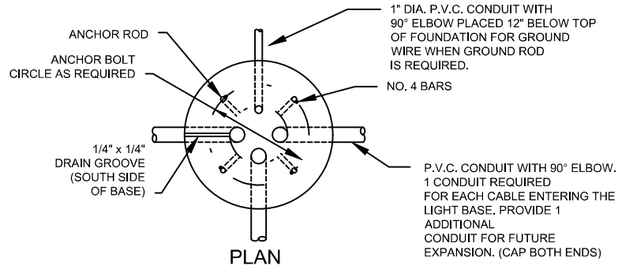
ELEVATION



ANCHOR ROD PLACEMENT

ANCHOR ROD DETAIL

4 REQ'D. (NOTE 8)



LIGHT BASE

DETAIL E26018

NO SCALE

NOTES:

1. FOUNDATIONS MAY BE CONSTRUCTED IN AUGERED HOLES UNLESS THE NATURAL SOILS WILL NOT STAND OPEN, IN WHICH CASE FORMING WILL BE REQUIRED.
2. P.V.C. CONDUIT SHALL BE PROJECTED 1" ± ABOVE THE FOUNDATION BEFORE THE MORTAR IS PLACED AND SHALL BE THE SIZE AND NUMBER SHOWN IN THE PLAN.
3. A TEMPLATE SHALL BE PROVIDED FOR ANCHOR ROD PLACEMENT AND SHALL BE LEFT IN PLACE UNTIL THE CONCRETE HAS SET.
4. THE DEPTH OF THE FOUNDATION MAY BE CHANGED IN THE PLANS OR SPECIAL PROVISIONS.
5. ANCHOR RODS SHALL BE PLACED AT RIGHT ANGLES TO THE DIRECTION OF THE MAST ARM UNLESS OTHERWISE SPECIFIED BY MANUFACTURER.
6. WRAP THREADS OF ANCHOR RODS BELOW BOTTOM NUT WITH 3 LAYERS OF PLASTIC ELECTRICAL TAPE.
7. PLACE GROUND ROD 6" DEEP AND WITHIN 1' OF BASE.
8. ANCHOR RODS PROVIDED BY MANUFACTURER WITH POLE MAY BE USED IN LIEU OF THOSE DETAILED. WHERE NOT PROVIDED BY MANUFACTURER, ANCHOR RODS SHALL BE PROVIDED BY CONTRACTOR AS SHOWN AND SPECIFIED..
9. AN ALTERNATE PRECAST BASE MAY BE USED WITH THE ENGINEERS APPROVAL.

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

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NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

STANDARD DETAILS

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

00.EM002

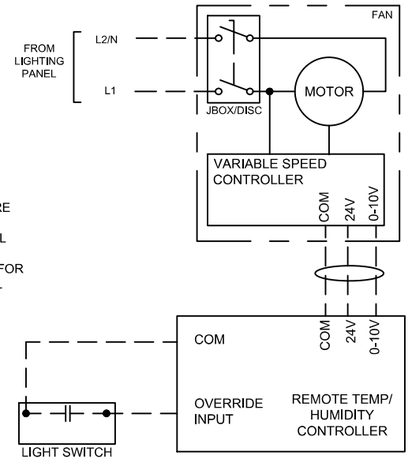
CHEMICAL ROOM EXHAUST FAN CONTROL CIRCUIT

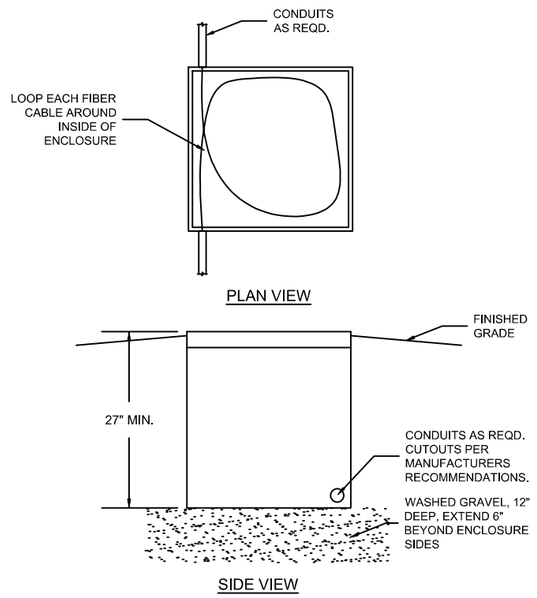
NOTES:

1. ALL WIRING TO BE FIELD VERIFIED.
2. SCHEMATIC CIRCUIT IS TYPICAL AND MAY REQUIRE ADDITIONAL COMPONENTS AND CIRCUITRY FOR CORRECT OPERATION. PROVIDE AND INSTALL ALL ANCILLARY COMPONENTS AND CIRCUITS NOW DIRECTLY SHOWN OR SPECIFIED BUT REQUIRED FOR PROPER OPERATION. COORDINATE WITH ACTUAL EQUIPMENT SUPPLIED.
3. OVERRIDE INPUT CAUSES FAN TO GO TO FULL VENTILATION RATE AS NOTED ON SCHEDULES.

FIELD WIRING BY CONTRACTOR

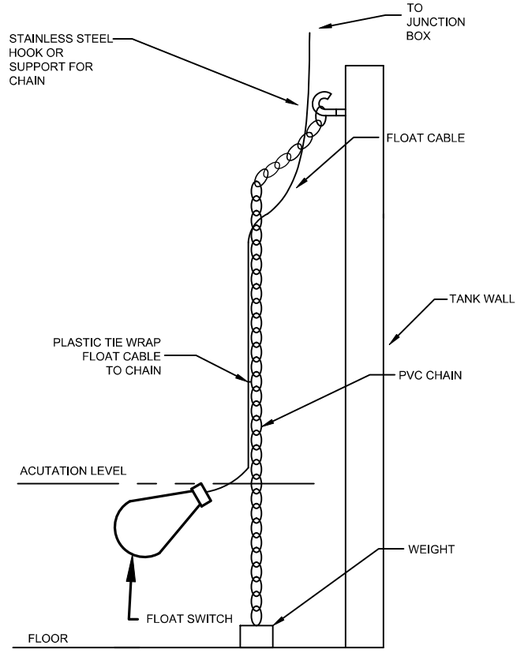
FACTORY WIRING BY FAN SUPPLIER





FIBER HANDHOLE DETAIL E26016

NO SCALE



FLOAT SWITCH OPEN TANK DETAIL E26041

NO SCALE

LUMINARE SCHEDULE

TYPE	DESCRIPTION	LIGHTING TYPE	VOLTS	NOM. INPUT WATTS	NOM. LUMENS	NOM. COLOR (CCT)	DESCRIPTION	MANUFACTURER OR EQUAL	PART NUMBER OR EQUAL	MOUNTING	OPTIONS	DIST TYPE
1	AREA/ROOM	LED	120	40	3,600 - 4,600	4000K	INDUSTRIAL LIGHT, FIBERGLASS HOUSING, SURFACE OR SUSPENDED, CLEAR ACRYLIC LENS, SUITABLE FOR WET LOCATIONS, UL LISTED	COLUMBIA	LXEM2-40ML-RA-EU	SURFACE		N/A
2	EXTERIOR, GENERAL AREA	LED	120	25,38,48	3,420 - 6,275	4000K	PERIMETER LED LIGHTING SUITABLE FOR OUTDOOR LOCATIONS. ENCLOSED AND GASKETED. CAST ALUMINUM HOUSING WITH DARK BRONZE POWER COATED FINISH. BOROSILICATE GLASS REFLECTOR. THREE SELECTABLE WATTAGE RANGES. UL LISTED.	C-LITE	C-WP-E-TR-S6L-*	WALL	PHOTOCELL INITIAL SETTING 25W	TYPE 4 WIDE
3	EXTERIOR, GENERAL LARGE AREA	LED	120	29,45,58	4,960 - 8,525	4000K	PERIMETER LED LIGHTING SUITABLE FOR OUTDOOR LOCATIONS. ENCLOSED AND GASKETED. CAST ALUMINUM HOUSING WITH DARK BRONZE POWER COATED FINISH. BOROSILICATE GLASS REFLECTOR. THREE SELECTABLE WATTAGE RANGES. UL LISTED.	C-LITE	C-WP-E-TR-S9L-*	WALL	PHOTOCELL INITIAL SETTING 58W	TYPE 4 WIDE
4	EXTERIOR, LARGE AREA, ADJUSTABLE ANGLE	LED	120	185	24,000	4000K, 80 CRI	AREA/SITE LOW PROFILE LED FIXTURE. CORROSION RESISTANT ALUMINUM HOUSING. DARK BRONZE POWDER COATED FINISH. ZERO UPLIGHT AT 0 DEGREES TILT. SUITABLE FOR WET AND OUTDOOR LOCATIONS. KNUCKLE MOUNT FOR ADJUSTMENT BETWEEN 0 AND 60 DEGREES AT 15 DEGREE INCREMENTS. UL LISTED.	HUBBELL	RAR2-480L-185-4K7-4W-*	SQ. POLE/ KNUCKLE	PHOTOCELL 20 FT. POLE, SEE NOTE	TYPE 4 WIDE

NOTE: PROVIDE MATCHING BRONZE POLE. POLE SHALL BE STRAIGHT SQUARE STEEL, COLORED BRONZE TO MATCH FIXTURE. POLE SHALL INCLUDE GFCI RECEPTACLE AND HANDHOLE ACCESS. INCLUDE ALL REQUIRED ACCESSORIES TO ACCOMODATE SPECIED LUMINAR MOUNTING TYPE.

MECHANICAL EQUIPMENT SCHEDULE

MARK	LOCATION	DESCRIPTION	SIZE	CFM	CAPACITY (MBH)	S.P	ELECTRICAL			FUEL		NOTES
							VOLTAGE	AMP	POWER	TYPE	PRESSURE	
AHU-1	BIOSOLIDS BUIDING	AIR HANDING UNIT		2100	189	0.5	480 - 3PH		1 HP	NAT GAS	8"wc/0.5 psi	DIRECT FIRE, DISCHARGE AIR CONTROL, SET DISCHARGE AIR TEMPERATURE TO 60 DEGF. SET HEATING LOCKOUT AT 50 DEGREE F. OTHER CONTROLS AS SPECIFIED.
D-2	CHEMICAL ROOM	DAMPER	16"X16"	160/800		0.1						ADJUSTABLE GRAVITY RELIEF DAMPER, SS FRAME AND AXLE/AXLE BEARINGS. ADJUST START OPEN PRESSURE TO 0.1 IN WC.
D-3	PROPOSED STORAGE BUILDING	DAMPER	18" x 18"	1215		0.1	120V - 1PH					PROVIDE LOUVER, BIRD SCREEN, WEATHERHOOD, AND 120VAC OPEN/CLOSE STRING RETURN ACTUATOR.
D-4	PROPOSED STORAGE BUILDING	DAMPER	18" x 18"	1215		0.1	120V - 1PH					PROVIDE LOUVER, BIRD SCREEN, WEATHERHOOD, AND 120VAC OPEN/CLOSE STRING RETURN ACTUATOR.
EF-1	BIOSOLIDS BUILDING	AXIAL WALL MOUNT EXHAUST FAN	26" x 26"	2100		0.2	120V - 1PH		1/2 HP			FACTORY MOUNTED AND WIRED DISCONNECT. SIZE NOTED IS EXISTING OPENING SIZE - FIELD VERIFY AND MODIFY AS REQUIRED.
EF-2	CHEMICAL ROOM	CENTRIFUGAL WALL MOUNT EXHAUST FAN	19" x 19"	160/800		0.2	120V - 1PH					FACTORY MOUNTED AND WIRED DISCONNECT, EC MOTOR, AND TRANSFORMER. WALL MOUNT, VARIABLE SPEED OPERATION.
EF-3	PROPOSED STORAGE BUILDING	AXIAL WALL MOUNT EXHAUST FAN	26" x 26"	1215		0.2	120V - 1PH		1/4 HP			FACTORY MOUNTED AND WIRED DISCONNECT WITH BACKDRAFT DAMPER.
EF-4	PROPOSED STORAGE BUILDING	AXIAL WALL MOUNT EXHAUST FAN	26" x 26"	1215		0.2	120V - 1PH		1/4 HP			FACTORY MOUNTED AND WIRED DISCONNECT WITH BACKDRAFT DAMPER.
T-2	CHEMICAL ROOM	CONTROLLER										TEMPERATURE/HUMIDITY CONTROL. SET TO 80 DEGREE F FOR COOLING AND 50% RH FOR HUMIDITY CONTROL. ADJUST TO MIN CFM UNLESS TEMP OR RH SP IS MET.
UH-2	CHEMICAL ROOM	UNIT HEATER			30		120V - 1PH			NAT GAS	8"wc/0.5 psi	INTEGRAL THERMOSTAT, SET TO 50 DEGREE F.

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

SCHEMATIC DETAILS/ SCHEDULES

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

00.EM003

PANEL: DP-2 (NEW) — **ELECTRICAL PANELBOARD SCHEDULE**

VOLTAGE: 480V, 3 PH, 3 W
BUS SIZE: 400A, COPPER
MAIN: 400 AMP CIRCUIT BREAKER

LOCATION: EXISTING STORAGE BUILDING
INTERRUPTING RATING: 42,000 AMPS AIR
TYPE: WALL
MOUNTING: WALL

CIRCUIT TITLE	VOLT	CONTROL TYPE	BREAKER CKT NO.	BREAKER AMP	BREAKER POLE	LOAD, KVA PHASE A	LOAD, KVA PHASE B	LOAD, KVA PHASE C	LOAD, KVA PHASE A	LOAD, KVA PHASE B	LOAD, KVA PHASE C	BREAKER POLE	BREAKER AMP	BREAKER CKT NO.	VOLT	CONTROL TYPE	CIRCUIT TITLE
SCREW PRESS CONTROL PANEL	480	LOCAL	1	15	3	2			1			3	20	2	480	LOCAL	COMPRESSOR NO. 1
"	"	LOCAL	3	"	"		2			1		"	"	4	"	LOCAL	"
"	"	LOCAL	5	"	"			2			1	"	"	6	"	LOCAL	"
STORM WATER PUMP STATION (NOTE 1)	480	LOCAL	7	250	3	55			1			3	20	8	480	LOCAL	COMPRESSOR NO. 2
"	"	LOCAL	9	"	"		55			1		"	"	10	"	LOCAL	"
"	"	LOCAL	11	"	"			55			1	"	"	12	"	LOCAL	"
AHU-1	480	LOCAL	13	20	3	0.8			8.5			3	125	14	480	LOCAL	XFMR LP-2
"	"	LOCAL	15	"	"		0.8			8.5		"	-	16	"	LOCAL	"
"	"	LOCAL	17	"	"			0.8			8.5	"	-	18	"	LOCAL	"
SPACE	-	LOCAL	19	-	-							-	-	14	-	LOCAL	SPACE
SPACE	-	LOCAL	21	-	-							-	-	16	-	LOCAL	SPACE
SPACE	-	LOCAL	23	-	-							-	-	18	-	LOCAL	SPACE
SPACE	-	LOCAL	25	-	-							-	-	14	-	LOCAL	SPACE
SPACE	-	LOCAL	15	-	-							-	-	16	-	LOCAL	SPACE
SPACE	-	LOCAL	17	-	-							-	-	18	-	LOCAL	SPACE
SPACE	-	LOCAL	19	-	-							-	-	20	-	LOCAL	SPACE
SPACE	-	LOCAL	21	-	-							-	-	22	-	LOCAL	SPACE
SPACE	-	LOCAL	23	-	-							-	-	24	-	LOCAL	SPACE
			TOTAL LOAD			57.8	57.8	57.8	10.5	10.5	10.5						

NOTES:
1) SPACE RESERVED FOR FUTURE STORM WATER PUMPING STATION.
2)
3)
4)

PHASE A LOAD (KVA) =	68.3
PHASE B LOAD (KVA) =	68.3
PHASE C LOAD (KVA) =	68.3
TOTAL LOAD (KVA) =	204.9
CURRENT =	246.7

PANEL: LP-2 (NEW) — **ELECTRICAL PANELBOARD SCHEDULE**

VOLTAGE: 208/120, 3PH, 4W
BUS SIZE: 225A, COPPER
MAIN: 225 AMP CIRCUIT BREAKER

LOCATION: EXISTING STORAGE BUILDING
INTERRUPTING RATING: 10,000 AMPS AIR
TYPE: WALL
MOUNTING: WALL

CIRCUIT TITLE	VOLT	CONTROL TYPE	BREAKER CKT NO.	BREAKER AMP	BREAKER POLE	LOAD, VA PHASE A	LOAD, VA PHASE B	LOAD, VA PHASE C	LOAD, VA PHASE A	LOAD, VA PHASE B	LOAD, VA PHASE C	BREAKER POLE	BREAKER AMP	BREAKER CKT NO.	VOLT	CONTROL TYPE	CIRCUIT TITLE
EXISTING STORAGE BLDG LTS (NOTE 1)	120	LOCAL	1	15	1	500			1000			1	20	2	120	LOCAL	NEW STORAGE BLDG LTS
EXISTING STORAGE BLDG N. RECEP (NOTE 1)	120	LOCAL	3	20	1		1000			800		1	20	4	120	LOCAL	EXHAUST FAN EF-3
EXISTING STORAGE BLDG S. RECEP (NOTE 1)	120	LOCAL	5	20	1			1000			800	1	20	6	120	LOCAL	EXHAUST FAN EF-4
BIOSOLIDS BLDG LP-3 (NOTE 1)	208	LOCAL	7	20	2	4475			500			1	20	8	120	LOCAL	VALVE MODULE VM-1
"	"	LOCAL	9	"	"		4475			500		1	20	10	120	LOCAL	AIR DRAIN VALVE DV-1
SPARE	120	LOCAL	11	20	1			0						12		LOCAL	SPACE
STORM WATER PUMP STATION (NOTE 1)	208	LOCAL	13	40	3	3500								14		LOCAL	SPACE
"		LOCAL	15	"	"		3500							16		LOCAL	SPACE
"		LOCAL	17	"	"			3500						18		LOCAL	SPACE
SPACE		LOCAL	19 - 41											20 - 42		LOCAL	SPACE
			TOTAL LOAD			8475	8975	4500	1500	1300	800						

NOTES:
1) REROUTE, EXTEND, AND RECONNECT EXISTING CIRCUIT
2)
3)
4)

PHASE A LOAD (KVA) =	9975
PHASE B LOAD (KVA) =	10275
PHASE C LOAD (KVA) =	5300
TOTAL LOAD (KVA) =	25550
CURRENT =	71.0

PANEL: LP-3 (NEW) (NOTE 1) — **ELECTRICAL PANELBOARD SCHEDULE**

VOLTAGE: 240/120, 1 PH, 3 W
BUS SIZE: 100A, COPPER
MAIN: 100 AMP CIRCUIT BREAKER

LOCATION: BIOSOLIDS BUILDING
INTERRUPTING RATING: 10,000 AMPS AIR
TYPE: WALL
MOUNTING: WALL

CIRCUIT TITLE	VOLT	CONTROL TYPE	BREAKER CKT NO.	BREAKER AMP	BREAKER POLE	LOAD, VA PHASE A	LOAD, VA PHASE B	LOAD, VA PHASE C	LOAD, VA PHASE A	LOAD, VA PHASE B	LOAD, VA PHASE C	BREAKER POLE	BREAKER AMP	BREAKER CKT NO.	VOLT	CONTROL TYPE	CIRCUIT TITLE
BLDG LIGHTS (NOTE 1)	120	LOCAL	1	20	1	1000			500			1	20	2	120	LOCAL	GAS UNIT HEATER (NOTE 1)
BLDG RECEPTACLES (NOTE 1)	120	LOCAL	3	20	1		1000			500		1	20	4	120	LOCAL	POLYMER DRUM MIXER (NOTE 1)
OUTDOOR RECEPTACLES (NOTE 1)	120	LOCAL	5	-	-	1000			500			1	20	6	208	LOCAL	POLYMER CONTROL PANEL (NOTE 1)
OVERHEAD DOOR	120	LOCAL	7	-	-		1000			500		1	20	8	120	LOCAL	CEILING FANS (NOTE 1)
EXHAUST FAN EF-1	120	LOCAL	9	20	2	1200			1000			1	20	10	120	LOCAL	STORM STATION RECEPTACLES (NOTE 1)
Spare	120	LOCAL	11	20	1					250		1	20	12	120	LOCAL	CAMERA
SPARE	120	LOCAL	13	20	1				250			1	20	14	120	LOCAL	REMOTE I/O & NETWORK PANEL
SPARE	120	LOCAL	15	20	1					250		1	20	16	120	LOCAL	SLUDGE FLOW METER
SPARE	120	LOCAL	17	20	1							1	20	18	120	LOCAL	SPARE
SPARE	120	LOCAL	19	20	1							1	20	20	120	LOCAL	SPARE
			TOTAL LOAD			3200	2000	0	2250	1500	0						

NOTES:
1) SEE DRAWINGS FOR MOUNTING REQUIREMENTS. PANEL HEIGHT SHALL ACCOMMODATE MOUNTING HEIGHT AND NEC REQUIREMENTS. PANEL MAY BE SEPARATED TO TWO PANELAS REQUIRED.
2) REROUTE, EXTEND, AND RECONNECT EXISTING CIRCUIT

PHASE A LOAD (VA) =	5450
PHASE B LOAD (VA) =	3500
PHASE C LOAD (VA) =	0
TOTAL LOAD (VA) =	8950
CURRENT =	43.0

CIRCUIT SCHEDULE

ID	DRAWING	DESCRIPTION	TO/FROM	NOTES
[AHU-1]	00.EM011	3-#12, #12G	DP-2/AHU	
[AHU-2]	00.EM011	8-#14, #14G	AHU/RIO	
[CAM]	00.EM011	CAT 6, 1"C	CAMERA/RIO	
[CHEM1-1]	55.EM101	2-#14, #14G	CHEM PUMP/MCP	
[CHEM1-2]	55.EM101	1-STP	CHEM PUMP/MCP	
[CHEM2-1]	55.EM101	2-#14, #14G	CHEM PUMP/MCP	
[CHEM2-2]	55.EM101	1-STP	CHEM PUMP/MCP	
[CHEM3-1]	55.EM101	2-#14, #14G	CHEM PUMP/MCP	
[CHEM3-2]	55.EM101	1-STP	CHEM PUMP/MCP	
[CHEM4-1]	55.EM101	2-#14, #14G	CHEM PUMP/MCP	
[CHEM4-2]	55.EM101	1-STP	CHEM PUMP/MCP	
[COMP-1]	00.EM011	3-#8, #10G	DP-2/COMP-1	
[COMP-2]	00.EM011	3-#8, #10G	DP-2/COMP-2	
[COMP-3]	00.EM011	4-#14, #14G	COMP-1/RIO	
[COMP-4]	00.EM011	4-#14, #14G	COMP-2/RIO	
[COMP-5]	00.EM011	8-#14, #14G	COMPRESSORS/RIO	
[DP-2-1]	00.EM011	(2X) 3-#2/0, #6G	MDP/DP-2	
[DV-1]	00.EM011	2-#12, #12G	LP-2/DV-1	
[EF2-1]	55.EM101	2-#12,#12G	EXIST LPNL/EF-2	
[EF2-2]	55.EM101	3 WIRE SHIELDED	T2/EF-2	
[LP2]	00.EM011	3-#2/0, #6G	XFMR/LP-2	
[LP3]	00.EM011	3-#3, #8G	LP-2/LP-3	
[LS3-1]	00.EM011	2-#14, #14G	LS-3/MCP	
[PDP-1]	00.EM011	3-#2/0, #6G	MPD/PLANT DRAIN PUMP PANEL	
[PDP-2]	00.EM011	3-#8, #10G	JUNCTION BOX/PUMP 1	
[PDP-2]	00.EM011	3-#8, #10G	PLANT DRAIN PUMP PANEL/PUMP 1	2
[PDP-3]	00.EM011	3-#8, #10G	JUNCTION BOX/PUMP 2	
[PDP-3]	00.EM011	3-#8, #10G	PLANT DRAIN PUMP PANEL/PUMP 2	2
[PDP-4]	00.EM011	3-#8, #10G	JUNCTION BOX/MIXER	3
[PDP-5]	00.EM011	8-#14, #14G	PLANT DRAIN PUMP PANEL/LEVEL SW	2
[PDP-6]	00.EM011	8-#14, #14G	PLANT DRAIN PUMP PANEL/MCP	
[PDP-6]	00.EM011	9-#6, #6G, 1-1/2"C	PLANT DRAIN PUMP PANEL/JUNCTION BOX	2
[PF]	00.EM011	2-#12, #12G	LP-3/POLY FEED UNIT	
[PM]	00.EM011	2-#12, #12G	LP-3/POLY MIXER	
[RIO-1]	00.EM011	FIBER, 2"C	RIO/MCP	1
[RIO-2]	00.EM011	8-#14, #14G	SPCP/RIO	
[RIO-3]	00.EM011	CAT 6, 1"C	SPCP/RIO	
[SPCP-1]	00.EM011	3-#8, #10G	MDP/SPCP	
[SPCP-10]	00.EM011	2-#12, #12G	SPCP/FM-1	
[SPCP-11]	00.EM011	2-#14, #14G	SPCP/SCP-ESTOP	
[SPCP-12]	00.EM011	2-#14, #14G	SPCP/FV-1	
[SPCP-13]	00.EM011	2-#14, #14G	SPCP/LS-1	
[SPCP-14]	00.EM011	3-#12, #12G	SPCP/CON	
[SPCP-15]	00.EM011	2-#14, #14G	SPCP/CON-ESTOP	
[SPCP-16]	00.EM011	2-#14, #14G	SPCP/ZSS	
[SPCP-17]	00.EM011	2-#14, #14G	SPCP/FV-2	
[SPCP-18]	00.EM011	2-#14, #14G	SPCP/LS-2	
[SPCP-19]	00.EM011	2-#14, #14G	SPCP/LS-4	
[SPCP-2]	00.EM011	2-STP	POLY FEED UNIT/SPCP	
[SPCP-3]	00.EM011	4-#14, #14G	POLY FEED UNIT/SPCP	
[SPCP-4]	00.EM011	3-#12, #12G	SPCP/SCP	
[SPCP-5]	00.EM011	3-#12, #12G	SPCP/SC	
[SPCP-6]	00.EM011	3-#12, #12G	SPCP/SW	
[SPCP-7]	00.EM011	3-#12, #12G	SPCP/SP	
[SPCP-8]	00.EM011	2-#14, #14G	SPCP/SP PRESS SWITCH	
[SPCP-9]	00.EM011	1-STP	SPCP/FM-1	
[STWP]	00.EM011	3-#8, #10G	LP-2/STORM WATER PUMP	
[VM-1]	00.EM011	2-#12, #12G	LP-2/VM-1	
[WH1]	55.EM101	3-#8, #10G	MDP/WH-1	
[XFMR]	00.EM011	3-#1/0, #6G	DP-2/XFMR	

NOTES:
1. FIBER OPTIC CABLE PROVIDED BY SYSTEM INTEGRATOR FOR INSTALLATION BY CONTRACTOR.
2. EXTEND EXISTING CONDUIT. FIELD VERIFY SIZE.
3. FIELD VERIFY MOTOR SIZE AND ADJUST CONDUCTOR SIZE AS APPROPRIATE.

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ANAMOSA WASTEWATER TREATMENT FACILITY
ANAMOSA, IA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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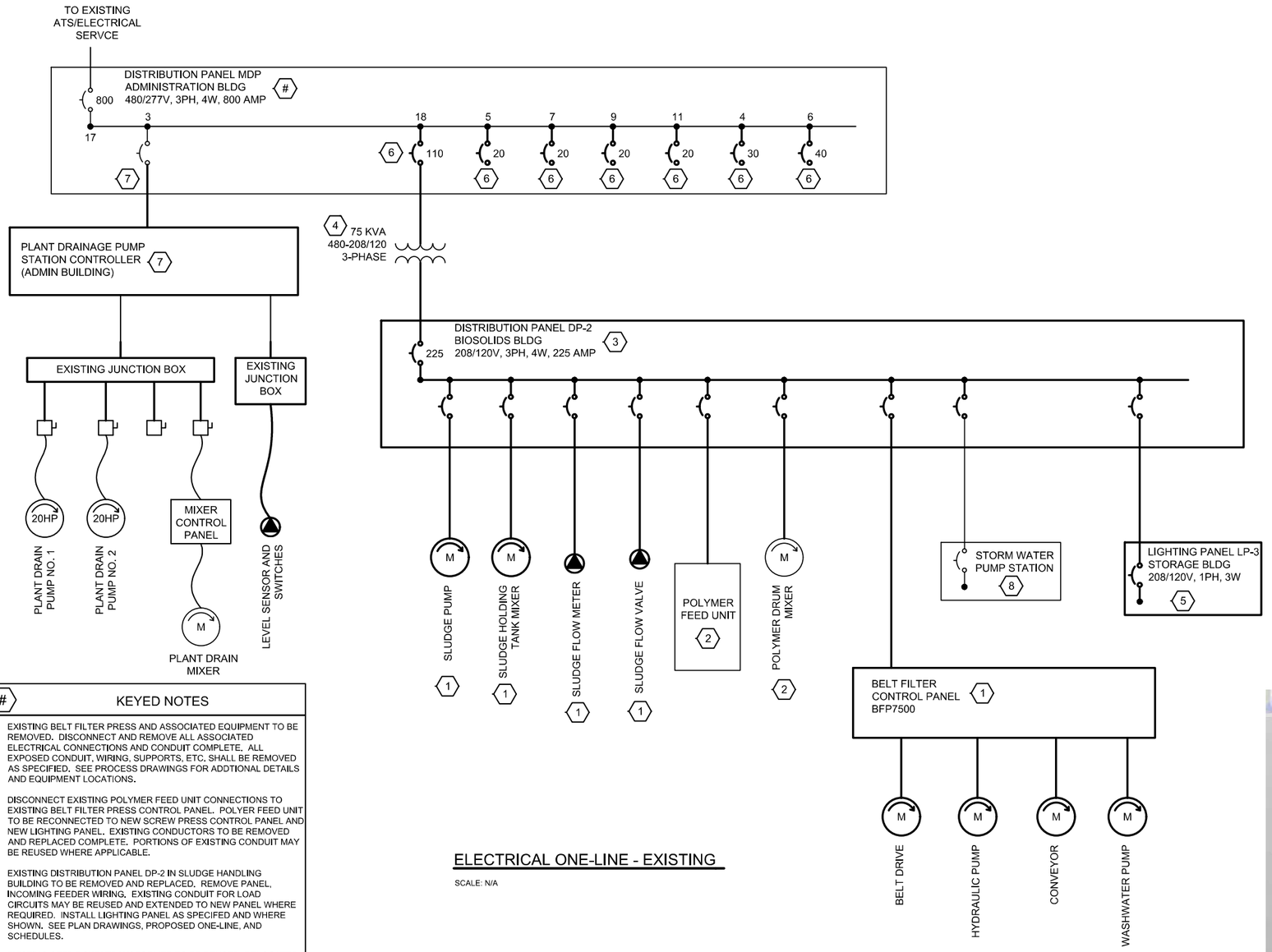
ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

SCHEDULES

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

00.EM004



ELECTRICAL ONE-LINE - EXISTING

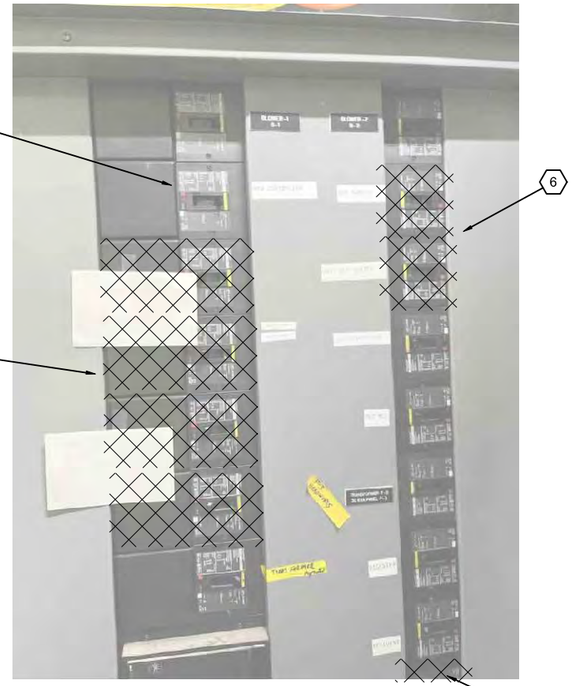
SCALE: N/A

KEYED NOTES

1. EXISTING BELT FILTER PRESS AND ASSOCIATED EQUIPMENT TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED ELECTRICAL CONNECTIONS AND CONDUIT COMPLETE. ALL EXPOSED CONDUIT, WIRING, SUPPORTS, ETC. SHALL BE REMOVED AS SPECIFIED. SEE PROCESS DRAWINGS FOR ADDTIONAL DETAILS AND EQUIPMENT LOCATIONS.
2. DISCONNECT EXISTING POLYMER FEED UNIT CONNECTIONS TO EXISTING BELT FILTER PRESS CONTROL PANEL. POLYER FEED UNIT TO BE RECONNECTED TO NEW SCREW PRESS CONTROL PANEL AND NEW LIGHTING PANEL. EXISTING CONDUCTORS TO BE REMOVED AND REPLACED COMPLETE. PORTIONS OF EXISTING CONDUIT MAY BE REUSED WHERE APPLICABLE.
3. EXISTING DISTRIBUTION PANEL DP-2 IN SLUDGE HANDLING BUILDING TO BE REMOVED AND REPLACED. REMOVE PANEL, INCOMING FEEDER WIRING. EXISTING CONDUIT FOR LOAD CIRCUITS MAY BE REUSED AND EXTENDED TO NEW PANEL WHERE REQUIRED. INSTALL LIGHTING PANEL AS SPECIFED AND WHERE SHOWN. SEE PLAN DRAWINGS, PROPOSED ONE-LINE, AND SCHEDULES.
4. EXISTING STEP DOWN TRANSFORMER TO BE REUSED, RELOCATED TO EXISTING STORAGE BULIDING, AND CONNECTE TO NEW PANELS DP-2 AND LP-2. SEE PLAN DRAWINGS, PROPOSED ONE-LINE, AND SCHEDULES FOR DETAILS.
5. EXISTING LP-3 AT EXISTING STORAGE BUILDING TO BE REMOVED. EXISTING LOADDS TO BE RECONNECTED TO LIGHTING PANEL LP-2 IN EXISTING STORAGE BUILDING, SEE PLAN DRAWINGS, PROPOSED ONE-LINE, AND SCHEDULES.
6. EXISTING FEEDER TO EXISTING SLUDGE BUILDING TO BE REMOVED. DISCONNECT AND REMOVE EXISTING SPARE/UNUSED BREAKERS IN MAIN DISTRIBUTION PANEL FOR INSTALLATION OF NEW BREAKER FOR NEW DISTRIBUTION PANEL DP-2. SEE PROPOSED ONE-LINE FOR DETAILS.
7. EXISTING PLANT DRAINAGE PUMP STATION CONTROLS TO BE REPLACED. DISCONNECT AND REMOVE EXISTING CONTROL PANEL IN ADMIN BUILDING. SEE ONE-LINE FOR LOCATION. EXISTING BREAKER IN MDP TO BE REUSED FOR NEW CONTROL PANEL. EXISTING CONDUIT MAY BE REUSED BETWEEN ADMIN BUIDING AND PLANT DRAINAGE PUMP STATION. SEE PROPOSED ONE-LINE FOR CIRCUIT DETAILS.
8. EXISTING STORM WATER PUMP STATION TO BE RECONNECT TO NEW PANEL LP-2. SEE PROPSED ONE-LINE FOR DETAILS.

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES APPLICABLE TO THIS SHEET.
2. SEE DETAILS AND OTHER DISCIPLE DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
3. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
4. SEE SITE PLAN AND PLAN VIEW DRAWINGS FOR EQUIPMENT LOCATIONS. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.



EXISTING MAIN DISTRIBUTION PANEL

EXISTING PLANT DRAING PUMP STATION CONTROL PANEL (7)

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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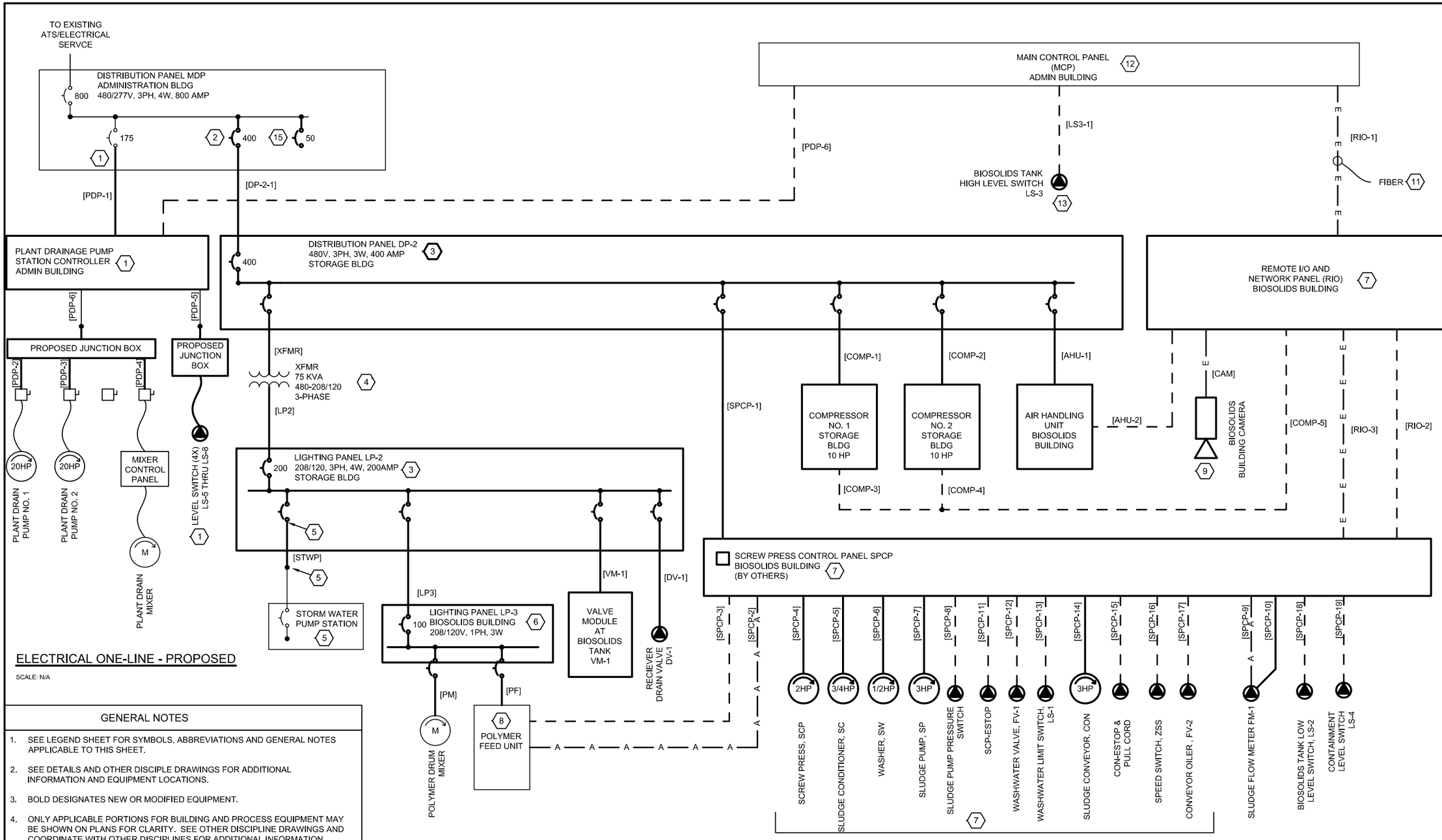
ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

EXISTING ELECTRICAL ONE-LINE

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

00.EM010



ELECTRICAL ONE-LINE - PROPOSED

SCALE: N/A

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES APPLICABLE TO THIS SHEET.
2. SEE DETAILS AND OTHER DISCIPLE DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
3. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
4. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.

(#) KEYED NOTES

1. PROVIDE AND INSTALL NEW PLANT DRAINAGE PUMP STATION CONTROL PANEL IN PLACE OF EXISTING ADMIN BUILDING. PROVIDE NEW FLOAT SWITCHES AT PUMPS STATION. INSTALL NEW CIRCUITS TO RECONNECT EXISTING PUMPS AND MIXER TO NEW CONTROL. INSTALL NEW POWER CIRCUIT TO EXISTING BREAKER IN MDP. SEE PLAN DRAWINGS FOR ADDITIONAL INFORMATION.
2. PROVIDE AND INSTALL NEW 400 AMP BREAKER IN EXISTING MDP TO FEED NEW DISTRIBUTION PANEL DP-2 IN EXISTING STORAGE BUILDING.
3. PROVIDE NEW DISTRIBUTION PANEL DP-2 AND NEW LIGHTING PANEL LP-2 IN EXISTING STORAGE BUILDING AS SPECIFIED AND SHOWN. SEE PLAN VIEW DRAWINGS AND SCHEDULES FOR ADDITIONAL CIRCUITS AND REQUIREMENTS.
4. EXISTING STEP DOWN TRANSFORMER TO BE RELOCATED, REUSED, AND CONNECTED TO NEW PANEL DP-2 AND LP-2. SEE EXISTING STORAGE BUILDING PLAN VIEW FOR PROPOSED LOCATION.
5. EXISTING PLANT DRAIN PUMP STATION TO BE RECONNECTED TO NEW LP-2. SEE SCHEDULES FOR ADDITIOANL INFORMATION. PROVIDE A NEW CIRCUIT AND JUNCTION BOX TO EXISTING CIRCUIT LOCATION IN BIOSOLIDS BUILDING AND CONNECT TO EXISTING FEEDER.
6. PROVIDE NEW LIGHTING PANEL LP-3 IN BIOSOLIDS BUILDING FOR EXISTING CIRCUITS. SEE PLAN VIEW DRAWINGS AND SCHEDULES FOR ADDITIONAL INFORMATION.
7. NEW SCREW PRESS CONTROLS PROVIDED BY OTHERS FOR INSTALLATION AND CONNECTED BY CONTRATORS. COORDINATE WITH SUPPLIER FOR ALL REQUIRED CIRCUITS AND CONNECTIONS.
8. RECONNECT EXISTING POLYMER UNIT TO NEW SCREW PRESS CONTROL PANEL.
9. CAMERA PROVIDED BY SYSTEM INTEGRATOR. COORDINATE WITH SYSTEM INTEGRATOR FOR CIRCUIT REQUIREMENTS AND POWER SUPPLY LOCATION.
10. REMOTE I/O AND NETWORK PANEL PROVIDED BY SYSTEMS INTEGRATOR FOR INSTALLATION AND CONNECTION BY CONTRACTOR. COORDINATE WITH SYSTEM INTEGRATOR .
11. FIBER OPTIC CABLE PROVIDE BY SYSTEMS INTEGRATOR FOR INSTALLATION BY CONTRACTOR. PROVIDE A MINIMUM OF A 2 INCH CONDUIT FOR FIBER INSTALLATION.
12. INTERFACE NEW CONTROL AND COMMUNCIATION SIGNALS WITH EXISTING MAIN CONTROL PANEL IN ADMIN BUILDING. COORDINATE WITH SYSTEM INTEGRATOR FOR LOCATION AND CONNECTION REQUIREMENTS.
13. FLOAT SWITCH TO BE INTERLOCKED WITH EXISTING DIGESTER PUMPS. COORDINATE WITH SYSTEM INTEGRATOR FOR ROUTING AND TERMINATION LOCATION.
14. PROVIDE NEW BREAKER FOR NEW EMERGENCY SHOWER WATER HEATER. SEE 55.EM101.

WIRE TYPE KEY

- POWER
- CONTROL (DISCRETE)
- A — A — CONTROL (ANALOG)
- E — E — COMMUNICATION SIGNAL (ETHERNET - TCP)

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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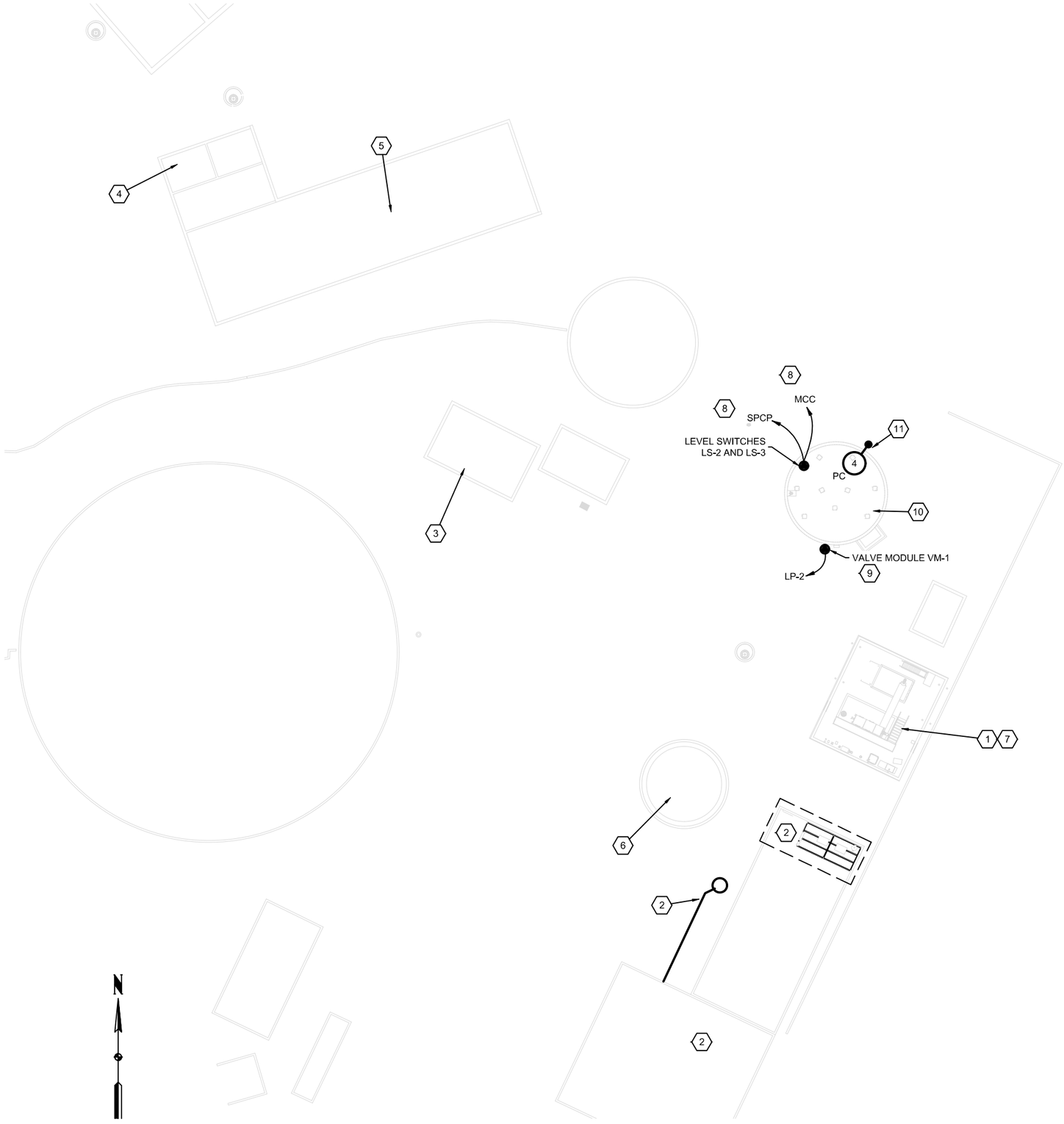
ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PROPOSED ELECTRICAL ONE-LINE

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

00.EM010



SITE PLAN - PROPOSED

SCALE: 1" = 40'-0"

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. FIELD VERIFY ALL SCALES AND DIMENSIONS.
3. CIRCUIT NUMBERS ARE USED FOR DESIGN INTENT. CONTRACTOR SHALL VERIFY EXACT CIRCUIT NUMBERS IN FIELD.
4. SEE OTHER DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
5. CONDUIT SIZES DETERMINED BY CONTRACTOR PER NEC REQUIREMENTS, UNLESS OTHERWISE NOTED, CONDUIT SHALL NOT BE SMALLER THAN 3/4" EXCEPT FOR FINAL CONNECTION TO EQUIPMENT, UNLESS OTHERWISE NOTED.
6. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
7. SEE PLAN DRAWINGS, SCHEDULES, AND ADDITIONAL ONE-LINES FOR ADDITIONAL CIRCUITS.
8. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.

(#) KEYED NOTES

1. SEE SHEET 40.EM101 FOR WORK WITHIN BIOSOLIDS HANDLING BUILDING.
2. SEE SHEET 60.EM100 AND 60.EM101 FOR WORK WITHIN EXISTING AND PROPOSED STORAGE BUILDINGS. EXTEND NEW FLOOR DRAIN PIPING FROM PROPOSED STORAGE BUILDING TO EXISTING MANHOLE. FIELD VERIFY LOCATION.
3. EXISTING CONTROLS, DISCONNECT, AND PANELS FOR PLANT DRAINAGE PUMP STATION TO BE REPLACED. EXISTING PUMPS AND MIXER TO BE CONNECTED TO NEW CONTROLS. SEE ONE-LINE AND DETAILS ON 50.EM100.
4. SEE SHEET 55.EM100 FOR WORK WITHIN EXISTING ADMINISTRATION BUILDING.
5. EXISTING ELECTRICAL ROOM. LOCATION OF MAIN DISTRIBUTION PANEL, MOTOR CONTORL CENTER, MAIN CONTROL PANEL (MCP), AND EXISTING/NEW PLANT DRAIN PUMP STATION CONTROL PANEL.
6. EXISTING SLUDGE MIXER AND SLUDGE PUMP ELECTRICAL AND CONTROLS TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED ELECTRICAL INCLUDING, BUT NOT LIMITED TO, CONDUCTORS, PANELS, AND CONDUITS AS SPECIFIED.
7. EXISTINGS BELT FILTER PRESS AND ASSOCIATED EQUIPMENT WITHIN BIOSOLIDS HANDLING BUILDING TO BE REMOVED. SEE DRAWINGS 40.EM100 FOR ADDITIONAL WORK WITHIN BUILDING.
8. PROVIDE AND INSTALL NEW FLOAT SWITCHES IN NEW BIOSOLIDS STORAGE TANK. FIELD LOCATE. HIGH LEVEL FLOAT TO CONNECTED TO MCP OR MCC IN ADMIN BUILDING TO DISABLE EXISTING DIGESTER TRANSFER PUMPS. FLOAT SHALL DISABLE BOTH PUMPS. COORDINATE WITH OWNER'S SYSTEM INTEGRATOR FOR CONNECTION DETAILS AND LOCATION. LOW LEVEL FLOAT TO CONNECT TO NEW SCREW PRESS CONTROL PANEL TO DISABLE BIOSOLIDS PUMP.
9. VALVE MODULE PROVIDED WITH MIXING COMPRESSORS FOR INSTALLATION AND CONNECTION BY ELECTRICAL CONTRACTOR. FIELD LOCATE AND COORDINATE CONNECTION REQUIREMENTS WITH SUPPLIER.
10. DISCONNECT AND REMOVE ALL EXISTING ELECTRICAL AND CONTROLS FROM ABANDONED DIGESTER.
11. INSTALL NEW LIGHT FIXTURES, POLE, AND BASE WITH TYPE SPECIFIED. SEE LUMINARE SCHEDULE FOR DETAILS. SEE ELECTRICAL DETAILS FOR POLE BASE. CONNECT TO NEW LIGHTING PANEL IN BIOSOLIDS BUILDING. LIGHTING CIRCUIT TO BE #8 AWG BETWEEN FIXTURE AND PANEL. FIELD LOCATE FINAL LOCATION WITH ENGINEER AND OWNER. ADJUST LUMINARE MOUNTING ANGLE TO MAXIMIZE LIGHTING OF TANK AREA.

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

DRAWING LOG

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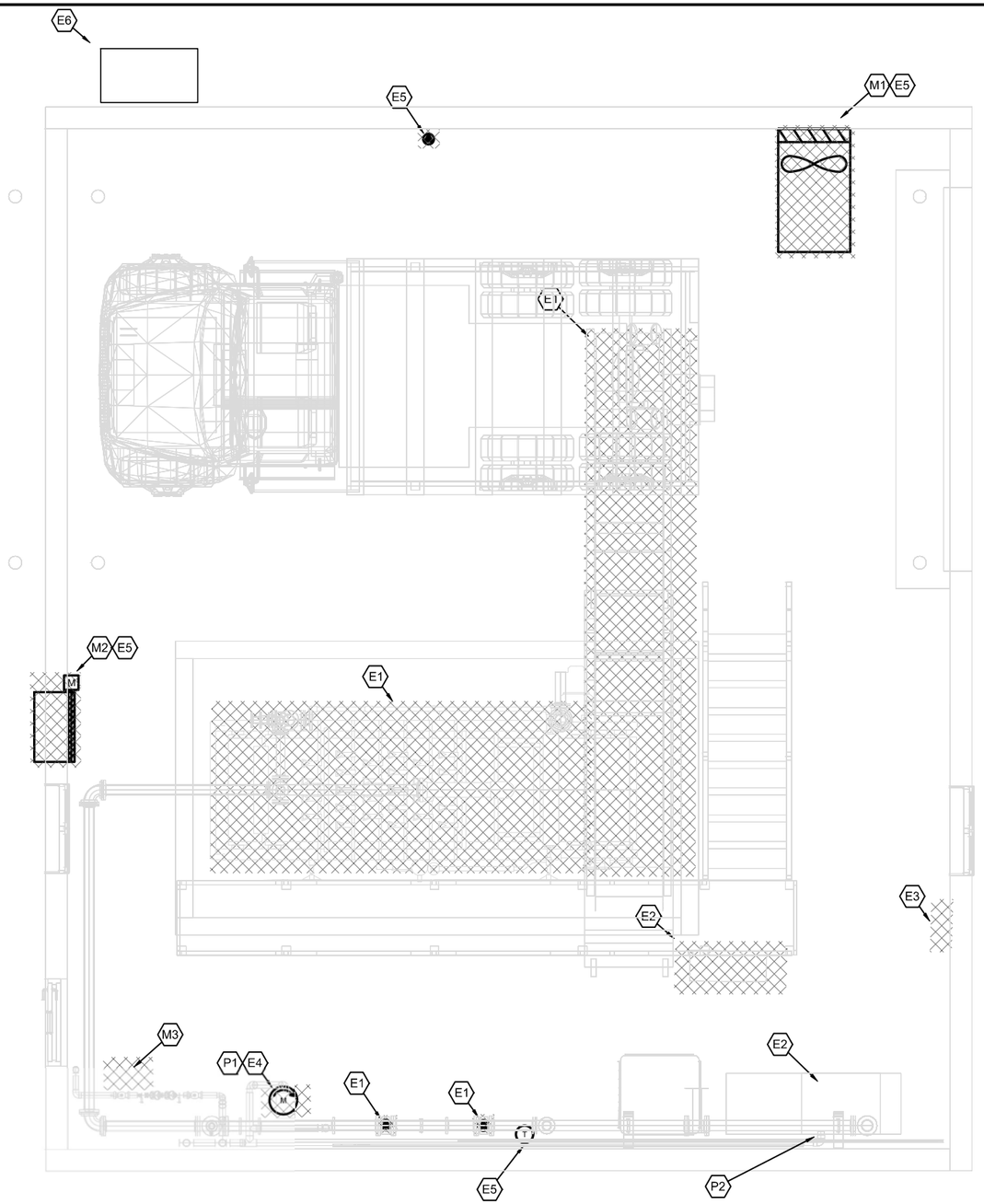
ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

SITE PLAN

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

00.EM100



BIOSOLIDS HANDLING BUILDING - EXISTING

SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. FIELD VERIFY ALL SCALES AND DIMENSIONS.
3. SEE PLAN DRAWINGS, SCHEDULES, AND OTHER DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
4. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
5. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.

M# MECHANICAL KEYED NOTES

1. REMOVE EXISTING WALL MOUNTED EXHAUST FAN. OPENING TO BE REUSED FOR NEW EXHAUST FAN.
2. REMOVE EXISTING LOUVER, DAMPER, AND ACTUATOR. SEAL OPENING.
3. REMOVE ABANDONED VENT PIPING FOR OLD UNIT HEATER. SEAL OPENINGS.

P# PLUMBING KEYED NOTES

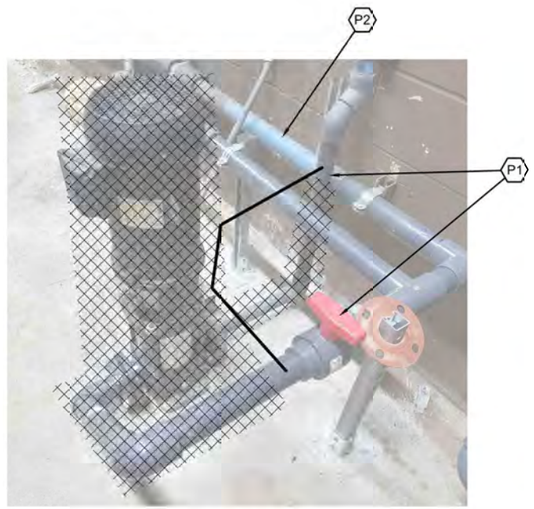
1. REMOVE EXISTING BOOSTER PUMP. REROUTE AND RECONNECT PIPING TO EXISTING WATER SUPPLY. REUSE EXISTING ISOLATION VALVE. SEE DETAL THIS PAGE.
2. RE-ROUTE AND EXTEND POLYMER WATER CONNECTION TO NEW PCLYMER SYSTEM LOCATION WITHIN BUILDING. SEE PROPOSED PLAN VIEW.

E# ELECTRICAL KEYED NOTES

1. EXISTING BELT FILTER PRESS AND ASSOCIATED EQUIPMENT TO BE REMOVED. DISCONNECT AND REMOVE ALL ASSOCIATED ELECTRICAL CONNECTIONS AND CONDUIT COMPLETE. ALL EXPOSED CONDUIT, WIRING, SUPPORTS, ETC. SHALL BE REMOVED AS SPECIFIED. SEE PROCESS DRAWINGS FOR ADDTIONAL DETAILS AND EQUIPMENT LOCATIONS.
2. DISCONNECT EXISTING POLYMER FEED UNIT CONNECTIONS TO EXISTING BELT FILTER PRESS CONTROL PANEL. POLYER FEED UNIT TO BE RELOCATED AND RECONNECTED TO NEW SCREW PRESS CONTROL PANEL AND NEW LIGHTING PANEL.
3. EXISTING DISTRIBUTION PANEL DP-2 IN SLUDGE HANDLING BUILDING TO BE REPLACED. REMOVE PANEL, INCOMING FEEDER AND GROUND WIRING. EXISTING CONDUIT FOR RECONNECTED LOAD CIRCUITS MAY BE REUSED AND EXTENDED TO NEW PANEL LOCATION. SEE PANEL SCHEDULE AND ONE-LINE FOR DETAILS.
4. DEMO EXISTING BOOSTER PUMP, COMPLETE.
5. EXISTING EXHAUST FAN TO BE REPLACED. DISCONNECT AND REMOVE ALL ASSOCATED ELECTRICAL FOR EXISTING EXHAUST FAN INCLUDING EXISTING GAS SENSORS, THERMOSTAT, AND DAMPER ACUTATOR.
6. EXISTING STEP DOWN TRANSFORMER TO BE REUSED, RELOCATED, AND CONNECTE TO NEW PANEL DP-2 AND LP-2. SEE ELECTRICAL ONE-LINE AND SCHEDULES FOR DETAILS.

EXISTING DISTRIBUTION PANEL DP-2

SCALE: N/A



EXISTING BOOSTER PUMP

SCALE: N/A

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

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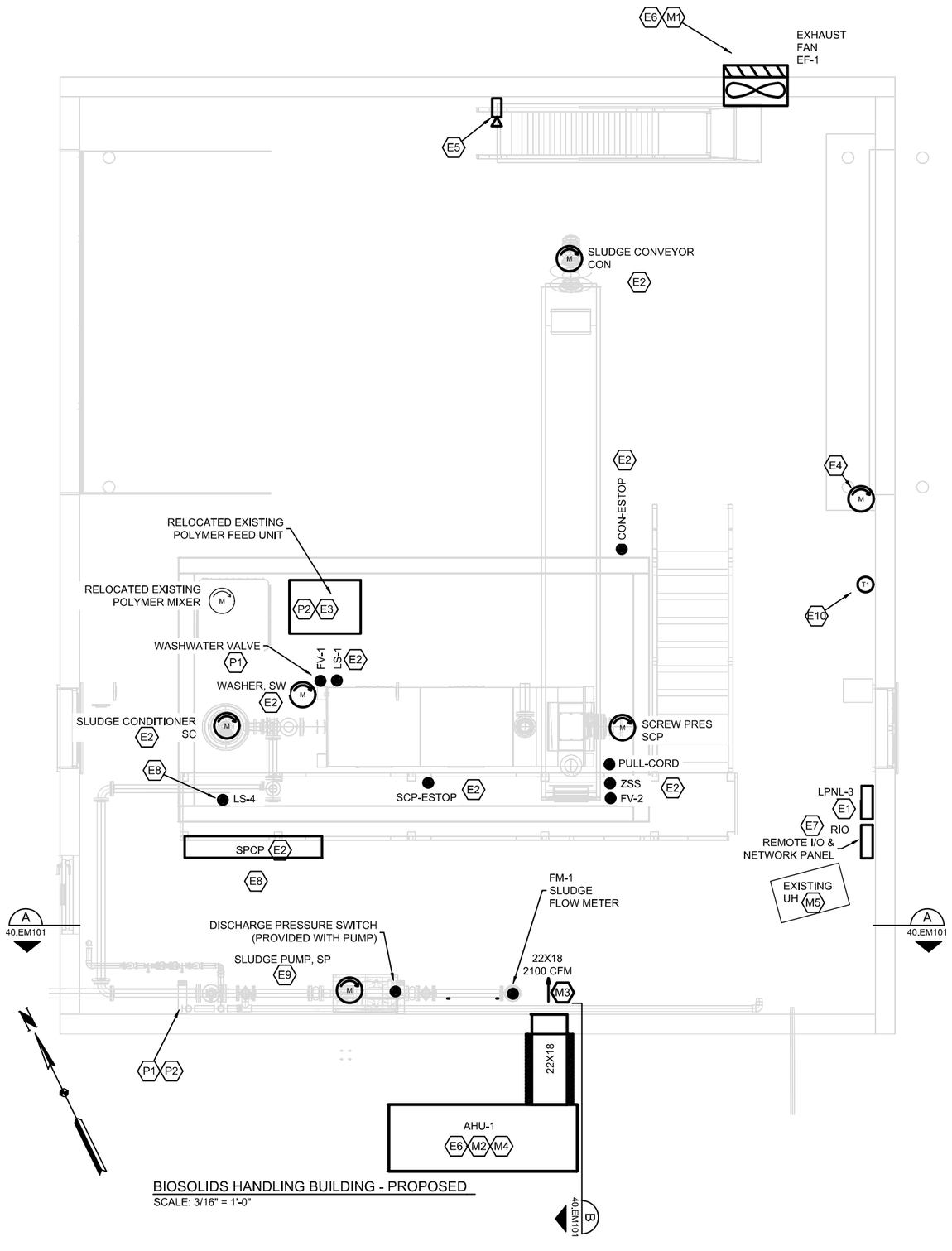
ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

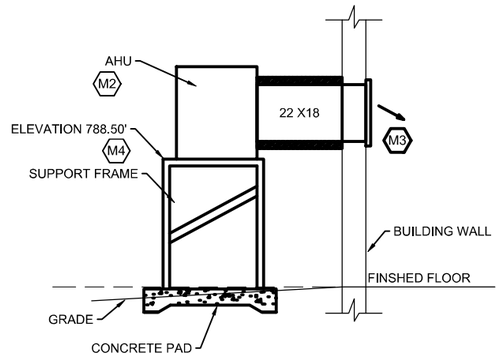
EXISTING BIOSOLIDS BUILDING

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

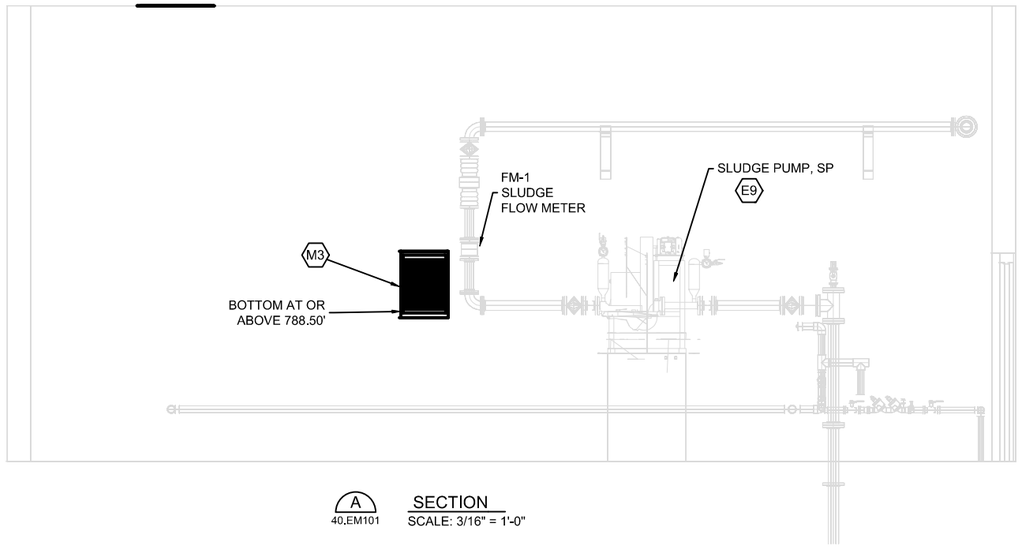
40.EM100



BIOSOLIDS HANDLING BUILDING - PROPOSED
SCALE: 3/16" = 1'-0"



B 40.EM101 AIR HANDING UNIT - SECTION
SCALE: 3/16" = 1'-0"



A 40.EM101 SECTION
SCALE: 3/16" = 1'-0"

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. FIELD VERIFY ALL SCALES AND DIMENSIONS.
3. SEE PLAN DRAWINGS, SCHEDULES, AND OTHER DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
4. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
5. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.
6. EQUIPMENT LAYOUT AND CONNECTIONS SHOWN HERIN IS BASED ON ISHIGAKI AS SPECIFIED IN SECTION 11150. ANY EQUIPMENT MODIFICATIONS AND ADDITIONAL CIRCUITS REQUIRED TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER.

P# PLUMBING KEYED NOTES

1. EXTEND AND RECONNECT EXISTING WATER LINE TO NEW SCREW PRESS WASH WATER INLET. FIELD VERIFY CONNECTION POINT ON SCREW PRESS WITH PROVIDED EQUIPMENT.
2. ROUTE AND EXTEND WATER CONNECTION TO RELOCATED POLYMER SYSTEM.

E# ELECTRICAL KEYED NOTES

1. PROVIDE AND INSTALL NEW LIGHTING PANEL LP-3 AND EXTEND AND RECONNECT EXISTING CIRCUITS. SEE ONE-LINE AND SCHEDULES FOR CIRCUITS AND ADDITIONAL INFORMATION. PANEL SHALL BE MOUNTED SUCH THAT BOTTOM OF PANEL IS AT OR ABOVE ELEVATION 788.50'.
2. INSTALL AND CONNECT MANUFACTURER PROVIDED EQUIPMENT. FIELD VERIFY EQUIPMENT LOCATIONS. COORDINATE WITH SUPPLIER FOR CONNECTION INFORMATION. PROVIDE ALL ANCILLARY COMPONENTS AND CONNECTIONS REQUIRED BY MANFACTURER. CONTROL PANEL TO BE MOUNTED ON PLATFORM SUCH THAT FACE OF PANEL IS FLUSH WITH RAILING. PROVIDE ALL REQUIRED MOUNTING ACCESSORIES. SEE ONE-LINE FOR ADDITIONAL INFORMATION.
3. RECONNECT EXISTING POLYMER FEED UNIT TO NEW SCREW PRESS MANUFACTURER PROVIDED CONTROL PANEL AND NEW LIGHTING PANEL. SEE ONE-LINE FOR CIRCUIT DETAILS.
4. NEW DOOR OPERATOR AND CONTROLS PROVIDED BY OTHERS FOR CONNECTION BY ELECTRICAL CONTRACTOR. COORDINATE WITH SUPPLIER FOR CONNECTION REQUIREMENTS. FIELD VERIFY COMPONENT LOCATIONS.
5. NEW IP CAMERA PROVIDED BY OWNER'S SYSTEM INTEGRATOR FOR MOUNTING AND CONNECTION. CAMERA TO BE MOUNTED FROM WALL OR CIELING. PROVIDE ALL REQUIRED MOUNTING BRACKETS AND ACCESSORIES. FIELD LOCATE AND ADJUST CAMERA TO SEE TRUCK BED. CONNECT CAMERA TO REMOTE I/O NETWORK PANEL. POWER CAMERA FROM LIGHTING PANEL OR NETWORK PANEL PER REQUIREMENTS FROM SYSTEM INTEGRATOR.
6. CONNECT NEW HVAC EQUIPMENT. COORDINATE WITH MECHANICAL CONTRACTOR FOR REQUIREMENTS. SEE ONE-LINE AND DETAILS FOR ADDITIONAL INFORMATION.
7. NEW REMOTE I/O AND NETWORK PANEL PROVIDED BY OWNER'S SYSTEMS INTEGRATOR FOR INSTALLATION AND CONNECTION BY ELECTRICL CONTRACTOR. PANEL TO BE CONNECTED TO MAIN CONTROL PANEL IN ADMIN BUILDING. SEE ONE-LINE AND SCHEDULES. COORDINATE WITH SYSTEMS INTEGRATOR. PANEL SHALL BE MOUNTED SUCH THAT BOTTOM OF PANEL IS AT OR ABOVE ELEVATION 788.50'.
8. PROVIDE AND INSTALL FLOAT LEVEL SWITCH IN CONTAINMENT AREA. FIELD VERIFY LOCATION AND ELEVATION. PROVIDE ALL REQUIRED MOUNTING ACCESSORIES REQUIRED. FLOAT TO INTERFACE WITH SCREW PRESS CONTROL PANEL TO SHUT DOWN PRESS ON HIGH LEVEL.
9. CONNECT NEW SLUDGE PUMP AND DISCHARGE PRESSURE SWITCH TO NEW SCREW PRESS CONTROL PANEL.
10. RELOCATE AND RECONNECT EXISTING UNIT HEATER THERMOSTAT FROM SOUTH WALL TO APPROXIMATE LOCATION SHOWN. FIELD LOCATE. THERMOSTAT SHALL BE MOUNTED AT OR ABOVE ELEVATION 788.50'.

M# MECHANICAL KEYED NOTES

1. PROVIDE NEW WALL MOUNTED EXHAUST FAN AS SPECIFIED. INSTALL INTO EXISTING 32" X 32" OPENING. FIELD VERIFY OPENING SIZE AND MODIFY AS REQUIRED FOR NEW FAN.
2. PROVIDE NEW AIR HANDLING UNIT AS SPECIFIED. EXTEND EXISTING GAS LINE FROM EXISTING UNIT HEATER TO NEW AIR HANDLING UNIT. PROVIDE PRESSURE REGULATOR AND SHUTOFF VALVE AT UNIT.
3. PROVIDE NEW DUCT FROM AIR HANDLING UNIT INTO ROOM AS SHOWN. SEAL AND INSULATE EXTERIOR SUPPLY DUCT WITH R-12 WEATHERPROOF INSULATION. INSTALL GRILL WITH ADJUSTABLE LOUVERS TO DIRECT AIR FLOW AS SHOWN. COORDINATE DUCT PENETRATION AND LOUVER LOCATION WITH EXISTING AND PROCESS EQUIPMENT.
4. PROVIDE MOUNTING STRUCTURE FOR AIR HANDLING UNIT AS SHOWN. BOTTOM OF UNIT SHALL BE AT OR ABOVE ELEVATION 788.50'. MAINTAIN MANUFACTURER RECOMMENDED CLEARANCE AROUND UNIT, MINIMUM OF 36".

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ANAMOSA WASTEWATER TREATMENT FACILITY
ANAMOSA, IA
CITY OF ANAMOSA

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PROPOSED BIOSOLIDS BUILDING

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
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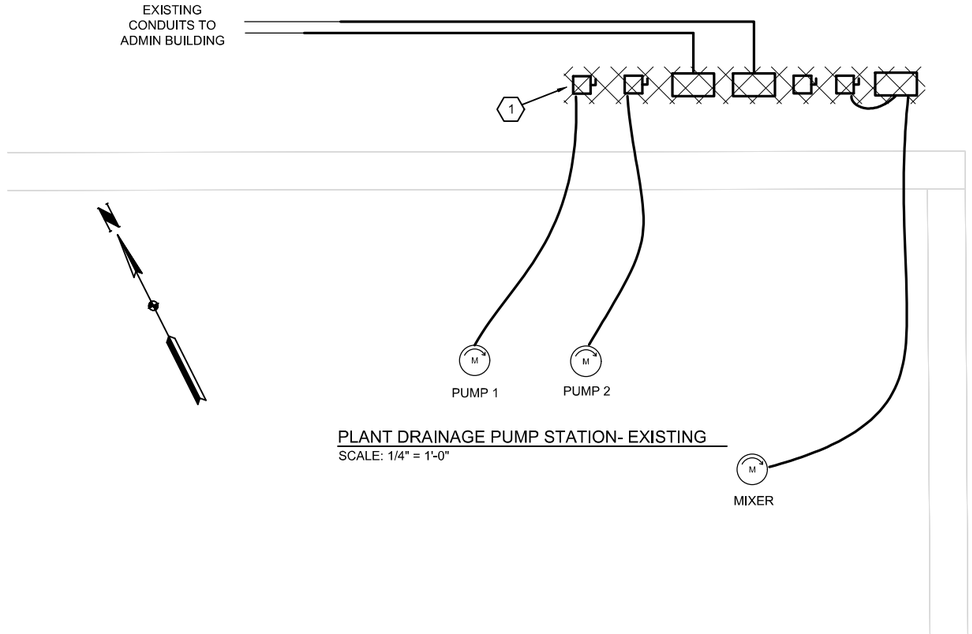


PLANT DRAINAGE PUMP STATION- EXISTING
SCALE: 1/4" = 1'-0"

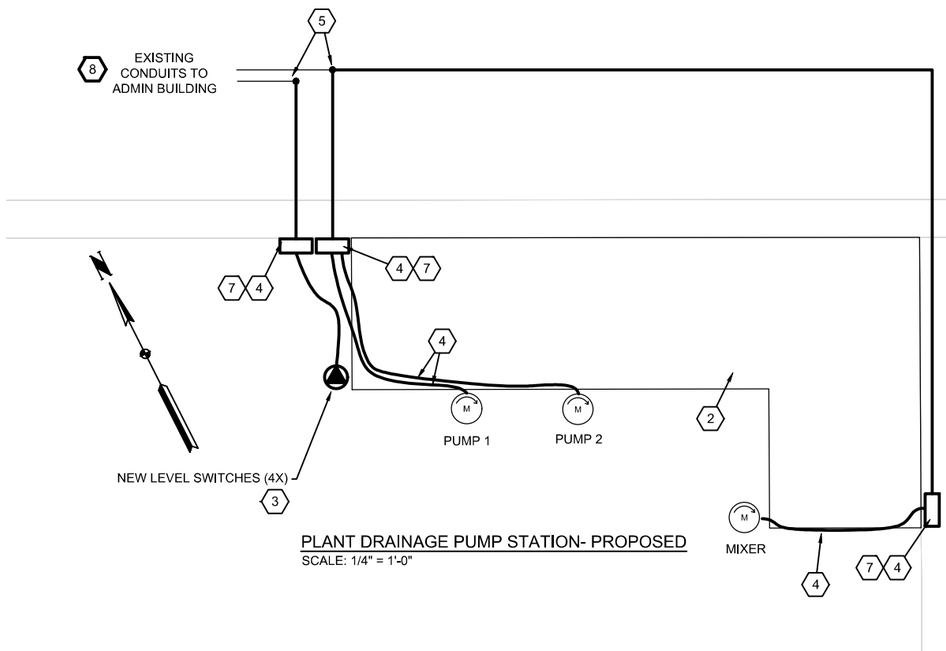
GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. FIELD VERIFY ALL SCALES AND DIMENSIONS.
3. SEE PLAN DRAWINGS, SCHEDULES, AND OTHER DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
4. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
5. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.

KEYED NOTES

1. DISCONNECT AND REMOVE EXISTING JUNCTION BOXES, DISCONNECTS, AND MIXER CONTROL PANEL. REMOVE EXISTING MOUNTING STRUCTURE COMPLETE. REMOVE EXISTING CONDUCTORS BACK TO ADMIN BUILDING. PORTIONS OF EXISTING CONDUIT TO BE REUSED. PUMPS AND MIXER TO BE RECONNECT TO NEW CIRCUITS.
2. NEW WALKWAY SHOWNS FOR ILLUSTRATIVE PURPOSES ONLY AND NOT NECESSARILY DRAWING TO SCALE. SEE STRUCTURAL SHEETS FOR WALKWAY DETAILS.
3. PROVIDE AND INSTALL NEW FLOAT SWITCHES. FLOAT SWITCHES TO BE CONNECTED TO NEW CONTROL PANEL THROUGH NEW JUNCTION BOX TO CONTROL PUMPS. SEE ONE-LINE FOR CIRCUIT INFORMATION. SEE 50.EM101 FOR PANEL DETAILS.
4. PROVIDE AND INSTALL NEW JUNCTION BOXES FOR FLOATS, MIXER, AND PUMPS. FIELD LOCATE BOXES ON INTERIOR TO ACCOMDATE EXISTING PUMP AND MIXER CABLES AND BE ACCESSIBLE FROM NEW PLATFORM. BOXES SHALL BE MOUNTED AT OR ABOVE ELEVATION 788.5 FEET. REROUTE EXISTIGN PUMP AND MIXER CABLES TO NEW JUCNTION BOXES. SUPPORT CABLES AS REQUIRED. PROVIDE ALL ANCILLARY MOUNTING AND SUPPORT COMPONENTS.
5. EXTEND EXISTING CONDUIT FROM ADMIN BUILDING TO NEW JUNCTION BOXES. NEW CONDUCTORS TO BE INSTALLED BETWEEN ADMIN BUILDING AND NEW JUNCTION BOXES. SEE ONE-LINE FOR CIRCUIT DETAILS.
6. NEW CONTROL PANEL TO BE PROVIDED AND INSTALLED IN PLACE OF EXISTING IN ADMIN BUILDILNG. SEE ELECTRICAL ONE-LINE FOR DETAILS. EXISTING MIXER AND PUMPS TO BE RECONNECTED TO NEW CONTROL PANEL. SEE PANEL DETAILS ON DRAWING 50.EM101.
7. PROVIDE THE FOLLOWING LABEL ON EACH JUNCTION BOX COVER.

CAUTION
DISCONNECT AND LOCKOUT POWER AT MAIN CONTROL PANEL IN ADMINISTRATION BUILDING PRIOR TO OPENING.



PLANT DRAINAGE PUMP STATION- PROPOSED
SCALE: 1/4" = 1'-0"

PLANT DRAINAGE PUMP STATION - DETAIL
SCALE: N/A

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ANAMOSA, IA
CITY OF ANAMOSA

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PLANT DRAINAGE PUMP STATION

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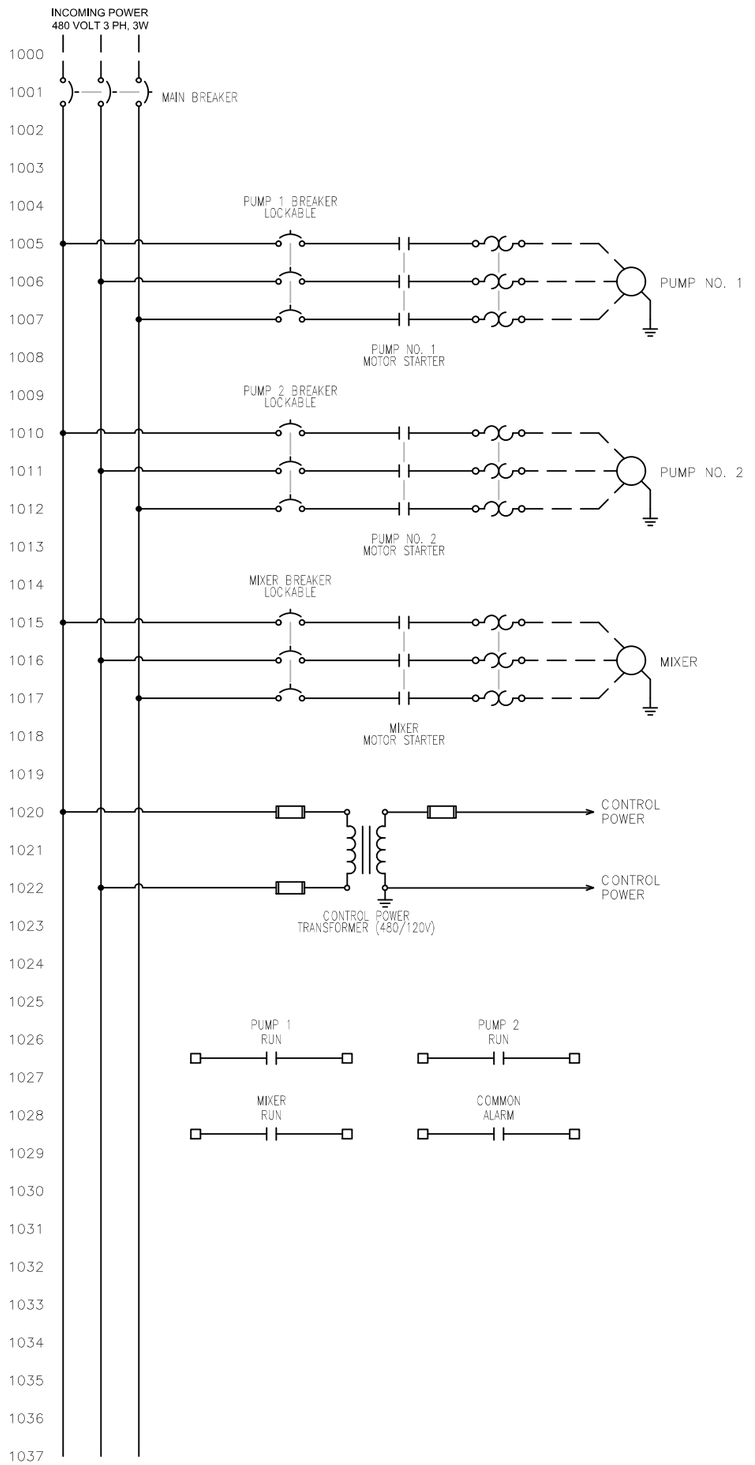

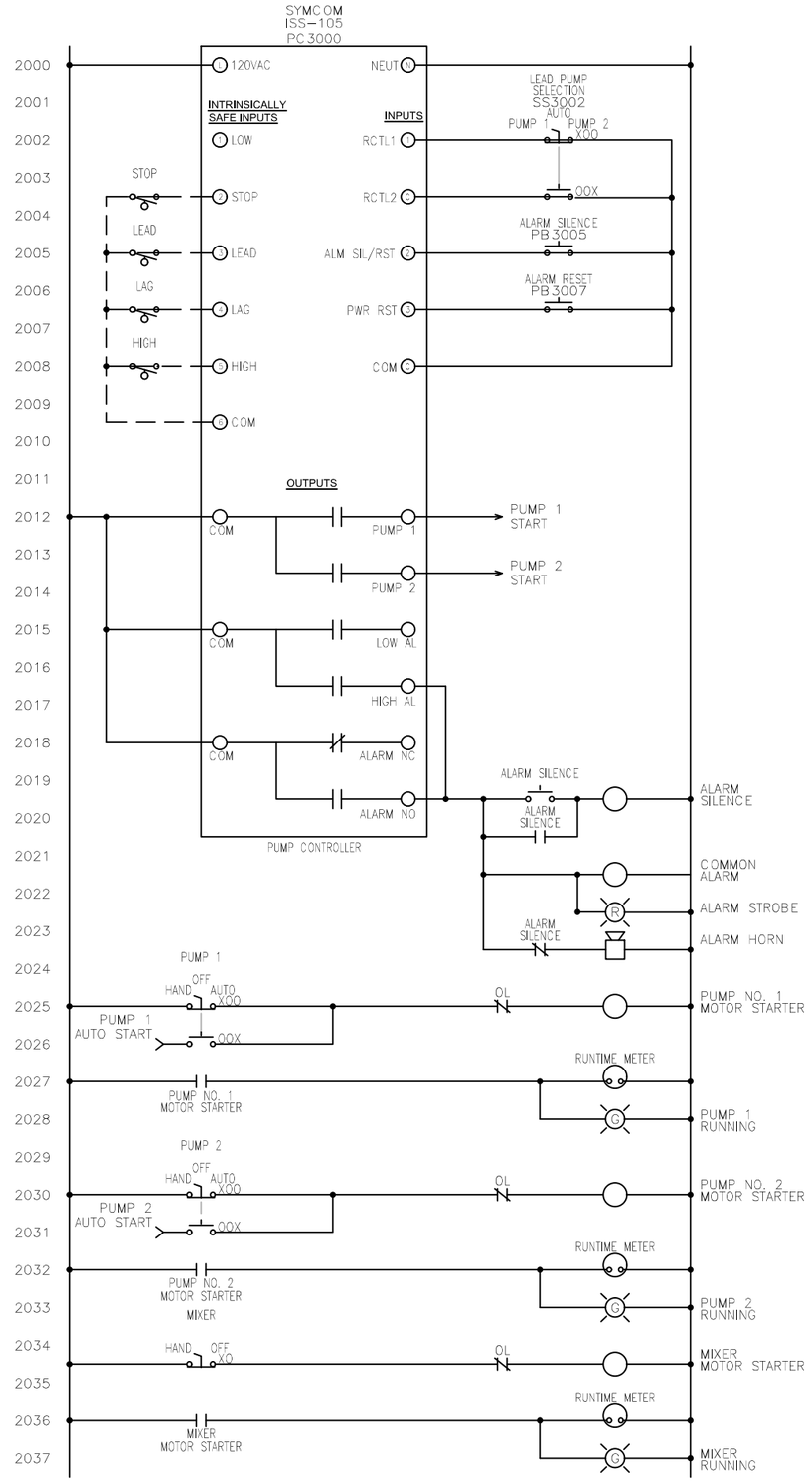

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES.
2. FIELD VERIFY ALL SCALES AND DIMENSIONS.
3. SEE PLAN DRAWINGS, SCHEDULES, AND OTHER DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
4. SCHEMATIC DRAWING IS TYPICAL AND MAY NOT SHOW ALL REQUIRED COMMENTS AND CIRCUITS. CONTRACTOR TO PROVIDE ALL REQUIRED CONTROLS TO MEET OPERATIONAL REQUIREMENTS.

OPERATIONAL DESCRIPTION

CONTROL PANEL TO CONTROL EXISTING SLUDGE PUMPS AND SLUDGE MIXER IN EXISTIGN PLANT DRAINAGE PUMP STATION. ENSURE THAT PUMP BREAKER AND OVERLOAD SETTINGS ARE ADEQUATELY SET FOR ACTUAL MOTORS CONNECTED.

MIXER TO RUN CONTINOUSLY AND BE CONTROLLED BY LOCAL HAND-OFF SWITCH ON CONTROL PANEL. THE MIXER ALSO CONTAINS A RUN-TIME METER AND ON INDICATING LIGHT.

PUMPS ARE CONTROLLED IN A LEAD-LAG SEQUENCE BASED ON LEVEL DETECTED BY FLOATS. BOTH PUMPS SHARE A COMMON STOP FLOAT. THE LEAD PUMP IS SELECTED VIA THE LEAD PUMP SELECTOR SWITCH AS EITHER PUMP 1, PUMP 2, OR AUTO. IN AUTO POSITION, THE ASSIGNED LEAD PUMP WILL ROTATE DURING EACH PUMPING CYCLE BY THE PUMP CONTROLLER. EACH PUMP CAN BE MANUALLY OPERATED BY TURNING THE ASSOCIATED HAND-OFF-AUTO SWITCH TO HAND. EACH PUMP ALSO CONTAINS A RUN-TIME METER, ON INDICATING LIGHT, AND RESET PUSHBUTTON FOR RESET OF THE PUMP'S ASSOCIATED OVERLOAD RELAY.

THE PUMP CONTROLLER MONITORS FOUR FLOATS: STOP, LEAD, LAG, AND HIGH. WHEN THE LEAD FLOAT IS ACTIVATED, THE PUMP CONTROLLER SIGNALS THE ASSIGNED LEAD PUMP TO START. IF THE LEVEL CONTINUES TO RISE AND THE LAG FLOAT SIGNAL IS ACTIVATED, THE PUMP CONTROLLER SIGNALS THE ASSIGNED LAG PUMP TO START.

IF THE LEVEL CONTINUES TO RISE AND THE HIGH FLOAT SIGNALS IS ACTIVATED, THE PUMP CONTROLLER SIGNALS BOTH PUMPS TO RUN (IF NOT ALREADY SIGNALED TO RUN) AND ACTIVATES THE HIGH LEVEL ALARM.

ONCE PUMPS ARE SIGNALED TO RUN, THEY CONTINUE TO RUN UNTIL THE STOP FLOAT IS ACTIVATED.

THE PUMP CONTROLLER MONITORS AND ALARMS FOR OUT-OF-SEQUENCE CONDITIONS SUCH AS DETECTION OF A LAG FLOAT PRIOR TO DETECTION OF THE LEAD FLOAT AND GENERATES AND OUT-OF-SEQUENCE ALARM.

A COMMON ALARM OUTPUT SIGNAL IS GENERATED WHEN ANY OF THE ABOVE ALARMS ARE ACTIVE OR ON LOSS OF CONTROL POWER.

THE CONTROL PANEL CONTAINS A LOCAL ALARM HORN/STROBE, ALARM SILENCE, AND ALARM RESET PUSHBUTTON. WHEN ANY OF THE ABOVE ALARMS ARE ACTIVE, THE COMMON ALARM OUTPUT AND THE HORN/STROBE WILL ACTIVATE. PRESSING THE ALARM SILENCE PUSHBUTTON WILL DEACTIVATE THE LOCAL HORN/STROBE. THE COMMON ALARM OUTPUT WILL REMAIN ACTIVE UNTIL THE ALARM HAS CLEARED AND THE ALARM RESET PUSHBUTTON IS PRESSED.

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PLANT DRAINAGE PUMP CONTROLS

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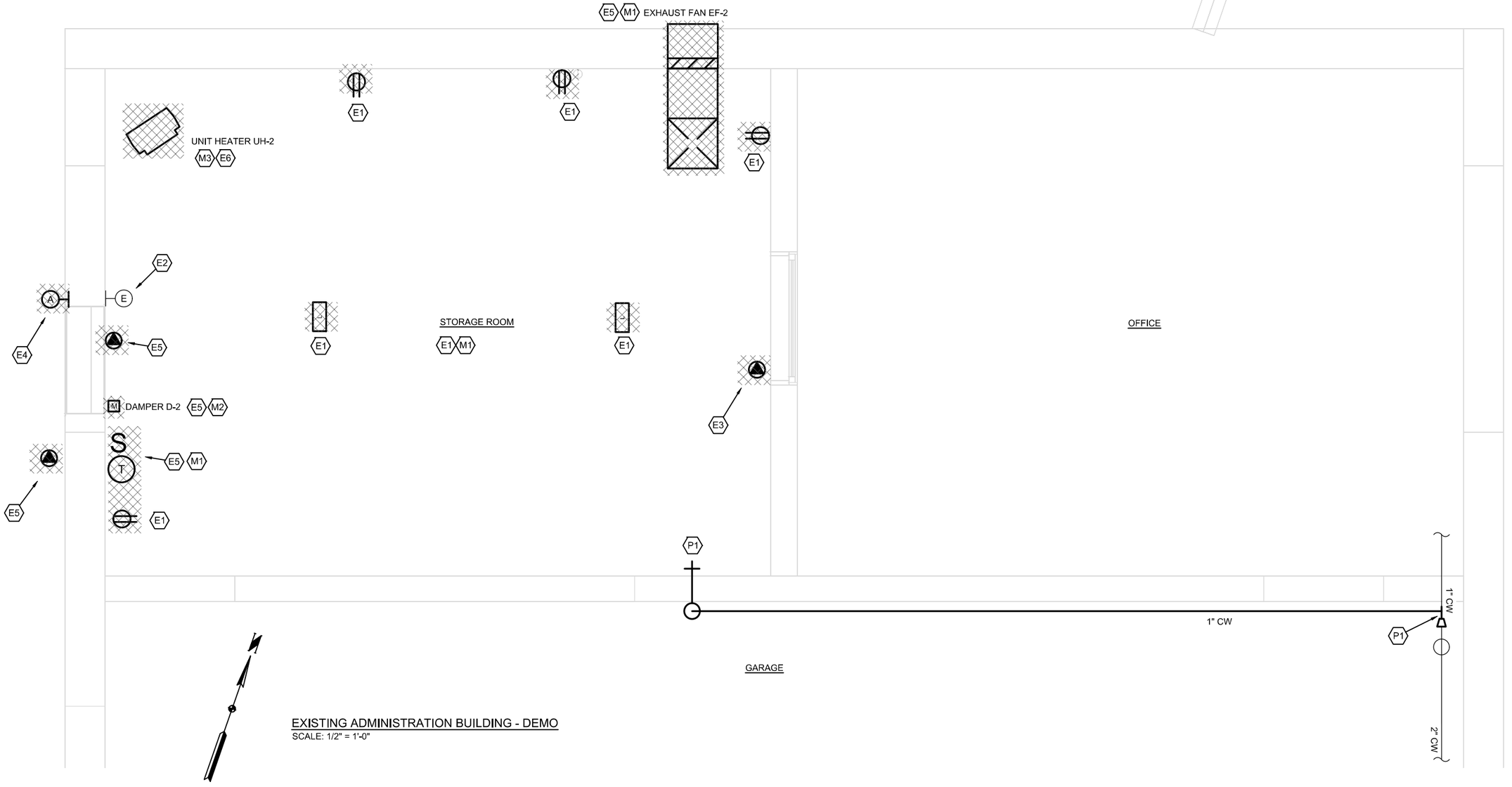

EXISTING ADMINISTRATION BUILDING - DEMO

SCALE: 1/2" = 1'-0"

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES APPLICABLE TO THIS SHEET.
2. SEE DETAILS AND OTHER DISCIPLE DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
3. BOLD DESIGNATES REMOVED OR MODIFIED EQUIPMENT.
4. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.

(M) MECHANICAL KEYED NOTES

1. REMOVE EXISTING WALL MOUNTED EXHAUST FAN, DUCTWORK, AND CONTROLS. EXISTING OPENING TO BE REUSED FOR NEW VENTILATION EQUIPMENT.
2. REMOVE EXISTING INLET LOUVER, DAMPER, ACTUATOR, AND CONTROLS. EXISTING OPENING TO BE REUSED FOR NEW VENTILATION EQUIPMENT.
3. REMOVE EXISTING GAS UNIT HEATER, AND CONTROLS. EXISTING GAS SERVICE LINE AND VENTING TO BE REUSED FOR NEW UNIT HEATER.

(P#) PLUMBING KEYED NOTES

1. REMOVE EXISTING WATER SPIGOT AND ASSOCIATED WATER LINE BACK TO CONNETION POINT IN EXISTING GARAGE. MODIFY EXISTING CONNECTION POINT TO ALLOW EXTENSION OF NEW 2 INCH WATER LINE TO CHEMICAL ROOM. SEE PROPOSED PLANS FOR ADDITIONAL INFORMATION.

(E#) ELECTRICAL KEYED NOTES

1. DISCONNECT AND REMOVE ALL ELECTRICAL WITHIN ROOM, UNLESS OTHERWISE NOTED. THIS SHALL INCLUDE ALL LIGHTING AND RECEPTACLE CIRCUITS WITHIN ROOM. LIGHTINGN AND RECEPTACLE SUPPLY CIRCUITS TO BE REUSED AND RECONNECTED TO NEW LIGHTS AND RECEPTACLES. SEE PROPOSED PLAN FOR ADDITIONAL INFORMATION.
2. EXISTING EXIT SIGN TO REMAIN AND BE RECONNECTED TO LIGHTING CIRCUIT.
3. DISCONNECT AND REMOVE ABANDONED CHLORINE DETECTOR AND ALL ASSOCIATED WIRING AND CONDUIT COMPLETE.
4. DISCONNECT AND REMOVE EXTERIOR ALARM LIGHT AND ALL ASSOCIATED WIRING AND CONDUIT COMPLETE. SEAL WALL PENETRATION.
5. DISCONNECT AND REMOVE ALL EXISTING HAVE POWER AND CONTROL CIRCUITS FOR EXHAUST FAN, DAMPER, AND CONTROLS. EXISTING POWER SOURCE TO BE REUSED FOR NEW HVAC EQUIPMENT. SEE PROPOSED PLAN FOR ADDITIONAL INFORMATION.
6. DISCONNECT AND REMOVE ALL ELECTRICAL AND CONTROLS FOR EXISTING UNIT HEATER. EXISTING POWER SOURCE TO BE REUSED FOR NEW UNIT HEATER. SEE PROPOSED PLAN FOR ADDITIONAL INFORMATION.

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

EXISTING ADMINISTRATION BUILDING

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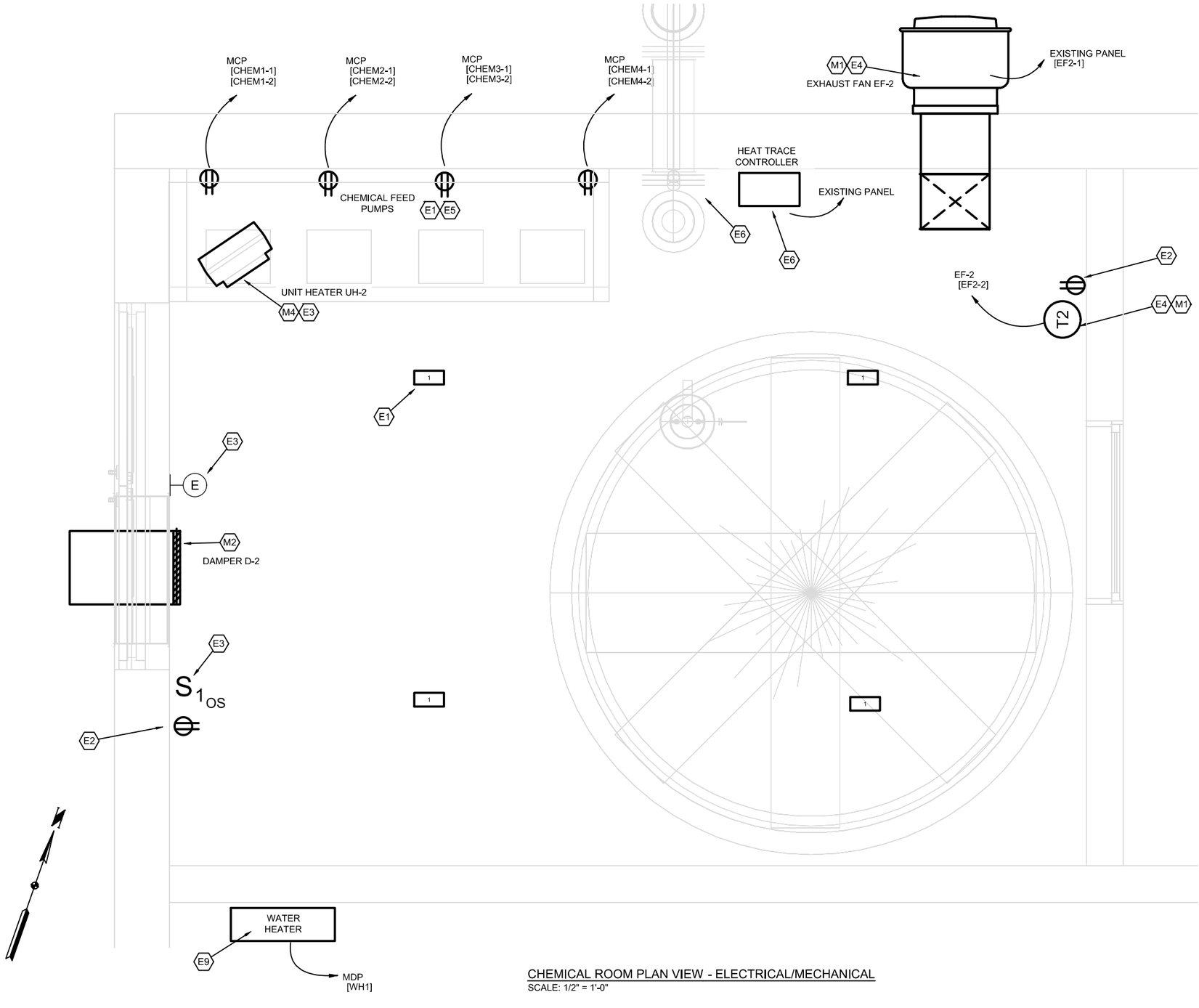

CHEMICAL ROOM PLAN VIEW - ELECTRICAL/MECHANICAL
SCALE: 1/2" = 1'-0"

GENERAL NOTES

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E# ELECTRICAL KEYED NOTES

1. PROVIDE NEW 120 VAC CIRCUITS TO CHEMICAL FEED PUMPS FROM EXISTING DISTRIBUTION PANEL IN ADMINISTRATION BUILDING ELECTRICAL ROOM. SEE SITE PLAN FOR GENERAL LOCATION. LOCATE EXISTING SPARE OR OPEN CIRCUITS WITHIN EXISTING PANELS. PROVIDE NEW CIRCUIT BREAKERS AS REQURED. EACH CHEMICAL PUMP RECEPTACLE SHALL BE ON SEPARATE DEDICATED 20 AMP CIRCUIT.
2. PROVIDE AND INSTALL NEW RECEPTACLES AND CONNECTED TO EXISTING RECEPTACLE CIRCUIT. INSTALL RECEPTACLES AT 4 FT AFF..
3. CONNECT NEW UNIT HEATER TO EXISTING CONTROL CIRCUIT.
4. ROOM EXHAUST FAN AND CONTROLS TO BE REPLACED. FAN TO BE INTERLOCKED WITH EXISTING ROOM LIGHT SWITCH. SEE DETAILS AND FOR CIRCUIT DETAILS.
5. PROVIDE CIRCUITS AS NOTED FROM EACH CHEMICAL FEED PUMP TO EXISTING SCADA SYSTEM MAIN CONTROL PANEL LOCATED WITHIN ADMIN BUILDING. SEE SCHEDULES FOR CIRCUIT INFORMATION. SEE SITE PLAN FOR APPROXIMATE LOCATION. COORDINATE WITH OWNER'S SYTEM INTEGRATOR FOR INTERCONNECTION.
6. PROVIDE AND INSTALL NEW HEAT CABLE CONTROLLER AS SPECIFIED. PROVIDE 240VAC, 30 AMP CIRCUIT FROM EXISTING LIGHTING PANEL WITHIN ADMIN BUILDING. PROVIDE AND INSTALL NEW BREAKERS FOR LIGHTING PANEL. COODINATE WITH EQUIPMENT SPECIFICATIONS FOR SIZE AND CONNECTION REQUIREMENTS OF HEAT CABLE. CONTROLLER SHALL BE MOUNTED SUCH THAT BOTTOM OF PANEL IS AT OR ABOVE ELEVATION 788.50'.
7. PROVIDE AND INSTALL NEW FIXTURES OF TYPE REQUIRED. FIELD LOCATE TO AVOID SHADOWING FROM CHEMICAL TANK. FIXTURES TO BE CONTROLLED BY NEW SWITCH S1.
8. PROVIDE AND INSTALL NEW OCCUPANCY SENSOR LIGHT SWITCH AS SPECIFIED TO CONTROL ROOM LIGHTS. SWITCH TO INCLUDE ADDITIONAL CONTACT TO INTERLOCK WITH EXHAUST FAN CONTROLLER.
9. NEW WATER HEATER PROVIDED BY PLUMBING CONTRACTOR FOR CONNECTION BY ELECTRICAL CONTRACTOR. PROVIDE 240VAC, 30 AMP CIRCUIT FROM EXISTING LIGHTING PANEL WITHIN ADMIN BUILDING. PROVIDE AND INSTALL NEW BREAKERS FOR LIGHTING PANEL. HEATER SHALL BE MOUNTED SUCH THAT BOTTOM IS AT OR ABOVE ELEVATION 788.50'.

M MECHANICAL KEYED NOTES

1. REMOVE EXISTING WALL MOUNTED EXHAUST FAN. PROVIDE NEW WALL MOUNTED EXHAUST FAN AS SPECIFIED. INSTALL INTO EXISTING 15" X 15" OPENING. FIELD VERIFY OPENING SIZE AND MODIFY AS REQUIRED FOR NEW FAN. INSTALL 16" X 16" DUCT DOWN TO WITHIN 12" ABOVE FINISHED FLOOR.
2. REMOVE EXISTING INLET LOUVER, DAMPER, AND ACTUATOR. INSTALL NEW 16" X 16" LOUVER, BIRD SCREEN, WEATHER HOOD, AND PRESSURE RELIEF DAMPER AS SPECIFIED. FIELD VERIFY OPENING SIZE AND MODIFY AS REQUIRED.
3. INSTALL NEW TEMPERATURE/HUMIDTY CONTROLLER AS SPECIFIED TO CONTROL FAN AND DAMPER OPERATION. CONTROLLER SHALL BE INTERLOCKED WITH EXISTING ROOM LIGHTING CIRCUIT TO FORCE FAN TO HIGH SPEED OPERATION. SEE ELECTRICAL SCHEMATIC DIAGRAMS FOR ADDITIONAL INFORMATION. CONTROLL SHALL BE MOUNTED AT OR ABOVE ELEVATION 788.50'.
4. PROVIDE AND INSTALL NEW GAS UNIT HEATER AS SPECIFIED. RECONNECT TO EXISTING GAS SUPPLY AND VENT, MODIFY AS REQUIRED.

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

ADMINISTRATION BUILDING MODIFICATIONS

PROJECT NUMBER	9433.1
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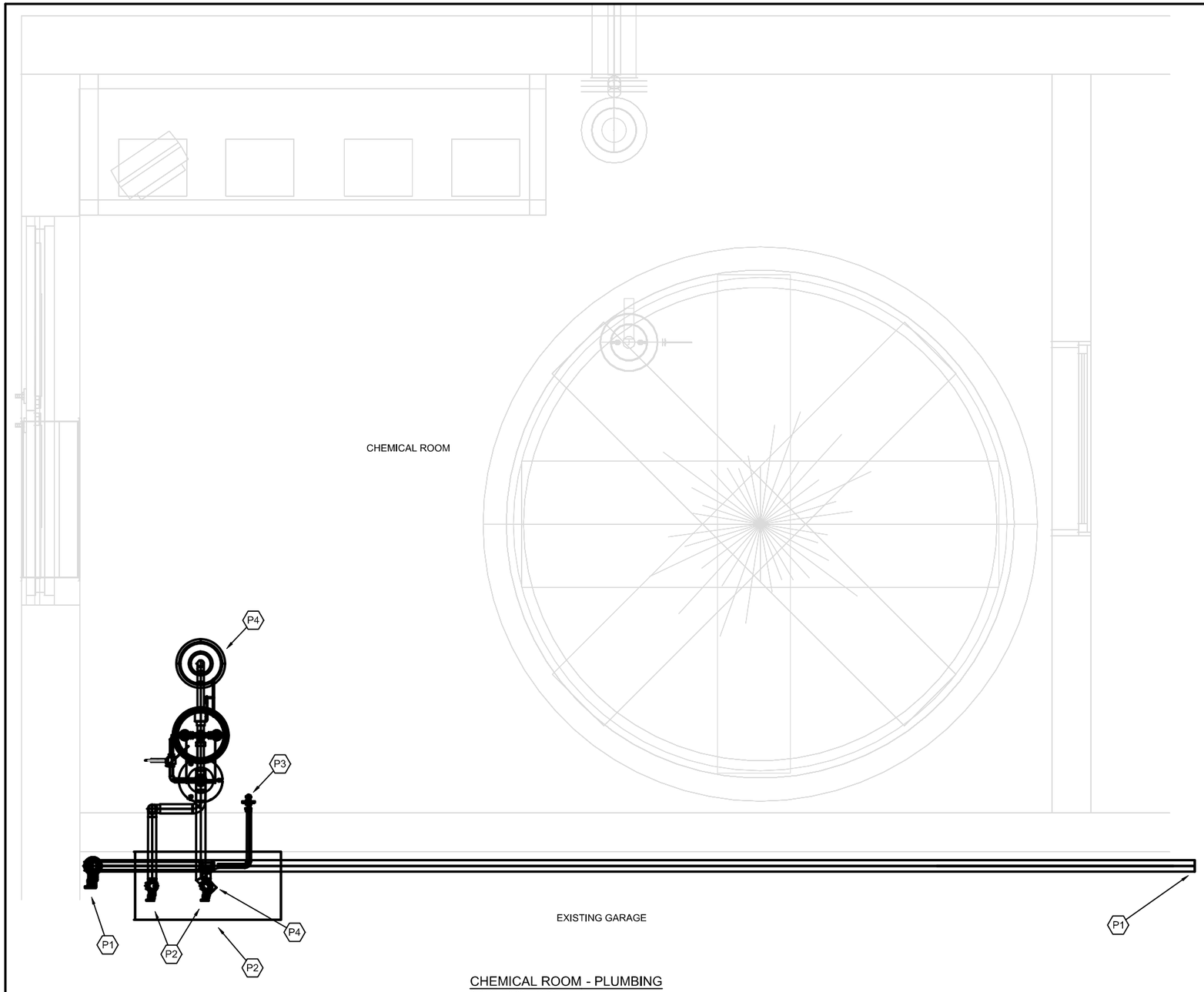

CHEMICAL ROOM - PLUMBING
SCALE: 1/2" = 1'-0"

GENERAL NOTES

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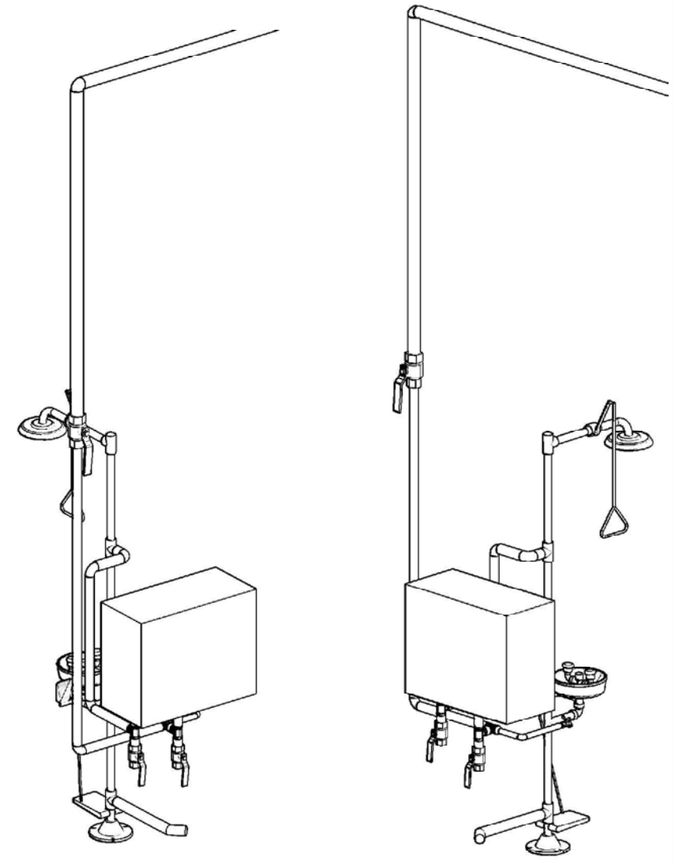
P# PLUMBING KEYED NOTES

1. EXTEND EXISTIGN 2 INCH COLD WATER LINE TO NEW EMERGENCY SHOWER SYSTEM. PROVIDE ISOLATION VALVE PRIOR TO HEATER.
2. PROVIDE AND INSTALL EMERENGY SHOWER HEATER AS SPECIFIED. EXTEND AND CONNECT WATER SUPPLY TO HEATER. EXTEND HEATER OUTLET TO SHOWER. INSTALL DRAIN VALVES ON HEATER INLET AND OUTLET AS SHOWN. INSTALL ANY ADDITIONAL FITTINGS REQUIRED FOR PROPER CONNECTION TO HEATER AND SHOWER. HEATER SHALL BE MOUNTED SUCH THAT BOTTOM IS AT OR ABOVE ELEVATION 788.50'.
3. PROVIDE AND INSTALL NEW HOSE BIB WHERE SHOWN AND SPECIFIED. EXTEND 3/4" WATER SUPPLY TO NEW HOSE BIB.
4. PROVIDE AND INSTALL NEW SAFETY EYEWASH/SHOWER AS SPECIFIED. FIELD VERIFY LOCATION TO AVOID CONFLICTS. EXTEND DRAIN FOR EYEWASH THROUGH WALL INTO EXISTING GARAGE AND ORIENT TOWARDS EXISTING FLOOR DRAIN IN GARAGE.



CHEMICAL ROOM SAFETY SHOWER ISOMETRIC

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ANAMOSA WASTEWATER TREATMENT FACILITY

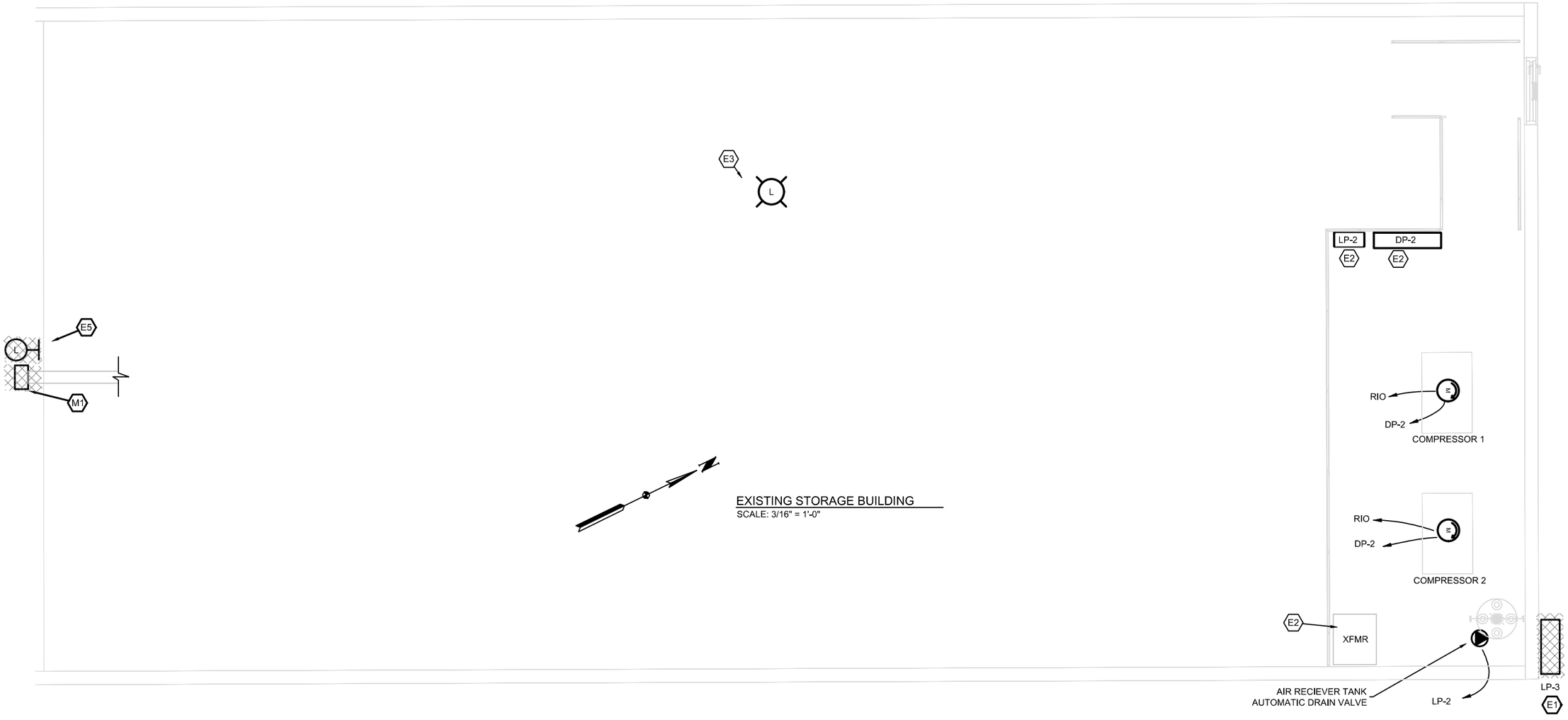
ANAMOSA, IA

ADMINISTRATION BUILDING MODIFICATIONS

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

55.EM102

M# MECHANICAL KEYED NOTES	E# ELECTRICAL KEYED NOTES	GENERAL NOTES
1. RELOCATE AND REROUTE EXISTING HEATER EXHAUST VENT DUE TO INSTALLATION OF PROPOSED BUILDING.	1. DISCONNECT AND REMOVE EXISTING LIGHTING PANEL LP-3. CIRCUITS TO BE RELOCATED TO NEW PANEL LP-2. SEE ONE LINE AND SCHEDULES. EXTEND AND RECONNECT EXISTING CIRCUITS AS REQUIRED. 2. PROVIDE AND INSTALL NEW DISTRIBUTION PANEL DP-2 AND LIGHTING PANEL LP-2. RELOCATE EXISTING TRANSFORMER FROM BIOSOLIDS BUILDING TO POWER LP-2. EXTEND AND RECONNECT CIRCUITS FROM REMOVED PANEL LP-3 TO NEW PANEL LP-2. SEE ONE-LINE AND SCHEDULES FOR ADDITIONAL CIRCUITS AND INFORMATION. 3. MATCH EXISTING LED HIGH BAY FIXTURES FOR NEW BUILDING.	1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES APPLICABLE TO THIS SHEET. 2. SEE DETAILS AND OTHER DISCIPLE DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS. 3. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT. 4. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.



EXISTING STORAGE BUILDING
SCALE: 3/16" = 1'-0"

whks
planners + land surveyors
1412 6th STREET SW, PO BOX 1467
MASON CITY, IA 50402
PHONE: (641) 423-8271
WWW.WHKS.COM
integrated technology
ENGINEERING, INC.
ROCHESTER, MN (507) 282-5736

ANAMOSA WASTEWATER TREATMENT FACILITY
ANAMOSA, IA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

EXISTING STORAGE BUILDING

PROJECT NUMBER	9433.1
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DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

60.EM100

GENERAL NOTES

1. SEE LEGEND SHEET FOR SYMBOLS, ABBREVIATIONS AND GENERAL NOTES APPLICABLE TO THIS SHEET.
2. SEE DETAILS AND OTHER DISCIPLE DRAWINGS FOR ADDITIONAL INFORMATION AND EQUIPMENT LOCATIONS.
3. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT.
4. ONLY APPLICABLE PORTIONS FOR BUILDING AND PROCESS EQUIPMENT MAY BE SHOWN ON PLANS FOR CLARITY. SEE OTHER DISCIPLINE DRAWINGS AND COORDINATE WITH OTHER DISCIPLINES FOR ADDITIONAL INFORMATION.

(E#) ELECTRICAL KEYED NOTES

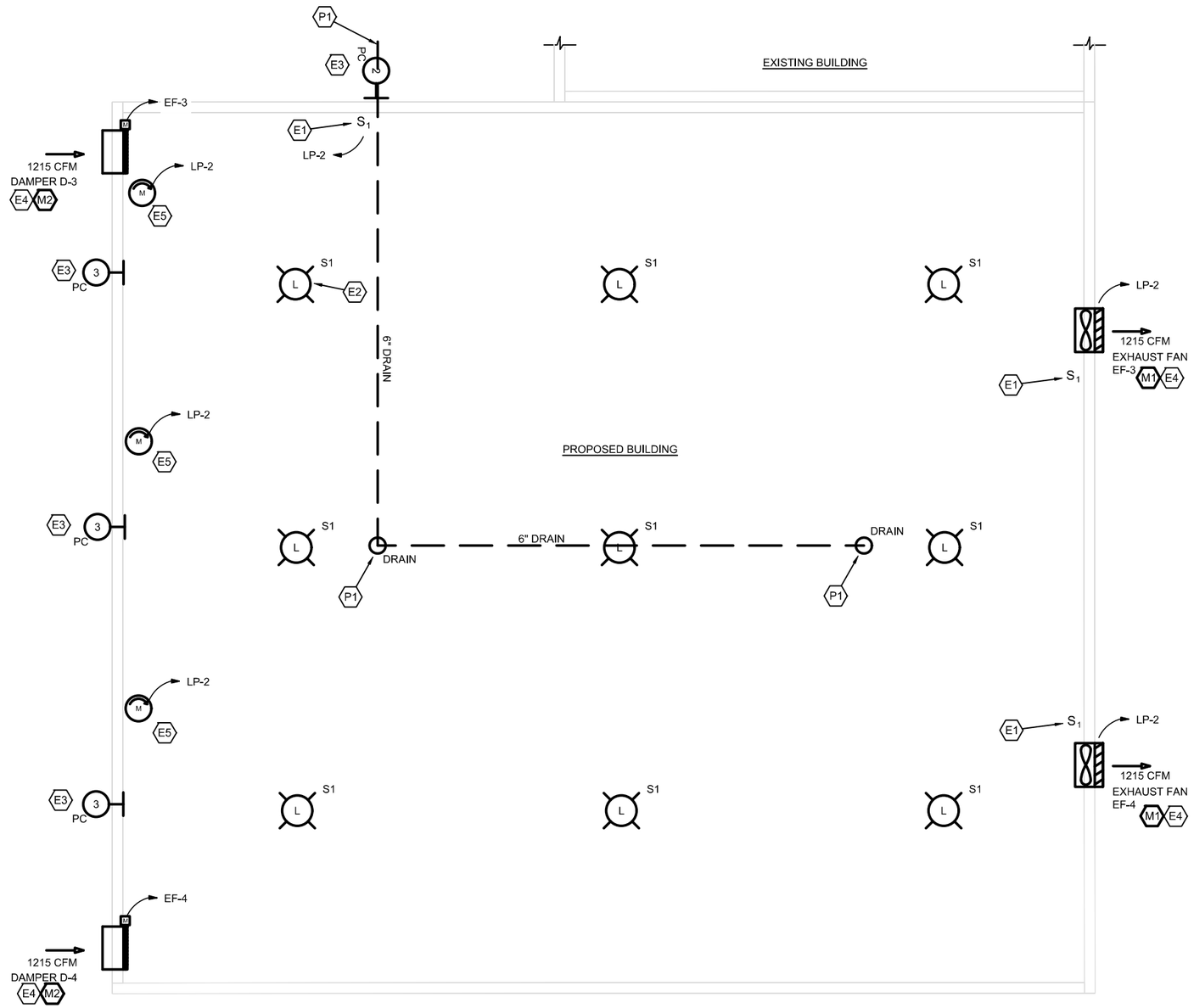
1. PROVIDE OCCUPANCY SENSORS AS SPECIFED AND AT GENERAL LOCATION SHOWN. FIELD LOCATE AND ADJUST SENSORS FOR PROPER OPERATION. SENSORS SHALL NOT BE MOUNTED LOWER THAN 9 FEET AFF. CONNECT TO LIGHTING CIRCUIT WITHIN NEW BUILDING AND TO POWER SOURCE IN LP-2.
2. PROVIDE HIGH BAY LED LIGHT FIXTURES AS SHOWN. MATCH FIXTURE TYPES AND SIZES WITHIN EXISTING BUILDING. CONNECT TO NEW LIGHTING CIRCUIT CONTROLLED BY OCCUPANCY SENSORS.
3. PROVIDE NEW OUTDOOR LIGHT FIXTURE OF TYPE SPECIFIED. MOUNT FIXTURED CENTERED ABOVE DOOR. CONNECT TO NEW CIRCUIT IN LP-2.
4. CONNECT NEW HVAC EQUPIMENT. COORDIANTE WITH MECHANICAL CONTRACTOR. DAMPER ACTATOR TO BE INTERLOCKED WITH RESPECTIVE EXHAUST FANS TO OPEN WHEN FAN IS OPERATING.
5. NEW OVERHEAD DOOR AND CONTROLS PROVIDE BY OTHERS FOR CONNECTION BY CONTRACTOR. COORDINATE WITH SUPPLIER FOR CONNECTION REQUIIREMENTS. FIELD VERIFY MOTOR AND CONTROL LOCATIONS.

(M#) MECHANICAL KEYED NOTES

1. PROVIDE AND INSTALL AXIAL WALL FANS AS SPECIFIED. FANS TO BE OPERATED CONTINUOUSLY.
2. PROVIDE AND INSTALL NEW INLET DAMPERS, ACTUATORS, WEATHERHOOD, AND SCREEN AS SPECIFIED. DAMPER ACTUTOR TO BE INTERLOCKED WITH RESPECTIVE EXHAUST FAN TO OPEN WHEN FAN IS OPERATING.

(P#) PLUMBING KEYED NOTES

1. PROVIDE AND INSTALL FLOOR DRAINS AND PIPING WHERE SHOWN. COORDINATE WITH STRUCTURAL DRAWINGS. ROUTE DRAIN PIPING TO EXISTING MANHOLE ALONG WEST SIDE OF EXISTING STORAGE BUILDING. SEE SITE PLAN FOR DRAIN CONTINUATION.



PROPOSED STORAGE BUILDING
SCALE: 1/8" = 1'-0"

whks
engineers + planners + land surveyors
1412 6th STREET SW, PO BOX 1467
MASON CITY, IA 50402
PHONE: (641)-424-5271
WWW.WHKS.COM

integrated technology ENGINEERING, INC.
ROCHESTER, MN (507)-282-5736

ANAMOSA WASTEWATER TREATMENT FACILITY
ANAMOSA, IA
CITY OF ANAMOSA

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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PROPOSED STORAGE BUILDING

PROJECT NUMBER	**9433.1**
DATE	**12/7/23**
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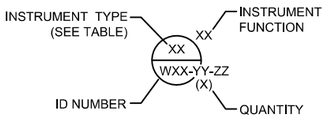
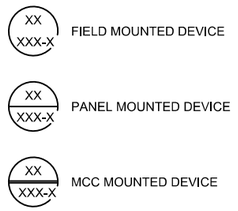
DESIGN BY	**RF**
CHECKED BY	**RF**

60.EM101

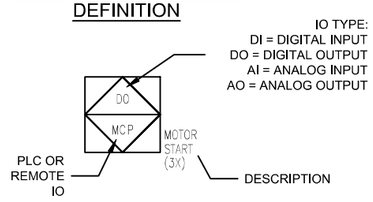
INSTRUMENT IDENTIFICATION



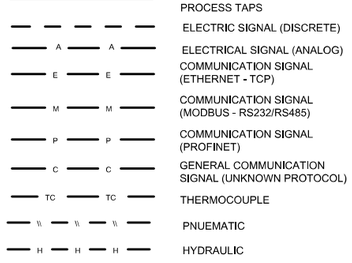


INSTRUMENT SOCIETY OF AMERICA TABLE					
LETTER	FIRST LETTER		SUCCEEDING LETTER(S)		
	PROCESS OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER FLAME		CLOSE	USER'S CHOICE	USER'S CHOICE
C	CONDUCTIVITY			CONTROL	
D	DENSITY	DIFFERENTIAL	OPEN		
E	VOLTAGE		PRIMARY ELEMENT		
F	FLOW RATE	RATIO	FAILURE		HIGH
G	GAUGE		GLASS	GATE	
H	HAND (MANUAL)		HIGH		
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME OR SCHEDULE		LIGHT (PILOT)	CONTROL STATION	
L	LEVEL		ON/OFF		LOW
M	MOTOR OR MOTION				MIDDLE
N	USER'S CHOICE		OVERLOAD	OPEN/CLOSE OR START/STOP	USER'S CHOICE
O	TORQUE		TEST POINT		
P	PRESSURE OR VACUUM		INTEGRATE		
Q	QUANTITY OR EVENT	INTEGRATE	POINT OR RECORD		
R					
S	SPEED OR FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	
V	VALVE			VALVE OR DAMPER	
W	WEIGHT OR FORCE		WELL		
X	UNCLASSIFIED		UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	COMPUTER			RELAY OR COMPUTER	
Z	POSITION			DRIVE OR ACTUATE	

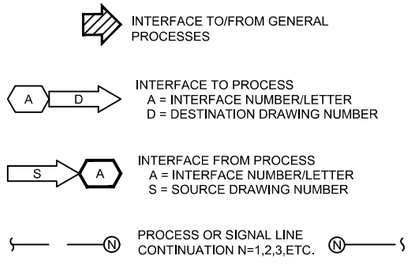
PLC INPUT AND OUTPUT DEFINITION



INSTRUMENT SIGNAL LINES



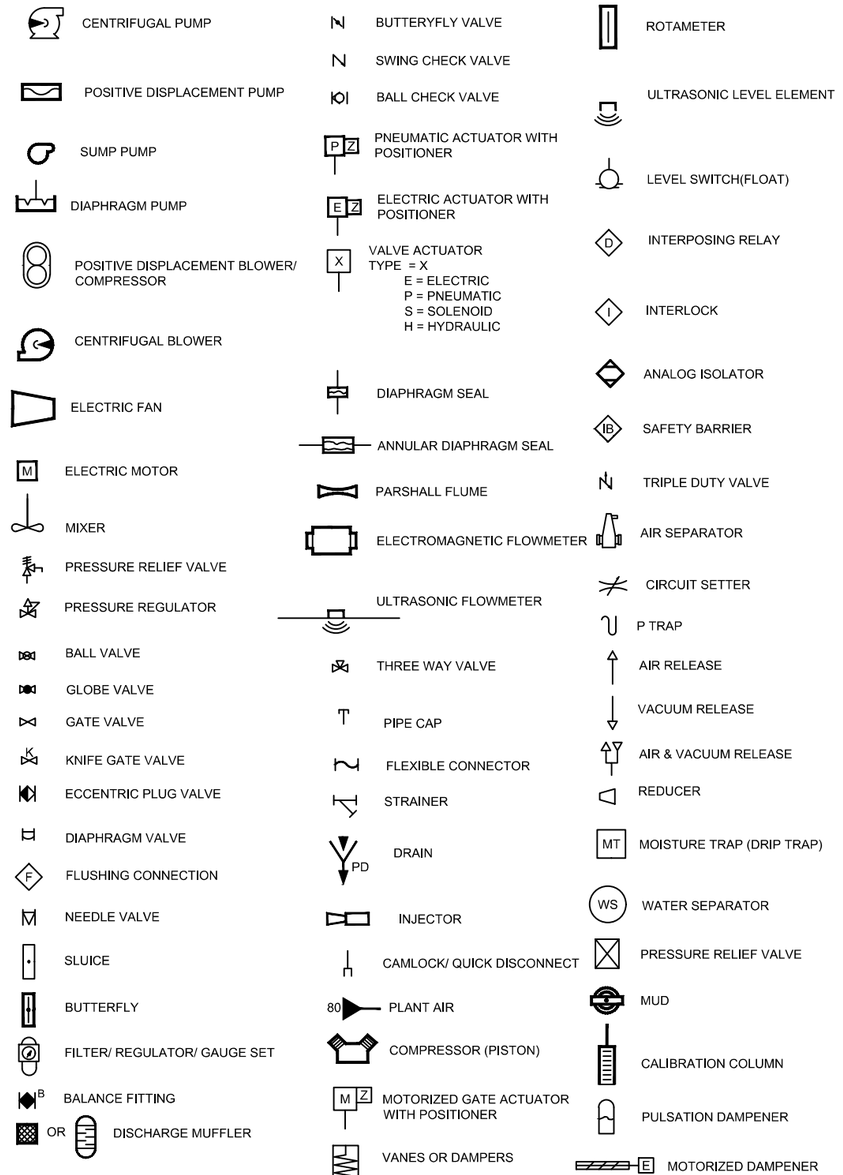
INTERFACE SYMBOLS



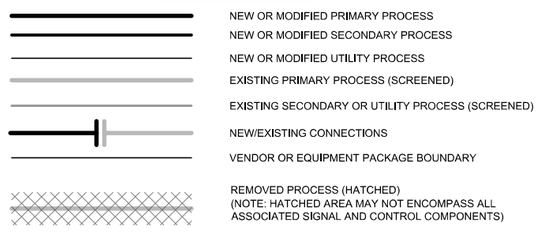
ABBREVATIONS & LETTER SYMBOLS

ABBREVIATION	DESCRIPTION
ACK	ACKNOWLEDGE
AM	AUTO-MANUAL
CAM	COMPUTER-AUTO-MANUAL
CM	COMPUTER-MANUAL
CMPTR	COMPUTER
DO	DISSOLVED OXYGEN
ESTOP	EMERGENCY STOP
FC	FAIL CLOSE
FO	FAIL OPEN
FR	FORWARD-REVERSE
FROA	FORWARD-REVERSE-OFF-AUTO
HO	HAND-OFF
HOA	HAND-OFF-AUTO
HOAR	HAND-OFF-AUTO-REMOTE
HOR	HAND-OFF-REMOTE
LEL	LOWER EXPLOSIVE LIMIT
LOS	LOCKOUT STOP
LR	LOCAL-REMOTE
OC	OPEN-CLOSE
OCR	OPEN-CLOSE-REMOTE
OCA	OPEN-CLOSE-AUTO
OO	ON-OFF
OOA	ON-OFF-AUTO
OOR	ON-OFF-REMOTE
OSC	OPEN-STOP-CLOSE
SS	START-STOP

SYMBOL LEGEND



PROCESS LINES



GENERAL NOTES

1. THIS IS A GENERAL LEGEND SHEET. SOME ABBREVIATIONS MAY APPEAR ON THIS SHEET AND NOT ON THE PLANS. CONTACT ENGINEER FOR ABBREVIATIONS THAT ARE NOT LISTED.
2. PIPING AND EQUIPMENT SHOWN ON THE P&IDs ARE SHOWN FOR REFERENCE ONLY. PIPING AND EQUIPMENT SHOWN ON MECHANICAL DRAWINGS TAKE PRECEDENCE OVER THE P&IDs UNLESS OTHERWISE NOTED.
3. THE INFORMATION SHOWN ON THE FOLLOWING DRAWINGS HAS BEEN TAKEN FROM OTHER DRAWINGS AND PREVIOUS PLAN DOCUMENTS. ACTUAL CONSTRUCTION OF FACILITIES MAY VARY FROM THAT SHOWN. CONTRACTOR SHALL BE RESPONSIBLE FOR FIELD VERIFYING ACTUAL CONDITIONS.
4. EXISTING AND NEW EQUIPMENT AND CONTROL SIGNALS ARE DESIGNATED ON THE P&IDs AND ELECTRICAL ONE-LINE DIAGRAMS. PORTIONS OF EXISTING CONTROL CIRCUITS THAT ARE TO BE REPLACED BY NEW CONDUCTORS AND EQUIPMENT SHALL BE REMOVED FROM PANELS AND OTHER APPLICABLE LOCATIONS. FIELD WIRING OF EXISTING CONTROL CIRCUITS SHALL REMAIN AS EXISTING UNLESS OTHERWISE NOTED.
5. BOLD DESIGNATES NEW OR MODIFIED EQUIPMENT AND SIGNALS.

whks
engineers | planners | land surveyors
1412 6th STREET SW, PO BOX 1467
MASON CITY, IA 50402
PHONE: (641) 423-8271
WWW.WHKS.COM
integrated technology ENGINEERING, INC.
ROCHESTER, MN (507) 282-5736

ANAMOSA WASTEWATER TREATMENT FACILITY
ANAMOSA, IA
CITY OF ANAMOSA

DRAWING LOG

NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PROCESS AND INSTRUMENTATION INDEX

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
DESIGN BY	RF
CHECKED BY	RF

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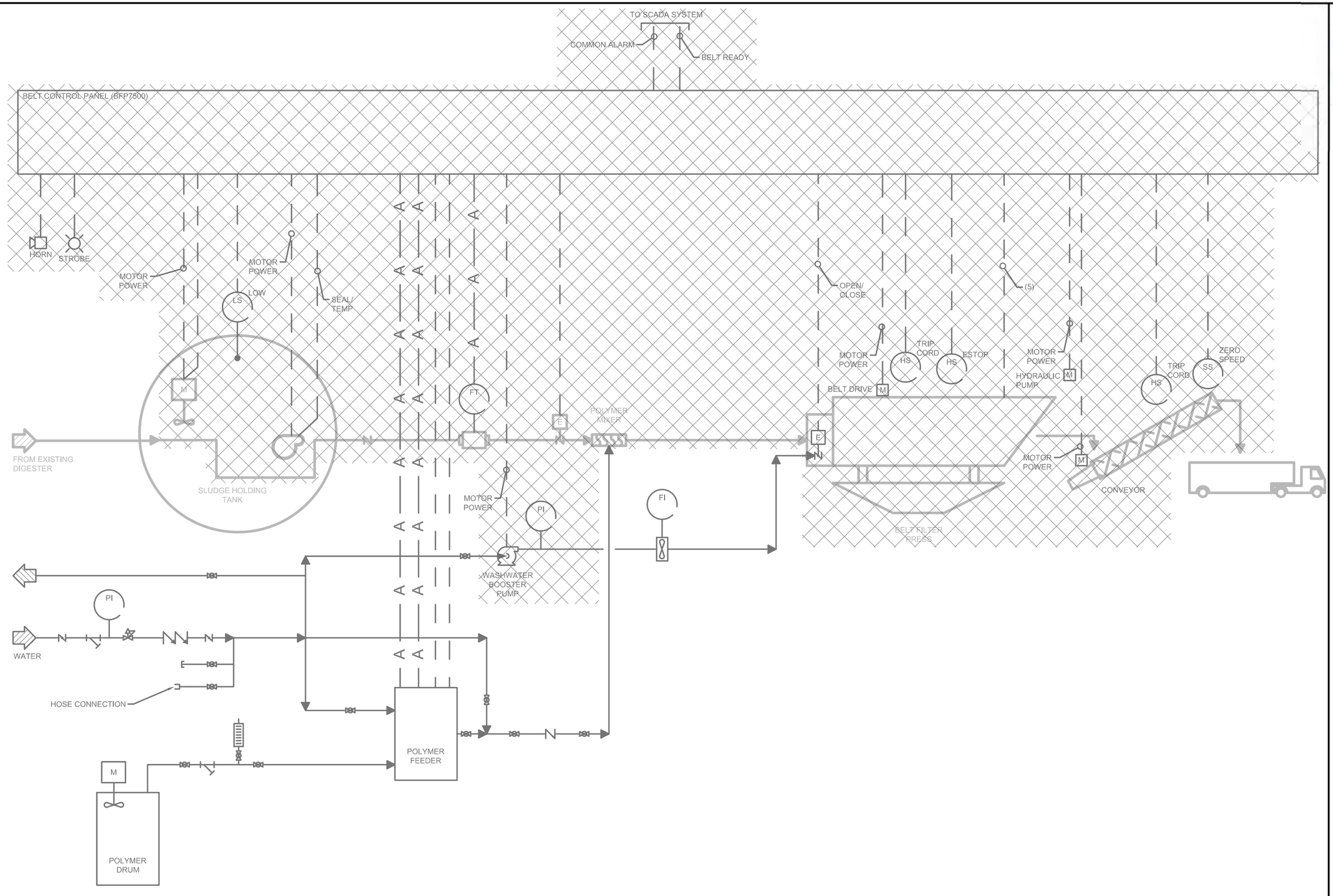

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NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		

ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

EXISTING BIOSOLIDS P&ID

PROJECT NUMBER	9433.1
DATE	12/7/23
DRAWN BY	RF
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CHECKED BY	RF

40.I100

EXISTING MAIN CONTROL PANEL/SCADA 4

HIGH

FIBER

REMOTE I/O PANEL 3

ON FAIL

ALARM

NETWORK 5

CAT 6

NETWORK

CAT 6

SCREW PRESS CONTROL PANEL (SPCP) 1

COMPRESSOR 1

COMPRESSOR 2

AIR RECIEVER 1

FV

DRAIN VALVE

FV

VALVE BOX 1

LS-3 2

LS-2 2

BIOSOLIDS HOLDING TANK

FROM EXISTING DIGESTER

MOTOR POWER

M

PSH

FT

POLYMER MIXER

MOTOR POWER

M

CONDITIONING TANK

PI

FI

E

MOTOR POWER

M

WASHER

LIMIT SWITCH

LS

LS-1

OPEN/ CLOSE

ESTOP

HS

MOTOR POWER

M

SCREW PRESS

2 LS-4

CONTAINMENT AREA

MOTOR POWER

M

CONVEYOR

SV

OILER

TRIP CORD

HS

SS

ZERO SPEED

CAMERA 3

PI

WATER

HOSE CONNECTION

POLYMER FEEDER

M

POLYMER DRUM

GENERAL NOTES

1. MANUFACTURER PROVIDED CONTROL PANEL AND CONTROLS.
2. PROVIDED BY ELECTRICAL CONTRACTOR.
3. PROVIDED BY OWNER'S SYTEMS INTEGRATOR FOR INSTALLATION AND CONNECTION BY CONTRACTOR.
4. INTERFACE WITH EXISTING SCADA CONTROLS. COORDINATE WITH OWNER'S SYSTEM INTEGRATOR.
5. PARAMETERS PASSED OVER NETWORK CONNECTION TO BE COORDINATED BY OWNER'S SYTEM INTEGRATOR AND SUPPLIER SEE EQUIPMENT SPECIFICATIONS FOR REQUIRED PARAMETERS.
6. P&ID MAY NOT SHOW ALL SIGNALS INTO REMOTE I/O PANEL OR SCADA SYSTEM. SEE OTHER DRAWINGS FOR ADDITIONAL SIGNALS.
7. EQUIPMENT LAYOUT AND CONNECTIONS SHOWN HERIN IS BASED ON ISHIGAKI AS SPECIFIED IN SECTION 11150. ANY EQUIPMENT MODIFICATIONS AND ADDITIONAL CIRCUITS REQUIRED TO FIT OTHER'S DESIGNS SHALL BE AT THE CONTRACTOR'S EXPENSE AND AS APPROVED BY THE ENGINEER

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engineers + planners + land surveyors
1412 6th STREET SW, PO BOX 1467
MASON CITY, IA 50402
PHONE: (641)-424-6271
WWW.WHKS.COM

integrated technology ENGINEERING, INC.
ROCHESTER, MN (507)-282-5736

ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

CITY OF ANAMOSA

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NO.	DESCRIPTION	DATE
1		
2		
3		
4		
5		
6		
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8		
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ANAMOSA WASTEWATER TREATMENT FACILITY

ANAMOSA, IA

PROPOSED BIOSOLIDS P&ID

PROJECT NUMBER	**9433.1**
DATE	**12/7/23**
DRAWN BY	**RF**
DESIGN BY	**RF**
CHECKED BY	**RF**

40.I101

WHKS JOB #9433

SPECIFICATIONS AND CONTRACT DOCUMENTS

FOR

WASTEWATER TREATMENT PLANT IMPROVEMENTS

ANAMOSA, IOWA
2024

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

12/7/2023

Jonathan D. Contag, P.E. Date

License number P26824

My license renewal date is December 31, 2024.

Pages or sheets covered by this seal
All pages except Sections 15400 thru 15950 and Division 16

I hereby certify that this engineering document was prepared by me or under my direct personal supervision and that I am a duly licensed Professional Engineer under the laws of the State of Iowa.

12/7/2023

Robert Flaaen, P.E. Date

License number P18803

My license renewal date is December 31, 2023.

Pages or sheets covered by this seal:
15400 thru 15950, Division 16

whks
engineers + planners + land surveyors

TABLE OF CONTENTS

PAGES

NOTICE TO BIDDERS AND NOTICE OF PUBLIC HEARING ON PROPOSED PLANS, SPECIFICATIONS, FORM OF CONTRACT, AND ESTIMATE OF COST FOR CONSTRUCTION OF WASTEWATER TREATMENT PLANT IMPROVEMENTS, IN AND FOR THE CITY OF ANAMOSA, IOWA, AND THE TAKING OF BIDS FOR SAID IMPROVEMENTS

Sealed proposals, subject to the conditions contained herein, will be received by the City Clerk of the City of Anamosa, Iowa, at the City Clerk's office in City Hall, 107 S Ford St, Anamosa, Iowa 52205, until 2:00 o'clock p.m. on the 5th day of March, 2024, for:

Construction of Wastewater Treatment Plant Improvements, as hereinafter described in general and as described in detail in the plans and specifications are now on file in the office of the City Administrator, Anamosa, Iowa.

Proposals received will be opened, read aloud, tabulated, and referred to the City Council for consideration at 6:00 p.m. on the 11th day of March, 2024. Bids will be acted upon at such time or at such later time as may then be fixed. Prior thereto, at said time specified above at the City Council Chambers in said City Hall, a hearing will be held on the proposed plans, specifications, form of contract, and estimate of cost for said Improvements, and at said hearing any interested person may appear and file objections thereto.

The extent of the work involved is the furnishing of labor and new materials for the construction of Wastewater Treatment Plant Improvements and related items in accordance with the contract documents.

The contract documents are available at www.questcdn.com. This contract is QuestCDN project number eBidDoc 8861229. A Contractor may view the contract documents at no cost prior to deciding to become a Planholder. Registering as a Planholder is recommended for all prime Contractors and subcontractors as Planholders will receive automatic notice of addenda and other contract document updates via QuestCDN. Contact QuestCDN Customer Support at 952-233-1632 or info@questcdn.com for assistance in membership registration and downloading digital project information.

The Proposal shall be made out on the form furnished by the City of Anamosa and obtained from WHKS & Co., Engineers, Planners, and Surveyors, and must be accompanied in a sealed envelope by either: (1) a certified check, or a cashier's check drawn on an Iowa bank, or a bank chartered under the laws of the United States, in an amount of 5% of bid amount; or (2) a certified share draft drawn on a credit union in Iowa or chartered under the laws of the United States, in an amount of 5% of bid amount; or (3) a bid bond executed by a corporation authorized to contract as a surety in the State of Iowa, in the penal sum of 5% of bid amount.

The bid security shall be made payable to the City of Anamosa, Iowa.

The bid security must not contain any conditions either in body or as an endorsement thereon. The bid security shall be forfeited to the Owner as liquidated damages in the event the successful bidder fails or refuses to enter into contract within ten (10) days after the award of contract and post bond satisfactory to the Owner insuring the faithful fulfillment of the contract and the maintenance of said

work, if required, pursuant to the provisions of this notice and the other contract documents. The Owner will accept bid bond forms that meet the Requirements of Iowa Code, Section 26.8.

Sales Tax Exemption. Contractors and subcontractors shall not include sales tax for material purchases. At the time of the contract acceptance by the City Council, the prime contractor and all subcontractors will be issued a certificate of exemption.

Bidders shall not be permitted to withdraw their bids for a period of thirty (30) days after the same are opened.

By virtue of statutory authority, preference will be given to products and provisions grown and produced within the State of Iowa and to Iowa domestic labor.

In accordance with Iowa statutes, a resident bidder shall be allowed a preference as against a nonresident bidder from a state or foreign country if that state or foreign country gives or requires any preference to bidders from that state or foreign country, including but not limited to any preference to bidders, the imposition of any type of labor force preference, or any other form of preferential treatment to bidders or laborers from that state or foreign country. The preference shall be equal to the preference given or required by the state or foreign country in which the nonresident bidder is a resident. In the instance of a resident labor force preference, a nonresident bidder shall apply the same resident labor force preference to a public improvement in this state as would be required in the construction of a public improvement by the state or foreign country in which the nonresident bidder is a resident.

Bidders will be required to complete a Bidder Status Form from the Iowa Department of Labor regarding the Contractor's resident status within the State of Iowa. Failure to submit a fully completed Bidder Status Form with the bid may result in the bid being deemed nonresponsive and rejected.

The right is reserved, as the interest of the Owner may require, to reject all bids, any unresponsive bid and to waive technicalities in bids received.

The Contractor shall commence work within ten (10) days after the Notice to Proceed is issued and shall be completed on or before October 1, 2025.

Payment to the Contractor for said Project will be made in cash derived from the proceeds of the issuance of bonds as may be legally used for such purposes, governmental grants and/or from cash on hand. Any combination of the above methods of payment may be used at the discretion of the Owner.

The Contractor will be paid each month ninety-five (95) percent of the Engineer's estimate of the value of acceptable work completed at the end of the preceding month. Final payment will be made in accordance with Iowa Code chapters 26 and 573, as amended. No partial or final payment will be due until the Contractor has certified to the City that the materials, labor and services involved in each estimate have been paid for in accordance with the requirements stated in the specifications.

The successful bidder will be required to furnish a bond in an amount equal to one hundred (100) percent of the contract price, said bond to be issued by a responsible surety approved by the Owner and which shall guarantee a faithful performance of the contract and the terms and conditions therein

contained and shall guarantee the prompt payment of all materials and labor and protect and save harmless the Owner from claims and damages of any kind caused by the operations of the Contractor and shall also guarantee the maintenance of the improvements constructed for a period of two (2) years after completion and acceptance by the Owner.

The project is funded in part with Federal funds and is therefore subject to certain labor standards and civil rights requirements included in the Contract Documents. Contractors performing work on the project shall comply with the requirements as enumerated in the applicable statutes.

Minimum wage rates to be paid laborers and mechanics have been determined by the Department of Labor and are listed in the Contract Documents. The Contractor(s) will be required to comply with the wage and labor requirements and to pay minimum wages in accordance with the schedule of wage rates.

The successful bidder(s) will be required to submit a certification of Non-segregated Facilities and of compliance with Section 3 of the Housing and Urban Development Act of 1968, as Amended. The successful bidder(s) shall also notify prospective subcontractors of the requirements for such certification.

Plans and specifications governing the construction of the proposed improvements have been prepared by WHKS & Co., Engineers, Planners, and Surveyors, which plans and specifications and the proceedings of the Owner referring to and defining said proposed improvements are hereby made a part of the Notice by reference, and the proposed contract shall be executed in compliance therewith. Copies of said plans and specifications are now on file in the office of the City Administrator, City Hall, Anamosa, Iowa, for examination by bidders. Bid forms, plans and specifications are available to download at www.questcdn.com, as stated above.

Published upon order of the City Council of the City of Anamosa, Iowa.

CITY OF ANAMOSA, IOWA

Attest: /s/ Penny Lode
City Clerk

INFORMATION FOR BIDDERS

Proposals

Proposals must be submitted on forms furnished by the Engineer and endorsed:

To: City Council
Anamosa, IA
Bid for Wastewater Treatment Plant Improvements

Proposals must be filled out with ink or typewriter, and without erasure, interlineation or changes, and if not made in accordance with Information for Bidders, will be subject to rejection as irregular, yet the Owner reserves the right to waive any irregularity.

It is expressly agreed that by submitting a proposal the bidder acknowledges that he/she has examined the location or site of the proposed improvements and the plans and specifications and accepts all the terms and conditions thereof.

Proposals will be made in the name of the principal, and if a partnership, the names of all partners shall be given. Exact post office address shall be given in all cases.

Facsimile Proposals and modifications by facsimile will not be considered.

Proposal Guaranty

See Notice to Bidders for requirements and responsibility.

Award

The Owner will proceed without unnecessary delay to consider the proposals and reserves the right to reject all bids, to reject any unresponsive bid, or to waive any technicalities in bids received. One contract will be awarded for the total project construction work based on the low total base bid.

Time for Completion

The work shall commence after the Notice to Proceed is issued and shall be completed within the time frame stated in the Notice to Bidders. Any extension of time shall be at the discretion and express approval of the Owner.

Failure to Complete on Time

If the Contractor should fail to complete the contract within the date set for completion or the date set for completion as extended by the Owner, he/she shall be held liable, as stated in the Special Provisions.

Return of Proposal Guaranty

See Notice to Bidders for requirements and responsibility.

Owner

Whenever the term "Owner" appears in these specifications, it shall mean the City of Anamosa, Iowa.

Engineer

Whenever the term "Engineer" appears in these specifications, it shall be understood to mean WHKS & Co., Engineers, Planners, and Surveyors or their duly authorized representatives, such representatives acting severally within the scope of the particular duties entrusted to them.

Drawings

The drawings which show the details of the work specified herein are designated the "Plans" and form an integral part of the specifications and contract documents.

Right-of-Way

The Owner will furnish all property, easements or right-of-way necessary for the construction of the project. The Contractor shall conduct their operations within the right-of-way provided, unless additional arrangements are made between the Contractor and adjacent property owners.

Payment

The Contractor should refer to the Notice to Bidders for the method of financing and work progress payments.

Pre-Construction Meeting and Schedule of Work

The pre-construction meeting shall be held on call by the Engineer and shall include discussion of the schedule of work, safety, related responsibilities with utilities, and other pertinent related items concerning the proposed construction. At this meeting the Contractor shall provide the Owner with a list of subcontractors, their foreman, and telephone numbers, as well as a planned construction schedule. Representatives of the various utility companies will be invited to the pre-construction meeting to begin early coordination and cooperation.

Bond and Insurance

The Contractor shall present the following documents before completion and signing of the contract:

A. Performance Bond equal to 100% of the contract amount.

B. Payment Bond equal to 100% of the contract amount.

C. Maintenance Bond whereby the Contractor expressly agrees to maintain the work for two (2) years from the date of final acceptance by the Owner. It is understood and agreed that the maintenance shall cover all repairs and replacements made necessary

by defects in material and workmanship and such maintenance shall be provided without additional charge or cost to the Owner.

D. The Contractor shall file with the Owner proof of insurance coverage meeting the requirements of Section 6.1 of the General Conditions.

Sales Tax

All bids shall not include Iowa Sales Tax for materials used in the project. Upon award, the successful bidder shall immediately provide a listing of all Contractors, which will work on the project. The listing shall include name, address, tax ID number, and brief description of the work to be performed. The City will register the contractors with the Iowa Department of Revenue and will furnish appropriate tax-exempt certificates to the successful bidder for distribution and use.

All other sales and use taxes associated with the project construction shall be included in the Contractor's bid and said taxes shall be paid by the Contractor.

Federal Contractual Requirements

This project is funded in part with Federal funds and is therefore subject to certain labor standards and civil rights requirements included in the Contract Documents. Contractors performing work on the project shall comply with the requirements as enumerated in the applicable statutes.

Minimum wage rates to be paid laborers and mechanics have been determined by the Department of Labor and are listed in the Contract Documents. The Contractor(s) will be required to comply with the wage and labor requirements and to pay minimum wages in accordance with the schedule of wage rates.

The successful bidder(s) will be required to submit State Revolving Fund (SRF) attachments as listed in the specifications. The successful bidder(s) shall also notify prospective subcontractors of the requirements associated with this funding.

Plan Charge

See Notice to Bidders for details.

Prompt Payment to Subcontractors Provisions

The Iowa Legislature has passed legislation relating to progress payments, final payments, and retention from payments made to subcontractors on public improvement construction projects. Provisions of the legislation include the following:

1. Retention: The Contractor may retain from each payment to a subcontractor not more than the lesser of five percent (5%) or the amount specified in the contract between the Contractor and the Subcontractor.

2. Prompt Payment: A progress payment or final payment to a subcontractor for satisfactory performance of the subcontractor’s work shall be made no later than:

a) Seven (7) days after the Contractor receives payment for that subcontractor's work.

b) A reasonable amount of time after the Contractor could have received payment for the subcontractor's work, if the reason for nonpayment is not the subcontractor's fault.

A Contractor's acceptance of payment for one subcontractor's work is not a waiver of claims, and does not prejudice the rights of the Contractor, as to any other claim related to the Contract or project.

3. Interest Payments: If the Contractor receives an interest payment, the Contractor shall pay the subcontractor a share of the interest payment proportional to the payment for the subcontractor's work.

Addenda

No interpretation of the meaning of the Plans, Specifications or other prebid documents will be made to any bidder orally.

Every request for such interpretation should be in writing addressed to WHKS & Co., 2905 Broadway Avenue South. Rochester, MN 55904 and to be given consideration must be received at least five days prior to the date fixed for the opening of Bids. Any and all such interpretations and any supplemental instructions will be in the form of written addenda to the Specifications which, if issued, will be delivered to all prospective bidders (at the respective address furnished for such purposes). Failure of any bidder to receive any such addendum or interpretation shall not relieve such bidder from any obligation under his Bid as submitted. All addenda so issued shall become part of the Contract documents.

Bidders shall file their names and addresses with the Engineer via the online electronic bid service through QuestCDN.com in order that any addenda, which may be issued, may be mailed to them electronically.

Substitution of Materials

A. Substitution or approval of materials prior to bidding

Whenever any particular brand or make of material or apparatus is hereinafter called for, every bidder, submitting a Bid upon this Specification and the accompanying Drawings, obligates himself to the use of such brands and makes, or of such other brands or makes as shall have been duly approved by the Engineer and the Owner in the manner described herein.

Whenever any article or any material is specified by a reference to the name of any manufacturer or dealer, or by specific reference to the catalogs of manufacturers or dealers, the intent is to establish a standard of excellence which the Engineer and the Owner have determined upon as requisite and necessary for this Project, and subject only therefore, to such modifications as the Engineer and the Owner may make in

accordance with the procedure given in this article. It is, therefore, mandatory and binding upon the bidders to abide within the limits of the restrictions imposed.

Where the words "or equal", "as selected", "approved", "approved make" or other synonymous terms are used in reference to material, quality, methods or apparatus in lieu of or in addition to other specific references, it is to be distinctly understood that the approval of any such substitutions is vested in the Engineer whose decision shall be final and binding upon all concerned.

The intent of this Specification is not to ELIMINATE PROPERLY QUALIFIED ENTRANTS FROM COMPETITION, but to confine the bidding on the part of Contractors, manufacturers and dealers, to those whose standing and qualifications are such that the Engineer and the Owner feel warranted in giving them their approval. If, however, any bidder desires to have consideration given to INDIVIDUALS, FIRMS, MATERIALS, BRANDS, MAKES, ETC., OTHER THAN SPECIFIED, he may have the privilege at any time prior to ten days (240 hours) of the hour and day set for the opening of Bids of submitting or causing to be submitted to the Engineer for his approval, any such matters. Request for approval of materials or equipment shall be submitted to the Engineer in writing at 2905 Broadway Avenue South. Rochester, MN 55904, at any time prior to the established deadline. Requests received after the established deadline will not be considered. All requests shall clearly define and describe materials or equipment for which approval is requested. Requests shall be accompanied by manufacturer's literature, specifications, drawings, cuts, performance data, etc., where same is necessary to completely describe the product.

If, therefore, the same shall receive the Engineer's approval, or if the Engineer himself shall decide to enlarge the scope of the Specifications, such approvals or additional information will be made only by addendum duly numbered, dated and issued and delivered to each bidder receiving a set of Contract Documents, so that the bidders may have an opportunity to avail themselves of any such information prior to the submission of their proposals.

It is hereby understood and agreed by all bidders that all Bids will be based upon materials and equipment as specified or approved via addendum by the Engineer and the Owner as acceptable on this project.

Where specific reference has been made to one or more brands, or makes or materials, no substitution will be considered or permitted after the Bids have been opened, except as the Owner may elect in accordance with the following provision of these Specifications.

B. Substitution or approval of materials after bidding

Since all Bids are based upon materials and equipment as specified or approved prior to bidding, the Engineer and the Owner will not consider substitutions after bidding except in such cases where it is necessary to make a substitution because of strikes, lockouts, bankruptcy, discontinuance of a product, etc. Requests for such substitutions of materials after the award of a Contract shall be made in writing to the Engineer with a copy to the Owner and shall be made within ten days of the date that the Contractor ascertains he cannot obtain the material or equipment specified. Such request shall be

accompanied by a complete description of the material or apparatus on which a substitution is desired to be made. Substitution of materials or apparatus other than those specified will not be accepted except upon the recommendation of the Engineer to the Owner and with written approval of the Owner.

PROPOSAL FORM

Proposal of _____
(Name of Bidder)

of _____
(City) (State)

To construct Wastewater Treatment Plant Improvements

TO: The City Council
107 S Ford St.
Anamosa, Iowa 52205

(I) (We) hereby certify that (I am) (we are) the only person or persons interested in this proposal as principals; that an examination has been made of the plans, specifications and contract forms, including the supplemental requirements contained herein, and of the site of the work; (I) (we) understand that all quantities of work are to be performed at the unit prices or lump sums stipulated herein; (I) (we) propose to furnish all necessary machinery, equipment, tools, labor, and other means of construction and to furnish all materials specified, in the manner and the time prescribed, and to do the work at the prices herein set out.

To do the work in accordance with the Plans, Special Provisions and Technical Specifications.

To do all "extra work" which may be required to complete the work contemplated at unit prices or lump sums to be agreed upon in writing prior to starting such work.

As evidence of good faith in submitting this Proposal, the undersigned encloses a bid security as required by the Notice, which, in case he/she refuses or fails to accept an award and to enter into a contract and file the required bonds within the prescribed time, shall be forfeited to the Owner, as liquidated damages.

The undersigned agrees to execute the Standard Form of Contract upon written notice of acceptance of the bid as accepted and give bond with good and sufficient surety or sureties and in the required amounts within ten (10) days after the prescribed forms are presented for signature or forfeit the bid security furnished herewith.

The undersigned understands that the breakdown of proposal items into various categories of work is for the convenience of the Owner. The undersigned agrees to begin work within ten (10) days after "Notice to Proceed" is issued and to complete the same within the contract period shown below:

Beginning Date	Completion Date
10 days after Notice to Proceed	See Notice to Bidders

Any Contractor who proposes any alteration of the plans in any respect from that shown shall submit such proposal to the Engineer for approval at least ten days prior to the letting date.

The undersigned has completed the attached Bidder Status Form from the Iowa Department of Labor regarding the Contractor's resident status within the State of Iowa. Failure to submit a fully completed Bidder Status Form with the bid may result in the bid being deemed nonresponsive and rejected.

The right is reserved, as the interest of the Owner, may require, to reject all bids, any unresponsive bid and to waive technicalities in bids received.

The receipt of the following addenda is hereby acknowledged:

Addendum No.	Dated

The Contractor understands that this Proposal is binding upon him/her for a period of thirty (30) days from and after the opening of all bids for this proposed construction.

With the above understood, the undersigned proposes to furnish the materials, labor, machinery, and equipment to construct the project items at the following prices:

Lump Sum Base Bid Price of: $_____

Bid Alternate No. 1 – Sludge Holding Tank #1 Demolition: The Contractor shall provide a lump sum adder price to demolish and backfill the sludge holding tank #1 as noted on the drawings and specifications. Tank equipment shall be removed and disposed of including hoist, pipe/fittings, pump, guiderails, handrails, etc. Tank walls shall be demolished to 7 ft below grade. Nine (9) equally spaced 18" +/- diameter holes shall be cored/drilled through tank slab prior to backfilling.

Bid Alternate No. 1 Lump Sum Add Price: $_____

Total Lump Sum Bid Price including Bid Alternate No. 1: $_____

This Proposal includes the following major equipment items supplied by the firms listed below. Failure to list the supplier may be grounds for proposal rejection.

Section No.	Equipment Description	Supplier/Manufacturer
09900	Painting	Tnemec, Inc.
11235	Chemical Feed Pumps	Blue White Pumps
11310	Double Disc Pumps (P1)	Penn Valley
11400	Large Bubble Mixing System	
11500	Screw Press Equipment	

11500	Polymer Optimization	Rhino Industries
11500	Conveyor Equipment	
Div. 13	Systems Integrator	JETCO
Div. 16	Electrical Subcontractor	

Dated this ____ day of_____ 2024.

_____
Company Name

_____
Company Owner/Officer Printed Name

_____
Company Owner/Officer Signature

Address _____

_____

E-mail _____

Bidder Status Form

To be completed by all bidders — Part A

Please answer "Yes" or "No" for each of the following:

☐ Yes ☐ No My company is authorized to transact business in Iowa.
(To help you determine if your company is authorized, please review the worksheet on the next page).

☐ Yes ☐ No My company has an office to transact business in Iowa.

☐ Yes ☐ No My company's office in Iowa is suitable for more than receiving mail, telephone calls, and e-mail.

☐ Yes ☐ No My company has been conducting business in Iowa for at least 3 years prior to the first request for bids on this project.

☐ Yes ☐ No My company is not a subsidiary of another business entity or my company is a subsidiary of another business entity that would qualify as a resident bidder in Iowa.

If you answered "Yes" for each question above, your company qualifies as a resident bidder. Please complete Parts B and D of this form.

If you answered "No" to one or more questions above, your company is a nonresident bidder. Please complete Parts C and D of this form.

To be completed by resident bidders — Part B

My company has maintained offices in Iowa during the past 3 years at the following addresses:

Dates: _____ /_____ /_____ to _____ /_____ /_____ Address: _____

City, State, Zip: _____

Dates: _____ /_____ /_____ to _____ /_____ /_____ Address: _____

City, State, Zip: _____

Dates: _____ /_____ /_____ to _____ /_____ /_____ Address: _____

You may attach additional sheet(s) if needed. City, State, Zip: _____

To be completed by non-resident bidders — Part C

1. Name of home state or foreign country reported to the Iowa Secretary of State:

_____

2. Does your company's home state or foreign country offer preferences to bidders who are residents? ☐ Yes ☐ No

3. If you answered "Yes" to question 2, identify each preference offered by your company's home state or foreign country and the appropriate legal citation.

_____

_____

You may attach additional sheet(s) if needed.

To be completed by all bidders — Part D

I certify that the statements made on this document are true and complete to the best of my knowledge and I know that my failure to provide accurate and truthful information may be a reason to reject my bid.

Firm Name: _____

Signature: _____ Date: _____

You must submit the completed form to the governmental body requesting bids per 875 Iowa Administrative Code Chapter 156.
This form has been approved by the Iowa Labor Commissioner.

Worksheet: Authorization to Transact Business

This worksheet may be used to help complete Part A of the Resident Bidder Status form. If at least one of the following describes your business, you are authorized to transact business in Iowa.

☐ Yes ☐ No My business is currently registered as a contractor with the Iowa Division of Labor.

☐ Yes ☐ No My business is a sole proprietorship and I am an Iowa resident for Iowa income tax purposes.

☐ Yes ☐ No My business is a general partnership or joint venture. More than 50 percent of the general partners or joint venture parties are residents of Iowa for Iowa income tax purposes.

☐ Yes ☐ No My business is an active corporation with the Iowa Secretary of State and has paid all fees required by the Secretary of State, has filed its most recent biennial report, and has not filed articles of dissolution.

☐ Yes ☐ No My business is a corporation whose articles of incorporation are filed in a state other than Iowa, the corporation has received a certificate of authority from the Iowa secretary of state, has filed its most recent biennial report with the secretary of state, and has neither received a certificate of withdrawal from the secretary of state nor had its authority revoked.

☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in this state and the statement has not been canceled.

☐ Yes ☐ No My business is a limited liability partnership which has filed a statement of qualification in a state other than Iowa, has filed a statement of foreign qualification in Iowa and a statement of cancellation has not been filed.

☐ Yes ☐ No My business is a limited partnership or limited liability limited partnership which has filed a certificate of limited partnership in this state, and has not filed a statement of termination.

☐ Yes ☐ No My business is a limited partnership or a limited liability limited partnership whose certificate of limited partnership is filed in a state other than Iowa, the limited partnership or limited liability limited partnership has received notification from the Iowa secretary of state that the application for certificate of authority has been approved and no notice of cancellation has been filed by the limited partnership or the limited liability limited partnership.

☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in Iowa and has not filed a statement of termination.

☐ Yes ☐ No My business is a limited liability company whose certificate of organization is filed in a state other than Iowa, has received a certificate of authority to transact business in Iowa and the certificate has not been revoked or canceled.

CONTRACT

This contract, made as of the _____ day of _____ 2024, by and between the City of Anamosa, Iowa, hereinafter called the Owner, and _____, hereinafter called the Contractor.

WITNESSETH:

That whereas the Owner intends to have constructed Wastewater Treatment Plant Improvements hereinafter called the Project, in accordance with the Plans, Specifications, Addenda and other Contract Documents prepared by WHKS & Co. Engineers, Planners and Surveyors, Mason City, Iowa.

Now, therefore, the Owner and Contractor for the considerations hereinafter set forth, agree as follows:

The Contractor agrees to furnish all the necessary labor, materials, equipment, tools and services necessary to perform and complete in an acceptable manner all work required for the construction of the Project, in strict compliance with the Contract Documents.

The Owner agrees to pay and the Contractor agrees to accept, in full payment for the performance of this contract, the contract amount of:_____
_____ Dollars and _____/100 ($_____) in accordance with the provisions of the Contract Documents.

This Contract and all of the covenants hereof shall insure to the benefit of and be binding upon the Owner and the Contractor respectively and his/her partners, successors, assigns and legal representatives. Neither the Owner nor the Contractor shall have the right to assign, transfer or sublet his interest or obligations hereunder without written consent of the other party.

By virtue of statutory authority, preference will be given to Iowa domestic labor and products, provisions and coal produced in the State of Iowa.

IN WITNESS WHEREOF, the parties have made and executed this contract the day and year first written.

	Contractor
	By
	City State
	City of Anamosa
	Owner
ATTEST:	By
	Anamosa Iowa
City Administrator	City State

PERFORMANCE AND MAINTENANCE BOND

KNOWN BY ALL THESE PRESENTS, That we, the undersigned

_____

(Hereinafter called the “Principal”)

of _____

a/an _____
duly authorized by the law to do business as a Construction Contractor in the State of Iowa and _____of _____(hereinafter called the "Surety") a Corporation duly authorized to do a Surety business under the laws of the State of Iowa, are held and firmly bound unto City of Anamosa, IA (hereinafter called the "Obligee,") in the penal sum of _____ _____ and /100 ($_____.___), lawful money of the United States, for the payment of which well and truly to be made unto said Obligee, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents, as follows:

The conditions of this obligation are such that, whereas on the _____ day of _____ 2024, the said Principal entered into a written Agreement with said Obligee for the construction of Wastewater Treatment Plant Improvements as set forth in detail in the Bid Announcement, Proposal, Plans, Specifications, and other related contract documents referred to in said Agreement, all of which are hereby made a part hereof as if written herein at length.

NOW, THEREFORE, if the said Principal shall well and truly perform and complete said project in strict accordance with said Agreement, Bid Announcement, Proposal, Plans, Specifications, and related documents shall comply with all the requirements of the Laws of the State of Iowa, shall pay as they become due all just claims for work or requirements performed and materials furnished in connection with said Agreement, and shall defend, indemnify and save harmless said Obligee, against any and all liens, encumbrances, damages, claims, demands, expenses, costs and charges of every kind, including patent infringement claims arising out of or in relation to the performance of said work and the provisions of said Agreement, and shall guarantee the work against defects in workmanship and material during the construction and for two (2) years after the time of acceptance of the work, and make good such guarantee; then these presents shall be void; otherwise they shall remain in full force and effect.

This obligation is made for the use of said Obligee and also for use and benefit of all persons who may perform any work or labor or furnish any material in the execution of said Agreement.

The Principal and Sureties on this bond hereby agree to pay to all persons, firms, or corporations having contracts directly with the Principal or with subcontractors all just claims due them for labor performed or materials furnished, in the performance of the contract on account of which this bond is given when the same are not satisfied out of the portion of the contract price which the public corporation retains until completion of the public improvement but the Principal and Sureties shall not be liable to said persons, firms, or corporations unless the claims of said claimants against said portion of the contract price shall have been established as provided by law.

Every Surety on this bond shall be deemed and held, any contract to the contrary notwithstanding, to consent without notice:

1. To the extension of time to the Contractor in which to perform the contract.

2. To any change in the Plans, Specifications, or Contract, when such change does not involve an increase of more than twenty percent (20%) of the total contract price, and shall be released only as to such excess increase.

The said Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the Agreement or to the work to be performed thereunder or the specifications accompanying the same, shall in anywise affect its obligation on this Bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the Agreement or to the work or to the specifications.

IN TESTIMONY WHEREOF, the parties hereunto have caused the execution hereof as of the ____ day of _____ 2024.

(SEAL)

ATTEST: _____ _____

Principal

By: _____

Title: _____

(SEAL)

ATTEST: _____ _____

Surety

By: _____

PAYMENT BOND

KNOWN BY ALL THESE PRESENTS, That we, the undersigned

_____

(Hereinafter called the “Principal”)

of _____

a/an _____
duly authorized by the law to do business as a Construction Contractor in the State of Iowa and _____of_____(hereinafter called the "Surety") a Corporation duly authorized to do a Surety business under the laws of the State of Iowa, are held and firmly bound unto City of Anamosa, Iowa (hereinafter called the "Obligee,") in the penal sum of _____ Dollars and /100 ($_____.__), lawful money of the United States, for the payment of which well and truly to be made unto said Obligee, we bind ourselves, our heirs, executors, administrators, successors and assigns, jointly and severally, firmly by these presents, as follows:

The conditions of this obligation are such that, whereas on the _____ day of _____ 2024, the said Principal entered into a written Agreement with said Obligee for the construction of Wastewater Treatment Plant Improvements as set forth in detail in the Bid Announcement, Proposal, Plans, Specifications, and other related contract documents referred to in said Agreement, all of which are hereby made a part hereof as if written herein at length.

NOW, THEREFORE, if the Principal shall promptly make payment to all persons, firms, subcontractors, and corporations furnishing materials for or performing labor in the prosecution of the WORK provided for in such contract, and any authorized extension or modification thereof, including all amounts due for materials, lubricants, oil, gasoline, coal and coke, repairs on machinery, equipment and tools, consumed or used in connection with the construction of such work, and all insurance premiums on said work, and for all labor, performed in such work whether by Subcontractor or otherwise, then this obligation shall be void; otherwise to remain in full force and effect.

PROVIDED, FURTHER, that the said Surety for value received hereby stipulates and agrees that no change, extension of time, alteration or addition to the terms of the contract or to the work to be performed thereunder or the specifications accompanying the same shall in any wise affect its obligation on this bond, and it does hereby waive notice of any such change, extension of time, alteration or addition to the terms of the contract or to the work or to the specifications.

PROVIDED, FURTHER, that no final settlement between the Owner and the Principal shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

IN WITNESS WHEREOF, this instrument is executed in five counterparts, each one of which shall be deemed an original, this the ____ day of _____ 2024.

(SEAL)

ATTEST: _____ _____

Principal

By: _____

Title: _____

(SEAL)

ATTEST: _____ _____

Surety

By: _____

SRF Required Front-End Specifications

Attachment 1: Certification of Non-Segregated Facilities Form *(to be completed and signed by Prime Contractor and submitted with the bid)*

Attachment 2: Statement in Advertisement for Bids on Debarment and Suspension/Certification Regarding Debarment and Suspension Form *(to be completed and signed by Prime Contractor and submitted with the bid)*

Attachment 3: Disadvantaged Business Enterprise Certification Form (to be completed and signed by Prime Contractor and submitted with the bid)

Attachment 4: DBE Program Subcontractor Performance Form (to be completed and signed by Prime and DBE Subcontractor for each subcontract and submitted with the bid)

*If no DBE was chosen by the Prime Contractor to be utilized for this project, then this form is not required to be submitted.

Attachment 5: DBE Program Subcontractor Utilization Form (to be completed and signed by Prime and DBE Subcontractor for each subcontract and submitted with the bid)

* If no DBE was chosen by the Prime Contractor to be utilized for this project, then this form is not required to be submitted.

Attachment 6: DBE Program Subcontractor Participation Form (for voluntary use of DBEs)

Attachment 7: Other Federal Requirements Language

A. Standard Equal Employment Opportunity Specifications
B. Federal Labor Standards Provisions (including Davis-Bacon prevailing wage rates**)
C. Preservation of Open Competition and Government Neutrality
D. Historical and Archeological Finds
E. Prohibitions on Procurement from Violating Facilities

Attachment 8: Right of Entry and Records Retention

Attachment 9: American Iron and Steel Requirements

Attachment 10: Prohibition on Certain Telecommunications and Video Surveillance Services or Equipment *(to be completed and signed by Prime Contractor and submitted with the bid)*

Attachment 1
SRF Required Front-End Specifications
(This form must be completed and signed by Prime Contractor and submitted with the bid.)

U.S. Environmental Protection Agency
Certification of Non-Segregated Facilities

(Applicable to contracts, subcontracts, and agreements with applicants who are themselves performing federally assisted construction contracts, exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause.)

By the submission of this bid, the bidder, offeror, applicant, or subcontractor certifies that he does not maintain or provide for his employees any segregated facilities at any of his establishments, and that he does not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. He certifies further that he will not maintain or provide for his employees any segregated facilities at any of his establishments, and that he will not permit his employees to perform their services at any location, under his control, where segregated facilities are maintained. The bidder, offeror, applicant, or subcontractor agrees that a breach of this certification is a violation of the Equal Opportunity clause in this contract. As used in this certification, the term "segregated facilities" means any waiting rooms, work areas, restrooms and washrooms, restaurants and other eating areas, time clocks, locker rooms and other storage or dressing areas, parking lots, drinking fountains, recreation or entertainment areas, transportation, and housing facilities provided for employees which are segregated by explicit directive or are in fact segregated on the basis of race, creed, color, or national original, because of habit, local custom, or otherwise. He further agrees that (except where he has obtained identical certifications from proposed subcontractors for specific time periods) he will obtain identical certifications from proposed subcontractors prior to the award of subcontracts exceeding $10,000 which are not exempt from the provisions of the Equal Opportunity clause; that he will retain such certifications in his files; and that he will forward the following notice to such proposed subcontractors (except where the proposed subcontractors have submitted identical certifications for specific time periods):

NOTICE TO PROSPECTIVE SUBCONTRACTORS OF REQUIREMENT FOR CERTIFICATIONS OF NON-SEGREGATED FACILITIES

A Certification of Non-segregated Facilities, as required by the May 9, 1967, order (33 F.R. 7808, May 28, 1968) on Elimination of Segregated Facilities, by the Secretary of Labor, must be submitted prior to the award of a subcontract exceeding $10,000 which is not exempt from the provisions of the Equal Opportunity clause. The certification may be submitted either for each subcontract or for all subcontracts during a period (i.e., quarterly, semiannually, or annually).

Signature	Date
Printed Name	Title

NOTE: The penalty for making false statements in offers is prescribed in 18 U.S.C. 1001.

EPA-7 5720-4.2

Attachment 2

SRF Required Front-End Specifications

(This form must be completed and signed by the Prime Contractor and submitted with the bid.)

Debarments and Suspensions

Any bidder or equipment supplier whose firm or affiliate is listed in on the U.S. General Services Administration Excluded Parties List will be prohibited from the bidding process. The excluded parties records search engine is located at the System for Award Management (SAM) website: https://sam.gov. Pursuant to 2 CFR Part 180, as supplemented by 2 CFR 1532, any entity submitting a bid while the SAM website lists that entity as having an active exclusion will be determined by the DNR to be a non-responsive bidder and will not be able to receive SRF funding.

United States Environmental Protection Agency Washington, DC 20460

Certification Regarding Debarment, Suspension, and Other Responsibility Matters

The prospective participant certifies to the best of its knowledge and belief that it and the principals:

(a) Are not presently debarred, suspended, proposed for debarment, declared ineligible, or voluntarily excluded from covered transactions by any Federal department or agency;

(b) Have not within a three year period preceding this proposal been convicted of or had a civil judgment rendered against them for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State, or local) transaction or contract under a public transaction: violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

(c) Are not presently indicted or otherwise criminally or civilly charged by a government entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph (1) (b) of this certification; and

(d) Have not within a three-year period preceding this application/proposal had one or more public transactions (Federal, State, or local) terminated for cause or default.

I understand that a false statement on this certification may be grounds for rejection of this proposal or termination of the award. In addition, under 18 U SC Sec. 10 01, a false statement may result in a fine of up to $10,000 or imprisonment for up to 5 years, or both.

Signature of Authorized Representative	Date
Printed Name	Title

☐ I am unable to certify to the above statements. My explanation is attached.

Attachment 3

SRF Required Front-End Specifications

(This form must be completed and signed by Prime Contractor and submitted with the bid.)

Disadvantaged Business Enterprise (DBE) Solicitation

It is EPA's policy that recipients of EPA financial assistance through the State Revolving Fund programs award a "fair share" of subagreements to small, minority and women-owned businesses, collectively known as Disadvantaged Business Enterprises (DBEs). Iowa's Fair Share goals are:

	Minority-Owned Business Enterprise (MBE) Goal	Women-Owned Business Enterprise (WBE) Goal
Construction	1.7%	2.2%
Supplies	0.6%	5.6%
Services	2.5%	11.3%
Goods/Equipment	2.5%	10.4%
Average	1.8%	7.4%

Only work performed by certified DBEs can be counted toward the goals. In Iowa, DBEs must be certified through the Iowa Department of Transportation (IDOT). Information on certification requirements and a list of certified DBEs is on the IDOT website at https://secure.iowadot.gov/DBE/Home/Index/.

Prime contractors' DBE requirements for SRF projects include:

- Taking affirmative steps for DBE participation
- Documenting the efforts and the proposed utilization of certified DBEs

PROJECT INFORMATION

SRF Applicant: _____ Bidder: _____

Address: _____

City: _____ State: _____ Zip: _____

Contact Person: _____

Phone Number: _____ Email: _____

Check if Prime Contractor is: ☐ Minority-Owned ☐ Women-Owned

After the Good Faith Efforts Checklist was completed, was a DBE chosen by the primary contractor to be utilized for this Project? ☐ Yes ☐ No

Signature: _____

GOOD FAITH EFFORTS CHECKLIST

Please complete the checklist to determine if you have complied with the requirement to make good faith efforts to ensure that certified DBEs have the opportunity to compete for procurements funded by EPA financial assistance funds. Bidders/offerers must make good faith efforts prior to submission of bids/proposals.

1. Did you ensure that DBEs are made aware of contracting opportunities to the fullest extent practicable through outreach and recruitment activities?

   ☐ Yes ☐ No

2. Did you make information on forthcoming opportunities available to DBEs and arrange time frames for contracts and establish delivery schedules, where the requirements permit, in a way that encourages and facilitates participation by DBEs in the competitive process? This includes, whenever possible, posting solicitation for bids or proposals for a minimum of 30 calendar days before the bid or proposal closing date.

   ☐ Yes ☐ No

3. Did you consider in the contracting process whether firms competing for large contracts could subcontract with DBEs? This will include dividing total requirements, when economically feasible, into smaller tasks or quantities to permit maximum participation by DBEs in the competitive process.

   ☐ Yes ☐ No

4. Did you encourage contracting with a consortium of DBEs when a contract is too large for one of these firms to handle individually?

   ☐ Yes ☐ No

5. Did you use the services of the Small Business Administration and the Minority Business Development Agency of the Department of Commerce to identify potential subcontractors?

   ☐ Yes ☐ No

6. List the potential DBE subcontractors that were contacted. Only list those that are certified through the Iowa Department of Transportation.

Name	**How Contacted** (e.g. letter, phone call, fax, e-mail)	**Response** (e.g. did not respond, not interested, not competitive)

PROPOSED UTILIZATION OF DBE SUBCONTRACTORS

Please include Attachments 4 and 5 to document the proposed utilization of certified DBE subcontractors.

CONTRACT ADMINISTRATION PROVISIONS

Several contract provisions are required to prevent unfair practices that adversely affect DBEs. These include:

1. Prime Contractor must pay its Subcontractor for satisfactory performance no more than 30 days from the Prime Contractor's receipt of payment from the SRF loan recipient.
2. Prime Contractor must notify the SRF loan recipient in writing prior to termination of a DBE subcontractor for convenience.
3. Prime Contractor must employ the six Good Faith Efforts to solicit a replacement subcontractor if a DBE subcontractor fails to complete work under a subcontract for any reason.

Attachment 4
SRF Required Front-End Specifications

(This form must be completed and signed by Prime and DBE Subcontractor for each subcontract and submitted with the bid.)
* If no DBE was chosen by the Prime Contractor to be utilized for this project, then this form is not required to be submitted.

Disadvantaged Business Enterprise Program
DBE Subcontractor Performance Form

This form is intended to capture the DBE[1] subcontractor's[2] description of work to be performed and the price of the work submitted to the prime contractor. An EPA Financial Assistance Agreement recipient must require its prime contractor to have its DBE subcontractors complete this form and include all completed forms in the prime contractor's bid or proposal package.

Subcontractor Name: _____

Project Name: _____

Bid/Proposal No.: _____ Assistance Agreement ID No. (if known): _____

Point of Contact: _____

Address: _____

Telephone No.: _____ Email: _____

Prime Contractor Name: _____

Issuing/Funding Entity: _____

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor

DBE Certified by ☐ DOT ☐ SBA ☐ Other: _____

Meets/exceeds EPA certification standards? ☐ Yes ☐ No ☐ Unknown

[1]A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certification as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.
[2]Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

IA SRF6100-3

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date
Subcontractor Signature	Print Name
Title	Date

IA SRF6100-3

Attachment 5
SRF Required Front-End Specifications

(This form must be completed and signed by Prime Contractor and submitted with the bid if utilizing DBE subcontractors.)
* If no DBE was chosen by the Prime Contractor to be utilized for this project, then this form is not required to be submitted.

Disadvantaged Business Enterprise Program
DBE Subcontractor Utilization Form

This form is intended to capture the prime contractor's actual and/or intended use of identified certified DBE[1] subcontractors[2] and the estimated dollar amount of each subcontract. An EPA Financial Assistance Agreement Recipient must require its prime contractors to complete this form and include it in the bid or proposal package. Prime contractors should also maintain a copy of this form on file.

Prime Contractor Name: _____

Project Name: _____

Bid/Proposal No.: _____ Assistance Agreement ID No. (if known): _____

Point of Contact: _____

Address: _____

Telephone No.: _____ Email: _____

Issuing/Funding Entity: _____

I have identified potential DBE certified subcontractors ☐ Yes ☐ No

If yes, complete the table below. If no, explain: _____

Subcontractor Name/ Company Name	Company Address/Phone/Email	Estimated Dollar Amount	Currently DBE Certified?
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No
			☐ Yes ☐ No

[1]A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certification as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.
[2]Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

IA SRF6100-4

I certify under penalty of perjury that the forgoing statements are true and correct. Signing this form does not signify a commitment to utilize the subcontractors above. I am aware of that in the event of a replacement of a subcontractor, I will adhere to the replacement requirements set forth in 40 CFR Part 33 Section 33.302 (c).

Prime Contractor Signature	Print Name
Title	Date

IA SRF6100-4

Attachment 6
SRF Required Front-End Specifications
(This form is for the voluntary use of DBE Subcontractors.)

Disadvantaged Business Enterprise Program
DBE Subcontractor Participation Form

An EPA Financial Assistance Agreement Recipient must require its prime contractors to provide this form to its DBE subcontractors. **The use of this form by DBE subcontractors is voluntary and is not required for bidding.** This form gives a DBE[1] subcontractor[2] the opportunity to describe work received and/or report any concerns regarding the EPA-funded project (e.g. in areas such as termination by prime contractor, late payments, etc.). The DBE subcontractor can, as an option, complete and submit this form to the EPA DBE Coordinator at any time during the project period of performance.

Subcontractor Name: _____

Project Name: _____

Bid/Proposal No.: _____ Assistance Agreement ID No. (if known): _____

Point of Contact: _____

Address: _____

Telephone No.: _____ Email: _____

Prime Contractor Name: _____

Issuing/Funding Entity: _____

Contract Item Number	Description of Work Submitted to the Prime Contractor Involving Construction, Services, Equipment or Supplies	Price of Work Submitted to the Prime Contractor

[1]A DBE is a Disadvantaged, Minority, or Woman Business Enterprise that has been certified by an entity from which EPA accepts certification as described in 40 CFR 33.204-33.205 or certified by EPA. EPA accepts certifications from entities that meet or exceed EPA certification standards as described in 40 CFR 33.202.
[2]Subcontractor is defined as a company, firm, joint venture, or individual who enters into an agreement with a contractor to provide services pursuant to an EPA award of financial assistance.

IA SRF6100-2

Please use the space below to report any concerns regarding the above EPA-funded project:

Subcontractor Signature	Print Name
Title	Date

Return to: Regional Coordinator, Small Business Utilization, U.S. Environmental Protection Agency, Region 7, 11201 Renner Blvd, Lenexa KS 66219

IA SRF6100-2

Attachment 7
SRF Required Front-End Specifications

Other Federal Requirements Language

A. Standard Federal Equal Employment Opportunity Construction Contract Specifications (Executive Order 11246)

1. As used in these specifications:
   a. "Covered area" means the geographical area described in the solicitation from which this contract resulted;
   b. "Director" means Director, Office of Federal Contract Compliance Programs, United States Department of Labor, or any person to whom the Director delegates authority;
   c. "Employer identification number" means the Federal Social Security number used on the Employer's Quarterly Federal Tax Return, U.S. Treasury Department Form 941.
   d. "Minority" includes:
      i. Black (all persons having origin in any of the Black African racial groups not of Hispanic origin);
      ii. Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
      iii. Asian and Pacific Islander (all persons having origins in any of the original peoples of the Far East, Southeast Asia, the Indian Sub-continent, or the Pacific Islands); and
      iv. American Indian or Alaskan Native (all persons having origins in any of the original peoples of North America and maintaining identifiable tribal affiliations through membership and participation or community identification).

2. Whenever the Contractor, or any Subcontractor at any tier subcontracts a portion of the work involving any construction trade, it shall physically include in each subcontract in excess of $10,000 the provisions of these specifications and the Notice which contains the applicable goals for minority and female participation and which is set forth in the solicitations from which this contract resulted.

3. If the Contractor is participating (pursuant to 41 CFR 6-4.5) in a Hometown Plan approved by the U.S. Department of Labor in the covered area either individually or through an association, its affirmative action obligations on all work in the Plan area (including goals and timetables) shall be in accordance with that Plan for those trades which have unions participating in the Plan. Contractors must be able to demonstrate their participation in and compliance with the provisions of any such Hometown Plan. Each Contractor or Subcontractor participating in an approved Plan is individually required to comply with its obligations under the EEO clause, and to make a good faith effort to achieve each goal under the Plan in each trade in which it has employees. The overall good faith performance by other Contractors or Subcontractors toward a goal in an approved Plan does not excuse any covered Contractor's or Subcontractor's failure to take good faith efforts to achieve the Plan goals and timetables.

4. The Contractor shall implement the specific affirmative action standards provided in paragraphs 7a through p of these specifications. The goals set forth in the solicitation from which this contract resulted are expressed as percentages of the total hours of employment and training of minority and female utilization the Contractor should reasonably be able to achieve in each construction trade in which it has employee in the covered area. Covered construction contractors performing construction work in geographical areas where they do not have a Federal or federally assisted construction contract shall apply the minority and female goals established for the geographical area where the work in being performed. Goals are published periodically in the Federal Register in notice form, and such notices may be obtained from any Office of Federal Contract Compliance Programs office or from Federal procurement contracting officers. The Contractor is expected to make substantially uniform progress in meeting its goals in each craft during the period specified.

5. Neither the provisions of any collective bargaining agreement, nor the failure by a union with whom the Contractor has a collective bargaining agreement, to refer either minorities or women shall excuse the Contractor's obligations under these specifications, Executive Order 11246, or the regulations promulgated pursuant thereto.

6. In order for the nonworking training hours of apprentices and trainees to be counted in meeting the goals, such apprentices and trainees must be employed by the Contractor during the training period, and the Contractor must have made a commitment to employ the apprentices and trainees at the completion of their training, subject to the availability of employment opportunities. Trainees must be trained pursuant to training programs approved by the U.S. Department of Labor.

7. The Contractor shall take specific affirmative actions to ensure equal emp1oyment opportunity. The evaluation of the Contractor's compliance with these specifications shall be based upon its effort to achieve maximum results from its actions. The Contractor shall document these efforts fully, and shall implement affirmative action steps at least as extensive as the following:
   a. Ensure and maintain a working environment free of harassment, intimidation, and coercion at all sites, and in all facilities at which the Contractor employees are assigned to work. The Contractor, where possible will assign two or more women to each construction project. The Contractor shall specifically ensure that all foremen, superintendents, and other on-site supervisory personnel are aware of and carry out the Contractor's obligation to maintain such a working environment, with specific attention to minority or female individuals working at such sites or in such facilities.
   b. Establish and maintain a current list of minority and female recruitment sources, provide written notification to minority and female recruitment sources and to community organizations when the Contractor or its unions have employment opportunities available and maintain a record of the organizations' responses.
   c. Maintain a current file of the names, addresses and telephone numbers of each minority and female off-the-street applicant and minority or female referral from a union, a recruitment source or community organization and of what action was taken with respect to each such individual. If such individual was sent to the union hiring hall for referral and was not referred back to the Contractor by the union or, if referred, not employed by the Contractor, this shall be documented in the file with the reason therefore, along with whatever additional actions the Contractor may have taken.
   d. Provide immediate written notification to the Director when the union or unions with which the Contractor has a collective bargaining agreement has not referred to the Contractor a minority person or woman sent by the Contractor, or when the Contractor has other information that the union referral process has impeded the Contractor's effort, to meet its obligations.
   e. Develop on-the-job training opportunities and/or participate in training programs for the area which expressly include minorities and women, including upgrading programs and apprenticeship and trainee programs relevant to the Contractor's employment needs, especially those programs funded or approved by the Department of Labor. The Contractor shall provide notice of these programs to the source complied under 7b above.
   f. Disseminate the Contractor's EEO policy by providing notice of the policy to unions and training programs and requesting their cooperation in assisting the Contractor in meeting its EEO obligations; by including it in any policy manual and collective bargaining agreement; by publicizing it in the company newspaper, annual report, etc.; by specific review of the policy with all management personnel and with all minority and female employees at least once a year; and by posting the company EEO policy on bulletin boards accessible to all employees at each location where construction work is performed.
   g. Review, at least annually, the company's EEO policy and affirmative action obligations under these specifications with all employees having any responsibility for hiring, assignment, layoff, termination or other employment decisions including specific review of these items with onsite supervisory personnel such as Superintendents, General Foremen, etc., prior to the initiation of construction work at any job site. A written record shall be made and maintained identifying the time and place of these meetings, persons attending, subject matter discussed, and disposition of the subject matter.
   h. Disseminate the Contractor's EEO policy externally by including it in any advertising in the news media, specifically including minority and female news media, and providing written notification to and discussing the

Contractor's EEO policy with other Contractors and Subcontractors with whom the Contractor does or anticipates doing business.

i. Direct its recruitment efforts, both oral and written, to minority, female and community organizations, to schools with minority and female students and to minority and female recruitment and training organizations serving the Contractor's recruitment area and employment needs. Not later than one month prior to the date for the acceptance of applications for apprenticeship or other training by any recruitment source, the Contractor shall send written notification to organizations such as the above, describing the openings, screening procedures, and test to be used in the selection process.
j. Encourage present minority and female employees to recruit other minority persons and women and, where reasonable, provide after school, summer and vacation employment to minority and female youth both on the site and in other areas of a Contractor's workforce.
k. Validate all tests and other selection requirements where there is an obligation to do so under 41 CFR Part 60-3.
l. Conduct, at least annually, an inventory and evaluation at least of all minority and female personnel for promotional opportunities and encourage these employees to seek or to prepare for, through appropriate training, etc., such opportunities.
m. Ensure that seniority practices, job classifications work assignments and other personnel practices, do not have a discriminatory effect by continually monitoring all personnel and employment related activities to ensure that the EEO policy and the Contractor's obligations under these specifications are being carried out.
n. Ensure that all facilities and company activities are nonsegregated except that separate or single-user toilet and necessary changing facilities shall be provided to assure privacy between the sexes.
o. Document and maintain a record of all solicitations of offers for subcontracts from minority and female construction contractors and suppliers, including circulation of solicitations to minority and female contractor associations and other business associations.
p. Conduct a review, at least annually, of all supervisors' adherence to and performance under the Contractor's EEO policies and affirmative action obligations.

8. Contractors are encouraged to participate in voluntary associations which assist in fulfilling one or more of their affirmative action obligations (7a through p). The efforts of a contractor association, joint contractor-union, contractor-community, or other similar group of which the contractor is a member and participant, may be asserted as fulfilling any one or more of its obligations under 7a through p of these Specifications provided that the contractor actively participates in the group, makes every effort to assure that the group has a positive impact on the employment of minorities and women in the industry, ensures that the concrete benefits of the program are reflected in the Contractor's minority and female workforce participation, makes a good faith effort to meet its individual goals and timetables, and can provide access to documentation which demonstrates the effectiveness of actions taken on behalf of the Contractor. The obligation to comply, however, is the Contractor's and failure of such a group to fulfill an obligation shall not be a defense for the Contractor's noncompliance.

9. A single goal for minorities and a separate single goal for women have been established. The Contractor, however, is required to provide equal employment opportunity and to take affirmative action for all minority groups, both male and female, and all women, both minority and non-minority. Consequently, the Contractor may be in violation of the Executive Order if a particular group is employed in a substantially disparate manner (for example, even though the Contractor has achieved its goals for women generally, the Contractor may be in violation of the Executive Order if a specific minority group of women is underutilized).

10. The Contractor shall not use the goals and timetable or affirmative action standards to discriminate against any person because of race, color, religion, sex, or national origin.

11. The Contractor shall not enter into any Subcontract with any person or firm debarred from Government contracts pursuant to Executive Order 11246.

12. The Contractor shall carry out such sanctions and penalties for violation of these specifications and of the Equal Opportunity Clause, including suspension, termination and cancellation of existing subcontracts as may be imposed or ordered pursuant to Executive Order 11246, as amended, and its implementing regulations, by the Office of Federal Contract Compliance Programs. Any Contractor who fails to carry out such sanctions and penalties shall be in violation of these specifications and Executive Order 11246, as amended.

13. The Contractor, in fulfilling its obligations under these specifications, shall implement specific affirmative action steps at least as extensive as those standards prescribed in paragraph 7 of these specifications so as to achieve maximum results from its efforts to ensure equal employment opportunity. If the Contractor fails to comply with the requirements of the Executive Order, the implementing regulations, or these specifications, the Director shall proceed in accordance with 41 CFR 60-4.8.

14. The Contractor shall designate a responsible official to monitor all employment related activity to ensure that the company EEO policy is being carried out, to submit reports relating to the provisions hereof as may be required by the Government and to keep records. Records shall at least include for each employee the name, address, telephone numbers, construction trade, union affiliation if any, employee identification number when assigned, social security number, race, sex, status (e.g., mechanic, apprentice, trainee, helper, or laborer), dates of changes in status, hours worked per week in the indicated trade, rate of pay, and locations at which the work was performed. Records shall be maintained in an easily understandable and retrievable form; however, to the degree that existing records satisfy this requirement, contractors shall not be required to maintain separate records.

15. Nothing herein provided shall be construed as a limitation upon the application of other laws which establish different standards of compliance or upon the application of requirements for the hiring of local or other area residents (e.g., those under the Public Works Employment Act of 1977 and the Community Development Block Grant Program).

Federal Register, Vol. 43, No. 68 - Friday, April 7, 1978 (Corrected May 5, 1978).
Effective Date: May 8, 1978
Federal Register, Vol. 45, No. 194. Paragraph 4, revised October 3, 1980
Effective Date: September 30, 1980

APPENDICES A and B-80
Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity
(Executive Order 11246)

1. The Offeror's or Bidder's attention is called to the "Equal Opportunity Clause" and the "Standard Federal Equal Employment Specifications" set forth herein.

2. The goals and timetables for minority and female participation, expressed in percentage terms for the Contractor's aggregate workforce in each trade on all construction work in the covered area, are as follows:

(See Appendix B-80 and Appendix A Below)

These goals are applicable to all the Contractor's construction work (whether or not it is Federal or federally assisted) performed in the covered area. If the contractor performs construction work in a geographical area located outside of the covered area, it shall apply the goals established for such geographical area where the work is actually performed. With regard to this second area, the contractor also is subject to the goals for both its federally involved and non-federally involved construction.

The Contractor's compliance with the Executive Order and in the regulations in 41 CFR Part 60 - 4 shall be based on its implementation of the Equal Opportunity Clause, specific affirmative action obligations required by the specifications set

forth in 41 CFR 60 - 4.3(a), and its efforts to meet the goals. The hours of minority and female employment and training must be substantially uniform throughout the length of the contract, and in each trade, and the contractor shall make a good faith effort to employ minorities and women evenly on each of its projects. The transfer of minority or female employees or trainees from Contractor to Contractor or from project to project for the sole purpose of meeting the Contractor's goals shall be a violation of the contract, the Executive Order and the regulations in 41 CFR Part 60 - 4. Compliance with the goals will be measured against the total work hours performed.

3. The Contractor shall provide written notification to the Director of the Office of Federal Contract Compliance Programs within 10 working days of award of any construction subcontract in excess of $10,000 at any tier for construction work under the contract resulting from this solicitation. The notification shall list the name, address and telephone number of the subcontractor, employer Identification number of the subcontractor, estimated dollar amount of the subcontract, and the geographical area in which the subcontract is to be performed.

4. As used in this Notice, and in the contract resulting from this solicitation, the "covered area" is (State of Iowa).

APPENDIX A

The following goals and timetables for female utilization shall be included in all Federal and federally assisted construction contracts and subcontracts in excess of $10,000. The goals are applicable to the contractor's aggregate on-site construction workforce whether or not part of that workforce is performing work on a Federal or federally assisted construction contract or subcontract.

Area covered: Goals for Women apply nationwide.

Timetable Goals (percent)
From Apr. 1, 1978 until March 31, 1979 .....3.1
From Apr. 1, 1979 until March 31, 1980 .....5.0
From Apr. 1, 1980 until March 31, 1981 .....6.9

Published, Federal Register May 5, 1978

APPENDIX B-80

Until further notice, the following goals for minority utilization in each construction craft and trade shall be included in all Federal or federally assisted construction contracts and subcontracts in excess of $10,000 to be performed in the respective geographical areas. The goals are applicable to each nonexempt contractor's total onsite construction workforce, regardless of whether or not part of that workforce is performing work in a Federal, federally assisted or nonfederally related project, contract or subcontract. Construction contractors which are participating in an approved Hometown Plan (see 41 CFR 60 - 4.5) are required to comply with the goals of the Hometown Plan with regard to construction work they perform in the area covered by the Hometown Plan. With regard to all their other covered construction work, such contractors are required to comply with the applicable SMSA of EA goal contained in this appendix B-80.

Economic Areas

State: Iowa Goal %

096 Dubuque IA:
SMSA Counties:
2200 Dubuque, IA 0.6
IA Dubuque
Non-SMSA Counties 0.5

IA Allamakee, IA Clayton, IA Delaware, IA Jackson IA Winneshiek

099 Davenport Rock Island Moline, IA-IL:
SMSA Counties:
1960 Davenport Rock Island Moline, IA-IL.....4.6
IL Henry, IL Rock Island Moline, IA Scott
Non-SMA Counties.....3.4
IL Carroll, IL Hancock, IL Henderson, IL Mercer, IL Whiteside, IA Clinton, IA Des Moines, IA Henry, IA Lee, IA Louisa, IA Muscatine, MO Clark

100 Cedar Rapids, IA:
SMSA Counties:
1360 Cedar Rapids, IA 1.7
IA Linn
Non-SMSA Counties 1.5
IA Benton, IA Cedar, IA Iowa, IA Johnson, IA Jones, IA Washington

101 Waterloo, IA:
SMSA Counties:
8920 Waterloo-Cedar Falls, IA.....4.7
IA Black Hawk
Non-SMSA Counties 2.0
IA Bremer, IA Buchanan, IA Butler, IA Cerro Gordo, IA Chickasaw, IA Fayette, IA Floyd, IA Franklin, IA Grundy, IA Hancock, IA Hardin, IA Howard, IA Mitchell, IA Winnebago, IA Worth

102 Fort Dodge, IA:
Non-SMSA Counties 0.4
IA Buena Vista, IA Calhoun, IA Carroll, IA Clay, IA Dickinson, IA Emmet, IA Greene, IA Hamilton, IA Humboldt, IA Kossuth, IA Palo Alto, IA Pocahontas, IA Sac, IA Webster, IA Wright

103 Sioux City, IA:
SMSA Counties:
7720 Sioux City, IA-NE 1.9
IA Woodbury, NE Dakota
Non-SMSA Counties 1.2
IA Cherokee, IA Crawford, IA Ida, IA Monona, IA O'Brien, IA Plymouth, IA Sioux, NE Antelope, NE Cedar, NE Cuming, NE Dixon, NE Knox, NE Madison, NE Pierce, NE Stanton, NE Thurston, NE Wayne, SD Bon Homme, SD Clay, SD Union, SD Yankton

104 Des Moines, IA:
SMSA Counties:
2120 Des Moines, IA 4.5
IA Polk, IA Warren

Non SMSA Counties: 2.4
IA Adair, IA Appanoose, IA Boone, IA Clarke, IA Dallas, IA Davis, IA Decatur, IA Guthrie, IA Jasper, IA Jefferson, IA Keokuk, IA Lucas, IA Madison, IA Mahaska, IA Marion, IA Marshall, IA Monroe, IA Poweshiek, IA Ringgold, IA Story, IA Tama, IA Union, IA Van Buren, IA Wapello, IA Wayne

143 Omaha, NE:
SMSA Counties:
5920 Omaha, NE-IA.....7.6
IA Pottawattamie, NE Douglas, NE Sarpy
Non-SMSA Counties.....5.3
IA Adams, IA Audubon, IA Cass, IA Fremont, IA Harrison, IA Mills, IA Montgomery, IA Page, IA Shelby, IA Taylor, NE Burt, NE Cass, NE Colfax, NE Dodge, NE Platte, NE Saunders, NE Washington

Published, Federal Register October 3, 1980

B. Federal Labor Standards Provisions (including Davis-Bacon prevailing wage rates) Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

(1) Minimum wages.
(i) All laborers and mechanics employed or working upon the site of the work will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR part 3)), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under section 1(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of paragraph (a)(1)(iv) of this section; also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period. Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in Sec. 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided that the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under paragraph (a)(1)(ii) of this section) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible place where it can be easily seen by the workers.
(ii) (A) The contracting officer shall require that any class of laborers or mechanics, including helpers, which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. The contracting officer shall approve an additional classification and wage rate and fringe benefits therefore only when the following criteria have been met:
(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and
(2) The classification is utilized in the area by the construction industry; and
(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.
(B) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and the contracting officer agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by the contracting officer to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, DC 20210. The Administrator, or an authorized

representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(C) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and the contracting officer do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), the contracting officer shall refer the questions, including the views of all interested parties and the recommendation of the contracting officer, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise the contracting officer or will notify the contracting officer within the 30-day period that additional time is necessary.

(D) The wage rate (including fringe benefits where appropriate) determined pursuant to paragraphs (a)(1)(ii) (B) or (C) of this section, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided that the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program.

(2) Withholding. The EPA shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor, so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees, and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract. In the event of failure to pay any laborer or mechanic, including any apprentice, trainee, or helper, employed or working on the site of the work, all or part of the wages required by the contract, the EPA may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased.

(3) Payrolls and basic records.

(i) Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work and preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in section 1(b)(2)(B) of the Davis-Bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5(a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in section 1(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs.

(ii) (A) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant, sponsor, or owner, as

the case may be, for transmission to the (write in name of agency). The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i), except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at http://www.dol.gov/whd/programs/dbra/forms.htm or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to the (write in name of appropriate federal agency) if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit them to the applicant, sponsor, or owner, as the case may be, for transmission to the (write in name of agency), the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this section for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to the sponsoring government agency (or the applicant, sponsor, or owner).

(B) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under Sec. 5.5 (a)(3)(ii) of Regulations, 29 CFR part 5, the appropriate information is being maintained under Sec. 5.5 (a)(3)(i) of Regulations, 29 CFR part 5, and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in Regulations, 29 CFR part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(C) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by paragraph (a)(3)(ii)(B) of this section.

(D) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under section 1001 of title 18 and section 231 of title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under paragraph (a)(3)(i) of this section available for inspection, copying, or transcription by authorized representatives of the EPA or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, the Federal agency may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

(4) Apprentices and trainees

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where

appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by the Employment and Training Administration shall be paid not less than the applicable wage rateon the wage determination for the classification of work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under this part shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR part 30.

(5) Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR part 3, which are incorporated by reference in this contract.

(6) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses contained in 29 CFR 5.5(a)(1) through (10) and such other clauses as the (write in the name of the Federal agency) may by appropriate instructions require, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in 29 CFR 5.5.

(7) Contract termination: debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract, and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

(8) Compliance with Davis-Bacon and Related Act requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR parts 1, 3, and 5 are herein incorporated by reference in this contract.

(9) Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (and any of its subcontractors) and the contracting agency, the U.S. Department of Labor, or the employees or their representatives.

(10) Certification of eligibility.

(i) By entering into this contract, the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1).

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001.

(b) Contract Work Hours and Safety Standards Act. The Agency Head shall cause or require the contracting officer to insert the following clauses set forth in paragraphs (b)(1), (2), (3), and (4) of this section in full in any contract in an amount in excess of $100,000 and subject to the overtime provisions of the Contract Work Hours and Safety Standards Act. These clauses shall be inserted in addition to the clauses required by Sec. 5.5(a) or 4.6 of part 4 of this title. As used in this paragraph, the terms laborers and mechanics include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which he or she is employed on such work to work in excess of forty hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of forty hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in paragraph (b)(1) of this section the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in paragraph (b)(1) of this section, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of forty hours without payment of the overtime wages required by the clause set forth in paragraph (b)(1) of this section.

(3) Withholding for unpaid wages and liquidated damages. The loan recipient shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contractor, or any other federally-assisted contract subject to the Contract Work Hours and Safety Standards Act, which is held by the same prime contractor, such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in paragraph (b)(2) of this section.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in paragraph (b)(1) through (4) of this section and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in paragraphs (b)(1) through (4) of this section.

(c) In addition to the clauses contained in paragraph (b), in any contract subject only to the Contract Work Hours and Safety Standards Act and not to any of the other statutes cited in Sec. 5.1, the Agency Head shall cause

or require the contracting officer to insert a clause requiring that the contractor or subcontractor shall maintain payrolls and basic payroll records during the course of the work and shall preserve them for a period of three years from the completion of the contract for all laborers and mechanics, including guards and watchmen, working on the contract. Such records shall contain the name and address of each such employee, social security number, correct classifications, hourly rates of wages paid, daily and weekly number of hours worked, deductions made, and actual wages paid. Further, the Agency Head shall cause or require the contracting officer to insert in any such contract a clause providing that the records to be maintained under this paragraph shall be made available by the contractor or subcontractor for inspection, copying, or transcription by authorized representatives of the EPA and the Department of Labor, and the contractor or subcontractor will permit such representatives to interview employees during working hours on the job.

C. Preservation of Open Competition and Government Neutrality Towards Government Contractors' Labor Relations on Federal and Federally Funded Construction Projects (Executive Order 13202, as amended by Executive Order 13208)

Executive Order 13202, signed February 17, 2001 and amended April 4, 2001, requires all executive agencies that issue grants to ensure Government neutrality toward contractors' labor relations. This applies to recipients of SRF assistance. The Executive Order prohibits discrimination against contractors and their employees in construction contracts based upon labor affiliation or lack thereof.

SRF assistance recipients and any construction managers acting on their behalf must ensure that bidding specifications, project agreements, and other controlling documents do not require, prohibit, or otherwise discriminate, with respect to labor affiliation or lack thereof.

D. Historical and Archeological Finds

If, during the course of construction, evidence of deposits of historical or archeological interest is found, the contractor shall cease operations affecting the find. The owner shall then notify the State Revolving Fund Environmental Review Specialist, who shall in turn notify the State Historic Preservation Office. The SRF shall consult with the SHPO and other interested parties to determine the proper course of action regarding the discovery. No further disturbance of the deposits shall ensue until the SRF Environmental Review Specialist determines that the project activities in that area may proceed. Compensation to the contractor, if any, for lost time or changes in construction to avoid the find, shall be determined in accordance with changed conditions or change order provisions of the specifications.

Authority for this derives from the National Historic Preservation Act (16 U.S.C. §§ 470 *et seq.*) and 36 CFR Part 800. If human remains are discovered then state law also applies IC 263B.

E. Prohibitions on Procurement from Violating Facilities (Section 306, Clean Air Act; Section 508, Clean Water Act; Executive Order 11738)

Both the Clean Water Act and the Clean Air Act prohibit federal agencies from extending assistance by way of loans or contracts to persons who have been convicted of violations of either law. Executive Order 11738 was issued to coordinate enforcement by the U.S. Environmental Protection Agency, which shall designate facilities which have given rise to a conviction for an offense under the criminal provisions of the Clean Air Act and the Clean Water Act.

The Executive Order also prohibits agencies from extending assistance to facilities that are not in compliance with either Act.

SRF assistance recipients may not procure goods, services, or materials from suppliers listed by the EPA as violators.

The Excluded Parties Listing search engine is located at the System for Award Management (SAM) website: https://sam.gov.

Attachment 8
SRF Required Front-End Specifications

Right of Entry and Records Retention

The recipient shall provide access at all times for the Department of Natural Resources, the Iowa Finance Authority, the state auditor, and the U.S. EPA Office of the Inspector General to all project records and documents for inspection and audit purposes for a period of three years after the date of last loan payment. The same access to the project site(s) shall be provided for inspection purposes.

567 Iowa Administrative Code paragraph 92.8 (2).e. State inspections. Personnel of the department shall have the right to examine all construction aspects of the project, including materials and equipment delivered and stored on site for use on the project.

Attachment 9
SRF Required Front-End Specifications

"American Iron and Steel" Requirements

H.R. 3547, the "Consolidated Appropriations Act, 2014," enacted January 17, 2014 by the U.S. Congress, includes "American Iron and Steel" provisions that require Clean Water and Drinking Water State Revolving Fund assistance recipients of these funds to use iron and steel produced in the United States.

H.R. 3547 includes the following language in Division G, Title IV, under the heading, "Use of American Iron and Steel":

> Sec. 436. (a)(1) None of the funds made available by a State water pollution control revolving fund as authorized by title VI of the Federal Water Pollution Control Act (33 U.S.C. 1381 et seq.) or made available by a drinking water treatment revolving loan fund as authorized by section 1452 of the Safe Drinking Water Act (42 U.S.C. 300j-12) shall be used for a project for the construction, alteration, maintenance, or repair of a public water system or treatment works unless all of the iron and steel products used in the project are produced in the United States.
>
> (2) In this section, the term "iron and steel products" means the following products made primarily of iron and steel: lined or unlined pipes and fittings, manhole covers and other municipal castings, hydrants, tanks, flanges, pipe clamps and restraints, valves, structural steel, reinforced precast concrete, and construction materials.
>
> (b) Subsection (a) shall not apply in any case or category of cases in which the Administrator of the Environmental Protection Agency (in this section referred to as the "Administrator") find that—
>
> 1) Applying subsection (a) would be inconsistent with the public interest;
> 2) Iron and steel products are not produced in the United States in sufficient and reasonably available quantities and of a satisfactory quantity; or
> 3) Inclusion of iron and steel products produced in the United States will increase the cost of the overall project by more than 25 percent.
>
> (c) If the Administrator receives a request for a waiver under this section, the Administrator shall make available to the public on an informal basis a copy of the request and information available to the Administrator concerning the request, and shall allow for informal public input on the request for at least 15 days prior to making a finding based on the request. The Administrator shall make the request and accompanying information available by electronic means, including on the official public Internet Web site of the Environmental Protection Agency.

The final guidance and any published waivers are found at: https://www.epa.gov/cwsrf/state-revolving-fund-american-iron-and-steel-ais-requirement. In particular the contractor should pay attention to the guidance for documentation of

compliance. There is also a waiver for incidental items; in order to qualify for this waiver the total materials and costs for the project must be tracked and incidental items identified.

Sample "American Iron and Steel" Contract Language

In order to fulfill the requirements, the assistance recipient must in good faith design the project and solicit bids for construction with U.S.-made iron and steel. The following information will be included in any contracts resulting from this request for bids:

The Contractor acknowledges to and for the benefit of the City of _____ ("Purchaser") and the State of Iowa (the "State") that it understands the goods and services under this Agreement are being funded with monies made available by the Clean Water State Revolving Fund and/or Drinking Water State Revolving Fund and such law contains provisions commonly known as "American Iron and Steel;" that requires all of the iron and steel products used in the project to be produced in the United States ("American Iron and Steel Requirement") including iron and steel products provided by the Contactor pursuant to this Agreement.

The Contractor hereby represents and warrants to and for the benefit of the Purchaser and the State that (a) the Contractor has reviewed and understands the American Iron and Steel Requirement, (b) all of the iron and steel products used in the project will be and/or have been produced in the United States in a manner that complies with the American Iron and Steel Requirement, unless a waiver of the requirement is approved, and (c) the Contractor will provide any further verified information, certification or assurance of compliance with this paragraph, or information necessary to support a waiver of the American Iron and Steel Requirement, as may be requested by the Purchaser or the State.

Notwithstanding any other provision of this Agreement, any failure to comply with this paragraph by the Contractor shall permit the Purchaser or State to recover as damages against the Contractor any loss, expense, or cost (including without limitation attorney's fees) incurred by the Purchaser or State resulting from any such failure (including without limitation any impairment or loss of funding, whether in whole or in part, from the State or any damages owed to the State by the Purchaser). While the Contractor has no direct contractual privity with the State, as a lender to the Purchaser for the funding of its project, the Purchaser and the Contractor agree that the State is a third-party beneficiary and neither this paragraph (nor any other provision of this Agreement necessary to give this paragraph force or effect) shall be amended or waived without the prior written consent of the State.

Sample Certifications

As indicated in the contract language, it will be the responsibility of the Contractor to obtain certifications that the products and materials used in the project are U.S.-made. EPA recommends the use of a step certification process for documenting compliance with AIS requirements, similar to one used by the Federal Highway Administration. Step certification creates a paper trail which documents the location of the manufacturing process involved with the production of steel and iron materials. Each handler (supplier, fabricator, manufacturer, processor, coater, etc.) of the iron and steel products certifies that their step in the process was domestically performed.

The following information is provided as a sample letter of step certification for AIS compliance. Documentation must be provided on company letterhead. In this example, there may be multiple letters from different manufacturers if one manufacturer did not perform all of the steps.

Date

Company Name
Company Address
City, State Zip

Subject: American Iron and Steel Step Certification for Project (XXXXXXXXXX)

I, (company representative), certify that the (melting, bending, coating, galvanizing, cutting, etc.) process for (manufacturing or fabricating) the following products and/or materials shipped or provided for the subject project is in full compliance with the American Iron and Steel requirement as mandated in EPA's State Revolving Fund Programs.

Item, Products and/or Materials:

1. Xxxx

2. Xxxx

3. Xxxx

Such process took place at the following location:

_____

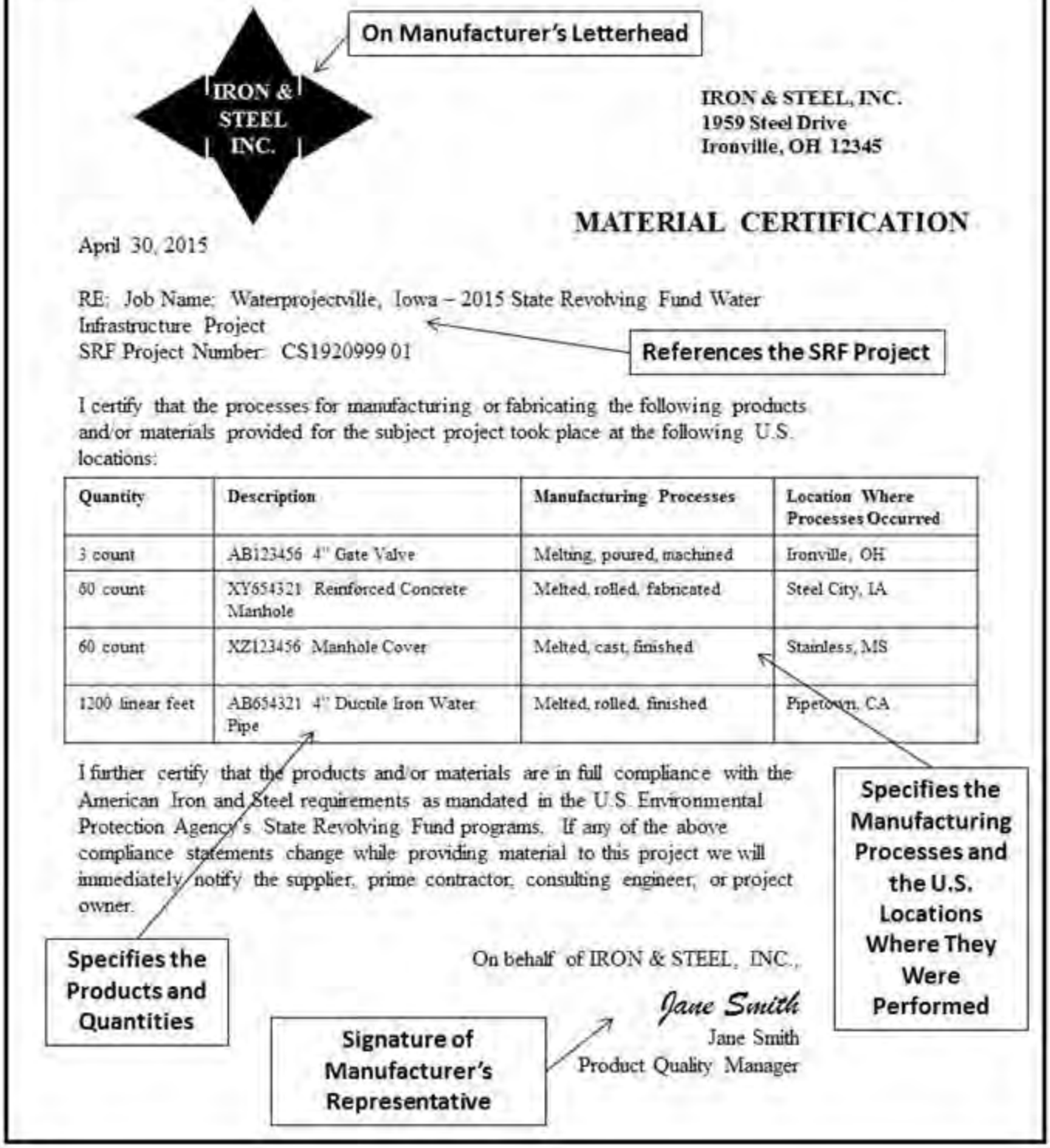
If any of the above compliance statements change while providing material to this project we will immediately notify the prime contractor and the engineer.

Signed by company representative

Alternatively, the final manufacturer that delivers the iron or steel product to the worksite, vendor, or contractor, may provide a certification asserting that all manufacturing processes occurred in the US and providing detailed information on the steps involved.

The following is a template for this type of final certification.

Template American Iron and Steel Certification Letter



On Manufacturer's Letterhead

IRON & STEEL INC.

IRON & STEEL, INC.
1959 Steel Drive
Ironville, OH 12345

MATERIAL CERTIFICATION

April 30, 2015

RE: Job Name: Waterprojectville, Iowa – 2015 State Revolving Fund Water Infrastructure Project
SRF Project Number: CS1920999 01

References the SRF Project

I certify that the processes for manufacturing or fabricating the following products and/or materials provided for the subject project took place at the following U.S. locations:

Quantity	Description	Manufacturing Processes	Location Where Processes Occurred
3 count	AB123456 4" Gate Valve	Melting, poured, machined	Ironville, OH
60 count	XY654321 Reinforced Concrete Manhole	Melted, rolled, fabricated	Steel City, IA
60 count	XZ123456 Manhole Cover	Melted, cast, finished	Stainless, MS
1200 linear feet	AB654321 4" Ductile Iron Water Pipe	Melted, rolled, finished	Pipetown, CA

I further certify that the products and/or materials are in full compliance with the American Iron and Steel requirements as mandated in the U.S. Environmental Protection Agency's State Revolving Fund programs. If any of the above compliance statements change while providing material to this project we will immediately notify the supplier, prime contractor, consulting engineer, or project owner.

Specifies the Products and Quantities

Specifies the Manufacturing Processes and the U.S. Locations Where They Were Performed

On behalf of IRON & STEEL, INC.,

Jane Smith

Jane Smith
Product Quality Manager

Signature of Manufacturer's Representative

Covered and Non-Covered Items

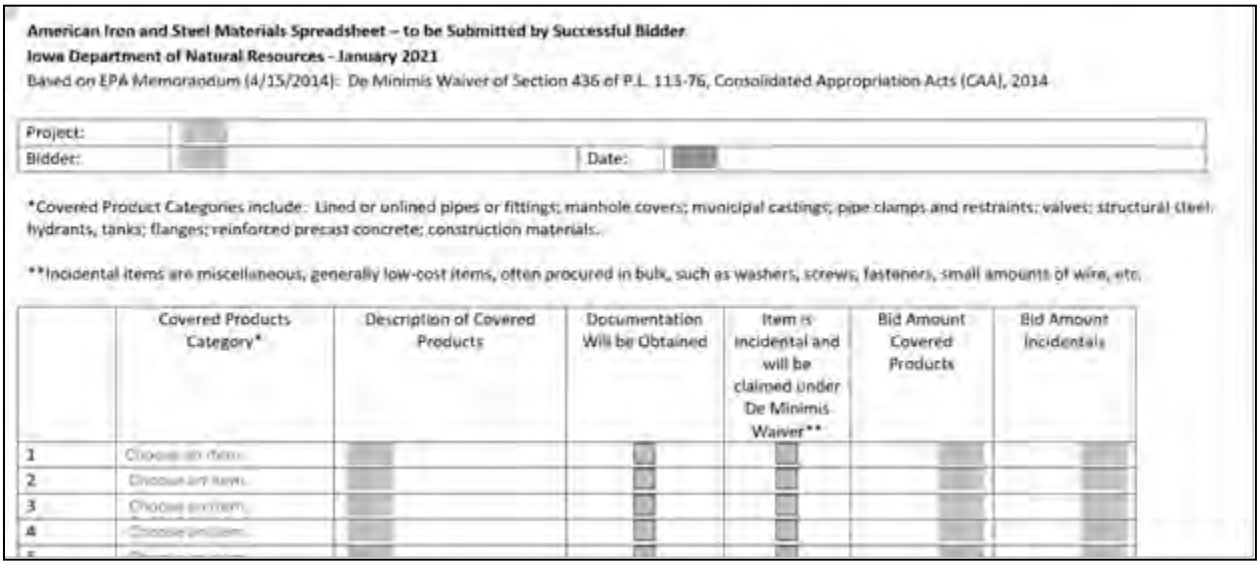
The EPA issued a waiver for De Minimus incidental components of eligible water and wastewater infrastructure projects. Funds used for such De Minimus incidental components cumulatively may comprise no more than a total of 5% of the total cost of the materials used in and incorporated into a project. The cost of an individual incidental item may not exceed 1% of the total cost of the materials used in and incorporated into a project.

De Minimus incidental items include miscellaneous, generally low-cost components that are essential for, but incidental to, the construction and are incorporated into the physical structure of the project. For many of these incidental components, the country of manufacture and the availability of alternatives are not readily or reasonably identifiable prior to procurement in the normal course of business. For others, the country of manufacture may be known but the miscellaneous character in conjunction with the low cost, individually and (in total) as typically procured in bulk, mark them as properly incidental.

Examples of incidental components could include small washers, screws, fasteners (i.e., nuts and bolts), miscellaneous wire, corner bead, ancillary tube, etc. Examples of items that are clearly not incidental include significant process fittings (i.e., tees, elbows, flanges, and brackets), distribution system fittings and valves, force main valves, pipes, treatment and storage tanks, large structural supports, etc.

In consultation with their contractors, assistance recipients should determine the items to be covered by this waiver, and must retain relevant documentation (i.e. invoices) as to those items. Assistance recipients must summarize in reports to the State of Iowa the types and/or categories of items to which this waiver is applied, the total cost of incidental components for each type or category, and the calculations by which they determined the total cost of materials used in and incorporated into the project.

The successful bidder will fill out the materials spreadsheet (shown below) and submit it to the assistance recipient to indicate iron and steel items proposed to be procured for the project.



American Iron and Steel Materials Spreadsheet – to be Submitted by Successful Bidder
Iowa Department of Natural Resources - January 2021
Based on EPA Memorandum (4/15/2014): De Minimis Waiver of Section 436 of P.L. 113-76, Consolidated Appropriation Acts (CAA), 2014

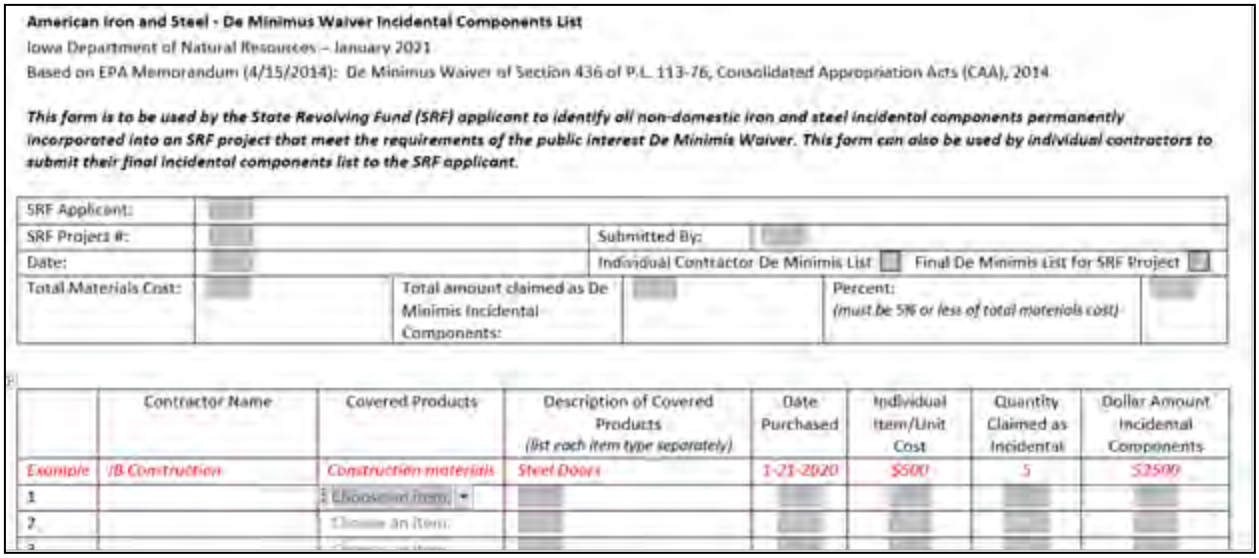
Project:			
Bidder:		Date:	

*Covered Product Categories include: Lined or unlined pipes or fittings; manhole covers; municipal castings; pipe clamps and restraints; valves; structural steel; hydrants, tanks; flanges; reinforced precast concrete; construction materials.

**Incidental items are miscellaneous, generally low-cost items, often procured in bulk, such as washers, screws, fasteners, small amounts of wire, etc.

	Covered Products Category*	Description of Covered Products	Documentation Will be Obtained	Item is incidental and will be claimed under De Minimis Waiver**	Bid Amount Covered Products	Bid Amount Incidentals
1	Choose an item					
2	Choose an item					
3	Choose an item					
4	Choose an item					

At the end of construction, the contractor will submit a final list showing covered items being claimed as incidental components under the De Minimis Waiver. Assistance recipients will complete a De Minimis Waiver Incidental Components List for the entire project to demonstrate compliance with the De Minimis Waiver cost requirements outlined above.



American Iron and Steel - De Minimus Waiver Incidental Components List

Iowa Department of Natural Resources – January 2021

Based on EPA Memorandum (4/15/2014): De Minimus Waiver of Section 436 of P.L. 113-76, Consolidated Appropriation Acts (CAA), 2014

This form is to be used by the State Revolving Fund (SRF) applicant to identify all non-domestic iron and steel incidental components permanently incorporated into an SRF project that meet the requirements of the public interest De Minimis Waiver. This form can also be used by individual contractors to submit their final incidental components list to the SRF applicant.

SRF Applicant:					
SRF Project #:		Submitted By:			
Date:		Individual Contractor De Minimis List ☐		Final De Minimis List for SRF Project ☐	
Total Materials Cost:		Total amount claimed as De Minimis Incidental Components:		Percent: *(must be 5% or less of total materials cost)*	

	Contractor Name	Covered Products	Description of Covered Products *(list each item type separately)*	Date Purchased	Individual Item/Unit Cost	Quantity Claimed as Incidental	Dollar Amount Incidental Components
Example	JB Construction	Construction materials	Steel Doors	1-21-2020	$500	5	$2500
1		Choose an item.					
2		Choose an item.					

These documents are available online at http://www.iowasrf.com/documents-and-guides/

Attachment 10
SRF Required Front-End Specifications
(This form must be completed and signed by Prime Contractor and submitted with the bid.)

PROHIBITION ON CERTAIN TELECOMMUNICATIONS AND VIDEO SURVEILLANCE SERVICES OR EQUIPMENT

This term and condition implements 2 CFR 200.216 and is effective for obligations and expenditures of EPA financial assistance funding on or after 8/13/2020. EPA recipients and subrecipients, including borrowers under EPA funded revolving loan fund programs, are prohibited from obligating or expending loan or grant funds to:

(a) Procure or obtain, extend or renew a contract to procure or obtain;
(b) Enter into a contract (or extend or renew a contract) to procure; or
(c) Obtain the equipment, services, or systems that use "covered telecommunications equipment or services"

identified in the regulation as a substantial or essential component of any system, or as critical technology as part of any system.

Certain equipment, systems, or services, including equipment, systems, or services produced or provided by entities subject to the prohibition are recorded in the System for Award Management exclusion list, website: https://sam.gov.

(1) As described in Public Law 115-232, section 889, covered telecommunications equipment or services includes:
    (i) Telecommunications equipment produced by Huawei Technologies Company or ZTE Corporation (or any subsidiary or affiliate of such entities).
    (ii) For the purpose of public safety, security of government facilities, physical security surveillance of critical infrastructure, and other national security purposes, video surveillance and telecommunications equipment produced by Hytera Communications Corporation, Hangzhou Hikvision Digital Technology Company, or Dahua Technology Company (or any subsidiary or affiliate of such entities).
    (iii) Telecommunications or video surveillance services provided by such entities or using such equipment.
    (iv) Telecommunications or video surveillance equipment or services produced or provided by an entity that the Secretary of Defense, in consultation with the Director of the National Intelligence or the Director of the Federal Bureau of Investigation, reasonably believes to be an entity owned or controlled by, or otherwise connected to, the government of a covered foreign country.

(2) Consistent with 2 CFR 200.471, costs incurred for telecommunications and video surveillance services or equipment such as phones, internet, video surveillance, and cloud servers are allowable except for the following circumstances:
    (i) Obligating or expending EPA funds for covered telecommunications and video surveillance services or equipment or services to procure (enter into, renew or extend contracts) or obtain the equipment, services, or systems as described in 2 CFR 200.216.

I understand the above prohibitions and certify that the project will be in compliance with all the requirements.

Signature	Date
Printed Name	Title

DAVIS-BACON
WAGE RATE DETERMINATION
TO BE ADDED BY ADDENDUM

INDEX OF
GENERAL CONDITIONS

Page

GENERAL CONDITIONS

DEFINITIONS

1.1 **Contract** is the agreement covering the performance of the work described in the Contract Documents including all supplemental agreements thereto and all general and special provisions pertaining to the work or materials therefore. The contract includes the Contract Documents listed below. In the event any provision of one Contract Document conflicts with the provision of another Contract Document, the provision in that Contract Document first listed shall govern.

a. Contract
b. Addenda to Contract Documents
c. Other Legal and Procedural Documents
d. Proposal
e. Bid Announcement
f. Special Provisions
g. Detailed Specifications
h. Plans
i. General Conditions
j. Performance and Maintenance Bond
k. Proposal Guaranty

1.2 **Engineer** is the Engineer named in the Contract Documents or his/her representative duly authorized to act for the Engineer.

1.3 **Owner** is the Owner named in the Contract Documents.

1.4 **Contractor** is the individual, firm, partnership or corporation, and his/her, their, or its heirs, executors, administrators, successors and assigns, or the lawful agent of any such individual, firm, partnership, covenant or corporation, or his/her, their or its surety under the contract bond, constituting one of the principals to the Contract and undertaking to perform the work herein specified. Where any pronoun is used, as referring to the work "Contractor" it shall mean the Contractor as defined above.

1.5 **Subcontractor** is any person, firm or corporation with a direct contract with the Contractor who acts for or on behalf of the Contractor in executing any part of the Contract, but does not include one who only furnishes material.

1.6 **Proposal** is the offer of a Bidder to perform the work described by the Contract Documents when made out and submitted on the prescribed Proposal Form, properly signed and guaranteed.

1.7 **Bid Announcement** is the Notice of Hearing and Letting or Advertisement for Bids.

1.8 **Performance Bond** is the approved form of security furnished by the Contractor and his/her Surety as a guaranty of good faith on the part of the Contractor to execute the work in accordance with the terms of the Contract.

1.9 **Maintenance Bond** is the approved form of security furnished by the Contractor and his/her Surety as a maintenance guaranty on the part of the Contractor furnished in accordance with the applicable statutes or as specifically required by the terms of the Contract or Contract Documents.

1.10 **Payment Bond** is the approved form of security furnished by the Contractor and his/her surety as a guaranty of payment to subcontractors and suppliers in accordance with the applicable statutes.

1.11 **Surety** is the person, firm or corporation who executes the Contractor's required bonds.

1.12 **Specifications** shall mean the Legal and Procedural Documents, General Conditions of the Contract, together with the modifications thereof, and the Detailed Specification Requirements, with all addenda thereto.

1.13 **Plans** shall mean the detailed construction drawings or sketches furnished to the Contractor.

1.14 **Written Notice** shall be considered as served when delivered in person or sent by mail to the individual, firm or corporation or to the last business address of such known to him/her who serves the notice.

a. Change of Address: It shall be the duty of each party to advise the other parties to the Contract as to any change in his/her business address until completion of Contract.

1.15 **Act of God** means an earthquake, flood, cyclone or other cataclysmic phenomenon of nature. Rain, wind, flood or other natural phenomenon of normal intensity for the locality shall not be construed as an Act of God and no reparation shall be made to the Contractor for damages to the work resulting therefrom.

1.16 **Working Day** is any day the Contractor can work six hours or more, excluding Saturday, Sunday or Legal Holidays.

INFORMATION FOR BIDDERS

2.1 **Form of Proposal**: Each Proposal shall be made on a form prepared by the Engineer and included as one of the Contract Documents. The Proposal shall be submitted in a sealed envelope bearing the title of the work and the name of the Bidder.

2.2 **Discrepancies**: In case of a difference between the unit price amount of a bid item and the extension total amount of a bid item, the unit price amount shall govern.

2.3 **Modifications**: Proposals shall not contain any modifications of the work to be done. Alternate proposals will not be considered unless called for. Oral proposals or modifications will not be considered. Facsimile proposals will not be considered, but modifications by facsimile of proposals already submitted will be considered if received prior to the time set for the bid opening.

2.4 **Examination of Contract Documents And Visit To Site**: Before submitting a Proposal, bidders shall carefully examine the plans, read the specifications and the other Contract Documents, visit the site of work and fully inform themselves as to all existing conditions and limitations.

2.5 **Delivery of Proposals**: Proposals shall be delivered by the time and to the place stipulated in the Bid Announcement. It is the sole responsibility of the bidder to see that his/her Proposal is received in proper time. Any Proposal received after the scheduled closing time for receipt of Proposals shall be returned to the bidder unopened.

2.6 **Withdrawal**: Any bidder may withdraw his/her Proposal, either personally, by facsimile or written request, at any time prior to the scheduled closing time for receipt of Proposals.

2.7 **Bid Letting:** Proposals will be opened and publicly read aloud at the time and place set forth in the Bid Announcement.

2.8 **Award of Contract**: The Contract will be awarded to the lowest, responsive, responsible bidder complying with these instructions and with the Bid Announcement. The Owner reserves the right to reject any or all Proposals or to waive any formality or technicality in any Proposal in the interest of the Owner. No bidder may withdraw his/her Proposal for a period of 30 days after the date of opening thereof. Should there be reasons why the contract cannot be awarded within the specified period, the time may be extended by mutual agreement between the Owner and the bidder.

2.9 **Interpretation of Documents**: If any person contemplating submitting a Proposal is in doubt as to the true meaning of any part of the Plans, Specifications or other Contract Documents, or finds discrepancies in or omissions from the Plans or Specifications, he/she shall submit to the Engineer a request for an interpretation or correction thereof. Any interpretation or correction of the documents will be made only by Addenda duly issued and copies of the Addenda will be delivered to each person receiving a set of the Contract Documents. Neither the Owner nor the Engineer will be responsible for any other explanations or interpretations of the Contract Documents.

2.10 **Addenda**: All addenda issued during the time of bidding or forming a part of the Contract Documents issued to the bidder for the preparation of his/her Proposal, shall be covered in the Proposal and shall be made a part of the Contract. Receipt of each addendum shall be acknowledged on the Proposal Form.

2.11 **Bidders Interested in More Than One Proposal**: No person, firm, or corporation shall be allowed to make, file or to be interested in more than one Proposal for the same work, unless alternate Proposals are called for. A person, firm, or corporation who has submitted a subproposal to a bidder or who has quoted prices on materials to a bidder is not disqualified from submitting a subproposal or quoting prices to other bidders.

2.12 **Errors**: To insure against accidental errors, the Contractor shall read carefully the contract documents before preparing his/her Proposal.

2.13 **Proposal Guaranty**: Each Proposal shall be accompanied by a guaranty of the form and in the amount indicated in the Contract Documents.

2.14 **Preparing the Proposal**: In preparing the Proposal, the bidder shall specify the unit prices, written legibly in ink or typewritten, at which he/she proposes to do each item of work. The unit price shall be stated in figures and the total amount of each item shall be computed by the bidder based on the unit prices bid for the quantities given in the Proposal.

2.15 **Estimate of Quantities**: The estimate of quantities listed in the Proposal is approximate only and is to be used only as a basis of comparing bids. Any later change in the quantities will not affect the previous selection of the low bidder and any change in quantities less than twenty percent (20%), or as provided by law, shall not require the approval of the Contractor.

DRAWING, SPECIFICATIONS AND RELATED DATA

3.1 **Intent of Plans and Specifications**: The intent of the Plans and Specifications is that the Contractor furnish all labor, materials, equipment and transportation necessary for the proper execution of the work, unless specifically noted otherwise. The Contractor shall do all the work shown on the Plans and described in the Specifications and all incidental work considered necessary to complete the project in a substantial and acceptable manner and to fully complete the work or improvements ready for use, occupancy and operation by the Owner.

3.2 **Discrepancies in Plans**: Any discrepancies found between the Plans and Specifications and site conditions or any errors or omissions in the Plans or Specifications shall be immediately reported to the Engineer. The Engineer shall promptly correct such error or omission in writing. Any work performed by the Contractor after discovery of such discrepancies, errors or omissions shall be done at the Contractor's risk.

3.3 **Copies of Plans and Specifications Furnished**: Except as provided for otherwise, all required copies of Plans and Specifications necessary for the execution of the work shall be furnished to the Contractor.

3.4 **Plans and Specifications at Job Site:** One complete set of all Plans and Specifications shall be maintained at the job site and shall be available to the Engineer at all times.

3.5 **Ownership of Plans and Specifications**: All original or duplicated Plans and Specifications and other data prepared by the Engineer shall remain the property of the Engineer.

3.6 **Dimensions**: Listed dimensions on the Plans shall be used in preference to scaling the Plans. Where the work of the Contractor is affected by finish dimensions, these dimensions shall be determined by the Contractor at the site and he/she shall assume the responsibility therefore.

3.7 **Models**: All models prepared for this work shall become the property of the Owner at the completion of the work.

3.8 **Samples**: Samples called for in the Specifications or required by the Engineer shall be furnished by the Contractor. Samples shall be furnished so as not to delay fabrication and to allow the Engineer reasonable time for the consideration of the samples submitted.

3.9 **Shop Drawings**: The Contractor shall provide shop drawings, schedules and such other drawings and samples as may be necessary for the prosecution of the work in the shop and in the field. Drawings shall include, but not necessarily be limited to, all equipment, materials, machinery, piping layouts, electrical line drawings, structural steel, reinforcement, and apparatus required to be furnished under this Contract.

Reviews by the Engineer of Shop Drawings and Samples for any material, apparatus, devices, and layouts shall not relieve the Contractor from the responsibility of furnishing same of proper dimension, size, quantity, quality, and all performance characteristics to efficiently perform the requirements and intent of the Contract Documents. Such review shall not relieve the Contractor from responsibility for errors of any sort on the Shop Drawings. If the Shop Drawings or Samples deviate from the Contract Documents, the Contractor shall advise the Engineer of the deviation in writing accompanying the Shop Drawings or Samples, including the reasons for the deviation.

Shop Drawings shall be submitted according to the following schedule:

a. A minimum of six copies shall be submitted at least thirty (30) days before the materials indicated thereon are to be needed, or earlier if required to prevent delay of work.

b. The Engineer will return all Samples or all but three Shop Drawing copies to the Contractor marked with corrections and changes.

c. The Contractor shall then correct the Shop Drawings or Samples to conform to the corrections and changes requested by the Engineer.

d. Following completion of such corrections and changes, the Contractor shall furnish the Engineer three copies of the Shop Drawings conforming to the required corrections and changes.

e. One copy of all Shop Drawings used shall be kept in good condition at the job site by the Contractor.

f. Upon submittal of corrected Shop Drawings, the Contractor shall also furnish the Engineer with two copies of operating and maintenance manuals, spare parts catalogs and equipment maintenance data sheets with nameplate data for each item of mechanical, electrical and process equipment and the source of procurement of spare parts.

3.10 **Quality of Equipment and Materials**: In order to establish standards of quality, the Engineer has, in the detailed Specifications, referred to certain products by name and catalog number. This procedure is not to be construed as eliminating from competition other products of equal or better quality by other manufacturers where fully suitable in design.

a. The Contractor shall furnish the complete list of proposed desired substitutions prior to signing of the Contract, together with such engineering and catalog data as the Engineer may require.

b. The Contractor shall abide by the Engineer's judgment when proposed substitute materials or items of equipment are judged to be unacceptable and shall furnish the specified material or item of equipment in such case. All proposals for substitutions shall be submitted in writing by the General Contractor and not by individual trades or material suppliers. The Engineer will approve or disapprove proposed substitutions in writing within a reasonable time. No substitute materials or equipment shall be used unless approved in writing.

3.11 **Equipment Approval Data**: The Contractor shall furnish one (1) copy of complete catalog data for every manufactured item of equipment and all components to be used in the work, including specific performance data, material description, rating, capacity, working pressure, material gage or thickness, brand name, catalog number and general type.

a. The submittal shall be compiled by the Contractor and approved by the Engineer before the equipment is ordered.

b. Each data sheet or catalog in the submittal shall be indexed according to specification section and paragraph for easy reference.

c. After written approval, this submittal shall become a part of the Contract and may not be deviated from except upon written approval of the Engineer.

d. Catalog data for equipment approved by the Engineer does not in any case supersede the Engineer's Contract Documents. The approval of the Engineer shall not relieve the Contractor from responsibility for deviations from Plans or Specifications, unless he/she has in writing called the Engineer's attention to such items submitted. The Contractor shall check the work described by the catalog data with the Engineer's Contract Documents for deviations and errors.

e. It shall be the responsibility of the Contractor to insure that items to be furnished fit the space available. He/she shall make necessary field measurements to ascertain space requirements, including those for connections, and shall order such sizes and shapes of equipment that the final installation shall suit the true intent and meaning of the Plans and Specifications.

f. Where equipment requiring different arrangement of connections from those shown is approved, it shall be the responsibility of the Contractor to install the equipment to operate properly and in harmony with the intent of the Plans and Specifications and to make all changes in the work required by the different arrangement of connections.

3.12 **Surveys**: Unless otherwise specified, the Owner shall establish all base lines for the location of the principal component parts of the work together with a suitable number of grade stakes, slope stakes and bench marks adjacent to the work. Based upon the information provided by the Owner, the Contractor shall develop and set other necessary construction stakes, including batter boards, stakes for individual pile locations and other working points. The Contractor shall have the responsibility to carefully preserve bench marks, reference points and stakes; and, in the case of destruction thereof by the Contractor or resulting from his/her negligence, the Contractor shall be charged with the expense and damage resulting therefrom and shall be responsible for any mistakes that may be caused by the unnecessary loss or disturbance of such bench marks, reference points and stakes.

3.13 **Discrepancies in Surveys**: If the Contractor, in the course of the work finds any discrepancy in the layout of the work as given by the grade stakes, slope stakes or other references given for construction procedures, he/she shall immediately inform the Engineer of such discrepancy. The Engineer shall promptly verify the same and shall make corrections where they are required. Any work performed by the Contractor after such discovery, until authorized, shall be accomplished at the Contractor's risk.

ENGINEER-OWNER-CONTRACTOR RELATIONS

4.1 **Engineer's Responsibility and Authority**: The Engineer shall be the Owner's representative during the construction period. The duties and responsibilities and the limitations of authority of the Engineer as the Owner's representative during construction are set forth in Sections 1 through 8 of these General Conditions and shall not be extended without written consent of the Owner and Engineer.

The Engineer shall not be responsible for the construction means, methods, techniques, sequences or procedures or the health and safety precautions and programs incident thereto, and he/she will not be responsible for the Contractor's failure to perform the work in accordance with the Contract Documents.

4.2 **Engineer's Decisions**: All claims of the Owner or the Contractor shall be presented to the Engineer for decision, which shall be made in writing within a reasonable time. All decisions of the Engineer shall be final, except in cases where time and/or financial considerations are involved. In these cases, disputed decisions shall be subject to mediation or arbitration.

4.3 **Suspension of Work**: The Owner shall have the authority to suspend the work, wholly or in part, for such period or periods as he/she may deem necessary due to unsuitable weather, or such other conditions as are considered unfavorable for prosecution of the work, or failure on the part of the Contractor to carry out the provisions of the Contract or to supply materials meeting the requirements of the Specifications. The Contractor shall not suspend operation without the Owner's permission.

4.4 **Arbitration**: Should there be any dispute or any questioned decision of the Engineer which is subject to arbitration, it shall be promptly submitted to arbitration upon demand by either party to the dispute. The Contractor shall not delay the work because arbitration proceedings are pending unless he/she has written permission from the Engineer to do so and such delay shall not extend beyond the time when the arbitrators shall have opportunity to determine whether the work shall continue or be suspended pending decision by the arbitrators of such a dispute. Any demand for arbitration shall be in writing and shall be delivered to the Engineer and any adverse party either by personal delivery or by registered mail addressed to the last known address of each within twenty (20) days of receipt of the Engineer's decision, and in no event after final payment has been made and accepted, subject however, to any express stipulation to the contrary in the Contract Documents. Should the Engineer fail within a reasonable period to make a decision, a demand for arbitration may then be made as if the Engineer's decision had been rendered against the party demanding arbitration.

a. No one shall be qualified to act as an arbitrator who has, directly or indirectly, any financial interest in the Contract or who has any business or family relationship with the Owner, the Contractor, or the Engineer. Each arbitrator selected shall be qualified by experience and knowledge of the work involved in the matter to be submitted to arbitration.

b. Arbitration shall be in accordance with the procedure and standards of The American Arbitration Association and/or the applicable State Statutes.

In lieu of arbitration, if both parties agree, the dispute may be submitted for mediation.

4.5 **Observation of Work**: The Contractor agrees to complete the construction in conformity with

the contract documents regardless of the extent or character of the observation. All materials and each part or detail of the work shall be subject at all times to construction observation. Such observation may include mill, plant or shop observation and any material furnished under this contract is subject to such observation. The Engineer shall be allowed access to all parts of the work and shall be furnished with such information and assistance by the Contractor as is required to make a complete and detailed observation.

4.6 **Resident Observation**: The Resident Engineer or Resident Observer shall observe the work being performed. The primary purpose of this function is to help assure the Contractors compliance with the plans and specifications and does not guarantee the Contractor's performance nor does it relieve the Contractor of his/her responsibility to construct the work in accordance with the Plans and Specifications. The Observer's duties do not include construction means, methods or procedures used by the Contractor. The Contractor is solely responsible for construction means, methods, procedures and job-site safety.

4.7 **Examination of Completed Work**: If requested by the Engineer, the Contractor, at any time before acceptance of the work, shall remove or uncover such portions of the finished work as may be directed. After examination, the Contractor shall restore said portions of the work to the standard required by the Specifications. Should the work thus exposed or examined prove acceptable, the uncovering or removing and the replacing of the covering or making good of the parts removed shall be paid for as Extra work. Should the work so exposed or examined prove unacceptable, the uncovering, removing and replacing shall be at the Contractor's expense.

4.8 **Contractor's Superintendence**: A qualified superintendent shall be on the project site and shall give efficient supervision to the work until its completion. The superintendent shall have full authority to act on behalf of the Contractor and all directions given to the superintendent shall be considered given to the Contractor. The Engineer's instructions shall be confirmed in writing upon written request from the Contractor.

4.9 **Lands by Owner**: The Owner shall provide the lands shown on the Plans upon which the work under the Contract is to be performed and to be used for rights-of-way for access. Any delay in furnishing these lands by the Owner shall be deemed proper cause for adjustment in the contract amount and in the time of completion.

4.10 **Lands by Contractor**: Any additional land and/or access thereto not shown on the Plans that may be required for temporary construction facilities or for storage of materials shall be provided by the Contractor with no liability to the Owner. The Contractor shall confine his/her apparatus, storage of materials and operation of his/her workmen to those areas described in the Plans and Specifications and to such additional areas which he/she may provide as approved by the Engineer.

4.11 **Private and Public Property**: The Contractor shall not enter upon private property for any purpose without obtaining permission. The Contractor shall be responsible for the preservation of all public property, trees, monuments, etc. along and adjacent to the project area, and shall use every precaution necessary to prevent damage or injury thereto. The Contractor shall notify all public and private utilities and use suitable precautions to prevent damage to pipes, conduits, and other underground structures and shall protect carefully from disturbance or damage all monuments and property marks until an authorized agent has witnessed or otherwise referenced their location and shall not remove them until so directed. The Contractor shall bear the cost of repair for all damage caused by his/her negligence.

4.12 **Assignment of Contract**: Neither the Contractor nor the Owner shall sublet, sell, transfer, assign or otherwise dispose of the Contract or any portion thereof, or of his/her right, title or interest therein, or his/her obligations thereunder, without written consent of the other party.

4.13 **Removal of Construction Equipment, Tools and Supplies**: At the termination of the Contract and before acceptance of the work by the Owner, the Contractor shall remove all equipment, tools and supplies from the property of the Owner. Should the Contractor fail to remove such equipment, tools, and supplies, the Owner shall have the right to remove them.

4.14 **Suspension of Work by Owner**: The work or any portion thereof may be suspended at any time by the Owner provided that he/she gives the Contractor five (5) days' written notice of suspension and sets forth the date on which work is to be resumed. The Contractor shall resume the work upon written notice from the Owner and within ten (10) days after the date set forth in the notice of suspension. If the Owner does not give written notice to resume work within ten (10) days of the date fixed in the notice of suspension, the Contractor may abandon that portion of the work so suspended and shall be entitled to payment in accordance with Paragraph 8.11.

4.15 **Owner's Right to Correct Deficiencies**: Upon failure of the Contractor to perform the work in accordance with the Contract Documents, including any requirements with respect to the Schedule of Completion, the Owner may, after five (5) days' written notice to the Contractor, correct such deficiencies, at the Contractor's expense, without prejudice to any other remedy he/she may have.

4.16 **Owner's Right to Terminate Contract and Complete the Work**: The Owner shall have the right to terminate the employment of the Contractor after giving ten (10) days' written notice of termination to the Contractor in the event of any default by the Contractor and upon receiving written notice from the Engineer certifying cause for such action. In the event of such termination, the Owner may take possession of the work and of all materials, tools and equipment thereon, and may finish the work by whatever method and means he/she may select. It shall be considered a default by the Contractor whenever he/she shall:

a. Declare bankruptcy, become insolvent, or assign his/her assets for the benefit of his/her creditors, or

b. Disregard or violate important provisions of the Contract Documents or Engineer's instructions, or fail to prosecute the work according to the agreed Schedule of Completion, including extensions thereof, or

c. Fail to provide a qualified superintendent, competent workmen or subcontractors, or proper materials, or fail to make prompt payment therefor.

4.17 **Contractor's Right to Suspend Work or Terminate Contract:** The Contractor may suspend work or terminate Contract upon ten (10) days' written notice to the Owner and the Engineer for the following reason:

a. If an order of any court or other public authority caused the work to be stopped or suspended for a period of ninety (90) days through no act or fault of the Contractor or his/her employees.

4.18 **Rights of Various Interests**: Wherever work being done by the Owner's forces or by other contractors is contiguous to work covered by this Contract, the respective rights of the various interests involved shall be established by the Engineer to secure the completion of the various portions of the work in general harmony.

4.19 **Separate Contracts**: The Owner may let other contracts requiring coordination of the work of the Contractor. The Contractor shall cooperate with other Contractors with regard to storage of materials and execution of their work. It shall be the Contractor's responsibility to inspect all work by other Contractors affecting his/her work and to report to the Engineer any irregularities which will not permit him/her to complete his work in a satisfactory manner. Failure to notify the Engineer of such irregularities shall indicate the work of the other Contractors has been satisfactorily completed to receive this work.

4.20 **Subcontracts**: The Contractor shall submit to the Owner the names of the subcontractors proposed for the work. Subcontractors may not be changed except with the approval of the Owner. The Contractor is responsible to the Owner for the acts and omissions of his/her subcontractors, and of their direct and indirect employees, to the same extent as he/she is responsible for the acts and omissions of his/her employees. The Contract Documents shall not be construed as creating any contractual relation between any subcontractor and the Owner. The Contractor shall bind every subcontractor by the terms of the Contract Documents.

4.21 **Work During an Emergency**: The Contractor shall perform any work and shall furnish and install any materials and equipment necessary during an emergency endangering life or property. In all cases, he/she shall notify the Engineer of the emergency as soon as practicable, but he/she shall not wait for instructions before proceeding to properly protect both life and property.

4.22 **Oral Agreements**: No oral order, objection, claim or notice by any party to the others shall affect or modify any of the terms or obligations contained in any of the Contract Documents, nor shall any of the provisions of the Contract Documents be held to be waived or modified by reason of any act whatsoever, other than by a definitely agreed upon waiver or modification in writing.

MATERIALS AND WORKMANSHIP

5.1 **Materials Furnished by the Contractor**: All materials used in the work shall meet the requirements of the respective Specifications and no material shall be used until it has been approved by the Engineer. All materials not otherwise specifically indicated shall be furnished by the Contractor.

5.2 **Materials Furnished by the Owner**: Materials specifically indicated shall be furnished by the Owner. The fact that the Owner is to furnish material is conclusive evidence of its acceptability for the purpose intended and the Contractor may continue to use it until otherwise directed. If the Contractor discovers any defect in material furnished by the Owner, he/she shall notify the Engineer. The Contractor shall be responsible for material loss or damage after receipt of Owner-furnished material.

5.3 **Storage of Materials**: Materials shall be so stored as to insure the preservation of their quality and fitness for the work. When considered necessary, they shall be placed on wooden platforms or other hard, clean surfaces and not on the ground and/or they shall be placed under cover. Stored materials shall be located so as to facilitate prompt inspection. Private property shall not be used for storage purposes without the written permission of the Owner or leasee of the property.

5.4 **Character of Workers**: The Contractor shall at all times be responsible for the conduct and discipline of his/her employees and/or any subcontractor or persons employed by subcontractors. All workers shall have sufficient knowledge, skill, and experience to properly perform the work assigned to them.

5.5 **Rejected Work and Materials**: All materials which do not conform to the requirements of the Contract Documents, are not equal to samples approved by the Engineer, or are, in any way, unsatisfactory or unsuited to the purpose for which they are intended, shall be rejected. Any defective work whether the result of poor workmanship, use of defective materials, damage through carelessness or any other cause, shall be removed within ten (10) days after written notice is given by the Engineer and the work shall be re-executed by the Contractor. The fact that the Engineer may have previously overlooked such defective work shall not constitute an acceptance of any part of it.

a. Should the Contractor fail to remove rejected work or materials within ten (10) days after written notice to do so, the Owner may remove and store the materials.
b. Correction of Faulty Work After Final Payment shall be in accordance with Paragraph 8.19.

5.6 **Manufacturer's Directions**: Manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned and conditioned by the Contractor as directed by the Manufacturer unless specified to the contrary.

5.7 **Cutting and Patching**: The Contractor shall do all necessary cutting and patching of the work that may be required to properly receive the work of the various trades or as required by the contract documents to complete the structure. The Contractor shall restore all such cut or patched work as directed by the Engineer.

5.8 **Restoration of Site**: The Contractor shall remove from the Owner's property and from all public and private property all temporary structures, rubbish, and waste materials resulting from the construction operations. The Contractor shall remove all surplus materials leaving the site smooth, clean and true to line and grade. Upon failure to do so within seventy-two (72) hours after request by the Engineer, the work may be done by the Owner and the cost thereof be charged to the Contractor and deducted from the final payment.

5.9 **Guarantee**: The Contractor shall guarantee all work and material against all defects for the period specified in the Bond Form or Special Provisions. The Contractor shall repair or replace any such defective work and/or material to conform to the provisions of this Contract and without expense to the Owner within (10) days after notification in writing by the Owner of such defective work or material. If the Contractor shall not have made such repairs or replacements or have made arrangements for the correction thereof within the period specified above, the Owner shall do so and shall charge the cost of same to the Contractor. The Contractor shall perform the work so as to cause the Owner a minimum of inconvenience and interruption of services.

INSURANCE, LEGAL RESPONSIBILITY AND PUBLIC SAFTEY

6.1 **Insurance**: The Contractor shall secure and maintain such insurance from an insurance company authorized to write casualty insurance in the State where the work is located as will protect the Contractor and subcontractors, and which shall indemnify and save harmless the Owner and the Engineer and their officers, agents and employees from and against all claims for bodily injury, death or property damage which may arise from the Contractor's operations under this contract. The insurance shall be in effect whether such operations be by the Contractor or any subcontractor or by anyone directly or indirectly employed by the Contractor and subcontractor. Said insurance shall be provided by an insurance company having an A.M. Best rating of "A" or better.

Each insurance policy shall contain a clause providing that it shall not be cancelled by the insurance company, nor shall the limits be reduced, without thirty (30) days written notice to the Owner and the Engineer of intention to cancel. The amounts of such insurance shall be not less than the following:

a. Workers' Compensation - A standard workers' compensation policy approved for use in the state in which the work is to be completed shall be issued with the following coverages.

   1. Statutory Benefits covering all employees injured on the job by accident or disease.

   2. Employer's Liability Insurance with the following limits:

(a)	Bodily injury by accident	$	500,000	each accident
(b)	Bodily injury by disease	$	500,000	each accident
(c)	Bodily injury by disease	$	500,000	policy limit

   3. Waiver of Subrogation in favor of the Owner and Engineer.

   4. Applicable Federal insurance coverages when required.

b. Commercial General Liability Insurance with the minimum limits shown below covering claims for damages because of bodily injury, personal injury, or damage to property which occur on the premises under contract or arise out of the operations in performance of the contract.

1.	General Aggregate Limit	$	2,000,000
2.	Products' Completed Operations Aggregate Limit	$	2,000,000
3.	Personal and Advertising Injury Limit	$	1,000,000
4.	Each Occurrence Limit	$	1,000,000

5. Fire Damage Limit (any one fire) $ 50,000

6. Medical Damage Limit (any one person) $ 5,000

The above insurance must include the following features:

1. Coverage for all premises and operations.

2. Personal and Advertising injury.

3. Operations by independent contractors or subcontractors.

4. Coverage for demolition of any building or structure, collapse, explosion, blasting, excavation, and damage to property below the surface of the ground (XCU coverage).

5. Inclusion of the Owner and Engineer as an additional insured on the Commercial General Liability Insurance on a primary and non-contributory basis.

6. Waiver of Subrogation in favor of the Owner and Engineer.

7. If the policy is a claims-made policy, coverage shall remain in effect for a period of two (2) years after the project is complete.

8. The policy shall not contain a total or absolute pollution exclusion. Coverage shall be provided for pollution exposures arising from products and completed operations. Pollution coverage limits shall be $1,000,000.

c. Automobile Liability Insurance covering all owned, non-owned, hired and leased vehicles with a minimum combined single limit of $1,000,000 per accident covering claims for damages because of bodily injury, personal injury, or damage to property which arise out of operations in performance of the contract.

d. Railroad Protective Liability Insurance if required by the Owner in the Special Provisions or by an affected railroad. The Contractor shall procure and maintain Railroad Protective Liability Insurance naming the railroad as the insured with minimum limit for bodily injury and property damage liability of $2,000,000 per occurrence, $6,000,000 aggregate, or with such other limits as the railroad shall require. The original of said Policy shall be furnished to the railroad and a certified copy of said Policy shall be furnished to the Owner prior to any construction or entry upon the railroad premises by the Contractor.

e. Umbrella/Excess Insurance - At the Contractor's option, the limits specified in Section 6.1, a, b and c may be satisfied with a combination of primary and Umbrella/Excess Insurance. Umbrella Insurance shall be in the minimum amount of $2,000,000.

f. Builder's Risk Insurance (Property Insurance) - Unless otherwise provided in the Special Provisions, the Contractor shall purchase and maintain Builder's Risk Insurance in the amount of the initial contract amount. Such insurance shall allow for partial utilization of the work by the Owner and shall be maintained until final acceptance of the work by the Owner.

Builder's Risk Insurance shall be on an all-risk policy form and shall insure against the perils of fire and extended coverage and physical loss or damage including, without duplication of coverage, flood and earthquake, theft, vandalism, malicious mischief, collapse, falsework, temporary buildings, debris removal, materials and equipment in transit, materials and equipment stored at the site or another location approved by the Owner.

Testing and startup services shall be included or the Contractor shall notify the Owner in writing forty eight (48) hours prior to testing or startup so the Owner can ensure that Boiler and Machinery coverage is in place.

g. Proof of Insurance - The Contractor shall, prior to the Owner's approval and execution of the contract, provide to the Owner a certificate(s) of insurance documenting all required insurance coverages as required in this Section 6.1, utilizing the ACORD certificate form, or equivalent form.

Copies of additional insured endorsements and waivers of subrogation shall also be provided with the certificate of insurance.

6.3 **Performance Bond**: The Contractor shall, at the time of execution of the Contract, furnish a corporate surety bond in the sum equal to the Contract Amount. The form of the bond shall be as the Owner may approve and with a Surety Company authorized to do business in the State where the work is located.

6.4 **Maintenance Bond**: The Contractor shall, at the time of execution of the Contract, furnish a corporate surety bond whereby the Contractor agrees to maintain the work for the time specified in the Contract Documents. The maintenance shall cover all repairs and replacements made necessary by defects in materials and workmanship. The form of the bond shall be as the Owner may approve and with a Surety Company authorized to do business in the State where the work is located.

6.5 **Payment Bond**: When required in the Contract Documents, the Contractor shall, at the time of execution of the contract, furnish a corporate surety bond in the sum equal to the Contract Amount. The form of the bond shall be as the Owner may approve and with a Surety Company authorized to do business in the State where the work is located.

6.6 **Patents and Royalties**: If any design, device, material or process covered by letters of patent or copyright is used by the Contractor, he/she shall provide for such use by legal agreement with the owner of the patent or a duly authorized licensee of such owner and shall save harmless the Owner from any and all loss or expense on account thereof, including its use by the Owner.

6.7 **Permits**: All temporary permits and licenses necessary for the prosecution of the work shall be secured by the Contractor.

6.8 **Laws to be Observed**: The Contractor shall give all notices and shall comply with all applicable Federal, State and local laws, ordinances and regulations in any manner affecting the conduct of the work; with all such orders and decrees as exist or may be enacted by bodies or tribunals having any jurisdiction or authority over the work; and shall indemnify and save harmless the Owner against any claim or liability arising from, or based on, the violation of any such law, ordinance, regulation, order or decree.

6.9 **Warning Signs and Barricades**: The Contractor shall provide adequate signs, barricades, fencing, lights and watchperson and take all necessary precautions for the protection of the work and the safety of the public.

6.10 **Public Safety and Convenience**: The Contractor shall at all times conduct the work so as to insure the least possible obstruction to traffic and inconvenience to the general public and the residents in the vicinity of the work, and to insure the protection of persons and property in a manner satisfactory to the Engineer. No road or street shall be closed to the public except with the permission of the Engineer and proper governmental authority. Fire hydrants on or adjacent to the work shall be kept accessible to fire-fighting equipment at all times. Temporary provisions shall be made by the Contractor to insure the use of sidewalks and the proper functioning of all gutters, sewer inlets, drainage ditches and irrigation ditches, which shall not be obstructed except as approved by the Engineer.

6.11 **Crossing Utilities**: When new construction crosses highways, railroads, streets or utilities under the jurisdiction of State, County, City or other public agency, public utility or private entity, the Contractor shall secure written permission from the proper authority before executing such new construction. A copy of this written permission must be filed with the Owner before any work is done. The Contractor will be required to furnish a release from the proper authority before final acceptance of the work.

6.12 **Sanitary Provisions**: The Contractor shall provide and maintain such sanitary accommodations for the use of his/her employees and those of subcontractors as may be necessary to comply with local and State health requirements and regulations.

6.13 **Use of Explosives**: Blasting will not be permitted in any case without specific approval of the Owner and then only under such restrictions as may be required by the proper authorities and only when the Contractor has adequate blasting insurance in force.

When the use of explosives is necessary for the prosecution of the work, the Contractor shall use the utmost care so as not to endanger life or property, cause slides or disturb the materials outside the neat lines of the cross section.

Blasting shall be completed in the vicinity of new structures before construction on such structures is undertaken. All explosives shall be stored in a secure manner and place in compliance with local laws and ordinances and all such storage places shall be clearly marked "Dangerous - Explosives". No explosive shall be left in an unprotected manner along or adjacent to any existing roadway or public place.

PROGRESS AND COMPLETION OF THE WORK

7.1 **Notice to Proceed**: Following the execution of the Contract by the Owner, written Notice to Proceed with the work shall be given to the Contractor. The Contractor shall begin and shall prosecute the work regularly and uninterruptedly thereafter (unless otherwise directed in writing by the Owner) with such effort as to secure the completion of the work within the time stated in the Contract Documents.

7.2 **Schedule of Completion**: The Contractor shall submit, at such times as may be reasonably requested by the Engineer, schedules which shall show the order in which the Contractor proposes to carry on the work. Said schedules shall include dates at which the Contractor will start the several parts of work and estimated dates of completion of the several parts.

7.3 **Changes in the Work**: The Owner may, as the need arises, order changes in the work through additions, deletions or modifications without invalidating the Contract. Compensation and time of completion affected by the change shall be adjusted at the time of ordering such changes.

7.4 **Extra Work**: New and unforeseen items of work found to be necessary and which cannot be covered by any item or combination of items for which there is a Contract price, shall be classed as Extra Work. The Contractor shall do such Extra Work and furnish such materials as may be required for the proper completion or construction of the whole work contemplated upon written order from the Engineer. In the absence of such written order, no claim for Extra Work shall be considered. Extra Work shall be performed in accordance with these Specifications where applicable and work not covered by the Specifications or Special Provisions shall be done in accordance with the best practice as approved by the Engineer. Extra Work required in an emergency to protect life and property shall be performed by the Contractor as required.

7.5 **Extension of Contract Time**: A delay beyond the Contractor's control occasioned by an Act of God, or act or omission on the part of the Owner or by strikes, lockouts, fire, etc. may entitle the Contractor to an extension of time in which to complete the work as determined by the Engineer. The Contractor shall immediately give written notice to the Engineer and Owner of the cause of such delay.

7.6 **Use of Completed Portions**: The Owner shall have the right to take possession of and use any completed or partially completed portions of the work, notwithstanding that the time for completing the entire work or such portions may not have expired. Taking possession and use shall not be deemed an acceptance of any work not completed in accordance with the Contract Documents. If such prior use increases the cost of or delays the completion of uncompleted work or causes refinishing of completed work, the Contractor shall be entitled to such extra compensation or extension of time or both, as the Engineer may determine.

MEASUREMENT AND PAYMENT

8.1 **Detailed Breakdown of Contract Amount**: Except in cases where unit prices form the basis for payment under the Contract, the Contractor shall submit a complete breakdown of the Contract Amount showing the value assigned to each part of the work. Upon approval of the breakdown of the Contract Amount by the Engineer, it shall be used as the basis for all Requests for Payment.

8.2 **Progress Payments**: Where the project financing permits, the Contractor shall be entitled to monthly progress payments corresponding to the stage of the work. Progress estimates will be prepared by the Contractor not later than thirty (30) days after commencing work and every thirty (30) days thereafter, if so entitled, for the duration of the construction. These progress payments shall be based upon an approximate estimate of quantities of work completed and considered acceptable multiplied by the unit prices established in the Contract.

Cost of materials, properly stored, protected and insured at the site of work will be paid on monthly estimates only for the specific materials listed therein for partial payment. In preparing the monthly estimates, advancement will be made therein for ninety percent of the cost of such materials, as evidenced by invoices to the Contractor. All materials must conform to the requirements of the Specifications; however, advancement for materials will not constitute acceptance and any faulty material will be condemned although advancement may have been made for same in the estimates. Deductions at the same rates and equal in amount to the advancements will be made on the estimates as the material is used.

Quantities used for progress estimates shall be considered only as approximate and provisional and shall be subject to recalculations, adjustment and correction by the Engineer in subsequent progress estimates and in final estimates. Inclusion of any quantities in progress estimates, or failure to disapprove the work at the time of progress estimate, shall not be construed as acceptance of the corresponding work or materials.

Payment of the retained percentage shall be withheld for a period consistent with applicable state law following the final acceptance by the Owner and shall be paid to the Contractor at the expiration of said time period in event no claims, as provided by law, have been filed against such funds. In the event such claims are filed, the Contractor shall be paid such retained percentages less an amount sufficient to pay any such claims, together with a sum sufficient to pay the cost of such action and to cover attorney fees.

8.3 **Engineer's Action on a Request for Payment**: Within ten (10) days of submission of the Request for Payment by the Contractor, the Engineer shall:

a. Approve the Request for Payment as submitted.

b. Approve such other amount as he/she shall decide is due the Contractor, informing the Contractor in writing of the reasons for approving the amended amount.

c. Withhold the Request for Payment, informing the Contractor in writing of the reasons for withholding it.

8.4 **Owner's Action on an Approved Request for Payment**: Within thirty (30) days, when monthly payments are specified, from the date of approval of a Request for Payment by the Engineer, the Owner shall:

a. Pay the Request for Payment as approved.

b. Withhold payment in accordance with Paragraph 8.5 informing the Contractor and the Engineer in writing of the reasons for withholding payment.

c. Withhold any payment in accordance with statutory requirements.

8.5 **Owner's Right to Withhold Payment of an Approved Request for Payment**: The Owner may withhold payment in whole or in part on an approved Request for Payment to the extent necessary to protect him/her from loss for any of the following causes discovered subsequent to approval of a Request for Payment by the Engineer.

a. Defective work.

b. Evidence indicating the probable filing of claims by other parties against the Contractor.

c. Failure of the Contractor to make payments to subcontractors, material suppliers or labor.

d. Damage to another contractor.

e. Conflict with legal requirements.

8.6 **Interest on Unpaid Requests for Payment**: Should the Owner fail to pay, unless otherwise regulated by statute, an approved Request for Payment within sixty (60) days from the date of approval by the Engineer, and should he/she fail to inform the Engineer and the Contractor in writing of the reasons for withholding payment, the Owner shall pay the Contractor interest on the amount of the Request for Payment at the rate of six percent (6%) per annum until payment is made.

8.7 **Responsibility of the Contractor**: Unless specifically noted otherwise, the Contractor shall furnish all materials and services and perform all the work described by the Contract Documents and complete said work within the time specified plus any additional time extensions that might be granted by the Owner.

Should the Contractor fail to complete the work within the time specified, he/she shall pay the Owner all extra cost for engineering and observation, as evidenced by suitable vouchers, and such damages as may be shown to have been incurred by the Owner due to failure to complete the work within the time limit.

8.8 **Payment for Uncorrected Work**: Should the Engineer direct the Contractor not to correct work that has been damaged or that was not performed in accordance with the Contract Documents, an equitable deduction from the Contract Amount shall be made to compensate the Owner for the uncorrected work.

8.9 **Payment for Rejected Work and Materials**: The removal of work and materials rejected and the re-execution of acceptable work by the Contractor shall be at the expense of the Contractor and he/she shall pay the cost of replacing the work of other contractors destroyed or damaged by the removal of the rejected work or materials and subsequent replacement of acceptable work.

a. Removal of rejected work or materials and storage of materials by the Owner shall be paid by the Contractor within thirty (30) days after written notice to pay is given by the Owner. If the Contractor does not pay the expenses of such removal and after ten (10) days' written notice being given by the Owner of his/her intent to sell the materials, the Owner may sell the materials at auction or at private sale and shall pay to the Contractor the net proceeds therefrom after deducting all the costs and expenses that should have been borne by the Contractor.

8.10 **Payments for Extra Work**: Written notice of claims for payments for Extra Work shall be given by the Contractor within ten (10) days after receipt of instructions from the Engineer to proceed with the Extra Work and also before any work is commenced except in emergency endangering life or property. No claim shall be valid unless so made. In all cases, the Contractor's itemized estimate sheets showing all labor and material shall be submitted to the Engineer. The order for Extra Work shall specify any extension of the Contract Time and one of the following methods of payment:

a. Unit prices or combinations of unit prices which formed the basis of the original Contract.

b. A lump sum based on the Contractor's estimate, approved by the Engineer and accepted by the Owner.

c. Actual cost plus 10% for overhead and profit.

8.11 **Payment for Work Suspended by the Owner**: If the work or any part thereof shall be suspended by the Owner and abandoned by the Contractor, the Contractor will be entitled to payment for all work done on the portions so abandoned, plus 10% of the value of the abandoned work to compensate for overhead, plant expense, and anticipated profit.

8.12 **Payment for Work by the Owner**: The cost of the work performed by the Owner in removing construction equipment, tools and supplies and in correcting deficiencies shall be paid by the Contractor.

8.13 **Payment for Work by the Owner Following His/Her Termination of the Contract**: Upon termination of the Contract by the Owner, no further payments shall be due the Contractor until the work is completed. If the unpaid balance of the Contract Amount shall exceed the cost of completing the work, including all overhead costs, the excess shall be paid to the Contractor. If the cost of completing the work shall exceed the unpaid balance, the Contractor shall pay the difference to the Owner. The cost incurred by the Owner, as herein provided, and the damage incurred through the Contractor's default, shall be certified by the Owner and approved by the Engineer.

8.14 **Payment for Work Terminated by the Contractor**: Upon suspension of the work or termination of the Contract by the Contractor, the Contractor shall recover payment from the Owner for the work performed, plus loss on plant and materials, plus established profit and damages, as approved by the Engineer.

8.15 **Payment for Samples and Testing of Materials**: Samples shall be furnished by the Contractor at his/her expense.

a. Initial testing of samples and materials furnished shall be arranged and paid for by the Owner. Subsequent testing due to failed tests shall be paid for by the Contractor.

8.16 **Acceptance and Final Payment**: When the Contractor has completed the work in accordance with the terms of the Contract Documents, the Engineer shall state his/her acceptance to the Owner and his/her approval of the Contractor's Final Request for Payment, which shall be the Contract Amount plus all approved additions less all approved deductions and less previous payments made. After acceptance of the work by the Owner, the Owner shall release the Contractor, except as to the conditions of the Bonds, any legal rights of the Owner, required guarantees, and Correction of Faulty Work after Final Payment, and shall authorize payment of the Contractor's final Request for Payment. The Contractor must allow sufficient time between the time of completion of the work and approval of the final Request for Payment for the Engineer to assemble and check the necessary data.

8.17 **Termination of Contractor's Responsibility:** The Contract will be considered complete when all work has been finished, the final review made by the Engineer, and the project accepted in writing by the Owner. The Contractor's responsibility shall then cease, except as set forth in these Contract Documents.

8.18 **Correction of Work After Final Payment**: The approval of the final Request for Payment by the Engineer and the making of the final payment by the Owner to the Contractor shall not relieve the Contractor of responsibility for faulty materials or workmanship. The Owner shall promptly give notice of faulty materials or workmanship and the Contractor shall promptly replace any such defect, discovered within the time stated in the Maintenance Bond, from the date of written acceptance of the work. The Engineer shall decide all questions arising under this paragraph.

8.19 **No Waiver of Legal Rights**: Should an error be discovered in or payment of unauthorized work be made by the final estimate or should dishonesty on the part of the Contractor be discovered in the work, the Owner reserves the right, after the final payment has been made, to claim and recover by process of law such sums as may be sufficient to correct the error, to recover the overpayment, or to make good the defects in the work resulting from the Contractor's dishonesty.

Revised 07/14

DIVISION 1 - SPECIAL PROVISIONS

SECTION 01100 SPECIAL CONDITIONS

PART 1: GENERAL

1.0 Continuity of Existing Operations – WWTP

The Contractor shall maintain the operation of the existing treatment plant system at all times. Temporary pumping and piping shall be the Contractor's responsibility. Under no circumstances will the Contractor be allowed to bypass raw wastewater to the outfall sewer. Short-term shutdowns of individual treatment units shall be coordinated with the Owner.

In addition to what is noted on the plans, the Contractor should note the following items while developing the planned sequence of construction (a suggested sequence of construction is included at the end of this specification section for reference):

1. Temporary pumping, bypass piping, temporary wiring, and all other items are the responsibility of the Contractor.

2. Contractor shall coordinate any and all work affecting shutdowns of individual treatment units with Owner a minimum of 48 hours prior to construction.

3. Prior to demolition of the belt filter press equipment, Contractor shall coordinate with the Owner on their aerobic digester biosolids inventory such that the Owner is not required to waste solids from the digesters to the belt filter press during construction.

4. Contractor shall have the screw press and conveyor equipment, piping, valves, and fittings onsite prior to any demolition activities to minimize down time of the Owner's biosolids handling system.

1.1 Soil Conditions

The Contractor shall accept the existing soil conditions at the site and shall make the excavations required in the Plans and Specifications. Structural or piping changes required by unforeseen soil conditions will be compensated for as provided by the extra work provisions of the Specifications.

Bidders are invited to make any soil borings or site determinations, which they deem necessary for preparation of their bids and proper execution of the Contract requirements.

1.2 Investigation of the Site and Oral Agreements

The Contractor shall investigate the nature and location of the work, the general and local conditions including but not limited to existing electrical distribution and other utilities, transportation, disposal, handling, and storage of materials, availability of labor, water, electric power, fuel, roads and uncertainties of weather, ground water table or other physical conditions at the site, the conformation and condition of the ground, the character, quality and quantity of surface and subsurface materials to be encountered and the character of equipment and facilities needed prior to and during the prosecution of the work. The Contractor's failure to properly conduct such investigation shall not relieve him/her from the responsibility for performing the work for the Contract Sum.

No oral agreement or conversation with any officer, agent or employee of the Owner or the Engineer, either before or after the execution of this contract, shall effect or modify any of the terms or obligations contained in the Contract Documents.

1.3 Temporary Power and Water

All electricity and water required for and in connection with the work to be done under this Contract will be furnished by the Owner in the vicinity of the site without charge to the Contractor, provided:

The Contractor shall procure electricity and water in the location and manner designated by the Engineer and Owner.

The Contractor, at his/her own expense, shall make authorized connections and provide means for delivering electricity and water to the site.

The Contractor shall prevent waste and needless use of electricity and water.

1.4 Legal Plats and Construction Layout

The Owner will furnish all legal plats describing the construction area, if required, and the Contractor shall, immediately upon entering the project site for the purpose of beginning work, locate reference points and survey monuments and take such actions as are necessary to prevent their destruction. The Contractor shall verify existing conditions shown on the drawings before constructing any work and shall correct without additional charge to the Owner any defects in the work resulting from his failure to perform this verification.

The Contractor shall at his/her own expense lay out the work which shall include responsibility for all lines, elevations and measurements of buildings, grading, paving, utilities and other work executed by him/her under the Contract. The Contractor shall verify existing conditions shown on the drawings before laying out any work and shall correct without additional charge to the Owner any defects in the work resulting from his/her failure to perform this verification. The Owner will furnish horizontal and vertical control sufficient to use as a basis for staking the project. This will consist of one or

more benchmarks and one or more base lines.

If, in the course of construction, survey monuments are destroyed, the Contractor shall be held responsible for replacement. If replacement is necessary, the Contractor shall, prior to final payment, obtain the services of a licensed surveyor who shall reestablish all such monuments with reference at no cost to the Owner.

The Contractor shall indemnify and hold harmless the Owner and Engineer from liability of any kind arising from any use, trespass, or damage occasioned, in whole or in part, by his/her operation on premises of a third person.

1.5 Access

Representatives of the Iowa Department of Natural Resources and the U.S. Environmental Protection Agency shall have access to the project whenever it is in preparation or progress, and the Contractor shall provide proper facilities for such access and inspection.

Access to the project site shall be by Walworth Ave. No other site access restrictions.

1.6 Schedule and Sequence of Construction

Within fourteen days after issuance of the Notice to Proceed, the Contractor shall submit to the Engineer a balanced breakdown of the Contract Amount showing the value assigned to each part of the project. Upon approval of the Contract Amount by the Engineer, the breakdown will be used as the basis for all Requests for Payment.

The Contractor shall also submit to the Engineer at or before the Preconstruction Conference a planned sequence of construction, indicating the order and approximate dates of initiation and completion of each element of the project. The Contractor shall coordinate work to minimize the amount of time the solids handling system is out of service during the switchover.

1.7 Observation and Testing

All work performed and all material and equipment furnished by the Contractor shall strictly conform to the drawings and specifications. Competent labor, mechanics, and tradesmen shall be used on all work.

The acceptance at any time of the materials by or in behalf of the Owner shall not bar the Owner from future rejection if they are subsequently found to be defective or inferior in quality or uniformity to the material specified.

Whenever the Engineer shall reject any material, such material shall be removed at once from the line of work at the Contractor's expense, and shall not be brought back.

The Engineer shall have the right to observe and witness routine testing of all work and

materials covered by the specifications. He/she shall have the right to review the manner in which special or requested tests are conducted.

The Contractor will obtain a Testing Laboratory and pay for soil investigation and tests including soil proctors and density tests, which meet the specification requirements. The Contractor will also obtain a Testing Laboratory and pay for satisfactory compression and/or flexural tests on concrete specimens made by the Testing Laboratory from materials furnished by the Contractor. Three cylinders shall be tested for compressive strength for each 100 cubic yards of concrete poured. For volumes of concrete under 100 cubic yards, a minimum of three cylinders shall be tested for each pour. Air content, slump and temperature shall be recorded for all concrete samples taken by the contractor. The Contractor shall pay for all of the above tests and any additional testing where the soil densities or the concrete specimens fail to comply with specification requirements. The Contractor shall pay for the cost of any re-testing by coring of hardened concrete required because of failure of original tests. No separate payment will be made to the Contractor for such testing as such costs shall be considered subsidiary to work for which payment is made. If, however, in the event that personnel from the Testing Laboratory are not on the job site during the placing of concrete, then it shall be the CONTRACTOR'S responsibility to obtain and store concrete test specimens, made at the job site, for delivery to the Testing Laboratory. No concrete shall be placed unless said test specimens are made. All other tests required to be performed by the Specifications shall be performed by an approved independent Testing Laboratory and the cost thereof shall be paid by the Contractor unless otherwise specifically stated in the Specifications.

Work rejected by the Engineer shall be replaced with acceptable work at the expense of the Contractor.

Any inspections, tests or approval of waiver of tests shall not in any way relieve the Contractor of full responsibility for furnishing apparatus, equipment and all materials meeting the guaranteed performance and requirements of the Contract.

Payment for observation and testing items listed here shall be incidental to sitework.

1.8 Materials and Equipment

All materials and equipment shall be new and unused unless otherwise specified, shall be of good quality, free from faults and defects, and shall meet or exceed the requirements of the specifications.

1.9 Cross References

The cross references listed in several Sections of these Specifications shall be used as a general guide only and shall not determine or limit the extent of the work required by the balance of the Specifications or Drawings.

1.10 Iowa Department of Transportation Standard Specifications

When work is specified to comply with Iowa Department of Transportation (IDOT) "Standard Specifications for Highway and Bridge Construction" (IA) the latest edition of all standards shall apply, except that the Contractor will be solely responsible for the means, methods, techniques, sequences, procedures of construction, safety requirements and first aid requirements and any portion of said Standard Specification which infer otherwise shall be disregarded. The Contractor shall be responsible to see that the finished work complies accurately with the Contract Documents. Copies of said specifications may be obtained from the Iowa Department of Transportation.

1.11 Applicable Codes and Regulations

All work shall conform to the requirements of all National, State or local laws, ordinances, building codes or other regulations that are in effect at the place of work.

1.12 Shop Drawings and Samples

Refer to General Conditions Section 3.9 for submittal requirements.

The following list of submittal items is not intended to be all-inclusive but rather to be a list of major equipment items which require submittals.

A. Coating systems
B. Process pumping units
C. Screw press and conveyor equipment
D. Large bubble biosolids mixing system
E. Yard and process piping
F. Chemical feed equipment
G. Valves
H. HVAC equipment
I. HMI system software
J. Programable logic controller
K. Electrical Service Distribution equipment

1.13 Progress and Completion

The work shall be commenced and completed within the time limits stated in the Bid Announcement.

The Contract Time may be extended by the Owner in an amount equal to the time lost due to delays beyond the control of the Contractor if he/she makes a claim therefore in accordance with the General Conditions. Such delays shall include delays caused by fire, flood, labor strikes, epidemics, abnormal weather conditions, or Acts of God. A weather condition which is not more extreme than has occurred at the closest official weather recording stations in the most recent five year period will not be considered an abnormal weather condition. The term "Act of God" as used herein above shall be defined as an inevitable accident; such as an extraordinary interruption of the usual

course of events that no experience, foresight or care which might reasonably have been expected could have foreseen or guarded against it, as lightning or tornadoes.

The parties hereby agree that damages occasioned the Owner by the Contractor's failure to complete the work within the Contract time are difficult to measure. Therefore, if the Contractor does not complete all work under this Contract as required here-in above, the Contractor shall pay to the Owner the sum of Three Thousand and NO/100 Dollars ($3,000.00) per calendar day as agreed liquidated damages accrued by the Owner as a result of not having 100% use of the facilities and for administrative costs and professional services. Said payment of liquidated damages at the daily rate stated above shall continue until all work is satisfactorily completed as specified and so determined by the Engineer. The Owner shall have the right to collect the above described liquidated damages by deducting said amounts from funds payable to the Contractor or by such other means as are available. In addition to the above liquidated damages for delay in performance, the Owner reserves all rights and remedies he may have against the Contractor for breach of Contract. Time is of the essence.

1.14 Sundays, Holidays and Overtime

Any work necessary to be performed after regular working hours, on Sundays, or legal holidays, shall be performed without additional expense to the Owner. Additionally the Contractor shall reimburse the Owner for additional Engineering expenses incurred during such period of Sunday, legal holiday or after regular working hours when work is being performed.

1.15 Work in Cold Weather

During cold weather construction operations, the Contractor shall protect all work, heat materials and provide sufficient temporary heat for drying, curing and conditioning of materials.

1.16 Sales Tax, Permits, Licenses and Miscellaneous Fees

Refer to Information for Bidders section for state sales tax Information. The Contractor shall pay all sales, consumer, use and similar taxes required by the law where the work is to be performed.

The Contractor shall be responsible for obtaining all the necessary permits and licenses required by law. Any utility connection charges or other miscellaneous fees shall be paid by the Contractor.

1.17 Environmental Protection

The Contractor is required to rigorously control the work so that the environment including air, water, and land is not environmentally damaged by dust, runoff, erosion, and/or noise during the course of construction. When spoil from earthwork is stored as part of the Contract work, it will be protected by barriers or dikes to prevent erosion of spoil material and runoff of solids to any stream or other body of water. To ensure

adequate erosion and sedimentation control, the Contractor shall be familiar with the following manuals:

A. EPA-B27-2015 "Guidelines for Erosion and Sedimentation Control Planning and Implementation", (August, 1972) and

B. EPA 430/9-73-007 "Processes, Procedures and Methods to Control Pollution Resulting from all Construction Activity", (October, 1973).]

In accepting the Contract, the Contractor accepts full liability for any lawsuits brought by any person, corporation or agency as a result of environmental damage caused by the construction work.

Erosion and sediment control shall be constructed prior to the start of grading operations, and shall remain functioning until turf is re-established. Payment for erosion and sediment control shall include compensation for their maintenance and removal. This shall also include removal of all silted materials and turf establishment at erosion control locations.

Any displacement of erosion control by surface drainage shall be considered defective work. Clean up and disposal of all materials, which are carried downstream, shall be included along with other required repair work.

1.18 Historical/Archaeological

If, during the course of construction, evidence of deposits of historical or archaeological interest is found, the Contractor shall cease all operations affecting the find and shall notify the Owner who shall notify the Iowa Department of Natural Resources and the State Historic Preservation Officer, Iowa State Historical Society. No further disturbance of the deposits shall ensue until the Contractor has been notified by the Owner that he may proceed. The Owner will issue a Notice to Proceed only after the appropriate State official has surveyed the find and made a determination of value and effect and submitted such determination to Iowa Department of Natural Resources and the Owner. Compensation to the Contractor if any, for lost time or changes in construction to avoid the find, shall be determined in accordance with changed conditions or change order provisions of the specifications.

1.19 Engineer-Architect References

References to Engineer, Architect-Engineer or Architect in these contract documents are to be considered as synonymous.

1.20 Record Drawings

The Contractor shall maintain at the construction site one complete set of drawings suitably marked to show all deviations from the original set of drawings and other information as specified. Supplementary sketches shall be included, if necessary, to clearly indicate all work as constructed.

All work shall be clearly shown and the record drawings shall be satisfactory to the Owner in order to insure that adequate information is indicated to show the actual construction. One complete set of the record drawings shall be furnished to the Engineer prior to submittal of the final Application for Payment. Failure of the Contractor to maintain an up-to-date set of record drawings on the project site shall be reason to withhold payments. All underground lines shall be referenced to surface landmarks so the exact location can be determined from the record drawings.

1.21 Start-Up of Plant Improvements

All items of equipment shall be checked for proper functioning under actual operating conditions. The start-up period shall be not less than 1 day nor more than 5 days. During this period any instruction, not previously given to the Owner's personnel, shall be given by the Contractor and Equipment Suppliers. Any undelivered O & M Manuals shall be furnished at this time.

Such defects or maladjustments as may be observed during the start-up period shall be promptly corrected by the Contractor.

At all times during the start-up period, the Contractor shall be represented by an agent or agents with intimate knowledge of the project; capable and authorized to proceed with valid instructions directed to the Contractor.

Contractor shall furnish written certifications to the Engineer from all equipment suppliers that the equipment has been checked out and is in operating condition.

Refer to Division 11 for additional provisions relating to start-up of equipment.

1.22 Preconstruction Conference

Prior to commencing construction, a preconstruction conference will be held to work out the details of accomplishment of the project. Items of consideration to be discussed at the preconstruction conference include coordination with utility companies, construction priority and scheduling, quality control and any other items pertinent to successful completion of the Project. Contractor shall provide the Owner with a list of subcontractors, their foreman, and telephone numbers, as well as a planned construction schedule.

1.23 Items Incidental to the Project

Items indicated on the plans and not listed separately on the Proposal Form shall be included in the construction as part of the Contractor's responsibility at no additional cost to the Owner.

1.24 Precedence Within the Specifications

Should any of the items of these Special Provisions conflict with any other items of the

Contract Documents, these Special Provisions shall govern.

1.25 Existing Utilities

The Contractor shall contact the utility companies having existing facilities in the project area to determine the exact location of their buried facilities. It shall be the Contractor's responsibility to inform, periodically, the affected utility managers of his/her operations.

The Contractor shall protect the identified facilities from damage due to his/her operations. The Contractor shall be responsible for any damage to located and identified facilities.

Utility locations shown on the plan sheets are approximate only. The Contractor shall call “One Call 1-800-292-8989” for actual utility locates prior to construction.

1.26 Protection of Work and Property

The Contractor is responsible for job-site safety and for protection of workers and the public from construction site hazards. The Contractor shall continuously maintain adequate protection of all work from damage and shall protect the Owner's property from injury or loss arising in connection with this contract.

The Contractor shall confine the work to the limits of the easements or right-of-way provided for the construction. The Contractor will be held responsible for any damages sustained to adjoining public or private property as a result of the work and shall restore and replace all such damaged property at his/her expense. Any damage to paved areas or rutting and damage to grass areas shall be restored and replaced at no additional cost to the Owner.

1.27 Removals and Excess Excavation

All removals, excess earth, pavement debris, and other materials removed for the project construction will become the property of the Contractor. The Contractor shall dispose of and/or stockpile these items in accordance with applicable laws and regulations or as otherwise directed by the Owner. Grating and stairs in the Biosolids Handling Building shall be salvaged to the Owner.

1.28 Cleanup

The term "cleanup" applies to the backfilling and compaction of trenches and related excavation, the removal of excess materials, the cleaning of streets adjacent to construction, the shaping of ditches and grassed areas, the replacement of removed driveways, sidewalks and street paving, and related work necessary to restore the construction area to its original condition and usability.

Unnecessary delay by the Contractor in cleanup may result in the suspension of further construction until such cleanup is completed.

1.29 Temporary Storage

Limited temporary storage of materials on city property adjacent to work areas may be permitted when approved by the Engineer, provided such storage does not interfere with the safety of the public or vehicular access to adjacent properties.

The Contractor may at his own risk and expense, arrange for storage of materials and equipment on private property with the approval of the Engineer.

1.30 Street Closings

The Contractor shall notify appropriate officials at least 48 hours prior to closing any streets. Warning signs and barricades shall be provided to adequately alert motorists to the closed streets.

1.31 Signs and Barricades

The Contractor shall furnish, erect and maintain all signs, barricades, fencing, etc. to adequately mark and protect the construction area. Flashing lights shall be provided for nighttime marking.

1.32 Safety and Health Requirements

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs for their employees in connection with the work. Furthermore, the Contractor is responsible to provide a safe work site for employees and/or representatives of the owner.

The Contractor shall comply with all Federal, State and local safety requirements. The Contractor shall have a current safety plan and a designated safety officer. Copies of the plan shall be made available to the Owner at the pre-construction conference.

Safety inspections will be discussed at the preconstruction conference. The Contractor's safety officer will conduct a site safety inspection prior to the beginning of the work, and the Contractor shall file a copy of the report with the Owner. The Owner may require additional safety inspections to be performed as the work progresses.

Manholes are confined spaces. Contractor is responsible for following all applicable confined space entry procedures and requirements.

1.33 Dewatering

Dewatering for this project, if required, shall be incidental to the construction. Contractor is responsible for disposal of water and all effects of dewatering, including noise caused by equipment and erosion caused by operations. Owner does not pay for erosion control structures used in dewatering operations.

1.34 Staging Area

The staging area at the project site for the Contractor shall be determined during the pre-construction conference with the Owner and Engineer.

Suggested Construction Sequencing
Anamosa WWTP

Summer 2024 / 2025

- Mobilize
- Garage Building Expansion
- Dewater and clean existing digester tank for installation of mixing equipment.
- Install mixing system equipment into the sludge holding tank including the mixing system compressors receiver tank in the adjacent building as shown on the plans.
- Install decant piping to and into the plant drainage pump station.
- Install all high-pressure air lines to the sludge holding tank.
- Install sludge piping from digester tank and make tie-in connections with the aerobic digester pump force main.
- Put digester tank into service and coordinate jar testing for polymer optimization with the thicker sludges (between 1% and 6%).
- Demolish belt filter press and controls in the biosolids building.
- Install new screw press, conveyor, and piping in the biosolids building.
- Equipment startups for new screw press, pumping, polymer system equipment.
- Optimize polymer feed and screw press system.
- Complete the chemical feed improvements and piping in the Administration Building and around the AeroMod Tanks.
- Complete the drainage pump station structural and electrical modifications.

END

DIVISION 2 – SITE WORK

SECTION 02050 DEMOLITION

PART 1: GENERAL

1.0 Scope of Work

A. The work to be performed under these specifications includes demolition and removal of the existing structures, equipment, foundations, masonry walls, utilities, piping, valves and appurtenances as shown in the plans. Contractor shall provide labor, equipment and supervision required to perform the work in accordance with all applicable ANSI/OSHA rules and regulations.

B. Related work covered elsewhere:

1. Excavation, Filling and Backfilling - Section 02200

1.1 Salvage

All salvage material is the property of the Owner who shall have the prerogative of claiming and carrying away, at the Owner's expense, any such salvage material at a time and in a manner convenient to the Contractor. Any salvage not wanted by the Owner shall be hauled away and disposed of, by the Contractor at the Contractor's expense.

1.2 Asbestos Containing Materials Contractor's Note

If any materials to be removed, disposed of or otherwise disturbed, are suspected or known to contain asbestos, DO NOT DISTURB. Contact the Owner's Representative for consultation and access to records, identification, removal, handling and disposal of asbestos containing materials. If encountered, asbestos removal will be negotiated, and payment will be processed as a change order.

PART 2: MATERIALS

2.0 Furnish temporary pumps, piping, etc. to bypass flow around the demolition area if necessary, as the work is performed.

PART 3: EXECUTION

3.0 General

Salvage materials as necessary to perform contract work specified elsewhere herein.

Buried structures and/or piping may be encountered as shown on the plans and Contractor shall remove to enable installation of site piping as specified in Division 15. Remove all portions of structures including existing below ground portions and dispose of the debris in a state certified landfill or in disposal areas that are in accordance with applicable laws and regulations.

The Contractor shall take all special precautions required to protect the public. Care shall be taken to prevent damage to the existing buildings remaining as is. Damage, if any, shall be repaired equal to the same condition as it was before the work was started. The Laws of the State in which the project is located and other Governmental Bodies applicable to Demolition Work shall, at all times, be observed.

Contractor shall restrict access to the demolition area. Protect all neighboring structures, piping and other items from damage. Any damage shall be immediately repaired to equal or better condition than original.

Disconnect any existing electrical service to items prior to demolition and/or removal of the items, and/or associated items that may also be affected.

3.1 Surface Restoration

After demolition, all surfaces shall be restored to equal or better condition than original. Contractor shall grade all disturbed areas to smooth uniform lines without clumps, clods or debris and provide fill in areas where voids remain after materials have been removed.

Any adjacent facilities damaged during demolition shall be restored to original condition by the Contractor at no expense to the Owner.

3.2 Yard Piping Removal

All yard piping noted on the plans to be removed (including below grade, regardless of cover) shall be completely removed unless otherwise noted on plans. Any remaining pipe ends shall be plugged watertight with one foot of concrete. Trenches left by the removal of such items shall be filled and compacted to match existing ground elevation. Backfilling shall be in compliance with Section 02200.

3.3 Existing Manholes and/or Concrete Structures Demolition

Demolish and dispose of existing structures noted on plans, per Item 3.0 above. All removed materials shall become the property of the Contractor and shall be disposed of by him/her in a State Certified landfill or in disposal areas that are in accordance with applicable laws and regulations.

3.4 Existing Digester Tank

Prior to demolition activities, Contractor shall dewater and clean tank, including proper disposal of any accumulated solids within the tank. Demolish all process

equipment including but not limited to digester cover and supports, mixing equipment, guiderails, miscellaneous supports, piping, fittings, and electrical boxes inside and around tank. Contractor shall protect digester walls and slab during demolition activities. Plug and seal water tight all existing process pipe penetration into tank.

3.5 Sludge Holding Tank #1 – Bid Alternate No. 1

Refer to drawings and Proposal Form for information on demo of sludge holding tank #1. These tasks are listed as a bid alternate for the project.

END

DIVISION 2 - SITE WORK

SECTION 02200 EXCAVATION, FILLING AND BACKFILLING

PART 1: GENERAL

1.0 Scope

A. This specification covers the furnishing of all labor, materials, equipment and services necessary for and incidental to the proper completion of borrow operations, excavation, filling, backfilling and grading to provide finished grades in accordance with the Plans and Specifications.

B. The requirements of Section 01100 shall apply to the work under this section.

C. Work Included:

1.1 Quality Assurance

Material testing and observation for quality assurance during earthwork operations will be provided as specified in Section 01100.

1.2 Job Conditions

A. Dust Control

1. Use all means necessary to control dust on and near work, if such dust is caused by the Contractor's operations during performance of the work or if resulting from the condition in which the Contractor leaves the site. All dust control methods will be reviewed with the Owner's Representative.

B. Protection:

1. Use all means necessary to protect all materials of this Section before, during, and after installation and to protect all objects that are to remain.

2. In the event of damage, immediately make all necessary repairs and replacements to the satisfaction of the Owner's Representative and at no additional cost to the Owner.

1.3 Standard Specifications and Standards

A. The Iowa Department of Transportation “Standard Specifications for Highway and Bridge Construction” shall apply to this work insofar as applicable and except as modified herein. The Sections for "Methods of Measurement" and "Basis of Payment" will not apply.

B. Compaction requirements stated in percentages refer to the minimum degree of compaction required in relation to the maximum dry density of the backfill material as determined in the laboratory in accordance with ASTM D-698, Standard Proctor Density.

C. The moisture content shall be within the limits of plus or minus two percent (2%) of optimum for maximum density, where required.

D. Codes and Standards

Comply with the applicable provisions of the codes and standards published by the following organizations to the extent indicated by reference thereto:

1. "American Society of Testing and Materials” (ASTM)

2. "American Association of State Highway and Transportation Officials" (AASHTO)

PART 2: PRODUCTS

2.0 Classification of Materials

A. Earth:

All materials not classified as rock include clay, silt, sand, gravel, hardpan, disintegrated shale and rock debris, junk brick, loose stones, and boulders.

B. Rock:

1. Solid deposits so firmly cemented together that their removal requires continuous use of pneumatic tools or blasting. Refer to Section 01100 for additional details regarding rock excavation.

2. Use blasting only with written permission of the Engineer. Contractor shall be responsible for any permits required for transport, storage, handling, or usage of explosives. Do not bring or store explosives on the site or use in the work without the prior written permission of all authorities having jurisdiction there-over. The Contractor shall be solely responsible for the handling, storage and use of explosive materials if and when permission as required above is obtained, and even then the Contractor's activities shall conform to the minimum requirements of the Iowa Department of Transportation.

2.1 On-Site Fill Material

A. All materials used for filling and backfilling, except crushed stone as defined under Item B below, shall be obtained from any excess excavation. Such material shall be suitable for the purpose intended and shall be capable of being compacted to the desired density. Except as noted on the plans, all fill material shall be soil, soil-gravel mixture, or soil-rock mixture which is free from organic matter and other deleterious substances; it shall contain no rocks or lumps over eight (8) inches in greatest dimension. Undesirable material shall be wasted by the Contractor at a location designated by the Owner's Representative on the construction site. Material used for fill or backfill shall not contain sticks, roots, debris or organic matter.

B. Granular Backfill material shall be composed of particles passing the No. 8 sieve or these particles in combination with coarser particles passing the 3-inch sieve with fine particles predominating so that voids between coarse particles are not likely to occur. The material shall be drainable with the portion passing the No. 200 sieve not to exceed 10 percent.

Crushed Stone shall consist of a uniform mixture of coarse and fine particles produced by crushing ledge rock, predominately limestone, dolomite or quartzite. The percentage of wear when tested according to AASHTO T 96, Grading B, shall not exceed 45. When tested, the material shall not contain more than 4% mud balls nor 6% passing the #200 sieve. The gradation shall

be: 100% passing the 3/4" sieve, 75% passing the #4 sieve, and at least 20% passing but not more than 40% passing the #8 sieve. Acceptability of material may be determined visually by the Owner's Representative.

Crushed stone for road surfacing shall be Class A Material.

C. Pea gravel material shall be composed of particles 100% passing the 1/2" sieve, at least 35% but not more than 55% passing the 3/8" sieve, and not more than 20% passing the #8 sieve. The material shall be granular material which is drainable. The percentage of wear, determined in accordance with AASHTO T 96, shall not exceed 40. Acceptability of material may be determined visually by the Owner's Representative.

2.2 Other Materials

All other materials, not specifically described but required for proper completion of the work of this Section, shall be as selected by the Contractor subject to review by the Owner's Representative.

PART 3: EXECUTION

3.0 General

A. Familiarization

Prior to all work of this Section, become thoroughly familiar with the site, the site conditions, and all portions of the work falling within this Section.

B. Backfilling prior to approvals:

1. Do not allow or cause any of the work performed or installed to be covered up or enclosed by work of this Section prior to all required reviews and tests.

2. Should any of the work be so enclosed or covered up before it has been reviewed and/or tested, the Contractor shall uncover all such work at no additional cost to the Owner.

3.1 Clearing and Grubbing

A. Clear trees, saplings, shrubs, bushes, vines, undergrowth and the like from areas required. Stumps cut to within six (6) inches of the ground line may be left in place, if they will be covered with at least two (2) feet of fill, unless specified for removal.

B. Grub all stumps and roots, larger than one (1) inch in diameter, that occur within the construction limits and interfere with construction activities. Remove stumps

and roots from areas to be excavated and where material is to be used for fill material. Remove stumps and roots within two (2) feet of new grade lines.

C. Cleared and/or grubbed materials deemed disposable by the Owner's Representative shall become the property of the Contractor and shall be disposed of by him/her. The method and location of disposal shall be reviewed by the Owner's Representative and shall be consistent with applicable laws and ordinances.

3.2 Stripping, Salvaging, and Spreading Topsoil

A. General:

1. Respread excess strippings in undisturbed areas to a uniform depth.

2. Areas where the strippings will be stockpiled will be discussed at the pre-construction conference and reviewed by the Owner's Representative and Owner.

B. Topsoiling:

1. Material

Topsoil shall be the material obtained on-site from stripping and stockpiling. During the course of stripping, stockpiling, and spreading of topsoil, the topsoil shall be protected against the admixture of foreign debris. Remove from the topsoil prior to spreading all sticks, stones, and refuse 1 inch or more in any dimension.

2. Grade verification:

Before commencing the spreading of topsoil, verify that the subgrades are at the proper elevation to accept the topsoil.

3. Time of work:

Spreading of topsoil may be from early spring to late fall when no frost exists in the ground or is likely to occur.

4. Spreading of topsoil:

a. When construction work is finished and after rough grading has settled and been reviewed, and immediately prior to finished grading, any sticks, stones, or foreign material 3 inches or greater shall be removed from the subgrade, and the surface shall be harrowed or otherwise loosened to a depth of 3 inches.

b. Topsoil shall be spread over all disturbed areas of the project site where construction activity has disturbed the natural grass

cover and shall conform smoothly to the lines, grades, and elevations shown.

5. After spreading topsoil all large stiff clods, hard lumps, roots, litter, other foreign matter, and stones larger than 1 inch in greatest dimensions shall be raked up from the topsoiled areas and removed from premises or disposed of in a manner satisfactory to the Owner's Representative. All topsoiled areas shall be raked to a smooth uniform surface.

   Topsoil shall not be spread if the topsoil or the subgrade is in a muddy condition.

3.3 Excavation

A. General

1. The Contractor shall be responsible for excavating all materials encountered and performing all earthwork required for the construction of the improvement. The excavation shall be made outside of walls as required for placement and removal of forms, installation of services and inspection.

2. Unless otherwise shown or specified, there shall be no extra payment or other charges due to the encounter of unexpected materials.

3. Surplus excavated material shall be deposited on the site by the Contractor as directed by the Owner's Representative. Any such work shall be considered incidental to the Contract and shall be accomplished by the Contractor without extra compensation.

4. If the Contractor is in doubt as to the bearing capacity of the soil at the bottom of the footings or other work, he/she shall notify the Owner's Representative before proceeding with his/her work. By failing to do this, he/she shall be responsible for any damage to the structure due to settlement.

   The Contractor shall do all shoring necessary to maintain banks or excavation or to protect property and shall be held responsible for any damage done due to failure of such.

5. The work shall be conducted so that excavations shall drain.

6. In excavated areas defined for driveway and paving construction, the excavated grade shall be scarified and recompacted in accordance with Article 3.5 of this section.

7. Depressions Resulting from Removal of Obstructions:

Where depressions result from or have resulted from the removal of surface or subsurface obstructions, open the depression to equipment working width and remove all debris and soft material as directed by the Owner's Representative.

8. Other Areas:

   a. Excavate to the grades shown on the plans.

   b. Where excavation grades are not shown on the plans, excavate as required to accommodate the installation.

   c. All final exposed borrow excavation slopes shall be no steeper than 3:1 and shall be graded to drain.

9. Overexcavation:

   Excavations for the lowest section of concrete footings, floors and foundations to be placed on the ground shall be made to exact grade and shall be undisturbed. In the event that any excavation is carried below proper grade or the grade is disturbed, the Contractor shall thicken the footing, floor or foundation or backfill with granular backfill, as noted on the plans, or as requested by the Owner's Representative at no additional cost to the Owner.

B. Rock Excavation

1. Where rock is encountered at final footing elevation under only part of a structure, the rock shall be overexcavated 12 inches below final plan elevations and backfilled with mechanically compacted excavated material to a density at least equal to that of the surrounding ground.

C. Excess Water Control

1. Unfavorable Weather:

   Do not place, spread, or roll any fill material during unfavorable weather conditions.

2. Flooding:

   Provide berms or channels to prevent flooding of subgrade; promptly remove all water collecting in depressions.

3. Softened Subgrade

   Where soil has been softened or eroded by flooding or placement during unfavorable weather, remove all damaged areas and re-compact as specified for fill and compaction below.

4. Dewatering:

a. Provide and maintain at all times during construction, ample means and devices with which to promptly remove and dispose of all water from every source entering the excavations or other parts of the work.

b. Dewater by means which will ensure dry excavations and the preservation of structures and the final lines and grades of bottoms of excavations.

3.4 Fill and Compaction in Areas Not Defined for Buildings, Driveways, Roads, Dikes, and Paving

A. Surface Preparation:

1. When fill is to be placed over the existing grade, the area shall first be stripped in accordance with Article 3.2 of this section.

2. Embankments placed on or against an existing slope shall be keyed into the natural slope. The slope shall be cut with a continuous series of steps or benches extending at least 3 feet horizontally into the natural slope. The bench under the toe of the fill shall be at least 10 feet wide horizontally.

B. Filling:

Spread fill material in layers not exceeding 8 inches in uncompacted thickness.

C. Moisture-conditioning:

Water or dry the fill material as necessary and thoroughly mix to obtain a moisture content which will permit proper compaction.

D. Earth Fill Compaction Requirements:

1. All fill, including that placed in spoil areas, shall be compacted in accordance with IDOT Specification 2107, using Type A compaction.

2. Re-spread or stockpiled topsoil shall not require compaction.

3.5 Fill and Compaction in Areas Defined For Buildings, Driveways, Roads, Dikes, and Paving

A. Surface Preparation:

When fill is to be placed over the existing grade, the area shall first be stripped in accordance with Article 3.2 of this section.

B. Filling:

Spread fill material in layers not exceeding 8 inches in uncompacted thickness.

C. Moisture-Conditioning:

1. Water or dry the fill material as necessary and thoroughly mix to obtain a moisture content which will permit proper compaction.

2. A uniform moisture content will be required throughout the layers of fill material. The moisture content shall be within plus or minus two percent (2%) of optimum for a maximum density.

D. Compaction Requirements:

1. All fill that is placed shall be constructed using moisture and density control. The compaction requirements shall be 95% Standard Proctor Density per ASTM D-698.

2. All excavated areas shall be roughened to a depth of 6 inches, scarified, and recompacted using moisture and density control. The compaction requirements shall be 98% Standard Proctor Density per ASTM D-698.

E. Filling for Subgrades

Fill required to raise subgrades for floors, platforms, etc. shall be granular backfill as described elsewhere in this specification. Placement of the fill shall be coordinated with the backfilling outside of the walls. Deposit fill in uniform layers not exceeding 6 inches in depth. Spread fill evenly over the entire area and compact by rolling, pneumatic tamping or other approved equipment.

3.6 Fill and Compaction in Areas Defined for Building and Tank Foundations

A. Foundations:

1. Overexcavate where shown on the drawings or as may be required for unsuitable soils.

2. Spread fill material in uniform layers not exceeding 8 inches in uncompacted thickness. Water or dry the fill material as necessary and mix to obtain a moisture content that will permit proper compaction.

3. Placement of the fill shall be coordinated with backfilling outside of the walls where appropriate. Compact by rolling, pneumatic tamping or other approved equipment.

B. Subgrades:

Fill required to raise subgrades for floors, platforms, etc. shall be granular backfill as described elsewhere in this specification. Placement of the fill shall be coordinated with the backfilling outside of the walls. Deposit fill in uniform layers not exceeding 6 inches in depth. Spread fill evenly over the entire area and compact by rolling, pneumatic tamping or other approved equipment.

3.7 Backfilling

A. General

Backfill shall not be placed until the forms have been removed, required surface treatments applied, excavation cleaned of all trash and debris, and the work reviewed by the Owner's Representative.

Backfill shall not be placed against the walls until they have attained sufficient strength to withstand the compacting operation and all support structures are placed and have attained sufficient strength. Compaction required within three (3) feet of any structure shall be by hand held mechanical methods.

B. Backfilling

Granular backfill material shall be placed in six-inch lifts and be mechanically compacted.

C. Backfilling in Freezing Weather

Backfilling shall not be done in freezing weather or with frozen material.

D. Backfill Under Permanent Pavement, Utilities or Walks

Where the excavation is made through permanent pavements, curbs, driveways or sidewalks or under existing utilities (where such structures are undercut by the excavation), the entire backfill to the subgrade of the structures shall be made in six-inch lifts with mechanically compacted granular backfill material.

E. Backfilling Under Proposed Pavement, Structures or Walks

Where a structure or paving is to be placed over the trench after backfilling, granular backfill material shall be placed in six-inch lifts and be mechanically compacted at optimum moisture content to 100% of Standard Proctor density.

3.8 Grading

A. General: Except as otherwise directed by the Owner's Representative, perform all grading required to attain the elevations indicated on the plans. All bulges shall be removed and all sags filled unless shown on the plans.

B. Grades on plans are finished grades. Contractor shall adjust subgrade elevations to allow for placement of topsoil on all areas that are specified to receive topsoil as outlined in Article 3.2 of this section.

C. Grading tolerances: Plus or minus 0.1 foot.

D. All finishing work shall be kept as close as possible to construction operations. The Contractor will be expected to complete erosion control work on all finished areas within five working days after completion of finishing. The Contractor will be expected to keep finishing operations current with other construction operations and to keep erosion control operations current with finishing operations near the end of the seeding period so that unfinished or finished and unseeded work in the winter season is at a minimum.

E. If the Contractor fails to maintain partly finished work in a satisfactory manner when so ordered by the Owner's Representative, all other work shall be discontinued until all finishing and maintenance work is in a satisfactory condition.

F. Treatment after completion of grading:

1. After grading is completed and the Engineer has finished his review, permit no further excavation, filling, or grading except with the authorization of the Owner's Representative.

2. Use all means necessary to prevent the erosion of freshly graded areas during construction and until such time as permanent drainage and erosion control measures have been installed.

3.9 Cleaning Up and Maintenance

A. Upon completion of the work of this section, immediately remove all debris from the site. The Contractor shall maintain the site during the process of construction up to the final acceptance of the project.

END

DIVISION 9 - FINISHES

SECTION 09900 PAINTING

PART 1: GENERAL

1.0 Scope

A. The Contractor shall furnish all materials, equipment, tools and labor necessary for the complete surface preparation and painting as shown on the drawings and/or specified.

This work includes but is not limited to the following for new construction:

1. Pumps, appurtenances, motors, metal mechanisms, equipment, and other exposed metal items.

2. Exposed piping, pipe fittings, valves, pipe hangers, supports, ductwork and electrical conduit.

3. Interior walls, ceilings, wood, metal trim, door frames, miscellaneous metals in and appurtenant to structures, and exposed interior and exterior structural steel elements.

4. Interior poured and precast concrete.

5. Exclude all stainless steel and aluminum items from painting.

A more detailed description of items to be painted is included in the painting schedule at the end of this section.

B. These specifications apply to all work scheduled except as modified below or by approved manufacturer’s paint specifications. Each paint system shall be from a single manufacturer. Paint shall be manufactured by Tnemec Co. Inc.

1.1 Quality Assurance

Container labels shall include manufacturer's name, type of paint, manufacturer's stock number, color, ingredient analysis, Federal Specification Number, instruction for reduction, if applicable, and instruction for use.

Applicator Qualifications:

1. Documentation that the Painting Contractor specializes in performing the work specified with a minimum five (5) years’ experience.

2. A list of five (5) completed projects with contact information of the same scope and size that utilized the same products specified herein.
3. A qualification letter from the Coating Manufacturer.
4. Certification that all aspects of the project will be performed on their own. Sub-Contracting any portion of the project is not allowed.
5. A letter from the Coating Manufacturer stating that the Painting Contractor's Project Foreman has been trained by the Manufacturer in the installation of the products specified herein.

1.2 Product Delivery, Storage and Handling

Materials shall be delivered in original containers with labels intact and seals unbroken. Only acceptable materials shall be stored on project site. Store in a suitable location, restricting storage to paint materials and related equipment, complying with health and fire regulations. Rectify any damage to storage area.

PART 2: PRODUCTS

2.0 Materials

All painting materials must be delivered in the original containers with seals unbroken and labels intact. All painting materials shall be pure and of the highest quality, and bear an identifying label on the container. All paints shall be from one manufacturer insofar as possible. The Contractor shall coordinate the prime coat materials and finish coat materials to insure that both are of the same manufacturer. Applying one manufacturer's finish coat over another manufacturer's prime will not be permitted.

2.1 Mixes

Deliver paints and enamels ready-mixed and factory tinted to job site.

PART 3: EXECUTION

3.0 Observation

Examine surfaces scheduled to receive paint and finishes for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into acceptable condition through preparatory work as included below. Notify Engineer and General Contractor in writing if unacceptable conditions exist. Do not proceed with surface preparation or coating application until conditions are satisfactory.

The contractor shall allow for one (1) hour during each day for observation by the Engineer or Owner's representative. During this time, the Contractor shall cease all operations and allow the Engineer to observe the work with the Contractor's foreman. In addition, the entire surface shall be observed after surface preparation and after each coat of paint is applied. The Contractor shall provide the necessary equipment and labor for use by the Engineer to access all surfaces to be observed.

3.1 Surface Preparation

A. Surfaces to be painted and floors adjacent shall be cleaned and free of loose dirt, dust and grease/oil before other surface preparation for painting is started. All surfaces shall be thoroughly clean and dry prior to coating.

B. Non-submerged metals shall be prepared in accordance with SSPC-SP6 Commercial Blast Cleaning standards. Substrate shall be clean, dry and free of contaminants.

C. Submerged metal surfaces shall be cleaned by whatever means are necessary to expose bare metal entirely free of mill scale, rust, grease, or other foreign material and field sand blasted in accordance with SSPC-SP10 Near White Blast Cleaning standards. Substrate shall be clean, dry and free of contaminants.

D. Galvanized surfaces shall be sweep-blasted and solvent washed to clean and roughen surface.

E. Non-submerged concrete, masonry, and block masonry shall be cured a minimum of 28 days prior to being coated unless specified otherwise by material supplier in writing. All poured-in-place concrete shall be sweep-blasted in accordance with SSPC-SP13 Surface Preparation of Concrete. Substrate shall be clean, dry, and free of oil, grease, and other contaminants including form release agents and laitance. The engineer may wave sweep-blasting requirements in situations where this step is not necessary to promote adhesion of the coatings.

F. Submerged concrete shall be cured a minimum of 28 days prior to being coated. All submerged concrete surfaces to be coated shall be abrasive blasted in accordance with SSPC-SP13 Surface Preparation of Concrete and manufacturer's guidelines. Substrate shall be clean, dry, and free of oil, grease, and other contaminants including form release agents and laitance.

All oil, grease, waste and chemical contaminants must be removed from the surface of the concrete prior to preparation in accordance with NACE SP0892 and SSPC-SP13/NACE No. 6. Surface preparation requirement is to expose a sound, uniform surface texture confirming to the minimum recommended ICRI-CSP.

Level or grind concrete substrates to produce a uniform and smooth surface, including removal of all sharp edges, ridges, form fins, and other concrete protrusions.

G. Ductile iron piping shall be abrasive blasted for the entire surface to be coated. Remove all tar and other coatings. The surface should turn a dull bluish-gray color. Do not blast to the extent of exposing carbon fiber. Piping should be clean, dry, and free of contaminants prior to receiving prime coat.

3.2 Protection

The Contractor shall furnish and lay drop cloths in all areas where painting is done to protect all adjacent finished surfaces from damage during the prosecution of his work and to collect all over spray, painting debris, spent sand and dust. Adequate protection of all equipment and electrical cabinets shall be provided. Under no circumstances shall water, spent sand, or debris be allowed to enter nearby equipment, electrical, or adjoining areas.

3.3 Application

A. Apply paint with suitable brushes, rollers or spraying equipment with the rate of application as recommended by the paint manufacturer for the surface involved. Keep brushes, rollers and spraying equipment clean, dry, free of contaminants and suitable for the finish required. The number of coats and thickness required shall be the same regardless of application method.

Finish coats shall be uniform in color and sheen without streaks, laps, runs, sags, holidays, or other surface imperfections. Edges of coatings adjoining other materials or other colors shall be sharp and clean without overlapping.

B. The Contractor shall meet paint manufacturer's recommendations for drying time between coats and shall not apply additional coats until the completed coating has been observed and approved by Engineer. Only observed coats of paint will be considered in determining the number of coats applied. Succeeding coats shall vary slightly in color. Sand and dust between coats to remove visible defects.

3.4 Painting Conditions

Contractor shall provide the engineer with five (5) days notice before painting begins.

Painting shall be done at such times as approved by the Engineer. All painting shall be done strictly in accordance with the manufacturer’s instructions following time and temperature requirements written into each data sheet as supplied by the manufacturer. All painting shall be performed in a manner satisfactory to the Engineer.

Coatings shall be applied in favorable painting conditions. No paint shall be applied when the surrounding air temperature or the temperature of the surface to be painted is below the minimum temperature recommended by the paint manufacturer. Paint shall not be applied to wet or damp surfaces, or when the relative humidity exceeds 85%, or when the air temperature is anticipated to be within 5 degrees of the dew point at any time before the paint has had sufficient time to cure according to manufacturer’s recommendations. Dew or moisture condensation should be anticipated, and if such conditions are prevalent, painting shall be delayed until it is certain that the surfaces are dry. It is recommended that painting be performed when the air temperature is near the water temperature in the pipes (50-55° F), thus reducing the potential for condensation. Conform to all paint manufacturers’ requirements and recommendations, which may be more restrictive than these specifications. Contractor shall be responsible, if necessary,

for providing the means to meet required favorable painting conditions listed above. Protective coating systems shall be installed when ambient air and surface temperature is above 50°F.

The substrate temperature shall be at least 5°F (3°C) above the dew point. Condition the material between 70-80°F (21-27°C) for 24 hours prior to use. Application when temperatures outside of this range will require written instruction from the Manufacturer and approval of the Engineer.

Application in direct sunlight and/or with rising surface temperatures is not allowed, as this may result in blistering of the materials due to expansion of entrapped air or moisture in the concrete. In such cases, it will be necessary to postpone the application until later in the day when the temperature of the substrate is falling. Concrete surfaces that have been in direct sunlight should be shaded for at least 24 hours prior to application. Consult the Manufacturer for application schedule guidelines specific to temperature conditions and possible sealer application recommendations to reduce outgassing.

3.5 Field Quality Control & Testing

Contractor to perform the quality control procedures listed below in conjunction with the requirements of this Section.

Surface Profile: Inspect and record substrate profile (anchor pattern). Surfaces shall be profiled, at a minimum, equal to the CSP roughness as recommended by the coating manufacturer in accordance with ICRI Guideline 310.2 and SSPC-SP13/NACE No. 6.

Surface pH Testing: The pH of the concrete substrate will be measured using pH indicating papers. The pH testing is to be performed once every 50 square feet (5 square meters). Acceptable pH values shall be a minimum 9.0 as measured using color indicating pH paper with readable color calibrations and a scale at whole numbers (minimum). Use Hydrion Insta-Check Jumbo 1-12, or equal. The paper shall be touched to the surface once using moderate gloved finger pressure. The surface shall not be wiped or moved laterally to disturb the surface during pH testing. Following the one touch, lift the paper vertically to not "wipe" the surface. Compare the color indicated with the scale provided and record the pH. Spot check any questionable areas with a 1% phenolphthalein solution. The phenolphthalein solution shall turn bright pink on concrete.

Temperature: Measure and record ambient air temperature once every two hours of each work shift using a thermometer and measure and record substrate temperature once every two hours using an infrared or other surface thermometer.

Relative Humidity and Dew Point: Measure and record relative humidity and dew point temperature every two hours of each work shift using a sling psychrometer in accordance with ASTM E 337

High-Voltage Holiday (Spark) Testing: Upon full cure, the installed lining system shall be checked by high voltage spark detection in accordance with NACE SP0188 and the Manufacturer's printed application guide to verify a pinhole-free surface. Areas which do not pass the spark detection test shall be corrected at no cost to the Owner.

3.6 Acceptance of Work

All Surface Preparation shall be approved by the Engineer or the Owner's Representative before the primer is applied. The Contractor shall request acceptance of each coat prior to the next coat application. The Contractor shall correct work that is not acceptable and then request re-inspection.

The Contractor shall submit, to the Engineer, immediately upon completion of the job, certification from the manufacturer indicating that the quantity of each coating purchased was sufficient to properly coat all surfaces. Such certification shall make reference to the square footage figures provided to the manufacturer and the Engineer by the Contractor. The Contractor shall also certify in writing that the painting was completed in accordance with the manufacturer's recommendations and these specifications.

3.7 Guarantee

The Contractor shall guarantee the painting system against any defect in material or workmanship for the period stated in the Performance and Maintenance Bond. In case any such defect should appear, the Contractor shall make any necessary repairs without charge to the Owner.

All guarantees obtained by the Contractor from the manufacturer or installer of paint shall be obtained for the benefit of the Owner.

PART 4: COLOR CODING

Colors of all piping, fittings, specialties, and valves not specified elsewhere shall be as follows or selected by the Engineer. All piping shall be color coded in accordance with recommendations of the Ten States Standards for Wastewater Facilities.

The colors are as follows:

Aluminum Sulfate	- Orange (04SF Safety Orange or equal)
Raw Sludge Line	- Brown with black bands
Sludge Recirc. Suction Line	- Brown with yellow bands
Sludge Draw-off Line	- Brown with orange bands
Sludge Recirc. Discharge Line	- Brown
Sludge Gas Line	- Orange
Natural Gas Line	- Orange with black bands
Non-potable Water Line	- Blue with black bands
Potable Water Line	- Blue
Chlorine Line	- Yellow
Sulfur Dioxide	- Yellow with red bands

Sewage Line	- Gray
Compressed Air Line	- Green
Water Lines for Heating	- Blue with 6-inch Red Bands
Digesters or Buildings	- Spaced 30" Apart
Fuel Oil / Diesel	- Red
Plumbing Drains and Vents	- Black
Polymer	- Purple

Note: Non-Potable H_2O Lines Require a Stencil Stating "Non-Potable"

The contents shall be stenciled on the piping in a contrasting color.

Colors of concrete and other metal items (non piping or equipment) shall be as selected by Owner or Engineer.

PART 5: PAINTING SCHEDULE

Paint shall be paint products of Tnemec Company, Inc., or pre-approved equal.

MAT'L. OR SURFACE TO BE PAINTED	COATS	TNEMEC COATINGS	COATING DRY FILM THICKNESS DFT (MILS)
FERROUS METALS NOT IN CONTACT WITH WATER INCLUDING STEEL, DUCTILE IRON, AND CAST IRON (GALVANIZED ITEMS TO BE PAINTED AS DIRECTED BY ENGINEER)	1st – Prime Coat	Series N69 Epoxoline	3 – 5 mils
	2nd – Primer Touch-up	Series N69 Epoxoline	
	3rd – Finish Coat	Series N69 Epoxoline	4 - 6 mils
	4th – Exterior Metal Only	Series 1074 Endura Shield II	2 – 5 mils
		Total DFT	7 – 11 mils (Interior Only)
			9 – 16 mils (Exterior Metal)
DUCTILE IRON PIPING	1st – Prime Coat	Series N69 Epoxoline	4 – 6 mils
	2nd – Primer Touch-up	Series N69 Epoxoline	
	3rd – Finish Coat	Series N69 Epoxoline	4 – 6 mils
		Total DFT	8 – 12 mils
ITEMS ABOVE WHEN COVERED BY MASONRY OR WHERE MADE INACCESSIBLE BY CONSTRUCTION	1st – Prime Coat	Series N69 Epoxoline	4 – 6 mils
	2nd – Primer Touch up	Series N69 Epoxoline	4 – 6 mils
		Total DFT	8 – 12 mils
FERROUS METALS WHICH ARE SUBMERGED OR WITHIN 1 FOOT OF THE WATER SURFACE; OR ARE IN CONTACT WITH WATER OR DIGESTER GASES (INCLUDES GALVANIZED ITEMS)	1st – Coat	Series N69 Epoxoline	4 – 6 mils
	2nd – Coat	Series N69 Epoxoline	4 – 6 mils
	3rd – Coat Finish	Series N69 Epoxoline	4 – 6 mils
		Total DFT	12 – 18 mils

MAT'L. OR SURFACE TO BE PAINTED	COATS	TNEMEC COATINGS	COATING DRY FILM THICKNESS DFT (MILS)
FIELD PAINTING OF FACTORY FINISHED EQUIPMENT	1st – Prime	Factory Applied Epoxy	3 mils
	2nd – Coat	Series 27 WB Typoxy	3 – 5 mils
	3rd – Finish Coat		
	Interior Metal	Series N69 Epoxoline	4 – 6 mils
	Exterior Metal	Series 1074 Endura Shield II	3 – 5 mils
		Total DFT	10 – 14 mils (Interior Metal)
			13 – 19 mils (Exterior Metal)
HARD COATED INSULATION CANVAS PIPE OR COVER OR INSULATION	1st – Prime Coat	Series 1029 Enduratone Semi Gloss	2 – 3 mils
	2nd – Coat	Series 1029 Enduratone Semi Gloss	2 – 3 mils
		Total DFT	4 – 6 mils
PVC AND FRP PIPE	1st – Coat	Series N69 Epoxoline	2 – 3 mils
	2nd - Coat	Series N69 Epoxoline	2 – 3 mils
		Total DFT	4 – 6 mils
INTERIOR CONCRETE AND CONCRETE MASONRY UNITS (NON-SUBMERGED INTERIOR WALLS AND CEILINGS)	1st – Surfacer	Series N69 Epoxoline	4 – 6 mils
	2nd - Coat	Series N69 Epoxoline	4 – 6 mils
		Total DFT	8 – 12 mils
SUBMERGED CONCRETE (INTERIOR OF ALL WASTE-WATER AND SLUDGE TANKS*, CHANNELS, SPLITTER BOXES, ANAEROBIC DIGESTERS, WET WELLS, ETC.)	1st – Coat	Series N69 Epoxoline	4 – 6 mils
	2nd – Coat	Series N69 Epoxoline	4 – 6 mils
	3rd - Coat	Series N69 Epoxoline	4 – 6 mils
		Total DFT	12 – 18 mils

*Locations and depth of restoration coating to be determined by Engineer in field after blasting surface preparation is completed.

Items to be painted include, but are not limited to the following schedule:

Item	Plan Sheet(s)
Biosolids Building – Existing interior walls and ceiling. Proposed piping, fittings, valves, supports.	40.P.Series Sheets
Chemical Feed Room – Existing interior walls and ceiling. Existing pipe, fittings, supports, etc. Proposed piping, fittings, and supports.	55. P. Series Sheets

END

DIVISION 11 - EQUIPMENT

SECTION 11000 GENERAL PROVISIONS

PART 1: GENERAL

1.0 Scope

These requirements shall apply to all items of equipment to be furnished and installed as part of the project.

PART 2: EQUIPMENT REQUIREMENTS

2.0 General

Each item shall be furnished complete and installed as shown on the plans and in accordance with the manufacturer's recommendations, instructions and directions. All installed equipment shall be properly protected during subsequent construction operations.

All equipment shall be placed in operation by the Contractor and all acceptance tests shall be run by the Contractor before operation of it is transferred to the Owner. Acceptance tests shall be scheduled with the Engineer to permit the observation of all tests by the Engineer. All testing equipment, fuel, supplies, etc. shall be furnished by the Contractor.

2.1 Guards

All couplings and rotating shafts shall be covered with a substantial, removable sheet metal guard or screen.

2.2 Anchor Bolts

Equipment manufacturer shall furnish all anchor bolts required to securely anchor each item of equipment. They shall be set by template and protected from misalignment by the Contractor. Equipment shall be placed on the foundations, leveled, shimmed, bolted down, and grouted in with a non-shrinking grout equal to Embeco.

2.3 Nameplate

Each piece of equipment and motor shall have a standard nameplate securely affixed in a conspicuous place, showing the serial number and name of the manufacturer. The nameplate of distributing agent only will not be acceptable.

2.4 Painting

Pumps, motors, drives, bases and equipment shall be furnished with a factory paint finish which is compatible with the paints specified elsewhere in these specifications. All equipment shall be painted as specified in Section 09900.

2.5 Manuals and Instructions

The Contractor shall furnish and turn over to the Engineer in duplicate, complete manuals fully describing the construction, operation and maintenance of each piece of equipment furnished and/or installed under this contract. A list giving the name and address of the nearest supply house carrying spare parts for all equipment shall be furnished in each manual.

Each manual shall be bound in a looseleaf binder with a plastic leather cover. Each cover shall be labeled with a typewritten label stating:

"Manual of Operating and Maintenance Instructions"
Project Name
Date
Contractor's Name
Address
Telephone Number

Inside each manual include an index sheet and manufacturer's maintenance manuals as well as approved shop drawings.

Also include copies of all wire diagrams, painting schedules and valve charts.

2.6 Bases

All major items of equipment shall be installed on concrete bases in accordance with the manufacturer's recommendations or the Engineer's plans.

2.7 Equipment Check-Out

All major items of equipment shall be checked-out by a service engineer or factory trained mechanic who shall be present at start-up to put the equipment in service. He/she shall remain in attendance until it is ascertained that the unit is functioning properly. Each check-out representative shall provide the engineer with a certificate stating what items of equipment were checked and that each item was properly installed and functioning properly.

2.8 Initial Operating Supplies

The contractor shall provide all fuel, cooling solution, lubrication, etc. for check-out of equipment and shall provide a full tank of all fuels, oil lubrication and other exhaustible supplies when the plant operation is turned over to the Owner.

2.9 Cleaning and Sterilizing

The Contractor shall clear away all debris, surplus materials, etc. resulting from his/her work, leaving the job and equipment furnished in a clean condition. Thoroughly clean all fixtures and equipment furnished, removing all plaster, paint, stickers, rust stains and other foreign matter of discolorations, leaving every part in an acceptable condition and ready for use.

END

DIVISION 11 - EQUIPMENT

SECTION 11235 CHEMICAL FEED EQUIPMENT

PART 1: GENERAL

1.0 Scope

The Contractor shall furnish and install the phosphorus removal chemical feed system as shown on the plans and as specified herein. It shall be the Contractor's responsibility to provide all necessary incidental items such as taps, transition pieces necessary for connection to the discharge piping, and all electrical work related to the chemical phosphorus removal system.

1.1 Related Work Specified Elsewhere

1. Yard and Process Piping, Gates and Valves – Section 15100
2. Electrical – Division 16

1.2 Quality Assurance

Supplier and pump manufacturer shall have installed a minimum of ten (10) chemical feed systems of similar size and application.

Chemical feed pump head and drive shall be manufactured by the same company as specified herein.

1.3 Service Conditions

All components of chemical phosphorus removal system equipment shall be suitable for continuous use with either aluminum sulfate [$Al_2(SO_4)_3$] or ferric chloride [$FeCl_3$].

The chemical feed system is intended for chemical phosphorus removal to supplement biological phosphorus removal to lower effluent total phosphorus concentrations. Chemical will be routed in tubing through conduit as shown on the drawings and will be dosed in each of the four (4) secondary aeration basins at the AeroMod tanks.

1.4 Submittals

Submit the following drawings:

A. Pump performance curve showing flow rate as a function of RPM and pressure.
B. Dimensional drawings.
C. Process schematic of chemical feed system.
D. All pipe, tubing, fittings, valves, calibration columns, and appurtenances.

E. Operating, maintenance, programming, and wiring diagrams.
F. Mounting system and other appurtenances.
G. Upon Engineer's request, provide installation list of projects with similar size and application as required in Item 1.2.

1.5 Warranty

The Manufacturer shall warrant the equipment being supplied to the owner against defects in workmanship and material under normal use, operation, and service for a minimum of three (3) years from the date of shipment or two (2) years from the date of Substantial Completion, whichever is greater.

PART 2: EQUIPMENT TO BE FURNISHED AND INSTALLED

2.0 General

The phosphorus removal system shall consist of the following:

A. Chemical metering pump(s).

B. Chemical solution tank(s).

C. All connecting piping, fittings, valves and accessories required to complete the phosphorus removal chemical feed system.

2.1 Chemical Metering Pumps

Chemical metering pumps shall be installed in the Chemical Feed Room, where shown on the plans. The metering pumps shall be Model M-2 Flexflo® as manufactured by Blue White, or pre-approved equal. The metering pumps shall be a positive displacement peristaltic type pump comprised of pumphead, self-contained variable speed drive, and flexible tubing. Pump shall be self-priming, capable of being run dry for up to 30 min. without damaging effects to the pump or tube and shall have a suction lift capability of up to 30 ft vertical water column. Pumps shall be capable of pumping both liquids and gases without vapor locking. Pumps shall not require the use of check valves, back pressure valves, suction lift valves and shall not require dynamic seals in contact with pumped fluid.

Below are the pump performance requirements:

a. Number of Feed Pumps = 5 Pumps (4 Installed on skid and 1 shelf spare as specified below)
b. Pump model shall be capable of output volumes from 0.01 to 17.2 gallons per hour.
c. Typical Minimum Pump Flow Rate = 0.30 gal/hour
d. Typical Maximum Pump Flow Rate = 4.5 gal/hour
e. Pressure = 100 psi

Pump shall include HMI interface and control. Pump head shall direct couple mount to the controller via a splined drive shaft and shall be locked in place by tool-free thumbscrews or lever mechanism. The pump head cover shall be clear, annealed acrylic thermoplastic with an integral ball bearing fitted to support the overhung load on the motor shaft. Cover shall include an imbedded magnetic safety interlock which will limit the motor rotation speed to 6 RPM when removed.

Pump head shall be sealed for leak containment. Pump shall include sensor within the pump head for leak detection. A splashguard shall be provided to prevent spray of chemicals from the pumps into space occupied by personnel. Sensor shall not come in contact with the process fluid, shall contain no moving parts, shall not depend on the capacitance of the process fluid, shall not require fluid to leak out of the pump housing for engagement, nor shall require any sensitivity or calibration adjustment.

Peristaltic pumping action is created by the compression of the flexible tube between the pumphead rollers and track, induced forward fluid displacement within the tube by the rotation of the pump rotor, and subsequent vacuum creating restitution of the tube. Each pump shall consist of a fixed track occlusion rotor assembly and integral variable speed drive. At all times, one pressing shoe or roller shall be fully engaged with the tubing providing complete compression and preventing back flow or siphoning.

Rotor assembly shall include two squeeze rollers for tubing compression located 180 degrees apart and two guide rollers that do not compress the tubing shall be located 180 degrees apart. Process fluid shall be contained within the pump tubing and shall not directly contact any rotary or metallic components. Two (2) reinforced transparent PVC flexible hoses each one meter long shall be included for connection of pump to suction and discharge process lines with two (2) polypropylene compression style connectors for connection of the interface tube to the process lines.

Pumphead rotor shall be constructed of Kynar (PVDF), sealed within the track housing, and supported by its own bearings. Peristaltic occlusion level shall be factory set to ensure flow accuracy of +/- 1% and repeatability performance of +/- 0.5% and shall not require any field adjustment. Spring-loaded or hinged rollers shall not be used.

Drive shall be reversible 1/8 hp gear motor rated for continuous duty operation, rated for a maximum speed of 130 RPM, and shall include overload protection.

Drive enclosure shall be NEMA 4X, IP66 constructed out of pressure cast aluminum with acidic liquid iron phosphate three-stage clean and coat pretreatment and exterior grade corrosion resistant polyester polyurethane powder coat. Enclosure shall house the drive motor and all control circuitry in one integrated unit. Separate VFDs and motors are not acceptable. Provide 316SS pump shelf leveling brackets.

Each pump shall be provided with a flow verification sensor to provide a scalable 4-20 mA output signal to verify chemical injection to each tank. Sensor shall be an ultrasonic transit time sensor. Wetted components shall be polyvinylidene fluoride (PVDF or Kynar), polyetheretherketone (PEEK), and Tetrafluoroethylene Propylene (TFE/P). Sensor operating range shall be 0.158 gal/hr to 79.2 gal/hr and scaled to meet the specific

project requirements. Accuracy shall be +/- 0.75% full scale. Accuracy shall be +/- 0.25% at the field calibrated setpoint.

Pump shall be 100-240 VAC powered, cord and plug connected. Pump controller shall include integral relay module and terminals to allow connection of the following interfaces to an external control system:

- Run/Stop Dry Contact Input
- Speed Command Analog Input, 4-20 mA
- Run Status, Dry Contact Output
- Alarm Digital, Dry Contact Output
- Speed Transmit Analog Output, 4-20 mA

The pumps shall be provided by the supplier as part of a metering skid as shown on the drawings with necessary appurtenances including, but not limited to, the following:

- ½" minimum polypropylene corrosive-resistant wall mounted skid.
- Pressure gauge with PVC diaphragm seal, 0-100 PSI, 2 ½" Dial, 316SS Movement, 1/4" NPT, Trerice or equal.
- Pulsation dampener, 10ci, PVC/EDPM, Blacoh or equal.
- Back Pressure / Pressure relief valve, valve shall be anti-siphon, 2-port, ½" PVC/EPDM, Field Adjustable to 150 PSI
- Calibration column with vent, 500 mL, 8GPH, PVC, Accudraw or equal.
- Full port ball valve, ½", PVC with EPDM seals, rated for 250 PSI @ 70 F, True Union or equal.
- Y-Strainers shall be PVC with EPDM O-ring Seals
- Schedule 80 PVC piping and connections
- ¼" Polyethylene chemical feed tubing

General contractor shall be responsible for connections of skid to other chemical feed equipment as necessary for a full functioning system.

A set of manufacturer-recommended spare parts shall be furnished for each pump. The following shall be provided as spare parts:

a. A spare pumphead shall be provided for each pump.
b. Contractor shall furnish one (1) complete shelf spare pump with one (1) spare pumphead.

2.2 Chemical Solution Tank(s)

A total of one (1) double wall chemical solution tanks shall be installed for aluminum sulfate. Appropriate labels should be provided for each storage tank and associated fill lines. Each tank shall have the following capacity and dimensions:

Minimum capacity: 3,500 gallons
Maximum outer diameter: 8'-6"
Maximum total height: 13'-6"

Chemical solution tanks shall be crosslinked polyethylene tanks. The tank shall be provided with a 2" bulkhead flange fitting to fill the tank including a plug. The tank shall have a side mounting opening for the metering pump skid feed line. An 18" access manway with bolt on cover shall be provided at top of the storage tank.

Level Indication: The chemical bulk tank shall be provided with a clear sight level indication assembly for determining tank level during filling and drawing operations. Assembly shall be constructed of clear PVC, easily removed for maintenance and cleaning, and shall be as shown on the drawings.

The Contractor shall provide all vent and tank fill piping and flexible connections on the pump suction line as shown on the drawings.

The tank shall be by Snyder Tanks, Assman Tanks, Poly Processing Company or equal.

2.3 Phosphorus Removal Piping, Tubing, Fittings, and Valves

A. Piping

Phosphorus removal piping shall match the size and material as shown on the plans and shall be installed neatly in vertical or horizontal runs. Frequent supports and brackets shall be used to ensure continuous alignment. The piping system shall permit chemical solution feed to treatment plant piping and/or tanks as shown on the plans.

B. Tubing

The polyethylene tubing shall be as specified herein but shall be colored to correlate to the basin being dosed as specified herein:

Second Stage Aeration Basin A – Green
Second Stage Aeration Basin B - Blue
Second Stage Aeration Basin C - Red
Second Stage Aeration Basin D - Black

C. Fittings and Valves

Fittings and valves shall be of PVC as specified herein and in accordance with Section 15100. The installation shall include all accessories such as check valves, ball valves, safety goggles, apron, gloves, and spare parts kit. Contractor to supply hose barb-to-process line adapters for connection of pump tubing to process lines. Hose barbs to be secured to the pump tubing via a hose clamp tightened around the O.D. of the tubing.

2.4 Electrical and Control Equipment

Electrical and control equipment shall be as specified in Division 16.

PART 3: EXECUTION

3.0 Installation

The equipment shall be installed properly to provide a complete working system. Installation shall follow the supplier's recommendations.

3.1 Startup

The equipment supplier shall provide the service of a qualified representative for inspection and testing for a minimum of one (1) trip and one (1) full 8-hour day.

The manufacturer shall test the equipment for proper rotation and installation and provide training to the operators on operation and maintenance of the equipment.

END

DIVISION 11 - EQUIPMENT

SECTION 11310 PROCESS PUMPING UNITS

PART 1: GENERAL

1.0 Scope

The Contractor shall furnish and install process pumping units as shown on the plans. Pumping equipment to be furnished shall be as follows:

A. One (1) Double Disc Displacement Sludge Pump (P1)

1.1 Related Work Specified Elsewhere

Screw Press and Conveyor Equipment – Section 11500
Electrical and Controls – Division 16

1.2 Quality Assurance

All equipment furnished under this section shall be new and unused from a manufacturer who is fully experienced, reputable, and qualified, and regularly engaged in the manufacture of the equipment as specified herein.

Materials covered by these specifications are intended to be standard equipment of proven reliability and shall operate satisfactorily when installed as shown on the contract drawings and operated per manufacturer's recommendations.

1.3 Service Conditions

The double disc sludge pump is intended to be installed in an existing biosolids building and is intended to pull a suction lift from the sludge holding #1 and pump thickened aerobically digested sludge up to 6% solids to a new screw press.

Pump shall be capable of pumping sludge anywhere between 1% and 6% solids through approximately 100 ft of 4" suction pipe at the suction lift and discharge head conditions as specified herein.

1.4 Submittals

Complete fabrication, assembly, foundation, and installation drawings, together with detailed specifications and data covering materials used, parts, devices, and other accessories forming a part of the equipment furnished shall be submitted in accordance with the Section 01100 and as follows:

1. Pumps:
    Name of manufacturer.
    Type and model.
    Rotative speed.
    Size of discharge elbow outlet
    Type of bearings.
    Net weight of pump and motor only.
    Complete performance curves showing capacity versus head, NPSH required, efficiency, and bhp.
    Data on shop painting.

2. Motors:
    Name of manufacturer.
    Type and model.
    Type of bearings and lubrication.
    Rated size of motor, hp.
    Temperature rating.
    Full load rotative speed.
    Net weight.
    Efficiency at full load and rated pump condition.
    Full load current.
    Locked rotor current.
    Cable entry water seal design.

Operation and maintenance manuals shall be submitted in accordance with Section 01100 and the General Conditions for all materials and equipment.

1.5 Warranty

The Manufacturer shall warrant the equipment being supplied to the owner against defects in workmanship and material under normal use, operation, and service for a minimum of three (3) years from the date of shipment or two (2) years from the date of Substantial Completion, whichever is greater.

PART 2: PRODUCTS

1.5 Double Disc Positive Displacement (Sludge Pumps P1)

A. General

Pumping units shall be heavy-duty, positive displacement type. Each pump and electric motor shall be installed as shown on the plans.

The following Manufacturers shall be considered acceptable for this project:
1. Penn Valley Pump of Warrington, PA
2. Or pre-approved equal.

The pump manufacturer shall submit a dimensional installation layout drawn to scale for

approval with all necessary pump data and performance curves before filling the order for the pumps. Matching components shall be submitted for approval by the Engineer. Any changes to what is shown on the plans that are required for pump installation shall be submitted to the Engineer for approval and shall be incidental to the project.

A. Performance

Each positive displacement double disc pumping unit shall be designed for the following operating conditions and requirements:

Total Number of Units	1
Number of Duty Units	1
Primary Design Flow Point per Duty Pump, gpm	24
Primary Design Head, feet	56
Minimum Suction lift at design condition, feet	12
Max pump speed at design condition, rpm	230
Motor nominal speed, rpm	1160
Maximum Pump Power, HP	3
Design Percent Solids, %	1 to 6
Min pump suction nozzle size, inches:	3
Min pump discharge nozzle size, inches:	3
Minimum Turndown Flow, gpm	2
Min hydrostatic test pressure, psi	60

Pump performance shall be stable and free from cavitation and noise throughout the specified operating head range at minimum suction submergence.

Design equipment so parts are readily accessible for inspection and repairs, easily duplicated and replaced, and suitable for service required.

B. Construction

Each pump shall be a simplex heavy duty, free diaphragm, disc style positive displacement type, with Class 30 Cast Iron Housings. Duplex pumping arrangements shall not be acceptable. The pump shall consist of three (3) housings horizontally split to allow access to the internal components. The pump shall incorporate a Maintain-in-Place hinged design that allows the pump to be serviced and discs replaced without removal of the pump or disturbing the suction and discharge piping. The discharge housing shall contain the mounting lugs and be bolted directly to the mounting frame. The discharge, intermediate and suction housings shall incorporate an integral hinge arrangement that allows the suction and intermediate housings to be lowered and removed. The hinges shall be connected to each other with a quick release ball detent pin allowing for easy pin removal.

The pump(s) shall be capable of providing 0.11 gallons per revolution when operating at 60ft TDH. The pumps shall be capable of operating dry for an indefinite period of time without damage. The pumps shall be capable of self-priming up to 14”Hg and 25”Hg when fully primed.

The pumping action shall be achieved by two (2) free floating reciprocating discs attached to high tensile aluminum connecting rods driven by a rotating eccentric shaft. Each disc shall be mounted to the connecting rod by a stub shaft constructed of hardened high tensile stainless steel. The discs shall be of integral design and constructed of high tensile neoprene with multiple layers of fabric for longevity and strength. Pump designs that use a captive diaphragm with external metal plate shall not be acceptable. The suction and discharge discs shall be universal and interchangeable with each other to increase the commonality of spare parts and eliminate confusion. The reciprocating action of the discs shall also perform the duty of valves. Pumps that require internal check valves for operation shall not be acceptable.

Sealing of the pump fluid chamber shall be achieved by flexible trunnions. The trunnion seal shall not be designed to provide any pumping action. The trunnion construction shall be of fabric-reinforced neoprene and shall be capable of withstanding pressures from 0 to 110 PSI on an intermittent basis. Maximum operating pressure is 140' TDH. Pump designs utilizing packing glands, mechanical seals or water seal systems will not be acceptable.

The swan neck entry port to the suction housing shall be a two (2) piece design allowing for mounting of the suction connection in 90-degree increments and provide easy access for clack replacement. The upper swan neck shall be provided with a 2" NPT connection to allow mounting of the suction pulsation dampener if required. The swan neck entry port shall be a 3" diameter with a minimum opening of 7.065 square inches to minimize debris buildup and blockages. The seating surface for the clack valve shall be machined on the mounting face of the swan neck. The clack valve shall be integrally mounted to the swan neck to facilitate access and replacement. The clack valve shall be manufactured of neoprene construction with multiple layers of fabric encapsulating a rigid core. The clack valve shall incorporate an integral O-ring seal for positive sealing. Designs that incorporate a separate clack valve plate and smaller diameter opening shall not be acceptable.

The bearing drive assembly shall consist of two (2) aluminum modular pedestals designed to provide accurate bearing alignment, superior bearing loading and ease of assembly. The drive shaft shall be a minimum 1 inch diameter and capable of withstanding a dead head situation. The shaft shall be constructed of hardened high-tensile stainless steel and shall be mounted on four (4) self-aligning, sealed bearings. The eccentric cams shall be constructed of high tensile, cast bronze alloy and shall be pinned to the shaft by spirol drive pins to allow for the absorption of reciprocating loads generated by the pumping action. Pump drive assemblies that utilize keyways and setscrews will not be acceptable. All drive bearings must be completely sealed with no provisions for scheduled grease lubrication. No grease fittings shall be supplied for the bearings.

The pump shall be driven through a V-belt and drive assembly consisting of a 2 groove Type B arrangement. The pulley ratios shall be sized to provide the maximum pump speed listed in the pump schedule in this section and to provide the required torque generated between the pump and motor.

Pump shall be provided with OSHA approved guards and covers. The V-belt drive cover and pump drive assembly cover shall be manufactured from SS304 material.

Each pump and V-Belt assembly shall be mounted on a common SS304 sub base. Base design shall have raised cross-members on the suction and discharge end to allow for complete wash-out and draining without trapping liquid. Each subbase shall be manufactured from 2" SS304 square tubing. Base shall be sufficiently gusseted, reinforced and braced to withstand all shock loads and resist all wearing and buckling during pump operation. Tubing ends shall be capped with black plastic plugs for neat appearance.

Pulsation dampeners shall be provided on the suction and discharge lines. The dampeners main tube shall be 4" diameter SCH 40 carbon steel pipe with fully welded end caps. The suction dampener shall mount directly to the suction swan neck through the 1.5" NPT connection. The discharge dampener shall be a separate piece with 3" ASA 150# flanged connections. The dampeners shall be pressure tested to 60 psi for leaks. Each dampener shall be provided with a 1-inch half coupling located at the top. This connection shall be suitable for the vacuum and pressure switch assembly or the ball valve/quick disconnect assembly should a switch not be specified. Each dampener shall be supplied with a 1 ½" NPT coupling and plug in the bottom to act as a drain/sample port. Bladder type and three-piece assemblies using connecting rods and gasket shall not be acceptable.

C. Motor

The motor shall be 460V, 3Phase, 60 Hz and adequately sized to withstand the loads during starting and pump operation. The horsepower and motor speeds shall conform to the specifications as outlined in the pump schedule in this section. Motor shall be severe duty, premium efficient, inverter ready per NEMA STD MG1 Part 31.4.4.2 with epoxy coated cast iron frame or equal. Equipment shall be rated for Class 1 Division 2 location. Furnish and install AEGIS shaft grounding rings

D. Run-Dry, Suction Vacuum Protection

The pump manufacturer shall provide a suction vacuum sensor assembly to mount on the suction pulsation dampener. The sensor shall be a PVP420V, Red Valve 42/742 or equal 1-inch NPT isolation pressure sensor with SS316 body and EPDM elastomeric sensing tube. The process pressure is sensed through the 360- degree elastomeric tube and glycerin transfers pressure to the gauge. The gauge shall be attached to the sensor with SS316 fittings. The vacuum assembly shall be fitted with 2.5" stainless steel 30"Hg – 30psi gauge. The units shall be capable of being cleaned in place by simply using the process pressure through a SS316 isolation valve mounted to the top of the sensor. The opposite end of the valve shall be fitted with a universal, quick acting coupling, suitable for compressed air. This valve connection will be suitable to charge the dampener with compressed air. Equipment shall be rated for Class 1 Division 2 location.

E. Discharge Pressure Protection

The pump manufacturer shall provide a discharge pressure sensor and switch assembly to mount on the discharge pulsation dampener. The sensor shall be a PVP420, Red Valve 42/742 or equal 1-inch NPT isolation pressure sensor with SS316 body and EPDM elastomeric sensing tube. The process pressure is sensed through the 360- degree elastomeric tube and glycerin transfers pressure to the gauge and switch. The gauge and switch shall be attached to the sensor with SS316 fittings. The discharge assembly shall be fitted with a 2.5" stainless steel 0-60 psi pressure gauge and shall be fitted with Ashcroft, Barksdale, or equal, adjustable switch preset at 30 psi. The units shall be capable of being cleaned in place by simply using the process pressure through a SS316 isolation valve mounted to the top of the sensor. The opposite end of the valve shall be fitted with a universal, quick acting coupling, suitable for compressed air. This valve connection will be suitable to charge the dampener with compressed air. Equipment shall be rated for Class 1 Division 2 location.

F. Monitoring and Control

Appurtenant Monitoring and Controls shall be as specified in Divisions 11 and 13.

G. Level Regulators

Refer to Specification Divisions 13 and 16.

H. Electrical

Appurtenant electrical shall be as specified in Division 16.

2.4 Spare Parts

A. Manufacturer shall supply the following spare parts:
a. Two (2) Discs
b. Two (2) Trunnions
c. One (1) Complete set of gaskets
d. One (1) Clack Valve

PART 3: EXECUTION

3.0 Installation

Each pumping unit shall be leveled, plumbed, and aligned into position to fit connecting piping. Installation procedures shall be as recommended by the pump manufacturer and the Hydraulic Institute Standards. Piping shall be adjusted to proper fit and shimming between machined surfaces will not be permitted.

3.1 Start-Up of Equipment

Coordinate installation and start-up scheduling with Pump Supplier, Systems Integrator, Owner and Engineer.

The Contractor shall provide the services of a factory trained service technician who shall adequately inspect the installation and test the equipment furnished under this Contract and instruct the Owner's operating personnel in its maintenance and operation. The services of the technician shall be provided as follows:

One trip of one (1) day of eight (8) hours to inspect the units for proper installation, supervise initial start-up and operation, test each pumping unit as necessary to verify that pump operation matches the specified pump design or as specified by the Engineer and instruct the Owner's personnel in proper operation and maintenance of the equipment.

Devices requiring field calibration shall be calibrated in the presence of Owner's representative and documented. Demonstrate proper operation of all system features and functions to Owner and Engineer.

Refer to Sections 01100 and 11000 for additional provisions relating to start-up of equipment.

END

DIVISION 11 – EQUIPMENT

SECTION 11400 COMPRESSED AIR MIXING SYSTEM

PART 1. GENERAL

1.0 Scope

The contractor shall furnish and install a compressed gas mixing system for the Sludge Holding Tank including compressors, receivers, valve modules, header supply piping, nozzle headers, nozzles, auxiliary equipment and accessories as specified herein. The Contractor shall furnish all labor, supervision, materials, tools, and appurtenances necessary for proper system installation.

In general, this work shall include the furnishing and installation of the following:

A. Two new rotary screw compressors and receiver tank for compressed air mixing system.

B. New stainless steel pipe headers and nozzles for the large bubble mixing assembly.

This item shall include the complete installation and responsibility for the proper operation of the various components of this item. It shall also include painting, field testing and additional services of the equipment supplier. The complete in-basin mixing system shall be supplied by a single manufacturer.

It is the intent of this contract that the installation be complete in all respects and ready for use and operation. The Contractor will be responsible for all incidental details and for any special construction necessary to complete the work in an acceptable manner.

Contractor shall provide all required interconnecting compressed air piping. See Section 15100.

1.1 Workmanship and Materials

All equipment and materials furnished under this contract shall be new, suitable for the conditions of service to which they will be subject and equal to the best of their respective classes. Grade and quality shall meet the applicable cited specifications and standards.

Workmanship shall be of the highest quality and shall be carried out by competent and experienced workers.

Upon Engineer's request, Manufacturer shall submit a list of installation references of not less than ten (10) separate North American installations of compressed air mixing systems similar to that required for the Project in satisfactory operation for at least two (2) years and not less than five (5) separate North American installations of compressed air mixing systems with nozzle quantity not less than required for this Project. Installations shall be where the Manufacturer supplied compressors,

receivers, control panels, header supply piping, nozzle headers and nozzles. For each installation, submit the following information: name of facility owner, facility name, facility location including city and state, facility operation and maintenance contact person including name and telephone number, equipment model number and motor size, nozzle quantity, and month and year that equipment was place into continuous service.

1.2 Shop Drawings and Manuals

Detailed, dimensioned shop drawings, mixing requirements, and data conforming to the requirements of the specifications shall be submitted to the Engineer and approved before fabrication, shipment, or work specified under this item begins. Manufacturer shall also submit the following:

A. Catalog data or illustrations showing principal parts and materials.
B. A complete set of all layout drawings and details, including complete assembly and installation drawings, including overall equipment layout and piping interconnection drawings.
C. Complete electrical schematics and field termination drawings.
D. Complete data for accessory items.
E. Detailed specifications and data including the following:
    a. Compressors
        i. Manufacturer
        ii. Type and model
        iii. Rotative speed
        iv. Dimensions
        v. Weight including motor
        vi. Performance data
        vii. Bearing data
        viii. Separator details
        ix. Filter details
        x. Accessory details
        xi. Piping schematic
        xii. Control equipment
        xiii. Sequence of operation
    b. Motors
        i. Manufacturer
        ii. Type and model
        iii. Horsepower rating and service factor
        iv. Insulation class
        v. Temperature rise full load
        vi. Rotative speed
    c. Particulate and Coalescing Filters
        i. Manufacturer
        ii. Type and model
        iii. Pressure drop
F. Compressor support locations and loads transmitted to bases and foundations.
G. Compressor electrical schematics and field termination wiring.
H. Test or performance data that the system does not contribute measurable oxygen into the process stream.
I. List of recommended spare parts.

J. Qualifications of field service engineer.
K. Recommendations for short and long-term storage.
L. Special tool requirements.
M. Testing procedures.
N. Upon Engineer's request, submit full scale test results from a minimum of ten (10) U.S. compressed gas mixing systems,

The Contractor shall also furnish under this item three copies of complete and detailed instructions for the operation and maintenance of all equipment furnished and installed. Manuals shall be complete with drawings, cuts, parts lists, and other necessary data. All parts shall be numbered or otherwise clearly identified to facilitate ordering of replacements. Descriptions of all operational control devices and their specific functions shall also be included.

1.3 Service Conditions

The compressed gas mixing system shall be installed in the converted sludge holding tank as indicated on the drawings. The compressor and receiver shall be located in the adjacent building as shown on the drawings.

The compressed gas mixing system shall be designed to fully mix the aerobically digested sludge with solids concentration of between 1-6%. Sludge holding tank has a water level as shown on the Drawings.

1.4 Warranty

The Manufacturer shall warrant the equipment being supplied to the owner against defects in workmanship and material under normal use, operation, and service for a minimum of two (2) years from the date of Substantial Completion.

1.5 Related Sections

A. Section 15100 – Yard and Process Piping, Gates and Valves
B. Division 13 and 16– Electrical and Controls

1.6 References

A. ASTM A240/A240M, Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and General Applications.
B. ASTM A276, Standard Specification for Stainless Steel Bars and Shapes.
C. ASTM A312, Standard Specification for Seamless, Welded, and Heavily Cold Worked Austenitic Stainless Steel Pipe
D. ASTM A380, Standard Practice for Cleaning, Descaling, and Passivation of Stainless Steel Parts, Equipment, and Systems

PART 2: EQUIPMENT TO BE FURNISHED AND INSTALLED

2.0 Acceptable Compressed Air Mixing Manufacturers

A. The following Manufacturers shall be considered acceptable:
   a. EnviroMix Inc.

b. Verti-Mix
c. Or Pre-Approved Equal

B. Alternate manufacturers requesting pre-approval shall submit design data during bidding in accordance with the front end specifications.

2.1 Design Conditions – Compressed Gas Mixing System

Provide a compressed gas mixing system for the converted sludge holding tank. The system shall intermittently and sequentially inject compressed air through fixed nozzles located on the tank floor to create large bubbles which mix the tank contents using no moving parts located within the tank with negligible oxygen transfer from the mixing system to the bulk liquid. Tank mixing shall be uniform throughout the tank with effective mixing confirmed through a Field Performance Test as specified herein.

Mixing intensity and balancing shall be sufficient to maintain suspended solids in a state of suspension over the entire tank. The operator shall control firing parameters (sequence, duration, and frequency) to achieve tank mixing. Firing air flow rate shall be adjustable via the throttling valve.

The compressed gas mixing system equipment and piping shall be sized to thoroughly mix the contents of the tanks for which the systems are designed.

	Converted Sludge Holding Tank (Old Digester)	
A.	Number of Nozzle Headers	4
B.	Number of Nozzles per Nozzle Header	Varies
C.	Minimum Total Number of Nozzles	34
D.	Minimum Nozzle Density	28.3 SF/Nozzle
E.	Minimum Nozzle Header Dia.	2.0 inch
F.	Number of Valves/Valve Module	4
G.	Percent Solids Concentration	1% to 6%

The compressed gas mixing system Manufacturer shall be responsible for sizing and selecting all system components to meet the requirements of the field mixing performance test specified herein. The compressor size, number of nozzles and piping size specified herein and shown on the Drawing are minimum. Any increase in the number and size of system components to meet the requirements of the field mixing performance test shall be at no additional cost to the Owner.

Compressed Gas Mixing System Materials

2.2 Header Supply Piping

Sch 5S, stainless steel press technology system (Victaulic, Viega, or equal), comprised of stainless steel press technology fittings, couplings, and pipe, unless specified otherwise. Maximum working pressure of 150 psi. Threaded connections for header supply piping will not be acceptable.

Couplings and fittings: Press technology products formed of Type 316 stainless steel piping or tubing including self-contained o-ring seals molded of HNBR or EPDM.

Pipe shall be Type 316, ASTM A312 stainless steel.

2.3 Nozzle Headers

Supply factory pre-assembled nozzle headers constructed of Sch 10S, 316 stainless steel with 1" Sch 40S, stainless steel nozzle offsets. Nozzle couplings shall be 1" NPT, 150 lb 316/316L stainless steel and fitted with removable end caps to facilitate clean out.

Pipe shall be Type 316 ASTM A312 stainless steel.

Provide nozzle headers in maximum 20-ft segments with two bolt 316 stainless steel flexible gasketed coupling connections. Flexible couplings shall be rated for a maximum working pressure of 150 psi.

2.4 Nozzles

Top plate fabricated from 14 gauge, 316 stainless steel plate, ASTM A240, Type 316. Bottom channels shall be welded to the top plate and fabricated from 16 gauge 316 stainless steel plate, ASTM A240. Nozzles shall be designed with adequate strength to withstand vertical thrust of mixing air.

Threaded Rod Anchors: Four (4) 3/8" diameter threaded rods with a minimum of 3" embedment shall be installed with Hilti HIT-RE 500 adhesive or equal per nozzle.

Nozzles shall be installed in the locations as shown in the Drawings.

2.5 Appurtenances

Nuts, bolts, washers, threaded rod, and other non-welded parts shall be 316 stainless steel, ASTM A240. Threaded assemblies shall be chemically treated or lubricated prior to assembling to prevent galling.

2.5 Fabrication

The piping used for the air mixing system shall be Type 316/316L stainless steel unless otherwise noted.

Shop fabricate welded metal parts and assemblies from stainless steel, ASTM A240/A240M, Type 316/316L with a 2D finish.

Shop fabricate non-welded parts and pieces from sheets and plates of stainless steel, ASTM A240/A240M, Type 316 or from bars of stainless steel ASTM A276, Type 316, unless specified otherwise.

Welds and Welding Procedure

a. Shop weld with filler wire using MIG, TIG or shield-arc, or plasma-arc welding inert gas processes. Provide a cross-section equal to or greater than parent metal.

b. Provide full penetration welds to interior surface with gas shielding to interior and exterior of joint.

c. Provide smooth, evenly distributed interior weld beads with an interior projection not exceeding 1/16 inch beyond inner diameter of nozzle header or fittings.

d. Field welding is not permitted.

e. Clean all welded stainless steel surfaces and welds after fabrication to remove weld splatter and finish clean all exterior welds, carbon deposits and contaminants by passivation per ASTM A380 Section 6.2.11.

2.6 High Pressure Compressors

Provide two (2) high pressure compressors. Each unit shall include V-belt drive and guard, motor, compressor control regulation system, intake pressure control switch, discharge pressure switch, hour meter, and field control panel. All electrical wiring between the compressor motors, air dryer, regulation and safety devices, and the field control panel shall be complete for a single point connection of the electrical service to each package unit.

Compressor module shall be completely factory assembled requiring only field connection of electrical power, air piping, and condensate drain tubing. The compressor shall be rated for continuous industrial duty at 44 cfm with maximum pressure of 100 psig.

The following ambient conditions shall be accounted for in the design:

a. Max Air Temperature: 115ºF
b. Min Air Temperature: 32ºF
c. Relative Humidity: 80%
d. Site Elevation: 800 ft AMSL

Compressor shall be of the single stage, positive displacement, oil-flooded, rotary screw type. The compressor shall be provided with an integral skid or lifting lugs for unloading and placement.

Air compressor module shall have automatic controls integral to the unit which open (loaded condition) and close (unloaded condition) the inlet valve to the air end to deliver appropriate volume to meet demand and maintain system target pressure. On sensing high pressure, the motor will keep running but the air end inlet valve will close, resulting in a decreased “idling” power draw on the motor. On sensing a low pressure, the valve shall reopen.

Positive pressure lubrication shall be provided by an inherent pressure differential system. Lubricant shall be provided as recommended by the Manufacturer. A lubricant filter shall have a high-capacity 10-micron rating.

Control panel shall accept 480 volt, three-phase, 60 Hz electrical service. Control panel shall contain main disconnect, starters, step-down transformers, relays, and other ancillary devices required for a complete and operational packaged system.

Control panel shall be capable of operating through a power outage such that sequence of operations is continued upon return of AC power. Remote mounted fusible disconnects with time delay fuses shall be provided by Contractor.

Control Panel shall accept the following control interfaces to an external control system:

A. Dry contact digital input for Compressor Enable.
B. Dry contact digital outputs for the following functions and conditions:
    a. Run status
    b. Load Status
    c. Warning which shall indicate high air temp, high pressure dew point, or service due.
    d. Shutdown Alarm

Maximum rotational speed of the compressor shall be 3,500 rpm. Motor shall be 10.0 hp, 480 volt, three-phase, 60 Hz, TEFC. The unit shall be heavy-duty, air-cooled, V-belt drive

The rotor shafts shall be precision ground to tolerances within 12 microns (0.0005 of an inch). The rotor housings shall be made of high quality, close grain cast iron.

The discharge end of the male and female rotors shall each be equipped with a pair of tapered roller bearings offset at opposing axis for maximum positional stability and absorption of thrust and radial loads. The thrust bearing housing shall be made of a close grain cast iron. Cylindrical roller bearings shall be used to carry the radial loads on the inlet end of the rotors.

Compressor shall be supplied in a sound attenuated enclosure. The enclosure shall reduce the measured sound to a maximum of 85 decibels, as measured by ISO 8571, while the compressor is operating, and the sound level is measured a distance of three feet from the enclosure.

A high air/fluid temperature shutdown system shall be provided. The unit must have safety devices mounted and wired. Safety devices shall include motor thermal overload and high compressor discharge temperature shut-down. These systems must be designed to prevent the compressor from running in an over-temperature situation or motor from running in an overload condition.

V-belt guards shall be of the enclosed type to meet OSHA requirements. Each compressor shall be equipped with its own discharge pressure gauge.

Air-cooled after-coolers shall be installed on the compressor discharge header. After-cooler shall include a separator with electronic drain valve.

The compressors shall be manufactured by Atlas Copco, Model GA7 or equal.

2.7 Refrigerated Dryer

Each compressor shall be equipped with a refrigeration type air dryer rated for the capacity of the compressor at a pressure dew point of 37 degree F ± 2 degrees F. Each unit shall be complete with air to refrigerate heat exchanger, moisture

separator, auto drain, refrigerant system with air cooled condenser and complete controls. Unit shall be for operation on 120 volt, single phase, 60 Hz. Power, derived and factory wired from control panel.

2.8 Particulate and Coalescing Oil Filters

Replaceable-cartridge primary particulate and secondary high-efficiency oil-removal filters shall be provided for the compressor package. Each compressor intake shall be equipped with a dry-type air cleaner filter. The cooling and intake airflow shall be pre-filtered through an easy to service electrostatic filter panel, which protects the dryer and main cooler matrix from heavy dirt ingress. Each compressor discharge shall be equipped with a coalescing filter. Following both filters, the maximum particulate size removal shall be to 1 micron and coolant removal shall be to 0.1 mg/ m3 at 21 degrees C.

2.9 Receiver Tank

Furnish a single 120-gallon steel storage tank to receive the air from both compressors. Receiver shall be rated at 200 psig. It shall be equipped with necessary connections including a condensate valve and base. The receiver shall be provided with mounting feet valve and pressure gauge. One quart of touch-up paint shall be provided.

Receiver shall be provided with a ½" diameter drain valve with integral liquid level sensors for condensation removal control. The valve shall be supplied with 120VAC Type B plug and cord.

The receivers shall be designed and constructed in accordance with the ASME Code of Unfired Pressure Vessels and shall bear the code stamp.

Receiver shall be factory powder coated.

2.10 Compressor Shop Painting

All components of the compressed air equipment system shall be shop primed and finish painted with the Manufacturer's standard paint system prior to shipment to the site.

Controls and Operation

2.11 Valve Module (VM) and Controller

The VM enclosure shall be 304 stainless steel. The VM shall be designed and rated for a maximum ambient temperature of 115°F.The VM shall be built in accordance with UL standards by a UL certified panel shop and rated NEMA 4X for outdoor duty. The enclosure shall be manufactured by Hoffman, Delta Fabricating or equal. An aluminum support stanchion shall also be provided unless wall mounted.

Each VM shall include a 5-micron filter with ¼" NPT inlet/outlet and an automatic pulse drain to remove fine particles, condensate, and oil from the air supply. The

filter shall be rated for 150 psig maximum pressure, 175ºF maximum temperature, and 24 scfm. The filter shall be Parker 14F15BB or equal.

All VMs located outdoors shall be provided with a 120 VAC heater designed to maintain 40°F in an ambient outside temperature of 20°F. The heater shall be equipped with a thermostat to turn the heater off at temperatures above 55°F.

VMs shall accept a single source 120 VAC power connection. Lightning and surge protection shall be provided on the incoming line power.

The valve module shall have a Local-Off-Remote (LOR) selector switch, a Frequency dial, and a Duration dial. In Local control the 'Duration' dial and the 'Frequency' dial inside the valve module shall allow the operator to adjust mixing intensity locally.

Valve Module shall be equipped with a Controller. The controller shall be rated for a -40°F to 176°F temperature range, Class I, Division 2 Hazardous Areas, and be submersible in up to 3 feet of water. The controller shall be programmed to operate according to the dial settings for valve open frequency and duration when the LOR is in Local mode.

2.12 Controls and Operation

Control shall allow mixing to be started and stopped, and mixing intensity to be adjusted at any point during operation. Control features shall be initially set according to Manufacturer recommendations.

The operator shall be able to enable/disable mixing operation, select the firing duration and the frequency of firing. Minimum control features selected through the local interface shall include the following:

a. Local-Off-Remote (LOR) Switch.
    1. Local Position. In Local, the Zombie controls the ZVM mixing intensity. The 'Duration' dial and the 'Frequency' dial inside the ZVM shall allow the operator to adjust mixing intensity locally.
    2. Remote Position. In Remote, the MCP Controller shall control the ZVM mixing intensity based on mixing parameters from the MCP OIT. If the system does not have an MCP, this mode will function the same as the Off position.
    3. Off Position. In Off, the ZVM will be disabled locally and remotely.

Duration Dial. Length of time an individual ACV is open during a firing event. The duration shall be operator adjustable from 0.1 to 1 seconds by adjusting the dial. The duration will be the same for all ACV's in the ZVM.

Frequency Dial. Length of time to complete the firing sequence. Frequency shall be operator adjustable from 1 to 100 seconds by adjusting the dial.

Valve Isolation. Individual air control valves may be removed from the firing sequence at any point during operation by unplugging the solenoid from the ACV. Alternatively, the header supply pipe isolation valve can be closed.

Alarms: Each valve module shall come equipped with a pressure switch plumbed to the valve manifold. The alarm light will illuminate, and a dry contact shall be provided for remote indication of low pressure.

The valve module shall interface with the plant control system.

2.13 Compressor System Control Panel

An enclosure-integrated control panel mounted on the compressor module shall include:

1. Each compressor electrical control cabinet shall be a NEMA 1 rated enclosure.
2. Full voltage, non-reversing, motor starters sized as required by the Manufacturer.
    a. Starters shall include auxiliary contacts as required.
    b. Magnetic motor circuit protectors shall be 3 phase, 480 volts, molded-case circuit breakers with instantaneous trip elements.
    c. One thermal overload relay shall be provided in each phase lead. Each starter shall be provided with an external manual reset push button for reset of the thermal overload relays. Overloads shall be bimetallic ambient compensated type, matched to motor current, and shall be provided with a manual reset pushbutton.
3. Control power transformers shall have both primary leads fused, one secondary lead fused, and one secondary lead grounded.
4. Terminal blocks for all system wiring. Internal panel wiring shall be neatly bundled and tied and shall be identified with suitable wire markers.
5. Controller shall be provided to indicate the following conditions: discharge pressure, compressor element discharge temperature, power on, hours of operation, operating mode.
6. Remote mounted fusible disconnects with time delay fuses shall be provided by Contractor.
7. The following I/O shall be provided at the compressor control panel and hardwired to the Plant Control System.
    a. RUN status discrete output
    b. NO FAULT discrete output
    c. WARNING discrete output

2.14 Spare Parts

A. Provide spare parts that are identical to and interchangeable with similar parts installed.
    1. One (1) air control valves (ACVs) and solenoid.
    2. One (1) solenoid plug and cable assembly.
    3. One (1) set of relays.
    4. One (1) compressor intake air filter element per compressor provided.

5. One (1) compressor oil filter element per compressor provided.
6. One (1) each compressor separator element per compressor provided.
7. One (1) quart of touch-up paint for the receiver tank.
8. One (1) gallon of spare coolant and one (1) gallon of oil filter
9. Any other standard parts recommended by the manufacturer

PART 3: EXECUTION

3.1 Installation

Install items in accordance with approved shop drawings, Manufacturer's printed instructions and as indicated.

All nozzles on respective nozzle header shall be level within ½-inch of a common horizontal plane.

Air piping shall be internally cleaned by Contractor prior to placing system in operation. Exposed and buried air piping between compressor and valve modules shall be thoroughly flushed by closing isolation valves and uncapping the blow down tee at each valve module and applying 100 psi air pressure to completely remove sand, dirt, and debris to protect downstream equipment, as damage to the air control valves may occur.

3.2 Manufacturer's Startup Services

The equipment supplier shall provide the service of a qualified representative for inspection and testing for a minimum of one (1) trip and two (2) days.

3.3 Field Performance Testing

All mixer components shall be field tested with the respective tanks full to the maximum water surface elevation.

Exposed air piping shall be tested by Contractor for leaks using soapy water on all joints and applying 100 psi test pressure. Buried air piping shall be tested using this method before the trench is filled. Air piping in the tanks may be tested by submersing the piping in non-potable water and pressurizing the piping to 100 psi, in lieu of using soapy water on all joints. Pressure testing requirement shall not apply to supply piping downstream from VM or pre-manufactured nozzle headers.

The Contractor shall operate each mixing system at the maximum water surface elevation in the tanks for a continuous period of not less than 72 hours. The Contractor shall correct and resolve all operating problems, deficiencies, etc., determined as a result of the tests.

After the above testing is complete, field performance testing of the installed compressed gas mixing system shall be performed by the Manufacturer as described below.

1. Mixing performance testing and DO/ORP performance testing shall be conducted in Sludge Holding Tank #2.
2. All personnel and equipment necessary to conduct and supervise all testing shall be provided by the compressed gas mixing system Manufacturer. Engineer/Owner shall be notified of the test to witness at their option and expense.
3. The TSS shall be in typical operating ranges of 50,000 – 60,000 mg/L. No flow shall enter or exit the respective tank for two hours prior to and during the test.
4. The compressed gas mixing system Manufacturer shall conduct total suspended solids (TSS) testing using a Cerlic TSS probe, or equal, suspended solids analyzer.
5. For the DO/ORP performance test the compressed gas mixing system Manufacturer shall take ORP measurements from the same location as the TSS measurements. The ORP measurements shall be conducted using an ORP analyzer capable of measuring an ORP range of -1000 mV to 1000 mV at an accuracy of ±0.02 mV. Technical specifications for the analyzer, indicating the appropriate measurement range and accuracy shall be provided to Engineer for approval in advance of performance testing.
6. The Mixing System Manufacturer shall conduct dissolved oxygen (DO) testing using a dissolved oxygen analyzer capable of measuring a DO range of 0.05 to 20.0 mg/L at an accuracy of ±0.1 mg/L for 0 to 8 mg/L. Technical specifications for the analyzer, indicating the appropriate measurement range and accuracy shall be provided to Engineer for approval in advance of performance testing.
7. Testing Procedure:
    a. In the mixing test, the compressed gas mixing system shall have been in normal operating mode for at least two days prior to testing and must have TSS in the typical operating range indicated above.
    b. Four horizontal-plane sample sites to be tested shall be selected by the Engineer, and field verified as safely accessible. At each sample site, three vertical samples shall be collected as follows: 12-inches from the surface, tank sidewall mid-point and 12-inches above the tank sidewall bottom. Each sample site must be a minimum of 4 ft away from any structure within the tank. The samples for each location shall be analyzed as described above.
    c. The Coefficient of Variation (Cv) shall be determined for the sample set, excluding the maximum and minimum samples. The Cv shall be calculated by taking the resultant set of ten (10) samples as follows: Cv = (100 x Standard Deviation of Ten Samples)/(Mean Value of Ten Samples).
    d. If the Cv is less than or equal to 10%, then the mixer performance shall be acceptable for that location.
    e. If the Cv is greater than 10%, then the mixer performance shall be unacceptable for that location and the Contractor and/or Manufacturer shall make all necessary improvements (at no additional cost to the Owner) and repeat the testing procedure at no additional cost to the Owner until the Cv is less than or equal to 10% for that location.
    f. In the DO/ORP test, the compressed gas mixing system shall have been in normal operating mode for at least two days prior to testing.

An average value of the baseline DO and ORP measurements shall be collected.

g. If the average value of the final DO and ORP measurements is less than or within a standard deviation of the baseline DO and ORP measurements, the Mixing System performance shall be acceptable for that location. If the average value of the final DO and ORP measurements exceeds the average value of the baseline DO and ORP measurements, the Mixing System performance shall be unacceptable for that location and the Contractor and/or Manufacturer shall make all necessary improvements (at no additional cost to Owner) and repeat the testing procedure at no additional cost to Owner until the performance testing can be performed with baseline DO measurements which are less than or equal to the final DO and ORP measurements.

END

DIVISION 11 – SPECIALTIES

SECTION 11500 SCREW PRESS AND CONVEYOR EQUIPMENT

PART 1: GENERAL

1.0 Scope

The Contractor shall furnish and install One (1) Dewatering Screw Press including conditioning tank or motorized inline polymer mixing device, automated control panel, and appurtenances as specified and indicated on the drawings and as required to meet the specified performance requirements.

The Contractor shall furnish and install One (1) Dewatered Sludge Screw Conveyor, supports, and appurtenances as specified and indicated on the drawings and as required to meet the specified performance requirements.

The Contractor shall coordinate the discharge size and orientation of the supplied screw press discharge to mate with the supplied conveyor system as a fully functioning system.

The Contractor shall coordinate with the City's polymer feed supplier and the equipment manufacturer(s) specified herein to optimize polymer type and quantity to the new screw press system. See Part 3 for additional requirements.

The Contractor shall coordinate all details of the equipment with other related parts of the work. Contractor shall verify that all structures, piping, wiring, and equipment components are compatible. The contractor shall be responsible for all structural and other alterations required to accommodate equipment differing in dimensions, weight, or other characteristics from these specifications and drawings.

The Contractor shall install the equipment according to instructions and recommendations of the equipment manufacturer.

1.1 Related Work Specified Elsewhere

Process Pumping Units – Section 11310

Electrical and Controls – Division 16

1.2 Workmanship and Design

All components of the sludge dewatering equipment shall be engineered for long, continuous, and uninterrupted service with minimal operator intervention. All components of the press shall be designed to withstand damage or permanent distortion, the full stalling torque of the drive motor. Provisions shall be made for easy maintenance, adjustment, or replacement of all parts.

1.3 Service Conditions

The proposed screw press will receive between 1% - 6% solids from a proposed positive displacement double disc pump on a variable frequency drive, specified in Section 11310. Proposed sludge holding tank will receive digested solids from two submersible pumps located in each of the aerobic digesters.

The City currently uses a Prominent ProMix-S Polymer Feed Skid to feed the belt filter press. Polymer system shall be reused and optimized as specified herein to feed the proposed screw press.

1.4 Warranty

The manufacturer shall warrant, in writing, that all equipment supplied by them shall be free from defects in material and workmanship under normal use, operation, and service for a period of two (2) years from the date of substantial completion.

1.5 Submittals

Complete assembly, foundation, and installation drawings, together with detailed specifications, and data covering material used, parts, devices, and other accessories forming a part of the equipment furnished, shall be submitted.

Submitted Drawings shall specifically show the screw press and inclined screw conveyor configuration at the required height and angle within the biosolids building. Installation drawings shall show all Manufacturer required equipment clearances for operations and maintenance.

Descriptive literature, brochures, catalogs, cut-sheets and supplementary material to define the equipment.

a. Motor characteristics and performance information.
b. Gear reducer data including service factor, efficiency, torque rating, and materials.
c. Parts list including a list of recommended spare parts.
d. Manufacturer's installation drawings.
e. Wiring and schematic diagrams.
f. Detailed mechanical and electrical installation instructions and procedures.
g. Equipment weights and lifting points.
h. Recommendations for short and long-term storage.

Submit jar testing report including results and recommendations on polymer use.

Operations and maintenance manual shall be submitted with the provisions noted in Section 01110 and General Conditions.

1.6 Quality Assurance

All equipment furnished under this section shall be new and unused from a manufacturer who is fully experienced, reputable, and qualified, and regularly engaged in the manufacture of the equipment as specified herein.

The manufacturer shall have a minimum of twenty (20) years' experience producing dewatering screw presses and upon request will submit to the engineer documentation of fifteen (15) installations similar or larger than specified herein, that have been in operation for at least five (5) years.

Materials covered by these specifications are intended to be standard equipment of proven reliability and shall operate satisfactorily when installed as shown on the contract drawings and operated per manufacturer's recommendations.

PART 2: PRODUCTS

2.0 General

The sludge dewatering system shall be capable of dewatering the feed sludge and producing a solids cake with no free water present. The system shall be able to start up, operate as required, and shut down in the absence of any operators when operating in fully automatic mode.

Each unit shall be designed to operate in the environment for which it is intended, continuously or intermittently on demand, and shall perform the required dewatering operation without spillage of water or sludge beyond the nominal machine envelope. In addition, the unit will operate with no requirement for operator attention other than periodic inspection and chemical replenishment.

The sludge dewatering equipment shall be designed to adequately condition and dewater the sludge such that a dewatered sludge cake is produced that easily discharges from the dewatering unit, without blinding or plugging, and that may be transported by solids conveying equipment.

2.1 Manufacturers

The following manufacturers shall be considered acceptable for this project:

Screw Press:

a. Ishigaki USA LTD. of Portsmouth, NH
b. Schwing Bioset of Somerset, WI
c. Huber Technology of Denver, NC
d. Or Pre-approved Equal

Screw Conveyor:

a. Custom Conveyor Corporation of Rogers, MN
b. Huber Technology of Denver, NC
c. Or Pre-approved Equal

The Screw Press and Conveyor as shown on the Drawings is based on the manufacturers as specified herein. Any re-design or changes as required by a different Manufacturer's equipment shall be made at the Contractor's expense. Contractor shall provide a complete system and shall furnish and install all required piping, polymer injection points fittings, and appurtenances based on the Manufacturers specified herein.

2.2 Screw Press Performance Requirements

The system shall be suitable for operation under the following performance and design conditions:

a.	Sludge Type:	Aerobically Digested Sludge
b.	Biological Treatment Process	AeroMod Activated Sludge
c.	Maximum number of screw presses:	1 Unit
d.	Unit Capacity (lbs DS/hr):	300

e. Cake solids concentration (%): 16-25

f. Capture efficiency (%): >95

g. Polymer dosage (Lbs Active/DT): 23-35

h. Maximum Plant Sludge Prod. (lbs DS/day): 850

i. Minimum Plant Sludge Prod. (lbs DS/day): 200

With manufacturer's recommended procedures, screw press system shall be capable of sitting idle for several weeks if not required to run during low solids production.

Contractor shall supply air to the screw press from compressors in adjacent building near the biosolids building.

A. The following spare parts shall be provided:

1. Five (5) spray nozzles
2. One (1) set of fuses

2.3 Screw Press Design – Ishigaki and Schwing Bioset Design

A. Materials and Coating Schedule

All materials utilized in the construction of the dewatering equipment shall be entirely suitable in every respect for the service required. All metals in contact with polyelectrolyte or sludge, and all other metal components other than those specified in Table 1 shall be stainless steel, type 304.

The following table indicates the materials and coatings that shall be provided for the dewatering screw press and related components unless specified herein:

Item of Equipment	Material
Conditioning Tank	Type 304 Stainless Steel
Dewatering Drum	Type 304 Stainless Steel
Dewatering Screw	Type 304 Stainless Steel
Spray Bars and Water Piping	Type 304 Stainless Steel
Spray Nozzles	Type 304 Stainless Steel
Dewatering Press Frame	Epoxy Coated Carbon Steel
Electrical Control Panel	NEMA 4X Type 304 Stainless Steel

B. Structural Frame

The structural support frame shall be fabricated with A 36 carbon steel conforming to the latest ASTM specifications for structural steel. It will be a rigid structure adequately braced to withstand intended loads without excessive vibration or deflection. The framework shall be of welded and/or bolted construction. All welding shall conform to the American Welding Society Structural Welding Code.

The structure shall be designed for installation on a prepared concrete foundation or suitable flat concrete slab and secured with anchor bolts. The construction shall allow easy access for visual inspection of all internal components.

C. Dewatering Drum and Screw

The dewatering drum shall be constructed of type 304 stainless steel. The drum shall consist of perforated screens of segmented sections bolted together for ease of maintenance.

The total length of the dewatering drums shall be shorter than the length between the cake side and slurry side frames allowing for easy disassembly without the need to move the frames.

The screen drum shall consist of two concentric shells. The outer shell shall be a machined cylinder, to ensure that the drum is perfectly concentric, of 1/8” thick stainless steel, to support an inner perforated screen without deflection when dewatering sludge.

The hole size(s) in the perforated screen shall be sized for maximum solids capture efficiency.

The dewatering drum shall be completely enclosed to prevent odor emissions.

The screw shall have a tapered shaft with screw flights to dewater sludge as the solids are conveyed along its length. Constant sized diameter shafts shall not be permitted.

The screw shall be supported by sealed radial and thrust bronze bushings rated for the loads at maximum screw speed or anti-friction bearings designed for the intended loads.

The screw shall have an easily replaceable sealing wear strip on the tip of its flight. Screw Presses without a sealing wear strip shall not be permitted.

The screw shall discharge dewatered solids against a pressure cone supported by pneumatic cylinders. The pressure cone shall be constructed of UHMW-Polyethylene or 304 stainless steel.

D. Dewatering Drum Wash System

The washing system spray bar shall encircle the dewatering drum and be designed to automatically walk the length of the drum via an electrically driven chain drive or linear pneumatic actuator system. Nozzles shall be positioned so that they wash, with an overlapping spray pattern, the drum and interior of the drum enclosure in a single pass.

The wash ring, containing the washing nozzles, shall travel at a constant speed by a pneumatic actuator or motor driven system.

Limit switches must count the beginning and end of each pass of the wash cycle to ensure the washing system has completely cleaned the screens.

The washing system shall operate periodically to remove solids such that no significant buildup occurs over time.

The washing system must function automatically. Additionally, initiation of a wash cycle shall not halt the dewatering process, temporarily or indefinitely.

E. Screw Press Drive

The screw press shall be driven by a shaft mounted gearbox and motor assembly. The gear reducer shall be bolted to a machined flange welded to the end of the press. The gear reducer shall be driven by a 3-phase, 60 Hertz, 240/480 volt TEFC continuous duty motor.

Chain, belt, or hydraulic drives are not acceptable.

The screw press shall be driven from the discharge (cake outlet) end.

F. Conditioning Tank

The conditioning tank shall be manufactured out of type 304 stainless steel and have a minimum 12 gage thickness. Tank shall be fully welded construction.

The conditioning tank drive shall be a variable speed unit to provide the optimum mixing energy to blend polymer with the sludge without shearing the flocculated solids. The conditioning tank must be completely sealed, along with the remainder of the system, to prevent odor emissions.

The tank shall be sized to allow sufficient residence time for flocculation to occur. The tank shall be designed so that no leakage occurs during normal operation and shall be baffled to ensure all feed sludge resides in the conditioning tank for the designed residence time.

Conditioning tank shall be supplied with an observation window allowing for easy visual confirmation of the quality of the “floc”. Viewing window must include a wiper to clean the inner surface of the window. Alternatively, a 1-foot length of clear pipe shall be provided for viewing the flocculated sludge between the floc tank and Screw Press in lieu of a viewing window in the floc tank.

Conditioning tank shall include a pressure transmitter located at the top of the tank. The conditioning tank agitator shaft shall be sealed by a replaceable packing gland.

The flocculated solids shall exit the conditioning tank from the side or top of the tank.

2.4 Screw Press Design – Huber Design

A. Screw Press Materials

Sludge dewatering press shall be manufactured from AISI 304L stainless steel shapes (rods, angles, and channels), pipes, and sheets. In particular, wedge wire basket, screw, shaft, support legs, fasteners and anchor bolts shall be made of this material. Presses with carbon steel components shall not be acceptable because of corrosive wastewater environments.

Press access covers shall be either stainless steel or a composite of acrylonitrile butadiene styrene (ABS) and poly(methyl methacrylate) (PMMA). Materials other than stainless steel shall be acceptable if the material meets the following requirements:

a. Is not a structural load-bearing component.

b. Is equal to or exceeds stainless steel’s resistance to wastewater environment chemicals.

c. Is resistant to heat degradation up to 185°F (85°C).

d. Is equal to or exceeds stainless steel's resistance to UV degradation.

e. Is resilient to impact

Wipers for helical screw flights shall be of wear resistant polyurethane (PU) material. Wipers must have a basket contact width of at least 0.315 in (8 mm) to provide sufficient basket cleaning. The wiper is held in place by stainless steel clamps and set screws which can be easily removed. The wiper shall have a self-contained dampening mechanism to maintain constant contact with the basket while limiting wear. Wiper self-contained dampening mechanism shall compensate for up to 4mm of radial wiper wear. Equipment using brushes or wipers without this functionality shall provide service trips and replacement parts for the first two (2) brush or wiper replacements to account for additional maintenance time. Equipment without wipers or brushes shall provide four (4) replacement baskets and augers to account for additional equipment wear. Equipment with moving and fixed ring systems shall provide service trips and replacement parts for the first four (4) replacement intervals to account for both the additional maintenance time and additional equipment wear.

B. Screw Press Design

The screw press shall be installed inclined (at 15º). Horizontal units shall provide a diverter chute to prevent wet material from discharging into the downstream process during startup.

Dewatering of the sludge takes place in a basket, which consists of three sections of wedge wire baskets. Basket openings shall vary in each of the three sections, from wider openings to tighter openings, to facilitate optimum release of water from the sludge. The overall basket length shall be 86 in (2,250 mm). The basket diameter shall be 17 in (440 mm). Baskets with constant basket opening sizes must provide a minimum basket length of 138 in (3,500 mm) to facilitate additional detention time in the unit for water release.

The wedge wire basket where the wet sludge enters the basket shall provide a minimum free surface area of 18.2% of the active wedge wire surface area to facilitate free water drainage. Flanges and reinforcement bars or supporting structures around the basket blocking the drainage of water shall be deducted from the active surface area. Baskets without this minimum free surface area must provide additional length of basket until they achieve this minimum free surface area.

Each section of the wedge wire basket shall be split in half along the length of the basket to allow for easy separation of the basket into halves for servicing of the wiper. The basket shall be fastened together using bolt fasteners made of stainless steel. The screw press shall be provided with alignment pins for ease of basket alignment during reassembly. The bottom half of the wedge wire basket shall remain inside of the machine during servicing of the wiper for ease of maintenance.

The screw press shall be completely enclosed to prevent odor emission. The whole dewatering section and basket area shall be easily accessible through an inspection panel, which are mounted via hinges on the sides and quick release latches on the top of the machine.

A screw shall be installed inside of the screen basket. The screw transports the sludge from the inlet to the discharge area at the end of the pressure zone. Its shaft diameter shall be conical towards the discharge section of the machine. The flights of the helical screw shall be provided with a PU wiper to clean the wedge wire screen from the inside.

The screw shall be shafted and shall be made of stainless steel. A shaft-less screw is not acceptable because of the pressure and torque involved with dewatering. A bearing shall support the feed end of the screw shaft.

A screw drive shall be provided at the discharge side of the press. The nominal motor power shall be 2.0 hp. The motor speed shall be controlled with a Variable Frequency Drive (VFD). The drive unit shall be directly coupled to the screw shaft through a planetary gearbox.

A pressure sensor shall be installed at the inlet housing of the screw press. The pressure sensor provides a signal which is used to control the speed of the auger. The pressure in the inlet box shall automatically adjust the speed of the screw via the control system and the range for the pressure shall be adjustable at the HMI.

The cleaning of the wedge wire screen from the outside shall be performed with a stationary spray bar washing system made of stainless steel piping and spray nozzles. The spray area shall run the entire length of the screen. One solenoid valve shall control the flow to the spray bar washing system. If a cleaning cycle is initiated, the screw press motor reverses and rotates the basket, until has completed a 360 degree rotation ensuring the entire surface area of the screen is cleaned. Contractor shall provide 1 in female threaded connection for the water supply piping to the manifold of the spray system. Designs that do not rotate through the entire circumference of the basket or over the entire length of the basket will not be accepted because they fail to clean the entire basket.

Spray water supply shall be designed for a minimum flow of 28 gpm (can be filtered non-potable water, allowed particle size 800 microns at maximum 200 ppm) at a minimum pressure of 70 psig. Water pressure at each nozzle of the spray bar shall be a minimum of 70 psig. Average spray water consumption shall not exceed 21 Gallons at 70 psig per wash cycle. Spray washing systems that operate at pressures less than 70 psig shall provide any necessary basket cleaning services at the owner's request for the first 10 years of operation to account for insufficient cleaning of the basket.

A pneumatically actuated cone that serves for adjusting the pressure in the pressure zone shall be provided at the discharge end of the screening basket. The pressurized air supply shall be provided by the contractor.

The pneumatically actuated cone is controlled by a 5-2-way solenoid valve. The solenoid directs the pressurized air to the ports which engage or disengage the cone at the discharge of the screw press. The control valve shall be installed in a local control station which also houses the pressure control valve and the pressure switch. The switch monitors the availability of pressurized air. If the supply of pressurized air is interrupted, the switch shall send a signal to the PLC and an alarm message will be generated.

Sludge cake shall be automatically discharged through a rectangular sludge discharge opening. The discharge height shall be minimum 37 in above floor level. Designs with standard discharge height lower than this minimum level must include provisions to interface properly with downstream equipment and a platform to allow proper service access to the equipment.

Contractor shall provide a 4 in diameter drain line for the filtrate and connect it to the bottom drain connection of the screw press. The contractor shall also provide a 1.5 in flush connection with manual ball valve for the drain connection.

C. Internal Piping

Polymer mixing device shall be supplied by the screw press manufacturer.

Pipe flocculator shall be supplied by the contractor and shall provide a minimum retention time of 60 seconds at design flow for the polymer and sludge mixture.

The design of the flocculation pipe reactor shall be approved by the screw press manufacturer.

The size of the piping needs to take into account: maximum capacity, loading rate, minimum velocity in piping to avoid sedimentation and conditions that do not negatively affect the flocculation process.

D. Drives

The press screw shall be driven by a shaft mounted gearbox and motor assembly. The gearbox shall be bolted to a machined flange welded to the upper end of the press.

The gearbox shall be driven by a motor with the following characteristics:

1. 2.0 hp
2. VFD sized for 3-phase, 60 Hz, 460 V
3. 0-2100 rpm
4. Continuous Duty
5. Permanent magnet motor
6. 40°C environmental temperature
7. Insulation Class F
8. Motor efficiency class IE4
9. Non-hazardous environment

The gearbox shall have the following outputs:

1. 24,000 Nm output torque
2. 1.1 rpm output speed

E. Inline Polymer Mixing System

A motorized inline polymer mixing system shall be provided for each dewatering press to facilitate polymer delivery to the sludge. The polymer solution shall be fed through a supply chamber along the vertical shaft of the rotating paddle. The shaft seal shall be located in the supply chamber to allow continuous lubrication and cooling by polymer. The shaft seal should be inspected during operation; systems that must be taken out of operation or must be disassembled for seal inspection will not be accepted.

Mixer shall be capable of providing sufficient mixing energy for sludge concentrations specified in the Performance and Design Requirements. The speed of the paddle shall be adjustable to provide varying mixing energy as needed for viscous sludges or concentrated polymer solutions. Adjustment shall be by a potentiometer located on the VFD or on the control panel.

The paddle shall be designed and controlled to prevent accumulation of debris. Additionally, the mixer shall have an automatic self-cleaning feature to clean the rotating paddle section of the mixer. Systems without this self-cleaning feature will not be accepted as they will require manual cleaning of the system.

The inline polymer mixer shall be capable of operating under the following conditions:

Operating Pressure: 2.9 to 7.25 psi (maximum 15 psi)

Head loss: ≤ 3.0 psi

Polymer solution: 0.3 – 0.5 %

Pipe Connection: 4” ANSI as required by the application flowrate

Circumferential speed: <= 45 ft/sec

Mixing systems which exceed 3psi of pressure lost across the mixer will not be accepted due to the requirement of larger sludge feed pumping and polymer feed systems to overcome the higher pressure at the injection point. Additionally, these high pressures will also cause excessive wear on the pumping systems utilized.

Systems which require diluted polymer concentration of less than 0.3% will not be accepted due to the use of higher volumes of dilution water which increase the hydraulic flow to the dewatering equipment limiting the system throughput.

Mixer housing, shaft, and paddle shall be made of 316Ti stainless steel. O-rings shall be made of nitrile butadiene rubber (NBR).

The inline polymer mixer shall have a direct drive, permanent-magnet motor with integrally mounted or control panel mounted frequency converter (VFD). Motor efficiency shall be class IE4 with a minimum efficiency of 89% over the operating range of the mixer. Rated motor horsepower shall be no less than 3HP (2.2kW).

2.5 Controls

A. Screw Press Electrical and Control System Panel

The dewatering system shall have an integrated electrical and control system that will allow for a safe, simple, and automatic operation of the unit. All electrical work, motors and drives shall comply with any relevant NEMA, UL standards and other requirements in Division 16. The system shall be designed to interface with the external components and the existing plant SCADA system as outlined below.

Control panel shall be provided by the screw press manufacturer and incorporate components and controls for other components of the system which may be provided others. The Manufacturers for the sludge feed pump, screw press, and screw conveyor shall provide, deliver, and coordinate the controls requirements with the SPCP provider. See electrical drawings and specifications for additional information. System shall be configured to control sludge feed pump, screw press, polymer system, and conveyor for a full functioning sludge dewatering system.

The system control panel shall be fabricated out of type 304 stainless steel suitable for NEMA 4X service, and be UL approved. The panel shall have all the necessary control devices and equipment for automatically controlling the dewatering system processes. The panel shall accept a 480 volt, three phase electrical supply and include a lockable main disconnect.

Control panel shall include a Programmable Logic Controller (PLC) for system operation and control and Operator Interface Terminal (OIT). Control panel may include other individual operator control components such as pilot lights, pushbuttons, switches, etc. as required. PLC shall be capable of communicating and sharing data with existing Rockwell PLCs in plant SCADA system. Manufacturer shall coordinate with Owner's Systems Integrator for SCADA interconnection and provide all necessary communication interface components required. System program shall include an extended shut down option to prevent manual emptying of the press and shall automatically create a data log file to aide in measuring performance and aide in remote troubleshooting.

B. The control panel shall include, as a minimum, the following additional components:

    a. Provisions for power distribution to motors and other internal and external ancillary loads identified on drawings and required for proper operation. Provide all required circuit breakers, disconnects, fuses, and terminals.

    b. Motor starters or drives for each load. This shall include the sludge feed pump, screw press motor(s), and conveyor motor.

    c. Control power transformer or power supply, sized as required for expected loads plus 25% spare capacity.

    d. Ability for operator to manually operate each piece of equipment individually.

    e. Alarms, messages, and other indications to identify abnormal conditions and assist in troubleshooting.

    f. Terminals for connection of the electric power circuit, load circuits, field devices, and signal interfaces

C. The control panel shall incorporate the following external interfaces, in addition to those required directly by the screw press and press components.

    a. Control panel shall accept the following external signals:

        i. Biosolids Level Tank Low Level Switch dry contact input: Switch provided by others for connection to control panel. Upon receipt of input, system shall alarm and shut down sludge pump.

        ii. Screw Press Containment High Level Switch dry contact input: Switch provided by others for connection to control panel. Upon receipt of input, system shall alarm and shutdown press

        iii. Sludge Flow: 4-20 mA signal from sludge flow meter

    b. Control panel shall interface with the existing Polmer System:

        i. Dry contact digital output for Polymer System Start

        ii. Dry contact digital input for Polymer System Running feedback

        iii. 4-20 mA analog output for Polymer System Speed Command

        iv. 4-20 mA analog input for Polymer System Speed feedback

    c. Control Panel shall interface with the conveyor system. Signals shall be coordinated with conveyor system manufacturer but shall include, as a minimum:

        i. Conveyor Start output

        ii. Conveyor Emergency Stop input

iii. Conveyor Zero Speed Switch input

iv. Conveyor Oiler Flow Valve output

d. Control Panel shall interface with the existing SCADA system. Coordinate with Owner's System Integrator

i. Dry contact for Common Alarm. Signal shall incorporate any alarm condition with system

ii. Ethernet/TCP or EthernetIP interface to SCADA system network which shall pass the following parameters, as a minimum:

1. System enable/start/stop command from SCADA
2. System running/alarm status
3. Running/alarm status of individual equipment
4. Sludge flow rate set point and feedback
5. Sludge feed pump speed set point and feedback
6. Polymer flow rate set point and feedback
7. Speed set point and feedback of any variable speed equipment

2.6 Injection Assembly

A. Furnish and install injection assembly as recommended by the screw press manufacturer and as shown on the drawings. Contractor shall bring the polymer feed to the dose point(s) as required by the equipment furnished.

2.7 Inclined Screw Conveyor

A. General:

a. Conveyor shall be capable of transporting the quantity of cake solids from the screw press up to the discharge point to dump into the City's sludge truck.

b. Controls for conveyors shall be integrated into screw press control panels by their respective manufacturers.

B. Performance:

a. The screw conveyor performance shall be as follows:

Feed Solids	
No. of Units	1
Minimum Design Capacity	50 lbs/hour
Design Incline	28 Degrees +/-
Approx. Length of Trough/Screw	23'-0" +/-
Minimum Screw Diameter	9"
Sludge Cake Dry Solids Content	25%
Maximum Motor Horsepower	3 HP
Maximum Speed	1800 RPM

C. Hardware:

a. All stainless steel bolts shall be assembled using an anti-seize compound.

b. All hardware including structural bolts, anchors, washers, and nuts shall be 304 Stainless Steel.

D. Conveyor Spare Parts

a. One (1) drive end seal for each conveyor supplied.

b. One (1) Trough liner set for each conveyor supplied

2.8 Inclined Screw Conveyor – Custom Conveyor Design

A. Flighting:

a. Spiral flighting for the shaftless screw conveyors shall be designed to convey material without a center shaft or hanger bearings.

b. Spirals should conform to CEMA 300-34. Spiral shall be manufactured from chromium nickel alloy steel with a Brinell hardness of 250, and maximum yield strength of 80,000 psi.

c. The spiral flights shall be designed with the stability to prevent distortion and jumping in the trough. A second, inner spiral, concentric with the outside spiral shall also be provided. Outer spiral shall be minimum 1” thick. Inner spiral shall be minimum ¾” thick.

d. The torsional rating of the spiral shall be such that, at 150% of the motor nameplate horsepower, the drive unit cannot produce more torque than the torsional rating of the flighting. Spiral flights shall be 1” thick x 3” wide. Sectional flighting, formed from plate, shall not be permitted. The "spring effect" of the spiral shall not exceed + 0.16” per foot of length at maximum load conditions.

e. A gland packing ring consisting of two Teflon fiber packing rings shall seal the drive shaft at its penetration through the end plate, along with a greased labyrinth sealing system.

f. Compression and/or elongation: Less than 0.08 inch per 1 foot at maximum loading

g. Spirals shall be manufactured in a two-stage process. Single stage forming of diameter and pitch is not acceptable. Manufacturer shall certify the two-stage forming process, and this certification shall be included in the submittal information. Such two stages shall first consist of tightly cold rolling at zero pitch on a mandrel which uses a device to control the plastic flow of the spiral during forming and maintain a uniform outside and inside diameter thickness with no neck-down. The second stage of spiral forming shall consist of pulling the closely wound spiral in tension to the specified pitch in a device permitting free spiral rotation.

h. Spiral flighting shall have full penetration welds at all splice connections. The flights shall be aligned to assure true alignment when assembled in the field and shall be made in accordance with the supplier's requirements. The spiral flights shall be coupled to the end shaft by a flanged, bolted connection.

B. Conveyor Trough:

a. The trough shall be a U-trough style, minimum 3/16” thickness, and 304 stainless steel.

b. A neoprene or rubber gasket shall be provided at each trough flange and between trough top trough flange and covers.

c. Trough Covers shall be minimum 14 gauge thick, 304 stainless steel provided over the top of trough to enclose unit and shall be bolted. Each cover section shall not exceed 4’ in length.

d. The downstream side of the trough shall be outfitted with a 4-inch drain. The drain shall be standard ANSI flange and constructed of 304 stainless steel. Drain shall be welded perpendicular to the length of the trough.

e. Each trough shall be equipped with discharge spouts at the location shown on the drawings. Discharge spout shall be flanged suitable for interconnection with other devices.

f. UHMW-PE Liner: Liner shall be 3/8” thick in four feet sections, held in place without penetrations or fasteners through trough, and shall be replaceable SS clips. Liner shall be two color wear indicator Polystone M by Rochling.

g. Stiffeners shall be placed across the top of the trough and fastened to both sides of the trough to maintain trough shape.

h. Trough end plates shall be a minimum 3/8” thick on the drive end and ¼” thick on the non-drive end. Plates shall be constructed of 304 SS.

i. Loadout skirt shall be a minimum 2” square, 2’ long fabricated from polyester scrim reinforced vinyl with 304 SS back bar located on each Loadout drop point.

C. Supports

a. Conveyor shall be provided with a 304 stainless steel support system attached to the conveyor trough at appropriate intervals to support the entire length of the conveyor machinery and the live load.

b. Provide base plates at each support leg for anchor bolting. Height of support legs as indicated on Drawings.

c. All structural supporting members shall be designed such that the ratio of the unbraced length to least radius of gyration (slenderness ratio) shall not exceed 120 for any compression member and shall not exceed 240 for any tension member. In addition, all structural members and connections shall be designed so that the unit stresses will not exceed the American Institute of Steel Construction allowable stresses by more than 1/3 when subject to loading of twice the maximum design operating torque of the spiral conveyor drive motors.

d. The supports shall be shop fabricated from structural steel shapes and plates, and shall be assembled and fitted to the conveyor prior to its delivery to the jobsite. The manufacturer shall allow for 1 inch of grout beneath each support foot pad for the Contractor to compensate for uneven floor elevation.

e. Other components such as motors, speed reducers, and pillow block bearings shall be painted in accordance with applicable provisions of Section 09900 “Painting”.

D. Drive Unit:

a. The drive unit shall be mounted on the downstream end of the conveyor and in a bevel arrangement.

b. The drive shall be outfitted with a 480V, 3-phase squirrel cage TEFC induction motor. TEFC motor shall be corrosion resistant. Motor shall be random wound copper coils. Motor shall meet NEMA MG 1 for Premium efficiency motors.

c. All motor shall be continuous time rated suitable for operation in a 40 degrees C ambient, unless specified otherwise.

d. Drive assembly shall consist of an integral gearmotor, mounted directly to the screw shaft. Gearmotor housing shall be cast iron, furnishing complete protection under all conditions of service. Gears shall be manufactured and rated for continuous duty in accordance with AGMA Standards, of heat treated alloy steel. Provide splash type gear lubrication. Gear reducer shall be Class II speed reducer as manufactured by Eurodrive or equal.

e. The gear reducer and drive shall be designed to provide an applied torque adequate to start a fully loaded conveyor.

f. Drive shall have a minimum AGMA service factor of 1.4.

g. In the event of a prolonged power failure or emergency system shutdown, the drive system shall be designed, at a minimum, to start the conveyor from a dead stop with the trough filled at 2 times the design load.

h. Gearboxes and motors shall be factory-assembled on the conveyor, factory-tested and shipped fully assembled with the conveyors.

E. Field Instruments and Devices

a. Emergency Shutdown: Each conveyor shall be furnished with an emergency trip cord and safety switch. The conveyor is to be provided with a cable operated OSHA safety stop switch with continuous cable run on both sides. The trip switch shall immediately stop the associated conveyor when the switch is actuated. The switch shall be RS2 type by Conveyor Components Corporation or approved equal.

b. Each conveyor shall be furnished with a zero speed switch. The switch shall be housed in a NEMA 4X 304 stainless steel enclosure, mounted on the side of the conveyor U-trough with a stainless steel bracket. The switch shall be a Milltronics ZSS or equal. It shall operate on 120 volt, single phase, 60 Hz power supply, and shall be housed in a NEMA 4X enclosure.

c. Each conveyor shall be furnished with a standalone NEMA 4X 304 stainless steel emergency stop latching mushroom head pushbutton. Contractor shall install where shown on drawings.

2.9 Inclined Screw Conveyor – Huber Design

A. Materials:

a. Unless otherwise specified in these specifications, the entire equipment shall be manufactured from AISI 304L austenitic stainless steel shapes (rods, angles, and channels), pipes, and sheets. All mechanical parts shall be designed to handle the forces that may be exerted on the unit during fabrication, shipping, erection, and proper operation according to the O&M manual.

b. The entire equipment shall be manufactured in a stainless steel only factory to prevent contamination of the stainless steel with rusty dust.

c. The equipment, after its fabrication, shall undergo a passivation (pickling) process to ensure maximum resistance to corrosion. All stainless steel components and structures shall be submersed in a chemical bath of nitric acid and hydrofluoric acid to remove any residues that may be present on the material as a result of forming, manufacture, or handling. After removal from the pickling bath, the equipment must be washed with a high-pressure wash of cold water to remove any remaining surface debris and promote the formation of an oxidized passive layer which is critical to the long life of the stainless steel. Submergence insures complete coverage. Spray on chemical treatments and glass bead blasting are specifically not acceptable due to their inability to provide complete and uniform corrosion protection.

B. Design:

a. The spiral shall have a center shaft. Minimum flight thickness shall be 3/16 inch (5 mm). The spiral flight shall have sufficient stability to prevent distortion and jumping in the trough.

C. Trough Design:

a. Each conveyor trough shall be U-shaped, fabricated from a minimum thickness of 1/8” (3 mm) AISI 304L stainless steel plate. Each trough shall be equipped with inlet and discharge connections, as indicated on the drawings. The outlet openings in the trough bottom shall be sized to prevent screw conveyor plugging.

b. The entire length of the screw conveyor, with the exception of the filling chute, shall be covered by a bolted cover. Covers shall be manufactured from a material thickness of 5/64” (2 mm) AISI 304L stainless steel plate. The covers shall be manufactured in sections with a maximum of 5 foot lengths to allow for easy access.

c. A wear liner shall be provided for the trough. The wear liner shall be made of a minimum 5/16 inch (8 mm) thick ultra-high-molecular-weight polyethylene. The wear liners shall be manufactured in sections with a maximum length of 39 inches to allow for easy replacement.

D. Screw Conveyor Supports Design

a. Each conveyor shall be furnished complete with supports suitable for mounting as shown on the Drawings and as required by the supplier's design. The supports shall be shop fabricated from structural AISI 304L stainless steel shapes and plates. At a minimum, each screw conveyor trough shall have supports at the drive end and other end of the trough plus intermediate supports at a maximum of 11-1/2 foot intervals. The supports shall be designed to avoid interference with other equipment or equipment supports. The supports shall be designed to prevent excessive vibration of any portion of the conveyor unit under all loading conditions.

b. The spiral shall have a center shaft. Minimum flight thickness shall be 3/16 inch (5 mm). The spiral flight shall have sufficient stability to prevent distortion and jumping in the trough.

E. Screw Conveyor Drive Design

a. The screw conveyor mechanism shall be driven by a shaft mounted gearbox and motor assembly. The gear reducer shall be bolted to a machined flange welded to the upper end of the conveyor trough.

b. The gear reducer shall be driven by a 1,760 rpm, 3-phase, 60 Hertz, 230/460 volt, continuous-duty motor with a conduit box suitable for outdoor operation. Motor power shall be 1.5hp.

c. Chain drives, belt drives, hydraulic drives or a separate upper bearing for the transport screw will not be acceptable for this project.

PART 3: EXECUTION

3.0 Installation

The equipment shall be installed in strict accordance with the recommendations, instructions, and drawings provided by the Manufacturer, unless exceptions are noted by the Engineer.

Contractor shall field measure and field verify heights, angle, orientation, clearances etc. prior to submitting shop drawings. Installation of screw press and inclined screw conveyor equipment shall provide all Manufacturer required equipment clearances for operations and maintenance of the equipment and all required clearances for City Staff to pull their sludge truck through the biosolids building during loadout.

After installation, touch-up paint shall be applied to all scratched, abraded and damaged shop painted surfaces. Coating type and color shall match shop painting. The Contractor shall passivate all field welds.

3.1 Startup

The Contractor shall provide the services of factory-employed service technicians for each piece of equipment specified herein who shall adequately inspect the installation and test the equipment furnished under this Contract and instruct the Owner's operating personnel in its maintenance and operation. Start-up or commissioning service provided by anyone other than the equipment supplier could limit or void the equipment warranty. Such services shall be completed jointly with those required for the Sludge Feed Pump, Screw Press, and Screw Conveyor as specified in Section 11310 and as specified herein.

The services of the technician for the screw press and/or screw conveyor shall be provided as follows:

1. Two (2) trips of three (3) workdays each trip to supervise initial start-up and operation and instruct the Owner's personnel in proper operation and maintenance of the equipment.

3.2 Polymer Feed and Optimization

The Contractor shall coordinate with the City's current polymer chemical supplier and the equipment manufacturers to provide a fully functioning and optimized system. The following shall be the scope of the polymer chemical supplier as a part of this Contract:

1. One (1) trip of one (1) day of jar testing of the sludge located in the digester no. 1 tank after startup of the tank as outlined in the proposed construction sequencing recommendations outlined in Section 01100. At a minimum, sludge concentrations at 1%, 3%, and 6% shall be tested. Jar testing to begin once sludge holding tank has been filled as required for testing procedures.
2. Submit to the Engineer a report of the jar testing results and polymer recommendations for polymer type and dosing requirements at the different % solids concentrations specified above.
3. One (1) Trip of three (3) days of onsite optimization of the polymer feed and makeup system, to include cake solids testing using a moisture analyzer provided by Rhino and the plant's laboratory oven and scales. Chemical supplier shall work with the OEM to assist in startup and optimization of the equipment. Trip shall be coordinated with the other equipment as specified herein.
4. Chemical supplier shall provide one (1) initial bulk delivery of polymer as required for the operation of the equipment post-construction.

Polymer optimization and startup services shall be provided by:

1. Rhino Industries, Inc. Contact: Tim Reinhardt (309) 337-0827.
2. No others allowed.

END

DIVISION 13 – SPECIAL CONSTRUCTION

SECTION 13852 ALUMINUM GRATING

PART 1: GENERAL

1.0 The Contractor shall furnish and install aluminum grating where shown on plans. Grating dimensions and supports shall be as shown on the plans.

PART 2: MATERIALS

2.0 Grating shall be constructed of straight parallel bearing "I" beams composed of aluminum.

2.1 Aluminum grating shall safely sustain a uniform distributed load of 100 lbs. per sq. ft. on a 72-inch span and deflect no more than 0.30-inch and shall safely sustain a concentrated load of 300 lbs. per ft. of width on a 72-inch span and deflect no more than 0.25-inch. Grating sections shall provide a 20%-40% open area.

2.2 Recesses shall be ¼ aluminum angle frames, sized as required for the grating. Frames shall have mitered and welded corners.

2.3 Grating shall be banded around all edges.

2.4 Aluminum grating shall be gray in color and provide a non-slip top surface.

2.5 Grating shall conform to UBC Section 2304, Table No. 23-A, and the appropriate portions of OSHA Regulations, Sections 1910.22 and 1910.23.

2.6 Grating shall be furnished with stainless steel hold-down clips.

END

DIVISION 15 - MECHANICAL

SECTION 15100 YARD AND PROCESS PIPING, GATES AND VALVES

PART 1. GENERAL

1.0 Scope

The Contractor shall furnish and install yard and process piping complete as shown on the plans and as enumerated in this specification. Included shall be all pipe and fittings, gates, valves and other piping appurtenances and supports necessary to complete the installation.

1.1 Related Work Specified Elsewhere

Excavation, Filling and Backfilling - Section 02200

PART 2: PIPING, FITTINGS AND COUPLINGS

2.0 Ductile Iron Pipe and Fittings

Ductile iron pipe shall conform to the requirements of ANSI/AWWA C151 standard specification for centrifugally cast ductile iron pipe for water or other liquids.

Ductile iron pipe in exterior locations shall be provided with either mechanical joint type or push-on type ends, and shall be of ANSI/AWWA thickness class as follows:

Pipe Diameter	ANSI Thickness Class
4"	Class 52
6" or larger	Class 52

Ductile iron pipe in interior locations shall be provided with flanged ends as shown on the plans and all interior ductile iron piping shall be ANSI/AWWA Thickness Class 53 (minimum).

Flanges shall be of ANSI/AWWA Standard 125 lb. template. Mechanical joints and push-on joints shall conform to ANSI/AWWA C111 standard for rubber gasket joints for ductile-iron and gray-iron pressure pipe and fittings.

Unless otherwise shown on the plans, ANSI/AWWA short-body fittings shall be furnished. Short body fittings shall conform to ANSI/AWWA C110 standard specification for gray-iron and ductile iron fittings for water and other liquids. Short body mechanical joint fittings conforming to AWWA C-153 will be acceptable.

Flanged long radius elbows, reducing on-the-run tees, side outlet fittings, eccentric reducers and laterals shall conform to ANSI B16.1 standard specification for flanged fittings and flanges.

All fittings, valves, hydrants, etc. shall be installed with Stainless Steel T-bots as manufactured by Burmingham Fasteners or an approved equal. Refer to item 7.3 below for more information on restraining joints.

Ductile iron pipe and fittings shall be furnished with standard thickness cement interior coating conforming to ANSI/AWWA C104. Pipe used for buried locations shall be furnished with standard bituminous exterior coating. Buried ductile iron pipe and valves shall be wrapped in polyethylene. Polyethylene wrap and installation shall conform to ANSI/AWWA C105 standard specification for polyethylene encasement for ductile iron piping for water and other liquids. Pipe used for interior and exposed locations shall be furnished without coating to facilitate painting.

2.1 PVC Gravity Pipe and Fittings

Gravity PVC sewer pipe shall conform to the requirements of ASTM D-3034 with wall thickness conforming to SDR-26. Pipe joining shall be as specified for pressure piping above. Gasketed pipe joints shall show no leakage when tested in accordance with ASTM D 3212. Elastomeric seals shall be supplied meeting the requirements of ASTM F 477. Minimum acceptable cell class shall be 12454 B as per ASTM D 1784 requirements.

Perforated pipe shall be of similar specification as gravity sewer pipe above. Pipe shall have 1/4 inch holes arranged in rows parallel to the axis of the pipe approximately 3-inches center to center with at least 4 rows per section of pipe. Perforated pipe shall be wrapped with Geotextile, MN/DOT 3733, Type 1.

Deflection measurements shall be made prior to completion of the project, provided that the pipe has been installed and backfilled for not less than 30 days. The maximum allowable deflection shall not exceed 5 percent of the base internal diameter of the pipe. The test shall be conducted by pulling a pointed mandrel through the pipe which shall be 95% of the pipe's published ASTM average inside diameter. Allowances for pipe wall thickness tolerance or ovality shall not be deducted from the ASTM average inside diameter, but shall be counted as part of the 5% allowance. Any sections of the sewer not passing the mandrel test shall be uncovered and the contractor shall replace and recompact the embedment backfill material to the satisfaction of the Engineer.

2.2 PVC Drain Pipe

Interior drain piping shall be polyvinyl chloride (PVC), Schedule 80. Fittings shall be DWV directional fittings.

All piping shall be installed in a neat and workmanlike manner and slope to drain

without any peaks or sags.

2.3 Flexible Pipe Couplings

Flexible pipe couplings shall be installed where shown on the plans or for transition between pipe materials. Couplings shall be provided as recommended by the pipe manufacturer to accommodate pipe movement due to temperature changes, and shall be constructed of materials compatible with the contained fluid. Couplings and piping on pressure lines shall be secured against movement with tie rods. Couplings shall be suitable for the type and dimension of pipes to be connected. Interior of steel middle rings shall be epoxy-coated. Couplings shall be as manufactured by Dresser, Smith-Blair, Rockwell or equal.

2.4 Flexible Rubber Connectors

Flexible rubber connectors shall be lightweight spool type, U.S. Rubber, Mercer or equal. Connectors shall consist of single, filled arch with control rods. Where installation requires, furnish with steel companion flanges for installation of adjacent insert check valves or water butterfly valves.

2.5 Pipe Adapters

Flanged pipe adapters shall be installed where noted on the plans or necessary for transition between dissimilar pipe materials. Adapters shall be provided and installed as recommended by manufacturer. Pipe adapters shall be suitable for the type and dimension of pipes to be connected. Any metal parts other than stainless steel shall be epoxy-coated. Flanged pipe adapters shall be megaflange as manufactured by EBAA iron or equal.

2.6 Copper Tubing

Copper tubing shall be ASTM B88, Type K for buried or submerged installations and Type L for piping inside structures or buildings. Buried piping shall have flared fittings and interior piping shall have soldered fittings.

2.7 Aluminum Pipe

Aluminum pipe shall be ridged and manufactured in 6063-T5 as defined in ASTM B241. It shall be extruded and calibrated within the tolerances specifically required by the manufacturer of the instant to connect fittings. Piping shall be rated for pressures up to 232 psig in temperatures -22 deg. C to +120 Deg. C. Piping shall also be vacuum rated for up to -29.6 Hg. Piping shall be powder coated. Coordinate color with Engineer.

Fittings shall be aluminum alloy without the use of plastic or polyamide fitting bodies, except for equal union connections which are hot plate, rolled steel and powder coated. Pipe-to-pipe sealing utilizes concentric nitrile seals with thickness greater than ½". Fittings ¾" to 2" shall utilize 315 Stainless Steel grab rings with a greater than 2 mm

cross-sectional width that bites into the pipe past the powder coating surface. Fittings 2-1/2" to 8" shall utilize a lugged groove. Fittings shall be modular and reusable. Fittings shall be connected using gripping ring with half turn release nut, clamshell, or cartridge technology as recommended by manufacturer for pressure rating of the pipe system.

2.7 Stainless Steel Pipe

Sch 5S, stainless steel press technology system (Victaulic, Viega, or equal), comprised of stainless steel press technology fittings, couplings, and pipe, unless specified otherwise. Maximum working pressure of 150 psi. Threaded connections for header supply piping will not be acceptable.

Couplings and fittings: Press technology products formed of Type 316 stainless steel piping or tubing including self-contained o-ring seals molded of HNBR or EPDM.

Pipe shall be Type 316, ASTM A312 stainless steel.

PART 3: VALVES AND GATES

3.0 General

Valves, sluice gates and slide gates shall be installed in sizes and locations shown on the plans. Valves located six feet or higher above operating floors shall be provided with enclosed chain wheel gear type actuators and chain. Chain shall extend to a point four feet above the operating floor.

3.1 Plug Valves

Plug valves shall be of the non-lubricated, eccentric type with resilient faced plugs and flanged or mechanical joint ends as shown on the plans. Port areas of valves shall be at least 80% of full pipe area. Valve bodies shall be pressure rated not less than 175 psi. Bodies shall be semi-steel with raised seats. Seats shall have a welded-in overlay of not less than 90% pure nickel on all surfaces contacting the plug face. Valves shall have stainless steel permanently lubricated upper and lower plug stem bushings. All valves 4" and larger shall be of the bolted bonnet design. Operating shaft seal on all valves shall be multiple ring "U" cup type or adjustable packing type. Shaft seals on valves 4" and larger shall be repairable without removing valve bonnet. All exposed nuts, bolts, springs and washers on all valves shall be zinc plated. Flanged valves shall be furnished with ANSI/AWWA Standard 125 lb. flanges. Mechanical joint type ends shall conform to ANSI A21.11.

Plug valves 6" or smaller shall be equipped with lever actuators unless shown on the plans to be furnished with electric motor operators or noted otherwise.

Valves 8" and larger shall be equipped with gear actuators limiting operating pull to not more than 25 lbs. on hand wheels, unless shown on the plans to be furnished with

electric motor operators. All gearing shall be enclosed suitable for running in oil with seals provided on all shafts to prevent entry of dirt and water into the actuator. All shaft bearings shall be furnished with permanently lubricated bronze bearing bushings. Actuators shall clearly indicate valve position and an adjustable stop shall be provided to set closing torque. Valve packing adjustment on non-submerged valves shall be accessible without removing the actuator from the valve. Construction of actuator housing shall be semi-steel. All exposed nuts, bolts and washers on actuators shall be zinc plated.

Gear actuators shall be sized to operate at the full pressure rating of the valve.

Where shown on the plans, plug valves shall be equipped with electric motor operators. These actuators shall be in high aluminum alloy castings with bronze self-locking worm gearing. The units shall include power and control terminal strips, and torque limit switches on opening and closing, all in O-ring sealed, NEMA 4 or 7 enclosures depending on installation location. Limit switches shall be geared to the drive mechanism and be activated by a rotor type design. Limit switches shall provide Plant PLC with open and closed valve positions. Contacts shall be silver and have a rating of 10 amps at 120 VAC or 24 VDC. The torque switch shall have a calibrated dial for adjustment and have means to ensure maximum actuator rating is not exceeded. Mechanical torque springs for load control shall be field replaceable without need of actuator dismantling or removal of the worm assembly. A 120 volt single-phase motor, and motor ground lugs shall be capable of operation under maximum specified loads when voltage to the motor is +/- 10% of the nominal voltage. Motor shall have Class F insulation with thermal overload sensors imbedded in the motor windings and be totally enclosed in a NEMA 4 or 7 enclosures depending on installation location. All shafts, gears and other rotating parts shall be supported on heavy duty anti friction bearings. All thrust components shall be supported by use of tapered roller bearings. An external hand wheel operator with declutch feature shall be included to place the actuator in manual mode.

Modulating service controls shall include as a minimum: reversing contactor, indicating lights, local controls, positioner, comparator circuit, and feedback potentiometer. Valve shall accept a 4-20 mA input control signal for commanded valve position. Valve shall provide 4-20 mA feedback output signal proportional to valve position. Two (2) long life, high intensity LED type pilot lights shall indicate open and closed valve position. Red shall indicate valve open and green shall indicate valve closed. An additional LED pilot light shall be furnished to indicate power is on, and a fourth LED pilot light shall indicate torque switch trip. A 3-postion selector switch, for Local (Hand)-Off-Remote (Auto) control modes shall be included. Provide normally open dry contact for Plant PLC feedback when selector switch is in the Auto position. Provide local open and close push buttons for hand operation of valve.

Valves and actuators for exterior underground service shall have seals on all shafts, and gaskets on valve actuator covers, to prevent the entry of water. Underground valves 6” and larger shall have a buried service gear actuator. Actuator mounting brackets for such service shall be totally enclosed and shall have gasket seals. Valves

for buried installations shall be provided with extension stems, road boxes and other necessary appurtenances. Stem extensions shall be within 6" of finish grade, and valve boxes shall be flush with finished grade.

Buried valves and boxes shall be wrapped in polyethylene. Polyethylene wrap and installation shall conform to ANSI/AWWA C105 standard specification for polyethylene encasement for ductile iron piping for water and other liquids.

Plug valves shall be as manufactured by Henry Pratt Company, Milliken Valve, Dezurik, or equal.

3.2 Gate Valves (removed)

3.3 Check Valves (removed)

3.4 Ball Valves

Ball valves 3" and smaller for water shall be lead free bronze rated at a minimum pressure of 150 psi. Valves shall be full port, chrome plated solid ball, PTFE seal and seat with handle operator.

3.5 Stainless Steel Ball Valves

Stainless steel ball valves shall be Duravalve, or equal, Buna-N seats and stem seal for wastewater applications; stainless steel ball and trim, and 3-piece construction.

Valves 4-inches and larger shall be flanged meeting ANSI B16.5. Valves less than 4-inches may be threaded. Valves shall be suited for the intended service.

3.6 Telescoping Valves – Rising Screw Type

The telescoping valves shall be of the rising stem type of extra sturdy construction throughout and designed to provide vertical travel between the high and low water levels as indicated on the Drawings.

The valve shall consist essentially of a fabricated stainless steel pedestal incorporating a valve lifting stem and a traveling indicating device calibrated in ½" increments, handwheel with handle grip for rapid adjustment, stainless steel slip tube, and stainless steel tube guide collar with EPDM or Neoprene gasket. The valve shall have a v-notch.

The sliding valve tube shall be minimum 10 gauge thickness stainless steel tubing. The outside diameter shall be such to slide inside of the specified diameter pipe.

The telescoping valve shall be manually operated by means of a handwheel with handle. The handwheel shaft, designed to prevent rotation of the sleeve during

operation, shall be of stainless steel operating stem with full depth of Acme threads. Acme threads shall allow for rapid adjustment of the handwheel to set precise water levels of valve operation. The stainless steel valve stem shall be bolted to or have an Acme thread at one end for engagement with the valve tube and shall engage a bronze lift nut mounted inside the ductile iron gearbox housing. The stem threading shall be arranged so that it is self-locking. A clear butyrate stem cover with indicator markings shall be provided. The valve shall be complete with tube guide collar made of stainless steel and an EPDM or Neoprene gasket for sealing at the draw-off pipe.

All anchor bolts shall be 316 stainless steel and shall be of ample size and strength for purpose intended. Anchor bolts shall have a minimum diameter of ½ inch. All anchor bolts shall be set by the Contractor in accordance with the manufacturer's instructions.

All parts of the mechanism shall be amply proportioned for all stresses that may occur during fabrication, erection, and intermittent expansion. Workmanship shall be of high grade in all respects.

Rising stem telescoping valves shall be such as manufactured by Vulcan Industries, Missouri Valley, Iowa, Troy Valve, Troy, Pennsylvania, RW Gate, Troy New York; or equal.

PART 4: YARD HYDRANTS (NOT USED)

PART 5: WALL PIPES AND WALL SLEEVES

Wall sleeves and wall pipes for yard and process piping shall be used as shown on the plans where pipes pass through walls. Cast iron wall sleeves and wall pipes shall be as manufactured by Clow Corporation, American Cast Iron Pipe Company, or equal. Steel sleeves and water stop rings shall be Schedule 40 wall thickness, hot-dipped zinc-coated in accordance with ASTM A53. Sleeve and wall pipes installed below grade or through water-bearing walls shall be furnished with a waterstop ring.

Cast iron wall sleeves shall be carefully and thoroughly caulked at both faces after installation to make a watertight joint.

Steel sleeves shall be sealed with rubber link-type seals. Sealing elements shall be EPDM rubber; pressure plates shall be delrin plastic; and bolts and nuts shall be stainless steel.

Wall pipes shall be poured in place and sufficiently braced so as to prevent loss of alignment during pouring of concrete.

PART 6: PIPE HANGERS AND SUPPORTS

Pipe hangers or supports shall be furnished and installed for all interior or exposed process piping as shown on the plans or at intervals not to exceed 8'-0". Hangers shall be Grinnell

Figure 260, Michigan Hanger No. 400 or equal. Hangers shall be supported by solid rods and nuts to brackets, concrete inserts or as shown on the plans. Brackets shall be Grinnell Figure 195, Michigan Hanger No. 352 or equal. All supports shall be hot-dip galvanized, except when submerged or otherwise noted on plans. All pipe supports and hardware installed in submerged applications shall be Type 316 stainless steel.

Unless shown otherwise on the plans, pedestal supports shall be used when piping is installed at or near floor level, and shall consist of floor flange, pipe and saddle. Anchor bolts shall be provided where necessary. All supports shall be adjustable except when specifically shown otherwise on the plans.

The above hanger information indicates a general class of pipe supports required. Where situations are encountered that require other types of supports, they shall be provided to complement those specified.

All hangers shall be located to properly and adequately support the piping system to eliminate pipe stresses and vibrations and yet allow pipe expansion. Spring supports and vibration dampeners shall be provided as found to be required.

The Contractor shall submit drawings showing pipe supports and hangars as well as support/hangar spacing.

PART 7: PROCESS PIPE HEAT TRACE CABLE AND INSULATION

7.0 Heat Trace Cable

A. Heat trace cable shall be capable of keeping aluminum sulfate chemical tubing lines from freezing inside insulated PVC chemical feed conduit piping. Cabling shall have a rating of 12 watts/LF, 240 volt and be self-regulating.

B. Two (2) runs of heat trace cabling shall be pulled through the chemical feed conduits from the chemical room in the administration building to each of the two farthest points at the AeroMod tank as shown on the drawings. The Contractor shall field verify all lengths of heat trace cabling as shown on the drawings and coordinate with electrician. Any changes in cabling length shall be considered incidental and shall be brought to the attention of the Engineer.

C. See electrical drawings and specifications.

7.1 Glass Fiber Insulation

A. Glass fiber insulation meeting the requirements of ANSI/ASTM C547 by Johns Manville or equivalent.

B. 0.24 maximum 'K' value at 75ºF and noncombustible.

C. All purpose, white kraft jacket bonded to aluminum foil and reinforced with

fiberglass yarn, 25/50 flame spread/smoke developed rating. Maximum service temperature rating of 450°F or higher.

D. Plastic Jackets and Fitting Covers:

1. High impact, 0.030" thick, self-extinguishing plastic.
2. Suitable for 40ºF to 150ºF.
3. 25/50 maximum flame spread/smoke developed.
4. Suitable for indoor or outdoor use with ultraviolet light inhibitors added.
5. Plastic jackets shall be of the color selected by the Engineer from the manufacturer's standard listing of colors. White jacket color shall not be acceptable.
6. Johns Manville or equivalent.

7.1 Installation

A. Install materials per manufacturer's instructions, building codes and industry standards.

B. On exposed piping, locate and cover seams in least visible locations.

C. Neatly finish insulation at supports, protrusions, and interruptions.

D. Insulate all fittings, valves and flanges.

7.2 Insulation

A. Service Jackets: Seal all longitudinal joints with self-seal laps using a single pressure sensitive adhesive.

B. Insulation without self-seal lap may be used if installed with Benjamin Foster 85-20 or equivalent Chicago Mastic, 3M or Childers lap adhesive system. Do not staple.

C. Apply insulation with laps on top of pipe.

D. Fittings, Valve Bodies and Flanges: use mitered segments of pipe insulation. Finish with preformed plastic fitting covers. Secure fitting covers with pressure sensitive tape at each end. Overlap tape at least 2" on itself.

7.2 Jacket Cover Installation – Plastic Covering

A. Provide vapor barrier as specified for insulation type. Cover with plastic jacket covering. Position seams to shed water.

B. Solvent weld all joints with manufacturer recommended cement.

C. Overlap all laps and butt joints 1-1/2" minimum. Repair any loose ends that do not seal securely. Solvent weld all fitting covers in the same manner. Final installation shall be watertight.

D. All joints in areas noted shall meet USDA standards for Totally Sealed Systems, including overlaps of 1” on circumferential and 1.5” to 2” on longitudinal seams.

7.2 Insulation Schedule – Pipe Requiring Insulation

A. Exposed chemical feed carry pipe around AeroMod Activated Sludge Tank and shown on the plans.

1. Insulation shall be 2” thick glass fiber insulation with plastic jacket covering as specified above.
2. Jacket covering shall be of an orange color as selected by the Engineer.

PART 8: BURIED PIPE INSTALLATION

8.0 Trench Excavation and Backfill

A. Protection of Property and Surface Structures

Trees, shrubbery, fences, poles and all other property and surface structures shall be protected unless their removal is shown on the drawings or authorized by the Engineer.

B. Excavation

Excavation of every description and of whatever material encountered shall be made to alignments and grades as shown on the plans. Excavation shall be made by open cut. Sides of trenches shall be kept as nearly vertical as possible, and the trench shall be so braced, sheeted and drained that workers may work safely and efficiently therein. The trenches shall be sufficiently straight between designated angle points to permit the pipe to be laid true to line in the approximate center of the trench.

Width of trenches shall be ample to permit pipe to be laid and jointed properly and backfill to be placed and compacted as specified. Trenches shall be of such extra width, when required, as will permit the convenient placing of timber supports, sheeting and bracing, and handling of specials.

The bottoms of trenches shall be excavated to an elevation to provide for a 4-inch cushion of granular bedding material to be placed below the bottom of pipe; this trench elevation shall be defined as subgrade.

C. Blasting

See Section 02200.

D. Braced and Sheeted Trenches

"Stepped" or un-sheeted trenches shall not be used when damage to surface or underground facilities will result unless the Contractor assumes the obligation for such damage.

E. Care of Surface Material for Re-use

All surface materials, which are suitable for re-use in restoring the surface, shall be kept separate from general excavation material.

F. Caution in Excavation

The Contractor shall proceed with caution in the excavation and preparation of trenches so that the exact location of underground structures, both known and unknown, may be determined, and he/she shall be held responsible for the repair of such structures when broken or otherwise damaged because of carelessness on his/her part.

G. Subsurface Explorations

Whenever it is necessary to the satisfactory performance of the project to explore and excavate to determine the location of existing underground structures, the Contractor shall make explorations and excavations for such purposes as directed by the Engineer.

H. Structure Protection

Temporary support, adequate protection and maintenance of all underground and surface structures, drains, sewers and other obstructions encountered in the progress of the work shall be furnished by the Contractor at his expense. The structures, which may have been disturbed, shall be restored upon completion of the work.

I. Excavation in Poor Soil and Refilling to Grade

Where the bottom of trenches at subgrade are found to be unstable or to include ashes, cinders, or other types of refuse, vegetable or other organic material, or large pieces of fragments of inorganic material, the Contractor shall excavate and remove such unsuitable material to the width and depth required. Before pipe is laid, the subgrade shall be made by backfilling with an approved material in 6-inch un-compacted layers. The layers shall be thoroughly tamped so as to provide a uniform and continuous bearing support for pipe. The finished subgrade shall be prepared accurately by means of hand tools.

J. Special Foundation in Poor Soil

Where the bottom of trenches at subgrade is found to consist of material which is unstable to such a degree that it cannot be removed and replaced with an approved material thoroughly compacted in place to support the pipe properly, the Contractor shall construct a foundation for the pipe consisting of piling, timbers or other materials.

K. Pipe Clearance in Rock

Ledge rock boulders and large stones shall be removed to provide a clearance of at least 6 inches below and 9 inches on each side of all pipe, valves and fittings for pipes 24 inches in diameter or less, and 9 inches all around for pipes larger than 24 inches in diameter.

L. Granular Bedding

Uniformly graded granular material with maximum particle size of 3/4 inch shall be placed at a 4-inch thickness under pipe. Excavated material obtained from trenching operations, consisting of native sands or gravels may be acceptable material on which to place pipe providing it complies with the above requirements. The material shall be compacted and shaped so as to provide uniform continuous bearing for barrels of pipe.

M. Backfill

No backfill shall be placed until work has been inspected, tested and approved by the Engineer.

N. Backfill Material

All backfill material shall be free from cinders, ashes, refuse, vegetable or organic material, boulders, rocks or stones, frozen lumps or other unsuitable material. However, from one foot above the top of pipe to one foot below the surface, material containing stones up to 6 inches in greatest dimension may be used, unless specified otherwise herein.

When the type of backfill material is not indicated on the drawings or specified, the Contractor may backfill with excavated material, provided such material consists of loam, clay, sand, gravel or other materials, which are suiable for backfilling. Where there is a deficiency of excavated material for backfill, the Contractor shall backfill with sand, gravel or other approved material.

O. Backfilling Under Pipe

All trenches shall be backfilled by hand, from the bottom of trenches to the

centerline of pipe, with granular backfill material placed in 3-inch layers and compacted by tamping. Backfilling material shall be deposited in trenches for the full width on each side of pipe, fittings and appurtenances simultaneously.

P. Backfilling Over Pipe

From the centerline of pipe, fittings and appurtenances to a depth of one foot above the top of pipe, trenches shall be backfilled by hand or by approved mechanical methods. The Contractor shall use special care in placing this portion of backfill so as to avoid damaging or moving the pipe.

Q. Backfilling to Grade

From one foot above pipe to the grade shown on the drawings or specified herein, trenches shall be backfilled by hand or by approved mechanical methods.

R. Backfill Under Permanent Pavement, Utilities or Walks

Paragraph 3.7(C) of Section 02200 applies.

S. Backfilling Under Proposed Pavement, Structures or Walks

Paragraph 3.7(D) of Section 02200 applies.

T. Backfilling Where Settlement Unimportant

Unless otherwise specified or shown on the plans, the Contractor may backfill trenches from one foot above the pipe to the top of the trench with excavated material. Backfill shall be neatly rounded over trenches to a sufficient height to allow settlement to grade after construction.

U. Backfilling in Freezing Weather

Backfilling shall not be done in freezing weather except by permission of the Engineer, and it shall not be made with frozen material.

V. Surplus Excavated Material

All surplus excavated material shall be the property of the Owner and shall be hauled away and deposited by the Contractor as directed by the Engineer.

W. Surfacing Materials

Surfacing materials shall be as specified elsewhere.

7.1 Pipe Laying

The type of pipe to be used shall be as shown on the plans. All pipe shall be laid and maintained to the required line and grade.

Proper implements, tools, and facilities satisfactory to the Engineer shall be provided and used by the Contractor for the safe and convenient prosecution of the work.

Cutting of pipe shall be done in a neat and workmanlike manner without damage to pipe or lining. Pipe shall be handled properly. Materials must at all times be handled with care to prevent damage. Under no circumstances will pipe be dropped or damaged. Hook ends shall not be used for installing or removing pipe.

The pipe and fittings shall be inspected for defects and, while suspended above grade, be rung with a light hammer to detect cracks.

Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. During laying operations, no debris, tools, clothing or other materials shall be placed in the pipe.

After placing a length of pipe in the trench, the spigot end shall be centered in the bell and the pipe forced home and brought to correct line and grade. The pipe shall be secured in place with approved backfill material tamped under it except at the bells. Pipe joint deflection shall not exceed manufacturer's recommendations.

At times when pipe laying is not in progress, the open ends of pipe shall be closed by a watertight plug or other means approved by the Engineer.

Pipe shall be laid with bell ends facing in the direction of laying unless directed otherwise by the Engineer.

No pipe shall be laid in water or when, in the opinion of the Engineer, trench conditions are unsuitable.

7.2 Setting Valves and Fittings

Valves and fittings shall be set and fastened in the manner heretofore specified for pipe laying or as shown on the plans.

7.3 Anchorage of Process Piping and Water Service

All plugs, caps, tees, and bends deflecting 22-1/2 deg. or more on mains 6 inches in diameter or larger shall be provided with a restrained joint.

Mechanical joint retainer glands shall be Megalug Retainer Glands as manufactured by EBBA Iron, Inc. or approved equal. The minimum distance to closest unrestrained joint is given in the table below.

Type of Fitting	Minimum Distance
11 1/4° Bend	3.6 - feet
22 1/2° Bend	6.6 - feet
45° Bend	11.6 - feet
90° Bend	19.6 - feet
Tee	12.0 - feet
Plug	12.0 - feet

7.4 Hydrostatic Testing

Process piping may be field tested for leakage at 100 psi in accordance with the appropriate section (Hydrostatic Tests) of AWWA C600, with exceptions as given in the table below. Test pressure shall be 100 psi except as stated below. Duration of hydrostatic testing shall be two hours and allowable leakage shall be determined in accordance with the formula:

$$L = \frac{SD\sqrt{P}}{133{,}200}$$

where factors and units are as described in AWWA 7400 C600. Contractor shall conduct test under supervision of the Engineer.

Line	Test Pressure*
Force Mains	150 psi
Gravity Lines	50 psi
2-Inch Water Service	150 psi

* - Test pressure based on the elevation of the lowest point in the line under test and corrected to the elevation of the test gauge.

7.4 Gas and Air Piping Testing

All gas piping systems shall be air tested at 1-1/2 times the working pressure using compressed air but not less than 5 psi. Leakage may be determined by loss of pressure, soap solution, or other positive means acceptable to the Engineer. All joints in piping shall remain tight and free from leaks for a 24 hour test period. Any leaks shall be repaired, and the tests repeated.

Piping Schedule for Materials Specified Under Section 15100						
SERVICE	**Materials**	**Class**	**Joints**	**Coatings**	**Linings**	**Insulation**
Plant Process Piping [1,3]						
Buried Piping (SL, DCT)	DIP	SC 52	Push-On / Mechanical Joint	Asphaltic	Cement Mortar	None
Exposed Piping (SL, DCT)	DIP	SC 52	Flanged	None	Cement Mortar	None
Chemical Feed Carry Pipe/Conduit						
Buried Piping	DIP	SC 52	Push-On / Mechanical Joint	Asphaltic	None	None
Exposed Piping [4]	PVC	SCH 80	Solvent Weld / Push On	None	None	Section 15100
Compressed Air [2]	316 Stainless Steel	Sch 5S	Press Technology Connections	None	None	None

Notes:

(1) Includes but not limited to piping identified by the following streams: DS, SL, W, NPW, DCT, OF

(2) Compressed air piping, if required, for 20 – 100 psi. See Section 11400 for header supply piping.

(3) All buried piping beneath structures shall be DIP Restrained Joint pipe and fittings to five (5) feet outside the building lines.

(4) Heat Trace all exposed chemical feed carry pipe/conduit.

END

DIVISION 15 – MECHANICAL

SECTION 15400, PLUMBING GENERAL PROVISIONS

Part 1 GENERAL

1.1 SCOPE

A. This Section pertains to all work necessary to furnish and install, complete, all plumbing systems including domestic water piping, sanitary sewer piping, special drains, fuel gas piping, fixtures, products and equipment. Installation to include all ancillary equipment necessary for a complete and operating system. Equipment not directly referenced, but required for a complete and operating system shall be provided by CONTRACTOR at no additional cost.

B. Standardization: Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

C. See GENERAL CONDITIONS and Division 1 GENERAL REQUIREMENTS, which contain information and requirements that apply to the work specified herein and are mandatory, for this project.

1.2 REGULATORY

A. Furnish and install all materials and equipment in full accordance with the most recently adopted edition of the following codes, rules, regulations, requirements, standards and specifications:

1. Local, State and Federal Laws and Ordinances.
2. Americans with Disabilities Act (ADA).
3. Food and Drug Administration (FDA)
4. Uniform Mechanical Code (UMC)
5. International Mechanical Code (IMC)
6. National Electrical Code (NEC).
7. National Fire Protection Association (NFPA).
8. Underwriters' Laboratories (UL).
9. American National Standards Institute (ANSI).
10. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
11. American Society for Testing and Materials (ASTM).

B. Conflicts, if any, which may exist between the above items, will be resolved at the discretion of the Engineer.

1.3 PERMITS, CODES, AND INSPECTIONS

A. The Contractor shall obtain all permits and arrange all inspections required by codes applicable to this section and shall submit written evidence to the Engineer that required permits, inspections, and code requirements have been secured.

1.4 SEQUENCING AND SCHEDULING

A. Do not start the following key Project activities until prerequisite activates have been completed and satisfied:

1. Progress Schedule and Schedule of Values.
   a. No prerequisites.
2. Shop Drawing Review:
   a. Prerequisite: Engineer's acceptance of Progress Schedule and Schedule of Values.
3. Equipment Installation:
   a. Prerequisite: Engineer's acceptance of equipment Submittals.
4. Testing:
   a. Prerequisite: Associated testing procedure Submittals complete.
5. Training:
   a. Prerequisite: Associated training plan Submittals complete.

1.5 SUBMITTALS

A. Progress Schedule and Schedule of Values.

B. Complete specifications descriptive drawings, catalog cuts and descriptive literature which shall include make, model, dimensions, and weight of equipment.

C. Complete performance data that will indicate full compliance with the Specifications.

D. Manufacturers' installation instructions, including manufacturer's descriptive literature, start-up instructions, installation instructions, and maintenance procedures.

E. All exceptions to the applicable requirements and Specifications provided in these Contract Documents.

F. Detailed information on structural, mechanical, electrical, or other changes or modifications necessary to adapt materials or equipment to the arrangement or details shown.

G. Recommended procedure for the protection and handling of materials prior to installation.

H. List of recommended spare parts for equipment specified herein.

1.6 MANUFACTURERS' CERTIFICATE(S)

A. Provide manufacturers' certificate(s) certifying proper installation and operations.

1.7 WORK COORDINATION

A. The work under this section must be coordinated with:

1. Division 16000 Electrical work.
2. Division 15500 Heating, Ventilation and Air Conditioning work.

1.8 INSPECTION OF THE SITE AND EXISTING CONDITIONS

A. The drawings were developed from past record drawings and information supplied by the Owner. Verify all dimensions prior to submitting bids.

B. Before submitting bid, visit site and determine conditions at site and at all existing structures in order to become familiar with all existing conditions and mechanical systems which will, in any way or manner, affect the work required under this Contract. No subsequent increase in Contract cost will be allowed for additional work required because of the Contractor's failure to fulfill this requirement.

C. Carry out any work involving the shutdown of the existing services to any piece of equipment now functioning in existing areas at such time as to provide the least amount of inconvenience to the Owner. Do such work when directed by the Engineer.

1.9 WARRANTY

A. Provide a full parts and service warranty for one year from start-up.

Part 2 PRODUCTS

2.1 GENERAL

A. All products and equipment provided under Division 15400 shall meet the general requirements specified in Division 1, GENERAL REQUIREMENTS, in addition to specific requirements as specified under the respective equipment section.

B. The use of a manufacturer's name, model or catalog number is for the purpose of establishing the standard of quality and general configuration desired. Products of other manufacturers will be considered in accordance with the GENERAL CONDITIONS.

C. If a proposed substitution requires structural, mechanical, or electrical modifications to connect to related work, all costs for those modifications shall be included, including the cost of any additional engineering design work required. The Engineer shall be the sole judge as to the equality of all proposed substitutions to the item specified. The Engineer will determine the extent of engineering costs for making the necessary modifications to the Design Drawings and Specifications that result from substitutions.

2.2 GENERAL MATERIALS

A. Furnish and install unions at all locations necessary to disconnect for repairs. Use dielectric unions wherever dissimilar metals are connected.

B. Furnish and install trap primers on all floor drains.

C. Use pipe sleeves when passing through any general construction.

D. Support all pipes at a maximum spacing of 10 feet with:
   1. 3/8 inch rod for up to 2 inch pipes.
   2. 1/2 inch rod for up to 3-1/2 inch pipes or multiple pipes.
   3. Rods shall attach to building structure.

4. Use saddles appropriate for insulated pipe.

E. Provide full port specification grade ball valves on all domestic water pipe unless noted other wise. Valves shall be furnished and installed where shown on plans and at all joints requiring flow control or where isolation for inspection or maintenance is required.

F. All fixtures shall be furnished and installed with shut off valves, stops, flexible supplies, strainers and P traps.

2.3 DOMESTIC WATER SYSTEM

A. Domestic water pipe shall be Type "M" copper for use inside of building.

B. Domestic water pipe shall be Type "K" copper for use outside of building.

C. No hot or cold water pipe shall be concealed in outside walls.

D. Install water hammer arrestors at each plumbing fixture.

E. New pipe shall be disinfected with a 50 parts/million chlorine solution for 24 hours.

F. Insulate all pipe with 1 inch fiberglass or ½ inch close cell foam insulation unless otherwise shown. Cold surface insulation shall have vapor barrier jacket. Insulation shall be Johns-Manville, Owens Corning or equal.

2.4 SANITARY DRAIN

A. Sanitary waste and vent shall be ABS/PVC DWV Schedule 40 plastic pipe, no hub cast iron soil pipe or hard temper copper with compatible fittings.

B. Pitch drain pipe ¼ inch per foot minimum.

C. All exposed clean outs covers shall be chrome plated in wall and nickel bronze on floor.

2.5 FUEL GAS PIPING

A. Fuel gas piping shall be standard weight black steel pipe with malleable fittings on pipe 2 inch or smaller. Concealed pipe and pipe larger than 2 inches shall have welded fittings.

B. Provide lever handle gas cocks at entrance to building and at all equipment locations.

C. Provide U.L. and AGA approved regulators where required.

2.6 PLUMBING FIXTURES

A. Safety Shower/Eyewash

1. Provide combination eye/face wash and shower safety station with ABS plastic shower head (optional stainless steel shower head "SSH"), internal 20 GPM flow control, ABS plastic eye/face wash bowl, powder-coated cast aluminum flag handle and floor flange, 1¼" IPS Schedule 40 galvanized pipe and fittings, 1" IPS and ½" IPS U.S. made chrome-plated brass stay-open ball valves, and polished stainless steel pull rod. Unit shall have (2) polypropylene FS-Plus™ spray heads with integral "flip-top" dust covers, filters, and 3.2 GPM flow control orifices mounted on a chrome-plated brass eyewash assembly. Unit shall include ANSI compliant sign.

2. Unit shall meet or exceed ANSI Z358.1 – 2014, and come with a full 2-year warranty.

3. Manufacturers: Guardian Equipment G1950P or equal.

2.7 PLUMBING SPECIALTIES

A. Water Hammer Arrestors/Shock Arrestors:
   1. Manufacturers: Smith, Sioux Chief or equal.

B. Trap Primers:
   1. Manufacturers: Smith, Wade or equal.

2.8 DRAINAGE PRODUCTS

A. Clean Out:
   1. Manufacturers: Smith or equal.

B. Floor Drain:
   1. Manufacturers: Smith or equal.

2.9 TANKLESS HOT WATER HEATER

A. Provide tankless water heater where shown on drawings. Heater shall be rated and suitable for the required service and use noted.

B. Heater shall be rated to supply tepid water to safety shower and emergency eyewash per ANSI Z358.1 and shall comply with ANSI Z358.1 tepid water without additional mixing or purge features.

C. Tankless water heater must have water connections on the bottom, and be constructed with NSF 61 listed materials. Direct heating element to be non-ferrous, cartridge style, designed for field replacement.

D. Tankless water heater shall be an Eemax SpecAdvantage or equal.

2.10 VALVES

A. Type Ball Valve 2 Inches and Smaller for General Water and Air Service:

   1. Three-piece body type, bronze body and end pieces, hard-chrome plated bronze or brass ball, full bore port, RTFE seats and packing, blowout-proof stem, zinc-plated steel hand lever operator with vinyl grip, rated 600 pound WOG, 150 psi SWP.

   2. Manufacturers and Products: Milwaukee, Nibco, Conbraco Apollo, or Equal

B. Sill Faucet

   1. Cast brass construction with 3/4" inlet. Solid cast brass mounting flange or pipe mount. Solid brass operating stem

   2. Powder coated cast aluminum multi-turn handle assembly with stainless steel mounting screw. AFG teflon with graphite packing

   3. 3/4" garden hose connection outlet. Five full ACME hose threads and 1/4" L bibb washer

   4. Manufacturers and Products: Prier, Nibco, or Equal

Part 3 EXECUTION

3.1 GENERAL

A. All material and equipment shall be installed as shown and described in Contract Documents and as may be required by the applicable codes of the state and city. The Drawings do not attempt to show exact details and no extra payment will be allowed for obstruction by work of other trades or local obstructions to the work under this Contract which require offsets. Where diagrams have been made to show piping connections, the Contractor is cautioned that these diagrams must not be used for obtaining material quantities. Changes in location of equipment or piping advisable in the opinion of the Contractor, shall be submitted to the Engineer for approval before proceeding with the work. All measurements and dimensions shall be verified at the site. All equipment shall be adjusted and left in a condition satisfactory to the Engineer.

B. Any preparation of the structural components of the building for the equipment and material installed under this Section shall be done by the particular affected trade to the satisfaction of the Engineer. Work not conforming to the Contract Documents shall be corrected to the satisfaction of the Engineer. Work shall be done in a neat and orderly fashion, and all surplus material shall be removed and disposed of by the Contractor.

C. The Plumbing Contractor shall be responsible for all repair work of existing facilities affected by plumbing work performed in the existing structure. Repair work shall include, but not be limited to, such items as replacement of ceiling tiles or plaster removed or damaged for access to ceiling; patching walls and ceilings for piping and ductwork penetrations, repair of concrete or asphalt paving removed for pipe access, and other repairs due to extension and remodeling of the plumbing systems.

D. Test and Balance

1. All systems shall be tested as required by code.
2. Sanitary and vent pipe shall hold 5 psi for 5 minutes with no pressure drop.
3. Domestic water pipe shall be leak free at 100 psi.
4. Provide written documentation of all testing.
5. System shall be balanced to provide water distribution as indicated.

3.2 SAFETY CONSIDERATIONS

A. All plumbing equipment shall be installed with suitable access clearances for maintenance or removal of replaceable parts and components, and with necessary couplings or flanges to perform the maintenance or removal without removing the connecting appurtenances.

B. No water piping shall be installed immediately over or within a 3-foot plan view clearance of any electrical panel, motor starter, or Mechanical Mounting Panel. Where piping must be located within these zones, either install piping inside a PVC conduit or shield the electrical device to prevent direct water access to electrical equipment.

C. Where equipment requiring periodic maintenance cannot be reached by normal walkways because of interference with ductwork, piping, or other mechanical obstructions created by conflicts or changes made during construction, or by substitution of equipment, the Contractor shall provide an alternate safe means of access. These may include construction of an overhead platform with stairway or ladder ends and safety railings or handholds, of walk-through duct plenums with hinged access doors, or as required to meet OSHA standards for safe maintenance procedures.

3.3 PIPING SYSTEMS

A. Testing:
   1. Hot water supply and return per UMC Section 1208.
   2. Gas piping per UMC Chapter 13.

3.4 INDICATING DEVICES

A. All direct-reading control devices, thermometers, and pressure gauges shall be installed so that they can easily be read from floor level and are readily accessible for maintenance and service. All thermometer sensing bulbs shall be coated with a silver-base heat transfer grease prior to insertion into the sensing well.

B. Install pressure gauges and thermometers where indicated on the piping schematics.

C. Provide field calibration of all control devices at time of installation to ensure measuring and reading accuracy.

D. The Contractor shall inspect the internal casing insulation and seal all exposed edges and butt joints with mastic to ensure that insulation will not be loosened during operation.

3.5 CLEANING, STARTUP, AND ADJUSTING

A. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work.

B. The Plumbing Contractor shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate startup procedures, calibration, and system check-out with all subcontractors involved. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated with the various subcontractors as required to bring the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally. Any remaining difficulties shall be brought to the attention of the Engineer.

Part 4 PAYMENT

4.1 GENERAL

A. Payment for the work in this Section will be included as part of the lump sum bid amount stated in the Proposal.

End of Section 15400, Plumbing Provisions

DIVISION 15 – MECHANICAL

SECTION 15500, HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to furnish and install, complete, all heating, ventilating, and air conditioning (HVAC) systems. Furnish materials, labor, and equipment in accordance with these Specifications and the accompanying Drawings. Equipment not directly referenced but required for a complete and operating system shall be provided by CONTRACTOR at no additional cost.

B. This Section covers general requirements applying to the following Sections:

1. Section 15766 – Unit Heaters
2. Section 15815 – Metal Ducts
3. Section 15816 – PVC Ducts
4. Section 15820 – Duct Accessories
5. Section 15830 – Fans
6. Section 15950 – Testing, Adjusting, and Balancing

C. Equipment furnished and installed under this section shall be fabricated, assembled, erected, and placed in proper operating condition in full conformity with drawings, specifications, engineering data, instructions, and recommendations of the equipment manufacturer unless exceptions are noted by the Engineer.

D. See CONDITIONS OF THE CONTRACT; and GENERAL REQUIREMENTS, which contain information and requirements that apply to the work specified herein and are mandatory for this project.

E. Standardization: Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

F. As shown on drawings certain areas of this project are NEC Class I Division I or Division II Hazardous Locations. Equipment furnished and installed in these areas shall be suitable for NEC Class I Division I or Division II Hazardous Locations.

1.2 PERMITS, CODES, AND INSPECTIONS

A. The Contractor shall obtain all permits and arrange all inspections required by codes applicable to this section and shall submit written evidence to the Engineer that required permits, inspections, and code requirements have been secured.

1.3 INSPECTION OF SITE AND EXISTING CONDITIONS

A. The drawings were developed from past record drawings and information supplied by the Owner. Verify all conditions and dimensions prior to submitting

bid.

B. Before submitting a bid, visit the site and determine conditions at the site and at all existing structures in order to become familiar with all existing conditions and mechanical systems which may, in any way or manner, affect the work required under this Contract. No subsequent increase in Contract cost will be allowed for additional work required because of the Contractor's failure to fulfill this requirement.

C. After award of Contract, verify at each area of construction activity the location of existing underground utilities. Protect all existing underground utilities during construction. Pay for all required repairs without increase in Contract cost should damage to underground utilities occur during construction.

1.4 WORK COORDINATION

A. In general, work under this section must be coordinated with Division 16 ELECTRICAL in order to accomplish the interfacing necessary to provide complete and operating systems in conformance with the intent of these Contract Documents.

1. Division 16 ELECTRICAL work shall furnish and install for Division 15500 HVAC the following, including but not limited to:

a. Power and control conduit and wiring.
b. Power and control connections to all equipment.
c. MCC controls, disconnect switches, and motor starters, except for starters specified within manufacturer supplied control panels or Environmental Control Panels.
d. Mounting of all manufacturer supplied control panels and Environmental Control Panels.
e. Variable Frequency Drives, except for Variable Frequency Drives specified within manufacturer or Environmental Control Panels or specified within these Sections.
f. Start-up assistance for all equipment utilizing electrical power.

1.5 INTENT OF DRAWINGS

A. Mechanical Plan Drawings show only general locations of equipment, devices, and piping, unless specifically dimensioned. The Contractor shall be responsible for the proper routing of piping and locations of equipment, subject to the approval of the Engineer.

1.6 DEPARTURES FROM CONTRACT DOCUMENTS

A. Submit to the Engineer in writing details of any necessary, proposed departures from these Contract Documents, and the reasons therefore. Submit such requests as soon as practicable. Make no such departures without written approval of the Engineer.

1.7 SUBSTITUTION OF MATERIALS AND EQUIPMENT

A. In accordance with provisions elsewhere in these Contract Documents, manufacturers' names and catalog numbers stated herein are intended to

indicate the type and quality of equipment or materials desired. Unless substitution is specifically forbidden, proposed alternatives may be submitted for approval in accordance with procedures established elsewhere in these Contract Documents.

1.8 SUBMITTALS

A. Submittals shall be in accordance with Section 01300 SUBMITTALS, the requirements of the individual specification sections, and with the following:

1. Complete specifications descriptive drawings, catalog cuts and descriptive literature which shall include make, model, dimensions, and weight of equipment
2. Complete performance data that will indicate full compliance with the Specifications.
3. Manufacturers' installation instructions, including manufacturer's descriptive literature, start-up instructions, installation instructions, and maintenance procedures.
4. All exceptions to the applicable requirements and Specifications provided in these Contract Documents.
5. Detailed information on structural, mechanical, electrical, or other changes or modifications necessary to adapt materials or equipment to the arrangement or details shown.
6. Recommended procedure for the protection and handling of materials prior to installation.
7. List of recommended spare parts for equipment specified herein.

1.9 SEQUENCING AND SCHEDULING

A. Do not start the following key Project activities until prerequisite activates have been completed and satisfied:

1. Progress Schedule and Schedule of Values.
   a. No prerequisites.

2. Shop Drawing Review:
   a. Prerequisite: Engineer's acceptance of Progress Schedule and Schedule of Values.

3. Equipment Installation:
   a. Prerequisite: Engineer's acceptance of equipment Submittals.

4. Testing:
   a. Prerequisite: Associated testing procedure Submittals complete.

5. Training:
   a. Prerequisite: Associated training plan Submittals complete.

1.10 MANUFACTURER'S QUALIFICATION

A. QUALIFICATIONS

1. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years documented experience.

1.11 MANUFACTURERS' CERTIFICATE(S)

A. Provide manufacturers' certificate(s) certifying proper installation and operations.

1.12 ENVIRONMENTAL CONDITIONS

A. All equipment shall perform as specified under the following environmental conditions:

1. Temperature, Ambient
   a. Summer Max 95 DB/84 WB deg F
   b. Winter Min -17 DB deg F
2. Altitude
   a. 1,300 feet MSL

B. Unless otherwise shown on the drawings or specifications, the following classifications shall apply. Use Materials and methods required for such areas.

1. The following areas are classified as Unfinished, Indoor, Dry:

   a. Admin Building (excluding chemical room)

   b. Storage Building (existing and proposed)

2. The following areas are classified as Indoor, Damp/Wet, Corrosive:

   a. Bio-Solids Building

   b. Chemical Room

3. The following areas are classified as Outdoor, Damp/Wet:

   a. Outdoor areas.

Part 2 PRODUCTS

2.1 GENERAL

A. Equipment shall be rated and approved for installation in the intended environment. Unless otherwise specified, ratings shall be required as follows:

1. Finished, Indoor, Dry Locations: NEMA 1.
2. Unfinished Indoor, Dry Locations: NEMA 12
3. Indoor Damp/Wet or Outdoor Locations: NEMA 3R.
4. Wash-Down or Corrosive Locations: NEMA 4X
5. Hazardous Areas: NEMA 7.

2.2 STANDARDIZATION AND UNIFORMITY

A. Provide all first-quality, new materials and equipment, free from any defects, in first-class condition, and suitable for the space provided.

B. Like items of material and equipment provided under Division 15000 shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

2.3 EQUIPMENT FINISH

A. Provide materials and equipment with manufacturers' standard finish system. Provide manufacturers' standard finish color, except where specific color is indicated. If manufacturer has no standard color, finish equipment in ANSI No.61, light gray color.

2.4 DELIVERY AND STORAGE

A. Products supplied under Division 15000 shall be delivered in accordance with accepted Progress Schedule and coordinated to avoid conflicts with the Work and conditions at Site.

B. Products shall be delivered in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.

C. Products shall be unloaded in accordance with manufacturer's instructions or as specified. Provide necessary equipment and personnel to unload items delivered to the site. Record receipt of products at site. Promptly inspect for completeness and evidence of damage during shipment. Remove damaged products from site and expedite delivery of identical, new, undamaged products, and remedy incomplete or lost products to provide that specified, so as to not delay progress of work.

D. Handle and store products in accordance with manufacturer's instructions and in a manner to prevent damage. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.

E. Arrange storage in a manner to provide easy access for inspection. Keep running account of products in storage to facilitate inspection and to estimate progress payments.

F. Storage fabricated products above ground on blocking or skids, and prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.

G. All stored equipment subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) shall be stored in a weather tight building to prevent damage. Building may be a temporary structure on the site or elsewhere, but must be satisfactory to the Engineer. Building shall provide adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.

H. All equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacture, as applicable. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding". Lubricants shall be changed upon completion of installation and as frequently as required by manufacturer thereafter during the period between installation and acceptance.

I. Inspect, maintain, and service stored products on a regularly scheduled basis, consistent with manufacturer's instructions. For items furnished by others, perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems. Record inspection, maintenance, and services performed, and keep log available for review.

2.5 CHANNEL-STRUT

A. Provide channel roll-formed from 12-gauge steel in conformance with ASTM A 569-72. Channel shall have a cross sectional width and depth of no less than 1 - 5/8 inches. All accessories, including nuts, bolts, straps, threaded rods and factory-punched holes shall be corrosion-resistant material equivalent to the finish or material of the channel. Channel and accessories shall be stainless steel or aluminum for outside, indoor damp, and wet and hazardous areas: and galvanized steel for indoor dry locations.

Part 3 EXECUTION

3.1 GENERAL

A. At the completion of work remove refuse material and thoroughly clean all work areas and parts of the installation.

B. HVAC systems shall be tested and balanced in accordance with the procedures described in Section 15950, TESTING, ADJUSTING, AND BALANCING.

3.2 INSTALLATION, COMMON REQUIREMENTS

A. Follow manufacturers' installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between the manufacturers' instructions, codes and regulations, and these Contract Documents, follow the Engineer's decision. Keep a copy of manufacturers' installation instructions on the jobsite available for review at all times.

B. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work which has a neat and finished appearance.

C. Coordinate mechanical work with the Engineer and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the plant during construction.

D. Be responsible for receiving and handling of Owner furnished or relocated equipment which is to be installed per the requirements of this Specification.

E. Check the approximate locations of mechanical system components shown on Drawings for conflicts with openings, structural members, and components of

other systems and equipment having fixed locations. In the event of conflicts, notify the Engineer in writing. The Engineer's decision shall govern. Make modifications and changes required to correct conflicts.

F. Locate equipment approximately where shown on the Drawings to provide access spaces required for filter changing, motor, drive, and bearing servicing, and fan shaft and coil removal.

G. All floor-mounted equipment (i.e., pumps, heat exchangers, etc.) shall be installed on concrete housekeeping pads. Dimension of pad shall be 3-1/2-inches high, and extend 2-inches past equipment base on all sides, or as shown on Drawings.

H. Isolate fan units or other rotating equipment from adjacent ductwork.

I. Following installation, protect materials and equipment from corrosion, physical damage, and the effects of moisture on insulation. When equipment intended for indoor installation is installed at the Contractor's convenience in areas where it is subject to dampness, moisture, dirt, or other adverse environment until completion of construction, ensure that adequate protection from the environment is provided that is acceptable to the Engineer. Seal all open ends of piping and equipment until ready for final connection.

J. Systems shall not be operated for any purpose until filters are installed. Complete interior cleaning of equipment and coils will be required if operated without filters.

K. Air handling equipment with multiple heating and/or cooling coils shall be piped such that-each coil has a manual balancing cock and gauge cock as required for water balancing.

L. Lubricate all bearings prior to startup.

M. The Contractor shall inspect the internal casing insulation and seal all exposed edges and butt joints with mastic to ensure that insulation will not be loosened during operation.

3.3 CUTTING AND PATCHING

A. Layout work carefully in advance. Do not cut or notch any structural member or building surface without specific approval of Engineer. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, paving, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical materials and equipment. Following such work, restore surfaces neatly to original condition.

B. Damaged facilities or equipment shall be repaired to return the damaged item to a condition equal to or better than was present at commencement of the project.

3.4 CLEANING AND TOUCHUP PAINTING

C. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove all materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch up scratches,

scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish. If extensive damage is done to equipment paint surfaces, refinish the entire equipment in a manner that provides a finish equal to or better than the factory finish, that meets the requirements of the Specifications, and that is acceptable to the Engineer.

3.5 SAFETY CONSIDERATIONS

A. All mechanical equipment shall be installed with suitable access clearances for maintenance or removal of replaceable parts and components, and with necessary couplings or flanges to perform the maintenance or removal without removing the connecting appurtenances.

B. Where equipment requiring periodic maintenance cannot be reached by normal walkways because of interference with ductwork, piping, or other mechanical obstructions created by conflicts or changes made during construction, or by substitution of equipment, the Contractor shall provide an alternate safe means of access. These may include construction of an overhead platform with stairway or ladder ends and safety railings or handholds, of walk-through duct plenums with hinged access doors, or as required to meet OSHA standards for safe maintenance procedures.

C. No water piping shall be installed immediately over or within a 3-foot plan view clearance of any electrical panel, motor starter, or Mechanical Mounting Panel. Where piping must be located within these zones, either install piping inside a PVC conduit or shield the electrical device to prevent direct water access to electrical equipment.

3.6 IDENTIFICATION PLATES

A. Identification Plates and Coding:

1. Equipment: A plastic identification plate shall be securely mounted on the equipment in a readily visible location. The plate shall bear the 1/4-inch engraved equipment identification name and/or number as indicated in this Specification and/or as shown on the Drawings.

B. Attach nametags to equipment with screws, bolts, or mastic to create a permanent bond.

3.7 PAINT

A. Shop Coat:

1. Manufacturer's standard, except as noted.

B. Finish Coat:

1. Manufacturer's standard, except as noted.

3.8 HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

3.9 PIPING SYSTEMS

A. Installation:

1. Gas piping per 2015 MN Fuel Gas Code

3.10 INDICATING DEVICES

A. All direct-reading control devices, thermometers, and pressure gauges shall be installed so that they can easily be read from floor level and are readily accessible for maintenance and service. All thermometer sensing bulbs shall be coated with a silver-base heat transfer grease prior to insertion into the sensing well.

B. Install pressure gauges and thermometers where indicated on the piping schematics. Refrigerant pressure gauge taps shall be installed on the compressor suction and discharge lines in every field-piped refrigeration system where integral gauges are not furnished with the equipment.

C. Provide field calibration of all control devices at time of installation to ensure measuring and reading accuracy.

3.11 CLEANING, STARTUP, AND ADJUSTING

A. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work. Remove, clean, and reinstall all filters. Belt-drive tensions and alignments shall be checked. All motors and bearings shall be lubricated in accordance with the manufacturer's service manuals prior to equipment startup. Provide a lubrication schedule for every item of equipment furnished under this Section. The schedule shall include the type of lubricant and the application frequency.

B. Clean Duct System and force high velocity air through ducts to remove accumulated dust.

C. The Mechanical Contractor shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate startup procedures, calibration, and system check-out with all subcontractors involved. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated with the various subcontractors as required to bring the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally. Any remaining difficulties shall be brought to the attention of the Engineer.

Part 4 INSPECTION

4.1 GENERAL

A. Allow materials, equipment, and workmanship to be inspected at any time by the Engineer, Owner or their representatives. Correct work, materials, or equipment

not in accordance with these Contract Documents or found to be deficient or defective in a manner satisfactory to the Engineer and Owner

Part 5 STANDARDS, CODES, PERMITS, AND REGULATIONS

5.1 GENERAL

A. Furnish and install all materials and equipment in full accordance with the most recently adopted edition of the following codes, rules, regulations, requirements, standards and specifications:

1. Local, State, and Federal Laws and Ordinances.
2. State Fire Marshal.
3. American National Standards Institute (ANSI).
4. American Petroleum Institute (API)
5. American Society of Mechanical Engineers (ASME)
6. American Society for Nondestructive Testing (ASNT)
7. American Society for Testing and Materials (ASTM)
8. American Water Works Association (AWWA)
9. American Welding Society (AWS)
10. Manufacturers Standardization Society of the Valve and Fittings Industry, Inc. (MSS).
11. National Fire Protection Association (NFPA)
12. Occupational Safety and Health Act (OSHA)
13. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE).
14. Air Movement and Control Association (AMCA).
15. Sheet Metal and Air Conditioning Contractor's National Association (SMACNA).
16. Spiral Duct Manufacturers Association (SPIDA)

B. Conflicts, if any, which may exist between the above items, will be resolved at the discretion of the Engineer.

Part 6 OPERATIONS AND MAINTENANCE MANUALS

6.1 GENERAL

A. Provide operations and maintenance manuals. Provide three copies containing:

1. Operation, maintenance, recommended spare parts, and renewal parts information for all equipment furnished under this section
2. Set of complete, final, as-reviewed and accepted shop drawing information.
3. As-built piping, equipment, and installation drawings.
4. Index of all equipment suppliers listing current names, addresses, and telephone numbers of those who should be contacted for service, information, and assistance.
5. As-built Contract Drawings marked with red indelible pencil to show all departures from original drawings. Include underground piping or duct runs dimensioned from established building lines, and all mechanical work revisions. Prepare by obtaining new, clean sets of Contract Drawings from Engineer and pay all costs for same, field marked as-built drawings shall be initialed by the Engineer or his representative.

6. All field and factory test results.
7. Information listed under individual specification items.
8. Use only clean material. File under dividers with headings in accordance with Specification item title.
9. Submit material to the Engineer for review prior to delivery of the final Operations and Maintenance Manuals to the Owner. Make additions or changes required by the reviewer.

Part 7 GUARANTEE

7.1 GENERAL

A. Materials, equipment and workmanship shall be guaranteed in accordance with provisions of GENERAL REQUIREMENTS. Unless otherwise specified, materials, equipment and workmanship shall be guaranteed for a period of not less than one year after substantial completion of project.

Part 8 PAYMENT

8.1 GENERAL

A. Payment for work covered by Division 15000 shall be as specified under Division 1, GENERAL REQUIREMENTS.

End of Section 15500, Heating, Ventilation and Air Conditioning General Provisions

DIVISION 15 – MECHANICAL

SECTION 15730, DIRECT FIRED MAKE UP AIR UNIT

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to furnish and install Direct Fired Make Up Air Units for Heating, Ventilating, and Air Conditioning (HVAC) systems. Equipment not directly referenced, but required for a complete and operating system shall be provided by Contractor at no additional cost.

1.2 GENERAL

A. Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement

B. See HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS Section 15500 which contains information and requirements that apply to the work specified herein and are mandatory for this project.

C. All fan equipment in this section shall be statically and dynamically balanced. Field testing shall be performed on all rotating equipment. If there is excessive vibration the manufacturer shall rebalance the equipment in place.

D. All fan equipment shall be rated and tested in accordance with AMCA Standards for Class 1 service, unless otherwise specified.

E. All supply units, filters, and fans shall comply with the requirements of NFPA 90A.

F. Air velocities at inlets, coils, and filters shall not exceed 900 feet per minute unless otherwise noted.

1.3 SUBMITTALS

A. Submittals shall be made in accordance with Section 15500 HVAC GENERAL PROVISIONS and with this section.

B. Submittal information shall indicate complete compliance with all requirements of this specification and with scheduled performance criteria. Clearly highlight all areas where submitted equipment data varies from the requirements of this specification.

1.4 WORK COORDINATION

A. See Section 15500, HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS for additional Work Coordination information.

1.5 QUALITY ASSURANCE

A. Manufacturer of equipment specified in this section shall have minimum 5 years documented experience.

B. Equipment shall have UL certification.

1.6 SUPPLEMENTS

A. The supplements listed below are included as part of this specification:

1. Equipment Schedules as noted on drawings.

Part 2 PRODUCTS

2.1 GENERAL

A. Manufacturer shall provide all ancillary items not directly referenced but required for a complete and operation system.

2.2 MAKE UP AIR UNIT

A. For performance requirements see included supplements at the end of this section.

B. Gas Train and Controls:
1. Factory assembled, piped, and wired.
2. Direct gas-fired system will be 92% efficient.
3. Fuel Type: Natural Gas.
4. Dual Safety Shutoff Valves.
5. Direct Spark Ignition.
6. Cast aluminum burners with stainless steel mixing plates.
7. Burner modulation with 25:1 turn down ratio.
8. Internal discharge air temperature control with override capability from room thermostat.

C. Construction:
1. Weather resistant cabinet suitable for exterior installation.
2. Heavy gauge double wall 1” fiberglass insulated cabinet constructed of galvanized steel.
3. Insulation tested to meet UL 181 requirements and attached to unit with permanent mechanical fasteners.
4. Galvanized steel weather hood with birdscreen.
5. Filter section with 2” aluminum filter.
6. Inlet damper.

D. Supply Fan:
1. Double width, double inlet.
2. Forward curved wheel, permanently sealed ball bearings.
3. Fan and motor mounted on a common base, vibration isolated from cabinet.
4. Statically and dynamically balanced.
5. High efficiency electric motor.
6. Horizontal or down blast discharge as shown on drawings.

E. Electrical and Controls:

1. EC Motor type. Motors shall be open type enclosure and electronic commutation type motor (ECM) specifically designed for fan applications. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed (80% turndown).

2. Equipment shall include a manufacturer supplied unit-mounted control center including the following:
   a. Control circuit fusing
   b. 24 VAC control transformer
   c. Supply Fan and drive
   d. Electrical Disconnect Switch
   e. Unit Controller
   f. Relays and terminals for remote interfaces as specified

3. Unit Mounted Control
   a. Unit shall be supplied with integral controller. Controller shall maintain discharge air temperature set point. Discharge set point shall be adjustable on the controller.
   b. Units shall accept the following dry contact inputs.
      - Fan Enable – jumpered at factory such that exhaust fan is enable upon unit power up.
      - Heat Enabled – jumpered at factory such that heat is enabled upon unit power up.
   c. Controller shall provide the following dry contact outputs.
      - Alarm, normally open, closed for the following conditions
        1. Fan Fail
        2. Flame Lockout/Failure
      - Dirty Filter

F. Dampers and Actuators:

1. Units shall include manufacturer provided damper and actuator for field installation.
2. Actuators shall be 24VAC operated, normally closed type.
3. Actuator shall be enclosed in NEMA-rated enclosure suitable for outdoor installation.

G. Accessory and Control Items:

1. The following items shall be provided with the unit, factory installed and wired or suitable for field installation.
2. Manufacturer supplied duct adapter
3. Dirty Filter Switch (factory installed and wired)
4. Blower Proving Switch (factory installed and wired)
5. Outside Air Temp Sensor (factory installed and wired)
6. Discharge Air Temp Sensor (factory installed and wired)

H. Manufacturers and Products:

1. Greenheck Fan Corporation, Model DG; or Equal.

Part 3 EXECUTION

3.1 INSTALLATION REQUIREMENTS

A. See HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS Section 15500.

B. Install specified equipment as shown on plans and in accordance with manufacturer's printed instructions. Provide all ancillary materials not directly reference for required for complete installation of the equipment.

C. Isolate sheet metal duct connections as specified in Section 15815, METAL DUCTS.

D. Install specified equipment with suitable access to clearance for maintenance or removal of replaceable components. Provide sufficient clearance to allow full opening of all access panels and doors.

E. Following installation, a technical representative of Contractor shall inspect and startup specified equipment. Startup shall include checkout to ensure installation of equipment, adjustment of set points, and testing and verification of equipment operation. All test equipment for the checking of system operation shall be provided by CONTRACTOR for the duration of the testing work and this test equipment will remain the property of CONTRACTOR.

3.2 ADJUSTING AND CLEANING

A. Air system cleaning, adjusting, and balancing in accordance with Section 15500, HVAC GENERAL PROVISIONS.

B. Do not operate units until ductwork is clean, filters are in place, bearings lubricated, condensate properly trapped, piping connections verified, and leak tested, belts aligned and tensioned, all shipping braces have been removed, and fan has been test run under observation.

3.3 EQUIPMENT OPERATION

A. Initial temperature and operational set points shall be as noted on schedule, as recommended by installer, or per manufacturer's recommendations.

B. During startup, set points shall be adjusted by installer to meet site specific conditions and per Engineer or Owner recommendations.

C. Description of Operation

1. Unit will operate continuously at ventilation rate noted on schedule. Fans speeds to be initially field adjusted by Contractor to provide ventilation rate noted on plans.

2. Unit Start Up Sequence
   a. Supply damper opens.
   b. Once damper is verified open, supply fan is enabled and started started.

3. Fan Control
   a. Fan setup to provide a nominal ventilation rate as noted on plans.

4. Heating Control
    a. Heating will automatically be locked out when the outside air temperature is above the inlet air sensor heat setpoint (adjustable, initially set at 50 deg F)
    b. Discharge air temperature adjustable via remote set point dial Adjustable from 50 to 100 degrees F.

5. Freeze Protection
    a. If supply air temp drops below 35 degrees F for adjustable time delay (typically 300 seconds), supply fan is disabled. Cycling unit enable signal will reset the timer and allow for unit operation.

End of Section 15730, Make Up Air Unit

SECTION 15766, UNIT HEATERS

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to furnish and install Unit Heaters for Heating, Ventilating, and Air Conditioning (HVAC) systems.

B. See HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS Section 15500 which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.2 GENERAL:

A. All fan equipment in this section shall be statically and dynamically balanced. Field testing shall be performed on all rotating equipment as described herein under Article AIR AND WATER SYSTEM TESTING AND BALANCING to determine actual operating vibration. If the vibration limits described therein are exceeded, the manufacturer shall rebalance the equipment in place, if directed by the Engineer, until design tolerances are met.

B. All fan equipment shall be rated and tested in accordance with AMCA Standards for Class 1 service, unless otherwise specified.

C. All fans shall comply with the requirements of NFPA 90A.

1.3 SUBMITTALS

A. Submittals shall be made in accordance with Section 15500 HVAC GENERAL PROVISIONS and with this section.

B. Submittal information shall indicate complete compliance with all requirements of this specification and with scheduled performance criteria. Clearly highlight all areas where submitted equipment data varies from the requirements of this specification.

Part 2 PRODUCTS

2.1 TYPE G1, FUEL FIRED UNIT HEATER, NORMAL DUTY

A. See schedules for sizing information.

B. Heavy duty steel housing with baked enamel finish.

C. 20-gauge aluminized steel tubular heat exchanger.

D. Hot surface pilot ignition system.

E. Power vented suitable for horizontal or vertical venting.

F. 115V, 60Hz, single phase totally enclosed electric motor with disconnect

G. The following field installed options are to be supplied factory mounted and wired on the unit:

1. Control power transformer
2. Thermostat
3. Disconnect

H. Unit Heater shall be Trane Model GTND, GTPD, or equal.

Part 3 EXECUTION

3.1 GENERAL

A. See HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS Section 15500.

End of Section 15766 Unit Heaters

SECTION 15815, METAL DUCTS

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to furnish and install Metal Ducts for Heating, Ventilating, and Air Conditioning (HVAC) systems.

1.2 GENERAL.

A. See Section 15500, HEATING VENTILATING AND AIR CONDITIONING which contains information and requirements that apply to the work specified herein and are mandatory, for this project.

1.3 SUBMITTALS

A. Make submittals in accordance with Section 15500, HEATING VENTILATING AND AIR CONDITIONING.

Part 2 PRODUCTS

2.1 GENERAL

A. Material:
   1. Screen Building: 304 Stainless Steel.
   2. Blower Building: Aluminum

B. All duct system components shall have flame spread and smoke developed ratings as required by code and shall be tested in accordance with ASTM E84 and NFPA 255.

C. Ductwork shall be fabricated in accordance with the latest editions of ASHRAE Handbook, SMACNA Manual of Duct and Sheet Metal Construction for Ventilating and Air Conditioning Systems, NFPA, and the Uniform Mechanical Code. Where a conflict among these references arises, the most stringent source shall be followed.

D. Fasteners shall be the same material as the duct. Where dissimilar metals are used, washers, sleeves, or other means must be used for dielectric isolation.

E. Duct interior shall be smooth and free of obstructions. Seams, flanges, joints, and other sheet metal projections shall be external.

F. All round duct takeoffs from round mains shall be made with conical tee's. All round duct takeoffs from rectangular mains shall be made with bellmouth fittings.

2.2 DAMPERS

A. See SECTION 15820 – DUCT ACCESSORIES

Part 3 EXECUTION

3.1 GENERAL

A. All material and equipment shall be installed as shown and described herein and as may be required by the applicable codes of the state and city. The Drawings do not attempt to show exact details of all piping and ductwork, and no extra payment will be allowed for obstruction by work of other trades or local obstructions to the work under this Contract which require offsets. Where diagrams have been made to show piping connections, the Contractor is cautioned that these diagrams must not be used for obtaining material quantities. Changes in location of equipment, piping, or ductwork, advisable in the opinion of the Contractor, shall be submitted to the Engineer for approval before proceeding with the work. All measurements and dimensions shall be verified at the site. All equipment shall be adjusted and left in a condition satisfactory to the Engineer.

B. Any preparation of the structural components of the building for the equipment and material installed under this Section shall be done by the particular affected trade to the satisfaction of the Engineer. Work not conforming to the Contract Documents shall be corrected to the satisfaction of the Engineer. Work shall be done in a neat and orderly fashion, and when requested by the Engineer, all surplus material shall be removed and disposed of by the Contractor.

C. The Mechanical Contractor shall be responsible for all repair work of existing facilities affected by mechanical work performed in the existing structure. Repair work shall include, but not be limited to, such items as replacement of ceiling tiles or plaster removed or damaged for access to ceiling; patching walls and ceilings for piping and ductwork penetrations, repair of concrete or asphalt paving removed for pipe access, and other repairs due to extension and remodeling of the existing mechanical systems.

3.2 IDENTIFICATION PLATES AND CODING

A. Attach nametags to equipment with screws, bolts, or mastic to create a permanent bond.

3.3 PAINT

A. None

3.4 HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

3.5 DUCTWORK

A. All sheet metalwork ductwork shall be fabricated and installed by qualified, experienced mechanics as specified herein and in accordance with the requirements of ASHRAE and the-latest edition of the applicable SMACNA Manual. All horizontal surfaces shall be cross-broken, and additional bracing to prevent ballooning or breathing shall be installed as required. Duct hanging devices in contact with metallic ducts shall be of the same material as the duct or be separated from direct contact by a nonmetallic sleeve of a material approved by the Engineer.

B. All joints and seams for fume hood exhaust, general laboratory exhaust, range hood exhaust, and all ductwork connecting to exhaust fans that are required to be of AMCA spark-proof construction shall be sealed with a chemical resistant mastic, and all butt joints shall be riveted with a minimum of eight pop rivets. Furnish a removable gasketed cleanout access door at each elbow.

C. Duct sizes shown on the Drawings are net air side face-to-face dimensions required. Balancing dampers and fire dampers shall provide 100 percent unobstructed free area. Ductwork with internal sound-attenuation duct liner shall be 2 inches larger in each dimension to allow net inside dimensions shown.

Part 4 PAYMENT

4.1 GENERAL

A. Payment for the work in this Section will be included as part of the lump sum bid amount stated in the Proposal.

End of Section 15815, Metal Ducts

SECTION 15820, DUCT ACCESSORIES

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to furnish and install Duct Accessories for Heating, Ventilating, and Air Conditioning (HVAC) systems.

B. Standardization: Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

C. See CONDITIONS OF THE CONTRACT and Division 1, GENERAL REQUIREMENTS, and Section 15000 MECHANICAL GENERAL PROVISIONS, which contain information and requirements that apply to the work specified herein and are mandatory, for this project.

1.2 GENERAL

A. Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement

B. See HEATING VENTILATING AND AIR CONDITIONING GENERAL PROVISIONS Section 15500 which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.3 SUBMITTALS

A. Submittals shall be made in accordance with Section 15500 HVAC GENERAL PROVISIONS and with this section.

B. Submittal information shall indicate complete compliance with all requirements of this specification and with scheduled performance criteria. Clearly highlight all areas where submitted equipment data varies from the requirements of this specification.

1.4 QUALITY ASSURANCE

A. Manufacturer of equipment specified in this section shall have minimum 5 years documented experience.

1.5 SUPPLEMENTS

A. None.

Part 2 PRODUCT

2.1 DAMPERS, RELIEF

A. Manufacturer: Greenheck SEBR Series or Equal

B. Ratings
   1. Back Pressure: 2 in wg

   2. Velocity: maximum velocity 2000 fpm

C. Construction:
   1. Frame: Damper frame shall be 304 or 316 stainless steel.

   2. Blades: Damper blades shall be a minimum 0.063 inch thick aluminum.

   3. Blade Stops: Each blade stop (at top and bottom of damper frame) shall occupy no more than 3 ½ in. of the damper opening area to allow for maximum free area and to minimize pressure loss across the damper.

   4. Seals:

      a. Blade Edge: Standard
      b. Jamb: None Required

   5. Linkage: External, steel tie bars

   6. Axles: Stainless steel

   7. Bearings: Acetal with stainless steel ball

   8. Finish: Mill finish.

   9. Counterbalance: Blade mounted with adjustable weights.

   10. Mounting: Horizontal

2.2 DAMPERS, VOLUME CONTROL

A. Type D101, multiple-blade damper:

   1. Parallel or opposed blade type for open/close operation. Opposed blade type for balancing or modulating operation. Frame and blade material to match adjacent duct. Locking hand quadrant operator unless otherwise specified.

   2. Low leakage control damper with thermally insulated blades.

   3. Greenheck VCD, or equal.

B. B. Type D102, single-blade damper:
   1. Frame and blade material to match adjacent duct, 18-gauge minimum thickness. Locking hand quadrant operator unless otherwise specified.

2. Approved for use in hazardous and corrosive location.

3. Greenheck MBD, Ruskin MD series, or equal.

C. Type D201, Backdraft damper:

1. Frame and blade material to match adjacent duct. Suitable for pressures to 2-inches w.c.

2. Aluminum dampers provided with vinyl seals, stainless steel axles and synthetic bearings.

3. Greenheck WD (Steel), Greenheck ES (Aluminum), or equal.

D. Type D301, Combination Louver and Damper

1. Drainable type incorporating both stationary and adjustable blades within a single frame. Integral gutters and downspouts to facilitate water drainage.

2. Aluminum construction with clear anodized finish, unless otherwise specified.

3. Low-leakage design with vinyl blade edge and perimeter jamb seals. When closed, damper shall provide weather tight seal.

4. Louver shall be capable of withstanding wind loadings of 25 PSF (100.0 MPH wind equivalent).

5. Louver shall bear the AMCA Certified Ratings Seal.

6. Greenheck Model ECD-401, or equal.

E. Operators:

1. Provide locking, manual quadrant-type operating handle on all balancing dampers, unless otherwise specified. Ventlock Type 635 on accessible ductwork, Type 639 on accessible insulated ductwork, and Type 677 with extended operating rod and concealed regulator with plain cover on concealed ductwork, or equal.

2. Actuators for dampers shown on the Drawings or specified as automatic control type shall be furnished suitable for use with standard electric or pneumatic operators. Actuator voltage, failure position, and accessories shall be as shown on Drawings or in Schedules.

3. Actuators for dampers located in a hazardous or corrosive area shall meet the certification and material requirements for the specific area.

2.3 LOUVERS

A. Type L101

1. Weather louver designed to protect air intake and exhaust opening in exterior walls.

2. Design incorporate drain gutters in head member and horizontal blades to channel water to jambs where water is further channeled to vertical downspouts and out at the sloped sill.

3. Aluminum construction with clear anodized finish, unless otherwise specified.

4. Louver shall be capable of withstanding wind loadings of 25 PSF (100.0 MPH wind equivalent).

5. Louver shall be provided with insect screen.

6. Louver shall bear the AMCA Certified Ratings Seal.

7. Greenheck Model ESD, or equal.

2.4 GRILLES AND DIFFUSERS

A. General:

1. Diffusers and grilles shall be constructed of the same material as adjoining duct.

2. Where specific air volumes are shown on drawings, units shall be supplied with integral adjustable volume control dampers. Where units are not available with integral dampers, separate volume control dampers shall be provided to accomplish system balancing.

3. Where installed on round duct, provide and install duct adaptor.

B. Type D, Supply Air Grille

1. Price Model 610, Model 610D (with damper); or equal.

C. Type E, Return Air Grille

1. Price Model 630, Model 630D (with damper); or equal.

2.5 DAMPERS, FIRE & SMOKE CONTROL

A. Provide fire, smoke, or combination fire and smoke dampers where shown and/or specified. Devices and installation shall comply with all code requirements. Damper dimensions are not to exceed duct I.D. dimensions. Blades to be airfoil construction with full length structural reinforcement. Frame to be galvanized steel. Actuator to be electric type, fail to close. As manufactured by Greenheck or equal.

2.6 TURNING VANES

A. Square-turn elbows shall be fitted with Elgeri All-Tight, or equal, vane side rails with shop-fabricated double-blade turning vanes of the same material as the ductwork.

2.7 ACCESS & INSPECTION DOORS

A. Ceiling access doors shall be Inryco/Milcor or equal, size 24 x 24, suitably positioned for access to concealed equipment, finished in baked white enamel. Furnish adjacent to each electric duct heater, booster coil, motorized damper, terminal unit, smoke detector, nonaccessible ceiling systems and fire damper located above.

B. Duct inspection doors shall be Ventlock or equal, size 12 x 16 steel frame with gasketing around periphery, either hinged glass, or hinged or removable plexiglass visual panel, or separate size 6 x 8 access door and 6 x 6 visual panel on smaller ductwork, required at each duct mounted fire damper, duct mounted smoke or ionization detector, electric duct heater, booster coil, humidifier, motorized damper, and plenum.

2.8 WEATHERHOOD

A. Where shown on the drawings, supply shall include manufacturer provided weatherhood. Hood shall be constructed of galvanized steel and provide 90 degree turndown to prevent the entrance of rain and snow for supply applications. Exterior opening shall be equipped with an insect screen.

Part 3 EXECUTION

3.1 GENERAL

A. All material and equipment shall be installed as shown and described herein and as may be required by the applicable codes of the state and city. The Drawings do not attempt to show exact details of all piping and ductwork, and no extra payment will be allowed for obstruction by work of other trades or local obstructions to the work under this Contract which require offsets. Where diagrams have been made to show piping connections, the Contractor is cautioned that these diagrams must not be used for obtaining material quantities. Changes in location of equipment, piping, or ductwork, advisable in the opinion of the Contractor, shall be submitted to the Engineer for approval before proceeding with the work. All measurements and dimensions shall be verified at the site. All equipment shall be adjusted and left in a condition satisfactory to the Engineer.

B. Any preparation of the structural components of the building for the equipment and material installed under this Section shall be done by the particular affected trade to the satisfaction of the Engineer. Work not conforming to the Contract Documents shall be corrected to the satisfaction of the Engineer. Work shall be done in a neat and orderly fashion, and when requested by the Engineer, all surplus material shall be removed and disposed of by the Contractor.

C. The Mechanical Contractor shall be responsible for all repair work of existing facilities affected by mechanical work performed in the existing structure. Repair work shall include, but not be limited to, such items as replacement of ceiling tiles or plaster removed or damaged for access to ceiling; patching walls and ceilings for piping and ductwork penetrations, repair of concrete or asphalt paving removed for pipe access, and other repairs due to extension and remodeling of the existing mechanical systems.

3.2 CLEANING, STARTUP, AND ADJUSTING

A. The Mechanical Contractor shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate startup procedures, calibration, and system check-out with all subcontractors involved. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated with the various subcontractors as required to bring the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally. Any remaining difficulties shall be brought to the attention of the Engineer.

B. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work. Remove, clean, and reinstall all filters. Belt-drive tensions and alignments shall be checked. All motors and bearings shall be lubricated in accordance with the manufacturer's service manuals prior to equipment startup. Provide a lubrication schedule for every item of equipment furnished under this Section. The schedule shall include the type of lubricant and the application frequency.

End of Section 15820, Duct Accessories

SECTION 15830, FANS

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to furnish and install Fans for Heating, Ventilating, And Air Conditioning (HVAC) systems.

1.2 GENERAL

A. Like items of materials provided hereunder shall be the end products of one manufacturer in order to achieve standardization for appearance, maintenance, and replacement.

B. See CONDITIONS OF THE CONTRACT; Division 1, GENERAL REQUIREMENTS; and DIVISION 15500, HVAC GENERAL REQUIREMENTS; which contain information and requirements that apply to the work specified herein and are mandatory, for this project.

1.3 SUBMITTALS

A. Submittals shall be made in accordance with Section 15500 HVAC GENERAL PROVISIONS and with this section.

B. Submittal information shall indicate complete compliance with all requirements of this specification and with scheduled performance criteria. Clearly highlight all areas where submitted equipment data varies from the requirements of this specification.

1.4 QUALITY ASSURANCE

A. Manufacturer of equipment specified in this section shall have minimum 5 years documented experience in the manufacture of HVAC fans.

Part 2 PRODUCTS

2.1 GENERAL

A. Base fan performance at standard conditions (density 0.075 Lb/ft^3).

B. Fans selected shall be capable of accommodating static pressure and flow variations of +/-15% of scheduled values.

C. Each fan shall be direct drive in AMCA arrangement 4 according to drawings.

D. Normal operating temperature up to 104 Degrees Fahrenheit (40 Deg. Celsius).

E. Each fan shall bear a permanently affixed manufacture's engraved metal nameplate containing the model and individual serial number.

F. Fans are to be equipped with lifting lugs.

G. Constructed of heavy gauge steel.

H. Fan shall be rated for environment in which they are installed.

I. Units Serving NEC Classified Hazardous Areas:

1. Units shall include nonferrous impellers, rub rings, or other components equivalent to AMCA Type A or Type B spark resistant construction.

2. Motors shall meet Division 16 ELECTRICAL requirements for motors within NEC Class I, Division 1 or NEC Class I, Division 2 areas as noted in these Specifications and noted on Drawings.

3. All wiring shall be located outside of the exhaust airstream.

4. Disconnects shall be located external to the fan and rated for the environment in which installed.

J. Where noted, fan shall be coated with protective coating suitable for use with corrosive exhaust gases. No uncoated metal fan parts will be allowed.

2.1 FAN, TYPE 1, CENTRIFUGAL SIDEWALL OR ROOF MOUNTED UPBLAST

A. Construction:

1. Housing, fan wheel and inlet cone constructed of heavy gauge aluminum.
2. Roof mounted units shall include integral curb cap. Wall mounted units provided with wall mounting plate.

B. Motors and Drives:

1. EC Motor type. Motors shall be open type enclosure and electronic commutation type motor (ECM) specifically designed for fan applications. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed (80% turndown).

C. Controls

1. Where indicated on the Drawings, fans shall be equipped with a controller of the type indicated. Controls shall be factory mounted and wired to the fan motor, requiring only an external power and control signal connection.

2. The controller shall be in an enclosure of the type specified for the environment to which the fan or starter is installed.

3. All wiring shall be located outside of the exhaust airstream.

4. Disconnects shall be located external to the fan and rated for the environment in which installed.

5. Manufacturers and Products: Greenheck Vari-Green or equal.

D. Accessories:

1. Roof mounted units shall be provided with manufacturer supplied roof curbs and curb seals.

2. All units shall include manufacturer provided gravity dampers unless otherwise specified.

3. Motor disconnect, factory mounted and wired.

E. Manufacturers and Products:

1. Roof Mounted Fans: Greenheck Fan Corporation, CUE/CUBE; or Equal.
2. Wall Mounted Fans: Greenheck Fan Corporation, CW/CWB; or Equal.

2.2 FAN, TYPE 3, SIDEWALL MOUNTED PROPELLER

A. General:

1. Supply or exhaust configuration, as scheduled.

B. Construction

1. Aluminum or steel blades mounted to steel hub.
2. Galvanized steel drive frame assembly and panels.
3. Fan propeller and inlet shall be matched and have precise running tolerances for optimal performance.
4. Statically and dynamically balanced per AMCA guidelines.

C. Motors and Drives:

1. Fans 1 HP and larger shall be belt driven.

2. EC Motor type. Motors shall be open type enclosure and electronic commutation type motor (ECM) specifically designed for fan applications. Motors are permanently lubricated, heavy duty ball bearing type to match with the fan load and pre-wired to the specific voltage and phase. Internal motor circuitry to convert AC power supplied to the fan to DC power to operate the motor. Motor shall be speed controllable down to 20% of full speed (80% turndown).

D. Dampers and Actuators:

1. All units shall include manufacturer provided dampers unless otherwise specified. Exhaust fans shall be equipped with gravity dampers. Supply fans shall be equipped with motorized dampers.

2. Actuators shall be 120 volt AC operated, normally closed type.

3. Where actuators are to be installed in the airstream of supply fans, the actuator shall be enclosed in NEMA-rated enclosure suitable for outdoor installation.

E. Guards:

1. Exposed propellers, dampers and motors shall be protected with OSHA approved guards. Guards shall be galvanized steel.

F. Weatherhood:

1. Where shown on the drawings, supply and exhaust fans shall include manufacturer provided weatherhood. Hood shall be constructed of galvanized steel and provide 90 degree turndown to prevent the entrance of rain and snow for supply fan applications. Exterior opening shall be equipped with an insect screen.

G. Accessories:

1. Motor disconnect, factory mounted and wired.

H. Manufacturers and Products:

1. Greenheck Fan Corporation, SE/SBE; or Equal.

2.3 EXTERNAL CONTROL DEVICES

A. General
1. Provide and install control devices noted on drawings and/or required for operation of the system.

B. Temperature/Humidity Controller
1. Function: Monitor space air temperature for control of ventilating equipment to maintain space temperature and/or humidity.
2. Controller to interface with an electronic commutation (EC) Vari-Green Motor and regulate fan speed based on level of temperature and/or relative humidity in a space.
3. Controller shall include a Proportional Integral Derivative (PID) feedback loop and shall have labeled terminal strips for easy wiring.
4. Manufacturers and Products:
   a. Greenheck

Part 3 EXECUTION

3.1 GENERAL

A. Locate units approximately where shown on the Drawings to provide access spaces required for maintenance and inspection. Provide sufficient clearance to allow full opening of all access panels and doors.

B. Protect equipment from damage by leaving in protective shipping materials until installation, and by storing indoors.

3.2 IDENTIFICATION PLATES AND CODING

A. Attach equipment identification label in accordance with Section 15500, HVAC GENERAL PROVISIONS.

3.3 HANDLING

A. Comply with manufacturer's installation instructions for rigging, unloading, and transporting units.

3.4 FANS

A. Fans shall be isolated from adjacent ductwork with flexible connections.

B. Base mounted fans shall be installed on concrete base as specified in Section 15500, HVAC GENERAL REQUIREMENTS.

C. Inline mounted fans shall be fully supported from the building structure and shall not be supported from adjacent ductwork.

D. All units shall include an electrical disconnect rated for the environment in which the unit is installed.

3.5 SAFETY CONSIDERATIONS

A. All mechanical equipment shall be installed with suitable access clearances for maintenance or removal of replaceable parts and components, and with necessary couplings or flanges to perform the maintenance or removal without removing the connecting appurtenances.

B. Where equipment requiring periodic maintenance cannot be reached by normal walkways because of interference with ductwork, piping, or other mechanical obstructions created by conflicts or changes made during construction, or by substitution of equipment, the Contractor shall provide an alternate safe means of access. These may include construction of an overhead platform with stairway or ladder ends and safety railings or handholds, of walk-through duct plenums with hinged access doors, or as required to meet OSHA standards for safe maintenance procedures.

3.6 CLEANING, STARTUP, AND ADJUSTING

A. Fan systems shall be Tested, Adjusted and Balanced as required by Section 15500, HVAC GENERAL REQUIREMENTS.

B. The Mechanical Contractor shall be responsible for proper operation of all systems, minor subsystems, and services provided under this section. He shall coordinate startup procedures, calibration, and system check-out with all subcontractors involved. Any system operational problems shall be diagnosed; all correctional procedures shall be initiated with the various subcontractors as required to bring the system into compliance with the design, and the problem then shall be rechecked to verify that the system operates normally. Any remaining difficulties shall be brought to the attention of the Engineer.

C. Thoroughly clean all parts of the installation at the completion of the work. The Contractor shall clean up and remove from the premises all refuse material, crates, and rubbish arising from his work. Remove, clean, and reinstall all filters. Belt-drive tensions and alignments shall be checked. All motors and bearings shall be lubricated in accordance with the manufacturer's service manuals prior to equipment startup. Provide a lubrication schedule for every item of equipment furnished under this Section. The schedule shall include the type of lubricant and the application frequency.

Part 4 PAYMENT

4.1 GENERAL

A. Payment for the work in this Section will be included as part of the lump sum bid amount stated in the Proposal.

End of Section 15830, Fans

DIVISION 15 – MECHANICAL

SECTION 15950, TESTING, ADJUSTING, AND BALANCING

Part 1 GENERAL

1.1 SCOPE

A. This Section covers the work necessary to perform testing, adjusting, and balancing on new and modified HVAC systems for this project. Perform testing, adjusting, and balancing in accordance with these Specifications and the accompanying Drawings.

B. See Division 1, GENERAL REQUIREMENTS, and Section 15500 HVAC GENERAL PROVISIONS which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.2 WORK COORDINATION

A. In general, work under this section must be coordinated with Division 15 MECHANICAL in order to provide complete and operating systems in conformance with the intent of these Contract Documents.

B. Where testing and balancing services are performed by an independent firm, Contractor(s) shall cooperate by:

1. Providing sufficient time before final completion date so testing and balancing can be accomplished.

2. Providing, without undue delay, labor and tools to make corrections when required.

1.3 SUBMITTALS

A. Complete Balancing Log Report shall be submitted as required in this specification.

1.4 CONTRACTOR'S QUALIFICATION

A. Air and Water System Balancing

1. Firm selected to perform work shall be an independent balancing and test agency, with a proven record of at least five similar projects in the area.

2. The agency shall have no vested interest in project such as sales of equipment, services, etc., and shall not be partly or wholly, an owned subsidiary of any vested or interested party, Contractor or Subcontractor.

3. All instruments used by the balancing firm shall have been calibrated within a period of 12 months and proof of such calibration shall be submitted to the Engineer if requested.

Part 2 PRODUCTS (NOT USED)

Part 3 EXECUTION

3.1 AIR AND WATER SYSTEM BALANCING

A. Mechanical Contractor shall cooperate with Balancing Firm by:

1. Install balancing dampers and valves as required by balancing firm.

2. Furnish and make all drive and belt changes on motors or fans that are required to adjust equipment to the specified conditions.

3. Putting all heating, ventilating, air conditioning, and process systems and equipment into full operation and continue operation during each working day of testing and balancing.

4. Removing, cleaning, and replacing all strainer baskets prior to balancing water systems; treating and cleaning water in system; checking expansion tanks to determine that they are not air bound and that the system is completely full of water; and bleeding all air from manual vents.

5. Keeping balancing firm informed of changes made to system during construction, and providing with complete set of as-built drawings.

B. General air and water system balancing services shall include the following:

1. Review shop drawings and installed system for balancing devices and test ports. Recommend to Engineer any changes required for system balancing as required by the Drawings and these Specifications.

2. Provide equipment nameplate data including manufacturer, model, size, type, and serial number on all fans, pumps, boilers, unit heaters, coils, condensing units, etc., indicating equipment identification, motor frame, hp, volts, and rpm, sheave and belt, data, and starter and heater data.

3. Verify proper startup procedures have been completed on each system to be balanced.

4. Verify control system installation is complete and operational.

5. After adjustments are made to a portion of any air or water system, all other portions of that same system must be reread to determine the effects imposed by the adjustments.

6. Check and report room or process temperature setpoints and resulting temperatures after all adjustments have been made.

C. Air system balancing services shall include the following:

1. List design data including air flow rates, static pressures, etc.

2. Adjust air volumes on supply diffusers, grilles, and on return and exhaust grilles, until the design quantity is reached, or as directed by the Engineer, with allowable variation of +10 percent.

3. Adjust fan speeds, motor drives and air volumes until the required equipment air volumes are attained, with allowable variation of +10 percent. After final adjustments, motor shall not operate above nameplate amperage on any phase

4. Airflow test readings shall be performed under simulated or actual conditions of maximum and minimum cooling, heating, outside air, exhaust air, return air, and partially loaded filters.

5. Provide static pressure readings at unit inlet and discharge, filters, coils, dampers, plenums, and terminal control boxes, on every supply, return, and exhaust fan.

6. Adjust diffusers and grilles for proper deflection, throw, and coverage; check for drafts and noise, eliminate where possible.

7. All fan and airflow adjustments shall be corrected for the jobsite elevation; duct layouts have been based on the use of the Trane Ductulator, and airflow values shown are the standard air quantities necessary for proper heat transfer; the Balance Logs shall indicate the recorded jobsite values, and, all velocity and mass correction factors used to provide equivalent standard air quantities.

8. Mark final positions of all balancing dampers with red felt pen.

9. Air systems shall be adjusted in accordance with standard procedures and recognized practices of the Associated Air Balance Council.

D. Balancing Log Report Requirements:

1. Log and record all information from every test, reading, and adjustment necessary to accomplish the services described. Prepare five copies of balance logs, and submit to the Engineer for review and approval. Balance Log shall include a reduced set of Mechanical Drawings showing the final air and water flow readings for each system.

2. Include a separate section in the Log, if necessary, that describes any operating difficulties in any of the air or water systems that could not be eliminated by the procedures above. These problems shall be specifically identified by system and location within the building. A summary of the condition and its effect on the building shall be outlined, and all corrective action attempted shall be described.

E. Following air flow balancing, the manufacturer shall statically and dynamically field balance the equipment as directed by the Engineer. After readjustment of those items, measure and record the displacement only of the modified equipment to determine its conformance with design tolerances.

F. After all adjustments have been completed and the balance logs submitted, the balancing firm shall demonstrate the air and water balancing procedures and vibration tests to the Engineer and verify the test results. Spot tests shall be performed on a maximum of 20 percent of the total diffusers and grilles, on two air handling fan devices per building, and on 10 percent of the total water balance fittings, with measuring equipment used in the original tests, at random points selected by the Engineer. The results of these spot tests shall agree with the balance logs within ±10 percent. Where this accuracy cannot be verified, the Engineer shall require a rebalance of portions of the system as directed. At completion of the rebalance procedures, another spot test shall be made if required by the Engineer to verify those results. All test results and any adjustments or rebalancing procedures shall be submitted to the Engineer and be included in the Balance Logs.

End of Section 15950, Testing, Adjusting, and Balancing

DIVISION 16 – ELECTRICAL

SECTION 16000 ELECTRICAL GENERAL PROVISIONS

PART 1 GENERAL

1.01 SCOPE

A. Division 16, Electrical covers the work necessary to furnish and install, all electrical systems. Furnish materials, labor, and equipment in accordance with these Specifications and the accompanying Drawings. Equipment not directly referenced but required for a complete and operating system shall be provided by CONTRACTOR at no additional cost.

B. This Section covers general requirements applying to all sections included in Division 16, Electrical.

1.02 WORK INCLUDED IN DIVISION 16, ELECTRICAL

A. Materials and equipment furnished and installed under other divisions with raceway and electrical conductors furnished, installed and connected under Division 16, Electrical include but are not limited to:
   1. Process equipment
   2. Indoor lighting
   3. Outdoor lighting
   4. Communications
   5. HVAC equipment
   6. Control System

1.03 ELECTRICAL SERVICE

A. Project site is serviced by existing 480 VAC 3 Phase electrical service. The existing electrical service and distribution system will be modified as part of this project.

B. Work on existing electrical services and equipment shall be coordinated to minimize outages. Coordinate work with utility in accordance with paragraph 1.04 WORK COORDINATION.

1.04 WORK COORDINATION

A. In general, work under this section must be coordinated with other Divisions within these specifications in order to accomplish the interfacing necessary to provide complete and operating systems in conformance with the intent of these Contract Documents. See appropriate sections for work specified under those Divisions.
   1. Division 16 ELECTRICAL shall furnish and install for Division 11 EQUIPMENT and Division 15 HVAC the following, including but not limited to:
      a. Power and control conduit and wiring.
      b. Power and control connections to all equipment.

c. Motor starters, MCC controls and disconnect switches except for starters specified as provided by Division 11 or 16 or those within manufacturer supplied control panels.
d. Mounting of all manufacturer supplied control panels.
e. Variable Frequency Drives except for drives specified within manufacturer supplied control panels.
f. Start-up assistance for all equipment utilizing electrical power.

2. Division 16 ELECTRICAL shall furnish and install for Systems Integrator the following, including but not limited to:
   a. Power, control, and communication conduit and wiring.
   b. Power control, and communication connections to all equipment.
   c. Installation of fiber optic cabling and components provided by Systems Integrator.
   d. Installation of control panels, MCCs, and equipment panels.
   e. Installation of Systems Integrator supplied control panels.
   f. Other requirements specified under Division 1.

B. Coordination of Electrical Service Outages
   1. Electrical installations shall be installed in such a way as to minimize disruption to existing process. Provide for and use temporary power sources as required. Work shall be coordinated with ENGINEER, OWNER, and other trades to minimize interference with plant processes or construction progress.
   2. Restrictions
      a. See specification section SPECIAL CONDITIONS for any required outage coordination and work sequencing.
      b. Existing MCCs, switchgear, and other distribution equipment serving plant process equipment shall be out of power no longer than 45 minutes consecutively, unless otherwise coordinated and approved by ENGINEER and OWNER.
      c. If power outage is expected to last longer than restriction, temporary bypass pumping and/or temporary power shall be provided.

1.05 INSPECTION OF THE SITE AND EXISTING CONDITIONS

A. The electrical drawings were developed from past record drawings and information supplied by the Owner. Verify all dimensions prior to submitting bids.

B. Before submitting a bid, visit the site and determine conditions at the site and at all existing structures in order to become familiar with all existing conditions and electrical systems which will, in any way or manner, affect the work required under this Contract. No subsequent increase in Contract cost will be allowed for additional work required because of the Contractor's failure to fulfill this requirement.

C. Carry out any work involving the shutdown of the existing services to any piece of equipment now functioning in existing areas at such time as to provide the least amount of inconvenience to the Owner. Do such work when directed by the Engineer.

D. After award of Contract, verify at each area of construction activity the location of existing underground utilities. Protect all existing underground utilities during construction. Pay for all required repairs without increase in Contract cost should damage to underground utilities occur during construction.

1.06 RESPONSIBILITY

A. The Contractor shall be responsible for:
   1. Complete systems in accordance with the intent of these Contract Documents.
   2. Coordinating the details of facility equipment and construction for all Specification Divisions which affect the work covered under Division 16, ELECTRICAL.
   3. Furnishing and installing all incidental items; not actually shown or specified, but which are required by good practice to provide complete functional systems.

1.07 INTENT OF DRAWINGS

A. Electrical Plan Drawings show only general locations of equipment, devices, and raceway, unless specifically dimensioned. The Contractor shall be responsible for the proper routing of raceway and locations of equipment, subject to the approval of the Engineer.

1.08 DEPARTURES FROM CONTRACT DOCUMENTS

A. Submit to the Engineer in writing details of any necessary, proposed departures from these Contract Documents, and the reasons therefore. Submit such requests as soon as practicable. Make no such departures without written approval of the Engineer.

1.09 SUBSTITUTION OF MATERIALS AND EQUIPMENT

A. In accordance with provisions elsewhere in these Contract Documents, manufacturers' names and catalog numbers stated herein are intended to indicate the type and quality of equipment or materials desired.
   1. Where indicated as “Without Exception” or similar, specified manufacturer and model shall be provided.
   2. Where indicated as “Or Pre-Approved Equal” or similar, proposed alternatives, meeting the specified requirements may be submitted for pre-approval. Make requests for approval of alternatives in writing to the Engineer before submitting bid. Provide sufficient material or data to allow evaluation of the proposed alternative and determination of compliance with these Contract Documents. List any proposed deviations from these Contract Documents.
   3. Where indicated as “Or Equal” or similar, substitution is allowed without pre-approval. Substitute components shall meet requirements of specifications. Provide sufficient material or data in shop drawing submittals to allow for evaluation of the proposed alternative and determination of compliance with these Contract Documents. List any proposed deviations from these Contract Documents.

1.10 SUBMITTALS

A. Provide complete manufacturers' descriptive information and certified shop drawings for all equipment, material, and devices furnished under Division 16, Electrical including:

1. Literature and requested samples showing items proposed for use. Their size, dimensions, capacity, operational description and special features.
2. Time current curves for fuses, circuit breakers, or other overcurrent protective devices. Include current limiting curves showing maximum let-through fault current for any current limiting devices used.
3. Certified outline drawings, arrangement drawings, elementary (schematic) diagrams, control diagrams, interconnection and connection diagrams, schedules, and rough-in drawings. Include equipment dimensions and clearances, sections, and installed features and devices. Schematic, control, and interconnection diagrams shall include connections between any equipment, power sources and loads and shall show any interlocking provisions as required.
4. Installation, operation and maintenance manuals. Include features and operating sequences, both automatic and manual. Include a list of all factory settings including relays, timers, etc. Provide all setting and calibration instructions, including software, as required.
5. Spare parts list.
6. Test reports.

B. Check submittals for proper number of copies, adequate identification, correctness and compliance with Drawings and Specifications and initial all copies indicating this has been done. Revise, change and/or resubmit all submittal information until acceptable to the Engineer. Obtain Engineer's acceptance before commencing fabrication or installation of any materials or equipment.

C. Review of submittal information by the Engineer shall not relieve the Contractor from responsibility for deviations from Drawings and Specifications, unless he has in writing at time of submission requested and received written approval from the Engineer for specific deviations. Review of submittal information shall not relieve the Contractor from responsibility for errors and omissions in shop drawings or literature.

D. Manufacturer's standardized elementary diagrams will not be acceptable.

E. Other requirements as specified in Division 1.

F. Make submittals in accordance with the scheduling requirements in Division 1.

1.11 SEQUENCING AND SCHEDULING

A. Do not start the following key Project activities until prerequisite activates have been completed and satisfied:
   1. Progress Schedule and Schedule of Values.
      a. No prerequisites.
   2. Shop Drawing Review:
      a. Prerequisite: Engineer’s acceptance of Progress Schedule and Schedule of Values.
   3. Equipment Installation:
      a. Prerequisite: Engineer’s acceptance of equipment Submittals.
   4. Testing:
      a. Prerequisite: Associated testing procedure Submittals complete.

5. Training:
    a. Prerequisite: Associated training plan Submittals complete.

1.12 ENVIRONMENTAL CONDITIONS

A. Unless otherwise shown on the drawings or specifications, the following classifications shall apply:

B. The following areas are classified non-hazardous, wet and corrosive and shall use NEMA 4X materials and methods:
    1. Plant Drain Pump Station
    2. Chemical Room
    3. Bio-Solids Building

C. The following areas are classified non-hazardous, wet and shall use NEMA 3R or NEMA 4 materials and methods as indicated:
    1. Outdoor above grade areas not covered above (NEMA 3R or 4).
    2. Outdoor below grade areas not covered above (NEMA 3R or 4).

D. The following areas are classified as indoor, dry, and shall use NEMA 12 materials and methods:
    1. Storage Building (Existing and Proposed)
    2. All other areas not otherwise covered.

PART 2 PRODUCTS AND EQUIPMENT, COMMON REQUIREMENTS

2.01 GENERAL

A. Provide all first-quality, new materials and equipment, free from any defects, in first-class condition, and suitable for the space provided.

B. Where two or more units of the same class of material or equipment are required, provide products of a single manufacturer. Component parts of materials or equipment need not be products of the same manufacturer.

C. All electrical equipment and materials shall be UL listed and labeled for the purpose for which it is used. All control panels provided under or referenced to this Division shall be certified or labeled as described above and be constructed by a panel fabrication shop certified in compliance with UL.

2.02 STANDARD PRODUCTS

A. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturers' latest standard design that conforms to these Specifications.

2.03 EQUIPMENT FINISH

A. Provide materials and equipment with manufacturers' standard finish system. Provide manufacturers' standard finish color, except where specific color is indicated. If manufacturer has no standard color, finish equipment in ANSI No.61, light gray color.

2.04 DELIVERY, STORAGE, AND HANDLING

A. Products supplied under Division 16000 shall be delivered in accordance with accepted Progress Schedule and coordinated to avoid conflicts with the Work and conditions at Site.

B. Products shall be delivered in undamaged condition, in manufacturer's original container or packaging, with identifying labels intact and legible. Include on label, date of manufacture and shelf life, where applicable.

C. Products shall be unloaded in accordance with manufacturer's instructions or as specified. Provide necessary equipment and personnel to unload items delivered to the site. Record receipt of products at site. Promptly inspect for completeness and evidence of damage during shipment. Remove damaged products from site and expedite delivery of identical, new, undamaged products, and remedy incomplete or lost products to provide that specified, so as to not delay progress of work.

D. Handle and store products in accordance with manufacturer's instructions and in a manner to prevent damage. Provide manufacturer's recommended maintenance during storage, installation, and until products are accepted for use by Owner.

E. Arrange storage in a manner to provide easy access for inspection. Keep running account of products in storage to facilitate inspection and to estimate progress payments.

F. Store fabricated products above ground on blocking or skids. Prevent soiling or staining. Cover products that are subject to deterioration with impervious sheet coverings; provide adequate ventilation to avoid condensation. After installation, provide coverings to protect products from damage due to traffic and construction operations. Remove coverings when no longer needed.

G. All stored equipment subject to corrosive damage by the atmosphere if stored outdoors (even though covered by canvas) shall be stored in a weather tight building to prevent damage. Building may be a temporary structure on the site or elsewhere, but must be satisfactory to the Engineer. Building shall provide adequate ventilation to prevent condensation. Maintain temperature and humidity within range required by manufacturer.

H. All equipment shall be stored fully lubricated with oil, grease, and other lubricants unless otherwise instructed by the manufacture, as applicable. Moving parts shall be rotated a minimum of once weekly to insure proper lubrication and to avoid metal-to-metal "welding". Lubricants shall be changed upon completion of installation and as frequently as required by manufacturer thereafter during the period between installation and acceptance.

I. Inspect, maintain, and service stored products on a regularly scheduled basis, consistent with manufacturer's instructions. For items furnished by others, perform inspection in the presence of the Engineer. Notify Engineer verbally, and in writing, of any problems.

Record inspection, maintenance, and services performed, and keep log available for review.

PART 3 INSTALLATION, COMMON REQUIREMENTS

3.01 GENERAL

A. Install materials and equipment in a workmanlike manner utilizing craftsmen skilled in the particular trade. Provide work which has a neat and finished appearance. Carryout work in accordance with NECA Standard of Installation unless otherwise specified.

B. Coordinate electrical work with the Engineer and work of other trades to avoid conflicts, errors, delays, and unnecessary interference with operation of the plant during construction.

C. Check the approximate locations of luminaries; electrical outlets, equipment, and other electrical system components shown on Drawings for conflicts with openings, structural members, and components of other systems and equipment having fixed locations. In the event of conflicts, notify the Engineer in writing. The Engineer's decision shall govern. Make modifications and changes required to correct conflicts.

D. Be responsible for receiving and handling of that Owner furnished or relocated equipment which is to be installed under Division 16, Electrical per the requirements of this Specification.

3.02 PROTECTION DURING CONSTRUCTION

A. Throughout this Contract, provide protection for materials and equipment against loss or damage in accordance with provisions elsewhere in these Contract Documents. Throughout this Contract, follow manufacturers' recommendations for storage. Protect everything from the effects of weather. Prior to installation, store items in clean, dry, indoor locations. Store in clean, dry, indoor, heated locations items subject to corrosion under damp conditions, and items containing electrical insulation, such as transformers, conductors, motors, and controls. Energize all space heaters furnished with equipment. Provide temporary heating, sufficient to prevent condensation, in equipment which does not have space heaters. Install corrosion inhibiting capsules or pads in all equipment enclosures containing electronics, instruments, and controls.

B. Following installation, protect materials and equipment from corrosion, physical damage, and the effects of moisture on insulation. When equipment intended for indoor installation is installed at the Contractor's convenience in areas where it is subject to dampness, moisture, dirt, or other adverse atmosphere until completion of construction, ensure that adequate protection from these atmospheres is provided that is acceptable to the Engineer. Cap conduit runs during construction with manufactured seals. Keep openings in boxes or equipment closed during construction. Energize all space heaters furnished with equipment. Seal all ends of cables and conductors until ready for termination at equipment.

3.03 MATERIAL AND EQUIPMENT INSTALLATION

A. Follow manufacturers' installation instructions explicitly, unless otherwise indicated. Wherever any conflict arises between the manufacturers' instructions, codes and

regulations, and these Contract Documents, follow the Engineer's decision. Keep a copy of manufacturers' installation instructions on the jobsite available for review at all times.

B. Use appropriate conduit and conductor entry fittings with enclosures which maintain the specified enclosure environmental capability after proper installation.

C. All floor-mounted electrical equipment (i.e., MCCs, transformers, motor starters, adjustable speed controllers, control panels, switch gear, substations, switchboards, etc.) shall be installed on 3-1/2-inch high concrete housekeeping pads.

3.04 REMOVAL OR RELOCATION OF MATERIALS AND EQUIPMENT

A. Where existing materials and equipment are removed or relocated, remove all materials no longer used such as studs, straps, conduits, and wires. Remove or cut off concealed or embedded conduit, boxes, or other materials and equipment to a point at least 3/4-inch below the final finished surface.

B. Repair affected surfaces to conform to the type, quality, and finish of the surrounding surface in a neat and workmanlike, manner. Utilize skilled craftsmen of the trades involved.

3.05 CUTTING AND PATCHING

A. Layout work carefully in advance. Do not cut or notch any structural member or building surface without specific approval of Engineer. Carefully carry out any cutting, channeling, chasing, or drilling of floors, walls, partitions, ceilings, paving, or other surfaces required for the installation, support, or anchorage of conduit, raceways, or other electrical materials and equipment. Following such work, restore surfaces neatly to original condition. Use skilled craftsmen of the trades involved.

3.06 MOTOR TESTING

A. After final power connections are made, check and correct the rotation of all motors.

B. Coordinate rotation checks with the Engineer and the Contractor responsible for the driven equipment.

C. Check voltage between each phase and phase to ground at the motor terminals.

D. Check line current on each phase while the motor is loaded.

3.07 CLEANING AND TOUCHUP PAINTING

A. Keep the premises free from accumulation of waste material or rubbish. Upon completion of work, remove all materials, scraps, and debris from premises and from interior and exterior of all devices and equipment. Touch up scratches, scrapes, or chips in interior and exterior surfaces of devices and equipment with finishes matching as nearly as possible the type, color, consistency, and type of surface of the original finish. If extensive damage is done to equipment paint surfaces, refinish the entire equipment in a manner that provides a finish equal to or better than the factory finish, that meets the requirements of the Specifications, and that is acceptable to the Engineer.

3.08 HAZARDOUS AREAS

A. Install all materials and equipment in hazardous areas in a manner acceptable to the regulatory authority having jurisdiction for the Class, Division, and Group of hazardous, area indicated.

PART 4 INSPECTION

4.01 GENERAL

A. Allow materials, equipment, and workmanship to be inspected at any time by the Engineer, Owner or their representatives. Correct work, materials, or equipment not in accordance with these Contract Documents or found to be deficient or defective in a manner satisfactory to the Engineer and Owner.

PART 5 STANDARDS, CODES, PERMITS, AND REGULATIONS

5.01 GENERAL

A. Perform all work; furnish and install all materials and equipment in full accordance with the latest applicable rules, regulations, requirements, and specifications of the following:
   1. Local Laws and Ordinances.
   2. State and Federal Laws.
   3. National Electrical Code (NEC).
   4. State Fire Marshal.
   5. Underwriters' Laboratories (UL).
   6. National Electrical Safety Code (NESC).
   7. American National Standards Institute (ANSI).
   8. National Electrical Manufacturer's Association (NEMA).
   9. National Electrical Contractor's Association (NECA) Standard of Installation.
   10. Institute of Electrical and Electronics Engineers (IEEE).
   11. Insulated Cable Engineers Association (ICEA).
   12. Occupational Safety and Health Act (OSHA).
   13. National Electrical Testing Association (NETA).
   14. American Society for Testing and Materials (ASTM).
   15. National Fire Protection Agency (NFPA)

B. Conflicts, if any, which may exist between the above items will be resolved at the discretion of the Engineer.

C. Wherever the requirements of the Specifications or Drawings exceed those of the above items, the requirements of the Specifications or Drawings govern. Code compliance is mandatory. Construe nothing in the Contract Documents as permitting work not in compliance with these codes.

D. All industrial control panels shall be marked with required information based on National Electric Code and UL standards. This marking shall include, as a minimum, the short

circuit current rating as calculated by either the manufacturer or another approved method described in the National Electrical Code or UL standards.

E. Obtain all permits and pay all fees required by any governmental agency having jurisdiction over the work. Arrange all inspections required by these agencies. On completion of the work, furnish satisfactory evidence to the Engineer that the work is acceptable to the regulatory authorities having jurisdiction.

PART 6 OPERATIONS AND MAINTENANCE MANUALS

6.01 GENERAL

A. Provide operations and maintenance manuals. Provide three copies containing:
   1. Operation, maintenance, recommended spare parts, and renewal parts information for all equipment furnished under this section.
   2. Set of complete, final, as-reviewed and accepted shop drawing information.
   3. As-built electric circuit, equipment, and installation drawings.
   4. Index of all equipment suppliers listing current names, addresses, and telephone numbers of those who should be contacted for service, information, and assistance.
   5. As-built Contract Drawings marked with red indelible pencil to show all departures from original drawings. Include underground cable, conduit, or duct runs dimensioned from established building lines, and all electrical work revisions. Prepare by obtaining new, clean sets of Contract Drawings from Engineer and pay all costs for same, field marked as-built drawings shall be initialed by the Engineer or his representative.
   6. All field and factory test results.
   7. Information listed under individual specification items.
   8. Complete interconnection diagrams between all instrumentation and control devices showing field wiring from numbered terminal to numbered terminal in block diagram format.
   9. Use only clean material. File under dividers with headings in accordance with Specification item title.
   10. Submit material to the Engineer for review prior to delivery of the final Operations and Maintenance Manuals to the Owner. Make additions or changes required by the reviewer.

PART 7 SERVICE CONTINUITY

7.01 GENERAL

A. Maintain continuity of electric service to all functioning portions of the process or buildings during hours they are normally in use. Temporary outages will be permitted during cutover work at such times and places as can be prearranged with the Engineer and Owner.

B. Outages shall be coordinated according to Paragraph 1.4 WORK COORDINATINON. Such outages shall be kept to a minimum number and minimum length of time. Make no outages without prior authorization of the Engineer. Include all costs for temporary wiring

and overtime work required in the Contract price. Remove all temporary wiring at the completion of the work.

PART 8 TEMPORARY ELECTRIC POWER

8.01 GENERAL

A. Refer to SPECIAL PROVISIONS, in these Contract Documents for necessary provisions for electric power used during construction.

PART 9 SALVAGED MATERIAL

A. GENERAL
   1. Unless otherwise indicated, all material required to be removed and salvaged shall become the property of the Contractor and shall be promptly removed from the site.

PART 10 CHECKOUT AND STARTUP

10.01 GENERAL

A. During checkout and startup of the various plant systems, provide a crew of skilled craftsmen to be available for checkout and troubleshooting activities as required by the Engineer. Since coordination with other crafts and contractors will often be required, the craftsmen assigned to checkout must be available outside normal working hours when necessary.

PART 11 TESTS

11.01 GENERAL

A. See Section 16080 ELECTRICAL TESTING for tests required on electrical equipment.

PART 12 GUARANTEE

12.01 GENERAL

A. Materials, equipment and workmanship shall be guaranteed in accordance with provisions of SPECIAL PROVISIONS in these Contract Documents.

PART 13 PAYMENT

13.01 GENERAL

A. Payment for the work under Division 16 will be included as part of the lump sum bid amount stated in the Proposal.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16050 BASIC MATERIALS AND METHODS

PART 1 GENERAL

1.01 SCOPE

A. This Section covers the work necessary to furnish and install, complete, the materials specified hereinafter.

1.02 GENERAL

A. See Division 16000 Electrical – General Provisions which contains information and requirements that apply to the work specified herein and are mandatory for this project.

B. See Division 16000 typical details for installation details.

1.03 SUBMITTALS

A. Make submittals in accordance with Division 16000 Electrical – General Provisions.

PART 2 PRODUCTS

2.01 GENERAL

A. Enclosures
   1. In general and unless otherwise noted, enclosures for items such as separately mounted motor starters, disconnect switches and circuit breakers, terminal junction boxes, and control panels shall be suitable for the environment in which they are installed as identified in Section 16000 and as shown on the drawings.
   2. NEMA 4X rated equipment shall be fiberglass reinforced plastic (FRP) or stainless steel or aluminum as appropriate and as noted for the environment. Equip NEMA 4X enclosures with breathers/drains.
   3. For enclosures requiring constant access, i.e., circuit breakers and fused safety switches, provide quick-release door latches or knurled thumbscrews with padlock hasps.
   4. All gasketing shall be permanently adhered, closed-cell neoprene.
   5. All screws, bolts, washers, nuts and other items used for exposed raceway support systems and boxes shall be Type 316 stainless steel in outdoor and normally damp, wet or corrosive locations.
   6. Where steel is specified or indicated for use as equipment or raceway supports, it shall be galvanized. All galvanizing shall be by hot-dipping.
   7. Aluminum items shall be copper-free. Where aluminum may come into contact with concrete or dissimilar metals, it shall be coated with a protective coating.

B. Hazardous Areas
   1. In general and unless otherwise noted, hazardous areas, as identified within these Specifications and as shown on the drawings, shall contain devices, materials, and equipment suitable for the environment noted.

2. Provide devices, materials, and equipment that are specifically approved for installation in hazardous areas of the Class, Division, and Group indicated, and are of construction that will ensure safe performance under conditions of proper use and maintenance.
3. Provide devices, materials, and equipment meeting the requirements of the NEC, applicable state and local codes, and the authority enforcing these codes.
4. Acceptable manufacturers: Killark, Crouse-Hinds, Appleton, or equal.

2.02 OUTLET AND DEVICE BOXES

A. General
1. Provide boxes not less than 2 inches deep, unless shallower boxes are required by structural conditions and are specifically accepted by the Engineer. Do not use box extensions to provide wiring space required by the NEC. For hollow masonry construction, provide boxes of sufficient depth so that conduit knockouts or hubs are in the masonry void space.

B. Sheet Steel (SS) Boxes
1. Provide zinc or cadmium-plated boxes of the one-piece drawn type. Install 4-inch minimum octagonal boxes for ceiling outlets, except where smaller boxes are required for the particular fixture being installed. Use concrete type boxes in poured concrete slabs. Provide 2-inch by 4-inch minimum boxes for switches and receptacles. Provide plaster rings where required.

C. Cast Steel (CS) Boxes
1. Provide boxes of cast ferrous metal with gasketed, watertight, cast ferrous metal covers and stainless steel screws. Provide boxes with threaded conduit hubs and cast mounting lugs for all surface-mounted boxes. Use Crouse-Hinds, Appleton, or equal.

D. Where PVC-coated steel conduit is designated, provide boxes and covers having minimum PVC coating 40 mils nominal, thickness bonded to the metal. Use Rob Roy Plasti-Bond Red, or equal.

E. Cast Aluminum (CA) Boxes
1. Provide boxes of cast, copper-free aluminum with gasketed, watertight, cast copper-free aluminum covers and stainless steel screws. Provide boxes with threaded conduit hubs and cast mounting lugs for all surface mounted boxes. Use Crouse-Hinds, Appleton, or equal.

F. Nonmetallic Boxes
1. Provide PVC boxes with gasketed watertight covers and stainless steel screws. Provide boxes with conduit hubs and any required mounting lugs. Phenolic type nonmetallic boxes and other fittings shall not be used in any location. Use Carlon boxes, or equal.

2.03 WIRING DEVICES

A. Switches:
1. General Use Switches

a. Provide specification grade, totally-enclosed, ac type, quiet tumbler switches meeting NEMA WD I performance standards and Federal Specification W-S-896E, and capable of control of 100 percent tungsten filament and fluorescent lamp loads. Provide 2-pole and 3-position, center-off, momentary-contact toggle switches where indicated use switches rated at 20 amps, 120/277 volts. Provide operating handles colored ivory in office areas, and brown in all other areas. Switches shall have screw terminals for both power and grounding conductors.

2. Weatherproof Switches
   a. Use switches as specified mounted in a cast metal box with gasketed, weatherproof device plate as specified.
3. Switches with Pilot Lights
   a. Provide switches as specified with 125-volt, neon light with red jewel, or lighted toggle which is lighted when the switch is OFF.
4. Acceptable Manufacturers: Bryant, General Electric, Hubbell, Pass and Seymour, or equal.
5. Switches in Hazardous Locations
   a. Switches shall be factory-sealed assemblies Type EDS by Crouse-Hinds, or equal, with epoxy powder coating.

B. Receptacles:
1. Single and Duplex
   a. Provide specification grade receptacles meeting NEMA WD 1 performance standards and Federal Specification W-C-596, and having a contact arrangement such that contact is made on two sides of each inserted blade without detent. Use two-pole, three-wire grounding type receptacles rated 20 amps, 125 volts, NEMA Configuration 5-20R, and with screw type wire terminals suitable for No. 10 AWG. Provide high strength thermoplastic back and face colored ivory in office areas and brown in all other areas. Acceptable manufacturers: Bryant, General Electric, Hubbell, Pass and Seymour, or equal.
2. Ground Fault Interrupter (GFI) Receptacles
   a. Provide duplex specification grade GFI receptacles tripping at 5 milliamps; rated 20 amps, 120 volts, NEMA Configuration 5-20R; and capable of interrupting 1,000 amps without damage. Use units meeting NEMA WD I, fitting standard sized outlet boxes, having No.12 AWG copper TW insulated pigtails, having provision for testing, and ivory in color. Use standard model where ground fault protection is needed at an individual location. Use feed-thru model where ground fault protection is specified for "downstream" conventional receptacles. Provide receptacles accepting standard device plates. Acceptable manufacturers: Pass and Seymour, Square D, General Electric, or equal.
3. Special Purpose Receptacles
   a. Provide receptacles of the type, rating, and number of poles indicated or required for the anticipated purpose. Furnish a matching plug with cord-grip features for each special purpose receptacle.
4. Receptacles in Hazardous Locations
   a. Receptacles shall be factory-sealed Type ENR by Crouse-Hinds, or equal, with epoxy powder coating.
   b. Provide adapters consisting of the following:

1) Hazardous location rated matching plug connector.
2) Cord rated for environment and application, minimum length 1 foot.
3) Female receptacle connector, standard NEMA configuration.
4) Adapters shall be assembled by contractor.
5) Provide a minimum of one (1) adapter for each building/area in which hazardous location receptacles were required as part of Project, but not less than two (2) total adapters.

5. Corrosion Resistant (CRE) Receptacles
   a. In outdoor or indoor damp, wet or corrosive areas, and for all floor-mounted receptacles, provide receptacles complying with item 1 above, but with yellow thermoplastic back and face; all contact and pressure plates heavily nickel plated; stainless steel screws, fasteners, and springs, mounted strap and terminal screws heavily nickel plated brass, and complying with UL498.
6. Weatherproof Receptacles
   a. Receptacles shall be CRE type specified above mounted in a cast metal box with gasketed, weatherproof device plate as specified below.

C. Multioutlet Surface Raceway System
   1. Provide Wiremold, or equal, with three-wire grounding receptacles on 24-inch centers. Provide an insulated grounding conductor to each receptacle. Wire alternate outlets to each circuit of the two-circuit, three-wire supply.

D. Device Plates:
   1. General
      a. Provide plates fitting closely and tightly to the box on which they are to be installed. On surface mounted boxes, provide plates which do not extend beyond the sides of the box.
      b. Use plate material compatible with the box material such that galvanic corrosion of the plate and/or box does not occur.
   2. Plastic (P)Plates
      a. Provide specification grade device plates manufactured of 0.10 -inch minimum thickness, high impact, noncombustible, thermoplastic material. Provide ivory one-piece with smooth exterior faces and with oval-head metal mounting screws of a color matching that of the plate.
   3. Metal (M) Plates
      a. Provide specification grade, one-piece, 0.040-inch nominal minimal thickness, Type 302 satin finish stainless steel device plates with oval-head, matching mounting screws.
   4. Engraved Plates
      a. Where device titles are indicated, provide device plates engraved with the designated titles. Provide engraved letters, numbers, or characters 1/8 - inch high with filler of black color.
   5. Cast Metal (CM) Plates
      a. Provide cast metal device plates of malleable ferrous metal or copper-free aluminum with gaskets and stainless steel screws with oval heads.
   6. Raised Sheet Metal (SM) Plates

a. Provide 1/2-inch high zinc or cadmium-plated steel device plates designed for one-piece drawn type sheet steel boxes.

2.04 JUNCTION AND PULL BOXES

A. Where outlet boxes are used as junction or pull boxes, use materials as specified under OUTLET AND DEVICE BOXES.

B. Where larger sheet steel boxes are required, utilize boxes of code-gauge, galvanized steel for indoor, dry locations, and stainless steel for outdoor, damp, or wet locations with full-access screw covers mounted with corrosion-resistant (stainless steel for wet locations) machine screws. Stainless steel boxes shall have neoprene-gasketed covers.

C. Where larger cast metal boxes are required, use neoprene gasketed, watertight boxes with hinged, cast metal full access covers, stainless steel cover hardware, and drilled and tapped conduit entrances. Use Crouse-Hinds boxes, or equal. For below grade conduit, use Crouse-Hinds, O.Z./Gedney, or equal, minimum size 8 inches by 8 inches by 6 inches. For hazardous areas, use boxes applicable for the location and hazardous atmosphere present. Use boxes with integral O-ring for damp/wet hazardous areas.

D. Where larger nonmetallic boxes are required, they shall be gasketed, watertight, corrosion resistant, and have a hinged, full-access screw cover. The hinge and machine screws shall be stainless steel. The box and cover shall be of high impact strength fiberglass-reinforced polyester material with stability to high heat. The boxes shall have conduit hubs and any required mounting lugs. The minimum size shall be 7 inches by 10 inches by 6-1/2 inches deep. Use Crouse-Hinds Type, or equal.

E. Hand Holes: Heavy duty polymer concrete construction with floor, gasketed four bolt cover. Install per manufacture's recommendations, Newbasis or equal.

F. Use special boxes where indicated on the Drawings.

2.05 TERMINAL JUNCTION BOXES (TJB)

A. Provide hinged-cover terminal junction boxes of the required type and size where indicated and with the type of enclosure specified in Section 16000. Provide terminal blocks with a separate connection point for each conductor entering or leaving the box. Provide 25 percent spare terminal points (5 points minimum). Paint interior surfaces with white enamel or lacquer.

B. The Contractor shall size the TJB based on:
   1. Number of required connection points and conduits connected to the TJB.
   2. Size of conductors and cables.
   3. Eight inches between terminal strips.
   4. Six-inch clearance between terminal strips and box, all sides, including a 6-inch stand-off.

C. Provide a removable interior mounting panel; do not stack terminal strips, back-to-front, one on the other. Provide an internal copper grounding bus for all ground connections.

D. Terminals shall be as specified in 16460.

2.06 CIRCUIT BREAKERS

A. Where indicated on drawings, furnish and install additional circuit breaker for existing distribution switchboards.

B. Circuit breakers shall match switchboard voltage and short circuit current rating.

C. Provide quick-make, quick-break circuit breakers of the indicating molded case type showing ON/OFF and TRIPPED positions of the operating handle.

D. Provide circuit breakers suitable for use with 75 degrees C wire at full NEC 75 degrees-C ampacity. Circuit breakers shall meet the requirements of NEMA AB 1 and be sized as shown on the drawings.

E. Each breaker shall be individually mounted in the same enclosure with the operating handle extending through the front cover of the section. Provide circuit breakers with handles that can be locked in the OFF position. Interlock enclosure and circuit breaker to prevent opening the cover with the circuit breaker in the ON position.

F. Utilize multipole circuit breakers designed so that an overload on one pole automatically causes all poles to open.

G. Where indicated or required, provide circuit breakers with electrical interlocks.

H. Circuit breakers shall be of the manufacturer required for the switchboard. Circuit breakers shall be of the type shown on the drawings or matching existing circuit breakers or switchboard.

2.07 LIGHTING AND POWER DISTRIBUTION PANELBOARDS

A. General
   1. Provide circuit breaker panelboards (including those in motor control equipment) meeting standards established by UL, NEMA PB 1, and the NEC. Provide panels rated for connection to an electric system having an available amperes rms symmetrical short circuit current of 22,000 at system voltage. Provide panelboards and circuit breakers suitable for use with 75 degrees C wire at full NEC 75 degrees C ampacity.
   2. Provide one (1) circuit breaker lock for each new panelboard installed.

B. Cabinets (not applicable to panelboards mounted in motor control centers)
   1. Furnish boxes/large enough to provide NEC required minimum wiring gutter space on both sides and top and bottom. Provide surface mounted boxes manufactured with reinforced steel frame and code-gauge, hot-dip galvanized sheet steel. Utilize front trim the same size as the box for surface mounted panelboards. Provide sheet steel fronts finished with a prime coat of rust inhibitor and the manufacturer's standard baked enamel or lacquer finish and utilizing adjustable clamps as the means for fastening the front to the boxes. Utilize fronts having doors with concealed hinges and flush type lock and catch device. Provide multipoint locking devices for all doors over 30 inches in height. Key all locks alike, and furnish two milled type keys with

each lock. Furnish on door interior a metal directory frame with transparent plastic face and enclosed directory card. Furnish an engraved, laminated plastic nameplate screwed (no adhesives) to the cabinet exterior face indicating the panelboard designation, service voltage, and phases. Nameplates shall be black, engraved to a white core.

C. Interiors

1. Utilize panelboard interiors that are factory assembled complete with circuit breakers as indicated. Furnish circuit breakers in positions where schedule indicates SPARE. Furnish only complete provisions for future circuit breakers where schedule indicates SPACE, and cover the resulting opening in the cabinet front with an easily removable metal cover. Utilize panelboards with interiors designed so that circuit breakers can be replaced without disturbing adjacent circuit breakers or without removing the main bus.
2. Provide bus bars of copper and full sized throughout their length. Make complete provisions for mounting future circuit breakers throughout the full length of the bus provided regardless of the number of units and spaces called for. Provide all machining, drilling, or tapping required to add or change circuit breakers in the future. Bolt together and rigidly support bus bars and connection straps on molded insulators.
3. Furnish an insulated neutral bus bar rated the same as the phase bus bars and having at least one terminal screw for each branch circuit. Furnish a copper ground bus bar installed on the panelboard frame, bonded to the box, and containing at least one terminal screw for each circuit. Provide solder less main lugs for main, neutral, and ground bus bars. Provide lugs and connection points on phase, neutral, and ground buses suitable for either copper or aluminum conductors.

D. Circuit Breakers

1. Furnish indicating type molded circuit breakers providing ON/OFF and TRIPPED positions of the operating handle. Furnish thermal magnetic, quick-make, quick-break circuit breakers which are non-interchangeable in accordance with the NEC. Do not use tandem or dual circuit breakers in normal single-pole spaces. Do not use single-pole circuit breakers with handle ties where multipole circuit breakers are indicated. Utilize multipole circuit breakers designed so that an overload on one pole automatically causes all poles to open. Provide circuit breakers meeting requirements of NEMA AB 1. Install bolt-on circuit breakers in all panelboards. Provide circuit breaker handle padlocking provisions where indicated or required.
2. Where ground fault interrupter (GFI) circuit breakers are indicated or required by the NEC, provide a unit containing a conventional thermal magnetic trip and a ground fault sensor rated to trip the circuit breaker in approximately 0.025 second for a 5-milliampere ground fault (UL Class A sensitivity). Utilize a ground fault sensor having the same rating as the circuit breaker and having a push-to-test button.

E. Acceptable Manufacturers: Cutler-Hammer, General Electric, Siemens, Square D, or equal.

2.08 FUSED SWITCHES, INDIVIDUAL, 0 TO 600 VOLTS

A. Mount individual fused switches in the specified type of enclosure. Provide fused switches that can be locked in the OFF position. Interlock enclosure and switch to

prevent opening the cover with the switch in the ON position. Provide fused switches which are quick-make, quick-break, motor rated, load-break, heavy-duty (HD) type having external marking clearly indicating ON and OFF positions. Provide blown fuse indicators. Provide fuses of the current ratings indicated and types specified herein. Utilize fuse mountings that reject Class H fuses and will accept only the current limiting fuses specified. Provide fused switches meeting the requirements of NEMA KS 1 and UL listed for application to a system having an available short circuit current as indicated. Provide switches suitable for use with 75 degrees C wire at full NEC 75 degrees C ampacity.

B. Where indicated or required, provide switches with electrical interlocks or auxiliary contacts.

2.09 NONFUSED SWITCHES, INDIVIDUAL, 0 TO 600 VOLTS

A. Mount individual switches in the specified type of enclosure. Provide switches that can be locked in the OFF position. Interlock enclosure and switches to prevent opening the cover with the switch in the ON position. Provide switches which are quick-make, quick-break, motor rated, load-break, heavy-duty (HD) type having external marking clearly indicating ON and OFF positions. Furnish switches meeting the requirements of NEMA KS 1. Provide switches suitable for use with 75 degrees C wire at full NEC 75 degrees C ampacity.

B. For hazardous locations, as shown on the drawings, provide UL-listed nonfused safety switches with corrosion resistant epoxy finish, suitable for the indicated environment and complying with NEC Class I location. Manufacturers: Crouse-Hinds Series FLS, or equal.

C. Where indicated or required, provide switches with electrical interlocks or auxiliary contacts.

2.10 FUSES, 0 TO 600 VOLTS

A. Provide a complete set of current-limiting fuses wherever fuses are indicated. Supply set of six spare fuses of each type and each current rating installed. Utilize fuses that fit mountings specified, with switches and which provide features rejecting Class H fuses. Provide the following types (or as recommended by the protected-equipment manufacturer):
   1. For 0 to 600-volt motor and transformer circuits, 0 to 600 amps, UL Class RK-1 with time delay, Bussmann Type LPS-RK, or equal.
   2. For 0 to 250-volt motor and transformer circuits, 0 to 600 amps, UL Class RK-1 with time delay, Bussmann Type LPN-RK, or equal.
   3. For 0 to 600-volt feeder and service circuits, 0 to 600 amps, UL Class RK-1, Bussmann Type KTS-R, or equal.
   4. For 0 to 250-volt feeder and service circuits, 0 to 600 amps, UL Class RK-1, Bussmann Type KTN-R, or equal.
   5. For 0 to 600-volt feeder and service circuits, 601 to 6,000 amps, UL Class L, Bussmann Type KRP-C, or equal.

2.11 MINIATURE POWER CENTERS

A. Provide and install miniature power centers as indicated in drawings or schedules.

B. Power center shall contain the following components in a common enclosure.
   1. Main breaker with minimum size as shown on drawings.
   2. Three phase dry-type transformer sized as shown on drawings.
   3. Secondary distribution load center with main breaker, minimum size as shown on drawings.

C. Primary voltage shall be 480 VAC, 3 phase, 3 wire, 60 Hz, unless otherwise noted.

D. Secondary voltage shall be 280Y/120, 3 phase, 4 wire, 60 Hz, unless otherwise noted.

E. Enclosure shall be UL listed with all live part enclosed.

F. Enclosure shall contain hinged cover with provisions for padlocking.

G. Transformer cores shall be grounded.

H. Enclosure shall contain ground bar and neutral bar. Neutral bar shall be grounded to enclosure case.

I. Load center shall contain individual feeder circuit breakers which can be easily modified or removed. Circuit breakers shall be as specified under LIGHTING AND POWER DISTRIBUTION PANELBOARDS.

J. Provide one (1) circuit breaker lock for each new power center installed.

K. Manufacturer and Products: Cutler Hammer, Square D, or equal.

2.12 DRY TYPE TRANSFORMER (0 TO 600 VOLT PRIMARY)

A. Furnish dry type transformers where indicated on drawings. Transformer shall have phase, voltage, and kVA ratings as indicated on drawings or schedules.

B. Transformers shall be UL listed and suitable for 60 Hz operation. Transformers shall be designed with short-term overload capabilities as required and according to ANSI.

C. Transformer shall have ventilated NEMA 2 enclosure suitable for indoor applications. Where transformers are indicated to be installed outdoors or in wet environments, a weathershield shall be provided and enclosure shall be rated NEMA 3R.

D. Transformer insulation class and temperature rise shall be manufacturer's standard.

E. Units shall be suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity.

F. Transformer shall contain a minimum of four 2 1/2 percent voltage taps rated for full capacity. Two taps shall be above and two taps shall be below normal voltage rating tap.

G. Maximum sound levels shall meet or exceed NEAM ST 20.
   1. 0 to 9 kVA: 40 dB
   2. 10 to 50 kVA: 45 dB
   3. 51 to 150 kVA: 50 dB

4. 151 to 300 kVA: 55 dB
5. 301 to 500 kVA: 60 dB

H. Vibration isolators shall be included with transformer. Isolators shall be rated for transformer's weight with an isolation efficiency of 99 percent at the fundamental frequency of sound emitted by transformer. For transformers less that 30 kVA, isolators shall be installed external to isolate the entire unit. For transformers 30 kVA and larger, isolators shall be installed internal to isolate core and coil assembly from transformer enclosure.

I. Provide wall mounting bracket where wall installation is indicated on the drawings or schedules for single phase units up to 37 1/2 kVA and three phase units up to 30 kVA.

J. Manufacturer and Products: Hammond Power Solutions, Cutler Hammer, Square D, or equal.

2.13 NAMEPLATES

A. Unless indicated otherwise provide engraved laminated plastic nameplates, high-contrast black background with white letters. Unless specified elsewhere, nameplates shall be 1-1/2 inches high, with 1 inch letters, for small, wall or pedestal mounted equipment and 4 inches high, with two lines of 1-inch letters, for large, floor-mounted equipment. Manufacturer's standard device identification will be considered (submit to the Engineer for approval) if "nameplate" is corrosion resistant and meets the intent of these specifications.

B. Provide factory-installed nameplates for all individual circuit breakers, fused and nonfused disconnect switches, and individual capacitors citing the tag number and name of the related drive or equipment. When no tag number exists, use the name of the drive (i.e., "Wall Fan", etc.).

C. For terminal junction boxes, transformers, panelboards (not mounted inside motor control centers), and other cabinets or electrical equipment, provide nameplates which include the name and tag number as identified on Drawings or in the Schedules.

2.14 CHANNEL-STRUT

A. Provide channel roll-formed from 12-gauge steel in conformance with ASTM A 569-72. Channel shall have a cross sectional width and depth of no less than 1 - 5/8 inches. All accessories, including nuts, bolts, straps, threaded rods and factory-punched holes shall be corrosion-resistant material equivalent to the finish or material of the channel. Channel and accessories shall be stainless steel or aluminum (as indicated) for outside, and indoor damp, wet and hazardous areas: and galvanized steel for indoor dry locations.

PART 3 EXECUTION

3.01 STANDARD DETAILS

A. As shown on drawings.

3.02 OUTLET AND DEVICE BOXES

A. Provide a box suitable for the conditions encountered at each outlet in the wiring or raceway system and sized in accordance with the NEC. Use the listed types unless otherwise indicated or accepted.

B. Types of Boxes to be Provided:
   1. Use sheet steel boxes for steel raceway systems exposed, embedded, or concealed in interior non-process, nonhazardous, non-corrosive, dry areas.
   2. Use cast steel boxes for steel raceway systems exposed embedded, or concealed in process and hazardous areas.
   3. Use cast aluminum boxes for aluminum raceway systems.
   4. Use corrosion resistant PVC-coated boxes for PVC-coated rigid steel conduit systems.
   5. Mount boxes at the following heights unless otherwise indicated (heights are to the centerline of the box):
      a. Wall switches - 48 inches above floor
      b. Thermostats - 60 inches above floor
      c. Wall mounted intercom outlets - 52 inches above floor
      d. Where above heights do not suit the building construction or finish, locate boxes where directed by the Engineer.
      e. Mount all boxes plumb and level. Use flush mounted boxes with concealed conduits. Make edges of boxes flush with finished surface. Provide proper type extension rings or plaster covers for this purpose. For flush mounted boxes, make holes in the surrounding surface no larger than required to receive the box.
      f. Install boxes in a secure, substantial manner supported independently of conduit by attachment to the building structure or a structural member. Use bar hangers in frame construction, or fasten boxes directly with wood screws on wood, bolts and expansion shields on concrete or brick, toggle bolts on hollow masonry units, and machine screws or welded, threaded studs on steelwork. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields. Boxes embedded in concrete or masonry need not be additionally supported. Utilize galvanized mounting hardware in industrial areas.
      g. Open no more knockouts in sheet steel boxes than are actually required. Seal any unused openings in any type box.

3.03 JUNCTION AND PULL BOXES

A. Where indicated on the Drawings, and where necessary to terminate, tap-off, or redirect multiple conduit runs, provide and install appropriately designed junction boxes. Furnish and install pull boxes where necessary in the raceway system to facilitate conductor installation. Provide pull boxes to limit conduit runs to less than 150 feet and to contain no more than the equivalent of three right-angle bends unless accepted by the Engineer.
   1. Types to be Provided:
      a. Use boxes of the types listed for specific locations under OUTLET AND DEVICE BOXES hereinbefore.
      b. Use outlet boxes as junction boxes and pull boxes wherever possible and allowed by applicable codes.
      c. Provide watertight, cast metal or watertight, nonmetallic boxes for above grade outdoor locations.

d. Provide handholes for below grade outdoor locations.

2. Installation:
   a. Make all boxes accessible. Do not install boxes in finished areas unless accepted by the Engineer. Mount all boxes plumb and level. Use flush mounted boxes with concealed conduits. Make edges of boxes flush with the final surface.
   b. Install boxes in a secure, substantial manner, supported independently of conduit by attachment to the building structure or a structural member. Use bar hangers in frame construction, or fasten boxes directly with wood screws on wood, bolts and expansion shields on concrete or brick, toggle bolts on hollow masonry units, and machine screws or welded threaded studs on steelwork. Threaded studs driven in by a powder charge and provided with lock washers and nuts are acceptable in lieu of expansion shields. Boxes embedded in concrete or masonry need not be additionally supported. Utilize galvanized mounting hardware in industrial areas.
   c. Install boxes for conduits under grade flush with finished grade.
   d. If adjacent structure is available, the box may be mounted on the structure surface just above finished grade in accessible but unobtrusive location. If it is found desirable to locate boxes in paved areas, roadways, or walkways, obtain Engineer's written approval and utilize boxes and covers suitable for the weights to which they may be subjected.

3.04 TERMINAL JUNCTION BOXES (TJB)

A. Install in accordance with all the requirements detailed under JUNCTION AND PULL BOXES above. Label each block and terminal with a permanently attached, non-destructible tag.

3.05 CIRCUIT BREAKERS - DISTRIBUTION SWITCHBOARDS AND MCC'S

A. Install in accordance with switchboard/MCC and circuit breakers manufacturers recommendations. Provide an engraved, laminated plastic nameplate on the outside of each switch board section or circuit breaker showing section name and or feed location.

3.06 MINIATURE POWER CENTERS, LIGHTING AND POWER DISTRIBUTION PANELBOARDS

A. Mount securely where indicated, plumb, in-line, and square with walls. Unless otherwise indicated, mount with top of its cabinet approximately 6 feet above the floor. Provide a typewritten circuit directory under a metal-framed, transparent plastic cover inside each panelboard. Provide an engraved, laminated plastic nameplate on the outside of the panelboard showing the panelboard designation, voltage, and phases.

3.07 NAMEPLATES

A. All electrical equipment and devices, which are identified on the Drawings or in the Specifications with a unique or specific identification name and/or number shall be provided with an engraved, laminated plastic nameplate as specified.

B. Where nameplates are required, they shall be permanently attached to the device specified, located on the device so as to be easily read under normal operation of the device, and shall in no way alter nor limit the rating, function, UL listing, and enclosure of

the device. Nameplates shall be smoothly attached to the device with no overlaps, protrusions, or sharp edges and corners.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16060 GROUNDING

PART 1 GENERAL

1.01 SCOPE

A. This Section covers the work necessary to furnish and install, complete, the electrical grounding system.

1.02 GENERAL

A. See Division16000, Electrical – General Provisions which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.03 SUBMITTALS

A. Make submittals in accordance with Division 16000, Electrical – General Provisions.

PART 2 PRODUCTS

2.01 GROUND RODS

A. Provide copper-clad steel ground rods not less than 3/4 inch in diameter, 10 feet long, minimum, driven full length into the earth. Special requirements shall be as shown and as specified herein.

2.02 GROUNDING CONDUCTORS

A. Provide grounding conductors of the size shown and the type specified in Section CONDUCTORS.

2.03 GROUNDING CONNECTIONS

A. For below grade connections, provide exothermic-welded type of connectors suitable for direct burial. Exothermic-welded type of connectors shall be as manufactured by Cadweld, Thermoweld, or equal.

B. For above grade connections, provide exothermic-welded, compression, or brazed connectors.

C. Above grade exothermic-welded connections shall be suitable for exposure to elements. Indoor exothermic-welded connections shall utilize low-smoke, low-emission process. Exothermic-welded type of connectors shall be as manufactured by Cadweld, Thermoweld, or equal.

D. Above grade compression connections shall be of the compression-deforming type and wrought copper extrusion material with single identification for conductors 6 AWG and smaller and double identification with extended barrel for conductors 4 AWG and larger. Barrels shall be prefilled with oxide-inhibiting and anitseizing compound and sealed. Manufacturers shall be Burndy Corporation, Thomas and Betts Co., or equal.

2.04 EQUIPMENT GROUNDING CONNECTIONS

A. Equipment shall have means for attaching a grounding conductor. Equipment suppliers shall provide grounding means conforming to any of the following:
   1. A noncorrodible metal pad welded or brazed to the equipment frame having a threaded 3/8-inch hole at its center and a mating bronze cap screw and lockwashers.
   2. A tapered, threaded 3/8-inch hole in a flat surface of equipment frame, with a mating high strength bronze post-type connector having threads coated with a corrosion inhibiting compound.
   3. A terminal connector attached to the equipment frame by a 3/8-inch bronze bolt, nut, and lockwasher.

B. Threaded holes shall have sufficient number of threads to ensure a firm connection. All connections shall conform and meet all requirements of NEC Article 250. Connections shall be suitable for up to No. 4/0 AWG ground conductors.

2.05 GROUND ROD TEST WELL

A. Heavy duty polymer concrete construction without floor, gasketed four bolt cover. Suitable for below grade installations. Traffic cover suitable for expected loaded based on installation location marked GROUND ROD. Newbasis, Christy Concrete Products, or equal.

PART 3 EXECUTION

3.01 GENERAL

A. Except where specifically indicated otherwise, ground all exposed noncurrent-carrying metallic parts of electrical equipment, raceway systems, and the neutral of all wiring systems in strict accordance with the NEC, state, and other applicable laws and regulations.

B. Bond the grounding conductors to metallic enclosures at each end and to all intermediate metallic enclosures. Connect grounding conductors to all grounding bushings on raceways. Where any equipment contains a ground bus, extend and connect grounding conductors to that bus. Connect the enclosure of the equipment containing the ground bus to that bus. Run grounding conductors inside conduits enclosing the power conductors.

C. Ground shields of any shielded power cable at each splice or termination in accordance with recommendations of the splice or termination manufacturer. Ground shields of any control cables in accordance with the details shown.

D. Ground shields of any shielded instrumentation cable to ground bus at power supply for analog signal. Expose shield a minimum of 1 inch at termination to field instrument and apply heat shrink tube. Do not ground instrumentation cable shield at more that one point.

3.02 WIRE CONNECTIONS

A. Install ground conductors in all conduit containing power conductors and control circuit above 50 volts. Connect ground conductors to raceway grounding bushings. Where nonmetallic raceways and flexible tubing is used, install equipment grounding conductor connected at both ends to noncurrent-carrying grounding bus.

B. Extend and connect ground conductors to ground bus in all equipment containing a ground bus. Connect enclosure of equipment containing ground bus to that bus. Bolt connections to equipment ground bus.

C. Bond grounding conductors to metallic enclosures at each end, and to intermediate metallic enclosures. Where junction boxes are used, furnish materials and connect equipment ground system with grounding clips mounted directly on box, or with 3/8 inch machine screws.

3.03 MOTOR GROUNDING

A. Extend equipment ground bus via grounding conductor installed in motor feeder raceway and connect to motor frame. Where nonmetallic raceways and flexible tubing is used, install equipment grounding conductor connected at both ends to noncurrent-carrying grounding bus.

B. Make connections of any grounding conductors to motors 10 hp and above or circuits 20 amps or above by a solderless terminal and a 5/16-inch minimum bolt tapped to the motor frame or equipment housing. Ground connections to smaller motors or equipment may be made by fastening the terminal to a connection box. Connect junction boxes to the equipment grounding system with grounding clips mounted directly on the box or with 3/8-inch machine screws. Completely remove all paint, dirt, or other surface coverings at grounding conductor connection points so that good metal-to-metal contact is made. Restore paint finish to prevent corrosion of the surface after grounding connections are made.

3.04 GROUND RODS

A. Install the full length of the rod with conductor connection at upper end. Install with connection point a minimum of 6 inches below finished grade, unless otherwise noted or shown. Space multiple ground rods by one rod length, minimum.

3.05 GROUNDING CONNECTIONS

A. For exothermic-weld type connections, wire brush or file contact point to bare metal surface. Use welding cartridges and molds in accordance with manufacturer's recommendations. Avoid using badly worn molds. Molds shall be completely filled with metal when making welds. After welds have cooled, brush slag from weld area and thoroughly clean joint.

B. Install compression type connections in accordance with manufacturer's recommendations. Install connectors of proper size for grounding conductors and ground rods specified. Install using manufacturer's compression tool having proper sized dies.

3.06 GROUNDING WELLS

A. Install per manufacturers' recommendations flush with finished grade or surface. Place 3 inches of crushed rock in bottom of each well.

3.07 METAL STRUCTURE GROUNDING

A. Ground metal sheathing and any exposed metal vertical structural elements of buildings. Bond any metal equipment platforms which support electrical equipment to that equipment. Provide good electrical contact between metal frames and railings supporting pushbutton stations, receptacles, instrument cabinets, etc., and raceways carrying circuits to these devices.

3.08 MANHOLE AND HANDHOLE GROUNDING

A. Install one ground rod inside each manhole and handhole used. Ground rod shall protrude four to six inches above floor. Make connections of grounding conductors fully visible and accessible. Connect all noncurrent-carrying metal parts, and any metallic raceway grounding bushings to ground rod with No. 6 AWG copper conductor.

3.09 TRANSFORMER GROUNDING

A. Bond neutrals of transformers within buildings to the system ground network, and to any additional indicated grounding electrodes. Bond neutrals of substation transformers to substation grounding system.

3.10 SERVICE GROUNDING ELECTRODE SYSTEM

A. Install a grounding electrode system to properly ground the service entrance as required by the National Electric Code. Install system according to National Electric Code, utility requirements, and any other state or local regulations. If an existing facility ground network is present, install grounding electrode system as specified for each new service entrance and connect to existing facility ground network.

B. Grounding electrode system shall consist of ground rods as specified and as shown on the drawings. Space ground rods as shown on the drawings. Ground rods shall be buried a minimum of 6 inches below final grade.

C. Main bonding jumper shall be provided and installed at the service entrance equipment as required by the NEC and shown on drawings. Main bonding jumper shall be one piece in length. Bonding jumper shall be either provided as part of service entrance equipment from manufacturer or provided by CONTRACTOR. CONTRACTOR shall coordinate who is providing main bonding jumper and shall be responsible for verifying that one is provided. Main bonding jumper shall be sized as shown on the drawings and according to the NEC based on specified service entrance conductors.

D. Install grounding electrode conductor to connect ground rods and service equipment ground. Grounding electrode conductor shall be one piece in length, supported and protected by rigid conduit as required by the National Electric Code. Grounding electrode conductor shall be as specified in Section 16120, Conductors and sized as required by the National Electric Code and as shown on drawings.

3.11 FIELD TESTS

A. Ground system testing shall be in accordance with Section 16080 – Electrical Testing.

B. In addition to Section 16080, test all ground fault interrupter (GFI) receptacles and circuit breakers for proper connection and operation with methods and instruments prescribed by the manufacturer.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16080 ELECTRICAL TESTING

PART 1 GENERAL

1.01 SCOPE

A. This Section covers the work necessary to furnish and install, complete, the materials specified hereinafter.

B. See Supplement to this Section for additional information related to work specified under this Section.

1.02 REFERENCES

A. The following is a list of standards, and codes which may be referenced in this section:
   1. National Electrical Code (NEC).
   2. State Fire Marshal.
   3. Underwriters' Laboratories (UL).
   4. National Electrical Safety Code (NESC).
   5. American National Standards Institute (ANSI).
   6. National Electrical Manufacturer's Association (NEMA).
   7. National Electrical Contractor's Association (NECA) Standard of Installation.
   8. Institute of Electrical and Electronics Engineers (IEEE).
   9. Insulated Cable Engineers Association (ICEA).
   10. Occupational Safety and Health Act (OSHA).
   11. National Electrical Testing Association (NETA).
   12. American Society for Testing and Materials (ASTM).
   13. National Fire Protection Agency (NFPA)
   14. National Institute for Certification in Engineering Technologies (NICET)

1.03 SUBMITTALS

A. Make submittals in accordance with Section 16000.

B. Prior to performing inspections or tests, submit the following:
   1. Schedule of performing tests.
   2. List of references to be used for each test.
   3. Sample copy of test result forms.

C. After the completion of each test, submit test or inspection report and certificates for each item tested.

1.04 QUALITY ASSURANCE

A. Test equipment shall have an operating accuracy equal to, or greater than, requirements established by NETA ATS.

B. Test instrument calibration shall be in accordance with NETA ATS.

1.05 SEQUENCING AND SCHEDULING

A. Perform inspection and electrical tests after equipment here in listed has been installed.

B. Perform tests with apparatus de-energized whenever feasible.

C. Inspection and electrical tests on energized equipment shall be scheduled with Engineer and Owner prior to de-energization and minimized to avoid extended period of interruption to the operating plant equipment.

D. Notify Engineer at least 48 hours prior to performing tests on energized equipment

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION

3.01 GENERAL

A. Carry out tests specified hereinafter and as indicated under individual items of materials and equipment specified in other sections.

B. Perform the visual inspections, manual operations, and tests on systems and equipment as specified hereinafter.

C. All field testing specified under Division 16 shall be performed under the direct supervision of a licensed journeyman or master electrician experienced in the specific testing identified. After testing, 2 copies of a full report of all test results shall be submitted to the Engineer for review.

D. Provide written test reports, signed and dated, for all tests prior to acceptance of the tested equipment by the Owner. Test reports on megger, dielectric absorption and high potential tests shall include the ambient temperature and relative humidity existing at the time of the tests.

E. Example test reports are attached to this section. Test repots specific to the manufacturer, testing agency, or contractor conducting individual test may be used upon approval of Engineer.

F. All costs for testing shall be included in the Contractor's lump sum bid amount.

3.02 VISUAL INSPECTIONS

A. Prior to any testing, perform visual inspections to verify the following:
   1. The equipment is completely and properly installed
   2. The equipment is free from damage and defects
   3. Shipping blocks and restraints have been removed
   4. Electrical terminations have been properly tightened
   5. The equipment has been properly aligned

6. The equipment has been properly lubricated
7. The ventilation louvers are open and unobstructed
8. The equipment is ready to be tested

3.03 MANUAL OPERATION

A. Prior to any testing, mechanical devices shall be exercised or rotated manually to verify that they operate properly and freely.

3.04 PRIMARY CABLE TESTS (ABOVE 600 VOLTS) (NOT USED)

3.05 POWER CABLE TESTS (600 VOLTS AND BELOW)

A. Perform a continuity check and a 1,000-volt DC megger test on 600 volt power cables No. 4 AWG and larger.
   1. The megger test shall be performed between each pair of conductors and from each conductor to ground.
   2. The megger test shall be performed for 15 seconds or until the insulation resistance value stabilizes.
   3. The insulation resistance between conductors and from each conductor to ground shall be 100 megohms minimum in one minute or less. In addition, the lowest insulation resistance value shall not differ from the highest value by more than 20 percent.

3.06 CONTROL CABLE TESTS

A. Perform a continuity check on control and instrumentation wiring.

3.07 PRIMARY SWITCHGEAR TESTS (NOT USED)

3.08 SUBSTATION TRANSFORMER TESTS (NOT USED)

3.09 SECONDARY SWITCHGEAR TESTS (NOT USED)

3.10 SERVICE, DISTRIBUTION, AND MOTOR CONTROL EQUIPMENT TESTS (NOT USED)

3.11 EMERGENCY POWER SYSTEM TESTS (NOT USED)

3.12 MOTOR TESTS

A. Inspection and testing limited to motors 15 horsepower (hp) and larger.

B. At the time of equipment delivery, "Megger" test each motor 15 horsepower (hp) and larger. Refer any motor not passing the test to the Engineer and the Contractor.

C. Prior to energizing, check motor for proper electrical and grounding connections, shaft alignment, and blockage of ventilating air passageways.

D. Operate motor and check for excessive mechanical and electrical noise, overheating, and correct rotation. Check vibration detectors, resistance temperature detectors, or motor

inherent protectors for functionality and proper operation. Check for vibration in excess of values in NETA ATS Table 100.10.

3.13 POWER FACTOR CORRECTION CAPACITORS (NOT USED)

3.14 GROUNDING TESTS (NOT USED)

3.15 VOLTAGE

A. When the installation is essentially complete and the new facilities are in operation, check the voltage at the following points of termination. Record voltage amplitude for phase-to-phase, phase-to-neutral, and phase-to-ground.
   1. Line side of 480 volt DP-2.

B. Record test results and include in report to Engineer.

3.16 EQUIPMENT LINE CURRENT

A. Check the line current in each phase and neutral conductor at the following locations. If any phase current is above the rated nameplate current, determine the cause of the problem and submit it in writing to the Engineer.
   1. Line side of 480 volt DP-2.

B. Record test results and include in report to Engineer.

END OF SECTION

Voltage and Current Tests

Specification Section: 16080 - 3.15, 3.16
Date: _____
Project: _____
Engineer: _____
Contractor: _____

Voltage Readings

Location	Phase									
	A-G	B-G	C-G	N-G	A-B	B-C	C-A	A-N	B-N	C-N

Current Radings

Location	Phase			
	A	B	C	N

Comments:

Deficiencies:

Signed: _____

DIVISION 16 - ELECTRICAL

SECTION 16120 CONDUCTORS

PART 1 GENERAL

1.01 SCOPE

A. This Section covers the work necessary to furnish and install, complete, electrical conductor systems.

1.02 GENERAL

A. See Division 16000, Electrical – General Provisions which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.03 SUBMITTALS

A. Make submittals in accordance with Division 16000, Electrical – General Provisions.

PART 2 PRODUCTS

2.01 GENERAL

A. The use of a manufacturer's name and model or catalog number is for the purpose of establishing the standard of quality and general configuration desired only. Products of other manufacturers will be considered in accordance with the GENERAL CONDITIONS.

2.02 CONDUCTORS

A. Conductors 600 Volts and Below:
   1. Unless otherwise indicated, provide stranded conductors, except provide solid conductors where No. 10 AWG and No. 12 AWG are designated for branch circuit power wiring in lighting and receptacle circuits.
   2. Utilize only conductors meeting applicable requirements of NEMA WC 70 and ICEA S-95-658.
   3. Provide conductors with Type THHN/THWN, except for sizes No.6 and larger, provide conductors with XHHW insulation.
   4. Provide copper conductors. Unless noted otherwise sizes indicated are based on copper conductors. Do not provide conductors smaller than those indicated.
   5. For all direct burial conductors and cables provide Type USE-2/RHH/RHW-2 insulation meeting the physical requirements of UL 854 and NEMA WC 70.
   6. Where flexible cords and cables are specified, provide heavy-duty, extra-flexible, Type SO, 600-volt, with the number and size of copper conductors indicated.
   7. Provide conductors with a minimum temperature rating of 75 degrees C in wet and dry locations. Conductors shall be suitable for installation in open air, cable trays, or conduit.

B. 600 volt VFD cables:
   1. Conductor:
      a. Provide Class B stranding in accordance with ASTM B8.
   2. Insulation:
      a. Cross-linked Polyethylene.
      b. 90 degree Celsius rating.
      c. UL 44 Type RHH/RHW-2 or XHHW-2.
   3. Ground:
      a. Provide Class B stranding in accordance with ASTM B8.
      b. 3 symmetrically placed bare copper conductors in direct contact with shield.
   4. Metallic shield:
      a. Overall 5 mil bare copper tape shield with 50 percent overlap.
   5. Outer jacket:
      a. UL 1277 Type PVC.
   6. Integral Control Conductors
      a. Where required or shown, VFD cable shall include signal pairs within cable jacket.
   7. Cable tray rated, UL Type TC-ER.
   8. Manufacturers: Lutze, Belden, General Cable, or Equal

C. 600 Volt Multiconductor Control Cable:
   1. Type TC, meeting requirements of UL 1277 and NFPA 70, suitable for installation in open air, cable trays, or conduit and meeting UL 1685 Vertical Flame Test requirements.
   2. Permanently and legibly marked with manufacturer's name, maximum working voltage, type of cable, and UL listing mark.
   3. Minimum cable temperature rating shall be 90 degrees C in dry locations and 75 degrees C in wet locations.
   4. Cable shall contain overall PVC, flame retardant, sunlight and oil resistant jacket.
   5. Individual Conductors:
      a. No. 16 AWG, seven strand copper, unless otherwise noted in plans and schedules.
      b. Insulation: 15-mil PVC with 4-mil nylon.
      c. UL listed
         1) Type THHN/THWN for 14 AWG and larger
         2) Type TFN or TFFN for 16 AWG
      d. Conductor group shall be bound with spiral wrap of barrier tape.
      e. Conductor color code shall be in accordance with ICEA S-58-679, Method 1, Table 2.
   6. Belden, Okonite, Southwire, or equal.

D. 600 Volt Single Shielded Twisted Pair Instrumentation Cable:
   1. Single pair instrumentation cable designed for noise rejection in process control, computer, or data log applications meeting NEMA WC 55 requirements. Suitable for installation in cable trays, conduit, or other approved raceways.

2. Outer Jacket: 45-mil nominal thickness PVC.
3. Individual Conductors:
    a. No. 16 AWG, Bare soft annealed copper, Class B, seven-strand concentric per ASTM B8, Twisted Pair
    b. No. 20 AWG, seven-strand, tinned copper drain wire.
    c. Insulation and Jacket: Each conductor 15-mil nominal PVC and 4-mil nylon insulation.
    d. Pair conductors pigmented black and red.
4. Individual Pair Shield 1.35 - mil double-faced aluminum/synthetic polymer overlapped to provide 100 percent coverage.
5. Dimension: 0.31 inch nominal OD.
6. Alpha Wire Corporation, Okonite Co., Belden or equal.

E. 600 Volt Shielded Twisted Triad Instrumentation Cable:
1. Single triad, designed for noise rejection for process control, computer, or data log applications meeting NEMA WC 55 requirements. Suitable for installation in cable trays, conduit, or other approved raceways.
2. Outer Jacket: 45-mil nominal.
3. Individual Shield: 1.35-mil, double-faced aluminum/synthetic polymer, overlapped to provide 100 percent coverage.
4. Dimension: 0.32 inch nominal OD.
5. Individual Conductors:
    a. No. 16 AWG, Bare soft annealed copper, Class B, seven-strand concentric, meeting requirements of ASTM B8.
    b. No. 20 AWG, seven-strand, tinned copper drain wire.
    c. Insulation and Jacket: Each conductor 15-mil nominal PVC and 4-mil nylon insulation.
    d. Color Code: Triad conductors black, red, and blue.
6. Alpha Wire Corporation, Okonite Co., Belden or equal.

F. 600 Volt Multiple Twisted Shielded Pair Instrumentation Cable:
1. Multi-pair instrumentation cable with common, overall shield designed for noise rejection in process control, computer, or data log applications meeting NEMA WC 55 requirements. Suitable for installation in cable trays, conduit, or other approved raceways.
2. Individual Conductors:
    a. No. 18 AWG, Bare soft annealed copper, Class B, seven-strand concentric per ASTM B8, Twisted Pair
    b. No. 20 AWG, minimum, seven-strand tinned copper drain wire. Group drain wire size No. 18 AWG.
    c. Insulation and Jacket: Each conductor 15-mil nominal PVC insulation and 4-mil nylon jacket.
    d. Pair conductors pigmented black and red with red conductor numerically printed for group identification.
    e. Individual pair shield: 1.35-mil, double-faced aluminum/synthetic polymer.

3. Cable Shield: 2.35 - mil double-faced aluminum/synthetic polymer, overlapped to provide 100 percent coverage.
4. Alpha Wire Corporation, Okonite Co., Belden or equal.

G. Shielded Communication Cable:
1. Communication cable with common, overall shield designed for noise rejection in process control, computer, or data log applications meeting NEMA WC 55 requirements. Suitable for installation in cable trays, conduit, or other approved raceways.
2. Suitable for use in RS-485 communications.
3. Nominal impedance: 120 ohm
4. Individual Conductors:
   a. No. 18 AWG, Bare soft annealed copper, Class B, seven-strand concentric per ASTM B8, Twisted Pair
   b. Insulation and Jacket: Each conductor 15-mil nominal PVC insulation and 4-mil nylon jacket.
5. Cable Shield:
   a. Tape: Bi-laminate materials with 100% coverage
   b. Braid: Tinned copper with 55% coverage.
6. Alpha Wire Corporation, Okonite Co., Belden or equal.

H. Unshielded Twisted Pair Data Cable
1. Cable shall exceed all TIA and ISO specifications for 5E cabling systems and components including independently confirmed system performance and independently confirmed Gigabit Ethernet Zero Bit Error Rate.
2. Cable shall be the solution of a single vendor to ensure optimum system performance. Vendor shall have a warranty of 5E performance for 25 years.
3. Cable shall exceed performance requirements for any existing and proposed high speed network applications including Gigabit Ethernet.
4. Cable shall be of a round design, round solid filler, and non-bonded pairs. Conductors shall be 24 AWG, four-pair UTP, UL/NEC CMP rated with a plenum-rated, lead-free PVC jacket and individual conductors 100 percent FEP insulated. Operating temperature of minus 20 to 60 degrees C.
5. Cable impedance shall be nominal 100 ohms plus or minus 15 percent from 1 MHz to 100 MHz. Cable shall have a maximum propagation delay of 498 ns/100 m at 250 MHz with a delay skew of 25 ns, maximum.
6. Conductor resistance shall be a maximum of 66.58 ohms per kilometer and a maximum mutual capacitance of 5.6 nF per 100 meters.
7. Alpha Wire Corporation, Belden, or equal

I. Equipment Grounding Conductors:
1. Provide stranded copper conductors, as indicated or as required by NEC for equipment grounding. Provide solid conductors where No.10 AWG and No.12 AWG are designated in lighting and receptacle circuits.
2. Provide conductors with green insulation matching the circuit conductors.

J. Direct Buried Grounding Conductors:

1. Provide bare stranded copper conductors, size as indicated, for the ground system at transformers, switch gear, and where indicated.
2. Copper-clad steel conductor of equivalent capacity and surface area may be substituted if accepted by the Engineer.

2.03 ACCESSORIES FOR CONDUCTORS 600 VOLTS AND BELOW

A. Conductor and Cable Tags:
   1. Provide adhesive conductor tags for conductors No.8 AWG and below with legible machine printed black marking.
   2. Provide tags for cables, and for conductors No.6 AWG and larger, consisting of permanent nylon marker plates with legible designations hot stamped on the plate. Attach, these marker plates to conductors and cables with selflocking UV-protected ties.

B. Conductor Arc and Fireproofing Materials: Use Scotch Brand 77 or Plymouth Plyarc 30 arc and fireproofing tape. Scotch Brand 69 or Plymouth Plyglass glass cloth electrical tape, or preapproved equal.

C. Connectors and Terminations:
   1. Nylon, Self-Insulated Crimp Connectors shall be Thomas & Betts, Burndy, ILSCO, or preapproved equal.
   2. Nylon, Self-Insulated, Crimp Locking-Fork, Torque-Type Terminator:
      a. Seamless terminator, suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity. Thomas & Betts, Burndy, ILSCO, or preapproved equal.
   3. Self-Insulated, Freespring Wire Connector (Wire Nuts):
      a. Plated steel, square wire springs meeting UL Standard 486C. Thomas & Betts, Ideal, or preapproved equal.
   4. Self-Insulated, Set Screw Wire Connector:
      a. Two piece compression type with set screw in brass barrel. Insulated by insulator cap screwed over brass barrel. Thomas & Betts, 3M, Marrette, or preapproved equal.

D. Cable Lugs
   1. Lugs shall be in accordance with NEMA CC 1, rated 600 volts of the same material as conductor metal.
   2. Uninsulated Crimp Connectors and Terminators:
      a. Suitable for use with 75 degrees C wire at full NFPA 70, 75 degrees C ampacity. Thomas & Betts, Burndy, ILSCO, or preapproved equal.
   3. Uninsulated, Bolted, Two-Way Connectors and Terminators shall be Thomas & Betts, Burndy, ILSCO, or preapproved equal.

E. Cable Ties:
   1. Nylon, adjustable, self-locking and reusable. Thomas & Betts, or preapproved equal.

F. Heal Shrinkable Insulation
   1. Thermally stabilized, cross-linked polyolefin. Thomas & Betts, or preapproved equal.

2.04 PULLING COMPOUND

A. Nontoxic, noncorrosive, noncombustible, nonflammable, water based lubricant. Compound shall be U.L. listed, suitable for rubber, neoprene, PVC, polyethylene, hypalon, CPE, and lead covered wire and cable.

B. Compound shall be approved for intended use by cable manufacturer and suitable for zinc-coated steel, aluminum, PVC, bituminized fiber, and fiberglass raceways.

C. Compound shall be Ideal Co., Polywater, Cable Grip, or preapproved equal.

PART 3 EXECUTION

3.01 GENERAL

A. Conductor storage, handling, and installation shall be in accordance with manufacturer's recommendations.

B. Conductor and cable sizing shown is based on copper conductors, unless otherwise noted.

C. Do not exceed cable manufacturer's recommendations for maximum pulling tensions and minimum bending radii. Where pulling compound is used, use only UL listed compound compatible with the cable outer jacket and with the raceway involved.

D. Tighten all screws and terminal bolts using torque type wrenches and/or drivers to tighten to the inch-pound requirements of the NEC and UL.

E. Where single conductors and cables in cable trays, and other indicated locations are not wrapped together by some other means such as arc and fireproofing tapes, bundle throughout their exposed length all conductors entering from each conduit with nylon, self-locking, releasable, cable ties placed at intervals not exceeding 18 inches on centers.

F. Provide cable lugs with correct number of holes, bolt size, and center-to-center spacing as required by equipment terminals.

3.02 CONDUCTOR COLOR CODING

A. Color coding of multiconductor control and instrumentation cable is specified in the individual cable type specification.

B. For 600 V conductors and below, provide all single power and control conductors and individual conductors of multiconductor power cables with integral insulation pigmentation of the designated colors. Provide colored conductors for No. 8 AWG and smaller conductors. Power conductors larger than No.6 AWG may be provided with color coding by wrapping the conductor at each end and at all accessible locations with vinyl tape. Where this method of color coding is used, wrap at least six full overlapping turns of tape around the conductor covering an area 1-1/2 to 2 inches wide at a visible location.

C. For conductors above 600 volts, provide color coding by wrapping the conductor at each end and at all accessible locations with vinyl tape. Wrap at least six full overlapping turns

of tape around the conductor covering an area 1-1/2 to 2 inches wide at a visible location.

D. Phase A, B, C implies the direction of positive phase rotation.

E. Use the following colors:

System	Conductor	Color
All Systems	Equipment Grounding	Green
480/277 Volts 3-Phase, 4-Wire	Grounded Neutral Phase A Phase B Phase C	White Brown Orange Yellow
208/120 Volts 3-Phase, 4-Wire	Grounded Neutral Phase A Phase B Phase C	White Black Red Blue
Control	Equipment Grounding Grounded Neutral AC Line Voltage DC DC Common	Green w/ Yellow Stripe White Black Blue White w/ Blue Stripe

3.03 CONDUCTOR IDENTIFICATION SYSTEM

A. Provide a complete power and control conductor identification system so that after installation, circuits can be easily traced from origin to final destination.

B. Identify power and control conductors at each termination and in all accessible locations such as panels, switchboards, pull boxes, terminal boxes, etc. For identification, use type of tags specified herein.

C. Tag bundled power conductors and control and instrument cables with the origin and destination indicated on the Drawings and Schedules.

D. If circuit names are specifically called out on the drawings, use these circuit names for tagging circuits. If no circuit name is provided for in the drawings, a circuit name shall be devised such that it easily identifies the equipment served or origin and final destination of circuit.

E. Change any circuit name that the Engineer finds unacceptable.

3.04 CONDUCTORS AND CABLES 600 VOLTS AND BELOW

A. Provide conductor sizes indicated on Drawings.

B. Arrange wiring in cabinets, panels, and motor control centers neatly cut to proper length, remove surplus wire, and bridle and secure in an acceptable manner. Identify all circuits entering motor control centers, other control cabinets, terminal junction boxes, etc., in accordance with the conductor identification system specified herein.

C. Terminate with methods consistent with terminals provided, and in accordance with terminal manufacturer's instructions.

D. For terminals designed to accept only bare wire compression terminations use only stranded wire, and terminate only one wire per terminal. Tighten all terminal screws with torque screwdriver to recommended torque values.

E. Attach compression lugs with a tool specifically designed for that purpose which provides a complete, controlled crimp where the tool will not release until the crimp is complete. Use of plier type crimpers is not acceptable.

F. Cap spare conductors and conductors not terminated with UL listed end caps.

G. Where conductors pass through holes or over edges in sheet metal, remove all burrs, chamfer all edges, and install bushings and protective strips of insulating material to protect the conductors.

H. Maintaining the integrity of shielding of instrumentation cables is essential to the operation of the control systems. Take special care in cable installation to ensure that grounds do not occur because of damage to the jacket over the shield.

3.05 SPLICES

A. Provide continuous circuits from origin to termination whenever possible.
   1. Obtain Engineer's approval prior to making any splices.

B. Lighting and receptacle circuit conductors may be spliced without prior approval from the Engineer.

C. Where splices are required and approved:
   1. Locate splices in readily accessible cabinets or boxes.
   2. Soldered mechanical joints insulated with tape are not acceptable.
   3. Wire nuts may be used on solid conductors of 120-volt and 208-volt lighting and 120-volt receptacle circuits only.
   4. Splices shall be compatible with the conductor materials and possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.
   5. Leave sufficient slack at junction boxes and termination boxes to make proper splices and connections. Do not pull splices into conduits.
   6. Place no more than one conductor in any single-barrel pressure connection. Use crimp connectors with tools by same manufacturer and/or UL listed for connectors of all stranded conductors.
   7. Compression type butt splices shall be installed with and insulated using a heat-shrink sleeve. In NEMA Type 4 or NEMA Type 4X areas, provide heat-shrink sleeves that are listed for submersible applications.
   8. Control and instrumentation cables and conductors shall only be spliced in readily accessible cabinets or junction boxes using terminal strips. Compression lugs, wire nuts, or other forms of splicing shall not be used on control and instrumentation wiring unless specifically indicated or approved by Engineer.
   9. Splices in below grade pull boxes, in any box subject to flooding, and in wet areas shall be made waterproof using a heat shrink insulating system listed for submersible applications or an epoxy resin splicing kit.

10. Vinyl plastic insulating tape for wire and cable splices shall be flame retardant, 7-mil thick minimum, rated for 90 degrees C minimum meeting the requirements of UL 510.

3.06 CONDUCTOR ARC AND FIREPROOFING TAPES

A. Use arc and fireproofing tapes on all 600-volt single conductors and cables except those rated Type TC in all cable trays, and other indicted locations.

B. Wrap together as a single cable all conductors entering from each conduit.

C. Follow tape manufacturer's installation instructions. Secure the arc and fireproofing tape at frequent intervals with bands of the specified glass cloth electrical tape. Make each band of at least two wraps of tape directly over each other.

3.07 FIELD TESTS

A. Perform tests as specified under section 16080.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16130 RACEWAYS

PART 1 GENERAL

1.01 SCOPE

A. This Section covers the work necessary to furnish and install, complete, electrical raceway systems.

1.02 GENERAL

A. See Division 16000, Electrical – General Provisions which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.03 SUBMITTALS

A. Make submittals in accordance with Division16000, Electrical – General Provisions.

PART 2 PRODUCTS

2.01 RIGID STEEL CONDUIT

A. Rigid steel conduit, including threads, bushings, couplings, elbows, nipples, and other fittings, galvanized by hot-dipping, and meeting the requirements of ANSI C80.1, ANSI C80.4, UL, and the NEC. Do not use setscrew type couplings, bushings, elbows, nipples, and other fittings.

2.02 RIGID ALUMINUM CONDUIT

A. Rigid copper-free (less than 0.1 percent copper) aluminum alloy conduit, including couplings, bushings, elbows, nipples, and other fittings, meeting the requirements of ANSI C80.5, Federal Specification WW-C-540, UL, and the NEC. Do not use setscrew type couplings, bushings, elbows, nipples, and other fittings.

2.03 PVC SCHEDULE 40 AND 80 CONDUIT

A. Rigid PVC Schedule 40 and 80 conduit, UL listed for concrete-encased, underground direct burial, concealed and direct sunlight exposed use, and UL listed and marked for use with conductors having 90 degrees C insulation. Use conduits, couplings, bushings, elbows, nipples, and other fittings meeting the requirements of NEMA TC 2 and TC 3, Federal Specification W-C-1094, UL, NEC, and ASTM specified tests for the intended use.

2.04 HDPE

A. HDPE conduit shall be smoothwall, approved/listed for directional boring, approved/listed for electrical system installations, and minimum Schedule 80 meeting ASTM D2447/F2160/NEMA TC-7 (latest editions).

2.05 FLEXIBLE METAL CONDUIT, LIQUID-TIGHT

A. Use UL listed liquid-tight flexible metal conduit consisting of galvanized steel flexible conduit with integrally-coiled copper ground and covered with an extruded PVC jacket.

2.06 FLEXIBLE CONDUIT, NONLIQUID-TIGHT

A. Use nonliquid-tight flexible steel conduit tubing meeting UL -Standard for Flexible Steel Conduit, UL 1, or any subsequent revisions.

2.07 FLEXIBLE METAL COUPLINGS, EP:

A. Use flexible metal couplings UL-listed for Class I, Division 1, Group D with a flexible neoprene protective coating. Manufacturer: Crouse-Hinds Type EC, or equal.

2.08 WIREWAYS

A. Provide hinged-cover indoor, steel-enclosed wireway and auxiliary gutter where indicated. Utilize wireways and fittings that are UL listed, have a cover that can easily be removed, and have a gray, baked enamel finish for indoor, dry locations. Provide NEMA 4X wireways and fittings for outdoor or damp, wet, or corrosive indoor areas.

2.09 RACEWAY FITTINGS

A. Fittings for Rigid Metal Conduit (Aluminum or Steel):
   1. Use insulated throat bushings of metal with integral plastic bushings rated for 105 degrees C. For insulated throat bushings for rigid conduit, use Thomas & Betts Nylon Insulated Metallic Bushings, O-Z Gedney Type B, or equal.
   2. Use Myers Scru-Tite hubs, or equal, for rigid conduit. For PVC coated rigid conduit, use PVC coated Bullet hubs by Thomas & Betts, or equal.
   3. Use conduit bodies for rigid conduit of metal and sized as required by the NEC (NFPA 70). Use Appleton Form 35 threaded Unilets; Crouse-Hinds Mark 9 or Form 7 threaded condulets; Killark Series O Electrolets; or equal, for normal conduit bodies for rigid conduit. Where conduit bodies for rigid conduit are required to be approved for hazardous (classified) locations, use conduit bodies manufactured by Appleton, Crouse-Hinds, or Killark.
   4. Use only couplings for rigid conduit supplied by the conduit manufacturer.
   5. Use Appleton, Crouse-Hinds, or Killark sealing fittings for rigid conduit. Where condensate may collect on top of a seal, provide a drain by using Appleton or Crouse-Hinds drain seals.

B. Fittings for Liquid-Tight Flexible Metal Conduit: Use insulated, metal throat connectors for liquid-tight flexible metal conduit, with an integral plastic bushing rated for 105 degrees C, and of the long design type extending outside of the box-or other device at least 2 inches. In outdoor or indoor damp, wet, or corrosive areas, use fittings with a 40-mil, factory-applied, bonded PVC coating. Use Thomas & Betts Super-Tite Nylon Insulated Connectors, or equal.

C. Fittings in Hazardous Areas: In hazardous areas, use only fittings approved for the atmosphere involved.

D. Use cable sealing fittings forming a watertight nonslip connection to pass cords and cables into conduit. Size cable sealing fitting for the conductor OD. For conductors with

OD's of 1/2 inch or less, provide a neoprene bushing where the conductor enters the connector. Use Crouse-Hinds, Appleton, or equal, cable sealing fittings.

E. Provide expansion/deflection couplings for use on embedded, underground, concrete encased conduits and direct burial conduits. The couplings shall alleviate longitudinal, angular, and shear conduit stress caused by ground differential settlement. Manufacturers: Crouse-Hinds Type XD, O-Z/Gedney Type DX, or equal.

2.10 CABLE TRAY

A. Provide cable tray meeting the requirements of NEMA VE 1.

B. Provide ladder type cable tray constructed of aluminum.

C. Provide cable tray of dimensions indicated on Drawings or to accommodate specified cables plus an additional volume of 20 percent.

D. Provide cable tray with the next higher NEMA class designation for the proposed support span length and working load adequate for the actual cable installed plus a 10 percent additional weight allowance for future cables plus a 250 pound concentrated static load applied between the side rails at midspan, all with a safety factor of 1.5.

E. Provide cable tray suitable for use as a grounding conductor in accordance with the NEC and UL.

F. Provide all elbows, risers, barrier strips, bonding jumpers, hangers, supports, cable clamps, box connectors, and other accessories as indicated or as required for a complete system.

PART 3 EXECUTION

3.01 GENERAL

A. Provide raceway systems meeting or exceeding the requirements of the NEC.

B. Where raceway sizes are not specified on Drawing or Schedules, size raceways per NEC requirements based on number of required conductors. Unless specifically required, circuits may be grouped together in common raceways except for different circuit types as specified within this Section. When multiple circuits are grouped in common raceways, original required circuit ampacity shall be maintained using NEC required derating factors and increasing conductor sizes as required.

3.02 PROTECTION DURING CONSTRUCTION

A. In addition to the requirements of the GENERAL CONDITIONS; Division 1, GENERAL REQUIREMENTS; and Section ELECTRICAL GENERAL PROVISIONS, prior to installation, store all products specified in this section in a dry location. Following installation, protect products from the effects of moisture, corrosion, and physical damage during construction. Keep openings in conduit capped with manufactured seals during construction.

3.03 MINIMUM RACEWAY SIZE

A. Use no circular raceway less than 3/4 inch except final connections to small devices with maximum 1/2-inch threaded hubs may be with 1/2-inch flexible conduit.

3.04 REQUIRED RACEWAY TYPE FOR LOCATION AND INSTALLATION METHOD

A. Interior, Exposed:
   1. Dry locations: Rigid aluminum or steel conduit
   2. Damp or Wet locations: Rigid aluminum conduit

B. Interior, Concealed (Not embedded in concrete):
   1. Rigid aluminum or steel conduit.
   2. PVC Schedule 40 (except for analog circuits).

C. Exterior, exposed: Rigid aluminum.

D. Aboveground, embedded in concrete walls, ceilings and floors: PVC Schedule 40.

E. Concrete encased raceways: PVC Schedule 40.

F. Under slabs on grade: PVC Schedule 40.

G. Direct earth burial: PVC Schedule 80.

H. Directional Boring under roads and parking lots: HDPE Schedule 80.

I. Corrosive areas: PVC Schedule 80.

J. Hazardous Gas Areas: Rigid Aluminum

K. Final Connection to Certain Equipment:
   1. In nonhazardous locations, make final connection to motors, wall or ceiling mounted fans and unit heaters, dry type transformers, valves, local instrumentation, and other equipment where flexible connection is required to minimize vibration or where required to facilitate removal or adjustment of equipment, with 18 inch minimum, 60 inch maximum lengths of liquid-tight, PVC-jacketed, flexible steel conduit where the required conduit size is 4 inches or less. For larger sizes, use nonflexible conduit as specified.
   2. The flexible conduit shall be long enough to allow the item to which it is connected, to be withdrawn or moved off its base. Use liquid-tight flexible metal conduit in outside areas, process areas exposed to moisture, and areas required to be oiltight and dust-tight.
   3. Flexible conduit used in dry areas for final connections to lighting fixtures may be nonliquid-tight, flexible steel conduit.
   4. Flexible connectors used in hazardous locations for final connections to equipment indicated above shall be liquid tight, flexible metal couplings UL-listed for Class I, Group D.

L. Special Conditions:
   1. Do not use aluminum conduit in direct contact with concrete. Support with non-metallic spacers or clamps.

3.05 GENERAL INSTALLATION REQUIREMENTS FOR CONDUCTOR TYPES IN RACEWAYS

A. Power wiring shall not be run in the same conduit as analog or digital control wiring, unless otherwise noted.

B. Digital control wiring shall not be run in the same conduit as power or analog control wiring, unless otherwise noted.

C. Analog control wiring shall not be run in the same conduit as power or digital control wiring.

D. Load side power cables shall not be run in the same conduit as line side power cables for any piece of equipment or device.

3.06 GENERAL INSTALLATION REQUIREMENTS FOR RACEWAYS

A. Location, Routing, and Grouping:
   1. Conceal or expose raceways as indicated. Group raceways in same area together. Locate raceways at least 12 inches away from parallel runs of heated piping for other utility systems.
   2. Run exposed raceways parallel or perpendicular to walls, structural members, or intersections of vertical planes to provide a neat appearance. Follow surface contours as much as possible.
   3. Avoid obstruction of passageways. Run concealed raceways with a minimum of bends in the shortest practical distance considering the building construction and other systems.
   4. In block walls, do not run raceways in the same horizontal course with reinforcing steel.
   5. Paint all threads of steel conduits that are installed in exposed or damp locations with zinc-rich paint or liquid galvanizing compound before assembling. Touch up after assembly to cover nicks or scars.
   6. Do not notch or penetrate structural members for passage of raceways except with prior approval of the Engineer.
   7. Do not run raceways in equipment foundation pads.

B. Special Conduit Seal Requirements: Seal up the inside of all electrical conduits that terminate in electrical and control cabinets (MCC's, switchboards, boxes, control panels, etc.) and rooms. Seal the conduits at the "room or equipment end" and seal empty conduits (spares) as well as used conduits (filled with conductors). Install sealing compound inside the conduit and around each conductor to form a dust-tight and fire-stop barrier; install sealing compound in accordance with the manufacturer's recommendations. Seal the conduits only after conduit fill and circuit testing requirements have been met in this Contract. The Contractor shall notify the Engineer in writing five (5) days in advance of the time and location that conduit sealing will take place.

C. Support:
   1. Support raceways at intervals not exceeding NEC requirements unless otherwise indicated. Support multiple raceways adjacent to each other by ceiling trapeze. Support individual raceways by wall brackets, straphangers, or ceiling trapeze.

2. Support all raceways from structural members only. Do not support from pipe hangers or rods, cable tray, or other conduit.
3. Do not use nails anywhere or wooden plugs inserted in concrete or masonry as a base for raceway or box fastenings. Do not weld raceways or pipe straps to steel structures. Do not use wire in lieu of straps or hangers.
4. Use nonmetallic, corrosion resistant conduit supports for all conduits installed in damp, wet, or corrosive areas. Use CLIC as manufactured by Litchfield International, Inc., or equal.
5. Where aluminum conduits come into contact with dissimilar metals, wrap the conduit with overlapping layers of PVC electrical tape.

D. Bends:
1. Make changes in direction of runs with symmetrical bends or cast metal fittings. Make bends and offsets of the longest practical radius. Avoid field-made bends and offsets where possible, but where necessary, make with an acceptable hickey or conduit bending machine. Do not heat metal raceways to facilitate bending.
2. Make bends in parallel or banked runs of raceways from the same center or centerline so that bends are parallel and of neat appearance. Factory elbows may be used in parallel or banked raceways if there is a change in the plane of the run and the raceways are of the same size. Otherwise, make field bends in parallel runs.
3. For PVC conduits, use factory made elbows for all bends 30 degrees or larger. Use PVC-coated rigid steel elbows on all 90-degree bends in PVC conduits. Use acceptable heating methods for forming smaller bends.
4. Make no bends in flexible conduit that exceed allowable bending radius of the cable to be installed or that significantly restricts the conduits flexibility.

E. Bushing and Insulating Sleeves:
1. Where metallic conduit enters metal equipment enclosures through conduit openings, install a bonding bushing on the end of each conduit. Install a bonding jumper from the bushing to any equipment ground bus or ground pad.
2. If neither exists, connect the jumper to a lag-bolt connection to the metallic enclosure.
3. Use manufacturer's standard insulating sleeves in all metallic conduits terminating at an enclosure.

F. Expansion Joints: Provide suitable expansion fittings for raceways crossing expansion joints in structures or concrete slabs, and at 150-foot maximum intervals in all conduit runs exceeding 150 feet in length, or provide other means approved by the Engineer to compensate for expansion and contraction. Provide for the high rate of thermal expansion and contraction of PVC and aluminum conduit by providing expansion joints as recommended by the manufacturer and as required.

G. Expansion/Deflection Couplings:
1. Provide expansion/deflection couplings in concrete encased conduits. Also provide expansion/deflection couplings in all underground, direct burial conduits at these locations:
   a. Where the conduit leaves a fixed structure.

b. After a 2-foot section of conduit connected to the coupling at the point where the conduit leaves the fixed structure.
c. At one location midway between structures when the underground, direct burial conduit is routed between fixed structures more than 15 feet apart.

2. Where the conduit leaves a fixed structure, the coupling shall be within 6 inches of the structure. "Leaving a fixed structure" is defined to be the point where the conduit:
   a. Penetrates through a concrete wall from inside a structure to direct earth burial outside the structure;
   b. Is mounted to/and routed exposed down the side of fixed structure underground and away from the structure in direct earth burial: or
   c. Is on top of an underground, fixed structure (e.g., gallery roof, etc.) and is routed away from the top of the structure in direct earth burial.

H. PVC Conduit: Solvent weld PVC conduit joints with solvent recommended by the conduit manufacturer. Follow manufacturer's solvent welding instructions and provide watertight joints. Use acceptable PVC terminal adapters when joining PVC conduit to metallic fittings. Use acceptable PVC female adapters when joining PVC conduit to rigid metal conduit. Where belled conduits are used, bevel the unbelled end of the joint before joining.

I. Penetrations:
   1. Seal the interior of all raceways entering structures at the first box or outlet with oakum or suitable plastic expandable compound to prevent the entrance into the structure of gases, liquids, or rodents.
   2. Dry pack with nonshrink grout around raceways that penetrate concrete walls, floors, or ceilings aboveground. See Standard Details for additional requirements for conduits installed in wall sleeves.
   3. Where an underground raceway without concrete encasement enters a structure through a nonwaterproofed wall or floor, install as detailed in the Standard Details for wall sleeves. A watertight entrance sealing device as specified may be used in lieu of the sleeve.
   4. Where raceways penetrate fire-rated walls, floors, or ceilings, fire stop openings around electrical penetrations to maintain the fire-resistance rating.

J. Direct Earth Burial
   1. Conduit Zone Backfill Installation (Compacted Select Backfill):
      a. Backfill material for the conduit zone of direct burial conduit trenches may be selected from the excavated material if it is free from roots, foreign material, and oversized particles. Use material with 3/4 inch maximum particle size and suitable gradation for satisfactory compaction. Remove material if necessary to meet these requirements.
      b. Imported 3/4 inch gravel or sand may be used in lieu of material from the excavation.
      c. After conduits have been properly installed, backfill the trench with specified material placed around the conduits and carefully tamped around and over them with hand tampers. Final, tamped conduit cover shall be 4 inches minimum.
   2. Backfill Installation Above Conduit Zone (Compacted Trench Backfill):

a. Backfill material above the conduit zone may be selected from the excavated material, if it contains no particles larger than 3 inches in diameter and is free from roots or debris.
b. Imported material meeting these same requirements may be used in lieu of material from the excavation.
c. Compact backfill in maximum 12-inch layers to at least 95 percent of the maximum density.

K. Directional Boring
1. Water-jetting is not permitted.
2. Pre-installed cable-in-conduit is not permitted.
3. Drilling fluids used for directional boring methods shall be approved by federal, state, and local codes.
4. The conduit(s) shall be installed immediately after the conduit hole is completed.
5. Butt and electrofusion joining means are the only joining methods approved for HDPE conduit installations and shall be accomplished by persons certified in the process and in accordance with the manufacturer's procedures.
6. Transition from HDPE to PVC shall be made using only electrofusion coupling means with approved and listed materials. Coupling means shall be accomplished by persons certified on the equipment and process.

3.07 WIREWAYS

A. Mount wireways securely in accordance with the NEC and manufacturer's instructions. Locate removable cover or hinged cover on accessible vertical face of wireway unless otherwise indicated.

3.08 CABLE TRAYS

A. Install cable trays in strict accordance with the recommendations contained in the Application Information Section of NEMA VE 1.

B. Assemble cable trays so that joints are not made at support brackets. Install trays so as to be level, straight, and true to line or grade within +1/8 inch in 10 feet and within an accumulative maximum of 1/2 inch. Make vertical structures plumb within a tolerance of 1/8 inch.

C. Install cable trays to leave no exposed raw edges.

D. Support all control cables, either single or multiple conductor with suitable clamps or straps.

E. Gather all wires and cables in the trays together in bundles, if a combination of two or more multiple-conductor cables and/or single conductors are in the run. Determine the grouping and number of wires in each bundle in the field, mainly with consideration to physical locations of the routing and destination of their wires.

F. Use nylon cable ties for bundling with a spacing between tie points of approximately 8 feet.

G. Do all bundling and clamping before the end terminations are connected.

H. As far as practicable, lay the wire parallel and straight in the tray. Separate discrete and analog cables in the same cable tray with barriers.

I. Securely fasten all wires, cables, and bundles to the tray with nylon cable straps, or other specified means, to maintain their relative positions in the trays.

3.09 PREPARATION FOR PULLING IN CONDUCTORS

A. Do not install crushed or deformed raceways. Avoid traps in raceways where possible. Take care to prevent the lodging of plaster, concrete, dirt, or trash in raceways, boxes, fittings, and equipment during the course of construction. Make raceways entirely free of obstructions or replace them. Ream all raceways, remove burrs, and clean raceway interior before introducing conductors or pull wires.

B. Immediately after installation, plug or cap all raceway ends with watertight and dust-tight seals until the time for pulling in conductors.

C. For concrete-encased raceways, after the concrete envelope has set, pull a mandrel of a diameter approximately 1/4 inch less than the raceway inside diameter, through each raceway. Then pull a bristle brush through each raceway to remove debris.

3.10 EMPTY RACEWAYS

A. Certain raceways may have no conductors pulled in as part of this Contract. Identify with tags at each end and at any intermediate pull point the origin and destination of each such empty raceway. Provide a removable permanent cap over each end of each empty raceway. Provide a nylon pull cord in each empty raceway.

3.11 PAINTING

A. Paint raceway systems as specified in other Divisions. The following raceway systems do not require painting, unless otherwise required:
   1. Aluminum raceways installed outside.
   2. Concealed, underground, embedded or encased raceways. PVC coated or jacketed raceways.
   3. Cable trays.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16460 INSTRUMENTATION AND CONTROLS

PART 1 GENERAL

1.01 DESCRIPTION

A. Scope:
   1. CONTRACTOR shall provide all labor, materials, equipment and incidentals as shown, specified and required to furnish, install, calibrate, test, adjust and place into satisfactory operation all primary sensors, field instruments, and controls shown and specified herein.
   2. Contract Documents illustrate and specify functional and general construction requirements of the field instruments and controls and do not necessarily show or specify all components, wiring, electrical conduit, piping and accessories required to make a completely integrated system. CONTRACTOR shall provide all components, piping, wiring, electrical conduit, accessories and labor required for a complete, workable, and integrated system.
   3. CONTRACTOR shall be responsible for installing in-line flow elements (magnetic flow meter flow tubes, insert flow tubes) and for providing taps in the process piping systems for installation of other flow, pressure, and temperature sensing instrumentation.

B. Coordination: Coordinate with other suppliers for installation of all items specified herein and required to ensure the complete and proper interfacing of all components and systems.

1.02 QUALITY ASSURANCE

A. Comply with the requirements of Section 16000 Electrical General Provisions.

B. Acceptable Manufacturers:
   1. Furnish primary sensors and field instruments by the named manufacturers or equal equipment by other manufacturers.
   2. The named manufacturers have been specified to establish the standard of quality and performance of the equipment to be supplied.
   3. Obtain all sensors and field instruments of a given type from the same manufacturer.
   4. The primary sensors and field devices shall be interchangeable with similar function existing primary sensors and field devices to minimize spare parts inventory.

C. Manufacturers' Responsibilities and Services:
   1. Design and manufacture the primary sensors and field instruments in accordance with the applicable general design requirements specified in Section 16000 Electrical General Provisions and the detailed Specifications herein.
   2. Field supervision, inspection, start-up and training in accordance with the requirements of Section 16000 Electrical General Provisions and the detailed Specifications herein.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Comply with the requirements specified in Section 16000 Electrical General Provisions.

B. Primary sensors and field instruments shall not be delivered to the Site until all product information and system Shop Drawings for the sensors and instruments have been approved by the ENGINEER and OWNER.

C. The CONTRACTOR shall be responsible for coordinating the installation schedule with the Installation Contractor. Each shipment shall contain a listing of protective measures required to maintain sensor operation, including a listing of any common construction or cleaning chemicals that may affect instrument operation.

1.04 SPARE PARTS

A. Spare parts shall be provided as specified.

1.05 SUBMITTALS

A. Comply with the requirements specified in Section 16000 Electrical General Provisions.

1.06 IDENTIFICATION TAGS

A. Performance Requirements:
   1. Tag numbers of sensors and field instruments shall be as shown and as specified. For items not shown or specifically tagged, the item tag number shall be established by the System Supplier. All instruments, whether field or panel mounted, shall have an identification tag.
   2. Information to be permanently engraved onto the tag shall include the identifying tag number, manufacturer, model number, service, and range.
   3. The tags shall be fastened to the device with self-tapping stainless steel screws. Where fastening with screws cannot be accomplished the tags shall be permanently attached to the device by a circlet of stranded stainless steel wire rope and clamp.
   4. All sensors and field instruments mounted on or within control panels and enclosures shall have the identification tag installed so that the engravings are easily visible to service personnel.

B. Construction Features:
   1. Tags shall be engraved with 3/16-inch letters and constructed as follows.
      a. 3/32-inch thick laminated phenolic for engraving composed of core, laminated on both sides with a matte (non-glare) finish cover sheet.
      b. Core to be black; cover sheet to be white. c. Mounting holes to be centered on width and 1/4-inch from each end.

PART 2 PRODUCTS

2.01 GENERAL

A. Enclosures

1. In general and unless otherwise noted, enclosures for controls and instrumentation shall be suitable for the environment in which they are installed as identified in Section 16000 and as shown on the drawings.
2. NEMA 4X rated equipment shall be fiberglass reinforced plastic (FRP) or stainless steel or aluminum as appropriate and as noted for the environment. Equip NEMA 4X enclosures with breathers/drains.
3. All gasketing shall be permanently adhered, closed-cell neoprene.
4. All screws, bolts, washers, nuts and other items used for exposed raceway support systems and boxes shall be Type 316 stainless steel in outdoor and normally damp, wet or corrosive locations.

B. Hazardous Areas
1. In general and unless otherwise noted, hazardous areas, as identified within these Specifications and as shown on the drawings, shall contain devices, materials, and equipment suitable for the environment noted.
2. Provide devices, materials, and equipment that are specifically approved for installation in hazardous areas of the Class, Division, and Group indicated, and are of construction that will ensure safe performance under conditions of proper use and maintenance.
3. Provide devices, materials, and equipment meeting the requirements of the NEC, applicable state and local codes, and the authority enforcing these codes.

2.02 LEVEL SWITCH - FLOAT TYPE

A. General: The device shall be capable of detecting fluid level and initiating a signal.

B. Type: Direct acting float.

C. Required Features:
1. Sealed SPDT control switch (non-mercury).
2. Actuation by steel ball.
3. High impact, corrosion resistant, polypropylene float material.
4. Heavy duty, flexible 18 gauge, three connector, neoprene-jacketed cable with waterproof connection. Provide cable length, as required.
5. Not sensitive to rotation.
6. Operating Temperature: Up to 140 degrees F.
7. Provide weighted stainless steel cable or mounting bracket to suit installation.
8. Product and Manufacturer:
   a. Warrick.
   b. Flygt.
   c. Or equal.

2.03 FLOW - MAGNETIC FLOWTUBE AND TRANSMITTER

A. General:
1. Provide sludge flow meter as shown on the drawings and meeting the specifications below.

B. Process Requirements:
   1. Size: 3 inch, unless otherwise shown
   2. Range:
      a. Full Sensing Range: 0 – 50 GPM
      b. Typical Flow Range: 24 GPM

C. Functions:
   1. Flowtube: Produce low level, high impedance pulsed DC signal proportional to the rate of fluid flow using the principle of electromagnetic induction.
   2. Pulsed DC Magnetic Flow Transmitter: Drive the flowtube coils with pulsed DC power and convert the flowtube output signal into a DC current output linear to the flow rate.

D. System (Flowtube and Transmitter) Performance Requirements:
   1. System Accuracy (with Analog Output): ±0.5 percent of flow rate or better over range from 1 fps to 31 fps.
   2. System Repeatability: ±0.15 percent of flow rate or ±.0015 fps, whichever is greater.
   3. Drift: Complete zero stability.
   4. Fluid Property Effects: Accuracy unaffected by changes in fluid velocity, density, pressure, temperature or conductivity (above minimum conductivity limits).
   5. Transmitter Outputs:
      a. 4 to 20 mADC, direct acting and isolated, into 0 to 1000 ohms.
      b. High accuracy, field adjustable scaled pulse output (0.1 to 10 Hz or greater) to drive local totalizer and provide scaled pulse output to Process Control System.
   6. Power Consumption: Not to exceed 50 watts for flowtube and transmitter combined.
   7. Operating Temperature: Suitable for operation with process fluid temperature from 0 degrees F to 140 degrees F.
   8. Pressure Rating: Greater than or equal to test pressure specified in Section (--1--), Piping Systems, for appropriate piping system.
   9. Environmental: Suitable for Class 1, Division 1 environments.

E. Construction and Required Features:
   1. Flowtube:
      a. Type: Lined metal flowtubes.
      b. Interchangeability: Ratio of flow velocity to voltage reference signals generated identical for all meter sizes to permit interchangeability with transmitter without requiring circuit modifications.
      c. System accuracy in Paragraph 2.13.B.1. shall be proven by submittal of flow test curves of the actual meters being furnished.
      d. Test curves shall show a minimum of ten equally spaced flow points. Tests shall be performed using water and a weight or volume tank. A "Master Meter" used, as a reference standard is not acceptable. The test setup shall be submitted and approved prior to testing.
      e. Tube Material:
         1) Meter tubes 12-inch and smaller: Type 304 stainless steel.

2) Metering tubes 14-inch and larger: Type 304 stainless steel, .125-inch wall thickness.

f. Electrodes:
   1) Concentric, conical or elliptical shaped.
   2) Material: Type 316 stainless steel or Hastelloy C based on fluid.

g. Lining: PFTE. h. Enclosure:
   1) Materials and Rating: Cast low-copper aluminum alloy or fabricated sheet steel, NEMA 6 rated and capable of withstanding accidental submergence in 30 feet of water for 48 hours.
   2) Finish: Finish exterior, except for flange faces, with a high build epoxy paint.

h. End Connections: ANSI Class 150 suitable for mating with pipe specified.

i. Electrical Connections: 3/4-inch NPT tapped holes for power conduit fitting and signal conduit fittings.

2. Pulsed DC Magnetic Flow Transmitter:
   a. Solid state construction.
   b. Pulse and analog outputs galvanically isolated from input and earth ground.
   c. Automatic zeroing feature making it unnecessary to zero the instrument before or after placing it in operation.
   d. Precalibrated span adjustment providing continuous span adjustment over entire range.
   e. Range adjustment: Direct reading thumbwheel switches or calibrated potentiometer, continuously adjustable for full-scale settings from 1 to 31 feet per second.
   f. Signal Conditioning: Adjustable damping circuit with response times of 1 to 25 seconds minimum.
   g. Low Flow Cutoff: Provide automatic low flow cutoff circuitry to stop pulse output and local totalization when flow drops below 0.5 percent ±0.2 percent of the calibrated upper range valve.
   h. Enclosure:
      1) Die cast, low-copper aluminum alloy, suitable for Class 1, Division 1 environments.
      2) Finish: Epoxy coating.
   i. Mounting:
      1) All transmitter and driver electronics shall be remotely mounted from the flow tubes at locations shown on the Drawings.
      2) Provide complete Type 316 stainless steel mounting hardware.
      3) Type of mounting (wall, support frame or pipe stand), as required.
   j. Local Indication:
      1) 3-1/2 digit minimum LCD meter with field selectable engineering units; with linear 0 to 100 percent scale for flow rate indication. The engineering units shall be as specified in the Instrument List.
      2) 8 digit electronic LCD totalizer with reset and lithium battery backup. Count scaling shall be as specified in the Instrument List. Totalizer shall be integral with transmitter and visible through viewing window, or shall be externally

mounted in a separate NEMA 4X enclosure or condulet with viewing window and installed adjacent to the transmitter.

k. Power Requirements: Designed for operation on 120 VAC ± ten percent, 60 Hz, ±3 Hz power supply.

3. Accessories:
   a. Shielded cable assemblies of sufficient length for connection between flowtube and transmitter electronics.
   b. Type 316 stainless steel grounding rings for flowtubes.
   c. Type 316 stainless steel grounding straps.
   d. Provide spool piece for replacement of each different size flow tube where no bypass piping is provided.
   e. Provide one calibrator suitable to calibrate all pulsed DC magnetic flow transmitters provided.

F. Product and Manufacturer:
   1. Endress and Hauser
   2. Khrone
   3. Emerson
   4. Or equal

2.04 HEAT TRACE CONTROLLER

A. Provide controller for heat trace application as specified and shown on drawings. Controller shall be coordinated with heat trace device specified under the equipment sections. Contractor shall provide all required accessories and ancillary devices to ensure a complete and operational heat trace system.

B. Controller shall be a dual channel heat–trace control with a dual–point microprocessor–based heat–trace control thermostat.

C. A single universal power supply from 100 V ac to 277 V ac shall provide power to the controller and the heaters. Controller shall be able to independently or jointly control two resistive loads up to 30 amps each.

D. Controller shall have independent, adjustable temperature setpoints.

E. Controller shall include two 100K ohm thermistor temperature sensors inputs. Thermistor sensors shall be provided with controller and include 20 ft. jacketed cables. Channels shall be able to operate independently or from one sensor.

F. The controller shall monitor temperature, load current, and ground leakage current. Alarms include high temperature, low temperature, high load current, low load current, ground fault, sensor fault, internal fault, and power fail.

G. Controller shall include integral GFEP for each channel. Controller shall perform a self–test of the GFEP circuits when power is first applied, along with a load ground fault test, and this repeats periodically thereafter at an adjustable interval.

H. Controller shall be UL Listed.

I. Controller shall be in a NEMA 4/4X housing suitable for wall mounting. Enclosure shall contain terminals for all field wiring connections.

J. Controller shall contain user interface to show status, alarms, and allow set point adjustment and configuration.

K. Controller shall be Tracon GPT-230 or equal.

2.05 TERMINAL BLOCKS 0 TO 600 VOLTS

A. Provide 600-volt terminal blocks for termination of all control circuits entering or leaving equipment, panels, or boxes. Provide screw clamp compression, dead front barrier type terminal blocks with current bar providing direct contact with wire between the compression screw and yoke. Provide yoke, current bar, and clamping screw constructed of high strength and high conductivity metal. Utilize yoke that guides all strands of wire into the terminal. Utilize current bar providing dependable vibration-proof connection. Supply terminals constructed to allow connection of wire without any special preparation other than stripping. Rail mount individual terminals to create a complete assembly and provide terminals constructed such that jumpers can be installed with no loss of space on terminal or rail.

B. Size all terminal block components to allow insertion of all necessary wire sizes and types. Supply terminal blocks with marking system allowing the use of preprinted or field-marked tags. Supply CSA certified and UL approved terminal blocks manufactured by Phoenix Contact, Weidmuller, Ideal, Electrovert, or equal.

2.06 CONTROL RELAYS

A. Provide magnetic control relays, NEMA Class A600 (600 volts) 10 amps continuous, 7,200VA make, 720VA break, industrial control type with field convertible contacts, and meeting the requirements of NEMA ICS 2. Provide Cutler-Hammer, Square D, IDEC or equal.

B. Where latching (mechanically held) relays or motor thermal detector relays are specified, provide magnetic control relays with mechanical latch attachment with unlatching coil and coil clearing contacts. Utilize an attachment allowing easy manual latching and unlatching.

2.07 TIME DELAY RELAY

A. Furnish and install time delay relays where indicated on drawings.

B. Relay shall be of the industrial type, rated 150 volts, 5 amps continuous, 3600 VA make, 360 VA break.

C. Relay shall be solid-state electronic, with a field convertible ON/OFF delay.

D. Relay shall include, as a minimum, one normally open and one normally closed contact.

E. Repeat accuracy shall be plus or minus 2 percent.

F. Timer shall be adjustable from 1 to 60 seconds, unless otherwise indicated on drawings.

G. Time delay relay shall be of the following manufacturers and products:
   1. Square D Co.; Type F.
   2. Cutler-Hammer
   3. General Electric Co.
   4. Or equal

2.08 SINGLE PULSE TIMERS

A. Furnish and install single shot pulse timers where indicated on drawings or schedules.

B. Timer shall be single shot timer with individually adjustable ON delay and PULSE times.

C. Timer shall have selectable ranges from 5 to 50 seconds/minutes/hours.

D. Timer shall be capable of being powered from 120 VAC, 60 Hz with maximum inrush of 1.5 amps and power requirement of 1.2 watts. Timer shall reset on power interruption.

E. Timer shall contain DPDT Form C relay outputs rated 10 A at 240 VAC. Relay contacts shall be suitable for 100,000 operations at rated amps.

F. Manufacturers and Products: Automatic Timing or equal.

2.09 ALTERNATING RELAYS

A. Provide alternating relays to alternate pump or motor operation where indicated or specified.

B. Alternating relay shall be of the proper voltage and load rating suitable for the application.

C. Alternating relay shall contain inputs for each controlled motor which indicate to the relay that the controlled motor is in an AUTO or ENABLED state.

D. Alternating relay shall contain inputs for five (5) input float channels.

E. Alternating relay shall contain outputs for each controlled motor to allow motor to operate. Relay shall automatically alternate active output to allow alternation of motors.

F. Alternating relays to only alternate motors that are in an AUTO or ENABLED state.

G. Manfacturer: Lifflefuse ISS-105 or equal

2.10 MAGNETIC CONTACTORS

A. Provide contactors of the NEMA sizes indicated. Mount contactors in NEMA 12, dust-tight, drip-tight, industrial use enclosures unless otherwise indicated. Utilize contactors manufactured and rated in accordance with NEMA ICS 2.

2.11 PUSHBUTTONS, INDICATING LIGHTS, AND SELECTOR SWITCHES

A. For nonhazardous, indoor, dry locations, including motor control centers, control panels, and individual stations, provide heavy-duty, oiltight type pushbuttons, indicating lights, selector switches, and stations for these devices. Utilize Square D, Allen Bradley or equal.

B. For nonhazardous, outdoor, or normally wet locations, or where otherwise indicated, provide heavy-duty corrosion resistant, watertight type pushbuttons, indicating lights, or selector switches mounted in NEMA 4X watertight enclosures. Provide special gasketing required to make complete station watertight. Utilize Square D, Allen Bradley or equal.

C. Provide devices meeting the requirements of NEMA ICS 2, and having individual, extra large nameplates indicating their specific function. Provide pushbutton stations with laminated plastic nameplates indicating the drive they control, the handswitch tag number, and its function (i.e., EMERGENCY STOP, JOG, etc.). Provide contacts with NEMA designation rating A600. Install provisions for locking pushbuttons and selector switches in the OFF position wherever lockout provisions are indicated.

D. Utilize selector switches having standard operating levers. Make all indicating lights full-voltage (120 VAC) type. Provide ON or START pushbuttons colored green. Provide OFF or STOP pushbuttons colored red.

E. For hazardous locations indicated in these Specifications and on the Drawings, provide UL-listed, heavy-duty, pushbuttons, indicating lights, and selector switches mounted in factory-sealed enclosures complying with NEC Class I. Provide boots and any special gasketing required to make complete station waterproof. Provide enclosures of copper-free aluminum or cast metal with epoxy powder finish. Manufacturers: Crouse-Hinds, Killark, or equal.

2.12 RUN TIME METERS

A. Provide run time meters where indicated or specified.

B. Run time meters shall be of the electromechanical type.

C. Meter shall increment time when energized and be of the proper voltage for the application.

D. Meter shall increment every 1/10 of an hour and contain six digits, minimum.

E. Meter shall automatically roll over after reaching the maximum value.

F. Meter shall be UL listed or recognized.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install each item in accordance with manufacturer's recommendations and in accordance with the Contract Documents. Transmitters and instruments, which require access for periodic calibration or maintenance, shall be mounted so they are accessible while standing on the floor. Care shall be taken in the installation to ensure sufficient

space is provided between instruments and other equipment or piping to allow for easy removal and servicing.

B. All field instruments shall be rigidly secured to walls, stands or brackets as required by the manufacturer and as shown. All items shall be mounted and anchored using stainless steel hardware, unless otherwise noted.

C. Conform to all applicable provisions of the NEMA standards, NEC and local, State and Federal codes when installing the equipment and interconnecting wiring.

3.02 STANDARD DETAILS

A. As shown on drawings.

3.03 START-UP, CALIBRATION, TESTING, AND TRAINING

A. Comply with the requirements of Section 16000 Electrical General Provisions and the following.

B. Calibration
   1. After installation, calibrate and adjust all instruments, devices, valves, and systems, in conformance with the component manufacturer's instructions and as specified in these Contract Documents.
      a. Components having adjustable features are to be set carefully for the specific conditions and applications of this installation. Test and verify that components and/or systems are within the specified limits of accuracy.
      b. Replace either individually or within a system, defective elements that cannot achieve proper calibration or accuracy.
      c. Calibration points:
         1) Calibrate each analog instrument at 0 percent, 25 percent, 50 percent, 75 percent, and 100 percent of span,
      d. Field verify calibration of instruments that have been factory-calibrated to determine whether any of the calibrations are in need of adjustment.
      e. Analyzer calibration:
         1) Calibrate and test each analyzer system as a workable system after installation. Follow the testing procedures directed by the manufacturers' technical representatives.
      f. Provide completed instrument calibration sheets for each field instrument and analyzer.

C. Testing
   1. General
      a. Instruments and controls shall be tested on site following completion of installation and calibration.
      b. In addition to testing specified herein, perform any additional tests required by Manufacturers instructions.

END OF SECTION

DIVISION 16 - ELECTRICAL

SECTION 16511 LIGHTING

PART 1 GENERAL

1.01 SCOPE

A. This Section covers the work necessary to furnish and install, complete, the materials specified hereinafter.

1.02 GENERAL

A. See Division 16000, Electrical General Provisions which contains information and requirements that apply to the work specified herein and are mandatory for this project.

1.03 SUBMITTALS

A. Make submittals in accordance with Division 16000, Electrical General Provisions.

PART 2 PRODUCTS

2.01 LUMINAIRES

A. Specific requirements relative to this section are located in Luminaire Schedule on Drawings.

B. Luminaries shall be feed-through type or require separate junction box.

C. Wire leads shall be a minimum of 18 AWG.

D. Component access shall be accessible and replaceable without removing luminaire from ceiling.

E. Exterior installation luminaries shall be U.L listed as suitable for wet locations. Ballasts shall be removable and pre-wired. When factory installed photocells are provided, entire assembly shall have U.L. label.

F. Emergency lighting shall contain integral power pack consisting of 120/277-volt dual voltage transformer, inverter/charger, sealed nickel cadmium battery, and indicator switch in accordance with UL 924. Emergency lighting fixtures shall contain lighted, push-to-test indicated. Fixture shall be capable of providing full illumination for 1-1/2 hours in emergency mode and shall automatically be fully recharged in 24 hours upon resumption of normal line voltage. Luminaire shall be capable of protecting against excess charging and discharging.

G. Hazardous area fixtures shall be U.L. labeled for Class 1, Division 1 or 2 as identified in schedule.

2.02 LAMPS

A. LED lamps shall be energy efficient, with nominal wattage, lumen output, and color (CCT) as indicated on schedule.

B. Fluorescent lamps shall be of the energy efficient type and cool white color.

C. High Intensity Discharge lamps shall be of the high pressure sodium and metal halide type and clear.

D. Incandescent lamps shall be of the energy efficient type and frosted.

E. Tungsten Halogen lamps shall be of the energy efficient type and clear.

F. Manufacturers: General Electric Co., Osram Sylvania, Phillips Lighting Company, or equal.

2.03 LIGHTING CONTROL

A. Lighting controls shall be compatible with the lamps, ballasts, and other loads being controlled.

B. Time Switch
   1. Provide where indicated on drawings, plain 24-hour dial time switch. Switch shall contain bypass circuit which shall be pre-wired, externally operated ON/AUTO/OFF, for each circuit shown.
   2. Contact ratings and configuration for circuit shall be as required.
   3. Enclosure shall be NEMA Type 1.
   4. Switch shall contain reserve power of the spring driven type, capable of operating time switch for 16 hours after power failure.
   5. Manufactures: Tork, Paragon Electric Company, or equal.

C. Photocell
   1. Provide automatic ON/OFF switching photo control where indicated on drawings.
   2. Photocell housing shall be self-contained, die-cast aluminum, unaffected by moisture. Photocell shall turn ON at dusk and OFF at dawn with integral time delay feature to prevent false switching. Photocell shall be field adjustable to control operating levels.
   3. Manufactures:
      a. Tork
      b. Paragon Electric Company
      c. Or Equal

D. Occupancy Sensors
   1. Passive Infrared
      a. Provide passive infrared wall switch sensor where indicated capable of detection of motion at desk top level up to 300 square feet and gross motion up to 1,000 square feet.
      b. Sensors shall accommodate loads from 0 to 800 watts at 120 volts, 0 to 1200 watts at 277 volts and shall have 180 degree coverage capability.

c. Bi-level wall switch sensors shall accommodate up to two loads from 0 to 800 watts at 120 volts, 0 to 1200 watts at 277 volts for each load.
d. Sensors shall have a multiple segmented lens, in a multiple-tier configuration, with grooves-in to eliminate dust and residue build up.

2. Dual Technology Units
   a. Provide sensors utilizing both passive infrared and ultrasonic technologies where indicated.
   b. Sensors shall be ceiling mounted for 360 degree coverage. Sensor shall be easily programmed to accommodate different environmental and architectural conditions.
   c. Sensor shall detect up to 2,000 square feet with no blind spots.
   d. No audio dual technology units shall be accepted.
3. Circuit Control Hardware
   a. Control units shall be able to mount through a 1/2 inch knock-out in a standard electrical enclosure and be an integrated, self-contained unit consisting internally of an isolated load switching control relay and a transformer to provide low-voltage power. Transformer shall provide power to a minimum of two sensors. Relay contacts shall be rated 13 amps for 120 VAC tungsten and 20 amps for 120 VAC ballast.
4. Control wiring between sensors and control units shall be Class II, 14-AWG, stranded, UL Classified, PVC insulated or Teflon jacketed cable approved for use in plenums, where applicable.
5. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to cycling of air conditioner or heating fans.
6. Sensors shall have readily accessible, user adjustable controls for time delay and sensitivity.
7. In event of failure, bypass manual override ON switch shall be provide on each sensor. When bypass is utilized, lighting shall remain on constantly or control shall divert to a wall switch until sensor is replaced. This control shall be recessed to prevent tampering.
8. Units shall have extra Form C contact for interface with building system. Units shall be designed to be mountable in standard electrical box. Units shall be capable of being ordered with integral power pack.
9. Manufacturers:
   a. Unenco, Inc.
   b. The Watt Stopper, Inc.
   c. Or Equal.

2.04 POLES

A. Poles shall be of extruded aluminum and shall be rated for 125 steady winds with luminaire installed, without incurring damage.

2.05 EMERGENCY BALLAST

A. Provide emergency ballast where indicated. Emergency ballast shall be in accordance with UL 924.

B. Ballast shall contain nickel cadmium battery, charger, and electronic circuitry in metal cast plus AC ballast.

C. Ballast shall contain solid state charging indicator monitoring light and double pole test switch.

D. Ballast shall be capable of operating one fluorescent lamp for a period of 90 minutes with output of 1,100 to 1,200 lumens.

E. Manufactures:
   1. MagneTek Lighting Products
   2. The Bodine Co.
   3. Lithonia
   4. Or Equal

2.06 IN-LINE FUSE HOLDER AND FUSE

A. Fuse holder shall be waterproof and of corrosion resistant material rated at 600 volts.

B. Fuses shall be midge, dual element, fuses rated at 5 amps with voltage as required by application.

PART 3 EXECUTION

3.01 LUMINAIRES

A. Install luminaires in accordance with manufacturer's recommendations. Provide proper hangers, pendants, and canopies as necessary for complete installation.

B. Provide additional ceiling bracing, hanger supports, and other structural reinforcements to building required to safely mount fixture.

C. Install fixture plumb and level. Mounting height shown for pendant mounted luminaires are measured from bottom of luminaire to finished floor or finished grade, whichever is applicable.

D. Mounting heights shown for wall mounted luminaires are measured from center of mounting plate to finished floor to finished grade, whichever is applicable.

E. Install each luminaire outlet box with galvanized stud.

F. Pendant Mounted
   1. Provide swivel type hangers and canopies to match luminaires, unless otherwise noted.
   2. Space single stem hangers on continuous-row fluorescent luminaires nominally 48 inches apart.
   3. Provide twin stem hangers on single luminaires.

G. Pole Mounted
   1. Provide precast concrete base.

H. Swinging Type
   1. Provide at each support, safety cable capable of supporting four times vertical load from structure to luminaire.

I. Finished Areas
   1. Install luminaires systematically with tile pattern. Locate with centerlines either on centerline of tile or on joint between adjacent tile runs.
   2. Install recessed luminaires tight to finished surface such that no spill light will show between ceiling and sealing rings.
   3. Where luminaires are installed in Combustible Low Density Cellulose Fiberboard, provide spacers and mount luminaires 1 1/2 inches from ceiling surface, or use fixtures suitable for mounting on low density ceilings.
   4. Junction Boxes
      a. Locate junction boxes a minimum of 1-foot from luminaire for flush and recessed luminaires. In concealed locations, install junction boxes to be accessible by removing luminaire.
   5. Wiring and Conduit
      a. Provide wiring of temperature rating required by luminaire. Unless otherwise noted, provide flexible steel conduit for connection to luminaire.
   6. Provide plaster frames when required by ceiling construction.
   7. Independent Supports
      a. Provide recessed fluorescent luminaire with two safety chains or two No. 12 soft-annealed galvanized steel wires of length needed to secure luminaire to building structure independent of ceiling structure.
      b. Tensile strength of chain or wire, and method of fastening to structure shall be adequate to support weight of luminaire.
      c. Fasten chain or wire to each end of luminaire.

J. Unfinished Areas
   1. Locate luminaires to avoid conflict with other building systems of blockage of luminaire light output.
   2. Provide 1/4 inch threaded steel hanger rods for fixture suspension. Scissor type hangers are not permitted.
   3. For attachment to steel beams, provide flanged beam clips and straight or angled hangers.

K. Building Exterior
   1. Provide flush-mounted back box and concealed conduit, unless otherwise indicated.

3.02 LAMPS

A. Provide, in each fixture, lamps of the number and type for which fixture is designed, unless otherwise indicated.

3.03 LIGHTING CONTROL

A. Photocells shall switch lights ON at dusk and OFF at dawn.

B. Occupancy Sensors

1. Locate and aim sensors in correct location required for complete and proper volumetric coverage within range of coverage(s) of controlled area per manufacturer's recommendations.
2. Rooms shall have 90 to 100 percent coverage to completely cover controlled area to accommodate all occupancy habits of single or multiple occupants at any location within room(s).
3. Locations and quantities of sensors shown on Drawings are diagrammatic and indicate on rooms which are to be provided with sensors. Provide additional sensors if required to properly and completely cover respective room.

3.04 EMERGENCY BALLAST

A. Install battery, charger, and electronic circuitry metal case inside fluorescent fixture housing adjacent to ac ballast.

B. Install monitoring light and double pole switch adjacent to fixture.

C. Wire in accordance with manufacturer's wiring diagrams and as shown in Drawings.

3.05 EMERGENCY LIGHTING UNIT

A. Install in accordance with manufacturer's recommendations.

B. Provide permanent circuit connections with conduit and wire.

C. Connect to branch circuit feeding normal lighting in area ahead of all local switches.

D. Provide separate circuit wiring to luminaire.

3.06 CLEANING

A. Remove labels and markings, except UL listing mark.

B. Wipe luminaires inside and out to remove construction dust.

C. Clean luminaire plastic lenses with antistatic cleaners only.

D. Touch up painted surfaces of luminaires and poles with matching paint ordered from manufacturer.

E. Replace defective lamps at time of Substantial Completion.

END OF SECTION

DIVISION 16 – ELECTRICAL

SECTION 16950 ELECTRIC MOTORS

PART 1 GENERAL

1.01 SCOPE

A. The purpose of this Section is to cite general requirements for motors and motor starters provided as part of driven equipment (pumps, conveyors, etc.) specified in other sections. When this section applies, it will be referenced in the Detailed Equipment Specifications. If a conflict exists between provisions of this section and provisions of other sections detailing the driven equipment, the provisions of this section shall govern.

B. See Supplement to this Section for additional information related to work specified under this Section.

1.02 GENERAL

A. See CONDITIONS OF THE CONTRACT, Division I, GENERAL REQUIREMENTS, and Section 16000 which contain information and requirements that apply to the work specified herein and are mandatory for this project.

B. Requirements for motor horsepower, enclosures, ratings, etc., cited or shown on the Drawings and in the Specifications are what is expected. When motors provided differ from the expected equipment, the Contractor shall make the necessary adjustments to conductors, raceways, disconnect switches, controllers, motor starters, circuit protection, and all other affected materials or equipment to accommodate the motors actually installed.

C. Deviation from the requirements of this section may be allowed only when the motor is of special design to suit the driven equipment. Such deviations are, however, allowed only when stated specifically in the section which defines the unit of equipment.

D. Motors installed in designated Hazardous (Classified) Locations shall meet NEC.

1.03 STANDARDS

A. Motors and starters shall be designed, manufactured, and tested in accordance with latest revisions of the industry standards:
   1. NEMA
   2. CSA
   3. IEEE
   4. ETL(UL 508)
   5. ANSI
   6. NFPA 70 (NEC)

1.04 NOMENCLATURE AND RESPONSIBILITY

A. The following terms, abbreviations, and phrases may be referenced within the Contract Documents.
   1. CISD-TEFC: Chemical industry, severe-duty enclosure.
   2. DIP: Dust-ignition-proof enclosure.
   3. EXP: Explosion-proof enclosure.
   4. ODP: Open drip-proof enclosure.
   5. TEFC: Totally enclosed, fan cooled enclosure.
   6. TENV: Totally enclosed, nonventilated enclosure.
   7. WPI: Open weather protected enclosure, Type I.
   8. WPII: Open weather protected enclosure, Type II.
   9. Motor Nameplate Horsepower: That rating after any derating required to allow for extra heating caused by the harmonic content in the voltage applied to the motor by its controller.
   10. Inverter Duty Motor: Motor meeting all applicable requirements of NEMA MG 1, Section IV, Parts 30 and 31.

B. Throughout this Specification the term "constant speed" is used in conjunction with the drive system cited in the Detailed Equipment Specifications. For use herein, "constant speed" shall be defined as a drive system consisting of a motor and, if asked for in the Detailed Equipment Specifications, the motor starter all provided by the equipment supplier and used to drive the equipment (including gear trains, pulley systems, etc.) cited in the Detailed Equipment Specifications.

C. The motor, all specified accessories and attachments, and the device to be driven shall be furnished by a single supplier in order to obtain single source responsibility for the equipment system.

D. A system may have system components (i.e., motor pump, VFD) of different manufacturers. Where more than one identical system is specified, components common to each system shall be the same product of one manufacturer.

1.05 SUBMITTALS

A. Submittals shall be made in accordance with Division 1, GENERAL REQUIREMENTS. In addition, the following specific information shall be provided:

B. For each motor, submit:
   1. Descriptive information for motor
   2. Nameplate data in accordance with NEMA MG 1, including:
      a. Horsepower
         1) Rated horsepower of the motor
         2) Maximum brake horsepower of the connected load at the motor shaft.
      b. Rated voltage and number of phases.
      c. Rated full load current.
      d. Motor rpm at 60-Hz input (rated load).
      e. NEMA design class.
   3. Additional rating information, including:

a. Service factor.
b. Locked rotor current.
c. No load current.
d. Safe stall time for motors 300 horsepower and larger
e. Adjustable frequency drive motor classification (e.g., variable torque) and minimum allowable motor speed for that load classification.
f. Guaranteed minimum full load efficiency and power factor for all motors below 20 HP.
g. Guaranteed minimum efficiency and power factor at rated voltage for 50 percent, 75 percent, and 100 percent full load conditions in accordance with IEEE Test Method 112B for an electrically duplicate motor for all motors 20 hp and above.
h. Maximum rms current and speed at which maximum current occurs over operating speed range if greater than rated full load current (this applies only for adjustable speed control operation).

4. Description of bearings, lubrication system (special lubricating requirements, if any), and bearing lift.
5. Enclosure type, finish and mounting configuration.
6. Location and size of conduit boxes. Include conduit box dimensions and usable volume as defined in NEMA MG 1 and NFPA 70.
7. Description, ratings, and wiring diagram of motor thermal protection.
8. Accessories.
9. Total weight and dimensions.
10. For motors 600 horsepower and larger:
    a. Thermal limit curves in accordance with IEEE 620.
    b. Speed torque curve.
    c. Starting time-current curve.
    d. Thermal capability during starting.
11. Description and rating of submersible motor moisture sensing system.
12. Operation and Maintenance Manuals, including:
    a. Complete information for storage and installation.
    b. Complete operating and maintenance instructions.
    c. Bill of Materials.
13. Factory test reports.

C. For each motor starter, submit: Data as required for motor starters in Division 16, ELECTRICAL.

1.06 PERFORMANCE AND SERVICE CONDITIONS

A. All equipment shall be designed for both inactive and continuous duty operation in an industrial indoor environment. In addition, motors and motor starters cited in this section shall be suitable to withstand the effects of an atmosphere that is made corrosive by traces of chemicals normally found in a waste treatment plant.

B. Motors shall be specifically designed for the use and application intended, with a NEMA design letter classification to fit the application.

C. All equipment shall perform as specified herein and under the following operating and service conditions:
   1. Ambient Temperature Range: 0 to 40 degrees C
   2. Altitude: Approximately 1000 feet MSL
   3. Seismic Zone: 2
   4. Motors shall be suitable for operating conditions without any reduction being required in the nameplate rated horsepower or exceeding the rated temperature rise.
   5. Overspeed in either direction in accordance with NEMA MG 1.

PART 2 MATERIALS

2.01 GENERAL

A. Unless otherwise indicated, provide materials and equipment which are the standard products of manufacturers regularly engaged in the production of such materials and equipment. Provide the manufacturers' latest standard designs that conform to these Specifications.

B. Electrical equipment and material shall be listed and labeled for the purpose for which it is tested by a testing agency recognized under Minnesota Rule 3801.3620. All motors, transformers, and control panels provided under this section shall be certified or labeled as described above; and control panels shall be constructed by a panel fabrication shop certified in compliance with Rule 3801.3620.

C. All motors shall meet the requirements of NEMA MG 1. Motor frame assignments shall be in accordance with NEMA MG 13. Provide motors for hazardous (classified) locations that conform to UL 674 and have an applied UL listing mark.

D. Unless otherwise stated, motor shall conform to the following:
   1. Single phase motors shall be general purpose, split capacitor start, alternating current, induction type.
   2. Three phase motors shall be general purpose, squirrel-cage induction type.
   3. Motors may be ODP except where exposed to weather or otherwise specified. Motors through frame sizes 445U shall be case iron construction, unless otherwise specified or required for special applications. Larger frame sizes may be of welded steel unless otherwise specified or required for special applications.
   4. Motors installed unprotected, exposed to weather shall be totally enclosed for all motor frames sizes 445 and smaller. Larger motors shall be NEMA weather protected type II-A or shall be totally enclosed.
   5. All motors provided under this section shall have copper windings.
   6. All motors to have shaft grounding kits supplied with motor.

E. All motors supplied by adjustable voltage and adjustable frequency drives shall be inverter duty rated as specified under SPECIAL MOTORS.

F. Provide lifting lugs on all motors weighing 100 pounds or more.

2.02 MANUFACTURERS

A. Motors provided under this section shall be of the following manufactures or equal:
   1. General Electric
   2. Reliance Electric
   3. MagneTek
   4. Siemens Energy and Automation, Inc., Motors and Drives Division
   5. Baldor
   6. U.S. Electrical Motors
   7. TECO-Westinghouse Motor Co.
   8. Toshiba International Corp., Industrial Division
   9. WEG Electric Motors Corp.

2.03 VOLTAGE RATINGS

A. This Specification allows the use of ac (60-Hz) equipment with input voltage ratings depending upon the type of drive and horsepower required. The following table shall be used to determine the voltage rating of motors and VFDs to drive equipment described in the Detailed Equipment Specifications, unless otherwise stated elsewhere in these documents. To determine the voltage rating:
   1. Note (a) type equipment drive and (b) motor nameplate horsepower cited in the Detailed Equipment Specifications.
   2. From the table determine the motor input voltage rating:

Size	Voltage	Phases
1/2 hp and smaller	115	1
3/4 hp through 150 hp	460	3
200 hp and larger	4,000	3

   3. An exception to the preceding table is equipment, such as electric gate and valve operators, that require a reversible constant speed drive. Unless noted otherwise in the Detailed Equipment Specifications, all reversible drive systems shall be 460V, 3-phase.
   4. All motors shall be suitable for full voltage starting. Motors shall be suitable for accelerating the connected load with supply voltage at motor start supply terminals dipping to 90 percent of motor rated voltage.

2.04 HORSEPOWER RATING

A. Motor horsepower ratings shall be as specified in motor-driven equipment specifications.

B. For constant speed applications, brake horsepower of the driven equipment at any operating condition shall not exceed motor nameplate horsepower rating, excluding any service factor.

C. For adjustable frequency and adjustable speed applications (inverter duty motors) the driven equipment brake horsepower at any operating condition shall not exceed the motor nameplate horsepower rating, excluding any service factor.

2.05 SERVICE FACTOR

A. All motors shall have a minimum service factor of 1.15 at rated ambient temperature, unless otherwise indicated.

2.06 EFFICIENCY AND POWER FACTOR

A. For all motors except single-phase, under 1 horsepower, multispeed, short-time rated and submersible motors, or motors driving gates, valves, elevators, cranes, trolleys, and hoists:

1. Motor efficiency shall be tested in accordance with NEMA MG 1, Paragraph 12.59. Motor shall have a guaranteed minimum efficiency at full load in accordance with NEMA MG 1 Table 12-11, or as indicated in motor-driven equipment specifications.
2. Motors of 1 to 200 horsepower, ODP and TEFC shall meet the requirements of Table 1 located at the end of this section.
3. Motors shall have a guaranteed minimum power factor at full load in accordance with Table 1 or as indicated in motor-driven equipment specifications.

2.07 LOCKED ROTOR RATINGS

A. Ratings shall be in accordance with NEMA MG 1. If motor horsepower is not covered by NEMA MG 1 tables, locked rotor kVA rating shall be Code F or lower.

B. All motors shall have a safe stall time of 12 seconds or greater.

2.08 INSULATION SYSTEMS

A. For single-phase and fractional horsepower motors, provide manufacturer's standard winding insulation system.

B. For motors rated over 600 volts, windings shall be sealed in accordance with NEMA MG 1.

C. For three-phase and integral horsepower motors, unless otherwise indicated in motor-driven equipment specifications, insulation system shall be Class B or Class F at nameplate horsepower and designated operating conditions, except EXP motors which must be Class F with Class B rise.

D. For motors with form-wound coils, provide locked coil bracing system in accordance with ANSI C50.41.

2.09 ENCLOSURES

A. Motor enclosures shall conform to NEMA MG 1. For TEFC and TENV motors, furnish a drain hole with porous drain/weather plug.

B. For explosion-proof (EXP) motors, enclosures shall meet the following:
1. Enclosure shall be TEFC and listed to meet UL 674 and NFPA 70 requirements for Class 1, Division 1, Group D hazardous locations.
2. Enclosure shall contain drain holes with drain and breather fittings.

3. Enclosure shall contain integral thermostat opening on excessive motor temperature in accordance with UL 2111 and NFPA 70. Terminate thermostat leads in terminal box separate from main terminal box.

C. For Submersible and Chemical Industry, Severe-Duty (CISD-TEFC) motors, enclosure shall be in accordance with section SPECIAL MOTORS.

2.10 TERMINAL (CONDUIT) BOXES

A. All motors shall be provided with terminal boxes as specified. Main terminal boxes shall be oversized for all motors. Terminal boxes shall be diagonally split, rotatable to each of four 90-degree positions. Boxes shall contain threaded hubs for conduit attachment.

B. Except for ODP motors, furnish gaskets between box halves and between box and motor frame.

C. Minimum usable volume in percentage of that specified in NEMA MG 1, Section 1, Paragraph 4.19 and NFPA 70, Article 430 shall be as follows:

Terminal Box Usable Values		
Voltage	Horsepower	Percentage
Below 600	15 through 125	500
Below 600	150 through 300	275
Below 600	350 through 600	225

D. A terminal shall be provided in each terminal box for connection of equipment grounding wire.

2.11 BEARINGS AND LUBRICATION

A. Horizontal Motors
   1. For 3/4 horsepower and smaller motors, bearings shall be permanently lubricated and sealed ball bearings or greasable ball bearings in labyrinth sealed end bells with removable grease relief plugs.
   2. For 1 through 400 horsepower motors bearings shall be regreasable ball bearings in labyrinth sealed end bells with removable grease relief plugs.
   3. Motors above 400 horsepower shall have regreasable antifriction bearings in labyrinth sealed end bells with removable grease relief plugs.
   4. Bearings shall have a minimum of 100,000 hours L-10 bearing life for ball and roller bearings as defined in ABMA 9 and 11.

B. Vertical Motors
   1. Thrust bearings shall be of the antifriction type with manufacturer's standard lubrication for 250 horsepower and smaller motors. Bearings shall have a minimum of 100,000 hours L-10 bearing life.
   2. Guide bearings shall be of the manufacturer's standard bearing type with standard lubrication for 250 horsepower and smaller motors. Bearings shall have a minimum of 100,000 hours L-10 bearing life.

C. Regreasable Antifriction Bearings:
   1. Bearing shall have readily accessible grease injection fittings and readily accessible, removable grease relief plug.

D. Motors rated for inverter duty shall have electrically isolated bearings to prevent stray current damage.

2.12 NOISE

A. Motor noise shall be measured in accordance with IEEE 85 and NEMA MG 1. Motors controlled by adjustable frequency drive systems shall not exceed sound levels of 3 dBA higher than NEMA MG 1.

2.13 BALANCE AND VIBRATION

A. Motor balance and vibration shall be in accordance with NEMA MG 1.

2.14 FINISHES

A. Equipment finishes shall protect the equipment per the service conditions cited in this section. Painted surfaces shall be primed and painted in accordance with Section PAINTING.

2.15 SPECIAL FEATURES AND ACCESSORIES

A. Stainless steel screens shall be furnished over air openings on motors with ODP, WPI, and WPII enclosures meeting requirements for Guarded Machine in NEMA MG 1. Screens shall be attached with stainless steel screws.

B. Thermal Protection
   1. Motor winding thermal protection shall be provided. Thermistors shall be provided on motors for constant speed application that are 200 horsepower and larger and motor for adjustable speed application that are 100 horsepower and larger. Thermistor shall be embedded in each stator phase winding before winding dip and bake process. Thermistors shall be in intimate contact with winding conductors. Individual thermistor circuits shall be wired to junction box.
   2. Abnormally high temperature conditions in the stator windings shall result in a relay contact opening, for external use that shall remain open until conditions return to normal (i.e., a lower temperature that is not damaging to the stator windings). The relay and relay enclosure shall be mounted at the motor. Control power shall be connected by the Contractor but will originate at the motor starter.
   3. The relay shall be compatible with the thermistors, operate at 120 V ac, and the relay contact shall be rated no less than 5 amperes, 120 V ac. Contact opening and return to normal closed conditions shall be automatic. All control wiring and devices shall conform to the requirements per Division 16, ELECTRICAL.

C. Each motor shall have a nameplate consisting of raised or stamped letters on stainless steel or aluminum. Nameplate shall display motor data required by NEMA MG 1, Paragraph 10.39 and Paragraph 10.40 in addition to bearing numbers for both bearings.

D. Premium efficiency motor nameplates to also display NEMA nominal efficiency, guaranteed minimum efficiency, full load power factor, and maximum allowable kVAR for power factor correction capacitors.

E. Provide anchor bolts for motors meeting manufacturer's recommendations and of sufficient size and number for the specified seismic conditions.

2.16 SPECIAL MOTORS

A. Requirements in this article take precedence over conflicting features specified elsewhere in this section.

B. Chemical Industry, Severe-Duty (CISD-TEFC)
   1. Motors shall be in accordance with IEEE 841. Motor enclosure shall be TEFC in accordance with NEMA MG 1.
   2. Motor shall be suitable for indoor and outdoor installation in severe-duty applications including high humidity, chemical (corrosive), dirty, or salty atmospheres.
   3. Motor frame, end shields, terminal box, and fan cover shall be cast iron. Ventilating fan shall be corrosion-resistant, nonsparking and external. Motor drain and breather fittings shall be stainless steel. Motor nameplate shall be stainless steel.
   4. Gaskets shall be provided between terminal box halves and terminal box and motor frame.
   5. Extra slinger on rotor shaft shall be provided to prevent moisture seepage along shaft into motor.
   6. Motor shall have double shielded bearings with a minimum of 125,000 hours L-10 bearing life for direct-connected loads.
   7. Motor external finish shall be double-coated epoxy enamel.
   8. Motor shall have coated rotor and stator air gap surfaces.
   9. Motor shall have Class F insulation and Class B rise or better at 1.0 service factor. Motor insulation system shall have multiple dips and bakes of nonhygroscopic polyester varnish.
   10. Motor service factor shall be 1.15 at 40 degrees C ambient and 1.00 at 65 degrees C ambient.
   11. Motor safe stall time without injurious heating shall be 20 seconds minimum.

C. Severe-Duty Explosion-Proof
   1. Motor shall meet requirements for EXP enclosures and CISD-TEFC motors.

D. Multispeed
   1. Meet requirements for speeds, number of windings, and load torque classification indicated in the motor-driven equipment specifications.

E. Inverter Duty Motors
   1. Motors shall be suitable for operation over entire speed range indicated. Provide forced ventilation where speed ratio is greater than published range for motor being installed.
   2. Motor installed in Division 1 hazardous (classified) locations shall be identified as acceptable for variable speed when used in Division 1 location.

F. Submersible Pump Motor

1. At 100 percent load, motor shall meet the following criteria:

Submersible Pump Motors		
Horsepower	Guaranteed Minimum Efficiency	Guaranteed Minimum Power Factor
5 through 10	80	82
10.1 through 50	85	82
50.1 though 100	87	82
Over 100	89	82

2. Motor shall have manufacturer's standard Class B or Class F insulation. Motor shall be capable of running dry continuously.
3. Motor enclosure shall be hermetically sealed, watertight, for continuous submergence up to 65 foot depth. Enclosure shall be listed to meet UL 674 and NFPA 70 requirements for Class 1, Division 1, Group D hazardous atmosphere and shall contain tandem mechanical seals.
4. Motor shall contain permanently sealed and lubricated, replaceable antifriction guide and thrust bearings with a minimum of 15,000 hours L-10 bearing life.
5. Motor inrush kVA/horsepower shall be no greater than the following NEMA MG 1 and NFPA 70 Code Letters. Less than 2 hp: L, 2.1 to 3 hp: K, 3.1 to 5hp: J, 5.1 to 10 hp: H, more than 10 hp: G.
6. Motor shall contain a thermal sensor and switch assembly, one for each phase, embedded in stator windings and wired in series. Switches shall be normally closed, open upon excessive winding temperature, and automatically reclose when temperature has cooled to safe operating level. Switch contacts shall be rated at 5 amps, 120 VAC.
7. Motor shall contain seal failure moisture detection probes or sensors to detect moisture beyond seals. Motor shall contain probe or sensor monitoring module for mounting in motor controller, suitable for operation from 120 VAC supply. Monitoring module shall contain control power transformer, probe test switch and test light, and two independent 120 VAC contacts, one opening and one closing when the flux of moisture is detected.
8. Motors shall be equipped with two separate cables; one for power and grounding conductors, and the other for control and grounding conductors. Each cable shall be suitable for hard service, submersible duty with watertight seal where cable enters motor. Cable shall be UL listed and sized in accordance with NFPA 70 with length as required.

2.17 MOTOR STARTERS

A. Motor starters shall be provided by the equipment supplier if and only if required to do so in the Detailed Equipment Specifications. When provided by the equipment supplier, motor starters shall conform to the requirements in Section 16050 BASIC MATERIALS AND METHODS, and shall have the following features:

1. Where motor starters are included as part of the Detailed Equipment Specifications and are specified as being located inside a field panel (FP), the motor starters shall be combination type (starter and circuit breaker, with provisions for locking circuit breaker in the OFF position); motor starters included with the Detailed Equipment Specifications, but specified as located on equipment, shall be starter-only type and

shall be provided with the enclosure specified (i.e., NEMA 12, NEMA 4X, etc.). For NEMA 12 or NEMA 4X enclosures, all attachments and accessories shall be of a type and quality and installed" in such a manner to ensure the integrity of the NEMA rating.

2. Starter, enclosure, and enclosure nameplates shall be located and arranged in a manner that gives best advantage for equipment identification, normal maintenance, and visual inspection of parts.
3. Provide local-operator motor control switches, reset buttons, and indicating lights as specified. Provide motor starters to accept control via normally OPEN dry contacts from remote equipment provided by others. Remote contacts will initiate the control function (ON, OFF, UP, DOWN, etc.); all other control peculiar to the normal operation of the equipment shall be provided in the motor starter. Motor control design shall be "maintained contact," i.e., if a power outage occurs, upon restoration, the motor shall run if the remote run command is initiated. Provide for motor shutdown in the event of motor overtemperature, see MOTORS, this section; motor shall start if temperature returns to normal and the run command is initiated.
4. Provide a normally OPEN motor starter contactor contact ("M" contact) for use in remote equipment; contact shall close when motor "runs." Bring contact leads to terminal board for ready access and connection to external wiring and raceway provided by others. Contacts shall be rated 120 volts, 5 amperes, minimum.

PART 3 EXECUTION

3.01 GENERAL

A. Installation of all equipment, shall be in strict accordance with the manufacturer's recommendations and as required by the various sections of the Specifications. Furnish services for the initial phase of setting and aligning of the equipment and after the installation is completed for startup and testing as required by the various sections of these Specifications. A manufacturer's certificate(s) of proper installation is required as specified in Division 1, GENERAL REQUIREMENTS.

3.02 TESTS

A. Perform test in accordance with Division 16000, General Provisions. In addition to tests specified in Division 16000, the following test shall be performed.

B. Factory Tests:
   1. Provide test data for electrically equivalent and identical motors to those being actually supplied, as listed below. Tests shall be in conformance with the IEEE Procedure for Polyphase Induction Motors and Generators--Publication No. 112A and NEMA latest edition thereof:
      a. Determination of efficiency and power factor at 1/2, 3/4, full load and service factor load.
      b. Measurement of full load current, slip, and temperature rise.
      c. Determination of locked rotor and breakdown torques.
      d. Measurement of winding resistance.
      e. Measurement of vibration.
      f. Measurement of insulation resistance.

g. Measurement of no-load current.

2. Tests for single-phase motors shall be in conformance with IEEE Standard 114.
3. Test data shall be submitted to the Engineer for review and written acceptance. No motor shall be shipped to the construction site until written acceptance by the Engineer is obtained by the supplier.

C. Perform all other tests specified in the motor manufacturer's O & M Manuals for field tests prior to startup.

End of Section

Table 1 – Motor Performance Requirements

HP	RPM	Minimum Guaranteed Efficiency				Minimum Guaranteed Power Factor			
		Horizontal		Vertical		Horizontal		Vertical	
		ODP	TEFC	ODP	TEFC	ODP	TEFC	ODP	TEFC
1	1800	82.5	82.5	-	-	Mfr. Std.	Mfr. Std.	-	-
	1200	80.0	80.0	-	-	Mfr. Std.	Mfr. Std.	-	-
1.5	3600	82.5	82.5	-	-	Mfr. Std.	Mfr. Std.	-	-
	1800	84.0	84.0	-	-	Mfr. Std.	Mfr. Std.	-	-
	1200	84.0	85.5	-	82.0	Mfr. Std.	Mfr. Std.	-	Mfr. Std.
2	3600	84.0	84.0	-	-	Mfr. Std.	Mfr. Std.	-	-
	1800	84.0	84.0	-	-	Mfr. Std.	Mfr. Std.	-	-
	1200	85.5	86.5	83.7	83.7	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	85.5	82.5	82.9	81.7	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
3	3600	84.0	85.5	82.0	82.0	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	86.5	87.5	84.8	84.8	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	86.5	87.5	87.5	86.6	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	86.5	83.0	84.1	82.9	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
5	3600	85.5	87.5	84.8	84.8	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	87.5	87.5	84.8	84.8	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	87.5	87.5	87.5	86.6	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	87.5	85.5	87.5	86.6	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
7.5	3600	87.5	88.5	84.8	86.6	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	88.5	89.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	88.5	89.5	88.4	87.5	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	88.5	85.5	87.5	86.6	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
10	3600	88.5	89.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	89.5	89.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	90.2	89.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	89.5	88.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
15	3600	89.5	90.2	88.4	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	91.0	91.0	90.9	90.2	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	90.2	90.2	90.2	89.3	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	89.5	88.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
20	3600	90.2	90.2	90.9	89.3	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	91.0	91.0	91.7	90.9	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	91.0	90.2	90.2	89.3	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	90.2	89.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
25	3600	91.0	91.0	91.7	90.2	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	91.7	92.4	92.4	91.7	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	91.7	91.7	90.9	89.3	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	90.2	89.5	89.3	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
30	3600	91.0	91.0	89.5	88.4	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1800	92.4	92.4	92.4	91.7	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	1200	92.4	91.7	91.7	90.2	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.
	900	91.0	91.0	90.9	90.9	Mfr. Std.	Mfr. Std.	Mfr. Std.	Mfr. Std.

HP	RPM	Minimum Guaranteed Efficiency				Minimum Guaranteed Power Factor			
		Horizontal		Vertical		Horizontal		Vertical	
		ODP	TEFC	ODP	TEFC	ODP	TEFC	ODP	TEFC
40	3600	91.7	91.7	90.2	89.3	86.6	86.1	87.0	89.0
	1800	93.0	93.0	92.8	91.7	78.2	78.2	83.0	84.5
	1200	93.0	93.0	91.7	90.9	81.5	81.5	81.5	81.5
	900	91.0	91.0	90.9	90.2	70.0	70.5	70.0	70.5
50	3600	92.4	92.4	90.2	89.3	85.1	86.7	89.0	89.0
	1800	93.0	93.0	92.8	91.7	79.5	79.4	82.5	82.5
	1200	93.0	93.0	91.7	90.9	81.5	81.5	81.5	81.5
	900	91.7	91.7	90.9	90.9	78.5	72.9	78.5	80.0
60	3600	93.0	93.0	90.2	90.9	85.8	88.3	87.5	89.0
	1800	93.6	93.6	92.8	92.8	80.5	79.9	80.5	80.5
	1200	93.6	93.6	91.7	91.7	81.5	81.5	81.5	81.5
	900	92.4	91.7	90.9	90.9	79.5	73.2	79.5	79.5
75	3600	93.0	93.0	91.7	91.7	87.1	88.5	88.5	88.5
	1800	94.1	94.1	93.5	93.5	81.0	81.5	81.0	81.5
	1200	93.6	93.6	92.8	92.8	82.0	82.0	82.0	82.0
	900	93.6	92.4	91.7	91.7	80.5	74.5	80.5	81.0
100	3600	93.0	93.6	91.7	91.7	87.0	88.2	87.0	88.5
	1800	94.1	94.5	94.0	93.5	81.0	81.0	81.0	81.0
	1200	94.1	94.1	92.8	92.8	82.1	81.7	85.5	85.5
	900	93.6	92.4	92.8	91.7	77.0	77.3	77.0	80.0
125	3600	93.6	94.5	91.7	91.7	86.1	89.1	87.0	90.5
	1800	94.5	94.5	93.5	92.8	85.4	85.5	87.5	86.0
	1200	94.1	941.0	93.5	92.8	82.7	82.3	85.5	85.5
	900	93.6	93.0	92.8	92.4	78.5	78.5	78.5	78.5
150	3600	93.6	94.5	92.4	91.7	86.5	90.0	86.5	90.5
	1800	95.0	95.0	94.5	94.0	82.5	85.0	84.5	85.0
	1200	94.5	95.0	93.5	94.0	81.5	81.5	81.5	81.5
	900	93.6	93.0	92.8	92.4	78.0	78.5	78.0	78.5
200	3600	94.5	95.0	92.4	93.0	87.8	89.4	91.0	91.0
	1800	95.0	95.0	94.0	94.0	85.2	86.5	87.0	87.0
	1200	94.5	95.0	93.5	93.5	79.0	82.5	79.0	82.5
250	3600	94.5	95.0	91.7	92.4	85.0	86.5	85.0	86.5
	1800	95.4	96.0	94.5	94.5	79.0	79.0	79.0	79.0
	1200	95.4	95.0	94.5	93.5	82.0	82.0	82.0	82.0
300	3600	95.0	95.0	-	-	89.8	89.9	-	-
	1800	95.4	95.2	94.5	94.0	80.0	80.0	80.0	80.0
	1200	95.4	95.0	-	-	84.5	90.1	-	-
350	3600	95.0	95.0	-	-	89.4	85.9	-	-
	1800	95.4	95.0	-	-	85.9	85.9	-	-
400	3600	95.4	95.0	-	-	88.4	-	-	-
	1800	95.4	95.0	-	-	86.8	-	-	-
450	3600	95.8	95.0	-	-	89.1	-	-	-

HP	RPM	Minimum Guaranteed Efficiency				Minimum Guaranteed Power Factor			
		Horizontal		Vertical		Horizontal		Vertical	
		ODP	TEFC	ODP	TEFC	ODP	TEFC	ODP	TEFC
500	3600	95.8	95.0	-	-	88.3	-	-	-

RESOLUTION NO. 2024-04

RESOLUTION APPROVING THE PLANS AND SPECIFICATIONS FOR THE WASTEWATER TREATMENT PLANT IMPROVEMENT PROJECT.

WHEREAS, the City is acting upon recommendations of the Iowa Department of Natural Resources to make wastewater treatment plant improvements; and

WHEREAS, WHKS was selected to prepare the plans, specifications, form of contract, and estimated costs for the Wastewater Treatment Plant Improvement Project; and

WHEREAS, this project will go out for bid on January 23, 2024 and the tentative date for the required Public Hearing is planned for March 11, 2024.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF ANAMOSA, IOWA, that the City of Anamosa City Council does hereby approve the plans and specifications for the Wastewater Treatment Plant Improvement Project.

Councilmember _____ introduced this Resolution and moved for its adoption.
Councilmember _____ seconded the motion to adopt.
The roll was called and the following indicates the result of the vote.

COUNCIL MEMBER	AYES	NAYS	ABSENT	ABSTAIN
CRUMP				
K. SMITH				
TUETKEN				
WEIMER				
D. SMITH				
GOMBERT				

PASSED AND APPROVED this 22nd day of January, 2024.

_____
ROD SMITH, MAYOR

ATTEST:

_____
JEREMIAH HOYT, CITY ADMINISTRATOR

RESOLUTION NO. 2024-05

RESOLUTION RESCINDING SALE AND CONVEYANCE OF PARCEL 2010-69, A PART OF LOT 15, ANAMOSA COMMERCIAL PARK SECOND ADDITION, ANAMOSA, IA, ALSO IDENTIFIED AS AUDITOR'S PARCEL NO. 0535476009

WHEREAS, the City of Anamosa previously approved Resolution 2023-64, on October 9, 2023, approving the sale and conveyance of Parcel 2010-69, a part of Lot 15, Anamosa Commercial Park Second Addition, also identified as Auditor's Parcel No. 0535476009, to SAJA Land LLC; and

WHEREAS, the representatives of SAJA Land LLC has provided notification to the City of Anamosa that they have decided not to proceed with the sale and conveyance of this property; and

WHEREAS, the City attorney advised that the Anamosa City Council should rescind Resolution 2023-64, by a subsequent Resolution.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF ANAMOSA, IOWA, that the City of Anamosa rescinds Resolution 2023-64, which was approved on October 9, 2023, by the Anamosa City Council.

Councilmember _____ introduced this Resolution and moved for its adoption.
Councilmember _____ seconded the motion to adopt.
The roll was called and the following indicates the result of the vote.

COUNCIL MEMBER	AYES	NAYS	ABSENT	ABSTAIN
CRUMP				
K. SMITH				
TUETKEN				
WEIMER				
D. SMITH				
GOMBERT				

PASSED AND APPROVED this 22nd day of January, 2024.

_____
ROD SMITH, MAYOR

ATTEST:

_____
JEREMIAH HOYT, CITY ADMINISTRATOR

RESOLUTION NO. 2024-06

RESOLUTION SETTING THE DATE FOR A PUBLIC HEARING ON THE PROPOSED SALE OF CITY OWNED REAL ESTATE PURSUANT TO SECTION 364.7 OF THE IOWA CODE.

WHEREAS, the City of Anamosa has received an offer to purchase the City-owned real estate, described as Parcel 2010-69, a part of Lot 15, Anamosa Commercial Park Second Addition; and

WHEREAS, the City has no future plans or purpose for this city owned real estate; and

WHEREAS, a public notice of said public hearing is required to be published in the designated local paper no less than four and no more than 20 days prior to the public hearing;

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF ANAMOSA, IOWA, that the City of Anamosa City Council does hereby set February 12, 2024 at 6:00 p.m. as the date and time for the public hearing to be held in the Anamosa Library and in Anamosa, Iowa.

FURTHERMORE, the Council does hereby direct City personnel to proceed with the publication of said public notice in accordance with the State Code of Iowa.

Councilmember _____ introduced this Resolution and moved for its adoption.
Councilmember _____ seconded the motion to adopt.
The roll was called and the following indicates the result of the vote.

COUNCIL MEMBER	AYES	NAYS	ABSENT	ABSTAIN
CRUMP				
K. SMITH				
TUETKEN				
WEIMER				
D. SMITH				
GOMBERT				

PASSED AND APPROVED this 22nd day of January, 2024.

_____
ROD SMITH, MAYOR

ATTEST:

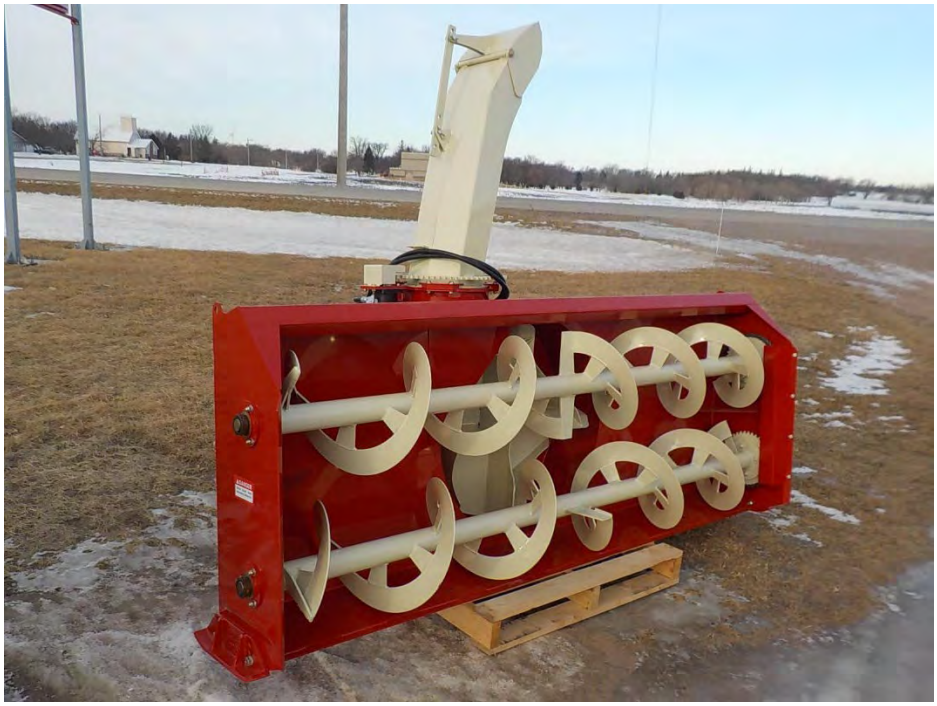
_____
JEREMIAH HOYT, CITY ADMINISTRATOR

Agenda Item 7.6

Request to Purchase 8’ Industrial Snowblower

State Bid Price: $7,800.00

(Price does not include $50/hr. tractor rental fee or $50/hr. operating fee)



*Example – Not actual product

*Example – Not actual product

Council,

The Utilities Dept would like your consideration of approval to purchase a 2023 Bobcat UV34 Gas Utility Vehicle Side by Side with a snowplow and possible salt/sand spreader. This would have a full cab, heat, but not have A/C so it can utilize it during the winter months.

The plan would be to purchase the side by side and swap out the 2019 Dodge 2500 2X4 with the Bobcat UV34 side by side. We would then give the truck to the streets department to replace their F150 that they are currently using. This would help the streets dept get a better truck and one that is more reliable and user friendly. The 2019 truck is not a critical vehicle to the dept because we have acquired an old squad car from the PD and utilizing that instead of the truck.

The side by side would be used by multiple depts i.e. PD, Streets, and Utilities when needed. The utilities dept would utilize the side by side for a variety of things like. locates, snow removal: with the increase of the walking trails that the city will be getting, this would greatly decrease the time spent on cleaning the trails opened and cleared, running to get samples from the prison, small landscape fixes, many more things. We would also be able to use this in remote areas where we have water and sewer lines. We can put a hydrant flusher on the back as well as if we need to camera a sewer line out behind house where we can't get a truck, we will have the ability to remove the camera from the trailer and load it into the back of the side by side and take it to the location that is needing to be inspected. We have talked with City of Cedar Rapids (Sewer Dept) Pat Keating, City of Marion (Parks And Rec) Drew Mollenhauer, City of Dyersville (Public Works Director) John Wandsnider and all of them said it was a very valuable piece of equipment to have in their arsenal. They all greatly recommended making the purchase of a side by side to be utilized within the city.

2023 Bobcat UV34 w/cab and heat: $22,153.12

V-plow snow blade..... $6,150.00

Spreader..... $4800.00

Total Cost..... $33,103.12

Line Item: 600-810-6710..... $37,046.00

Utilities Superintendent

Steve Agnitsch

2023 Bobcat UV34 w/Cab and heat

Bobcat

Product Quotation
Quotation Number: **MB272256**
Quote Sent Date: **Jan 02, 2024**
Expiration Date: **Feb 01, 2024**

Your Bobcat Contact
Mason Brekke
Phone:
E-mail: mason.brekke@doosan.com

Your Customer Contact

Deliver to
CITY OF ANAMOSA 271153 - ANAMOSA - IA
107 S FORD ST
ANAMOSA, IA, 52205-1841

Bobcat Dealer
Shannon McDonald
Bobcat of Cedar Rapids, Cedar Rapids, IA
10995 High Life Court SW
CEDAR RAPIDS, IA, 52404

Bill to
NEW GOVERNMENT CUSTOMER 2391333
250 E Beaton Dr
West Fargo, ND, 58078-2656

Item Name	Item Number	Quantity	Price Each	Total
UV34 Gas Utility Vehicle	M1503	1	15,265.12	15,265.12

Standard Equipment:

Engine
- Liquid Cooled Engine
- 40 HP Gas EFI Engine
- Pressurized Oiling System with Spin On Filter
- Engine Protection Oil Pressure & Water Temp
- High Capacity Air Filter
- 49 State Emission Compliant

Drive System
- CVT (Continuous Variable Transmission)
- *Sealed CVT Cover w/remote intake & exhaust*
- Four Wheel Drive 3 Drive Modes
- Forward Travel, Two Range (H/L)
- Integrated In-Transmission Park (P)
- Brakes - 4 Wheel, Hydraulic Disc with Dual-Bore

Front Calipers
- CV Guard, Front
- Shaft Drive with CV Joints

Suspension & Steering
- Front - Independent, Dual A Arm
- Rear - Independent, Dual A Arm
- Adjustable Front and Rear Coil Over Shocks
- Rack & Pinion
- Electric Power Steering Assist
- Tilt Steering Column

Operator Compartment
- Beverage Holder (4)
- *60/40 Split Bench Seats (3 Occupants)*
- Under Seat, Upper & Lower Dash Storage
- Sealed Glove Box Storage
- 3 Seat Belts with 3 Point Restraint

Tires
- All Terrain Industrial (8 ply)
- Front/Rear, 26x10 12

Wheels
- Front/Rear, 12x6 Orange Steel Rim

Electrical
- Headlights, High & Low Beams 4-35 Watts
- LED Tail & Brake Lights
- 6 Outlet Accessory Pwr Bar
- 75 Amp/900W Stator
- 575 CCA Battery

Instrumentation Panel
- *Indicator Lights: Glow Plug (Diesel Only), Seat Belt Reminder, High Beam On, Engine Oil Pressure* (Diesel only), Engine Temp High, Service Power Steering and Service Engine.
- LCD Display: Speedo, Engine Temp, Engine RPM, Volt, Trip and Hour Meter, Tachometer, Fuel Level, Clock, Drive Mode, Odometer, Service Reminder and Gear Position.

Cargo Box and Frame
- Composite Cargo Box w/ Cylinder Lift Assist
- Quick Latch Tailgate w/ Single Latch
- Integrated Box Accessory System
- Rear Receiver Hitch - 2 in.
- Full Chassis Skid Plates
- ROPS (Roller Over Protective Structure)

Warranty
- 1 year/1000 hours

UV34 Gas EPS Cab & Heat Package	M1503-P01-C03	1	6,888.00	6,888.00
	Total for UV34 Gas Utility Vehicle			**22,153.12**

Quote Total - USD	22,153.12
Dealer P.D.I.	0.00
Destination Charges	0.00
Quote Total - USD	**22,153.12**

Comment:
*Plus applicable taxes. IF Tax Exempt, please include Tax Exempt Certificate with the order.

*Prices per the Iowa NASPO Grounds Equipment Contract # E194-81037

*All orders should include 1) Accounts Payable Contact and email address, 2) W9 with correct legal entity name, and 3) Bill to Address.

*Orders may be placed with the contract holder or authorized dealer as allowed by the terms and conditions of the contract. *A Copy of all orders must be provided to Heather.Messmer@Doosan.com.

*Contact Holder Information: Clark Equipment Company dba Bobcat Company, Govt Sales, 250 E Beaton Drive, West Fargo, ND 58078. TID# 38-0425350.

*Payment Terms: Net 60 Days. Credit cards accepted.

*Remittance address: Clark Equipment Company d/b/a Bobcat Company, P. O. Box 74007382, Chicago, IL 60674-7382

*Questions can be submitted via email to randy.fuss@doosan.com or by phone at: 1-800-965-4232

Customer Acceptance:
Quotation Number: **MB272256** Purchase Order:_____

Authorized Signature:

Print:_____ Sign:_____

Date:_____ Email:_____

Addresses:

Delivery Address:_____

Billing Address (if different from ship to):_____

Tax Exempt: Y ☐ / N ☐

Exempt in the State of:_____

Tax Exempt ID:

REXCO
EQUIPMENT, INC.

Rexco Equipment, Inc and Boss Brand Partners in bringing solutions to you!
We are pleased to present you with the estimate for your trailer needs.
Installed UV34 Blade and Hitch Mount Salter options
Customer Name:_____City of Anamosa_____
Customer Agreement:_____
Should you have any questions, let us know.
$4,900 for Blade unit and kits
$1,250 for install
$6,150 Total

Item	Description	Qty
BOSS 6-6 V UTV ...		
MSC12480	BLADE CRATE (SNOWPLOW),6-6,UTV STL V-XT	1.00
MSC12060	PLOW BOX, RT3-V, UTV, BOSS, 2010+	1.00
MSC25007	KIT-WIRING,UTV,12V	1.00
MSC09601	CONTROL-HANDHELD,V-BLADE,12V	1.00
	Boss 6-6 V-Blade UTV Steel	
LTA12650	UC/RT3,UTV,POLARIS RANGER XP 900,13+	1.00
MSC13171	POWER/GROUND EXTENSION KIT,90,4 GA	1.00
MSC13099	SNOW DEFLECTOR KIT,6'6,UTV,POWER-V,XT	1.00

Hitch Mount Drop spreader 2.5 Cubi foot
$4,200 Unit
$300 Install
$4,500 Total

Item	Description
DPS21250	DROP SPREADER,2.5 CU FT
MSC21428	KIT-CONTROL,2.5/6.0 DPS
DPS22730	KIT-2" SLIDE-IN,ADJUSTABLE HEIGHT
FREIGHT-TRUCK	Freight - Inbound - TRUCK
	DPS22730 Will Need Ordered.
	1 Week Lead Time.

Hitch Mount Drop spreader 6.0 Cubic Foot
$4,500 Unit
$300 Install
$4,800 Total

Item	Description
DPS21350	DROP SPREADER,6.0 CU FT
MSC21428	KIT-CONTROL,2.5/6.0 DPS
DPS22730	KIT-2" SLIDE-IN,ADJUSTABLE HEIGHT
FREIGHT-TRUCK	Freight - Inbound - TRUCK
	DPS22730 Will Need Ordered.
	1 Week Lead Time.

Aaron Prull
319-826-0679
Aaron@rexcomail.com

Shannon McDonald
319-855-2219
Shannon@rexcomail.com

1925 Blairs Ferry Rd NE
Cedar Rapids, IA 52402
319.393.2820

www.rexcoequipment.com

1/16/24
11:11 am

METRO HARLEY DAVIDSON
Deal Accessory List

Page 1

Deal Number 10792
Contract Date 1/16/24
Delivery Date 1/16/24
Salesperson Ramirez, Paul

VIN/Serial 3JBUKAX43PK004320
Model DEF HD10 XT
Make CAN-AM
Date Expected

Ref# 004320
Year 2023
Color CAMO
Date In 7/15/23

Customer 92307
ANAMOSA, CITY OF

Phone
Fax

Work

Ext

Status	Item Number	Vendor	Description	Qty	Bin Loc 1	Bin Loc 2	Install?	Ext List		Total
	715004462	CANAM	WINDOW HARNESS	1.00	TC2		N	73.99	0.00	73.99
	715002461	CANAM	FLIP WINDSHIELD WITH WIPE	1.00	12C2		N	2,099.99	0.00	2,099.99
	715003264	CANAM	ROOF POWER CABLE KIT	1.00	6F4		N	59.99	0.00	59.99
	715004474	CANAM	SNOW PLOW_72 INCH B-160 K	1.00	16A2		N	479.99	0.00	479.99
	715007281	CANAM	REAR WINDOW KIT UR	1.00	12A4		N	459.99	0.00	459.99
	715007745	CANAM	SUPPORT_SNOW PLOW KIT UR	1.00	12A2		N	169.99	0.00	169.99
	715009259	CANAM	DOOR_SOFT F KIT UR	1.00	12A3		N	1,269.99	0.00	1,269.99
	715008118	CANAM	FRAME_PUSH KIT SSV	1.00	15A3		N	559.99	0.00	559.99
	772150	CANAM	COOLANT EXTENDED LIFE PRE	4.00	1H5		N	43.96	0.00	43.96
	LABOR115	METRO	LABOR PLACEHOLDER DEAL	20.50			N	2,357.50	0.00	2,357.50
	SSW0021-00	INFRNO	DEFENDER HTR	1.00			N	479.99	0.00	479.99

Retail Total	8,565.37
Discount Total	0.00
Total	8,565.37

5,565.37

Soft door Kit
Straight blade

No Sander

THIS IS NOT AN INVOICE

1/16/24
11:10 AM

METRO HARLEY-DAVIDSON
2415 WESTDALE DR SW
CEDAR RAPIDS, IA 52404-0020
(319) 362-9400

VEHICLE SALES QUOTE

CUSTOMER		ANAMOSA, CITY OF		
		77		
VEHICLE		2023 CAN AM DEF HD10 XT		
	Stock	034320		
	Color	CAMO		
	Cycls	2		
	Mileage	1		
	VIN	3JBUKAX43PK004320		
TRADE				
	Color			
	Cycls			
	Mileage			
	VIN			
SALES INFO		Sell Price	21,799.00	21,799
		Accessories & Labor	0.00	
		Total Deal Add-On	8,055.37	8055.37
		ESP	0.00	
		PPM	0.00	
		Payment Protection	0.00	
		Charges & Fees	148.50	148.50
		Total Taxes	0.00	
		Trade Allowances	0.00	
		Trade Payoff	0.00	
		Total Deposits	0.00	
		Cash Down	0.00	
		Rebate	0.00	
		Total Due	0.00	
		Amount Financed	30,000.87	30,000.87
		60 Monthly Payment(s) of	500.01	
		APR	0.00%	
GOOD UNTIL	1/16/24			
QUOTE BY				
NOTES				

** This quote is based on information provided and is not a final [illegible]

JOHN DEERE

Quote Summary

Prepared For:

Steve Agnitsch
CITY OF ANAMOSA
Steve Agnitsch
107 S FORD ST
ANAMOSA, IA 52205
Business: 319-558-8335
STEVE.AGNITSCH@ANAMOSA-IA.ORG

Prepared By:

Philip Rave
Bodensteiner Implement Co.
1047 South Main Street
Monticello, IA 52310
Phone: 319-465-3515
Mobile: 563-920-5673
ravep2@bodimp.com

Quote Id:	30202064
Created On:	09 January 2024
Last Modified On:	09 January 2024
Expiration Date:	24 January 2024

Equipment Summary	Selling Price		Qty		Extended
2024 JOHN DEERE GATOR™ XUV835M HVAC (Model Year 2024) - 1M0835MDJRM070689	$ 28,500.00	X	1	=	$ 28,500.00
WESTERN IMPACT 6' V-PLOW	$ 7,000.00	X	1	=	$ 7,000.00
Equipment Total					**$ 35,500.00**

Quote Summary	
Equipment Total	$ 35,500.00
Document Fees	$ 0.00
Registration Fees DNR	$ 0.00
SubTotal	$ 35,500.00
Est. Service Agreement Tax	$ 0.00
Total	$ 35,500.00
Down Payment	(0.00)
Rental Applied	(0.00)
Balance Due	**$ 35,500.00**

no spreader

Salesperson : X _____ **Accepted By : X** _____

JOHN DEERE

Selling Equipment

Quote Id: 30202064 **Customer:** CITY OF ANAMOSA

2024 JOHN DEERE GATOR™ XUV835M HVAC (Model Year 2024) - 1M0835MDJRM070689

Hours: 0
Stock Number: 655365W

Code	Description	Qty
57KGM	2024 JOHN DEERE XUV 835M HVAC MY24	1
	Standard Options - Per Unit	
182A	LESS AUTOTRAC/GREENSTAR HARN	1
183B	LESS JDLINK HARDWARE	1
0202	COUNTRY CODE- US	1
0505	BUILD TO ORDER	1
1062	TIRES,HARD SURF,ALLOY,14"YEL	1
1950	LESS APPLICATION	1
2031	SEAT,FRONT,40/60 SPLIT,BLACK	1
2350	PARK POSITION IN TRANSMISSIO	1
2500	COMPNTS,XUV,835M, G&Y	1
3003	BOX SPRAY LINERBRAKE/TAILGHT	1
3101	CARGO BOX POWER LIFT	1
4022	DOOR,FULL CAB,SIDE MIRR	1
4062	SELECT HVAC CAB	1
5006	FRONT BRUSH GUARD	1
6349	LESS WINCH	1
	Technology Options	
1880	LESS STARFIRE RECEIVER	1
1900	LESS DISPLAY	1
	Dealer Attachments	
BM26268	Harness Kit - HARNESS KIT, DASH ATTACHMENT PORT	1
	Other Charges	
	Freight	1
	Setup	1
	Admin Fee	1

Original Factory Build Codes

Code	Description
0202	COUNTRY CODE- US
0505	BUILD TO ORDER
1062	TIRES,HARD SURF,ALLOY,14"YEL

JOHN DEERE

Selling Equipment

Quote Id: 30202064 **Customer:** CITY OF ANAMOSA

182A	LESS AUTOTRAC/GREENSTAR HARN
183B	LESS JDLINK HARDWARE
1880	LESS STARFIRE RECEIVER
1900	LESS DISPLAY
1950	LESS APPLICATION
2031	SEAT,FRONT,40/60 SPLIT,BLACK
2350	PARK POSITION IN TRANSMISSIO
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3101	CARGO BOX POWER LIFT
4022	DOOR,FULL CAB,SIDE MIRR
4062	SELECT HVAC CAB
5006	FRONT BRUSH GUARD
6349	LESS WINCH

WESTERN IMPACT 6' V-PLOW

Hours: 0
Stock Number:

Code	Description	Qty
1	IMPACT 6' V-PLOW	1
	Other Charges	
	Setup	1

Please Remit To:
HR Green, Inc.
PO Box 8213
Des Moines, IA 50301-8213
319-841-4000

Jeremiah Hoyt
City of Anamosa, IA
1124 N. Williams
Anamosa, IA 52205-1841

January 11, 2024
Project No: 191791
Invoice No: 170858

Invoice Total: $312.00

Project 191791 Anamosa, IA - GIS Services

Email invoices to: Jeremiah.Hoyt@anamosa-ia.org

Water = robert.young@anamosa-ia.org
Wastewater Department=steve.agnitsch@anamosa-ia.org
Streets Department= shane.brown@anamosa-ia.org

Professional Services Through December 22, 2023

Phase 2023 GIS Services Annual Renewal

Task 02 Water Department - Supplemental Services

Professional Personnel

	Hours	Amount	
Senior Technician	2.00	300.00	
Totals	2.00	300.00	
Total Labor			**300.00**

Unit Charges

Technology & Communication Charge	12.00	
Total Unit Charges	**12.00**	**12.00**

Billing Limits	**Current**	**Prior**	**To-Date**
Total Billings	312.00	1,315.50	1,627.50
Limit			10,000.00
Remaining			8,372.50

Total this Task	**$312.00**
Total this Phase	**$312.00**
Total this Invoice	**$312.00**

MARTIN GARDNER ARCHITECTURE

City of Anamosa
107 South Ford Street
Anamosa, IA 52205

January 12, 2024
Project No: I191103
Invoice No: 2400010

Project I191103 Anamosa Downtown Revitalization Project Phase #2

Professional Services from December 01, 2023 to December 31, 2023

Task 600 Construction Administration

Professional Personnel

	Hours	Rate	Amount	
Employee				
Jordan, Bethany	9.50	150.00	1,425.00	
Totals	9.50		1,425.00	
Total Labor				**1,425.00**

Billing Limits	**Current**	**Prior**	**To-Date**	
Labor	1,425.00	1,312.50	2,737.50	
Limit			35,000.00	
Remaining			32,262.50	
		Total this Task		**$1,425.00**
		Total this Invoice		**$1,425.00**

Please remit payment to Martin Gardner Architecture, P.C., 700 11th St., Ste. 200, Marion, IA 52302
Accounts Receivable Contact: Justin Hoff, CDFA, COO | (319) 200-8494 | justinh@martingardnerarch.com

SNYDER & ASSOCIATES

IOWA | MISSOURI | NEBRASKA | SOUTH DAKOTA | WISCONSIN

INVOICE FOR PROFESSIONAL SERVICES

January 14, 2024

Jeremiah Hoyt
City of Anamosa, Iowa
107 South Ford Street
Anamosa, IA 52205

Invoice No: 121.1106.08 - 9

Project **121.1106.08** **2nd St Lift Station Improvements Phase 2**

Professional Services through December 31, 2023

Basic Services
Lump Sum Fees

Total Lump Sum Fees	67,500.00			
Percent Complete	100.00	Total Earned	67,500.00	
		Previous Fee Billing	67,500.00	
		Current Fee Billing	0.00	
		Total Lump Sum Fees		**0.00**
			Phase Subtotal	**0.00**

Basic Services Hourly

Bidding Services

	Task Subtotal	**0.00**
	Phase Subtotal	**0.00**

Easement Acquisition Services
Lump Sum Fees

	0.00			
Fee Each	1,500.00			
Total Lump Sum Fees	0.00			
		Total Earned	0.00	
		Previous Fee Billing	0.00	
		Current Fee Billing	0.00	
		Total Lump Sum Fees		**0.00**
			Phase Subtotal	**0.00**

Additional Services

Revisions

	Task Subtotal	**0.00**
	Phase Subtotal	**0.00**

Construction Services

Const Admin
Hourly Services

	Hours	Rate	Amount
Engineer VI	20.00	173.00	3,460.00

Project	121.1106.08	Ana-2ndStLiftStationImprovPh2		Invoice	9
Engineer II		2.75	123.00	338.25	
	Total Services	22.75		3,798.25	
					3,798.25
			Task Subtotal		**$3,798.25**
Const Staking					
			Task Subtotal		**0.00**
Const Obs					
Hourly Services					
		Hours	**Rate**	**Amount**	
Technician VII		23.50	120.00	2,820.00	
	Total Services	23.50		2,820.00	
					2,820.00
Fleet Mileage					
					383.83
			Task Subtotal		**$3,203.83**
			Phase Subtotal		**$7,002.08**
			Amount Due this Invoice		**$7,002.08**

	Total	Prior	Current
Billings to Date	**94,307.81**	**87,305.73**	**7,002.08**

Thank you. We appreciate the opportunity to serve you.

Accounts Receivable Inquiry: ar@snyder-associates.com

Project Manager: Nicholas Eisenbacher