CITY OF ANAMOSA

CITY COUNCIL AGENDA – REGULAR SESSION

MONDAY, April 12, 2021 – 6:00 P.M.
ANAMOSA LIBRARY & LEARNING CENTER (VIA ZOOM)
600 EAST 1ST STREET, ANAMOSA, IA 52205

Zoom Meeting Link	Join by Telephone
https://us02web.zoom.us/j/86858395163	+1 312 626 6799
Meeting ID: 868 5839 5163	Meeting ID: 868 5839 5163
Passcode: Anamosa	Passcode 2856449

If you wish to address the City Council, please use the "raise your hand" feature or comment indicating such. Once the Mayor has opened the issue for public comment, you will be called on and your microphone will be turned on. Before speaking, please state your name and address. Each speaker is limited to five (5) minutes per agenda item and is expected to refrain from the use of profane, obscene, or slanderous language.

1.0) ROLL CALL

2.0) PLEDGE OF ALLEGIANCE

3.0) APPROVAL OF AGENDA

4.0) MOTION TO APPROVE THE MINUTES FROM THE FOLLOWING MEETINGS:

4.1) March 22, 2021 – Regular City Council Meeting

5.0) PUBLIC HEARINGS:

6.0) PROCLOMATIONS: NONE

7.0) OLD BUSINESS:

7.1) **DISCUSSION** AND POSSIBLE ACTION ON WAYFINDING SIGNAGE CONTRACT AWARD (Derek Lumsden, JCED)

7.2) **DISCUSSION** AND POSSIBLE ACTION ON AMBULANCE FUNDING REQUEST (Eric Bremeister, Jones Reginal Medical Center)

7.3) **UPDATE** ON PLANNING FOR THE DOWNTOWN NODES (Shelly Carr, Park and Rec Director)

7.4) **DISCUSSION** AND POSSIBLE ACTION ON SEASONAL ALLEY CLOSURE REQUEST (LeeAnna Boone, Anamosa Chamber of Commerce)

7.5) **DISCUSSION** AND POSSIBLE ACTION ON SEASONAL PARKLET PLACEMENT (LeeAnna Boone, Anamosa Chamber of Commerce)

7.6) **DISCUSSION** AND POSSIBLE ACTION ON PROPOSAL TO PURCHASE THE CITY BUILDING LOACATED AT 100 E 1ST STREET (Currently the Police Station) (Kreg Tjelmeland, Kjore)

8.0) NEW BUSINESS

8.1) **DISCUSSION** AND POSSIBLE ACTION ON PROPOSED DEVELOPMENT AGREEMENT WITH BY DESIGN, LLC. (Kreg Tjelmeland, By Design, LLC)

8.2) **PROJECT** STATUS UPDATE FROM HR GREEN (Andrew Marsh, HR Green)

8.3) **REVIEW** AND APPROVAL OF PLANS AND SPECS FOR FIRE STATION ADDITION

8.4) **REVIEW** AND APPROVAL OF ENGINEERING AGREEMENTS WITH IIW ENGINEERING FOR FEMA GABION WALL PROJECT AND DIVISION STREET BRIDGE

8.5) **DISCUSSION** AND POSSIBLE ACTION ON UTILITY BILLING PROTEST FOR 202 N HUBER (Darryl Reinick)

8.6) **RESOLUTION** HIRING AND SETTING SALARY FOR WASTEWATER SUPERINTENDENT FOR FISCAL YEAR ENDING JUNE 30, 2021

8.7) **RESOLUTION** APPROVING THE TIME EXTENSION AND SETTING SALARY FOR FULL TIME TEMPORARY WATER OPERATOR FOR THE FISCAL YEAR ENDING JUNE 30, 2021

8.8) **RESOLUTION** APPROVING THE HIRING AND SETTING SALARIES OF SEASONAL PART TIME EMPLOYEES FOR THE PARKS AND RECREATION DEPARTMENT FOR THE 2021 SUMMER SEASON

8.9) **REVIEW** AND APPROVAL OF RAGBRAI AGREEMENT

8.10) **DISCUSSION** AND POSSIBLE ACTION WITH REGARD TO ITEM 3 OF THE RAGBRAI AGREEMENT TITLED CHARITABLE DONATION.

8.11) **FIRST READING OF AN ORDINANCE** AMENDING THE CODE OF ORDINANCES OF THE CITY OF ANAMOSA, IOWA UNDER GENERAL CODE PROVISIONS BY ADDING A NEW CHAPTER, CHAPTER 10 ENTITLED "RAGBRAI - MISCELLANEOUS PERMITS and REGULATIONS"

8.12) **REVIEW** AND APPROVAL OF MARCH TREASURER'S REPORT

8.13) **REVIEW** AND APPROVAL OF CURRENT BILLS

9.0) CITY ADMINISTRATOR'S REPORT:

10.0) MAYOR AND COUNCIL REPORTS:

10.1) MAYOR'S REPORT

10.2) COUNCIL REPORTS

11.0) PUBLIC COMMENT FOR ITEMS NOT ON THE AGENDA

12.0) ADJOURNMENT

STATEMENT OF COUNCIL PROCEEDINGS
March 22, 2021

The City Council of the City of Anamosa met in Regular Session March 22, 2021 at the Anamosa Library and Learning Center and via Zoom at 6:00 p.m. with Mayor Rod Smith presiding. The following Council Members were present: John Machart, Rich Crump (via Zoom), Jeff Stout (via Zoom), Kay Smith, Alan Zumbach, and Galen Capron. Absent: none. Also present were Beth Brincks, City Administrator/Clerk; Rebecca Vernon, Library Director and Jeremiah Hoyt, Police Chief. Due to the restrictions on public gatherings, the public utilized Zoom to participate in the meeting from their homes. Iowa Code Chapter 21, as interpreted, permits public meetings to be held electronically.

Mayor Rod Smith called the meeting to order at 6:00 p.m. Roll call was taken with a quorum present. All votes will be called as roll votes.

Pledge of Allegiance.

Director Vernon gave some brief instructions on use of Zoom and how to participate in the meeting.

Motion by Zumbach, second by Capron to approve the agenda. Ayes: all. Nays: none. Motion carried.

Motion by Machart, second by Zumbach to approve the minutes of the March 8, 2021 Regular City Council meeting. Ayes: all. Nays: none. Motion carried.

The Mayor opened the public hearing on the proposed Annual Budget for Fiscal Year 2022. The Mayor asked if any comments had been received by the City Clerk and no verbal or written comments were received prior to the meeting. The Mayor asked if any member of the public or City Council had any comments and none were given. With there being no further comment, Crump made a motion, second by Zumbach to close the public hearing. Ayes: all. Nays: none. Motion carried.

Motion by Smith, second by Zumbach to approve Resolution 2021-11 approving the proposed Annual Budget for Fiscal Year 2022. Roll vote. Ayes: Capron, Stout, Crump, Smith, Machart, and Zumbach. Nays: none. Motion carried.

Motion by Smith, second by Capron to approve Resolution 2021-12 authorizing the Fiscal Year 2022 budgeted transfers. Roll Vote. Ayes: Crump, Stout, Smith, Machart, Capron, and Zumbach. Nays: none. Motion carried.

Motion by Crump, second by Stout to approve the bid documents for the wayfinding signage and to solicit bids. Derek Lumsden of Jones County Economic Development presented the bid documents and explained that the fabrication and installation bids would be separated. Sign size and location were discussed. Ayes: all. Nays: none. Motion carried.

The monthly memo was presented to Council from Snyder and Associates. Brincks answered questions on the projects as per her last discussion with Snyder.

Motion by Crump, second by Stout to approve moving forward with a proposal presented by MDSI for the rent and renovation of the 2nd floor of City Hall. Kreg Tjelmeland of MDSI gave an introduction and an overview of the needs of his company for office space for approximately 12 months while their new offices are under construction. MSDI will pay the cost of $36,000 in upgrades in lieu of rent and the City will need to cover the other $12,500 in costs. This is a mutually beneficial arrangement. Ayes: all. Nays: none. Motion carried.

Kreg Tjelmeland representing Kjore presented a request for the purchase of the currently Police Station building. He would like to restore the building historically and eventually turn it into commercial space. The City Council requested that the Library Board be informed of the proposal since it was originally built for the Library. An appraisal will be done and once the Library Board has meet it will be on the April 12th Council Agenda.

LeeAnna Boone of the Anamosa Chamber discussed a request to have the alley next to the theater building closed and turned into a pocket park for the summer. They will be in charge of cleaning and maintaining the area. Kreg Tjelmeland has volunteered to work with them on seating ideas. Brinks will look into insurance concerns and this item will be back on the agenda on April 12th.

Motion by Smith, second by Zumbach to approve Resolution 2021-13 hiring and setting for Park and Rec Assistant Director, Lindsay Duncan. Ayes: Capron, Machart, Smith, Zumbach, Crump, and Stout. Nays: none. Motion carried.

Motion by Smith, second by Zumbach to approve a settlement and release agreement. Ayes: all. Nays: none. Motion carried.

Motion by Capron, second by Zumbach to approve the February 2021 Treasurer's Report. Ayes: all. Nays: none. Motion carried.

Motion by Zumbach, to approve the current bills, second by Stout. Ayes: all. Nays: none. Motion carried.

City Administrators Report: Brincks reported that RAGBRAI planning has begun. There will be an agreement coming at the next meeting from RAGBRAI once it has been reviewed by the City Attorney. We are still working through the derecho insurance and FEMA claims. IIW of Dubuque is working with FEMA on the gabion wall project. City will have a 15% match for funding. A contractor will begin working with our insurance carrier to get repairs going. The roof replacements should begin in the next few weeks. The audit has begun and will last through next week. This month's department meeting budget amendments were discussed as well as general updates.

Mayor and Council Reports: The Mayor reported that RAGBRAI subcommittees have been meeting and are in need of volunteers. Positively Anamosa is a Facebook page and would like to have people share positive things going on in the community. Send items to Jackie Schneiter or Lisa McQuillen to share.
Smith reported that the Library Board met and Rebecca and Steve had launched the digital yearbook site has been very successful. Zumbach reported that he had also attended a RAGBRAI meeting and he will be hosting camping and showers.

There were no Public comments for items not on the agenda.

Motion by Machart, second by Zumbach to adjourn. Ayes: all. Nays: none. Motion Carried. Meeting adjourned at 7:01 pm.

Rod Smith, Mayor

ATTEST:

Beth Brincks, City Clerk

Bid No.: 2021-1
Bid Title: Wayfinding Signage for Anamosa

FORMAL SEALED BID
BID WORKSHEET

Bid No.	2021-1
Bid Title	Wayfinding Signage for Anamosa
Bid Due Date and Time	April 7, 2021 at 2pm
Contact	Derek Lumsden
E-mail Address	director@jonescountydevelopment.com

BID INVITATION:

This is an invitation to submit sealed bids for furnishing the materials and/or services specified herein subject to the terms and conditions defined in the solicitation documents.

BID SUBMISSION INSTRUCTIONS:

Bid shall be mailed or delivered to:
City of Anamosa, Derek Lumsden, 107 S. Ford Street, Anamosa, IA 52205
Bid envelope must reference the Name & Address of Bidder, Bid Number, Title, and Bid Opening Date and Time. Bid must be received at the above address on or before the bid opening date and time. Bid must be signed in ink. Bidder must complete and include with its bid, the forms provided in Section V – Forms and Legal Appendices.

The undersigned bidder affirms and declares that s/he has carefully examined the advertised invitation for bids, the bid terms and conditions and detailed specifications and certifies that this bid is signed with full knowledge and acceptance of all the provisions thereof and offers and agrees, if this bid is accepted within 90 days from the bid opening date, the undersigned offers and agrees to furnish any of the items in which prices are quoted at the price and delivery time indicated, subject to all the terms and conditions herein.

BID MUST BE SIGNED BY SOLE PROPRIETOR, PARTNER OR OFFICER AUTHORIZED TO SIGN FOR CORPORATION

NAME OF BIDDING FIRM Latimer Associates, Inc. (dba: ASI Signage Innovations)

ADDRESS 1219 Zimmerman Drive South

CITY Grinnell STATE IA ZIP CODE 50112 PHONE NO. 641-236-6616

E-MAIL michael.mckeag@asisignage.com FEDERAL TAX IDENTIFICATION NUMBER 42-1241530

In executing this bid, the Bidder warrants that the prices submitted herein are not higher than those offered to any governmental or commercial consumer for like deliveries. The prices herein do not include any Federal excise taxes or sales tax imposed by any State or Municipal Government.

SIGNATURE OF AUTHORIZED INDIVIDUAL

President/CEO
TITLE

Michael S. McKeag
PRINT NAME OF SIGNER

April 5, 2021
DATE

Bid No.: 2021-1
Bid Title: Wayfinding Signage for Anamosa

SECTION III
BID PRICES

Bidder shall submit and indicate that the following information has been submitted with its bid:

(1) The primary contact who shall be the contract liaison with the City.

(2) Lump Sum Bid for all the work required under this bid

Lump Sum Bid Amount for all work required herein shall include:
- all equipment and materials;
- labor (including but not limited to concrete and any electrical work);
- tools; and
- any other incidentals required to complete all the work described herein.

The City will not reimburse the Contractor for any additional costs beyond the amounts indicated in this Section III – Bid Prices.

***Lump Sum Bid:** $ 114,335

Fabrication Bid: $ 86,160

Installation Bid: $ 28,175

*The Fabrication Bid and Installation Bid should equal the Lump Sum Bid.

End of Section III

****$16,280 of the Fabrication bid amount is strictly for the (2) attic stock signs.**

Quote No. IOWA 91137

March 5, 2021

Customer Jones County Economic Development
Location Primary Location
Reference Jones County: Anamosa Wayfinding

Bill to
Anamosa Downtown Task Force
Derek Lumsden
121 E. Main St
Anamosa, IA 52205
US
T: 319-480-7446
Email: director@jonescountydevelopment.com

Ship to
Anamosa Downtown Task Force
Derek Lumsden
121 E. Main St
Anamosa, IA 52205
US
T: 319-480-7446
Email: director@jonescountydevelopment.com

Valid Until	**05/04/2021**	**Revision Date**	03/05/2021	**Lead Time**	6 - 7 Weeks	**SR**	Bryce Carlson
F.O.B.	Job Site	**Revision No**		**Ship Method**	Installed	**PM**	Andrew Walter
Terms	Payment in Advance / Pending Credit Approval						
Estimator	Mike McKeag						

No.	Item	Description	Qty	UOM	Unit Price	Extension
1.	Sign Type E21.1	Sign Type E21.1 83"(h) x 47"(w) Custom Legacy Product Series Illumination: None Background Color: ASI Standard Graphics Color: ASI Standard Mounting: custom brackets to client post See drawings for detail	6	Each	8,140.00	48,840.00
2.	Sign Type E21.2	Sign Type E21.2 59-1/4"(h) x 35-1/4"(w) Custom Legacy Product Series Illumination: None Background Color: ASI Standard Graphics Color: ASI Standard Mounting: custom brackets to client post See drawings for detail	2	Each	4,745.00	9,490.00
3.	Sign Type E21.3	Sign Type E21.3 42"(h) x 22"(w) Custom Legacy Product Series Illumination: None Background Color: ASI Standard Graphics Color: ASI Standard Mounting: custom post See drawings for detail	6	Each	1,925.00	11,550.00

continued on next page

Quote No. IOWA 91137

March 5, 2021

Customer Jones County Economic Development
Location Primary Location
Reference Jones County: Anamosa Wayfinding

No.	Item	Description	Qty	UOM	Unit Price	Extension
4.	Installation (Boom Truck)	Standard Boom Truck Installation: Set (6) E21.1 post & panel signs Hang (2) E21.2 sign panel assemblies Set/embed (6) E21.3 sign assemblies NOTE: Local Sign Permit Fees Not Included	1	Each	28,175.00	28,175.00
5.	Attic Stock per bid instructions E21.1	Sign Type E21.1 83"(h) x 47"(w) Custom Legacy Product Series Illumination: None Background Color: ASI Standard Graphics Color: ASI Standard Mounting: custom brackets to client post See drawings for detail	2	Each	8,140.00	16,280.00

Subtotal	114,335.00
Sales Tax (0 %)	0.00
Total	**114,335.00**

Quote Valid Until: May 4, 2021

By signing below, I approve and authorize this quote and acknowledge that I have read and agree to the attached terms and conditions.

Submitted by	Date	Approved by	Date
	04/01/2021		

Print Name

continued on next page

Quote No. IOWA 91137

March 5, 2021

Customer	Jones County Economic Development
Location	Primary Location
Reference	Jones County: Anamosa Wayfinding

Conditions

All pricing requires the customer provide final, usable, artwork in electronic form (i.e. Adobe illustrator file in outlines). Additional services for artwork touch-up or altering may incur additional charges.

ASI Signage Innovations (Latimer Associates, Inc.) will add a _PROJECT CHANGE FEE_ on any order, project, or contract job whereby a material change to the product is requested after receipt of approved submittals & release to production. Overall charges will vary based on a case-by-case basis but it will be determined on materials & labor already consumed along with $100 per hour for administrative time.

Lead times are defined as the period of time to complete fabrication and delivery of product. This time period follows final approval of all details required to make the product. Lead times do not include time for design services, approvals, price negotiations, message schedule development, location plan development, etc.

ASI will charge customers $75 for each paint color (swatch) request and $100 for digital print ink color matching requests. This includes all of our standard colors along with any Pantone or CMYK color requests.

Pricing is based on exact quantities shown. Changes in services, quantities or delivery timeline may alter the per unit price.

This quotation is valid for 60 days from the date of its creation.

Final delivery dates are determined by ASI PROJECT MANAGEMENT. The final date is estimated upon receipt of the order via an electronic order acknowledgment, and finalized after the LAUNCH DATE.

Standard purchaser credit agreement applicable to all customers and projects.

A minimum order charge may apply and will be added to the final invoice.

asi®
Signage Innovations™

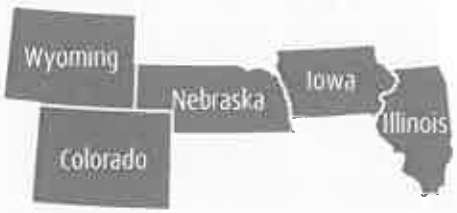
Bringing brand visions to life through expertly designed plans, quality signage materials and polished installations that stand the test of time.

CORE SERVICE OFFERINGS

// CLIENT NEEDS ASSESSMENT
// PLANNING & WAYFINDING
// DESIGN
// PROJECT MANAGEMENT
// FABRICATION
// INSTALLATION
// ONGOING SIGNAGE MANAGEMENT

NETWORK
55 YEARS
IN BUSINESS

LATIMER GROUP
35 YEARS
IN BUSINESS



SALES & INSTALL OFFICES IN:

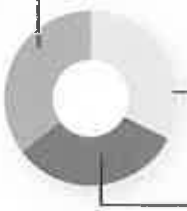
- Des Moines, IA
- Grinnell, IA
- Iowa City, IA
- Omaha, NE
- Denver, CO
- Chicago, IL
- Streator, IL

OUR VALUE PROPOSITION

Creating direction by planning and designing architectural signage to enhance the customer experience for the brands we serve.

GLOBAL
ABLE TO SERVICE SIGNAGE PROGRAMS GLOBALLY

OOS Online Ordering Service
INTUITIVE WEB-BASED TOOL TO STREAMLINE RE-ORDERS



INNOVATIVE
Staying ahead of industry/market developments by creating custom designed products, using new materials, and updating production techniques.

FUN
Every day, every project, every client is an opportunity to push ourselves and our capabilities, what could be more fun than that?

RESPONSIBLE
Take care of our customers, take care of our employees, take care of our planet.

Bonding capabilities **$2 million aggregate**

Last 5 years sales average **$14 million**

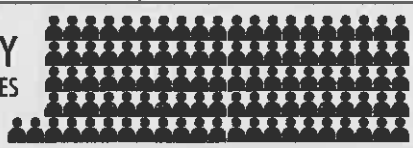
Employer Modification Rate **0.86**

Ultimate Strategic Position

As a signage project partner, we collaborate to plan, design, manufacture and install high-quality, long-lasting signage products. Our difference is our passion for introducing new designs, discovering new materials, and delivering high-quality fabrications for architectural signage that elevates brands to enhance their customers' experience.

1985 2 EMPLOYEES ····· TODAY 102 EMPLOYEES

EMPLOYEES



Average Tenure of employees 15 years

Leadership team tenure 19 years

OUR PROMISE
What You Get With ASI

Versatility
Responsiveness
Expertise
Quality

800.236.6616 | ASISIGNAGELATIMERGROUP.COM

Anamosa Area Ambulance Service Annual Funding Request

Financial Situation, 2019-2017

	2019	2018	2017
Total Operating Revenue	$628,650	$611,449	$643,195
Expenses			
Salaries, Wages, Benefits	$816,270	$832,306	$737,616
Supplies	$27,354	$24,186	$29,631
Purchased Services	$45,730	$42,368	$23,193
Building & occupancy	$28,723	$26,419	$27,520
Repairs/Maint	$56,104	$55,784	$41,861
Other	$17,644	$12,505	$75,690
Depreciation	$66,544	$60,278	$44,734
Total Oper. Exp.	$1,058,369	$1,053,846	$980,245
Income (Loss) from Oper.	($429,719)	($442,397)	($337,050)

Ambulance Funding History

- In rural areas, typically started as a volunteer service
- Costs/training have increased, volunteer services started to bill
- Some communities lost their volunteers, turned to larger services
  - Backup coverage, expertise, “guaranteed” coverage
- Reimbursement has not kept up with expense for rural services
  - Must be larger to be profitable

AAAS Annual losses

- Average loss of $403,055 over last 3 years
- Smaller ambulance services need some type of support
  - Many counties/townships around us already support EMS (Delaware, Jackson, Iowa, Linn-counties, 6 townships in Jones Co, 7 in Delaware Co)
- Losses have occurred every year since JRMC took over AAAS from City of Anamosa for $1
- We are asking for help with 911 call expense
  - 667-911 calls, 642 transfers, 1,309 total (51.0% of all calls are 911 calls)
- 51% of $403,055=Average $205,558 annually

Calculations for support

- Use a formula similar to fire
  - Tested, trusted
  - Fair allocation of cost based on usage and population
- Only allocate expenses associated with 911 calls,
  - (51.0% of all calls are 911 calls)
- The calculation is as follows:
  - (population % of total ambulance service area-16,057) + (% of 911 calls)/2
  - Multiply by average (over 3 years) annual loss

Funding ask for City of Anamosa

- Population—5,533 (34.5% of 16,057 served)
- 911 calls—405 (60.7% of 667-911 calls)
- Annual loss, 3 year average--$205,558
- So,
  - (34.5%+60.7%)/2=47.6%
  - 47.6% X $205,558=$97,824

Questions?

Kjore Partners

3/9/21

City of Anamosa
Attn: Beth Brinks

Kjore Partners appreciates your time and attention for a proposal regarding property located at 100 E. 1st Street in Anamosa.

Kjore Partners recently had the opportunity to visit the Police Department where Chief Hoyt provided a tour and reviewed the building history and current state of the facility. We are thankful for his time and willingness to show us this historic structure.

After visiting the building, Kjore Partners further recognizes the significance of the building to the town and its residents. Kjore has a vested interest in maintaining historical aspects of the city and broader area. In the case of this building, we would like to see the exterior completely renovated to its historical aesthetic and quality. As you are aware, the building is in critical need of repairs on the exterior and interior, and Kjore wishes to save the building from further damage.

Kjore Partners propose:

In exchange for the City of Anamosa selling the building and property to Kjore Partners for 1 dollar, Kjore Partners would guarantee the following investments in repair and restoration of the building:

- Replacement or repair of the terra cotta tile roof.
- Replacement or repair of all gutters and downspouts with era specific materials. (Tin or copper)
- Replacement of all windows with energy efficient windows that present a historically accurate aesthetic.
- Restoration of the front entrance to be reflective of historical vestibule and door aesthetic.
- Restoration of the limestone exterior.
- Restoration of the original library plaque to its previous placement on the fireplace.

Kjore will initiate these repairs starting in 2021, and fully complete them no later than 2024 in exchange for the sale of 1 dollar.

In turn, Kjore will immediately lease the facility back to the City of Anamosa for 1 dollar per month for a period of 12 months.

This allows the Police Department to stay in place and repairs to begin. Coordination with the Chief of Police will assure day-to-day operations are not disrupted.

The City of Anamosa will be responsible for the day-to-day care and maintenance of the facility, as it is today, until the Police Department relocates to another facility.

Kjore's long-term plans for the facility are to have the exterior maintained in historical accuracy and to complete interior restorations for a revenue-generating business which is important to cover restoration and maintenance costs. And, to bring additional revenue to the city increasing liveliness and energy to the town.

Kjore asks the City of Anamosa for future support in licensing needs related to operating a commercial enterprise, within the scope of city jurisdiction.

Kjore is ready to prioritize investments in this facility. We would appreciate a response to this proposal within 30 days.

Please let us know if you have any questions or would like to discuss the proposal in further detail.

Regards,

Kreg Tjelmeland
Kjore Partners

Beacon™ Jones County, IA

Summary

Parcel ID	0227105013
Property Address	116 E GRAND ST MONTICELLO IA 52310
Sec/Twp/Rng	N/A
Brief	VARVELS ADD LOT 101 EXC E 30'
Tax Description	(Note: Not to be used on legal documents)
Deed Book/Page	2020-3222 (10/5/2020)
Contract	
Book/Page	
Gross Acres	0.00
Net Acres	0.00
Class	R - Residential (Note: This is for tax purposes only. Not to be used for zoning.)
District	MONCO - MONTICELLO CITY/MONTICELLO SCH
School District	MONTICELLO SCHOOL

Owner

Deed Holder
Achenbach, Ryan C & Tina M
116 E Grand St
Monticello IA 52310

Contract Holder

Mailing Address
Achenbach, Ryan C & Tina M
116 E Grand St
Monticello IA 52310

Land

Lot Dimensions	Regular Lot: 80.00 x 130.00
Lot Area	0.24 Acres; 10,400 SF

Residential Dwelling

Residential Dwelling	
Occupancy	Single-Family / Owner Occupied
Style	1 Story Frame
Architectural Style	N/A
Year Built	1900
Effective Year	1900
Exterior Material	Stucco
Total Gross Living Area	2,702 SF
Attic Type	None;
Number of Rooms	7 above; 0 below
Number of Bedrooms	4 above; 0 below
Basement Area Type	Full
Basement Area	2,702
Basement Finished Area	
Plumbing	1 Full Bath;
Central Air	No
Heat	FHA - Gas
Fireplaces	
Porches	
Decks	
Additions	
Garages	

Sales

Date	Seller	Buyer	Recording	Sale Condition - NUTC	Type	Multi Parcel	Amount
9/22/2020	ZUMBACH, CODY A & LAURA C	ACHENBACH, RYAN C & TINA M	2020-3222	Normal	Deed		$46,150.00

Valuation

		2021	2020	2019	2018	2017	2016
	Classification	Residential	Residential	Residential	Residential	Residential	Residential
+	Assessed Land Value	$14,700	$14,700	$14,700	$20,540	$20,540	$20,540
+	Assessed Building Value	$0	$0	$0	$0	$0	$0
+	Assessed Dwelling Value	$19,420	$17,240	$17,240	$15,000	$15,000	$15,000
=	Gross Assessed Value	**$34,120**	**$31,940**	**$31,940**	**$35,540**	**$35,540**	**$35,540**
-	Exempt Value	$0	$0	$0	$0	$0	$0
=	Net Assessed Value	**$34,120**	**$31,940**	**$31,940**	**$35,540**	**$35,540**	**$35,540**

Taxation

		2019 Pay 2020-2021	2018 Pay 2019-2020	2017 Pay 2018-2019	2016 Pay 2017-2018
=	Taxable Value	**$17,591**	**$20,229**	**$19,768**	**$20,236**
x	Levy Rate (per $1000 of value)	35.82467	35.93577	34.05254	35.18460
=	Gross Taxes Due	**$630.19**	**$726.94**	**$673.15**	**$712.00**
-	Credits	$0.00	$0.00	$0.00	$0.00
=	Net Taxes Due	**$630.00**	**$726.00**	**$674.00**	**$712.00**

Tax History

Year	Due Date	Amount	Paid	Date Paid	Receipt
2019	March 2021 September 2020	$315 $315	Yes Yes	3/18/2021 10/1/2020	621089
2018	March 2020 September 2019	$363 $363	Yes Yes	3/27/2020 10/1/2019	521077
2017	March 2019 September 2018	$337 $337	Yes Yes	5/3/2019 9/26/2018	421164
2016	March 2018 September 2017	$356 $356	Yes Yes	3/20/2018 8/22/2017	321470

Homestead Tax Credit Application

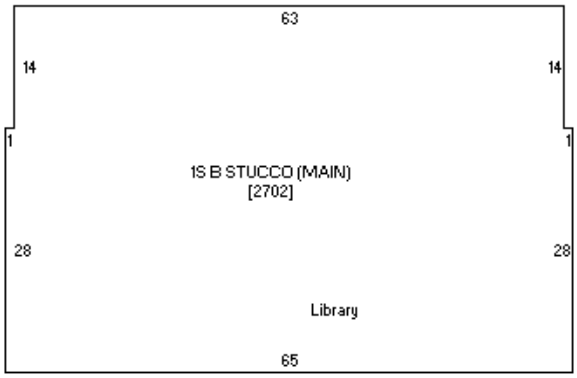
Apply online for the Iowa Homestead Tax Credit

Business Property Tax Credit Application

Apply online for the Iowa Business Property Tax Credit

Photos

Sketches



Sketch by www.camavision.com

No data available for the following modules: Commercial, Yard Extras, Agricultural Buildings, Tax Sale Certificates, Iowa Land Records.

Kjore Partners

3/9/21

City of Anamosa
Attn: Beth Brinks

Kjore Partners appreciates your time and attention for a proposal regarding property located at 100 E. 1st Street in Anamosa.

Kjore Partners recently had the opportunity to visit the Police Department where Chief Hoyt provided a tour and reviewed the building history and current state of the facility. We are thankful for his time and willingness to show us this historic structure.

After visiting the building, Kjore Partners further recognizes the significance of the building to the town and its residents. Kjore has a vested interest in maintaining historical aspects of the city and broader area. In the case of this building, we would like to see the exterior completely renovated to its historical aesthetic and quality. As you are aware, the building is in critical need of repairs on the exterior and interior, and Kjore wishes to save the building from further damage.

Kjore Partners propose:

In exchange for the City of Anamosa selling the building and property to Kjore Partners for 1 dollar, Kjore Partners would guarantee the following investments in repair and restoration of the building:

- Replacement or repair of the terra cotta tile roof.
- Replacement or repair of all gutters and downspouts with era specific materials. (Tin or copper)
- Replacement of all windows with energy efficient windows that present a historically accurate aesthetic.
- Restoration of the front entrance to be reflective of historical vestibule and door aesthetic.
- Restoration of the limestone exterior.
- Restoration of the original library plaque to its previous placement on the fireplace.

Kjore will initiate these repairs starting in 2021, and fully complete them no later than 2024 in exchange for the sale of 1 dollar.

In turn, Kjore will immediately lease the facility back to the City of Anamosa for 1 dollar per month for a period of 12 months.

This allows the Police Department to stay in place and repairs to begin. Coordination with the Chief of Police will assure day-to-day operations are not disrupted.

The City of Anamosa will be responsible for the day-to-day care and maintenance of the facility, as it is today, until the Police Department relocates to another facility.

Kjore's long-term plans for the facility are to have the exterior maintained in historical accuracy and to complete interior restorations for a revenue-generating business which is important to cover restoration and maintenance costs. And, to bring additional revenue to the city increasing liveliness and energy to the town.

Kjore asks the City of Anamosa for future support in licensing needs related to operating a commercial enterprise, within the scope of city jurisdiction.

Kjore is ready to prioritize investments in this facility. We would appreciate a response to this proposal within 30 days.

Please let us know if you have any questions or would like to discuss the proposal in further detail.

Regards,

Kreg Tjelmeland
Kjore Partners

METAL DESIGN SYSTEMS
DESIGNED FOR A PERFECT FIT.

3/22/2021
City of Anamosa
Attn: Ms. Beth Brinks
107 South Ford Street
Anamosa, Iowa 52205

Re: Tax Increment Financing proposal

Council Members and Mayor,

Please accept this formal proposal from By Design LLC related to the building and property located at 103 Chamber Dr., formerly known as Bennett Manufacturing. By Design, LLC will be leasing the building to Metal Design Systems, Inc. (MDSI). MDSI manufactures and fabricates architectural metal/facades and ships nationwide. Both By Design LLC and MDSI have common ownership. Metal Design employs approximately 100 people and will be moving 90 of those jobs from Linn County to Jones County and anticipates growing its workforce after its move to Anamosa by hiring an additional 20 to 30 employees.

The overall plan is to renovate the existing manufacturing space to accommodate the needs of MDSI. This renovation is expected to be at a cost of $500,000 and will be completed prior to September of 2021. MDSI is expecting to move the manufacturing component to Anamosa at this time. We will simultaneously be adding a new 26,000 square foot office expansion with a budget of approximately $3,000,000 with 90% spent in 2021. Final completion of the office would be expected before the end of the first quarter of 2022. I have attached some images of the building for your review.

The new office will house our sales and engineering teams along with a new architectural design studio. There will also be a 150 seat auditorium that will be utilized for business and community events alike. Some of the other future items to expect would be the addition of a new paint and finishing line and building. This will bring another 10 jobs to the area and would have a future budget of $2,000,000 which would be spent over the next three years.

MDSI is extremely excited to be a part of the Anamosa and Jones county community. In moving from Cedar Rapids to Anamosa we see a great opportunity to serve the community with our facility and also provide a positive economic impact for the city and business community. Our request is that the City provides By Design with a 13 year graduated T.I.F. rebate as outlined below:

Year 1:	75%
Year 2:	85%
Year 3:	95%
Years 4-7:	100%
Year 8:	95%
Year 9:	90%
Year 10:	85%
Year 11:	80%
Year 12:	75%
Year 13:	70%

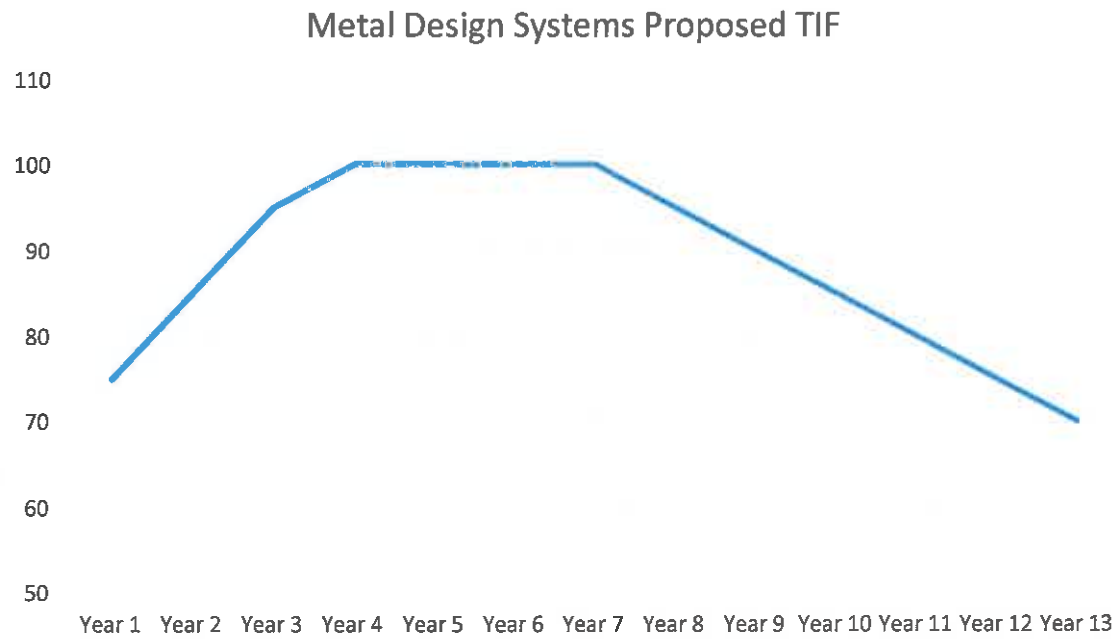
The graduated TIF allows the most benefit due to the phased nature of the project. By starting at 75% and increasing until the second build-out is complete, we can maximize our TIF rebate in the middle years at 100% and slowly graduate down through the remainder of the program. It allows us to get both building projects in one development agreement and keep the cost of administration to a minimum.
This allows Metal Design Systems and the City of Anamosa to realize some real tax benefits for the project.

4150 C Street SW
Cedar Rapids, IA 52404

319-362-7454
Toll Free 866-442-6803
Fax 319-396-2935

metaldesignsystems.com

METAL DESIGN SYSTEMS
DESIGNED FOR A PERFECT FIT.



A summary of the amounts involved is as follows:
Building purchase: $3,000,000 2021
Renovation/improvements to existing building $500,000 2021
Office Expansion $ 3,000,000 90% 2021
Paint and Finishing Line Expansion $2,000,000 (2023)

We see this as a great opportunity for a public/private collaboration that can bring great economic value to the local economy. MDSI works with many national brands in the retail and automotive sectors along with many architectural firms throughout the United States. Through normal business, MDSI brings these customers and architects to it facility and we are excited to introduce them to Anamosa and Jones County businesses and cultural opportunities.

We would appreciate your earliest consideration and response to this proposal. Our greatest desire is to allow us to include your conclusion along with our public release of our plans in the community at large. We also welcome you to learn more about MDSI at www.metaldesignsystems.com . Thank you once again for your valuable time and consideration.

4150 C Street SW
Cedar Rapids, IA 52404

319-362-7454
Toll Free 866-442-6803
Fax 319-396-2935

metaldesignsystems.com

Sincerely,

Kreg Tjelmeland
CEO

METAL
DESIGN
SYSTEMS

DESIGNED FOR
A PERFECT FIT.

4150 C Street SW
Cedar Rapids, IA 52404

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Toll Free 866-442-6803
Fax 319-396-2935

metaldesignsystems.com

HRGreen

HRGREEN.COM

To: Beth Brincks, City of Anamosa

From: HR Green

Subject: Anamosa Project Status

Date: April 6, 2021

1. Sycamore Street Rehabilitation

- Survey Received and Processed.
- Design process and plan sheet set-up initiated.

Action Items: HR Green to continue working on design and quantities. Establish preliminary ROW needs to kickstart any property discussions required.

2. Scott & Main Intersection Improvements

- Field Review with City Staff completed.
- Concept & Opinion of Preliminary Construction Cost (OPCC) developed and shared with Shane.

Action Items: City to review and comment on concept and OPCC.

3. 5-Way Intersection TEAP Study

- Site visit completed and aggregated base condition data from various sources.
- Draft Letter of Request to DOT developed, awaiting review from senior traffic engineering staff.

Action Items: HR Green develop draft letter of request and share with City to review. City will review then send to Iowa DOT for consideration. Funding will likely be released early July.

4. Jordan Well No. 6

- Met with City to discuss site plan for Remley Woods.
- Completed SRF Environmental Review Meeting.

Action Items: HR Green developing final design plans and specs for City review.

5. City GIS

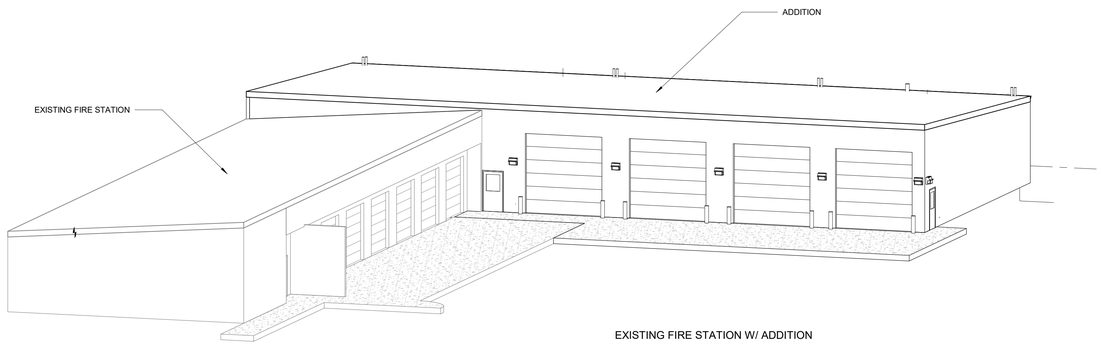
- Data Collection on City Hydrants (X, Y, Z, Year, Manufacturer, Sizes, and Photos)
  - 2/3rds completed.
  - Estimated to be complete by April 9th.
- New Subdivision by Chamber Dr Data Collection.

    - Need to Inspect and update information on Stormwater Assets and Sanitary Manholes.
    - Water has been completed.
- Annual GIS Services Work Order coming due in May.
    - Need to discuss next years agreement with Beth regarding (Water, Streets, Wastewater, and Planning and Zoning Departments).
    - Jim Henson is asking for the possibility of purchasing GPS equipment for internal data updates.
    - Mapping of Residential/Commercial curb stops as well as Mainline water valves.
    - Cemetery Project (Mapping of all Headstones in the Riverside Cemetery).

Action Items: HR Green to continue working on final design drawings and specifications. Nothing outstanding from the City on GIS at this time.

CITY OF ANAMOSA - FIRE STATION ADDITION

701 E. THIRD STREET, ANAMOSA, IA 52205



EXISTING FIRE STATION W/ ADDITION

NORTH

A1 PROJECT LOCATION
NOT TO SCALE

SHEET INDEX

CERTIFICATIONS

CIVIL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE DATE

PRINTED OR TYPED NAME: **Jeffery M Rath**

LICENSE NUMBER

MY LICENSE RENEWAL DATE IS DECEMBER 31,

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
C-SERIES

STRUCTURAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE DATE

PRINTED OR TYPED NAME: **Alexander C. Brase**

LICENSE NUMBER **23203**

MY LICENSE RENEWAL DATE IS DECEMBER 31, **2021**

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
S-SERIES

ARCHITECT

I HEREBY CERTIFY THAT THE PORTION OF THIS TECHNICAL SUBMISSION DESCRIBED BELOW WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND RESPONSIBLE CHARGE. I AM A DULY LICENSED ARCHITECT UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE DATE

PRINTED OR TYPED NAME: **Phillip J. Parrott**

LICENSE NUMBER **03601**

MY LICENSE RENEWAL DATE IS JUNE 30, **2021**

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
G-SERIES, A-SESRIES

MECHANICAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE DATE

PRINTED OR TYPED NAME: **Tyson L. Scheidecker**

LICENSE NUMBER **21691**

MY LICENSE RENEWAL DATE IS DECEMBER 31, **Even**

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
P-SERIES & M-SERIES

ELECTRICAL ENGINEER

I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF IOWA.

SIGNATURE DATE

PRINTED OR TYPED NAME: **Jake J. Henkle**

LICENSE NUMBER **12668**

MY LICENSE RENEWAL DATE IS DECEMBER 31, **2022**

PAGES, SHEETS OR DIVISIONS COVERED BY THIS SEAL:
E-SERIES

PROJECT DESCRIPTION:

PROJECT CONSISTS OF A PRE-ENGINEERED METAL BUILDING ADDITION ONTO AN EXISTING FIRE STATION BUILDING. WORK INCLUDED CONCRETE FOOTINGS AND FOUNDATIONS, EXTERIOR BUILDING SHELL, OVERHEAD SECTIONAL DOORS, LIGHTING AND ROUGH-IN FOR FUTURE INTERIOR BUILD-OUT.

LEGEND:

PEMB - PRE-ENGINEERED METAL BUILDING

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, IA 50266
515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska

CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

QC REVIEW
APRIL 6, 2021
PROJECT NO: 4207090

G000

Plotted:
Autodesk Revit 2020

ABBREVIATIONS

SYMBOLS	
&	AND
@	AT
#	NUMBER or POUND

A	
A/E	ARCHITECT / ENGINEER
ACP	ACOUSTICAL CEILING PANEL
ADA	AMERICANS WITH DISABILITIES ACT
ADAAG	AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES
ADD	ADDENDUM
ADJ	ADJUSTABLE or ADJACENT
ADMIN	ADMINISTRATION
AFF	ABOVE FINISHED FLOOR
AHJ	AUTHORITY HAVING JURISDICTION
AHU	AIR HANDLING UNIT
AL or ALUM	ALUMINUM
ALT	ALTERNATE
AP	ACCESS PANEL
APA	AMERICAN PLYWOOD ASSOCIATION
APPROX	APPROXIMATE (LY)
ASTM	AMERICAN SOCIETY FOR TESTING & MATERIALS
AUTO	AUTOMATIC (DOOR OPERATOR)
AVE	AVENUE
AVG	AVERAGE

B	
B/O	BOTTOM OF
BLDG	BUILDING
BLVD	BOULEVARD
BRG	BEARING

C	
CCTV	CLOSED CIRCUIT TELEVISION
CG	CORNER GUARD
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CFOI	CONTRACTOR FURNISHED OWNER INSTALLED
CJ	CONSTRUCTION/CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLG HT	CEILING HEIGHT
CLR	CLEAR (ANCE)
CMU	CONCRETE MASONRY UNIT
CO	CLEANOUT
COL	COLUMN
CONC	CONCRETE
CONF	CONFERENCE
CONST	CONSTRUCTION
CORR	CORRIDOR
CPT	CARPET
CT	CERAMIC TILE
CTRL	CONTROL
CF	CUBIC FEET
CW	COLD WATER

D	
DBL	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION/ DEMOLISH
DEPT	DEPARTMENT
DF	DRINKING FOUNTAIN
DIA	DIAMETER
DISP	DISPENSER
DIV	DIVISION
DN	DOWN
DTL	DETAIL
DS	DOWNSPOUT
DW	DISHWASHER
DWG	DRAWING
DWGS	DRAWINGS

E	
EA	EACH
EF	EPOXY FLOORING or EXHAUST FAN
EJ	EXPANSION JOINT
ELEC	ELECTRIC / ELECTRICAL
ELEV	ELEVATION
EL	ELEVATOR
ENGR	ENGINEER
EP	EPOXY PAINT
EPXY	EPOXY
EQ	EQUAL
EQUIP	EQUIPMENT
EXIST	EXISTING

F	
FDN or FNDN	FOUNDATION
FE	FIRE EXTINGUISHER
FEC	FIRE EXTINGUISHER CABINET
FFE	FINISH (ED) FLOOR ELEVATION
FHC	FIRE HOSE CABINET
FL	FLOOR
FLR	FLOOR (ING)
FM	FM GLOBAL
FRP	FIBERGLASS REINFORCED PANEL
FT	FOOT (FEET)
FTG	FOOTING
FURN	FURNITURE

G	
GA	GAGE or GAUGE
GAL	GALVANIZED
GB	GRAB BAR
GC	GENERAL CONTRACTOR
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
GWB	GYPSUM WALLBOARD

H	
HDWD	HARDWOOD
HDWR	HARDWARE
HM	HOLLOW METAL
HORIZ	HORIZONTAL
HR	HOUR
HT	HEIGHT
HVAC	HEATING, VENTILATION, AIR CONDITIONING
HW	HOT WATER

I	
IBC	INTERNATIONAL BUILDING CODE
ICC	INTERNATIONAL CODE COUNCIL
ID	IDENTIFICATION or INSIDE DIAMETER
IN	INCHES
INCL	INCLUDE
INFO	INFORMATION

J	
JAN	JANITOR
JC	JANITOR'S CLOSET
JST	JOIST (S)
JT	JOINT

K	
KO	KNOCKOUT

L	
LAV	LAVATORY
LF	LINEAR FOOT
LH	LEFT HAND
LHR	LEFT HAND REVERSE
LLV	LONG LEG VERTICAL
LVL	LAMINATED VENEER LUMBER
LVT	LUXURY VINYL TILE

M	
MAINT	MAINTENANCE
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEZZ	MEZZANINE
MFRG	MANUFACTURING
MFR	MANUFACTURER
MIC	MICROPHONE
MIN	MINIMUM or MINUTE
MISC	MISCELLANEOUS
MO	MASONRY OPENING
MTD	MOUNTED
MTL	METAL

N	
N/A	NOT APPLICABLE
NEC	NATIONAL ELECTRICAL CODE
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION
NIC	NOT IN CONTRACT
NOM	NOMINAL
NRC	NOISE REDUCTION COEFFICIENT
NRCA	NATIONAL ROOFING CONTRACTORS ASSOCIATION
NTS	NOT TO SCALE

O	
OC	ON CENTER
OD	OUTSIDE DIAMETER
OFCI	OWNER FURNISHED CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED OWNER INSTALLED
OPP	OPPOSITE
OHD	OVERHEAD DOOR

P	
P	PAINT
PERP	PERPENDICULAR
PKWY	PARKWAY
PL	PLATE or PLASTIC LAMINATE
PLAM	PLASTIC LAMINATE
PLWD	PLYWOOD
PR	PAIR
PREFAB	PREFABRICATED
PREFIN	PREFINISHED
PREP	PREPARE (ATION)
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH

R	
R	RAD or RADIUS
RCI	ROOF CONSULTANTS INSTITUTE
RCP	REFLECTED CEILING PLAN
RD	ROOF DRAIN
REINF	REINFORCE (D) (ING) (MENT)
REQD	REQUIRED
RESIL	RESILIENT
RF	RADIO FREQUENCY
RH	RIGHT HAND
RHR	RIGHT HAND REVERSE
RM	ROOM
RO	ROUGH OPENING
VTR	VENT THROUGH ROOF

S	
SAN	SANITARY
SCHED	SCHEDULE
SECT	SECTION
SF	SQUARE FOOT
SHT	SHEET REFERRING TO PAGES
SIM	SIMILAR
SH	SHIVE-HATTERY
SOG	SLAB ON GRADE
SPEC(S)	SPECIFICATION(S)
SQ	SQUARE
SQ IN	SQUARE INCH
SS	SOLID SURFACE or STAINLESS STEEL
ST	STREET or STONE
STAG	STAGGERED
STC	SOUND TRANSMISSION CLASS
STD	STANDARD
STL	STEEL
STRUC	STRUCTURE (AL)
SYM	SYMMETRICAL

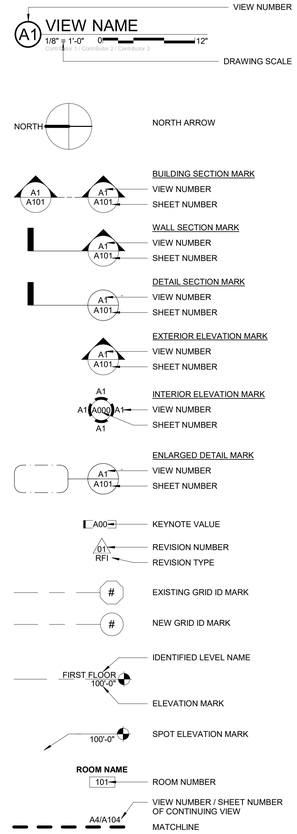
T	
T/O	TOP OF
T&G	TONGUE AND GROOVE
TAN	TANGENT
TBD	TO BE DETERMINED
TEL	TELEPHONE
TEMP	TEMPORARY
THRU	THROUGH
TV	TELEVISION
TYP	TYPICAL

U	
UL	UNDERWRITERS LABORATORIES
UNO	UNLESS NOTED OTHERWISE

V	
VB	VINYL BASE
VCT	VINYL COMPOSITION TILE
VERT	VERTICAL
VIF	VERIFY IN FIELD
VT	VINYL TILE
VTR	VENT THROUGH ROOF
VWC	VINYL WALL COVERING

W	
W	WIDTH
W/	WITH
W/O	WITHOUT
WC	WATER CLOSET or WALL COVERING
WT	WALL TILE or WEIGHT
WTR	WATER

GENERAL SYMBOLS LEGEND



PROJECT GENERAL INFORMATION

1. ANY DAMAGE TO AREAS INSIDE OR OUTSIDE OF THE PROJECT AREA SHALL BE REPAIRED TO THE STATUS PRIOR TO CONSTRUCTION AT NO COST TO OWNER.
2. STRUCTURAL STEEL MEMBERS AND DECKING PROFILES, AS INDICATED ON ARCHITECTURAL DETAILS, ARE DIAGRAMMATIC AND MAY VARY FROM ACTUAL PROFILES AND SIZES SPECIFIED IN THE STRUCTURAL DRAWINGS. IN ALL CASES STRUCTURAL DRAWINGS SHALL GOVERN. FIELD VERIFY EXISTING PROFILE DIMENSIONS WHEN REQUIRED TO MATCH OR REPLACE EXISTING. NOTE CHANGES REQUIRED TO ARCHITECTURAL DETAILS IN SHOP DRAWINGS.
3. ALL ELEVATION REFERENCE IN BUILDING DRAWINGS ARE BASED ON 100'-0" WHICH RELATES TO [XXX.X] ABOVE SEA LEVEL ON SITE DRAWINGS.
4. IF COMPLIANCE WITH TWO OR MORE STANDARDS IS SPECIFIED AND THE STANDARDS ESTABLISH DIFFERENT OR CONFLICTING REQUIREMENTS FOR MINIMUM QUANTITIES OR QUALITY LEVELS, COMPLY WITH THE MOST STRINGENT REQUIREMENT. REFER UNCERTAINTIES AND REQUIREMENTS THAT ARE DIFFERENT, BUT APPARENTLY EQUAL, TO ARCHITECT FOR A DECISION BEFORE PROCEEDING.
5. THE INDICATION OF TYPE AND LOCATION OF EXISTING CONDITIONS AND MATERIALS IN THE DRAWINGS IS NOT INTENDED AS EXACT DOCUMENTATION OF IN-PLACE CONDITIONS. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING EXISTING CONDITIONS BEFORE SUBMISSION OF BIDS. EXISTING CONDITIONS VARYING FROM THOSE SHOWN IN THE DRAWINGS WILL NOT BE JUSTIFICATION FOR ADDITIONAL ALLOWANCE TO THE CONTRACTOR. NOTIFY THE ARCHITECT IMMEDIATELY IF ANY CONDITIONS CONFLICT WITH THE DRAWINGS.
6. PROTECT ALL BUILDING SYSTEMS, NEW AND EXISTING, COVER SUPPLY, RETURN, AND EXHAUST AIR GRILLES, AND PROTECT OTHER SENSITIVE EQUIPMENT FROM ALL ACTIVITIES RELATED TO THIS CONTRACT. REMOVE PROTECTION AT END OF CONSTRUCTION.
7. ALL DISSIMILAR METALS SHALL BE ISOLATED FROM EACH OTHER EVEN IF NOT SPECIFICALLY IDENTIFIED IN THE CONTRACT DOCUMENTS.
8. ALL CODE-REQUIRED LABELS SUCH AS "UL", "FACTORY MUTUAL", OR ANY EQUIPMENT IDENTIFICATION, PERFORMANCE RATING, NAME, OR NOMENCLATURE PLATES SHALL REMAIN READABLE AND NOT PAINTED OR COVERED BY OTHER CONSTRUCTION.
9. STRUCTURAL INFORMATION ON ARCHITECTURAL DRAWINGS IS FOR REFERENCE ONLY. STRUCTURAL INFORMATION ON STRUCTURAL DRAWINGS AND SPECIFICATIONS SHALL GOVERN.
10. ARCHITECTURAL DIMENSIONS AND DESIGN INTENT ARE INDICATED ON ARCHITECTURAL DRAWINGS. IF THE INSTALLATION OF EQUIPMENT FROM OTHER TRADES INTERFERES WITH COMPLIANCE OF THE DESIGN INTENT, NOTIFY THE ARCHITECT BEFORE PROCEEDING.
11. DO NOT SCALE DRAWINGS; DIMENSIONS GOVERN LOCATION OF BUILDING ELEMENTS. IF DIMENSIONS ARE NOT AVAILABLE, CONTACT THE ARCHITECT.

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, IA 50266
515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska

CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: MU
APPROVED: PJP
ISSUED FOR: QC REVIEW
DATE: APRIL 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

PROJECT GENERAL INFORMATION

G001

Printed:
Autodesk Revit 2020

LIFE SAFETY PLAN SYMBOLS LEGEND

TRAVEL DISTANCE 20'-0" — EXIT PATH AND ASSOCIATED TRAVEL DISTANCE

0 — OCCUPANT LOAD AT DOOR

0" — EXIT WIDTH REQUIRED BASED ON OCCUPANT LOAD

0" — EXIT WIDTH PROVIDED

ROOM NAME

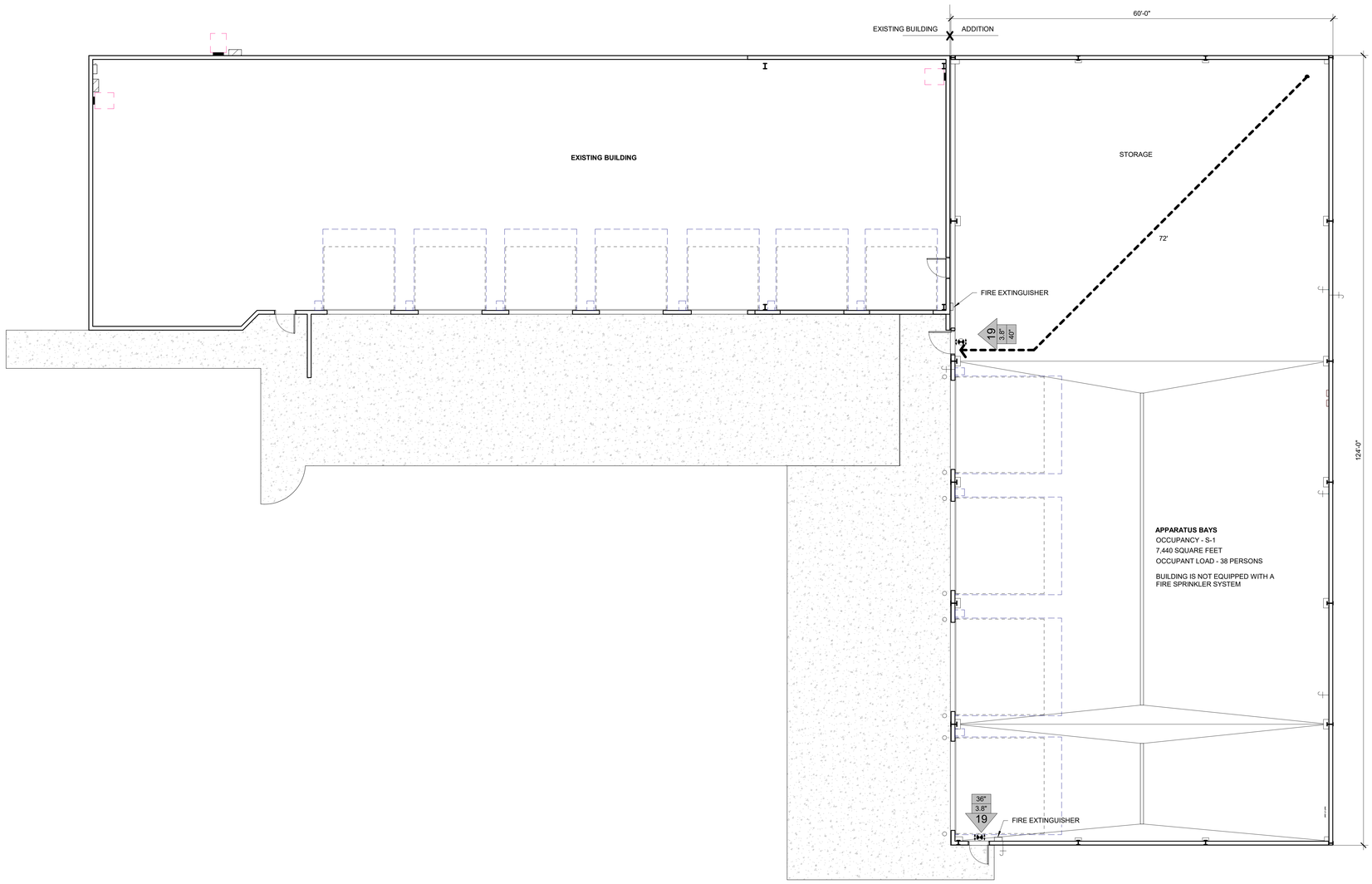
101 — ROOM NUMBER

150 SF — ROOM AREA

FEC FEC FEC — FIRE EXTINGUISHER CABINET

EXIT SIGN
ILLUMINATED SURFACE (BLACK QUARTERS)
DIRECTIONAL ARROWS

180 MIN — DOOR FIRE RATING



NORTH

6E FIRST FLOOR LIFE SAFETY PLAN
1/8" = 1'-0" 0 12'

SHIVEHATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, IA 50266
515.223.8104 | www.shivehattery.com
Iowa | Illinois | Indiana | Nebraska

CITY OF ANAMOSA - FIRE STATION ADDITION

701 E. THIRD STREET, ANAMOSA, IA 52205

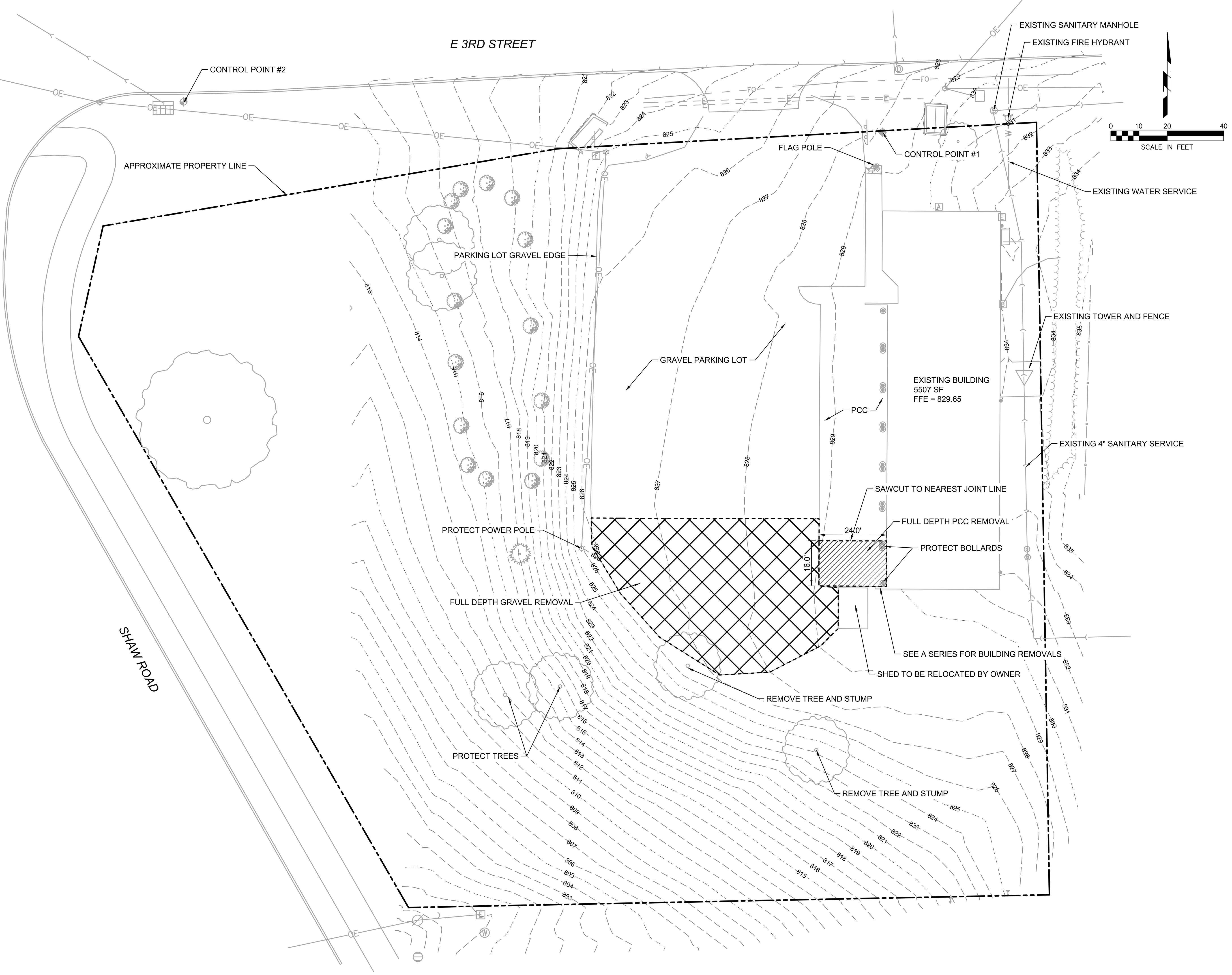
PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: MJ
APPROVED: PJP
ISSUED FOR: QC REVIEW
DATE: APRIL 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

LIFE SAFETY PLAN

G100

Printed:
Autodesk Revit 2020



EXISTING CONDITIONS AND DEMO PLAN

NOT TO SCALE

SITE PREPARATION NOTES

1. PROVIDE WASTE AREAS OR DISPOSAL SITES FOR EXCESS MATERIAL (EXCAVATED MATERIAL OR BROKEN CONCRETE) WHICH IS NOT DESIRABLE TO BE INCORPORATED INTO THE WORK INVOLVED ON THIS PROJECT. NO PAYMENT FOR OVERHAUL WILL BE ALLOWED FOR MATERIAL HAULED TO THESE SITES. NO MATERIAL SHALL BE PLACED WITHIN THE SITE, UNLESS SPECIFICALLY STATED IN THE PLANS OR APPROVED BY THE ENGINEER. DISPOSAL SITES MUST BE APPROVED BY THE ENGINEER. OFF-SITE DISPOSAL SHALL BE IN ACCORDANCE WITH THE APPLICABLE GOVERNMENTAL REGULATIONS.
2. WHERE A SECTION OF PAVEMENT, CURB AND GUTTER, OR SIDEWALK IS CUT OR OTHERWISE DAMAGED BY THE CONTRACTOR, THE ENTIRE SECTION SHALL BE REMOVED AND REPLACED. PAVEMENT, CURBS, GUTTERS, AND SIDEWALKS SHALL BE REMOVED A MINIMUM OF TWO FEET BEYOND THE EDGE OF THE TRENCH CUT AND TO THE NEAREST JOINT.
3. DOUBLE SAWCUT EDGES OF PAVEMENT FULL DEPTH PRIOR TO REMOVAL TO PREVENT DAMAGE TO ADJACENT SLABS AND FIXTURES.
4. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROTECT ALL TREES AND SHRUBS IN PROJECT AREA FROM DAMAGE DUE TO CONSTRUCTION ACTIVITY UNLESS SHOWN ON THE PLANS OR DIRECTED BY THE OWNER'S REPRESENTATIVE.
5. REMOVAL AND DISPOSAL OF EXISTING TREES AND SHRUBS WITHIN CONSTRUCTION LIMITS SHALL BE INCIDENTAL TO THE GRADING PORTION OF THE PROJECT. STUMPS ARE TO BE GROUND TO TWO FEET BELOW FINISHED GRADE. TREES THAT QUALIFY FOR ENDANGERED BAT HABITAT ARE TO BE FELLED BETWEEN OCTOBER 1ST AND MARCH 31ST.
6. CONTRACTOR SHALL OBTAIN ALL NECESSARY DEMOLITION PERMITS AND COORDINATE ALL DEMOLITION WORK WITH THE MUNICIPALITY AND OWNERS REPRESENTATIVE TO ENSURE PROTECTION AND MAINTENANCE OF EXISTING SITE FEATURES NOT NOTED FOR REMOVAL.
7. ALL EROSION AND SEDIMENTATION CONTROL MEASURES AND DEVICES SHALL BE INSTALLED AND FUNCTIONAL BEFORE THE SITE IS OTHERWISE DISTURBED. THEY SHALL BE KEPT OPERATIONAL AND MAINTAINED CONTINUOUSLY THROUGHOUT THE PERIOD OF LAND DISTURBANCE UNTIL PERMANENT SITE STABILIZATION HAS BEEN ACHIEVED (SEE EROSION CONTROL PLAN FOR ADDITIONAL INFORMATION AND DETAILS).
8. THE PURPOSE OF THIS DRAWING IS TO CONVEY THE OVERALL SCOPE OF DEMOLITION WORK AND IT IS NOT INTENDED TO COVER ALL DETAILS OR SPECIFICATIONS REQUIRED TO COMPLY WITH GENERALLY ACCEPTED DEMOLITION PRACTICES. CONTRACTOR SHALL THOROUGHLY FAMILIARIZE THEMSELVES WITH THE SITE, SCOPE OF WORK, AND ALL EXISTING CONDITIONS AT THE JOB SITE PRIOR TO BIDDING AND COMMENCING THE WORK. THE DEMOLITION CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR MEANS, METHODS, TECHNIQUES, OR PROCEDURES USED TO COMPLETE THE WORK IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS AND IS LIABLE FOR THE SAFETY OF THE PUBLIC AND CONTRACTOR'S EMPLOYEES DURING THE COURSE OF THE PROJECT.
9. THE DEMOLITION PLAN IS INTENDED TO SHOW REMOVAL OF KNOWN SITE FEATURES AND UTILITIES AS SHOWN ON THE SURVEY PROVIDED TO THE ENGINEER FOR DESIGN. THERE MAY BE OTHER SITE FEATURES, UTILITIES, STRUCTURES, AND MISCELLANEOUS ITEMS BOTH BURIED AND ABOVE GROUND THAT ARE WITHIN THE LIMITS OF WORK THAT MAY REQUIRE REMOVAL FOR THE PROPOSED SITE IMPROVEMENTS BUT THAT ARE NOT SHOWN HEREIN. THE CONTRACTOR IS RESPONSIBLE FOR THE REMOVAL OF SUCH ITEMS AT NO ADDITIONAL COST TO THE OWNER.
10. CONTRACTOR SHALL CONTACT THE RESPECTIVE UTILITY COMPANIES PRIOR TO COMMENCING ANY SITE DEMOLITION OPERATIONS TO COORDINATE DISCONNECTION AND REMOVAL OF EXISTING UTILITIES WITHIN THE PROPOSED AREA OF WORK.
11. CONTRACTOR SHALL COORDINATE ANY SHUT DOWNS OF EXISTING ROADWAYS AND UTILITIES WITH THE NECESSARY GOVERNING AUTHORITIES.
12. ALL EXISTING BUILDINGS, FOUNDATIONS, CONCRETE OR ASPHALT PAVEMENT OR WALKS, CURB AND GUTTER, AND MISCELLANEOUS STRUCTURES (INCLUDING, BUT NOT LIMITED TO FENCES, POLES, YARD LIGHTS, ELECTRICAL PANELS, WHEEL STOPS, AND MISCELLANEOUS DEBRIS) NOTED TO BE REMOVED SHALL BE DEMOLISHED, REMOVED FROM THE SITE, AND LEGALLY DISPOSED OF BY THE CONTRACTOR.
13. VOIDS LEFT BY ANY ITEM REMOVED UNDER ANY PROPOSED BUILDINGS, PAVEMENTS, OR WALKS OR WITHIN 24 INCHES THEREOF SHALL BE BACKFILLED IN ACCORDANCE WITH SUDAS SPECIFICATION AND THE PROJECT SPECIFICATIONS AND GEOTECHNICAL ENGINEERING REPORT.
14. AS SOON AS DEMOLITION WORK HAS BEEN COMPLETED, FINAL GRADE OF BACKFILL IN DEMOLITION AREAS SHALL BE COMPACTED PER SUDAS SPECIFICATIONS AND THE GEOTECHNICAL ENGINEERING REPORT TO PRESENT A NEAT, WELL DRAINED APPEARANCE, AND TO PREVENT WATER FROM DRAINING UNNECESSARILY ONTO ADJACENT PROPERTIES. CONTRACTOR SHALL PROVIDE TEMPORARY DIVERSION SWALES OR OTHER MEANS OF MAINTAINING ADEQUATE SITE DRAINAGE.
15. CONTRACTOR SHALL UTILIZE CARE WHEN WORKING NEAR EXISTING UTILITIES TO REMAIN. ANY DAMAGE TO EXISTING UTILITIES NOT NOTED TO BE REMOVED SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE AND TO THE SATISFACTION OF THE OWNER AND/OR ENGINEER.
16. ALL FIRE ACCESS LANES WITHIN THE PROJECT AREA SHALL REMAIN IN SERVICE, CLEAN OF DEBRIS, AND ACCESSIBLE FOR USE BY EMERGENCY VEHICLES.
17. ALL EXISTING SANITARY SEWERS, STORM SEWERS, WATER MAINS OR IRRIGATION LINES AND APPURTENANCES NOTED FOR REMOVAL WITHIN THE AREA OF THE PROPOSED CONSTRUCTION SHALL BE REMOVED FROM THE SITE AND DISPOSED OF BY THE CONTRACTOR. ALL ABANDONED SEWER LINES SHALL BE PLUGGED AT BOTH ENDS WITH A MINIMUM OF TWO (2) FEET LONG NON-SHRINK CONCRETE MORTAR PLUGS UNLESS OTHERWISE NOTED.
18. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF A FIELD OR DRAIN TILE IS ENCOUNTERED AND SHALL INDICATE THE METHOD OF RESOLVING THE CONFLICT. THE ENGINEER SHALL APPROVE THE PROPOSED METHOD. A RECORD OF THE LOCATION OF ALL FIELD TILE OR DRAIN PIPE ENCOUNTERED SHALL BE KEPT BY THE CONTRACTOR AND TURNED OVER TO THE OWNER AND/OR ENGINEER UPON COMPLETION OF THE PROJECT AND ACCURATELY SHOWN ON THE RECORD DRAWINGS. EXISTING FIELD TILE LINES ENCOUNTERED IN THIS PROJECT SHALL BE REPAIRED BY THE CONTRACTOR IN ONE OF THE FOLLOWING WAYS:
    - 18.1. CONNECT TILE TO THE NEAREST STORM SEWER.
    - 18.2. DAYLIGHT TO FINISHED GROUND.
    - 18.3. REPAIR TILE AND MAINTAIN SERVICE.

SURVEY CONTROL POINTS

NOTE: SEE THIS SHEET FOR CONTROL POINT (CP) LOCATIONS

1. CP #1

DESCRIPTION: 5/8" REBAR AT THE EAST SIDE OF FIRE STATION ENTRANCE. 6 FEET EAST OF GRAVEL EDGE, 10 FEET NORTH OF FLAG POLE, AND 30 FEET SOUTHWEST OF LIGHT POLE ALONG 3RD STREET.

N: 8099086.59' ELEVATION - 828.22'

E: 20605827.36'

2. CP #2

DESCRIPTION: 5/8" REBAR NEAR SHAW ROAD AND 3RD STREET. 6 FEET SOUTH OF THE SOUTH CURB OF 3RD STREET, 3 FEET NORTH OF HAND HOLE, AND 25 FEET EAST OF LIGHT POLE.

N: 8099097.30' ELEVATION - 811.69'

E: 20605579.55'

LEGEND

SURVEY

PLAN MARK	DESCRIPTION
	BENCH MARK
	CONTROL POINT
	IRON ROD - FOUND
	IRON ROD - SET
	SECTION CORNER FOUND
	MONUMENT SET
	X CUT FOUND
	X CUT SET
	RIGHT OF WAY MARKER
	NAIL FOUND
	NAIL SET
	STATION MARKER
	SOIL BORING
(00)	RECORD BEARING/DISTANCE
00	MEASURED BEARING/DISTANCE
POB	POINT OF BEGINNING
POR	POINT OF REFERENCE

LEGEND

UTILITIES

PLAN MARK	DESCRIPTION
	FLOODLIGHT
	LIGHT POLE OVERHANG
	LIGHT POST
	SIREN POLE
	UTILITY POLE
	GUY ANCHOR
	UTILITY POLE W/ TRANSFORMER
	FIRE HYDRANT
	FLARED END SECTION
	UTILITY END CAP
	VALVE
	POST INDICATOR VALVE
	CABLE TV PEDESTAL
	CLEANOUT
	JUNCTION BOX
	FIBER OPTIC BOX
	MANHOLE
	DRAINAGE MANHOLE
	ELECTRICAL MANHOLE
	SANITARY MANHOLE
	TELEPHONE MANHOLE
	TELEPHONE PEDESTAL
	VAULT BOX
	MONITORING WELL
	WATER MANHOLE
	WATER IRRIGATION VALVE
	WATER SHUTOFF VALVE
	WATER METER
	HANDHOLE
	SIGNAL BOX
	GAS METER
	ELECTRIC METER
	TRANSFORMER
	AIR CONDITIONER
	CURB INLET
	INTAKE - CIRCLE
	INTAKE - RECTANGLE
	INTAKE - SQUARE
	RA-3 INTAKE
	RA-5 INTAKE
	RA-8 INTAKE
	YARD HYDRANT
	FIRE DEPARTMENT VALVE
	GAS REGULATOR
	ROOF DOWNSPOUT

LEGEND

GENERAL SITE

PLAN MARK	DESCRIPTION
	EXISTING STRUCTURE
	GUARD POST/ BOLLARD
	MAILBOX
	PARKING METER
	FLAGPOLE
	HANDICAPPED PARKING
	SHRUB
	DECIDUOUS TREE
	CONIFEROUS TREE
	SINGLE POLE SIGN
	DOUBLE POLE SIGN
	TRAFFIC SIGNAL WITH ARM
	TRAFFIC SIGNAL
	UTILITY MARKER
	RAILROAD CROSSING SIGNAL
	TRAFFIC MANHOLE
	WIRE FENCE
	WOOD FENCE
	CHAINLINK FENCE
	RAILROAD
	GUARD RAIL
	TREE LINE
621	MINOR CONTOUR
620	MAJOR CONTOUR

LEGEND

UTILITY LINES

EXISTING LINE TYPE	DESCRIPTION	PROPOSED LINE TYPE
OE	ELECTRIC - OVERHEAD	OE
E	ELECTRIC - UNDERGROUND	E
G	GAS MAIN	G
W	WATER MAIN	W
	SANITARY SEWER	
FM	SANITARY FORCE MAIN	FM
	STORM SEWER	
OT	TELEPHONE - OVERHEAD	T
T	TELEPHONE - UNDERGROUND	T
OC	CABLE LINE - OVERHEAD	OC
C	CABLE LINE - UNDERGROUND	C
FO	FIBER OPTICS	FO
	PROCESS/HEATING STEAM	

LEGEND

GENERAL SITE DESIGN

PLAN MARK	DESCRIPTION
	SPOT ELEVATION
	TOP OF CURB AND GUTTER ELEVATION
	SLOPE ARROW
	FLOW ARROW
	TRAFFIC FLOW
	SILT FENCE
	LIMITS
	LEFT-TURN ARROW
	RIGHT-TURN ARROW
	THRU ARROW
	LEFT/ THRU ARROW
	RIGHT/ THRU ARROW
	LEFT/ RIGHT/ THRU ARROW

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CITY OF ANAMOSA - FIRE DEPARTMENT ADDITION

CITY OF ANAMOSA

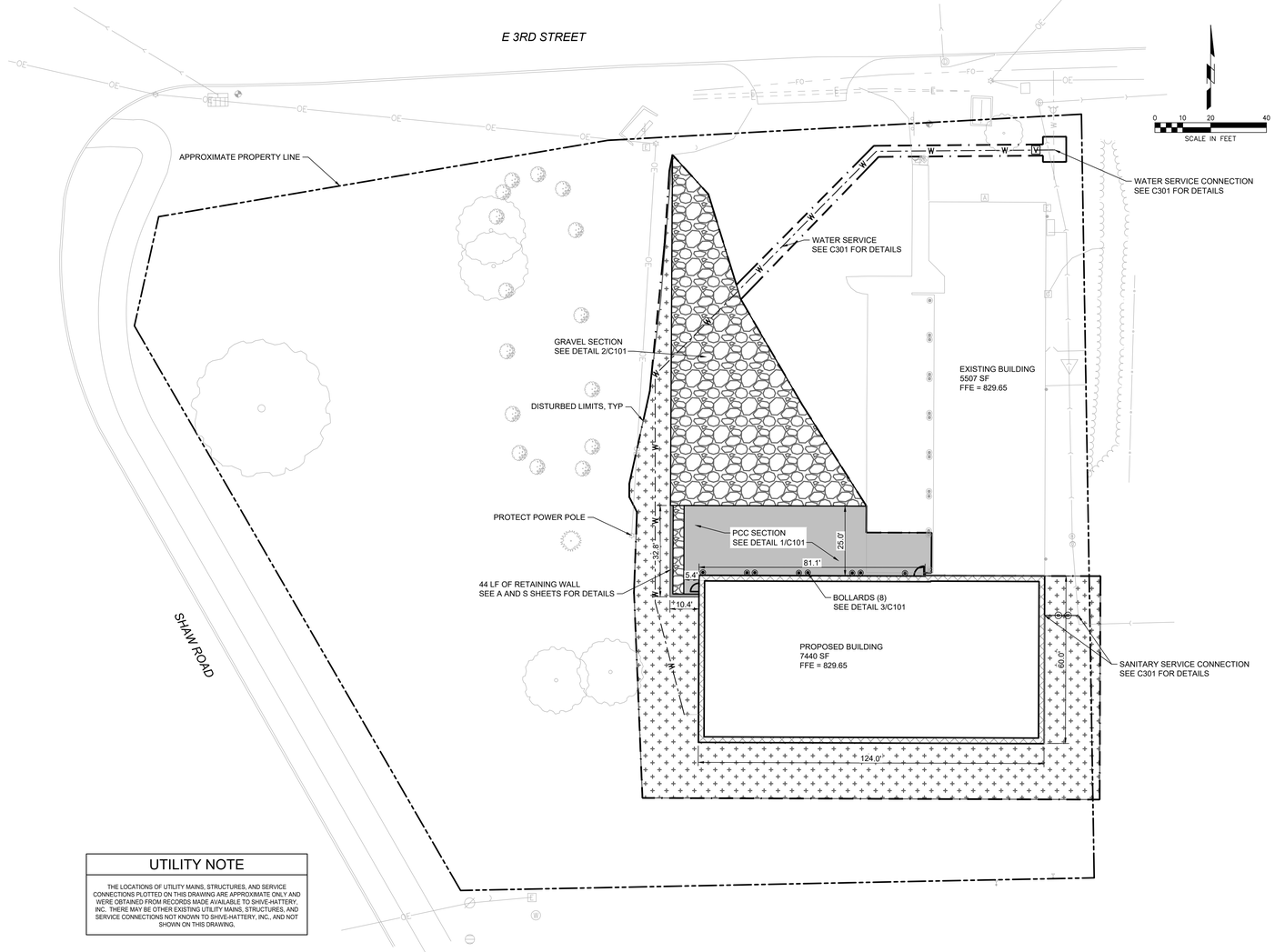
ANAMOSA, IA

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: EAD
APPROVED: JMR
ISSUED FOR: QC Review
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:
CLIENT NO:

LEGEND, EXISTING CONDITIONS, AND DEMO PLAN

CD01



UTILITY NOTE

THE LOCATIONS OF UTILITY MAINS, STRUCTURES, AND SERVICE CONNECTIONS PLOTTED ON THIS DRAWING ARE APPROXIMATE ONLY AND WERE OBTAINED FROM RECORDS MADE AVAILABLE TO SHIVE-HATTERY, INC. THERE MAY BE OTHER EXISTING UTILITY MAINS, STRUCTURES, AND SERVICE CONNECTIONS NOT KNOWN TO SHIVE-HATTERY, INC., AND NOT SHOWN ON THIS DRAWING.

SITE PLAN

NOT TO SCALE

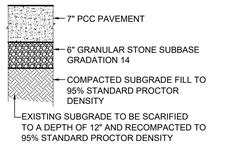
LEGEND

7" PCC PAVEMENT
SEE DETAIL 1/C101

0-6" GRAVEL
SEE DETAIL 2/C101

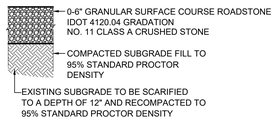
DISTURBED AREA TO BE SEEDED, FERTILIZED, AND MULCHED
TYPE 1 SEED MIXTURE PER SUDAS SECTION 9010 - 2.02A

PCC PAVEMENT - 7"



1 PCC PAVEMENT SECTION

NOT TO SCALE



2 GRAVEL SECTION

NOT TO SCALE

TOTAL LOT AREA

77,821 SF = ACRES

PROPOSED BUILDING AREA = 7440 SF

EXISTING BUILDING AREA = 5507 SF

FLOOD ZONE

NOT APPLICABLE

ADDRESS

701 EAST 3RD STREET
ANAMOSA, IOWA 52205

ZONING AND USE

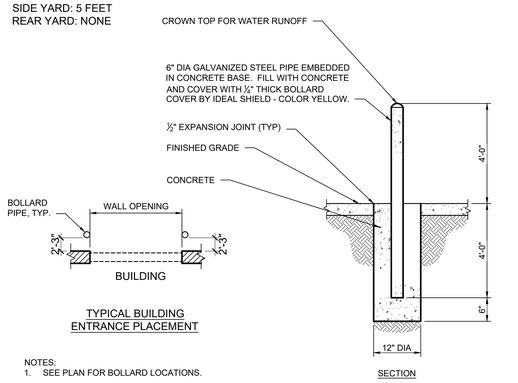
ZONING: C-2
USE: ARTERIAL COMMERCIAL DISTRICT

BUILDING SETBACKS

FRONT YARD: NONE
SIDE YARD: 8 FEET
REAR YARD: 30 FEET

PARKING SETBACKS

FRONT YARD: NONE
SIDE YARD: 5 FEET
REAR YARD: NONE



NOTES:
1. SEE PLAN FOR BOLLARD LOCATIONS.

3 BOLLARD DETAIL

NOT TO SCALE

GENERAL NOTES

1. ALL CONSTRUCTION PUBLIC OR PRIVATE SHALL BE IN ACCORDANCE WITH IOWA STATEWIDE URBAN DESIGN AND SPECIFICATIONS (SUDAS), LATEST EDITION,, UNLESS OTHERWISE NOTED ON THE DRAWINGS.
2. UTILITY NOTE: THE LOCATIONS OF UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS PLOTTED ON THIS DRAWING ARE APPROXIMATE ONLY AND WERE OBTAINED FROM RECORDS MADE AVAILABLE TO SHIVE-HATTERY, INC. THERE MAY BE OTHER EXISTING UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS NOT KNOWN TO SHIVE-HATTERY, INC. AND NOT SHOWN ON THIS DRAWING. THE VERIFICATION OF EXISTENCE OF, AND THE DETERMINATION OF THE EXACT LOCATION OF, UTILITY MAINS, STRUCTURES AND SERVICE CONNECTIONS SHALL BE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR(S).
3. NOTIFY UTILITY COMPANIES WHOSE FACILITIES ARE SHOWN ON THE PLANS OR KNOWN TO BE WITHIN CONSTRUCTION LIMITS OF THE SCHEDULE PRIOR TO EACH STAGE OF CONSTRUCTION.
4. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL UNCOVER EXISTING UTILITIES AT CRITICAL LOCATIONS TO VERIFY EXACT HORIZONTAL AND VERTICAL LOCATION.
5. IOWA CODE 480, UNDERGROUND FACILITIES INFORMATION, REQUIRES VERBAL NOTICE TO IOWA ONE-CALL 1-800-292-8989, NOT LESS THAN 48 HOURS BEFORE EXCAVATING, EXCLUDING WEEKENDS AND HOLIDAYS. UTILITIES ON SITE ARE PRIVATE.
6. THE MEANS OF THE WORK AND THE SAFETY OF THE CONTRACTOR'S EMPLOYEES ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.
7. NO WORK SHALL BE PERFORMED BEYOND THE PROJECT LIMITS WITHOUT PRIOR AUTHORIZATION FROM THE OWNER'S REPRESENTATIVE.
8. A PRECONSTRUCTION MEETING SHALL BE HELD FOLLOWING ISSUANCE OF THE NOTICE TO PROCEED BUT PRIOR TO COMMENCING WORK.
9. PROTECT ALL EXISTING FEATURES (INCLUDING BUT NOT LIMITED TO WALLS, TREES, LANDSCAPING, DRIVEWAYS, SIDEWALKS, CURBS, PAVEMENT, UTILITIES, ETC.) NOT SPECIFICALLY NOTED FOR REMOVAL. FEATURES NOT DESIGNATED FOR REMOVAL THAT ARE DAMAGED OR REMOVED BY THE CONTRACTOR SHALL BE REPLACED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE.
10. MAINTAIN POSITIVE DRAINAGE ON THE SITE THROUGHOUT THE PROJECT DURATION.
11. ADJUST ALL VALVES, MANHOLES, CASTINGS, GAS VENTS, ETC., TO MATCH THE NEW SURFACE. ADJUSTMENT SHALL BE COORDINATED WITH THE UTILITY COMPANIES AND THE COST FOR ALL ADJUSTMENTS SHALL BE INCIDENTAL TO THE CONSTRUCTION. AT NO ADDITIONAL COST TO THE OWNER, REPAIR ANY DAMAGE TO SAID STRUCTURES AND APPURTENANCES THAT OCCUR DURING CONSTRUCTION.
12. CONTRACTOR SHALL REFER TO BUILDING PLANS FOR BUILDING DIMENSIONS, STOOP SIZES AND LOCATIONS, AND BUILDING UTILITY ENTRANCE LOCATIONS AND ELEVATIONS.
13. SITE CLEAN-UP SHALL BE PERFORMED ON A DAILY BASIS. SIDEWALKS, PARKING LOTS, ROADWAYS, ETC. SHALL BE KEPT CLEAN AT ALL TIMES.
14. ALL OPEN EXCAVATIONS SHALL BE PROTECTED.
15. REPLACE ANY PROPERTY MONUMENTS REMOVED OR DESTROYED BY CONSTRUCTION. MONUMENTS SHALL BE SET BY A LAND SURVEYOR REGISTERED TO PRACTICE IN THE STATE OF IOWA.
16. CONTROL DUST SPREADING FROM ALL WORK AND STAGING AREAS.
17. ANY WORK REQUIRED TO COMPLETE THE SCOPE OF THIS PROJECT BUT NOT SET FORTH AS A SPECIFIC BID ITEM, SHALL BE CONSIDERED INCIDENTAL TO THE PROJECT. NO ADDITIONAL COMPENSATION SHALL BE ALLOWED FOR THE COMPLETION OF THIS WORK.
18. CONTRACTOR SHALL PROTECT ALL TREES AS COORDINATED WITH THE OWNER. CONTRACTOR SHALL ERECT FENCING AROUND TREE AT THE DRIP LINE, UNDER NO CIRCUMSTANCES SHALL THE CONTRACTOR PARK OR TRAVEL WITH ANY VEHICLE UNDER THE TREE DRIP LINE.
19. REPAIR OR REPLACE EXISTING FACILITIES (CURBS, PAVEMENT, UTILITIES, ETC.) TO REMAIN, AT NO ADDITIONAL EXPENSE TO THE OWNER.
20. CONSTRUCTION ACTIVITIES ARE TO BE LIMITED TO THE EXISTING RIGHT-OF-WAY, TEMPORARY CONSTRUCTION EASEMENTS, OR LIMITS OF THE PROJECT AS INDICATED ON THE PLANS. IF ADDITIONAL AREAS ARE NEEDED FOR STAGING, STORAGE, ETC., IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN WRITTEN PERMISSION FROM THE PROPERTY OWNER(S). COPIES OF THE AGREEMENTS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE PRIOR TO THE USE OF PROPERTY.
21. IT IS INTENDED THAT ALL COSTS OF MATERIALS, EQUIPMENT, TOOLS, LABOR AND INCIDENTALS BE PAID FOR UNDER THE ITEMS LISTED ON THE BIDDER'S PROPOSAL. BEFORE SUBMITTING A BID ON THIS PROJECT, THE CONTRACTOR SHALL EXAMINE ALL DRAWINGS, SPECIFICATIONS, SPECIAL PROVISIONS AND THE JOB SITE. IF ANY DISCREPANCIES OR DELETIONS OCCUR IN THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL REPORT SAME TO SHIVE-HATTERY, INC. IN WRITING AND OBTAIN WRITTEN CLARIFICATION AND/OR INSTRUCTIONS ON HOW TO PROCEED.
22. WORK WHICH DOES NOT CONFORM TO THE REQUIREMENTS OF THE CONTRACT WILL BE CONSIDERED UNACCEPTABLE. UNACCEPTABLE WORK, WHETHER THE RESULT OF POOR WORKMANSHIP, USE OF DEFECTIVE MATERIALS, DAMAGE THROUGH CARELESSNESS OR ANY OTHER CAUSE, FOUND TO EXIST PRIOR TO THE FINAL ACCEPTANCE OF THE WORK, SHALL BE REMOVED AND REPLACED IN AN ACCEPTABLE MANNER, AS REQUIRED BY SHIVE-HATTERY, INC. AT THE CONTRACTOR'S EXPENSE. WORK DONE CONTRARY TO THE INSTRUCTIONS OF SHIVE-HATTERY, INC., WORK DONE BEYOND THE LINES SHOWN ON THE PLANS OR ANY EXTRA WORK DONE WITHOUT AUTHORITY WILL NOT BE PAID FOR.
23. A LIMITED NUMBER OF SUBSURFACE INVESTIGATIONS HAVE BEEN CONDUCTED ON THE PROJECT SITE BY TERRACON AS DOCUMENTED IN THE GEOTECHNICAL REPORT. IT IS THE CONTRACTOR'S RESPONSIBILITY TO ASCERTAIN SUBSURFACE INFORMATION THAT MAY AFFECT COSTS. IF ADVERSE SUBSURFACE CONDITIONS ARE ENCOUNTERED, THE CONTRACTOR SHALL NOTIFY THE OWNER REPRESENTATIVE IMMEDIATELY. THE CONTRACTOR SHALL VISIT THE SITE AND ACQUAINT HIM/HERSELF WITH ALL EXISTING CONDITIONS PRIOR TO BIDDING/CONSTRUCTION. POTENTIAL CONTRACTORS MAY MAKE A SUBSURFACE INVESTIGATION TO SATISFY THEMSELVES AS TO SITE AND SUBSURFACE CONDITIONS. ANY INVESTIGATION SHALL BE CLEARED THROUGH THE OWNER PRIOR TO COMMENCEMENT. A JOINT UTILITY MEETING AND LOCATE WILL BE REQUIRED PRIOR TO ANY EXCAVATION OPERATIONS.
24. ALL INSPECTIONS REQUIRED FOR PUBLIC OR PRIVATE IMPROVEMENTS SHALL BE FACILITATED BY THE OWNER.
25. CONSTRUCTION STAKING TO BE PROVIDED BY GENERAL CONTRACTOR.

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CITY OF ANAMOSA - FIRE DEPARTMENT ADDITION

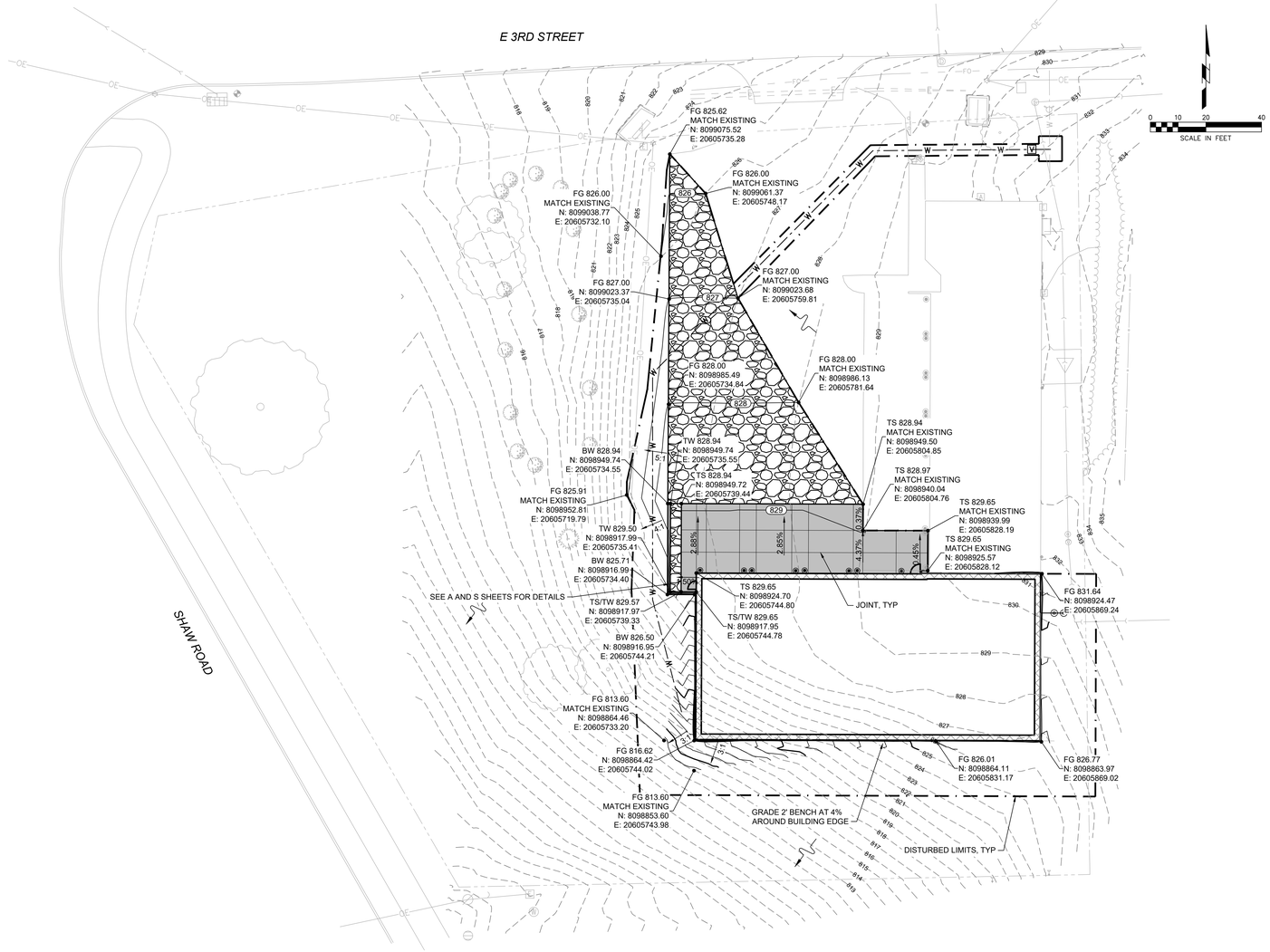
CITY OF ANAMOSA
ANAMOSA, IA

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: EAD
APPROVED: JMR
ISSUED FOR: QC Review
DATE: April 6, 2021
PROJECT NO: 4207099
FIELD BOOK:
CLIENT NO:

SITE PLAN

C101



GRADING AND PAVING PLAN

NOT TO SCALE

GRADING LEGEND

TC - TOP OF CURB ELEVATION
GU - GUTTER ELEVATION
TS - TOP OF SLAB ELEVATION
FG - FINISHED GRADE ELEVATION
LP - LOW POINT
HP - HIGH POINT
TW - FINISHED GRADE ELEVATION AT TOP OF WALL
BW - FINISHED GRADE ELEVATION AT BOTTOM OF WALL

GENERAL NOTES

1. FINISHED GRADE CONTOURS ARE SHOWN AT 1' AND 5' INTERVALS.
2. EXISTING GRADE CONTOURS ARE SHOWN AT 1' AND 5' INTERVALS.
3. FINISHED GRADE IS TO TOP OF PAVEMENT AND TOP OF TOPSOIL, UNLESS OTHERWISE NOTED.
4. CONTRACTOR SHALL COORDINATE WITH OWNER FOR ACCEPTABLE STAGING AREAS.
5. 4" MINIMUM THICKNESS OF TOP SOIL TO BE PLACED ON SITE IN NON-PAVED AREAS TO REACH FINISHED GRADE.
6. STRIP EXISTING TOPSOIL 6" DEEP WITHIN THE PROJECT LIMITS AND AREAS TO RECEIVE FILL. STOCKPILE TOPSOIL FOR REUSE. SUITABLE TOPSOIL SHALL BE STOCKPILED AT A LOCATION APPROVED BY THE OWNER'S REPRESENTATIVE OUTSIDE OF PROJECT LIMITS WITHIN CAMPUS. UNSUITABLE TOPSOIL SHALL BE HAULED OFF-SITE BY CONTRACTOR. PLEASE NOTE TOPSOIL DEPTHS MAY VARY ON-SITE. REFER TO THE GEOTECHNICAL ENGINEERING REPORT FOR SPECIFIC TOPSOIL DEPTHS BASED UPON THE SOIL INVESTIGATIONS OF THE SITE.
7. OTHER THAN SUITABLE TOPSOIL, ALL EXCESS CUT AND UNSUITABLE SOILS SHALL BE HAULED OFF-CAMPUS BY CONTRACTOR.

GRADING NOTES

1. NO ROCK EXCAVATION IS ANTICIPATED ON THIS PROJECT, SHOULD ROCK BE ENCOUNTERED DURING CONSTRUCTION, NOTIFY THE OWNER'S REPRESENTATIVE.
2. STRIP EXISTING VEGETATION WITHIN THE PROJECT LIMITS AND AREAS TO RECEIVE FILL. HAUL OFF SITE BY CONTRACTOR.
3. STRIP EXISTING TOPSOIL 9" DEEP, AVERAGE DEPTH, WITHIN THE PROJECT LIMITS AND AREAS TO RECEIVE FILL. STOCKPILE TOPSOIL FOR REUSE. SUITABLE TOPSOIL SHALL BE STOCKPILED AT A LOCATION APPROVED BY THE OWNER'S REPRESENTATIVE OUTSIDE OF PROJECT LIMITS WITHIN CAMPUS. UNSUITABLE TOPSOIL SHALL BE HAULED OFF-SITE BY CONTRACTOR. PLEASE NOTE TOPSOIL DEPTHS MAY VARY ON-SITE. REFER TO THE GEOTECHNICAL ENGINEERING REPORT FOR SPECIFIC TOPSOIL DEPTHS BASED UPON THE SOIL INVESTIGATIONS OF THE SITE.
4. PROOFROLL ALL FILL AREAS TO IDENTIFY SOFT OR DISTURBED AREAS IN THE SUBGRADE. ALL UNSUITABLE MATERIAL IDENTIFIED SHALL BE REMOVED AND REPLACED WITH STRUCTURAL FILL AND RECOMPACTED TO 95% STANDARD PROCTOR DENSITY. PROOFROLL WITH 25 TON MINIMUM GROSS VEHICLE WEIGHT.
5. REMOVE AND RECOMPACT AREAS OF SUBGRADE WHICH ARE SOFT OR UNSTABLE TO MEET SPECIFIED LIMITS FOR DENSITY AND MOISTURE CONTENT. PAVED AREAS TO BE COMPACTED TO 95%.
6. SCARIFY AND RECOMPACT THE TOP 12 INCHES OF SUBGRADE IN ALL CUT AREAS AFTER ROUGH GRADING IS COMPLETED. COMPACT THE ENTIRE PAVING SUBGRADE TO 95% STANDARD PROCTOR DRY DENSITY TO WITHIN 12 INCHES OF FINAL SUBGRADE. THE FINAL 12 INCHES OF FILL TO BE COMPACTED TO 95% STANDARD PROCTOR DRY DENSITY (ASTM D698).
7. DO NOT PLACE, SPREAD, OR COMPACT ANY FILL MATERIAL DURING UNFAVORABLE WEATHER CONDITIONS AND DO NOT RESUME COMPACTION OPERATIONS UNTIL MOISTURE CONTENT AND DENSITY OF IN-PLACE FILL MATERIAL ARE WITHIN SPECIFIED LIMITS.
8. PLACE FILL MATERIAL IN 8 INCH MAXIMUM LIFTS AND COMPACTED TO 95% STANDARD PROCTOR DENSITY IN PAVED AREAS AND 98% STANDARD PROCTOR DENSITY FOR BUILDING PAD. FILL MATERIAL SHALL BE FREE FROM ORGANIC MATTER, DEBRIS, AND OTHER DELETERIOUS SUBSTANCES.
9. FILLS PLACED BELOW LAWN AREAS SHALL BE COMPACTED TO 90% OF MATERIALS MAXIMUM STANDARD PROCTOR DRY DENSITY (ASTM D698).
10. FILL MATERIAL OBTAINED FROM OFF-SITE SOURCES SHALL BE SOIL OR SOIL AND ROCK MIXTURE FREE FROM ORGANIC MATTER AND OTHER DELETERIOUS SUBSTANCES. IT SHALL CONTAIN NO ROCKS OR LUMPS OF 6 INCHES IN GREATEST DIMENSION AND NOT MORE THAN 15% OF THE ROCKS OR LUMPS SHALL BE LARGER THAN 2-1/2 INCHES IN GREATEST DIMENSION.
11. FILL PLACED WITHIN THE BUILDING PAD AND IN AREAS TO BE PAVED SHOULD CONSIST OF APPROVED MATERIALS WHICH ARE FREE OF ORGANIC MATTER AND DEBRIS.
12. MAINTAIN OPTIMUM MOISTURE CONTENT OF FILL MATERIALS TO ATTAIN REQUIRED COMPACTION DENSITY. REFER TO THE GEOTECHNICAL ENGINEERING REPORT FOR OPTIMUM MOISTURE CONTENT RANGES FOR FILL MATERIALS. PLACE FILL MATERIAL OF LOW PLASTICITY COHESIVE SOILS WITHIN -2% TO +3% OF OPTIMUM MOISTURE CONTENT. FOR GRANULAR MATERIAL, THE ACCEPTABLE RANGE IS -3% TO +3% OF OPTIMUM MOISTURE CONTENT.
13. GRADING TOLERANCES: GRADE AREAS ADJACENT TO BUILDING LINES AND DRAIN AWAY FROM STRUCTURES TO PREVENT PONDING. FINISH SURFACES FREE FROM IRREGULAR SURFACE CHANGES, AND AS FOLLOWS
    - 13.1. UNPAVED AREAS NEAR BUILDINGS, PARKING AREAS AND SIDEWALKS: +/- 0.10 FEET
    - 13.2. UNPAVED AREAS AWAY FROM BUILDINGS, PARKING AREAS AND SIDEWALKS: +/-0.15 FEET
    - 13.3. GRADING SURFACES OF FILL UNDER BUILDING SLAB +0.04 FEET TO -0.10 FEET
    - 13.4. SUBGRADE SURFACES: +/- 0.15 FEET
14. CONTRACTOR SHALL CAREFULLY PRESERVE ALL SITE BENCHMARKS AND REFERENCE POINTS DURING CONSTRUCTION OPERATIONS.
15. CONTRACTOR SHALL ENSURE POSITIVE DRAINAGE TO ALL STORM DRAINAGE STRUCTURES. AREAS OF SURFACE PONDING SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL EXPENSE TO THE OWNER.
16. MAXIMUM CROSS SLOPES AND LONGITUDINAL SLOPES FOR ALL CONCRETE SIDEWALKS AND ADA ACCESSIBLE ROUTES SHALL NOT EXCEED 2% AND 5%, RESPECTIVELY.
17. MAXIMUM SLOPES WITHIN THE ADA ACCESSIBLE PARKING AREAS SHALL NOT EXCEED 2% IN ANY DIRECTION.
18. MAXIMUM GRADE DIFFERENCE BETWEEN PAVEMENT SURFACES AND ADJACENT CONCRETE SIDEWALKS FOR THE ACCESSIBLE ROUTE TO THE BUILDING PAD SHALL NOT EXCEED 1/4 INCH VERTICAL OR 1/2 INCH WHEN BEVELED.
19. ALL ADA ACCESSIBLE EXTERIOR DOORWAY LOCATIONS REQUIRE AN EXTERIOR LANDING THAT IS A MINIMUM OF FIVE (5) FEET IN LENGTH WITH A SLOPE NOT EXCEEDING 2% IN ANY DIRECTION.
20. EXCAVATION SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. SHORING SHALL BE IN ACCORDANCE WITH ALL O.S.H.A AND LOCAL REGULATIONS.
21. ALL UNSUITABLE OR EXCESS MATERIAL SHALL BE DISPOSED OF LEGALLY OFFSITE OR AS DIRECTED BY THE PROJECT REPRESENTATIVE IN THE FIELD.
22. ALL TESTING, INSPECTION AND SUPERVISION OF SOIL QUALITY, UNSUITABLE SOIL REMOVAL AND ITS REPLACEMENT AND OTHER SOILS RELATED OPERATIONS SHALL BE THE RESPONSIBILITY OF THE OWNER.
23. PROPOSED ELEVATIONS INDICATE FINISHED GRADE CONDITIONS. FOR ROUGH GRADING ELEVATIONS ALLOW FOR THE THICKNESS OF THE PROPOSED PAVEMENT SECTION (ROADS, WALKS, DRIVE, ETC.) OR TOPSOIL AS INDICATED ON THE PLANS.
24. CONTRACTOR SHALL PROVIDE SMOOTH VERTICAL CURVES THROUGH THE HIGH AND LOW POINTS INDICATED BY SPOT ELEVATIONS ON THE PLANS. CONTRACTOR SHALL PROVIDE UNIFORM SLOPES BETWEEN NEW AND EXISTING GRADES AND AVOID ANY RIDGES AND/OR DEPRESSIONS.
25. ALL PROPOSED GRADING, PAVEMENT, APRONS, CURBS, WALKS, ETC. SHALL MATCH EXISTING GRADES FLUSH.
26. ALL EXISTING AND PROPOSED TOP OF RIM ELEVATIONS FOR STORM, SANITARY, WATER AND OTHER UTILITY STRUCTURES SHALL BE ADJUSTED TO MEET FINISHED GRADE WITHIN THE PROJECT LIMITS.
27. CONTRACTOR SHALL ENSURE POSITIVE SITE DRAINAGE AT THE END OF EACH WORKING DAY DURING CONSTRUCTION OPERATIONS. FAILURE TO PROVIDE ADEQUATE DRAINAGE WILL PRECLUDE THE CONTRACTOR FROM ANY POSSIBLE COMPENSATION REQUESTED DUE TO DELAYS OR UNSUITABLE MATERIALS CREATED AS A RESULT.
28. DRIVEWAYS SHALL BE CONSTRUCTED SO AS NOT TO IMPEDE THE SURFACE DRAINAGE SYSTEM.
29. ALL DISTURBED AREAS NOT PAVED OR HARD SURFACE ON THE SITE SHALL RECEIVE MINIMUM 4" TOPSOIL. SCARIFY AREAS TO RECEIVE TOPSOIL TO A DEPTH OF 3". REMOVE ALL STONES, WOOD AND OTHER DEBRIS LARGER THAN 2" FROM AREAS TO RECEIVE TOPSOIL. DO NOT COMPACT TOPSOIL.
30. FINISH CONTOURS AND SPOT ELEVATIONS SHOWN ARE TO TOP OF PAVEMENT OR TO TOP OF TOPSOIL, UNLESS OTHERWISE NOTED.
31. UNSUITABLE SOILS MAY EXIST IN THE AREAS OF THE SITE REQUIRING FILL. THESE SOILS MAY NEED TO BE REMOVED AND REPLACED WITH STABILIZED SUBGRADE (CRUSHED AGGREGATE). REFER TO THE GEOTECHNICAL ENGINEERING REPORT FOR SPECIFIC INFORMATION CONCERNING THE LOCATION OF UNSUITABLE SOILS AND CORRECTIVE ACTION NECESSARY WHEN ENCOUNTERING THESE SOILS. THE CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER IF UNSUITABLE SOILS ARE ENCOUNTERED DURING CONSTRUCTION. CONSTRUCTION SHALL NOT PROCEED UNTIL UNSUITABLE SOILS ARE PROPERLY REMOVED AND REPLACED BY STABILIZED SUBGRADE MATERIALS TO THE SATISFACTION OF THE OWNER.

PAVEMENT GENERAL NOTES

1. SEE STRUCTURAL PLANS FOR ANY SPECIAL EXCAVATION AND FILL REQUIREMENTS.
2. LIMIT OPERATIONS TO THE PUBLIC RIGHT-OF-WAYS AND EASEMENTS OR INDICATED PROJECT LIMITS. THE CONTRACTOR SHALL NOT UTILIZE PRIVATE PROPERTY UNLESS HE HAS SUBMITTED A COPY OF THE PROPERTY OWNER'S WRITTEN PERMISSION TO THE OWNER'S REPRESENTATIVE.
3. ALL SLOPES IN PAVEMENT SHALL BE UNIFORM TO AVOID PONDING.
4. ALL DIMENSIONS ARE TO BACK-OF-CURB, UNLESS OTHERWISE NOTED.
5. REMOVE AND REPLACE OR RESTORE ALL STREET SIGNS, PAVEMENT MARKINGS, SIDEWALK LAMPS, SIDEWALKS, STEPS, LANDSCAPE STRUCTURES, CURB AND GUTTER, STREETS, DRIVES, AND ALL OTHER SURFACE STRUCTURES REMOVED OR OTHERWISE DAMAGED DURING THE COURSE OF THE WORK. SIDEWALKS SHALL BE REMOVED AND REPLACED TO NEAREST JOINT BEYOND CONSTRUCTION AREA.
6. COMPACT SUBGRADE BENEATH PAVEMENTS IN ACCORDANCE WITH GRADING NOTES.
7. MODIFIED SUBBASE FOR PAVEMENTS SHALL MEET THE LIMITS OF GRADUATION NO.14 IOWA DOT STANDARD SPECIFICATION FOR HIGHWAY AND BRIDGE CONSTRUCTION SECTION 4123.
8. ALL SIDEWALKS SHALL BE CONSTRUCTED PER SUDAS SECTION 7030.
9. ALL PCC PAVEMENT SHALL BE PROTECTED ACCORDING TO SUDAS SECTION 7010-3.04

PCC PAVEMENT NOTES

1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS WITH 6-1/2 PERCENT± 1/2% AIR ENTERTAINMENT AND LIMESTONE AGGREGATE 1-1/2 INCH MAXIMUM SIZE. PROVIDE CONTROL JOINTS 14 FEET O/C MAXIMUM (7 INCH PAVEMENT) OR 12 FEET O/C MAXIMUM (6 INCH PAVEMENT) UNLESS NOTED OTHERWISE. INSTALL TYPE "KT" OR TYPE "L" JOINTS AT 14 FEET O/C MAXIMUM (7 INCH PAVEMENT) OR 12 FEET O/C MAXIMUM (6 INCH PAVEMENT) UNLESS NOTED OTHERWISE. MATERIALS AND CONSTRUCTION FOR PORTLAND CEMENT CONCRETE PAVEMENTS SHALL MEET THE REQUIREMENT OF IOWA DOT STANDARD SPECIFICATIONS FOR HIGHWAY AND BRIDGE CONSTRUCTION, LATEST REVISION, SECTION 2301. THE PARAGRAPHS FOR MEASUREMENT AND PAYMENT SHALL NOT APPLY.
2. GRANULAR SUBBASE SHALL BE COMPACTED TO 95% STANDARD PROCTOR DENSITY, UNLESS OTHERWISE NOTED ON PLANS.
3. CURBS SHALL BE CAST INTEGRAL WITH CONCRETE PAVEMENT UNLESS NOTED OTHERWISE. EDGES SHALL BE ROUNDED BUT NOT ROLLED.
4. THE CONTRACTOR SHALL PROVIDE THE ENGINEER A PAVEMENT POURING DIAGRAM TO THE OWNER AND ENGINEER FOR APPROVAL PRIOR TO PAVEMENT OPERATIONS. DESIGN FILE AND ADDITIONAL PAVEMENT ELEVATIONS AT JOINTS CAN BE COORDINATED WITH ENGINEER TO FACILITATE STAKING, LAYOUT, AND DESIGNED DRAINAGE PATTERNS UPON REQUEST.
5. THE CONTRACTOR SHALL PROVIDE THE ENGINEER A FINAL PAVEMENT JOINTING PLAN FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. ALL JOINT TYPES REFERRED TO IN THE FOLLOWING NOTES OR ELSEWHERE ON THE PLANS ARE DETAILED IN IOWA SUDAS STANDARD DETAIL 7010.101.
7. WHERE ACCESS DRIVES INTERSECT EACH OTHER OR WHERE ACCESS DRIVES INTERSECT PARKING AREAS, THE JOINTING PLAN SHALL BE CONSTRUCTED PER IOWA SUDAS STANDARD DETAIL 7010.904.
8. PAVEMENT LONGITUDINAL JOINTS SHALL BE TYPE "KT-1" OR "L-1", TYP.
9. PAVEMENT TRANSVERSE JOINTS SHALL BE TYPE "C", TYP.
10. ALL JOINTS, INCLUDING "KT" OR "L" TYPE JOINTS, SHALL BE SEALED PER IOWA SUDAS STANDARD DETAIL 7010.101 DETAIL "A" AND IOWA SUDAS STANDARD SPECIFICATION SECTION 3.02 K.
11. INSTALL 1 INCH EXPANSION JOINT AT ALL LOCATIONS WHERE PAVEMENT ABUTS A BUILDING, STOOP, OR BACK-OF-CURB.

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CITY OF ANAMOSA - FIRE DEPARTMENT ADDITION

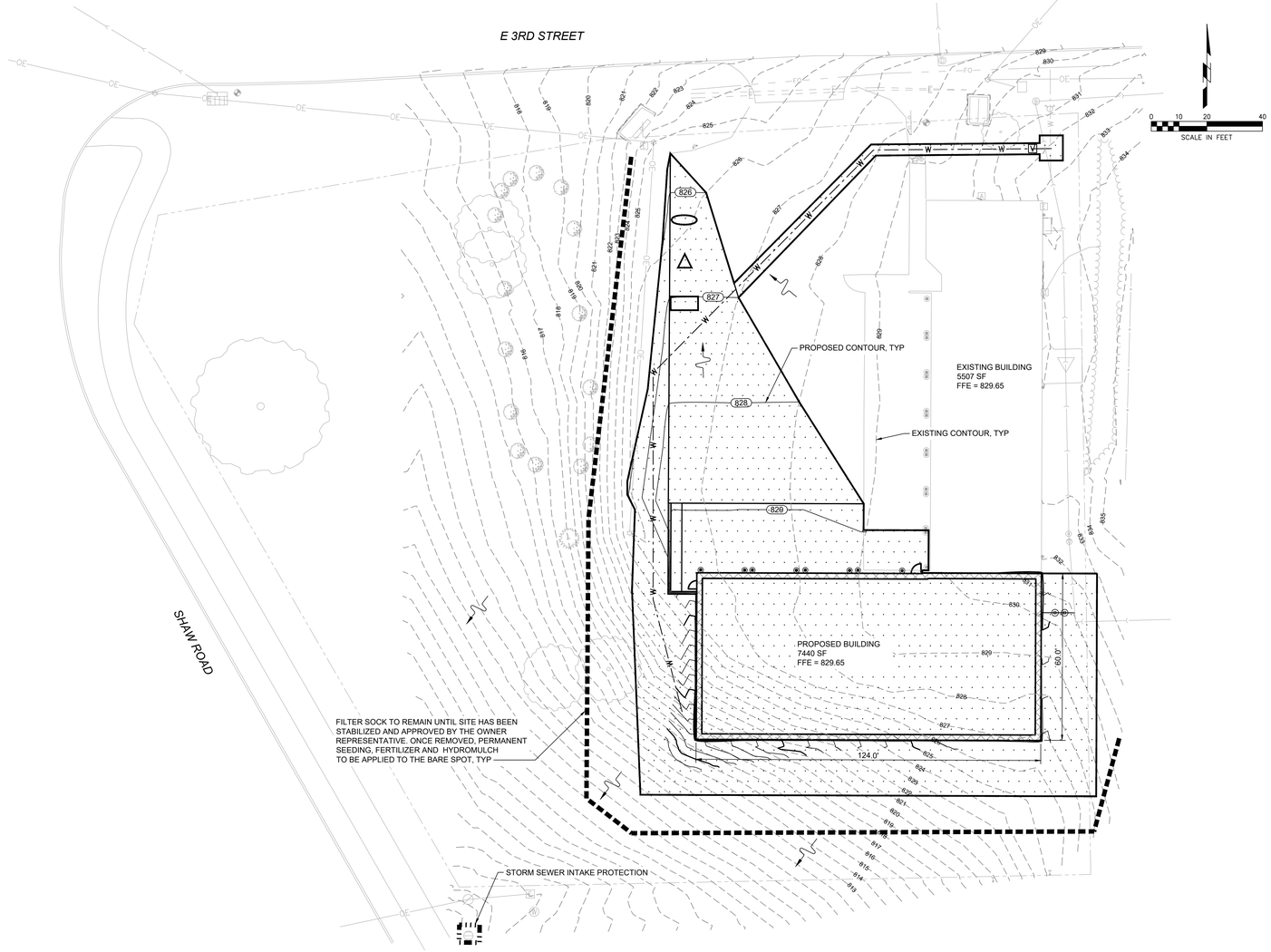
CITY OF ANAMOSA
ANAMOSA, IA

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: ESD
APPROVED: JMR
ISSUED FOR: QC Review
DATE: April 6, 2021
PROJECT NO: 4207060
FIELD BOOK:
CLIENT NO:

PAVING AND GRADING PLAN

C201

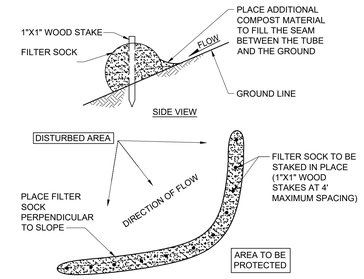


EROSION CONTROL PLAN
NOT TO SCALE

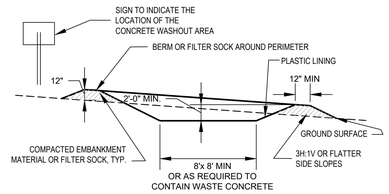
SITE INFORMATION:
PROJECT SITE/DISTURBED AREA = 0.48 AC
PRE-DEVELOPMENT COEFFICIENT= 0.73
POST-DEVELOPMENT COEFFICIENT= 0.85
NEAREST SURFACE WATER ACCEPTING
SITE DISCHARGE: WAPSIPINICON RIVER

EROSION CONTROL LEGEND

- DISTURBED AREA/ PROJECT SITE
- 8" FILTER SOCK
- INTAKE PROTECTION - GRATED CURB INTAKE
- 2.2% EXISTING GRADE
- DIRECTION OF DRAINAGE
- CONCRETE, PAINT AND GROUT WASHOUT AREA. PROTECT WITH (2) 18" STACKED FILTER SOCKS LINED WITH AN IMPERMEABLE PLASTIC LINER OR A METAL ROLL-OFF DUMPSTER. CONTRACTOR TO HAUL OFF WASTE MATERIAL. RELOCATE AS REQUIRED FOR CONSTRUCTION.
- SPILL KIT TO BE INSTALLED AND RELOCATED AS REQUIRED FOR CONSTRUCTION
- CONTRACTOR STAGING AREA FOR PORTABLE RESTROOM FACILITIES, TEMPORARY FUEL TANKS, WASTE CONTAINERS AND OTHER HAZARDOUS CHEMICALS. PROTECT WITH (1) 12" FILTER SOCK. RELOCATE AS REQUIRED FOR CONSTRUCTION.



1 COMPOST FILTER TUBE DETAIL
NOT TO SCALE



2 CONCRETE WASHOUT DETAIL
NOT TO SCALE

EROSION CONTROL GENERAL NOTES

1. EROSION/SEDIMENT CONTROL MEASURES ARE REQUIRED REGARDLESS OF THE TIME OF YEAR. THIS PLAN AND ITS ASSOCIATED REQUIREMENTS FOR THE PERMIT MUST ALSO BE IMPLEMENTED DURING WINTER MONTHS AS WELL. ADDITIONAL INSTALLATION/REMOVAL OF STABILIZATION CONTROLS ASSOCIATED WITH SEEDING OUTSIDE THE SEEDING WINDOW ARE INCIDENTAL TO THE PROJECT.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTROL EROSION/SEDIMENT ON THE SITE AT ALL TIMES. THE CONTROL MEASURES IDENTIFIED ON THE PLAN ARE A MINIMUM. THE CONTRACTOR SHALL PROVIDE ADDITIONAL EROSION/SEDIMENT CONTROL MEASURES AS NECESSARY AND BY CONSTRUCTION PHASE, TO FULFILL THIS REQUIREMENT.
3. EXCEPT AS PRECLUDED BY SNOW COVER, THE CONTRACTOR IS REQUIRED TO USE STABILIZATION CONTROLS ON ALL DISTURBED AREAS OF THE SITE REGARDLESS OF THE TIME PERIOD BEFORE THEY WILL BE DISTURBED AGAIN. IN THE EVENT THAT CONSTRUCTION ACTIVITY WITHIN A DISTURBED AREA WILL NOT OCCUR FOR A PERIOD OF 14 OR MORE CALENDAR DAYS, THE CONTRACTOR IS REQUIRED TO INSTALL STABILIZATION MEASURES IMMEDIATELY AFTER CONSTRUCTION ACTIVITY HAS CEASED IN THAT AREA. REFER TO SWPPP BOOKLET AND SUDAS SPECIFICATION SECTION 9040 FOR REQUIRED STABILIZATION CONTROLS NOT SHOWN ON THIS PLAN.
4. IN THE EVENT THAT SOILS LEAVE THE SITE, CLEANUP OF ALL SURROUNDING ROADS, DRIVES AND PARKING LOTS SHALL BE PERFORMED IMMEDIATELY AND UPON REQUEST BY OWNER'S REPRESENTATIVE AT NO ADDITIONAL COST. PAVEMENT IS TO BE SCRAPED OF DEBRIS AND MUD AND BROOMED CLEAN. MUD TRACKS ARE TO BE REMOVED AS THEY ARE CREATED.
5. MAINTAIN SILT FENCING AT ALL TIMES IN AN UPRIGHT POSITION. CLEAN SILT FROM FENCING/COMPOST FILTER TUBES ON A REGULAR BASIS AS PER THE SPECIFICATIONS. SILT FENCES MUST BE CLEANED OUT WHEN THEY ARE 50% FULL. COMPOST FILTER TUBES MUST BE CLEANED OUT WHEN THEY ARE 33% FULL.
6. CONTRACTOR TO LOCATE/RELOCATE SILT FENCING/COMPOST FILTER TUBES AS NECESSARY THROUGHOUT THE PROJECT TO CONTROL EROSION/SEDIMENT.
7. REMOVE ALL TEMPORARY EROSION/SEDIMENT CONTROLS, NOT CALLED OUT TO REMAIN, AFTER SITE HAS BEEN STABILIZED AND APPROVED BY THE OWNER'S REPRESENTATIVE.
8. ALL EXISTING STORM INTAKES WITHIN THE PROJECT AREA MUST BE PROTECTED THROUGHOUT THE DURATION OF THE PROJECT AS IDENTIFIED ON THE DRAWINGS. OPEN THROAT CURB INTAKES SHALL BE PROTECTED BY CURB INLET FILTERS. GRATED CURB INTAKES SHALL BE PROTECTED BY INTAKE PROTECTION BAG WITH CURB FILTER OR MAGNETIC INLET PROTECTION WITH CURB FILTER. BEEHIVE AREA DRAINS SHALL BE PROTECTED BY INTAKE PROTECTION BAGS OR FILTER SACKS. FLAT GRATED AREA DRAINS SHALL BE PROTECTED BY INTAKE PROTECTION BAGS, FILTER SACKS, OR MAGNETIC INLET PROTECTION. THESE PROTECTION MEASURES ARE TO REMAIN IN PLACE UNTIL THE SITE HAS BEEN STABILIZED AND APPROVED BY THE OWNER'S REPRESENTATIVE.
9. CONTRACTOR TO USE EXTREME CAUTION WHILE INSTALLING SILT FENCE OR OTHER EROSION/SEDIMENT CONTROL DEVICES TO NOT DAMAGE UNDERGROUND UTILITIES.
10. WHERE WATER IS PUMPED FROM EXCAVATIONS ON SITE, PROVISIONS SHALL BE MADE TO REMOVE SEDIMENT FROM THE WATER BEFORE IT IS RELEASED INTO THE STORM SEWER SYSTEM. METHODS INCLUDE: DEWATERING BAGS, ADDING FLOCCULANTS TO SILTY WATER AND PLACING A FILTER FABRIC BARRIER AROUND THE PUMP INLET. THE COMBINATION OF THESE METHODS HELPS TO REMOVE SEDIMENT FROM THE WATER. THE MOST COMMON METHOD INCLUDES PLACING CHITOSAN GEOTEXTILE TREATMENT BAGS WITHIN THE DEWATERING BAG AND INSTALLING AN ADDITIONAL INTAKE PROTECTION BAG AT THE NEAREST DOWNSTREAM INTAKE.
11. WHERE WATER IS RELEASED FROM A DEWATERING SYSTEM, PRECAUTIONS SHALL BE TAKEN TO ENSURE THAT EROSION GULLIES DO NOT FORM. ONE METHOD IS TO PIPE THE WATER DIRECTLY INTO A STORM SEWER STRUCTURE. WATER MUST BE FREE OF SEDIMENT PRIOR TO DISCHARGING INTO THE STORM SEWER.
12. CONTRACTOR TO CLEAN OUT ALL INTAKES WIHTIN THE PROJECT SITE AT COMPLETION OF WORK. THIS INCLUDES ALL CURB INTAKES, AREA DRAINS AND DRIVEWAY CULVERTS.
13. CONCRETE SLURRY AND DUST FROM SAWCUTTING ACTIVITIES IS PROHIBITED FROM ENTERING THE STORM SEWER SYSTEM. ALL STORM INTAKES LOCATED NEAR SAWCUTTING ACTIVITIES ARE REQUIRED TO BE PROTECTED. SAWCUT SLURRY AND DUST MUST BE CONTAINED, CLEANED UP, AND DISPOSED OF OFF-SITE. ECO-QUICK GEL BY GEL MAXX USA AND A TEMPORARY 8" COMPOST FILTER TUBE ARE REQUIRED.
14. SANITARY WASTE DISPOSAL: ALL LOCATIONS OF PORTABLE RESTROOM FACILITIES MUST BE IDENTIFIED ON THE PLAN. IN THE EVENT THAT PORTABLE RESTROOM FACILITIES ARE USED ON-SITE, THE CONTRACTOR IS REQUIRED TO INSTALL AN 8" COMPOST FILTER TUBE AROUND THE FACILITY TO MINIMIZE THE RADIUS OF THE AFFECTED ZONE IN THE EVENT OF A SPILL. WASTES SHALL BE COLLECTED AND DISPOSED OF IN COMPLETE COMPLIANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS. PORTABLE RESTROOM FACILITIES MUST NOT BE LOCATED NEAR DRAINAGE WAYS. RELOCATE AS REQUIRED FOR CONSTRUCTION.
15. IDENTIFICATION OF ALLOWABLE NON-STORMWATER DISCHARGES: DURING CONSTRUCTION THE NON-STORMWATER DISCHARGES, WHICH INCLUDE WATER FLUSHED FROM WATER LINES, PAVEMENT WASHING (WHERE NO SPILLS OR LEAKS HAVE OCCURRED, UNLESS THE SPILLED MATERIAL HAS BEEN CLEANED UP), VEHICLE WASHING, AND GROUNDWATER (DEWATERING), SHOULD BE DIRECTED AS MUCH AS POSSIBLE TOWARDS VEGETATED AREAS AND AWAY FROM DRAINAGE WAYS. REFER TO THE IDNR NPDES GENERAL PERMIT NO. 2 FOR ALLOWABLE NON-STORMWATER DISCHARGES.
16. POLLUTION AND SPILL PREVENTION PLANNING: POTENTIALLY HAZARDOUS MATERIALS ON THE CONSTRUCTION SITE INCLUDE FUEL, LUBRICANTS, CURING COMPOUNDS, FERTILIZERS, GREASE AND CLEANING SOLVENTS. THE CONTRACTOR STAGING AREA FOR PORTABLE RESTROOM FACILITIES, TEMPORARY FUEL TANKS, WASTE CONTAINERS AND OTHER HAZARDOUS CHEMICALS MUST BE PROTECTED BY A 12" COMPOST FILTER TUBE AT ALL TIMES (RELOCATE AS REQUIRED FOR CONSTRUCTION). ALL REASONABLE PRECAUTIONS WILL BE TAKEN TO PREVENT SPILLS. ANY SPILLED MATERIAL WILL IMMEDIATELY BE DIRECTED AWAY FROM STORMWATER INTAKES, DETENTION BASINS, OR DRAINAGE WAYS. SPILLED MATERIALS WILL BE CLEANED AND, IF NECESSARY, SOIL REMEDIATION PRACTICES WILL BE USED. A RECORD OF SPILLS WILL BE MAINTAINED BY THE PRIME CONTRACTOR. RELOCATE AS REQUIRED FOR CONSTRUCTION.
17. CONCRETE, PAINT AND GROUT WASHOUT AREA: PROTECT WITH (2) 18" STACKED COMPOST FILTER TUBES LINED WITH AN IMPERMEABLE PLASTIC LINER OR A METAL ROLL-OFF DUMPSTER. CLEAN OUT AND MAINTENANCE OF THE WASHOUT SHALL BE INCIDENTAL TO SWPPP MANAGEMENT. IF A PUMP TRUCK IS USED ON-SITE AND UNABLE TO USE THE WASHOUT AREA, THE CONTRACTOR SHALL DIG A PIT FOR WASTE MATERIAL AND LINE IT WITH AN IMPERMEABLE PLASTIC LINER. CONTRACTOR TO HAUL OFF ALL WASTE MATERIAL. ALL LOCATIONS OF CONCRETE, PAINT AND GROUT WASHOUT AREAS MUST BE PROVIDED BY THE CONTRACTOR AND IDENTIFIED ON THE PLAN. THE CONTRACTOR IS REQUIRED TO INSTALL A SIGN THAT DESIGNATES THE WASHOUT AREA. RELOCATE AS REQUIRED FOR CONSTRUCTION.
18. SPILL KIT: THE LOCATION OF THE SPILL KIT MUST BE IDENTIFIED ON THE PLAN. THE SPILL KIT SHALL BE A SEALED STORAGE SHED LOCATED NEAR THE CONSTRUCTION TRAILER OR FUELING AREA. THE SPILL KIT SHALL CONTAIN, BUT NOT BE LIMITED TO THE FOLLOWING ITEMS: A GARBAGE CAN, GLOVES, SAFETY GOGGLES, BROOM AND DUST PAN AND OIL ABSORBENT CLAY CHIPS OR PADS. THE SPILL KIT SHALL BE RESTOCKED AS SUPPLIES ARE USED. THE CONTRACTOR SHALL INSTALL A SIGN THAT DESIGNATES THE SPILL PLAN. RELOCATE AS REQUIRED FOR CONSTRUCTION.
19. STOCKPILED MATERIALS: CONTRACTOR TO IDENTIFY ALL LOCATIONS OF STOCKPILED MATERIALS ON THE PLAN. CONTRACTOR SHALL PROVIDE ALL EROSION/SEDIMENT CONTROLS AS REQUIRED TO CONTAIN MATERIALS ON-SITE. AT A MINIMUM, THE CONTRACTOR IS REQUIRED TO PROVIDE SILT FENCE/8" COMPOST FILTER TUBES AROUND THE PERIMETER OF STOCKPILED SOILS BEFORE STOCKPILE IS RE-SPREAD. FOR STOCKPILES THAT REMAIN FOR 14 DAYS OR MORE, CONTRACTOR TO PROVIDE COVER OR TEMPORARY STABILIZATION CONTROLS.
20. DUST CONTROL: THE CONTRACTOR SHALL IMPLEMENT DUST CONTROL MEASURES WHERE DUST IS GENERATED. FREQUENT WATERING OF THE SITE, SPRINKLING/IRRIGATION, VEGETATIVE COVER, MULCH, WINDBREAKS, TILLAGE, STONE AND SPRAY-ON CHEMICAL SOIL TREATMENTS (PALLIATIVES) ARE POSSIBLE DUST CONTROL MEASURES. IF THE DUST CONTROL IS NOT ACCEPTABLE IT SHALL BE CHANGED AS DIRECTED BY THE OWNER'S REPRESENTATIVE.
21. INITIAL JOBSITE AND PROJECT WORK ACTIVITIES SHALL BE TO INSTALL ALL DRAINAGE BASINS AND THEIR RELATED ITEMS, INSTALL ALL STABILIZING CONTROLS AND ALL SEDIMENT CONTROL ITEMS AND IMMEDIATELY AND CONSTANTLY WORK TOWARDS PERMANENT MEANS OF STABILIZATION AS SMALL WORK AREAS PRESENT THEMSELVES. ALL IS TO BE RECORDED IN THE INSPECTIONS WEEKLY AND FOLLOWING A RAIN EVENT GREATER THAN ONE-HALF ($\frac{1}{2}$") INCH.
22. SEQUENCE OF MAJOR ACTIVITIES: INCORPORATE ALL TEMPORARY STABILIZING AND PERMANENT EROSION/SEDIMENT CONTROL FEATURES AT THE EARLIEST TIME PRACTICABLE.

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CITY OF ANAMOSA - FIRE DEPARTMENT ADDITION

CITY OF ANAMOSA
ANAMOSA, IA

PRELIMINARY - NOT FOR CONSTRUCTION

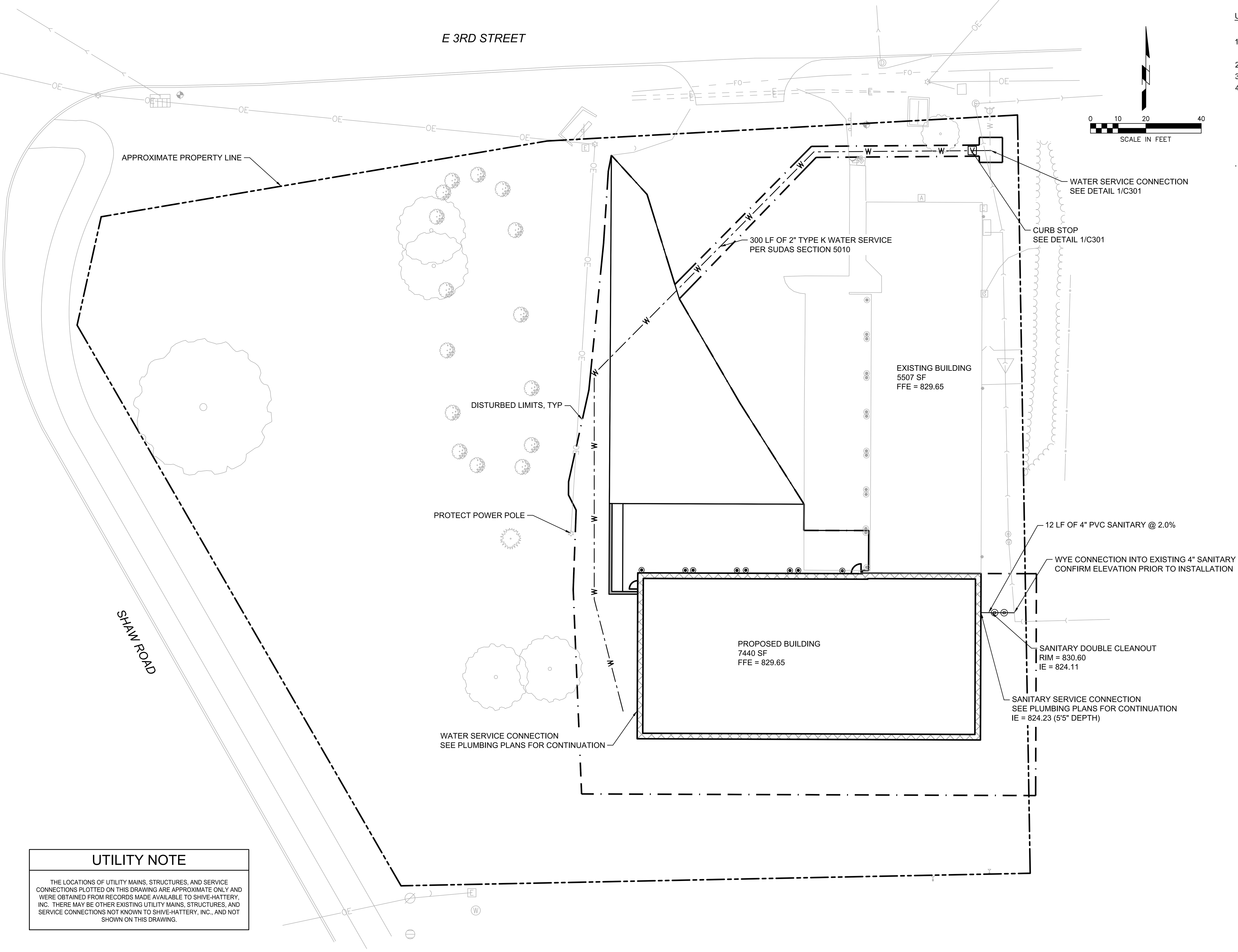
DRAWN: EAD
APPROVED: JMR
ISSUED FOR: QC Review
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:
CLIENT NO:

EROSION CONTROL PLAN

C251

UTILITY NOTES

1. CONTRACTOR TO CONFIRM THE HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES AND INFORM THE ENGINEER OF ANY POTENTIAL CONFLICTS WITH PROPOSED UTILITIES PRIOR TO CONSTRUCTION.
2. ALL PROPOSED SANITARY SHALL MEET SUDAS SPECIFICATION SECTION 4010.
3. ALL PROPOSED WATER SHALL FOLLOW PROPOSED GRADES WITH 5'-6' OF COVER, TYP
4. A BACKFLOW DEVICE SHALL BE INCLUDED INSIDE THE BUILDING, SEE BUILDING PLANS.



UTILITY NOTE

THE LOCATIONS OF UTILITY MAINS, STRUCTURES, AND SERVICE CONNECTIONS PLOTTED ON THIS DRAWING ARE APPROXIMATE ONLY AND WERE OBTAINED FROM RECORDS MADE AVAILABLE TO SHIVE-HATTERY, INC. THERE MAY BE OTHER EXISTING UTILITY MAINS, STRUCTURES, AND SERVICE CONNECTIONS NOT KNOWN TO SHIVE-HATTERY, INC., AND NOT SHOWN ON THIS DRAWING.

UTILITY PLAN

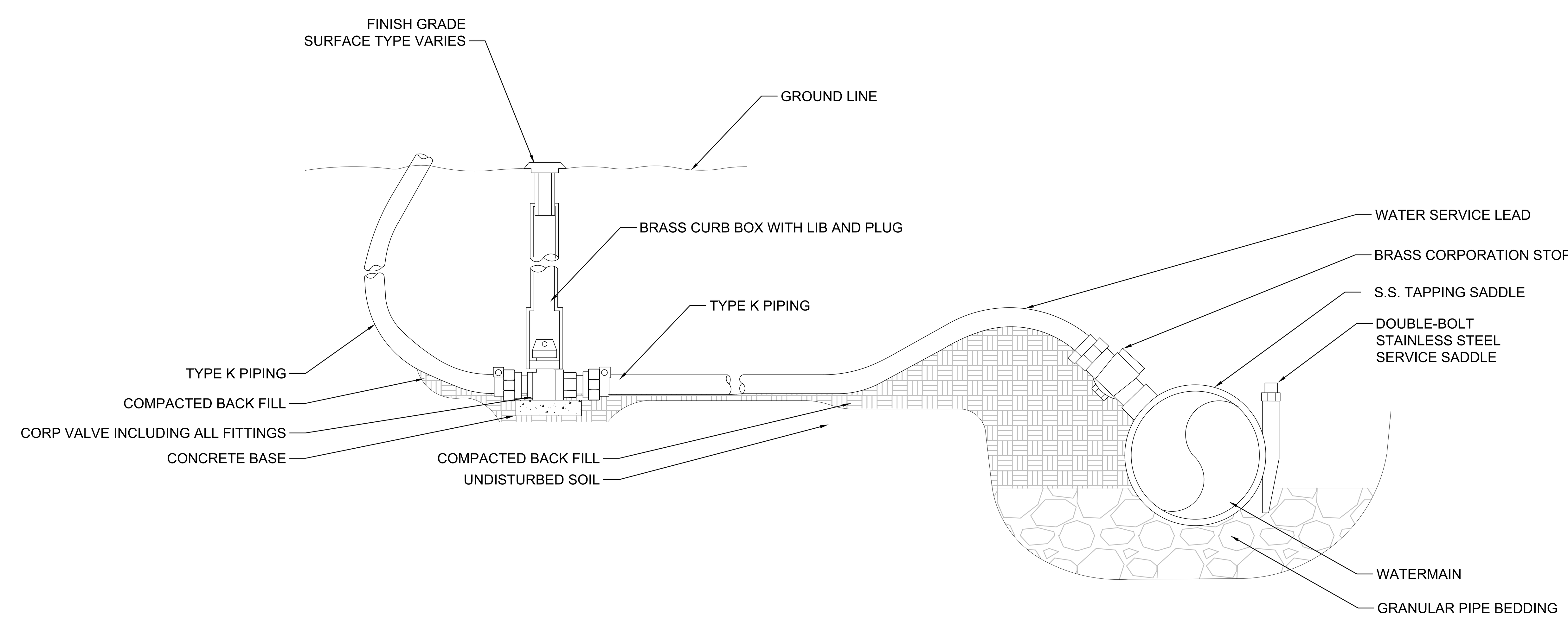
NOT TO SCALE

UTILITY NOTES

1. ALL SEWERS AND DRAINS SHALL FOLLOW DIVISION 4 SUDAS SPECIFICATION SECTIONS.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL EXISTING UTILITIES DAMAGED DURING CONSTRUCTION. IF GROUNDWATER MONITORING WELLS ARE DAMAGED DURING THE PROJECT, THEY MUST BE REPAIRED BY A STATE CERTIFIED WELL CONTRACTOR.
3. VERIFY THE ELEVATION OF POSSIBLE CONFLICTING UTILITIES PRIOR TO CONSTRUCTING PROPOSED WATER MAINS, SANITARY SEWERS, STORM SEWERS, ETC. ANY CONFLICTS MUST IMMEDIATELY BE BROUGHT TO THE ENGINEER'S ATTENTION.
4. SITEWORK UTILITY CONTRACTOR TO EXTEND ALL PIPING TO WITHIN 5 FEET OF BUILDING AND CAPPED FOR CONNECTION BY BUILDING UTILITY CONTRACTOR UNLESS OTHERWISE INDICATED. COORDINATE ALL INVERT ELEVATIONS AND PIPING LOCATIONS WITH BUILDING PLANS.
5. CONTRACTOR SHALL EXCAVATE AND VERIFY IN FIELD ALL EXISTING UTILITY LOCATIONS, SIZES, CONDITIONS AND ELEVATIONS AT PROPOSED POINTS OF CONNECTION PRIOR TO COMMENCING ANY UNDERGROUND CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE OWNER AND ENGINEER OF ANY DISCREPANCIES OR CONFLICTS PRIOR TO PROCEEDING WITH CONSTRUCTION.
6. ADJUSTMENTS TO EXISTING UTILITY STRUCTURE MANHOLE RIM ELEVATIONS REQUIRE BARREL SECTIONS TO BE REMOVED AND REPLACED AS NEEDED TO ADJUST TO THE PROPOSED ELEVATION. ONLY 12 INCHES OF RISERS WILL BE ALLOWED. ALL MANHOLE CASTINGS EXTENDING INTO PAVEMENT SHALL MATCH PAVEMENT ELEVATIONS WITH ADDITIONAL ADJUSTMENTS AS NECESSARY.
7. CONTRACTOR TO COORDINATE FRANCHISE UTILITIES.
8. SEE STRUCTURAL PLANS FOR FOUNDATION DRAIN DESIGN.
9. ALL PROPOSED CONNECTIONS TO EXISTING UTILITY STRUCTURES OR PIPING SHALL BE IN ACCORDANCE WITH THE APPLICABLE GOVERNING AUTHORITY REQUIREMENTS AND SPECIFICATIONS.
10. CONTRACTOR SHALL CONTINUOUSLY MAINTAIN ALL EXISTING SEWER SYSTEMS DURING CONSTRUCTION OPERATIONS AS NECESSARY TO PREVENT SILT OR DEBRIS ACCUMULATION.
11. THE CONTRACTOR WILL MAINTAIN A RECORD DRAWING SET WITH WITNESS DIMENSIONS TO ALL CONNECTIONS. THESE DRAWINGS WILL BE SUBMITTED TO THE ENGINEER PRIOR TO FINAL ACCEPTANCE.

TRENCH, EXCAVATION AND BACKFILL NOTES

1. TRENCH, EXCAVATION AND BACKFILL SHALL SHALL FOLLOW DIVISION 3 SUDAS SPECIFICATION SECTIONS.
2. THE CONTRACTOR SHALL MAKE PROVISIONS TO HANDLE WATER ENCOUNTERED DURING CONSTRUCTION. THE CONTRACTOR SHALL OBTAIN APPROVAL FROM THE OWNER'S REPRESENTATIVE OF THE PROPOSED METHOD OF DEWATERING..
3. SANITARY SERVICE PIPE BEDDING SHALL BE SW-103 CLASS F-3, UNLESS NOTED OTHERWISE ON THE PLANS.
4. WATER PIPE BEDDING SHALL BE PER SW-104 CLASS P-1, UNLESS NOTED OTHERWISE ON THE PLANS OR DIRECTED BY THE LOCAL MUNICIPALITY.



1 CURB STOP

NOT TO SCALE

SHIVE-HATTERY
ARCHITECTURE + ENGINEERING
4125 Westown Pkwy, Suite 100 | West Des Moines, Iowa 50266
515.223.8104 | www.shive-hattery.com
Iowa | Illinois | Indiana | Nebraska

CITY OF ANAMOSA - FIRE DEPARTMENT ADDITION

CITY OF ANAMOSA

ANAMOSA, IA

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: EAD
APPROVED: JMR
ISSUED FOR: QC Review
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:
CLIENT NO:

UTILITY PLAN

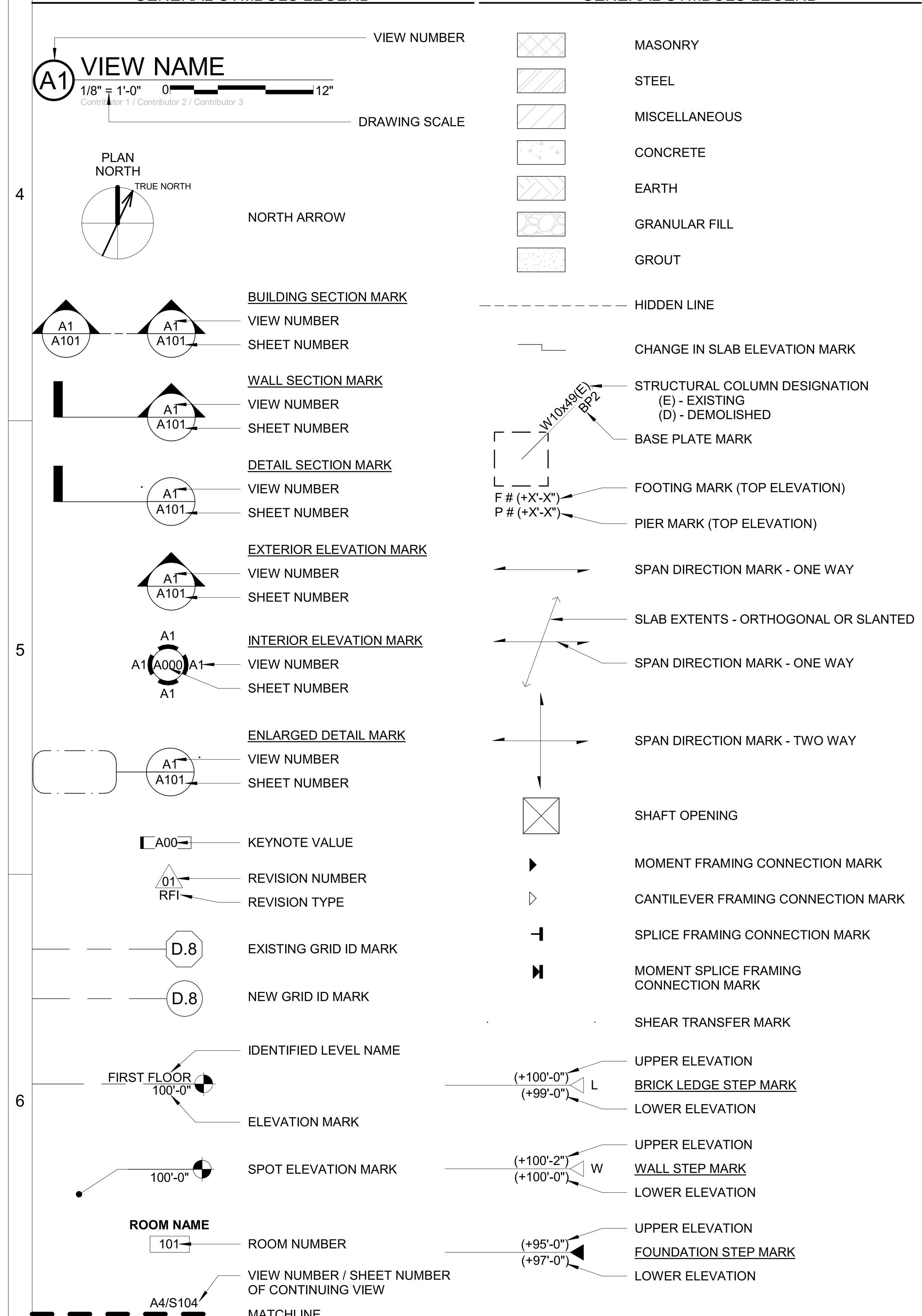
C301

ABBREVIATIONS

A	
ADD'L	ADDITIONAL
ADD	ADDENDUM
AFF	ABOVE FINISHED FLOOR
AL	ALUMINUM
ALT	ALTERNATE
APPROX	APPROXIMATE (LY)
ARCH	ARCHITECT (URAL)
B	
B/	BOTTOM OF
BLDG	BUILDING
BM	BEAM
BOT	BOTTOM
BP	BASE PLATE
BRG	BEARING
BSMT	BASEMENT
BTWN	BETWEEN
BF	BEAM FLANGE WIDTH
C	
CFCI	CONTRACTOR FURNISHED CONTRACTOR INSTALLED
CIP	CAST-IN PLACE
CJ	CONSTRUCTION/CONTROL JOINT
CL	CENTER LINE
CLR	CLEAR (ANCE)
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECT (ION) (ED) (OR)
CONT	CONTINUOUS
CONST	CONSTRUCTION
COORD	COORDINATE
CFSF	COLD FORMED STEEL FRAMING
D	
D	DEPTH
DBE	DECK BEARING ELEVATION
DBL	DOUBLE
DEG	DEGREE
DEMO	DEMOLITION
DIA	DIAMETER
DIM	DIMENSION
DN	DOWN
DTL	DETAIL
DWG	DRAWING
DWL	DOWEL
E	
E or EXST	EXISTING
E/	EDGE OF
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
ELEC	ELECTRIC / ELECTRICAL
ELEV or EL	ELEVATION
EMBED	EMBEDDED
EOR	ENGINEER OR RECORD
EQ	EQUAL
EQUIP	EQUIPMENT
ES	EACH SIDE
EW	EACH WAY
F	
F	ISOLATED FOOTING
F'C	CONCRETE COMPRESSIVE STRENGTH
F/	FACE OF
FC	CONCRETE COMPRESSIVE STRENGTH
FDN	FOUNDATION
FF	FINISHED FLOOR
FFE	FINISH (ED) FLOOR ELEVATION
FLR	FLOOR (ING)
FP	FIRE PROTECTION
FRP	FIBER REINFORCED POLYMER
FTG	FOOTING
FV	FIELD VERIFY
FY	YIELD STRENGTH
G	
GA	GAGE or GAUGE
GALV	GALVANIZED
GB	GRADE BEAM
GC	GENERAL CONTRACTOR
G or GL	GRID LINE
GRD	GRAD (E) (ING)
H	
HC	HOLLOW CORE
HDR	HEADER
HGR	HANGER
HK	HOOK
HORIZ	HORIZONTAL
HT	HEIGHT
HWS	HEADED WELDED STUDS
I	
ID	INSIDE DIAMETER
J	
JBE	JOIST BEARING ELEVATION
JST	JOIST (S)
JT	JOINT
K	
KO	KNOCK-OUT
L	
L or LNTL	LINTEL
LF	LINEAR FOOT
LLBB	LONG LEG BACK TO BACK
LLOS	LONG LEG OUTSTANDING
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDE (INAL)
LSL	LONG SLOTTED (HOLES)
LVL	LEVEL (ER) or LAMINATED VENEER LUMBER
M	
MATL	MATERIAL
MAX	MAXIMUM
MECH	MECHANICAL
MEMB	MEMBRANE
MEP	MECHANICAL, ELECTRICAL, PLUMBING
MEZZ	MEZZANINE
MFRG	MANUFACTURING
MFR	MANUFACTURER
MID	MIDDLE
MIN	MINIMUM
MISC	MISCELLANEOUS
MK	MARK
MO	MASONRY OPENING
MTL	METAL
N	
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NTS	NOT TO SCALE
O	
O/O	OUT TO OUT
OC	ON CENTER
OD	OUTSIDE DIAMETER
OF	OUTSIDE FACE
OFCI	OWNER FURNISHED-CONTRACTOR INSTALLED
OFOI	OWNER FURNISHED-OWNER INSTALLED
OH	OPPOSITE HAND
OPNG	OPENING (S)
ORIG	ORIGINAL
OVHD	OVERHEAD
P	
PAF	POWDER ACTUATED FASTENER
PC	PRECAST CONCRETE or PILE CAP
PED	PEDESTAL
PERF	PERFORATED
PERIM	PERIMETER
PERP	PERPENDICULAR
PH	PHASE
PL	PLATE
PLYWD	PLYWOOD
PREFAB	PREFABRICATED
PRELIM	PRELIMINARY
PVC	POLYVINYL CHLORIDE
Q	
QTY	QUANTITY
R	
R	RADIUS
RD	ROOF DRAIN
REF	REFER (ENCE)
REINF	REINFORCE (D) (ING) (MENT)
REQD	REQUIRED
RF	RETAINING FOUNDATION
RO	ROUGH OPENING
RTU	ROOF TOP UNIT
S	
SC	SLIP CRITICAL
SCH or SCHED	SCHEDULE
SECT	SECTION
SEOR	STRUCTURAL ENGINEER OF RECORD
SIM	SIMILAR
SJ	SAW CUT JOINT or SLIP JOINT
SLBB	SHORT LEG BACK TO BACK
SLOS	SHORT LEG OUTSTANDING
SLP	SLOPE
SOG	SLAB ON GRADE
SPC	SPACE (ING)
SPEC	SPECIFICATIONS
SS	STAINLESS STEEL
SSL	SHORT SLOTTED (HOLES)
STA	STATION
STAG	STAGGERED
STD	STANDARD
STIFF	STIFFENER
STL	STEEL
STRUC	STRUCTURE (AL)
T	
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
T/	TOP OF
TC	TENSION CONTROLLED BOLT
TEMP	TEMPORARY
TF	TRENCHED FOUNDATION
THK	THICK (NESS)
TOT	TOTAL
TRANS	TRANSVERSE
TYP	TYPICAL
U	
UNO	UNLESS NOTED OTHERWISE
V	
VERT	VERTICAL
W	
W/	WITH
W/O	WITHOUT
WD	WIDTH or WOOD
WF	WALL FOOTING
WP	WORKING POINT
WWR	WELDED WIRE REINFORCEMENT
WWF	WELDED WIRE FABRIC

GENERAL SYMBOLS LEGEND

GENERAL SYMBOLS LEGEND



DESIGN INFORMATION

1. CODES:
   A. INTERNATIONAL BUILDING CODE (IBC) 2015
   B. AMERICAN CONCRETE INSTITUTE - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318)
   C. AMERICAN INSTITUTE OF STEEL CONSTRUCTION - SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (AISC 360)
      ALLOWABLE STRENGTH DESIGN (ASD)
   D. AMERICAN SOCIETY OF CIVIL ENGINEERS AND STRUCTURAL ENGINEERING INSTITUTE (ASCE/SEI 7) - MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES
   E. AMERICAN WELDING SOCIETY D1.1
   F. AMERICAN IRON AND STEEL INSTITUTE (AISI S100) SPECIFICATION FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS
2. DESIGN LOADS PER THE 2015 IBC (RISK CATEGORY IV)
   A. DEAD LOADS
      STRUCTURE SELF WEIGHT AS SHOWN
      CEILING, MEP & FP — 10 PSF
      ROOFING SYSTEM — 10 PSF
   B. LIVE LOADS
      TYPICAL ROOF LIVE LOAD - 20 PSF
      TYPICAL FLOOR LIVE LOADS (REDUCIBLE PER IBC 1607.10)
      GARAGE SURCHARGE LOAD — 250 PSF
   C. ROOF SNOW LOAD
      GROUND SNOW LOAD, Pg — 25 PSF
      FLAT ROOF SNOW LOAD, Pf — 24 PSF
      SNOW EXPOSURE FACTOR, Ce — 1.0
      SNOW IMPORTANCE FACTOR, Is — 1.2
      THERMAL FACTOR, Ct — 1.0
   D. WIND PRESSURE (ASCE 7-10)
      WIND SPEED, Vult — 120 MPH
      NOMINAL DESIGN WIND SPEED, Vasd — 93 MPH
      WIND EXPOSURE — C
      INTERNAL PRESSURE COEFFICIENT — +/-0.18
      MWFRS DESIGN WIND LATERAL PRESSURE — 28 PSF
   E. WIND PRESSURE - COMPONENTS AND CLADDING
      PER ASCE 7 -10 FOR EACH REQUIRED COMPONENT
      SEE SHEET S001 FOR COMPONENTS AND CLADDING LOAD TABLE
   F. SEISMIC DESIGN DATA
      SEISMIC IMPORTANCE FACTOR — 1.5
      MAPPED SPECTRAL RESPONSE ACCELERATIONS, Ss — 0.078
      MAPPED SPECTRAL RESPONSE ACCELERATIONS, S1 — 0.051
      SITE CLASS — D
      SPECTRAL RESPONSE COEFFICIENTS, Sds — 0.083
      SPECTRAL RESPONSE COEFFICIENTS, Sd1 — 0.082
      SEISMIC DESIGN CATEGORY — A
      BASIC SEISMIC FORCE-RESISTING SYSTEM:
      STEEL SYSTEMS NOT SPECIFICALLY DESIGNED
      DESIGN BASE SHEAR, V = Cs x W — 41.6 KIPS
      SEISMIC RESPONSE COEFFICIENT, Cs — 0.0416
      RESPONSE MODIFICATION FACTOR, R — 3.0
      ANALYSIS PROCEDURE: - EQUIVALENT LATERAL FORCE
   G. LATERAL EARTH PRESSURES
      ACTIVE PRESSURE — 40 PCF X DEPTH
      AT-REST PRESSURE — 60 PCF X DEPTH
      PASSIVE PRESSURE — 360 PCF X DEPTH
   H. DEFLECTION CRITERIA
      a. FLOOR LIVE LOAD — L/360
      b. ROOF LIVE LOAD — L/240
3. SOILS INFORMATION BASED ON GEOTECHNICAL REPORT PREPARED BY TERRACON, REPORT NO. XXXXXXX, DATED XXXXXX.
   NET ALLOWABLE SOIL BEARING PRESSURES:
   SPREAD FOOTINGS — 2000 PSF
   CONTINUOUS WALL FOOTINGS — 2000 PSF
4. MINIMUM FROST PROTECTION DEPTH MEASURED FROM GRADE
   EXTERIOR FOOTING ADJACENT TO HEATED AREA — (-3'-6")

SUBMITTALS

1. CONRACTOR SHALL SUBMIT FOR REVIEW AND APPROVAL THE FOLLOWING SUBMITTALS FOR EACH MATERIAL INDICATED BELOW.
2. CONCRETE REINFORCING
   A. SUBMIT CONCRETE REINFORCEMENT SHOP DRAWINGS IN ACCORDANCE WITH ACI 315 FOR APPROVAL.
      a. DETAIL BARS IN ACCORDANCE WITH "ACI DETAILING MANUAL", PUBLICATION SP-66 AND THE LATEST EDITION OF ACI 318 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE".
3. CAST-IN-PLACE CONCRETE
   A. SUBMIT CONCRETE MIX DESIGNS FOR EACH APPLICATION LOCATION INDICATED IN THE DRAWINGS.
   B. SUBMIT SHOP DRAWING OF EMBEDDED STEEL ELEMENTS AND CONNECTIONS.
4. COLD FORMED STEEL FRAMING
   A. PROVIDE COLD FORMED STEEL FRAMING SHOP DRAWINGS WHICH INCLUDE THE FOLLOWING:
      a. PLANS INDICATING MEMBER SIZES, LOCATIONS, DIMENSIONS, OPENING LOCATIONS SUPPORT CONDITIONS AND WEB REINFORCEMENT.
      b. DETAIL CONNECTIONS AT MEMBER ENDS AND ADJACENT CONSTRUCTION.
      c. TYPE, SIZE AND LENGTH OF WELDED CONNECTIONS.
      d. LOCATIONS AND DETAILS OF ANCHORAGE DEVICES TO BE EMBEDDED IN OR ATTACHED TO STRUCTURE OR OTHER CONSTRUCTION.
      e. PROVIDE ENGINEERING DESIGN ANALYSIS AND CALCULATIONS DATA SIGNED AND SEALED BY THE QUALIFIED PROFESSIONAL ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED.

FOUNDATIONS - SLAB ON GRADE

1. THE PROJECT SITE SHALL BE PREPARED BY STRIPPING ALL UNSUITABLE SOILS, AS DETERMINED IN THE GEOTECHNICAL REPORT, IN THE BUILDING ADDITION AREA AS WELL AS WITHIN A ZONE THAT EXTENDS 8" LATERALLY BEYOND THE ADDITION AND/OR THE FOOTING PERIMETERS FOR EVERY FOOT OF STRIPPING DEPTH BELOW FINISHED SUBGRADE ELEVATION. THE SITE SHOULD THEN BE BACKFILLED UP TO THE FINISHED SUBGRADE ELEVATION WITH ACCEPTABLE SOILS AS LAID OUT IN THE GEOTECHNICAL REPORT REFERENCED IN THE DESIGN INFORMATION. SEE THE GEOTECHNICAL REPORT FOR MORE INFORMATION.
2. ALL ORGANIC MATERIAL AND UNACCEPTABLE FILL MATERIAL SHALL BE REMOVED FROM BENEATH THE SLAB ON GRADE AS DIRECTED IN THE SOIL REPORT. EXPOSED SUBGRADE SHALL BE PROOF ROLLED WITH A HEAVY WEIGHTED VEHICLE OF ROLLER IN THE PRESENCE OF THE GEOTECHNICAL SPECIAL INSPECTION AGENCY. AREAS EXHIBITING RUTTING, PUMPING OR WEAKNESS SHALL BE REMOVED AND REPLACED WITH COMPACTED ACCEPTABLE FILL MATERIAL.
3. COMPACTION SHALL BE TESTED AND VERIFIED TO MEET 98% STANDARD PROCTOR MAXIMUM DRY DENSITY ACCORDANCE WITH ASTM D698. FOR RELATIVELY COHESIONLESS GRANULAR FILL WHICH HAS A PERCENT PASSING THE #200 SIEVE LESS THAN 10 PERCENT AND HAS ONLY A SLIGHT SENSITIVITY TO MOISTURE CHANGES, COMPACTION SHALL BE 75 PERCENT RELATIVE DENSITY IN ACCORDANCE WITH ASTM D4253 AND D4254. IF COMPACTION DOES NOT COMPLY, CONTRACTOR SHALL RECOMPACT AREA AND UNTIL TEST RESULTS ARE PASSING. AN AREA EXHIBITING WEAKNESS SUCH AS RUTTING OR PUMPING SHALL BE REMOVED AND REPLACED WITH COMPACTED GRANULAR FILL.
4. CONCRETE SLAB ON GRADE SHALL BE PLACED ON A 6" WELL GRADED COMPACTED GRANULAR FILL SUB-BASE.
5. PLACE ALL SLABS ON GRADE WITH AN APPROVED JOINT PATTERN SUBMITTED BY CONTRACTOR AND APPROVED BY ENGINEER OR AS SHOWN ON DRAWINGS. SEQUENCE OF CONSTRUCTION AND CONTROL JOINTS SHALL BE PLACED TO MINIMIZE SHRINKAGE CRACKS.
6. CONCRETE SLAB ON GRADES SHALL HAVE CONTROL JOINTS SAW CUT OR TOOLED . LOCATE JOINT ALONG COLUMN CENTER LINES WITH INTERMEDIATE JOINTS AT A MAXIMUM SPACING OF 36 TIMES THE SLAB THICKNESS, UNLESS NOTED OTHERWISE. SLAB JOINT PANELS SHALL HAVE A MAXIMUM LENGTH TO WIDTH RATIO OF 1.5:1. DO NOT STAGGER OR OFFSET JOINTS. PROVIDE ADDITIONAL JOINTS AT RE-ENTRANT CORNER. IF RE-ENTRANT CORNERS ARE UNAVOIDABLE, THEN ADDITIONAL REINFORCING COMPRISED OF (2) #4 BARS x 3'-0" SHALL BE PLACED IN THE CENTER OF THE SLAB DIAGONAL TO THE RE-ENTRANT CORNER CONDITION. PROVIDE SHOP DRAWING OF CONTROL JOINT PATTERN AND CORNER REINFORCING.
7. SAWCUT JOINTS AS SOON AS SURFACE WILL ALLOW WITHOUT EDGES RAVELING BUT PRIOR TO THE NEXT DAY AFTER THE POUR.
8. FLOOR FINISHES SHALL BE STEEL TROWELED FOR ALL INTERIORS AND BROOM FINISHED FOR ALL EXTERIORS UNLESS NOTED OTHERWISE.
9. UTILITY TRENCH BACKFILL UNDER THE SLAB ON GRADE SHALL MEET THE SAME COMPACTION REQUIREMENTS AS THE ORIGINAL SUBGRADE LISTED ABOVE.
10. SLOPE SLABS TO DRAINS TO CREATE POSITIVE DRAINAGE. PROVIDE DEPRESSIONS WHERE INDICATED ON ARCHITECTURAL DRAWINGS, WHILE MAINTAINING THE THICKNESS OF THE CONCRETE SLAB.

GENERAL NOTES

1. THE GENERAL STRUCTURAL NOTES ARE INTENDED TO SUPPLEMENT THE DRAWINGS AND SPECIFICATIONS. SHOULD CONFLICTS EXIST BETWEEN THESE DRAWINGS AND THE SPECIFICATIONS NOTIFY THE ENGINEER OF ANY SUCH CONFLICTS.
2. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH ALL PROJECT DRAWINGS AND SPECIFICATIONS. REFER TO ALL DRAWINGS FOR THE COORDINATION OF THE WORK IN THIS PROJECT.
3. THE INTENT OF THESE PLANS AND NOTES IS TO PRESENT THE PROJECT REQUIREMENTS. MAJOR DETAILS HAVE BEEN SHOWN ON THE DRAWINGS. HOWEVER, CERTAIN MINOR DETAILS MUST BE WORKED OUT IN THE FIELD OR SHOP DRAWING PROCESS BY THE CONTRACTOR.
4. **ELEVATIONS GIVEN ON PLANS ARE IN REFERENCE TO THE FINISHED FLOOR ELEVATION (+100'-0") WHICH IS EQUAL TO THE CIVIL DATUM OF (XXX.XX').**
5. UNLESS NOTED OTHERWISE, DETAILS SHOWN ON DRAWINGS ARE TO BE CONSIDERED TYPICAL FOR ALL SIMILAR CONDITIONS.
6. THE STRUCTURE IS DESIGNED TO BE STABLE AND SELF-SUPPORTING AFTER THE BUILDING IS FULLY ERECTED AND ALL CONNECTIONS ARE COMPLETED. UNLESS NOTED OTHERWISE, THE DRAWINGS DO NOT INDICATE THE MEANS AND METHODS OF CONSTRUCTION. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO DETERMINE THE ERECTION PROCEDURE AND SEQUENCING TO ENSURE THE SAFETY OF THE BUILDING AND ITS COMPONENT PARTS DURING ERECTION. THIS INCLUDES THE ADDITION TEMPORARY BRACING, GUYS AND TIE-DOWNS NECESSARY FOR THE ERECTION PROCESS.
7. IT IS SOLELY THE CONTRACTOR'S RESPONSIBILITY TO FOLLOW THE APPLICABLE SAFETY CODES AND REGULATIONS DURING ALL PHASES OF CONSTRUCTION.
8. CONTRACTOR'S CONSTRUCTION AND ERECTION SEQUENCE SHALL CONSIDER THE EFFECTS OF THERMAL MOVEMENTS OF THE STRUCTURAL ELEMENTS DURING THE CONSTRUCTION PERIOD.
9. EXISTING CONDITIONS:
   A. THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL DIMENSIONS AND CONDITIONS RELATING TO EXISTING CONSTRUCTION AND EXISTING SERVICES ON SITE. THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND LOCATIONS OF EXISTING COLUMNS, WALLS, OPENINGS, ETC, WITH THE ARCHITECTURAL DRAWINGS PRIOR TO PROCEEDING WITH THE WORK. ANY DISCREPANCIES WITH THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ARCHITECT AND ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.
   B. DURING CONSTRUCTION THE CONTRACTOR MAY ENCOUNTER EXISTING CONDITIONS WHICH ARE NOT KNOWN OR ARE AT VARIANCE WITH PROJECT DOCUMENTATION (DISCOVERY). SUCH CONDITIONS MAY INTERFERE WITH THE NEW CONSTRUCTION OR REQUIRE PROTECTION AND/OR SUPPORT OF EXISTING WORK DURING CONSTRUCTION. IT MAY ALSO CONSIST OF DAMAGED OR DETERIORATION OF STRUCTURAL MATERIALS OR COMPONENTS WHICH COULD JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING(S). THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ALL DISCOVERIES WHICH MAY INTERFERE WITH THE PROPER EXECUTION OF THE WORK OR JEOPARDIZE THE STRUCTURAL INTEGRITY OF THE BUILDING(S) PRIOR TO PROCEEDING WITH THE WORK RELATED TO SUCH DISCOVERIES.
   C. DURING THE CONSTRUCTION PROCESS, IT SHALL BE SOLELY THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN THE INTEGRITY OF THE EXISTING STRUCTURE AND TO PROTECT IT FROM DAMAGE ANY PORTIONS THAT ARE TO REMAIN.
   D. CONTRACTOR SHALL INVESTIGATE THE SITE DURING EARTHWORK OPERATIONS FOR FILL MATERIAL OR BURIED STRUCTURES. IMMEDIATELY, NOTIFY THE ENGINEER IF ANY SUCH MATERIALS OR STRUCTURES ARE DISCOVERED.
10. STRUCTURAL COORDINATION
    A. MECHANICAL, ELECTRICAL OR PLUMBING LOADS, OPENINGS AND SUPPORT FRAMING ARE SHOWN FOR BIDDING PURPOSES ONLY. CONTRACTOR SHALL OBTAIN APPROVAL OF THE MECHANICAL, ELECTRICAL OR PLUMBING CONTRACTOR BEFORE PROCEEDING WITH SUCH PORTION OF THE WORK.
    B. THE CONTRACTOR SHALL VERIFY THE SIZE AND LOCATION OF ALL OPENINGS, HOLES AND SLEEVES THROUGH FOUNDATIONS AND OTHER STRUCTURAL ELEMENTS WITH THE MECHANICAL, ELECTRICAL AND PLUMBING CONTRACTORS. NO OPENINGS SHALL PASS THROUGH STRUCTURAL MEMBERS UNLESS SHOWN ON THE DRAWINGS OR APPROVED BY THE ENGINEER.
    C. EXCESS COST DUE TO VARIATION IN THE STRUCTURE TO ACCOMMODATE A SUBSTITUTION OR ALTERNATE MANUFACTURER(S) FROM THE LISTED BASIS OF DESIGN SHALL BE BORNE BY THE CONTRACTOR.
11. BEFORE SUBMITTING A BID, EACH BIDDER SHALL VISIT THE SITE AND BECOME FULLY ACQUAINTED WITH THE EXISTING CONDITIONS, CONSTRUCTION REQUIREMENTS, RESTRICTIONS, QUANTITIES AND EQUIPMENT NECESSARY TO COMPLETE THE WORK. THE BID SHALL INCLUDE ALL ITEMS REQUIRED TO COMPLETE THE WORK WITHIN THE EXISTING CONDITIONS. DISRUPTION OF THE OWNERS NORMAL ACTIVITIES AROUND THE CONSTRUCTION SITE SHALL BE KEPT TO A MINIMUM.
12. THE COST OF ADDITIONAL DESIGN WORK DUE TO ERRORS AND OMISSIONS BY THE CONTRACTOR DURING CONSTRUCTION SHALL BE BORNE BY THE RESPONSIBLE CONTRACTOR.
13. ANY ENGINEERING DESIGN PROVIDED BY OTHER AND SUBMITTED FOR REVIEW OR RECORD SHALL BEAR THE STAMP AND SIGNATURE OF A PROFESSIONAL STRUCTURAL ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT EXISTS.
14. CONTRACTOR SHALL COORDINATE WORK SCHEDULES WITH THE OWNER TO ESTABLISH CONSTRUCTION SEQUENCING AROUND ANY OCCUPIED AREAS. CONTRACTOR SHALL NOT PROCEED TO OCCUPIED AREAS UNTIL AUTHORIZED BY THE OWNER.
15. ALL ELEMENTS AND SURFACES DAMAGED BY DEMOLITION, BUT NOT SCHEDULED FOR REMOVAL SHALL BE REPAIRED AND REFINISHED TO MATCH THE ADJACENT SURFACES AT NO ADDITIONAL COST TO THE OWNER.
16. CONTRACTOR SHALL REMOVE ALL DEBRIS AND WASTE MATERIALS RESULTING FROM CONSTRUCTION FROM THE SITE, UNLESS NOTED OTHERWISE.
17. CONTRACTOR SHALL MINIMIZE CREATION OF DUST, DIRT AND WINDBORNE DEBRIS FROM BLOWING ACROSS THE SITE AND ONTO ADJACENT SITES.
18. CONTRACTOR SHALL COVER ANY EXTERIOR OPENING WITH TEMPORARY CLOSURES WHEN NOT WORKING ON SITE TO PROTECT THE INTERIOR SPACES FROM WEATHER, INSECTS, RODENTS AND INTRUDERS.

STRUCTURAL COLD-FORMED STEEL FRAMING

1. ALL STRUCTURAL COLD-FORMED STEEL SHALL CONFORM TO THE REQUIREMENTS AND RECOMMENDATIONS OF AISI S202, CODE OF STANDARD PRACTICE FOR COLD-FORMED STEEL STRUCTURAL FRAMING, LATEST EDITION.
2. MINIMUM REQUIREMENTS FOR ALL COLD-FORMED STEEL REFERENCED IN THE STRUCTURAL DRAWINGS ARE AS FOLLOWS:
   A. BASE METAL THICKNESS = 0.042 IN = 18 GAUGE = 43 MILS
   B. FLANGE WIDTH OF STUD = 1.625 IN
   C. FLANGE WIDTH OF TRACK = 1.25 IN
   D. FLANGE WIDTH OF BOX, BACK-TO-BACK, = 1.625 IN
   E. YIELD STRENGTH Fy = 50 KSI
3. STRUCTURAL COLD FORMED FRAMING IS PERFORMANCE SPECIFIED BASED ON THE DESIGN INFORMATION INCLUDED IN THESE DOCUMENTS. MEMBER DEPTHS AND SPACING SHALL MEET THE DRAWING REQUIREMENTS, WHILE MEMBER GAUGE, SECTION PROFILE, MATERIAL STRENGTH, BRACING, STIFFENERS AND CONNECTION DETAILS ARE THE RESPONSIBILITY OF THE MANUFACTURERS ENGINEER BASED ON THE LOADS INDICATED IN THE DOCUMENTS AND SPECIFICATIONS.
4. STEEL SHEET USED IN SHEETS OR TO FABRICATE STEEL-FRAMING ACCESSORIES SHALL BE ASTM A1003, STRUCTURAL GRADE, TYPE H, METALLIC COATED, AND OF SAME GRADE AND COATING WEIGHT USED FOR FRAMING MEMBERS.
5. ALL STEEL USED IN EXTERIOR WALL ASSEMBLIES SHALL BE ZINC COATED WITH A MINIMUM RATING OF G60.
6. STEEL SHAPES AND CLIPS SHALL MEET ASTM A36 AND BE ZINC COATED BY HOT-DIP PROCESS IN ACCORDANCE WITH ASTM A123.
7. GALVANIZING REPAIR PAINT: ASTM A780
8. POWER-ACTUATED FASTENERS:
   A. CORROSION-RESISTANT FINISH
   B. MINIMUM LENGTH = 1 1/4" FOR CONCRETE EMBEDMENT
9. MECHANICAL FASTENERS:
   A. ASTM C 1513
   B. CORROSION-RESISTANT FINISH
   C. SELF-DRILLING, SELF-TAPPING, STEEL DRILL SCREWS
   D. LOW-PROFILE HEAD BENEATH SHEATHING
   E. MANUFACTURER'S STANDARD HEAD WHEN NOT BENEATH SHEATHING.
10. ALL WELDED CONNECTIONS ARE TO BE PERFORMED IN ACCORDANCE WITH AMERICAN WELDING SOCIETY(AWS) D1.3 LATEST EDITION SPECIFICATION FOR WELDING SHEET STEEL IN STRUCTURES.
11. BEARING WALL STUDS SHALL BE FABRICATED WITH FULL STUD ENDS SEATED AGAINST THE BOTTOM TRACK. STUDS CUT AT WEB PUNCHOUTS ARE NOT ACCEPTABLE FOR USE IN WALLS.
12. WALL STUDS SHALL BE PLACED TO ENSURE WEB PUNCHOUT ALIGNMENT WHEN ASSEMBLING FRAMING.
13. ALL FIELD CUTTING OF STUDS SHALL BE DONE BY SAWING. ALL FRAMING SHALL BE CUT SQUARE AND TRUE FOR CONNECTION TO PERPENDICULAR MEMBERS.
14. TOP AND BOTTOM TRACK SHALL BE SAME DEPTH AND GAGE AS WALL STUDS FRAMING. SPLICE TRACKS PER MANUFACTURERS STANDARD DETAILS.
15. ALL STUD WALLS, INCLUDING FURRING STUDS ATTACHED TO STRUCTURAL STUDS, SHALL HAVE LATERAL BRIDGING AT 3RD POINTS OF SPAN OR SPACED AT 48" OC MAXIMUM VERTICAL SPACING.

FOUNDATIONS

1. ALL EXCAVATIONS SHALL BE PROPERLY AND SAFELY BACKFILLED. DO NOT PLACE BACKFILL BEHIND BASEMENT WALLS OR RETAINING WALLS UNTIL CONCRETE HAS ATTAINED THE SPECIFIED COMPRESSIVE STRENGTH. BASEMENT WALLS SHALL NOT BE BACKFILLED UNTIL SUPPORTING FLOOR IS COMPLETED AND ATTAINED FULL STRENGTH. CONTRACTOR SHALL PROTECT ALL BELOW GRADE WALLS FROM LATERAL EARTH PRESSURES UNTIL SUPPORTING FLOOR STRUCTURE IS COMPLETED. CONTRACTOR PROVIDE FOR DESIGN, PERMITS AND INSTALLATION OF LATERAL SHORING TO BRACE WALLS IN LIEU OF WAITING FOR FLOOR SLAB COMPLETION.
2. FOOTING SHALL BE CENTERED UNDER WALLS AND COLUMNS UNLESS NOTED OTHERWISE.
3. CONTRACTOR SHALL ACCOUNT FOR PUMPING OF WATER FROM THE EXCAVATION DUE TO SURFACE WATER, GROUND WATER AND SEEPAGE.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN AND INSTALLATION OF ALL SHEETING, SHORING AND CRIBBING REQUIRED TO SAFELY RETAIN THE EARTH BANK AROUND THE EXCAVATIONS.
5. ALL FOOTINGS SHALL BE PLACED ONTO FIRM UNDISTURBED SOIL OR ACCEPTABLE COMPACTED BACKFILL AS OUTLINED IN THE SOIL REPORT AND PROJECT SPECIFICATIONS.
6. FOOTING ELEVATIONS SHOWN DESIGNATE THE MINIMUM DEPTH OF THE FOOTING WHERE THE ALLOWABLE SOIL BEARING IS EXPECTED. LOCALIZED AREAS OF UNACCEPTABLE SOILS OR POOR COMPACTION MAY BE DISCOVERED DURING THE EXCAVATION PROCESS REQUIRING OVEREXCAVATION AND BACKFILL WITH ACCEPTABLE FILL. FOOTING EXCAVATIONS SHALL BE LOWERED TO REACH SOIL MEETS THE DESIGN BEARING PRESSURE AND APPROVED BY THE GEOTECHNICAL SPECIAL INSPECTION AGENCY.
7. ACCEPTABLE BACKFILL MATERIAL SHALL BE PLACED IN LIFTS NOT TO EXCEED EIGHT (8) INCHES IN LOOSE THICKNESS.
8. FOR FOOTING AND FOUNDATIONS, THE SUBGRADE OR FILL MATERIAL SHALL BE COMPACTED AND VERIFIED TO MEET 98% STANDARD PROCTOR MAXIMUM DRY DENSITY ACCORDANCE WITH ASTM D698. FOR RELATIVELY COHESIONLESS GRANULAR FILL WHICH HAS A PERCENT PASSING THE #200 SIEVE LESS THAN 10 PERCENT AND HAS ONLY A SLIGHT SENSITIVITY TO MOISTURE CHANGES, COMPACTION SHALL BE 75 PERCENT RELATIVE DENSITY IN ACCORDANCE WITH ASTM D4253 AND D4254. IF COMPACTION DOES NOT COMPLY, CONTRACTOR SHALL RECOMPACT AREA AND UNTIL TEST RESULTS ARE PASSING. AN AREA EXHIBITING WEAKNESS SUCH AS RUTTING OR PUMPING SHALL BE REMOVED AND REPLACED WITH COMPACTED GRANULAR FILL.
9. FOOTING EXCAVATIONS SHALL BE INSPECTED AND APPROVED BY THE GEOTECHNICAL SPECIAL INSPECTION AGENCY BEFORE CONCRETE IS PLACED. CONTRACTOR SHALL NOTIFY INSPECTION AGENCY WHEN EXCAVATION IS READY FOR TESTING. INSPECTION AGENCY SHALL PROVIDE A WRITTEN REPORT OF TEST RESULTS AND COMPLIANCE TO THE OWNER.
10. ACCEPTABLE SOIL SHALL BE DEFINED AS MEETING ASTM D2487 SOIL CLASSIFICATION GROUPS GW, GP, GM, SW, SP, SM OR A COMBINATION OF THESE TYPES.
11. UNACCEPTABLE SOILS SHALL BE DEFINED AS MEETING ASTM D2487 SOIL CLASSIFICATION GROUPS GC, SC, ML, MH, CL, CH, OL, OH, PT OR A COMBINATION OF THESE TYPES. GROUPS CL AND ML MAY BE ACCEPTABLE IF THE LIQUID LIMIT IS LESS THAN 45 AND THE PLASTICITY INDEX IS LESS THAN 20.
12. THE CONTRACTOR SHALL PROVIDE ALL NECESSARY MEASURES TO PREVENT ANY FROST OR ICE FROM PENETRATING ANY FOOTING OR SLAB SUBGRADES BEFORE AND AFTER PLACING THE CONCRETE AND UNTIL SUCH SUBGRADE IS FULLY PROTECTED BY THE PERMANENT BUILDING ENCLOSURE AND THE SPACE IS CONDITIONED TO REMAIN ABOVE FREEZING.
13. CONCRETE FOOTINGS AND SLABS SHALL NOT BE PLACED ON OR AGAINST SUBGRADES CONTAINING FROST, SNOW OR ICE. FROZEN SUBGRADES SHALL BE COMPLETELY THAWED AND RECONDITIONED BEFORE CONCRETE MAY BE PLACED.
14. REPEATED HEAVY CONSTRUCTION TRAFFIC OVER EXPOSED SUBGRADE WILL CAUSE RUTTING AND PUMPING WHEN SOIL IS ABOVE THE OPTIMUM MOISTURE CONTENT. AVOID EXCESS CONSTRUCTION ACTIVITY ON WET SOILS. IF SUBGRADE IS ABOVE THE OPTIMUM MOISTURE CONTENT DURING CONSTRUCTION, THEN DRYING OF THE SOIL SHALL BE CONDUCTED BY DISKING, SCARIFICATION, AND AERATION.
15. SOILS WITH A MOISTURE CONTENT ABOVE THE OPTIMUM LEVEL SHALL BE REMOVED AND REPLACED WITH COMPACTED GRANULAR FILL.
16. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER OF ANY UNUSUAL SOIL CONDITIONS THAT ARE IN VARIANCE WITH THE SOIL REPORT.
17. CONTRACTOR SHALL NOTIFY THE ARCHITECT AND ENGINEER IMMEDIATELY IF THE EXISTING FOUNDATIONS VARY FROM THAT SHOWN ON THE DRAWINGS.
18. CONTRACTOR SHALL VERIFY OPENINGS AND SLEEVES THROUGH FOUNDATION WALLS WITH THE ARCHITECTURAL, MECHANICAL AND ELECTRICAL REQUIREMENTS. CHANGES IN SIZE, LOCATION AND NUMBER SHALL NOT BE PERMITTED WITHOUT WRITTEN APPROVAL BY THE ENGINEER.
19. CONTINUOUS WALL FOOTING REINFORCING SHALL EXTEND THROUGH COLUMN SPREAD FOOTINGS UNLESS NOTED OTHERWISE.

CAST-IN-PLACE CONCRETE

1. ALL CONCRETE SHALL CONFORM TO THE LATEST REQUIREMENTS OF THE AMERICAN CONCRETE INSTITUTES PUBLICATIONS: ACI 301, ACI 305.1, ACI 306.1, ACI 315, AND ACI 318 UNLESS NOTED OTHERWISE.
2. CONCRETE COMPRESSIVE STRENGTH (28 DAY)(F'c)
   FOOTINGS — 4000 PSI
   FOUNDATION WALLS AND PIERS — 4000 PSI
   SLAB ON GRADE — 4000 PSI
   TIE BEAMS — 4000 PSI
3. CONCRETE REINFORCEMENT STANDARDS:
   DEFORMED BARS — ASTM A615 — Fy = 60 KSI
   WELDED WIRE REINFORCEMENT (WWR) — ASTM A1064 — Fy = 65 KSI
   EPOXY COATED REINFORCING — ASTM A775 — Fy = 60 KSI
4. ALL CONCRETE SHALL BE STONE AGGREGATE UNLESS NOTED OTHERWISE. SUBMIT MIX DESIGN AND DOCUMENTATION FOR APPROVAL PER ACI 318.
5. REINFORCEMENT PROTECTION
   A. CONCRETE PLACED AGAINST EARTH - 3"
   B. CONCRETE PLACED IN FORMS BUT EXPOSED TO WEATHER OR EARTH:
      a. BARS #5 AND SMALLER - 1 1/2"
      b. BARS LARGER THAN #5 - 2"
   C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:
      a. SLABS, WALLS, AND JOISTS - 3/4"
      b. BEAMS, COLUMNS - 1 1/2"
6. WHERE REQUIRED, DOWELS SHALL MATCH THE SIZE, NUMBER AND SPACING OF THE MAIN REINFORCING UNLESS NOTED OTHERWISE.
7. ALL SPLICES, STANDARD HOOKS, AND DEVELOPMENT LENGTHS TO BE PER THE REFERENCED EDITION OF ACI 318. MAKE BARS CONTINUOUS AROUND CORNERS. ALL SPLICES SHALL BE BY CONTACT LAP.
8. ALL SPLICES SHALL BE A CLASS "B" TENSION SPLICE AS DEFINED IN ACI 318. PROVIDE LAP SPLICES LENGTHS AS FOLLOWS:

	4000 PSI	
BAR SIZE	TYPICAL	TOP BARS
#3	19"	25"
#4	25"	33"
#5	31"	41"
#6	37"	49"
#7	54"	71"
#8	62"	81"
#9	70"	91"
#10	79"	102"
#11	87"	114"

   LAP SPLICE LENGTHS GIVEN, ASSUME CLEAR SPACING BETWEEN BARS OF 2 BAR DIAMETERS, AND A MINIMUM CLEAR COVER OF 1 BAR DIAMETER. TOP BARS ARE DEFINED AS HORIZONTAL BARS WITH MORE THAN 12" ON FRESH CONCRETE BENEATH THE BARS.
9. WALLS AND GRADE BEAMS SHALL NOT HAVE JOINTS IN A HORIZONTAL PLANE, UNLESS APPROVED BY THE ENGINEER.
10. CONSTRUCTION JOINTS IN STRUCTURAL CONCRETE WORK MUST BE MADE AT CENTER OF SPAN OR AT CENTER OF SUPPORT WITH VERTICAL BULKHEADS AND HORIZONTAL KEYS, UNLESS OTHERWISE SHOWN.
11. THERE SHALL BE NO ADDITIONAL OPENINGS LARGER THAN 10" IN CONCRETE WALLS AND SLABS NOT SHOWN. REFER TO CONCRETE OPENING DETAIL FOR ADDITIONAL REINFORCEMENT AROUND OPENINGS.
12. REINFORCING STEEL SHALL BE SECURELY FASTENED INTO FORMS PRIOR TO POURING CONCRETE. WET SETTING OF REINFORCING STEEL WILL NOT BE ACCEPTED PER ACI.
13. CONCRETE MIX - FOOTINGS AND PILE CAPS
    COARSE AGGREGATE — 100% PASSING 1" SIEVE
    FINE AGGREGATE — 100% PASSING 3/8" SIEVE
    WATER/CEMENT RATIO — 0.45
    SLUMP — 4" +/- 1"
    AIR CONTENT — 6% +/- 1.5%
14. CONCRETE MIX - FOUNDATIONS AND TIE BEAMS
    COARSE AGGREGATE — 100% PASSING 1" SIEVE
    FINE AGGREGATE — 100% PASSING 3/8" SIEVE
    WATER/CEMENT RATIO — 0.45
    SLUMP (NO WATER REDUCER) — 4" +/- 1"
    SLUMP (WITH WATER REDUCER) — 4" TO 8"
    AIR CONTENT — 6% +/- 1.5%
15. CONCRETE MIX - SLAB ON GRADE - INTERIOR
    COARSE AGGREGATE — 100% PASSING 1" SIEVE
    FINE AGGREGATE — 100% PASSING 3/8" SIEVE
    WATER/CEMENT RATIO — 0.5
    SLUMP (WITH WATER REDUCER) — 4" TO 6"
    AIR CONTENT — LESS THAN 3%

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CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: CRM
APPROVED: ACB
ISSUED FOR: QC REVIEW
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

STRUCTURAL GENERAL INFORMATION

S000

STATEMENT OF SPECIAL INSPECTIONS

This Statement of Special Inspections is submitted as a condition for permit issuance in accordance with the Special Inspection and Structural Testing requirements of the Building Code. It includes a schedule of Special Inspection services applicable to the structural components of this project. If applicable, it includes Requirements for Seismic Resistance and/or Requirements for Wind Resistance. This Statement of Special Inspections Encompasses the following disciplines:

[X] Structural [ ] Mechanical / Electrical / Plumbing
[ ] Architectural [ ] Other

The Special Inspection Coordinator shall keep records of all inspections and shall furnish inspection reports to the Building Official and the Registered Design Professional in Responsible Charge. Discovered discrepancies shall be brought to the immediate attention of the Contractor for correction. If such discrepancies are not corrected, the discrepancies shall be brought to the attention of the Building Official and the Registered Design Professional in Responsible Charge. The Special Inspection program does not relieve the Contractor of his or her responsibilities.

Interim reports shall be submitted to the Building Official and the Registered Design Professional in Responsible Charge. A Final Report of Special Inspections documenting completion of all required Special Inspections, testing and corrections of any discrepancies noted in the inspections shall be submitted prior to issuance of a Certificate of Use and Occupancy. Job site safety and means and methods of construction are solely the responsibility of the Contractor.

QUALIFICATIONS OF INSPECTORS AND TESTING TECHNICIANS

The qualifications of all personnel performing Special Inspection and testing activities are subject to the approval of the Building Official. The credentials of all Inspectors and testing technicians shall be provided if requested.

Key for Minimum Qualifications of Inspection Agents:

When the Registered Design Professional in Responsible Charge deems it appropriate that the individual performing a stipulated test or inspection have a specific certification or license as indicated below, such designations shall appear below the Agent on the Schedule.

PE/SE Structural Engineer - A licensed SE or PE specializing in the design of building structure
PE/GE Geotechnical Engineer - A licensed PE specializing in soil mechanics and foundations
EIT Engineer-In-Training - A graduate engineer who has passed the Fundaments of Engineering examination

American Concrete Institute (ACI) Certification
ACI-CFTT Concrete Field Testing Technician - Grade 1
ACI-CCI Concrete Construction Inspector
ACI-LTT Laboratory Testing Technician - Grade 1 & 2
ACI-STT Strength Testing Technician

American Welding Society (AWS) Certification
AWS-CWI Certified Welding Inspector
AWS/AISC-SSI Certified Structural Steel Inspector

American Society of Non-Destructive Testing (ASNT) Inspection
ASNT Non-Destructive Testing Technician - Level II or III

International Code Council (ICC) Certification
ICC-SMSI Structural Masonry Special Inspector
ICC-SFSI Spray-Applied Fireproofing Special Inspector
ICC-RCSI Reinforced Concrete Special Inspector
ICC-SWSI Structural Steel and Welding Special Inspector
ICC-PCSI Prestressed Concrete Special Inspector

National Institute of Certification in Engineering Technologies (NICET)
NICET-CT Concrete Technician - Levels I, II, III, & IV
NICET-ST Soils Technician - Levels I, II, III & IV
NICET-GET Geotechnical Engineering Technician - Level I, II, III & IV

Exterior Design Institute (EDI) Certification
EDI-EIFS EIFS Third Party Inspector

QUALITY ASSURANCE PLAN

Quality Assurance for Seismic Resistance:

1. Seismic Design Category:	X
2. Statement of Special Inspections for Seismic Resistance required (Y/N):	X
3. Description of Seismic-Force Resisting System subject to Special Inspection and testing for Seismic Resistance:	X
4. Description of Designated Seismic Systems subject to Special Inspections and testing for Seismic Resistance:	X
5. Description of additional Seismic Systems and components requiring Special Inspections and testing:	X
6. Each Contractor responsible for the construction and fabrication of a system or component described above must submit a Statement of Responsibility.	

Quality Assurance Plan for Wind Requirements:

1. Nominal Design Wind Speed, Vasd =	X
2. Wind Exposure Category:	X
3. Statement for Special Inspection for Wind Resistance Required (Y/N):	X
4. Description of main Wind Force-Resisting System subject to Special Inspection for Wind Resistance:	X
5. Description of Wind Force-Resisting components subject to Special Inspection of Wind Resistance:	X
6. Each Contractor responsible for the construction or fabrication of a system or component described above must submit a Statement of Responsibility.	

CONTRACTOR'S RESPONSIBILITY REGARDING INSPECTIONS

1. The Contractor is responsible for scheduling a pre-construction meeting (scheduled at least 5 business days before start of construction). Meeting should include all responsible parties (A/E, SI's, Field Inspector). Meeting is for entire project, not phase of work.
2. Pre-construction meeting is to be conducted by the contractor with meeting minutes to be taken and distributed to all members attending. Meeting minutes to include a sign-in sheet for all parties.
3. The contractor is responsible for scheduling inspections and tests. Sufficient notice and lead time must be allowed for the inspection and testing to be performed without impending construction operations.
4. The contractor must cooperate with the inspections and testing agencies. Safe access must be provided to all inspection and test to be performed. This may require the contractor to provide scaffolding, ladders or lifts.
5. When deficiencies are identified, the contractor must take corrective actions to comply with the contract documents or remedy the deficiencies as directed by the registered design professional.
6. The special inspection and quality assurance program does not relieve the contractor of his or her responsibility to perform quality control.
7. The contractor is responsible for testing services that are required for material submittals and that not part of the special inspections program (e.g. aggregate tests, concrete mix designs, testing of controlled fill, materials, etc.).

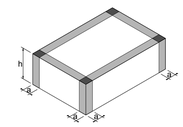
SOILS	SERVICE	EXTENT	AGENT
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	Field Inspection	Periodic	PE/GE/EIT
2. Verify excavations are extended to proper depth and have reached proper material	Field Inspection	Periodic	PE/GE/EIT
3. Perform sieve tests (ASTM D422 & D1140) and modified Proctor tests (ASTM D1557) of each source of fill material.	Field Inspection	Periodic	PE/GE/EIT
4. Verify use of proper materials, densities, and lift thicknesses during placement and compaction of controlled fill. Test density of each lift or fil by nuclear methods (ASTM D2922)	Field Inspection	Continuous	PE/GE/EIT
5. Prior to placement of controlled fill, observe subgrade and verify that site has been prepared properly	Field Inspection	Periodic	PE/GE/EIT

CONCRETE CONSTRUCTION	SERVICE	EXTENT	AGENT
1. Inspect size, spacing, cover, positioning and grade of reinforcing steel. Verify that reinforcing bars are free of form oil or other deleterious materials. Inspect bar laps and mechanical splices. Verify that bars are adequately tied and supported of chairs or bolsters.	Field Inspection	Periodic	ACI-CCI ICC-RCSI
2. Reinforcing steel welding	Field Inspection		
a. Verification of weldability of steel other than ASTM A707		Periodic	
b. Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, boundary elements of special concrete structural walls and shear reinforcement		Continuous	
c. Shear reinforcement		Continuous	
3. Inspect size, positioning and embedment of anchor rods. Inspect concrete placement and consolidation around anchors	Field Inspection	Periodic	
4. Inspection of anchors and reinforcing steel post-installed in hardened concrete: Per research reports including verification of anchor type, anchor dimensions, hole dimensions, hole cleaning procedures, anchor spacing, edge distances, concrete minimum thickness, anchor embedment and tightening torque	Field Inspection	Periodic or as required by the research report issued by an approved source	ACI-CCI ICC-RCSI
5. Review concrete batch tickets and verify compliance with approved mix design. Verify that water added at the site does not exceed that allowed by the mix design	Field Inspection	Periodic	ACI-CCI ICC-RCSI
6. Test concrete compressive strength (ASTM C31 & C39), slump (ASTM C143), air-content (ASTM C231 or C173) and temperature (ASTM C1064).	Field Inspection	Continuous	ACI-CFTT ACI-STT
7. Inspect placement of concrete. Verify that concrete conveyance and depositing avoids segregation or contamination. Verify that concrete is properly consolidated.	Field Inspection	Continuous	ACI-CCI ICC-RCSI
8. Inspection for maintenance of specified curing temperature and techniques	Field Inspection	Periodic	ACI-CCI ICC-RCSI
9. Inspection of formwork for shape, lines, location and dimensions	Field Inspection	Periodic	ACI-CCI ICC-RCSI
10. Concrete strength testing and verification of compliance with construction documents	Field testing and review of laboratory reports	Periodic	
11. Perform floor flatness and/or levelness testing (ASTM E1155) for all slab-on-grade and elevated slabs per specification.	Field Inspection	Continuous	ACI-CCI ICC-RCSI

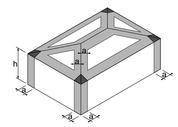
STEEL CONSTRUCTION	SERVICE	EXTENT	AGENT
1. Fabricator Certification	AISC Certified fabricator required by specification	Each submittal	AWS/AISC-SSI ICC-SWSI
2. Material verification. Review certified mill test reports and identification markings on wide-flange shapes, high-strength bolts, nuts, and welding electrodes	Field Inspection	Periodic	AWS/AISC-SSI ICC-SWSI
3. Embedments: Verify diameter, grade, type, length, embedment. See Concrete Construction for anchors	Field Inspection	Periodic	
4. Verify member locations, braces, stiffeners, and application of joint details at each connection comply with construction documents	Field Inspection	Periodic	
5. Structural steel welding:			
a. Inspection tasks Prior to Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-1)	Field Inspection	Periodic at all welded joints	
b. Inspection tasks During Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-2)	Field Inspection	Periodic at all welded joints	
c. Inspection tasks After Welding (Observe, or perform for each welded joint or member, the QA tasks listed in AISC 360, Table N5.4-3)	Field Inspection	Periodic at all welded joints	
d. Nondestructive testing (NDT) of welded joints:			
1) Complete penetration welds	Field ultrasonic testing - 100%	Periodic	
2) Thermally cut surfaces of access holes when material t > 2"	Field magnetic Particle or Penetrant testing	Periodic	
3) Welded joints subject to fatigue when required by AISC 360, Appendix 3, Table A-3.2	Field radiographic or Ultrasonic testing	Periodic	
4) Fabricator's NDT reports when fabricator performs NDT	Verify reports	Each submittal	
6. Structural steel bolting:	Field Inspection		
a. Inspection tasks Prior to Bolting (Observe, or perform tasks for each bolted connection, in accordance with QA tasks listed in AISC 360, Table N5.6-1)		Periodic at all bolted connections	
b. Inspection tasks During Bolting (Observe the QA tasks listed in AISC 360, Table N5.6-2)		Periodic at all bolted connections	
1) Pre-tensioned and slip-critical joints			
a) Turn-of-nut with matching markings		Continuous	
b) Direct tension indicator		Continuous	
c) Twist-off type tension control bolt		Continuous	
d) Turn-of-nut without matching markings		Continuous	
e) Calibrated wrench		Continuous	
2) Snug-tight joints		Periodic	
c. Inspection tasks After Bolting (Perform tasks for each bolted connection in accordance with QA tasks listed in AISC 360, Table N5.6-3)		Periodic at all bolted connections	
7. Inspection of steel elements of composite construction prior to concrete placement: Inspect size, number, positioning and welding of shear connectors. Inspect studs for full 360 degree flash. Ping test all shear connectors with a 3 lb. hammer. Bend test all questionable studs to 15 degrees.	Field Inspection and testing	Periodic	
8. Material verification of cold-formed steel deck: Identification markings	Field Inspection	Periodic	
9. Connection of cold-formed steel deck to supporting structure: Inspect welding and side-lap fastening of metal roof and floor deck is in conformance with approved submittal.	Field Inspection	Periodic	
10. Cold-formed steel trusses spanning 60 feet or greater: Verify temporary and permanent restraint/bracing are installed in accordance with the approved truss submittal package	Field Inspection	Periodic	
11. Open web steel joist. Inspect installation, field welding, and bridging of joist is in conformance with approved submittal.	Field Inspection	Periodic	

COMPONENTS AND CLADDING WIND PRESSURES (PSF)					
ZONE	TRIBUTARY AREA				
	10 SF OR SMALLER	50 SF	100 SF	200 SF	500 SF OR GREATER
WALL INTERIOR	+34.4 / -37.2	+30.8 / -33.7	+29.3 / -32.2	+27.8 / -30.7	+25.8 / -28.7
WALL EDGE	+34.4 / -45.8	+30.8 / -38.8	+29.3 / -35.7	+27.8 / -32.7	+25.8 / -28.7
ROOF INTERIOR	+16.0 / -37.6	+16.0 / -35.3	+16.0 / -34.4	+16.0 / -34.4	+16.0 / -34.4
ROOF EDGE	+16.0 / -63.0	+16.0 / -47.5	+16.0 / -40.7	+16.0 / -40.7	+16.0 / -40.7
ROOF CORNER	+16.0 / -94.9	+16.0 / -57.0	+16.0 / -40.7	+16.0 / -40.7	+16.0 / -40.7

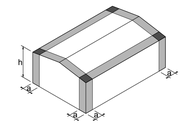
NOTES:
1. REFER TO DESIGN CRITERIA FOR INFORMATION REGARDING GOVERNING BUILDING CODE.
2. PLUS AND MINUS SIGNS SIGNIFY PRESSURES ACTING TOWARD AND AWAY FROM THE SURFACES, RESPECTIVELY.
3. LINEAR INTERPOLATION IS PERMITTED FOR TRIBUTARY AREAS NOT SHOWN.
4. SEE FIGURE BELOW FOR ZONE DEFINITIONS.
5. NOTATION:
   a: 10% OF LEAST HORIZONTAL DIMENSION OR 0.4h, WHICHEVER IS SMALLER, BUT NOT LESS THAN EITHER 4% OF LEAST HORIZONTAL DIMENSION OR 3 FEET.
   h: MEAN ROOF HEIGHT, IN FEET, EXCEPT THAT EAVE HEIGHT SHALL BE USED FOR ROOF ANGLES < 10°
   Θ: ANGLE OF PLANE OF ROOF FROM HORIZONTAL, IN DEGREES.



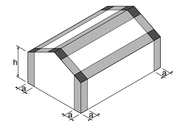
FLAT ROOF



HIP ROOF (7°<Θ<27°)



GABLE ROOF (Θ<7°)



GABLE ROOF (7°<Θ<45°)

INTERIOR ZONES
FLOORS - ZONE1
WALLS - ZONE 4

END ZONES
FLOORS - ZONE 2
WALLS - ZONE 5

CORNER ZONES
FLOORS - ZONE 3
WALLS - ZONE 3

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SPECIAL INSPECTIONS

S001

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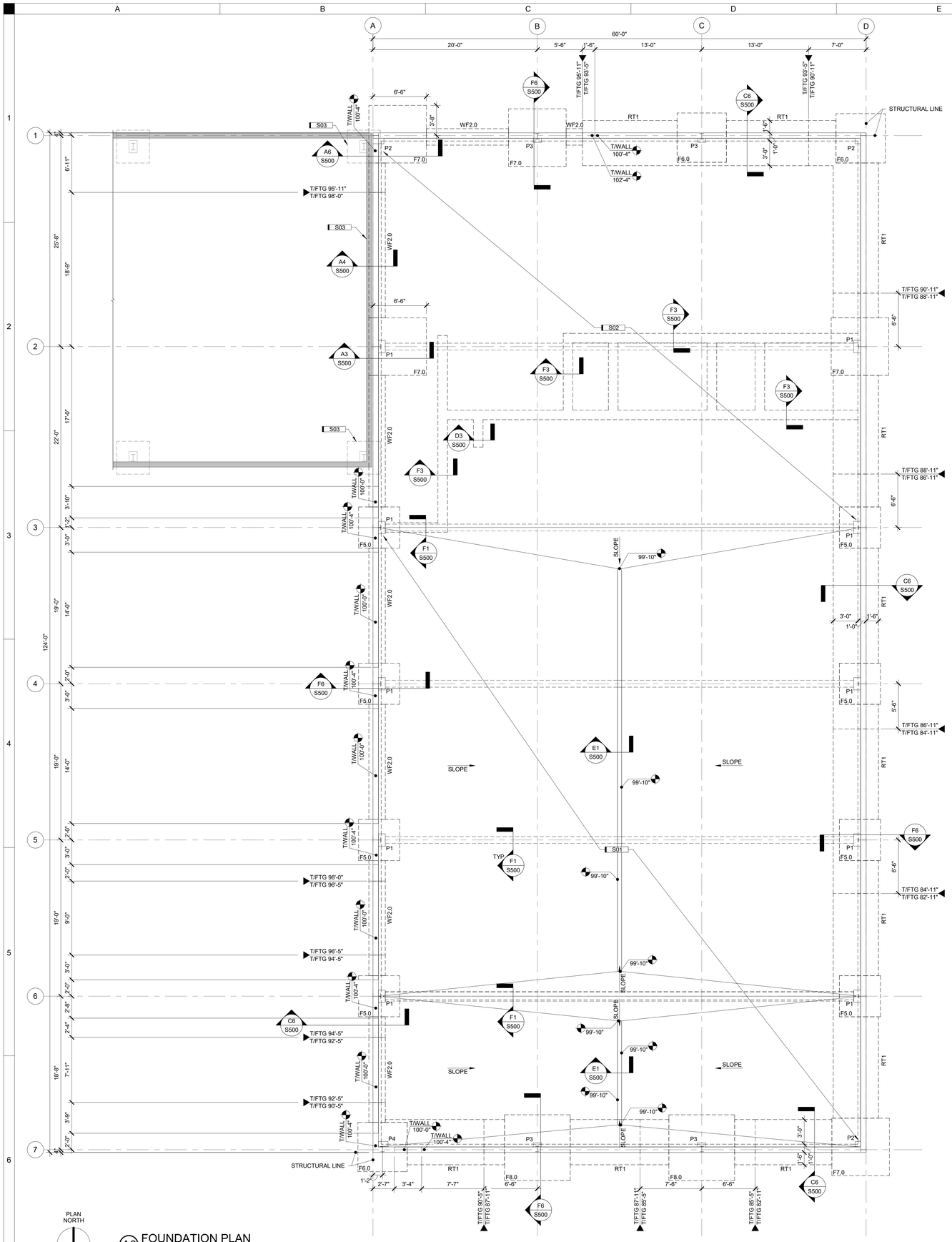

A6 FOUNDATION PLAN
3/16" = 1'-0"

SPREAD FOOTING SCHEDULE

MARK	SIZE WIDTH	SIZE LENGTH	SIZE DEPTH	BOTTOM REINFORCING LONGITUDINAL	BOTTOM REINFORCING TRANSVERSE	TOP REINFORCING LONGITUDINAL	TOP REINFORCING TRANSVERSE	REMARKS
F5.0	5' - 0"	5' - 0"	1' - 6"	(5) #6	(5) #6	(5) #6	(5) #6	
F6.0	6' - 0"	6' - 0"	1' - 6"	(6) #6	(6) #6	(6) #6	(6) #6	
F7.0	7' - 0"	7' - 0"	1' - 6"	(7) #6	(7) #6	(7) #6	(7) #6	
F8.0	8' - 0"	8' - 0"	1' - 6"	(8) #6	(8) #6	(8) #6	(8) #6	

WALL FOOTING SCHEDULE

MARK	SIZE WIDTH	SIZE DEPTH	LONGITUDINAL REINFORCING BOTTOM	LONGITUDINAL REINFORCING TOP	TRANSVERSE REINFORCING	REMARKS
RT1	5' - 6"	1' - 6"	(6) #6	(6) #6	#6 @ 12" O.C.	
WF2.0	2' - 0"	1' - 6"	(2) #6		#6 @ 12" O.C.	

KEYNOTE LEGEND

KEY	NOTE
S01	7" SLAB ON GRADE W/ #5 EPOXY COATED AT 12" O.C., E.W. AND VAPOR BARRIER ON COMPACTED, ENGINEERED FILL. T/SLAB = 100'-0"
S02	5" SLAB ON GRADE W/ WWF6X6-W2.9XW2.9, CENTERED IN SLAB, ON 15 MIL VAPOR BARRIER ON COMPACTED, ENGINEERED FILL. T/SLAB = 100'-0"
S03	EXISTING BUILDING FOUNDATIONS AND FOOTINGS. CONTRACTOR TO FIELD VERIFY ALL LOCATIONS AND SIZES PRIOR TO REBAR SHOP DRAWING FABRICATION.

SHEET NOTES:

1. SEE SHEET S000 FOR GENERAL NOTES AND SHEET S001 FOR REQUIRED SPECIAL INSPECTIONS.
2. SEE ARCHITECTURAL PLANS FOR DIMENSIONS AND INFORMATION NOT SHOWN ON THESE PLANS.
3. NORTH ARROW SHOWN IS FOR STRUCTURAL REFERENCE ONLY. SEE CIVIL DRAWINGS FOR ACTUAL BUILDING ORIENTATION.
4. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING DIMENSIONS INDICATED INCLUDING FLOOR ELEVATIONS, GRIDLINES, DIMENSIONS, ETC.
5. "SJ" INDICATES SAWCUT JOINT, "CJ" INDICATES CONSTRUCTION JOINT. PROVIDE SAWCUT JOINTS AS INDICATED IN NOTES ON S000. **FOR SAWCUT AND CONSTRUCTION JOINTS SEE DETAIL X/SXXX.**
6. **PROVIDE CORNER BARS AT FOUNDATION CORNERS AND T-INTERSECTIONS PER DETAIL X/SXXX.**
7. "FX" INDICATES ISOLATED FOOTINGS. SEE S100 FOR FOOTINGS SCHEDULE. **TOP OF FOOTINGS SHALL BE XXX'-XX" UNLESS NOTED OTHERWISE.**
8. "WFX" INDICATES CONTINUOUS WALL FOOTINGS. SEE S100 FOR WALL FOOTINGS SCHEDULE. **TOP OF FOOTING SHALL BE XXX'-XX" UNLESS NOTED OTHERWISE.**
9. "BPX" INDICATES STEEL BASEPLATE. **SEE BASEPLATE DETAILS ON SHEET SXXX.**
10. "PX" INDICATES CONCRETE PIER. **TOP OF CONCRETE PIER SHALL BE AT XXX'-XX" UNLESS NOTED OTHERWISE. FOR PIER REINFORCING SEE SHEET SXXX.**
11. **AT FOOTING STEPS PROVIDE ADDITIONAL REINFORCING PER DETAIL X/SXXX.**
12. ALL CMU WALLS NOT SHOWN ON PLAN TO BE SUPPORTED BY THICKENED SLAB. **FOR ADDITIONAL INFORMATION SEE DETAIL X/SXXX.**
13. "EPX" INDICATES EQUIPMENT PAD. **FOR ADDITIONAL INFORMATION SEE DETAIL X/SXXX.**
14. "PCX" INDICATES PILE CAP. **TOP OF PILE CAP SHALL BE AT XXX'-XX" UNLESS NOTED OTHERWISE.** CENTER PILE CAP BELOW COLUMNS OR WALLS UNLESS INDICATED OTHERWISE. **FOR ADDITIONAL INFORAMTION SEE DETAIL X/SXXX.**
15. "GBX" INDICATES GRADE BEAM. **TOP OF GRADE BEAM SHALL BE AT XXX'-XX" UNLESS NOTED OTHERWISE. FOR GRADE BEAM SCHEDULE SEE SHEET SXXX.**
16. SEE PLUMBING DRAWINGS FOR SUBSURFACE DRAWING LAYOUT. **FOR ADDITIONAL INFORMATION SEE DETAIL X/SXXX.**
17. SEE MEP DRAWINGS FOR ADDITIONAL LOCATION OF IN-SLAB CLEANOUTS AND MANHOLES FOR SANITARY, STORM, AND PROCESS PIPING.
18. CONTRACTOR SHALL COORDINATE ALL FOUNDATION WALL AND SLAB BLOCK-OUT REQUIREMENTS WITH MEP CONTRACTORS. **FOR ADDITIONAL INFORMATION SEE DETAIL X/SXXX.**

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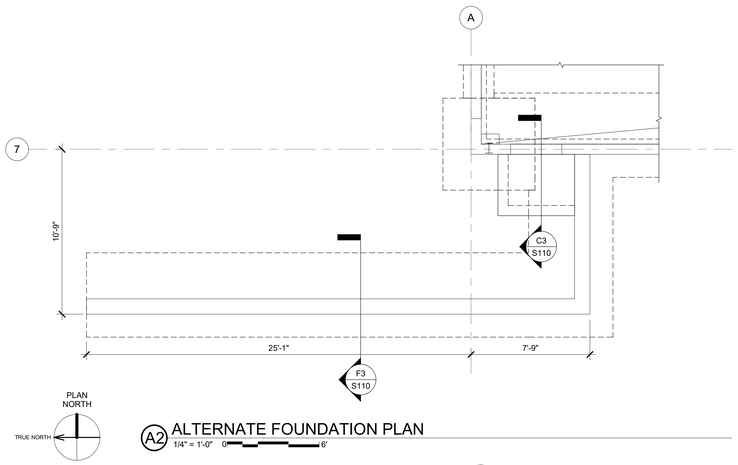
CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

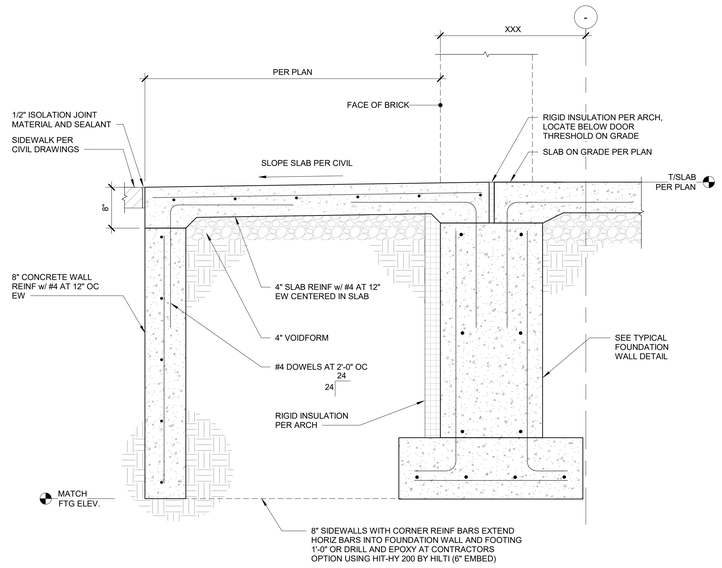
DRAWN: CRM
APPROVED: ACB
ISSUED FOR: QC REVIEW
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

FOUNDATION PLAN

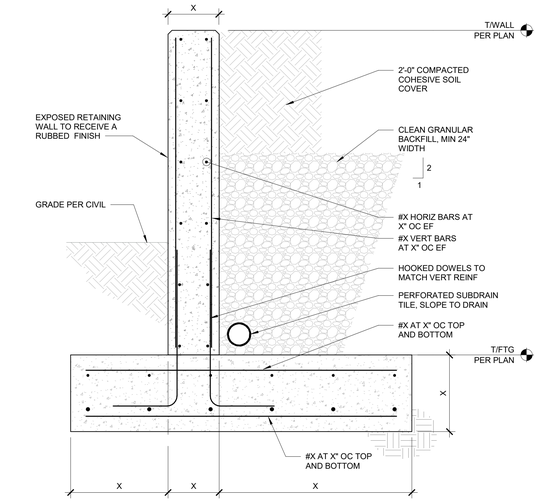
S100



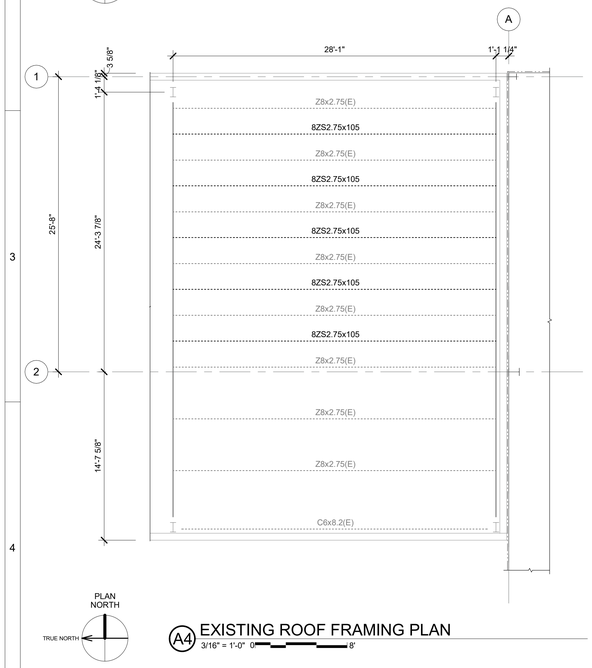
A2 ALTERNATE FOUNDATION PLAN
1/4" = 1'-0" 0 6'



C3 STOOP AT FOUNDATION WALL - ALTERNATE
1" = 1'-0" 0 1'-6"



F3 RETAINING WALL - ALTERNATE
1" = 1'-0" 0 1'-6"



A4 EXISTING ROOF FRAMING PLAN
3/16" = 1'-0" 0 8'

KEYNOTE LEGEND

KEY	NOTE

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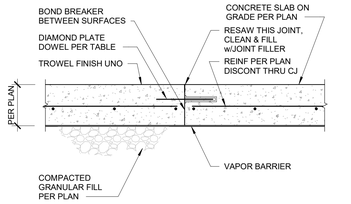
FRAMING PLAN
AND ALTERNATE
PLAN AND
DETAILS

S110

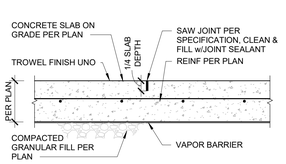
Printed:
Autodesk Revit 2020



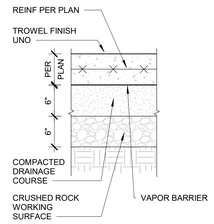
ACI 302.1R-04 TABLE 3.2		
SLAB DEPTH, IN	DIAMOND LOAD PLATE DIM, INCHES	DIAMOND LOAD PLATE SPACING CENTER-TO-CENTER, INCHES
5 TO 6	1/4x4 1/2x4 1/2	18
7 TO 8	3/8x4 1/2x4 1/2	18
9 TO 11	3/4x4 1/2x4 1/2	20

NOTE: FOR SLAB DOWEL BETWEEN DIFFERENT THICKNESSES, USE SMALLER SLAB DEPTH FOR DOWEL SIZE

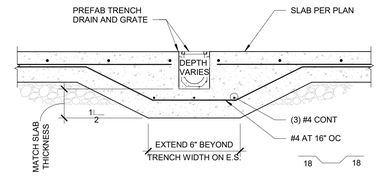
A1 CONSTRUCTION JOINT
1" = 1'-0"



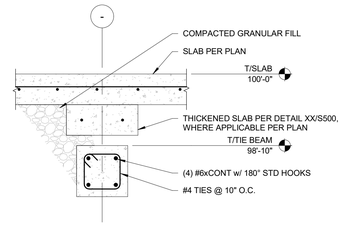
C1 SAWCUT JOINT
1" = 1'-0"



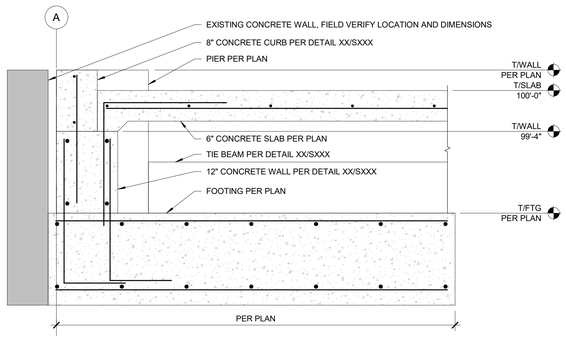
D1 SLAB ON GRADE
1" = 1'-0"



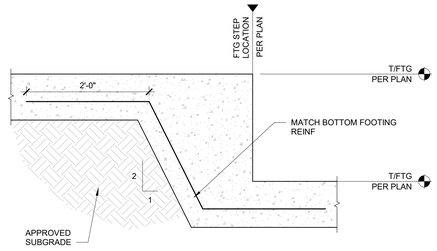
E1 PREFABRICATED TRENCH DRAIN
1" = 1'-0"



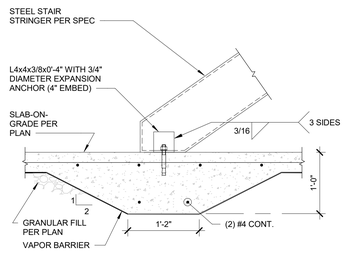
F1 TYPICAL TIE BEAM
1" = 1'-0"



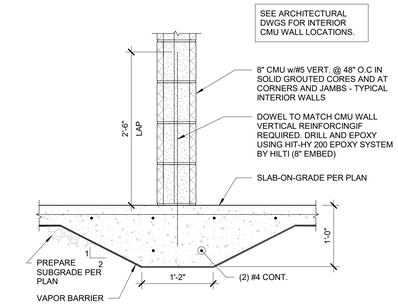
A3 COLUMN FOOTING AT EXISTING WALL FOOTING
1" = 1'-0"



C3 TYPICAL FOOTING STEP
1" = 1'-0"



D3 THICKENED SLAB AT STAIR
1" = 1'-0"



F3 THICKENED SLAB AT CMU WALL
1" = 1'-0"

A4 WALL FOOTING AT EXISTING WALL FOOTING
1" = 1'-0"

P1

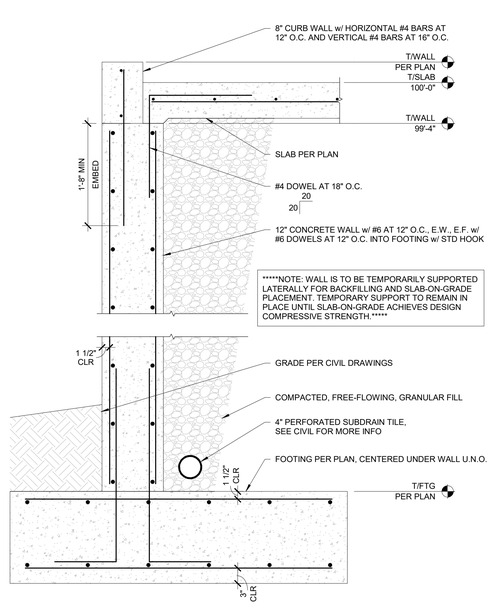
P2

P3

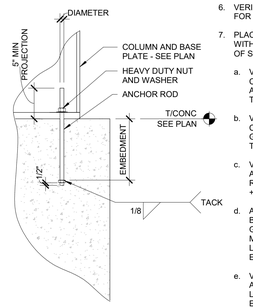
P4

B4 CONCRETE PIER DETAILS
1" = 1'-0"

A6 COLUMN FOOTING AT EXISTING COLUMN FOOTING
1" = 1'-0"



C6 TYPICAL WALL SECTION
1" = 1'-0"



E6 TYPICAL ANCHOR ROD DETAIL
1" = 1'-0"

NOTES:

1. REFER TO BASE PLATE DETAILS FOR ANCHOR ROD DIAMETER AND EMBEDMENT.
2. ALL ANCHOR RODS MATERIAL SHALL BE ASTM F1554, GRADE 36, UNLESS OTHERWISE NOTED.
3. SET ANCHOR RODS PRIOR TO CONCRETE PLACEMENT.
4. PROTECT ANCHOR RODS FROM DAMAGE.
5. SET ANCHOR RODS PERPENDICULAR TO BEARING SURFACE, UNLESS NOTED OTHERWISE.
6. VERIFY ANCHOR ROD PROJECTION TO ALLOW FOR PROPER FASTENING.
7. PLACEMENT OF ANCHOR RODS SHALL BE WITHIN TOLERANCE DESCRIBED IN AISC CODE OF STANDARD PRACTICE AS FOLLOWS:
   a. VARIATION IN DIMENSION BETWEEN THE CENTERS OF ANY TWO ANCHOR RODS WITH A GROUP SHALL BE EQUAL TO OR LESS THAN 1/8".
   b. VARIATION IN DIMENSION BETWEEN THE CENTERS OF ADJACENT ANCHOR ROD GROUPS SHALL BE EQUAL TO OR LESS THAN 1/4".
   c. VARIATION IN ELEVATION OF THE TOPS OF ANCHOR RODS SHALL BE EQUAL TO OR LESS THAN +/- 1/2".
   d. ACCUMULATED VARIATION IN DIMENSION BETWEEN CENTERS OF ANCHOR RODS GROUP ALONG A COLUMN LINE THROUGH MULTIPLE GROUPS SHALL BE EQUAL TO OR LESS THAN 1/4" PER 100 FEET, BUT NOT EXCEED A TOTAL OF 1".
   e. VARIATION IN DIMENSION FROM CENTER OF ANY ANCHOR ROD GROUP TO THE COLUMN LINE THROUGH THAT GROUP SHALL BE EQUAL TO OR LESS THAN 1/4".

F6 TYPICAL PIER SECTION
1" = 1'-0"

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CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: Author
APPROVED: Approver
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FIELD BOOK:

DETAILS

S500

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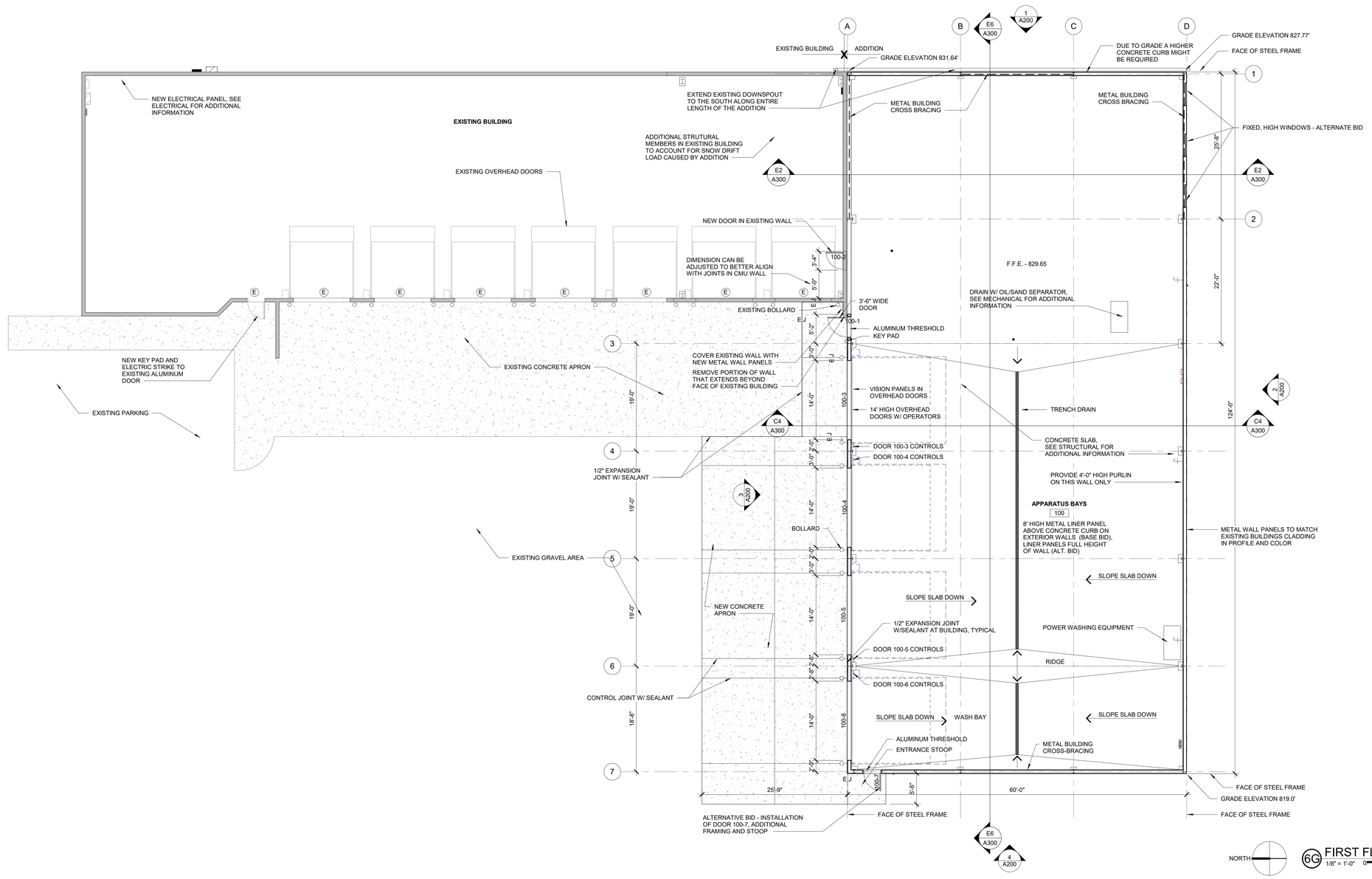
FLOOR PLAN SYMBOLS LEGEND

101 — DOOR MARK

(E) — EXISTING DOOR TO REMAIN



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FLOOR PLAN

A100

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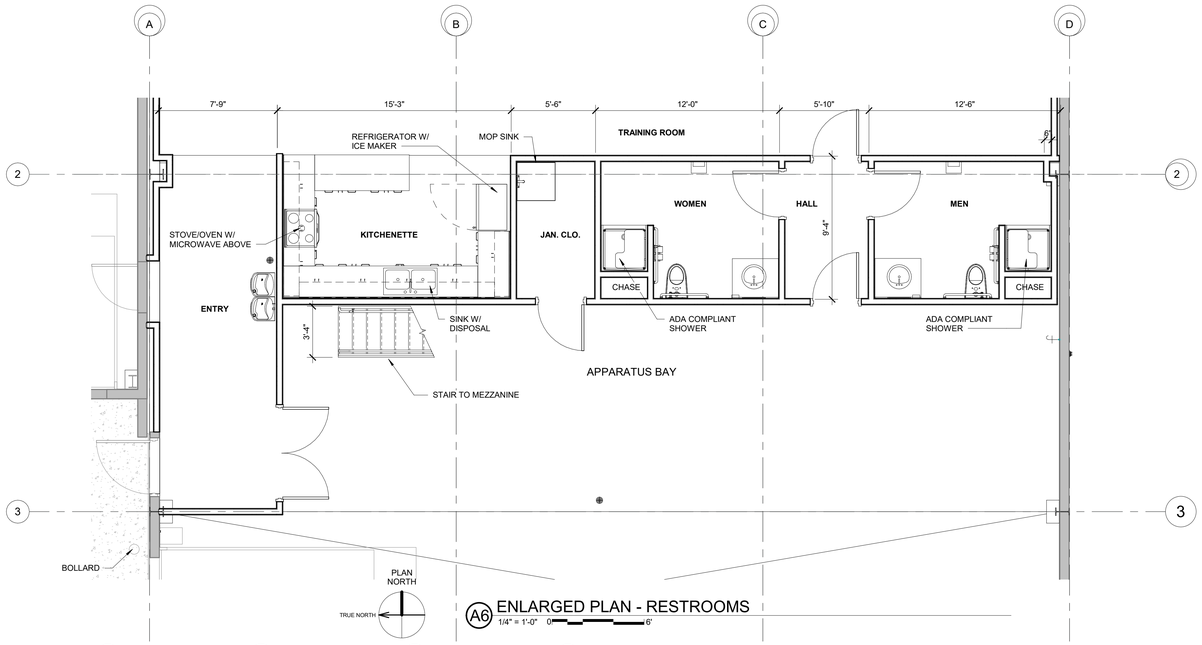
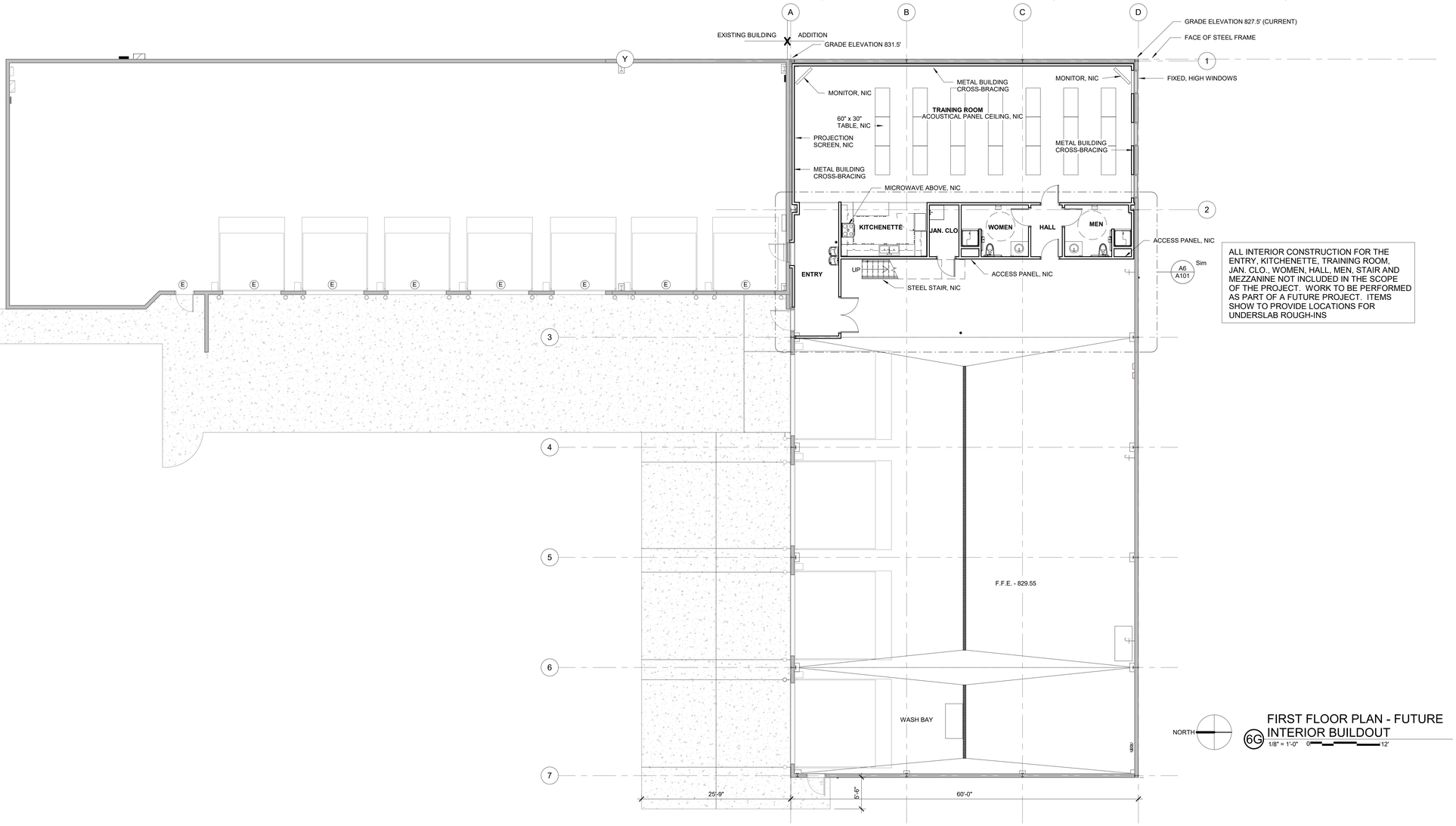


A6 ENLARGED PLAN - RESTROOMS
1/4" = 1'-0"



ALL INTERIOR CONSTRUCTION FOR THE ENTRY, KITCHENETTE, TRAINING ROOM, JAN. CLO., WOMEN, HALL, MEN, STAIR AND MEZZANINE NOT INCLUDED IN THE SCOPE OF THE PROJECT. WORK TO BE PERFORMED AS PART OF A FUTURE PROJECT. ITEMS SHOW TO PROVIDE LOCATIONS FOR UNDERSLAB ROUGH-INS

6G FIRST FLOOR PLAN - FUTURE INTERIOR BUILDOUT
1/8" = 1'-0"

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FUTURE INTERIOR BUILD-OUT

A101

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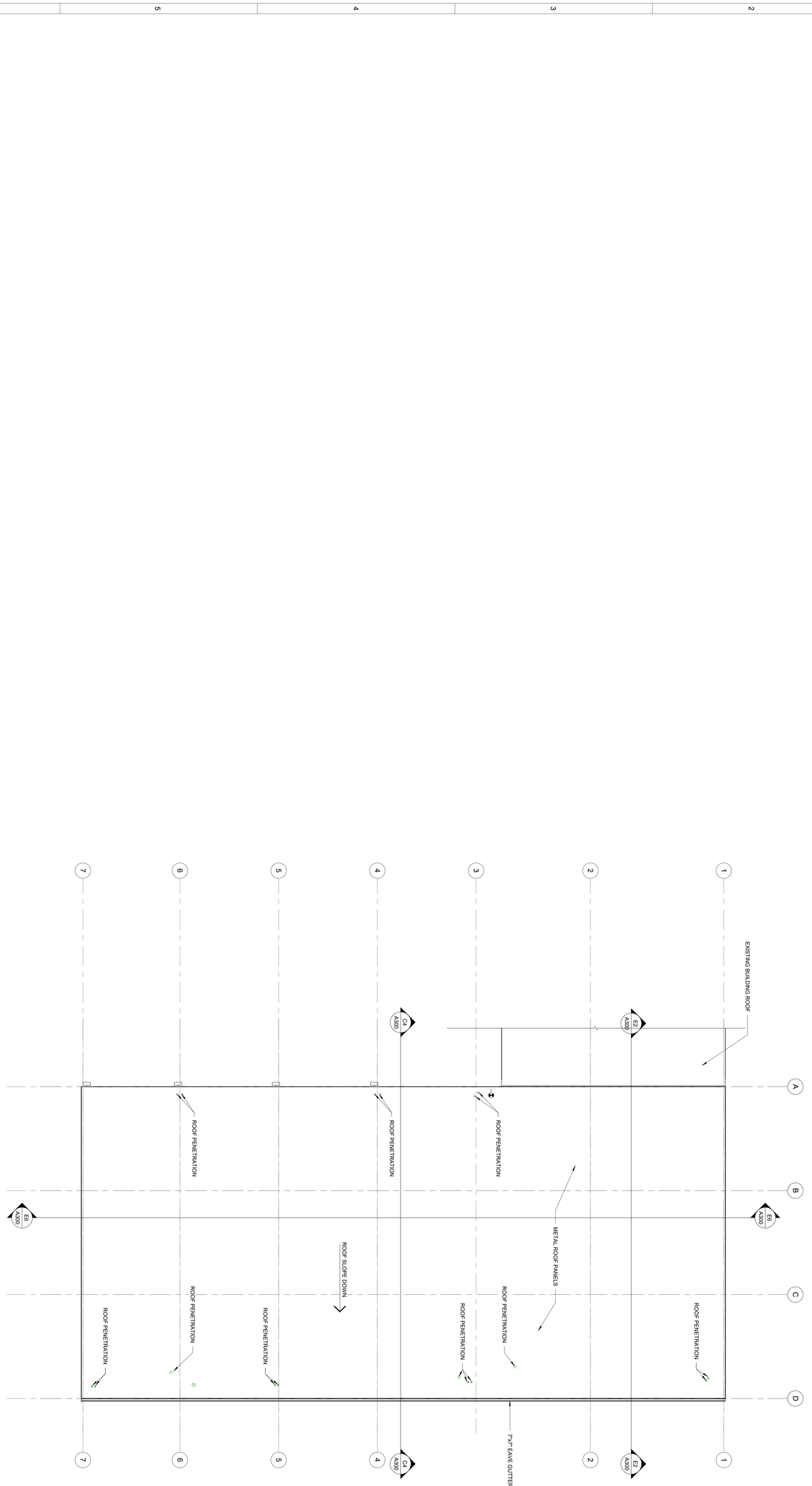

6F ROOF PLAN

1/8" = 1'-0"

0' 1' 2'

ROOF PLAN

A102

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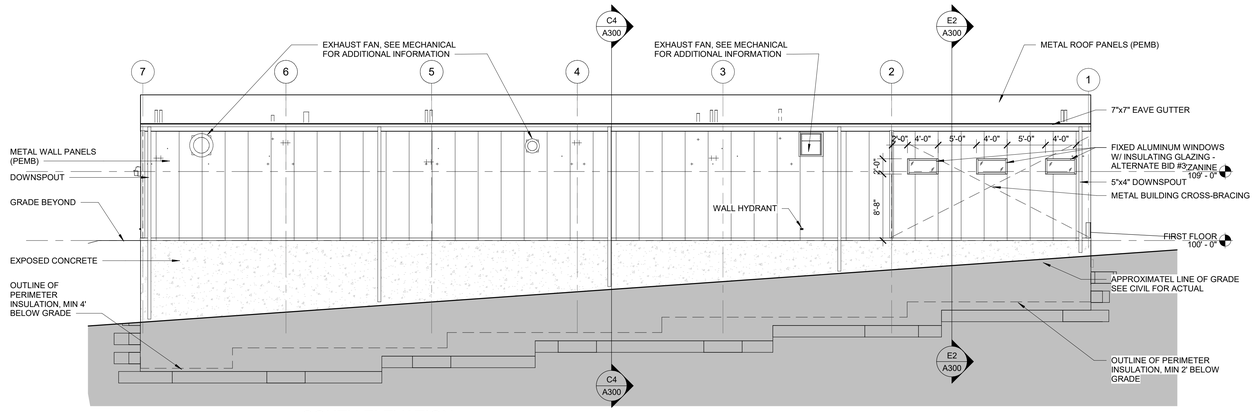
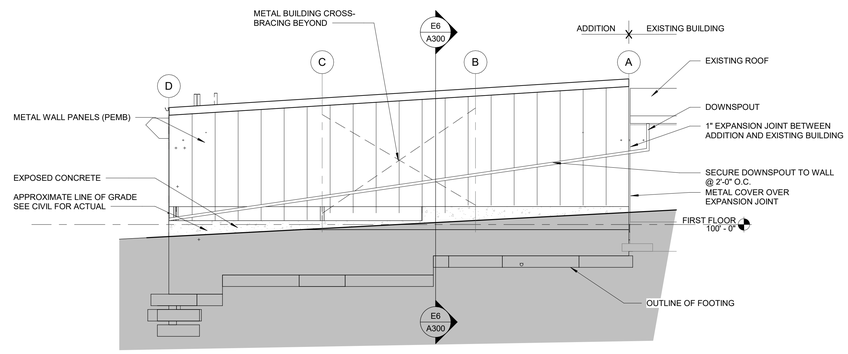


2 SOUTH ELEVATION
1/8" = 1'-0" 0 12'



1 EAST ELEVATION
1/8" = 1'-0" 0 12'

3 NORTH ELEVATION
1/8" = 1'-0" 0 12'

4 WEST ELEVATION
1/8" = 1'-0" 0 12'

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ELEVATIONS

A200

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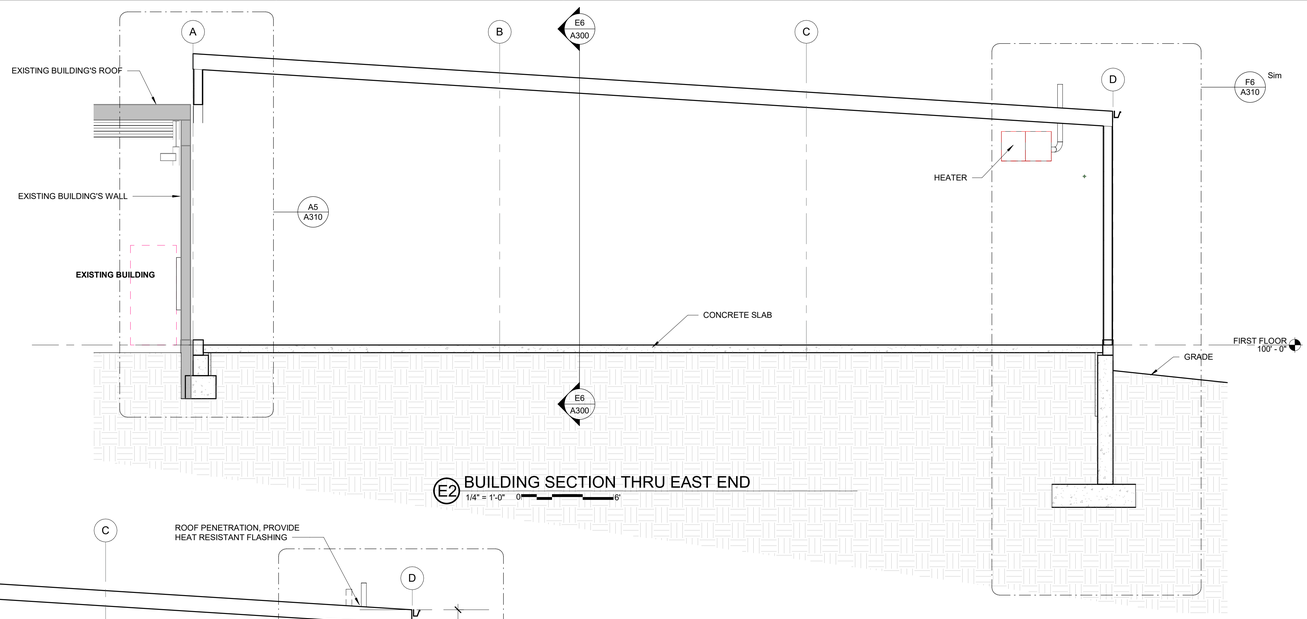
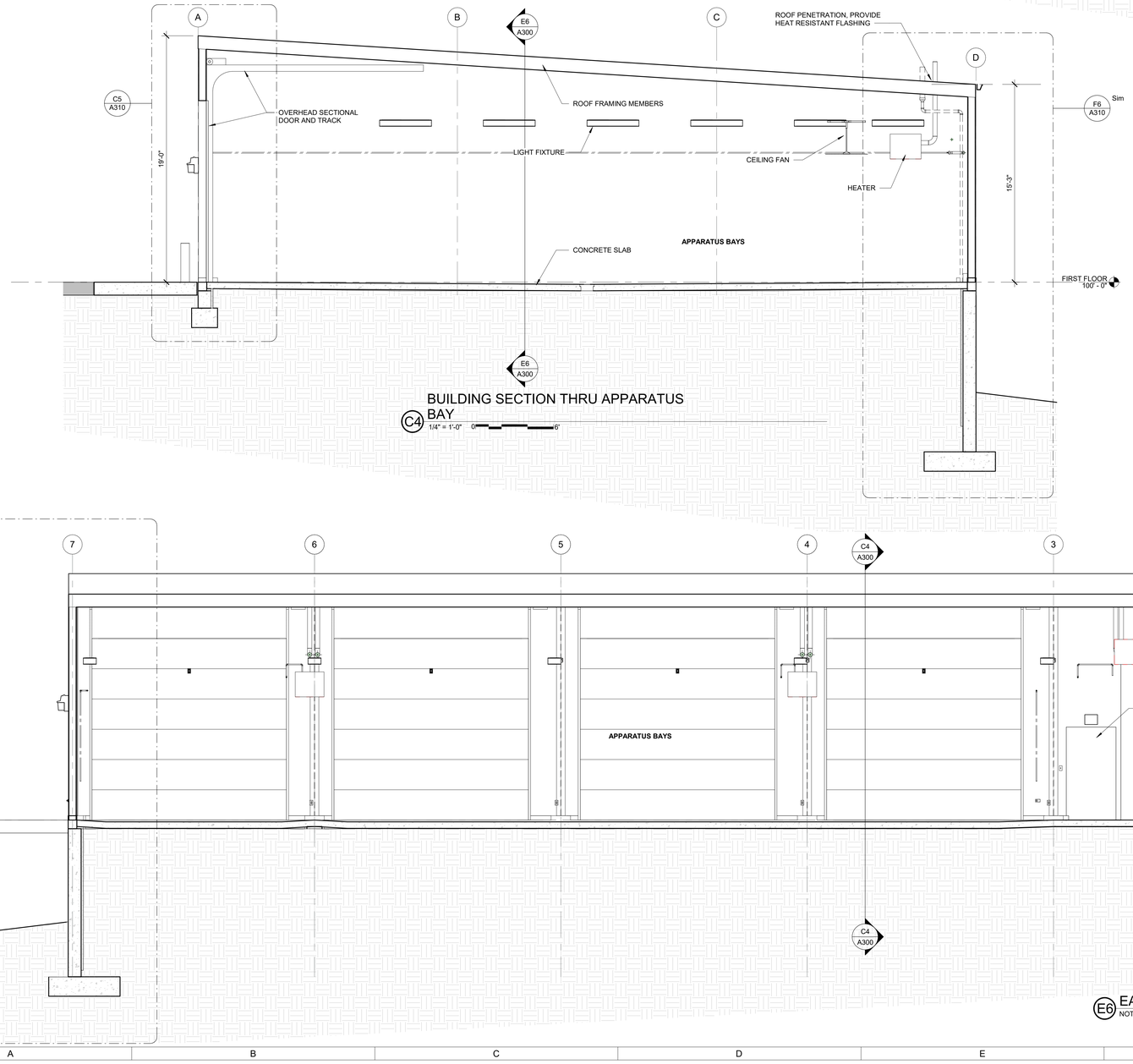


E2 BUILDING SECTION THRU EAST END
1/4" = 1'-0"



C4 BUILDING SECTION THRU APPARATUS BAY
1/4" = 1'-0"

E6 EAST WEST BUILDING SECTION
NOT TO SCALE

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FIELD BOOK:

BUILDING SECTIONS

A300

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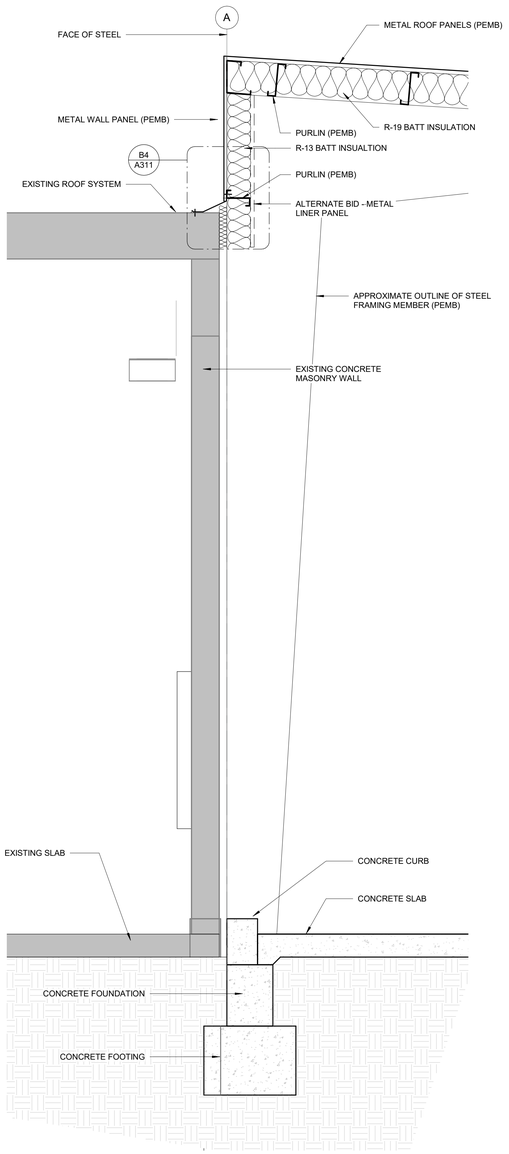
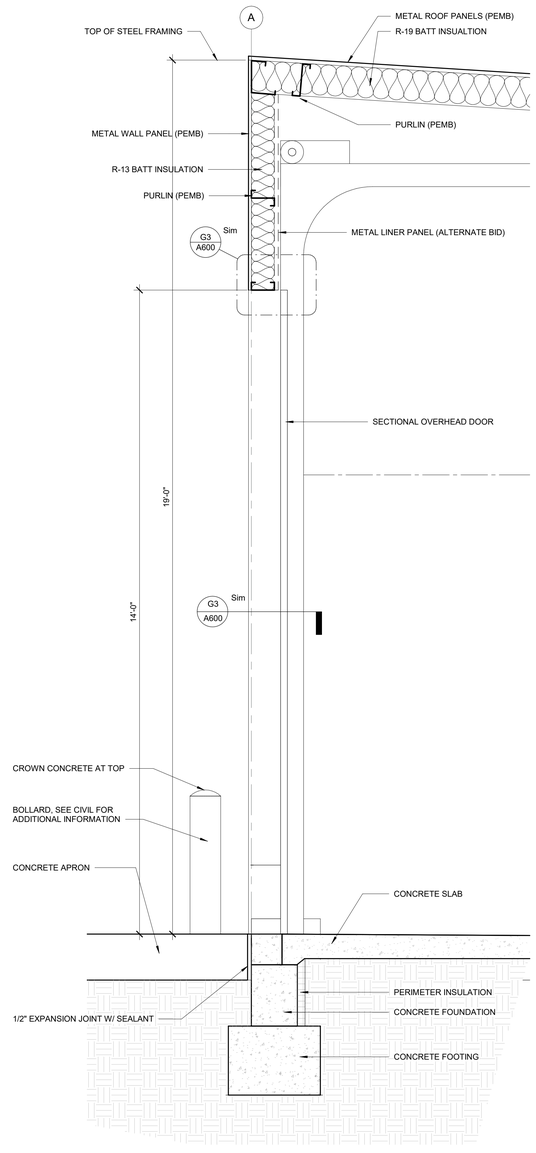
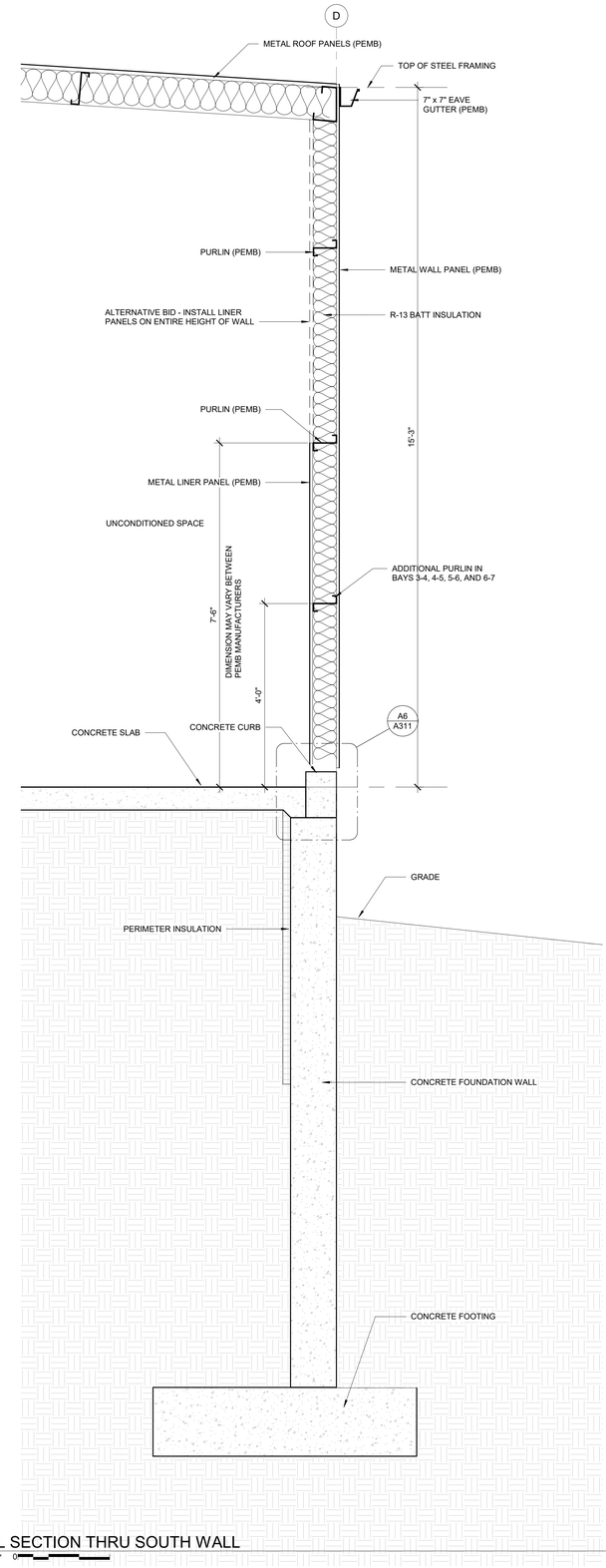


A5 SECTION THRU ADDITION/EXISTING BUILDING
3/4" = 1'-0"



C5 WALL SECTION THRU APPARATUS BAY
3/4" = 1'-0"



F6 WALL SECTION THRU SOUTH WALL
3/4" = 1'-0"

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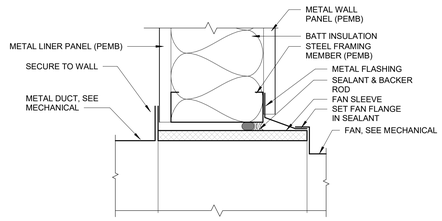
ISSUED FOR: QC REVIEW
DATE: APRIL 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

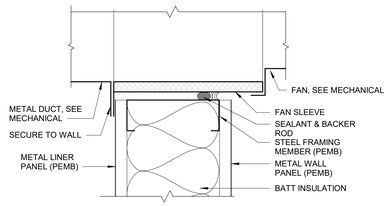
EXTERIOR WALL SECTIONS

A310

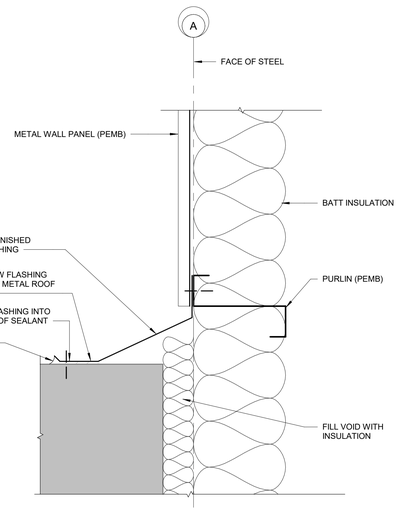
Plotted:
Autodesk Revit 2020



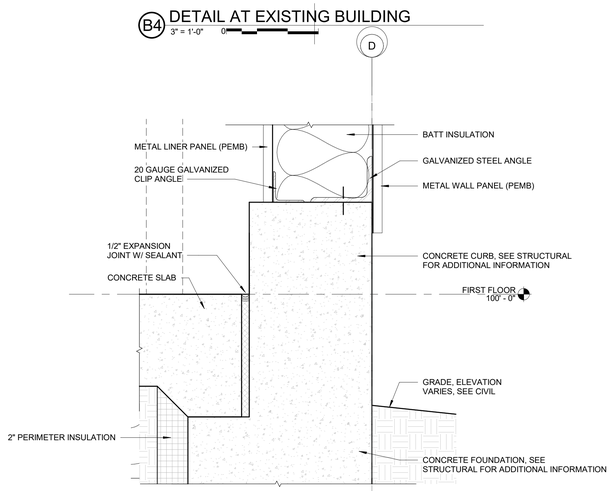
B2 LOUVER JAMB DETAIL
3" = 1'-0" HEAD SIMILAR



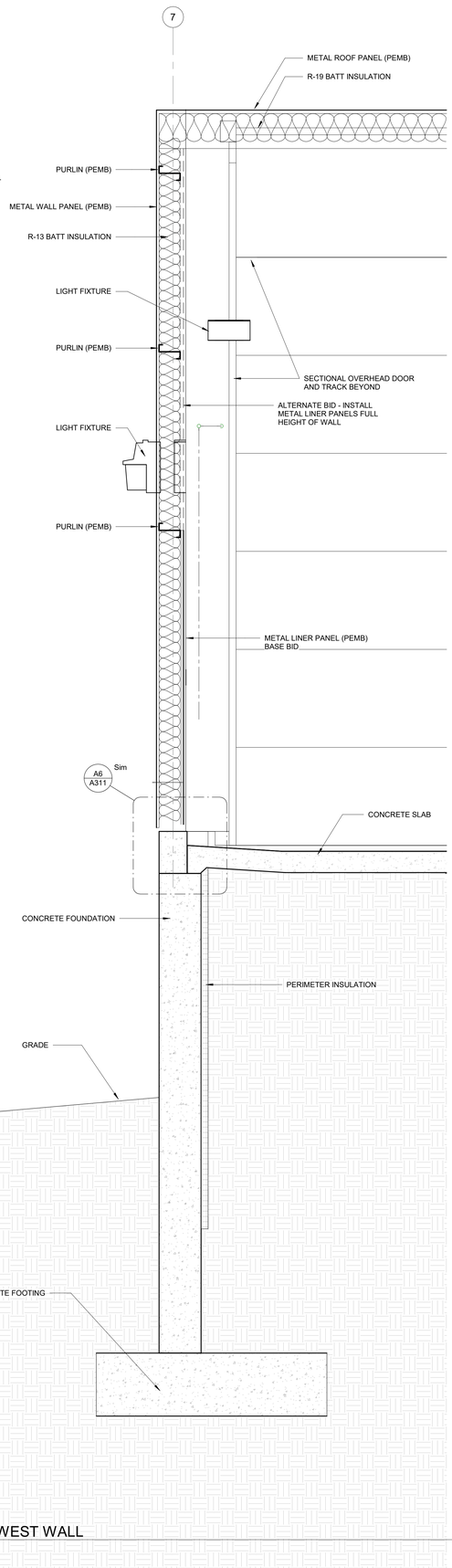
B3 LOUVER SILL DETAIL
3" = 1'-0"



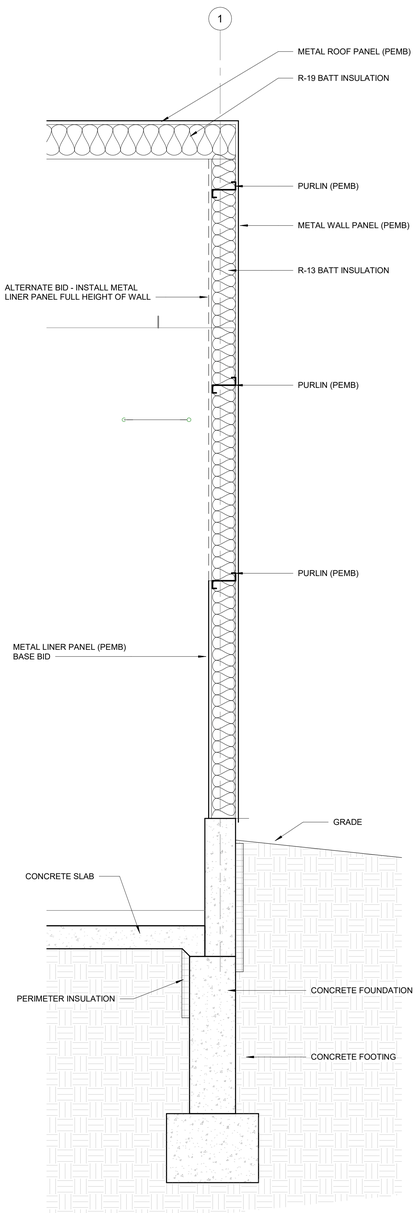
B4 DETAIL AT EXISTING BUILDING
3" = 1'-0"



A6 DETAIL AT BASE OF WALL
3" = 1'-0"



C6 WALL SECTION THRU WEST WALL
3/4" = 1'-0"



F5 WALL SECTION THRU EAST WALL
3/4" = 1'-0"

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CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

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EXTERIOR WALL SECTIONS

A311

Printed:
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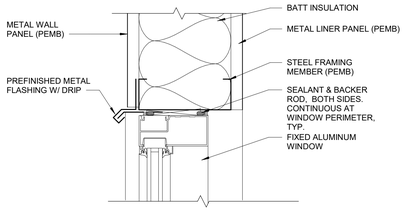
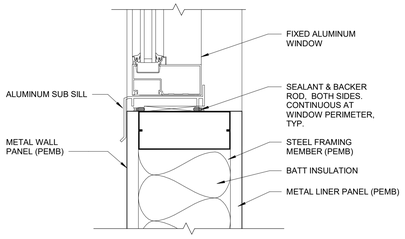


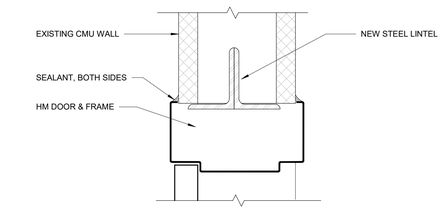
A2 ALUMINUM WINDOW HEAD/JAMB DETAIL

3" = 1'-0" 0 6" ALTERNATE BID



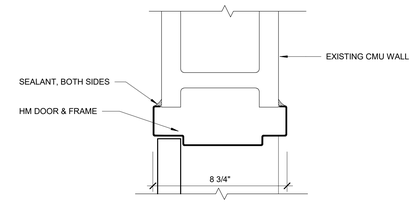
A3 ALUMINUM WINDOW SILL DETAIL

3" = 1'-0" 0 6" ALTERNATE BID



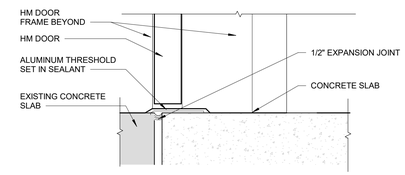
C2 HM DOOR HEAD DETAIL

3" = 1'-0" 0 6"



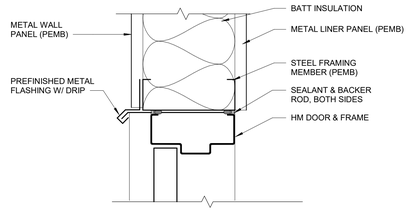
C3 HM DOOR JAMB DETAIL

3" = 1'-0" 0 6"



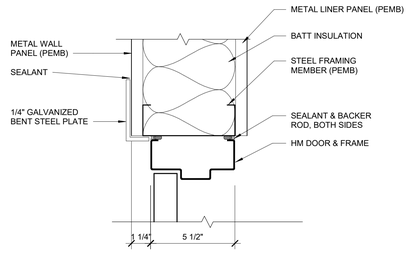
C4 HM DOOR THRESHOLD DETAIL

3" = 1'-0" 0 6"



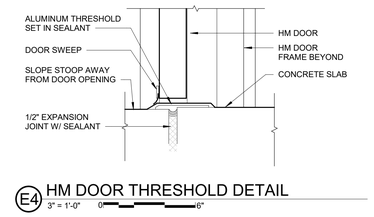
E2 HM DOOR HEAD DETAIL

3" = 1'-0" 0 6"



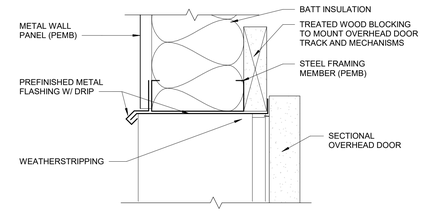
E3 HM DOOR JAMB DETAIL

3" = 1'-0" 0 6"

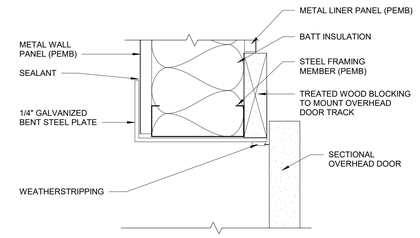


E4 HM DOOR THRESHOLD DETAIL

3" = 1'-0" 0 6"



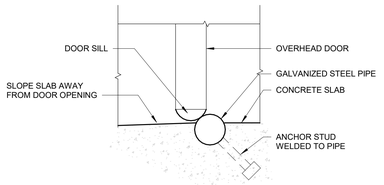
HEAD



JAMB

G3 OVHD DOOR DETAILS

3" = 1'-0" 0

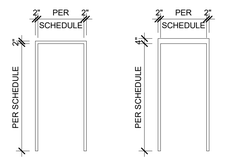


G4 OVHD DOOR THRESHOLD DETAIL

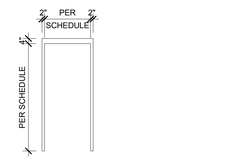
3" = 1'-0" 0 6"

DOOR AND FRAME SCHEDULE

MARK	ROOM NAME	FINISHED OPENING SIZE WIDTH	FINISHED OPENING SIZE HEIGHT	LEAF THICK	LEAF CONFIGURATION	LEAF TYPE	LEAF MTRL	LEAF GLAZ	FRAME MTRL-TYPE	FRAME GLAZ	DETAILS HEAD	DETAILS JAMB	DETAILS SILL	HDWR	RATING	REMARKS
100-1	APPARATUS BAYS	3' - 6"	7' - 0"	1 3/4"	-	HG	HM	INS-TCPG	HM-00 : F2	-	E2/A600	E3/A600	E4/A600	HG1	-	INSULATED, PAINT
100-2	APPARATUS BAYS	3' - 0"	7' - 0"	1 3/4"	-	F	HM		HM-00 : F4		C2/A600	C3/A600	C4/A600	HG2	-	EXTERIOR GRADE
100-3	APPARATUS BAYS	14' - 0"	14' - 0"	2"	-	OHSF	STEEL	INS-TCPG	OHN	-	G3/A600	G3/A600	G4/A600	-	-	INSULATED
100-4	APPARATUS BAYS	14' - 0"	14' - 0"	2"	-	OHSF	STEEL	INS-TCPG	OHN	-	G3/A600	G3/A600	G4/A600	-	-	INSULATED
100-5	APPARATUS BAYS	14' - 0"	14' - 0"	2"	-	OHSF	STEEL	INS-TCPG	OHN	-	G3/A600	G3/A600	G4/A600	-	-	INSULATED
100-6	APPARATUS BAYS	14' - 0"	14' - 0"	2"	-	OHSF	STEEL	INS-TCPG	OHN	-	G3/A600	G3/A600	G4/A600	-	-	INSULATED
100-7	APPARATUS BAYS	3' - 0"	7' - 0"	1 3/4"	-	HG	HM	INS-TCPG	HM-00 : F2	-	E2/A600	E3/A600	E4/A600	HG1	-	INSULATED, PAINT



HM-00 : V2
HOLLOW METAL FRAME WITH 0 TRANSOM AND 0 SIDELIGHTS



HM-00 : V4
HOLLOW METAL FRAME WITH 0 TRANSOM AND 0 SIDELIGHTS

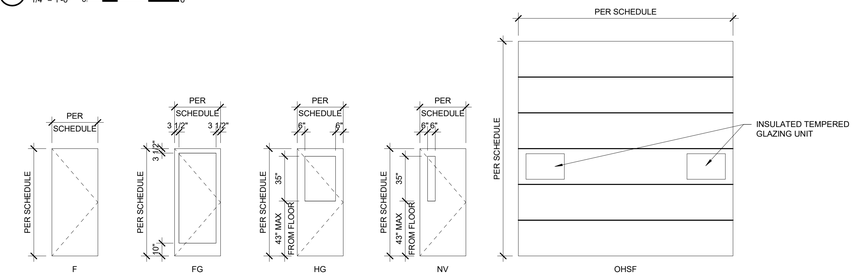
HARDWARE GROUPS

HG1 - (3) HEAVY DUTY HINGES
LOCKSET W/ LEVER HANDLES
DEADBOLT
ELECTRIC STRIKE WITH KEY PAD (NOT REQUIRED ON DOOR 100-7)
POWER SUPPLY FOR STRIKE
CLOSER
THRESHOLD
SWEEP
PERIMETER WEATHERSTRIPPING
DRIP
LATCH PROTECTION

HG2 - (3) HEAVY DUTY HINGES
LOCKSET W/ LEVER HANDLES
CLOSER

F5 DOOR FRAME ELEVATIONS

1/4" = 1'-0" 0 8"



F6 DOOR PANEL ELEVATIONS

1/4" = 1'-0" 0 8"

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CITY OF ANAMOSA - FIRE STATION ADDITION
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: MU
APPROVED: PJP
ISSUED FOR: QC REVIEW
DATE: APRIL 6, 2021
PROJECT NO.: 4207090
FIELD BOOK:

DOOR INFORMATION

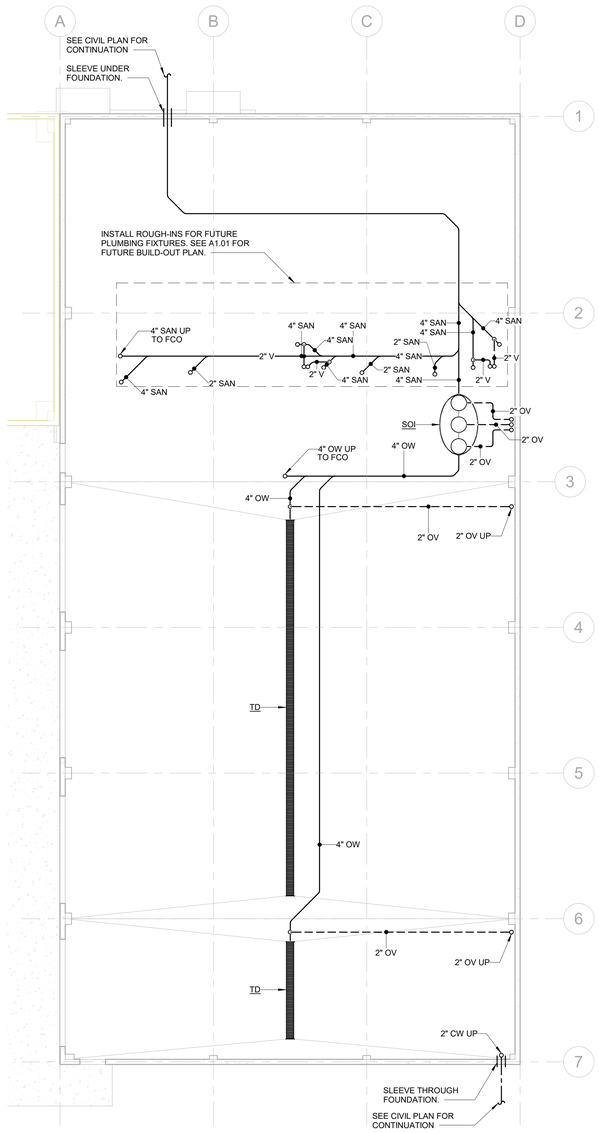
A600

Printed:
Autodesk Revit 2020

PLUMBING GENERAL NOTES:

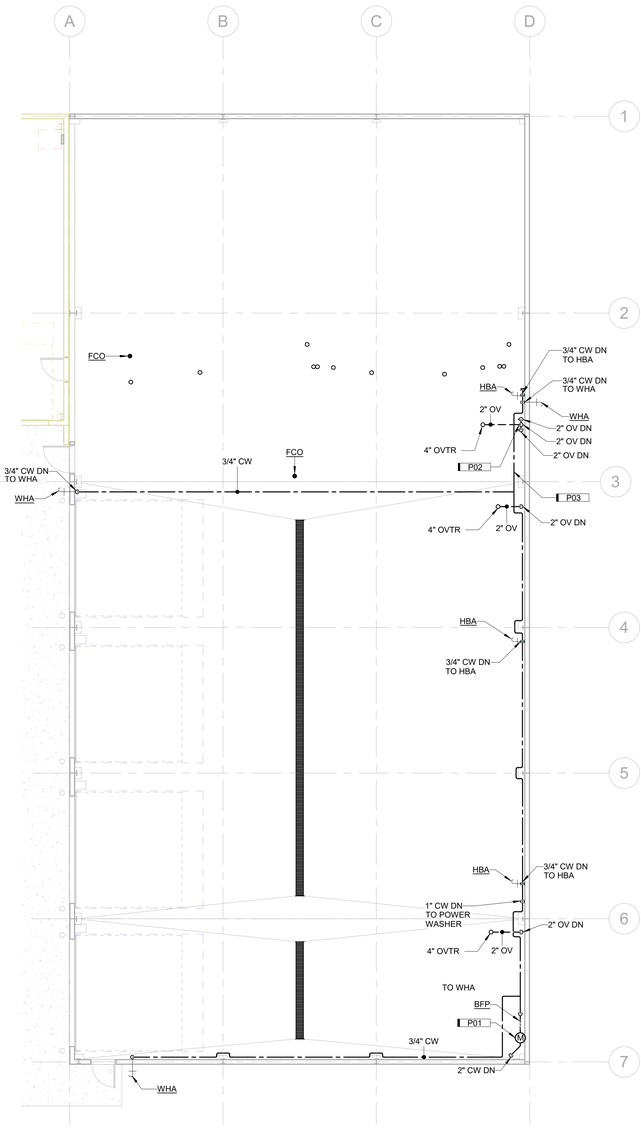
1. UNLESS NOTED OTHERWISE: LIGHT LINES DENOTE EXISTING PIPING, OR EQUIPMENT WHICH IS TO REMAIN. BOLD LINES INDICATE NEW WORK TO BE INSTALLED UNDER THIS CONTRACT.
2. PLUMBING SHOWN IS IN SCHEMATIC FORM. NOT ALL RISERS AND DROPS ARE SHOWN. PROVIDE OFFSETS AS REQUIRED TO MEET SPACE REQUIREMENTS AND TO AVOID INTERFERENCE WITH OTHER TRADES. THE CONTRACTOR SHALL PROVIDE COMPLETE FULLY FUNCTIONAL SYSTEMS.
3. PROVIDE ACCESSIBLE ISOLATION VALVES AT ALL BRANCH CONNECTIONS TO MAINS AND PIPING FIXTURE GROUPS. COORDINATE VALVE LOCATIONS WITH ACCESSIBLE CEILINGS.
4. REFER TO PLUMBING FIXTURE ROUGH-IN SCHEDULE FOR CONNECTION SIZES AT INDIVIDUAL FIXTURES.
5. PROVIDE WATER HAMMER ARRESTORS FOR EACH NEW PLUMBING FIXTURE OR GROUP OF FIXTURES. SIZE AND LOCATION REQUIREMENTS SHALL BE AS PER PDI STANDARD PDI-WH-201
6. ALL EQUIPMENT AND ACCESSORIES SHALL BE INSTALLED TO BE EASILY ACCESSIBLE.
7. PLUMBING WORK SHALL BE COORDINATED WITH OTHER TRADES, INCLUDING BUT NOT LIMITED TO DUCTWORK, ELECTRICAL EQUIPMENT, AND PIPING.
8. ALL WORK WITHIN THE CONTRACT DOCUMENTS, WHICH INCLUDE THIS DRAWING, SHALL BE COMPLETED IN A SAFE WORKMANLIKE MANNER AND IN ACCORDANCE WITH ALL APPLICABLE STATE, LOCAL, AND NATIONAL CODES, REGULATIONS AND ORDINANCES. IF ANY CONFLICTS ARISE BETWEEN THE CONTRACT DOCUMENTS AND THE APPLICABLE CODES, REGULATIONS OR ORDINANCE, THE CONTRACTOR SHALL BE RESPONSIBLE TO HAVE ALL WORK CONFORM TO THE STRICTER OF SAID REQUIREMENTS.
9. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS AS REQUIRED FOR ELECTRICAL, PLUMBING, MECHANICAL AND BACKFLOW PREVENTION INSTALLATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE BOTH A COMPLETE AND COMPLIANT INSTALLATION AS MAY BE DETERMINED BY THE AUTHORITY(S) HAVING JURISDICTION.
10. CONTRACTOR SHALL NOT PROCURE OR FABRICATE ANY PIPING, DUCTWORK OR OTHER EQUIPMENT WITHOUT FIRST VERIFYING ALL DIMENSIONS AND CONDITIONS WHETHER CURRENTLY EXISTING OR NOT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK, INCLUDING ANY REQUIRED REWORK.
11. MAINTAIN ALL MANUFACTURER RECOMMENDED EQUIPMENT SERVICE AND SAFETY CLEARANCES. DO NOT LOCATE ANY EQUIPMENT OR RUN MATERIALS ABOVE ANY ELECTRICAL PANELS OR SWITCHGEAR. MAINTAIN ALL NFPA/NEC CODE REQUIRED CLEARANCES.
12. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING, SCHEDULING AND SEQUENCING OF THEIR WORK WITH ALL OTHER TRADES. PROVIDE OFFSETS, EASEMENTS, OR RELOCATE TO AVOID CONFLICTS WITH WORK OF OTHER TRADES. FURNISH SUFFICIENT RESOURCES TO MEET ALL PROJECT MILESTONES AND DEADLINES.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE WATERTIGHT AND WEATHER-PROOF INTEGRITY OF ROOFS, WALLS AND FLOORS DURING CONSTRUCTION. EACH TRADE SHALL LOCATE/DIMENSION/COORDINATE THEIR ROOF, FLOOR AND WALL OPENINGS WITH THE GC OR CONSTRUCTION MANAGER.
14. PROTECT NEW WORK FROM DAMAGE OR CONTAMINATION. PROVIDE TEMPORARY PROTECTIVE CAPPING OR TAPED POLYETHYLENE ENCLOSURES OVER OPEN DUCTWORK AND PIPING ENDS AND EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING MECHANICAL SYSTEMS PRIOR TO PLACING THEM IN SERVICE.
15. IN A NEAT AND WORKMANLIKE MANNER; PATCH ANY REMAINING OPENINGS AND FILL EXCESSIVE GAPS; REWORK AND REFINISH TO MATCH ADJACENT STRUCTURES; FLASH AND SEAL ALL MECHANICAL AND ELECTRICAL PENETRATIONS THRU WALLS, CEILINGS, AND FLOORS WITH METAL FRAMEWORK OR ESCUTCHEONS. ALL OPENINGS SHALL BE PROPERLY SEALED SO AS TO MEET FIRE RATING NEEDS.

KEYNOTE LEGEND	
KEY	NOTE
P01	INSTALL NEW WATER METER AND BACKFLOW PREVENTER. COORDINATE METER INSTALLATION WITH UTILITY PROVIDER. SEE DETAIL ON SHEET P600.
P02	COMBINE OIL VENT RISERS INTO SINGLE HEADER MINIMUM 1'-0" ABOVE FINISHED FLOOR. ROUTE SINGLE VENT TO 4" VENT THROUGH ROOF.
P03	ROUTE CW PIPE AWAY FROM WALL TO MAINTAIN CODE-REQUIRED CLEARANCE ABOVE ELECTRICAL PANEL.



NORTH

C6 UNDERFLOOR PLUMBING PLAN
1/8" = 1'-0"



NORTH

F6 FIRST FLOOR PLUMBING PLAN
1/8" = 1'-0"

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CITY OF ANAMOSA - FIRE STATION ADDITION

ANAMOSA, IA
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

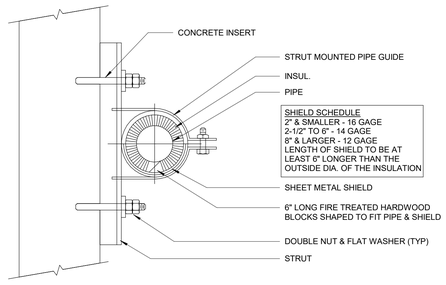
DRAWN: JDB
APPROVED: TLS
ISSUED FOR: QC REVIEW
DATE: 04.06.21
PROJECT NO. 4207090
FIELD BOOK:

FIRST FLOOR PLUMBING PLAN

P101

Printed:
Autodesk Revit 2020

C5a INSULATED PIPE HANGER DETAIL
NOT TO SCALE



NOTES:
1. SIZE STRUT AND CLAMP TO ADEQUATELY SUPPORT LOAD
2. STRUT SHALL BE EPOXY PAINTED.
3. FIBERGLASS PIPING REQUIRES MANUFACTURERS RECOMMENDED SADDLE.

D5 WALL MOUNTED TYPE HANGER DETAIL
NOT TO SCALE

BP1 (REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER):

FIXTURE: WATTS, 009 SERIES, FULL LINE SIZE, REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTER, TWO INDEPENDENTLY OPERATING CHECK VALVES SEPARATED BY A RELIEF VALVE, AIR-IN/WATER-OUT RELIEF VALVE CONCEPT, BALL VALVE TEST COCKS, COMPLIANT WITH USCFCC MANUAL FOR CROSS CONNECTION CONTROL, ASSE STANDARD 1013, AWWA STANDARD C506-78. PROVIDE WATTS DRAIN CONNECTION WITH AIR GAP.

WATER HAMMER ARRESTERS:

FIXTURE: SIOUX CHIEF MANUFACTURING COMPANY, HYDRA-RESTER, PISTON TYPE ARRESTER, TYPE L COPPER CHAMBER WITH PERMANENT 60 PSI AIR CHARGE ABOVE A TWO O-RING PISTON, CERTIFIED TO FUNCTION IN ACCORDANCE WITH STANDARDS, PDI-WH201 AND ASSE-1010

HBA (HOSE BIB):

FIXTURE: WOODFORD MODEL 122, ANTI-CONTAMINATION, WALL FAUCET, VACUUM BREAKER, 3/4" HOSE THREAD OUTLET, ROUGH BRASS FINISH, 3/4" INLET, POLYCARBONATE WHEEL HANDLE. MOUNT AT 36" AFF

WHA (WALL HYDRANT):

FIXTURE: WOODFORD MODEL 65, AUTOMATIC DRAINING, FREEZELESS WALL HYDRANT, VACUUM BREAKER, 3/4" HOSE THREAD OUTLET, FITS ONE STANDARD BRICK COURSE, CHROME PLATED, STAINLESS STEEL OPERATING STEM, 3/4" INLET, LENGTH AS REQUIRED TO PLACE STOP VALVE ON WARM SIDE OF EXTERIOR WALL INSULATION. FURNISH LOOSE KEY WITH EACH HYDRANT. MOUNT HORIZONTALLY AT 18" ABOVE FINISHED GRADE.

FLOOR CLEANOUT:

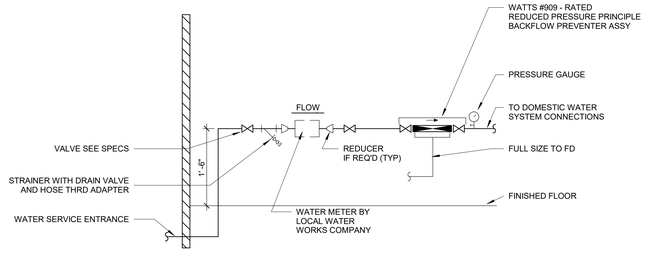
FIXTURE: ZURN, Z-1400 LEVEL-TROL SERIES FLOOR CLEANOUT, CAST IRON, INSIDE CAULK CONNECTION, ADJUSTABLE, THREADED ABS PLUG, SECURED SATIN NICKEL BRONZE TOP. SET TOP FLUSH WITH FINISHED CONCRETE. FURNISH DIMENSIONED RECORD DRAWING TO OWNER FOR FINAL LOCATIONS. PROVIDE EXTRA HEAVY DUTY FLOOR CLEANOUT COVER FOR CLEANOUTS LOCATED IN MECHANICAL SPACES

TD (TRENCH DRAIN):

FIXTURE: ZURN 82 SERIES WIDE REVEAL TRENCH DRAIN SYSTEM WITH 12" CLASS E GALVANIZED DUCTILE SLOTTED GRATE, 4" OUTLET IN END OF LAST SECTION. SET TOP OF GRADES FLUSH WITH FINISHED FLOOR. NO P-TRAP REQUIRED AS DRAIN PIPING IS ROUTED THROUGH SAND TRAP.

SOI (SAND/OIL INTERCEPTOR):

FIXTURE: PREFABRICATED 750 GALLON FRP SAND/OIL INTERCEPTOR. UPC/IAPMO APPROVED WITH TRIPLE ACCESSWAY. NOMINAL DIMENSIONS OF 96 X 62 X 68 (LxWxH). PROVIDE WITH SUCTION PIPE FOR INDOOR INSTALLATION. GREENTURTLE PROCEPTOR OMC 750 OR EQUIVALENT.



B6 DOMESTIC WATER METERING DETAIL
NOT TO SCALE

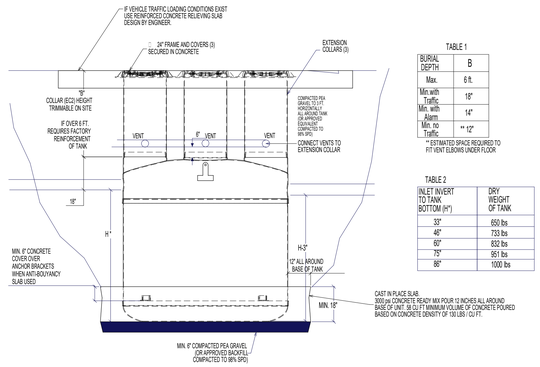


TABLE 1

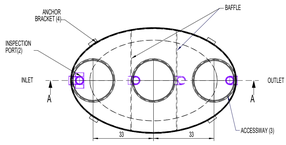
BURIAL DEPTH:	B
Max.	6 ft.
Min. with Traffic	18"
Min. with Alarm	14"
Min. no Traffic	** 12"

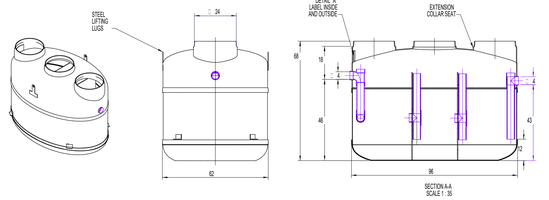
** ESTIMATED SPACE REQUIRED TO FIT VENT ELBOWS UNDER FLOOR

TABLE 2

INLET INVERT TO TANK BOTTOM (H")	DRY WEIGHT OF TANK
33"	650 lbs
45"	733 lbs
60"	832 lbs
75"	951 lbs
95"	1000 lbs

NOTES:
1. FOR GRAVITY APPLICATIONS ONLY.
2. ALL INTERCEPTOR UNITS ARE TO BE INSTALLED IN ACCORDANCE WITH THE MANUFACTURERS INSTALLATION INSTRUCTION.
3. STANDARD PIPING IS SCH. 40 PVC.
4. EXTENSION COLLAR TO BE ORDERED TO MEET FINISHED GRADE, CUT ON SITE FOR FINAL ADJUSTMENT AND SEALED WITH SIKAFLEX BY CONTRACTOR FOR WATERTIGHT SEAL.
5. 30 YEAR WARRANTY AGAINST LEAKS, AND STRUCTURAL FAILURE.





D6 SAND OIL INTERCEPTOR DETAIL
NOT TO SCALE

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CITY OF ANAMOSA - FIRE STATION ADDITION

ANAMOSA, IA
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: JDB
APPROVED: TLS
ISSUED FOR: QC REVIEW
DATE: 04/06/21
PROJECT NO: 4207090
FIELD BOOK:

PLUMBING SCHEDULES AND DETAILS

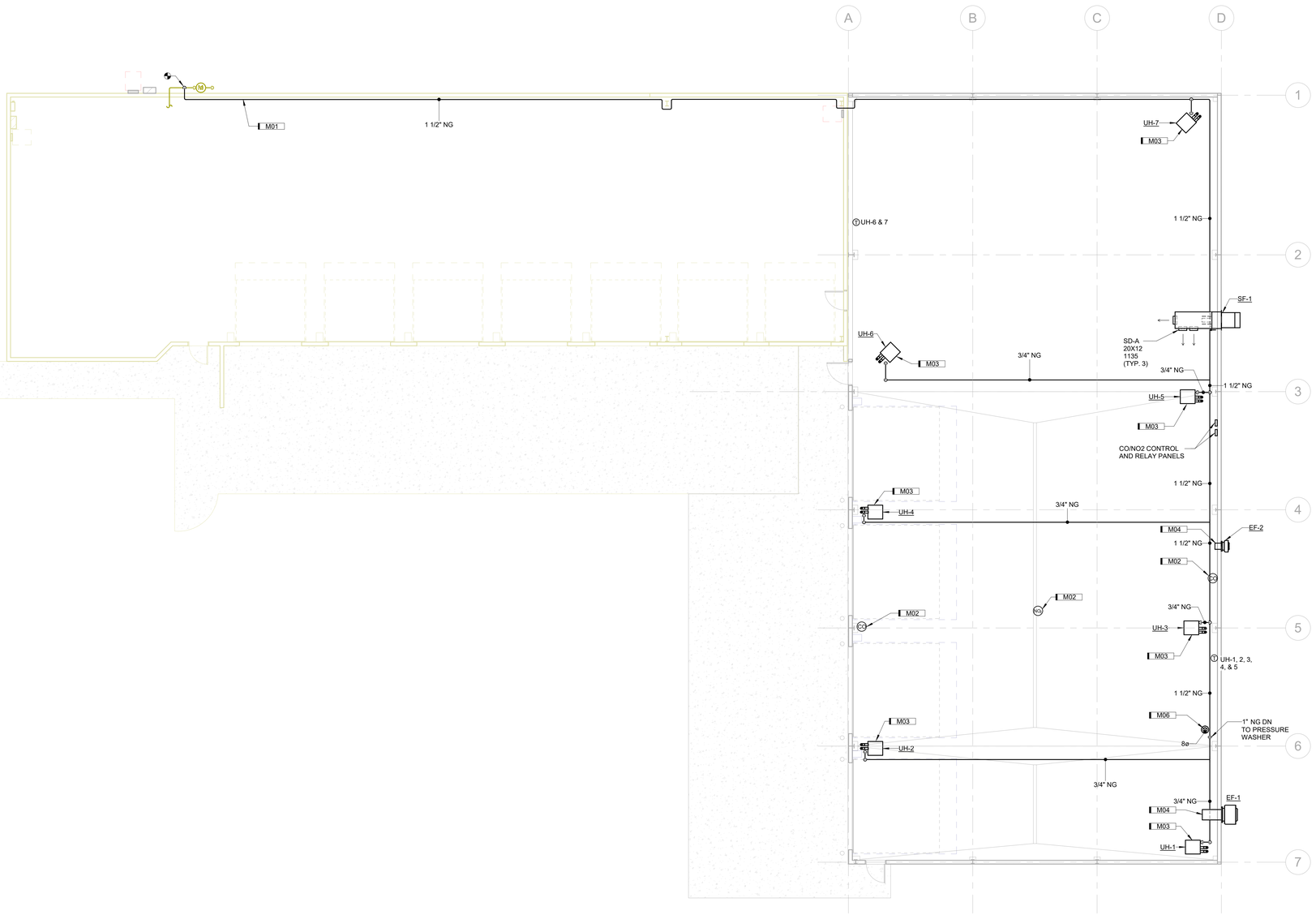
P600

Printed:
Autodesk Revit 2020

KEYNOTE LEGEND	
KEY	NOTE
M01	CONNECT TO EXISTING NATURAL GAS SERVICE DOWNSTREAM OF METER. ROUTE THROUGH EXISTING BUILDING TO NEW ADDITION.
M02	NEW CO/NO2 CONTROLS TO TURN FANS ON/OFF. LOCATE AS SHOWN AND VERIFY EXACT LOCATIONS AND SENSOR QUANTITIES WITH SENSOR MANUFACTURER. SEE CO/NO2 CONTROL PANEL DETAIL.
M03	EXTEND 4" VENT AND 4" COMBUSTION AIR INLET DUCTS TO COMBINED VERTICAL STACK ON ROOF. VERIFY SIZES WITH FINAL EQUIPMENT MANUFACTURER'S WRITTEN REQUIREMENTS. SEE DETAIL.
M04	EXTEND DUCTWORK AS REQUIRED TO INSTALL MOTORIZED DAMPER AND COVER OPEN END WITH 3/4" HARDWARE CLOTH.
M06	ROUTE FLUE FROM PRESSURE WASHER THROUGH ROOF AND TERMINATE PER MANUFACTURER'S WRITTEN INSTRUCTIONS. FLASH AND SECURE ROOF PENETRATION. FLUE SIZE DETERMINED BY PRESSURE WASHER MANUFACTURER.

MECHANICAL GENERAL NOTES

1. LIGHT LINES INDICATE EXISTING PIPING, DUCTWORK, EQUIPMENT, ETC. TO REMAIN. BOLD LINES INDICATE PIPING, DUCTWORK, EQUIPMENT, ETC. TO BE INSTALLED BY THIS CONTRACTOR UNLESS NOTED OTHERWISE.
2. NEW WORK HAS BEEN SHOWN DIAGRAMATICALLY AND DUE TO THE LIMITED SCALE OF THESE DRAWINGS, THE PLACEMENT AND ROUTING OF ALL DUCTWORK, PIPING, ETC. IS CONSIDERED SCHEMATIC IN NATURE; THEREFORE THE DRAWINGS MAY NOT SHOW ALL OFFSETS AND TRANSITIONS WHICH MAY BE REQUIRED. THE CONTRACTOR SHALL PROVIDE COMPLETE FULLY FUNCTIONAL SYSTEMS.
3. INSTALL MANUAL VOLUME DAMPERS IN ALL SUPPLY, RETURN, AND EXHAUST DUCT SYSTEMS AS REQUIRED FOR CONTROLLING AIR VOLUMES TO TRUNK DUCTS, BRANCH DUCTS, OUTLETS, AND INLETS. CONTRACTOR SHALL INSTALL A COMPLETE SYSTEM OF DAMPERS AS REQUIRED FOR BALANCING AIR SYSTEMS.
4. ALL WORK WITHIN THE CONTRACT DOCUMENTS, WHICH INCLUDE THIS DRAWING, SHALL BE COMPLETED IN A SAFE WORKMANLIKE MANNER AND IN ACCORDANCE WITH ALL APPLICABLE STATE, LOCAL, AND NATIONAL CODES, REGULATIONS AND ORDINANCES. IF ANY CONFLICTS ARISE BETWEEN THE CONTRACT DOCUMENTS AND THE APPLICABLE CODES, REGULATIONS OR ORDINANCE, THE CONTRACTOR SHALL BE RESPONSIBLE TO HAVE ALL WORK CONFORM TO THE STRICTER OF SAID REQUIREMENTS.
5. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS AS REQUIRED FOR ELECTRICAL, FIRE PROTECTION, PLUMBING, MECHANICAL AND BACKFLOW PREVENTION INSTALLATIONS. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PROVIDE BOTH A COMPLETE AND COMPLIANT INSTALLATION AS MAY BE DETERMINED BY THE AUTHORITY(S) HAVING JURISDICTION.
6. CONTRACTOR SHALL NOT PROCURE OR FABRICATE ANY PIPING, DUCTWORK OR OTHER EQUIPMENT WITHOUT FIRST VERIFYING ALL DIMENSIONS AND CONDITIONS WHETHER CURRENTLY EXISTING OR NOT. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WORK, INCLUDING ANY REQUIRED REWORK.
7. MAINTAIN ALL MANUFACTURER RECOMMENDED EQUIPMENT SERVICE AND SAFETY CLEARANCES. DO NOT LOCATE ANY EQUIPMENT OR RUN MATERIALS ABOVE ANY ELECTRICAL PANELS OR SWITCHGEAR. MAINTAIN ALL NFPA/NEC CODE REQUIRED CLEARANCES.
8. EACH CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING, SCHEDULING AND SEQUENCING OF THEIR WORK WITH ALL OTHER TRADES. PROVIDE OFFSETS, EASEMENTS, OR RELOCATE TO AVOID CONFLICTS WITH WORK OF OTHER TRADES. FURNISH SUFFICIENT RESOURCES TO MEET ALL PROJECT MILESTONES AND DEADLINES.
9. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE WATERTIGHT AND WEATHER-PROOF INTEGRITY OF ROOFS, WALLS AND FLOORS DURING CONSTRUCTION. EACH TRADE SHALL LOCATE/DIMENSION/COORDINATE THEIR ROOF, FLOOR AND WALL OPENINGS WITH THE GC OR CONSTRUCTION MANAGER.
10. PROTECT NEW WORK FROM DAMAGE OR CONTAMINATION. PROVIDE TEMPORARY PROTECTIVE CAPPING OR TAPED POLYETHYLENE ENCLOSURES OVER OPEN DUCTWORK AND PIPING ENDS AND EQUIPMENT. CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING MECHANICAL SYSTEMS PRIOR TO PLACING THEM IN SERVICE.
11. IN A NEAT AND WORKMANLIKE MANNER: PATCH ANY REMAINING OPENINGS AND FILL EXCESSIVE GAPS; REWORK AND REFINISH TO MATCH ADJACENT STRUCTURES; FLASH AND SEAL ALL MECHANICAL AND ELECTRICAL PENETRATIONS THRU WALLS, CEILINGS, AND FLOORS WITH METAL FRAMEWORK OR ESCUTCHEONS. ALL OPENINGS SHALL BE PROPERLY SEALED SO AS TO MEET FIRE RATING NEEDS.



NORTH

B6 MECHANICAL PLAN
1/8" = 1'-0"

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FIRST FLOOR
MECHANICAL
PIPING PLAN

M101

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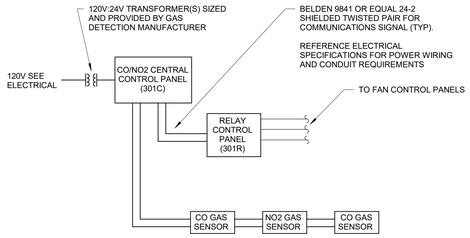
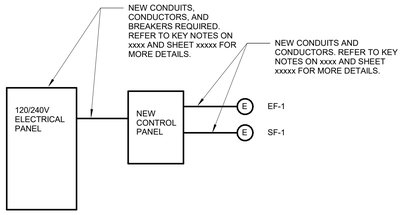
SCHEMATIC IS DIAGRAMMATIC. CONTRACTOR/MANUFACTURER MAY PROVIDE ALTERNATE WIRING CONFIGURATION AT THEIR DISCRETION SO LONG AS SEQUENCES, INTENT, AND MANUFACTURE'S REQUIREMENTS ARE STILL MET. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COMPLETE FUNCTIONING CO/NO2 SYSTEM. REFERENCE 23 0913 SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.





SEQUENCE OF OPERATION:

IF ANY GAS SENSOR DETECTS A LOW LEVEL GAS CONCENTRATION AS SPECIFIED BELOW, THE EXHAUST AND SUPPLY FANS SERVING THE AREA IN WHICH THAT SENSOR IS TRIGGERED SHALL TURN ON. MOTORIZED DAMPERS SERVING FANS SHALL FULLY OPEN BEFORE CORRESPONDING FANS ARE STARTED.

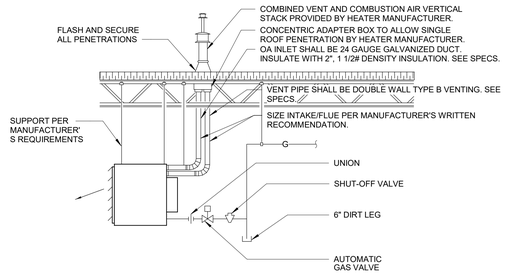
IF HAZARDOUS GAS HAS NOT CLEARED AFTER 30 MIN (ADJ.) OR IF ANY GAS SENSOR DETECTS A MEDIUM LEVEL GAS CONCENTRATION AS SPECIFIED BELOW, THE EXHAUST AND SUPPLY FANS SERVING THE AREA IN WHICH THAT SENSOR IS TRIGGERED SHALL CONTINUE TO OPERATE AND ALL AUDIBLE ALARM SOUNDS AND STROBES IN THE TRIGGERED AREA SHALL ACTIVATE. THE ALARM ON THE CENTRAL CONTROL PANEL SHALL ALSO BE ACTIVATED

SENSORS SHALL HAVE THE CAPABILITY TO PROVIDE A HIGH LEVEL ALARM THAT WILL NOT BE INCORPORATED INTO THE SEQUENCE AT THIS TIME.

TOXIC GASES	LOW LEVEL ALARM (1ST)	MEDIUM LEVEL ALARM (2ND)	HIGH LEVEL ALARM (FUTURE)
CARBON MONOXIDE (CO)	25 PPM	200 PPM	225 PPM
NITROGEN DIOXIDE (NO2)	0.72 PPM	2 PPM	9 PPM

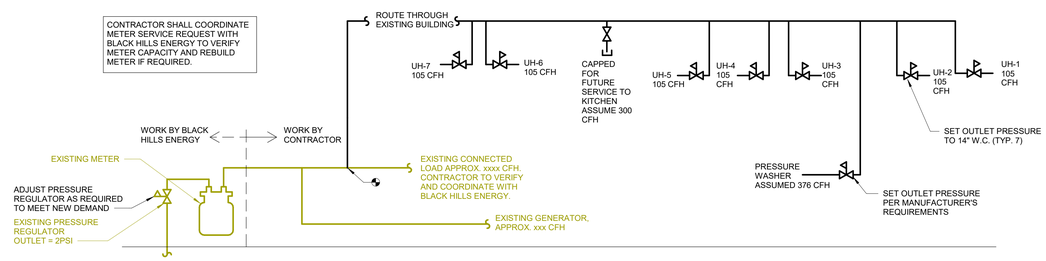
A5 ONELINE FOR EF AND SF CONTROL PANEL
NOT TO SCALE

B5 CO/NO2 CONTROL DETAIL
NOT TO SCALE



E5 GAS UNIT HEATER
NOT TO SCALE

SIZED AT 2 PSI WITH 1/2 PSI PRESSURE DROP



A6 NATURAL GAS SCHEMATIC
NOT TO SCALE

LINE WEIGHTS

DEMOLITION APPLIES TO MD SHEETS

BOLD DASHED LINES INDUCATE EXISTING EQUIPMENT, DUCTWORK, PIPING, ETC. TO BE REMOVED THIS CONTRACT UNLESS NOTED OTHERWISE.

LIGHT SOLID LINES INDUCATE EXISTING EQUIPENT, DUCTWORK, PIPING, ETC. TO REMAIN UNLESS NOTED OTHERWISE.

NEW WORK

BOLD LINES INDUCATE NEW EQUIPMENT, DUCTWORK, PIPING, ETC. THIS CONTRACT UNLESS NOTED OTHERWISE.

LIGHT SOLID LINES INDUCATE EXISTING EQUIPENT, DUCTWORK, PIPING, ETC. TO REMAIN UNLESS NOTED OTHERWISE.

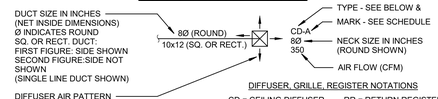
SYMBOLS

DENOTES NEW TO EXISTING CONNECTION

CARBON DIOXIDE SENSOR

NITROGEN DIOXIDE SENSOR

DIFFUSER NOTATION



DIFFUSER, GRILLE, REGISTER NOTATIONS

CD = CEILING DIFFUSER
EG = EXHAUST DIFFUSER
ER = EXHAUST REGISTER
LD = LINEAR DIFFUSER
RG = RETURN GRILLE
RR = RETURN REGISTER
SG = SUPPLY GRILLE
SR = SUPPLY REGISTER
TG = TRANSFER GRILLE

DIFFUSERS REGISTERS AND GRILLES SCHEDULE

MARK	MATERIAL	DESCRIPTION	FACE SIZE	FACTORY FINISH	DESIGN BASIS	REMARKS
SG-A	ALUMINUM	DRUM LOUVER	ADJ. VERT & HORIZ.	WHITE	TITUS DL	

UNIT HEATER SCHEDULE - GAS

REMARKS:
1. PROVIDE FACTORY MOUNTED DISCONNECT SWITCH.
2. PROVIDE 2-STAGE GAS VALVE AND COMBINED VENT AND COMBUSTION AIR VERTICAL STACK KIT, 316 STAINLESS STEEL HEAT EXCHANGER, AND TOTALLY ENCLOSED FAN MOTOR.
3. PROVIDE VERTICAL VENTING OF SEPARATED COMBUSTION THROUGH ROOF.
4. PROVIDE MANUFACTURER'S 2-STAGE THERMOSTATS. SEE DRAWINGS FOR LOCATIONS.
5. PROVIDE UNIT HEATERS WITH MANUFACTURER'S MULTIPLE HEATER CONTROLS. UH-1, UH-2, UH-3, UH-4 AND UH-5 TO BE CONTROLLED ON A SIGNLE THERMOSTAT. UH-6 AND UH-7 TO BE CONTORLLED ON A SINGLE THERMOSTAT. MOUNT THERMOSTATS 4'-0" A.F.F.

MARK	CFM	EAT (°F)	LAT (°F)	MINIMUM GAS PRESSURE HEATING INPUT (MBH)	MINIMUM GAS PRESSURE HEATING OUTPUT (MBH)	MOUNTING HEIGHT (FT)	ORIENTATION	FAN MOTOR DATA HP	FAN MOTOR DATA VOLTS	FAN MOTOR DATA PHASE	DESIGN BASIS	REMARKS
UH-1	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	
UH-2	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	
UH-3	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	
UH-4	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	
UH-5	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	
UH-6	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	
UH-7	1345	60	120	105	87.1	9' - 6"	HORIZONTAL	1/4	120	1	REZNOR UDAS 100	

FAN SCHEDULE

REMARKS:
1. VARI-GREEN EC MOTOR WITH DIAL ON MOTOR FOR BALANCING.
2. FAN, ACCESSORIES, AND SHALL BE COATED WITH HIGH PERFORMANCE POLYESTER URETHANE POWDER COATING FOR CORROSION RESISTANCE IN WASH BAY.
3. DAMPER SHALL BE PROVIDED BY FAN MANUFACTURER. PROVIDE END SWICH ON DAMPER ACUTATOR. DAMPER SHALL FULLY OPEN BEFORE FAN STARTS.
4. PROVIDE FACTORY MOUNTED DISCONNECT SWITCHES ON ALL FANS.
5. COORDINATE ALL ELECTRICAL VOLTAGE/PHASE REQUIREMENTS WITH ELECTRICAL CONTRACTOR AND SITE CONDITIONS PRIOR TO ORDERING.
6. SF-1 SHALL HAVE 90 DEGREE WEATHER HOOD.

MARK	SYSTEM SERVED	FAN TYPE	CFM	ESP (IN H20)	NO FLOW ESP (IN H20)	MOTOR DATA BHP	MOTOR DATA HP	MOTOR DATA VOLTS	MOTOR DATA PHASE	RPM	DRIVE	DAMPER TYPE	INLET SONES	DESIGN BASIS	REMARKS
EF-1	CO/NO2 EXHAUST	CENTRIFUGAL	3400	0.3	1	0.57	1	240	1	994	DIRECT	MOTORIZED	14.8	GREENHECK CUE-180-VG	2
EF-2	GENERAL EXHAUST	CENTRIFUGAL	270	0.3	0.5	0.04	1/4	120	1	1374	DIRECT	MOTORIZED	6.0	GREENHECK CUE-080-VG	
SF-1	CO/NO2 EXHAUST	PROPELLER	3400	0.61	1.15	0.61	3/4	120	1	1750	DIRECT	MOTORIZED	29	GREENHECK AER-S24C-310-VG	

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MECHANICAL SCHEDULES

M600

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ELECTRICAL SYMBOL LEGEND

HT AFF	SYMBOL	DESCRIPTION
	X	SURFACE LIGHT (TYPE DENOTED)
	X	RECESSED LIGHT (TYPE DENOTED)
PER SCHED	X	WALL MOUNTED LIGHT (TYPE DENOTED)
PER SCHED	X	WALL MOUNTED PACK LIGHT (TYPE DENOTED)
PER SCHED	X	WALL MOUNTED FLOODLIGHT (TYPE DENOTED)
		SURFACE LIGHT (TYPE DENOTED)
		SUSPENDED OR PENDANT LIGHT (TYPE DENOTED)
		RECESSED LIGHT (TYPE DENOTED)
		FLUORESCENT STRIP LIGHT (TYPE DENOTED)
AS NOTED		TRACK AND TRACK LIGHT (TYPE DENOTED)
96"	EM	EMERGENCY BATTER LIGHT (TYPE DENOTED)
	E E	EXIT SIGN (TYPE DENOTED)
AS NOTED		LIGHT FIXTURE ON EMERGENCY CIRCUIT
48"	$	SINGLE POLE SWITCH
48"	$3	3-WAY SWITCH
48"	$4	4-WAY SWITCH
48"	$K	KEYED SWITCH
48"	$D	DIMMER SWITCH
48"	$OS	OCCUPANCY SENSOR SWITCH
48"	$MC	MOMENTARY CONTACT SWITCH
48"	$T	TIMER SWITCH
48"	$SP	FAN SPEED CONTROL
48"	$M	MOTOR HORSEPOWER RATED SWITCH
48"		PUSH BUTTON CONTROL
48"	UC	DURESS PUSH BUTTON, UNDER COUNTER
18" UNO		DUPLEX RECEPTACLE
18" UNO		FOURPLEX RECEPTACLE
		RECEPTACLE ON CORD REEL
	CLG	CEILING MOUNTED DUPLEX RECEPTACLE

HT AFF	SYMBOL	DESCRIPTION
18"	A	SURFACE RACEWAY (TYPE DENOTED)
	A	CLOCK (TYPE DENOTED)
	P	POWER POLE (OPEN OFFICE STYLE)
	E	ELECTRICAL CONNECTION (SEE SCHEDULE)
AS NOTED	J	JUNCTION BOX
72"***		CIRCUIT BREAKER PANEL
72"***		POWER OR DISTRIBUTION PANEL
72"***		SPECIAL CABINET (TYPE DENOTED)
	T	TRANSFORMER (TYPE DENOTED)
	25 KVA	GENERAOR (KVA DENOTED)
	1 SF-1	MOTOR (SEE SCHEDULE)
	M	MOTORIZED DAMPER
72"***		SAFETY DISCONNECTION SWITCH
	ASD	ADJUSTABLE SPEED DRIVE
72"***	R	RELAY
	OS IR	OCCUPANCY SENSOR (TYPE DENOTED)
	LS A	LIGHT LEVEL SENSOR (TYPE DENOTED)
AS NOTED	PC	PHOTOCELL
AS NOTED	T	CCTV CAMERA (TYPE DENOTED)
	SM	SURVEILLANCE MONITOR
		PUSHBUTTON SWITCH
	SP	FAN SPEED CONTROL SWITCH
		CEILING FAN

HT AFF	SYMBOL	DESCRIPTION
		CONDUIT CONCEALED IN WALL OR OVERHEAD
		CONDUIT CONCEALED BELOW FLOOR
		CONDUIT TRANSITION UP
		CONDUIT TRANSITION DOWN
		CONDUIT STUBBED OUT
		BRANCH CIRCUIT HOME RUN
		CABLE TRAY (TYPE DENOTED)
		CONDUIT SLEEVE (SIZE DENOTED)
48"****	W	WALL TELEPHONE OUTLET (TYPE DENOTED)
18" UNO		TELEPHONE OUTLET (TYPE DENOTED)
18" UNO	X	DATA OUTLET (INDICATED QTY CABLES)
18" UNO		VOICE/DATA OUTLET (TYPE DENOTED)
		WIRELESS ACCESS POINT
18" UNO	TV	TELEVISION OUTLET
	TV	CEILING MOUNTED TELEVISION OUTLET
84"	S	SPEAKER (WALL OR CEILING MOUNT)
84"	S	HORN TYPE SPEAKER
	S	SURFACE MOUNT SPEAKER SUSPENDED FROM CEILING
48"	V	VOLUME CONTROL
48"	IC	INTERCOM STATION
	ICM	INTERCOM MASTER
	E#	KEYED NOTE (SEE SCHEDULE)
	FS	SPRINKLER FLOW SWITCH
	TS	SPRINKLER VALVE TAMPER SWITCH
	"ex"	DEVICE IS EXISTING TO REMAIN
	"re"	DEVICE IS EXISTING BUT RELOCATED

HT AFF	SYMBOL	DESCRIPTION
80"****	F	FIRE ALARM HORN
80"****	F 110cd	FIRE ALARM HORN WITH STROBE (CANDELAS)
80"****	F	FIRE ALARM BELL
80"****	F 110cd	FIRE ALARM BELL WITH STROBE (CANDELAS)
80"****	F	FIRE ALARM CHIME
80"****	F 110cd	FIRE ALARM CHIME WITH STROBE (CANDELAS)
80"****	F	FIRE ALARM STROBE CANDELAS
80"****	F S 110cd	FIRE ALARM SPEAKER WITH STROBE (CANDELAS)
72"***	FA ANNUN	FIRE ALARM REMOTE ANNUNCIATOR
72"***	FACP	FIRE ALARM CONTROL PANEL
72"***	FARP	FIRE ALARM RELAY PANEL
8"****	P P	SMOKE DETECTOR (TYPE DENOTED)
	H R/F135 R/F135	HEAT DETECTOR (TYPE AND TEMP DENOTED)
		LINEAR HEAT DETECTOR
	P	DUCT SMOKE DETECTOR (TYPE DENOTED)
48"		REMOTE TEST/STATUS STATION
48"****	F P	PULLSTATION
	DR	SMOKE DAMPER RELEASE
	DH	DOOR HOLDER/HOLD OPEN
48"	KP	DOOR SECURITY KEYPAD
	ES	DOOR SECURITY ELECTRIC STRIKE

ALL DISTANCES ARE TO CENTER OF DEVICE OR EQUIPMENT UNLESS OTHERWISE NOTED. DEVICES INDICATED AT 48" MAY NOT BE INSTALLED WITH ANY OPERABLE PART HIGHER THAN 48". DEVICES MAY BE INSTALLED IN CONCRETE MASONRY UNITS WITH THE TOP OF THE DEVICE AT 48".

* DISTANCE ABOVE DOOR FRAME ** DISTANCE TO TOP OF EQUIPMENT OR DEVICE *** DISTANCE TO HIGHEST OPERABLE POINT OF EQUIPMENT **** DISTANCE BELOW CEILING ***** DISTANCE TO BOTTOM OF DEVICE

ELECTRICAL GENERAL NOTES

1. ALL WORK SHALL BE IN CONFORMANCE WITH THE NATIONAL ELECTRICAL CODE - LATEST EDITION ADOPTED BY THE STATE, THE STATE AMENDMENTS, LOCAL/MUNICIPAL CODES AND ORDINANCES, AND THE AUTHORITY HAVING JURISDICTION. THE COMPLETE INSTALLATION SHALL BE IN ACCORDANCE WITH THE ADAAG (AMERICANS WITH DISABILITIES ACT ACCESSIBILITY GUIDELINES).
2. IT IS THE INTENT OF THESE DOCUMENTS TO COMPLY WITH THE APPLICABLE CODES. WHERE DISCREPANCIES OCCUR, NOTIFY THE ENGINEER/ARCHITECT IN WRITING FOR INTERPRETATION. CORRECT ANY INSTALLATION THAT FAILS TO COMPLY WITH THE CODES AND STANDARDS AT NO ADDITIONAL COST TO THE OWNER.
3. PROVIDE ALL WORK NECESSARY INCLUDING ALL LABOR, MATERIALS, PERMITS, TAXES, FEES, INSPECTIONS, HARDWARE, AND COST FOR INSTALLATION FOR A COMPLETE AND OPERATIONAL SYSTEM.
4. ALL MATERIALS FURNISHED BY THE CONTRACTOR SHALL BE NEW, COMPLETE WITH MANUFACTURER'S GUARANTEE OR WARRANTY AND SHALL BE LISTED BY A NATIONALLY RECOGNIZED TESTING LABORATORY (NRTL).
5. COORDINATE ELECTRICAL INSTALLATION WITH ALL TRADES PRIOR TO INSTALLATION. IF ELECTRICAL WORK INSTALLED INTERFERES WITH OTHER TRADES AFTER INSTALLATION, MAKE ALL NECESSARY CHANGES TO CORRECT THE CONDITION AT NO ADDITIONAL COST TO THE OWNER.
6. DEVICES, OUTLETS, AND JUNCTION BOXES SHOWN ON DRAWINGS ARE DIAGRAMMATIC. COORDINATE EXACT PLACEMENT OF ALL DEVICES WITH OWNER AND OTHER TRADES PRIOR TO INSTALLATION. VERIFY DOOR SWING PRIOR TO INSTALLATION OF ALL SWITCH BOXES. ADJUSTMENT OF LOCATION PRIOR TO INSTALLATION, SHALL BE DONE WITH NO ADDITIONAL COST TO THE OWNER.
7. DRAWINGS ARE DIAGRAMMATIC. ALL DIMENSIONS SHOWN ARE APPROXIMATE. VERIFY ALL FURNITURE, MODULAR FURNITURE, AND EQUIPMENT LOCATIONS WITH ARCHITECTURAL PLANS, ELEVATIONS AND REVIEWED SHOP DRAWINGS. PRIOR TO MAKING THE ACTUAL ELECTRICAL INSTALLATION, ADJUST CONNECTION LOCATIONS TO ACCOMMODATE FURNITURE AND/OR EQUIPMENT.
8. ALL ELECTRICAL PANELS WITH ANY BRANCH CIRCUIT/LOAD REVISIONS (DEMOLITION OR NEW WORK) SHALL HAVE A NEW TYPED UPDATED CIRCUIT DIRECTORY CARD INSTALLED INSIDE THE DOOR OF THE ELECTRICAL PANEL. VERIFY THAT ALL UNUSED CIRCUIT BREAKERS ARE TURNED 'OFF' AND PROPERLY INDICATED AS 'SPARE' ON THE NEW CIRCUIT DIRECTORY CARD. INSTALL FILLER PLATES WHERE BREAKERS ARE REMOVED AS PART OF THIS PROJECT OR HAVE BEEN REMOVED PREVIOUSLY.
9. NO ENERGIZED CONDUCTORS SHALL BE EXPOSED AT ANYTIME EXCEPT WHEN THE IMMEDIATE AREA IS UNDER THE SUPERVISION OF A QUALIFIED ELECTRICIAN.
10. WHERE CONDUIT IS SURFACE MOUNTED TO A WALL AND RUN VERTICALLY DOWN TO A SWITCH/OUTLET BOX, UTILIZE 1-HOLE OR 2-HOLE CONDUIT STRAPS.
11. REFER TO THE ARCHITECTURAL DRAWINGS FOR LOCATIONS OF BUILDING EXPANSION JOINTS. ALL CONDUITS CROSSING EXPANSION JOINTS SHALL BE INSTALLED WITH EXPANSION FITTINGS, UNLESS THE CONDUIT IS BELOW SLAB IN THE COMPACTED GRANULAR FILL. EXPANSION FITTINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE, AND MANUFACTURE'S WRITTEN RECOMMENDATIONS.
12. HVAC CONTROL WIRING FURNISHED AND INSTALLED BY DIVISION 23. HVAC POWER AND CONTROL WIRING, CONDUIT AND RACEWAY SHALL BE INSTALLED PER DIVISION 26 SPECIFICATIONS.
13. REFER TO APPROVED MECHANICAL EQUIPMENT SUBMITTAL DRAWINGS FOR EQUIPMENT RATINGS AND SIZES. COST OF CHANGES TO ELECTRICAL INSTALLATION RESULTING FROM SUBMISSION OF ALTERNATE EQUIPMENT FROM THAT SCHEDULED ON THE MECHANICAL DRAWINGS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR/VENDOR PROVIDING SUCH EQUIPMENT.
14. TO REDUCE NOISE BETWEEN WALLS, AVOID INSTALLING POWER OR DATA OUTLETS LOCATED BACK TO BACK. WHERE OUTLETS ARE REQUIRED TO BE LOCATED BACK TO BACK, PROVIDE SOUND PROOFING MATERIAL BETWEEN DEVICE BOXES.
15. PENETRATIONS THROUGH FIRE RATED WALLS BY DIVISION 26 CONTRACTOR SHALL BE SEALED WITH APPROPRIATE FIRE PROOFING MATERIAL TO RESTORE FIRE RATING. REFER TO ARCHITECTURAL DRAWINGS FOR FIRE RATED WALLS.
16. KEEP THE WORK AREA CLEAN OF ALL DEBRIS ON A DAILY BASIS. ALL NEW MATERIALS AWAITING INSTALLATION SHALL BE KEPT IN AREAS DESIGNATED BY THE OWNER.
17. THESE DRAWINGS SHALL NOT BE SCALED TO OBTAIN DIMENSIONS. REFER TO DIMENSIONED ARCHITECTURAL FLOOR PLANS. IF THE DIMENSIONS CANNOT BE DETERMINED BY THE INFORMATION GIVEN, CONTACT THE ENGINEER FOR ADDITIONAL INFORMATION.
18. PERIODIC SITE OBSERVATION BY THE ENGINEER IS SOLELY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR IS PROCEEDING IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THIS LIMITED SITE OBSERVATION SHOULD NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY OR QUANTITY OF THE WORK, BUT RATHER PERIODIC IN AN EFFORT TO GUARD THE OWNER AGAINST DEFECTS OR DEFICIENCIES IN THE WORK OF THE CONTRACTOR.
19. THE INFORMATION CONTAINED ON THE ELECTRICAL DRAWINGS IS IN ITSELF INCOMPLETE AND VOID UNLESS USED IN CONJUNCTION WITH ALL OTHER DISCIPLINE DRAWINGS, THE SPECIFICATIONS, TRADE PRACTICES, OR APPLICABLE STANDARDS, CODES, ETC., AND SHALL BE CONSIDERED THE CONTRACT DOCUMENTS AND WITH ALL THEREIN BY REFERENCE, WHICH THE CONTRACTOR CERTIFIES KNOWLEDGE OF BY SIGNING THE CONTRACT.
20. CONTRACTOR IS TO ASSUME FULL RESPONSIBILITY, UNRELIEVED BY REVIEW OF SHOP DRAWINGS OR PERIODIC OBSERVATION OF CONSTRUCTION, FOR COMPLIANCE WITH THE CONTRACT DOCUMENTS, FOR DIMENSIONS TO BE CONFIRMED AND CORRELATED ON THE JOB SITE AND BETWEEN INDIVIDUAL DRAWINGS OR SETS OF DRAWINGS FOR FABRICATION PROCESSES AND CONSTRUCTION TECHNIQUES (INCLUDING EXCAVATION, SHORING, SCAFFOLDING, BRACING, ERECTION, FORM WORK, ETC.), FOR COORDINATION OF THE VARIOUS TRADES, AND FOR SAFE CONDITIONS ON THE JOB SITE. VARIATIONS IN FIELD CONDITIONS RELATIVE TO THE CONTRACT DOCUMENTS SHALL BE REPORTED TO THE ENGINEER AS SOON AS THEY ARE FOUND. WORK SHALL NOT PROGRESS UNTIL WRITTEN PERMISSION FROM THE ENGINEER IS OBTAINED.

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CITY OF ANAMOSA - FIRE STATION ADDITION

ANAMOSA, IA
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: DMM
APPROVED: JJH
ISSUED FOR: QC REVIEW
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

ELECTRICAL GENERAL INFORMATION

E000

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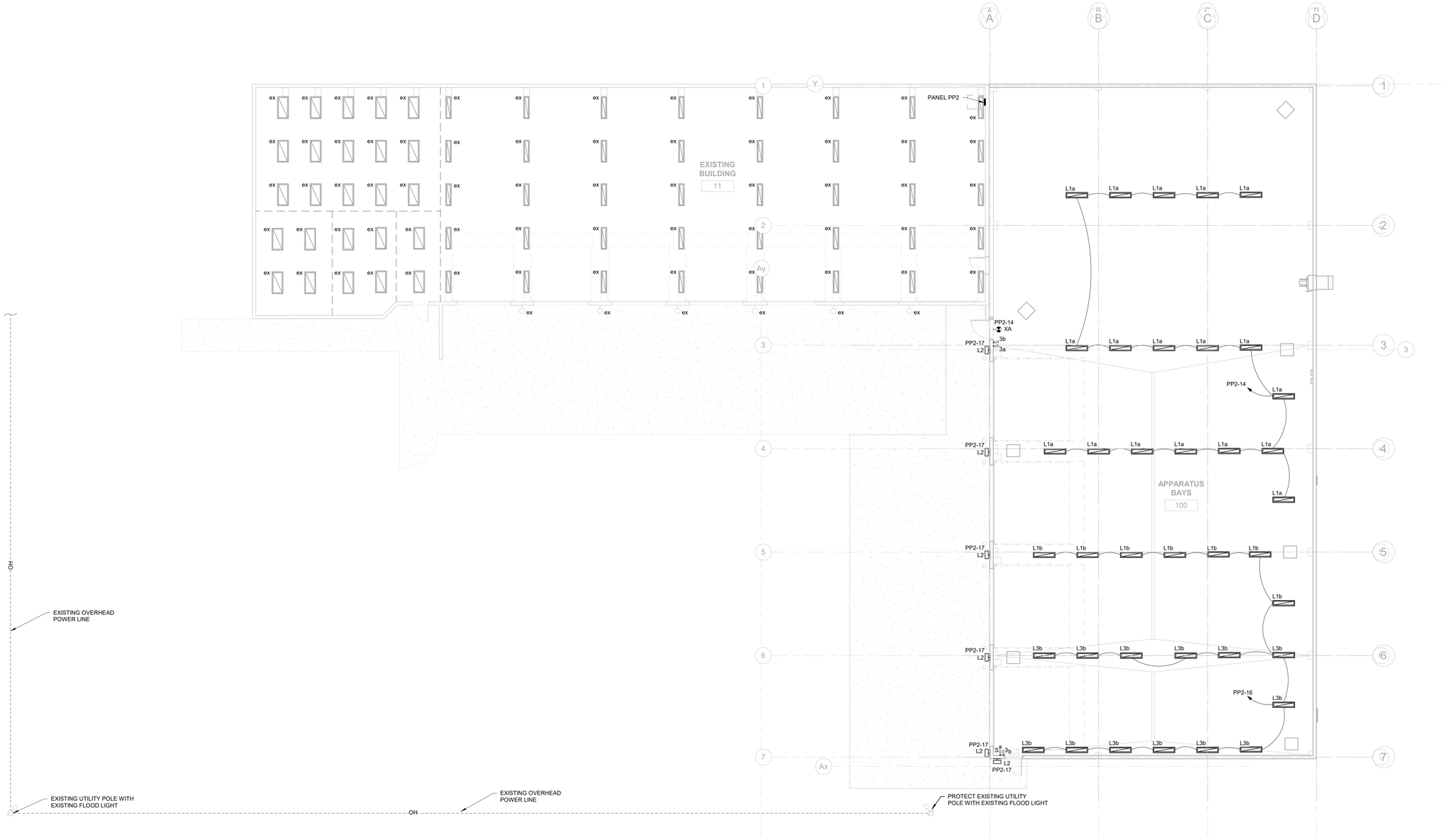

A5 FIRST FLOOR LIGHTING PLAN
1/8" = 1'-0"

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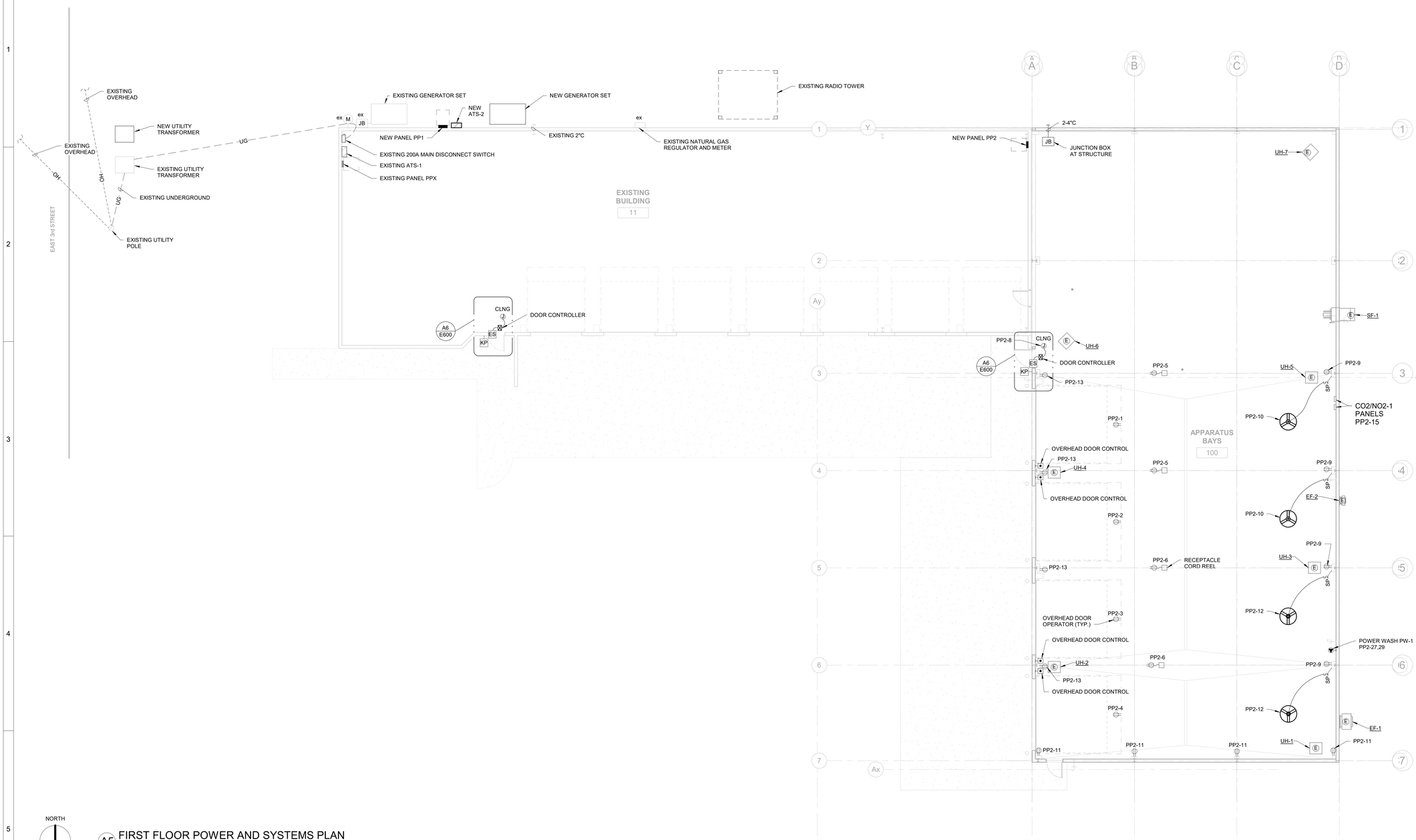
PROJECT NO.: 4207090
FIELD BOOK:

FIRST FLOOR LIGHTING PLAN

E101

Printed:
Autodesk Revit 2020



NORTH

A5 FIRST FLOOR POWER AND SYSTEMS PLAN

1/8" = 1'-0" 0

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CITY OF ANAMOSA - FIRE STATION ADDITION

ANAMOSA, IA
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APPROVED: JJH
ISSUED FOR: QC REVIEW
DATE: April 6, 2021
PROJECT NO: 4207090
FIELD BOOK:

FIRST FLOOR POWER AND SYSTEMS PLAN

E201

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PANELBOARD SCHEDULE - EXISTING

LOCATION: EXISTING MEETING RM CLOSET — PPX

240/120 VOLTS, 1 PHASE, 3 WIRE, 200 AMPERES
MAIN DISCONNECT: MLO — TYPE: GOULD GOF-4QB — MOUNTING: SURFACE — AIC: 10k
REMARKS: SECTION 1 OF 1 I-T-E LOAD CENTER

LOAD: PHASE A kVA — PHASE B kVA — PHASE C kVA — TOTAL kVA

LOAD DESCRIPTION	CT NO.	O.C.P.	kVA	PH	kVA	O.C.P.	CT NO.	LOAD DESCRIPTION
MEETING ROOM LIGHTS	1	20A/1	-	A	-	20A/1	2	BAY 1 LIGHTS
CHIEF'S OFFICE & HALLWAY	3	20A/1	-	B	-	20A/1	4	3RD ROW BAY 2 LIGHTS
OUTSIDE LIGHTS	5	20A/1	-	A	-	20A/1	6	5TH ROW BAY 5 LIGHTS
WEST WALL SHOP OUTLETS	7	20A/1	-	B	-	20A/1	8	6TH ROW BAY 7 LIGHTS
WEST KITCHEN OUTLETS	9	20A/1	-	A	-	20A/1	10	BAY 1 DOOR
SOUTH KITCHEN WALL	11	20A/1	-	B	-	20A/1	12	BAY 2 DOOR
CHIEF'S OFFICE OUTLETS	13	20A/1	-	A	-	20A/1	14	BAY 3 DOOR
HALLWAY WEST OUTLETS	15	20A/1	-	B	-	20A/1	16	BAY 4 DOOR
EMERGENCY LIGHTS	17	20A/1	-	A	-	20A/1	18	BAY 5 DOOR
TELEPHONE RELAY BOX	19	20A/1	-	B	-	20A/1	20	BAY 6 DOOR
AIR CONDITIONER	21	30A/2	-	A	-	20A/1	22	BAY 7 DOOR
- - -	23	- -	-	B	-	20A/1	24	MEETING ROOM FAN
FURNACE OUTLET	25	20A/2	-	A	-	40A/2	26	OVEN RECEPTACLE
SHOP HEATERS	27	20A/1	-	B	-	- -	28	- - -
GFI OUTLETS RESTROOMS	29	20A/1	-	A	-	20A/1	30	EAST WALL SHOP OUTLETS
240V OUTLET UNDER PANEL	31	40A/2	-	B	-	70A/2	32	AIR COMPRESSOR
- - -	33	- -	-	A	-	- -	34	- - -
EOC WALL	35	20A/1	-	B	-	20A/1	36	WASHER
DRYER	37	30A/2	-	A	-	20A/1	38	EOC WALL
- - -	39	- -	-	B	-	/1	40	SPACE

PANELBOARD SCHEDULE - NEW

LOCATION: EXISTING MEETING RM CLOSET — PP1

240/120 VOLTS, 1 PHASE, 3 WIRE, 400 AMPERES
MAIN DISCONNECT: *400A MCB — TYPE: SQUARE D NQ — MOUNTING: SURFACE — AIC: 22k
REMARKS:

LOAD: PHASE A kVA — PHASE B kVA — PHASE C kVA — TOTAL kVA

LOAD DESCRIPTION	CT NO.	O.C.P.	kVA	PH	kVA	O.C.P.	CT NO.	LOAD DESCRIPTION
ATS-1	1	200A/2	-	A	-	200A/2	2	ATS-2
- - -	3	- -	-	B	-	- -	4	- - -
SPACE	5	/1	-	C	-	/1	6	SPACE
SPACE	7	/1	-	A		/1	8	SPACE
SPACE	9	/1	-	B		/1	10	SPACE
SPACE	11	/1	-	C		/1	12	SPACE

* PROVIDE SERVICE ENTRANCE RATED MCB

PANELBOARD SCHEDULE - NEW

LOCATION: EXISTING MEETING RM CLOSET — PP2

240/120 VOLTS, 1 PHASE, 3 WIRE, 225 AMPERES
MAIN DISCONNECT: 400A MCB — TYPE: SQUARE D NQ — MOUNTING: SURFACE — AIC: 22k
REMARKS: SECTION 2 OF 2 PROVIDE WITH TVSS UNIT

LOAD: PHASE A kVA — PHASE B kVA — PHASE C kVA — TOTAL kVA

LOAD DESCRIPTION	CT NO.	O.C.P.	kVA	PH	kVA	O.C.P.	CT NO.	LOAD DESCRIPTION
OVERHEAD DOOR OPERATOR	1	20A/1	1.0	A	1.0	20A/1	2	OVERHEAD DOOR OPERATOR
OVERHEAD DOOR OPERATOR	3	20A/1	1.0	B	1.0	20A/1	4	OVERHEAD DOOR OPERATOR
RECPTACLE CORD REEL	5	20A/1	0.7	C	0.7	20A/1	6	RECEPTACLE CORD REEL
SPARE	7	20A/1	-	A	0.4	20A/1	8	DOOR 100-1 ACCESS CONTROL
EAST WALL GARAGE RECPT	9	20A/1	0.7	B	0.7	20A/1	10	CEILING FANS
SOUTH WALL GARAGE RECPT	11	20A/1	0.7	C	0.7	20A/1	12	CEILING FANS
WEST WALL GARAGE RECPT	13	20A/1	0.7	A	1.0	20A/1	14	APPARATUS BAY LIGHTS
CO/NO2 PANELS	15	20A/1	0.5	B	1.0	20A/1	16	APPARATUS BAY LIGHTS
EXTERIOR BUILDING LIGHTS	17	20A/1	0.4	C	0.7	20A/1	18	APPARATUS BAY UH-1, UH-2
APPARATUS BAY EF-2	19	20A/1	0.5	A	0.7	20A/1	20	APPARATUS BAY UH-3, UH-4
APPARATUS BAY EF-1	21	20A/2	1.0	B	-	20A/1	22	SPARE
- - -	23	- -	1.0	C	0.3	20A/1	24	APPARATUS BAY UH-5
APPARATUS BAY SF-1	25	25A/1	1.8	A	0.7	20A/1	26	CONFERENCE UH-6, UH-7
POWER WASHER P-1	27	20A/2	--	B	-	20A/1	28	SPARE
- - -	29	- -	-	C	-	20A/1	30	SPARE
SPARE	31	20A/1	-	B	-	20A/1	32	SPARE
SPARE	33	20A/1	-	A	-	20A/1	34	SPARE
SPARE	35	20A/1	-	B	-	20A/1	36	SPARE
SPACE	37	/1	-	A	-	/1	38	SPACE
SPACE	39	/1	-	B	-	/1	40	SPACE

LIGHTING FIXTURE SCHEDULE

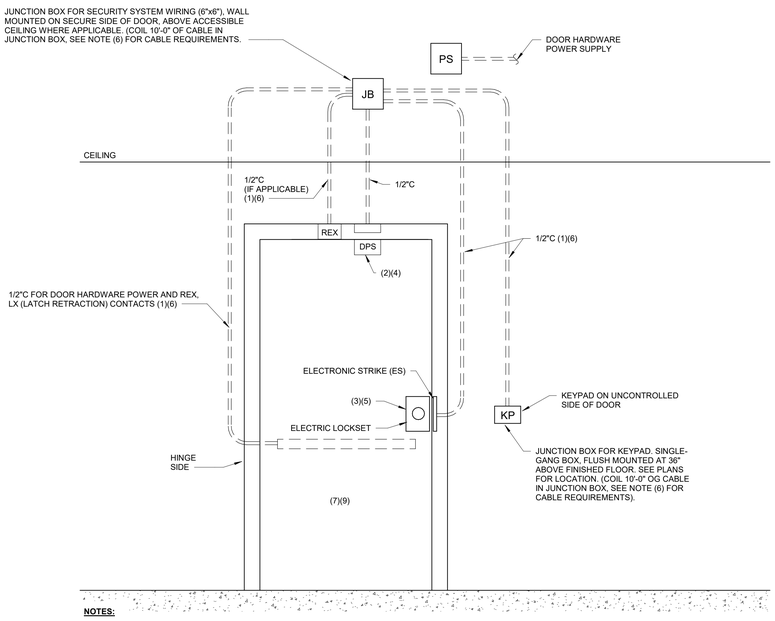
PLAN MARK	MANUFACTURER AND MODEL NUMBER	LUMENS	LAMPS	VOLTS	MOUNTING	MOUNTING HEIGHT	REMARKS
L1	METALUX #4-ILED-LD5-9-W-FL/UPL-120V-L840-CD1	9000	LED 4000k	120	SUSPENDED	12'-6"AFF	INDUSTRIAL LED LINEAR BAY FIXTURE
L2	Mc GRAW-EDISON #ISW-SA1-C-740-1-T3-BZ-CBP-BPC	3400	LED 4000k	120	WALL	9'-0"OC AFF	EXTERIOR WALL PACK W/PHOTOCELL
L3	METALUX #V4T3-LD5-8-W-120V-L840-CD1	8000	LED 4000k	120	SUSPENDED	12'-6"AFF	VAPORTITE LED LINEAR WASH BAY FIXTURE
XA	DUAL-LITE #EVE-U-R-W-E-I	- -	LED	120	SURFACE	- -	DOUBLE FACE EXIT SIGN

MOTOR AND EQUIPMENT SCHEDULE

PLAN MARK	DESCRIPTION	LOAD	VOLTS / PHASE	CIRCUIT NUMBER	DISCONNECT DEVICE (FUSE SIZE, A) MOTOR LOCATION	WIRE SIZE	CONDUIT SIZE	DISC BY	MS BY	CONTROLS TYPE	CONTROLS BY	REMARKS
UH-1	UNIT HEATER	300W	120/1	PP2-18	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
UH-2	UNIT HEATER	300W	120/1	PP2-18	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
UH-3	UNIT HEATER	300W	120/1	PP2-20	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
UH-4	UNIT HEATER	300W	120/1	PP2-20	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
UH-5	UNIT HEATER	300W	120/1	PP2-24	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
UH-6	UNIT HEATER	300W	120/1	PP2-26	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
UH-7	UNIT HEATER	300W	120/1	PP2-26	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	- -	M	
EF-1	EXHAUST FAN	1 HP	240/1	PP2-21,23	30A/12A	2#12 AWG+1#12 AWG GND	3/4"	E	E	MS	E	
EF-2	EXHAUST FAN	1/4 HP	120/1	PP2-19	20A/9A	2#12 AWG+1#12 AWG GND	3/4"	E	E	MS	E	
SF-1	SUPPLY FAN	3/4 HP	120/1	PP2-25	30A/20A	2#10 AWG+1#12 AWG GND	3/4"	E	E	MS	E	
CO/NO2-1	CO/N02 CONTROL & RELAY PANELS	- -	120/1	PP2-15	- -	2#12 AWG+1#12 AWG GND	3/4"	M	M	--	M	
PW-1	POWER WASHER	13A	230/1	PP2-27,29	30A/20A	2#10 AWG+1#10 AWG GND	3/4"	E	M	--	M	CORD AND PLUG. MATCH RECEPT TO PLUG

MOTOR AND EQUIPMENT SCHEDULE NOTES:

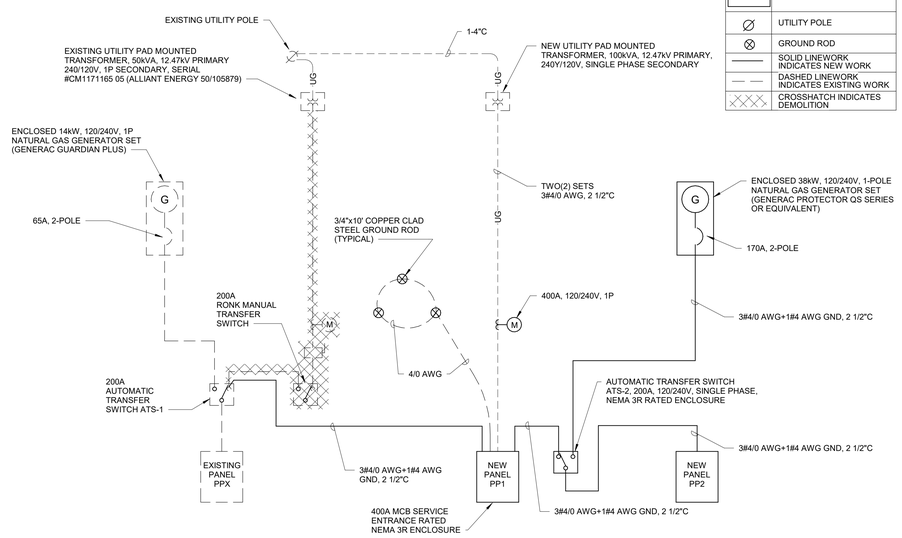
1. LOAD: A = AMPERES; FHP = FRACTIONAL HORSE POWER; HP = HORSEPOWER; kW = KILOWATTS; W = WATTS.
2. OVERCURRENT PROTECTION: ie: 3P/60 = 3 POLE, 60 AMPERE CIRCUIT BREAKER; 60AF = 60 AMPERE FUSE.
3. RESPONSIBILITY: E = ELECTRICAL CONTRACTOR; M = MECHANICAL CONTRACTOR; EX = EXISTING; G = GENERAL CONTRACTOR; INT = INTEGRAL WITH EQUIPMENT; O = OWNER;
4. CONTROLS: MAN = MANUAL; MS = AUXILLIARY CONTACT ON MOTOR STARTER; T = THERMOSTAT; H.O.A. = MAGNETIC STARTER WITH HANDS-OFF-AUTO; TS = TWO SPEED STARTER W/HANDS-OFF-STARTER; VFD = VARIABLE FREQUENCY DRIVE WITH BYPASS AND HOA; DS = MAGNETIC DOOR SWITCH.
5. MINIMUM WIRE SIZE SHALL BE NO. 12 AWG AND MINIMUM RACEWAY SHALL BE 3/4". MINIMUM SHALL APPLY WHERE SUCH IS OMITTED ON THE SCHEDULE.
6. INCLUDE A SEPARATE, GREEN, GROUNDING CONDUCTOR IN ALL FEEDER AND BRANCH CIRCUIT CONDUIT.



NOTES:

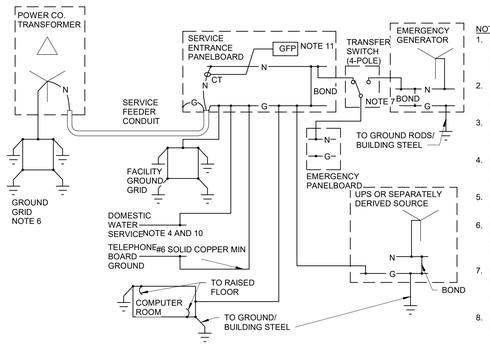
(1) CONCEAL CONDUIT IN NEW CONSTRUCTION WALL. SURFACE MOUNT ON EXISTING WALL.
(2) DOOR POSITION SWITCH. FURNISHED AND MOUNTED BY DOOR HARDWARE PROVIDER. WIRING BY ELECTRICAL CONTRACTOR.
(3) "REQUEST TO EXIT" AS INTEGRAL PART OF DOOR HARDWARE.
(4) "DPS" (DOOR POSITION SWITCH) MOUNTED IN FRAME HEADER, 10" FROM CENTER OF FRAME, TOWARD DOOR STRIKE.
(5) DOORS AND FRAMES TO RECEIVE NEW DOOR HARDWARE AS SCHEDULED.
(6) FURNISH AND INSTALL THE CONDUIT AND BACKBOX ROUGH-IN AS INDICATED. WIRING AND EQUIPMENT/DEVICES BY OTHERS EXCEPT FOR THE DOOR POSITION SWITCHES.
(7) NOT ALL DEVICES SHOWN ARE REQUIRED FOR EACH DOOR. COORDINATE WITH DOOR HARDWARE CONTRACTOR.
(8) PROVIDE 120V CIRCUIT FROM PANEL PP2 TO ABOVE CEILING JUNCTION BOX. LABEL JUNCTION BOX AS POWER FOR DOOR HARDWARE POWER SUPPLY.
(9) SPECIFICATION DIVISION 8 FURNISHES AND INSTALLS THE DOOR HARDWARE POWER SUPPLIES.

A6 Door Access Control Detail
NOT TO SCALE



E4 Electrical One-Line Diagram
NOT TO SCALE

ONE-LINE SYMBOLS	
G	GENERATOR
XX	TRANSFORMER
	DISCONNECT SWITCH
	TRANSFER SWITCH
PANEL XX	BRANCH CIRCUIT PANELBOARD
	UTILITY POLE
	GROUND ROD
	SOLID LINEWORK INDICATES NEW WORK
	DASHED LINEWORK INDICATES EXISTING WORK
	CROSSHATCH INDICATES DEMOLITION



NOTES:

1. CONDUITS SHALL BE SECURED TO PANELBOARDS AND JUNCTION BOXES WITH LOCKING WEDGES OR LOCK NUTS.
2. BURIED OR INACCESSIBLE GROUND CONNECTIONS MAY BE EXOTHERMIC WELD OR COMPRESSION.
3. SERVICE FEEDER SHALL CONTAIN 3 (THREE) PHASE CONDUCTORS AND 1 (ONE) NEUTRAL CONDUCTOR.
4. GROUND CONNECTION SHALL BE MADE AHEAD OF WATER METER OR ANY OTHER FITTINGS.
5. GROUND RODS SHALL BE 3/4"x10' UNLESS NOTED OTHERWISE.
6. POWER CO. TRANSFORMER GROUND RODS AREA BY POWER CO. UNLESS SHOWN OTHERWISE. COORDINATE WITH POWER CO.
7. SWITCHED NEUTRAL, WITH "BOND" AT EMERGENCY GENERATOR, OR, WITH "GROUND FAULT PROTECTION" AT SERVICE ENTRANCE.
8. CONNECT TO COMPUTER ROOM FLOOR SUPPORTS WITH T&B 241 OR 141 SERIES CLAMPS.
9. SIZE GROUNDING ELECTRODE AND EQUIPMENT GROUNDING CONDUCTORS PER NEC ARTICLE 250.
10. WATER LINE GROUND CLAMP SHALL BE A BURNDY GC XXA CLAMP OR APPROVED EQUIVALENT.
11. NEC 215-10. PROVIDE GROUND FAULT PROTECTION (GFP) FOR SERVICES RATED 1000 AMPERES OR MORE, ON SOLID GROUNDED WIRE SYSTEMS OF MORE THAN 150 VOLTS TO GROUND. BUT NOT EXCEEDING 600V PHASE-TO-PHASE.

E6 Grounding System Detail
NOT TO SCALE

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ANAMOSA, IA
701 E. THIRD STREET, ANAMOSA, IA 52205

PRELIMINARY - NOT FOR CONSTRUCTION

DRAWN: DMM
APPROVED: JJH
ISSUED FOR: QC REVIEW
DATE: April 6, 2021
PROJECT NO.: 4207090
FIELD BOOK:

ELECTRICAL SCHEDULES, DETAILS, AND ONE-LINE DIAGRAM

E600

Printed:
Autodesk Revit 2020

TABLE OF CONTENTS

DIVISION 10 - SPECIALTIES

DIVISION 13 - SPECIAL CONSTRUCTION

DIVISION 22 - PLUMBING

DIVISION 23 - HEATING, VENTILATING, AND AIR-CONDITIONING (HVAC)

DIVISION 26 – ELECTRICAL

SECTION 02 4100
DEMOLITION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Selective demolition of building elements for alteration purposes.

1.2 RELATED REQUIREMENTS

A. Section 01 1000 - Summary: Limitations on Contractor's use of site and premises.

B. Section 01 5000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

C. Section 01 5713 - Temporary Erosion and Sediment Control.

D. Section 01 6000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 01 7000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products; temporary bracing and shoring.

F. Section 01 7419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

G. Section 31 2323 - Fill: Fill material for filling holes, pits, and excavations generated as a result of removal operations.

1.3 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations 2019.

PART 2 PRODUCTS

PART 3 EXECUTION

3.1 SCOPE

A. Remove the entire building designated on the floor plan.

B. Remove other items indicated, for salvage, relocation, recycling, and [_____].

C. Fill excavations, open pits, and holes in ground areas generated as result of removals, using specified fill; compact fill as specified in Section 31 2200.

3.2 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 01 7000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.

1. Obtain required permits.

2. Comply with applicable requirements of NFPA 241.

3. Use of explosives is not permitted.
4. Provide, erect, and maintain temporary barriers and security devices.
5. Conduct operations to minimize effects on and interference with adjacent structures and occupants.

C. Do not begin removal until receipt of notification to proceed from Owner.

D. Protect existing structures and other elements that are not to be removed.

1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

F. If hazardous materials are discovered during removal operations, stop work and notify Architect/Engineer and Owner; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

3.3 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.

1. Verify that construction and utility arrangements are as indicated.
2. Report discrepancies to Architect/Engineer before disturbing existing installation.
3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Remove existing work as indicated and as required to accomplish new work.

1. Remove items indicated on drawings.

C. Protect existing work to remain.

1. Prevent movement of structure; provide shoring and bracing if necessary.
2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
3. Repair adjacent construction and finishes damaged during removal work.
4. Patch as specified for patching new work.

3.4 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Leave site in clean condition, ready for subsequent work.

C. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. Section includes cast-in-place concrete, including formwork, reinforcement, concrete materials, mixture design, placement procedures, and finishes, for the following:

1. Footings and foundations.
2. Foundation walls.
3. Slabs-on-grade.

1.2 REFERENCE STANDARDS

A. AASHTO M 182 - Standard Specification for Burlap Cloth Made from Jute or Kenaf and Cotten Mats 2005.

B. ACI 117 - Specifications for Tolerances for Concrete Construction and Materials 2010 (Reapproved 2015).

C. ACI 301 - Specifications for Structural Concrete 2016.

D. ACI 302.1R - Guide to Concrete Floor and Slab Construction 2015.

E. ACI 305R - Guide to Hot Weather Concreting 2010.

F. ACI 306R - Guide to Cold Weather Concreting 2016.

G. ACI 308R - Guide to External Curing of Concrete 2016.

H. ACI 347R - Guide to Formwork for Concrete 2014, with Errata (2017).

I. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete 2018a.

J. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement 2018.

K. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars 2017.

L. ASTM A934/A934M - Standard Specification for Epoxy-Coated Prefabricated Steel Reinforcing Bars 2016.

M. ASTM C1017/C1017M - Standard Specification for Chemical Admixtures for Use in Producing Flowing Concrete 2013.

N. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete 2013.

O. ASTM C1064/C1064M - Standard Test Method for Temperature of Freshly Mixed Hydraulic-Cement Concrete 2012.

P. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or (50-mm) Cube Specimens) 2020b.

Q. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete 2020.

R. ASTM C150/C150M - Standard Specification for Portland Cement 2020.

S. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete 2016.

T. ASTM C172/C172M - Standard Practice for Sampling Freshly Mixed Concrete 2017.

U. ASTM C219 - Standard Terminology Relating to Hydraulic Cement 2014.

V. ASTM C231/C231M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method 2014.

W. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete 2010a (Reapproved 2016).

X. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete 2019.

Y. ASTM C31/C31M - Standard Practice for Making and Curing Concrete Test Specimens in the Field 2021.

Z. ASTM C33/C33M - Standard Specification for Concrete Aggregates 2018.

AA. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens 2021.

BB. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete 2019.

CC. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete 2019.

DD. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete 2020a.

EE. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete 2020.

FF. ASTM D1709 - Standard Test Methods for Impact Resistance of Plastic Film by the Free-Falling Dart Method 2016.

GG. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars 2015.

HH. ASTM D882 - Standard Test Method for Tensile Properties of Thin Plastic Sheeting 2018.

II. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers 2020.

JJ. ASTM E1643 - Standard Practice for Selection, Design, Installation and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs 2018a.

KK. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs 2017.

LL. ASTM F1249 - Standard Test Method for Water Vapor Transmission Rate Through Plastic Film and Sheeting Using a Modulated Infrared Sensor 2020.

MM. AWS D1.4/D1.4M - Structural Welding Code - Reinforcing Steel 2018.

1.3 DEFINITIONS

A. Cementitious Materials: Portland cement alone or in combination with one or more of the following: blended hydraulic cement, fly ash and other pozzolans, ground granulated blast-furnace slag, and silica fume; subject to compliance with requirements.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

B. Design Mixtures: For each concrete mixture. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.

1. Indicate amounts of mixing water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Placing drawings that detail fabrication, bending, and placement. Include bar sizes, lengths, material, grade, bar schedules, stirrup spacing, bent bar diagrams, bar arrangement, splices and laps, mechanical connections, tie spacing, hoop spacing, and supports for concrete reinforcement.

D. Construction Joint Layout: Indicate proposed construction joints required to construct the structure.

1. Location of construction joints is subject to approval of the Architect.

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For installer and manufacturer.

B. Welding certificates.

C. Material Certificates: For each of the following, signed by manufacturers:

1. Cementitious materials.
2. Admixtures.
3. Form materials and form-release agents.
4. Steel reinforcement and accessories.
5. Waterstops.
6. Floor and slab treatments.
7. Bonding agents.
8. Adhesives.
9. Vapor barriers.
10. Joint-filler strips.
11. Repair materials.

D. Material Test Reports: For the following, from a qualified testing agency, indicating compliance with requirements:

1. Aggregates. Include test results per ASTM C295 indicating aggregate is free of materials with deleterious reactivity to alkali in cement.

E. Floor surface flatness and levelness measurements indicating compliance with specified tolerances.

F. Field quality-control reports.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified installer who employs on Project personnel qualified as ACI-certified Flatwork Technician and Finisher and a supervisor who is an ACI-certified Concrete Flatwork Technician.

B. Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C94/C94M requirements for production facilities and equipment.

1. Manufacturer certified according to NRMCA's "Certification of Ready Mixed Concrete Production Facilities."

C. Testing Agency Qualifications: An independent agency, acceptable to authorities having jurisdiction, qualified according to ASTM C1077 and ASTM E329 for testing indicated.

1. Personnel conducting field tests shall be qualified as ACI Concrete Field Testing Technician, Grade 1, according to ACI CP-1 or an equivalent certification program.

2. Personnel performing laboratory tests shall be ACI-certified Concrete Strength Testing Technician and Concrete Laboratory Testing Technician - Grade I. Testing Agency laboratory supervisor shall be an ACI-certified Concrete Laboratory Testing Technician - Grade II.

D. Source Limitations: Obtain each type or class of cementitious material of the same brand from the same manufacturer's plant, obtain aggregate from single source, and obtain admixtures from single source from single manufacturer.

E. Welding Qualifications: Qualify procedures and personnel according to AWS D1.4/D1.4M, "Structural Welding Code - Reinforcing Steel."

F. ACI Publications: Comply with the following unless modified by requirements in the Contract Documents:

1. ACI 301, "Specifications for Structural Concrete, Sections 1 through 5.
2. ACI 117, "Specifications for Tolerances for Concrete Construction and Materials."

1.7 DELIVERY, STORAGE, AND HANDLING

A. Steel Reinforcement: Deliver, store, and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

B. Waterstops: Store waterstops under cover to protect from moisture, sunlight, dirt, oil, and other contaminants.

PART 2 PRODUCTS

2.1 FORM-FACING MATERIALS

A. Smooth-Formed Finished Concrete: Form-facing panels that will provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints.

1. Plywood, metal, or other approved panel materials.

B. Rough-Formed Finished Concrete: Plywood, lumber, metal, or another approved material. Provide lumber dressed on at least two edges and one side for tight fit.

C. Void Forms: Biodegradable paper surface, treated for moisture resistance, structurally sufficient to support weight of plastic concrete and other superimposed loads.

D. Chamfer Strips: Wood, metal, PVC, or rubber strips, 3/4 by 3/4 inch (19 by 19 mm), minimum.

E. Rustication Strips: Wood, metal, PVC, or rubber strips, kerfed for ease of form removal.

F. Form-Release Agent: Commercially formulated form-release agent that will not bond with, stain, or adversely affect concrete surfaces and will not impair subsequent treatments of concrete surfaces.

1. Formulate form-release agent with rust inhibitor for steel form-facing materials.

G. Form Ties: Factory-fabricated, removable or snap-off metal or glass-fiber-reinforced plastic form ties designed to resist lateral pressure of fresh concrete on forms and to prevent spalling of concrete on removal.

1. Furnish units that will leave no corrodible metal closer than 1 inch (25 mm) to the plane of exposed concrete surface.
2. Furnish ties that, when removed, will leave holes no larger than 1 inch (25 mm) in diameter in concrete surface.
3. Furnish ties with integral water-barrier plates to walls indicated to receive dampproofing or waterproofing.

2.2 STEEL REINFORCEMENT

A. Reinforcing Bars: ASTM A615/A615M, Grade 60 (Grade 420), deformed.

B. Epoxy-Coated Reinforcing Bars:ASTM A615/A615M Grade 60, deformed bars, ASTM A775/A775M or ASTM A934/A934M, epoxy coated, with less than 2 percent damaged coating in each 12 inch (300 mm) bar length.

C. Plain-Steel Welded Wire Reinforcement: ASTM A1064/A1064M, plain, fabricated from as-drawn steel wire into flat sheets.

2.3 REINFORCEMENT ACCESSORIES

A. Diamond Plate Dowels: Provide one of the following:

1. Diamond Dowel System by PNA Construction Technologies
2. Pre-approved equivalent

B. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire reinforcement in place. Manufacture bar supports from steel wire, plastic, or precast concrete according to CRSI's "Manual of Standard Practice," of greater compressive strength than concrete and as follows:

1. For concrete surfaces exposed to view where legs of wire bar supports contact forms, use CRSI Class 1 plastic-protected steel wire or CRSI Class 2 stainless-steel bar supports.
2. For epoxy-coated reinforcement, use epoxy-coated or other dielectric-polymer-coated wire bar supports.
3. Supporting reinforcement on clay brick supports is not acceptable.

2.4 CONCRETE MATERIALS

A. Cementitious Material: Use the following cementitious materials, of the same type, brand, and source, throughout Project:

1. Portland Cement: ASTM C150/C150M, Type I, gray. Supplement with the following:
   a. Fly Ash: ASTM C618, Class F or Class C.

B. Normal-Weight Aggregates: ASTM C33/C33M, Class 3S coarse aggregate or better, graded. Provide aggregates from a single sourcewith documented service record data of at least 10 years' satisfactory service in similar applications and service conditions using similar aggregates and cementitious materials.

1. Maximum Coarse-Aggregate Size: 1 inch (25 mm) nominal.
2. Fine Aggregate: Free of materials with deleterious reactivity to alkali in cement. For slabs-on-grade or concrete exposed to view, use fine aggregate with a proven history of not being susceptible to popouts, use imported sand if necessary.

C. Water: ASTM C94/C94M and potable.

2.5 ADMIXTURES

A. Air-Entraining Admixture: ASTM C260/C260M.

B. Chemical Admixtures: Provide admixtures certified by manufacturer to be compatible with other admixtures and that will not contribute water-soluble chloride ions exceeding those permitted in hardened concrete. Do not use calcium chloride or admixtures containing calcium chloride.

1. Water-Reducing Admixture: ASTM C494/C494M, Type A.

2. Retarding Admixture: ASTM C494/C494M, Type B.
3. Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type D.
4. High-Range, Water-Reducing Admixture: ASTM C494/C494M, Type F.
5. High-Range, Water-Reducing and Retarding Admixture: ASTM C494/C494M, Type G.
6. Plasticizing and Retarding Admixture: ASTM C1017/C1017M, Type II.

2.6 WATERSTOPS

A. Self-Expanding Butyl Strip Waterstops: Manufactured rectangular or trapezoidal strip, butyl rubber with sodium bentonite or other hydrophilic polymers, for adhesive bonding to concrete, 3/4 by 1 inch (19 by 25 mm).

2.7 VAPOR BARRIERS

A. Sheet Vapor Barrier, ASTM E1745, Class A . Include manufacturer's recommended adhesive or pressure-sensitive tape.
   1. Minimum thickness; 15 mil.
   2. Water Vapor Permeance, ASTM F1249 Section 7; less than 0.01 Perms.
   3. Tensile Strength, ASTM D882 Section 9; 45 lb/in minimum.
   4. Puncture Resistance, ASTM D1709, Test Method B; 2200 grams minimum.

2.8 CURING MATERIALS

A. Evaporation Retarder: Waterborne, monomolecular film forming, manufactured for application to fresh concrete.

B. Absorptive Cover: AASHTO M 182, Class 2, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) when dry.

C. Moisture-Retaining Cover: ASTM C171, polyethylene film or white burlap-polyethylene sheet.

D. Water: Potable.

E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C309, Type 1, Class B, nondissipating, certified by curing compound manufacturer to not interfere with bonding of floor covering.
   1. Manufacturers: Subject to compliance with requirements, provide the following:
      a. Anti-Hydro International, Inc.; AH Clear Cure WB.
      b. BASF Construction Chemicals - Master Builders Solutions; MasterKure CC 160 WB.
      c. ChemMasters; Safe-Cure & Seal 309.
      d. Cresset Chemical Company; Crete-Trete 309-VOC Cure & Seal.
      e. Dayton Superior Corporation; Cure & Seal 309 J18.
      f. Euclid Chemical Company (The); Aqua Cure VOX.
      g. Kaufman Products, Inc.; Krystal 15 Emulsion.
      h. Laticrete International, Inc.; L&M Dress & Seal WB.
      i. Meadows, W. R., Inc.; Vocomp-20.
      j. Metalcrete Industries; Metcure.

k. Nox-Crete Products Group; Cure & Seal 150E.

l. Vexcon Chemicals, Inc.; Starseal 309.

2.9 RELATED MATERIALS

A. Expansion- and Isolation-Joint-Filler Strips: Flexible, closed-cell polyethylene with tear off strip for sealant installation.

B. Bonding Agent: ASTM C1059/C1059M, Type II, non-redispersible, acrylic emulsion or styrene butadiene.

C. Epoxy Bonding Adhesive: ASTM C881/C881M, two-component epoxy resin, capable of humid curing and bonding to damp surfaces, of class suitable for application temperature and of grade to suit requirements, and as follows:

1. Types IV and V, load bearing, for bonding hardened or freshly mixed concrete to hardened concrete.

2.10 REPAIR MATERIALS

A. Repair Underlayment: Cement-based, polymer-modified, self-leveling product that can be applied in thicknesses from 1/8 inch (3.2 mm) and that can be feathered at edges to match adjacent floor elevations.

1. Cement Binder: ASTM C150/C150M, portland cement or hydraulic or blended hydraulic cement as defined in ASTM C219.

2. Primer: Product of underlayment manufacturer recommended for substrate, conditions, and application.

3. Aggregate: Well-graded, washed gravel, 1/8 to 1/4 inch (3.2 to 6 mm) or coarse sand as recommended by underlayment manufacturer.

4. Compressive Strength: Not less than 4100 psi (29 MPa) at 28 days when tested according to ASTM C109/C109M.

2.11 CONCRETE MIXTURES, GENERAL

A. Prepare design mixtures for each type and strength of concrete, proportioned on the basis of laboratory trial mixture or field test data, or both, according to ACI 301.

1. Use a qualified independent testing agency for preparing and reporting proposed mixture designs based on laboratory trial mixtures.

B. Cementitious Materials:Limit percentage, by weight, of cementitious materials other than portland cement in concrete as follows:

1. Fly Ash: 25 percent.

C. Limit water-soluble, chloride-ion content in hardened concrete to 0.30 percent by weight of cement.

D. Admixtures: Use admixtures according to manufacturer's written instructions.

1. Use water-reducing or high-range water-reducing admixture in concrete, as required, for placement and workability.

2. Use water-reducing and retarding admixture when required by high temperatures, low humidity, or other adverse placement conditions.

3. Use water-reducing admixture in pumped concrete, concrete for heavy-use industrial slabs and parking structure slabs, concrete required to be watertight, and concrete with a water-cementitious materials ratio below 0.50.

2.12 CONCRETE MIXTURES FOR BUILDING ELEMENTS

A. Footings and Foundation Walls: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: Concrete mix shall be proportioned to achieve a maximum slump of 9" for concrete containing high range water reducing admixture, 6" for concrete containing a mid-range water reducing admixture, or 4" for other concrete. All mixes shall have a water slump of 2" to 3".
4. Air Content: 6 percent, plus or minus 1.5 percent at point of delivery for 1 inch (25 mm) nominal maximum aggregate size.

B. Slabs-on-Grade: Proportion normal-weight concrete mixture as follows:

1. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
2. Maximum Water-Cementitious Materials Ratio: 0.45.
3. Slump Limit: Concrete mix shall be proportioned to achieve a maximum slump of 9" for concrete containing high range water reducing admixture, 6" for concrete containing a mid-range water reducing admixture, or 4" for other concrete. All mixes shall have a water slump of 2" to 3".
4. Air Content: Do not allow air content of trowel-finished floors to exceed 3 percent.

2.13 FABRICATING REINFORCEMENT

A. Fabricate steel reinforcement according to CRSI's "Manual of Standard Practice."

2.14 CONCRETE MIXING

A. Ready-Mixed Concrete: Measure, batch, mix, and deliver concrete according to ASTM C94/C94Mand ASTM C1116/C1116M, and furnish batch ticket information.

1. When air temperature is between 85 and 90 deg F (30 and 32 deg C), reduce mixing and delivery time from 1-1/2 hours to 75 minutes; when air temperature is above 90 deg F (32 deg C), reduce mixing and delivery time to 60 minutes.

PART 3 EXECUTION

3.1 FORMWORK

A. Design, erect, shore, brace, and maintain formwork, according to ACI 301, to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads.

B. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits of ACI 117.

C. Limit concrete surface irregularities, designated by ACI 347R as abrupt or gradual, as follows:

1. Class A, 1/8 inch (3.2 mm) for smooth-formed finished surfaces.
2. Class B, 1/4 inch (6 mm) for rough-formed finished surfaces.

D. Construct forms tight enough to prevent loss of concrete mortar.

E. Fabricate forms for easy removal without hammering or prying against concrete surfaces. Provide crush or wrecking plates where stripping may damage cast concrete surfaces. Provide

top forms for inclined surfaces steeper than 1.5 horizontal to 1 vertical.

1. Install keyways, reglets, recesses, and the like, for easy removal.
2. Do not use rust-stained steel form-facing material.

F. Set edge forms, bulkheads, and intermediate screed strips for slabs to achieve required elevations and slopes in finished concrete surfaces. Provide and secure units to support screed strips; use strike-off templates or compacting-type screeds.

G. Provide temporary openings for cleanouts and inspection ports where interior area of formwork is inaccessible. Close openings with panels tightly fitted to forms and securely braced to prevent loss of concrete mortar. Locate temporary openings in forms at inconspicuous locations.

H. Chamfer exterior corners and edges of permanently exposed concrete.

I. Form openings, chases, offsets, sinkages, keyways, reglets, blocking, screeds, and bulkheads required in the Work. Determine sizes and locations from trades providing such items.

J. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete.

K. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment.

L. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

3.2 EMBEDDED ITEMS

A. Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

1. Install anchor rods, accurately located, to elevations required and complying with tolerances in Section 7.5 of AISC's "Code of Standard Practice for Steel Buildings and Bridges."

3.3 REMOVING AND REUSING FORMS

A. General: Formwork for sides of beams, walls, columns, and similar parts of the Work that does not support weight of concrete may be removed after cumulatively curing at not less than 50 deg F (10 deg C) for 24 hours after placing concrete. Concrete has to be hard enough to not be damaged by form-removal operations and curing and protection operations need to be maintained.

1. Leave formwork for beam soffits, joists, slabs, and other structural elements that supports weight of concrete in place until concrete has achievedat least 70 percent of its 28-day design compressive strength.
2. Remove forms only if shores have been arranged to permit removal of forms without loosening or disturbing shores.

B. Clean and repair surfaces of forms to be reused in the Work. Split, frayed, delaminated, or otherwise damaged form-facing material will not be acceptable for exposed surfaces. Apply new form-release agent.

C. When forms are reused, clean surfaces, remove fins and laitance, and tighten to close joints. Align and secure joints to avoid offsets. Do not use patched forms for exposed concrete surfaces unless approved by Architect.

3.4 VAPOR BARRIERS

A. Sheet Vapor Barriers: Place, protect, and repair sheet vapor barrier according to ASTM E1643 and manufacturer's written instructions.

1. Lap joints 6 inch (150 mm) and seal with manufacturer's recommended tape.

3.5 STEEL REINFORCEMENT

A. General: Comply with CRSI's "Manual of Standard Practice" for placing reinforcement.

1. Do not cut or puncture vapor barrier. Repair damage and reseal vapor barrier before placing concrete.

B. Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that would reduce bond to concrete.

C. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Do not tack weld crossing reinforcing bars.

1. Weld reinforcing bars according to AWS D1.4/D1.4M, where indicated.

D. Set wire ties with ends directed into concrete, not toward exposed concrete surfaces.

E. Install welded wire reinforcement in longest practicable lengths on bar supports spaced to minimize sagging. Lap edges and ends of adjoining sheets at least one mesh spacing. Offset laps of adjoining sheet widths to prevent continuous laps in either direction. Lace overlaps with wire.

F. Epoxy-Coated Reinforcement: Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D3963/D3963M. Use epoxy-coated steel wire ties to fasten epoxy-coated steel reinforcement.

3.6 JOINTS

A. General: Construct joints true to line with faces perpendicular to surface plane of concrete.

B. Construction Joints: Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Architect.

1. Place joints perpendicular to main reinforcement. Continue reinforcement across construction joints unless otherwise indicated. Do not continue reinforcement through sides of strip placements of floors and slabs.

2. Space vertical joints in walls at distance needed for construction sequencing. Locate joints beside piers integral with walls, near corners, and in concealed locations where possible.

C. Contraction Joints in Slabs-on-Grade: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness as follows:

1. Sawed Joints: Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8 inch (3.2 mm) wide joints into concrete when cutting action will not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

D. Isolation Joints in Slabs-on-Grade: After removing formwork, install joint-filler strips at slab junctions with vertical surfaces, such as column pedestals, foundation walls, grade beams, and other locations, as indicated.

1. Extend joint-filler strips full width and depth of joint, terminating flush with finished concrete surface unless otherwise indicated.
2. Terminate full-width joint-filler strips not less than 1/2 inch (13 mm) or more than 1 inch (25 mm) below finished concrete surface where joint sealants, specified in Division 07 section "Joint Sealants," are indicated.
3. Install joint-filler strips in lengths as long as practicable. Where more than one length is required, lace or clip sections together.

E. Doweled Joints: Install diamond plate dowels and support assemblies at joints where indicated in compliance with manufacturer's written instructions. Size and spacing of diamond plates shall be in compliance with ACI 302.1R.

3.7 WATERSTOPS

A. Self-Expanding Strip Waterstops: Install in construction joints and at other locations indicated, according to manufacturer's written instructions, adhesive bonding, mechanically fastening, and firmly pressing into place. Install in longest lengths practicable.

3.8 CONCRETE PLACEMENT

A. Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections have been performed.

B. Before test sampling and placing concrete, water may be added at Project site, subject to limitations of ACI 301.

C. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete will be placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation.

1. Deposit concrete in horizontal layers of depth to not exceed formwork design pressures and in a manner to avoid inclined construction joints.
2. Consolidate placed concrete with mechanical vibrating equipment according to ACI 301.
3. Do not use vibrators to transport concrete inside forms. Insert and withdraw vibrators vertically at uniformly spaced locations to rapidly penetrate placed layer and at least 6 inch (150 mm) into preceding layer. Do not insert vibrators into lower layers of concrete that have begun to lose plasticity. At each insertion, limit duration of vibration to time necessary to consolidate concrete and complete embedment of reinforcement and other embedded items without causing mixture constituents to segregate.

D. Deposit and consolidate concrete for floors and slabs in a continuous operation, within limits of construction joints, until placement of a panel or section is complete.

1. Consolidate concrete during placement operations so concrete is thoroughly worked around reinforcement and other embedded items and into corners.
2. Maintain reinforcement in position on chairs during concrete placement.
3. Screed slab surfaces with a straightedge and strike off to correct elevations.
4. Slope surfaces uniformly to drains where required.
5. Begin initial floating using bull floats or darbies to form a uniform and open-textured surface plane, before excess bleedwater appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

E. Cold-Weather Placement: Comply with ACI 306R and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures.

1. When average high and low temperature is expected to fall below 40 deg F (4.4 deg C) for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301.
2. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials.
3. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

F. Hot-Weather Placement: Comply with ACI 301 and ACI 305R and as follows:

1. Maintain concrete temperature below 90 deg F (32 deg C) at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option.
2. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

3.9 FINISHING FORMED SURFACES

A. Rough-Formed Finish: As-cast concrete texture imparted by form-facing material with tie holes and defects repaired and patched. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces not exposed to public view.

B. Smooth-Formed Finish: As-cast concrete texture imparted by form-facing material, arranged in an orderly and symmetrical manner with a minimum of seams. Repair and patch tie holes and defects. Remove fins and other projections that exceed specified limits on formed-surface irregularities.

1. Apply to concrete surfaces exposed to public view, to receive a rubbed finish, or to be covered with a coating or covering material applied directly to concrete.

C. Rubbed Finish: Apply the following to smooth-formed finished as-cast concrete where indicated:

1. Smooth-Rubbed Finish: Not later than one day after form removal, moisten concrete surfaces and rub with carborundum brick or another abrasive until producing a uniform color and texture. Do not apply cement grout other than that created by the rubbing process.

D. Related Unformed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

3.10 FINISHING FLOORS AND SLABS

A. General: Comply with ACI 302.1R recommendations for screeding, restraightening, and finishing operations for concrete surfaces. Do not wet concrete surfaces.

B. Float Finish: Consolidate surface with power-driven floats or by hand floating if area is small or inaccessible to power driven floats. Straighten, cut down high spots, and fill low spots. Repeat float passes and restraightening until surface is left with a uniform, smooth, granular texture.

1. Apply float finish to surfaces to receive trowel finish or to be covered with fluid-applied or sheet waterproofing, built up or membrane roofing.

C. Trowel Finish: After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and straighten until surface is free of trowel marks and uniform in texture and appearance. Grind smooth any surface defects that would

telegraph through applied coatings or floor coverings.

1. Apply a trowel finish to surfaces exposed to view or to be covered with resilient flooring, carpet, ceramic or quarry tile set over a cleavage membrane, paint, or another thin-film-finish coating system.
2. Finish surfaces to the following tolerances, according to ASTM E1155, for a randomly trafficked floor surface:
    a. Specified overall values of flatness, F(F) 35; and of levelness, F(L) 25; with minimum local values of flatness, F(F) 24; and of levelness, F(L) 17; for slabs-on-grade.
3. Remedies for out-of-tolerance work:
    a. Minimum local values measuring at or above all specified minimum local values F-numbers shall be accepted for tolerance compliance as constructed.
    b. Where minimum local values are measured to be below the specified F-numbers one of the following actions shall be performed. In all cases, the particular method of correction shall be determined solely by the Owner.
        1) The area within the boundaries of the minimum local area shall be removed and replaced and the area retested per ASTM E1155 to show tolerance compliance.
        2) The area within the boundary shall be repaired by grinding or depression-and-retopping of the entire minimum local area and the area retested per ASTM E1155 to show tolerance compliance.

D. Broom Finish: Apply a broom finish to exterior concrete platforms, steps, ramps, and elsewhere as indicated.

1. Immediately after float finishing, slightly roughen trafficked surface by brooming with fiber-bristle broom perpendicular to main traffic route. Coordinate required final finish with Architect/Engineer before application.

3.11 MISCELLANEOUS CONCRETE ITEMS

A. Filling In: Fill in holes and openings left in concrete structures after work of other trades is in place unless otherwise indicated. Mix, place, and cure concrete, as specified, to blend with in-place construction. Provide other miscellaneous concrete filling indicated or required to complete the Work.

B. Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

C. Equipment Bases and Foundations:

1. Coordinate sizes and locations of concrete bases with actual equipment provided.
2. Construct concrete bases 4 inch (100 mm) high unless otherwise indicated; and extend base not less than 6 inch (150 mm) in each direction beyond the maximum dimensions of supported equipment unless otherwise indicated.
3. Minimum Compressive Strength: 4000 psi (27.6 MPa) at 28 days.
4. Install dowel rods to connect concrete base to concrete floor. Unless otherwise indicated, install dowel rods on 18 inch (450 mm) centers around the full perimeter of concrete base.
5. Set anchor bolts for machines and equipment at correct elevations, complying with diagrams or templates from manufacturer furnishing machines and equipment.

3.12 CONCRETE PROTECTING AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306R for cold-weather protection and ACI 301 for hot-weather protection during curing.

B. Evaporation Retarder: Apply evaporation retarder to unformed concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete, but before float finishing.

C. Formed Surfaces: Cure formed concrete surfaces, including underside of beams, supported slabs, and other similar surfaces. If forms remain during curing period, moist cure after loosening forms. If removing forms before end of curing period, continue curing for the remainder of the curing period.

D. Unformed Surfaces: Begin curing immediately after finishing concrete. Cure unformed surfaces, including floors and slabs, concrete floor toppings, and other surfaces.

E. Cure concrete according to ACI 308R, by one or a combination of the following methods:

1. Moisture Curing: Keep surfaces continuously moist for not less than seven days with the following materials:

    a. Water.

    b. Continuous water-fog spray.

    c. Absorptive cover, water saturated, and kept continuously wet. Cover concrete surfaces and edges with 12 inch (300 mm) lap over adjacent absorptive covers.

2. Moisture-Retaining-Cover Curing: Cover concrete surfaces with moisture-retaining cover for curing concrete, placed in widest practicable width, with sides and ends lapped at least 12 inch (300 mm), and sealed by waterproof tape or adhesive. Cure for not less than seven days. Immediately repair any holes or tears during curing period using cover material and waterproof tape.

3. Curing Compound: Apply uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

    a. Removal: After curing period has elapsed, remove curing compound without damaging concrete surfaces by method recommended by curing compound manufacturer unless manufacturer certifies curing compound will not interfere with bonding of floor covering used on Project.

4. Moisture cure or use moisture-retaining covers to cure concrete surfaces to receive penetrating liquid floor treatments.

5. Cure concrete surfaces to receive floor coverings with either a moisture cure, a moisture-retaining cover or a curing compound that the manufacturer certifies will not interfere with bonding of floor covering used on Project.

3.13 JOINT FILLING

A. Prepare, clean, and install joint filler according to manufacturer's written instructions.

1. Defer joint filling until concrete has aged at least one month(s). Do not fill joints until construction traffic has permanently ceased.

B. Remove dirt, debris, saw cuttings, curing compounds, and sealers from joints; leave contact faces of joint clean and dry.

3.14 CONCRETE SURFACE REPAIRS

A. Defective Concrete: Repair and patch defective areas when approved by Architect/Engineer. Remove and replace concrete that cannot be repaired and patched to Architect/Engineer's approval.

B. Patching Mortar: Mix dry-pack patching mortar, consisting of one part portland cement to two and one-half parts fine aggregate passing a No. 16 (1.18-mm) sieve, using only enough water for handling and placing.

C. Repairing Formed Surfaces: Surface defects include color and texture irregularities, cracks, spalls, air bubbles, honeycombs, rock pockets, fins and other projections on the surface, and stains and other discolorations that cannot be removed by cleaning.

1. Immediately after form removal, cut out honeycombs, rock pockets, and voids more than 1/2 inch (13 mm) in any dimension to solid concrete. Limit cut depth to 3/4 inch (19 mm). Make edges of cuts perpendicular to concrete surface. Clean, dampen with water, and brush-coat holes and voids with bonding agent. Fill and compact with patching mortar before bonding agent has dried. Fill form-tie voids with patching mortar or cone plugs secured in place with bonding agent.

2. Repair defects on surfaces exposed to view by blending white portland cement and standard portland cement so that, when dry, patching mortar will match surrounding color. Patch a test area at inconspicuous locations to verify mixture and color match before proceeding with patching. Compact mortar in place and strike off slightly higher than surrounding surface.

3. Repair defects on concealed formed surfaces that affect concrete's durability and structural performance as determined by Architect/Engineer.

D. Repairing Unformed Surfaces: Test unformed surfaces, such as floors and slabs, for finish and verify surface tolerances specified for each surface. Correct low and high areas. Test surfaces sloped to drain for trueness of slope and smoothness; use a sloped template.

1. Repair finished surfaces containing defects. Surface defects include spalls, popouts, honeycombs, rock pockets, crazing and cracks in excess of 0.01 inch (0.25 mm) wide or that penetrate to reinforcement or completely through unreinforced sections regardless of width, and other objectionable conditions.

2. After concrete has cured at least 14 days, correct high areas by grinding.

3. Correct localized low areas during or immediately after completing surface finishing operations by cutting out low areas and replacing with patching mortar. Finish repaired areas to blend into adjacent concrete.

4. Correct other low areas scheduled to receive floor coverings with a repair underlayment. Prepare, mix, and apply repair underlayment and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface. Feather edges to match adjacent floor elevations.

5. Correct other low areas scheduled to remain exposed with a repair topping. Cut out low areas to ensure a minimum repair topping depth of 1/4 inch (6 mm) to match adjacent floor elevations. Prepare, mix, and apply repair topping and primer according to manufacturer's written instructions to produce a smooth, uniform, plane, and level surface.

6. Repair defective areas, except random cracks and single holes 1 inch (25 mm) or less in diameter, by cutting out and replacing with fresh concrete. Remove defective areas with clean, square cuts and expose steel reinforcement with at least a 3/4 inch (19 mm) clearance all around. Dampen concrete surfaces in contact with patching concrete and

apply bonding agent. Mix patching concrete of same materials and mixture as original concrete except without coarse aggregate. Place, compact, and finish to blend with adjacent finished concrete. Cure in same manner as adjacent concrete.

7. Repair random cracks and single holes 1 inch (25 mm) or less in diameter with patching mortar. Groove top of cracks and cut out holes to sound concrete and clean off dust, dirt, and loose particles. Dampen cleaned concrete surfaces and apply bonding agent. Place patching mortar before bonding agent has dried. Compact patching mortar and finish to match adjacent concrete. Keep patched area continuously moist for at least 72 hours.

E. Perform structural repairs of concrete, subject to Architect/Engineer's approval, using epoxy adhesive and patching mortar.

F. Repair materials and installation not specified above may be used, subject to Architect/Engineer's approval.

3.15 FIELD QUALITY CONTROL

A. Testing and Inspecting: Owner will engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports.

B. Inspections:

1. Steel reinforcement placement.
2. Steel reinforcement welding.
3. Headed bolts and studs.
4. Verification of use of required design mixture.
5. Concrete placement, including conveying and depositing.
6. Curing procedures and maintenance of curing temperature.
7. Verification of concrete strength before removal of shores and forms from beams and slabs.

C. Concrete Tests: Testing of composite samples of fresh concrete obtained according to ASTM C172/C172M shall be performed according to the following requirements:

1. Testing Frequency: Obtain at least one composite sample for each 100 cu. yd. (76 cu. m) or fraction thereof of each concrete mixture placed each day.
    a. When frequency of testing will provide fewer than five compressive-strength tests for each concrete mixture, testing shall be conducted from at least five randomly selected batches or from each batch if fewer than five are used.
2. Slump: ASTM C143/C143M; one test at point of placement for each composite sample, but not less than one test for each day's pour of each concrete mixture. Perform additional tests when concrete consistency appears to change.
3. Air Content: ASTM C231/C231M, pressure method, for normal-weight concrete; one test for each composite sample, but not less than one test for each day's pour of each concrete mixture.
4. Concrete Temperature: ASTM C1064/C1064M; one test hourly when air temperature is 40 deg F (4.4 deg C) and below and when 80 deg F (27 deg C) and above, and one test for each composite sample.
5. Compression Test Specimens: ASTM C31/C31M.
    a. Cast and laboratory cure two sets of two standard 6 inch by 12 inch cylinder specimens for each composite sample or two sets of three standard 4 inch by 8 inch cylinder specimens for each composite sample.

6. Compressive-Strength Tests: ASTM C39/C39M; test one set of laboratory-cured specimens at 7 days and one set of specimens at 28 days.
    a. A compressive-strength test shall be the average compressive strength from a set of two specimens for 6 in by 12 inch cylinders or three specimens for 4 inch by 8 inch cylinders obtained from same composite sample and tested at age indicated.
7. Strength of each concrete mixture will be satisfactory if every average of any three consecutive compressive-strength tests equals or exceeds specified compressive strength and no compressive-strength test value falls below specified compressive strength by more than 500 psi (3.4 MPa).
8. Test results shall be reported in writing to Architect/Engineer, concrete manufacturer, and Contractor within 48 hours of testing. Reports of compressive-strength tests shall contain Project identification name and number, date of concrete placement, name of concrete testing and inspecting agency, location of concrete batch in Work, design compressive strength at 28 days, concrete mixture proportions and materials, compressive breaking strength, and type of break for both 7- and 28-day tests.
9. Nondestructive Testing: Impact hammer, sonoscope, or other nondestructive device may be permitted by Architect/Engineer but will not be used as sole basis for approval or rejection of concrete.
10. Additional Tests: Testing and inspecting agency shall make additional tests of concrete when test results indicate that slump, air entrainment, compressive strengths, or other requirements have not been met, as directed by Architect/Engineer. Testing and inspecting agency may conduct tests to determine adequacy of concrete by cored cylinders complying with ASTM C42 (C42M) or by other methods as directed by Architect/Engineer.
11. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.
12. Correct deficiencies in the Work that test reports and inspections indicate do not comply with the Contract Documents.

D. Measure floor and slab flatness and levelness according to ASTM E1155 within 72 hours of finishing.

END OF SECTION 033000

SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Structural steel.
2. Grout.

1.2 REFERENCE STANDARDS

A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges 2010.

B. AISC 360 - Specification for Structural Steel Buildings 2016.

C. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold Finished 2018.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.

F. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021.

G. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless 2020.

H. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts 2015.

I. ASTM A563M - Standard Specification for Carbon and Alloy Steel Nuts (Metric) 2007 (Reapproved 2013).

J. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling 2019.

K. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings 2009 (Reapproved 2015).

L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes 2020.

M. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2017.

N. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments 2019.

O. ASTM E165/E165M - Standard Test Method for Liquid Penetrant Examination for General Industry 2018.

P. ASTM E709 - Standard Guide for Magnetic Particle Testing 2015.

Q. ASTM E94 - Standard Guide for Radiographic Examination 2004 (Reapproved 2010).

R. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.

S. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2019, with Editorial Revision (2020).

T. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions 2019.

U. ASTM F959 - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners 2013.

V. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

W. AWS D1.8/D1.8M - Structural Welding Code - Seismic Supplement 2016.

X. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections 2014, with Errata (2015).

Y. SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel 2016.

Z. SSPC-PS Guide 7.00 - Guide for Selecting One-Coat Shop Painting Systems 1982.

AA. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).

BB. SSPC-SP 2 - Hand Tool Cleaning 2018.

CC. SSPC-SP 3 - Power Tool Cleaning 2018.

1.3 DEFINITIONS

A. Structural Steel: Elements of the structural frame indicated on Drawings and as described in AISC 303.

1.4 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

1.5 PERFORMANCE REQUIREMENTS

A. Simple Shear Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand loads indicated and comply with other information and restrictions indicated.

1. Select and complete connections using schematic details indicated and AISC 360.
2. Use Allowable Strength Design; data are given at service-load level.

1.6 ACTION SUBMITTALS

A. Product Data: For each type of product.

B. Shop Drawings: Show fabrication of structural-steel components.

1. Include details of cuts, connections, splices, camber, holes, and other pertinent data.
2. Include embedment drawings.
3. Indicate welds by standard AWS symbols, distinguishing between shop and field welds, and show size, length, and type of each weld. Show backing bars that are to be removed and supplemental fillet welds where backing bars are to remain.
4. Indicate type, size, and length of bolts, distinguishing between shop and field bolts. Identify pretensioned and slip-critical, high-strength bolted connections.

C. Delegated-Design Submittal: For simple shear connections indicated to comply with design loads, include analysis data.

D. Delegated-Design Submittal: For lateral bracing or moment connections indicated to comply with design loads, include analysis datasigned and sealed by the qualified professional engineer responsible for their preparation.

1.7 INFORMATIONAL SUBMITTALS

A. Qualification Data: For Fabricator.

B. Product Test Reports: For the following:

1. Bolts, nuts, and washers including mechanical properties and chemical analysis.
2. Direct-tension indicators.
3. Tension-control, high-strength, bolt-nut-washer assemblies.
4. Shear stud connectors.
5. Shop primers.
6. Nonshrink grout.

C. Field quality-control and special inspection reports.

1.8 QUALITY ASSURANCE

A. Fabricator Qualifications: A qualified fabricator that participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category BU (certified buildng fabricator) at the time of bidding.

B. Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

C. Comply with applicable provisions of the following specifications and documents:

1. AISC 303 "Code of Standard Practice for Steel Buildings and Bridges".
2. AISC 360 "Specification for Structural Steel Buildings".
3. RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

1.9 DELIVERY, STORAGE, AND HANDLING

A. Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from corrosion and deterioration.

1. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

B. Store fasteners in a protected place in sealed containers with manufacturer's labels intact.

1. Fasteners may be repackaged provided Owner's testing and inspecting agency observes repackaging and seals containers.
2. Clean and relubricate bolts and nuts that become dry or rusty before use.
3. Comply with manufacturers' written recommendations for cleaning and lubricating ASTM F3125/F3125M, Grade 1852 fasteners and for retesting fasteners after lubrication.

PART 2 PRODUCTS

2.1 STRUCTURAL-STEEL MATERIALS

A. W-Shapes: ASTM A992/A992M.

B. Channels, Angles, M or S-Shapes: ASTM A36/A36M.

C. Plate and Bar: ASTM A36/A36M.

D. Cold-Formed Hollow Structural Sections: ASTM A500/A500M, Grade C, structural tubing.

E. Steel Pipe: ASTM A53/A53M, Type E or Type S, Grade B.

F. Welding Electrodes: Comply with AWS requirements.

2.2 BOLTS, CONNECTORS, AND ANCHORS

A. High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563, Grade C (ASTM A563M, Class 8S) heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers; all with plain finish.

1. Direct-Tension Indicators: ASTM F959 Type 325 (Type 8.8), compressible-washer type with plain finish.

B. Zinc-Coated High-Strength Bolts, Nuts, and Washers: ASTM F3125/F3125M, Grade A325, Type 1, heavy-hex steel structural bolts; ASTM A563 Grade DH (A563M, Class 10S) heavy-hex carbon-steel nuts; and ASTM F436/F436M, Type 1, hardened carbon-steel washers.

1. Finish: Hot-dip zinc coating.

2. Direct-Tension Indicators: ASTM F959, Type 325 (Type 8.8), compressible-washer type with mechanically deposited zinc coating finish.

C. Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: ASTM F3125/F3125M, Grade F1852, Type 1, heavy-hex head assemblies consisting of steel structural bolts with splined ends, heavy-hex carbon-steel nuts, and hardened carbon-steel washers.

1. Finish: Plain.

D. Shear Connectors: ASTM A108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1/D1.1M, Type B.

E. Headed Anchor Rods: ASTM F1554 grade 36, straight.

1. Nuts: ASTM A563 (ASTM A563M) heavy-hex carbon steel.

2. Plate Washers: ASTM A36/A36M carbon steel.

3. Washers: ASTM F436/F436M, Type 1, hardened carbon steel.

4. Finish: Plain.

F. Expansion bolt to HSS: Type HB Hollo-Bolt by Lindapter

2.3 PRIMER

A. Primer: Fabricator's standard lead- and chromate-free, nonasphaltic, rust-inhibiting primer complying with MPI#79 and compatible with topcoat.

B. Galvanizing Repair Paint: ASTM A780/A780M.

2.4 GROUT

A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C1107/C1107M, factory-packaged, nonmetallic aggregate grout, noncorrosive and nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.

2.5 FABRICATION

A. Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC 303 and AISC 360.

1. Camber structural-steel members where indicated.
2. Fabricate beams with rolling camber up.
3. Identify high-strength structural steel according to ASTM A6/A6M and maintain markings until structural steel has been erected.
4. Mark and match-mark materials for field assembly.
5. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

B. Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1/D1.1M.

C. Bolt Holes: Cut, drill, or punch standard, oversized, or slotted bolt holes as indicated on drawings, perpendicular to metal surfaces.

D. Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

E. Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 1

F. Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1/D1.1M and manufacturer's written instructions.

G. Holes: Provide holes required for securing other work to structural steel and for other work to pass through steel members.

1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
2. Baseplate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
3. Weld threaded nuts to framing and other specialty items indicated to receive other work.

2.6 SHOP CONNECTIONS

A. High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened, unless indicated otherwise on drawings..

B. Weld Connections: Comply with AWS D1.1/D1.1M and ASTM C150/C150M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

2.7 SHOP PRIMING

A. Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inch (50 mm).
2. Surfaces to be field welded.
3. Surfaces of high-strength bolted, slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials (applied fireproofing).
5. Galvanized surfaces.

B. Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning."
2. SSPC-SP 3, "Power Tool Cleaning."

C. Painting: Prepare steel and apply a one-coat, nonasphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

2.8 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by the hot-dip process to structural steel according to ASTM A123/A123M.

1. Fill vent and drain holes that are exposed in the finished Work unless they function as weep holes, by plugging with zinc solder and filing off smooth.
2. Galvanize lintels and shelf angles attached to structural-steel frame and located in exterior walls.
3. Galvanize items indicated to be galvanized on Drawings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify, with steel erector present, elevations of concrete- and masonry-bearing surfaces and locations of anchor rods, bearing plates, and other embedments for compliance with requirements.

1. Prepare a certified survey of existing conditions. Include bearing surfaces, anchor rods, bearing plates, and other embedments showing dimensions, locations, angles, and elevations.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Provide temporary shores, guys, braces, and other supports during erection to keep structural steel secure, plumb, and in alignment against temporary construction loads and loads equal in intensity to design loads. Remove temporary supports when permanent structural steel, connections, and bracing are in place unless otherwise indicated.

3.3 ERECTION

A. Set structural steel accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.

B. Baseplates,Bearing Plates, and Leveling Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting plates. Clean bottom surface of plates.

1. Set plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of baseplate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

C. Maintain erection tolerances of structural steel within AISC 303.

D. Align and adjust various members that form part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that are in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.
2. Make allowances for difference between temperature at time of erection and mean temperature when structure is completed and in service.

E. Splice members only where indicated.

F. Do not use thermal cutting during erection unless approved by Architect. Finish thermally cut sections within smoothness limits in AWS D1.1/D1.1M.

G. Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.

3.4 FIELD CONNECTIONS

A. High-Strength Bolts: Install high-strength bolts according to RCSC's "Specification for Structural Joints Using High-Strength Bolts" for type of bolt and type of joint specified.

1. Joint Type: Snug tightened, unless indicated otherwise on drawings.

B. Weld Connections: Comply with AWS D1.1/D1.1M for tolerances, appearances, welding procedure specifications, weld quality, and methods used in correcting welding work.

1. Comply with AISC 303 and AISC 360 for bearing, alignment, adequacy of temporary connections, and removal of paint on surfaces adjacent to field welds.
2. Remove backing bars or runoff tabs where indicated, back gouge, and grind steel smooth.
3. Assemble and weld built-up sections by methods that maintain true alignment of axes without exceeding tolerances in AISC 303 for mill material.

3.5 FIELD QUALITY CONTROL

A. Testing Agency: Owner will engage a qualified testing agency to perform tests and inspections.

1. Bolted Connections: Inspect and test bolted connections according to RCSC's "Specification for Structural Joints Using High-Strength Bolts".
2. Welded Connections: Visually inspect field welds according to AWS D1.1/D1.1M.
    a. In addition to visual inspection, test and inspect field welds according to AWS D1.1/D1.1M and the following inspection procedures, at testing agency's option:
        1) Liquid Penetrant Inspection: ASTM E165/E165M.
        2) Magnetic Particle Inspection: ASTM E709; performed on root pass and on finished weld. Cracks or zones of incomplete fusion or penetration are not accepted.
        3) Ultrasonic Inspection: ASTM E164.
        4) Radiographic Inspection: ASTM E94.
3. Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

3.6 REPAIRS AND PROTECTION

A. Galvanized Surfaces: Clean areas where galvanizing is damaged or missing and repair galvanizing to comply with ASTM A780/A780M.

B. Touchup Painting: Immediately after erection, clean exposed areas where primer is damaged or missing and paint with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
    1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.

END OF SECTION 051200

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:

1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Metal bollards.

B. Products furnished, but not installed, under this Section include the following:

1. Loose steel lintels.

C. Related Requirements:

1. Section 03 3000 "Cast-in-Place Concrete" for installing anchor bolts, steel pipe sleeves, slotted-channel inserts, wedge-type inserts, and other items cast into concrete.
2. Section 04 2000 "Unit Masonry" for installing loose lintels, anchor bolts, and other items built into unit masonry.
3. Section 05 1200 "Structural Steel Framing."

1.2 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

D. ASTM A27/A27M - Standard Specification for Steel Castings, Carbon, for General Application 2020.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2014, with Editorial Revision (2017).

F. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.

G. ASTM A47/A47M - Standard Specification for Ferritic Malleable Iron Castings 1999, with Editorial Revision (2018).

H. ASTM A563 - Standard Specification for Carbon and Alloy Steel Nuts 2015.

I. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings 2009 (Reapproved 2015).

J. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel 2019.

K. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2017.

L. ASTM E488/E488M - Standard Test Methods for Strength of Anchors in Concrete Elements 2018.

M. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2020.

N. ASTM F1941 - Standard Specification for Electrodeposited Coatings on Threaded Fasteners 2010.

O. ASTM F593 - Standard Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs 2017.

P. ASTM F594 - Standard Specification for Stainless Steel Nuts 2009 (Reapproved 2020).

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

R. SSPC-PA 1 - Shop, Field, and Maintenance Painting of Steel 2016.

S. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

T. SSPC-SP 3 - Power Tool Cleaning 2018.

1.3 COORDINATION

A. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

B. Coordinate installation of metal fabrications that are anchored to or that receive other work. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

1.4 PERFORMANCE REQUIREMENTS

A. Thermal Movements: Allow for thermal movements from ambient and surface temperature changes acting on exterior metal fabrications by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects.

1. Temperature Change: 120 deg F (67 deg C), ambient; 180 deg F (100 deg C), material surfaces.

1.5 ACTION SUBMITTALS

A. Product Data: For the following:

1. Paint products.

B. Shop Drawings: Show fabrication and installation details. Include plans, elevations, sections, and details of metal fabrications and their connections. Show anchorage and accessory items. Provide Shop Drawings for the following:

1. Steel framing and supports for applications where framing and supports are not specified in other Sections.
2. Metal bollards.
3. Loose steel lintels.

1.6 QUALITY ASSURANCE

A. Welding Qualifications: Qualify procedures and personnel according to the following:

1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.7 FIELD CONDITIONS

A. Field Measurements: Verify actual locations of walls and other construction contiguous with metal fabrications by field measurements before fabrication.

PART 2 PRODUCTS

2.1 METALS

A. Metal Surfaces, General: Provide materials with smooth, flat surfaces unless otherwise indicated. For metal fabrications exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

B. Steel Plates, Shapes, and Bars: ASTM A36/A36M.

2.2 FASTENERS

A. General: Unless otherwise indicated, provide Type 304 stainless-steel fasteners for exterior use and zinc-plated fasteners with coating complying with ASTM B633 or ASTM F1941, Class Fe/Zn 5, at exterior walls. Select fasteners for type, grade, and class required.

1. Provide stainless-steel fasteners for fastening stainless steel.

B. Steel Bolts and Nuts: Regular hexagon-head bolts, ASTM A307, Grade A; with hex nuts, ASTM A563; and, where indicated, flat washers.

C. Stainless-Steel Bolts and Nuts: Regular hexagon-head annealed stainless-steel bolts, ASTM F593; with hex nuts, ASTM F594; and, where indicated, flat washers; Alloy Group 1 (A1).

D. Anchor Bolts: ASTM F1554, Grade 36, of dimensions indicated; with nuts, ASTM A563; and, where indicated, flat washers.

1. Hot-dip galvanize where item being fastened is indicated to be galvanized.

E. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E488/E488M, conducted by a qualified independent testing agency.

F. Cast-in-Place Anchors in Concrete: Either threaded type or wedge type unless otherwise indicated; galvanized ferrous castings, either ASTM A47/A47M malleable iron or ASTM A27/A27M cast steel. Provide bolts, washers, and shims as needed, all hot-dip galvanized per ASTM F2329/F2329M.

G. Post-Installed Anchors: Torque-controlled expansion anchors.

1. Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B633 or ASTM F1941, Class Fe/Zn 5, unless otherwise indicated.

2. Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 1 (A1) stainless-steel bolts, ASTM F593, and nuts, ASTM F594.

2.3 MISCELLANEOUS MATERIALS

A. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.

1. Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

B. Galvanizing Repair Paint: High-zinc-dust-content paint complying with SSPC-Paint 20 and compatible with paints specified to be used over it.

C. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C1107/C1107M. Provide grout specifically recommended by manufacturer for interior and exterior applications.

D. Concrete: Comply with requirements in Section 03 3000 "Cast-in-Place Concrete" for normal-weight, air-entrained, concrete with a minimum 28-day compressive strength of 3000 psi (20 MPa).

2.4 FABRICATION, GENERAL

A. Shop Assembly: Preassemble items in the shop to greatest extent possible. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.

B. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

C. Form bent-metal corners to smallest radius possible without causing grain separation or otherwise impairing work.

D. Form exposed work with accurate angles and surfaces and straight edges.

E. Weld corners and seams continuously to comply with the following:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishingand contour of welded surface matches that of adjacent surface.

F. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners or welds where possible. Where exposed fasteners are required, use Phillips flat-head (countersunk) fasteners unless otherwise indicated. Locate joints where least conspicuous.

G. Fabricate seams and other connections that are exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

H. Cut, reinforce, drill, and tap metal fabrications as indicated to receive finish hardware, screws, and similar items.

I. Provide for anchorage of type indicated; coordinate with supporting structure. Space anchoring devices to secure metal fabrications rigidly in place and to support indicated loads.

J. Where units are indicated to be cast into concrete or built into masonry, equip with integrally welded steel strap anchors, 1/8 by 1 1/2 inch (3.2 by 38 mm), with a minimum 6 inch (150 mm) embedment and 2 inch (50 mm) hook, not less than 8 inch (200 mm) from ends and corners of units and 24 inch (600 mm) o.c., unless otherwise indicated.

2.5 MISCELLANEOUS FRAMING AND SUPPORTS

A. General: Provide steel framing and supports not specified in other Sections as needed to complete the Work.

B. Fabricate units from steel shapes, plates, and bars of welded construction unless otherwise indicated. Fabricate to sizes, shapes, and profiles indicated and as necessary to receive adjacent construction.

1. Fabricate units from slotted channel framing where indicated.
2. Furnish inserts for units installed after concrete is placed.

C. Galvanize miscellaneous framing and supports where indicated.

2.6 METAL BOLLARDS

A. Fabricate metal bollards from Schedule 40 steel pipe.

B. Prime bollards with zinc-rich primer.

2.7 LOOSE STEEL LINTELS

A. Fabricate loose steel lintels from steel angles and shapes of size indicated for openings and recesses in masonry walls and partitions at locations indicated. Fabricate in single lengths for each opening unless otherwise indicated. Weld adjoining members together to form a single unit where indicated.

B. Size loose lintels to provide bearing length at each side of openings equal to 1/12 of clear span, but not less than 8 inch (200 mm) unless otherwise indicated.

C. Galvanize loose steel lintels located in exterior walls.

2.8 FINISHES, GENERAL

A. Finish metal fabrications after assembly.

B. Finish exposed surfaces to remove tool and die marks and stretch lines, and to blend into surrounding surface.

2.9 STEEL AND IRON FINISHES

A. Galvanizing: Hot-dip galvanize items as indicated to comply with ASTM A153/A153M for steel and iron hardware and with ASTM A123/A123M for other steel and iron products.

B. Shop prime iron and steel itemsnot indicated to be galvanized unless they are to be embedded in concrete, sprayed-on fireproofing, or masonry, or unless otherwise indicated.

1. Shop prime with universal shop primer unless zinc-rich primer is indicated.

C. Preparation for Shop Priming: Prepare surfaces to comply with SSPC-SP 3 "Power Tool Cleaning."

D. Shop Priming: Apply shop primer to comply with SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting.

PART 3 EXECUTION

3.1 INSTALLATION, GENERAL

A. Cutting, Fitting, and Placement: Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.

B. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

C. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.

2. Obtain fusion without undercut or overlap.

3. Remove welding flux immediately.
4. At exposed connections, finish exposed welds and surfaces smooth and blended so no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

D. Fastening to In-Place Construction: Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction. Provide threaded fasteners for use with concrete and masonry inserts, toggle bolts, through bolts, lag screws, wood screws, and other connectors.

E. Provide temporary bracing or anchors in formwork for items that are to be built into concrete, masonry, or similar construction.

F. Corrosion Protection: Coat concealed surfaces of aluminum that come into contact with grout, concrete, masonry, wood, or dissimilar metals with the following:

1. Cast Aluminum: Heavy coat of bituminous paint.
2. Extruded Aluminum: Two coats of clear lacquer.

3.2 INSTALLING METAL BOLLARDS

A. Anchor bollards in place with concrete footings. Center and align bollards in holes 3 inch (75 mm) above bottom of excavation. Place concrete and vibrate or tamp for consolidation. Support and brace bollards in position until concrete has cured.

B. Fill bollards solidly with concrete, mounding top surface to shed water.

3.3 ADJUSTING AND CLEANING

A. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas. Paint uncoated and abraded areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1. Apply by brush or spray to provide a minimum 2.0 mil (0.05 mm) dry film thickness.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780/A780M.

END OF SECTION 055000

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Board insulation at perimeter foundation wall.

1.2 RELATED REQUIREMENTS

A. Section 07 2119 - Foamed-In-Place Insulation: Plastic foam insulation other than boards.

1.3 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

PART 2 PRODUCTS

2.1 APPLICATIONS

A. Insulation at Perimeter of Foundation: Extruded polystyrene board.

2.2 FOAM BOARD INSULATION MATERIALS

A. Extruded Polystyrene Board Insulation: Extruded polystyrene board; ASTM C578; with either natural skin or cut cell surfaces, and the following characteristics:

1. Type: ASTM C578.
2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88) per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
5. Board Edges: Square.
6. Type and Water Absorption: Type IV, 0.3 percent by volume, maximum, by total immersion.
7. Manufacturers:
   a. Dow Chemical Company; STYROFOAM HIGHLOAD 40: www.dowbuildingsolutions.com/#sle.
   b. Kingspan Insulation LLC; GreenGuard XPS TYPE IV 25 PSI: www.trustgreenguard.com/#sle.
   c. Owens Corning Corporation; FOAMULAR Extruded Polystyrene (XPS) Insulation: www.ocbuildingspec.com/#sle.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.2 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Adhere a 6 inch (150 mm) wide strip of polyethylene sheet over construction, control, and expansion joints with double beads of adhesive each side of joint.

1. Tape seal joints.
2. Extend sheet full height of joint.

B. Apply adhesive to back of boards:

1. Three continuous beads per board length.

C. Install boards horizontally on foundation perimeter.

1. Install in running bond pattern.
2. Butt edges and ends tightly to adjacent boards and to protrusions.

D. Extend boards over expansion joints, unbonded to foundation on one side of joint.

E. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

F. Immediately following application of board insulation, place protective boards over exposed insulation surfaces.

1. Apply adhesive in five continuous beads per board length.
2. Install boards horizontally from base of foundation to top of insulation.
3. Butt boards tightly, with joints staggered from insulation joints.

END OF SECTION

SECTION 07 2119
FOAMED-IN-PLACE INSULATION

PART 2 PRODUCTS

1.1 MATERIALS

END OF SECTION

SECTION 07 2500
WEATHER BARRIERS

PART 2 PRODUCTS

1.1 WEATHER BARRIER ASSEMBLIES

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.

B. Fire-rated hollow metal doors and frames.

C. Thermally insulated hollow metal doors with frames.

1.2 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.

B. Section 09 9113 - Exterior Painting: Field painting.

C. Section 09 9123 - Interior Painting: Field painting.

1.3 ABBREVIATIONS AND ACRONYMS

A. ANSI: American National Standards Institute.

B. HMMA: Hollow Metal Manufacturers Association.

C. NAAMM: National Association of Architectural Metal Manufacturers.

D. NFPA: National Fire Protection Association.

E. SDI: Steel Door Institute.

F. UL: Underwriters Laboratories.

1.4 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors 2011.

C. ANSI/SDI A250.6 - Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames 2003 (R2009).

D. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100) 2017.

E. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames 2011.

F. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

G. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable 2020.

H. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength 2018a.

I. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.

J. BHMA A156.115 - American National Standard for Hardware Preparation in Steel Doors and Steel Frames 2016.

K. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

L. ITS (DIR) - Directory of Listed Products current edition.

M. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames 2002.

N. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames 2011.

O. NAAMM HMMA 840 - Guide Specifications For Receipt, Storage and Installation of Hollow Metal Doors and Frames 2007.

P. NAAMM HMMA 861 - Guide Specifications for Commercial Hollow Metal Doors and Frames 2014.

Q. NFPA 80 - Standard for Fire Doors and Other Opening Protectives 2019.

R. NFPA 105 - Standard for Smoke Door Assemblies and Other Opening Protectives 2019.

S. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies 2017.

T. SDI 117 - Manufacturing Tolerances for Standard Steel Doors and Frames 2013.

U. UL (DIR) - Online Certifications Directory Current Edition.

V. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies Current Edition, Including All Revisions.

W. UL 1784 - Standard for Air Leakage Tests of Door Assemblies Current Edition, Including All Revisions.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, anchorage, connections, and identifying location of different finishes, if any.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Comply with NAAMM HMMA 840 or ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.

B. Deliver hollow metal work palletized, wrapped, or crated to provide protection during transit and Project-site storage. Do not use non-vented plastic.

C. Store hollow metal work under cover at Project site. Place in stacks of five units maximum in a vertical position with heads up, spaced by blocking, on minimum 4-inch (102 mm) high wood blocking. Do not store in manner that traps excess humidity.

1. Provide minimum 1/4 inch (6 mm) space between each stacked door to permit air circulation.

1.7 PROJECT CONDITIONS

A. Field Measurements: Verify actual dimensions of openings by field measurements before fabrication.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Ceco Door, an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Curries, an Assa Abloy Group company: www.assaabloydss.com/#sle.
3. Steelcraft, an Allegion brand: www.allegion.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.2 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:

1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
2. Accessibility: Comply with ICC A117.1 and ADA Standards.
3. Door Edge Profile: Manufacturers standard for application indicated.
4. Typical Door Face Sheets: Flush.
5. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
6. Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40z (12G) coating designation; mill phosphatized.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.3 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 2 - Heavy-duty.
    b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 1 - Full Flush.
    d. Door Face Metal Thickness: 18 gage, 0.042 inch (1.0 mm), minimum.
    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Core Material: Polystyrene, 1 lbs/cu ft minimum density.

a. Foam Plastic Insulation: Manufacturer's standard board insulation with maximum flame spread index (FSI) of 75, and maximum smoke developed index (SDI) of 450 in accordance with ASTM E84, and completely enclosed within interior of door.

3. Door Thermal Resistance: R-Value of 6.0 minimum, for installed thickness of polystyrene.
4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
5. Top Closures for Outswinging Doors: Flush with top of faces and edges.
6. Weeps: Provide weep-hole openings in bottom of exterior doors to permit moisture to escape.
7. Weatherstripping: Refer to Section 08 7100.

C. Interior Doors, Non-Fire-Rated:

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 2 - Heavy-duty.
   b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
   e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

D. Fire-Rated Doors:

1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
   a. Level 2 - Heavy-duty.
   b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
   c. Model 1 - Full Flush.
   d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.
   e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
   a. Provide units listed and labeled by UL (DIR) or ITS (DIR).
   b. Attach fire rating label to each fire rated unit.
   c. Smoke and Draft Control Doors (including all fire-rated doors): Self-closing or automatic closing doors in accordance with NFPA 80 and NFPA 105, with fire-resistance-rated wall construction rated the same or greater than the fire-rated doors, and the following;
      1) Maximum Air Leakage: 3.0 cfm/sq ft (0.02 cu m/sec/sq m) of door opening at 0.10 inch w.g. (24.9 Pa) pressure, when tested in accordance with UL 1784 at

both ambient and elevated temperatures.

2) Gasketing: Provide gasketing or edge sealing as necessary to achieve leakage limit.

3) Label: Include the "S" label on fire-rating label of door.

3. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.

4. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

5. Door Face Sheets: Flush.

2.4 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Frame Finish: Factory primed and field finished.

C. Exterior Door Frames: Full profile/continuously welded type.

1. Galvanizing: Components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A653/A653M, with A60/ZF180 coating.

2. Frame Metal Thickness: 14 gage, 0.067 inch (1.7 mm), minimum.

3. Weatherstripping: Separate, see Section 08 7100.

D. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

1. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.

E. Door Frames, Fire-Rated: Full profile/continuously welded type.

1. Fire Rating: Same as door, labeled.

2. Frame Metal Thickness: 16 gage, 0.053 inch (1.3 mm), minimum.

2.5 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

2.6 ACCESSORIES

A. Moldings

1. Fixed Frame Moldings: Formed integral with hollow metal frames, a minimum of 5/8 inch (16 mm) high unless otherwise indicated

B. Mechanical Fasteners for Concealed Metal-to-Metal Connections: Self-drilling, self-tapping, steel with electroplated zinc finish.

C. Frame Anchors

1. Jamb Anchors:

a. Masonry Type: Adjustable strap-and-stirrup or T-shaped anchors to suit frame size, not less than 0.042 inch (1.0 mm) thick, with corrugated or perforated straps not less than 2 inches (50 mm) wide by 10 inches (250 mm) long; or wire anchors not less than 0.177 inch (4.5 mm) thick.

b. Provide number and spacing of jamb anchors as follows:

1) Fire ratings may require additional anchors.

2) Masonry Type: Locate anchors not more than 18 inches (457 mm) from top and bottom of frame. Space anchors not more than 32 inches (813 mm) o.c. and as

follows:

(a) Two anchors per jamb up to 60 inches (1524 mm) high.
(b) Three anchors per jamb from 60 to 90 inches (1524 to 2286 mm) high.
(c) Four anchors per jamb from 90 to 120 inches (2286 to 3048 mm) high.
(d) Four anchors per jamb plus 1 additional anchor per jamb for each 24 inches (610 mm) or fraction thereof above 120 inches (3048 mm) high.

2. Floor Anchors: Formed from same material as frames, not less than 0.042 inch (1.0 mm) thick, and as follows:

   a. Attachment: Weld anchors to bottom of jambs and mullions with at least four spot welds per anchor.

   b. Monolithic Concrete Slabs: Clip-type anchors, with two holes to receive fasteners.

D. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

E. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

2.7 FABRICATION

A. Fabricate hollow metal work to be rigid and free of defects, warp, or buckle. Accurately form metal to required sizes and profiles, with minimum radius for thickness of metal. Where practical, fit and assemble units in manufacturer's plant. To ensure proper assembly at Project site, clearly identify work that cannot be permanently factory assembled before shipment.

B. Tolerances: Fabricate hollow metal work to tolerances indicated in SDI 117.

C. Hardware Preparation: Factory prepare hollow metal work to receive templated mortised hardware; include cutouts, reinforcement, mortising, drilling, and tapping according to the Door Hardware Schedule and templates furnished as specified in Section 08 7100.

1. Reinforce doors and frames to receive non-templated, mortised and surface-mounted door hardware.

2. Comply with applicable requirements in ANSI/SDI A250.6 and ANSI/DHI A115 Series specifications for preparation of hollow metal work for hardware.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

D. Examine roughing-in for embedded and built-in anchors to verify actual locations before frame installation.

E. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.

F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Remove welded-in shipping spreaders installed at factory. Restore exposed finish by grinding, filling, and dressing, as required to make repaired area smooth, flush, and invisible on exposed

faces.

B. Prior to installation, adjust and securely brace welded hollow metal frames for squareness, alignment, twist, and plumbness to the requirements listed in Tolerances article below.

C. Drill and tap doors and frames to receive non-templated, mortised, and surface-mounted door hardware.

3.3 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Smoke-Control Doors: Install doors according to NFPA 105.

D. Coordinate frame anchor placement with wall construction.

E. Install door hardware as specified in Section 08 7100.

1. Comply with recommended practice for hardware placement of doors and frames in accordance with ANSI/SDI A250.6 or NAAMM HMMA 861.

F. Hollow Metal Frames: Install hollow metal frames of size and profile indicated. Comply with ANSI/SDI A250.11.

1. Set frames accurately in position, plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.

a. Check plumbness, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.

2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor, and secure with post-installed expansion anchors.

G. Hollow Metal Doors: Fit hollow metal doors accurately in frames, within clearances specified below. Shim as necessary.

1. Non-Fire-Rated Standard Steel Doors:

a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).

b. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).

2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.

3. Smoke-Control Doors: Install doors according to NFPA 105.

3.4 TOLERANCES

A. Clearances Between Door and Frame: Comply with related requirements of specified frame standards or custom guidelines indicated in accordance with SDI 117 or NAAMM HMMA 861.

B. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

C. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.

D. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.

E. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.

F. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.

3.5 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including hollow metal work that is warped, bowed, or otherwise unacceptable.

END OF SECTION

SECTION 08 3613
SECTIONAL DOORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Overhead sectional doors, electrically operated.

B. Operating hardware and supports.

C. Electrical controls.

1.2 RELATED REQUIREMENTS

A. Section 26 0583 - Wiring Connections.

1.3 REFERENCE STANDARDS

A. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass 2018.

C. ASTM E283 - Standard Test Method for Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen 2004 (Reapproved 2012).

D. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference 2014.

E. DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors 2011.

F. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts 2000, with Errata (2008).

G. NEMA MG 1 - Motors and Generators 2018.

H. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum) 2018.

I. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems Current Edition, Including All Revisions.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

C. Product Data: Show component construction, anchorage method, and hardware.

1.5 WARRANTY

A. See Section 01 7800 - Closeout Submittals for warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for electric motor and transmission.

D. Provide five year manufacturer warranty for electric operating equipment.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: ThermalSeal, TM200C manufactured by Raynor.

B. Other Acceptable Manufacturers - Sectional Doors:

1. C.H.I. Overhead Doors: www.chiohd.com/#sle.
2. Wayne-Dalton, a Division of Overhead Door Corporation: www.wayne-dalton.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

2.2 STEEL DOORS

A. Steel Doors: Flush steel, insulated; standard lift operating style with track and hardware; complying with DASMA 102, Commercial application.

1. Performance: Withstand positive and negative wind loads equal to 1.5 times design wind loads specified by local code without damage or permanent set, when tested in accordance with ASTM E330/E330M, using 10 second duration of maximum load.
2. Door Nominal Thickness: 2 inches (51 mm) thick.
3. Thermal Transmittance: U-factor (Usi-factor) of 0.31 Btu/hr sq ft degrees F (1.76 W/sq m K), maximum, in accordance with DASMA 102.
4. Air Leakage Rate: Less than 0.40 cfm/sf (2.0 L/sec/sq m) when tested in accordance with ASTM E283 at test pressure difference of 1.57 psf (75 Pa).
5. Exterior Finish: Factory finished with acrylic baked enamel; color as selected by Architect.
6. Interior Finish: Factory finished with acrylic baked enamel; color as selected from manufacturers standard line.
7. Glazed Lights: [_____] glazed lights per panel, one row; set in place with resilient glazing channel.
8. Electric Operation: Electric control station.

B. Door Panels: Steel construction; outer steel sheet of 26 gauge, 0.0160 inch (0.40 mm) minimum thickness, flush profile; inner steel sheet of 27 gauge, 0.0164 inch (0.42 mm) minimum thickness, flat profile; core reinforcement 0.035 inch (0.91 mm) sheet steel roll formed to channel shape, rabbeted weather joints at meeting rails; polyurethane insulation.

C. Window Frame: Manufacturers standard, finish to match.

D. Glazing: Fully tempered glass; insulated glass units; clear; 1 inch (25.4 mm) overall thickness.

2.3 COMPONENTS

A. Track: Rolled galvanized steel, 0.090 inch (2.3 mm) minimum thickness; 2 inch (50 mm) wide, continuous one piece per side; galvanized steel mounting brackets 1/4 inch (6 mm) thick.

B. Hinge and Roller Assemblies: Heavy duty hinges and adjustable roller holders of galvanized steel; floating hardened steel bearing rollers, located at top and bottom of each panel, each side.

C. Lift Mechanism: Torsion spring on cross head shaft, with braided galvanized steel lifting cables.

D. Sill Weatherstripping: Resilient hollow rubber strip, one piece; fitted to bottom of door panel, full length contact.

E. Jamb Weatherstripping: Roll formed steel section full height of jamb, fitted with resilient weatherstripping, placed in moderate contact with door panels.

F. Head Weatherstripping: EPDM rubber seal, one piece full length.

G. Panel Joint Weatherstripping: Neoprene foam seal, one piece full length.

H. Lock: Inside center mounted, adjustable keeper, spring activated latch bar with feature to retain in locked or retracted position; interior and exterior handle.

I. Lock Cylinders: Keyed alike.

2.4 MATERIALS

A. Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A653/A653M, with G90/Z275 coating, plain surface.

B. Float Glass: Provide float glass glazing, unless noted otherwise.

1. Heat-Strengthened and Fully Tempered Types: ASTM C1048.

C. Insulation: Foamed-in-place polyurethane, bonded to facing.

1. R-value of [18.0] (RSI-value of [___]).

2.5 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.

1. Provide interlock switches on motor operated units.

B. Electric Operators:

1. Mounting: Side mounted on cross head shaft.
2. Motor Enclosure:
    a. Exterior Doors: NEMA MG 1, Type 4; open drip proof.
3. Motor Rating: 1/3 hp (250 W); continuous duty.
4. Motor Voltage: 120 volts, single phase, 60 Hz.
5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
6. Controller Enclosure: NEMA 250, Type 1.
7. Opening Speed: 12 inches per second (300 mm/s).
8. Brake: Adjustable friction clutch type, activated by motor controller.
9. Manual override in case of power failure.
10. Refer to Section 26 0583 for electrical connections.

C. Wiring Terminations: Provide terminal lugs to match branch circuit conductor quantities, sizes, and materials indicated; enclose terminal lugs in terminal box sized to comply with NFPA 70.

D. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.

1. 24 volt circuit.

2. Surface mounted, at interior door jamb.
3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.

E. Safety Edge: Located at bottom of sectional door panel, full width; electro-mechanical sensitized type, wired to stop and reverse door direction upon striking object; hollow neoprene covered to provide weatherstrip seal.

F. Provide radio control antenna detector.

G. Hand Held Transmitter: Digital control, and resettable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that wall openings are ready to receive work and opening dimensions and tolerances are within specified limits.

B. Verify that electric power is available and of the correct characteristics.

3.2 PREPARATION

A. Prepare opening to permit correct installation of door unit to perimeter air and vapor barrier seal.

3.3 INSTALLATION

A. Install door unit assembly in accordance with manufacturer's instructions.

B. Anchor assembly to wall construction and building framing without distortion or stress.

C. Securely brace door tracks suspended from structure. Secure tracks to structural members only.

D. Fit and align door assembly including hardware.

E. Coordinate installation of electrical service. Complete power and control wiring from disconnect to unit components.

3.4 TOLERANCES

A. Maximum Variation from Plumb: 1/16 inch (1.5 mm).

B. Maximum Variation from Level: 1/16 inch (1.5 mm).

C. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch (3 mm) from 10 ft (3 m) straight edge.

D. Maintain dimensional tolerances and alignment with adjacent work.

3.5 ADJUSTING

A. Adjust door assembly for smooth operation and full contact with weatherstripping.

3.6 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

B. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

END OF SECTION

SECTION 08 5113
ALUMINUM WINDOWS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Extruded aluminum windows with fixed sash and fixed sash.

1.2 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between window frames and adjacent construction.

B. Section 08 8000 - Glazing.

1.3 REFERENCE STANDARDS

A. AAMA/WDMA/CSA 101/I.S.2/A440 - North American Fenestration Standard/Specification for Windows, Doors, and Skylights 2017.

B. AAMA CW-10 - Care and Handling of Architectural Aluminum From Shop to Site 2015.

C. AAMA 609 & 610 - Cleaning and Maintenance Guide for Architecturally Finished Aluminum (Combined Document) 2015.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum 2014 (2015 Errata).

E. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products 2017.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes 2020.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric) 2013.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide component dimensions, information on glass and glazing, internal drainage details, and descriptions of hardware and accessories.

C. Performance Validation: Provide specified performance validation before submitting shop drawings or starting fabrication.

D. Shop Drawings: Indicate opening dimensions, elevations of different types, framed opening tolerances, method for achieving air and vapor barrier seal to adjacent construction, anchorage locations, [_____], and installation requirements.

E. Warranty: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Comply with requirements of AAMA CW-10.

B. Protect finished surfaces with wrapping paper or strippable coating during installation. Do not use adhesive papers or sprayed coatings that bond to substrate when exposed to sunlight or weather.

1.6 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C).

B. Maintain this minimum temperature during and 24 hours after installation of sealants.

1.7 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide five year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design: EFCO, a Pella Company,; HX32 Thermal Fixed Window: www.efcocorp.com.

B. Other Acceptable - Aluminum Windows Manufacturers:

1. Manko Window Systems, Inc; [_____]: www.mankowindows.com/#sle.
2. Wausau Window and Wall Systems: www.wausauwindow.com/#sle.
3. Kawneer: www.kawneer.com.
4. Substitutions: See Section 01 6000 - Product Requirements.

2.2 ALUMINUM WINDOWS

A. Aluminum Windows: Extruded aluminum frame and sash, factory fabricated, factory finished, with operating hardware, related flashings, and anchorage and attachment devices.

1. Frame Depth: 3-1/2 inch (89 mm).
2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for operating hardware and imposed loads.
3. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.
4. Movement: Accommodate movement between window and perimeter framing and deflection of lintel, without damage to components or deterioration of seals.
5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.

B. Performance Requirements:

1. Performance Validation: Windows shall comply with AAMA/WDMA/CSA 101/I.S.2/A440 performance requirements as indicated by having AAMA, WDMA, or CSA certified label, or an independent test report for indicated products itemizing compliance and acceptable by authorities having jurisdiction.
2. Design and size components to withstand dead and live loads caused by positive and negative wind pressure acting normal to plane of window wall.

C. Fixed, Non-Operable Type:

1. Construction: Thermally broken.
2. Glazing: Double; clear; transparent.
3. Exterior Finish: Class I natural anodized.
4. Interior Finish: Class I natural anodized.

2.3 COMPONENTS

A. Frames: [____] inch ([____] mm) 2 inch ([____] mm) wide by [____] inch ([____] mm) [____] inch ([____] mm) deep profile, of [____] inch ([____] mm) [____] inch ([____] mm) thick section; thermally broken with interior portion of frame insulated from exterior portion; ; thermally broken with interior portion of frame insulated from exterior portion; flush flush glass stops of snap-on snap-on type.

B. Sills: [.062] inch ([____] mm) [____] inch ([____] mm) thick, extruded extruded aluminum; sloped for positive wash; fit under sash leg leg to 1/2 inch (12 mm) 1/2 inch (12 mm) beyond wall face; one piece full width of opening; jamb angles to terminate sill end ; jamb angles to terminate sill end.

C. Fasteners: Stainless steel.

D. Glazing Materials: See Section 08 8000.

E. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

2.4 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Concealed Steel Items: Profiled to suit mullion sections; galvanized in accordance with ASTM A123/A123M.

2.5 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that wall openings and adjoining air and vapor seal materials are ready to receive aluminum windows.

3.2 INSTALLATION

A. Install windows in accordance with manufacturer's instructions.

B. Attach window frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Align window plumb and level, free of warp or twist. Maintain dimensional tolerances and alignment with adjacent work.

D. Install sill and sill end angles.

E. Provide thermal isolation where components penetrate or disrupt building insulation. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

F. Install glass and infill panels in accordance with requirements specified in Section 08 8000.

3.3 CLEANING

A. Remove protective material from factory finished aluminum surfaces.

B. Wash surfaces by method recommended and acceptable to window manufacturer; rinse and wipe surfaces clean.

C. Upon completion of installation, thoroughly clean aluminum surfaces in accordance with AAMA 609 & 610.

D. Remove excess glazing sealant by moderate use of mineral spirits or other solvent acceptable to sealant and window manufacturer.

END OF SECTION

SECTION 08 7100
DOOR HARDWARE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Hardware for hollow metal doors.

B. Electrically operated and controlled hardware.

C. Thresholds.

D. Weatherstripping and gasketing.

1.2 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 28 1000 - Access Control: Electronic access control devices.

1.3 REFERENCE STANDARDS

A. ADA Standards - Americans with Disabilities Act (ADA) Standards for Accessible Design 2010.

B. BHMA A156.1 - American National Standard for Butts and Hinges 2016.

C. BHMA A156.2 - American National Standard for Bored and Preassembled Locks & Latches 2017.

D. BHMA A156.4 - American National Standard for Door Controls - Closers 2013.

E. BHMA A156.7 - American National Standard for Template Hinge Dimensions 2016.

F. BHMA A156.18 - American National Standard for Materials and Finishes 2016.

G. BHMA A156.21 - American National Standard for Thresholds 2014.

H. BHMA A156.22 - American National Standard for Door Gasketing and Edge Seal Systems Sponsor 2017.

I. BHMA A156.31 - American National Standard for Electric Strikes and Frame Mounted Actuators 2013.

J. BHMA A156.36 - American National Standard for Auxiliary Locks 2016.

K. ICC A117.1 - Accessible and Usable Buildings and Facilities 2017.

L. NFPA 70 - National Electrical Code Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

M. UL (DIR) - Online Certifications Directory Current Edition.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the manufacture, fabrication, and installation of products that door hardware is installed on.

B. Keying Requirements Meeting:

1. Architect/Engineer will schedule meeting at project site prior to Contractor occupancy.

2. Attendance Required:

a. Contractor.

b. Owner.

3. Agenda:
   a. Establish keying requirements.
   b. Verify locksets and locking hardware are functionally correct for project requirements.
   c. Verify that keying and programming complies with project requirements.
   d. Establish keying submittal schedule and update requirements.
4. Incorporate "Keying Requirements Meeting" decisions into keying submittal upon review of door hardware keying system including, but not limited to, the following:
5. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect/Engineer, Owner, participants, and those affected by decisions made.
6. Deliver established keying requirements to manufacturers.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's catalog literature for each type of hardware, marked to clearly show products to be furnished for this project, and includes construction details, material descriptions, finishes, and dimensions and profiles of individual components.

C. Shop Drawings - Door Hardware Schedule: Submit detailed listing that includes each item of hardware to be installed on each door. Use door numbering scheme as included in Contract Documents.
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC).
   2. Provide complete description for each door listed.

D. Shop Drawings - Electrified Door Hardware: Submit diagrams for power, signal, and control wiring for electrified door hardware that include details of interface with building safety and security systems. Provide elevations and diagrams for each electrified door opening as follows:
   1. Prepared by or under supervision of Architectural Hardware Consultant (AHC) and Electrified Hardware Consultant (EHC).
   2. Elevations: Submit front and back elevations of each door opening showing electrified devices with connections installed and an operations narrative describing how opening operates from either side at any given time.
   3. Diagrams: Submit point-to-point wiring diagram that shows each device in door opening system with related colored wire connections to each device.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Package hardware items individually; label and identify each package with door opening code to match door hardware schedule.

1.7 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Warranty against defects in material and workmanship for period indicated, from Date of Substantial Completion.
   1. Closers: Five years, minimum.

2. Locksets and Cylinders: Three years, minimum.
3. Other Hardware: Two years, minimum.

PART 2 PRODUCTS

2.1 DESIGN AND PERFORMANCE CRITERIA

A. Provide specified door hardware as required to make doors fully functional, compliant with applicable codes, and secure to extent indicated.

B. Provide individual items of single type, of same model, and by same manufacturer.

C. Provide door hardware products that comply with the following requirements:

1. Applicable provisions of federal, state, and local codes.
2. Accessibility: ADA Standards and ICC A117.1.
3. Products Requiring Electrical Connection: Listed and classified by UL (DIR) as suitable for the purpose specified.

D. Electrically Operated and/or Controlled Hardware: Provide necessary power supplies, power transfer hinges, relays, and interfaces as required for proper operation; provide wiring between hardware and control components and to building power connection in compliance with NFPA 70.

1. Refer to Section 28 1000 for additional access control system requirements.

E. Fasteners:

1. Provide fasteners of proper type, size, quantity, and finish that comply with commercially recognized standards for proposed applications.
   a. Provide phillips flat-head screws with heads finished to match door surface hardware unless otherwise indicated.

2.2 HINGES

A. Manufacturers:

1. McKinney; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Bommer Industries, Inc: www.bommer.com/#sle.
3. Hager Companies: www.hagerco.com/#sle.
4. Stanley, dormakaba Group: www.stanleyhardwarefordoors.com/#sle.

B. Hinges: Comply with BHMA A156.1, Grade 1.

1. Butt Hinges: Comply with BHMA A156.1 and BHMA A156.7 for templated hinges.
   a. Provide hinge width required to clear surrounding trim.
2. Provide hinges on every swinging door.
3. Provide following quantity of butt hinges for each door:
   a. Doors From 60 inches (1.5 m) High up to 90 inches (2.3 m) High: Three hinges.

2.3 ELECTRIC STRIKES

A. Manufacturers:

1. Adams Rite, HES, or Securitron; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Electric Strikes: Comply with BHMA A156.31, Grade 1.

1. Provide UL (DIR) listed burglary-resistant electric strike; style to suit locks.
2. Provide non-handed 24 VDC electric strike suitable for door frame material and scheduled lock configuration.
3. Provide transformer and rectifier as necessary for complete installation.

2.4 CYLINDRICAL LOCKS

A. Manufacturers:

1. Schlage, an Allegion brand: www.allegion.com/us/#sle.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Cylindrical Locks (Bored): Comply with BHMA A156.2, Grade 1, 4000 Series.

1. Bored Hole: 2-1/8 inch (54 mm) diameter.
2. Latchbolt Throw: 1/2 inch (12.7 mm), minimum.
3. Backset: 2-3/4 inch (70 mm) unless otherwise indicated.
4. Strikes: Provide manufacturer's standard strike for each latchset or lockset with strike box and curved lip extending to protect frame in compliance with indicated requirements.
   a. Finish: To match lock or latch.
5. Trim: Provide lever handles

2.5 AUXILIARY LOCKS (DEADLOCKS)

A. Manufacturers:

1. Same as Cylinder Locks

B. Auxiliary Locks (Deadlocks): Comply with BHMA A156.36, Grade 1.

1. Type: Bored (cylindrical).
2. Application: Bored.
3. Backset: 2-3/4 inch (70 mm), unless otherwise indicated.
4. Bolt Throw: 1/2 inch (12.7 mm), with latch made of hardened steel.

2.6 CLOSERS

A. Manufacturers; Surface Mounted:

1. Norton or Sargent; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. LCN, an Allegion brand: www.allegion.com/us/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Closers: Comply with BHMA A156.4, Grade 1.

1. Type: Surface mounted to door.
2. Provide door closer on each exterior door.

2.7 THRESHOLDS

A. Manufacturers:

1. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. National Guard Products, Inc: www.ngpinc.com/#sle.
3. Reese Enterprises, Inc: www.reeseusa.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Thresholds: Comply with BHMA A156.21.

1. Provide threshold at each exterior door, unless otherwise indicated.
2. Type: Flat surface.
3. Material: Aluminum.
4. Threshold Surface: Fluted horizontal grooves across full width.
5. Field cut threshold to profile of frame and width of door sill for tight fit.
6. Provide non-corroding fasteners at exterior locations.

2.8 WEATHERSTRIPPING AND GASKETING

A. Manufacturers:

1. Pemko; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. National Guard Products, Inc: www.ngpinc.com/#sle.
3. Reese Enterprises, Inc: www.reeseusa.com/#sle.
4. Substitutions: See Section 01 6000 - Product Requirements.

B. Weatherstripping and Gasketing: Comply with BHMA A156.22.

1. Head and Jamb Type: Adjustable.
2. Door Sweep Type: Encased in retainer.
3. Material: Aluminum, with neoprene weatherstripping.
4. Provide weatherstripping on each exterior door at head, jambs, and meeting stiles of door pairs, unless otherwise indicated; .
5. Provide door bottom sweep on each exterior door, unless otherwise indicated.

2.9 LATCH PROTECTOR

A. Manufacturers:

1. Rockwood; an Assa Abloy Group company: www.assaabloydss.com/#sle.
2. Substitutions: See Section 01 6000 - Product Requirements.

B. Latch Protector: Provide on door to protect latch from being tampered with while in locked position.

1. Type: Standard latch protector.
2. Material: Stainless steel.

2.10 FINISHES

A. Finishes: Provide door hardware of same finish, unless otherwise indicated.

1. Finish: 626; satin chromium plated over nickel, with brass or bronze base material (former US equivalent US26D); BHMA A156.18.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that doors and frames are ready to receive this work; labeled, fire-rated doors and frames are properly installed, and dimensions are as indicated on shop drawings.

B. Verify that electric power is available to power operated devices and of correct characteristics.

3.2 INSTALLATION

A. Install hardware in accordance with manufacturer's instructions and applicable codes.

B. Use templates provided by hardware item manufacturer.

C. Door Hardware Mounting Heights: Distance from finished floor to center line of hardware item. As indicated in following list; unless noted otherwise in Door Hardware Schedule or on drawings.

1. Mounting heights in compliance with ADA Standards:

a. Locksets: 40-5/16 inch (1024 mm).

b. Deadlocks (Deadbolts): 48 inch (1219 mm).

D. Set exterior door thresholds with full-width bead of elastomeric sealant at each point of contact with floor providing a continuous weather seal; anchor thresholds with stainless steel countersunk screws.

3.3 ADJUSTING

A. Adjust work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Adjust hardware for smooth operation.

C. Adjust gasketing for complete, continuous seal; replace if unable to make complete seal.

3.4 CLEANING

A. Clean finished hardware in accordance with manufacturer's written instructions after final adjustments have been made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Replace items that cannot be cleaned to manufacturer's level of finish quality at no additional cost.

3.5 PROTECTION

A. Protect finished Work under provisions of Section 01 7000 - Execution and Closeout Requirements.

B. Do not permit adjacent work to damage hardware or finish.

END OF SECTION

SECTION 09 9000
PAINTING AND COATING - COMMERCIAL FACILITY GUIDE SPECIFICATION - SHERWIN-WILLIAMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Surface preparation.

B. Interior painting and coating systems.

C. Exterior painting and coating systems.

D. Scope:

1. Finish surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:

a. Exterior:

1) Metal: Aluminum, galvanized.

b. Interior:

1) Metal: Aluminum and galvanized.

1.2 REFERENCE STANDARDS

A. SSPC-SP 1 - Solvent Cleaning 2015, with Editorial Revision (2016).

B. SSPC-SP 6 - Commercial Blast Cleaning 2007.

1.3 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Product characteristics.
2. Surface preparation instructions and recommendations.
3. Primer requirements and finish specification.
4. Storage and handling requirements and recommendations.
5. Application methods.
6. Clean-up information.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, product name, product code, color designation, VOC content, batch date, environmental handling, surface preparation, application, and use instructions.

C. Paint Materials: Store at a minimum of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Basis of Design Products: Subject to compliance with requirements, provide Sherwin-Williams Company (The) products indicated; www.sherwin-williams.com/#sle.

B. Comparable Products: Products of approved manufacturers will be considered in accordance with 01 6000 - Product Requirements, and the following:

1. Products that meet or exceed performance and physical characteristics of basis of design products.

2. Other Acceptable Manufacturers:

a. PPG.

b. Diamond Vogel.

2.2 PAINTINGS AND COATINGS

A. General:

1. Provide factory-mixed coatings unless otherwise indicated.

2. Do not reduce, thin, or dilute coatings or add materials to coatings unless specifically indicated in manufacturer's instructions.

B. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

2.3 PAINT SYSTEMS - EXTERIOR

A. Metal: galvanized.

1. Alkyd Systems, Water Based:

a. Semi-Gloss Finish:

1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.

(a) 5 mils wet, 2 mils dry per coat.

2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.

(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

2.4 PAINT SYSTEMS - INTERIOR

A. Metal:galvanized.

1. Alkyd Systems, Water Based:

a. Semi-Gloss Finish:

1) 1st Coat: Sherwin-Williams Pro Industrial Pro-Cryl Universal Primer, B66-1310 Series: www.sherwin-williams.com/#sle.

(a) 5 mils wet, 2 mils dry per coat.

2) 2nd and 3rd Coat: Sherwin-Williams Pro Industrial Water Based Alkyd Urethane Enamel Semi-Gloss, B53-1150 Series: www.sherwin-williams.com/#sle.

(a) 4 to 5 mils wet, 1.4 to 1.7 mils dry per coat.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially effect proper application.

3.2 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Galvanized Surfaces:

1. Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

D. Ferrous Metal:

1. Solvent clean according to SSPC-SP 1.

2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Prime bare steel surfaces.

3. Remove rust, loose mill scale, and other foreign substances using methods recommended by paint manufacturer and blast cleaning according to SSPC-SP 6. Protect from corrosion until coated.

3.3 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions.

C. Apply coatings at spread rate required to achieve manufacturer's recommended dry film thickness.

3.4 PRIMING

A. Apply primer to all surfaces unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

B. Primers specified in painting schedules may be omitted on items that are factory primed or factory finished if acceptable to top coat manufacturers.

3.5 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

B. Clean surfaces immediately of overspray, splatter, and excess material.

C. After coating has cured, clean and replace finish hardware, fixtures, and fittings previously removed.

3.6 PROTECTION

A. Protect finished coatings from damage until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 2 PRODUCTS

1.1 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.

END OF SECTION

SECTION 13 3419
METAL BUILDING SYSTEMS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Manufacturer-engineered, shop-fabricated structural steel building frame.

B. Metal wall and roof panels including soffits, gutters and downspouts, and roof mounted equipment curbs.

1.2 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 3613 - Sectional Doors.

1.3 REFERENCE STANDARDS

A. AISC 360 - Specification for Structural Steel Buildings 2016.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel 2014.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware 2016a.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength 2014, with Editorial Revision (2017).

E. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes 2021.

F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing 2014.

G. ASTM A529/A529M - Standard Specification for High-Strength Carbon-Manganese Steel of Structural Quality 2014.

H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process 2020.

I. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process 2010 (Reapproved 2015).

J. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink) 2017.

K. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials 2020.

L. ASTM E96/E96M - Standard Test Methods for Water Vapor Transmission of Materials 2016.

M. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength 2018.

N. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength 2019.

O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination 2012.

P. AWS D1.1/D1.1M - Structural Welding Code - Steel 2020.

Q. IAS AC472 - Accreditation Criteria for Inspection Programs for Manufacturers of Metal Building Systems 2018.

R. MBMA (MBSM) - Metal Building Systems Manual 2012.

S. SSPC-Paint 20 - Zinc-Rich Primers (Type I, "Inorganic," and Type II, "Organic") 2002 (Ed. 2004).

T. UL 580 - Standard for Tests for Uplift Resistance of Roof Assemblies Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.5 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on profiles, component dimensions, fasteners.

C. Shop Drawings: Indicate assembly dimensions, locations of structural members, connections; wall and roof system dimensions, panel layout, general construction details, anchors and methods of anchorage, and installation; framing anchor bolt settings, sizes, locations from datum, and foundation loads; indicate welded connections with AWS A2.4 welding symbols; indicate net weld lengths; provide professional seal and signature.

D. Samples: Submit two samples of precoated metal panels for each color selected, 2 by 2 inch (____by____ mm) in size illustrating color and texture of finish.

E. Manufacturer's Instructions: Indicate preparation requirements, anchor bolt placement.

F. Erection Drawings: Indicate members by label, assembly sequence, and temporary erection bracing.

G. Designer's Qualification Statement.

H. Manufacturer's Qualification Statement: Provide documentation showing metal building manufacturer is accredited under IAS AC472.

1. Include statement that manufacturer designs and fabricates metal building system as integrated components and assemblies, including but not limited to primary structural members, secondary members, joints, roof, and wall cladding components specifically designed to support and transfer loads and properly assembled components form a complete or partial building shell.

I. Erector's Qualification Statement.

J. Project Record Documents: Record actual locations of concealed components and utilities.

1.6 QUALITY ASSURANCE

A. Designer Qualifications: Design structural components, develop shop drawings, and perform shop and site work under direct supervision of a Professional Structural Engineer experienced in design of this type of work.

1. Design Engineer Qualifications: Licensed in the State in which the Project is located.

2. Comply with applicable code for submission of design calculations as required for acquiring permits.

3. Cooperate with regulatory agency or authorities having jurisdiction (AHJ), and provide data as requested.

B. Perform work in accordance with AISC 360 and MBMA (MBSM).

C. Perform welding in accordance with AWS D1.1/D1.1M.

D. Manufacturer Qualifications: Company specializing in the manufacture of products similar to those required for this project.

1. Accredited by IAS in accordance with IAS AC472.

E. Erector Qualifications: Company specializing in performing the work of this section with minimum 3 years experience.

1.7 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

B. Correct defective Work within a five year period after Date of Substantial Completion.

C. Provide 25 year manufacturer warranty for water tightness and paint film.

1. Include coverage for exterior pre-finished surfaces to cover pre-finished color coat against chipping, cracking or crazing, blistering, peeling, chalking, or fading. Include coverage for weather tightness of building enclosure elements after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Metal Buildings Systems:

1. Butler Manufacturing Company: www.butlermfg.com/#sle.
2. Ceco Building Systems: www.cecobuildings.com/#sle.
3. Chief Buildings: www.chiefbuildings.com/#sle.
4. Nucor Building Systems: www.nucorbuildingsystems.com/#sle.
5. VP Buildings: www.vp.com/#sle.
6. Star: www.starbuildings.com.
7. Substitutions: See Section 01 6000 - Product Requirements.

2.2 ASSEMBLIES

A. Single span rigid frame.

B. Primary Framing: Rigid frame of rafter beams and columns, canopy beams, and wind bracing.

C. Secondary Framing: Purlins, and other items detailed.

D. Wall System: Preformed metal panels of horizontal profile, with sub-girt framing/anchorage assembly, and accessory components.

E. Roof System: Preformed metal panels oriented parallel to slope, with sub-girt framing/anchorage assembly, insulation, and liner panels, and accessory components.

F. Roof Slope: 3/4 inches in 12 inches (1:16).

2.3 PERFORMANCE REQUIREMENTS

A. Installed Thermal Resistance of Wall System: R-value of 13 (RSI-value of [____]).

B. Installed Thermal Resistance of Roof System: R-value of 19 (RSI-value of [____]).

C. Design structural members to withstand dead load, applicable snow load, collateral loads produced by mechanical systems, electrical systems and suspended ceilings; and design

loads due to pressure and suction of wind calculated in accordance with applicable code.

D. Equipment loads of 50 pounds or more shall be indicated on the Drawings and the structure shall be strengthened as required.

E. Exterior wall and roof system shall withstand imposed loads with maximum allowable deflection of 1/90 of span.

F. Provide drainage to exterior for water entering or condensation occurring within wall or roof system.

G. Permit movement of components without buckling, failure of joint seals, undue stress on fasteners or other detrimental effects, when subject to temperature range of 100 degrees F ([____] degrees C).

2.4 MATERIALS - FRAMING

A. Structural Steel Members: ASTM A36/A36M.

B. Structural Tubing: ASTM A500/A500M Grade B cold-formed.

C. Plate or Bar Stock: ASTM A529/A529M, Grade 50.

D. Anchor Bolts: ASTM F1554, Grade 36, Class 1A, with no preference for protective coating.

E. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1; galvanized to ASTM A153/A153M.

F. Welding Materials: Type required for materials being welded.

G. Primer: SSPC-Paint 20 zinc rich.

H. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.

1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).

2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).

2.5 MATERIALS - WALLS AND ROOF

A. Steel Sheet: Hot-dipped galvanized steel sheet, ASTM A653/A653M, Designation SS (structural steel), Grade 33 (230), with G90/Z275 coating.

B. Insulation: Semi-rigid glass fiber type, unfaced, ASTM E84 Class A, flame spread index of 25 or less where exposed, friction fit, [____] inches ([____] mm) thick.

C. Metal Building Type, Factory Applied, Vapor-Barrier Insulation Facings: Water vapor permeance no greater than 0.10 perm (5.7 ng/(Pa s sq m)) when tested in accordance with ASTM E96/E96M; flame spread index of 25 or less, and smoke developed index of 40 or less when tested in accordance with ASTM E84.

D. Joint Seal Gaskets: Manufacturer's standard type.

E. Fasteners: Manufacturer's standard type, galvanized to comply with requirements of ASTM A153/A153M, finish to match adjacent surfaces when exterior exposed.

F. Bituminous Paint: Asphaltic type.

G. Sealant: Manufacturer's standard type.

H. Trim, Closure Pieces, Caps, Flashings, Gutters, Downspouts, Rain Water Diverter, Fascias, and Infills: Same material, thickness and finish as exterior sheets; brake formed to required profiles.

2.6 COMPONENTS

A. Doors and Frames: Specified in Section 08 1113.

B. Overhead Doors: Specified in Section 08 3613.

C. Windows: Specified in Section 08 5200.

2.7 FABRICATION - FRAMING

A. Fabricate members in accordance with AISC 360 for plate, bar, tube, or rolled structural shapes.

B. Anchor Bolts: Formed with bent shank, assembled with template for casting into concrete.

2.8 FABRICATION - WALL AND ROOF PANELS

A. Siding and liner: Minimum .0180 inch (.454 mm) metal thickness, ribbed profile indicated, 1 inch (250 mm) deep, lapped edges fitted with continuous gaskets.

B. Roofing: Minimum .0180 inch (.454 mm) metal thickness, ribbed profile, lapped edges fitted with continuous gaskets.

C. Girts/Purlins: Rolled formed structural shape to receive siding, roofing and liner sheet.

D. Internal and External Corners: Same material thickness and finish as adjacent material, profile brake formed to required angles. Back brace mitered internal corners with .180 inch (.454 mm) thick sheet.

E. Flashings, Closure Pieces, Fascia: Same material and finish as adjacent material, profile to suit system.

F. Fasteners: To maintain load requirements and weather tight installation, same finish as cladding, non-corrosive type.

2.9 FABRICATION - GUTTERS AND DOWNSPOUTS

A. Fabricate of same material and finish as roofing metal.

B. Form gutters and downspouts of rectangular profile and size indicated to collect and remove water. Fabricate with connection pieces.

C. Form sections in maximum possible lengths. Hem exposed edges. Allow for expansion at joints.

D. Fabricate support straps of same material and finish as roofing metal, color as selected.

2.10 FINISHES

A. Framing Members: Clean, prepare, and shop prime. Do not prime surfaces to be field welded.

B. Exterior Surfaces of Wall Components and Accessories: Precoated enamel on steel of fluoropolymer PVDF finish, tan and green color.

C. Interior Surfaces of Wall Components and Accessories: Precoated enamel on steel of fluoropolymer finish, White color.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that foundation, floor slab, mechanical and electrical utilities, and placed anchors are in correct position

3.2 ERECTION - FRAMING

A. Erect framing in accordance with AISC 360.

B. Provide for erection and wind loads. Provide temporary bracing to maintain structure plumb and in alignment until completion of erection and installation of permanent bracing. Locate braced bays as indicated.

C. Set column base plates with non-shrink grout to achieve full plate bearing.

D. Do not field cut or alter structural members without approval.

E. After erection, prime welds, abrasions, and surfaces not shop primed.

3.3 ERECTION - WALL AND ROOF PANELS

A. Install in accordance with manufacturer's instructions.

B. Exercise care when cutting prefinished material to ensure cuttings do not remain on finish surface.

C. Fasten cladding system to structural supports, aligned level and plumb.

D. Locate end laps over supports. End laps minimum 2 inches (50 mm). Place side laps over bearing.

E. Provide expansion joints where indicated.

F. Use exposed fasteners.

G. Install insulation utilizing tension wires for attachment.

H. Install sealant and gaskets, providing weather tight installation.

3.4 ERECTION - GUTTERS AND DOWNSPOUTS

A. Rigidly support and secure components. Join lengths with formed seams sealed watertight. Flash and seal gutters to downspouts.

B. Apply bituminous paint on surfaces in contact with cementitious materials.

C. Slope gutters minimum 1/8 inch/ft (10 mm/m).

D. Install splash pans under each downspout.

3.5 TOLERANCES

A. Framing Members: 1/4 inch (6 mm) from level; 1/8 inch (3 mm) from plumb.

B. Siding and Roofing: 1/8 inch (3 mm) from true position.

END OF SECTION

SECTION 22 0500
COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The work shall include the furnishings of systems, equipment and materials specified in this Division and as called for on the Plumbing Drawings to include supervision, quality control, operation, methods and labor for the fabrication, installation, start-up and tests for the complete plumbing installation. The work shall also include the furnishing of necessary hoisting facilities to set materials and equipment in place and the furnishing of any scaffolding and transportation associated with this work.

B. Examine the project site and become familiar with existing conditions which will affect the work. Review the drawings and specifications of other trades and take note of conditions to be created which will affect the work. All conditions shall be considered in the preparation of bids; no additional compensation will be made on the behalf of this Contractor.

C. Provide labor necessary to demolish the existing plumbing systems as shown on the drawings, as described in Part 3.1, Existing Conditions, or as required.

D. Where noted on the drawings or where called for in other sections of the specification, the Contractor for this division shall install equipment furnished by others, and shall make required service connections. Verify with the supplier of the equipment the requirements for the installation. This contractor shall be responsible for the removal and installation of railings, piping, ductwork, louvers, etc. as required to install new equipment.

1.2 DAMAGE

A. The Contractor shall be responsible for damage to the work of other trades, or to the building and its contents, caused by equipment installation.

1.3 PERMITS AND INSPECTIONS

A. Obtain and furnish necessary permits and inspection certificates for material and labor furnished. Permits and certificates shall be obtained from the proper inspection authorities. The cost of permits, certificates and fees required in connection with the installation shall be borne by the Contractor, unless otherwise noted in the detailed contractual description preceding these specifications. Where applications are required for the procuring of utility services to the building, see that such application is properly filed with the utility, and that information required for such an application is presented to the extent and in the form required by the utility company.

1.4 CODES AND STANDARDS

A. Standards listed by reference, including revisions by issuing authority, form a part of this specification section to the extent indicated. Standards listed are identified by issuing authority, authority abbreviation, designation number, title or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. Applicable provisions of the following codes and standards are hereby imposed on a general basis for the mechanical work in addition to specific applications specified by individual work sections of these specifications.

1. ANSI/ASHRAE/IES 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings

2. IECC - International Energy Conservation Code
3. ANSI Pressure Piping Standards (B31)
4. ASME Boiler and Pressure Vessel Code and State Boiler Code
5. AWS Standards for Welding
6. NFPA/NEC 70 - National Electrical Code
7. Local and/or State Plumbing, Mechanical and Building Codes
8. Occupational Safety and Health Act (OSHA)
9. Uniform Plumbing Code
10. International Mechanical Code
11. NFPA Codes and Standards

C. Any product used for dispensing potable water shall meet NSF 61 and NSF 372 testing standards. Third party testing shall be required.

D. If any work indicated on the drawings or specified herein conflicts in any way with any of the rules and regulations of the above Authorities, the Contractor shall promptly notify the Architect/Engineer in writing and do so no less than 72 hours before bids are opened. In the event the Contractor fails to notify the Architect/Engineer and changes are required by said conflicts, the Contractor shall make such changes as are required without additional cost to this Owner.

E. Installations must be safe in every respect, and must not create a condition which will be harmful to building occupants; to operating, installing or testing personnel; to workmen; or to the public. The contractor for each installation shall be solely responsible for providing installations which will meet these conditions. If the Contractor believes that the installation will not be safe for all parties, report these beliefs in writing to the Architect/Engineer before any equipment is purchased or work is installed, giving recommendations. The Architect/Engineer will work out required changes and adjustments in contract price where adjustments are warranted.

1.5 DRAWINGS

A. A complete set of current up-to-date Project Drawings and Specifications shall be kept on the site at all times. Prior to installing any of the work, check the drawings for dimensions and see that the work does not interfere with clearance required for ceilings, beams, foundations, finished columns, pilasters, partitions and electrical equipment as shown on the drawings and details. After work is installed and it develops that interferences occur which have not been called to the Architect/Engineer's attention before the installation, the Contractor shall, at his own expense, make such changes in his work as directed by the Architect/Engineer.

B. The contract drawings for plumbing work are in part diagrammatic, intended to convey the scope of work and indicate general arrangement and approximate sizes and locations of equipment and materials. Where job conditions require reasonable changes in indicated locations and arrangement, the Contractor shall make such changes as directed by the Architect/Engineer, without additional cost to the Owner.

C. Because of the scale of the drawings, certain basic items such as pipe fittings, access panels, and sleeves may not be shown; but where such items are required by other sections of these specifications or where they are required by the nature of the work, they shall be furnished and installed. Rough-in dimensions and locations shall be verified with the supplier of equipment furnished by other trades, or by the Owner, prior to the time of roughing-in.

D. Equipment specification may not deal individually with minute items required such as components, parts, controls and devices which may be required to produce the equipment performance specified, or as required to meet the equipment warranties. Where such items

are required, they shall be included by the supplier of the equipment, whether or not specifically called for.

E. The drawings and the specifications are cooperative and supplementary. It is the intent of both said drawings and specifications to cover all mechanical requirements in their entirety as nearly as possible. The Contractor shall closely check the drawings and specifications for any obvious errors or omissions and bring any such condition to the attention of the Architect/Engineer prior to the receipt of bids, in order to permit clarification by means of a mailed Addendum. If there is no question prior to the bid proposal date, the Architect/Engineer shall assume that the drawings and specifications are complete and correct and will expect the intent of said documents to be complied with, and the installation to be complete in all respects, according to said intent.

F. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Minor deviations from the contract drawings may be made to allow for better accessibility, but changes of magnitude, or which involve extra cost, shall not be made without prior approval. Ample space shall be allowed for removal of parts that may require replacement or service in the future.

G. All valves, pumps, etc. shall be accessible for maintenance purposes. Locate items carefully and coordinate with other trades so that each valve and piece of equipment is accessible and functional. Items located above a non-accessible ceiling, chase, or soffit shall be accessible through an access door. Coordinate location of access doors with the general contractor.

1.6 RESPONSIBILITY

A. The Contractor's responsibility shall not end with the installation and connecting of the various apparatus. It shall include the services of an experienced superintendent, who shall be constantly in charge of the work, together with the qualified journeymen, helpers and laborers required to properly unload, install, connect, adjust, start, operate and test the work involved, including equipment and materials furnished by other trades or by the Owner, until such time as the entire plumbing installation functions properly in every detail.

1.7 COORDINATION

A. Coordinate the work with other trades prior to installation.

B. No piping or equipment, which is foreign to the electrical equipment, or architectural appurtenances shall be run over the top of any electrical panels or electrical equipment, in accordance with NEC 110.26. This does not prohibit sprinkler protection for the installation.

C. The determination of quantities of material and equipment required shall be made from the drawings. Schedules on the drawings and in the specifications are completed as an aid, but where discrepancies arise, it shall be the Contractor's responsibility to provide the required quantity.

D. Where the specifications state that equipment shall be furnished, installed or provided, it shall be understood to mean this Contractor shall furnish and install completely, unless it is specifically stated that the equipment is to be furnished and installed by others.

E. The Architect/Engineer reserves the right to determine space priority of the contractors in the event of interference between the piping and equipment of the various contractors. Conflicts between the drawings and specifications, or between requirements set forth for the various trades, shall be called to the attention of the Architect/Engineer. If clarification is not asked for prior to the taking of bids, it will be assumed that none is required, and that the Contractor has submitted his bid in conformance with plans and specifications as issued and that no interference exists.

F. No piping or equipment foreign to an elevator hoistway and machine room shall be run inside the hoistway or machine room in accordance with NEC 620.37 and ASME A17.1 Safety Code

for Elevators and Escalators.

1.8 GUARANTEE AND MAINTENANCE

A. Keep the entire portion of the work in repair, without additional cost to the Owner, so far as defects in workmanship, apparatus, material or construction are concerned for one (1) year from the date of final acceptance, except as otherwise specified herein.

B. Equipment which fails to meet performance ratings as specified and shown on the drawings shall be removed and replaced by new equipment that meets the specified requirements, without additional cost to the Owner.

C. Materials and workmanship shall be subject to the review of the Architect/Engineer, in whose presence various tests shall be made as required by these specifications.

PART 2 PRODUCTS

2.1 SUBMITTALS

A. Submit shop drawings and catalog data for plumbing equipment as called for in Division 01 - General Requirements.

B. Submittal data for plumbing equipment shall consist of shop drawings and/or catalog cuts showing technical data necessary to evaluate the material or equipment to include dimensions, wiring diagrams, performance curves, rating, and other descriptive data necessary to describe fully the item proposed and its operating characteristics. Shop drawings shall be submitted on equipment and materials as required by the specifications.

C. Approval of materials, including alternate or substitute items, shall be obtained in writing from the Architect/Engineer, verbal approval will not be considered binding.

D. Shop drawings shall be submitted and shall have been signed, checked, approved, and initialed by the Contractor prior to submittal to the Architect/Engineer. The Architect/Engineer will review shop drawings to aid in interpreting the plans and specifications, and will in so doing assume that the shop drawings conform to specified requirements set forth in this specification. The approval of the shop drawing by the Architect/Engineer does not relieve the Contractor of the responsibility of complying with elements of the specification. The name of the job, Architect/Engineer, location, and specification section shall appear on all pages of shop drawings. Equipment marks (such as S-1, WH-1) shall be indicated for each item.

E. Near completion of project, before conducting Owner orientation and training sessions and before authorization of final payment, submit to the Owner or their designated Representative for review: three (3) sets of installation and operational information, parts lists, and maintenance instructional manuals. These OMMs shall be organized, formatted and bound in accordance with Division 01 - General Requirements.

F. At the completion of the project, prepare and submit to the Owner record drawings showing the location of piping and valves. Drawing shall give accurate dimensions of such equipment for future use by the Owner. This drawing shall be submitted as soon as work is completed and before authorization of final payment.

2.2 SUBCONTRACTORS AND MATERIALS

A. Submit to the Architect/Engineer for review, when requested, a list of subcontractors, materials and equipment proposed to be used. The list must be reviewed by the Architect/Engineer before this Contractor may enter into any subcontractual agreement. Equipment, materials, and devices, etc. shall be subject to the review of the Architect/Engineer, whether or not said items are herein specified.

2.3 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Materials shall be new, complete with manufacturer's guarantee or warranty, and shall be as listed by Underwriters Laboratories (UL), Inc., American Water Works Association (AWWA), American Gas Association (AGA), etc., if a standard has been established by that agency for the type of material.

B. Materials shall also comply with applicable standards of the National Electrical Manufacturer's Association, National Board of Fire Underwriters, National Fire Protection Association, National Safety Council, National Bureau of Standards, the National Electrical Code and the Williams-Steiger Occupational Safety and Health Act of 1970. Such standards are hereby made a part of these specifications.

C. Work shall be performed by workmen skilled in the particular craft, shall be executed in a workmanlike manner, and shall present a neat mechanical appearance when completed. Align, level and adjust equipment for satisfactory operation, and install so that connecting and disconnecting of piping and accessories can be made readily and so that parts are easily accessible for inspection, operation and maintenance. Methods and techniques of installation shall be subject to the review of the Architect/Engineer.

D. Materials shall be the standard product of a reputable manufacturer regularly engaged in the manufacture of the specific product. Materials of the same type of class shall be the products of one manufacturer. For example, faucets shall be from the same manufacturer.

E. Materials shall be protected from damage, and stored indoors or protected from the weather at all times, unless other storage arrangements are approved by the Architect/Engineer.

F. Bearing lubrication fittings shall be as recommended by the manufacturer and shall be extended, where necessary, to an accessible location.

G. Material and equipment shall be installed in strict accordance with the manufacturer's recommendations.

2.4 MATERIAL SUBSTITUTIONS

A. Proposals as submitted shall be based on the products specifically named in the specification or on the drawings. Material or equipment by manufacturers other than those specified may be used only by permission of the Architect/Engineer. Such permission for substitution must be requested, in writing and in accordance with Division 01 - General Requirements.

B. The Architect/Engineer reserves the sole right for the approval of proposed material or equipment, and the phrase, "or approved equivalent", used in these specifications, or on the drawings, shall be interpreted to mean an equivalent approved by the Architect/Engineer.

C. Changes required by alternate equipment shall be made at no additional cost to the Owner; and costs incurred by other trades, public utilities or the Owner, as a result of the use of such equipment, shall be the responsibility of the Contractor.

D. Furnish to the Architect/Engineer, when requested, samples of proposed material or equipment substitutions. These samples shall remain with the Architect/Engineer as long as needed.

E. Identify the differences in alternate material or equipment as compared to that specified, and indicate the benefits to the project as a result of selecting the alternative.

F. The Architect/Engineer reserves the right to refuse approval of equipment which does not meet the specification, in their opinion, or of equipment for which no local experience of satisfactory service is available. The Architect/Engineer further reserves the right to reject equipment for which maintenance service and the availability of replacement parts is questionable.

2.5 JOINING MATERIALS

A. Refer to individual Division 22 piping sections for special joining materials not listed below.

B. Pipe-Flange Gasket Materials: Suitable for chemical and thermal conditions of piping system contents.

1. ASME B16.21, nonmetallic, flat, asbestos-free, 1/8-inch (3.2-mm) maximum thickness unless thickness or specific material is indicated.

a. Full-Face Type: For flat-face, Class 125, cast-iron and cast-bronze flanges.

b. Narrow-Face Type: For raised-face, Class 250, cast-iron and steel flanges.

1) AWWA C110, rubber, flat face, 1/8 inch (3.2 mm) thick, unless otherwise indicated; and full-face or ring type, unless otherwise indicated.

C. Flange Bolts and Nuts: ASME B18.2.1, carbon steel, unless otherwise indicated.

D. Plastic, Pipe-Flange Gasket, Bolts, and Nuts: Type and material recommended by piping system manufacturer, unless otherwise indicated.

E. Solder Filler Metals: ASTM B 32, lead-free alloys. Include water-flushable flux according to ASTM B 813.

F. Brazing Filler Metals: AWS A5.8, BCuP Series, copper-phosphorus alloys for general-duty brazing, unless otherwise indicated; and AWS A5.8, BAg1, silver alloy for refrigerant piping, unless otherwise indicated.

G. Welding Filler Metals: Comply with AWS D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

H. Solvent Cements for Joining Plastic Piping:

1. ABS Piping: ASTM D 2235.

2. CPVC Piping: ASTM F 493.

3. PVC Piping: ASTM D 2564. Include primer according to ASTM F 656.

4. PVC to ABS Piping Transition: ASTM D 3138.

5. Fiberglass Pipe Adhesive: As furnished or recommended by pipe manufacturer.

2.6 TRANSITION FITTINGS

A. AWWA Transition Couplings: Same size as, and with pressure rating at least equal to and with ends compatible with piping to be joined.

1. Available Manufacturers:

a. Cascade Waterworks Mfg. Co.

b. Dresser Industries, Inc.; DMD Div.

c. Ford Meter Box Company, Incorporated (The); Pipe Products Div.

d. JCM Industries.

e. Smith-Blair, Inc.

f. Viking Johnson.

1) Underground Piping NPS 1-1/2 (DN 40) and Smaller: Manufactured fitting or coupling.

2) Underground Piping NPS 2 (DN 50) and larger: AWWA C219, metal sleeve-type coupling.
3) Aboveground Pressure Piping: Pipe fitting.

2. Plastic-to-Metal Transition Fittings: PVC and CPVC one-piece fitting with manufacturer's Schedule 80 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.
   a. Available Manufacturers:
      1) Eslon Thermoplastics.
3. Plastic-to-Metal Transition Adaptors: One-piece fitting with manufacturer's SDR 11 equivalent dimensions; one end with threaded brass insert, and one solvent-cement-joint end.
   a. Available Manufacturers:
      1) Thompson Plastics, Inc.
4. Plastic-to-Metal Transition Unions: MSS SP-107, CPVC AND PVC four-part union. Include brass end, solvent-cement-joint end, rubber O-ring, and union nut.
   a. Available Manufacturers:
      1) NIBCO INC.
      2) NIBCO, Inc.; Chemtrol Div.
5. Flexible Transition Couplings for Underground, Aboveground, Underground and Aboveground, or [____] Nonpressure Drainage Piping: ASTM C 1173 with elastomeric sleeve, ends same size as piping to be joined, and corrosion-resistant metal band on each end.
   a. Available Manufacturers:
      1) Cascade Waterworks Mfg. Co.
      2) Fernco, Inc.
      3) Mission Rubber Company.
      4) Plastic Oddities, Inc.

2.7 DIELECTRIC FITTINGS

A. Description: Combination fitting of copper alloy and ferrous materials with threaded, solder-joint, plain, or weld-neck end connections that match piping system materials.

B. Insulating Material: Suitable for system fluid, pressure, and temperature.

C. Dielectric Unions: Factory-fabricated, union assembly, for 250-psig (1725-kPa) minimum working pressure at 180 deg F (82 deg C).
   1. Available Manufacturers:
      a. Capitol Manufacturing Co.
      b. Central Plastics Company.
      c. Eclipse, Inc.
      d. Epco Sales, Inc.
      e. Hart Industries, International, Inc.
      f. Watts Industries, Inc.; Water Products Div.
      g. Zurn Industries, Inc.; Wilkins Div.

2.8 GROUT

A. Description: ASTM C 1107, Grade B, nonshrink and nonmetallic, dry hydraulic-cement grout.

1. Characteristics: Post-hardening, volume-adjusting, nonstaining, noncorrosive, nongaseous, and recommended for interior and exterior applications.
2. Design Mix: 5000-psi (34.5-MPa), 28-day compressive strength.
3. Packaging: Premixed and factory packaged.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A. Examine the existing buildings and grounds or site and become familiar with the conditions as they exist, or that will in any manner affect the work under this contract. No allowance will be made subsequently, in this connection, on behalf of the Contractor for any error or negligence by the Contractor.

B. Existing equipment, such as duct or pipe, in or on the existing building and grounds which is to be replaced, or which interferes in any way with the remodeling of the existing facilities and/or installation of new equipment, shall be removed from the premises or relocated by this Contractor, as directed by the Architect/Engineer. Do not remove from the premises any equipment that may have maintenance value to the Owner without permission of the Owner. Equipment, duct or pipe not to be reused shall be removed from the premises, unless otherwise noted herein or shown on the drawings.

C. Where existing equipment is removed or changed, all piping no longer in service shall be removed and stubs plugged as directed by the Architect/Engineer. Building surfaces damaged and openings left by removal of equipment shall be repaired by the proper trades and paid for by this Contractor, unless otherwise noted on the drawings. The cutting and fitting shall be done by this Contractor. The cutting of floor, ceiling or wall surfaces shall be done by this Contractor with extreme care, in order to avoid any disrupting or damage of existing utility services which may be encountered. Coordinate with other trades and with the General Contractor to minimize the damage to the building in order to reduce the amount of patching required.

D. Where new openings are cut and concealed piping is encountered, such items shall be removed or relocated as required. Where systems to be removed stub through floors, walls or ceilings, openings shall be patched so that no evidence of the former installation remains.

E. Existing active services (water, gas, sewer, electric), when encountered, shall be protected against damage. Do not prevent or disturb operation of active services that are to remain. If active services are encountered which require relocation, make request to authorities with jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the utility or municipality having jurisdiction.

F. The location, size and elevation of underground utilities shown on the drawings are in accordance with data supplied by the Owner and/or the various utility companies. The Contractor shall verify this data and shall report any discrepancies to the Architect/Engineer, in writing, before submitting his bid.

3.2 INTERRUPTION OF SERVICE

A. Changes in service shall be made so as to provide a minimum of interference with the operation of services in the building. When changes require shutdown of building services,

notify the proper building authorities no less than 48 hours in advance and obtain approval from these authorities before making changes. Such notices shall give duration and nature of shutdown. Temporary arrangements shall be approved by the Architect/Engineer and/or Owner.

B. Any and all interruptions to building services shall be in accordance with Division 01 - General Requirements.

3.3 PIPING SYSTEMS - COMMON REQUIREMENTS

A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on Coordination Drawings.

B. Install piping in concealed locations, unless otherwise indicated and except in equipment rooms and service areas.

C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

E. Install piping at indicated slopes.

F. Install fittings for changes in direction and branch connections.

G. Install piping to allow application of insulation.

H. Select system components with pressure rating equal to or greater than system operating pressure.

3.4 OPENINGS, CUTTING, AND PATCHING

A. The General Contractor shall coordinate the placing of openings in the new structure, as required for the installation of the plumbing work.

B. Furnish to the General Contractor the accurate locations and sizes for required openings. This shall not relieve this Contractor of the responsibility of checking to assure that proper size openings are provided. When additional patching is required due to this Contractor's failure to inspect this work, this Contractor shall make arrangements for the patching required to properly close the opening, to include patch painting. This Contractor shall pay any additional cost incurred in this respect.

C. When cutting and patching of the structure is made necessary due to this Contractor's failure to install piping, sleeves or equipment on schedule, or due to this Contractor's failure to furnish, on schedule, the information required for the leaving of openings, it shall be this Contractor's responsibility to make arrangements for this cutting and patching. This Contractor shall pay any additional cost incurred in this respect.

D. Underfloor Plumbing Work:

1. Contractor shall coordinate all related activity with General Contractor at least 24 hours before beginning construction activity.

2. Contractor, before saw-cutting floor, must first field verify all existing piping service, sizes, locations, depths, flow directions as well as coordinate with any other trades who may have utilities such as wires or conduits concealed beneath floor and which may be subject to damage and subsequent service interruptions. The cost to repair any damaged utilities shall be borne by The Contractor.

3. Contractor shall be responsible for erecting and maintaining suitable temporary construction barriers and enclosures for containment of all construction dust and debris. Enclosures and barriers shall be maintained under negative pressure and fans and filters as needed to assist with containment.

3.5 EXCAVATION AND BACKFILL

A. See Division 31 - Trenching and Backfilling for requirements for trench excavation, backfill, and compaction.

B. Contractor shall coordinate all related activity with General Contractor at least 24 hours before beginning construction activity.

C. The Contractor shall be responsible for erecting and monitoring of all safety barricades and related protection around excavation and work areas.

D. Trenches and excavations may be backfilled by the Contractor only after required testing has been satisfactorily performed and locations of connections and appurtenances which will be concealed have been recorded by the Contractor in the construction record documents.

3.6 CONCRETE AND MASONRY WORK

A. Concrete work included herein or shown on the drawings shall be in conformance with Division 3 - Concrete.

B. Concrete work included herein or shown on the drawings shall be done only by experienced cement finishers. Brickwork, where included, shall be laid only by experienced brick masons. Brick shall be of uniform size, hard burned, and shall be laid in cement mortar, except for patch work at a location where cement and lime mortar has previously been used. Exposed, finish brickwork shall match existing brickwork as closely as practical and shall be to the satisfaction of the Architect/Engineer and Owner.

C. Concrete bases and pads for mechanical equipment will be furnished by General Contractor. This Contractor shall coordinate size and location.

D. Locate, furnish and install all support, hanger and equipment anchor bolts and related hardware.

3.7 ROOF OPENINGS

A. Roof openings required by this Contractor that are not shown on the Structural or Architectural Drawings shall be cut and adequately reinforced by an experienced roofing contractor.

B. Roof penetrations for piping shall be through curbed roof openings. Equipment supports shall be by curbed and flashed runners meeting current National Roofing Contractor Association (NRCA) standards and details. Pitch pockets, pitch pans, and wood blocking are not acceptable.

C. All roof work shall be completed such that it does not void any existing roof warranty.

3.8 PAINTING

A. The finish of any item that has been marred, scratched or damaged in any way by this Contractor shall be repainted at the expense of this Contractor, and to the satisfaction of the Architect/Engineer and the Owner.

B. Painting and finishing of exposed mechanical systems including piping and duct shall be as shown on the drawings and per Division 9 - Finishes.

3.9 CLEANING

A. Keep the premises clean of all dirt and debris, caused by the work in accordance with Division 1 - General Requirements.

B. Keep the premises clean of all debris caused by the work at all times, and keep materials stored, in areas designated by the Owner, in such a manner as not to interfere with the progress of the work of other Contractors or with the operation of existing facilities.

C. At the conclusion of the construction, the site shall be thoroughly cleaned of all rubble, debris and unused material and shall be left in good order. Closed off spaces shall be cleaned of waste such as material, cartons, and wood frame members used in the construction.

3.10 SUSPENSION FROM WOOD STRUCTURAL MEMBERS

A. In general, concentrated or other loads shall not be suspended directly from the bottom of wood structural members, unless approved by the Architect/Engineer. Loads suspended from open web joists or trusses may be transferred to the bottom chord of the structural member at the panel points. Loads suspended from solid web joists shall be transferred to the joists only through the top flange or web. Suspension systems shall be reviewed by the Architect/Engineer.

3.11 WIRING FOR PLUMBING EQUIPMENT

A. The Division 26 Contractor shall provide power including connection to all electrically powered equipment furnished by the Division 22 Contractor. Where electrical disconnect switches are not explicitly specified to be furnished as part of Division 22 equipment, the Electrical Contractor shall furnish suitable type(s) and properly rated electrical disconnect switches for all said mechanical equipment.

B. Provide integral wiring, alarm wiring, control wiring, temperature control wiring and interlock wiring for equipment furnished, whether or not such wiring is furnished by the equipment vendor.

C. Except as noted otherwise or where other sections call for motor starters to be furnished by manufacturers as part of their equipment, the Division 26 Electrical Contractor shall furnish motor starters as required for motors furnished by this Division 22 Contractor.

D. Furnish shop drawings including but not limited to detailed schedules and wiring diagrams to other interested trades including Division 26 electrical contractor for all electrically powered equipment furnished. Schedules shall include: electrical loads and characteristics, max. overcurrent fuse protection / circuit breaker needs, disconnect requirements, motor starter requirements and motor horsepower(s). Include drawings as needed to depict locations of electrical and control panels, service clearances, disconnects as well as wiring connection points.

E. The Division 22 Contractor shall be responsible to pay for all additional costs incurred due to equipment substitutions by Division 22 Contractor, which require either larger electrical service or service of a different electrical characteristic than scheduled on the Drawings.

F. Prior to bid submission, this Division 22 Contractor shall review the Electrical Drawings and promptly bring to the attention of the Architect/Engineer, any omissions or errors in the electrical services required for equipment proposed to be furnished.

3.12 PROTECTION

A. Special steps shall be taken as necessary for the protection of equipment and materials furnished under Division 22. Equipment and materials shall be protected by Contractor from any physical damage due to weather elements, dirt, dents, sheet rock installation, and painting

until the project is completed. Damage, if incurred, shall be promptly repaired at no additional cost to Owner, as-needed to restore equipment and materials to original as-new condition.

B. Protection of equipment during the finishing (sheet rock, plastering and painting) of the building interior shall be the responsibility of the contractor or contractors performing that work. This shall not relieve this Division 22 Contractor of the ultimate responsibility of checking and ensuring that adequate protection is provided and maintained at all times.

C. Where the installation or connection of equipment requires Division 22 Contractor to work in areas previously finished by other Contractors, the Division 22 Contractor shall be responsible to ensure that such finished areas are adequately protected and are not marred, soiled or otherwise damaged during the course of their said work. If damage occurs this Division 22 Contractor shall be responsible to arrange for the other Contractors to repair and refinish any damaged areas and shall pay for all repair, rework and refinishing required.

D. When heavy materials must be placed upon or transported over the roof deck, sheeting shall be placed to distribute the weight and support such materials. Any damage shall be immediately corrected at no cost to the Owner.

3.13 ASBESTOS IDENTIFICATION AND CONTROL

A. In the event that suspected asbestos containing material (ACM) is encountered during the course of the work, cease operations in the immediate area and promptly notify both the Owner and Architect/Engineer. Suspected materials will then be sampled and analyzed by the Owner' s Representative.

B. Should ACM be confirmed, the Owner's Representative shall direct the abatement procedures. This work shall be awarded either by subcontract to the Contractor or under a separate contract.

C. During abatement operations, cease operations in the immediate area of the abatement. Operations in other areas of the project may be performed, but care must be taken to control dust to avoid contamination of air monitoring samples. The Contractors shall coordinate activities with the asbestos abatement contractor as well as the Owner' s Representative.

D. Should no ACM be identified, operations in the restricted areas may be resumed. At the discretion of the Owner or Owner' s representative, any schedule delays caused by identification, analysis or abatement may be added in the form of an extension of time to the contract via a Change Order.

3.14 NOISE AND VIBRATION

A. Contractor shall install all equipment in a such a manner so as to control the transmission of noise and vibration from any installed equipment, components or systems, so the sound level in any occupied area does not exceed NC-35 levels. Contractor shall correct all objectionable noise levels in any occupied areas and at no additional cost to Owner, which are due to improperly installed or isolated equipment, components or systems.

3.15 TESTS AND DEMONSTRATIONS

A. Systems shall be tested and placed in proper working order prior to demonstrating systems to the Owner.

B. Prior to acceptance of the plumbing installation, demonstrate to the Owner or his designated representatives essential features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems.

C. Furnish the necessary trained personnel to perform the demonstrations and instructions, and arrange to have the manufacturer's representatives for the system present to assist with the demonstrations. The Owner and Contractor shall each sign a certification stating that the training has been performed and the Owner accepts same.

3.16 UTILITY REBATE APPLICATIONS

A. This contractor shall be responsible for gathering information necessary for completing local utility rebate applications, and submitting to the proper utility companies for gas and electric rebates. Potential rebates include high efficiency gas boilers, thermostats, timeclocks, motors, and other items furnished by this plumbing contractor.

END OF SECTION 22 0500

SECTION 22 0517
SLEEVES AND SLEEVE SEALS FOR PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pipe sleeves.

B. Manufactured sleeve-seal systems.

1.2 RELATED REQUIREMENTS

A. Section 07 8400 - Firestopping.

B. Section 09 9123 - Interior Painting: Preparation and painting of interior piping systems.

C. Section 22 0523 - General-Duty Valves for Plumbing Piping.

D. Section 22 0553 - Identification for Plumbing Piping and Equipment: Piping identification.

E. Section 22 0716 - Plumbing Equipment Insulation.

1.3 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate pipe materials used, jointing methods, supports, floor and wall penetration seals. Indicate installation, layout, weights, mounting and support details, and piping connections.

1.4 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified this section.

1. Minimum three years experience.

C. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store sleeve and sleeve seals in shipping containers, with labeling in place.

B. Provide temporary protective coating on cast iron and steel sleeves if shipped loose.

PART 2 PRODUCTS

2.1 PIPE SLEEVES

A. Manufacturers:

1. Flexicraft Industries; Pipe Wall Sleeve

2. Substitutions: See Section 01 6000 - Product Requirements.

B. Pipe Passing Through Below Grade Exterior Walls:

1. Zinc coated or cast iron pipe.
2. Provide watertight space with link rubber or modular seal between sleeve and pipe on both pipe ends.

2.2 MANUFACTURED SLEEVE-SEAL SYSTEMS

A. Manufacturers:

1. Advance Products & Systems, LLC; Innerlynx: www.apsonline.com/#sle.
2. Flexicraft Industries; PipeSeal: www.flexicraft.com/#sle.
3. Substitutions: See Section 01 6000 - Product Requirements.

B. Modular/Mechanical Seal:

1. Synthetic rubber interlocking links continuously fill annular space between pipe and wall/casing opening.
2. Provide watertight seal between pipe and wall/casing opening.
3. Elastomer element size and material in accordance with manufacturer's recommendations.
4. Glass reinforced plastic pressure end plates.

PART 3 EXECUTION

3.1 PREPARATION

A. Ream pipe and tube ends. Remove burrs.

B. Remove scale and foreign material, from inside and outside, before assembly.

3.2 INSTALLATION

A. Route piping in orderly manner, plumb and parallel to building structure. Maintain gradient.

B. Install piping to conserve building space, to not interfere with use of space and other work.

C. Install piping and pipe sleeves to allow for expansion and contraction without stressing pipe, joints, or connected equipment.

D. Structural Considerations:

1. Do not penetrate building structural members unless indicated.

E. Provide sleeves when penetrating footings and walls. Seal pipe including sleeve penetrations to achieve fire resistance equivalent to fire separation required.

1. Underground Piping: Caulk pipe sleeve watertight with lead and oakum or mechanically expandable chloroprene inserts with bitumen sealed metal components.

F. Manufactured Sleeve-Seal Systems:

1. Install manufactured sleeve-seal systems in sleeves located in grade slabs and exterior concrete walls at piping entrances into building.
2. Provide sealing elements of the size, quantity, and type required for the piping and sleeve inner diameter or penetration diameter.
3. Locate piping in center of sleeve or penetration.
4. Install field assembled sleeve-seal system components in annular space between sleeve and piping.

5. Tighten bolting for a water-tight seal.
6. Install in accordance with manufacturer's recommendations.

G. When installing more than one piping system material, ensure system components are compatible and joined to ensure the integrity of the system. Provide necessary joining fittings. Ensure flanges, union, and couplings for servicing are consistently provided.

3.3 CLEANING

A. Upon completion of work, clean all parts of the installation.

B. Clean equipment, pipes, valves, and fittings of grease, metal cuttings, and sludge that may have accumulated from the installation and testing of the system.

END OF SECTION

SECTION 22 0519
METERS AND GAUGES FOR PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, labor, and supervision necessary to install gauges .

B. Gauges

1.2 REFERENCE STANDARDS

A. ASME B40.100 - Pressure Gauges and Gauge Attachments; The American Society of Mechanical Engineers; 2013.

1.3 QUALIFICATIONS

A. Gauges: Weiss, Weksler, Ashcroft, McDaniel, U.S. Gauge or Therice.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's product and installation data. Provide list that indicates use, operating range, total range and location for manufactured components.

PART 2 PRODUCTS

2.1 THERMOMETERS

A. Stem Type:

1. 9 in. "Adjust-Angle" industrial thermometer, complete with double thick glass front, non-toxic blue ribbon liquid, separable socket and arranged so the unit can be set at any required angle front to back or left to right during or after installation. Range 32 F - 240 F for hot water, 50 F - 400 F for steam, and 0 F - 100 F for chilled or domestic cold water.

B. Dial Type:

1. 4-inch diameter, all stainless steel hermetically sealed per ASME B40.3, stainless steel stem, head and bezel. Coordinate stem length with system served. Bi-metal coil sensor, aluminum dial with black markings, glass lens, 1% full scale accuracy. Range 20 deg F - 240 deg F for hot water, 0 deg F - 100 deg F for domestic cold water.

2.2 GAUGES

A. 4 in. compound pressure vacuum gauge, liquid filled, aluminum, steel or stainless steel case, white dial, 1/4-in. male NPT. Range 30 in. vacuum to 100 pound pressure for water, 30 in. vacuum to 30 pound pressure for low pressure steam, 30 in. vacuum to 1-1/2 times system pressure for medium and high pressure steam. Provide siphon (pigtail) for steam gauges. Provide level handle union cock for steam and water gauges.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install gauges at pressure reducing valves and at other points as shown on the Drawings.

END OF SECTION 22 0519

SECTION 22 0523
GENERAL DUTY VALVES FOR PLUMBING PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES:

A. Provide equipment, materials, labor, and supervision necessary to install valves as indicated on drawings and in schedules, and herein specified.

B. As nearly as possible, all valves shall be of a single manufacturer.

C. Valves shall conform to ANSI standard dimensions.

D. ASME Compliance:

1. ASME B16.10 for ferrous valve dimensions.
2. ASME B31.9 for building services piping valves.

E. NSF Compliance: NSF/ANSI 61 and/or NSF/ANSI 372 for valve materials for potable-water service. Valves for domestic water must be 3rd Party Certified.

1.2 SUBMITTALS

A. Submit detailed Shop Drawings and Product Data clearly indicating manufacturer, model, size, dimensions and pressure rating.

B. For records documentation submit valve schedule, indicating valve ID, type, size and intended service and location.

1.3 PACKAGING

A. Valves shall be furnished or provided with protective packaging to prevent damage during shipping or on the job site.

B. Prepare valves for shipping as follows:

1. Protect internal parts against rust and corrosion.
2. Protect threads, flange faces, grooves, and weld ends.
3. Set angle, and globe valves closed to prevent rattling.
4. Set ball and plug valves open to minimize exposure of functional surfaces.
5. Set butterfly valves closed or slightly open.
6. Block check valves in either closed or open position.

C. Use the following precautions during storage:

1. Maintain valve end protection.
2. Store valves indoors and maintain at higher than ambient dew point temperature. If outdoor storage is necessary, store valves off the ground in watertight enclosures.

D. Use sling to handle large valves; rig sling to avoid damage to exposed parts. Do not use handwheels or stems as lifting or rigging points.

1.4 DEFINITIONS

CWP: Cold working pressure.

EPDM: Ethylene propylene copolymer rubber.

NBR: Acrylonitrile-butadiene, Buna-N, or nitrile rubber.

PTFE: Polytetrafluoroethylene plastic.

SSP - Saturated Steam Pressure

WP - Working Pressure

SWP - Steam Working Pressure

W.O.G. - Water, Oil, Gas Pressure

BR - Bronze

I.B.B.M. - Iron Body, Bronze-Mounted

O.S.&Y. - Outside Screw and Yoke

N.R.S. - Non-Rising Stem

R.S. - Rising Stem

M.S.S. - Manufacturer's Standardization Society of the Valve and Fitting Industry, Inc.

Lead Free: Refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content =0.25% per Safe Drinking Water Act as amended January 4, 2011, Section 1417. .

PART 2 PRODUCTS

2.1 GENERAL

A. Materials: Discs, gaskets, packings, seats, diaphragms and lubricants shall conform to recommendations of the valve manufacturer for the intended use.

B. Body materials, unless otherwise stated:

1. Bronze: 125-150 lbs., ASTM B62
2. High Grade Steam-Metal or Valve-Bronze Alloy: 200-300 lbs., ASTM B61
3. Cast Iron: ASTM A126, Class B
4. Ductile Iron: ASTM A395, A536
5. Cast Steel: ASTM A216

C. Lead Free silicon bronze (ASTM listed) valves shall be made with corrosion-resistant materials. Manufacturer shall provide third party certification tested in accordance with EN ISO 6509 regarding dezincification corrosion resistance and stress corrosion cracking.

D. Bronze Valves: NPS 2 (DN 50) and smaller with threaded or solder ends, unless otherwise indicated.

E. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

F. Valve Sizes: Same as upstream piping unless otherwise indicated.

G. Valve-End Connections:

1. Flanged: With flanges according to ASME B16.1 for iron valves.
2. Grooved: With grooves according to AWAA C606.
3. Solder Joint: With sockets according to ASME B16.18.
4. Threaded: With threads according to ASME B1.20.1.

5. Copper Press: With sockets according to ASME B16.22/ASTM B75.

H. Valves in Insulated Piping: With 2-inch stem extensions and the following features:

1. Ball Valves: With extended operating handle of non-thermal-conductive material that meets UL 2043 approved for inside air plenum, and protective sleeve that allows operation of valve without breaking the vapor seal or disturbing insulation and memory stops that are fully adjustable after insulation is applied.
2. Butterfly Valves: Shall have 2” extended neck for insulation clearance.
3. Gate Valves: With rising stem.

2.2 MANUFACTURERS

A. Subject to compliance with requirements, provide products manufactured by one of the following, as listed for each valve type, or Engineer-approved equivalent.

Valve Type	Approved Manufacturer
Gate, Globe, and Check Valves	Crane, Stockham, Lunkenheimer, Hammond Industrial Series, NIBCO, Milwaukee
Ball Valves	Jamesbury, Apollo, Jenkins, Milwaukee, Watts, Worchester, Powell, or NIBCO
Butterfly Valves	Lined: Keystone, Demco, Milwaukee, Centerline, Nibco High Performance: Jamesbury, Dezurik, Durco
Plug Valves	Flowserve-Nordstrom, Stockham, Dezurik, W-K-M

2.3 GATE VALVES

A. Provide gate valves complying with MSS SP-70 or MSS SP-80. Gate valves shall be as follows unless otherwise indicated on the drawings.

1. 2 in. and Smaller: 125-lb. saturated steam, screwed, solid wedge disc, and all parts ASTM B62 grade bronze except wheel and packing.

B. Equip valves with packing suitable for intended service.

C. Provide gate valves designed such that back seating protects packing and stem threads from fluid when valve is fully opened. Equip valves with gland follower.

D. Gate valves used for ASME Section IV vessel isolation valves shall have adjustable type packing gland.

2.4 GLOBE VALVES

A. Provide globe valves complying with MSS SP-80 or MSS SP-85. Globe valves shall be installed where shown on the drawings for tight shutoff and shall be as follows:

1. 2 in. and smaller: 150-lb. saturated steam, rising stem, bronze body meeting ASTM B62 bronze trim, stainless steel disc and seat, union bonnet with stuffing box.
2. Over 2 in.: 125-lb. saturated steam, flanged iron body and yoke bonnet meeting ASTM A126 Class B, rising stem with stuffing box and yoke bushing.
3. Equip valves with packing suitable for intended service.

4. Provide globe valves such that the back seating protects packing and stem threads from fluid when valve is fully opened. Equip valves with gland follower.

2.5 CHECK VALVES

A. Provide check valves complying with MSS SP-71 or MSS SP-80 for water, steam, and air shall be as follows unless otherwise shown on the drawings:

1. 3 in. and smaller: 200-lb. saturated steam, swing type, threaded, bronze body meeting ASTM B62, pressure tight removable disc, hinge bumper to prevent sticking open, can be mounted horizontally or vertically.

2.6 BALL VALVES

A. Provide ball valves complying with MSS SP-72 or MSS SP-110. Ball valves shall be as follows unless otherwise indicated on the drawings.

1. 2 in. and smaller: ASTM B584 bronze body, 2-piece, full port stainless steel brass ball, screwed or soldered ends with teflon seats and seals, blow out proof stem, tee or lever handle rated to 150 SWP/600WOG.

B. CPVC and PVC ball valves shall be union type, full port, schedule 80.

2.7 BUTTERFLY VALVES

A. Lined

1. Disc - Aluminum bronze ASTM B148 Class 9B or ASTM B584 Alloy 876 for chilled, heating and condenser water, air, and fuels
2. Seat:
   a. Buna N hardback type ASTM D735-SB620AABE1E3G for chilled, hot and condenser water, air, fuels.
3. Stem - Stainless steel dry journal type 416, ASTM A582.
4. Bodies – Semi-steel; ASTM A126 Class B; cast iron, ASTM 448; ductile iron. ASTM A536; or cast steel, ASTM A216. On insulated piping, butterfly valves shall have extended neck suitable for the associated insulation thickness.
5. Actuators - Lever handle with infinite position lever with positive locking feature on valve sizes 2 in. through 5 in. Geared hand wheel on valve sizes 6 in. and larger. Furnish chain operator for valve 6 inches and larger, and located 8 feet or more above the finished floor in mechanical equipment rooms.
6. General Specifications
   a. Butterfly valves may be of flanged, wafer, or lug type (lugs drilled and tapped). Grooved valve couplings may be used where grooved piping is applied
   b. Elastomer seats shall be bonded to a rigid backup ring, be field replaceable, and of the types listed above.
   c. The disc shall be aluminum bronze of the floating type with no external disc to stem fasteners. Drive is accomplished by a square stem engaging in a broached disc.
   d. Stems shall be stainless steel of the one-piece type, completely sealed from line flow.
   e. Working Pressures: 28 in. vacuum to 250 lb. working pressures, 300 lb. test, with bubble-tight end of line shutoff.

f. Dead end service at full pressure without the need of a downstream flange.

2.8 DRAIN VALVES (HOSE BIBBS)

A. Soldered or Threaded Ends: Bronze body, screwed bonnet, rising stem, composition disc, 3/4 in. threaded hose outlet connection; 125 psi maximum pressure rating.

2.9 PLUG VALVES

A. Plug valves shall not be furnished unless specifically shown on the drawings. When so indicated, this type of valve shall meet the following specifications:

1. Provide Class 125 lubricated tapered plug valves complying with MSS SP-78. Type II, ASTM A126 cast iron body with lubrication-sealing system, 200 psi pressure rating, cast iron or bronze plug with sealant groove.
2. Smaller than 2 in.: tapered plug valves, semi-steel, screwed, wrench operated with wrench.
3. 2 in. and larger: tapered plug valves, carbon steel, flanged, lubricated plug wrench operated with wrench.

2.10 ACTUATORS, HANDWHEELS, OPERATORS, HANDLES, AND WRENCHES

A. Provide suitable handwheels for gate, globe and drain valves.

B. Valve Actuator Types:

1. Handwheel: For valves other than quarter-turn types.
2. Hand lever: For quarter-turn valves NPS 6 (DN 150) and smaller.
3. Chainwheels: Valve actuation assembly with sprocket rim, brackets, and chain for mounting height.

C. Provide one plug valve wrench for every 10 plug valves sized 2 in. and smaller, minimum of one. Provide each plug valve, sized over 2 in. with a wrench, with set screw.

PART 3 EXECUTION

3.1 VALVE LOCATIONS – GENERAL

A. Unless otherwise noted, shutoff valves shall be provided at all equipment connections (supply and return where applicable) for the following piping: pump suction and discharge, water, air, fuel and gas and drain lines (except on gravity drains from pans). Equipment connections include such items as tanks, pumps, heat exchangers, and similar items.

B. Check valves of the non-slam type shall be installed at the discharge of pumps unless otherwise shown on the drawings.

C. Install isolation valves at each branch off of horizontal mains and vertical risers.

3.2 EXAMINATION

A. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent this movement during shipping and handling.

B. Operate valves in positions from fully open to fully closed. Examine guides and seats made accessible by such operations.

C. Examine threads on valve and mating pipe for form and cleanliness.

D. Examine mating flange faces for conditions that might cause leakage. Check bolting for proper size, length, and material. Verify that gasket is of proper size, that its material composition is suitable for service, and that it is free from defects and damage.

E. Do not attempt to repair defective valves; replace with new valves.

3.3 VALVE INSTALLATION

A. Follow the manufacturer's recommended installation instructions concerning soldering, silver brazing, welding, threading, and installation of flanged valves in order to prevent damage to the valve and assure its maximum efficiency. Additional specific installation requirements are as follows:

1. Thread pipe for threaded valves to standard length only, using new block dies.
2. Put pipe compound on the pipe end, not into the valve threads. Securely screw pipe and valve together.
3. Blow out or otherwise thoroughly clean pipe sections before they are installed.
4. Close valve before installation.
5. Secure and adjust valves for no leaks and for easy operation.
6. Install valves with stems horizontal or vertical above the pipe and square with building construction. Install valves in position to allow full stem movement.
7. Install valves so piping does not place a stress or strain on the valve body. Locate valves for easy access and provide separate support where necessary.
8. Install extended-stem valves where insulation is indicated. Stems shall be extended such that the handle moves freely without contact with the insulation.
9. Install drain valves at low points of piping, at each mechanical equipment item, and elsewhere, where indicated.
10. Locate valves, cock, and hose bibbs to allow easy accessibility for operation, maintenance and repair.
11. Lugged butterfly valves with rubber-lined seats shall be installed with the disc(s) partially open. Bolts shall be torqued to the manufacturer’s recommendations.

B. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

C. Install check valves for proper direction of flow and as follows:

1. Swing Check Valves: In horizontal position with hinge pin level.
2. Lift Check Valves: With stem upright and plumb.

D. When soldering use paste fluxes that are approved by the manufacturer for use with Lead Free Alloys.

3.4 PROVISION FOR WRENCHES

A. One operating wrench shall be provided for every 10 valves of each type not equipped with handwheels or levers. A minimum of two wrenches shall be provided for each type of valve.

3.5 SPECIAL OPERATORS FOR 1/4 TURN PRODUCTS

A. Special slow closing operators shall be provided for quick closing valves to prevent the destructive fluid action of "water hammer" effects.

1. Steam under 50 PSI and incompressible fluids: As recommended by the manufacturer.

3.6 ADJUSTING

A. Adjust or replace valve packing after piping systems have been tested and put into service but before final adjusting and balancing. Replace valves if persistent leaking occurs.

3.7 GENERAL REQUIREMENTS FOR VALVE APPLICATIONS

A. Drawings indicate valve types to be used. If valve applications are not indicated, use the following:

1. Shutoff Service: Ball, Butterfly, or Gate valves.
    a. Piping NPS 2 (DN 50) and smaller: Furnish bronze ball or gate valves.
2. Throttling - Balancing Service: Globe, Ball, or Butterfly valves.
    a. Piping NPS 2 (DN 50) and smaller: Furnish bronze ball or globe valves.
3. Drain Duty: Hose-end drain valves.
4. Cast-iron, grooved-end valves may be used with grooved-end piping.
5. Butterfly Valve Dead-End Service: Single-flange (lug) type.

B. Install shutoff valve close to water main on each branch and riser serving plumbing fixtures or equipment, on each water supply to equipment, and on each water supply to plumbing fixtures that do not have supply stops. Use ball or gate valves for piping NPS 2 (DN 50) and smaller. Use butterfly or gate valves for piping NPS 2-1/2 (DN 65) and larger.

C. Install drain valves for equipment at base of each water riser, at low points in horizontal piping, and where required to drain water piping.

1. Install hose-end drain valves at low points in water mains, risers, and branches.
2. Install stop-and-waste drain valves where indicated.

D. Install balancing valve in each hot-water circulation return branch and discharge side of each pump and circulator. Set balancing valves partly open to restrict but not stop flow. Use ball valves for piping NPS 2 (DN 50) and smaller and butterfly valves for piping NPS 2-1/2 (DN 65) and larger. Balancing valves are specified in Division 22 Section "Domestic Water Piping Specialties."

E. Install calibrated balancing valves in each hot-water circulation return branch and discharge side of each pump and circulator. Set calibrated balancing valves partly open to restrict but not stop flow. Calibrated balancing valves are specified in Division 22 Section "Domestic Water Piping Specialties."

F. If valves with specified CWP ratings are not available, the same types of valves with CWP ratings may be substituted.

G. Select valves, except wafer types, with the following end connections:

1. For Copper Tubing, NPS 2 (DN 50) and Smaller: Threaded, Sweat solder, or Press-to-fit ends.
2. For Steel Piping, NPS 2 (DN 50) and Smaller: Threaded or Welded ends.

3.8 VALVE SCHEDULE

VALVE TYPE	**SERVICE**
GATE - ALL SIZES	DOMESTIC COLD, HOT AND RECIRCULATING SYSTEMS; FOR OPERATION UP TO 200 PSI AT 500 F. FOR APPLICATIONS WHERE BALL VALVES ARE NOT SUITABLE.
GLOBE - ALL SIZES	WATER, STEAM AND AIR FOR PROCESS PIPING SYSTEMS. SUITABLE FOR THROTTLING SERVICE.
CHECK - ALL SIZES	WATER, AIR AND STEAM FOR PROCESS PIPING SYSTEMS.
BALL - ALL SIZES	DOMESTIC COLD WATER, HOT, AND RECIRCULATING SYSTEMS; FOR OPERATION UP TO 200 PSI AT 500 F.
BUTTERFLY - 2 IN. AND LARGER	DOMESTIC COLD WATER, HOT, AND (LINED) RECIRCULATING SYSTEMS; FOR OPERATION UP TO 200 PSI AT 500 F.
DRAIN	DOMESTIC WATER SYSTEMS

END OF SECTION 22 0523

SECTION 22 0529
HANGERS AND SUPPORTS FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, labor and supervision necessary to install pipe hangers and supports.

B. Pipe support systems shall secure pipes in place, prevent pipe vibration, provide vertical adjustment for maintaining required grades, and provide for expansion and contraction.

C. Where supports are attached to concrete or other structural members, care shall be taken to prevent damage or weakening of the structural members.

D. Where concrete inserts are to be used, it shall be this Contractor's responsibility to accurately locate and attach inserts to concrete forms.

1.2 REFERENCE STANDARDS

A. American National Standards Institute, ANSI:

1. ANSI B31.1 Power Piping
2. ANSI B31.9 Building Services Piping

B. Manufacturers Standardization Society of the Valve and Fittings Industry, MSS, 1815 North Fort Myer Drive, Arlington, VA 22209.

1. MSS SP-58: Pipe Hangers and Supports - Materials, Design and Manufacturer.
2. MSS SP-69: Pipe Hangers and Supports - Selection and Application.

C. Anvil International, 2 Holland Way, Exeter, NH 03833, www.anvilintl.com, (603) 418-2800.

1. Pipe Hangers and Supports Catalog (Jan. 2015)

1.3 DEFINITIONS

A. Pipe Hanger: A device normally suspended from structure and is used to carry the piping weight in tension.

B. Pipe Support: A device by which piping is normally carried from beneath and is used to carry the piping weight in compression.

1.4 SUBMITTALS

A. Submit manufacturer's product data on all hangers and support devices. Product data to include, but not be limited to materials, finishes, approvals, load ratings, and dimensional information.

PART 2 PRODUCTS

2.1 HANGERS AND SUPPORTS

A. Hangers and support devices shall be Anvil International Inc., Tolco, Fee and Mason, Michigan, B-Line or Engineer approved equivalent. Figure numbers within are based on Anvil International, Inc..

PART 3 EXECUTION

3.1 INSTALLATION - HORIZONTAL PIPE SUPPORTS

A. Hanger rods for steel, wrought iron and brass pipe shall be installed in accordance with MSS SP-69 Tables 3 and 4 and the following schedule:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1 1/4"	3/8"	7'-0"
1 1/2" and 2"	3/8"	9'-0"
2"	3/8"	10'-0"

B. Hanger rods for copper pipe and tube shall be installed in accordance with MSS-SP-69 Tables 3 and 4 and the following schedule:

Pipe Size	Rod Diameter	Maximum Spacing
1/2" and 3/4"	3/8"	5'-0"
1"	3/8"	6'-0"
1 1/4"	3/8"	7'-0"
1 1/2"	3/8"	8'-0"
2"	3/8"	8'-0"

C. Support horizontal cast iron soil pipe with two hangers for each pipe length. Locate hangers close to couplings.

D. In addition to the above specified spacings, install additional hangers at change in pipe direction and at concentrated loads, large valves and strainers.

E. Where more than one pipe is to be run parallel together, they may be supported on trapeze type hangers. Trapeze bar angles and hanger rods shall be of sufficient size to support the particular group of pipes. Trapeze hanger spacing shall be based on the smallest pipe on the rack. When hanging from light gauge metal trusses, coordinate pipe hanger spacing and hanger rod connection points with the truss manufacturer.

F. For suspending hanger rods from brackets attached to walls, use welded steel brackets: Fig. 194 for loads up to 750 lbs; Fig. 195 for loads up to 1500 lbs; Fig. 199 for loads up to 3000 lbs.

G. Where pipes are to be racked along walls, use " Unistrut" pipe racks or 12 gauge steel strut channel, 1-5/8" x 1-5/8" minimum.

1. Mount pipes to strut channel with two-piece pipe straps to match outside diameter of pipe including insulation.

H. Attach all pipe hangers from support rods using double locknuts tightened to prevent loosening.

3.2 INSTALLATION - VERTICAL PIPE SUPPORTS

A. Support vertical steel, wrought iron, copper and brass pipe at every other floor line.

B. Support vertical cast iron soil pipe at every floor line.

C. In addition to the above, support vertical pipes at base of riser with base fitting set on concrete or brick pier, or by hanger located on horizontal connection close to riser.

D. Where pipe sleeves extend above floor, place pipe clamps at ceiling below and support clamp extensions from inserts or other approved attachment.

3.3 PIPE ATTACHMENTS

A. For horizontal steel and wrought iron pipe, use carbon steel adjustable clevis hanger, Fig. 260. For floor support or support directly above steel beams, use adjustable pipe roll stand, Fig. 177.

B. For horizontal copper pipe and tube, use copper-plated, carbon steel adjustable swivel ring, Fig. CT-69.

C. When thermal expansion for horizontal pipe is in excess of ½" axially, use adjustable steel yoke pipe roll, Fig. 181, or adjustable pipe roll stand, Fig. 177.

D. For horizontal cast iron soil pipe, use carbon steel adjustable clevis hanger, Fig. 260.

E. For vertical steel, wrought iron and cast iron pipe, use extension pipe or riser clamps, Fig. 261.

F. For vertical copper pipe and tube, use copper-plated, copper plated copper tubing riser pipe clamp, Fig. CT-121.

3.4 INTERMEDIATE ATTACHMENTS

A. Hanger rods: Carbon steel single or double end threaded, Figs. 140, 253 as required. Continuous threaded rod, Fig. 146 may be used wherever possible.

B. Chain wire or perforated strap hangers will not be permitted. One pipe shall not be suspended from another pipe.

3.5 STRUCTURAL ATTACHMENTS

A. For attaching steel or copper plated hanger rods to reinforced concrete, use galvanized malleable iron universal concrete inserts; Fig. 282 for loads up to 1140 lbs.

B. For attaching steel hanger rods to structural steel beams, use malleable iron C-clamps; Fig. 92, Fig. 93 or Fig. 94 with retaining clip Fig. 89 or Fig. 89X for loads up to 500 lbs; Fig. 218 with extension piece for loads up to 1,365 lbs. For copper plated hanger rods, use copper plated malleable iron C-clamps; Fig. CT-138R for loads up to 180 lbs.

C. For attaching steel hanger rods to wood structural members, use malleable iron ceiling flange; Fig. 153 for loads up to 1,270 lbs. For copper plated hanger rods, use copper plated malleable iron ceiling flange: Fig. CT-128R for loads up to 180 lbs.

D. Vertical expansion shields or toggles shall not be used for suspending hanger rods, except with permission in cases where inserts have been omitted or cannot be used. If permitted, use expansion shields; for rod sizes up to ½", 320 lbs. max. load. For hanger rods larger than ½" use attachment plate, Fig. 52, with wedge anchors.

E. Powder actuated anchoring methods shall not be used.

3.6 PIPE COVERING PROTECTION

A. Hangers and supports for insulated piping shall not injure or pierce insulation. Provide insulation protection shields in conjunction with hanger or roll device. Use Fig. 160 and 165, Protection Saddles.

3.7 SUPPLEMENTAL STEEL

A. Provide supplemental steel as required to hang or support plumbing equipment or piping.

END OF SECTION 22 0529

SECTION 22 0553
IDENTIFICATION FOR PLUMBING PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide materials, equipment labor and supervision necessary to install piping identification products.

B. Comply with ANSI A13.1 for lettering size, length or color field, colors, and installed viewing angles of identification devices.

1.2 REFERENCE STANDARDS

A. ASME A13.1 - Scheme for the Identification of Piping Systems; The American Society of Mechanical Engineers; 2007.

B. ASTM D709 - Standard Specification for Laminated Thermosetting Materials; 2013.

1.3 SUBMITTALS

A. Submit manufacturer's product data.

B. Submit sample of each type of identification product and clearly identify the contents in a schedule.

C. List: Submit list of wording, symbols, letter size, and color coding for mechanical identification.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Brady Corp., Industrial Safety Supply, Emedco, Seton or Brimar.

B. Engineer approved alternative

2.2 PIPE MARKERS

A. Provide manufacturer's standard preprinted, semi-rigid snap-on or self-sticking, color-coded pipe markers, complying with ANSI A13.1.

B. Provide full-band pipe markers, extending 360° around pipe at each location or self-sticking pipe markers, fastened in the following method:

1. Snap-on application of pre-tensioned semi-rigid plastic pipe marker.
2. Secure to piping and install banding tape on both ends of each pipe label.

C. Lettering shall be manufacturer's pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance.

D. Print each pipe marker with arrows indicating direction of flow, integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic or on banding tape.

2.3 BRASS VALVE TAGS

A. Provide manufacturer's standard brass valve tags with stamped black filled lettering, with piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and

with 3/16" hole for fastener.

B. Provide 1-1/2" round brass tags with black lettering. Seton 250 BL or equal.

2.4 VALVE TAG FASTENERS

A. Manufacturer's standard solid brass chain or solid brass S-hooks of sizes required for proper attachment of tags to valves and manufactured specifically for that purpose.

2.5 VALVE SCHEDULE FRAMES

A. For each page of schedule, provide glazed display frame, with screws for removable mounting on masonry walls. Provide frames of finished hardwood or extruded aluminum, with SSD-grade sheet glass.

2.6 PIPING AND EQUIPMENT IDENTIFICATION

A. Piping systems that shall be identified by their controls (including directional arrows) on this project shall include, but are not necessarily limited to the following:

1. Domestic cold water and hot water recirculation.
2. Oil Waste and Oil Vent.
3. Sanitary and sanitary vent.

PART 3 EXECUTION

3.1 INSTALLATION OF MECHANICAL IDENTIFICATION

A. Where identification is to be applied to surfaces that require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

B. Install pipe markers on each system, and include arrows to show normal direction of flow.

C. Locate pipe markers as follows: wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) above lay-in type ceilings and exterior non-concealed locations.

1. Near each valve and control device.
2. Near each branch, excluding short take-offs for fixtures, mark each pipe at branch where there could be question of flow pattern.
3. Near locations where pipes pass through walls or floors/ceilings, (both sides) or center non-accessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. At each pipe passage to underground.
7. Spaced intermediately at maximum spacing of 50 feet along each piping run, except reduce spacing to 25 feet in congested areas of piping and equipment.
8. On piping above removable acoustical ceilings, maximum spacing of 10 feet along each piping run.
9. Where self-sticking labels are used, the pipe or its covering surface shall be properly prepared. This consists of removal of loose dirt, oil and grease, loose paint or peeling

insulation covering. This can be done with a brush and cloth; washing is not required. Use solvent for removal of oil or grease.

10. Banding tape must be used on both ends of all self-sticking labels. The tape shall encircle the pipe completely and overlap itself so the banding tape can adhere to itself.

D. Provide valve tags for all major valves 1/2" size or larger. Included are all main, zone and branch valves, valves in all equipment rooms, etc. All types of valves, ball, globe, butterfly, cocks, control, regulating, relief, reducing, solenoid, etc. are to be identified except check valves. Do not identify end use point valves for plumbing fixtures, and similar rough-in connections.

E. List each tagged valve in schedule for each system showing function and location. Provide separate charts for mechanical divisions of work. Charts shall be installed on a conspicuous wall in the main mechanical equipment room. Provide unframed copies of valve lists as part of closeout documents.

3.2 ADJUSTING AND CLEANING

A. Relocate any mechanical identification device which has become visually blocked by work of this division or by other divisions.

B. Clean face of identification devices and glass frames of valve schedules.

END OF SECTION 22 0553

SECTION 22 0700
PLUMBING INSULATION

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, labor and supervision necessary to install insulation to hot and cold surfaces of piping, tanks, ductwork, fittings and other surfaces.

B. Insulation shall include insulating materials, jackets, adhesive, mastic coatings, tie wire and other materials as required to complete the insulating work.

1.2 CODES AND STANDARDS

A. Insulating materials, jackets and mastics shall meet flame spread, fuel contribution and smoke developed ratings in accordance with NFPA-90A. Flame spread rating in accordance with NFPA 255, ASTM E-84, or UL 723 of not more than 25; smoke developed rating of not more than 50, unless otherwise noted in this section.

B. Insulation that has been treated with a flame-retardant additive to meet the flame spread and smoke developed ratings shown above is not permitted.

C. Insulation materials shall be non-corrosive to the materials they are applied to, including stress corrosion cracking of stainless steel and shall not breed or promote mold, fungus or bacteria.

D. Insulation shall meet or exceed all requirements of ASHRAE/IES 90.1 - Energy Standard for Buildings Except Low-Rise Residential Buildings .

1.3 QUALIFICATION

A. Insulating materials by Owens-Corning, Armacell, Pittsburgh-Corning, Knauf, Johns Manville, or Engineer approved equivalent.

B. Mastics and adhesives as recommended by insulation manufacturer.

1.4 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for each type of mechanical insulation and jacket. Submit schedule showing manufacturer's product number, flame spread and smoke development rating, k-value, density, temperature limitations, sound absorption coefficients, thickness, and furnished accessories for each mechanical system requiring insulation.

PART 2 PRODUCTS

2.1 INSULATION

A. Description:

1. Type A: Preformed, sectional, heavy density fiberglass insulation, suitable for operating temperatures form - 20 F to +850 F. Equipped with factory-applied, all-service vapor barrier jacket constructed of white Kraft paper bonded to aluminum foil reinforced with fiberglass yarn, with pressure-sensitive, self-sealing longitudinal laps and butt strips. Thermal conductivity of 0.23 BTU-in/hr-ft2- F @ 75 F mean temperature. Water vapor permeance of 0.02 perms. Johns Manville "Micro-Lok HP or Engineer approved equivalent.

2.2 PIPE INSULATION SCHEDULE

SERVICE	TYPE	THICKNESS	PIPE SIZES
DOMESTIC COLD	A	1/2"	LESS THAN 1-1/2" WATER
			1-1/2" AND LARGER

2.3 INSULATION JACKETS

A. 20-mil high impact PVC secured with spray contact adhesive. All PVC jacketing shall meet the 25/50 SDR. Manville "Zeston 2000" or equivalent.

B. 6-oz/sq yd UL listed cotton canvas fabric secured with Childers CP50 lagging adhesive.

C. Fitting and valve jackets shall be premolded PVC with joints and seams sealed with a spray contact adhesive or vapor barrier mastic. Premolded jackets shall be Manville "Zeston 2000" or approved equivalent.

D. At wall penetrations and on exterior pipe, provide an additional jacket of 0.020 inch thick smooth finish aluminum secured with 0.015 inch thick, 3/8-inch wide aluminum bands. Metal jacket shall have factory applied moisture barrier. Fitting and valve covers to be preformed of same material as adjacent metal jacket.

E. Where PVC or metal jackets are used, delete the factory applied ASJ on pipe and equipment operating above 75° F.

F. PVC jackets shall be used in the following areas and systems:

1. Whenever piping is routed exposed through occupied spaces.
2. Exposed piping in kitchens and dishwasher rooms.
3. Premolded PVC at all fittings and valve jackets.

PART 3 EXECUTION

3.1 GENERAL

A. Use only experienced applicators regularly engaged in the trade. Rough work will be rejected. Application details shall be in accordance with the insulation materials supplier's recommendations, except where a higher standard is specified.

B. Install materials after systems have been tested and approved. Material such as rust, scale, dirt and moisture shall be removed form surfaces to be insulated.

C. Insulation shall be kept clean and dry at all times.

D. Where pipes and ducts pass through fire rated walls, floors and partitions, a fire seal shall be provided.

3.2 PIPE INSULATION INSTALLATION

A. Insulate fittings, valves, unions, flanges, strainers, flexible connections and expansion joints with premolded or mitered segments of same insulating material as for adjacent pipe covering.

B. Pipe insulation shall continue through sleeves and hangers with vapor barrier and/or jacket.

C. Insert to be between support shield and piping but under the finish jacket. Provide an insert at hangars not less than 6 inches long, of same thickness and contour as adjoining insulation, to prevent insulation from sagging at support points. Inserts shall be heavy density insulating material suitable for the planned temperature range. Factory fabricated inserts may be used.

D. Neatly finish insulation at supports, protrusions and interruptions.

   1. On cold systems, valve stems shall be sealed with caulking which allows free movement of the stem, but provides a seal against moisture incursion.

E. Wherever piping penetrates a floor or is exposed in a finished area such as kitchens, furnish a floor pipe escutcheon and/or PVC (white) jacket to protect insulation and allow for a smooth finish for cleaning.

END OF SECTION 22 0700

SECTION 22 1116
DOMESTIC WATER PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, tools, labor, and supervision necessary to furnish, fabricate, and install complete piping system.

1.2 CODES AND STANDARDS

A. Pipe materials specified in this Section shall apply to technical sections of Division 22 of the Project Manual where applicable. Special requirements as may be called for in the technical sections, or shown on the Drawings, shall take precedence over General Requirements herein. Piping located in plenums shall be plenum rated for fire and smoke.

B. Lead Free: Refers to the wetted surface of pipe, fittings and fixtures in potable water systems that have a weighted average lead content =0.25% per Safe Drinking Water Act as amended January 4, 2011, Section 1417 .

C. NSF Compliance: NSF/ANSI 61 and/or NSF/ANSI 372 for valve materials for potable-water service. Valves for domestic water must be 3rd Party Certified.

1.3 PRODUCT HANDLING

A. Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage, and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

C. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

1.4 SUBMITTALS

A. For each system served: Submit piping schedule listing, by range of sizes, piping material used.

B. Submit manufacturer's specifications and/or catalog data including material and pressure test certifications for pipe, fittings, valves, and other related items including but not limited to pipe hangers and supports.

C. Locations of connections to existing water lines, service lines, valves, and water main appurtenances shall be submitted as a dimensioned drawing Owner's Representative or Architect/Engineer for construction record purposes.

PART 2 PRODUCTS

2.1 MATERIAL

A. Piping:

MATERIAL	SERVICE	
Ductile iron water pipe, standard joint. ASTM A 536. ANSI A21.5	Underground water service main 3" dia. and larger.	mechanical AWWA C151

Copper water tube, hard temper ASTM B88:

Type K Domestic water piping lines under building, concealed in solid concrete or masonry walls or construction; underground water service up to 3" dia.

Type L Aboveground domestic water piping lines.

Brass pipe, Schedule 40, chromium ASTM B43 Exposed piping connections for plumbing fixtures, showers and chrome plated tanks. plated,

B. Fittings:

1. Cast iron water pipe - Class 250, ANSI A21.20, AWWA C110, standard mechanical joint fitting with lugs for connecting to pipe.
2. Threaded pipe - ASME B16.3 malleable iron fittings, 125-pound, standard flat band water pattern.
3. Copper water tube, cast bronze or wrought copper, solder joint type. ANSI B16.18 and B16.22.
4. Copper water tube, cast bronze or wrought copper, press fitting joint type. ANSI B16.18 and B16.22. EPDM sealing elements.
5. Brass pipe - cast bronze screwed, 125 pound, flat band water pattern, chromium plated, for chromium-plated pipe.

2.2 JOINTS

A. Threaded pipe - make joints using approved pipe joint compound, applied to male threads only. Cut pipe square, cut threads clean, remove burrs, and ream ends to full size of bore. Threads shall not be exposed on chromium-plated pipe.

B. Copper water and drainage tube - use 95-5 tin antimony or silver solder, cut pipe square, clean and polish tube ends and inner surface of fittings, apply flux and solder joint as recommended by manufacturer of solder type fittings. Use same methods for copper refrigerant pipe, except use silver solder with 15% silver content, equivalent to Sil-Flos 15.

C. Copper water and drainage tube press joints - Compression sealing via integral internal EPDM gaskets via use of specialized tools. Assured leakage path feature to assist installer in determining un-pressed joint assembly condition.

D. Threadless brass pipe - use brazing alloy which will flow freely at 1300 degree F. Use flux and brazing method as recommended by manufacturer of brazing alloy.

E. When soldering use paste fluxes that are approved by the manufacturer for use with Lead Free Alloys.

2.3 NIPPLES AND UNIONS

A. Nipples shall conform to size, weight, and strength of adjoining pipe. When length of unthreaded portion of nipple is less than 1-1/2", use extra strong nipple; do not use close nipples.

B. For pipe 3" and smaller, use screwed unions; over 3", use flanged unions. For steel and wrought iron pipe, use malleable iron ground joint unions, black or galvanized, to conform to pipe. Cast iron flanged unions are to be gasket type. For threaded brass pipe, use bronze ground joint unions with octagon ends. Install unions on equipment intended to be disassembled.

C. Dielectric unions shall be installed between connections of copper pipe and ferrous piping.

2.4 SLEEVES

A. Floor sleeves shall be provided by the contractor. Coordinate with existing structure and notify engineer if structure interferes with design.

B. Sleeves passing through non-load bearing walls and partitions shall be galvanized sheet steel with lock seam joints of minimum gauges as follows: For pipes 2-1/2" in size and smaller - 24-gauge; 3 in. to 6 in. - 22-gauge; over 6 in. - 20-gauge.

C. Sleeves passing through load bearing walls, concrete beams, fireproof walls, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe or cast iron pipe.

D. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.

E. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions and ceilings, and shall extend 1/2 in. above finished floors. Extend sleeves 1 in. above finished floors in areas likely to entrap water and fill space between sleeves and pipe with graphite packing and caulking compound.

F. Sleeves passing through membrane waterproofing or roofing shall be flashed and sealed.

2.5 PIPE ESCUTCHEONS

A. Provide pipe escutcheons with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extensions, if any. Furnish pipe escutcheons with chrome finish for occupied areas, prime paint finish for unoccupied areas.

B. Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.

C. Pipe Escutcheons for Dry Areas: Provide sheet steel escutcheons, solid or split hinged.

D. Manufacturer: Chicago Specialty; Producers Specialty; or Sanitary-Dash.

2.6 GUARDS

A. Where exposed insulated piping extends through floor, provide sheet metal guard around insulation to extend up from floor 60 inches. Guard to be galvanized sheet steel not less than 26-gauge.

2.7 FIRE SAFING

A. Metal piping and sleeves passing through floors, roof, partitions and fire walls, shall be provided with firestop by packing space between pipe and sleeve with UL listed non-sag and self-leveling fire safing insulation per manufacturer's instructions.

B. Plastic piping passing through fire rated floors and fire rated walls shall be provided with firestop by providing intumescent wrap strip around the pipe, enclosed in steel collar attached to structure.

C. Cracks, Voids, or Holes Up to 4" Diameter: Use non-sag or self-leveling putty or caulking, one-piece intumescent elastomer, non-corrosive to metal, compatible with synthetic cable jackets, and capable of expanding 10 times when exposed to flame or heat, UL listed.

D. Openings 4" or Greater: Use sealing system capable of passing 3-hour fire test in accordance with ASTM E814, consisting of wall wrap or liner, partitions, and end caps capable of

expanding when exposed to temperatures of 250 to 350 degree F (121 to 177 degree C), UL listed.

E. Seal all holes or voids made by penetrations to ensure an effective barrier against smoke, fire, toxic and combustible gases.

F. Unless protected, from possible loading or traffic, install firestopping materials in floors having void openings or four (4) inches or more to support the same floor load requirements.

G. Manufacturer: Subject to compliance with requirements, provide non-sag and self-leveling fire barrier caulk, wrap/strip, moldable putty and sheet forms of one of the following:

1. 3M Brand.
2. Flame Stop.
3. Dow Corning.
4. Metacaulk.

H. Horizontal penetrations through fire rated walls where plenum rated cables or tubing bundles are being installed shall be made with EZ-Path Fire-rated Pathway by Specified Technologies, Inc.

2.8 MECHANICAL SLEEVE SEALS

A. Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

B. Manufacturer: Thunderline.

2.9 WATER METERS

A. Consult with Utility as to extent of work, costs, fees, and permits involved. Pay such costs and fees; obtain permits.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install pipe for plumbing and mechanical systems as shown on the Drawings, as called for in other Sections, and as specified herein

B. Arrange and install piping approximately as indicated, straight, plumb, and as direct as possible, form right angles on parallel lines with building walls. Keep pipes close to walls, partitions, and ceilings, offsetting only where necessary to follow walls and avoid interference with other mechanical items. Locate groups of pipes parallel to each other; space at a distance to permit applying full insulation and to permit access for servicing valves. Piping to be run in concealed locations unless indicated exposed, or in equipment rooms.

C. Install horizontal piping as high as possible without sags or humps so that proper grades can be maintained for drainage. Branch piping shall come off the tops of mains unless shown otherwise.

D. Locate valves within reachable distance from equipment being served for easy access and operation. Do not locate valves with stems below horizontal.

E. Check piping for interference with other trades; avoid placing water pipes over electrical equipment.

F. Verify final equipment locations before roughing in.

G. Where rough-ins are required for equipment furnished by others, verify exact rough-in dimensions with Owner or equipment supplier before roughing-in.

H. Press fit piping connections shall be made in accordance with manufacturer's installation instructions, using the manufacturer's approved tools and methods. Installation must meet or exceed IAPMO PS 117 functional performance criteria.

3.2 WATER METER INSTALLATION

A. Rough-in domestic water piping for water meter installation according to Utility company's requirements.

B. Water meters will be provided and installed by Utility company. Contractor shall pay required costs and fees.

3.3 SLEEVES

A. Install sleeves for piping passing through floors, roof, walls and foundations.

B. Install fire-proofing per manufacturer's written instructions.

3.4 ESCUTCHEONS

A. Install escutcheons for pipes entering finished spaces.

3.5 MECHANICAL SLEEVE SEAL INSTALLATION

A. Install mechanical sleeve seals at all pipe penetrations through foundations below grade.

B. Loosely assemble rubber links around pipe and bolts and pressure plates located under each bolt head and nut. Push into sleeve and center. Tighten bolts until links have expanded to form watertight seal.

3.6 PIPE PENETRATIONS

A. Penetrations shall be free of debris and dirt. Dam the penetration (when required) with an acceptable material. Apply firestop material to the penetration per manufacturer's installation instructions. Use a caulking gun, putty knife or other normal trade tools. Remove damming materials where necessary after cure. Clean up with Xylene.

3.7 FIRE SAFING

A. Install fire safing at all penetrations through walls, floors, etc. per manufacturer's installation instructions as required to meet UL listing.

3.8 FIELD QUALITY CONTROL

A. Inspect domestic water piping as follows:

1. Do not enclose, cover, or put piping into operation until it has been inspected and approved by authorities having jurisdiction.

2. During installation, notify authorities having jurisdiction at least 24 hours before inspection must be made. Perform tests specified below in presence of authorities having jurisdiction:

a. Roughing-in Inspection: Arrange for inspection of piping before concealing or closing-in after roughing-in and before setting fixtures.

b. Final Inspection: Arrange final inspection for authorities having jurisdiction to observe tests specified below and to ensure compliance with requirements.

3. Re-inspection: If authorities having jurisdiction find that piping will not pass test or inspection, make required corrections and arrange for re-inspection.
4. Reports: Prepare inspection reports and have them signed by authorities having jurisdiction.

B. Test domestic water piping as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
3. Leave new, altered, extended, or replaced domestic water piping uncovered and unconcealed until it has been tested and approved. Expose work that was covered or concealed before it was tested.
4. Cap and subject piping to static water pressure of 50 psig (345 kPa) above operating pressure, without exceeding pressure rating of piping system materials. Isolate test source and allow to stand for four hours. Leaks and loss in test pressure constitute defects that must be repaired.
5. Repair leaks and defects with new materials and retest piping or portion thereof until satisfactory results are obtained.
6. Prepare reports for tests and required corrective action.

C. Inspect grooved mechanical coupler joint and press joint systems for proper installation and leak free integrity per the manufacturer's installation requirements. Prepare and submit certified inspection reports and include approved copies in the OMM record documentation.

3.9 ADJUSTING

A. Perform the following adjustments before operation:

1. Close drain valves, hydrants, and hose bibbs.
2. Open shutoff valves to fully open position.
3. Open throttling valves to proper setting.
4. Remove plugs used during testing of piping and plugs used for temporary sealing of piping during installation.
5. Remove and clean strainer screens. Close drain valves and replace drain plugs.
6. Remove filter cartridges from housings and verify that cartridges are as specified for application where used and are clean and ready for use.
7. Check plumbing specialties and verify proper settings, adjustments, and operation.

3.10 CLEANING

A. Domestic water piping shall be cleaned and disinfected prior to substantial completion. Immediately prior to occupancy, the system(s) shall be flushed and a water sample submitted to the local Water Works for testing.

B. Clean and disinfect potable domestic water piping as follows:

1. Purge new piping and parts of existing domestic water piping that have been altered, extended, or repaired before using.
2. Use purging and disinfecting procedures prescribed by authorities having jurisdiction or, if methods are not prescribed, procedures described in either AWWA C651 or AWWA C652 or as described below:

a. Flush piping system with clean, potable water until dirty water does not appear at outlets.

b. Fill and isolate system according to either of the following:

1) Fill system or part thereof with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours.

2) Fill system or part thereof with water/chlorine solution with at least 200 ppm (200 mg/L) of chlorine. Isolate and allow to stand for three hours.

(a) Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.

(b) Submit water samples in sterile bottles to authorities having jurisdiction. Repeat procedures if biological examination shows contamination.

C. Clean interior of domestic water piping system. Remove dirt and debris as work progresses.

D. Prepare and submit reports of purging and disinfecting activities.

END OF SECTION 22 1116

SECTION 22 1316
SANITARY WASTE AND VENT PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, tools, labor, and supervision necessary to furnish, fabricate, and install a complete soil, waste and vent system.

1.2 CODES AND STANDARDS

A. Pipe materials specified in this Section shall apply to other technical sections of Division 22 of the Project Manual where applicable. Special requirements as may be called for in the technical sections, or shown on the Drawings, shall take precedence over General Requirements herein. Piping located in plenums shall be plenum rated for fire and smoke.

B. Local and/or State Plumbing, Mechanical and Building Codes

C. Uniform Plumbing Code

D. International Mechanical Code

E. NFPA Codes and Standards

1.3 PRODUCT HANDLING

A. Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage, and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

C. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

1.4 SUBMITTALS

A. For each system served: Submit piping schedule listing, by range of sizes, piping material used.

B. Submit product and performance data for equipment specified herein

C. Locations of connections to existing sanitary sewer lines, storm water lines, and related invert elevations shall be submitted as a dimensioned drawing to the Owner's Representative or Architect/Engineer for construction record purposes.

PART 2 PRODUCTS

2.1 SANITARY SEWERS, SOIL, WASTE AND VENT MATERIALS

A. Piping:

MATERIAL	SERVICE
Cast iron soil pipe, service weight, bell and spigot, ASTM A74.	
Asphalt coated	Sanitary and storm sewers.

Uncoated Above ground soil, waste, vent and downspouts 3" dia. and larger.

Cast iron soil pipe, service weight, no hub Above ground sanitary and storm sewers. CISPI 301, ASTM A888. Soil, waste, vent and downspouts as permitted by Code.

Copper water tube, hard temper, ASTM B88.

Type M Above ground soil, waste, vent and downspouts up to and including 3" dia.

Copper drainage tube, hard temper, Above ground soil, waste, vent and downspouts Type DWV, ASTM B306. up to and including 2-1/2" dia. as permitted by Code.

Solid wall Schedule 40 PVC pipe, Below ground soil, waste and vent piping. ASTM D2665, (DWV) drain, waste and vent.

Solid wall Schedule 40 PVC pipe, Above ground soil, waste and vent piping. ASTM D2665, (DWV) drain, waste and vent.

B. Fittings

1. Material and strength of fittings for cast sewer pipes, clay sewer pipes, and concrete sewer pipe shall conform to pipe as per ASTM Standards.
2. Ductile iron and grey Iron fittings - Class 250, ANSI/AWWA C110 A21.10, standard mechanical joint fitting with lugs for connecting to pipe.
3. Copper drainage tube (M) - Cast bronze fittings, solder joint fittings. ANSI B.16, 23-69.
4. Solid wall Schedule 40 PVC DWV - solvent cemented joints per ASTM D2665.

C. Joints

1. Cast iron bell and spigot soil pipe - pipe manufacturer's standard preformed, preset plastic or rubber joint, installed in accordance with manufacturer's instructions.
2. Cast iron no-hub pipe - coupling assembly tightened by torque wrench.
    a. Conforming to ASTM C1540 Performance Requirements, CISPI 310, and NSF certified, type 300 series stainless steel shield secured by two or more stainless steel worm drive clamps, ASTM C564 gasket , one piece neoprene compression gasket.
    b. Manufacturers:
        1) Clamp All: Hi-Torq 80
        2) MG Coupling
        3) Ideal Tridon
        4) Engineer approved equivalent
3. Copper water and drainage tube - use 95-5 tin antimony or silver solder, cut pipe square, clean and polish tube ends and inner surface of fittings, apply flux and solder joint as recommended by manufacturer of solder type fittings. Use same methods for copper refrigerant pipe, except use silver solder with 15% silver content, equivalent to Sil-Flos 15.
4. Solid wall Schedule 40 PVC DWV - solvent cemented joints per ASTM D2665.

2.2 VENTS

A. Vents through the roof shall be cast iron and shall extend at least above the highest possible water level on the roof but in no case less than 12 inches.

B. Provide a flashing of 4 pound sheet lead for each vent through the roof. The flashing shall extend up around the pipe and turn down into it at least 2 in. and shall extend over the roof deck at least 1 ft. in each direction from the base.

C. Coordinate flashing of vents through the roof with General Contractor or Roofing Contractor.

D. Where vents through the roof are subject to frost or snow closure the vent termination shall be increased beginning at least 12 in. under the roof with a cast iron long increaser. Size increasers as follows:

Vent Size	Increase To
1-1/4 in. and 1-1/2 in.	3 in. minimum
2 in. and 2-1/2 in.	4 in. minimum

2.3 SLEEVES

A. Sleeves passing through non-load bearing walls and partitions shall be galvanized sheet steel with lock seam joints of minimum gauges as follows: For pipes 2-1/2" in size and smaller - 24-gauge; 3 in. to 6 in. - 22-gauge; over 6 in. - 20-gauge.

B. Sleeves passing through load bearing walls, concrete beams, fireproof walls, foundations, footings, and waterproof floors shall be Schedule 40 galvanized steel pipe or cast iron pipe.

C. Sleeves for insulated piping shall be of sufficient internal diameter to take pipe and insulation and to allow for free movement of pipe. Waterproof sleeves shall be of sufficient internal diameter to take pipe and waterproofing material.

D. In finished areas where pipes are exposed, sleeves shall be terminated flush with wall, partitions and ceilings, and shall extend 1/2 in. above finished floors. Extend sleeves 1 in. above finished floors in areas likely to entrap water and fill space between sleeves and pipe with graphite packing and caulking compound.

E. Sleeves passing through membrane waterproofing or roofing shall be flashed and sealed.

2.4 PIPE ESCUTCHEONS

A. Provide pipe escutcheons with inside diameter closely fitting pipe outside diameter, or outside of pipe insulation where pipe is insulated. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, or ceilings; and pipe sleeve extensions, if any. Furnish pipe escutcheons with chrome finish for occupied areas, prime paint finish for unoccupied areas.

B. Pipe Escutcheons for Moist Areas: For waterproof floors, and areas where water and condensation can be expected to accumulate, provide cast brass or sheet brass escutcheons, solid or split hinged.

C. Pipe Escutcheons for Dry Areas: Provide sheet steel escutcheons, solid or split hinged.

D. Manufacturer: Chicago Specialty; Producers Specialty; or Sanitary-Dash.

2.5 GUARDS

A. Where exposed insulated piping extends through floor, provide sheet metal guard around insulation to extend up from floor 60 inches. Guard to be galvanized sheet steel not less than 26-gauge.

2.6 FIRE SAFING

A. Metal piping and sleeves passing through floors, roof, partitions and fire walls, shall be provided with firestop by packing space between pipe and sleeve with UL listed non-sag and self-leveling fire safing insulation per manufacturer's instructions.

B. Plastic piping passing through fire rated floors and fire rated walls shall be provided with firestop by providing intumescent wrap strip around the pipe, enclosed in steel collar attached to structure.

C. Cracks, Voids, or Holes Up to 4" Diameter: Use non-sag or self-leveling putty or caulking, one-piece intumescent elastomer, non-corrosive to metal, compatible with synthetic cable jackets, and capable of expanding 10 times when exposed to flame or heat, UL listed.

D. Openings 4" or Greater: Use sealing system capable of passing 3-hour fire test in accordance with ASTM E814, consisting of wall wrap or liner, partitions, and end caps capable of expanding when exposed to temperatures of 250 to 350oF (121 to 177oC), UL listed.

E. Seal all holes or voids made by penetrations to ensure an effective barrier against smoke, fire, toxic and combustible gases.

F. Unless protected, from possible loading or traffic, install firestopping materials in floors having void openings or four (4) inches or more to support the same floor load requirements.

G. Manufacturer: Subject to compliance with requirements, provide non-sag and self-leveling fire barrier caulk, wrap/strip, moldable putty and sheet forms of one of the following:

1. 3M Brand.
2. Flame Stop.
3. Dow Corning.
4. Metacaulk.

2.7 MECHANICAL SLEEVE SEALS

A. Modular mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

B. Manufacturer: Thunderline.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install underground building drains as shown and in accordance with the Uniform Plumbing Code. Lay underground building drains beginning at low point of systems, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install required gaskets in accordance with manufacturer's recommendations for use of lubricants, cements, and other special installation requirements. Clean interior of piping of dirt and other superfluous material as work progresses. Maintain swab or drag in line and pull past each joint as it is completed. Place plugs in ends of uncompleted piping at end of day or whenever work stops.

B. Follow indicated lines generally, but make exact layout on the job to work actual fitting dimensions, align piping, and avoid interference. Provide proper support to maintain uniform fall of 1/4 in. per ft. for lines 3 in. and smaller and 1/8 in. per ft. for lines larger than 3 inches. Protect openings against the entrance of dirt.

C. No soil or waste pipe shall be covered by earth or concealed by construction without first being proven free of leaks by means of a hydrostatic water test of no less than 10-feet of head or pneumatic air test of no less than 5 PSI. Pressure shall be held constant for a period of not less than 15 minutes before begining inspection or 15 minutes without the addition of air. Plastic pipe shall not be tested by air.

D. Install vents in practical alignment and supported with constant pitch back to the drainage system, concealed from finished spaces, unless shown or directed otherwise.

E. Soil, waste and vent connections to fixtures shall be accurately located and concealed from finished spaces, unless shown otherwise.

F. Refer to Division 31 - Earthwork for excavating, trenching, and backfilling requirements.

G. Contractor shall verify existing tie-in invert elevations of sanitary sewer piping prior to installation of new piping. Coordinate the site sewer tie-in invert elevation with the site utility contractor. Existing tie-in inverts that are discovered to be different from the information on the bid documents shall be reported to the General Contractor or Construction Manager and the Engineer immediately.

H. Install no-hub couplings and uniformly tighten clamps to manufacture's recommended torque specifications. No-hub coupling joints shall be properly supported so as to not be exposed to bending.

3.2 SLEEVES

A. Install sleeves for piping passing through floors, roof, walls, concrete beams, and foundations.

B. Install fire-proofing per manufacturer's written instructions.

3.3 ESCUTCHEONS

A. Install escutcheons for pipes entering finished spaces.

3.4 MECHANICAL SLEEVE SEAL INSTALLATION

A. Install mechanical sleeve seals at all pipe penetrations through foundations below grade.

B. Loosely assemble rubber links around pipe and bolts and pressure plates located under each bolt head and nut. Push into sleeve and center. Tighten bolts until links have expanded to form watertight seal.

3.5 PIPE PENETRATIONS

A. Penetrations shall be free of debris and dirt. Dam the penetration (when required) with an acceptable material. Apply fire stop material to the penetration per manufacturer's installation instructions. Use a caulking gun, putty knife or other normal trade tools. Remove damming materials where necessary after cure. Clean up with Xylene.

3.6 FIRE SAFING

A. Install fire safing at all penetrations through walls, floors, etc. per manufacturer's installation instructions as required to meet UL listing.

3.7 TESTING AND CLEANING

A. Provide labor, materials, facilities, and administration required to conduct the tests required under this section. Tests which fail to meet the specified performance shall be retested at no expense to the Owner. Repair all defective installations.

B. Flush out piping system with clean water before proceeding with required tests. Inspect each run of each system for completion of joints, supports and accessory items.

C. Testing shall be done in compliance with the Uniform Plumbing Code and to the satisfaction of the Authorities Having Jurisdiction.

D. Perform final testing after all fixtures have been set and all traps have been filled with water.

E. Hydraulic Water Testing:

1. Hydraulically pressure test each section or segment of the soil, waste and vent system prior to backfilling, encasing, enclosing or otherwise preventing visual observation of the section or segment being tested or access to repair if needed.
2. The system and all joints shall be tested with no less than 10 feet head of water pressure. Top of test standpipe to be filled with water shall be a minimum of 10 feet above the highest point of section being tested.
3. The water shall be kept in the tested system or sub-section for not less than 15 minutes before inspection for leakage begins.
4. All leaks shall be promptly repaired by replacing damaged or defective components with new parts and system shall be re-tested, repeating repair and re-testing steps as-needed, without additional cost to the Owner, until system is certified tight and leak free.

F. Pneumatic Air Pressure Testing:

1. Plastic piping shall not be tested with air. Do not overpressurize the system beyond maximum rating.
2. Pneumatically pressure test with air each section or segment of the soil, waste and vent system prior to backfilling, encasing, enclosing or otherwise preventing visual observation of the section or segment being tested or access to repair if needed.
3. The system and all joints shall be tested using an air compressor and pressure gauge or manometer testing apparatus.
4. Fill tested system with air to a uniform, stabilized gauge pressure of 5 PSI. The system shall be held at the test pressure without the addition of air for a period of not less than 15 minutes.
5. All leaks shall be promptly repaired by replacing damaged or defective components with new parts and system shall be re-tested, repeating repair and re-testing steps as-needed, without additional cost to the Owner, until system is certified tight and leak free.

END OF SECTION 22 1316

SECTION 22 1319
SANITARY WASTE PIPING SPECIALTIES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, labor and supervision neccessary to install soil, waste and vent system.

1.2 CODES AND STANDARDS

A. Local and/or State Plumbing, Mechanical and Building Codes

B. Uniform Plumbing Code

C. International Mechanical Code

D. NFPA Codes and Standards

1.3 SUMMARY

A. This Section includes the following sanitary drainage piping specialties:

1. Floor drains.
2. Cleanouts.
3. Trench drains
4. Miscellaneous sanitary drainage piping specialties.

1.4 DEFINITIONS

A. ABS: Acrylonitrile-butadiene-styrene plastic.

B. FRP: Fiberglass-reinforced plastic.

C. HDPE: High-density polyethylene plastic.

D. PE: Polyethylene plastic.

E. PP: Polypropylene plastic.

F. PVC: Polyvinyl chloride plastic.

1.5 SUBMITTALS

A. Product Data: For each type of product indicated, include rated capacities, operating characteristics, and accessories.

B. Installation, Operations and Maintenance data. Include signed copies of certified testing results reports.

1.6 QUALITY ASSURANCE

A. Drainage piping specialties shall bear label, stamp, or other markings of specified testing agency.

B. Comply with NSF 14, "Plastics Piping Components and Related Materials," for plastic sanitary piping specialty components.

PART 2 PRODUCTS

2.1 CLEANOUTS

A. General:

1. Floor:

a. In floors of finished areas - epoxy coated, cast iron caulking ferrule for soil pipe hub with brass countersunk plug and cast brass round flush access cover with polished top. Furnish carpet flange and cover and cleanout ID marker for all carpeted areas.

b. In floors of unfinished areas - epoxy coated, cast iron with tapered body for caulking into soil pipe hub, with brass countersunk plug.

B. Manufacturers: Subject to compliance with requirements, provide clean outs by one of the following:

1. Zurn Plumbing Products Group
2. J.R. Smith
3. Wade
4. Watts Drainage Products Inc.
5. Engineer approved equivalent

2.2 FLOOR DRAINS

A. General:

1. Body: Floor and shower drains shall be epoxy coated cast iron with bottom outlet, convertible membrane clamp, adjustable collar with seepage slots.
2. Strainer: Polished heavy duty vandal-proof secured polished nickel bronze strainer and removable sediment bucket.
3. End Connections: hub and spigot, hubless, or threaded.

B. Sizes: Refer to Project Drawings and Schedules.

C. Traps and Seals:

1. Drains without integral traps shall have service weight cast iron P traps.
2. Provide trap primers on all floor drains and on other drains as shown on Drawings.

D. Seepage Pans:

1. Provide seepage pans of four pound sheet lead or Chloraloy 240 plastic at least 3' -0" square for all floor drains over open space. Lead, if used, shall be thoroughly coated with asphaltum before it is placed in contact with concrete or concrete fill is poured over it.
2. Provide seepage pans of four-pound sheet lead or Chloraloy 240 plastic to cover total area of showers over open spaces. Pan shall turn up at ends at least 9 inches and corners shall be folded and properly sealed. Lead, if used, shall be thoroughly coated with asphaltum before it is placed in contact with concrete or concrete fill is poured over it
3. Flashing clamps and auxiliary drainage rims shall be provided for all drains that are to receive seepage pans.

E. Manufacturers: Subject to compliance with requirements, provide clean outs by one of the following:

1. Zurn Plumbing Products Group
2. J.R. Smith
3. Wade
4. Watts Drainage Products Inc.
5. Engineer approved equivalent

2.3 TRENCH DRAINS

A. General:

1. ASME A112.6.3 - compliant floor and trench Drains.

B. Construction:

1. Epoxy coated cast iron with vertically and horizontally adjustable bottom outlet and anchor flange.
2. 0% water absorbent high density polyethylene (HDPE) with bottom outlet and anchor flange.
3. Membrane Clamping Device: Required.
4. Seepage Pan: Required
5. Strainer: Bottom dome and Removable stainless steel basket.

C. Grating: Vandal proof reinforced medium duty slotted, class A, polished nickel bronze grating.

D. Manufacturers: Subject to compliance with requirements, provide a comparable product by one of the following:

1. Josam Company
2. Jay R. Smith Mfg. Co.
3. Mifab, Inc.
4. Tyler Pipe; Wade Div.
5. Watts Drainage Products Inc.
6. Zurn Plumbing Products Group
7. Engineer approved equivalent

2.4 MISCELLANEOUS SANITARY DRAINAGE PIPING SPECIALTIES

A. Deep-Seal Traps

1. Description: Epoxy coated cast iron, with inlet and outlet matching connected piping and cleanout trap-seal primer valve connection.
2. Size: Same as connected waste piping.
   a. NPS 2 (DN 50): 4-inch- (100-mm-) minimum water seal.
   b. NPS 2-1/2 (DN 65) and Larger: 5-inch- (125-mm-) minimum water seal.

B. Air-Gap Fittings

1. Description: Epoxy coated cast iron body, ASME A112.1.2, designed to ensure fixed, positive air gap between installed inlet and outlet piping.
2. Size: Outlet shall be same size as connected waste piping and with inlet large enough for associated indirect waste piping. Unless noted otherwise the inlet to the air gap fitting shall be a larger size than the discharge of the piping leading into it.

C. Expansion Joints

1. Description: ASME A112.21.2M compliant. Cast iron body with bronze sleeve, packing and gland.
2. End Connections: hub and spigot, hubless, or threaded. Match piping connections.
3. Size: Same as connected soil, waste, or vent piping.

2.5 FLASHING MATERIALS

A. Lead Sheet: ASTM B 749, Type L51121, copper bearing, with the following minimum weights and thicknesses, unless otherwise indicated:

1. General Use: 4.0-lb/sq. ft. (20-kg/sq. m), 0.0625-inch (1.6-mm) thickness.
2. Vent Pipe Flashing: 3.0-lb/sq. ft. (15-kg/sq. m), 0.0469-inch (1.2-mm) thickness.
3. Burning: 6-lb/sq. ft. (30-kg/sq. m), 0.0938-inch (2.4-mm) thickness.

B. Copper Sheet: ASTM B 152/B 152M, of the following minimum weights and thicknesses, unless otherwise indicated:

1. General Applications: 12 oz./sq. ft. (3.7 kg/sq. m or 0.41-mm thickness).
2. Vent Pipe Flashing: 8 oz./sq. ft. (2.5 kg/sq. m or 0.27-mm thickness).

C. Zinc-Coated Steel Sheet: ASTM A 653/A 653M, with 0.20 percent copper content and 0.04-inch (1.01-mm) minimum thickness, unless otherwise indicated. Include G90 (Z275) hot-dip galvanized, mill-phosphatized finish for painting if indicated.

D. Elastic Membrane Sheet: ASTM D 4068, flexible, chlorinated polyethylene, 40-mil (1.01-mm) minimum thickness.

E. Fasteners: Metal compatible with material and substrate being fastened.

F. Metal Accessories: Sheet metal strips, clamps, anchoring devices, and similar accessory units required for installation; matching or compatible with material being installed.

G. Solder: ASTM B 32, lead-free alloy.

H. Bituminous Coating: SSPC-Paint 12, solvent-type, bituminous mastic.

PART 3 EXECUTION

3.1 INSTALLATION

A. Refer to Division 22 Section "Common Work Results for Plumbing" for piping joining materials, joint construction, and basic installation requirements.

B. Install wood-blocking reinforcement for wall-mounting-type specialties.

C. Install cleanouts in aboveground piping and building drain piping according to the following, unless otherwise indicated:

1. Size same as drainage piping up to NPS 4 (DN 100). Use NPS 4 (DN 100) for larger drainage piping unless larger cleanout is indicated.
2. Locate at each change in direction of piping greater than 45 degrees.
3. Locate at minimum intervals of 50 feet (15 m) for piping NPS 4 (DN 100) and smaller and 100 feet (30 m) for larger piping.
4. Locate at base of each vertical soil and waste stack.

D. For floor cleanouts for piping below floors, install cleanout deck plates with top flush with finished floor.

E. For cleanouts located in concealed piping, install cleanout wall access covers, of types indicated, with frame and cover flush with finished wall.

F. Install floor drains at low points of surface areas to be drained. Set grates of drains flush with finished floor, unless otherwise indicated.

1. Position floor drains for easy access and maintenance.
2. Set floor drains below elevation of surrounding finished floor to allow floor drainage. Set with grates depressed according to the following drainage area radii:
   a. Radius, 30 Inches (750 mm) or Less: Equivalent to 1 percent slope, but not less than 1/4-inch (6.35-mm) total depression.
   b. Radius, 30 to 60 Inches (750 to 1500 mm): Equivalent to 1 percent slope.
   c. Radius, 60 Inches (1500 mm) or Larger: Equivalent to 1 percent slope, but not greater than 1-inch (25-mm) total depression.
3. Install floor-drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes where penetrated.
4. Install individual traps for floor drains connected to sanitary building drain, unless otherwise indicated.
5. Install traps on plumbing specialty drain outlets. Omit traps on indirect wastes unless trap is indicated.
6. Install deep-seal traps on floor drains, and other waste outlets unless otherwise indicated.
7. Provide trap primers on all floor drains and on other drains as shown on Drawings.

G. Install air-gap fittings on draining-type backflow preventers and on indirect-waste piping discharge into sanitary drainage system.

H. Install expansion joints on vertical stacks and conductors. Position expansion joints for easy access and maintenance.

I. Install escutcheons at wall, floor, and ceiling penetrations in exposed finished locations and within cabinets and millwork. Use deep-pattern escutcheons if required to conceal protruding pipe fittings.

3.2 COORDINATION

A. Coordinate size and location of concrete bases. Cast anchor-bolt inserts into bases. Concrete, reinforcement, and formwork requirements are specified in Division 03.

B. Coordinate size and location of roof penetrations.

3.3 FIELD QUALITY CONTROL

A. Tests and Inspections:

1. Leak Test: After installation, charge system and test for leaks. Repair leaks and retest until no leaks exist.
2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

3.4 PROTECTION

A. Protect drains during remainder of construction period to avoid clogging with dirt or debris and to prevent damage from traffic or construction work.

B. Place plugs in ends of uncompleted piping at end of each day or when work stops.

END OF SECTION 22 1319

SECTION 22 1323
SANITARY WASTE INTERCEPTORS

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following types of interceptors outside the building:

1. Oil interceptors.

1.2 DEFINITIONS

A. FRP: Fiberglass-reinforced plastic.

B. HDPE: High-density polyethylene plastic.

C. PE: Polyethylene plastic.

D. PP: Polypropylene plastic.

1.3 SUBMITTALS

A. Product Data: For each type of plastic interceptor indicated. Include materials of fabrication, dimensions, rated capacities, retention capacities, operating characteristics, size and location of each pipe connection, furnished specialties, and accessories.

B. Shop Drawings: For each type and size of plastic interceptor indicated.

1. Include materials of construction, dimensions, rated capacities, retention capacities, location and size of each pipe connection, furnished specialties, and accessories.

C. Coordination Drawings: Interceptors, drawn to scale, on which the following items are shown and coordinated with each other, based on input from installers of the items involved:

1. Interceptors.

2. Piping connections. Include size, location, and elevation of each.

3. Interface with underground structures and utility services.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

1. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, manufacturers specified.

2. Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified.

2.2 OIL INTERCEPTORS

A. Oil Interceptors: Plastic body; with removable sediment bucket or strainer, baffles, vents, and flow-control fitting on inlet.

1. Available Manufacturers for FRP Units:

a. Proceptor Div.; Green Turtle Technologies, Ltd.

b. Waterlink, Inc.

2. Available Manufacturers for PE or HDPE Units:

a. Schier Products Company.

b. Town & Country Plastics, Inc.

3. Inlet, Outlet, Vent, and Waste-Oil Outlet Piping Connections: Hub, hubless, or threaded, unless otherwise indicated.

4. Extension: Plastic shroud, full size of interceptor, extending from top of interceptor to grade.

5. Cover: Plastic with steel reinforcement to provide ASTM C 890 or A-03, walkway load.

6. Protective Coating: Factory-applied, 10-mil (0.26-mm) or 15-mil (0.38-mm) minimum thickness applied to all ferrous surfaces, except bucket or strainer, unless otherwise indicated.

PART 3 EXECUTION

3.1 EARTHWORK

A. Excavating, trenching, and backfilling are specified in Division 22 Section "Earth Moving."

3.2 INSTALLATION

A. Install interceptor inlets and outlets at elevations indicated.

B. Install manhole risers from top of underground concrete interceptors to manholes and gratings at finished grade.

C. Set plastic interceptors level and plumb.

D. Repair and restore protective coatings to original condition.

3.3 CONNECTIONS

A. Piping installation requirements are specified in other Division 22 Sections. Drawings indicate general arrangement of piping, fittings, and specialties.

B. Make piping connections between interceptors and piping systems.

3.4 IDENTIFICATION

A. Identification materials and installation are specified in Division 22 Section "Earth Moving." Arrange for installation of green warning tapes directly over piping and at outside edges of underground interceptors.

1. Use warning tapes or detectable warning tape over ferrous piping.

2. Use detectable warning tape over nonferrous piping and over edges of underground structures.

END OF SECTION

SECTION 23 0500
COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The work shall include the furnishings of systems, equipment and materials specified in this Division and as called for on the Mechanical Drawings to include supervision, quality control, operation, methods and labor for the fabrication, installation, start-up and tests for the complete mechanical installation. The work shall also include the furnishing of necessary hoisting facilities to set materials and equipment in place and the furnishing of any scaffolding and transportation associated with this work.

B. Examine the project site and become familiar with existing conditions which will affect the work. Review the drawings and specifications of other trades and take note of conditions to be created which will affect the work. All conditions shall be considered in the preparation of bids; no additional compensation will be made on the behalf of this Contractor.

C. Provide labor necessary to demolish the existing mechanical system as shown on the drawings, as described in Part 3, Existing Conditions, or as required.

D. Where noted on the drawings or where called for in other sections of the specification, the Contractor for this division shall install equipment furnished by others, and shall make required service connections. Verify with the supplier of the equipment the requirements for the installation. This contractor shall be responsible for the removal and installation of railings, piping, ductwork, louvers, etc. as required to install new equipment. Coordinate shipping splits for all equipment provided by this contractor.

1.2 DAMAGE

A. The Contractor shall be responsible for damage to the work of other trades or to the building and its contents, caused by equipment installation.

1.3 PERMITS AND INSPECTIONS

A. Obtain and furnish necessary permits and inspection certificates for material and labor furnished. Permits and certificates shall be obtained from the proper inspection authorities. The cost of permits, certificates and fees required in connection with the installation shall be borne by the Contractor, unless otherwise noted in the detailed contractual description preceding these specifications. Where applications are required for the procuring of utility services to the building, see that such application is properly filed with the utility, and that information required for such an application is presented to the extent and in the form required by the utility company.

1.4 CODES AND STANDARDS

A. Applicable provisions of the following codes and standards are hereby imposed on a general basis for the mechanical work (in addition to specific applications specified by individual work sections of these specifications):

1. ASHRAE/IES 90.1 - 2010 Code for Energy Efficiency
2. ANSI Pressure Piping Standards (B31)
3. ASHRAE Safety Code for Mechanical Refrigeration (ANSI B9.1)
4. AWWA Standards
5. ASME Boiler and Pressure Vessel Code and State Boiler Code

6. American Gas Association
7. AWS Standards for Welding
8. National Electrical Code
9. Local and/or State Plumbing, Mechanical and Building Codes
10. Occupational Safety and Health Act (OSHA)
11. International Energy Conservation Code 2012
12. International Plumbing Code
13. International Mechanical Code
14. NFPA Standards and Pamphlets

B. If any work indicated on the drawings or specified herein conflicts in any way with any of the rules and regulations of the above authorities, the Contractor shall notify the Architect/Engineer in writing 72 hours before bids are opened. In the event the Contractor fails to notify the Architect/Engineer and changes are required by said conflicts, the Contractor shall make such changes as are required without additional cost to this Owner.

C. Installations must be safe in every respect, and must not create a condition which will be harmful to building occupants; to operating, installing or testing personnel; to workmen; or to the public. The contractor for each installation shall be solely responsible for providing installations which will meet these conditions. If the Contractor believes that the installation will not be safe for all parties, report these beliefs in writing to the Architect/Engineer before any equipment is purchased or work is installed, giving recommendations. The Architect/Engineer will work out required changes and adjustments in contract price where adjustments are warranted.

1.5 DRAWINGS

A. A complete set of drawings including civil, architectural, structural, mechanical, and electrical drawings shall be on the site at all times. Prior to installing any of the work, check the drawings for dimensions and see that the work does not interfere with clearance required for ceilings, beams, foundations, finished columns, pilasters, partitions and electrical equipment as shown on the drawings and details. After work is installed and it develops that interferences occur which have not been called to the Architect/Engineer's attention before the installation, the Contractor shall, at his own expense, make such changes in his work as directed by the Architect/Engineer.

B. The contract drawings for mechanical work are in part diagrammatic, intended to convey the scope of work and indicate general arrangement and approximate sizes and locations of equipment and materials. Where job conditions require reasonable changes in indicated locations and arrangement, the Contractor shall make such changes as directed by the Architect/Engineer, without additional cost to the Owner.

C. Because of the scale of the drawings, certain basic items such as pipe fittings, access panels, and sleeves may not be shown; but where such items are required by other sections of these specifications or where they are required by the nature of the work, they shall be furnished and installed. Rough-in dimensions and locations shall be verified with the supplier of equipment furnished by other trades, or by the Owner, prior to the time of roughing-in.

D. Equipment specification may not deal individually with minute items required such as components, parts, controls and devices which may be required to produce the equipment performance specified, or as required to meet the equipment warranties. Where such items are required, they shall be included by the supplier of the equipment, whether or not specifically called for.

E. The drawings and the specifications are cooperative and supplementary. It is the intent of both said drawings and specifications to cover all mechanical requirements in their entirety as

nearly as possible. The Contractor shall closely check the drawings and specifications for any obvious errors or omissions and bring any such condition to the attention of the Architect/Engineer prior to the receipt of bids, in order to permit clarification by means of a mailed Addendum. If there is no question prior to the bid proposal date, the Architect/Engineer shall assume that the drawings and specifications are complete and correct and will expect the intent of said documents to be complied with, and the installation to be complete in all respects, according to said intent.

F. Locate equipment which must be serviced, operated or maintained in fully accessible positions. Minor deviations from the contract drawings may be made to allow for better accessibility, but changes of magnitude, or which involve extra cost, shall not be made without prior approval. Ample space shall be allowed for removal of parts that may require replacement or service in the future.

1.6 RESPONSIBILITY

A. The Contractor's responsibility shall not end with the installation and connecting of the various apparatus. It shall include the services of an experienced superintendent, who shall be constantly in charge of the work, together with the qualified journeymen, helpers and laborers required to properly unload, install, connect, adjust, start, operate and test the work involved, including equipment and materials furnished by other trades or by the Owner, until such time as the entire mechanical installation functions properly in every detail.

1.7 COORDINATION

A. Coordinate the work with other trades prior to installation.

B. No piping, ducts or equipment foreign to the electrical equipment or architectural appurtenances shall be run over the top of any electrical panels or electrical equipment, in accordance with NEC 110-16 and 384-4. This does not prohibit sprinkler protection for the installation.

C. The determination of quantities of material and equipment required shall be made from the drawings. Schedules on the drawings and in the specifications are completed as an aid, but where discrepancies arise, it shall be the Contractor's responsibility to provide the required quantity.

D. Where the specifications state that equipment shall be furnished, installed or provided, it shall be understood to mean this Contractor shall furnish and install completely, unless it is specifically stated that the equipment is to be furnished and installed by others.

E. The Architect/Engineer reserves the right to determine space priority of the contractors in the event of interference between the piping and equipment of the various contractors. Conflicts between the drawings and specifications, or between requirements set forth for the various trades, shall be called to the attention of the Architect/Engineer. If clarification is not asked for prior to the taking of bids, it will be assumed that none is required, and that the Contractor has submitted his bid in conformance with plans and specifications as issued and that no interference exists.

F. No piping, ducts or equipment foreign to an elevator hoistway and machine room shall be run inside the hoistway and machine room in accordance with NEC 620-37 and ASME A17.1, 102.2.

1.8 GUARANTEE AND MAINTENANCE

A. Materials and equipment shall be guaranteed to be free from defects and to be new equipment; no secondhand, used or salvaged equipment will be allowed.

B. Keep the entire portion of the work in repair, without additional cost to the Owner, so far as defects in workmanship, apparatus, material or construction are concerned for one (1) year

from the date of final acceptance, except as otherwise specified herein.

C. Equipment, which fails to meet performance ratings as specified and shown on the drawings, shall be removed and replaced by new equipment that meets the specified requirements, without additional cost to the Owner.

D. Materials and workmanship shall be subject to the review of the Architect/Engineer, in whose presence various tests shall be made as required by these specifications.

PART 2 PRODUCTS

2.1 SUBMITTAL PROCESS

A. Submit shop drawings and catalog data for mechanical equipment specified in Division 23 in accordance with Division 01.

B. Submittal data for mechanical equipment shall consist of shop drawings and/or catalog cuts showing technical data necessary to evaluate the material or equipment to include dimensions, wiring diagrams, performance curves, rating, control sequence, and other descriptive data necessary to describe fully the item proposed and its operating characteristics. Shop drawings shall be submitted on equipment and materials as required by the specifications.

C. Approval of materials, including alternate or substitute items, shall be obtained in writing from the Architect/Engineer, verbal approval will not be considered binding.

D. Shop drawings shall be submitted and shall have been signed, checked, approved, and initialed by the Contractor prior to submittal to the Architect/Engineer. The Architect/Engineer will review shop drawings to aid in interpreting the plans and specifications, and will in so doing assume that the shop drawings conform to specified requirements set forth in this specification. The approval of the shop drawing by the Architect/Engineer does not relieve the Contractor of the responsibility of complying with elements of the specification. The name of the job, Architect/Engineer, location, and specification section shall appear on all pages of shop drawings. Equipment marks (such as EF-1, RTU-1) shall be indicated for each item.

E. At the completion of the job, furnish three (3) copies of parts lists, operating and maintenance instructions, and manuals organized and bound, in three books.

F. At the completion of the project, prepare and submit to the Owner record drawings showing the location of piping and ductwork. Drawing shall give accurate dimensions of such equipment for future use by the Owner. This drawing shall be submitted as soon as work is completed and before authorization of final payment.

2.2 SUBCONTRACTORS AND MATERIALS

A. Submit to the Architect/Engineer for review, when requested, a list of subcontractors, materials and equipment proposed to be used. The list must be reviewed by the Architect/Engineer before this Contractor may enter into any subcontractual agreement. Equipment, materials, and devices, etc. shall be subject to the review of the Architect/Engineer, whether or not said items are herein specified.

2.3 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Materials shall be new, complete with manufacturer's guarantee or warranty, and shall be as listed by Underwriters Laboratories (UL), Inc., Air Movement and Control Association (AMCA), American Gas Association (AGA), Air Conditioning and Refrigeration Institute (ARI), etc., if a standard has been established by that agency for the type of material.

B. Materials shall also comply with applicable standards of the National Electrical Manufacturer's Association, National Board of Fire Underwriters, National Fire Protection Association, National

Safety Council, National Bureau of Standards, the National Electrical Code and the Williams-Steiger Occupational Safety and Health Act of 1970. Such standards are hereby made a part of these specifications.

C. Work shall be performed by workmen skilled in the particular craft, shall be executed in a workmanlike manner, and shall present a neat mechanical appearance when completed. Align, level and adjust equipment for satisfactory operation, and install so that connecting and disconnecting of piping and accessories can be made readily and so that parts are easily accessible for inspection, operation and maintenance. Methods and techniques of installation shall be subject to the review of the Architect/Engineer.

D. Materials shall be the standard product of a reputable manufacturer regularly engaged in the manufacture of the specific product. Materials of the same type of class shall be the products of one manufacturer. For example, fans shall be from the same manufacturer and pumps from the same manufacturer.

E. Materials shall be protected from damage, and stored indoors or protected from the weather at all times, unless other storage arrangements are approved by the Architect/Engineer.

F. Bearing lubrication fittings shall be as recommended by the manufacturer and shall be extended, where necessary, to an accessible location.

G. Material and equipment shall be installed in strict accordance with the manufacturer's recommendations.

2.4 MATERIAL SUBSTITUTIONS

A. Proposals as submitted shall be based on the products specifically named in the specification or on the drawings. Material or equipment by manufacturers other than those specified may be used only by permission of the Architect/Engineer. Such permission for substitution must be requested, in writingin accordance with Division 01.

B. The Architect/Engineer reserves the sole right for the approval of proposed material or equipment, and the phrase, "or approved equivalent", used in these specifications, or on the drawings, shall be interpreted to mean an equivalent approved by the Architect/Engineer.

C. Changes required by alternate equipment shall be made at no additional cost to the Owner; and costs incurred by other trades, public utilities or the Owner, as a result of the use of such equipment, shall be the responsibility of the Contractor.

D. Furnish to the Architect/Engineer, when requested, samples of proposed material or equipment substitutions. These samples shall remain with the Architect/Engineer as long as needed.

E. Identify the differences in alternate material or equipment as compared to that specified, and indicate the benefits to the project as a result of selecting the alternative.

F. The Architect/Engineer reserves the right to refuse approval of equipment which does not meet the specification, in their opinion, or of equipment for which no local experience of satisfactory service is available. The Architect/Engineer further reserves the right to reject equipment for which maintenance service and the availability of replacement parts is questionable.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A. Examine the existing building and become familiar with the conditions as they exist, or that will in any manner affect the work under this contract. No allowance will be made subsequently, in this connection, on behalf of the Contractor for any error or negligence by the Contractor.

B. Existing equipment, such as duct or pipe, in or on the existing building and grounds which is to be replaced, or which interferes in any way with the remodeling of the existing facilities and/or installation of new equipment, shall be removed from the premises or relocated by this Contractor, as directed by the Architect/Engineer. Do not remove from the premises, any equipment that may have maintenance value to the Owner without permission of the Owner. Equipment, duct or pipe not to be reused shall be removed from the premises, unless otherwise noted herein or shown on the drawings.

C. Where existing equipment is removed or changed, all duct and pipe no longer in service shall be removed and stubs plugged as directed by the Architect/Engineer. Building surfaces damaged and openings left by removal of equipment shall be repaired by the proper trades and paid for by this Contractor, unless otherwise noted on the drawings. The cutting and fitting shall be done by this Contractor. The cutting of floor, ceiling or wall surfaces shall be done by this Contractor with extreme care, in order to avoid any disrupting or damage of existing utility services which may be encountered. Coordinate with other trades and with the General Contractor to minimize the damage to the building in order to reduce the amount of patching required.

D. Where new openings are cut and concealed piping is encountered, such items shall be removed or relocated as required. Where systems to be removed stub through floors, walls or ceilings, openings shall be patched so that no evidence of the former installation remains.

E. Existing active services (water, gas, sewer, electric), when encountered, shall be protected against damage. Do not prevent or disturb operation of active services that are to remain. If active services are encountered which require relocation, make request to authorities with jurisdiction for determination of procedures. Where existing services are to be abandoned, they shall be terminated in conformance with requirements of the utility or municipality having jurisdiction.

F. The location, size and elevation of underground utilities shown on the drawings are in accordance with data supplied by the Owner and/or the various utility companies. The Contractor shall verify this data and shall report any discrepancies to the Architect/Engineer before submitting his bid.

3.2 INTERRUPTION OF SERVICE

A. Changes in service shall be made so as to provide a minimum of interference with the operation of services in the building. When changes require shutdown of building services, notify the proper building authorities no less than 24 hours in advance and obtain approval from these authorities before making changes. Such notices shall give duration and nature of shutdown. Temporary arrangements shall be approved by the Architect/Engineer and/or Owner.

B. Any and all interruptions to building services shall be in accordance with Division 01.

3.3 OPENINGS, CUTTING, AND PATCHING

A. The General Contractor shall coordinate the placing of openings in the new structure, as required for the installation of the mechanical work.

B. Furnish to the General Contractor the accurate locations and sizes for required openings. This shall not relieve this Contractor of the responsibility of checking to assure that proper size openings are provided. When additional patching is required due to this Contractor's failure to inspect this work, this Contractor shall make arrangements for the patching required to properly close the opening, to include patch painting. This Contractor shall pay any additional cost incurred in this respect.

C. When cutting and patching of the structure is made necessary due to this Contractor's failure to install piping, ducts, sleeves or equipment on schedule, or due to this Contractor's failure to furnish, on schedule, the information required for the leaving of openings, it shall be this

Contractor's responsibility to make arrangements for this cutting and patching. This Contractor shall pay any additional cost incurred in this respect.

D. Provide cutting and patching and patch painting in the existing structure, as required for the installation of the work. Furnish lintels and supports as required for openings. Cutting of structural support members will not be permitted without prior approval of the Architect/Engineer. Extent of cutting shall be minimized. Use core drills, power saws or other machines which will provide neat, minimum openings. Patching shall match adjacent materials and surfaces and shall be performed by craftsmen skilled in the respective craft required.

3.4 EXCAVATION AND BACKFILL

A. See Division 31 for requirements for trench excavation, backfill, and compaction.

3.5 CONCRETE AND MASONRY WORK

A. Concrete work included herein or shown on the drawings shall be done only by experienced cement finishers. Brickwork, where included, shall be laid only by experienced brick masons. Brick shall be of uniform size, hard burned, and shall be laid in cement mortar, except for patch work at a location where cement and lime mortar has previously been used. Exposed, finish brickwork shall match existing brickwork as closely as practical and shall be to the satisfaction of the Architect/Engineer and Owner.

B. Concrete bases and pads for mechanical equipment will be furnished by General Contractor. This Contractor shall coordinate size and location.

C. Furnish equipment anchor bolts and be responsible for their proper installation and accurate location.

3.6 ROOF OPENINGS

A. Roof openings required by this Contractor that are not shown on the Structural or Architectural Drawings shall be cut and (if necessary) reinforced by an experienced roofing contractor.

B. Roof penetrations for duct and piping shall be through curbed roof openings. Equipment supports shall be by curbed and flashed runners meeting current National Roofing Contractor Association (NRCA) standards and details. Pitch pockets, pitch pans, and wood blocking are not acceptable.

C. All roof work shall be completed such that it does not void any existing roof warranty.

3.7 PAINTING

A. The finish of any item that has been marred, scratched or damaged in any way by this Contractor shall be repainted at the expense of this Contractor, and to the satisfaction of the Architect/Engineer and the Owner.

B. Painting and finishing of exposed mechanical systems including piping and duct shall be as shown on the drawings and in DIVISION 09 - FINISHES.

3.8 CLEANING

A. Keep the premises clean of all debris, caused by the work as described in DIVISION 01.

B. At the conclusion of the construction, the site shall be thoroughly cleaned of all rubble, debris and unused material and shall be left in good order. Closed off spaces shall be cleaned of waste such as material, cartons, and wood frame members used in the construction.

3.9 SUSPENSION FROM WOOD STRUCTURAL MEMBERS

A. In general, concentrated or other loads shall not be suspended directly from the bottom of wood structural members, unless approved by the Architect/Engineer. Loads suspended from open web joists or trusses may be transferred to the bottom chord of the structural member at the panel points. Loads suspended from solid web joists shall be transferred to the joists only through the top flange or web. Suspension systems shall be reviewed by the Architect/Engineer.

3.10 WIRING FOR MECHANICAL EQUIPMENT

A. The electrical contractor will provide power to and connection of motors and equipment furnished by this Contractor. Where disconnect switches are not specified to be furnished with the equipment, the electrical Contractor will furnish disconnect switches for equipment furnished by this Contractor.

B. Provide integral wiring, alarm wiring, control wiring, temperature control wiring and interlock wiring for equipment furnished, whether or not such wiring is furnished by the equipment vendor.

C. Except where other Sections call for starters to be furnished by manufacturers as part of their equipment, the electrical contractor will furnish motor starters for motors furnished by this Contractor.

D. Furnish to the electrical contractor, shop drawings and a schedule for motors and other mechanical equipment furnished, which require electrical services. The schedule shall include the locations for rough-ins, electrical loads, size, and electrical characteristics for services required.

E. Additional costs incurred, where motors or equipment furnished by this Contractor require larger services or services of different electrical characteristics than those called for on the Electrical Drawings, due to the Contractor furnishing substitute equipment, shall be paid for by this Contractor.

F. Review the Electrical Drawings and call to the attention of the Architect/Engineer, prior to bidding, omissions of electrical services required for equipment.

G. Mechanical equipment which requires fuse protection, to maintain UL listing, shall be coordinated with the electrical contractor to provide such protection.

3.11 MOTORS

A. TEFC and ODP motors for equipment supplied by this contractor shall meet or exceed the listed values when tested in accordance with IEEE Standard 112 Method B as defined by NEMA Standard MG 1-12.6C. Efficiency values listed are based on NEMA Premium Efficiency Motors of NEMA MG 1-2003, Table 12-12 at 1800 RPM:

HP	ODP	TEFC
1	85.5	85.5
1.5	86.5	86.5
2	86.5	86.5
3	89.5	89.5
5	89.5	89.5
7.5	91.0	91.7
10	91.7	91.7
15	93.0	92.4
20	93.0	93.0

25	93.6	93.6
30	94.1	93.6
40	94.1	94.1
50	94.5	94.5
60	95.0	95.0
75	95.0	95.4
100	95.4	95.4
125	95.4	95.4
150	95.8	95.0
200	95.8	95.0

B. All motors that are indicated to be used with Variable Frequency Drives (VFDs) shall be inverter duty rated. Coordinate all motor requirements with the electrical contractor.

3.12 PROTECTION

A. Special care shall be taken for the protection of equipment furnished by this Contractor. Equipment and material shall be protected from elements such as weather, painting and plastering until the project is completed. Damage from rust, paint or scratches shall be repaired as required to restore equipment to original condition.

B. Protection of equipment during the plastering and painting of the building shall be the responsibility of the contractor performing that work, but this shall not relieve this Contractor of the responsibility of checking to assure that adequate protection is being provided.

C. Where the installation or connection of equipment requires this Contractor to work in areas previously finished by other contractors, this Contractor shall be responsible that such areas are protected and are not marred, soiled or otherwise damaged during the course of such work. This Contractor shall arrange with the other contractors for repairing and refinishing of such areas which may be damaged.

D. When heavy materials must be placed upon or transported over the roof deck, sheeting shall be placed to distribute the weight and support such materials. Any damage shall be immediately corrected at no cost to the Owner.

3.13 ASBESTOS IDENTIFICATION AND CONTROL

A. In the event that suspected asbestos containing material (ACM) is encountered during the course of the work, cease operations in the immediate area and promptly notify the Architect/Engineer. Suspected materials will then be sampled and analyzed by the Owner. Should ACM be identified, the Owner's Representative will direct the procedures for abatement, either by subcontract to the Contractor or separate contractor. During abatement operations, cease operations in the immediate area of the abatement. Operations in other areas of the project may be performed, but care must be taken to control dust to avoid contamination of the abatement containment or air monitoring samples. The Contractor shall coordinate activities with the asbestos abatement contractor.

B. Should no ACM be identified, operations may be resumed. Delays caused by identification, analysis or abatement may be added to the time of the contract, at the discretion of the Architect/Engineer by Change Order.

3.14 NOISE AND VIBRATION

A. Be responsible for the installation of all equipment in such a manner as to control the transmission of noise and vibration from any installed equipment or system, so that the sound level does not exceed NC35 in any occupied space. Be responsible for the correction of any objectionable noise in any occupied area due to improperly installed equipment.

3.15 TESTS AND DEMONSTRATIONS

A. Systems shall be tested and placed in proper working order prior to demonstrating systems to the Owner.

B. Prior to acceptance of the mechanical installation, demonstrate to the Owner or his designated representatives essential features and functions of all systems installed, and instruct the Owner in the proper operation and maintenance of such systems.

C. Furnish the necessary trained personnel to perform the demonstrations and instructions, and arrange to have the manufacturer's representatives for the system present to assist with the demonstrations. The Owner and Contractor shall each sign a certification stating that the training has been performed and the Owner accepts same.

3.16 UTILITY REBATE APPLICATIONS

A. This contractor shall be responsible for gathering information necessary for completing local utility rebate applications, and submitting to the proper utility companies for gas and electric rebates. Potential rebates include high efficiency gas boilers, thermostats, timeclocks, motors, and other items furnished by this mechanical contractor.

END OF SECTION 23 0500

SECTION 23 0529
HANGERS AND SUPPORTS FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, labor and supervision necessary to install pipe hangers and supports.

B. Pipe support systems shall secure pipes in place, prevent pipe vibration, provide vertical adjustment for maintaining required grades, and provide for expansion and contraction.

C. Where supports are attached to concrete or other structural members, care shall be taken to prevent damage or weakening of the structural members.

D. Where concrete inserts are to be used, it shall be this Contractor's responsibility to accurately locate and attach inserts to concrete forms.

1.2 REFERENCES

A. American National Standards Institute, ANSI:

B. ANSI B31.1: Power Piping

C. Manufacturers Standardization Society of the Valve and Fittings Industry, MSS, 1815 North Fort Myer Drive, Arlington, VA 22209.

1. MSS SP-58: Materials Standardization Society: Pipe Hangers and Supports-Materials, Design, and Manufacturer.
2. MSS SP-69: Materials and Standardization Society: Pipe Hangers and Supports - Selection and Application.
3. NFPA 13-Standard for the Installation of Sprinkler Systems.
4. ASTM A123-Specification for Zinc Hot-Galvanized Coatings by the Hot Dip Process.
5. ASTM A653 G90-Specification for Steel Sheet, Zinc on Iron and Steel.

1.3 SUBMITTALS

A. Submit manufacturer's product data on all hangers and support devices. Product data to include, but not be limited to materials, finishes, approvals, load ratings, and dimensional information.

PART 2 PRODUCTS

2.1 HANGERS AND SUPPORTS

A. Hangers and support devices shall be Anvil International Inc., Tolco, Fee and Mason, Michigan, B-Line or approved equivalent. Figure numbers based on Anvil.

PART 3 EXECUTION

3.1 INSTALLATION - HORIZONTAL PIPE SUPPORTS

A. Hanger rods for steel, wrought iron and brass pipe shall be installed in accordance with MSS SP-69 Tables 3 and 4 and the following schedule:

Pipe Size	Rod Diameter	Maximum Spacing
Up to 1-1/4"	3/8"	7'-0"
1-1/2" and 2"	3/8"	9'-0"
2"	3/8"	10'-0"
2-1/2", 3" and 3-1/2"	1/2"	10'-0"
Pipe Size	**Rod Diameter**	**Maximum Spacing**
1/2" and 3/4"	3/8"	5'-0"
1"	3/8"	6'-0"
1-1/4"	3/8"	7'-0"
1-1/2"	3/8"	8'-0"
2"	3/8"	8'-0"
2-1/2"	1/2"	9'-0"

B. Support horizontal cast iron soil pipe with two hangers for each pipe length. Locate hangers close to couplings.

C. In addition to the above specified spacings, install additional hangers at change in pipe direction and at concentrated loads, large valves and strainers.

D. Where more than one pipe is to be run parallel together, they may be supported on trapeze type hangers. Trapeze bar angles and hanger rods shall be of sufficient size to support the particular group of pipes. Trapeze hanger spacing shall be based on the smallest pipe on the rack. When hanging from light gauge metal trusses, coordinate pipe hanger spacing and hanger rod connection points with the truss manufacturer.

E. For suspending hanger rods from brackets attached to walls, use welded steel brackets; Fig. 194 for loads up to 750 lbs; Fig. 195 for loads up to 1500 lbs; Fig 199 for loads up to 3000 lbs.

F. Where pipes are to be racked along walls, use “Unistrut” pipe racks or 12 gauge steel strut channel, 1-5/8” x 1-5/8” minimum.

1. Mount pipes to strut channel with two-piece pipe straps to match outside diameter of pipe including insulation.

G. Attach all pipe hangers from support rods using double locknuts tightened to prevent loosening.

3.2 INSTALLATION - VERTICAL PIPE SUPPORTS

A. Support vertical steel, wrought iron, copper and brass pipe at every other floor line.

B. Support vertical cast iron soil pipe at every floor line.

C. In addition to the above, support vertical pipes at base of riser with base fitting set on concrete or brick pier, or by hanger located on horizontal connection close to riser.

D. Where pipe sleeves extend above floor, place pipe clamps at ceiling below and support clamp extensions from inserts or other approved attachment.

3.3 PIPE ATTACHMENTS

A. For horizontal steel and wrought iron pipe, use carbon steel adjustable clevis hanger, Fig. 260. For floor support or support directly above steel beams, use pipe roll stand, Fig. 177.

B. For horizontal copper pipe and tube, use copper-plated adjustable swivel ring, Fig. CT-69.

C. When thermal expansion for horizontal pipe is in excess of ½” axially, use adjustable swivel pipe roll, Fig. 181, or pipe roll stand, Fig. 177.

D. For horizontal cast iron soil pipe, use clevis hanger, Fig. 260.

E. For vertical, steel, wrought iron and cast iron pipe, use extension pipe clamps, Fig. 261.

F. For vertical copper pipe and tube, use copper-plated extension pipe clamp, Fig. CT-121.

3.4 INTERMEDIATE ATTACHMENTS

A. Hanger rods: use carbon steel single or double end threaded, Figs. 140, 253 as required. Continuous threaded rod: Fig. 146 may be used wherever possible.

B. Chain wire or perforated strap hangers will not be permitted. One pipe shall not be suspended from another pipe.

3.5 STRUCTURAL ATTACHMENTS

A. For attaching steel or copper plated hanger rods to reinforced concrete, use galvanized malleable iron concrete inserts; Fig. 282 for loads up to 1140 lbs.

B. For attaching steel hanger rods to structural steel beams, use malleable iron C-clamps; Fig. 92, Fig. 93 or Fig. 94 with retaining clip Fig. 89 or Fig. 89X for loads up to 500 lbs; Fig. 218 with extension piece for loads up to 1,365 lbs. For copper plated hanger rods, use copper plated malleable iron C-clamps; Fig. CT-138R for loads up to 180 lbs.

C. For attaching steel hanger rods to wood structural members, use malleable iron ceiling flange; Fig. 153 for loads up to 1,270 lbs. For copper plated hanger rods, use copper plated malleable iron ceiling flange: Fig. CT-128R for loads up to 180 lbs.

D. Vertical expansion shields or toggles shall not be used for suspending hanger rods, except with permission in cases where inserts have been omitted or cannot be used. If permitted, use expansion shields; for rod sizes up to ½", 320 lbs. max. load. For hanger rods larger than ½" use attachment plate, Fig. 52, with wedge anchors.

E. Powder actuated anchoring methods shall not be used.

3.6 PIPE COVERING PROTECTION

A. Hangers and supports for insulated piping shall not injure or pierce insulation. Provide insulation protection shields in conjunction with hanger or roll device. Use Fig. 160 and 165, Protection Saddles.

3.7 SUPPLEMENTAL STEEL

A. Provide supplemental steel required to hang or support mechanical equipment or piping.

END OF SECTION 23 0529

SECTION 23 0553
IDENTIFICATION FOR HVAC PIPING AND EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide materials, equipment labor and supervision necessary to install piping identification products.

B. Comply with ANSI A13.1 for lettering size, length or color field, colors, and installed viewing angles of identification devices.

1.2 QUALIFICATIONS

A. Brady Corp., Industrial Safety Supply, Emedco, Seton or Brimar.

1.3 SCHEDULES

A. Submit valve and damper schedule for each system, typewritten and reproduced on 8-1/2" x 11" bond paper. Tabulate valve and damper number, system, system abbreviation (as shown on tag), location of valve and damper (room or space), and variations for identification (if any). Mark valves and dampers that are intended for emergency shut-off and similar special uses, by special "flags", in margin of schedule.

1.4 SUBMITTALS

A. Submit manufacturer's product data.

PART 2 PRODUCTS

2.1 PIPE MARKERS

A. Provide manufacturer's standard preprinted, semi-rigid snap-on or self-sticking, color-coded pipe markers, complying with ANSI A13.1.

B. Provide full-band pipe markers, extending 360° around pipe at each location or self-sticking pipe markers, fastened in the following method:

1. Snap-on application of pre-tensioned semi-rigid plastic pipe marker.

2. Secure to piping and install banding tape on both ends of each pipe label.

C. Lettering shall be manufacturer's pre-printed nomenclature which best describes piping system in each instance, as selected by Architect/Engineer in cases of variance.

D. Print each pipe marker with arrows indicating direction of flow, integrally with piping system service lettering (to accommodate both directions), or as separate unit of plastic or on banding tape.

2.2 EQUIPMENT MARKERS

A. Provide engraved signage nameplates and tags constructed of multi-layered acrylic that has been treated for outdoor use and can withstand temperatures up to 160° F. Nameplates shall have beveled edges with contrasting color core, letters, and border. Minimum size of nameplate shall be 3" high by 6" long. The minimum letter height shall be 3/4". Attachment shall be by double faced 2 mil permanent acrylic adhesive. For equipment that doesn't allow for direct attachment, furnish sheet metal backing to integrate with equipment such that signage

can be read from 5 feet above the finished floor. Unless noted otherwise, signage shall be provided with black lettering, black border, and yellow core. All signage shall include up to 14 characters per line, minimum of 3 lines per tag. Furnish signage for equipment shown in Section 3:

1. All pumps shall include the full name description for system served such as *"Primary Chilled Water Pump – 1."*
2. All air handling unit filter sections shall be labeled with the exact quantity of filters, size, and type of filter such as *"14 – 24"x24"x2", 30% Pleated Filters."*

B. All equipment shall be named consistent with the plans and specifications as indicated on the schedules or as directed by the Owner.

2.3 BRASS VALVE AND DAMPER TAGS

A. Provide manufacturer's standard brass valve and damper tags with stamped black filled lettering, with piping system abbreviation in 1/4" high letters and sequenced valve numbers 1/2" high, and with 3/16" hole for fastener.

B. Provide 1-1/2" round brass tags with black lettering. Seton 250 BL or equal.

2.4 VALVE AND DAMPER TAG FASTENERS

A. Manufacturer's standard solid brass chain or solid brass S-hooks of sizes required for proper attachment of tags to valves and dampers, and manufactured specifically for that purpose.

2.5 VALVE AND DAMPER SCHEDULE FRAMES

A. For each page of schedule, provide glazed display frame, with screws for removable mounting on masonry walls. Provide frames of finished hardwood or extruded aluminum, with SSD-grade sheet glass.

PART 3 EXECUTION

3.1 INSTALLATION OF MECHANICAL IDENTIFICATION

A. Where identification is to be applied to surfaces that require insulation, painting or other covering or finish, including valve tags in finished mechanical spaces, install identification after completion of covering and painting. Install identification prior to installation of acoustical ceilings and similar removable concealment.

B. Install pipe markers on each system, and include arrows to show normal direction of flow.

C. Locate pipe markers as follows: wherever piping is exposed to view in occupied spaces, machine rooms, accessible maintenance spaces (shafts, tunnels, plenums) above lay-in type ceilings and exterior non-concealed locations.

1. Near each valve and control device.
2. Near each branch, excluding short take-offs for fixtures, mark each pipe at branch where there could be question of flow pattern.
3. Near locations where pipes pass through walls or floors/ceilings, (both sides) or center non-accessible enclosures.
4. At access doors, manholes, and similar access points that permit view of concealed piping.
5. Near major equipment items and other points of origination and termination.
6. At each pipe passage to underground.

7. Spaced intermediately at maximum spacing of 50' along each piping run, except reduce spacing to 25' in congested areas of piping and equipment.
8. On piping above removable acoustical ceilings, maximum spacing of 20' along each piping run.
9. Where self-sticking labels are used, the pipe or its covering surface shall be properly prepared. This consists of removal of loose dirt, oil and grease, loose paint or peeling insulation covering. This can be done with a brush and cloth; washing is not required. Use solvent for removal of oil or grease.
10. Banding tape must be used on both ends of all self-sticking labels. The tape shall encircle the pipe completely and overlap itself so the banding tape can adhere to itself.

D. Provide valve tags for all major valves 3/4" size or larger. Included are all main, zone and branch valves, valves in all equipment rooms, etc. All types of valves, ball, globe, butterfly, cocks, control, regulating, relief, reducing, solenoid, etc. are to be identified except check valves. Do not identify end use point valves for plumbing fixtures, and similar rough-in connections.

E. Provide damper tags on all automatic control dampers, motorized dampers, and smoke dampers.

F. List each tagged valve and damper in schedule for each system showing function and location. Provide separate charts for mechanical divisions of work. Charts shall be installed on a conspicuous wall in the main mechanical equipment room. Provide unframed copies of valve and damper lists as part of closeout documents.

3.2 ADJUSTING AND CLEANING

A. Relocate any mechanical identification device which has become visually blocked by work of this division or other divisions.

B. Clean face of identification devices and glass frames of valve schedules.

3.3 PIPING DUCTWORK, AND EQUIPMENT IDENTIFICATION

A. Piping systems that shall be identified by their controls (including directional arrows) on this project shall include, but are not necessarily limited to, the following:

1. Natural Gas

B. Equipment/Ductwork

1. Outdoor air intake plenums.
2. Exhaust fans.
3. Make Up Air Units
4. Directional arrows indicating flow of air at discharge and inlet of air handling units.
5. Provide name plates for all equipment scheduled on the drawings. Coordinate nameplate tag with Owner's sequencing system. If the Owner has no preference, the nameplates shall correspond with the equipment schedule.
6. All labeling for the machinery refrigeration room shall be in accordance with ASHRAE 15.

END OF SECTION 23 0553

SECTION 23 0593
TESTING, ADJUSTING, AND BALANCING FOR HVAC

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Testing, adjustment, and balancing of air systems.

B. Commissioning activities.

1.2 RELATED REQUIREMENTS

A. Section 01 4000 - Quality Requirements: Employment of testing agency and payment for services.

B. Section 01 9113 - General Commissioning Requirements: Commissioning requirements that apply to all types of work.

C. Section 23 0800 - Commissioning of HVAC.

1.3 REFERENCE STANDARDS

A. AABC (NSTSB) - AABC National Standards for Total System Balance, 7th Edition 2016.

B. ASHRAE Std 111 - Measurement, Testing, Adjusting, and Balancing of Building HVAC Systems 2008 (Reaffirmed 2017).

C. NEBB (TAB) - Procedural Standards for Testing Adjusting and Balancing of Environmental Systems 2015, with Errata (2017).

D. SMACNA (TAB) - HVAC Systems Testing, Adjusting and Balancing 2002.

1.4 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. TAB Plan: Submit a written plan indicating the testing, adjusting, and balancing standard to be followed and the specific approach for each system and component.

1. Submit to Architect/Engineer/Engineer.
2. Submit to the Construction Manager.
3. Submit six weeks prior to starting the testing, adjusting, and balancing work.
4. Include certification that the plan developer has reviewed Contract Documents, the equipment and systems, and the control system with the Architect/Engineer and other installers to sufficiently understand the design intent for each system.
5. Include at least the following in the plan:
    a. List of all air flow, water flow, sound level, system capacity and efficiency measurements to be performed and a description of specific test procedures, parameters, formulas to be used.
    b. Copy of field checkout sheets and logs to be used, listing each piece of equipment to be tested, adjusted and balanced with the data cells to be gathered for each.
    c. Discussion of what notations and markings will be made on the duct and piping drawings during the process.
    d. Final test report forms to be used.

e. Detailed step-by-step procedures for TAB work for each system and issue, including:
   1) Terminal flow calibration (for each terminal type).
   2) Diffuser proportioning.
   3) Branch/submain proportioning.
   4) Total flow calculations.
   5) Rechecking.
   6) Diversity issues.

f. Expected problems and solutions, etc.

g. Criteria for using air flow straighteners or relocating flow stations and sensors; analogous explanations for the water side.

h. Details of how TOTAL flow will be determined; for example:
   1) Air: Sum of terminal flows via control system calibrated readings or via hood readings of all terminals, supply (SA) and return air (RA) pitot traverse, SA or RA flow stations.
   2) Water: Pump curves, circuit setter, flow station, ultrasonic, etc.

i. Specific procedures that will ensure that both air and water side are operating at the lowest possible pressures and methods to verify this.

j. Confirmation of understanding of the outside air ventilation criteria under all conditions.

k. Method of verifying and setting minimum outside air flow rate will be verified and set and for what level (total building, zone, etc.).

l. Method of checking building static and exhaust fan and/or relief damper capacity.

m. Proposed selection points for sound measurements and sound measurement methods.

n. Methods for making coil or other system plant capacity measurements, if specified.

o. Time schedule for TAB work to be done in phases (by floor, etc.).

p. Description of TAB work for areas to be built out later, if any.

q. Time schedule for deferred or seasonal TAB work, if specified.

r. False loading of systems to complete TAB work, if specified.

s. Exhaust fan balancing and capacity verifications, including any required room pressure differentials.

t. Interstitial cavity differential pressure measurements and calculations, if specified.

u. Procedures for field technician logs of discrepancies, deficient or uncompleted work by others, contract interpretation requests and lists of completed tests (scope and frequency).

v. Procedures for formal progress reports, including scope and frequency.

w. Procedures for formal deficiency reports, including scope, frequency and distribution.

C. Field Logs: Submit at least twice a week to the Commissioning Authority.

D. Control System Coordination Reports: Communicate in writing to the controls installer all setpoint and parameter changes made or problems and discrepancies identified during TAB that affect, or could affect, the control system setup and operation.

E. Progress Reports.

F. Final Report: Indicate deficiencies in systems that would prevent proper testing, adjusting, and balancing of systems and equipment to achieve specified performance.

1. Submit under provisions of Section 01 4000.
2. Submit to the Commissioning Authority within two weeks after completion of testing, adjusting, and balancing.
3. Revise TAB plan to reflect actual procedures and submit as part of final report.
4. Submit draft copies of report for review prior to final acceptance of Project. Provide final copies for Architect/Engineer and for inclusion in operating and maintenance manuals.
5. Provide report in PDF, Excel, or Word format, complete with cover page.
6. Include set of reduced drawings with air outlets and equipment identified to correspond with data sheets.
7. Include set of reduced drawings indicating thermostat locations.
8. Include actual instrument list, with manufacturer name, serial number, and date of calibration.
9. Form of Test Reports: Where the TAB standard being followed recommends a report format use that; otherwise, follow ASHRAE Std 111.
10. Units of Measure: Report data in both I-P (inch-pound) and SI (metric) units.
11. Include the following on the title page of each report:
    a. Name of Testing, Adjusting, and Balancing Agency.
    b. Address of Testing, Adjusting, and Balancing Agency.
    c. Telephone number of Testing, Adjusting, and Balancing Agency.
    d. Project name.
    e. Project location.
    f. Project Architect/Engineer.
    g. Project Engineer.
    h. Project Contractor.
    i. Project altitude.
    j. Report date.

G. Project Record Documents: Record actual locations of flow measuring stations and balancing valves and rough setting.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.1 GENERAL REQUIREMENTS

A. Perform total system balance in accordance with one of the following:

1. SMACNA (TAB).

B. Begin work after completion of systems to be tested, adjusted, or balanced and complete work prior to Substantial Completion of the project.

C. TAB Agency Qualifications:

1. Company specializing in the testing, adjusting, and balancing of systems specified in this section.
2. Certified by one of the following:
    a. AABC, Associated Air Balance Council: upon completion submit AABC National Performance Guaranty.
    b. NEBB, National Environmental Balancing Bureau: www.nebb.org/#sle.
    c. TABB, The Testing, Adjusting, and Balancing Bureau of National Energy Management Institute: www.tabbcertified.org/#sle.

D. TAB Supervisor and Technician Qualifications: Certified by same organization as TAB agency.

3.2 EXAMINATION

A. Verify that systems are complete and operable before commencing work. Ensure the following conditions:

1. Systems are started and operating in a safe and normal condition.
2. Temperature control systems are installed complete and operable.
3. Proper thermal overload protection is in place for electrical equipment.
4. Final filters are clean and in place. If required, install temporary media in addition to final filters.
5. Duct systems are clean of debris.
6. Fans are rotating correctly.
7. Fire and volume dampers are in place and open.
8. Air coil fins are cleaned and combed.
9. Access doors are closed and duct end caps are in place.
10. Air outlets are installed and connected.
11. Duct system leakage is minimized.
12. Hydronic systems are flushed, filled, and vented.
13. Pumps are rotating correctly.
14. Proper strainer baskets are clean and in place.
15. Service and balance valves are open.

B. Submit field reports. Report defects and deficiencies that will or could prevent proper system balance.

C. Beginning of work means acceptance of existing conditions.

3.3 ADJUSTMENT TOLERANCES

A. Air Handling Systems: Adjust to within plus or minus 5 percent of design for supply systems and plus or minus 10 percent of design for return and exhaust systems.

B. Air Outlets and Inlets: Adjust total to within plus 10 percent and minus 5 percent of design to space. Adjust outlets and inlets in space to within plus or minus 10 percent of design.

3.4 RECORDING AND ADJUSTING

A. Field Logs: Maintain written logs including:

1. Running log of events and issues.
2. Discrepancies, deficient or uncompleted work by others.
3. Contract interpretation requests.
4. Lists of completed tests.

B. Ensure recorded data represents actual measured or observed conditions.

C. Permanently mark settings of valves, dampers, and other adjustment devices allowing settings to be restored. Set and lock memory stops.

D. Mark on drawings the locations where traverse and other critical measurements were taken and cross reference the location in the final report.

E. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.

F. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.

G. At final inspection, recheck random selections of data recorded in report. Recheck points or areas as selected and witnessed by the Owner.

3.5 AIR SYSTEM PROCEDURE

A. Air ducts with electric heating coils shall be adjusted to allow coil to energize at minimum airflow conditions.

3.6 COMMISSIONING

A. See Sections 01 9113 - General Commissioning Requirements and 23 0800 for additional requirements.

B. Perform prerequisites prior to starting commissioning activities.

C. Fill out Prefunctional Checklists for:

1. Air side systems.
2. Water side systems.

D. Furnish to the Commissioning Authority, upon request, any data gathered but not shown in the final TAB report.

E. Re-check minimum outdoor air intake flows and maximum and intermediate total airflow rates for 25 percent of the air handlers plus a random sample equivalent to 20 percent of the final TAB report data as directed by Commissioning Authority.

1. Original TAB agency shall execute the re-checks, witnessed by the Commissioning Authority.
2. Use the same test instruments as used in the original TAB work.
3. Failure of more than 10 percent of the re-checked items of a given system shall result in the rejection of the system TAB report; rebalance the system, provide a new system TAB report, and repeat random re-checks.
4. For purposes of re-check, failure is defined as follows:
    a. Air Flow of Supply and Return: Deviation of more than 10 percent of instrument reading.
    b. Minimum Outside Air Flow: Deviation of more than 20 percent of instrument reading; for inlet vane or VFD OSA compensation system using linear proportional control, deviation of more than 30 percent at intermediate supply flow.
    c. Temperatures: Deviation of more than one degree F (0.5 degree C).
    d. Air and Water Pressures: Deviation of more than 10 percent of full scale of test instrument reading.
    e. Sound Pressures: Deviation of more than 3 decibels, with consideration for variations in background noise.
5. For purposes of re-check, a whole system is defined as one in which inaccuracies will have little or no impact on connected systems; for example, the air distribution system served by one air handler or the hydronic chilled water supply system served by a chiller or the condenser water system.

F. In the presence of the Commissioning Authority, verify that:
1. Final settings of all valves, splitters, dampers and other adjustment devices have been permanently marked.
2. The air system is being controlled to the lowest possible static pressure while still meeting design loads, less diversity; this shall include a review of TAB methods, established control setpoints, and physical verification of at least one leg from fan to diffuser having all balancing dampers wide open and that during full cooling of all terminal units taking off downstream of the static pressure sensor, the terminal unit on the critical leg has its damper 90 percent or more open.
3. The water system is being controlled to the lowest possible pressure while still meeting design loads, less diversity; this shall include a review of TAB methods, established control setpoints, and physical verification of at least one leg from the pump to the coil having all balancing valves wide open and that during full cooling the cooling coil valve of that leg is 90 percent or more open.

3.7 MINIMUM DATA TO BE REPORTED

A. Air Moving Equipment:

B. Supply and Exhaust Fans:
1. Fan BHP

C. Unit Heaters, Fin-tube, etc.:
1. Unit type, manufacturer, model no., etc.
2. Entering and leaving air temperature
3. Electrical data

D. Air Distribution Tests (Diffusers, Registers, and Grilles):
   1. Design air flow.
   2. Test (final) air flow.

END OF SECTION

SECTION 23 1123
FACILITY NATURAL GAS PIPING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Provide equipment, materials, tools, labor, and supervision necessary to furnish, fabricate, and install a complete Natural Gas piping system.

1.2 STANDARDS AND CODES

A. Pipe materials specified in this Section shall apply to technical sections of Division 23 of the Project Manual where applicable. Special requirements as may be called for in the technical sections, or shown on the Drawings, shall take precedence over General Requirements herein. Piping located in plenums shall be plenum rated for fire and smoke.

B. Gas piping and connections to equipment shall be in accordance with NFPA-54 and the City of [_____] Gas Code and the local utility company.

1.3 PRODUCT HANDLING

A. Provide factory-applied plastic end-caps on each length of pipe and tube. Maintain end-caps through shipping, storage, and handling as required to prevent pipe-end damage and eliminate dirt and moisture from inside of pipe and tube.

B. Where possible, store pipe and tube inside and protected from weather. Where necessary to store outside, elevate well above grade and enclose with durable, waterproof wrapping.

C. Protect flanges and fittings from moisture and dirt by inside storage and enclosure, or by packaging with durable, waterproof wrapping.

1.4 SUBMITTALS

A. Submit piping schedule listing each pipe material used and systems served.

B. Submit shop drawings at ¼" per foot scale indicating exact routing and elevations for all piping systems.

PART 2 PRODUCTS

2.1 MATERIAL

A. Material and Service

B. Aboveground natural gas.

1. Black steel pipe seamless, Schedule 40, ASTM A53.

C. Gas vents and underground gas piping within 5'-0" of building.

1. Welded black steel Schedule 40, coated with asphalt and wrapped, ASTM A120.

D. Fittings

1. Threaded pipe - malleable iron fittings, 125-pound standard flat band water pattern.
2. Welded pipe - welded neck fittings and welded neck flanges, same material and strength as pipe.

3. Carbon steel pipe - material and strength shall correspond to pipe specifications. ANSI B31.5.
4. Plastic underground natural gas piping - all fittings shall be manufactured (tee's, elbows, reducers and transitions to steel pipe), by the piping manufacturer.

E. Joints

1. Threaded pipe - make joints using approved pipe joint compound, applied to male threads only. Cut pipe square, cut threads clean, remove burrs, and ream ends to full size of bore. Threads shall not be exposed on chromium-plated pipe.
2. Welded pipe - welding shall conform to welding section of ANSI B31.1 "Code for Power Piping". Pipe up to 2" diameter shall be screwed. Pipe 2 ½" diameter and over shall be welded.
3. Plastic underground natural gas piping - butt fusion welded in accordance with manufacturers recommendations.

F. Nipples and Unions

1. Nipples shall conform to size, weight, and strength of adjoining pipe. When length of unthreaded portion of nipple is less than 1-1/2", use extra strong nipple; do not use close nipples.
2. For pipe 3" and smaller, use screwed unions; over 3", use flanged unions. For steel and wrought iron pipe, use malleable iron ground joint unions, black or galvanized, to conform to pipe. Cast iron flanged unions are to be gasket type. For threaded brass pipe, use bronze ground joint unions with octagon ends. Install unions on equipment intended to be disassembled.
3. Dielectric unions shall be installed between connections of copper pipe and ferrous piping.

2.2 PLUG VALVES

A. Plug valves shall not be furnished unless specifically shown on the Drawings. When so indicated, this type of valve shall meet the following specifications:

1. Smaller than 2 in.: Tapered plug valves, semi-steel, screwed, wrench operated with wrench.
2. 2 in. and larger: Tapered plug valves, carbon steel, flanged, lubricated plug wrench operated with a wrench.

2.3 PRESSURE REGULATING VALVE (NATURAL GAS)

A. Gas regulators shall be furnished and installed to maintain the gas pressure to the pilot supply and main burner supply line within +10% of the operating pressure from maximum to minimum firing rates at inlet operating pressures of 1-1/2 to 2 psig.

B. Regulators shall be of the spring-loaded or pressure balanced type. Under no circumstances shall a dead weight or a weight and level type of regulator be used.

C. Gas regulators shall be suitable for operation with electronic ignition “dead end” conditions.

D. Gas pressure regulators shall be AGA and CGA certified for scheduled operating conditions.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install piping and make service connection as shown on the Drawings.

B. Pipe size 2 in. and larger or 2 psig and greater shall have welded joints; pipe less than 2 in. and less than 2 psig shall have threaded joints made up with gas resistant joint compound.

C. Install gas shutoff plug valve in main, in each branch line and at each appliance.

D. Install service plug valve at each outlet.

E. General: Comply with requirements of basic piping material sections for installation of piping materials. Install piping products in accordance with manufacturer's written instructions, with applicable installation requirements of ANSI Z 223.I, and in accordance with recognized industry practices to insure that products serve intended functions.

F. Use sealants on metal gas piping threads that are chemically resistant to LP and natural gas. Use sealants sparingly and apply to only male threads of metal joints.

G. Remove cutting and threading burrs before assembling piping.

H. Do not install defective piping or fittings. Do not use pipe with threads that are chipped, stripped or damaged.

I. Plug each gas outlet, including valves, with a threaded plug or cap immediately after installation, and retain until continuing piping or equipment connections are completed.

J. Install dirt-legs in gas piping at connections to equipment and elsewhere as indicated, and where required by code or regulation.

K. Install tee fittings with bottom outlet plugged, or capped, at bottom of pipe risers.

L. Do not install gas piping through foundations or under buildings. Where unavoidable, install in welded conduit, ventilated to outdoors on both ends, and tested to same requirements as gas piping.

M. Gas piping shall be electrically grounded and continuously grounded within the project, and bonded tightly to the grounding connection.

N. Use dielectric unions where dissimilar metals are joined together.

O. Install piping with 1/64" per foot (1/8%) downward slope in direction flow.

P. Install piping parallel to other piping, but maintain minimum of 12" clearance between gas piping and steam or hydronic piping above 200° F (93° C).

Q. Installation of Valves:

1. Gas Cocks: Provide at connection to gas train for each gas-fired equipment item; and on risers and braces where indicated.
2. Locate gas cocks where easily accessible, and where they will be protected from possible injury.
3. Control Valves: Install as indicated. Refer to Division 16 for wiring, not work of this section.
4. Pressure Regulating Valves: Install where shown and where required; comply with Utility requirements. Pipe atmospheric vent to outdoors, full size of outlet. Install gas shutoff valve upstream of each pressure regulating valve.

3.2 EQUIPMENT CONNECTIONS

A. Fuel Gas Piping Tightness Test: Prior to initial operation, test and purge fuel gas piping in accordance with ANSI Z 223.I, National Fuel Gas Code.

B. General: Connect gas piping to each gas-fired equipment item, with dirt leg and shutoff gas cock and pressure regulator where required. Comply with equipment manufacturer's instructions.

C. Piping Tests:

1. Using dry nitrogen, purge each segment to be tested. Cap or otherwise seal the segment to be tested. Fill system with dry nitrogen and test in accordance with NFPA 54.
2. Repair or replace fuel gas piping as required to eliminate leaks, and retest as specified to demonstrate compliance.
3. All welded pipe shall be pressure tested to 90 psig for a minimum period of one hour. Submit test results.

D. Purge System:

1. After all segments have been tested and entire system completed, purge the system free of air in accordance with NFPA 54. Do not leave purge discharge points unattended.

E. Spare Parts:

1. Furnish to Owner, with receipt, 2 valve wrenches for each type of gas valve installed, requiring same.

END OF SECTION 23 1123

SECTION 23 3113
METAL DUCTS

PART 1 GENERAL

1.1 SUMMARY

A. Provide material, devices, labor, and supervision necessary to fabricate and erect ductwork as required by the Drawings and this Section.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data and installation instructions for metal ductwork materials and products.

1.3 QUALITY ASSURANCE

A. Codes and Standards:

1. Ducts, plenums, apparatus casings, metal gauges, reinforcing, methods of supporting and hanging, and other sheet metal work as called for shall meet all functional criteria defined in Section VII, of the SMACNA "HVAC Duct Construction Standards Metal and Flexible" Current Edition. This shall be subsequently referred to as the SMACNA Manual. All ductwork must comply with all local, state and federal code requirements.
2. Comply with applicable requirements of NFPA 91.

1.4 DESCRIPTION

A. Air ducts shall be constructed as follows:

1. Supply, Exhaust, and OA Ductwork ±2” w-g.

PART 2 PRODUCTS

2.1 GENERAL

A. Shop fabricated sheet metal work shall be constructed of prime quality resquared tight coat galvanized steel, except where other type material is specified. Manufacturer's name and U.S. gauge number shall appear on each sheet.

B. Duct sealant shall be installed per SMACNA Class A-all transverse joints, longitudinal seams and duct wall penetrations.

C. Duct Sealant for Low Pressure Duct: UL labeled non-hardening, non-migrating mastic or liquid elastic sealant, type applicable for fabrication/installation detail, as compounded and recommended by manufacturer specifically for sealing joints and seams in ductwork. Sealant to be Mastic No. IG601 as manufactured by Hardcast or Engineer approved equivalent product manufactured by Ductmate or United McGill.

2.2 DUCT

A. Rectangular Duct:

1. Sheet Metal: Except as otherwise indicated, fabricate ductwork from minimum 24 gage galvanized sheet steel complying with ASTM A527, lockforming quality; with G90 zinc coating in accordance with ASTM A653; and mill phosphatized for exposed locations.

2. Rectangular duct shall be fabricated to the SMACNA functional criteria for the pressure class indicated on the Drawings.
3. Pittsburgh lock shall be used on all longitudinal seams. All longitudinal seams will be sealed with mastic sealant. Snaplock is not acceptable.

B. Rectangular Duct Fittings:

1. Elbows shall be constructed with centerline radius of not less than 1.5 times duct width; where space conditions will not permit this radius or where indicated on the Drawings, square elbows with single thickness streamline turning vanes shall be used. Provide trailing edge extension for elbows in series.
2. Slopes for transitions or other changes in dimension shall be minimum 1 to 3.
3. All duct seams and joints shall be sealed to SMACNA Class A requirements.
4. Rectangular branch taps from mains shall be 45° entry fittings.

C. Round Duct:

1. Round Duct shall be spiral lock seam type, fabricated of galvanized steel strip with airtight four-ply lock seams Minimum 24 gage.
2. Metal gauges shall be as listed in the SMACNA Standard for the pressure class indicated on the Drawings.
3. Round duct shall be externally insulated.

D. Round Fittings:

1. Elbows for round ducts shall have a center line radius of 1.5 times the duct diameter.
2. 45o and 90o elbows for ducts up to 8" diameter shall be die stamped two-piece with welded longitudinal seams.
3. Elbows for round ducts over 8" diameter shall be formed of segments with welded seams and following numbers of segments:
    a. 90 degree elbow: 5 segments
    b. 60 degree elbow: 3 segments
    c. 45 degree elbow: 3 segments
    d. 30 degree elbow: 2 segments
    e. 22½ degree elbow: 2 segments
4. Tees, crosses and lateral cross fittings for round duct shall be of the conical type.
5. Reducers, increasers, offsets, wyes, crosses, divided flow fittings and similar fittings for round duct shall be one-piece construction with welded seams.
6. Metal gauges for fittings for round duct shall be as listed in SMACNA Standard for the pressure class indicated on the Drawings.
7. Duct and fitting welds shall be painted after fabrication to prevent corrosion where zinc has been burned by welding.
8. No bull headed tees shall be used.
9. Pipe-to-pipe joints for round ducts up to 50" diameter shall be made with male sleeve couplings reinforced by rolled bead.
10. Pipe-to-fitting joints for round ducts up to 50" shall be made by slip-fit of projecting collar of fitting into the duct.
11. Slip-fit joints shall be fastened with sheet metal screws, place ½" from fitting or coupling head.

12. Joints shall be sealed with duct sealant installed as recommended by the manufacturer.
13. Duct reinforcing, size of reinforcing angles and spacing shall be as recommended by SMACNA.

2.3 DUCTWORK SUPPORT MATERIALS

A. Except as otherwise indicated, provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim and angles for support of ductwork.

2.4 DUCT ACCESSORIES

A. Transverse Duct Joints: May be made with the Ductmate Systems or an Engineer approved equivalent. The Ductmate Systems are to be used in accordance with the Ductmate factory installation and assembly instructions, (1-800-245-3188).

1. Ductmate 440 or a Butyl Rubber Gasket which meets Mil-C 18969B, Type II Class B, T-C-1796 A, Type II Class B, and TTS-S-001657 must also pass UL-723. This material, in addition to the above, shall not contain vegetable oils, fish oils, or any other type vehicle that will support fungal and/or bacterial growth associated with dark, damp areas of ductwork. The recommended test procedure for bacterial and fungal growth is found in 21CFR 177, 1210 closures with sealing gaskets for food containers.
2. Ductmate or W.D.C.I. proprietary duct connection systems are acceptable. Duct constructed using these systems shall refer to the manufacturer's guidelines for sheet gauge, intermediate reinforcement size and spacing, and joint reinforcements.
3. Formed on flanges (T.D.C./T.D.F./T-25A/T-25B) are acceptable. Formed on flanges shall be constructed as SMACNA T-25 flanges, whose limits are defined on Page 1.36 1985 SMACNA Manual, First Edition. No other construction pertaining to formed on flanges will be accepted. Formed on flanges shall be accepted for use on ductwork 42" wide or less, 2" static positive pressure or less, and shall include the use of corners, bolts and cleat. (Over 42", the reinforcement/joint deflection criteria no longer conform to the UMC).

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Assemble and install ductwork in accordance with recognized industry practices which will achieve airtight (5% leakage for systems rated 3" and under; 1% for systems rated over 3") and noiseless (no objectionable noise) systems, capable of performing each indicated service. Install each run with minimum number of joints. Align ductwork accurately at connections, within 1/8" misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers and anchors of type which will hold ducts true-to-shape and to prevent buckling. Support vertical ducts at every floor.

B. Inserts: Install concrete inserts for support of ductwork in coordination with form work, as required to avoid delays in work.

C. Field Fabrication: Complete fabrication of work at project as necessary to match shop-fabricated work and accommodate installation requirements.

D. Locate ductwork runs, except as otherwise indicated, vertically and horizontally and avoid diagonal runs wherever possible. Locate runs as indicated by diagrams, details and notations or, if not otherwise indicated, run ductwork in shortest route which does not obstruct usable space or block access for servicing building and its equipment. Install offsets, angles, and transitions as may be required to avoid interferences with other work, install streamlined easements around obstructions where necessary to pass obstructions through ducts. Maintain full capacity of ducts at offsets, angles, transitions and easements, except where Drawings

indicated use of reducing or increasing transitions. Hold ducts close to walls, overhead construction, columns, and other structural and permanent enclosure elements of building.

E. Limit clearance to ½" where furring is shown for enclosure or concealment of ducts, but allow for insulation thickness, if any. Where possible, locate insulated ductwork for 1" clearance outside of insulation. Wherever possible in finished and occupied spaces, conceal ductwork from view, by locating in mechanical shafts, hollow wall construction or above suspended ceilings. Do not encase horizontal runs in solid partitions, except as specifically shown. Coordinate layout with suspended ceiling and lighting layouts and similar finished work.

F. Where ducts pass through interior partitions and exterior walls, conceal the space between the construction opening and the duct or duct-plus-insulation with sheet metal flanges of the same gauge as the duct. Overlap the opening on all sides by at least 1½".

G. Coordinate duct installations with installation of accessories, equipment, controls and other associated work of the ductwork system.

H. Each duct section shall be rigidly supported from structure. Attach hangers to structure with expansion plugs, concrete inserts, beam clamps or other approved means. Rubber-in-shear isolators shall be installed in hangers for ducts in equipment rooms, to prevent vibration transmission to the structure.

I. Install as indicated on the Drawings duct mounted equipment as specified in other Sections.

J. Duct sizes shown on Drawings are net inside dimensions. Increase duct sizes as required to allow for installation of duct liner, where specified.

K. Application of Duct Sealant: All ducts to be properly sealed. Specified duct sealant to be pumped or painted into all joints and seams on all ductwork systems. Sealant shall be allowed to set 48 hours before any air pressure is applied to system.

L. Electrical Equipment Spaces: Do not route ductwork through electrical equipment spaces and enclosures. Do not run ductwork above electrical panels.

3.2 EQUIPMENT CONNECTIONS

A. General: Connect metal ductwork to equipment as indicated; provide flexible connection for each ductwork connection to equipment mounted on vibration isolators, and/or equipment containing rotating machinery.

3.3 ADJUSTING AND CLEANING

A. Clean ductwork internally, unit by unit as it is installed, of dust and debris. Clean external surfaces of foreign substances which might cause corrosive deterioration of metal or, where ductwork is to be painted, might interfere with painting or cause paint deterioration.

B. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

C. Balancing: Refer to Section 23 0593, "Testing, Adjusting and Balancing for HVAC" for air distribution balancing of metal ductwork; not work of this section. Seal any leaks in ductwork that become apparent during the balancing process.

END OF SECTION

SECTION 23 3300
AIR DUCT ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes the following:

1. Motorized control dampers.
2. Duct-mounting access doors.

1.2 SUBMITTALS

A. Product Data: For the following:

1. Duct-mounting access doors.

B. Shop Drawings:

1. Product Data: Submit manufacturer's technical product data and installation instructions for metal ductwork materials and products.

1.3 QUALITY ASSURANCE

A. Codes and Standards

1. Comply with NFPA 90A, "Installation of Air Conditioning and Ventilating Systems," and NFPA 90B, "Installation of Warm Air Heating and Air Conditioning Systems."
2. Ducts, plenums, apparatus casings, metal gauges, reinforcing, methods of supporting and hanging, and other sheet metal work as called for shall meet all functional criteria defined in the SMACNA "HVAC Duct Construction Standards Metal and Flexible" 2005, 3rd Edition. This shall be subsequently referred to as the SMACNA Manual. All ductwork must comply with all local, state and federal code requirements.
3. Comply with applicable requirements of NFPA 91.

PART 2 PRODUCTS

2.1 DUCT-MOUNTING ACCESS DOORS

A. General:

1. Shall be of same material as ducts in which they are installed, fabricated of two thicknesses of not less than 22 gauge, with 1" thick rigid glass fiber filler. Provide sheet metal frame, airtight gasket and two cam latches. Access doors and panels shall be 2 inches smaller than duct width and square for ducts 18” wide and larger, maximum size shall be 24" x 24" unless noted otherwise. For ducts less than 18” wide, access doors and panels shall be 2” smaller than duct width and 18” long. Pre-manufactured doors shall be hinged and shall be of adequate size to allow easy access to hardware which needs to be maintained.

PART 2 EXECUTION

3.1 APPLICATION AND INSTALLATION

A. Coordinate duct installations with installation of accessories, equipment, controls and other associated work of the ductwork system.

B. Install access panels for inspection and servicing of duct mounted equipment; reheat coils, sound attenuators, and smoke and fire dampers.

END OF SECTION 23 3300

SECTION 23 3416
FANS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. The extent of work is shown on drawings and in schedules and by requirements of this section, and is hereby defined to include, but not by way of limitation:

1. Propeller fans
2. Wall exhausters
3. Fan accessories
4. Motors and drives

1.2 CODES AND STANDARDS

A. Installer: A firm with at least 3 years of successful fan installation experience.

B. AMCA Standards: Comply with air movement and control association standards as applicable to testing and rating fans, including but not limited to, AMCA 99, 210, 211, 261, 300, 301. Provide fans that bear the AMCA Certified Ratings Seal for sound and air performance.

C. UL Compliance: Provide fan and components which are UL listed and labeled.

D. SMACNA Standards: Comply with applicable portions of SMACNA duct construction standards.

E. Grease hood exhaust fans shall be UL listed for grease removal (UL762)

1.3 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver products with factory-installed shipping skids and lifting lugs; pack components in factory-fabricated protective framing.

B. Handle products carefully to avoid damage to components, enclosures and finish. Do not install damaged components; replace and return damaged components to manufacturer for repairs or replacement.

C. Store products in clean dry place and protect from weather and construction traffic.

1.4 SUBMITTALS

A. Shop Drawings: Shop drawings shall indicate assembly, unit dimensions, weight loading, required clearances, construction details, and field connection details.

B. Product Data: Product data shall indicate performance data relative to the information scheduled on the drawings. In addition, provide dimensions, weights, capacities, ratings, fan performance, motor electrical characteristics, and gauges and finishes of materials.

C. Provide fan curves with specified operating point clearly plotted.

D. Submit sound power levels for both fan inlet and outlet and radiation at rated capacity.

E. Submit electrical requirements for power supply wiring including wiring diagrams for interlock and control wiring clearly indicating factory installed and field installed wiring.

F. Submit manufacturer’s installation instructions.

1.5 ENVIRONMENTAL REQUIREMENTS

A. Do not operate units for any purpose, temporary or permanent, until ductwork is clean, filters are in place, bearings lubricated, and fan has been test run under observation.

1.6 EXTRA MATERIALS

A. Supply two sets of belts for each belt driven fan.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Subject to compliance with requirements, provide products by one of the following, or engineer approved equivalent:

1. Greenheck
2. Penn barry
3. Trane
4. Cook
5. Twin City Fan
6. Carnes
7. Jenn Fan
8. Aerovent
9. Acme
10. Buffalo Forge, Division of Howden Fan
11. Howden Fan
12. Sun Air
13. Gaylord
14. General Electric

2.2 GENERAL

A. Provide fans of type, sizes, ratings and capacities as indicated on drawings and in schedules.

2.3 PROPELLER FANS

A. Propeller: Shaped steel or steel reinforced aluminum blade with heavy hubs, statically and dynamically balanced, keyed and locked to shaft, directly connected to motoror provided with V-belt drive.

B. Motors and drives shall be scheduled on the Drawings. On direct drive units, motors shall be resiliently mounted in basket type guards of heavy-duty steel in a concentric ring pattern. On belt drive units, motors shall be mounted on an adjustable motor base. Motor to be equipped with an adjustable pitch sheave.

C. Frame: One piece, square steel with die formed venturi orifice, mounting flanges and supports, with baked enamel finish.

D. Accessories

1. Backdraft damper: Multiple blade with offset hinge pin, blades linked.

2. Outlet damper: Multiple blade with offset hinge pin, blades linked, line voltage motor drive, power open, spring return.
3. Safety Screens: Expanded galvanized metal over inlet, motor, and drive [and outlet]; to comply with OSHA regulations.
4. Hood: Weathershield, to exclude rain and snow.
5. Controller: Solid-state speed controller.

2.4 WALL EXHAUSTERS

A. Wall Exhausters

1. Centrifugal, direct driven as scheduled, with spun aluminum housing, motor, 1/2 inch mesh bird screen, cadmium plated bolts and screws.
2. Disconnect Switch: Factory wired non-fusible in housing for thermal overload protected motor and solid state speed controller.
3. Motorized Damper: Motorized opposed blade damper interlocked with fan.
4. V-belt Drive: Cast iron or steel sheaves, dynamically balanced, bored to fit shafts and keyed, variable and adjustable pitch motor sheave selected so requiring rpm is obtained with sheaves set at mid-position, fan shaft with self aligning pre-lubricated ball bearings.

PART 3 EXECUTION

3.1 INSPECTION

A. Installer shall examine areas and conditions under which fans are to be installed, and notify Contractor in writing of conditions detrimental to proper completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.2 INSTALLATION OF FANS

A. Install fans where shown in accordance with equipment manufacturer’s written instructions, recognized industry practices, and in accordance with National Electrical Code, to insure compliance with requirements and serve intended purposes.

B. Coordinate with other work, including ductwork, roof decking, vibration isolation, and electrical work, as necessary to interface installation of fans with other work.

C. Temporary Closure: Upon completion of installation, provide protective covering on fan ductwork connection openings to prevent entrance of dust and debris into equipment.

D. Install vibration isolators and flexible electrical leads to properly isolate the fan vibration from the structure.

E. Duct Connections: Provide ductwork, accessories, and flexible connections as indicated.

F. Do not operate fans in normal operation until ductwork is clean, filters are in place, bearings are lubricated, and fan has been test run under observation.

G. Secure wall exhausters with cadmium plated steel lag screws to structure.

H. Extend ducts to wall exhausters into structure. Counterflash duct to wall opening.

3.3 ELECTRICAL CONNECTIONS

A. Insure that the fan is wired properly for proper fan rotationand proper interface with associated thermostat, variable speed controller and outdoor air damper.

B. Provide positive electrical motor grounding.

3.4 TESTING

A. After installation of fans has been completed, test each fan to demonstrate proper operation of unit at performance requirements specified, including, but not limited to, proper rotation of impeller. When possible, field correct malfunctioning units, then retest to demonstrate compliance. Replace units which cannot be satisfactorily corrected at no additional cost to owner.

3.5 DEMONSTATION/TRAINING

A. Contractor hsll train owner on operation of the system and how the CO/NO2 and exahust fans all interact. Manufacturer's representatives, installing contractor, and owner shall all participate in training for the owner. The contractor shall provide written report of the training which shall include both the contractor's and owners signature. Include this report in the O&M information provided to the owner at the completion of the project.

3.6 WARRANTY

A. Provide a full parts warranty for one year from start-up or 18 months from shipment, whichever occurs first.

END OF SECTION 23 3416

SECTION 23 3713
DIFFUSERS, REGISTERS, AND GRILLES

PART 1 GENERAL

1.1 SUMMARY

A. This Section includes duct-mounted diffusers.

1. Provide materials, devices, labor and supervision necessary for the installation of diffusers
2. Provide diffusers, registers and grilles as per schedule on Drawings.

1.2 SUBMITTALS

A. Product Data: Submit manufacturer's technical product data for diffusers, registers and grilles including the following:

1. Schedule of diffusers, registers and grilles indicating drawing designation, room location, number furnished, model number, size and accessories furnished.
2. Data sheet for each type of grille, register and diffuser and accessory furnished; indicating construction, finish and mounting details.
3. Performance data for each type of grille, register and diffuser furnished, including aspiration ability, temperature and velocity traverses, throw and drop, and noise criteria ratings. Indicate selections on data.

B. Shop Drawings: Submit manufacturer’s assembly-type shop drawing for each type of grille, register and diffuser, indicating materials and methods of assembly of components.

1.3 QUALITY ASSURANCE

A. Codes and Standards:

1. ARI Compliance: Test and rate diffusers, registers and grilles in accordance with ARI 650 “Standard for Air Outlets and Inlets”.
2. ASHRAE Compliance: Test and rate diffusers, registers and grilles in accordance with ASHRAE 70 “Method of Testing for Rating the Air Flow Performance of Outlets and Inlets”.
3. NFPA Compliance: Install diffusers, registers and grilles in accordance with NFPA 90A “Standard for the Installation of Air Conditioning and Ventilating Systems”.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Products by Titus, Krueger, Carnes, Metal-aire, Nailor, Price, Anemostat, Tuttle & Bailey, or Engineer approved equivalent.

2.2 DRUM LOUVER GRILLES

A. Supply grilles shall of the sizes and mounting type as shown on the plans and outlet schedule. Outer borders shall be 1¼ inches wide and shall be constructed of heavy gauge extruded aluminum. Corners shall be assembled with full penetration resistance welds with a reinforcing steel patch for extra strength

B. Screw holes shall be countersunk for a neat appearance. Drum shall be constructed of heavy gauge extruded aluminum and shall rotate a minimum of 25° up and down from center line of the diffuser. Heavy extruded aluminum blades shall be individually adjustable.

C. Optional opposed-blade volume damper shall be constructed of heavy gauge steel. Damper must be operable from the face of the grille.

D. The grille finish shall be #26 white. The finish shall be an anodic acrylic paint, baked at 315°F for 30 minutes. The pencil hardness must be HB to H. The paint must pass a 100-hour ASTM B117 Corrosive Environments Salt Spray Test without creepage, blistering or deterioration of film. The paint must pass a 250-hour ASTM D870 Water Immersion Test. The paint must also pass the ASTM D2794 Reverse Impact Cracking Test with a 50-inch pound force applied.

E. The manufacturer shall provide published performance data for the grille. The grille shall be tested in accordance with ANSI/ASHRAE Standard 70-1991.

PART 3 EXECUTION

3.1 INSTALLATION

A. General: Install diffusers, registers and grilles in accordance with manufacturer's written instructions and in accordance with recognized industry practices to insure that products serve intended functions.

B. Coordinate with other work, including ductwork and duct accessories, as necessary to interface installation of air outlets and inlets with other work.

C. Install diffusers, registers, and grilles level and plumb.

D. Install diffusers, registers, and grilles with airtight connections to ducts and to allow service and maintenance of dampers.

3.2 ADJUSTING

A. After installation, adjust diffusers, registers, and grilles to air patterns indicated, or as directed, before starting air balancing.

END OF SECTION

SECTION 26 0100
BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Basic materials and methods.

1.2 REFERENCES

A. Work shall comply with applicable standards of the:

1. American Insurance Association
2. American Society for Testing and Materials (ASTM)
3. Edison Electric Institute
4. Factory Mutual (FM)
5. Institute of Electrical and Electronics Engineers
6. Insulated Power Cable Engineers Association
7. National Board of Fire Underwriters
8. National Bureau of Standards
9. National Electrical Code (NEC)
10. National Electrical Manufacturer's Association
11. National Electrical Safety Code
12. National Fire Protection Association
13. National Safety Council
14. Underwriters' Laboratories, Inc. (UL)
15. Uniform Fire Code (UFC)
16. William-Steiger Occupational Safety and Health Act of 1970 (OSHA)

1.3 SYSTEM DESCRIPTION

A. Basic materials and methods are described.

1.4 SUBMITTALS

A. Submit to the Architect/Engineer for review, prior to the placing of orders for any equipment, a complete schedule of electrical fixtures, materials and panels to be installed. Schedule shall consist of catalog cuts, diagrams, shop drawings, performance curves, or any other descriptive material necessary to fully describe the equipment proposed and its operating characteristics.

B. Review of the materials, including alternate or substitute items, shall be obtained in writing from the Architect/Engineer; verbal review will not be considered binding.

C. Submittals shall have been reviewed and signed by the contractor, prior to submittal to the Architect/Engineer. Faxes or copies of faxes are not acceptable. The Architect/Engineer will review submittals to aid in interpreting the drawings and specifications, and in so doing will assume that the submittals conform to the specified requirements set forth in this specification. Review of submittals by the Architect/Engineer does not relieve the Contractor of the responsibility of complying with the elements of the specifications.

D. Furnish copies of parts lists and operating and maintenance instructions and manuals, and furnish the services of a competent, trained individual thoroughly familiar with the operation of each special system. Special systems shall include electrical and communications equipment requiring operating instructions, inspection or periodic maintenance. The person instructing the Owner shall see that the Owner is conversant with the operation of the system and its various controls; the company from whom maintenance service and repairs may be obtained; and the location and function of switches, devices and accessories, contained in the system.

E. Operations and Maintenance Manuals shall be supplied containing the following:

1. Operation, maintenance, recommended spare parts, and renewal parts information for equipment furnished.

2. Set of complete, final, as-reviewed and accepted information required to be submitted for review.

3. As-constructed electrical, equipment, and installation drawings.

4. Index of equipment suppliers listing current names, addresses and telephone numbers of those who should be contacted for service.

5. As-constructed contract drawings permanently marked in red to show departures from original drawings.

6. Submit one (1) copy for review. This copy will be returned. Submit three (3) final revised copies.

F. Submit fire stop information and data sheets.

1.5 PERMITS AND INSPECTIONS

A. Obtain, furnish and include the costs of necessary permits, fees and inspection certificates for material and labor furnished. Include costs of permits, certificates and inspection fees required in connection with the installation, unless otherwise noted in the detailed contractual description preceding these Electrical Specifications.

B. Obtain, furnish and include the costs of necessary permits, fees and inspections required by the local Fire Marshall and the UFC, for installation of the emergency generator.

C. Where applications are required for the procuring of utility services, see that such application is properly filed with the utility.

D. On completion of work, furnish satisfactory evidence that work is acceptable to regulatory authorities having jurisdiction.

E. Be responsible to see that the proper inspection authorities are notified when inspections are required by Code, and provide necessary assistance to the inspector during inspection.

1.6 REGULATIONS

A. Installation shall conform to or exceed the minimum requirements of the NEC, and federal, state, local and municipal ordinances.

B. Work shall be performed in accordance with applicable recommendations of the ADA and OSHA.

C. Installations shown on drawings or required in the specifications that exceed the minimum requirements of the NEC or other regulations shall be installed as shown or specified.

1.7 CONTRACT DOCUMENTS

A. Intent of the drawings and specifications is to describe the complete installation. At the conclusion of construction, the electrical system shall be turned over to the Owner complete and ready for safe, efficient operation.

B. Drawings and the specifications are intended to be cooperative and supplementary. Closely check the drawings and specifications for any obvious errors or omissions, and bring any such condition to the attention of the Architect/Engineer prior to the receipt of bids, in order to permit clarification by means of a mailed Addendum.

C. Drawings for electrical work are in part diagrammatic, intended to convey the scope of work, general arrangement, approximate sizes, and locations of equipment and materials. Exact locations shall be determined to best fit the layout of the job. Scaling of the drawings will not be sufficient or accurate for determining these locations. Where job conditions require reasonable changes in indicated locations and arrangement, make such changes as directed by the Architect/Engineer, without additional cost to the Owner.

D. A complete set of contract documents shall be on the site at all times. Prior to installing the work, check drawings for dimensions and conflicts.

E. Rules

1. Where the context requires, the singular includes the plural and the plural includes the singular.

2. The use of "and" in a combined provision means that all elements in the provision must be complied with, or must exist to make the provision applicable. Where compliance with one or more elements suffices, or where existence of one or more elements makes the provision applicable, "or" (rather than "and/or") is used.

3. "Shall" is mandatory and "may" is permissive.

1.8 RESPONSIBILITY

A. Examine the project site and become familiar with existing conditions that will affect the work. Review the drawings and specifications of other trades and take note of conditions to be created which will also affect the work.

B. Provide sensors, equipment and supervision required for work in "confined spaces".

C. No energized conductors shall be exposed at any time except when the immediate area is under the direct supervision of a qualified electrician.

D. Provide temporary insulated magnetic covers for open panelboards. Use SP Products (1-800-233-8595) Type TPC xx-xx or approved equivalent.

E. Locate equipment, which must be serviced, operated or maintained, in fully accessible positions.

F. Verify location and size of each motor, and properly connect motors.

G. Responsibility shall not end with installation and connecting of various apparatus. Include services of an experienced superintendent who shall be constantly in charge of the work. Provide qualified journeymen, helpers and laborers required to properly unload, install, connect, adjust, start, operate and test the work involved, including equipment and materials furnished by other trades or by the Owner.

1.9 DAMAGE

A. Be responsible for damage to the work of other trades or to the building and its contents caused by the electrical installation.

1.10 GUARANTEE AND MAINTENANCE

A. Material and equipment shall be fully guaranteed to be free from defects and to be new equipment. No secondhand, used or salvaged equipment will be allowed.

B. Keep entire portion of the work in repair, so far as defects in workmanship, apparatus, material or construction are concerned, without additional cost to the Owner, for one (1) year from the date of final acceptance, except as otherwise specified.

C. Equipment installed which fails to meet performance ratings specified or shown on drawings shall be removed and replaced by new equipment which meets specified requirements, without additional cost to the Owner.

D. Material and workmanship shall be subject to the review of the Architect/Engineer, in whose presence various tests shall be made as required by these specifications.

PART 2 PRODUCTS

2.1 STANDARDS OF MATERIALS AND WORKMANSHIP

A. Material shall be new, complete with manufacturer's guarantee or warranty, and shall be as listed by UL, if a standard has been established by UL for the type of material. Approved manufacturers shall be firms regularly engaged in the manufacture of equipment of types and capacities required and whose products have been in satisfactory use in similar service for not less than three years.

B. Methods and techniques of installation shall be subject to review by the Architect/Engineer.

C. Material shall be the standard product of a reputable manufacturer regularly engaged in the manufacture of the specific product. Materials of the same type or class shall be the products of one manufacturer. For example, panelboards shall be from the same manufacturer and lighting switches from the same manufacturer.

D. Material shall be protected from damage and stored indoors at all times, unless other storage arrangements are reviewed by the Architect/Engineer.

E. Material and equipment shall be installed in strict accordance with the manufacturer's recommendations.

F. The equipment manufacturer and installing contractor shall carefully check that the installed, operating equipment can be properly serviced. If the manufacturer or the contractor has any reservations in this regard, they shall state their reservations and suggested changes in a separate letter addressed to the Architect/Engineer, and shall include this letter as part of their shop drawing submission. Architect/Engineer will work out required changes and adjustments in contract prices where such adjustments are warranted. No adjustment in contract price will be allowed for additions required by applicable code, ordinance, statute, utility regulation or labor regulation. It is the obligation of the contractor to include such items in his original bid. Changes in equipment shall be incorporated in shop drawings. If the contractor fails to call such reservations or suggestions to the Architect/Engineer's attention, in writing, before any work is done or equipment is purchased, it shall be assumed that the contractor accepts the responsibility for providing a safe, coordinated and complete installation. If at a later date, changes become necessary to assure a safe, coordinated and complete installation, the changes shall be made without increase in contract price.

G. Equipment, devices, apparatus, systems and installations shall be entirely suitable and safe for each intended application in every respect, and must not create conditions which would be harmful to occupants of the building, to operating personnel, to installation personnel, to testing personnel, to workmen or to the public. The contractor shall be solely responsible for providing installations that will meet these conditions. If the contractor believes that the installation will not be safe for all parties, he shall so report to the Architect/Engineer, in writing, before any equipment is purchased or work is installed, giving his exact recommendations.

H. Where the specifications or drawings state that equipment shall be "furnished," "installed" or "provided," it shall be understood to mean that the contractor shall furnish and install that equipment completely, unless it is specifically stated that the equipment is to be furnished or installed by other trades, public utility companies or the Owner.

2.3 MATERIAL SUBSTITUTIONS

A. Proposals as submitted shall be based on the products specifically named in the specification or the equivalent. Furnishing material or equipment by manufacturers other than those specified shall only be by permission of the Architect/Engineer. Such permission for substitution must be requested, by the Bidder/Vendor, in writing, at least eleven (11) calendar days prior to bid opening time. The request shall identify the differences in the alternate material or equipment as compared to that specified, and shall indicate the benefits to the project as a result of selecting the alternative.

B. Changes required by alternate equipment shall be made at no additional cost to the Owner. Re-design costs incurred by the Architect/Engineer and costs incurred by other trades, public utilities, or the Owner as a result of the use of such equipment shall be the responsibility of the Contractor.

C. The Architect/Engineer reserves the sole right for the approval of proposed material or equipment, and the phrase "or an approved equivalent" used in these specifications or on the drawings shall be interpreted to mean an equivalent approved by the Architect/Engineer.

D. The Architect/Engineer reserves the right to refuse approval of equipment which does not meet the specification, in their opinion, or of equipment for which no local experience of satisfactory service is available. The Architect/Engineer further reserves the right to reject equipment for which maintenance service and the availability of replacement parts is questionable.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

A. Examine the existing building and grounds and become familiar with conditions as they exist, or that will, in any manner, affect the work under this contract. No allowance will be made subsequently, on the behalf of the contractors, for error or negligence on their part in connection with this.

B. Existing equipment, devices and conduits in or on the existing building or grounds which are to be replaced, or which interferes with the remodeling of the existing facilities or installation of new equipment, shall be removed from the premises or relocated as directed by the Architect/Engineer. Do not remove from premises any equipment that may have maintenance value to the Owner without permission of the Owner. Items not to be reused shall be removed from the premises, unless otherwise noted herein or on the drawings.

C. Where new openings are cut, and concealed items are encountered, the items shall be removed or relocated as required. Where conduit to be removed, stubs through floors, walls or ceilings, patching shall be so that no evidence of the former installation remains.

D. Conduit shall generally be concealed in the existing portion of the building. Review plans and specifications to determine where new ceilings and walls are to be installed, and make use of these areas to conceal conduit. Do not use surface raceways unless approved by the Architect/Engineer.

E. Existing surface raceways that will become concealed due to the work shall be replaced with new conduit and wire. Junction boxes for this modification shall be accessible.

F. Locate and protect existing utilities and other underground work in a manner that will ensure that no damage or service interruption will result from excavating or other site or building work.

3.2 TEMPORARY UTILITIES

A. Provide temporary lighting, as required, to light all construction areas, ramps, runways, corridors, shops and storage areas to a minimum of 10 foot-candles while any work is in progress. First aid stations, infirmaries and offices shall be lit to a minimum of 30 foot-candles.

B. Temporary services shall meet OSHA requirements.

C. Pay costs necessary to remove or relocate any existing private, public or municipally owned electrical service or telephone service, which are on or adjacent to the Owner's property, and which will interfere with or would be disturbed by the work of this trade or any other trade on this project.

3.3 FIRESTOPPING

A. Furnish and install "through-penetration fire stop systems," consisting of field constructed assemblage of products and materials, designed to prevent the spread of fire and gases through fire-rated openings which are commonly made through walls and floors to accommodate penetrants such as: busway, cable tray, electrical cables and conduits.

B. "Through-Penetration Fire Stop" is a material, device or construction installed to resist, for a prescribed time, the passage of flame, heat and gases through openings which penetrate the entire fire resistive construction in order to accommodate penetrating items. Incorporating the use of specific products installed in a specific manner, they shall only be installed in configuration for which they have been specifically tested and listed by UL or FM per UL-1479 or ASTM E-814.

C. Where a specific fire stop system is not specified for a through-penetration, the contractor shall include proposed fire stop system designs in submittals.

D. Where there is no specific UL fire stop system available for a particular application, the contractor shall obtain from the fire stop manufacturer a system drawing to be submitted for approval, prior to installation.

E. Holes or voids used to extend electrical installation through fire-rated floors, ceilings and walls shall be firestopped with a fire resistant foam sealant to prevent the passage of smoke, fire, toxic gas or water through the penetration either before, during or after a fire. Chase Technology Chase-Foam, CTC PR-855.

F. The materials and components of an approved fire stop system shall be the products of a single manufacturer and shall not be inter-mixed.

G. Fire stop materials used shall be suitable and compatible with the penetrating item(s) including the surrounding materials.

H. Fire stop materials used in exposed area shall be paintable and finished with similar surface treatments as used on the surrounding wall or floor surface.

3.4 IDENTIFICATION

A. Each device shall be identified according to the following system:

1. Panels and switchboard shall be identified as to panel designation, voltage and feeder, e.g., "Panel L1, 120/208 volts, Feeder FDP-1." Markings shall be outside the door.

2. Magnetic motor starters, safety switches, and remote push button stations shall be identified with the starter number, name and number of device controlled, and circuit number, e.g., "MS-1, Air Handling Unit 1, Circuit L1-24".

3. Manual motor starters shall be identified with the name and number of the device controlled and circuit number, e.g., "Exhaust Fan 1, Circuit L1-31".

4. Time clocks, contactors and relays shall be identified with a nameplate indicating the devices controlled, e.g., "Security Light".

5. Exhaust fans shall be identified at the disconnect switch with the circuit number.

6. Service disconnecting means shall be permanently identified on the exterior, e.g. "Main Service Disconnect".

7. Panel circuit number shall be identified on the convenience outlet and light switch box, or the backside of the plate with embossed lettering plastic tape or indelible marking pen.

8. Junction and pull box covers shall be labeled with circuits contained within. Mark on outside with permanent marker in concealed or mechanical spaces, or inside the cover in public areas.

9. Three phase outlet cover plates shall have special 1/8" engraved lettering "208 volt, 3 phase".

B. Identification shall be engraved, laminated plastic using white letters on black background, unless otherwise specified.

C. Accessible junction boxes and conduit for the emergency power system shall be identified in a manner as described in paragraph C above. In addition, receptacles connected to the emergency power system shall be identified by a special engraved cover plate with the word "EMERGENCY" and the circuit number, in 1/4-inch high letters.

D. Color-coding of branch circuit wiring shall be as stated in the NEC. Color-coding of neutral conductors in conduit with multi-circuits shall be as stated in the NEC. Wires of sizes larger than No. 8 AWG shall be color coded by a strip around the conductor at junctions, pull boxes and terminating points.

1. Color-coding of wiring shall match existing.

2. Color-coding of grounding wires shall be green.

3.5 ELECTRICAL CONNECTIONS TO EQUIPMENT

A. Furnish power wiring for the temperature control equipment.

B. Cooperate with other trades on the locations of the outlet boxes, switches and controls.

C. Devices or equipment requiring both electrical and mechanical connections shall be installed by the contractor furnishing the device or equipment. Remaining connections shall then be made by the appropriate contractor.

D. Where circuits serving specific items of equipment are shown on the electrical drawings, the breaker ratings, number of poles, and conductor sizes are nominal for the general class of equipment that includes each specific item. Final sizes shall be coordinated with the Owner or with the contractor furnishing the equipment.

3.6 EQUIPMENT BY OTHER CONTRACTORS

A. Verify with other contractors the location of equipment requiring electrical connection, including control devices that are supplied by the other contractors. Make any necessary changes before roughing-in for power and control power circuits.

B. Review drawings and specifications and be responsible for the proper electrical connection of equipment. Furnish labor and material, including flexible conduit for movable equipment, to completely connect outlets, receptacles, switches, starters, and limit switches for equipment furnished by other contractors.

C. Review other sections of this specification, and be responsible for connecting the equipment to operate as described.

3.7 EQUIPMENT BY MECHANICAL CONTRACTOR

A. The Mechanical Trades will furnish motors for items supplied by them. Furnish necessary labor and material, including wire and lugs, to completely connect the equipment.

B. Interlock contacts required on starters shall be furnished by the Electrical Contractor.

C. Review other sections of this specification, and be responsible for connecting the equipment to operate as described.

3.8 INTERRUPTIONS

A. Changes in electrical services shall be made so as to provide a minimum of interference with the operation of services in the building. When changes require shutdown of building services, notify the proper building authorities not less than 24 hours in advance and obtain approval from these authorities before making changes. Such notices shall give duration and nature of shutdown. Temporary arrangements shall be approved by the Architect/Engineer or Owner.

B. Include costs for temporary wiring and overtime work required, in the Contract price. Remove temporary wiring at the completion of work.

3.9 ROOF OPENINGS

A. Roof openings required that are not shown on the structural or architectural drawings shall be cut and (if necessary) reinforced by the roofing contractor, and not by electricians.

3.11 DEMOLITION

A. Provide labor necessary to demolish the existing electrical system described in the contract documents.

3.02 CUTTING AND PATCHING

A. Provide cutting and fitting necessary to properly install work, unless specifically noted otherwise in these specifications or shown on the drawings. Coordinate with other trades as required to minimize the damage and the amount of patching required.

B. Lay out work carefully in advance. Do not cut or notch any structural member or building surface without specific approval. 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.

C. Patch around holes cut for new work or holes where existing devices are removed.

3.03 EXCAVATION AND BACKFILL

A. Provide excavation and backfilling necessary in the construction of the work as shown on the drawings or as specified. Provide sheeting and bracing using proper materials that may be necessary for the protection of the foundations and walls of the building. Replace roads, curbs, walks, topsoil and dispose of surplus earth and debris as directed.

B. Review procedures with Owner for testing, covering, and containment of surplus earth and debris prior to disposal. Include any costs not covered by the Owner.

C. No materials except clean sand shall be placed within six (6) inches of any pipe, sewer, conduit or cable. Backfill under sidewalks, drives, parking lots, building or any other finished areas shall be 100% clean sand.

D. Backfill shall be placed and tamped pneumatically in six (6) inch lifts until pipe or conduit is covered with a minimum of twelve (12) inches of cover. Additional backfill to finished grade shall be placed and tamped pneumatically in ten (10) inch lifts. The Architect/Engineer's and Owner's representatives shall be notified prior to backfilling so that backfilling may be observed.

E. Where conduit passes below footings or through foundation walls, the cavity around the conduit shall be well filled and tamped, with rich concrete composed of one part Portland cement to six parts of clean sand and gravel.

F. Conduit and cable may be installed in advance of earth fills by the General Contractor. Such conduit shall be installed with backfill material adjacent to the conduit and with the compaction requirements as set forth for the General Contractor.

G. Protect property from damage which might result from excavating and backfilling and protect persons from injury at excavations, by barricades, warnings and illumination.

H. Coordinate excavations with weather conditions to minimize possibility of washouts, settlements, and other damages and hazards. Provide temporary covering or enclosure and temporary heat as necessary to protect bottoms of excavations from freezing and frost action. Do not install electrical work on frozen excavation bases or subbases.

3.04 PAINTING

A. No painting or finishing is to be included under this contract except as noted. The finish of any item that has been marred, scratched, or damaged in any way, shall be repainted to the satisfaction of the Architect/Engineer and the Owner.

3.05 CLEANING OF PREMISES

A. Keep the premises clean of debris caused by the work at all times. Keep material stored, in areas designated by the Owner, in such a manner so as not to interfere with the progress of the work of other trades or with the operation of existing facilities.

B. Interiors and exteriors of electrical panels shall be thoroughly cleaned.

C. At the conclusion of the construction, the site shall be thoroughly cleaned of rubble, debris and unused material and shall be left in good order. Closed off spaces shall be cleaned of waste material, cartons, and wood frame members used in the construction.

3.06 RECORD OF CHANGES MADE TO THE WORK

A. Maintain at the job site a separate and complete set of electrical plans and specifications upon which it is clearly and permanently marked in red and noted, in complete detail, any changes made. Include changes to location and arrangement of electrical apparatus or changes made in the electrical system and wiring as a result of building construction conditions or as a result of written instructions from the Architect/Engineer. Such record of changes shall be made daily and the marked plans and specifications shall be available for the Architect/Engineer's examination at any normal work time.

B. Upon completion of the job, and before final payment is made, transmit the marked-up plans and specifications to the Architect/Engineer. Refer to Section, Closeout Procedures.

END OF SECTION

SECTION 26 0519
CONDUCTORS AND CABLES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Wires and cables

1.2 REFERENCES

A. American Wire Gage (AWG)

B. National Electrical Code (NEC).

C. Underwriters' Laboratories, Inc. (UL).

1.3 SUBMITTALS

A. None required.

1.4 QUALIFICATIONS

A. Copper conductors shall be manufactured by American Insulated Wire Corp., General Cable, Pirelli Cable Corp., Rome Cable Corp., Southwire Co., Triangle/PWC Inc., Carol Cable Company, Cablec, Okonite or approved equivalent.

B. All wiring shall be listed by UL.

PART 2 PRODUCTS

2.1 REQUIREMENTS

A. Conductors used throughout this project shall be copper.

B. Conductors used for the electrical distribution system at voltages less than 600 volts shall have 600-volt insulation.

C. Color-coding shall be as stated in section 26 0100 *Identification*.

D. Six hundred (600) volt, insulated conductors, 6 AWG or larger, unless shown otherwise on the drawings or approved by the Architect/Engineer, shall be of the following types:

1. Type THWN moisture and heat-resistant or THHN heat-resistant thermoplastic (polyvinyl chloride) insulation rated 75° C in wet and dry locations and 90° C in dry locations.

2. XHHW, moisture and heat-resistant cross-linked polyethylene insulation rated 75° C in wet locations and 90° C in dry locations.

E. Six hundred (600) volt insulated conductors smaller than 6 AWG, unless shown otherwise on the drawings or approved by the Architect/Engineer, shall be type THWN moisture-resistant thermoplastic (polyvinyl chloride) insulation rated 75° C in wet and dry locations.

F. Conductors 8 AWG and larger shall be stranded. Conductors 10 AWG and smaller shall be solid.

G. Conductors smaller than 12 AWG shall not be used on this project unless otherwise specified, except that 14 AWG may be used for control wire where the current is less than 10 amps and the conductor length for each run is less than 50 feet.

PART 3 EXECUTION

3.1 INSTALLATION

A. Wiring shall be in conduit or approved raceways, unless directed otherwise by Architect/Engineer.

B. For feeders, no more than three phase conductors per conduit shall be installed, unless specifically shown.

C. For branch circuits, no more than six (6) phase conductors per conduit shall be installed, unless specifically shown.

D. Each branch circuit shall have a separate neutral.

E. Cables of larger sizes shall be continuously lubricated with an approved compound, except as noted, at the pull-in point of the conduit so that no damage occurs to the insulation. Lubricant shall be Polywater Lubricant J or approved equivalent. Pulling tension on feeder runs over 200 feet in length shall be measured by a dynamometer and shall not exceed the manufacturer's recommendations. The feeders shall be run continuously, without splices.

END OF SECTION

SECTION 26 0526
GROUNDING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Electrical System Ground

1.2 REFERENCES

A. American National Standards Institute (ANSI).

B. Institute of Electrical and Electronic Engineers (IEEE).

C. National Electrical Code (NEC).

D. National Electrical Manufacturers Association (NEMA).

E. Underwriters' Laboratories, Inc. (UL).

1.3 SYSTEM DESCRIPTION

A. Grounding provides equipment protection by allowing protective devices to operate during electrical faults.

1.4 SUBMITTALS

A. None required.

1.5 QUALIFICATION

A. Conductors and connectors: see Sections 26 0519.

B. Bare grounding conductors shall be ES-1895 DSA, as manufactured by Copperweld or approved equivalent.

C. Ground rods shall be copper-clad as manufactured by Copperweld or approved equivalent.

D. Compression connections shall be as manufactured by Blackburn, Burndy, or approved equivalent.

E. Exothermic connections shall be as manufactured by Cadweld, Furseweld, or approved equivalent.

F. Grounding materials shall meet applicable standards and codes.

PART 2 PRODUCTS

2.1 REQUIREMENTS

A. Ground rods and ground system shall be as shown on the drawings and as required by the NEC.

B. Ground rods shall be copper clad steel, 3/4" dia. X 10 feet long, unless shown otherwise.

C. Direct buried, bare copper, grounding conductors shall be dead soft annealed wire.

PART 3 EXECUTION

3.1 INSTALLATION

A. Grounding connection required for electrical equipment including (but not limited to) the following:

1. Conduit and raceways.

2. Panelboards.

3. Motor Starters.

4. Metal, non-current carrying parts of electrical equipment.

B. The electrical system ground shall conform to these specifications, but in no case shall it be less than the requirements of the NEC.

C. The contractor shall furnish grounding. Drive 3/4" x 10' ground rods as shown on plans to produce a resistance to ground of 5 ohms or less. Provide test results.

D. A grounding conductor shall be run in the raceway with the current carrying conductors.

E. An equipment-grounding conductor sized in accordance with Table 250-122 of the current approved NEC shall be provided from the main equipment grounding bus to each panelboard. An equipment-grounding conductor shall be provided from the main equipment grounding bus or from the grounding bus of the serving panel, with all equipment feeders and branch circuits.

F. Where steel (magnetic) conduit is used for mechanical protection of a grounding conductor, the conductor shall be securely bonded to the conduit at each end. This conduit shall be electrically continuous. Within computer rooms, non-magnetic conduit shall be used for grounding conductor protection.

G. Accessible or exposed grounding connections shall be made with approved pressure type connectors.

H. Water line ground clamps (4" line and smaller) shall be Burndy GCxxA or approved equivalent. Lines larger than 4" shall be Burndy GARxxxxBU or approved equivalent. For gas line grounding, isolate dis-similar metal bolts from pipe.

I. Inaccessible or buried grounding connections may be compression or exothermic.

J. Check the continuity of ground in the electrical system. This shall include panels, receptacles, switches, outlets, and other electrically operated devices. If continuity does not exist, install additional grounding conductors such that continuity exists.

K. Connect grounded circuit conductor and equipment ground conductors to equipment and devices in such a manner that removal of the device shall not degrade the integrity of the grounded circuit conductor or the equipment grounding conductor.

END OF SECTION

SECTION 26 0533
CONDUIT AND RACEWAY

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Conduit and raceway.

1.2 REFERENCES

A. National Electrical Code (NEC).

B. Conduit shall carry the Underwriters' Laboratories (UL) label.

C. Conduit shall meet the following American National Standards Institute (ANSI), National Electrical Manufacturers Association (NEMA) and Federal Specifications (FS) standards:

1. Rigid Steel Conduit (RGS): FS WW-C-581 and ANSI C80.1.

2. Electrical Metallic Tubing (EMT): FS WW-C-563, UL797, and ANSI C80.3.

3. Liquid-Tight Flexible Metal Conduit: CSA, UL.

4. Rigid Nonmetallic Conduit (PVC): NEMA Standards Pub. No. TC3.

1.3 QUALIFICATIONS

A. Rigid nonmetallic conduit shall be Carlon Type 40 PV-DUIT (heavy wall) or approved equivalent.

B. Liquid-tight flexible metal conduit shall be Electri-Flex, Type LA or approved equivalent.

PART 2 PRODUCTS

2.1 REQUIREMENTS

A. Conduit smaller than 1/2-inch diameter shall not be used on this project.

B. Only threaded type connectors and couplings shall be used with RGS.

C. Connections between EMT or rigid conduit and PVC shall be made with threaded PVC adapters or fittings.

D. RGS flexible conduit or flexible liquid tight conduit including fittings and hangers used throughout this project shall be galvanized steel.

E. Connectors for EMT shall be steel set screw type.

F. Connectors for EMT shall be steel or malleable iron. Fittings shall be capable of carrying ground fault currents of 10,000 amps rms for 1½ inch and smaller, and 20,000 amps rms for 2-inch and larger for a minimum of 3 cycles. Fittings shall be Thomas & Betts 5030, 5031, 5120, 5123, or 530 series. Die cast metal fittings will not be permitted on this project.

G. Type LA Liquatite flexible conduit, with appropriate fittings which are UL listed as an assembly, shall be used in a boiler room, kitchen, exterior location or any moist location.

PART 3 EXECUTION

3.1 INSTALLATION

A. Wiring shall be in conduit or approved raceways, unless shown otherwise.

B. Conduit and outlet installation shall be concealed throughout this project, as follows unless otherwise indicated.

1. Conduit or Raceway above suspended ceilings shall be supported from the building structure and not from the ceiling grid hanger wires.

C. Conduit throughout this project shall be EMT installed with steel support straps except where shown otherwise or as follows:

1. Service entrance conductors shall be installed in Schedule 40 PVC conduit.

2. Conduit to be used for utility company underground primary cables shall be Schedule 40 PVC (sized as shown on the drawings), installed a minimum of 42 inches below finished grade. Elbows and offsets shall be long sweep rigid fiberglass arranged to minimize cable jacket burn through.

3. Exterior conduits above grade shall be RGS conduit unless shown otherwise.

4. Conduit for communications systems shall be EMT regardless of size.

D. Conduit shall not be run horizontally in masonry walls or in masonry wall gaps.

E. Conduit shall not be used as the sole grounding means.

F. Nonmetallic conduit located underground, outside the building area, shall be installed a minimum of 36 inches below grade, unless otherwise indicated. Conduit shall be installed in a sand backfilled and compacted trench with a 2" wide yellow poly marker tape placed in the trench approximately 6" below finished grade.

G. Metallic conduit, cut with a power saw or hacksaw, shall be reamed to remove burrs.

H. Conduit bends shall be held to as large a radius as possible for ease in pulling of conductors and to provide a neatly installed appearance. The maximum length of straight conduit runs shall be 200 feet between pull boxes, with 50 feet deducted for each 90-degree bend and 25 feet deducted for each 45-degree bend; reduction of length for all other angle bends shall be calculated on a similar basis.

I. Conduit risers below grade, inside and outside the building, shall have the bend weighted with concrete to prevent the conduit from lifting when cables are pulled.

J. Suspended type conduit hangers for 2-inch and smaller conduit shall be with mounting devices, similar to Unistrut or Kindorf beam clamps. Hangers for groups of conduit with any size larger than 2-inch shall be channel type structural shapes, with conduits clamped to channel with U-shaped clamps.

K. When building ventilation conditions are such that the air may flow continuously in conduits or ducts, the conduit shall be sealed at each end with a pliable duct sealing compound such as Duct-Seal or Kerite Putty, or Chase Technology foam. If conduit is installed with possible access to rodents, the conduit shall be sealed in a manner similar to that described above.

L. Interferences

1. Conduit runs are not shown to allow this contractor to choose the route to the various electrical devices. However, care shall be taken to coordinate the conduit runs with duct work, beams, joists, plumbing pipes, and plumbing fixtures to be installed by other trades.

2. When interference develops, the Architect/Engineer will decide which equipment will be relocated; regardless of which apparatus was installed first.

M. Install conduit and wiring for electrical devices furnished by other trades or by the owner on this project, unless otherwise shown or specified.

N. Insulated Bushings

1. Conduits shall have insulated bushings installed at entrances to panelboards, starters, pull boxes and shall be secured to the enclosure by the bushing (and lock nut, if necessary) on the inside, and by lock nut on the outside.

2. Conduits entering distribution type panelboards and the main switchgear shall have insulated grounding bushings similar to T & B 3800 series, with bushings connected together by means of a continuous copper grounding conductor, sized to meet the requirements of the NEC.

O. Connectors, couplings and lock nuts shall be tightened securely by use of the proper tools to assure an effective and continuous path to ground through the conduit system.

P. Wherever conduit crosses a building expansion joint and is constrained from relief deflection (i.e. buried in concrete or a straight run anchored in concrete on both sides of the joint), expansion fittings or expansion/deflection fittings shall be provided.

Q. Where wire is run for a motor connection, to be connected under a separate contract, the conduit shall be terminated in the proper fitting at the correct location.

R. A short piece of flexible metal conduit shall be used in the feeder conduit near the motor.

S. Surface mounted conduit shall be mounted flush to wall and secured by one-hole or two-hole clamps.

END OF SECTION

SECTION 26 0533.01
PULL AND JUNCTION BOXES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Pull, junction, and outlet boxes.

1.2 REFERENCES

A. National Electrical Code (NEC).

B. National Electrical Manufacturers Association (NEMA).

C. Underwriters' Laboratories, Inc. (UL).

1.3 QUALIFICATIONS

A. Junction and pull boxes shall be as manufactured by Appleton Electric, Arrow-Hart, Bell Electric / Square D, General Electric, O.Z. / Gedney Co., Slater Electric Inc., or approved equivalent.

B. Conduit bodies shall be as manufactured by Appleton Electric Co., Crouse-Hinds Co., Harvey Hubbell Inc., Killark Electric Mfg. Co., O.Z. / Gedney Co., Pyle-National Co., Spring City Electrical Mfg. Co., or approved equivalent.

C. Bushings, knockout closures and lock nuts shall be as manufactured by Appleton Electric Co., Burndy Corp., Crouse-Hinds Co., Gould, Inc., O.Z. / Gedney Co., RACO, Inc., Steel City, Thomas and Betts Co., or approved equivalent.

D. Interior outlet boxes shall be as manufactured by Appleton Electrical Co., Arrow Conduit and Fittings Corp., RACO, Inc., Steel City / Thomas and Betts Co. or approved equivalent.

E. Weatherproof outlet boxes shall be as manufactured by Appleton, Bell Electric / Square D Co., Crouse-Hinds Co., Harvey Hubbell, Pyle-National, or approved equivalent.

F. Weatherproof outlet boxes for "unattended wet locations while in use" per NEC 406.8(B) (latest edition), Tay Mac Series 20xxx or approved equivalent.

PART 2 PRODUCTS

2.1 REQUIREMENTS

A. Provide galvanized, UL-code gauge sheet steel junction and pull boxes, with screw-held covers. Type, shape and size shall be as required to suit each respective location and installation. Boxes shall have welded seams with stainless steel nuts, bolts, screws and washers.

B. Provide galvanized cast-metal conduit bodies of type, shape, and size to suit each respective location and installation. Bodies shall have threaded conduit entrances, removable covers, and corrosion resistant screws.

C. Provide corrosion resistant, punched-steel box knockout closures, conduit locknuts and malleable iron conduit bushings, and offset connectors of type and size to suit respective uses and installation.

D. Outlet Boxes

1. Interior outlet boxes shall be galvanized flat rolled sheet steel, of the type, shape and size, including box depth to suit each respective location and installation. Boxes shall have stamped knockouts in back and sides and with threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

   a. Provide mounting brackets, wall board hangers, extension rings, fixture studs, cable clamps, and metal straps to rigidly support outlet boxes as required for each outlet location.

2. Weatherproof outlet boxes shall be corrosion-resistant cast-metal wiring boxes of the type, shape and size, including box depth to suit each respective location and installation. Boxes shall have threaded conduit ends and threaded screw holes with corrosion-resistant screws for securing box covers and wiring devices.

3. Weatherproof switch and receptacle coverplates shall be case aluminum or zinc die cast with spring hinged waterproof caps, faceplate gaskets, and corrosion-resistant fasteners.

PART 3 EXECUTION

3.1 INSTALLATION

A. Provide pull and junction boxes where required unless specifically shown on the drawings to be larger than required by the NEC, size pull and junction boxes in accordance with the minimum volumes set forth in the NEC.

B. Fasten boxes rigidly to structural surfaces to which they are to be mounted or, solidly embed in concrete or masonry.

C. Provide electrical grounding connections for installed boxes.

D. Junction boxes above inaccessible ceilings for power, lighting, communication, and signal systems shall be located about one (1) foot from a recessed fluorescent fixture to allow easy access to the junction box, by removal of the fixture.

E. Outlet Boxes

1. Provide 4" x 4" galvanized pressed steel outlet box at each receptacle, wall mounted light fixture, task light, wall switch, or any other device shown.

2. Outlet boxes exposed to weather or located in damp locations shall be galvanized cast iron, or malleable iron, or cast aluminum. Weatherproof switches and receptacles shall be mounted in "FS" (4-point mounting) boxes.

3. Outlet boxes shall be plumb and level and shall be firmly secured in position, with the face of the box flush with the finished wall or ceiling.

4. Remove only knockouts which are required for connection of conduit or insertion of conductors. Provide plugs for unused openings.

5. Conduit shall enter box squarely and shall be secured by means of lockout on outside and insulated bushing inside.

6. Provide electrical grounding connections for installed boxes.

7. Outlet boxes mounted on opposite side of fire rated walls shall have a minimum 24" horizontal spacing.

8. Outlet boxes mounted on opposite side of non-fire rated walls shall have a minimum of 6" horizontal spacing.

9. Outlet boxes shall be mounted 18" above finished floor to center of box for receptacles and 48" for switched unless shown otherwise on the drawings.

END OF SECTION

SECTION 26 2416

PANELBOARDS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Panelboards.

B. Panelboard components.

1.2 REFERENCES

A. American National Standards Institute (ANSI).

B. Federal Specifications (FS).

C. Institute of Electrical and Electronic Engineers (IEEE).

D. National Electrical Code (NEC).

E. Underwriters' Laboratories, Inc. (UL).

1.3 SYSTEM DESCRIPTION

A. Panelboards provide branch circuit distribution of electrical power.

1.4 SUBMITTALS

A. Submit the following information:

1. Detailed front, end, and top views.
2. Panel designation.
3. Voltage rating.
4. Current rating.
5. Top, bottom or through feed lugs, lug size.
6. Main overcurrent device size.
7. Branch device schedule, listing size and poles.
8. Surface trim or recessed.
9. Fault current rating of the panel and devices including series rating as required.

10. Circuit breaker mounting method, plug-in or bolt-in.

11. Bus material: copper

12. Indicate any special requirements including key locking, split bus, contactor panels, double panels, or panels in special NEMA enclosures.

13. Time - current curves for all breakers requiring settings and fuses.

B. Panel Circuit Schedule: Submit in the following format.

1. Provide 8 1/2" x 11" (or sized as required for panel) typewritten panel schedule for each panel, protected by a mylar jacket. Do not reproduce panel schedule shown on the contract documents.

2. Schedules shall include:

a. Panel designation.

b. Panel location.

c. Voltage, phase, current rating.

d. Main overcurrent device size.

e. Branch circuit listing indications circuit number and description of loads served.

3. Provide panel schedule book (three ring binder) based on "As Constructed" information. Submit to the Owner upon completion of the project.

4. Provide plastic laminated, ½ size, lighting and power plans for the areas served by the respective branch circuit panelboard(s). Provide one set of drawings per panelboard or group of panelboards. Include identification, on the drawing, of the panelboards covered by the drawing and the panelboard room location. Place a set of drawings in each of the respective rooms.

1.5 QUALIFICATIONS

A. Panelboards shall be designed, manufactured and tested in accordance with the latest applicable standards of IEEE, ANSI and NEMA, and shall comply with of the requirements of the NEC, the National Safety Rules of the United States Bureau of Standards, and the requirements of the local building code.

B. Panelboards shall bear the UL label and shall meet FS WP-115A.

C. Panelboards used for service entrance equipment shall be UL listed as "Suitable for Service Entrance".

D. Panelboards shall be as manufactured by Cutler-Hammer/Westinghouse, General Electric, Siemens, or Square D.

PART 2 PRODUCTS

2.1 GENERAL REQUIREMENTS

A. Panelboards shall be factory assembled and of dead-front construction. Panelboards shall be enclosed in UL code gauge galvanized steel boxes unless otherwise noted. Trims for panelboards shall be cold-rolled steel painted with light gray baked enamel. Panel covers shall be door-in-door construction.

B. Main bus bars shall be 98% pure copper, silver or tin plated designed for a maximum temperature rise of 55° C over a 40° C ambient, equipped with pressure-type solderless lugs, and be of the ampere rating as shown on the drawings. Main buses shall be at least of the same ampere capacity as the cables connected to the mains or as the main overcurrent protective device. Bolts used to connect current-carrying parts of buswork together shall be front accessible for ease of tightening. Bus bars shall be supported by glass-filled polyester type insulators. Porcelain insulators or supports shall not be acceptable. Panelboard bus shall have an UL listed short circuit current withstand rating at least equal to the short circuit rating of the largest circuit breaker or fusible switch connected to the bus. UL short circuit current withstand rating shall be included on the panelboard nameplate. Main lugs shall be located at the top or bottom of the assembly as required. Multi-section panels shall have sub-feed lug arrangements for main cable connections.

C. Panelboards shall have a copper equipment grounding bus.

D. Main circuit breakers, sub-main circuit breakers, sub-feed circuit breakers, bus sectionalizing control relays and contactors, where shown on the drawings to be an integral part of a panelboard, shall be solid bus bar connected to the panelboard main bus. Use of insulated wire bussing for the above shall not be permitted, unless specifically allowed on the drawings. Shunt trip and undervoltage trip devices, where shown to be an integral part of a panelboard, shall be factory wired to a terminal block with the terminals properly identified for field connection to the associated control wiring.

E. Terminals of the proper size for wire shown on the drawings shall be supplied by the panelboard manufacturer.

F. Outer door of panelboards shall be equipped with a tumbler GE 75 type lock with duplicate milled keys. Panelboards having doors over 38 inches in height shall have three-point vault type milled key lockable handles. Cabinet locks shall have identical keys.

2.2 CIRCUIT BREAKER PANELBOARDS

A. Panelboards shall be factory built-up assemblies with individual molded case circuit breaker units that are removable and replaceable from the front of the panelboard without disturbing the remaining breakers in the panelboard or cabinet. Phase sequence connection of circuit breakers shall start at the top left phase bus of the chassis for both top and bottom feed panels.

B. Molded case circuit breakers shall be designed for plug to the bus for 100 amp and smaller 120/240 volt breakers and bolt to the bus for breakers larger than 100 amps.

C. Multi-pole circuit breakers shall be designed for internal common trip operation so that an overload or short circuit on any one pole automatically causes all poles to open simultaneously.

D. Breakers shall be of the trip rating, interrupting capacity, and frame size as shown on the drawings. AC rated circuit breakers shall not be applied for DC service, unless they are UL listed for both types of current. Spaces designated on the drawings shall be fully bussed complete with necessary mounting hardware and removable filler plates.

E. HACR type circuit breakers shall be used for circuits feeding air conditioning, heating and refrigeration equipment having motor group combinations and marked for use with HACR type circuit breakers.

F. Main circuit breakers shall be separately mounted from grouped branch circuit breakers, for ease of identification and for safety when being manually operated as a disconnecting means.

G. Provide "Handle Lock-Offs" where shown on "Panelboard Schedules." In addition provide four (4) spare handle lock-offs for each panelboard installed.

PART 3 EXECUTION

3.1 PANELBOARDS

A. Furnish and install panelboards as located and scheduled on the drawings.

B. Mounting height of panelboards shall be 72 inches from the floor line to the top, unless shown otherwise on the drawings. Sections of multi-section panelboard boxes shall be identical in height.

C. Panelboards shall be securely mounted to walls. Provide necessary brackets, mounting devices, structural pieces and expansion type anchor inserts necessary for mounting. Panelboards shall not be mounted directly to metal surfaces or to concrete or masonry walls. Structural channels such as Kindorf or 3/4" painted plywood shall be used to mount panelboards at least 3/4 inch from the mounting surface.

F. A typed panel circuit schedule mounted in a directory frame shall be included on the rear side of the door of each panelboard. Before typing the schedule, verify if the owner plans to revise the room numbers from those shown on the drawings. If so, the schedule shall be prepared using the owner's designated room numbers. Schedule shall be at least 5" wide and protected by a mylar jacket. Located adjacent to each individual branch circuit device or space shall be an indelible number tag affixed to the dead-front breaker housing frame.

END OF SECTION

SECTION 26 2700
SERVICE ENTRANCE

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Service entrance requirements.

1.2 REFERENCES

A. Alliant Energy is referred to as the Power Company.

B. National Electrical Code (NEC), latest currently enforced edition.

C. Power Company standards.

1.3 SYSTEM DESCRIPTION

A. Main primary power service from Power Company.

B. The secondary electrical service shall be 240Y/120 volts, single-phase, three-wire.

PART 2 PRODUCTS

2.1 Materials for the service entrance shall be as specified in the various sections of these specifications including but not limited to the following.

A. Conduit and Raceway.

B. Conductors and Cables.

C. Pull and Junction Boxes.

D. Panelboards.

E. Disconnect Switches.

F. Grounding.

PART 3 EXECUTION

3.1 Verify what material and labor the Power Company will provide.

3.2 Coordinate with the power company, the installation of the primary conduits at the property line, and reinforced concrete pad for mounting the transformer. This transformer pad shall be provided by the electrical contractor and shall meet the power company's requirements.

3.3 The Power Company will furnish and install the underground primary cables, the pad mounted transformer and the meter. They will furnish and install in the utility transformer and meter head. Power Company will make all final connections to their transformer(s) and meter.

3.4 The electrical contractor shall furnish and install the primary conduit, the secondary feeder conduits, and the secondary cables and compression lugs to extend the incoming service from the power company transformer to the building. Contractor shall also furnish and install the meter base, meter base support, and any associated required metering current transformers and metering potential transformers.

3.5 Primary conduit elbows shall be long sweep rigid fiberglass with a 36" radius bend.

3.6 Install pulling wire, minimum 200-lb capacity, in empty and spare conduits.

3.7 Pre-installation meeting. Convene, at the site, two week(s) prior to commencing work of this section. Review service entrance requirements and details with power company representative.

END OF SECTION

SECTION 26 2726
OUTLET BOXES AND WIRING DEVICES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Switches

B. Receptacles

C. Dimmers

1.2 REFERENCES

A. Federal Specifications (FS).

B. General Services Administration (GSA).

C. National Electrical Manufacturers Association (NEMA).

D. Underwriters' Laboratories, Inc. (UL).

1.3 SUBMITTALS

A. None required.

1.4 QUALIFICATIONS

A. Coverplates shall be by the same manufacturer as the wiring devices.

B. Switches and receptacles shall be specification grade as manufactured by Arrow-Hart, Harvey Hubbell, Leviton, Pass and Seymour, or approved equivalent.

C. Dimmers shall be as manufactured by Lightolier, Lutron, or approved equivalent.

D. Switches shall be UL verified to meet FS W-S-896, GSA and NEMA Standard WD-1 heavy-duty testing requirements.

E. Receptacles (125 volt) shall be UL verified to meet FS W-C-596, GSA and NEMA Standard WD-1 3.02 to 3.10, heavy duty testing requirements.

PART 2 PRODUCTS

2.1 SWITCHES

A. Switches shall be heavy-duty, quiet type, 20 ampere, 120/277 volts AC, similar to Hubbell #1221-X or Pass and Seymour 20AC1-X, side and back-wired or 521-X side-wired only.

2.2 RECEPTACLES

A. Receptacles shall be specification grade, heavy duty, NEMA #5-20R configuration, 125 volts, 20 ampere, grounding, nylon body front Hubbell #HBL5362. Ground fault interrupter shall be equivalent to Hubbell GF5362.

B. Receptacles shall be of the type shown on the drawings.

C. Receptacles required by NEMA Type on the drawings, but not listed above, shall be of comparable quality to those listed.

D. Switches and receptacles shall have binding post terminals, and connections shall be made by wrapping wire around these terminals.

E. Switches and receptacles connected to the emergency power system shall have red bodies. Coverplates for receptacles connected to the emergency power system shall be engraved as described in Section 26 0100.

F. Receptacles required to meet NEC 406.8(B) (latest edition) shall be the size and color (lockable or non-lockable) as shown on the drawings.

2.3 COLOR OF DEVICE AND COVERPLATE

A. Switch and receptacle bodies shall be white.

B. Cover plates shall be:

1. .035 inch, 18-8 stainless steel type 302 in satin or brushed finish (maintenance areas, corridors, mechanical and electrical rooms, kitchen and similar areas.

2. High-impact smooth nylon of color to match device bodies (all other areas).

2.4 DIMMERS

A. Provide architectural style linear slider type LED dimmers with positive "OFF" position at bottom of slider control. Dimmers shall be modular size to be compatible with the decora style coverplate. Dimmer capacity shall be 600W, 1000W, 1500W, or 2000W as indicated on the drawings. Color shall be match devices as specified above.

PART 3 EXECUTION

3.1 SWITCHES, RECEPTACLES, AND COVERPLATES

A. Switches and receptacles shall be installed where shown on the drawings.

B. Switches shall be single-pole, double-pole, three-way, four-way, or momentary as required to control the circuit.

C. Confer with the Architect/Engineer or Owner to obtain the exact locations of each outlet box before any conduit is installed. However, the Owner reserves the right to change any of these locations without extra cost if the change is made before the installation. The exact location of outlet boxes shall be the sole responsibility of the contractor.

D. Switches shall be installed on the latch side of the door openings.

E. In cases where tile wainscot is approximately 48 inches high, the switch shall be in the second tile course from the top.

F. Receptacles shall have a grounding pole. Receptacle ground pole to be down for vertical mount, or, neutral pole up for horizontal mount.

G. Each outlet box shall be provided with a coverplate.

H. Receptacles flush mounted in exterior walls shall have a gasketed coverplate which will form a seal at the wall (TayMac specification grade weather-proof covers).

I. Existing switch or receptacle outlet boxes not shown to be reused, shall have blank coverplates, matching the existing, installed.

END OF SECTION

SECTION 26 2813

FUSES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Fuses.

1.2 REFERENCES

A. Underwriters' Laboratories, Inc. (UL).

1.3 SUBMITTALS

A. None required.

1.4 QUALIFICATIONS

A. Fuses shall be by Bussmann Manufacturing Division of McGraw Edison Company or by Littlefuse Tracor Company.

Fuses shall be UL listed for 200,000 ampere RMS interrupting capacity.

PART 2 PRODUCTS

2.1 FUSES

A. Fuses shall be capable of interrupting the available fault without rupturing or damaging fuse clips, buswork, cable or switching components, and shall safely contain within the insulated barrel of the fuse the smoke, hot gases, carbon, and other harmful by-products of the fault.

B. Fuses rated 600 amperes or less shall be UL Class R rejection type with time current characteristics as defined by the Bussmann or Littlefuse catalog number shown for each condition outlined herein.

C. Fuses protecting molded case circuit breakers or molded case circuit breaker panels shall be current limiting silver link types. They shall have interrupting capacity and let through current as defined by the Bussmann or Littlefuse catalog type shown below, unless otherwise indicated or required by the circuit breaker manufacturer.

1. 125 and 250 volt molded case circuit breakers shall be fed from switches fused as follows:

a. 0 to 60 amperes Bussmann LOW PEAK fuses Type LPN-R or Littlefuse Type LLN-RK.

b. 70 to 200 amperes Bussmann Limitron Fuses Type KTN-R or Littlefuse Type KLN-R.

E. Fuses not sized on the drawings for motor running protection, 100 amperes or less, shall be as follows:

1. Fuses shall be Bussmann Fusetron (or Littlefuse "SLO BLO") dual-element time delay type FRN-R (or FLNR) for 250 volts or less, and FRS-R (or FLSR) for 277 through 600 volts sized at 125% of the motor nameplate full load running amperes or the next larger NEC standard ampere size. Exceptions to the preceding are where excessive ambient temperature, high inertia motor loads, special motors, or frequent "ON-OFF" cyclic loads or other special circumstances require a larger or different type fuse to be approved by the Architect/Engineer. Such special circumstances shall be clarified with the Architect/Engineer not less than 72 hours prior to bid opening time.

2. Fuse reducers shall be used where switch fuse clip spacing is larger than the length of the required fuse.

F. Plug fuses shall be Fustat Bussmann Type S (or Littlefuse Type S).

G. Fuses for protection of grouped or racked lighting fixture ballasts shall have 100,000 amperes RMS interrupting capacity, shall be similar to Bussmann fuse type GLR mounted in type HLR fuse holders (or Littlefuse type LGR in LHR holders) and shall be ampere sized as recommended by the ballast manufacturer.

H. Fuses for protection of each individual exterior pole mounted light fixture or ballast shall have 100,000 amperes RMS interrupting capacity, and shall be Bussmann fuse Type KTK mounted in Type HEB (or Littlefuse type KLK in HLB holder) fuse holders located in a hand hole at the base of the pole or in a weatherproof fuse enclosure located on the pole, as shown on the drawings.

I. Other fuses, unless otherwise noted, shall be dual-element, current limiting, silver link type Bussmann LOW PEAK fuse, Type LPN-R or Littlefuse Type LLNRK for circuits rated 250 volts or less, and Bussmann LOW PEAK fuse Type LPS-R or Littlefuse Type LLSRK for circuits rated 277 through 600 volts. They shall have at least 10 seconds time delay at 500% rating.

PART 3 EXECUTION

3.1 FUSES

A. Fuses shall be installed as shown on the drawings after tests, inspections and the installations have been completed. Fuses shall be of the same manufacturer to retain selectivity and electrical coordination as designed. Fuses shall have dimensions and rejection features exactly as defined herein. Fuses having any other type rejection feature are not acceptable.

B. 20% of other fuses, including control circuit fuses of each amperage and voltage rating (minimum of 3), shall be furnished to the Owner.

END OF SECTION

SECTION 26 2816

DISCONNECT SWITCHES

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Safety disconnect switches.

1.2 REFERENCES

A. National Electrical Manufacturers Association (NEMA).

B. Underwriters' Laboratories, Inc. (UL).

1.3 SYSTEM DESCRIPTION

A. Disconnect switches provide safe disconnecting of electrical power to equipment.

1.4 SUBMITTALS

A. Submit the following information:

1. Outline drawing with dimensions.

2. Equipment Ratings.

a. Voltage.

b. Capacity.

c. Horsepower.

d. Short circuit withstand rating.

1.5 QUALIFICATIONS

A. Safety switches shall be NEMA heavy-duty type and shall carry the UL label. Fusible switches shall incorporate Class "R" fuse rejection feature and shall be braced to withstand 50,000 ampere RMS symmetrical fault current.

B. Switches shall be of the same manufacturer as the panelboards.

C. Safety switches used for service entrance equipment shall be UL listed as suitable for service entrance.

PART 2 PRODUCTS

2.1 Provide heavy-duty type, sheet steel enclosed, safety switches. Type, size, and rating shall be as shown on the drawings or as required by the motor or equipment served.

2.2 Switches shall incorporate quick-make, quick-break operating handles. Mechanism shall be an integral part of the box, not the cover, and switches shall have a cover interlock to prevent unauthorized opening of the switch door in the on position or closing of the switch mechanism with the door open. Current carrying parts shall be constructed of high-conductivity copper with silver-tungsten type switch contact.

2.3 Fuse clips shall be positive pressure type reinforced rejection type fuse clips.

2.4 Indoor enclosures shall be NEMA 1. Enclosures for wet locations and for outdoor use shall be NEMA 3R. Disconnect switch shall be lockable in the "On" and "Off" positions.

2.5 Equip each motor disconnect with auxiliary contacts (1-NO, 1-NC). Disconnect switches utilized with variable speed motor controllers shall be interlocked with the drive control circuit.

PART 3 EXECUTION

3.1 Furnish and install safety disconnect switches (fused and non-fused) shown on the drawings. In addition, furnish a safety disconnect switch for motors and equipment which do not have combination starters or integral disconnecting means.

3.2 For mechanical equipment rated for use only with fuses (such as condensing units, compressors, chillers), provide fusible disconnect switches. Such switches shall be one, two or three pole type, with solid neutral for 4- wire service, and shall have the proper current and voltage rating as required.

3.3 Terminals of the proper size for wire as shown on the drawings for line, load and ground shall be supplied by the disconnect switch manufacturer.

3.4 Each motor shall be individually protected. Furnish a safety disconnect for each motor as required by the NEC.

3.5 Disconnect switches shall not be directly mounted to equipment which is mounted on vibration isolation pads or springs, unless a piece of flexible conduit is used between the disconnect switch and the fixed conduit.

3.6 Safety switches shall be mounted securely to walls, columns or machine frames, and provided with brackets, mounting devices, structural pieces and expansion type anchor inserts necessary for this purpose. Switches shall not be mounted directly to metal surfaces or to concrete or masonry walls. Structural channels such as Kindorf or 3/4" plywood shall be used to mount switches at least 3/4 inch away from the mounting surface.

3.7 Switches shall be mounted at a height of 60 inches above the finished floor to the top of the back box.

3.8 Coordinate fuseable switches and fuse sizes, with mechanical trades, where required by UL listing for mechanical equipment installation.

3.9 Motors larger than 1/8 horsepower and controllers shall have a disconnecting means within sight and within 50'.

A. Combination motor starters, circuit breakers in panelboards, manual motor starters, integral disconnecting means on equipment, and cord/plug connections may be used as disconnecting means where they are within sight and 50' of the equipment.

B. Switches, combination starters, and circuit breakers which are pad-lockable in the "OFF" position may be used as disconnecting means when not in sight or within 50' unless prohibited by local code.

C. Provide a disconnect switch for motors, motor-driven appliances, and controllers not covered by paragraphs A or B above.

END OF SECTION

SECTION 26 2913

ENCLOSED CONTROLLERS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Starters.

1.2 REFERENCES

A. National Electrical Manufacturers Association (NEMA).

B. Underwriters' Laboratories, Inc. (UL).

1.3 SYSTEM DESCRIPTION

A. Starters provide control of and protection for electric motors.

1.4 SUBMITTALS

A. Submit the following information:

1. Wiring diagrams.

2. Electrical ratings.

a. NEMA size.

b. Voltage.

c. Current.

3. Number of poles.

4. Coil voltage.

5. Physical characteristics including enclosure size.

6. Time - current curves for all breakers requiring settings and fuses.

1.5 QUALIFICATIONS

A. Magnetic motor starters shall be as manufactured by Allen-Bradley Co., Cutler Hammer/Westinghouse, General Electric, Siemens, or Square D.

B. Manual motor starters shall be as manufactured by Allen-Bradley Co., Cutler Hammer/Westinghouse, General Electric, or Square D.

C. Motor starters shall be by the same manufacturer.

PART 2 PRODUCTS

2.1 Magnetic motor starters shall meet the following specifications:

A. Combination magnetic motor starters shall have a fusible disconnect type switch motor circuit protector unless shown otherwise.

B. Provisions for locking the disconnecting means handle in either the ON or OFF position.

C. Minimum starter size shall be NEMA Size 1.

D. Heater element or sensor size shall be based on the nameplate full load current rating of the motor.

E. Each starter shall contain a fused control circuit with the fuse properly sized by the Starter Manufacturer to protect the coil of the starter. Control transformers shall be protected by such a fuse in the primary and secondary circuits of the transformer. Furnish 20% spare fuses of each amperage used (minimum of three) to the Owner.

F. Indoor enclosures shall be NEMA 1, unless shown otherwise.

G. Enclosures for wet locations or outdoor use shall be NEMA 3R, unless shown otherwise.

2.2 For each magnetic starter supplied, provide a hand-off-automatic (HOA) selector switch, red run pilot light, (2) no and (2) NC auxiliary contacts, control power transformer with fusing, and heater motor protective elements. Supply additional push buttons, and similar control devices, not specifically furnished by other trades or by the owner but that are required for proper operation of the specific motor. These devices shall be by the same manufacturer as the starters.

2.3 Motors, smaller than 1/2 horse power, unless shown otherwise, shall have toggle switch type manual starters with thermal trip (TT) overload protection and pilot light. Flush mounted manual starters shall have a stainless steel cover plate. Manual starters used in existing construction where flush mounting is impractical shall be mounted in an appropriate NEMA 1 enclosure. Manual starters shall be similar to Square D Type F, Class 2510 Cat. No. FS1P or approved equivalent.

2.4 Motors, 1/2 horsepower and larger, shall have magnetic motor starters.

2.5 Terminals of the proper size for wire (as shown on the drawings for line, load, and ground) shall be supplied by the motor starter manufacturer.

PART 3 EXECUTION

3.1 Furnish and install motor starters and power and control wiring, complete as specified, unless shown otherwise.

3.2 Starters shall be mounted securely to walls, columns, or machine frames, and provided with the brackets, mounting devices, structural pieces, and expansion type anchor inserts necessary for this purpose. Starters shall not be mounted directly to metal surfaces or to concrete or masonry walls. Structural channels such as Kindorf or 3/4" plywood shall be used to mount starters at least 3/4 inch away from the mounting surface.

3.3 The top of each magnetic motor starter shall be mounted 60 inches above the finished floor unless shown otherwise.

3.4 The top of the box for manual motor starters shall be mounted 48 inches above the floor unless shown otherwise.

3.5 Motor starters furnished with "hand-off-automatic" switches, but not wired for automatic operation, shall have the reference to automatic deleted from the switch label by paint, revised nameplate, or other permanent means.

3.6 Mount motor starters adjacent to or on the equipment served, unless shown otherwise.

END OF SECTION

SECTION 26 3213
ENGINE GENERATORS

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Packaged engine generator system and associated components and accessories:

1. Engine and engine accessory equipment.
2. Alternator (generator).
3. Generator set control system.
4. Exterior Generator set enclosure.

1.2 REFERENCE STANDARDS

A. NECA 1 - Standard for Good Workmanship in Electrical Construction.

B. NECA/EGSA 404 - Standard for Installing Generator Sets.

C. NEMA MG 1 - Motors and Generators.

D. NFPA 30 - Flammable and Combustible Liquids Code.

E. NFPA 37 - Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines; 2015.

F. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

G. NFPA 110 - Standard for Emergency and Standby Power Systems.

H. UL 1236 - Battery Chargers for Charging Engine-Starter Batteries; Current Edition, Including All Revisions.

I. UL 2200 - Stationary Engine Generator Assemblies; Current Edition, Including All Revisions.

1.3 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate compatibility of generator sets to be installed with work provided under other sections or by others.
2. Coordinate arrangement of equipment with the dimensions and clearance requirements of the actual equipment to be installed.
3. Coordinate the work to provide electrical circuits suitable for the power requirements of the actual auxiliary equipment and accessories to be installed.
4. Notify Architect/Engineer of any conflicts with or deviations from the contract documents. Obtain direction before proceeding with work.

B. Preinstallation Meeting: Convene one week before starting work of this section; requires attendance of all affected installers.

1.4 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets for each product, including ratings, configurations, dimensions, finishes, weights, service condition requirements, and installed features. Include alternator starting capabilities, engine fuel consumption rates, and cooling, combustion air, and exhaust requirements.

1. Include generator set sound level test data.

B. Shop Drawings: Include dimensioned plan views and sections indicating locations of system components, required clearances, and field connection locations. Include system interconnection schematic diagrams showing all factory and field connections.

C. Manufacturer's factory emissions certification.

D. Manufacturer's certification that products meet or exceed specified requirements.

E. Source quality control test reports.

F. Provide NFPA 110 required documentation from manufacturer where requested by authorities having jurisdiction, including but not limited to:

1. Certified prototype tests.

2. Torsional vibration compatibility certification.

3. NFPA 110 compliance certification.

4. Certified rated load test at rated power factor.

G. Operation and Maintenance Data: Include detailed information on system operation, equipment programming and setup, replacement parts, and recommended maintenance procedures and intervals.

1. Include contact information for entity that will be providing contract maintenance and trouble call-back service.

H. Executed Warranty: Submit documentation of final executed warranty.

I. Project Record Documents: Record actual locations of system components, installed circuiting arrangements and routing, and final equipment settings.

1.5 QUALITY ASSURANCE

A. Comply with the following:

1. NFPA 70 (National Electrical Code).

2. NFPA 110 (Standard for Emergency and Standby Power Systems) ; meet requirements for Level 1 system.

3. NFPA 37 (Standard for the Installation and Use of Stationary Combustion Engines and Gas Turbines).

4. NFPA 30 (Flammable and Combustible Liquids Code).

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years' documented experience.

D. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Receive, inspect, handle, and store generator sets in accordance with manufacturer's instructions and NECA/EGSA 404.

B. Store in a clean, dry space. Maintain factory wrapping or provide an additional heavy canvas or heavy plastic cover to protect units from dirt, water, construction debris, and traffic.

C. Handle carefully in accordance with manufacturer's instructions to avoid damage to generator set components, enclosure, and finish.

1.7 FIELD CONDITIONS

A. Maintain field conditions within manufacturers' required service conditions during and after installation.

1.8 WARRANTY

A. Provide minimum two year manufacturer warranty covering repair or replacement due to defective materials or workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Packaged Engine Generator Set

1. Caterpillar Inc: www.cat.com.
2. Cummins Power Generation Inc
3. Kohler Co:

B. Products other than basis of design are subject to compliance with specified requirements and prior approval of Engineer. By using products other than basis of design, Contractor accepts responsibility for costs associated with any necessary modifications to related work, including any design fees.

C. Source Limitations: Furnish engine generator sets and associated components and accessories produced by a single manufacturer and obtained from a single supplier.

2.2 PACKAGED ENGINE GENERATOR SYSTEM

A. Provide new engine generator system consisting of all required equipment, sensors, conduit, boxes, wiring, piping, supports, accessories, system programming, etc. as necessary for a complete operating system that provides the functional intent indicated.

B. Provide products listed, classified, and labeled as suitable for the purpose intended.

C. System Description:

1. Application: Emergency/standby.
2. Configuration: Single packaged engine generator set operated independently (not in parallel).

D. Packaged Engine Generator Set:

1. Type: Gaseous (spark ignition).
2. Power Rating: 38 kW, standby.
3. Voltage: 240/120V, single phase, 60 Hz.
4. Generator Load Circuit Breaker: 170 Amps
5. Main Line Circuit Breaker:
    a. Type: Electronic trip with long time and short time delay and instantaneous pickup.
    b. Trip Rating: Select according to generator set rating.
    c. Features:
        1) Shunt trip.
        2) Auxiliary contacts.

E. Generator Set General Requirements:

1. Prototype tested in accordance with NFPA 110 for Level 1 systems.
2. Factory-assembled, with components mounted on suitable base.

3. List and label engine generator assembly as complying with UL 2200.

4. Power Factor: Unless otherwise indicated, specified power ratings are at 0.8 power factor for three phase voltages and 1.0 power factor for single phase voltages.

5. Provide suitable guards to protect personnel from accidental contact with rotating parts, hot piping, and other potential sources of injury.

6. Main Line Circuit Breakers: Provide factory-installed line side connections with suitable lugs for load side connections. Provide Circuit Breaker.

F. Service Conditions: Provide engine generator system and associated components suitable for operation under the service conditions at the installed location.

1. Ambient Temperature: Between -10 and 104 degrees F (-25 and 40 degrees C).

G. Starting and Load Acceptance Requirements:

1. Cranking Method: Cycle cranking complying with NFPA 110 (15 second crank period, followed by 15 second rest period, with cranking limiter time-out after 3 cycles), unless otherwise required.

2. Cranking Limiter Time-Out: If generator set fails to start after specified cranking period, indicate overcrank alarm condition and lock-out generator set from further cranking until manually reset.

3. Start Time: Capable of starting and achieving conditions necessary for load acceptance within 10 seconds (NFPA 110, Type 10).

4. Maximum Load Step: Supports 100 percent of rated load in one step.

a. Maximum Voltage Deviation with Load Step: 35 percent.

b. Maximum Frequency Deviation with Load Step: 10 percent.

5. Motor Starting Capability: Supports starting of motor load indicated with a maximum voltage dip of 20 percent.

H. Exhaust Emissions Requirements:

1. Comply with federal (EPA), state, and local regulations applicable at the time of commissioning; include factory emissions certification with submittals.

2. E.C. is responsible for all required permitting for a complete operating system.

3. EPA permit required by owner.

4. Do not make modifications affecting generator set factory emissions certification without approval of manufacturer and Engineer. Where such modifications are made, provide field emissions testing as necessary for certification.

I. Sound Level Requirements:

1. Do not exceed level 3 sound 70 dBA when measured at 23 feet (7 m) from generator set in free field (no sound barriers) while operating at full load ; include manufacturer's sound data with submittals.

2. Comply with applicable residential noise level regulations.

2.3 ENGINE AND ENGINE ACCESSORY EQUIPMENT

A. Provide engine with adequate horsepower to achieve specified power output at rated speed, accounting for alternator efficiency and parasitic loads.

B. Engine Fuel System - Gaseous (Spark Ignition):

1. Fuel Source: Natural gas.

2. Engine Fuel Connections: Provide suitable, approved flexible fuel lines for coupling engine to fuel source.

3. Provide components/features indicated and as necessary for operation and/or required by applicable codes, including but not limited to:

a. Carburetor.

b. Gas pressure regulators.

c. Fuel shutoff control valves.

d. Low gas pressure switches.

C. Engine Starting System:

1. System Type: Electric, with DC solenoid-activated starting motor(s).

2. Battery(s):

a. Battery Type: Lead-acid.

b. Battery Capacity: Size according to manufacturer's recommendations for achieving starting and load acceptance requirements under worst case ambient temperature; capable of providing cranking through two complete periods of cranking limiter time-outs without recharging.

c. Provide battery rack, cables, and connectors suitable for the supplied battery(s); size battery cables according to manufacturer's recommendations for cable length to be installed.

3. Battery-Charging Alternator: Engine-driven, with integral solid-state voltage regulation.

4. Battery Charger:

a. Provide dual rate battery charger with automatic float and equalize charging modes and minimum rating of 10 amps; suitable for maintaining the supplied battery(s) at full charge without manual intervention.

b. Capable of returning supplied battery(s) from fully discharged to fully charged condition within 24 hours, as required by NFPA 110 for Level 1 applications while carrying normal loads.

c. Recognized as complying with UL 1236.

d. Furnished with integral overcurrent protection; current limited to protect charger during engine cranking; reverse polarity protection.

e. Provide integral DC output ammeter and voltmeter with five percent accuracy.

f. Provide alarm output contacts as necessary for alarm indications.

5. Battery Heater: Provide thermostatically controlled battery heater to improve starting under cold ambient conditions.

6. Lock-Out-Tag-Out: Provide a factory wired and tested Lockout/tagout device for the genset starting circuit that complies with OSHA regulation 29 CSR 1910.147.

D. Engine Speed Control System (Governor):

1. Single Engine Generator Sets (Not Operated in Parallel): Provide electronic isochronous governor for controlling engine speed/alternator frequency.

2. Frequency Regulation, Electronic Isochronous Governors: No change in frequency from no load to full load; plus/minus 0.25 percent at steady state.

E. Engine Lubrication System:

1. System Type: Full pressure, with engine-driven, positive displacement lubrication oil pump, replaceable full-flow oil filter(s), and dip-stick for oil level indication. Provide oil cooler where recommended by manufacturer.

F. Engine Cooling System:

1. System Type: Closed-loop, liquid-cooled, with unit-mounted radiator/fan and engine-driven coolant pump; suitable for providing adequate cooling while operating at full load under worst case ambient temperature.

2. Fan Guard: Provide suitable guard to protect personnel from accidental contact with fan.

3. Coolant Heater: Provide thermostatically controlled coolant heater to improve starting under cold ambient conditions; size according to manufacturer's recommendations for achieving starting and load acceptance requirements under worst case ambient temperature.

4. Coolant reservoir shall be installed

G. Engine Air Intake and Exhaust System:

1. Air Intake Filtration: Provide engine-mounted, replaceable, dry element filter.

2. Engine Exhaust Connection: Provide suitable, approved flexible connector for coupling engine to exhaust system.

3. Exhaust Silencer: Provide standard grade or better exhaust silencer with sound attenuation not less than basis of design; select according to manufacturer's recommendations to meet sound performance requirements, where specified. Silencer shall be contained inside of Genset enclosure.

2.4 ALTERNATOR (GENERATOR)

A. Alternator: 4-pole, 1800 rpm (60 Hz output) revolving field, synchronous generator complying with NEMA MG 1; connected to engine with flexible coupling; voltage output configuration as indicated, with reconnectable leads for 3 phase alternators.

B. Exciter:

1. Exciter Type: Brushless; provide permanent magnet generator (PMG) excitation system; self-excited (shunt) systems are not permitted.

2. PMG Excitation Short-Circuit Current Support: Capable of sustaining 300 percent of rated output current for 10 seconds.

3. Voltage Regulation (with PMG excitation): Plus/minus 0.5 percent for any constant load from no load to full load.

C. Temperature Rise: Comply with UL 2200.

D. Insulation System: NEMA MG 1 , Class H; suitable for alternator temperature rise.

E. Enclosure: NEMA MG 1, drip-proof.

F. Total Harmonic Distortion: Not greater than five percent.

G. Alternator Heater: Provide strip heater to prevent moisture condensation on alternator windings.

2.5 GENERATOR SET CONTROL SYSTEM

A. Provide microprocessor-based control system for automatic control, monitoring, and protection of generator set. Include sensors, wiring, and connections necessary for functions/indications specified.

B. Control Panel:

1. Control Panel Mounting: Unit-mounted unless otherwise indicated; vibration isolated.

2. Generator Set Control Functions:

a. Automatic Mode: Initiates generator set start/shutdown upon receiving corresponding signal from remote device (e.g. automatic transfer switch).

b. Manual Mode: Initiates generator set start/shutdown upon direction from operator.

c. Reset Mode: Clears all faults, allowing generator set restart after a shutdown.

d. Emergency Stop: Immediately shuts down generator set (without time delay) and prevents automatic restarting until manually reset.

e. Cycle Cranking: Programmable crank time, rest time, and number of cycles.

f. Time Delay: Programmable for shutdown (engine cooldown) and start (engine warmup).

g. Voltage Adjustment: Adjustable through range of plus/minus 5 percent.

3. Generator Set Status Indications:

a. Voltage (Volts AC): Line-to-line, line-to-neutral for each phase.

b. Current (Amps): For each phase.

c. Frequency (Hz).

d. Real power (W/kW).

e. Reactive power (VAR/kVAR).

f. Apparent power (VA/kVA).

g. Power factor.

h. Duty Level: Actual load as percentage of rated power.

i. Engine speed (RPM).

j. Battery voltage (Volts DC).

k. Engine oil pressure.

l. Engine coolant temperature.

m. Engine run time.

n. Generator powering load (position signal from transfer switch).

4. Generator Set Protection and Warning/Shutdown Indications:

a. Comply with NFPA 110; configurable for NFPA 110 Level 1 or Level 2, or NFPA 99 systems.

C. Remote Annunciator:

1. Remote Annunciator Mounting: Wall-mounted; provide flush-mounted annunciator for finished areas and surface-mounted annunciator for non-finished areas unless otherwise indicated. Locate annunciator on interior wall. Location shall be based on Owner requirements.

2. Generator Set Status Indications:

a. Generator powering load (via position signal from transfer switch).

b. Communication functional.

3. Generator Set Warning/Shutdown Indications:

a. Comply with NFPA 110 for Level 1 systems.

b. Provide audible alarm with silence function.

c. Provide lamp test function that illuminates all indicator lamps.

D. Remote Emergency Stop: Provide approved red, mushroom style remote emergency stop button where indicated or required by authorities having jurisdiction (AHJ).

2.6 GENERATOR SET ENCLOSURE

A. Enclosure Type: Sound attenuating, weather protective.

B. Enclosure Material: Steel or aluminum.

C. Hardware Material: Stainless steel.

D. Color: Standard.

E. Access Doors: Lockable, with all locks keyed alike.

F. Openings: Designed to prevent bird/rodent entry.

G. External Drains: Extend oil and coolant drain lines to exterior of enclosure for maintenance service.

H. Sound Attenuating Enclosures: Line enclosure with non-hydroscopic, self-extinguishing sound-attenuating material.

I. Utilize an upward discharging radiator hood.

J. Exhaust Silencers: Where exhaust silencers are mounted within enclosure in main engine compartment, insulate silencer to minimize heat dissipation as necessary for operation at rated load under worst case ambient temperature.

K. The enclosure shall be shrink wrapped from the factory before shipping.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that the ratings and configurations of generator sets and auxiliary equipment are consistent with the indicated requirements.

C. Verify that rough-ins for field connections are in the proper locations.

D. Verify that mounting surfaces are ready to receive equipment.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 INSTALLATION

A. Perform work in a neat and workmanlike manner in accordance with NECA 1.

B. Install products in accordance with manufacturer's instructions.

C. Install generator sets and associated accessories in accordance with NECA/EGSA 404.

D. Arrange equipment to provide minimum clearances and required maintenance access.

E. Mount generator set on properly sized 6 inch (150 mm) high concrete pad. Layout for generator pad to be provided by generator manufacturer. Provide suitable vibration isolators, where not factory installed.

F. Use manufacturer's recommended oil and coolant, suitable for the worst case ambient temperatures.

G. Provide gas piping.

H. Provide engine exhaust piping, where not factory installed.

1. Include piping expansion joints, piping insulation, thimble, condensation trap/drain, rain cap, hangers/supports, etc. as indicated or as required.

2. Do not exceed manufacturer's maximum back pressure requirements.

I. Install exhaust silencer, where not factory installed.

J. Provide grounding and bonding in accordance with Section 26 0526.

3.3 FIELD QUALITY CONTROL

A. Provide services of a manufacturer's authorized representative to prepare and start systems and perform inspection and testing. Include manufacturer's detailed testing procedures and field reports with submittals.

B. Notify authorities having jurisdiction and comply with their requirements for scheduling inspections and tests and for observation by their personnel.

C. Preliminary inspection and testing to include, at a minimum:

1. Inspect each system component for damage and defects.

2. Verify tightness of mechanical and electrical connections are according to manufacturer's recommended torque settings.

3. Check for proper oil and coolant levels.

D. Prepare and start system in accordance with manufacturer's instructions.

E. Perform acceptance test in accordance with NFPA 110.

F. Inspection and testing to include, at a minimum:

1. Verify compliance with starting and load acceptance requirements.

2. Verify voltage and frequency; make required adjustments as necessary.

3. Verify phase sequence.

4. Verify control system operation, including safety shutdowns.

5. Verify operation of auxiliary equipment and accessories (e.g. battery charger, heaters, etc.).

6. Perform load tests in accordance with NFPA 110.

I. Provide field emissions testing where necessary for certification.

J. Sound Level Tests: Measure sound levels for compliance with specified requirements. Identify and report ambient noise conditions.

K. Correct defective work, adjust for proper operation, and retest until entire system complies with contract documents.

L. Submit detailed reports indicating inspection and testing results and corrective actions taken.

3.4 CLOSEOUT ACTIVITIES

A. Demonstration: Demonstrate proper operation of system to owner, and correct deficiencies or make adjustments as directed.

B. Training: Train owner’s representative on operation, adjustment, and maintenance of system.

1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.

2. Provide minimum of four hours of training.

3. Instructor: Manufacturer's authorized representative.

4. Location: At project site.

3.5 PROTECTION

A. Protect installed engine generator system from subsequent construction operations.

END OF SECTION

SECTION 26 3600
AUTOMATIC TRANSFER EQUIPMENT

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Automatic transfer switch to start and stop a generator set.

1.2 REFERENCES

A. National Electrical Code (NEC)

B. National Equipment Manufacturer's Association (NEMA)

C. National Fire Protection Association (NFPA)

D. Underwriters' Laboratories (UL)

1.3 SYSTEM DESCRIPTION

A. The automatic transfer switch operates to select between the normal and generator source to supply power to the facility as required.

1.4 SUBMITTALS

A. Submit the following information:

1. Equipment physical dimensions and electrical ratings.

2. Accessories and options.

3. Installation requirements and recommendations.

4. Manufacturer's Certificate: Certify that product meets or exceeds specified requirements.

B. Operating and Maintenance Manuals: Submit:

1. Technical data sheets.

2. Information for ordering replacement parts.

3. Wiring diagrams:

a. Wiring diagrams shall have terminals identified to facilitate installation, operation, and maintenance.

b. Wiring diagrams shall indicate internal wiring for each item of equipment and interconnections between items of equipment.

4. Description of operating procedures, component details, troubleshooting and part replacement.

1.5 QUALIFICATIONS

A. Automatic transfer switches shall be as manufactured by ASCO, Russelectric or generator supplier.

B. Automatic transfer switches shall be rated continuous duty as per UL 1008 test procedures and NEMA Standard I CS2-447. Environmental testing shall be per MIL Standard 202E. The switches shall have withstand ratings in excess of UL 1008 when tested per paragraph 25 thereof. Inrush current rating shall be 20 times the continuous current rating.

1.6 OPERATION

A. The sequence of operation shall be as follows:

1. When any phase of the normal source is reduced to 90% of rated voltage for approximately 3 seconds a pilot contact on the transfer switch will close and initiate starting of the standby plant. When the standby generator is delivering not less than 90% of rated voltage and frequency, the load shall be transferred (adjustable from 2-120 sec.) to the emergency generator. Transfer shall be controlled by an in-phase monitor.

2. Upon restoration of the normal source to not less than 95% of rated voltage, load shall be re-transferred to the normal source after a time delay of 0 to 30 minutes (adjustable). After retransfer to the normal source, the engine shall run for 5 minutes unloaded and then automatically shut down and be ready to start upon the next failure of the normal source. If the standby plant should fail while carrying the load, retransfer to the normal source shall be made instantaneously upon restoration of the normal source. Transfer shall be controlled by an in-phase monitor.

PART 2 PRODUCTS

2.1 TRANSFER SWITCHES

A. TRANSFER SWITCHES shall be based on contactor type assemblies with magnetic blowout coils and arc barriers on all poles. Contact assemblies designed and intended for use in molded case circuit breakers will not be accepted.

B. Each main contact shall be silver surfaced and protected by a separate arcing contact.

C. The transfer switch shall be a double throw switch controlled by an in-phase monitor circuit. The normal and emergency contacts shall each be inherently mechanically locked by the operating linkage when in the open or closed positions. All parts of the mechanical driving system and mechanical interlocks shall be electrically dead.

1. The following additional accessory features shall be included:

2. Test switch to simulate normal source failure.

3. Two auxiliary contacts closed on normal.

4. Two auxiliary contacts closed on emergency.

E. Monitor all three line-to-line voltages on the normal source to provide full-phase protection for loss-of-phase.

F. Rating of the transfer switch shall be sufficient to handle the loads being transferred. An exerciser shall be included to exercise the plant and loads for 30 minutes every 7 days.

G. Terminals of the proper size for wire as shown on the drawings for line, load and ground shall be supplied by the transfer switch manufacturer.

H. See drawings for transfer switch ampere rating.

PART 3 EXECUTION

3.1 Transfer switch shall be installed where shown on drawings and in accordance with the recommendations of the manufacturer.

3.2 Transfer switch shall be securely mounted to wall with all necessary brackets, mounting devices, structural pieces and expansion type anchor inserts necessary for this purpose. Transfer switch shall not be mounted directly to concrete or masonry walls. Structural channels such as Kindorf or 3/4-inch painted plywood shall be used to mount panelboards at least 3/4-inches from concrete or masonry walls.

3.3 Transfer switch shall be completely wired and tested in conjunction with the engine-generator.

END OF SECTION

SECTION 26 5100

LIGHTING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Luminaires.

B. Exit signs.

C. Drivers.

D. Luminaire accessories.

1.2 RELATED REQUIREMENTS

A. Section 26 0526 – Grounding and Bounding For Electrical Systems.

1.3 REFERENCE STANDARDS

A. ANSI C82.11 - American National Standard for Lamp Ballasts - High Frequency Fluorescent Lamp Ballasts - Supplements; 2011.

B. IEEE C62.41.2 - Recommended Practice on Characterization of Surges in Low-Voltage (1000 V and less) AC Power Circuits; 2002 (Cor 1, 2012).

C. NECA 1 - Standard for Good Workmanship in Electrical Construction; National Electrical Contractors Association; 2010.

D. NECA/IESNA 500 - Standard for Installing Indoor Commercial Lighting Systems; National Electrical Contractors Association; 2006.

E. NECA/IESNA 502 - Standard for Installing Industrial Lighting Systems; National Electrical Contractors Association; 2006.

F. NEMA LE 4 - Recessed Luminaires, Ceiling Compatibility; National Electrical Manufacturers Association; 2012.

G. NFPA 70 - National Electrical Code; National Fire Protection Association; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

H. NFPA 101 - Life Safety Code; National Fire Protection Association; 2012.

I. UL 924 - Emergency Lighting and Power Equipment; Current Edition, Including All Revisions.

J. UL 1598 - Luminaires; Current Edition, Including All Revisions.

K. UL 8750 - Light Emitting Diode (LED) Equipment for Use in Lighting Products; Current Edition, Including All Revisions.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Coordination:

1. Coordinate the installation of luminaires with mounting surfaces installed under other sections or by others. Coordinate the work with placement of supports, anchors, etc. required for mounting. Coordinate compatibility of luminaires and associated trims with mounting surfaces at installed locations.

2. Coordinate the placement of luminaires with structural members, ductwork, piping, equipment, diffusers, fire suppression system components, and other potential conflicts installed under other sections or by others.

3. Coordinate the placement of exit signs with furniture, equipment, signage or other potential obstructions to visibility installed under other sections or by others.

4. Notify Architect/Engineer of any conflicts or deviations from the contract documents to obtain direction prior to proceeding with work.

1.5 SUBMITTALS

A. Product Data: Provide manufacturer's standard catalog pages and data sheets including detailed information on luminaire construction, dimensions, ratings, finishes, mounting requirements, listings, service conditions, photometric performance, installed accessories, and ceiling compatibility; include model number nomenclature clearly marked with all proposed features.

1. Drivers: Include wiring diagrams and list of compatible lamp configurations.

2. Lamps: Include rated life, color temperature, color rendering index (CRI), and initial and mean lumen output.

1.6 QUALITY ASSURANCE

A. Conform to requirements of NFPA 70.

B. Maintain at the project site a copy of each referenced document that prescribes execution requirements.

C. Product Listing Organization Qualifications: An organization recognized by OSHA as a Nationally Recognized Testing Laboratory (NRTL) and acceptable to authorities having jurisdiction.

1.7 DELIVERY, STORAGE, AND PROTECTION

A. Receive, handle, and store products according to NECA/IESNA 500 (commercial lighting), NECA/IESNA 502 (industrial lighting), and manufacturer's written instructions.

B. Keep products in original manufacturer's packaging and protect from damage until ready for installation.

1.8 FIELD CONDITIONS

A. Maintain field conditions within manufacturer's required service conditions during and after installation.

1.9 WARRANTY

A. Provide two year manufacturer warranty for LED drivers.

B. Provide ten year pro-rata warranty for batteries for self-powered exit signs.

C. Provide three year full warranty for fluorescent emergency power supply units.

PART 2 PRODUCTS

2.1 LUMINAIRE TYPES

A. Furnish products as indicated in luminaire schedule included on the drawings.

2.2 LUMINAIRES

A. Provide products that comply with requirements of NFPA 70.

B. Provide products that are listed and labeled as complying with UL 1598, where applicable.

C. Provide products listed, classified, and labeled as suitable for the purpose intended.

D. Unless otherwise indicated, provide complete luminaires including lamp(s) and all sockets, ballasts, reflectors, lenses, housings and other components required to position, energize and protect the lamp and distribute the light.

E. Unless specifically indicated to be excluded, provide all required conduit, boxes, wiring, connectors, hardware, supports, trims, accessories, etc. as necessary for a complete operating system.

F. Provide products suitable to withstand normal handling, installation, and service without any damage, distortion, corrosion, fading, discoloring, etc.

G. Recessed Luminaires:

1. Ceiling Compatibility: Comply with NEMA LE 4.

H. LED Luminaire Components: UL 8750 recognized or listed as applicable.

1. Lumen Maintenance per Lumens-80-08 as determined by TM-21.

2. Minimum 50,000 hours L70.

3. Photometry per LM-79.

4. RoHS compliant.

5. Correlated Color Temperature (CCT): 4,000 K unless otherwise indicated.

6. Color Rendering Index (CRI): Not less than 80.

7. Minimum luminaire warranty 5 years.

8. Luminous efficacy of at least 70.

2.3 EXIT SIGNS

A. Description: Exit signs and similar signs for special purpose applications such as area of refuge/rescue assistance.

B. All Exit Signs: Internally illuminated with LEDs unless otherwise indicated; complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

1. Number of Faces: Single or double as indicated or as required for the installed location.

2. Directional Arrows: As indicated or as required for the installed location.

C. Self-Powered Exit Signs:

1. Operation: Upon interruption of normal power source or brownout condition exceeding 20 percent voltage drop from nominal, solid-state control automatically switches connected lamps to integral battery power for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

2. Battery: Sealed maintenance-free nickel cadmium unless otherwise indicated.

3. Diagnostics: Provide power status indicator light and accessible integral test switch to manually activate emergency operation.

4. Provide low-voltage disconnect to prevent battery damage from deep discharge.

5. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101; provide indicator light(s) to report test and diagnostic status.

2.4 DRIVERS

A. LED Drivers: RoHS compliant, 120-277V input voltage, 0-10V dimming,

1. LED Driver is certified by UL Class 2 for use in dry or damp location.

2. LED Driver has a Class A sound rating.

3. LED Driver has a minimum operating ambient temperature of -40C.

4. LED Driver has a life expectancy of 50,000 hours at Tcase of ≤ 70C.

5. LED Driver tolerates sustained open circuit and short circuit output conditions without damage.

6. LED Driver complies with FCC rules and regulations, as per Title 47 CFR Part 15 Non-Consumer (Class A).

2.5 EMERGENCY POWER SUPPLY UNITS

A. Description: Self-contained emergency power supply units suitable for use with indicated luminaires, complying with NFPA 101 and all applicable state and local codes, and listed and labeled as complying with UL 924.

B. Operation: Upon interruption of normal power source, solid-state control automatically switches connected lamp(s) to the emergency power supply for minimum of 90 minutes of rated emergency illumination, and automatically recharges battery upon restoration of normal power source.

C. Battery: Sealed maintenance-free high-temperature nickel cadmium unless otherwise indicated.

D. Diagnostics: Provide accessible and visible multi-chromatic combination test switch/indicator light to display charge, test, and diagnostic status and to manually activate emergency operation.

E. Self-Diagnostics: Provide units that self-monitor functionality and automatically perform testing required by NFPA 101; provide indicator light(s) to report test and diagnostic status and field selectable audible alert.

F. Accessories:

1. Provide compatible accessory remote combination test switch/indicator light.

2.6 LAMPS

A. Lamps - General Requirements:

1. Unless explicitly excluded, provide new, compatible, operable lamps in each luminaire.

2. Verify compatibility of specified lamps with luminaires to be installed. Where lamps are not specified, provide lamps per luminaire manufacturer's recommendations.

3. Minimum Efficiency: Provide lamps complying with all current applicable federal and state lamp efficiency standards.

4. Color Temperature Consistency: Unless otherwise indicated, for each type of lamp furnish products which are consistent in perceived color temperature. Replace lamps that are determined by the Architect/Engineer to be inconsistent in perceived color temperature.

5. LED source Correlated Color Temperature (CCT): 4,000 K unless otherwise indicated. Color Rendering Index (CRI): Not less than 80.

2.7 ACCESSORIES

A. Provide accessory plaster frames for luminaires recessed in plaster ceilings.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that field measurements are as shown on the drawings.

B. Verify that outlet boxes are installed in proper locations and at proper mounting heights and are properly sized to accommodate conductors in accordance with NFPA 70.

C. Verify that suitable support frames are installed where required.

D. Verify that branch circuit wiring installation is completed, tested, and ready for connection to luminaires.

E. Verify that conditions are satisfactory for installation prior to starting work.

3.2 PREPARATION

A. Provide extension rings to bring outlet boxes flush with finished surface.

B. Clean dirt, debris, plaster, and other foreign materials from outlet boxes.

3.3 INSTALLATION

A. Coordinate locations of outlet boxes provided under Section 26 0537 as required for installation of luminaires provided under this section.

B. Install products according to manufacturer's instructions.

C. Install luminaires securely, in a neat and workmanlike manner, as specified in NECA 1 (general workmanship) and NECA 500 (commercial lighting).

D. Install luminaires plumb and square and aligned with building lines and with adjacent luminaires.

E. Suspended Ceiling Mounted Luminaires:

1. Do not use ceiling tiles to bear weight of luminaires.

2. Do not use ceiling support system to bear weight of luminaires unless ceiling support system is certified as suitable to do so.

3. Secure surface-mounted and recessed luminaires to building structure.

4. Secure lay-in luminaires to ceiling support channels using listed safety clips at four corners.

5. In addition to ceiling support wires, provide two galvanized steel safety wire(s), minimum 12 gage, connected from opposing corners of each recessed luminaire to building structure.

6. See appropriate Division 9 section where suspended grid ceiling is specified for additional requirements.

F. Recessed Luminaires:

1. Install trims tight to mounting surface with no visible light leakage.

2. Luminaires Recessed in Fire-Rated Ceilings: Install using accessories and firestopping materials to meet regulatory requirements for fire rating.

G. Install accessories furnished with each luminaire.

H. Bond products and metal accessories to branch circuit equipment grounding conductor.

I. Exit Signs:

1. Unless otherwise indicated, connect unit to un-switched power from same circuit feeding normal lighting in same room or area. Bypass local switches, contactors, or other lighting controls.

J. Emergency Power Supply Units:

1. For field-installed units, install inside luminaire unless otherwise indicated. Where installation inside luminaire is not possible, install on top of luminaire.

2. Unless otherwise indicated, connect unit to un-switched power from same circuit feeding normal driver(s) in luminaire. Bypass local switches, contactors, or other lighting controls.

K. Install lamps in each luminaire.

3.4 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Inspect each product for damage and defects.

C. Operate each luminaire after installation and connection to verify proper operation.

D. Test self-powered exit signs, emergency lighting units, and fluorescent emergency power supply units to verify proper operation upon loss of normal power supply.

E. Correct wiring deficiencies and repair or replace damaged or defective products. Repair or replace excessively noisy ballasts as determined by Architect/Engineer.

3.5 ADJUSTING

A. Aim and position adjustable luminaires to achieve desired illumination as indicated or as directed by Architect/Engineer. Secure locking fittings in place.

B. Exit Signs with Field-Selectable Directional Arrows: Set as indicated or as required to properly designate egress path as directed by Architect/Engineer or authority having jurisdiction.

3.6 CLEANING

A. Clean surfaces according to NECA 500 (commercial lighting), NECA 502 (industrial lighting), and manufacturer's instructions to remove dirt, fingerprints, paint, or other foreign material and restore finishes to match original factory finish.

3.7 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Just prior to Substantial Completion, replace all lamps that have been operated for more than 20 percent of their rated life.

3.8 PROTECTION

A. Protect installed luminaires from subsequent construction operations.

END OF SECTION

SECTION 26 5950
OCCUPANCY SENSORS

PART 1 - GENERAL

1.1 WORK INCLUDED

A. Contractor's work to include all labor, materials, tools, appliances, control hardware, sensor, wire, junction boxes and equipment necessary for and incidental to the delivery, installation and furnishing of a completely operational occupancy sensor lighting control system, as described herein.

B. Contractor/Supplier shall examine all general specification provisions and drawings for related electrical work required as work under Division 26.

C. Contractor shall coordinate all work described in this section with all other applicable plans and specifications, including but not limited to wiring, conduit, fixtures, HVAC systems and building management systems.

1.2 EQUIPMENT QUALIFICATION

A. Products supplied shall be from a single manufacturer that has been continuously involved in the manufacturing of occupancy sensors for a minimum of five (5) years. Mixing of manufacturers shall not be allowed.

B. All components shall be U.L. listed, offer a five (5) year warranty and meet all state and local applicable code requirements.

C. Products shall be manufactured by an ISO 9002 certified manufacturing facility and shall have a defect rate of less than 1/3 of 1%.

D. Wall switch products must be capable of withstanding the effects of inrush current. Submittals shall clearly indicate the method used.

1.3 SYSTEM DESCRIPTION

A. The objective of this section is to ensure the proper installation of the occupancy sensor based lighting control system so that lighting is turned off automatically after reasonable time delay when a room or area is vacated by the last person to occupy said room or area.

B. The occupancy sensor based lighting control shall accommodate all conditions of space utilization and all irregular work hours and habits.

C. Contractor shall warrant all equipment furnished in accordance to this specification to be undamaged, free of defects in materials and workmanship, and in conformance with the specifications. The suppliers obligation shall include repair or replacement, and testing without charge to the Owner, all or any parts of equipment which are found to be damaged, defective or non-conforming and returned to the supplier. The warranty shall commence upon the Owner's acceptance of the project. Warranty on labor shall be for a minimum period of one (1) year.

1.4 SUBMITTALS

A. Manufacturer shall substantiate conformance to this specification by supplying the necessary documents, performance data and wiring diagrams. Any deviations to this specification must be clearly stated by letter and submitted.

B. Submit a lighting plan clearly marked by manufacturer showing proper product, location and orientation of each sensor.

C. Submit any interconnection diagrams per major subsystem showing proper wiring.

D. Submit standard catalog literature which includes performance specifications indicating compliance to the specification.

E. Catalog sheets must clearly state any load restrictions when used with electronic ballasts.

1.5 SYSTEM OPERATION

A. It shall be the contractor's responsibility to make all proper adjustments to assure Owner's satisfaction with the occupancy system.

PART 2 REQUIREMENTS

2.1 ACCEPTABLE MANUFACTURERS

A. The Watt Stopper, Hubbell Automation, Leviton or Pre-Approved Equal: For pre-approval, provide all the information listed under section 1.04A and 1.04D a minimum of ten (10) working days prior to bid date.

B. The listing of any manufacturer as "acceptable" does not imply automatic approval. It is the sole responsibility of the electrical contractor to ensure that any price quotations received and submittals made are for sensors which meet or exceed the specifications included herein.

2.2 PRODUCTS

A. Provide the following type of sensor per area unless noted otherwise on the Drawings:

1. Large rooms: Dual-Technology ceiling mounted.

2. Storage and Restrooms: Ultrasonic ceiling mounted.

3. Offices: Dual-Technology ceiling mounted.

4. Corridors and Hallways: Dual-Technology ceiling mounted.

B. Provide power pack units for operation of sensor.

C. Wall switch sensors shall be capable of detection of occupancy at desktop level up to 300 square feet, and gross motion up to 1000 square feet.

D. Wall switch sensors shall accommodate loads from 0 to 800 watts at 120 volts; 0 to 1200 watts at 277 volts and shall have 180˚ coverage capability.

E. Wall switch products shall utilize Zero Crossing Circuitry which increases relay life, protects from the effects of inrush current, and increases sensor's longevity.

F. Wall switch sensors shall have no leakage current to load, in manual or in Auto/Off mode for safety purposes and shall have voltage drop protection.

G. Wall switch sensors shall provide a field selectable option to convert sensor operation from automatic-ON to manual-ON.

H. Vandal resistant wall switch sensors shall utilize a hard lens with a minimum 1.0mm thickness. Products utilizing a soft lens will not be considered.

I. Passive infrared sensors shall utilize Pulse Count Processing and Digital Signature Analysis to respond only to those signals caused by human motion.

J. Passive infrared sensors shall utilize mixed signal ASIC which provides high immunity to false triggering from RFI (hand-held radios) and EMI (electrical noise on the line), superior performance, and greater reliability.

K. Passive infrared sensors shall have a multiple segmented Lodif Fresnel lens, in a multiple-tier configuration, with grooves-in to eliminate dust and residue build-up.

L. In rooms indicated on the Drawings, passive infrared and dual technology sensors shall offer day-lighting footcandle adjustment control and be able to accommodate dual level lighting.

M. Dual technology sensors shall be corner mounted to avoid detection outside the controlled area when doors are left open.

N. Dual technology sensors shall consist of passive infrared and ultrasonic technologies for occupancy detection. Products that react to noise or ambient sound shall not be considered.

O. Ultrasonic sensors shall utilize Advanced Signal Processing to adjust the detection threshold dynamically to compensate for constantly changing levels of activity and air flow throughout controlled space.

P. Ultrasonic operating frequency shall be crystal controlled at 25 kHz within ± 0.005% tolerance, 32 kHz within ± 0.002% tolerance, or 40 kHz ± 0.002% tolerance to assure reliable performance and eliminate sensor cross-talk. Sensors using multiple frequencies are not acceptable.

Q. All sensors shall be capable of operating normally with electronic ballasts, PL lamp systems and rated motor loads.

R. Coverage of sensors shall remain constant after sensitivity control has been set. No automatic reduction shall occur in coverage due to the cycling of air conditioner or heating fans.

S. All sensors shall have readily accessible, user adjustable settings for time delay and sensitivity. Settings shall be located on the sensor (not the control unit) and shall be recessed to limit tampering.

T. In the event of failure, a bypass manual override shall be provided 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.

U. All sensors shall provide an LED as a visual means of indication at all times to verify that motion is being detected during both testing and normal operation.

V. All sensors shall have UL rated, 94V-0 plastic enclosures.

W. All sensors shall have adjustable time delay, field adjusted to 15 minutes.

2.3 CIRCUIT CONTROL HARDWARE - CU

A. Control Units - For ease of mounting, installation and future service, control unit(s) shall be able to externally mount through a 1/2" knock-out on 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. Control unit shall provide power to a minimum of two (2) sensors.

B. Relay Contacts shall have ratings of:

1. 13A - 120 VAC Tungsten

2. 20A - 120 VAC Ballast

3. 20A - 277 VAC Ballast

C. Control wiring between sensors and controls units shall be Class II , 18-24 AWG, stranded U.L. Classified, PVC insulated or TEFLON jacketed cable suitable for use in plenums, where applicable. Wiring shall be routed in conduit.

D. Minimum acceptable wire gauge from the circuit control hardware relays shall be #14 AWG.

PART 3 EXECUTION

3.1 INSTALLATION

A. It shall be the contractor's responsibility to locate and aim sensory in the correct location required for complete and proper volumetric coverage within the range of coverage(s) of controlled areas per the manufacturer's recommendations. Rooms shall have ninety (90) to one hundred (100) percent coverage to completely cover the controlled area to accommodate all occupancy habits of single or multiple occupants at any location within the room(s). The locations and quantities of sensors shown on the drawings are diagrammatic and indicate only the rooms which are to be provided with sensors. The contractor shall provide additional sensors if required to properly and completely cover the respective room.

B. It is the contractors responsibility to arrange a pre-installation meeting with the manufacturer's factory authorized representative, at the Owner's facility, to verify placement of sensors and installation criteria.

C. Proper judgment must be exercised in executing the installation so as to ensure the best possible installation in the available space and to overcome local difficulties due to space limitations or interference of structural components. The contractor shall also provide, at the Owner's facility, the training necessary to familiarize the Owner's personnel with the operation, use, adjustment, and problem solving diagnosis of the occupancy sensing devices and systems.

3.2 FACTORY COMMISSIONING

A. Upon completion of the installation, the system shall be completely commissioned by the manufacturer's factory authorized technician who will verify all adjustments and sensor placement to ensure a trouble-free occupancy-based lighting control system. UI shall witness the commissioning.

END OF SECTION

IIW, P.C.

www.iiwengr.com

ARCHITECTURE
CIVIL ENGINEERING
CONSTRUCTION SERVICES
ENVIRONMENTAL ENGINEERING
LAND SURVEYING
MUNICIPAL ENGINEERING
STRUCTURAL ENGINEERING
TRANSPORTATION ENGINEERING

March 23, 2021

Beth Brincks
City of Anamosa
107 South Ford St
Anamosa, IA 52205

Re: Stanley Creek Waterway Improvements at Division St., Anamosa, IA
IIW Project No.: 21070

Dear Beth:

IIW, P.C. appreciates the opportunity to submit this Proposal for professional services for the above-referenced project. We have divided this Proposal into the following sections to fully describe our Proposal relating to this project.

PROJECT DESCRIPTION

In August 2020 the City of Anamosa (City) suffered a natural disaster event (derecho) that caused damage to the Stanley Creek waterway adjacent to Fountain Park and running parallel to Division Street. This event is FEMA-4557-DR, Iowa Disaster Declaration and includes Jones County as eligible for Public Assistance. Damage was primarily to the gabion baskets that provide embankment stabilization, although there are additional erosion repairs necessary at storm sewer outlets, at the Division St. bridge (replacement of wingwalls at the upstream side of the bridge), and erosion along the storm sewer alignment. Damage includes loss of material within the baskets and displacement of the existing gabion wall. The Federal Emergency Management Agency (FEMA) has indicated this project might be a candidate for a 406 Mitigation Proposal.

The waterway is within a FEMA Zone A on the FIRM maps, and the identified floodway appears to be within the channel banks. A Base Flood Elevation has not been established for this stream reach. The site has a drainage area of over 2 square miles; therefore a DNR floodplain permit is required in order to do any work within the waterway. The restoration would seem to fall under U.S. Army Corps of Engineers Nationwide Permit.

A condition of Hazard Mitigation Assistance grants is to comply with all the applicable environmental and historic preservation laws and regulations. This considers floodplains, wetlands, archeological sites, historic structures, and endangered and threatened species.

This proposal is to assist the City with administration as associated with the FEMA funding process, to conduct a damage assessment and cost estimate, and to develop a cost estimate for work associated with a 406 Mitigation Proposal. FEMA is in the process of developing a Project Worksheet that establishes the funding for the project. Potential elements of a 406 Mitigation Proposal include investigation of a different material for the channel lining and changing channel shape in order to reduce velocities to minimize erosion in the channel.

SCOPE OF SERVICES

The following list of services will be provided by or under the direct personal supervision of a Professional Engineer licensed to practice in the State of Iowa.

A. Initial Damage Inspection and Report

1. Perform a site visit to determine extent of damage and prepare a report documenting the damage.
2. Prepare a cost estimate to identify the extent of the repairs needed to restore to previous condition, considered and “in-kind restoration.
3. Submit report and cost estimate to FEMA and Iowa Homeland Security representatives.

B. Assistance with FEMA administration and Regulatory Coordination

1. Coordination with FEMA and Iowa Homeland Security representatives for confirmation on the existing damages caused by the natural disaster event.

2. Coordination to determine environmental investigation needed such as archeological investigation, wetland delineation, endangered species concerns.
3. Conduct a pre-application conference with the Iowa DNR to confirm floodplain permitting requirements or any concerns related to waterway changes.
4. Identify if the project seems to be eligible for a 406 Mitigation Proposal (100% of the cost eligibility) and the elements required to qualify.
5. Identify the associated costs for the City comparing an "in-kind" replacement, 406 Mitigation Proposal.

EXCLUSIONS FROM PROFESSIONAL SERVICES

The following is a list of services we are capable of providing, but have not included in this Proposal. We would be more than willing to perform any or all of the services under a separate Proposal or as a contract amendment.

1. Wetland delineation.
2. Archeological investigation of the corridor.
3. Subsurface investigations.
4. Analysis of replacement structures, mapping of floodplain beyond the limits specified within this Proposal.
5. Hydraulic analysis of the waterway.
6. Permit preparation and submittal.
7. Restoration Design and Bidding documents.
8. Assistance during construction.

COMPENSATION

IIW proposes to complete the Scope of Services as follows:

A. Initial Damage Inspection and Report: Items 1-3, lump sum fee of $6,650.00 (Six thousand six hundred fifty dollars and zero cents).

B. Assistance with FEMA Administration and Regulatory Coordination: Items 1-5, estimated hourly cost of $13,500.00 (Thirteen thousand five hundred dollars and zero cents).

GENERAL TERMS AND CONDITIONS

The attached General Terms and Conditions are a part of this Proposal. This proposal is valid for 30 days from the date it was issued. If the services and fees defined in this proposal are acceptable, please return one signed copy to our office. If you have any questions, or require further assistance, please feel free to contact me at n.miller@iiwengr.com or our office at (563) 556-2464. Thank you for allowing IIW, P.C. to submit this Proposal for professional services.

Sincerely,
IIW, P.C.

Nate Miller, PE
Structural Engineer

Geoff Blandin, PE
VP & Municipal Team Leader

I hereby accept this Proposal and General Terms and Conditions and authorize this work.

FOR: City of Anamosa

Authorized Signature *Date*

Typed or Printed Name

IIW, P.C.

THE FOLLOWING GENERAL TERMS AND CONDITIONS SHALL APPLY TO THE ATTACHED AGREEMENT FOR PROFESSIONAL SERVICES BETWEEN IIW, P.C., HEREIN REFERRED TO AS THE CONSULTANT, AND THE CLIENT IDENTIFIED IN THE ATTACHED AGREEMENT.

General Terms and Conditions

The Client shall provide all criteria and full information with regard to his or her requirements for the Project, and shall designate a person to act with authority on his or her behalf with respect to all aspects of the Project. This shall include, but not be limited to, review and approval of design issues in the schematic design phase, design development phase, and contract documents phase. These approvals shall include an authorization to proceed to the next phase.

Services beyond those outlined in the proposal may be required or be required as a result of unforeseen circumstances. The Consultant under terms mutually agreed upon by the Client and the Consultant may provide these services.

For the scope of services agreed upon, the Client agrees to pay the Consultant the compensation as stated. Invoices for the Consultant's services shall be submitted, at the Consultant's option, either upon completion of any phase of service or on a monthly basis. Invoices shall be payable when rendered and shall be considered past due if not paid within 30 days after the invoice date. A service charge will be charged at the rate of 1.5% (18% true annual rate) per month or the maximum allowed by law on the then outstanding balance of Past Due accounts. In the event any portion of an account remains unpaid 90 days after billing, the Client shall pay all costs of collection, including reasonable attorney's fees.

The Consultant shall secure and endeavor to maintain professional liability insurance, commercial general liability insurance, and automobile liability insurance to protect the Consultant from claims for negligence, bodily injury, death, or property damage which may arise out of the performance of the Consultant's services under this Agreement, and from claims under the Worker's Compensation Acts. The Consultant shall, if requested in writing, issue a certificate confirming such insurance to the Client.

The Client and the Consultant each agree to indemnify and hold the other harmless, and their respective officers, employees, agents, and representatives, from and against any and all claims, damages, losses and expenses (including reasonable attorney's fees) to the extent such claims, losses, damages, or expenses are caused by the indemnifying party's negligent acts, errors, or omissions. In the event claims, losses, damages or expenses are caused by the joint or concurrent negligence of Client and Consultant, they shall be borne by each party in proportion to its negligence.

In recognition of the relative risks, rewards and benefits of the Project to both the Client and the Consultant, the risks have been allocated such that the Client agrees that, to the fullest extent permitted by the law, the Consultant's total liability to the Client for any and all injuries, claims, losses, expenses, damages or claim expenses rising out of this Agreement, from any cause or causes, shall not exceed the amount of the Consultant's fee or other amount agreed upon. Such causes include, but are not limited to, the Consultant's negligence, errors, omissions, strict liability, breach of contract or breach of warranty.

Neither party shall be deemed in default of this Agreement to the extent that any delay or failure in the performance of its obligations results from any cause beyond its reasonable control and without its negligence.

The Client and Consultant agree that they shall first submit any and all unsettled claims, counterclaims, disputes, and other matters in question between them arising out of or relating to this Agreement to mediation in accordance with the Construction Industry Mediation Rules of the American Arbitration Association effective as of the date of this agreement.

All documents including calculations, computer files, drawings, and specifications prepared by the Consultant pursuant to this Agreement are instruments of professional service intended for the one time use in construction of this project. They are and shall remain the property of the Consultant. Any re-use without written approval or adaptation by the Consultant shall be at the Client's sole risk and the Client agrees to indemnify and hold the Consultant harmless from all claims, damages, and expenses, including attorney's fees, arising out of such reuse of documents by the Client and by others acting through the Client.

Copies of documents that may be relied upon by the Client are limited to the printed copies (also known as hard copies) that are signed or sealed by the Consultant. Files in electronic media format or text, data, graphic, or of other types that are furnished by the Consultant to the Client are only for convenience of the Client. Any conclusion or information obtained or derived from such electronic files will be at the user's sole risk. When transferring documents in electronic media format, the Consultant makes no representations as to long-term compatibility, usability, or readability of documents resulting from the use of software application packages, operating systems, or computer hardware differing from those used by the Consultant at the beginning of this project.

The delivery of electronic information to Contractors is for the benefit of the Owner for whom the design services have been performed. Nothing in the transfer should be construed to provide any right of the Contractor to rely on the information provided or that the use of the electronic information implies the review and approval by the Design Professional of the information. Electronic information is drawings, data, modeled data, or computational models. It is our professional opinion that this electronic information provides design information current as of the date of its release. Any use of this information is at the sole risk and liability of the user who is also responsible for updating the information to reflect any changes in the design following the preparation date of this information. The transfer of electronic information is subject to the approval of the Design Professional. Depending upon the type of information requested, and the format, a fee may be required for acquisition of the data, payable to the Design Professional. Contractors are required to submit a request in writing to the Design Professional indicating the type and format of the information requested. The Design Professional will make a reasonable effort to determine whether or not the information can be provided as requested, and the fee for providing the information.

If this Agreement provides for any construction phase services by the Consultant, it is understood that the Contractor, not the Consultant, its agents, employees, or sub-consultants, is responsible for the construction of the project, and that the Consultant is not responsible for the acts or omissions of any contractor, subcontractor, or material supplier; for safety precautions, programs, or enforcement; or for construction means, methods, techniques, sequences, and procedures employed by the Contractor.

When included in the Consultant's scope of services, opinions of probable construction cost are prepared on the basis of the Consultant's experience and qualifications and represent the Consultant's judgment as a professional generally familiar with the industry. However, since the Consultant has no control over the cost of labor, materials, equipment, or services furnished by others; over contractor's methods of determining prices, or over competitive bidding or market conditions, the Consultant cannot and does not guarantee that proposals, bids, or actual construction cost will not vary from the Consultant's opinions of probable construction cost.

The Client and the Consultant each binds himself or herself, partners, successors, executors, administrators, assigns, and legal representative to the other party of this Agreement and to the partners, successors, executors, administrators, assigns, and legal representative of such other party in respect to all covenants, agreements, and obligations of this Agreement.

Neither the Client nor the Consultant shall assign, sublet or transfer any rights under or interest in (including but without limitations, monies that may be due or monies that are due) this Agreement, without the written consent of the other, except as stated in the paragraph above, and except to the extent that the effect of this limitation may be restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assigner from any duty or responsibility under this Agreement. Nothing contained in this paragraph shall prevent the Consultant from employing such independent consultants, associates, and sub-contractors, as he or she may deem appropriate to assist in the performance of services hereunder.

It is acknowledged by both parties that the Consultant's scope of services does not include any services related to the presence at the site of asbestos, PCB's, petroleum, hazardous waste, or radioactive materials. The Client acknowledges that the Consultant is performing professional services for the Client and the Consultant is not and shall not be required to become an "arranger", "operator", "generator", or "transporter" of hazardous substances, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA).

The Client may terminate this Agreement with seven days (7) prior written notice to the Consultant for convenience or cause. The Consultant may terminate this Agreement for cause with seven (7) days prior written notice to the Client. The Client is obligated to pay for all services rendered up to the date the Consultant receives the written notice of intent to terminate. Failure of the Client to make payments when due shall be cause for suspension of services or ultimately termination, unless and until the Consultant has been paid in all full amounts due for services, expenses, and other related charges.

This Agreement supersedes all terms and conditions contained on a purchase order typically procuring products. It is understood by both parties upon execution of this agreement that if a purchase order is issued, it is for accounting purposes only. Purchase order terms and conditions are void and are not a part of our agreement.

IIW, P.C.

www.iiwengr.com

ARCHITECTURE
CIVIL ENGINEERING
CONSTRUCTION SERVICES
ENVIRONMENTAL ENGINEERING
LAND SURVEYING
MUNICIPAL ENGINEERING
STRUCTURAL ENGINEERING
TRANSPORTATION ENGINEERING

April 9, 2021

Beth Brincks
City of Anamosa
107 South Ford St.
Anamosa, IA 52205

Re: Stanley Creek at Division St., Anamosa, IA
IIW Project No.: 21090

Dear Beth:

IIW, P.C. (IIW) appreciates the opportunity to submit this Proposal for professional services for the above-referenced project. We have divided this Proposal into the following sections to fully describe our Proposal relating to this project.

PROJECT DESCRIPTION

This scope is only for the preliminary design to identify replacement structure options depending on what the regulatory agencies accept, and the solution the City of Anamosa (Client) prefers. This Proposal will also identify cost estimates to assist in budgeting and selection of an option. Modifications to the downstream channel as a part of the FEMA funded repairs could influence the proposed structure size.

The following permits are required in conjunction with the bridge replacement:

- The project requires a floodplain development permit from the Iowa Department of Natural Resources (Iowa DNR) because the drainage area is in excess of 2 square miles (the drainage area is approximately 2.09 square miles).
- A permit is needed from the U.S. Army Corps of Engineers (USACE) because the project impacts waters of the U.S. The applicable permit will most likely be a nationwide permit if wetland disturbance is under 0.1 acre. The USACE permit will also require verification that there are not endangered species or archeological sites that would be disturbed.

There are several options for a new structure type and size. A single-span slab bridge type structure or a multiple barrel box culvert (similar to the upstream structure) are the most likely options. Due to a need for the floodplain development permit from the Iowa DNR, the bridge will need to meet State of Iowa code requirements for the backwater effect caused by the bridge. These regulatory requirements will be a primary factor in determining the appropriate new structure type and size. Based on the current effective Jones County FEMA Flood Insurance Rate Maps, the project is in a Zone A flood study area, which means no published 100-year (1% probability) Base Flood Elevations (BFE) are available. Iowa DNR regulations will require that the structure backwater effect (the amount of increase in water surface elevation compared to if the structure and road was not there) be limited to the lesser of either that caused by the existing bridge, or 1.0'. In addition, if any insurable structures are located within the 100-year floodplain upstream of the bridge, typically the Iowa DNR classifies the floodplain as "High Damage Potential" and no increase in water surface elevation would be allowed at those structures. The Iowa DNR also has a minimum freeboard requirement of 3' over the 50-year storm water surface elevation, but a waiver is often granted by the Iowa DNR for this requirement if it cannot be met.

Topographic data collection and a hydraulic analysis would be necessary to determine the most cost-effective new structure option that meets the needs of the site. The preliminary hydraulic analysis to properly determine the BFE and backwater of the existing bridge structures in the area will use HEC-RAS software. The most cost-effective proposed size and subsequently the total project cost is unknown until some initial analysis is completed to identify the size of structure that will meet Iowa DNR floodplain permit requirements.

Division Street is a Local Street according to the Federal Functional Classifications. According to the Statewide Urban Design Standards, to meet design criteria, the bridge and approach roadway should meet the following design parameters:

- The new bridge should be a minimum of 3' wider on each side than the street lane widths, although the preference is a minimum of 4' clearance on each side.

- An urban section (curb and gutter) without parking would have a minimum width of 26', although a 31' width is preferred.
- Minimum bridge width is no less than curb face to curb face width of the approaching roadway. The Iowa Department of Transportation (Iowa DOT) already has standard bridge plans developed for 30' wide bridges without pedestrian accommodation. A bridge with pedestrian accommodation requires a custom structural design. A box culvert can be extended to accommodate the needed pedestrian walkway and then protective fencing installed at the end of the culvert.

Design Parameter	Preferred	Minimum Acceptable	Comments
Lane Width (single direction)	10.5'	10'	
Urban Section width (with parking on one side)	26'/27'/31' *	26'/31'*	* Depends on traffic volume
Urban Section width (without parking)	26'	26'	
Bridge Width	24' +4' +4' = 32'	22'+3'+3' = 28'	30' is Iowa DOT standard width

SCOPE OF SERVICES

The following list of services will be provided by or under the direct personal supervision of a Professional Engineer licensed to practice in the State of Iowa.

A. Preliminary Design

1. Contact Iowa One Call for utility maps.
2. Establish vertical and horizontal project control.
3. Create base drawing using LiDAR data for use in conceptual design and preliminary structure sizing.
4. Perform a limited topographic survey to collect spot elevation information at specific locations. The topographic survey would be limited only to that needed to perform the conceptual design, and future additional survey will be required for a more detailed final design and bid documents. Scope of survey to include:
    a. Collection of in-water channel cross sections at approximately seven locations.
    b. Existing profile of Division Street in the bridge area.
    c. Storm sewer system from the upstream intake to the channel in the structure area
5. Prepare hydraulic analysis for an additional structure to meet structure permitting requirements. Prepare a HEC-RAS computer program to model the existing and proposed conditions and identify the structure concepts that meet Iowa DNR criteria. Identify the most cost-effective structure size that meets Iowa DNR floodplain criteria.
6. Identify interface of proposed structure with the FEMA funded improvements to the streambank stabilization.
7. Prepare a statement of Engineer's opinion of the construction cost for the project (2 options based on council input). It should be noted that construction cost estimates are no more than estimates reflecting the Engineer's best judgement or construction costs at the time the estimate is made and that actual construction costs based upon the bids received will vary. The Client should be aware that construction costs are subject to factors such as supply and demand, inflation and availability of labor which are beyond the control of the Engineer. The Engineer cannot, therefore, guarantee the accuracy of estimates of construction costs.
8. Prepare exhibits and summary of findings for a presentation at one City Council meeting. Based on results of council meeting adjust design and cost estimate if needed.
9. General project management and quality review.

EXCLUSIONS FROM PROFESSIONAL SERVICES

The following is a list of services we are capable of providing, but have not included in this Proposal as they would typically occur as part of a subsequent phase after the City makes a decision as to the scope of the project. These added services would be proposed as contract amendments.

1. Phase 1 archeological investigation.
2. Geotechnical evaluation (if a new structure is selected as the option).
3. Attending in person meetings beyond those identified.
4. Wetland delineation (if required).
5. Establish existing right-of-way, preparing acquisition plats or identify section corners.
6. Prepare and submit Iowa DNR floodplain permit.
7. Prepare USACE permit, anticipated nationwide permit.
8. Final design and bidding documents.
9. Post-letting services such as construction staking, construction observation, or construction administration.

COMPENSATION

IIW proposes to complete the Scope of Professional Services as follows:

A. ***Preliminary Design:*** Items 1-9 for a lump sum fee of $14,900.00 (Fourteen thousand nine hundred dollars and zero cents).

DELIVERABLES

The following items will be delivered to the Client as the result of this project:

1. Preliminary design and structure size
2. Estimate of probable construction cost

GENERAL TERMS AND CONDITIONS

The attached General Terms and Conditions are a part of this Proposal. If the services and fees defined in this Proposal are acceptable, please return one signed copy to our office. If you have any questions, or require further assistance, please feel free to contact me at n.miller@iiwengr.com or our office at (563) 556-2464. Thank you for allowing IIW, P.C. to submit this Proposal for professional services.

Sincerely,
IIW, P.C.

Nate Miller, PE
Structural Engineer

Geoff Blandin, PE
Vice President/Treasurer & Branch Office Manager

I hereby accept this Proposal and General Terms and Conditions and authorize this work.

FOR: City of Anamosa, IA

_____ _____

Authorized Signature *Date*

_____

Typed or Printed Name

IIW, P.C.

THE FOLLOWING GENERAL TERMS AND CONDITIONS SHALL APPLY TO THE ATTACHED AGREEMENT FOR PROFESSIONAL SERVICES BETWEEN IIW, P.C., HEREIN REFERRED TO AS THE CONSULTANT, AND THE CLIENT IDENTIFIED IN THE ATTACHED AGREEMENT.

General Terms and Conditions

The Client shall provide all criteria and full information with regard to his or her requirements for the Project, and shall designate a person to act with authority on his or her behalf with respect to all aspects of the Project. This shall include, but not be limited to, review and approval of design issues in the schematic design phase, design development phase, and contract documents phase. These approvals shall include an authorization to proceed to the next phase.

Services beyond those outlined in the proposal may be required or be required as a result of unforeseen circumstances. The Consultant under terms mutually agreed upon by the Client and the Consultant may provide these services.

For the scope of services agreed upon, the Client agrees to pay the Consultant the compensation as stated. Invoices for the Consultant's services shall be submitted, at the Consultant's option, either upon completion of any phase of service or on a monthly basis. Invoices shall be payable when rendered and shall be considered past due if not paid within 30 days after the invoice date. A service charge will be charged at the rate of 1.5% (18% true annual rate) per month or the maximum allowed by law on the then outstanding balance of Past Due accounts. In the event any portion of an account remains unpaid 90 days after billing, the Client shall pay all costs of collection, including reasonable attorney's fees.

The Consultant shall secure and endeavor to maintain professional liability insurance, commercial general liability insurance, and automobile liability insurance to protect the Consultant from claims for negligence, bodily injury, death, or property damage which may arise out of the performance of the Consultant's services under this Agreement, and from claims under the Worker's Compensation Acts. The Consultant shall, if requested in writing, issue a certificate confirming such insurance to the Client.

The Client and the Consultant each agree to indemnify and hold the other harmless, and their respective officers, employees, agents, and representatives, from and against any and all claims, damages, losses and expenses (including reasonable attorney's fees) to the extent such claims, losses, damages, or expenses are caused by the indemnifying party's negligent acts, errors, or omissions. In the event claims, losses, damages or expenses are caused by the joint or concurrent negligence of Client and Consultant, they shall be borne by each party in proportion to its negligence.

In recognition of the relative risks, rewards and benefits of the Project to both the Client and the Consultant, the risks have been allocated such that the Client agrees that, to the fullest extent permitted by the law, the Consultant's total liability to the Client for any and all injuries, claims, losses, expenses, damages or claim expenses rising out of this Agreement, from any cause or causes, shall not exceed the amount of the Consultant's fee or other amount agreed upon. Such causes include, but are not limited to, the Consultant's negligence, errors, omissions, strict liability, breach of contract or breach of warranty.

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The Client and Consultant agree that they shall first submit any and all unsettled claims, counterclaims, disputes, and other matters in question between them arising out of or relating to this Agreement to mediation in accordance with the Construction Industry Mediation Rules of the American Arbitration Association effective as of the date of this agreement.

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information implies the review and approval by the Design Professional of the information. Electronic information is drawings, data, modeled data, or computational models. It is our professional opinion that this electronic information provides design information current as of the date of its release. Any use of this information is at the sole risk and liability of the user who is also responsible for updating the information to reflect any changes in the design following the preparation date of this information. The transfer of electronic information is subject to the approval of the Design Professional. Depending upon the type of information requested, and the format, a fee may be required for acquisition of the data, payable to the Design Professional. Contractors are required to submit a request in writing to the Design Professional indicating the type and format of the information requested. The Design Professional will make a reasonable effort to determine whether or not the information can be provided as requested, and the fee for providing the information.

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The Client and the Consultant each binds himself or herself, partners, successors, executors, administrators, assigns, and legal representative to the other party of this Agreement and to the partners, successors, executors, administrators, assigns, and legal representative of such other party in respect to all covenants, agreements, and obligations of this Agreement.

Neither the Client nor the Consultant shall assign, sublet or transfer any rights under or interest in (including but without limitations, monies that may be due or monies that are due) this Agreement, without the written consent of the other, except as stated in the paragraph above, and except to the extent that the effect of this limitation may be restricted by law. Unless specifically stated to the contrary in any written consent to an assignment, no assignment will release or discharge the assigner from any duty or responsibility under this Agreement. Nothing contained in this paragraph shall prevent the Consultant from employing such independent consultants, associates, and sub-contractors, as he or she may deem appropriate to assist in the performance of services hereunder.

It is acknowledged by both parties that the Consultant's scope of services does not include any services related to the presence at the site of asbestos, PCB's, petroleum, hazardous waste, or radioactive materials. The Client acknowledges that the Consultant is performing professional services for the Client and the Consultant is not and shall not be required to become an "arranger", "operator", "generator", or "transporter" of hazardous substances, as defined in the Comprehensive Environmental Response, Compensation, and Liability Act of 1990 (CERCLA).

The Client may terminate this Agreement with seven days (7) prior written notice to the Consultant for convenience or cause. The Consultant may terminate this Agreement for cause with seven (7) days prior written notice to the Client. The Client is obligated to pay for all services rendered up to the date the Consultant receives the written notice of intent to terminate. Failure of the Client to make payments when due shall be cause for suspension of services or ultimately termination, unless and until the Consultant has been paid in all full amounts due for services, expenses, and other related charges.

This Agreement supersedes all terms and conditions contained on a purchase order typically procuring products. It is understood by both parties upon execution of this agreement that if a purchase order is issued, it is for accounting purposes only. Purchase order terms and conditions are void and are not a part of our agreement.

TO: City Council - Attn Beth

Hello! My name is Darryl Reinick + I have a house in Anamosa - 208 N. Huber street. This letter is a request of appeal on excess water bill charge. I first was contacted + informed of $500 water bill and to check our house in Anamosa. I immediately called my neighbor (CJ Patnode) to check our house. He found an upstairs toilet running non stop. He turned off all wata to the house just to make sure. One month later Linda from Anamosa water dept called + said we have $1100 new water bill. I told her our water was off. CJ checked our house again and noticed that despite the water being off the meter was still showing water use. The water department changed the meter and now no problems. We know the stuck meter was the reason for the $1100 water bill and we never used $1100 of water. Please consider these facts of what happened here. Thank you,

Daryl Reinick

UT3002M1 IAANILIN Utility Billing System Acct Status ACTIVE
4/05/2021 15:24:05 Inquiry - Consumption History (B) *NOTES EXIST
500 0239 00 02 Screen? _ Meter Status ACTIVE
DARRYL REINICK Serial 88071965 Loc. WEST
202 HUBER ST N Meter ID# 98554088
Type R-B Rate 01 WA RESIDENTIAL WATER
ECR# 88071965 Mult Units Sewer 10 SW SEWER RESIDENTIAL

Per	Date	Reading	Cons	Type	Per	Date	Reading	Cons	Type
CUR	4/01/2021	1	1	H					
1	3/01/2021	2/01 - 3/01 0		H	13	2/28/2020	865		H
2	2/05/2021	1/1 ~ 2/05 1798	597	H	14	1/31/2020	865		H
3	12/31/2020	12/1 - 12/31 1201	324	H	15	12/31/2019	865		H
4	11/30/2020	877		H	16	12/02/2019	865	1	H
5	10/30/2020	877		H	17	10/31/2019	864		H
6	9/30/2020	877	5	H	18	9/30/2019	864	1	H
7	8/31/2020	872		H	19	8/30/2019	863	3	H
8	7/31/2020	872	5	H	20	8/01/2019	860	1	H
9	7/01/2020	867	1	H	21	6/28/2019	859	3	H
10	5/29/2020	866		H	22	6/11/2019	856	3	H
11	5/01/2020	866	1	H	23	5/01/2019	853	9	H
12	3/31/2020	865		H	24	3/29/2019	844	4	H

Average Cons: 68 Meter# 01 of 01
F1=Toggle Sewer F2=Toggle Amt F4=Lookup F9=Notes F10=Inv F24=MoreKeys

Final Read for New meter 2/05/21 1798

Read from

UT3005M1 IAANILIN Utility Billing System Acct Status ACTIVE
4/05/2021 15:24:15 Inquiry - Transaction History (C) *NOTES EXIST
500 0239 00 02 Screen? _ FILTER - ALL
DARRYL REINICK Acct Type RESIDENTIAL
202 HUBER ST N
Option: 2-Detail 3-View Bill 6-Print Bill

O	Tran Date	Tran Type	Pay Type	Amount	Balance	Agent
_	3/30/2021	ADJUSTMENT		30.00	.00	
_	3/30/2021	PAYMENT	PSN	108.60	30.00-	
_	3/22/2021	PAYMENT	DRPBX	1,137.36	78.60	
_	3/15/2021	BILLING		24.60	1,215.96	
_	3/09/2021	PENALTY		54.00	1,191.36	
_	3/02/2021	ADJUSTMENT		25.00	1,137.36	
_	3/01/2021	PAYMENT	ACH	1,112.36-	1,112.36	
_	2/25/2021	PAYMENT	ACH	1,112.36	.00	
_	2/16/2021	BILLING		1,112.36	1,112.36	
_	1/25/2021	PAYMENT	ACH	578.92	.00	
_	1/15/2021	BILLING		578.92	578.92	

More...

F3=Exit F4=Lookup F5=Refresh F9=Notes F10=History Detail F24=MoreKeys

UT3005M1 IAANILIN Utility Billing System Acct Status ACTIVE
4/05/2021 15:24:15 Inquiry - Transaction History (C) *NOTES EXIST
500 0239 00 02 Screen? _ FILTER - ALL
DARRYL REINICK . . . . . Acct Type RESIDENTIAL
202 HUBER ST N
Option: 2-Detail 3-View Bill 6-Print Bill

O	Tran Date	Tran Type	Pay Type	Amount	Balance	Agent
_	12/28/2020	PAYMENT	ACH	35.90	.00	
_	12/15/2020	BILLING		35.90	35.90	
_	11/25/2020	PAYMENT	ACH	35.90	.00	
_	11/16/2020	BILLING		35.90	35.90	
_	10/26/2020	PAYMENT	ACH	40.79	.00	
_	10/15/2020	BILLING		40.79	40.79	
_	9/25/2020	PAYMENT	ACH	35.90	.00	
_	9/15/2020	BILLING		35.90	35.90	
_	8/25/2020	PAYMENT	ACH	40.79	.00	
_	8/17/2020	BILLING		40.79	40.79	
_	7/27/2020	PAYMENT	ACH	36.88	.00	

More...

F3=Exit F4=Lookup F5=Refresh F9=Notes F10=History Detail F24=MoreKeys

UT2003M1 IAANILIN Utility Billing System Note Type: ALL
4/05/2021 15:25:00 Work with Notes

Account#: 500-0239-00-02 DARRYL REINICK
202 HUBER ST N
ANAMOSA IA 52205

Option: 2-Change 4-Delete 5-Display

	-------Created By--------			Alert	-Last Changed--	
Opt	Type Date	Time	User	Flag/EX Date	Date	User
_	COMM 3/31/2021	10:30:10	IAANILIN			
	KYLE TURNED WATER ON AT C/S 03/31/2021. LI					
_	ADJM 3/30/2021	15:17:15	IAANILIN			
	ADD RECONNECT FEE. LI					
_	COMM 3/04/2021	11:29:30	IAANILIN			
	CURTIS PUT IN NEW C/S AND SHUT WATER OFF 03/03/2021. LI					
_	ADJM 3/02/2021	10:27:36	IAANILIN			
	ADD DOOR POST FEE FOR NSF ACH RETURN. LI					
_	COMM 2/05/2021	14:31:02	IAANILIN			
	CURTIS INSTALLED NEW METER 02/05/2021. METER WAS RUNNING SLOWER THAN I					
_	COMM 2/03/2021	14:54:03	IAANILIN			
	SPOKE TO DARRYL TO LET HIM KNOW HIS BILL IS EVEN HIGHER THIS MONTH. HE					

More...

F3=Exit F5=Refresh F6=Add F11=Fold/Unfold F12=Cancel F24=MoreKeys

UT2003M1 IAANILIN Utility Billing System Note Type: ALL
4/05/2021 15:25:00 Work with Notes

Account#: 500-0239-00-02 DARRYL REINICK
202 HUBER ST N
ANAMOSA IA 52205

Option: 2-Change 4-Delete 5-Display

	-------Created By--------			Alert	-Last Changed--	
Opt	Type Date	Time	User	Flag/EX Date	Date	User
_	ADJM 4/27/2017	16:29:36	IAANILIN			
	ADD DOOR POST FEE FOR NSF CHECK RETURN. LI					
_	COMM 8/21/2009	13:11:08	PJS			
	Jim installed a new water meter and radio read					
_	COMM 8/19/2009	14:30:09	PJS	1/01/2200	8/29/2012	IAANZMAR
	Emergency contact Lisa Clark 480-9727					
_	COMM 8/19/2009	14:29:34	PJS	1/01/2200	8/29/2012	IAANZMAR
	Darryl lives in Wauwatosa but post office wants Milwaukee used					
_	COMM 6/11/2001	7:11:23				
	APPOINTMENT TO FIX OR REPLACE PJS					
_	COMM 6/11/2001	7:11:05				
	HAD PS CK THIS METER - POSSIBLE BROKEN HAVING JULIE SET UP					

Bottom

F3=Exit F5=Refresh F6=Add F11=Fold/Unfold F12=Cancel F24=MoreKeys

C.J. Patnode

CITY OF ANAMOSA WATER& SEWER WORK ORDER II

Account # 500-0239-00-02

cousin Lisa Meeks 480-9727

Date: 2-3-21 Service Date: 2-4-21 Time: 10:30AM

Name: Darryl Reinick Phone: 414-659-1836

Service Address: 202 N. Huber St.

Billing Address: _____

Requested by: City ___ Tenant ___ Owner/Landlord ___ Plumber ___

Reason: Monthly Re-Read ___ Snowbird ___ Repair ___ Moving ___

Other - Try to find c/s if not then shut off at meter

Action: Re-Read: ___ Read: ✓ Investigate: ___ Turn On: ___ Shut Off: ✓

ECR # 65580997

Previous Read Date: 1-29-21 Previous Read: 1798

Current Read Date: 2-4-21 Current Read: 1798

Results: Did not want off

Meter Changed Out: ___ Date: _____

New ECR #: _____ Starting Read: _____

Meter Installed By: City ___ Plumber ___ Other _____

Meter Inspection Completion Date: _____ By: _____

Completed By: YD Date: 2-4-21

For Office Use Only

Meter Change Out: 1 __ 2 __ 3 __

Inactivate: ___ Date: _____

Activate: ___ Reconnect Fee: ___

Fawn Creek: Initial Contact Date: _____

Confirmation of Completion Date: _____

ENTERED FEB 05 2021

CITY OF ANAMOSA WATER& SEWER WORK ORDER II

Account # 500-0239-00-02

Date: 2-5-21 **Service Date:** 2-5-21 **Time:** _____

Name: Darryl Reinke **Phone:** _____

Service Address: 202 N. Huber St.

Billing Address: _____

Requested by: City ___ **Tenant** ___ **Owner/Landlord** ___ **Plumber** ___

Reason: Monthly Re-Read ___ **Snowbird** ___ **Repair** ___ **Moving** ___

Other - Take meter off + test it.

Action: Re-Read: ___ **Read:** ___ **Investigate:** ___ **Turn On:** ___ **Shut Off:** ___

ECR # 65580997

Previous Read Date: 2-4-21 **Previous Read:** 1798

Current Read Date: 2-5-21 **Current Read:** 1798/0

Results: OLD meter was slower than test meter so we Replaced it

Meter Changed Out: ___ **Date:** _____

New ECR #: _____ **Starting Read:** _____

Meter Installed By: City ___ **Plumber** ___ **Other** _____

Meter Inspection Completion Date: _____ **By:** _

Completed By: CP 2-5-21 **Date:** _____

For Office Use Only

Meter Change Out: 1 __ 2 __ 3 __

Inactivate: ___ Date: _____

Activate: ___ Reconnect Fee: ___

Fawn Creek: Initial Contact Date: _____

Confirmation of Completion Date: _____

Port 1 M510M-F1-TC-X-NI
TX ID: 98554088 Date: 12/20

Date: 01/20

Part No: I285FMXX

Desc:
MTR 3/4S IPERL
4WHL5B 10CF 25'3-WR (PE)
SMART

Customer
Meter S/N: 88071965

Flow:
Lo:099.6 Md: 100.2 Hi: 099.9

Sensus
Meter S/N: 88071965

For Factory Use Only

FB0220020687

Inactivate after 3-15-21

CITY OF ANAMOSA WATER& SEWER WORK ORDER II

Account # 500-0239-0002

Date: 3-3-21 **Service Date:** 3-3-21 **Time:** _____

Name: Darryl Reinick **Phone:** _____

Service Address: 202 N. Hubert St.

Billing Address: _____

Requested by: City X **Tenant** ___ **Owner/Landlord** ___ **Plumber** ___

Reason: Monthly Re-Read ___ **Snowbird** ___ **Repair** ___ **Moving** ___

Other - _____

Action: Re-Read: ___ **Read:** ✓ **Investigate:** ___ **Turn On:** ___ **Shut Off:** ✓

ECR # 88071965

Previous Read Date: 2-5-21 **Previous Read:** 1798

Current Read Date: 3-3-21 **Current Read:** 0000

Results: Put in new c/s & shut off

Meter Changed Out: ___ **Date:** _____

New ECR #: _____ **Starting Read:** _____

Meter Installed By: City ___ **Plumber** ___ **Other** _____

Meter Inspection Completion Date: _____ **By:** _____

Completed By: CP **Date:** 3-4-21

For Office Use Only

Meter Change Out: 1 __ 2 __ 3 __
Inactivate: ✓ Date: 3-15-21
Activate: ___ Reconnect Fee: ___

Fawn Creek: Initial Contact Date: _____
Confirmation of Completion Date: _____

ENTERED MAR 3 1 2021

CITY OF ANAMOSA WATER& SEWER WORK ORDER II

Account # 500-0239-00-02

Date: 3-30-21 **Service Date:** 3-31-21 **Time:** 9:30AM

Name: Darryl Reinicke **Phone:** 414-659-1836

Service Address: 202 N. Huber St.

Billing Address: _____

Requested by: City ___ **Tenant** ___ **Owner/Landlord** ___ **Plumber** ___

Reason: Monthly Re-Read ___ **Snowbird** ___ **Repair** ___ **Moving** ___

Other - _____

Action: Re-Read: ___ **Read:** ✓ **Investigate:** ___ **Turn On:** ✓ **Shut Off:** ___

ECR # 88071965 RR# 98554088

Previous Read Date: 3-3-21 **Previous Read:** 0000

Current Read Date: 3-31-21 **Current Read:** 0006

Results: ⊘ Daryl Reinicke

Meter Changed Out: ___ **Date:** _____

New ECR #: _____ **Starting Read:** _____

Meter Installed By: City ___ **Plumber** ___ **Other** _____

Meter Inspection Completion Date: _____ **By:** _____

Completed By: KD **Date:** 3-31-21

For Office Use Only

Meter Change Out: 1 __ 2 __ 3 __
Inactivate: ___ Date: _____
Activate: ___ Reconnect Fee: ___

Fawn Creek: Initial Contact Date: _____
Confirmation of Completion Date: _____

RESOLUTION NO. 2021-

RESOLUTION APPROVING THE HIRING AND SETTING SALARY FOR FULL TIME WASTEWATER SUPERINTENDENT FOR THE FISCAL YEAR ENDING JUNE 30, 2021

***WHEREAS*,** the City Council regularly approves the hiring of new staff; and

***WHEREAS*,** the Wastewater Superintendent position is currently vacant; and

WHEREAS, the City Administrator and various stakeholders have reviewed applications, conducted interviews, and is now recommending the candidate below for the position of Wastewater Superintendent; and

***WHEREAS*,** such recommendation is now forwarded onto the City Council for their review and consideration.

WHEREAS, this candidate currently resides in Wyoming and is within 15 minutes of Anamosa, a residency requirement waiver is granted.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF ANAMOSA, ***IOWA,*** that the following hire be approved and in effect on satisfactory completion of per-employment physical, drug screen and background check:

Position	Employee Name	Annual Salary
Wastewater Superintendent	Steven Agnitch	$60,000

Councilmember _____ introduced the foregoing **Resolution No. 2021-** and moved for its adoption. Councilmember _____ seconded the motion to adopt. The roll was called and the following indicates the result of the vote.

COUNCILMEMBER		AYES	NAYS	ABSENT
CRUMP				
SMITH				
MACHART				
ZUMBACH				
STOUT				
CAPRON				

PASSED AND APPROVED this 12th day of April, 2021.

_____
Rod Smith, Mayor

ATTEST:

_____
Beth Brincks, City Clerk

RESOLUTION NO. 2021-

RESOLUTION APPROVING THE TIME EXTENSION AND SETTING SALARY FOR FULL TIME TEMPORARY WATER OPERATOR FOR THE FISCAL YEAR ENDING JUNE 30, 2021

***WHEREAS*,** the City Council regularly approves the hiring of new staff; and

***WHEREAS*,** a temporary opening of a Water Operator position has been created by military leave; and

WHEREAS, the City Council had approved a temporary assignment of a Water Trainee with a duration of approximately twelve months, starting on March 23,2020.

WHEREAS, the military leave he was hired to temporarily cover will not end until April 26, 2021 and will need a transition period until April 30, 2021.

***WHEREAS*,** the Water Trainee has received his Water Operator I Certification from the Iowa Department of Natural Resources during his 12 month assignment.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF ANAMOSA*, *IOWA, that the following temporary assignment be extended until April 30, 2021.

Position	Employee Name	Hourly Wage
Water Operator I	Kyle Dochterman	$20.40

Councilmember _____ introduced the foregoing **Resolution No. 2021-** and moved for its adoption. Councilmember _____ seconded the motion to adopt. The roll was called and the following indicates the result of the vote.

COUNCILMEMBER		AYES	NAYS	ABSENT
CRUMP				
SMITH				
MACHART				
ZUMBACH				
STOUT				
CAPRON				

PASSED AND APPROVED this 12th day of April, 2021.

_____
Rod Smith, Mayor

ATTEST:

_____
Beth Brincks, City Clerk

RESOLUTION NO. 2021-

RESOLUTION APPROVING THE HIRING AND SETTING SALARIES OF SEASONAL PART TIME EMPLOYEES FOR THE PARKS AND RECREATION DEPARTMENT FOR THE 2021 SUMMER SEASON

***WHEREAS*,** with the upcoming summer season there is a need to hire part time seasonal personnel to maintain the parks and to staff the Anamosa Aqua Court; and

***WHEREAS*,** the personnel list and personnel to hire have been reviewed by the Director and recommended to the Parks and Recreation Board where it was approved; and

***WHEREAS*,** such recommendation is now forwarded onto the City Council for their review and consideration.

NOW, THEREFORE, BE IT RESOLVED BY THE CITY COUNCIL OF ANAMOSA, IOWA, that the following personnel for the upcoming season be approved:

LIFEGUARDS	
Employee Name	**Hourly Rate**
Zoey Peterschmidt	$10.50
Walker Marsh	$10.00
Joe Brown	$9.00
Drew Pate	$8.50
Austin Wickham	$8.50
Dominic Haas	$8.50
Serina Norte	$8.50
Maddie Fisher	$8.25
Cece Venenga	$8.25
Sean Hollett	$8.25
Maggie Wagner	$8.00
Mara Sims	$8.00
Ava Scranton	$8.00
Nick Raine	$8.00
Jaiden Peasley	$8.00
Chelsea Holland	$8.00
Delaney Frater	$8.00
Taylor Delancey	$8.00
Kylie Chapman	$8.00
Tayte Peterschmidt	$8.00

CONCESSIONS	
Employee Name	**Hourly Rate**
Haley Nelson	$8.25
Eli Lehrman	$8.00
Jared Nelson	$8.00
Ruby Robertson	$8.00

Abigail Anders	$7.75
Jachel Burns	$7.75
Aphton Farrington	$7.75
Riley Wickham	$7.50

PARKS MAINTENANCE	
Employee Name	**Hourly Rate**
Wes Minneart	$9.00
Tucker Jones	$9.00
Sage Hoyt	$7.75
Nick Wagner	$9.00
Cole Haverly	$7.75
Bruce Miell	$10.00
Dale Gerst	$10.00
Pat Beebe	$10.00

Councilmember _____ introduced the foregoing **Resolution No. 2021** and moved for its adoption. Councilmember _____ seconded the motion to adopt. The roll was called and the following indicates the result of the vote.

COUNCILMEMBER		**AYES**	**NAYS**	**ABSENT**
CRUMP				
SMITH				
MACHART				
ZUMBACH				
STOUT				
CAPRON				

PASSED AND APPROVED this 12th day of April, 2021.

_____
ROD SMITH, MAYOR

ATTEST:

_____
BETH BRINCKS, CITY CLERK

2021 RAGBRAI OVERNIGHT TOWN AGREEMENT

This Agreement is effective 30 March, 2021 (the "Effective Date") by and between , known as the City of Anamosa, Iowa, 107 South Ford Street, 52205 (hereafter, the "Town"), and Ventures Endurance, LLC d/b/a RAGBRAI (hereafter, "RAGBRAI", and together with Town, the "Parties").

Whereas RAGBRAI desires to temporarily rent, occupy and make use of the Town for the purpose of hosting the annual RAGBRAI event (hereafter, the "Event"), which is a multi-day bicycling ride involving music, food, beer, overnight camping and other entertainment, on 29 July, 2021 (hereafter, the "Event Day"); and

Whereas, Town agrees to such rental, occupation and use in consideration of certain payments and covenants herein enumerated and subject to the terms and conditions herein stated;

Now, therefore, the Parties agree to the following terms and conditions:

1. **Rental Term.** RAGBRAI will have access to and use of the Town for 3 days, from 1 DAY BEFORE EVENT through 1 DAY AFTER EVENT for the purpose of planning, setting up, hosting and breaking down the Event, which may span both July 28 and July 30 (hereafter, the "Rental Term"). Town will provide RAGBRAI with any keys or codes necessary to give RAGBRAI such access no later than 9:00 a.m. on July 25.

2. **Rental Fee**. RAGBRAI will pay the Town a total of $15,000 for the use of facilities according to the following schedule: $7,500 no later than 60 days prior to the Event Day, and $7,500 no later than 30 days prior to the Event Day.

3. **Charitable Donation.** RAGBRAI will donate to a charitable organization(s) of the Town's choice no later than 30 days upon the completion of the Event the sum of $15,000. The designated charitable organization must be a registered not for profit with the Internal Revenue Service and/or the State of Iowa. The organization(s)'s EIN(s) must be provided to RAGBRAI by no later than 30 April, 2021.

4. **Termination.** RAGBRAI may terminate this Agreement up to thirty days before the Rental Term by informing the Town in writing.

5. **Town's Obligations.** Town agrees to the following obligations:

(a) Town will allow RAGBRAI to modify the Town's event area to create a RAGBRAI sponsor expo area, which will include, but is not limited to, 5-10 10 ft. x 10 ft. expo spaces within the Town's event area.

(b) Town will be responsible for creating, managing, and fulfilling all requirements of the Town Committees as outlined in the official RAGBRAI Overnight Town Handbook guide, including attending all scheduled RAGBRAI official meetings with RAGBRAI.

(c) In consultation with RAGBRAI and with respect to the official RAGBRAI Overnight Town Handbook guide, Town will be responsible for recruiting and providing all volunteers for the event.

(d) Town will be responsible for trash clean up/gathering and disposal in accordance with local laws and ordinances. RAGBRAI will have full use of the Town's trash disposal system, including dumpsters, during setup and breakdown of the event.

(e) Town will provide parking for 3,000 cars & recreational vehicles x` on each day of the Event and will provide staff for all parking areas in numbers adequate to ensure safe and orderly parking.

(f) Town will provide overnight camping space for up to 15,000 participants.

(g) Town will sell, or arrange for a third party to sell, beer to participants and spectators of the Event and will be entitled to all profits from such sales. If RAGBRAI is party to an exclusive beer sponsorship agreement, Town will work with the beer sponsor and RAGBRAI to make the beer sponsor's beer available non-exclusively at the Event wherever possible.

(h) In connection with the obligation to sell beer, Town will (i) obtain all licenses and permits required under local law for the sale of beer, (ii) provide staffing sufficient to adequately serve the expected number of participants and spectators and (iii) obtain insurance which covers any liability arising from such sales (if Town's current insurance policy does not already cover such sales). Beverage service must be capable of handling at least 20,000 people in four hours with minimal lines. RAGBRAI is not guaranteeing any level of revenues or profits.

(i) Town will sell, or arrange for a third party to sell, food and beverages to participants and spectators on the day(s) of the Event and will be entitled to all profits from such sales. Such food and beverage service must be capable of handling at least 20,000 people in four hours with minimal lines. RAGBRAI is not guaranteeing any level of revenues or profits.

(j) Town will make potable water (including related irrigation methods) and electricity available to RAGBRAI, for use throughout the duration of the Event, and (ii) all vendors, sponsors and other invited third parties during the day(s) of the Event. Town is not obligated to create new access points for either water or electricity.

(k) Town will secure live entertainment for the Event for up to 20,000 participants and spectators. Spectator and participant counts are strictly an estimate and, with the exception of the main staging provided by RAGBRAI as outlined in Section 6, Town is responsible for all aspects, management, and safety & health requirements of the live entertainment, including but not limited to all entertainment production (A/V, sound, lighting, etc.) costs and management.

(l) Town agrees to adhere to RAGBRAI guidelines regarding the use of the RAGBRAI trademark and logo. Further, Town agrees to promptly advise RAGBRAI of and cooperate with RAGBRAI regarding the unauthorized use of the RAGBRAI logo at any time of the logo or the unauthorized promotion or sale of merchandise bearing the RAGBRAI logo.

(m) In consultation with RAGBRAI, the Iowa State Patrol, RAGBRAI-designated Emergency Medical Services providers, County Sheriff Offices, County Engineers, and other Public Safety officials, Town agrees to provide an appropriate number of local Public Safety personnel for the duration of the Event including but not limited to local Law Enforcement and local Emergency Medical Services providers in sufficient numbers for the safe operation of the Event.

(n) Town will not advertise or promote any competing event, product or service, nor allow a third party to advertise or promote any competing event, product or service, within the Town, including but

not limited to the parking lots, campgrounds, expo area, and entertainment areas during the day(s) of the Event without the prior written consent of RAGBRAI.

6. RAGBRAI'S Obligations. RAGBRAI agrees to the following obligations:

(a) RAGBRAI will conduct all activities to build out and modify the Town in a safe, lawful, good and workmanlike manner, using safe and serviceable equipment and materials.

(b) RAGBRAI will work with local, County, and State Public Safety Officials toward the safe operation of the event.

(c) Town accepts that normal event operations, including but not limited to pedestrian traffic, vehicle traffic and adverse weather conditions, may damage and/or destroy grass and other similar vegetation. RAGBRAI will use reasonable efforts to limit such damage, but will not be liable for re-sodding or replacing such grass and/or vegetation.

(d) RAGBRAI will provide event staging and all signage for the Main Entertainment area for the Event.

(e) RAGBRAI will provide to the Town specifications and guidelines for the front-facing skirting area on the Main Stage only for which the Town may advertise local sponsors.

(f) RAGBRAI will provide a sufficient quantity of portable bathrooms at the Main Campground only.

(g) RAGBRAI will provide the Town access to a custom web page on the RAGBRAI website that will include information about the Event pertaining to the Town.

(h) RAGBRAI will provide informational signage for the Event at the entrance to the Town, to be erected & placed by RAGBRAI prior to the Event. Town will remove informational signage at the completion of the Event.

7. Event Liability. RAGBRAI assumes all responsibility, liability and risk associated with the participants in, the conduct of, and the activities associated with, the Event except to the extent caused by the negligence or willful misconduct of Town. RAGBRAI will obtain an insurance policy for the Event in the amount of one million dollars ($1,000,000) per occurrence and five million dollars ($5,000,000) aggregate, upon which Town will be listed as a named insured. RAGBRAI will provide proof of insurance within ten days of the Event. Limits may be fulfilled using a combination of primary and excess liability.

8. Event Revenue. Town will keep all revenue generated from the Event, including, but not limited to, the sale of food, beer, local expo fees, local/non-RAGBRAI branded merchandise at the Event as set forth in Section 4 above. This provision excludes all revenue generated from the sale of RAGBRAI participant registration fees, RAGBRAI merchandise sales, and RAGBRAI sponsorship fees where applicable, unless RAGBRAI otherwise determines to assign any income generating activity to Town or a third party. Subject to RAGBRAI's prior approval as to the identity of any potential sponsor, Town may sell local sponsorship to advertise on the Main Stage lower third, bottom skirting of the Main Stage, and the Town may retain sponsorship fees collected for this space only.

9. No Partnership. This Agreement does not constitute and shall not be construed as constituting or creating a partnership, joint venture or agency relationship between RAGBRAI and Town. Neither Party shall have any right to obligate or bind the other party in any manner whatsoever, except as

authorized by the other Party in advance in writing. Under no circumstances shall either Party, in its dealings with third parties, undertake to act or hold itself out as the other Party's agent or authorized representative, nor shall either Party incur financial or legal obligations on behalf of the other Party.

10. Force Majeure. Neither Party will be liable in damages for any delay or default in performing hereunder if such delay or default is caused by conditions beyond its control including, but not limited to, natural disasters, government restrictions, wars, acts of terrorism or any other cause beyond the reasonable control of the party whose performance is affected.

Without limiting the generality of the foregoing, if Owner is unable for any reason to provide RAGBRAI with the necessary facilities, at the capacities and/or occupancy contemplated herein (or if not expressly contemplated otherwise, then at full/maximum occupancy (as existed as of January 1, 2020)), by reason of any strike, labor controversy, civil tumult, government ordinance or restriction, court order, administrative ruling, the failure to obtain any of the licenses, permits or approval or other cause beyond Owner's or RAGBRAI' reasonable control, so as to render it impractical, illegal or impossible for RAGBRAI to conduct the Event on the date scheduled hereunder in a manner contemplated by RAGBRAI, RAGBRAI may elect to cancel the Event and this Agreement, or RAGBRAI may elect to postpone or move the Event. If the Event and this Agreement is cancelled pursuant hereto, all monies paid by RAGBRAI shall be immediately refunded.

11. Jurisdiction. RAGBRAI hereby stipulates and agrees that the state or federal court having jurisdiction in Jones County, Iowa shall be for all purposes related to this Agreement the only fair, convenient and proper forum for any proceeding relating to any dispute arising out of the terms or conditions of this Agreement.

12. Severability. In the event that any court of competent jurisdiction determines that any provision contained in this Agreement is unreasonable or unenforceable in any respect, then such provision will be deemed limited to the extent that such court deems it reasonable and enforceable, and as limited shall remain in full force and effect. In the event that such court shall deem any provision wholly unenforceable, the remaining provisions of this Agreement shall nevertheless remain in full force and effect.

Ventures Endurance, LLC d/b/a RAGBRAI

By:_____ _____
Name: _____ Date
Title: _____

_____ _____
City of Anamosa, Iowa, by Date

Contact Person, Title

ORDINANCE NO.

AN ORDINANCE AMENDING THE CODE OF ORDINANCES OF THE CITY OF ANAMOSA, IOWA UNDER GENERAL CODE PROVISIONS BY ADDING A NEW CHAPTER, CHAPTER 10 ENTITLED "RAGBRAI - MISCELLANEOUS PERMITS and REGULATIONS"

Be it enacted by the City Council of Anamosa, Iowa:

SECTION 1: This ordinance as amended is enacted to help city officials and citizens deal with the public health and safety problems created by the infusion of a large number of people into the City of Anamosa when the Des Moines Register's Annual Great Bicycle Ride Across Iowa™ (RAGBRAI®) arrives in Anamosa on July 29, 2021 and departs on July 30, 2021.

SECTION 2: That General Code Provisions, Chapter 10, RAGBRAI - Miscellaneous Permits of the Code of Ordinances of the City of Anamosa, Iowa, be and the same is hereby amended to read as follows:

General Code Provisions Chapter 10
RAGBRAI Ordinance - Miscellaneous Permits and Regulations

Sections:

10-1 Commercial Booth Food - Permit Required. No for-profit person, club, group, organization, corporation, or entity of any kind shall provide or sell food to the public in Anamosa on July 29, 2021 or July 30, 2021, at a location other than their regularly established place of business unless said person or entity shall first obtain a Commercial Booth Food Permit from the Anamosa RAGBRAI committee through Anamosa Festivals, Inc at 213 E Main St, Anamosa, IA. However, any person or entity which is a resident of Jones County and in possession of a valid permit issued by the State of Iowa for the sale of food to be consumed on its premises as of June 14, 2021, or in possession of a current Iowa retail sales tax permit, shall be exempt from the requirements of this Section.

10-2 Commercial Booth Food Fees. The fee for a Commercial Booth Food Permit shall be $700. $550 for Members of the Anamosa Chamber. * Must be an Anamosa Chamber member by 5-1-2021 to get the reduced rate and be a member at the time the application is submitted.

10-3 Commercial Booth Food Location. A vendor who has been granted an Anamosa Commercial Booth Food Permit shall locate its temporary sale facility at a location to be determined by the official Anamosa RAGBRAI Committee. A vendor who has been granted an Anamosa Vendor Booth permit shall locate its temporary sale facility at a location, and only at that location, to be determined by the official Anamosa RAGBRAI Committee.

10-4 Non-Profit Booth Food - Permit Required. No non-profit person, club, group, organization, corporation, or entity of any kind shall provide or sell food to the public in Anamosa on July 29, 2021 or July 30, 2021, at a location other than their regularly established place of business unless said person or entity shall first obtain a Non-Profit Booth Food Permit from the Anamosa RAGBRAI committee through Anamosa Festivals, Inc at 213 E Main St, Anamosa, IA. Those Anamosa organizations that operate only from their regularly established locations are exempt from the requirements of this section. For purposes of this Section, the Jones County Pork Producers and the Jones County Cattleman's Association shall each be deemed a local non-profit organization.

10-5 Non-Profit Booth Food Fees. The fee for a Non-Profit Booth Food Permit shall be $350, $250 for Members of the Anamosa Chamber. * Must be an Anamosa Chamber member by 5-1-2021 to get the reduced rate and be a member at the time the application is submitted.

3-6-6 Non-Profit Booth Food Location. A vendor who has been granted an Anamosa Non-Profit Booth Food Permit shall locate its temporary facility at a location to be determined by the official Anamosa RAGBRAI Committee. A vendor who has been granted an Anamosa Vendor Booth permit shall locate its temporary sale facility at a location, and only at that location, to be determined by the official Anamosa RAGBRAI Committee.

3-6-7 Health Regulations, A person or entity issued a commercial or non-profit booth food permit pursuant to this Chapter shall comply with the Iowa Department of Health and Jones County Department of Health rules and regulations pertaining to the sale and dispensing of food for consumption on its premises. Any issued license from the State must be posted and visible.

10-8 Commercial Booth Non-Food - Permit Required. No For-Profit person, club, group, organization, corporation, or entity of any kind shall provide or sell merchandise to the public in Anamosa on July 29, 2021 or July 30, 2021, at a location other than their regularly established place of business unless said person or entity shall first obtain a Commercial Booth Non-Food Permit from the Anamosa RAGBRAI committee through Anamosa Festivals, Inc at 213 E Main St, Anamosa, IA. However, any person or entity which is a resident of Jones County and in possession of a valid permit issued by the State of Iowa for the sale of merchandise as of June 14, 2021, or in possession of a current Iowa retail sales tax permit, shall be exempt from the requirements of this Section. A vendor who has been granted an Anamosa Vendor Booth permit shall locate its temporary sale facility at a location, and only at that location, to be determined by the official Anamosa RAGBRAI Committee.

10-9 Commercial Booth Non-Food Fees. The fee for a Commercial Booth Non-Food Permit shall be $700, $550 for Members of the Anamosa Chamber. * Must be an Anamosa Chamber member by 5-1-2021 to get the reduced rate and be a member at the time the application is submitted.

10-10 Commercial Booth Non-Food Location. A vendor who has been granted an Anamosa Commercial Booth Non-Food Permit shall locate its temporary sale facility at a location to be determined by the official Anamosa RAGBRAI Committee. A vendor who has been granted an Anamosa Vendor Booth permit shall locate its temporary sale facility at a location, and only at that location, to be determined by the official Anamosa RAGBRAI Committee.

10-11 Non-Profit Booth Non-Food - Permit Required. No non-profit person, club, group, organization, corporation, or entity of any kind shall sell merchandise to the public on July 29, 2021 or July 30, 2021, at a location other than their regularly established place of business unless said person or entity shall first obtain a Non-Profit Booth Non-Food Permit from the Anamosa RAGBRAI committee through Anamosa Festivals, Inc at 213 E Main St, Anamosa, IA. Those Anamosa businesses that operate only from their regularly established locations are exempt from the requirements of this section. A vendor who has been granted an Anamosa Vendor Booth permit shall locate its temporary sale facility at a location, and only at that location, to be determined by the official Anamosa RAGBRAI Committee.

10-12 Non-Profit Booth Non-Food Fees. The fee for a Non-Profit Booth Non-Food Permit shall be $350, $250 for Members of the Anamosa Chamber. * Must be an Anamosa Chamber member by 5-1-2021 to get the reduced rate and be a member at the time the application is submitted.

10-13 Non-Profit Booth Non-Food Location. A vendor who has been granted an Anamosa Non-Profit Booth Non-Food Permit shall locate its temporary facility at a location to be determined by the official Anamosa RAGBRAI Committee. A vendor who has been granted an Anamosa Vendor Booth permit shall locate its temporary sale facility at a location, and only at that location, to be determined by the official Anamosa RAGBRAI Committee.

10-14 Charge for Electricity at any booth or location. Any booth requiring electricity, shall make arrangements for service through the official RAGBRAI Committee. The minimum fee shall be $75.00. **No booth may provide their own electric generator or alternate source of electricity unless you are specifically granted permission by the RAGBRAI committee.**

10-15 Deposit Fee for Clean-up. Each booth shall be charged a refundable $100.00 fee for cleanup. Each site shall have all trash, waste, leftovers, etc. removed from the site and/or properly disposed of. Upon satisfactory inspection of site after shutting down, the fee shall be recommended for refund of the deposit. All temporary signs, markings, etc., shall be thoroughly removed. If the area is **unsatisfactory**, the fee shall be forfeited. The decision of the Anamosa RAGBRAI Official shall be final.

10-16 Glass Containers. To promote safety during RAGBRAI, all beverages sold in Anamosa, Iowa, by Commercial and Non-Profit Booth permitted vendors, on July 29, 2021 and until 10:00 a.m. on July 30, 2021, shall be sold in non-glass containers only. This requirement shall also apply to any existing business, restaurant, service station, grocery store or other establishment selling beverages on its premises in an outdoor setting open to the public.

10-17 Nuisance. The sale of food or the erection of a temporary facility for the sale of food or other merchandise without an Anamosa Commercial Booth permit on July 29 or 30, 2021, in violation of the provisions of this Chapter shall be considered a nuisance, as defined by the Code of Ordinances. If this type of nuisance is determined to exist, the notice, reasonable time to rehabilitate the nuisance, and appeal procedure sections contained in Chapter 50 of the Anamosa Municipal Code are suspended under the authority of this section, and an emergency procedure is hereby authorized to immediately abate the nuisance under this section. This emergency abatement procedure may be executed by any peace officer or those acting at their direction by dismantling and removing the nuisance without notice. However, if the only nuisance or violation of this chapter is the offender's failure to obtain the necessary permit, abatement may be delayed for a period not to exceed one hour so that the vendor or person may petition the official Anamosa RAGBRAI Official to immediately purchase a necessary permit as provided by this Ordinance in order to be in compliance with this section. This applies to both public and private property not being used as normal business operation. ALL VENDORS MUST BE APPROVED BY THE OFFICIAL RAGBRAI COMMITTEE.

10-18 Violations - Penalties. Selling or supplying food or merchandise to the public without an Anamosa Commercial / Non-Profit Booth or Anamosa Commercial / Non-Profit Booth Non-Food Permit on July 29 or 30, 2021, or any violation of this chapter shall be a municipal infraction is punishable by the following civil penalties:(Code of Iowa, Sec. 364.22[1])

1. Standard Civil Penalties.

A. First offense – not to exceed $750.00

B. Each repeat offense – not to exceed $1,000.00

Each day that a violation occurs or is permitted to exist constitutes a repeat offense as set forth in Chapter 4 of the City Code of Ordinances, and, therefore, any civil penalties may likewise be assessed and enforced as set forth.

10-19 Effective Period. The provisions of this ordinance shall be effective from 5:00 a.m. (local time) on July 29, 2021 until 10:00 am (local time) on July 30, 2021.

10-20 Street Closings. During the effective dates of this ordinance and without prior Council approval regarding the blocking of any city streets, the Anamosa City Administrator, Police Chief, or those at their direction, may place barricades or roadblocks in any City street, alley, or roadway to redirect vehicular traffic in order to enhance the proper and safe flow of bicycle and vehicular traffic within the City limits of the City of Anamosa. The following streets shall be closed from 12 am on Thursday July 29, 2021 until 10:00 am on Friday July 30, 2021: East Main Street from Garnavillo Street to Williams Street. Ford Street from East Main Street to Cedar Street, and Huber Street from East Main Street to an area south of Cedar Street. Booth St From East Main Street to the S Side of the alley.

10.21 Golf Cart, Gator, and other Similar Vehicles. Official members of the Anamosa RAGBRAI 2021 Committee may operate golf carts (or other similar vehicles not designed for street use) on the City streets and other public property on July 28, 29 and 30, 2021, provided they shall otherwise remain subject to all traffic laws and the direction of local law enforcement personnel, and FURTHER PROVIDED that the operator shall at all times have an official authorization tag issued by a City of Anamosa RAGBRAI 2021 Official in their possession while operating a golf cart (or other similar vehicle).

10.22 Primary Entertainment Venue and Beverage Garden. The primary and only entertainment venue beverage garden shall be located at City Parking lot on the 300 Block of East Main Street and other areas as shown on the attached map which is incorporated by reference. The beverage garden shall be constructed so as to meet the requirements of the vendor's liquor liability insurance and the liquor license or beer permit. Only beverage gardens already having a licensed outdoor sales permit prior to the announcement of RAGBRAI 2021 on January 30, 2021 shall be allowed to operate during Anamosa RAGBRAI 2021. No other outdoor entertainment other than the official Anamosa RAGBRAI 2021 venue as established by the official Anamosa RAGBRAI Committee shall be allowed to operate during or on July 29 or 30, 2021.

10-23 Authority. Any and all issues and appeals regarding this ordinance will be brought to the official Anamosa RAGBRAI Officials for resolution.

SECTION 3: REPEALER. All ordinances or parts thereof in conflict with the provisions of this ordinance are hereby repealed.

SECTION 4: SEVERABILITY CLAUSE. If any section, provision, or part of this ordinance shall be adjudged invalid or unconstitutional such adjudication shall not affect the validity of this ordinance as a whole or any section, provision, or party thereof not adjudged invalid or unconstitutional.

SECTION 5: WHEN EFFECTIVE. This ordinance shall be in effect from and after its final passage, approval, and publication as provided by law.

Passed and approved by this Council on the ___ day of May 2021.

Rod Smith, Mayor

ATTEST: _____
Beth Brincks, City Clerk

City of Anamosa
Treasurer's Monthly Report
as of March 31, 2021

Fund		Beginning Cash Balance	Monthly Revenue	Monthly Expenditure	Monthly Transfer In	Monthly Transfer Out	Investment Interest	Ending Cash Balance	Investment Balance	Petty Cash	Ending Fund Balance
General **	01	2,922,305.34	674,353.10	551,273.35			1.06	3,045,384.03	9,195.74	750.00	3,055,329.77
Fortiture- Police Dept	02	618.25						618.25			618.25
Police Canine	03	4,390.01	0.28					4,390.29			4,390.29
Local Access	04	3,889.89	0.83					3,890.72			3,890.72
Road Use Tax	06	1,439,088.45	23,950.25	36,782.21				1,426,256.49			1,426,256.49
Local Option-35%	09	456,318.37	12,649.74					468,968.11			468,968.11
Local Option-65%	09	509,945.02	23,451.29	67,525.91				465,870.40			465,870.40
Debt Service	11	124,724.12	3,030.41	300.00				127,454.53			127,454.53
TIF	12	432,600.93	19,151.17					451,752.10			451,752.10
Special Assessment	13	87,575.11	60.65					87,635.76			87,635.76
Employee Benefit	20	446,232.06	21,959.25					468,191.31			468,191.31
Library Special Gift	21	0.00						0.00	599,333.68		599,333.68
Library Campaign Fund	22	0.00						0.00			0.00
Cemetery Operations	25	10,000.00						10,000.00			10,000.00
Cemetery Perpertual Care	26	97,102.52	150.00					97,252.52			97,252.52
Wetlands Project	46	800.53						800.53			800.53
Consumer Deposits	50	193,647.14	516.10					194,163.24			194,163.24
Water	51	1,136,705.64	102,043.35	75,100.69				1,163,648.30			1,163,648.30
WasteWater	52	4,037,926.51	99,550.18	117,677.03				4,019,799.66			4,019,799.66
Senior Center	66	0.00						0.00			0.00
Street Projects	70	-26,285.19	65,643.40	25,000.00				14,358.21			14,358.21
Water Projects	71	-799,627.73		550.07				-800,177.80			-800,177.80
Sewer Projects	72	583,794.34		678.10				583,116.24			583,116.24
Downtown Projects	73	-123,120.37	251,501.28	7,211.97				121,168.94			121,168.94
Fire Station Addition	74	-5,600.00	704,289.36	24,875.00				673,814.36			673,814.36
Police Station Project	75	35,235.50	704,289.36					739,524.86			739,524.86
Captial Projects	76	0.38						0.38			0.38
Payroll Clearing	99	0.00						0.00			0.00
TOTAL		11,568,266.82	2,706,590.00	906,974.33	0.00	0.00	1.06	13,367,881.43	608,529.42	750.00	13,977,160.85

**Includes Savings Acct and $7,000 in Library Fund and $600,000 CD for LCC

Investments can only be used for specific purposes

The beginning cash balance increased by $18,637.00 due to an adjusting JE from auditor to reflect payroll account balance as of 6/30/14
The beginning cash balance increased by $9,259.00 due to an adjusting JE from auditor to reflect payroll account balance as of 6/30/15
The beginning cash balance decreased by $27,650.00 due to an adjusting JE from auditor to reflect payroll account balance as of 6/30/16

(NOTE: General Fund starting balance reflects a JE from auditor to account for payroll account outstanding checks totaling $14,750 as of 6/30/17)
The beginning cash balance decreased by $3,301.00 due to an adjusting JE from auditor to reflect payroll account balance as of 6/30/18

CITY OF ANAMOSA
PAYMENTS FOR APPROVAL BY CITY COUNCIL ON APRIL 12, 2021

March Manual Checks

Date Issued	Warrant	In Favor of	Check Amount	Description
3/31/2021	66631	PAYROLL TRANSFER	82,291.22	PAYROLL TRANS MAR 5
3/31/2021	66678	US POSTMASTER	83.73	UB REMINDER NOTICES
3/31/2021	66679	US POSTMASTER	245.00	UB BULK MAIL RENEWAL
3/31/2021	66680	ARW CONSTRUCTION CO. LLC	20,750.00	ROOFING MATERIAL RE
			36,800.00	ROOFING MATERIAL LCC
			3,140.00	ROOFING MATERIAL STREET
TOTAL **	66680		60,690.00	
3/31/2021	66695	US POSTMASTER	544.94	MAR UB BILLINGS
3/31/2021	66696	MAREK/JEFF	4,547.80	SETTLEMENT/REIMB
3/31/2021	66697	PAYROLL TRANSFER	64,024.82	MAR 19 PAYROLL TRANS
			212,427.51	

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
01	GENERAL FUND	120,637.06
06	ROAD USE TAX FUND	23,890.00
09	LOCAL OPTION TAX	36,800.00
51	WATER FUND	16,517.67
52	WASTEWATER FUND	14,582.78
TOTAL ALL FUNDS		212,427.51

April 12, 2021 Council Vouchers

Date Issued	Warrant	In Favor of	Check Amount	Description
4/12/2021	66764	ALLIANT ENERGY	262.89	PD
			207.83	FD
			8,126.68	WATER WELLS
			5,620.31	STREET LIGHTS
			36.82	SIREN
			1,697.70	LIBRARY
			481.69	PARKS
			32.52	POOL
			228.17	STREETS

			514.48	CITY HALL
			1,618.89	LCC
			13,150.96	WWTR PLATN
TOTAL **	66764		31,978.94	
4/12/2021	66765	ANIMAL WELFARE FRIENDS	175.00	PICK UP AND HOLD
4/12/2021	66766	AT&T MOBILITY	49.94	ADMIN
			49.94	STREET
			458.63	PD
			49.94	LCC
			99.88	WATER
			194.73	WWTR
			49.94	LIBRARY
TOTAL **	66766		953.00	
4/12/2021	66767	AUTOMOTIVE SERVICES	41.50	2018 FORD OIL CHANGE
4/12/2021	66768	BARRON MOTOR SUPPLY	10.84	LUBE
			6.95	CHERRY RED RUST
			10.71	SPIN ON LF315
			140.12	AIR FILTERS
			154.95	BATTERY
TOTAL **	66768		323.57	
4/12/2021	66769	BRINCKS/BETH	20.00	PHONE REIMB
4/12/2021	66770	CENTURYLINK	125.10	PD
			58.08	FD
			156.62	LIBRARY
			63.08	STREETS
			273.22	CITY HALL
			63.12	WATER DEPT
			227.29	WWTR
TOTAL **	66770		966.51	
4/12/2021	66771	CHEM RIGHT LABORATORIES INC	85.00	COLIFORM ANALYSIS
4/12/2021	66772	CR LC SOLID WASTE AGENCY	22.80	LATEX PAINT
			39.20	OIL BASE PAINT
			74.40	POISONS/PESTICIDES
			.30	FLAMMABLE LIQUIDS
			21.60	CORROSIVES
TOTAL **	66772		158.30	

4/12/2021	66773	DOCHTERMAN/KYLE	20.00	PHONE REIMB
4/12/2021	66774	ELAN-CARDMEMBER SERVICE	29.98	MEETING SOFTWARE
			20.00	WATER CERT FEE
			2,006.82	LIBRARY DELL LAPTOPS
TOTAL **	66774		2,056.80	
4/12/2021	66775	FAREWAY STORES, INC.	5.50	WATER
4/12/2021	66776	GALL'S INC.	177.75	TECH SHEATH TEFLON PANTS
4/12/2021	66777	HENRY/TROY	500.00	GRAVE OPENINGS
4/12/2021	66778	HOWARD R GREEN	226.50	GIS SERVICES
			1,014.50	RISK RESILIANCE
			23,500.02	WELL 6 FINAL DESIGN
			8,637.50	SYCAMORE STREET PROJECT
TOTAL **	66778		33,378.52	
4/12/2021	66779	INFRASTRUCTURE TECHNOLOGY SOLU	18.95	ANNUAL DOMAIN REGISTER
4/12/2021	66780	IOWA ONE CALL	36.30	EMAIL NOTIFICATIONS
4/12/2021	66781	IOWA PRISON INDUSTRIES	114.48	AIR FILTERS
			151.95	STREET MARKERS
			598.00	OFFICE CHAIR
TOTAL **	66781		864.43	
4/12/2021	66782	JETCO INC	1,463.50	HIGH PRESSURE ZONE
4/12/2021	66783	JOHN DEERE FINANCIAL	76.62	BRAKLEEN CLNR WHEEL FLAP
			62.47	GRINDER WHEEL CARB CLNR
			59.99	WEED BURNER
			45.08	HOOKS STRGE LADDER TOOL
			11.98	JB WELD
			7.99	ANTI SEIZE
			23.55	MARKERS PAINT SHARPIE
			287.58	FIXED POLE SAW
			3.57	CAP SCREW
			16.99	ROPE
			17.98	SCRUB BRUSH
			11.07	PVC FITTINGS ADAPTER
			11.49	AIR FILTER
			34.50	THERMOSTAT
			4.96	HOSE RUBBER ADAPTER
			179.99	HIGH FLOW PUMP

			92.45	TARPS STRAPS
			10.98	WET MOP REFILLS
TOTAL **	66783		959.24	
4/12/2021	66784	JOHN'S LOCK & KEY	154.00	LOCKSMITH SERVICES
4/12/2021	66785	JONES COUNTY ECONOMIC DEVELOP-	2,500.00	4TH QTR FY21 CONTRIBUT
4/12/2021	66786	JONES COUNTY ENGINEER	160.81	FIRE FUEL
			662.56	RUT FUEL
			285.50	WATER FUEL
			340.51	WASTEWATER FUEL
			1,496.21	JCET FUEL
TOTAL **	66786		2,945.59	
4/12/2021	66787	JONES COUNTY SOLID WASTE MGMT	5,416.25	4TH QTR FY21 ASSESSMENT
			191.40	PAPER
TOTAL **	66787		5,607.65	
4/12/2021	66788	JONES REGIONAL MEDICAL CENTER	207.00	COVID TESTING
4/12/2021	66789	KIECK'S	406.00	UNIFORM PANTS SHIRTS
			219.00	UNIFORM BOOTS
			68.94	UTILITY BELTS
TOTAL **	66789		693.94	
4/12/2021	66790	KONICA MINOLTA BUSINESS SOLUTI	73.29	METERED COPIES
4/12/2021	66791	KONICA PREMIER FINANCE	151.64	COPIER PURCHASE CONTRACT
4/12/2021	66792	LAWSON PRODUCTS, INC.	448.19	SHOP SUPPLIES
4/12/2021	66793	LODE/ERIC	20.00	PHONE REIMB
4/12/2021	66794	MATHESON TRI-GAS INC	57.21	MARCH RENTAL
4/12/2021	66795	MCALEER	47.00	CITY HALL
4/12/2021	66796	MEDIACOM	295.88	INTERNET
4/12/2021	66797	MID-IOWA SOLID WASTE	969.90	TYMCO SWEEPER REPAIR
4/12/2021	66798	MUNICIPAL SUPPLY, INC.	1,040.00	3/4 IPERL METER
			3,807.00	510M RADIO READ
TOTAL **	66798		4,847.00	
4/12/2021	66799	NAYLOR SEED CO	280.00	100 # HIGH GRADE SEED
4/12/2021	66800	OUTDOOR RECREATION PRODUCTS	875.00	LATCHING DEVICES
4/12/2021	66801	QC ANALYTICAL SERVICES LLC	558.58	RADIUM TESTING
			172.00	GROSS ALPHA
TOTAL **	66801		730.58	
4/12/2021	66802	RECREATIONAL MOTOR SPORTS	53.78	AIR FILTER

			12.45	GASKETS
			11.60	INSULATER
			23.31	GRAVELY BLADES
			6.32	OIL FILTER
			15.10	SPARK PLUGS
			479.28	SAMPLE SHIPPING
TOTAL **	66802		601.84	
4/12/2021	66803	SHAFFER PLBG & HTG	187.06	EYE WASH STATION REPAIR
4/12/2021	66804	SHIVE-HATTERY	44,775.00	FIRE STATION DESIGN
4/12/2021	66805	SIRCHIE FINGER PRINT LAB	73.76	BLOOD SPECIMEN KIT
4/12/2021	66806	SNYDER & ASSOCIATES INC.	5,500.00	WWTP FLOW BASIN
			24,498.00	US 151 GRADE SEPARATION
TOTAL **	66806		29,998.00	
4/12/2021	66807	ST. LUKE'S HEALTH SERVICE	35.00	NEW HIRE SCREENING
4/12/2021	66808	THOMAS/GINGER	20.00	PHONE REIMB
4/12/2021	66809	TRANSWORLD NETWORK, C0RP	6.92	PD
			54.47	CITY HALL
			2.46	LCC
			1.23	POOL
			2.46	WATER DEPT
			1.23	WWTP
			2.46	STREETS
			1.23	FD
TOTAL **	66809		72.46	
4/12/2021	66810	TYLER TECHNOLOGIES, INC	840.00	GL CONVERSION
4/12/2021	66811	U.S. CELLULAR	18.24	4620033
			30.23	4807928
			47.69	4808342
			177.96	PD MOBILE
TOTAL **	66811		274.12	
4/12/2021	66812	USA BLUE BOOK	20.44	DRIERITE ANHYDROUS
			51.58	DRIERITE DESICCANT
TOTAL **	66812		72.02	
4/12/2021	66813	WALMART	21.23	PAPER TOWELS WASH
			57.53	FIRST AID RESTOCK
			167.05	OIL

TOTAL **	66813		245.81	
4/12/2021	66814	WEBER STONE COMPANY	1,423.33	ROAD ROCK
4/12/2021	66815	WOODWARD COMMUNITY MEDIA	276.15	LEGALS
			132.00	HYDRANT FLUSHING
TOTAL **	66815		408.15	
			174,113.23	

FUND RECAP:

FUND	DESCRIPTION	DISBURSEMENTS
01	GENERAL FUND	21,878.89
06	ROAD USE TAX FUND	6,963.76
09	LOCAL OPTION TAX	14,257.81
51	WATER FUND	17,792.01
52	WASTEWATER FUND	20,447.74
70	STREET PROJECTS	24,498.00
71	WATER PROJECTS	23,500.02
74	CITY BUILDING PROJECTS	44,775.00
TOTAL	ALL FUNDS	174,113.23

March Cash Reciepts by Fund

FUND RECAP:

FUND	DESCRIPTION	RECEIPTS
01	GENERAL FUND	615,518.09
06	ROAD USE TAX FUND	23,950.25
09	LOCAL OPTION TAX	36,078.90
26	CEMETERY PERPETUAL CARE FUND	150.00
50	CONSUMER DEPOSITS FUND	2,300.00
51	WATER FUND	304.00
TOTAL	ALL FUNDS	678,301.24