CHARTER TOWNSHIP OF VAN BUREN
PLANNING COMMISSION AGENDA
Wednesday, December 14th, 2022 – 5:30 PM
Van Buren Township Hall
46425 Tyler Road

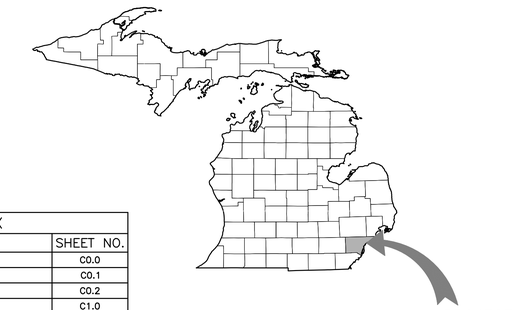
PRESENTATIONS:

Case 21-032:
Brookwood Multi-Family Senior Housing
(Revised Plans)

FLOOD PLAIN NOTE:

THIS SITE IS NOT LOCATED IN THE 100 YEAR FLOOD PLAIN.
PER FEMA MAP #26163C0352E DATED 2/2/2012
THIS SITE LIES IN ZONE X, AREA OF MIN. FLOOD HAZARD

PRELIMINARY SITE PLANS
FOR
BROOKWOOD VAN BUREN TWP MULTI FAMILY RESIDENTIAL
VAN BUREN TOWNSHIP
TYLER RD.
WAYNE COUNTY, VAN BUREN TOWNSHIP, MI 48111



KEY MAP
NOT TO SCALE

VICINITY MAP
SCALE: NTS

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CONTACTS	
OWNER	GARNER PROPERTY MANAGEMENT CHRIS GARNER 23944 EUREKA ROAD, SUITE 105, TAYLOR, MI 48180 CHRIS@LIVEGPM.COM
ARCHITECT	HOBBS+BLACK ARCHITECTS TOM DILLENBECK 100 N STATE STREET, ANN ARBOR, MI 48104 (734)–663–4189 TDILLENBECK@HOBBS–BLACK.COM
GAS	DTE ENERGY ARAS P. BUTKUNAS ONE ENERGY PLAZA, ROOM 570 SB, DETROIT, MI 48226 (800)–477–4747
ELECTRIC	DTE ENERGY SARA KIPP ONE ENERGY PLAZA, ROOM 570 SB, DETROIT, MI 48226 (800)–477–4747
TELEPHONE	AT&T YURI STOUDEMIRE 54 N MILL STREET, PLYMOUTH, MI 48342 (248)–454–4364
CABLE	COMCAST JEFF DOBIES 25626 TELEGRAPH ROAD, SOUTHFIELD, MI 48034 (734)–359–1669
ROADS	WAYNE COUNTY ROADS DIVISION ANDREW KANDREVAS DIRECTOR OF PUBLIC SERVICES (313)–224–7600
WATER & SEWER	GREAT LAKES WATER AUTHORITY DANIEL MILLER 6425 HUBER STREET, DETROIT, MI 48211 (313)–378–4908
SOIL EROSION CONTROL	WAYNE COUNTY SOIL EROSION & SEDIMENTATION CONTROL PATRICK CULLEN–DIVISION DIRECTOR 3600 COMMERCE COURT, WAYNE, MI 48184 (734)–326–3936 PCULLEN@WAYNECOUNTY.COM
STORM WATER MANAGEMENT	WAYNE COUNTY ENVIRONMENTAL SERVICES (313)–224–3620 ESGHELP@WAYNECOUNTY.COM
MUNICIPALITY	VAN BUREN TWP BUILDING, PLANNING, & ECONOMIC DEVELOPMENT DAN POWER–DIRECTOR 46425 TYLER ROAD VAN BUREN TOWNSHIP, MI 48111 (734)–699–8913 DPOWER@VANBUREN–MI.COM

NOTE

1. THE DEVELOPMENT IS PROJECTED TO BE BUILT OUT IN FOUR (4) PHASES.
2. WE ARE PROPOSING A SENIOR (55+) RESTRICTED CONDOMINIUM COMMUNITY. ALL UNITS WILL BE SINGLE–STORY AND ATTACHED TO OTHER UNITS IN DUPLEXES, QUADPLEXES OR SIXPLEXES.
3. IT WILL BE A CONDOMINIUM COMMUNITY. CONDOMINIUM OWNERS AND THE DEVELOPER MAY RENT THEIR UNITS AS THE MARKET DICTATES.
4. IT IS ANTICIPATED THAT THE DEVELOPMENT WILL BE A 55+ RESTRICTED COMMUNITY. COMMON ELEMENTS WITHIN THE COMMUNITY WILL BE SHARED AND MAINTAINED BY THE VARIOUS OWNERS.
5. WADE TRIM WILL BE WORKING WITH EGLE FOR IMPACTS TO WETLANDS
6. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS, SPECIFICATIONS, AND GENERAL CONDITIONS OF THE CHARTER TOWNSHIP OF VAN BUREN.

PERMIT APPLICATIONS	SUBMITTAL DATES
VAN BUREN TWP PLANNING AND ZONING PERMIT	7/27/2022
VAN BUREN TWP WATER AND SEWER PERMIT	
WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES LAND RESOURCE MANAGEMENT DIVISION SESC PERMIT	
WAYNE COUNTY DPS, PERMIT OFFICE APPLICATION FOR CONSTRUCTION PERMIT	9/29/2022
EGLE JOINT PERMIT	8/26/2022

PLAN DISTRIBUTION TABLE		SUBMITTAL DATES
ROADS	WAYNE COUNTY ROADS DIVISION ANDREW KANDREVAS–DIRECTOR OF PUBLIC SERVICES (313)–224–7600	
WATER & SEWER	VAN BUREN TWP WATER AND SEWER KEVIN LAWRENCE–DIRECTOR 4625 TYLER ROAD VAN BUREN TOWNSHIP, MI 48111 (734)–699–8947 KLAWRENCE@VANBUREN–MI.ORG	
SOIL EROSION CONTROL	WAYNE COUNTY SOIL EROSION & SEDIMENTATION CONTROL PATRICK CULLEN–DIVISION DIRECTOR 3600 COMMERCE COURT, WAYNE, MI 48184 (734)–326–3936 PCULLEN@WAYNECOUNTY.COM	
SURFACE WATER MANAGEMENT	WAYNE COUNTY DPS, PERMIT OFFICE HIKMAT KASSEM, PE 33809 MICHIGAN AVENUE, WAYNE, MI 48184 (734)–858–2757 HKASSEM@WAYNECOUNTY.COM	9/29/2022
SITE PLAN	VAN BUREN TWP BUILDING, PLANNING, AND ECONOMIC DEVELOPMENT DAN POWER–DIRECTOR 46425 TYLER ROAD VAN BUREN TOWNSHIP, MI, 48111 (734)–699–8913 DPOWER@VANBUREN–MI.COM	1ST SUBMITTAL 7/27/2022 2ND SUBMITTAL 9/19/2022
EGLE	EGLE–DETROIT DISTRICT OFFICE CADILLAC PLACE 3058 WEST GRAND BOULEVARD, SUITE 2–300 DETROIT, MI 48202 (313)–224–7600	8/26/2022

LEGAL DESCRIPTION:
PARCEL NUMBER: 83–043–99–0015–000
(OBTAINED FROM WAYNE COUNTY TAX DESCRIPTION)

THE E 1/2 OF THE W 1/2 OF THE SW 1/4 OF SEC 11 44.23 ACRES. LIBER 57177, PAGE 141, WAYNE COUNTY RECORDS

JOB NO.	SHEET
GPM2001.01F	C0.0

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.235.2555
www.wadetrim.com

PREPARED UNDER THE SUPERVISION OF:

STATE OF MICHIGAN
KEVIN P. ROYSTON
ENGINEER
No. 56523
LICENSED PROFESSIONAL ENGINEER

KEVIN P ROYSTON, PE

56523
REGISTRATION NO.

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PROJECT MANAGER: –
C:\PW_WORK\WADE–TRIM_VCLARK\D1129952\C0.0–GCS–PLTS–COVER SHEET.DWG – C0.0 – PLOTTED 11/29/2022 4:55 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION: –

EXISTING LEGEND

- BENCH MARK
- CONIFEROUS TREE
- CATCH BASIN (ROUND GRATE)
- CONTROL POINT
- CULVERT END SECTION
- DECIDUOUS TREE
- FIRE HYDRANT
- GATE VALVE & WELL (DETROIT)
- GROUND SHOT — XXX.XX
- MONUMENT
- PK NAIL — PK
- POWER POLE
- TELEPHONE MANHOLE
- U/G MARKER CABLE — U-C
- U/G MARKER ELECTRIC — U-E
- U/G MARKER FIBER OPTIC — U-FO
- U/G MARKER GAS — U-G
- U/G MARKER TELEPHONE — U-T
- BOUNDARY LINE
- DITCH CENTERLINE
- DOMESTIC WATER
- EDGE OF WOODS
- FENCE
- GAS
- GRAVEL
- PROPERTY LINE
- RIGHT OF WAY — R/W
- SECTION LINE
- TOP OF BANK
- UNDERGROUND TELEPHONE — UT
- WETLAND

PROPOSED UTILITY LEGEND

- FIRE HYDRANT
- WATER VALVE IN BOX
- DOMESTIC WATER SHUT OFF — WSO
- GATE VALVE & WELL
- WATER MAIN
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEAN OUT — CO
- SANITARY SEWER MAIN
- STORM CATCH BASIN
- STORM CURB INLET
- STORM MANHOLE
- STORM SEWER END SECTION
- STORM SEWER LINE
- DRAINAGE SWALE
- TOP OF BANK

NOTE: FOR EXISTING FEATURES SEE TOPOGRAPHIC SURVEY OR EXISTING CONDITIONS PLAN.

PROPOSED SWPP LEGEND

- TEMPORARY SILT FENCE
- MAJOR CONTOUR — 100
- MINOR CONTOUR — 101
- DRAINAGE SWALE
- DRAINAGE FLOW ARROW
- FILTER BERM OR CHECK DAM
- LIMITS OF DISTURBANCE/ PROJECT LIMITS
- TEMPORARY INLET PROTECTION
- EROSION CONTROL KEY
- SOIL TYPE — XxX
- CONSTRUCTION ENTRANCE
- STAGING/STOCK PILE AREA

NOTE: FOR EXISTING FEATURES SEE TOPOGRAPHIC SURVEY OR EXISTING CONDITIONS PLAN.

PROPOSED GRADING LEGEND

- CURB ELEVATION — 100.50 T / 100.00 G
  WHERE: T = TOP OF CURB
  G = GUTTER OR PVMT.
- THICKENED EDGE WALK ELEV. — 100.50 T / 100.00 P
  WHERE: T = TOP OF WALK
  P = PAVEMENT
- SPOT ELEV. — 100.00 / XXX

WHERE XXX IS ONE OF THE FOLLOWING:

TOP OF CONCRETE ELEV.	TOC
FINISH GRADE ELEV.	FG
RIM ELEV.	RIM
GUTTER ELEV.	GUT
MATCH EXISTING ELEV.	MATCH
TOP OF PAVEMENT ELEV.	T/P
FIINISH FLOOR ELEV.	FFE
ADJUST RIM ELEV.	ADJUST

- DRAINAGE FLOW
- DRAINAGE SLOPE — 1.0%
- FINISH GRADE SLOPE — 4:1
- MAJOR CONTOUR — 100
- MINOR CONTOUR — 101
- STORM CATCH BASIN
- STORM CURB INLET
- STORM MANHOLE
- STORM SEWER END SECTION
- STORM SEWER LINE
- HIGH POINT — H.P.
- DRAINAGE SWALE
- TOP OF BANK

NOTE: FOR EXISTING FEATURES SEE TOPOGRAPHIC SURVEY OR EXISTING CONDITIONS PLAN.

PROPOSED SITE LEGEND

- BUILDING LINE
- CURB AND GUTTER
- BUILDING SETBACK
- RIGHT OF WAY LINE — R/W
- STOP BAR
- PARKING COUNT
- SIGN AND SIGN POST
- ACCESSIBLE SYMBOL
- DETECTACBLE WARNING SURFACE
- BITUMINOUS SURFACE SEE DETAIL ON SHEET C3.7
- CONCRETE SURFACE SEE DETAIL ON SHEET C3.7
- AGGREGATE SURFACE SEE DETAIL ON WAYNE COUNTY STANDARD DETAILS
- PAINTED ISLAND
- DECORATIVE STONE
- TAPER SEE DETAIL ON WAYNE COUNTY STANDARD DETAILS

NOTE: FOR EXISTING FEATURES SEE TOPOGRAPHIC SURVEY OR EXISTING CONDITIONS PLAN.

811 Know what's below. Call before you dig.

PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129852\C0.1-GLS-PLTS-LEGEND SHEET.DWG – LAYOUT1 – PLOTTED 11/29/2022 4:55 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION:–

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.5050
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

LEGEND SHEET
FOR
VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

GPM2001.01F VAN BUREN MULTI-FAMILY

JOB NO. GPM2001.01F

SHEET C0.1

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SESC NOTES

1. CONTRACTOR SHALL IMPLEMENT BEST MANAGEMENT PRACTICES (BMPS) AS REQUIRED BY THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP). ADDITIONAL BMPS SHALL BE IMPLEMENTED AS DICTATED BY CONDITIONS AT NO ADDITIONAL COST TO OWNER THROUGHOUT ALL PHASES OF CONSTRUCTION IF DEEMED NECESSARY AND RESULTANT FROM THE CONTRACTOR'S OPERATIONS, METHODS, OR SEQUENCE OF CONSTRUCTION.

2. BMPS AND CONTROLS SHALL CONFORM TO FEDERAL, STATE, AND LOCAL REQUIREMENTS, OR MANUAL OF PRACTICE, AS APPLICABLE. CONTRACTOR SHALL IMPLEMENT ADDITIONAL CONTROLS AS DIRECTED BY PERMITTING AGENCY OR OWNER.

3. CONTRACTOR SHALL MINIMIZE CLEARING TO THE MAXIMUM EXTENT PRACTICAL, OR AS REQUIRED BY THE GENERAL PERMIT.

4. ALL WASH WATER (CONCRETE TRUCKS, VEHICLE CLEANING, EQUIPMENT CLEANING, ETC.) SHALL BE DETAINED AND PROPERLY TREATED OR DISPOSED.

5. INSTALL SILT FENCES, DITCH SEDIMENT TRAPS, CHECK DAMS, INLET FILTERS, TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXITS, TURBIDITY BARRIERS, EROSION CONTROL BLANKETS AND OTHER SOIL EROSION CONTROL DEVICES IN ACCORDANCE WITH THE DRAWINGS AND STORM WATER POLLUTION PREVENTION PLAN, OR AS MAY BE DICTATED BY SITE CONDITIONS IN ORDER TO MAINTAIN THE INTENT OF THE SPECIFICATIONS AND PERMITS.

6. DEFICIENCIES OR CHANGES ON THE DRAWINGS OR SWPPP SHALL BE CORRECTED OR IMPLEMENTED AS SITE CONDITIONS CHANGE. CHANGES DURING CONSTRUCTION SHALL BE NOTED IN THE SWPPP AND POSTED ON THE DRAWINGS.

7. OWNER HAS AUTHORITY TO LIMIT SURFACE AREA OF ERODIBLE EARTH MATERIAL EXPOSED BY CLEARING AND GRUBBING, EXCAVATION, BORROW AND EMBANKMENT OPERATIONS AND TO DIRECT CONTRACTOR TO PROVIDE IMMEDIATE PERMANENT OR TEMPORARY POLLUTION CONTROL MEASURES.

8. REMOVE TEMPORARY CONTROL DEVICES AFTER PERMANENT MEASURE ARE ESTABLISHED. REMOVE AND REPLACE TEMPORARY CONTROL DEVICES IF THEY BECOME INEFFECTIVE AT NO ADDITIONAL COST TO OWNER.

9. CONTRACTOR SHALL INCORPORATE PERMANENT EROSION CONTROL FEATURES, PAVING, PERMANENT SLOPE STABILIZATION, AND VEGETATION INTO PROJECT AT EARLIEST PRACTICAL TIME TO MINIMIZE NEED FOR TEMPORARY CONTROLS.

10. CONTRACTOR SHALL PERMANENTLY SEED AND MULCH CUT SLOPES AS EXCAVATION PROCEEDS TO EXTENT CONSIDERED DESIRABLE AND PRACTICAL.

11. CONTRACTOR SHALL PLACE ALL SOIL EROSION & SEDIMENTATION CONTROL MEASURES AS SHOWN IN THE PLANS OR AS DIRECTED BY THE ENGINEER IN ACCORDANCE WITH THE APPROVED DETAILS.

12. CONSTRUCTION OPERATIONS SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACK FILLING AND/OR GRADING OPERATIONS.

13. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.

14. THE CONTRACTOR SHALL LIMIT THE USE OF HEAVY EQUIPMENT AND OTHER CONSTRUCTION EQUIPMENT ON THE UNPROTECTED SUBGRADE.

15 CLEANUP WILL BE DONE IN A MANNER TO INSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.

16. THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENTATION CONTROL COMPLIANCE. ALL DEFICIENCIES WILL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS.

17. TEMPORARY EROSION CONTROL MEASURES SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR UPON ESTABLISHMENT OF PERMANENT CONTROL MEASURES AND AS DIRECTED BY LOCAL APPROVING AGENCY.

18. CONSTRUCTION WILL DISTURB MORE THAN 5 ACRES, THUS A NPDES STORM WATER DISCHARGE PERMIT **WILL** BE REQUIRED.

19. AREA OF DISTURBANCE IS **25.0** ACRES.

20. ALL ROADS WITHIN THE INFLUENCE OF THE PROJECT MUST REMAIN CLEAN AT ALL TIMES. CONTRACTOR SHALL SWEEP STREETS AS DIRECTED BY LOCAL MUNICIPALITY HAVING JURISDICTION OVER THE ROADWAY (I.E. TOWNSHIP, CITY, COUNTY, STATE, ETC).

21. BEST MANAGEMENT PRACTICES FOR SOIL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE USED ON THIS PROJECT AS SHOWN ON THE PLANS AND AS DEFINED BY THE ENGINEER.

22. THE CONTRACTOR SHALL SUBMIT A DETAILED SOIL EROSION AND SEDIMENTATION CONTROL PLAN AND OBTAIN AN ACT 451 PART 91, SOIL EROSION AND SEDIMENTATION CONTROL PERMIT, COPY TO BE PROVIDED TO THE ENGINEER. THE CONTRACTOR IS RESPONSIBLE FOR THE PAYMENT OF APPLICATION FEES, REVIEW FEES, INSPECTION FEES, BONDS, ETC. NO EARTH CHANGES OR EXCAVATION SHALL BE STARTED PRIOR TO THE ISSUANCE OF THIS PERMIT.

24. TEMPORARY SEEDING SHALL BE MAINTAINED DURING THE PERIOD OF CONSTRUCTION UNTIL THE CONTRACT HAS BEEN COMPLETED AND ACCEPTED.

MAINTENANCE NOTES

1. ALL EROSION CONTROL MEASURES STATED ON THE SOIL EROSION CONTROL PLAN AND IN THE SWPPP SHALL BE MAINTAINED IN FULLY FUNCTIONAL CONDITION UNTIL NO LONGER REQUIRED FOR A COMPLETED PHASE OF WORK, OR FINAL STABILIZATION OF THE SITE. CONTRACTOR SHALL INCLUDE IN HIS BID, MAINTENANCE OF THE SOIL EROSION CONTROL DEVICES DURING THE ENTIRE PROJECT PERIOD.

2. EROSION CONTROL DEVICES DAMAGED BY OTHERS WILL BE REPAIRED BY OTHERS.

3. REFER TO MAINTENANCE REQUIREMENTS ASSOCIATED WITH EACH BMP DETAIL AND THE SEQUENCE OF CONSTRUCTION IN THE CONTRACT DOCUMENTS.

4. ALL EROSION AND SEDIMENTATION CONTROL MEASURES SHALL BE CHECKED BY A QUALIFIED PERSON IN ACCORDANCE WITH THE CONTRACT DOCUMENTS OR THE APPLICABLE PERMIT, WHICHEVER IS MORE STRINGENT, AND REPAIRED AT NO ADDITIONAL COST TO THE OWNER IN ACCORDANCE WITH THE FOLLOWING:

4.1. INLET PROTECTION DEVICES AND BARRIERS SHALL BE REPAIRED OR REPLACED IF THEY SHOW SIGNS OF UNDERMINING OR DETERIORATION.

4.2. ALL SEEDED AREAS SHALL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHOULD BE FERTILIZED, WATERED, AND RESEEDED AS NEEDED.

4.3. SILT FENCES SHALL BE REPAIRED TO THEIR ORIGINAL CONDITIONS IF DAMAGED. SEDIMENT SHALL BE REMOVED FROM THE SILT FENCES WHEN IT REACHES ONE-HALF THE HEIGHT OF THE SILT FENCE.

4.4. CONSTRUCTION EXITS SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOW OF MUD ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING OF THE CONSTRUCTION EXITS AS CONDITIONS DEMAND.

4.5. TEMPORARY PARKING AND STORAGE AREAS SHALL BE KEPT IN GOOD CONDITION (SUITABLE FOR PARKING AND STORAGE). THIS MAY REQUIRE PERIODIC TOP DRESSING AS CONDITIONS DEMAND.

4.6. OUTLET STRUCTURES IN SEDIMENTATION BASINS SHALL BE MAINTAINED IN OPERATIONAL CONDITIONS AT ALL TIMES. SEDIMENT SHALL BE REMOVED FROM SEDIMENT BASINS OR TRAPS WHEN THE DESIGN CAPACITY HAS BEEN REDUCED BY 50%.

DEMOLITION NOTES

1. THE DEMOLITION CONTRACTOR SHALL OBTAIN A DEMOLITION PERMIT FROM THE APPROPRIATE GOVERNING AGENCY(S) PRIOR TO COMMENCING WITH DEMOLITION.

2. THE DEMOLITION CONTRACTOR SHALL BE RESPONSIBLE FOR BACKFILLING THE BUILDING EXCAVATION AREAS WITH M.D.O.T. CLASS II MATERIAL. ALL FILL MATERIAL SHALL BE BACKFILLED WITH MAX. 12" LIFTS & COMPACTED TO 95% MAX. DENSITY PER ASTM D1557 (MODIFIED PROCTOR).

3. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVAL OF THE CONCRETE BASES AND APPURTENANCES FOR ALL FLAG POLES, LIGHT POLES, FENCE POLES, PIPE BOLLARDS AND SIGNS THAT ARE TO BE REMOVED, INCLUDING ANY NOT IDENTIFIED ON THIS PLAN.

4. ALL ASPHALT & CONCRETE TO BE REMOVED SHALL BE SAW CUT WHERE REQUIRED ALONG PROPOSED LIMITS OF DEMOLITION.

5. THE EXACT LOCATION OF ALL EXISTING ON-SITE STORM SEWER PIPES ARE UNKNOWN. THE CONTRACTOR SHALL FIELD LOCATE ALL EXISTING STORM SEWER SERVICE PIPES AND REMOVE TO EXISTING STRUCTURE. THE CONTRACTOR SHALL INSTALL A WATERTIGHT BULKHEAD WHERE APPLICABLE.

6. THE DEMOLITION CONTRACTOR SHALL COORDINATE ALL UTILITY REMOVAL\RELOCATION WITH THE APPROPRIATE UTILITY COMPANY.

7. CONTRACTOR SHALL COORDINATE ALL RETAINING WALL AND FENCE REMOVAL, REPLACEMENT, OR RELOCATION, ALONG PROPERTY LINES, WITH ADJACENT PROPERTY OWNER.

8. ALL CONCRETE CURB AND GUTTER ON-SITE SHALL BE REMOVED AND PROPERLY DISPOSED OF, INCLUDING ANY NOT SHOWN ON THIS PLAN.

9. ALL EXISTING ON-SITE VEGETATION TO BE REMOVED WITHIN THE PROPERTY LIMITS.

10. THE CONTRACTOR SHALL COORDINATE THE REMOVAL OF SIGNS WITH THE EXISTING PROPERTY OWNER.

SITE PLAN NOTES

1. ALL WORK AND MATERIALS SHALL COMPLY WITH VAN BUREN TOWNSHIP REGULATIONS AND CODES AND O.S.H.A. STANDARDS.

2. CONTRACTOR SHALL REFER TO THE ARCHITECTURAL PLANS FOR DETAILS AND EXACT LOCATIONS, VESTIBULES, PRECISE BUILDING DIMENSIONS AND EXACT BUILDING UTILITY ENTRANCE LOCATIONS.

3. ALL DIMENSIONS AND RADII ARE TO THE **FACE OF CURB** OR FACE OF THICKENED EDGE SIDEWALK UNLESS OTHERWISE NOTED ON THE PLANS.

4. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL RELOCATIONS, (UNLESS OTHERWISE NOTED ON PLANS) INCLUDING BUT NOT LIMITED TO, ALL UTILITIES, STORM DRAINAGE, SIGNS, TRAFFIC SIGNALS & POLES, ETC. AS REQUIRED. ALL WORK SHALL BE IN ACCORDANCE WITH GOVERNING AUTHORITY'S REQUIREMENTS AND PROJECT SITE WORK SPECIFICATIONS AND SHALL BE APPROVED BY SUCH. ALL COST SHALL BE INCLUDED IN THE BASE BID.

5. THE SITE CONTRACTOR SHALL COORDINATE HIS WORK WITH THE BUILDING CONTRACTOR.

6. PROVIDE ISOLATION JOINTS WHERE CONCRETE ABUTS PROPOSED BUILDING.

7. ALL PARKING LOT STRIPING SHALL BE IN ACCORDANCE WITH THE "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES". ALL STRIPING SHALL BE WATERBORNE PER MDOT SPECIFICATIONS AND ALL STRIPING SHALL BE 4" TRAFFIC YELLOW UNLESS OTHERWISE NOTED. ALL DIAGONAL STRIPPING SHALL BE YELLOW OR BLUE AT 2 FT ON CENTER, ON A 45° ANGLE UNLESS OTHERWISE NOTED. CONTRACTOR SHALL APPLY 2 COATS OF PAVEMENT MARKINGS, 1 MONTH APART.

8. ALL BARRIER FREE PARKING, SIGNAGE & STRIPING SHALL BE IN ACCORDANCE WITH MICHIGAN BARRIER FREE STANDARDS. DETECTABLE WARNING SURFACE SHALL BE INSTALLED AS REQ'D BY MICHIGAN BARRIER FREE STANDARDS AT ALL RAMPS AND OTHER LOCATIONS AS PROVIDED IN MICHIGAN BARRIER FREE STANDARDS. STRIPING SHALL BE WATERBORNE PAVEMENT MARKING PER MDOT SPECIFICATIONS, COLOR BLUE UNLESS OTHERWISE SPECIFIED.

9. PLACEMENT OF SLEEVES FOR ANY ELECTRIC OR IRRIGATION SYSTEM SHALL BE COORDINATED WITH OWNER/ARCHITECT PRIOR TO BEGINNING CONSTRUCTION.

10. CONTRACTOR IS RESPONSIBLE FOR PROPER TRAFFIC CONTROL DURING CONSTRUCTION IN ACCORDANCE WITH THE "MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES".

11. SITE CONTRACTOR SHALL REFER TO LIGHTING PLANS FOR LIGHTING LOCATIONS AND FOUNDATIONS. SITE CONTRACTOR SHALL COORDINATE LOCATIONS OF ALL SITE LIGHTING AND CIRCUITRY PRIOR TO PLACING UTILITIES AND INSTALLING PAVEMENTS.

PERMANENT RESTORATION NOTES

1. ALL ON-SITE UNPAVED AREAS DISTURBED BY GRADING OPERATION SHALL RECEIVE 4 INCHES OF TOPSOIL, SEED/SOD AND MULCH. TOPSOIL SHALL BE PER ASTM D5268 AND SHALL BE NATURAL, FRIABLE, FERTILE, FINE LOAMY SOIL POSSESSING CHARACTERISTICS OF REPRESENTATIVE TOPSOIL IN THE VICINITY THAT PRODUCES HEAVY GROWTH. TOPSOIL SHALL HAVE A PH RANGE OF 5.5 TO 7.4 PERCENT, FREE FROM SUBSOIL, OBJECTIONABLE WEEDS, LITTER, SODS, STIFF CLAY, STONES LARGER THAN 1-INCH IN DIAMETER, STUMPS, ROOTS, TRASH, TOXIC SUBSTANCES, OR ANY OTHER MATERIAL WHICH MAY BE HARMFUL TO PLANT GROWTH OR HINDER PLANTING OPERATIONS. TOP SOIL SHALL CONTAIN A MINIMUM OF THREE PERCENT ORGANIC MATERIAL. IF EXISTING ONSITE TOPSOIL OR IMPORTED TOPSOIL DOES NOT MEET THESE REQUIREMENTS, THE TOPSOIL SHALL BE CONDITIONED UNTIL REQUIREMENTS ARE MET.

2. HYDROSEED FOR LAWN AREAS IS TO CONSIST OF A SEED MIXTURE AS FOLLOWS:
   40% PERENNIAL RYEGRASS
   20% KENTUCKY BLUEGRASS
   10% NEW PORT KENTUCKY BLUEGRASS
   30% PENN LAWN RED FESCUE
   THE GRASS SEED MIXTURE SHALL BE SOWN UNIFORMLY AT A RATE OF 220-250 POUNDS PER ACRE.

3. FERTILIZER SHALL HAVE AN ANALYSIS OF 8-8-8 OR 10-10-10 OF NITROGEN, PHOSPHORUS AND POTASSIUM AND IS TO BE USED IN THE LAWN AREA HYDROSEED APPLICATION. FERTILIZER SHALL BE APPLIED AT THE RATE REQUIRED TO FURNISH 300 POUNDS PER ACRE.

4. MULCH SHALL BE STRAW, HAY OR EXCELSIOR. THE MULCH SHALL BE APPLIED AT A RATE OF 1,500 POUNDS PER ACRE WITH 30 POUNDS PER ACRE OF GLUE

5. ADHESIVE SHALL BE TERR-TACK AR MULCH ADHESIVE

SOIL EROSION CONTROL SCHEDULE

WORK TO BE DONE	SOIL EROSION CONTROL METHOD	MONTH 1 (WEEK 1 2 3 4)	MONTH 2 (WEEK 1 2 3 4)	MONTH 3 (WEEK 1 2 3 4)	MONTH 4 (WEEK 1 2 3 4)	MONTH 5 (WEEK 1 2 3 4)	MONTH 6 (WEEK 1 2 3 4)	MONTH 7 (WEEK 1 2 3 4)	MONTH 8 (WEEK 1 2 3 4)	MONTH 9 (WEEK 1 2 3 4)	MONTH 10 (WEEK 1 2 3 4)
CONSTRUCTION PERMITS											
INSTALL SILT FENCE PLACE INLET PROTECTION	54 36										
CONSTRUCT CONSTRUCTION ENTRANCE	60										
STRIP TOP SOIL AND STOCKPILE	52 54										
PRELIMINARY SITE GRADING											
BUILDING CONSTRUCTION											
CONSTRUCT STORM SEWER AND DRAINAGE STRUCTURES	36										
INSTALL OTHER UTILITIES											
FINE GRADE PARKING LOT & INSTALL CURB & GUTTER											
INSTALL AGGREGATE SUBBASE & BITUMINOUS SURFACE											
INSTALL BITUMINOUS BITUMINOUS SURFACES											
FINAL SITE GRADING AND LANDSCAPING	2 4										
ESTIMATED FINISH CONSTRUCTION											

THE CONTRACTOR SHALL SUBMIT FINAL SOIL EROSION AND CONSTRUCTION SEQUENCE SCHEDULE PRIOR TO ISSUANCE OF SOIL EROSION CONTROL PERMIT

811 Know what's **below.** **Call** before you dig.

PROJECT MANAGER: -
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C0.2-GNS-PLTS-NOTES SHEET.DWG - LAYOUT1 - PLOTTED 11/29/2022 4:55 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION: -

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.232.3535
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180
NOTES SHEET
FOR
VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C0.2

GPM2001.01F VAN BUREN MULTI-FAMILY

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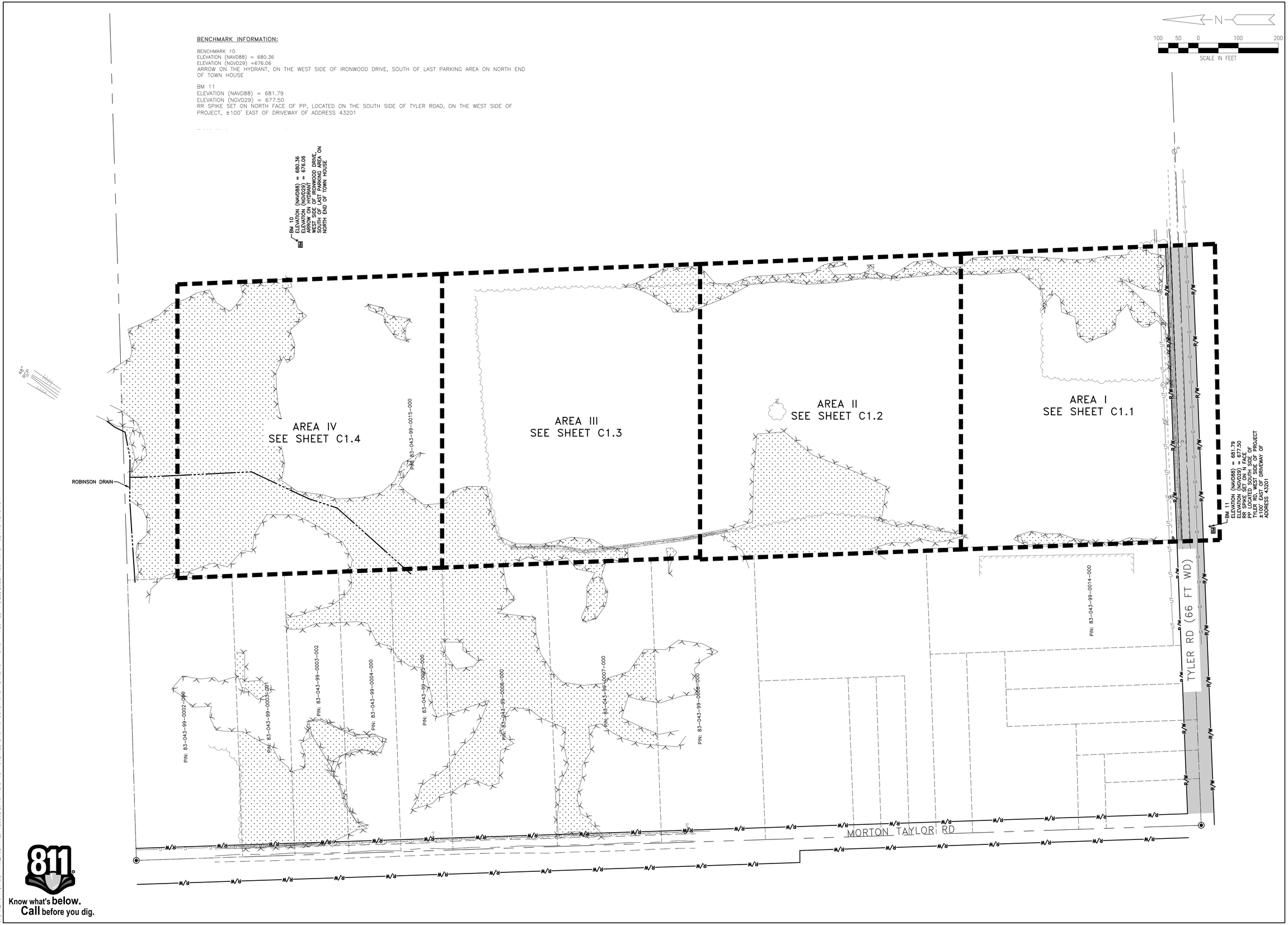
BENCHMARK INFORMATION:

BENCHMARK 10
ELEVATION (NAVD88) = 680.36
ELEVATION (NGVD29) =676.06
ARROW ON THE HYDRANT, ON THE WEST SIDE OF IRONWOOD DRIVE, SOUTH OF LAST PARKING AREA ON NORTH END OF TOWN HOUSE

BM 11
ELEVATION (NAVD88) = 681.79
ELEVATION (NGVD29) = 677.50
RR SPIKE SET ON NORTH FACE OF PP, LOCATED ON THE SOUTH SIDE OF TYLER ROAD, ON THE WEST SIDE OF PROJECT, ±100' EAST OF DRIVEWAY OF ADDRESS 43201



REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.5600
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

OVERALL EXISTING CONDITIONS PLAN
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C1.0

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PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C1.0-PLTS-VSP-OVERALL EXISTING CONDITIONS PLAN.DWG – C1.0 – PLOTTED 11/29/2022 4:55 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION: –

GPM2001.01F VAN BUREN MULTI-FAMILY

N

100 50 0 100 200

SCALE IN FEET

BM 10
ELEVATION (NAVD88) = 680.36
ELEVATION (NGVD29) = 676.06
ARROW ON HYDRANT
WEST SIDE OF FOXWOOD DRIVE
SOUTH OF LAST PARKING AREA ON
NORTH END OF TOWN HOUSE

48" RCP

ROBINSON DRAIN

EX. WATERCOURSE 1
(JUNE 1 & 4, 2021)

WETLAND D
±7.94 ACRES ONSITE
LIKELY EGLE REGULATED
(JUNE 1 & 4, 2021)

WETLAND D
SAMPLE POINT
(JUNE 1 & 4, 2021)

UPLAND
SAMPLE POINT
(JUNE 1 & 4, 2021)

EX. WATERCOURSE 2
(JUNE 1 & 4, 2021)

WETLAND F
±0.08 ACRES
LIKELY EGLE REGULATED
(JUNE 1 & 4, 2021)

UPLAND
SAMPLE POINT
(JUNE 1 & 4, 2021)

WETLAND F
SAMPLE POINT
(JUNE 1 & 4, 2021)

PIN: 83-043-99-0015-000

POTENTIAL FARMED
WETLAND AREA

UPLAND
SAMPLE POINT
(JUNE 1 & 4, 2021)

WETLAND C
SAMPLE POINT
(JUNE 1 & 4, 2021)

WETLAND C
±0.01 ACRES ONSITE
LIKELY EGLE REGULATED
(JUNE 1 & 4, 2021)

WETLAND B
±2.03 ACRES ONSITE
LIKELY EGLE REGULATED
(JUNE 1 & 4, 2021)

WETLAND B
SAMPLE POINT
(JUNE 1 & 4, 2021)

UPLAND
SAMPLE POINT
(JUNE 1 & 4, 2021)

WETLAND E
±2.01 ACRES ONSITE
LIKELY EGLE REGULATED
(JUNE 1 & 4, 2021)

WETLAND E
SAMPLE POINT
(JUNE 1 & 4, 2021)

UPLAND
SAMPLE POINT
(JUNE 1 & 4, 2021)

WETLAND A
±0.08 ACRES ONSITE
LIKELY NON-REGULATED
(JUNE 1 & 4, 2021)

UPLAND
SAMPLE POINT
(JUNE 1 & 4, 2021)

WETLAND A
SAMPLE POINT
(JUNE 1 & 4, 2021)

BM 11
ELEVATION (NAVD88) = 681.79
ELEVATION (NGVD29) = 677.50
RR SPIKE SET ON A FACE
PP LOCATED SOUTH SIDE OF
TYLER RD, WEST SIDE OF PROJECT
1100' EAST OF FOXWOOD DRIVE
ADDRESS 4,3201

PIN: 83-043-99-0014-000

TYLER RD (66 FT WD)

PIN: 83-043-99-0002-000

PIN: 83-043-99-0003-000

PIN: 83-043-99-0003-001

PIN: 83-043-99-0004-000

PIN: 83-043-99-0005-000

PIN: 83-043-99-0006-000

PIN: 83-043-99-0007-000

PIN: 83-043-99-0008-000

UPLAND
SAMPLE POINT

UPLAND
SAMPLE POINT

WETLAND D2
SAMPLE POINT

WETLAND D2
±1.67 ACRES ONSITE
LIKELY EGLE REGULATED

WETLAND DD
SAMPLE POINT

WETLAND DD
±12.77 ACRES ONSITE
LIKELY EGLE REGULATED
(±7.94 ACRES DELINEATED
JUNE 1 & 4, 2021)

MORTON TAYLOR RD

811
Know what's **below.**
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PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C1.7-PLTS-WIP-WETLAND PLANING – C1.5 – PLOTTED 11/29/2022 4:55 PM BY CLARK, VERONICA

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555 S. Saginaw Street, Suite 201
Flint, MI 48502
Ph: 810.766.9500
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

WETLAND PLAN
FOR
VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO.
GPM2001.01F

SHEET
C1.5

GPM2001.01F VAN BUREN MULTI-FAMILY

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NOTE

1. CONTRACTOR TO PICK UP DEBRIS WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.

N

100 50 0 100 200

SCALE IN FEET

811

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Call before you dig.

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.3500
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

OVERALL SESC PLAN

FOR

VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO.
GPM2001.01F

SHEET
C2.0

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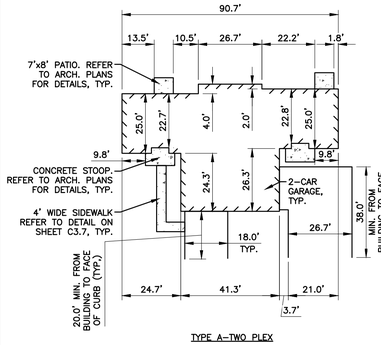
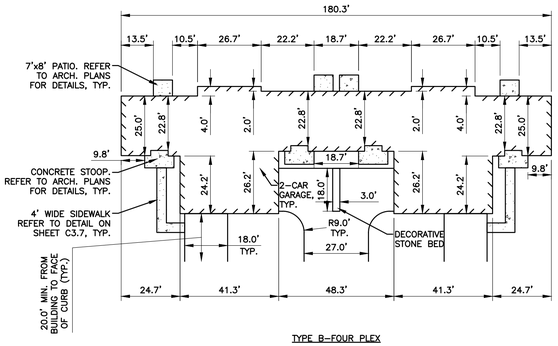
GPM2001.01F VAN BUREN MULTI-FAMILY

PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C2.0-PLTS-EED-OVERALL SESC PLAN.DWG – C2.0 – PLOTTED 11/29/2022 4:56 PM BY CLARK, VERONICA

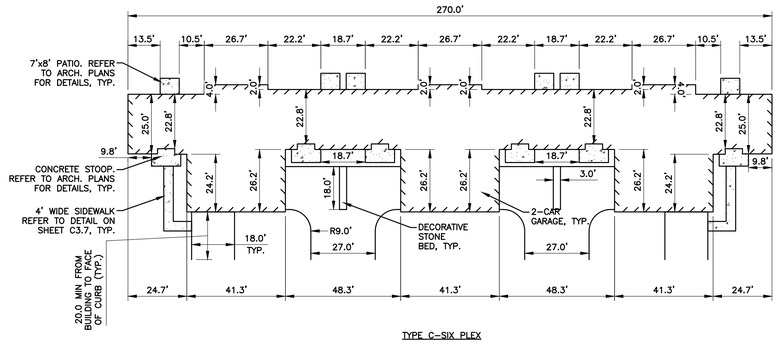
FIELD BOOK INFORMATION: –



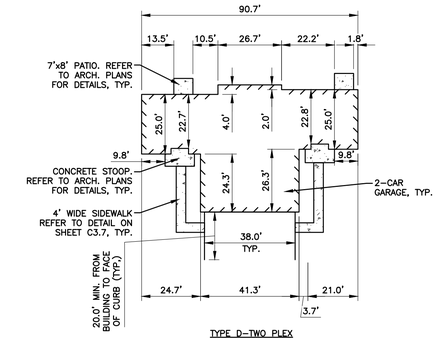
TYPE A–TWO PLEX



TYPE B–FOUR PLEX



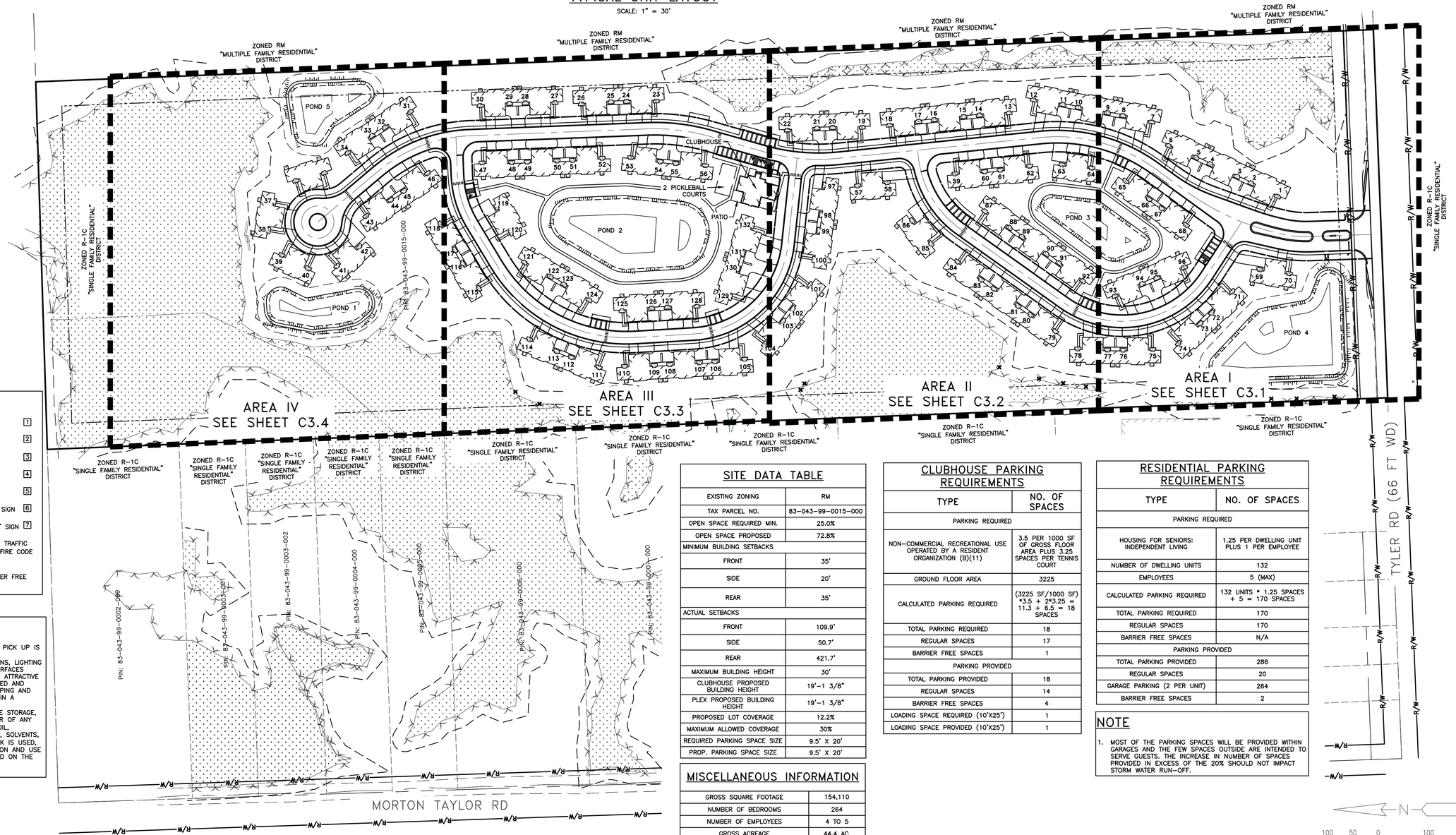
TYPE C–SIX PLEX



TYPE D–TWO PLEX

TYPICAL UNIT LAYOUT

SCALE: 1" = 30'



SIGN LEGEND

R1–1: 'STOP' SIGN	1
R7–8: 'BARRIER FREE PARKING' SIGN	2
R7–8P: 'VAN ACCESSIBLE' SIGN	3
R2–1: '25 MPH SPEED LIMIT' SIGN	4
R7–6: 'LOADING ZONE' SIGN	5
IFC D103.6: 'NO PARKING FIRE LANE' SIGN	6
R1–5(L&R): PEDESTRIAN CROSS WALK' SIGN	7

REFER TO MDOT MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES OR INTERNATIONAL FIRE CODE 2021 FOR DETAILS

REFER TO SITE SIGN BASE AND BARRIER FREE SIGN DETAILS ON SHEET C3.7

NOTE

1. GARBAGE COLLECTION CURB SIDE PICK UP IS ANTICIPATED.
2. PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES AND SURFACES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY DESIGNED AND CONSTRUCTED. PARKING LOT STRIPING AND MARKINGS SHALL BE MAINTAINED IN A CLEARLY VISIBLE CONDITION.
3. INFORMATION AND PLANS FOR THE STORAGE, LOADING, DISPOSAL AND TRANSFER OF ANY HAZARDOUS/TOXIC WASTE (GAS, OIL, TRANSMISSION FLUID, LUBRICANTS, SOLVENTS, ETC.). IF ANY UNDERGROUND TANK IS USED, THE LOCATION, SIZE, CONSTRUCTION AND USE OF THE TANK SHALL BE SPECIFIED ON THE SITE PLAN.
4. NO ON–STREET PARKING

Know what's **below.**
Call before you dig.

SITE DATA TABLE

EXISTING ZONING	RM
TAX PARCEL NO.	83–043–99–0015–000
OPEN SPACE REQUIRED MIN.	25.0%
OPEN SPACE PROPOSED	72.8%
MINIMUM BUILDING SETBACKS	
FRONT	35'
SIDE	20'
REAR	35'
ACTUAL SETBACKS	
FRONT	109.9'
SIDE	50.7'
REAR	421.7'
MAXIMUM BUILDING HEIGHT	30'
CLUBHOUSE PROPOSED BUILDING HEIGHT	19'–1 3/8"
PLEX PROPOSED BUILDING HEIGHT	19'–1 3/8"
PROPOSED LOT COVERAGE	12.2%
MAXIMUM ALLOWED COVERAGE	30%
REQUIRED PARKING SPACE SIZE	9.5' X 20'
PROP. PARKING SPACE SIZE	9.5' X 20'

MISCELLANEOUS INFORMATION

GROSS SQUARE FOOTAGE	154,110
NUMBER OF BEDROOMS	264
NUMBER OF EMPLOYEES	4 TO 5
GROSS ACREAGE	44.4 AC.
BUILDABLE AREA	36.4 AC.
DENSITY – DWELLING UNIT PER ACRE	132 UNITS/ 36.4 AC. 3.62 UNITS/AC.

CLUBHOUSE PARKING REQUIREMENTS

TYPE	NO. OF SPACES
PARKING REQUIRED	
NON–COMMERCIAL RECREATIONAL USE OPERATED BY A RESIDENT ORGANIZATION (B)(11)	3.5 PER 1000 SF OF GROSS FLOOR AREA PLUS 3.25 SPACES PER TENNIS COURT
GROUND FLOOR AREA	3225
CALCULATED PARKING REQUIRED	(3225 SF/1000 SF) *3.5 + 243.25 = 11.3 + 6.5 = 18 SPACES
TOTAL PARKING REQUIRED	18
REGULAR SPACES	17
BARRIER FREE SPACES	1
PARKING PROVIDED	
TOTAL PARKING PROVIDED	18
REGULAR SPACES	14
BARRIER FREE SPACES	4
LOADING SPACE REQUIRED (10'X25')	1
LOADING SPACE PROVIDED (10'X25')	1

RESIDENTIAL PARKING REQUIREMENTS

TYPE	NO. OF SPACES
PARKING REQUIRED	
HOUSING FOR SENIORS: INDEPENDENT LIVING	1.25 PER DWELLING UNIT PLUS 1 PER EMPLOYEE
NUMBER OF DWELLING UNITS	132
EMPLOYEES	5 (MAX)
CALCULATED PARKING REQUIRED	132 UNITS * 1.25 SPACES + 5 = 170 SPACES
TOTAL PARKING REQUIRED	170
REGULAR SPACES	170
BARRIER FREE SPACES	N/A
PARKING PROVIDED	
TOTAL PARKING PROVIDED	286
REGULAR SPACES	20
GARAGE PARKING (2 PER UNIT)	264
BARRIER FREE SPACES	2

NOTE

1. MOST OF THE PARKING SPACES WILL BE PROVIDED WITHIN GARAGES AND THE FEW SPACES OUTSIDE ARE INTENDED TO SERVE GUESTS. THE INCREASE IN NUMBER OF SPACES PROVIDED IN EXCESS OF THE 20% SHOULD NOT IMPACT STORM WATER RUN–OFF.

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
Phone: 810.239.2860
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

OVERALL SITE PLAN
FOR
VAN BUREN TOWNSHIP MULTI–FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C3.0

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GPM2001.01F VAN BUREN MULTI–FAMILY

PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C3.0-PLTS-CSP-OVERALL SITE PLAN.DWG – C3.0 – PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION:–

MATCHLINE SEE SHEET C3.2

POND 3

POND 4

N=269502.88
E=13368175.71

N=269485.48
E=13368372.66

N=269461.13
E=13368139.66

N=269436.52
E=13368398.06

N=269417.43
E=13368481.26

SIGN (TYP.), REFER TO LEGEND ON SHEET C3.0

N=269411.48
E=13368074.31

N=269361.52
E=13368085.31

N=269387.15
E=13368024.82

N=269345.02
E=13368032.69

N=269340.21
E=13368190.04

N=269336.41
E=13368245.06

N=269330.56
E=13368321.03

N=269339.62
E=13368266.63

N=269372.96
E=13368430.71

N=269374.50
E=13368485.85

N=269384.13
E=13368525.23

CONCRETE SIDEWALK (TYP.), VAN BUREN CHARTER TOWNSHIP STANDARD SIDEWALK DETAILS ON SHEET SW-1

CONCRETE DRIVE (TYP.), SEE DETAIL ON SHEET C3.7

PRECAST CONCRETE BUMPER (TYP.), SEE DETAIL ON SHEET C3.8

SEE 90° PARKING STRIPING DETAIL ON SHEET C3.8 (TYP)

CONCRETE SIDEWALK (TYP.), VAN BUREN CHARTER TOWNSHIP STANDARD SIDEWALK DETAILS ON SHEET SW-1

N=269267.23
E=13368176.25

STOP BAR (TYP.), SEE DETAIL ON SHEET C3.8

CROSSWALK (TYP.), SEE DETAIL ON SHEET C3.8

N=269215.22
E=13368157.86

N=269210.47
E=13368178.66

TYPE OF BUILDING (TYP.), SEE SHEET C3.0

N=269121.40
E=13368172.69

N=269178.36
E=13368232.23

N=269137.59
E=13368225.42

N=269172.91
E=13368337.58

N=269129.72
E=13368371.89

WAYNE COUNTY ROAD COMMISSION INTEGRAL STRAIGHT CURB AT ISLAND (TYP), SEE DETAIL ON SHEET C3.7

MOUNTABLE CURB AND GUTTER (TYP), SEE DETAIL ON SHEET C3.7

WAYNE COUNTY ROAD COMMISSION INTEGRAL STRAIGHT CURB AT ISLAND (TYP), SEE DETAIL ON SHEET C3.7

STANDARD HMA PAVEMENT (TYP.), SEE DETAIL ON SHEET C3.7

MOUNTABLE CURB AND GUTTER (TYP), SEE DETAIL ON SHEET C3.7

R200.0'
R330.0'
R500.0'
R30.0'
R30.0'
R9.3'
R230.0'
R8.2'
R8.2'

85.1'
91.5'
24.8'
143.1'
20.5'
21.8'
22.7'
109.9'
95.3'
22.0'
16.3'
22.0'
23.6' BC-BC
15.1' BC-BC
23.6' BC-BC
25.0'
27.0' BC-BC
8.0'
5.0'
7.0'
19.0'
10.0'
8.5'
8.0'
9.5'
6.0'
3.0'

50' SIDE SETBACK

50' FRONT SETBACK

FRONT SETBACK

ACCESS AND UTILITY EASEMENT

EX CONDUIT

TYLER RD (66 FT WD)

SS-200127
RIM = 679.12
15" RCP E = 667.82
15" RCP W = 667.82

FOR BLOW UP OF MAIN DRIVE ENTRY SEE SHEET C3.5 & C3.6

BM 11
ELEVATION (NAVD88) = 681.79
ELEVATION (NGVD29) = 677.50
RR SPIKE SET ON N FACE
PP LOCATED SOUTH SIDE OF TYLER RD, WEST SIDE OF PROJECT
±100' EAST OF DRIVEWAY OF ADDRESS 43201

ZONED R-1C "SINGLE FAMILY RESIDENTIAL" DISTRICT

N

SCALE IN FEET

30 15 0 30 60

Know what's **below.**
Call before you dig.

REV#	DATE	DESCRIPTION	BY

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555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.5555
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

SITE PLAN - I

FOR

VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO.
GPM2001.01F

SHEET
C3.1

GPM2001.01F VAN BUREN MULTI-FAMILY

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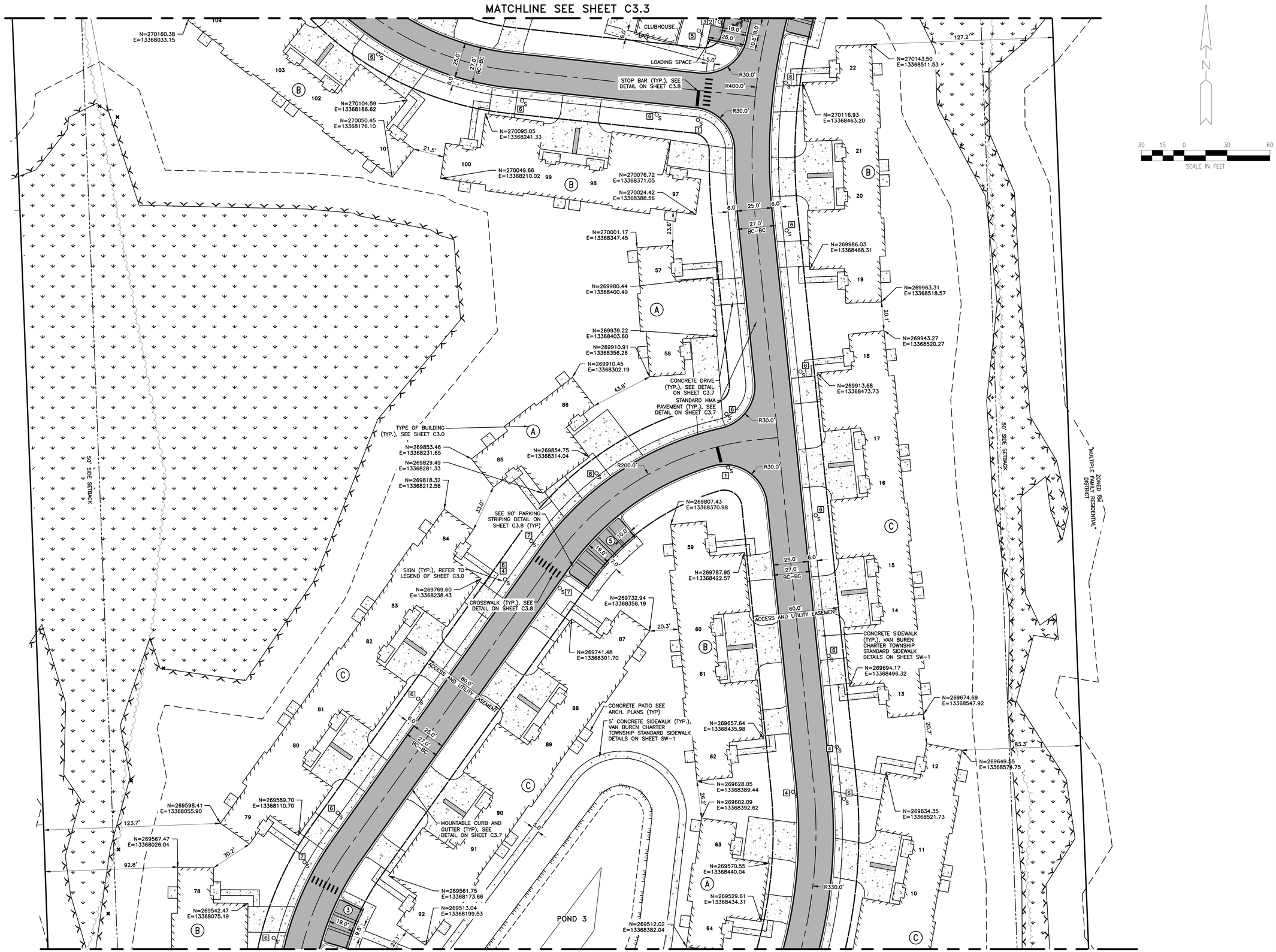
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C3.1-PLTS-CSP-SITE PLAN.DWG – C3.1 – PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA

FIELD BOOK INFORMATION: –



Know what's **below.** **Call** before you dig.

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.5555
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180
SITE PLAN – II
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C3.2

GPM2001.01F VAN BUREN MULTI-FAMILY

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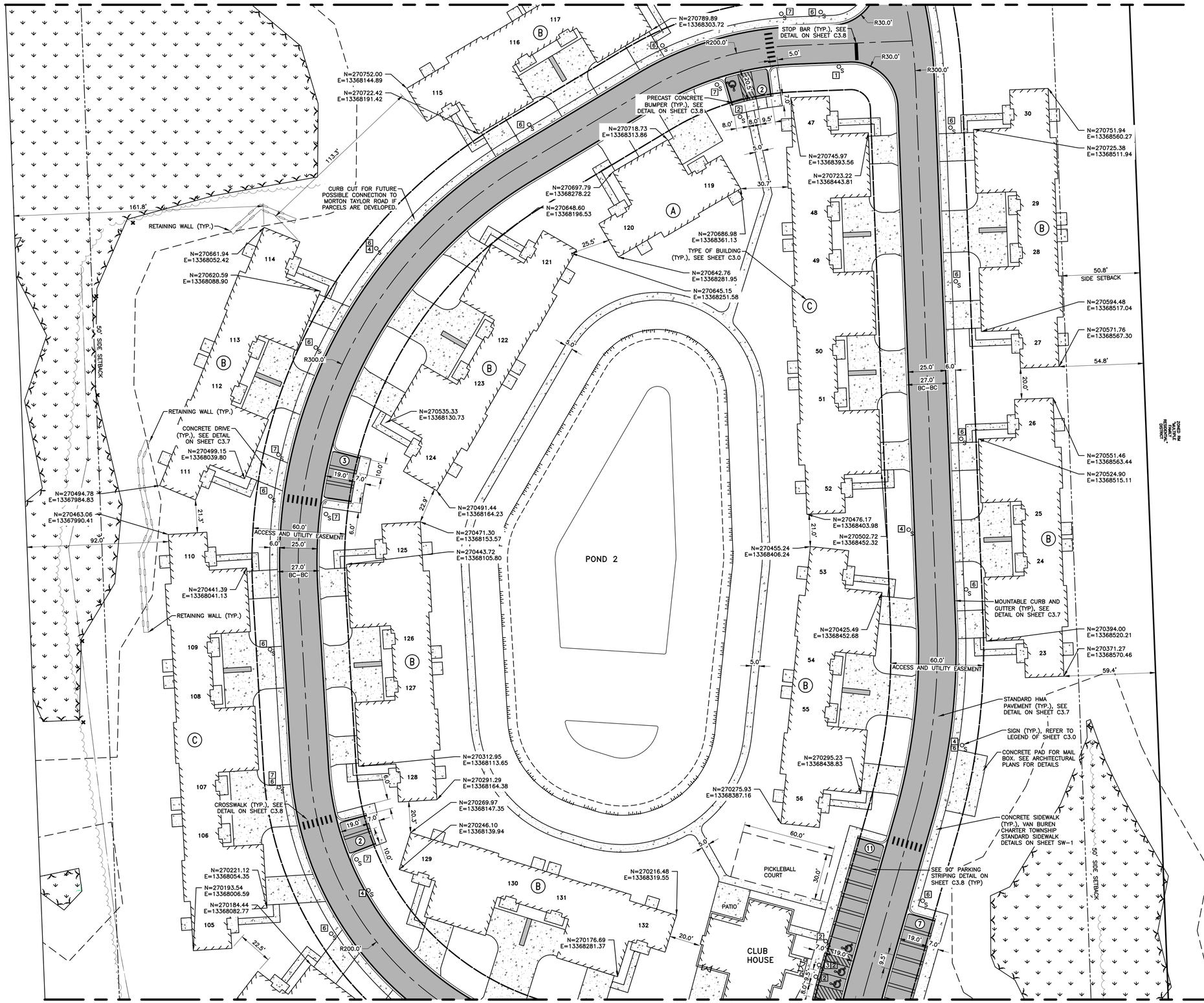
PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C3.1-PLTS-CSP-SITE PLAN.DWG – C3.2 – PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION: –

MATCHLINE SEE SHEET C3.4



N

SCALE IN FEET

30 15 0 30 60

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.5555
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

SITE PLAN – III

FOR

VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO.
GPM2001.01F

SHEET
C3.3

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GPM2001.01F VAN BUREN MULTI-FAMILY

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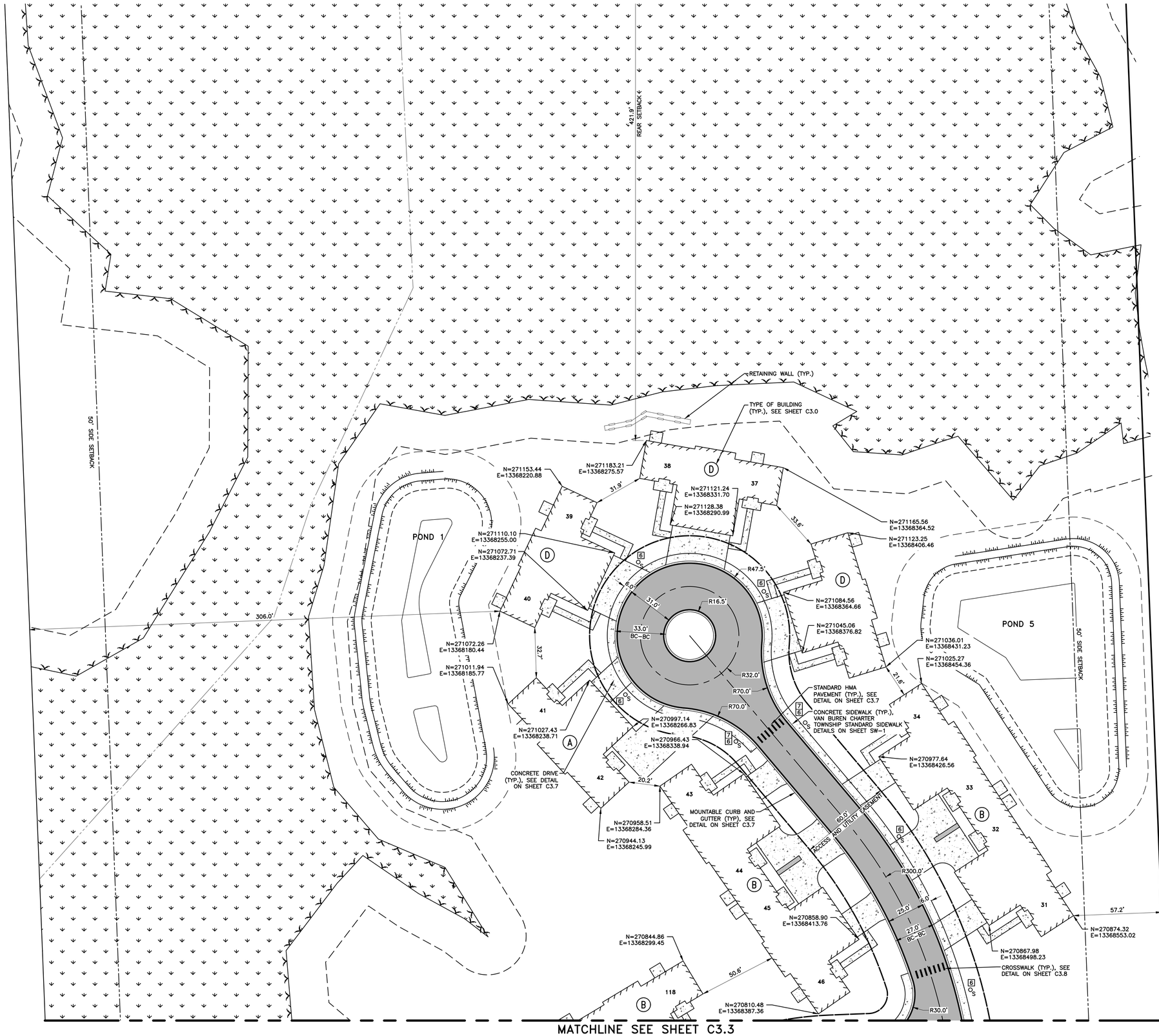
PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C3.1-PLTS-CSP-SITE PLAN.DWG – C3.3 – PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA

FIELD BOOK INFORMATION: –



MATCHLINE SEE SHEET C3.3

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555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.5555
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GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

SITE PLAN – IV
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C3.4

GPM2001.01F VAN BUREN MULTI-FAMILY

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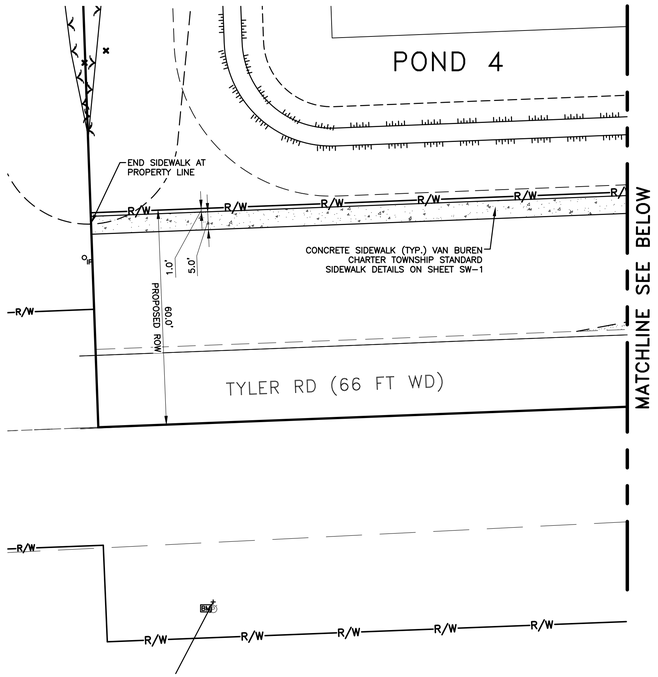
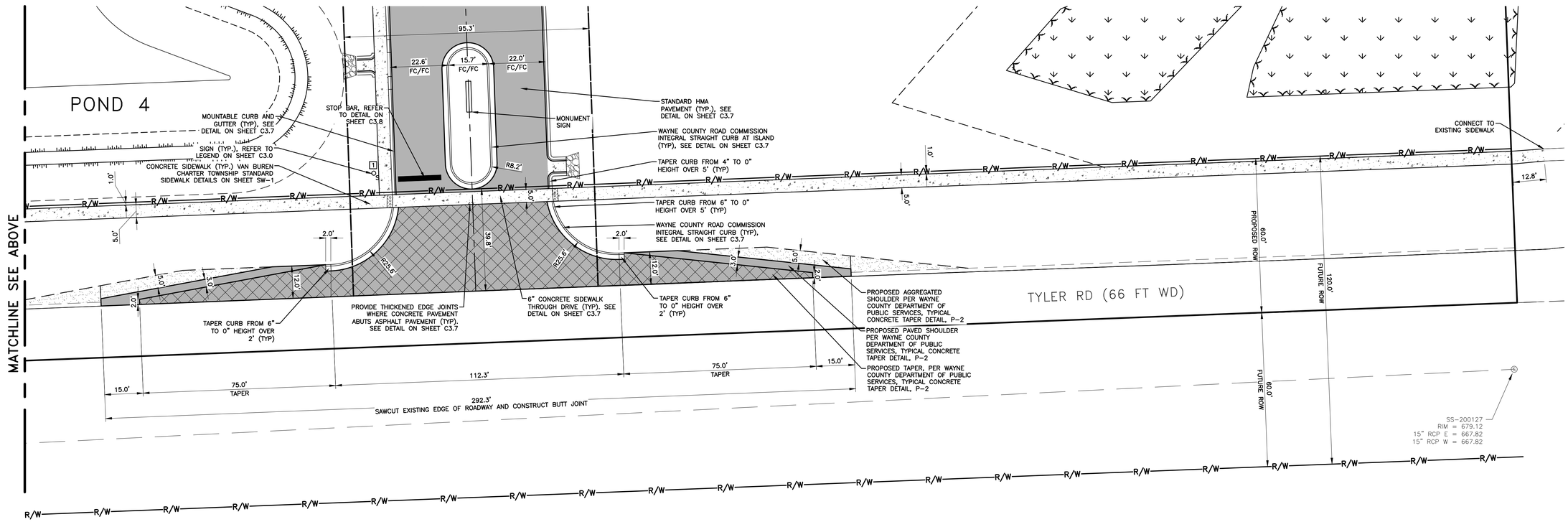
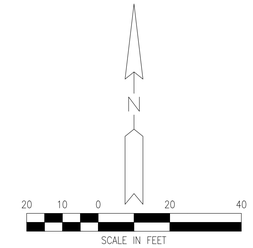
PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C3.1-PLTS-CSP-SITE PLAN.DWG – C3.4 – PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION: –







REV#	DATE	DESCRIPTION	BY

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Flint, MI 48502
810.785.5555
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

DRIVE ENTRY BLOW UP - SITE

FOR

VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C3.5

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GPM2001.01F VAN BUREN MULTI-FAMILY

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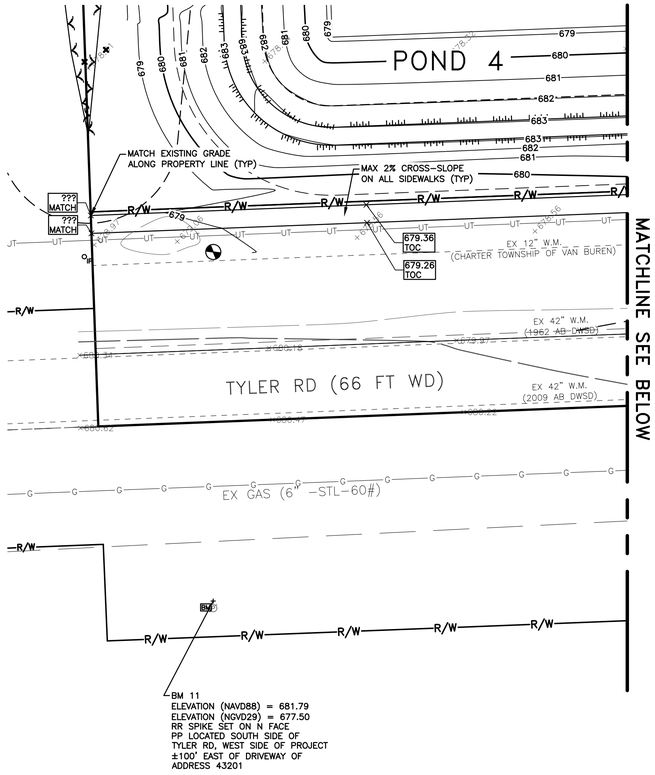
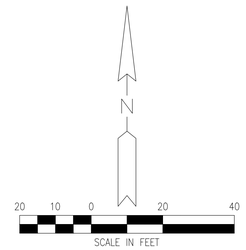
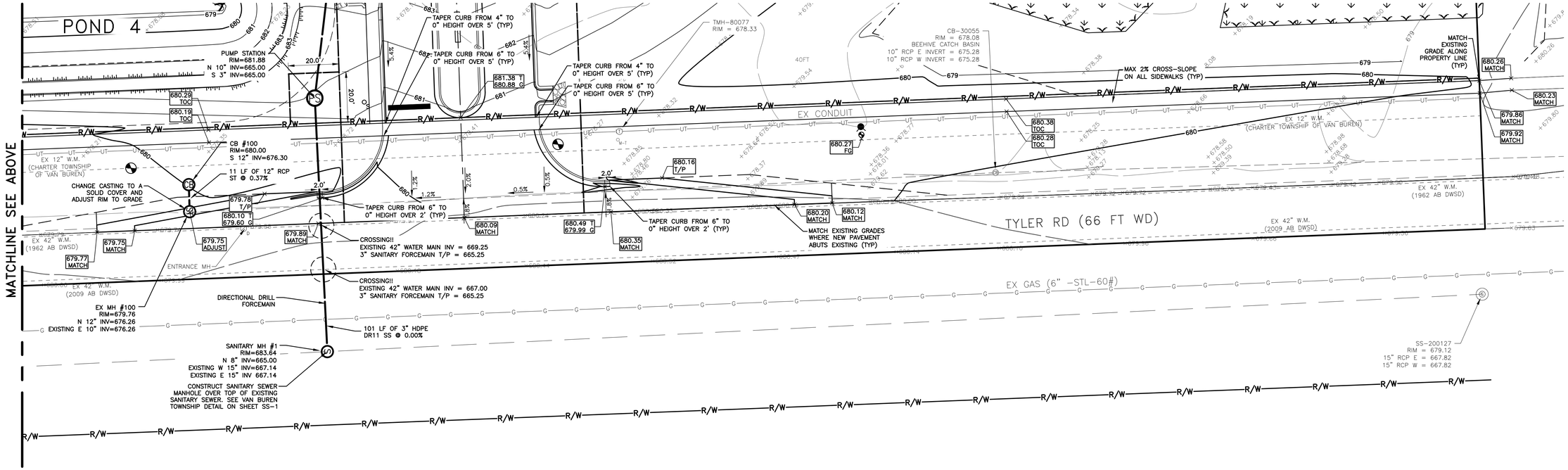
PROJECT MANAGER:-
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\PLTS-CSP-SITEPLAN-BLOW UP.DWG - 3.5 - PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA

FIELD BOOK INFORMATION:-







Know what's **below.**
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PROJECT MANAGER:
C:\PW_WSPA\WADE-TRIM_VCLARK\0112995\2\PLTS-CSP-SITEPLAN-BLOW UP-GRADING & UTILITY.DWG – LAYOUT1 – PLOTTED 11/29/2022 4:58 PM BY CLARK, VERONICA
FIELD BOOK INFORMATION:

REV#	DATE	DESCRIPTION	BY

WADE TRIM
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GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

DRIVE ENTRY BLOW UP – GRADING & UTILITY
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

GPM2001.01F VAN BUREN MULTI-FAMILY

JOB NO.
GPM2001.01F

SHEET
C3.6

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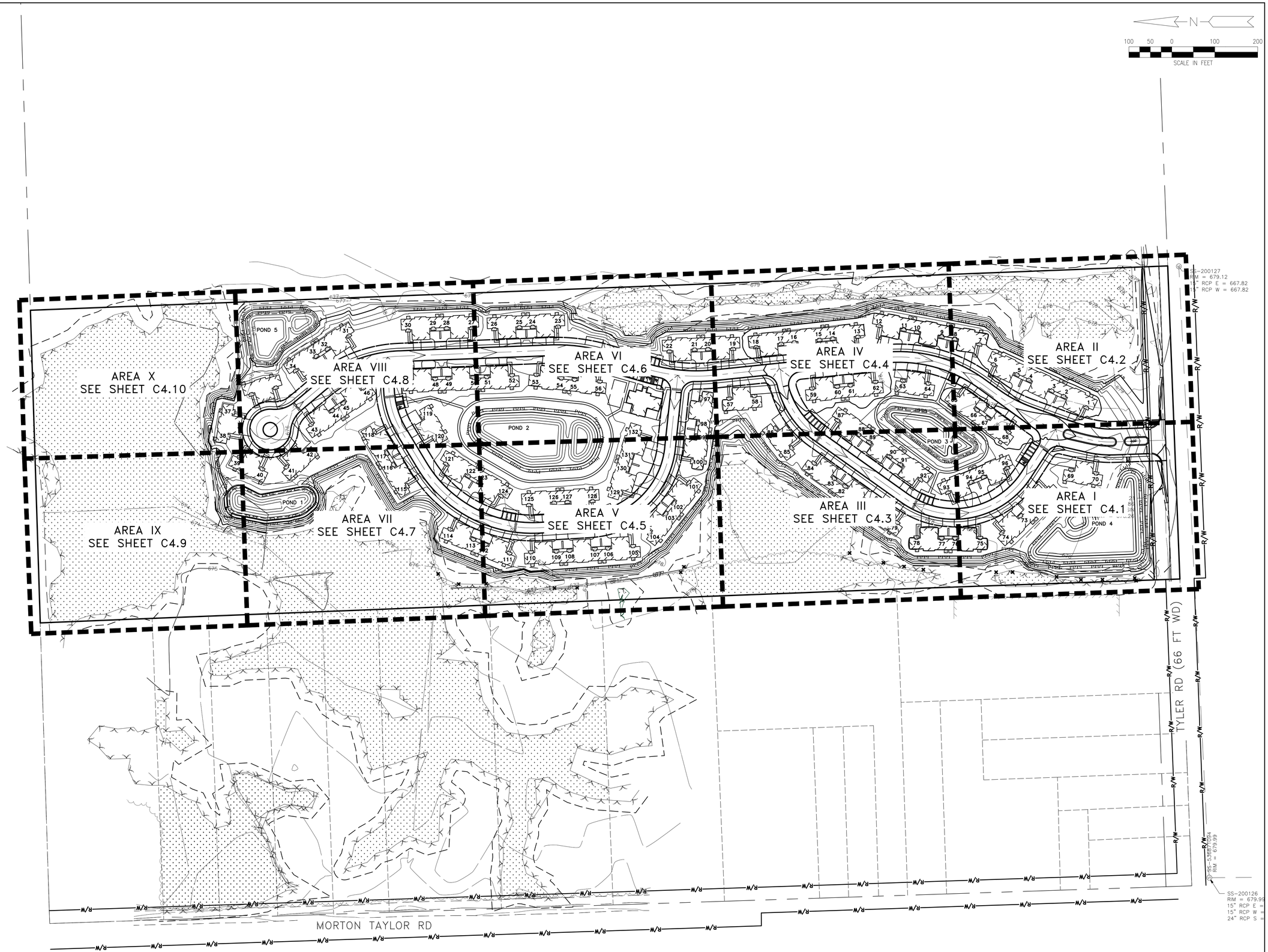

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
Phone: 810.239.2860
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

OVERALL GRADING PLAN
FOR
VAN BUREN TOWNSHIP MULTI-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C4.0

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GPM2001.01F VAN BUREN MULTI-FAMILY

PROJECT MANAGER:-
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C4.0-PLTS-CGP-OVERALL GRADING PLANDWG - C4.0 - PLOTTED 11/29/2022 4:59 PM BY CLARK, VERONICA

FIELD BOOK INFORMATION:-

811
Know what's below.
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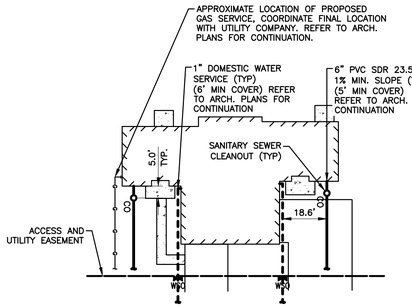
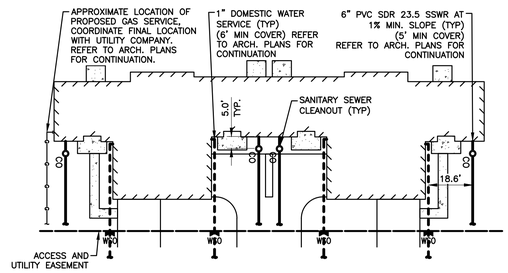
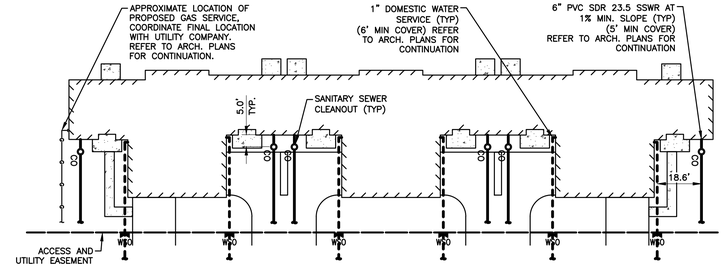


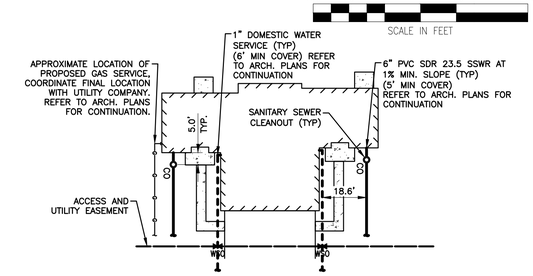
TYPE A–TWO PLEX



TYPE B–FOUR PLEX



TYPE C–SIX PLEX



TYPE D–TWO PLEX

TYPICAL UNIT LAYOUT

SCALE: 1" = 30'

N

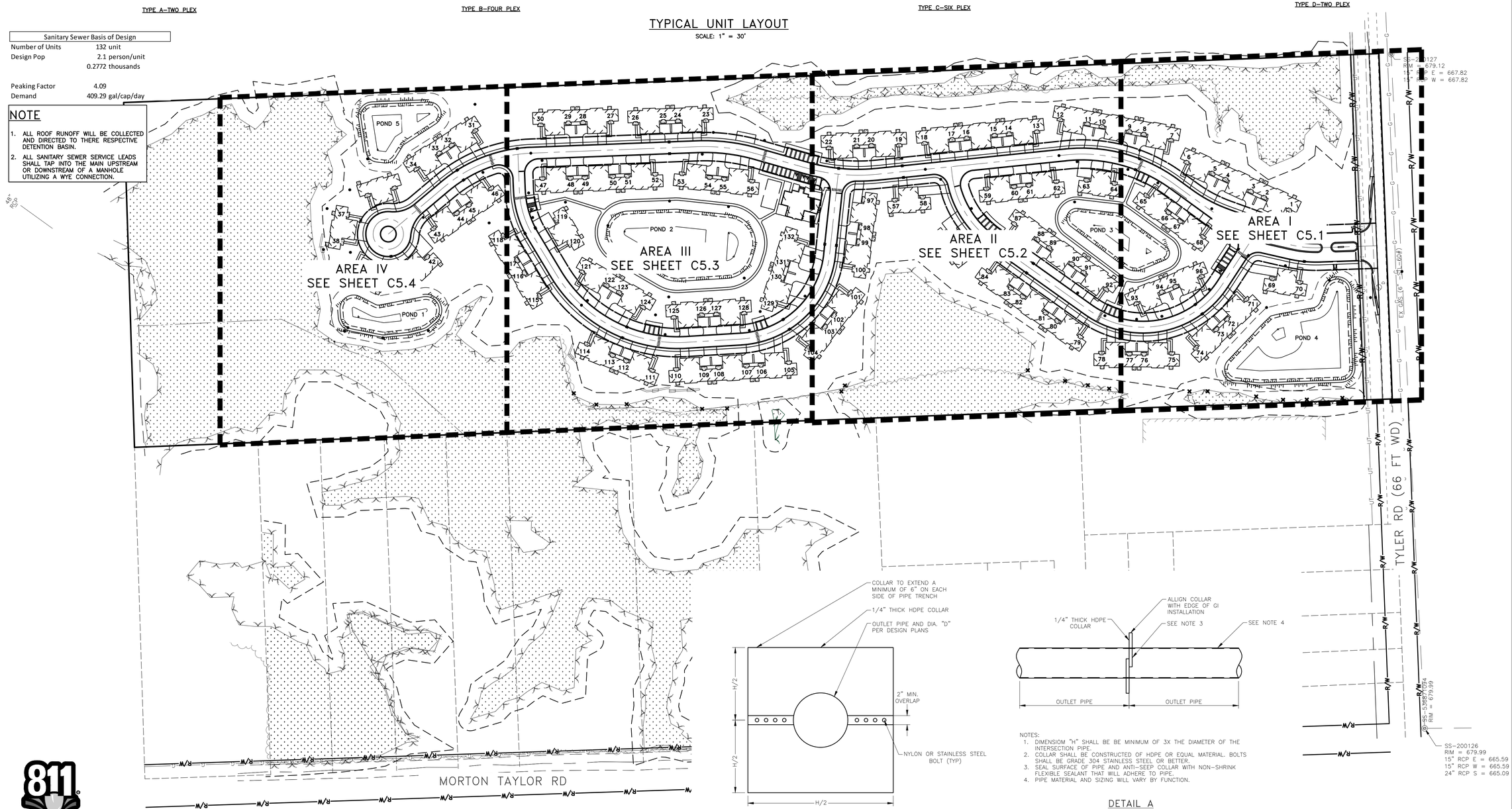
100 50 0 100 200

SCALE IN FEET

Sanitary Sewer Basis of Design	
Number of Units	132 unit
Design Pop	2.1 person/unit
	0.2772 thousands
Peaking Factor	4.09
Demand	409.29 gal/cap/day

NOTE

1. ALL ROOF RUNOFF WILL BE COLLECTED AND DIRECTED TO THERE RESPECTIVE DETENTION BASIN.
2. ALL SANITARY SEWER SERVICE LEADS SHALL TAP INTO THE MAIN UPSTREAM OR DOWNSTREAM OF A MANHOLE UTILIZING A WYE CONNECTION.



SECTION
ANTI–SEEP COLLAR

NOTES:
1. DIMENSIOM "H" SHALL BE BE MINIMUM OF 3X THE DIAMETER OF THE INTERSECTION PIPE.
2. COLLAR SHALL BE CONSTRUCTED OF HDPE OR EQUAL MATERIAL. BOLTS SHALL BE GRADE 304 STAINLESS STEEL OR BETTER.
3. SEAL SURFACE OF PIPE AND ANTI–SEEP COLLAR WITH NON–SHRINK FLEXIBLE SEALANT THAT WILL ADHERE TO PIPE.
4. PIPE MATERIAL AND SIZING WILL VARY BY FUNCTION.

DETAIL A
PIPE CONNECTION WITH ANTI–SEEP COLLAR

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555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.239.2555
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180
OVERALL UTILITY PLAN
FOR
VAN BUREN TOWNSHIP MULTI–FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C5.0

GPM2001.01F VAN BUREN MULTI–FAMILY

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PROJECT MANAGER: –
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C5.0-PLTS-CUP-OVERALL UTILITY PLAN.DWG – C5.0 – PLOTTED 11/29/2022 5:00 PM BY CLARK, VERONICA

FIELD BOOK INFORMATION: –

PROPOSED LEGEND

DRAINAGE AREA DESIGNATION — 1
DRAINAGE AREA IN ACRES — 0.04
DRAINAGE BOUNDARY

N

100 50 0 100 200
SCALE IN FEET

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WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.3500
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180
OVERALL EXISTING DRAINAGE PLAN
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C6.0

GPM2001.01F VAN BUREN MULTI-FAMILY

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PROJECT MANAGER:-
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\C6.0-PLTS-CDD-OVERALL EX DRAINAGE PLAN.DWG - C6.0 - PLOTTED 11/29/2022 5:01 PM BY CLARK, VERONICA

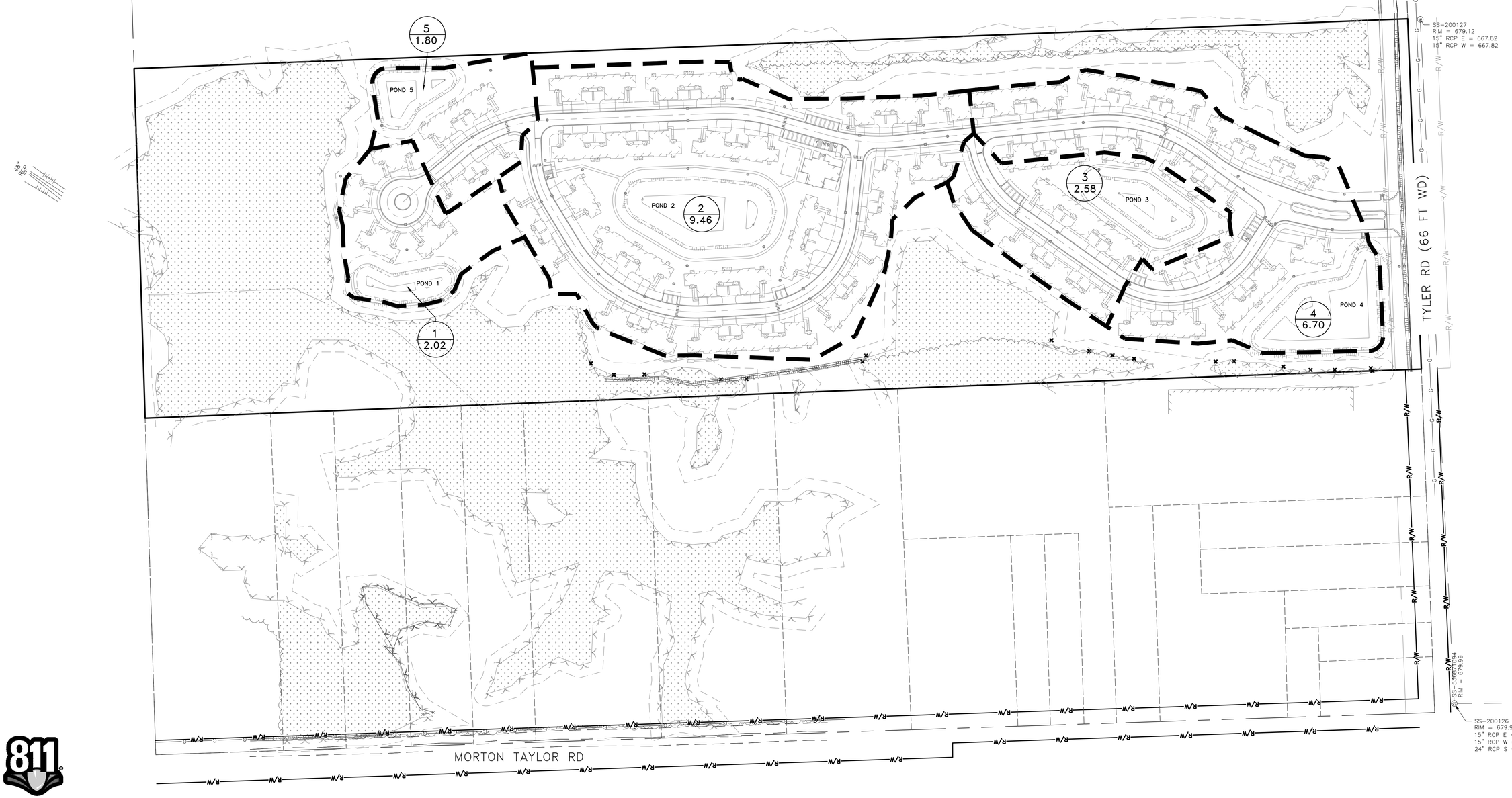
FIELD BOOK INFORMATION:-

PROPOSED LEGEND

DRAINAGE AREA DESIGNATION — 1
DRAINAGE AREA IN ACRES — 0.04
DRAINAGE BOUNDARY

N

100 50 0 100 200
SCALE IN FEET



REV#	DATE	DESCRIPTION	BY

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Flint, MI 48502
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www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

OVERALL PROPOSED DRAINAGE PLAN
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO.
GPM2001.01F

SHEET
C6.1

GPM2001.01F VAN BUREN MULTI-FAMILY

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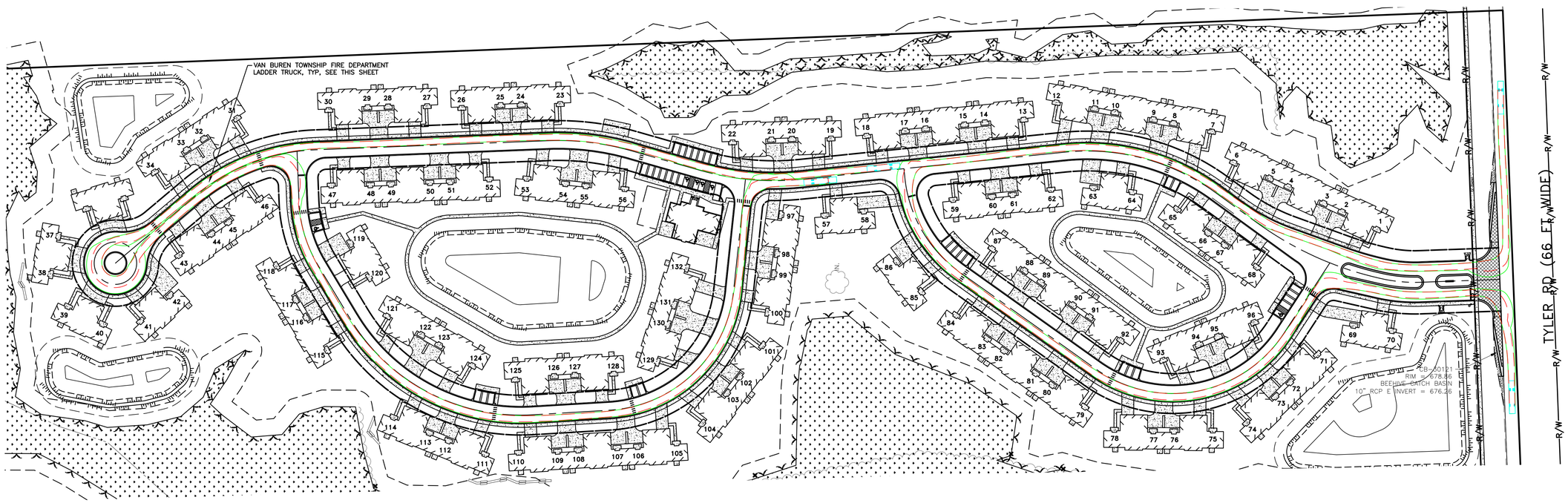
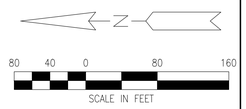
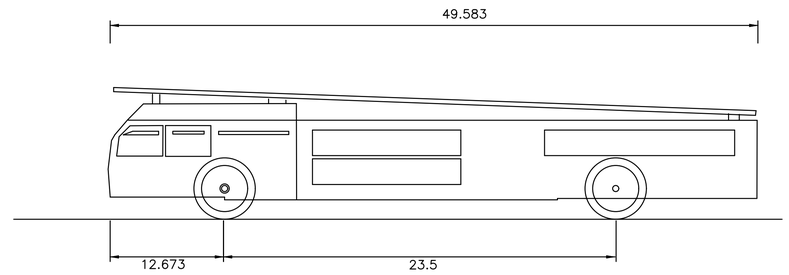
FIELD BOOK INFORMATION:-







VAN BUREN TOWNSHIP FIRE DEPARTMENT LADDER TRUCK

Overall Length	49.583ft
Overall Width	8.750ft
Overall Body Height	7.916ft
Min Body Ground Clearance	1.166ft
Track Width	8.420ft
Lock-to-lock time	5.00s
Curb to Curb Turning Radius	37.000ft

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REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.239.5500
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

FIRE TRUCK PLAN
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET C8.0

GPM2001.01F VAN BUREN MULTI-FAMILY

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PROJECT MANAGER:-
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\PLTS-CSP-TRUCK PLAN WITH VB FIRE TRUCK TURN.DWG - C8.0 - PLOTTED 11/29/2022 5:02 PM BY CLARK, VERONICA

FIELD BOOK INFORMATION:-

UNITS: 132 TOTAL UNITS

REQUIRED: 2 TREES/UNIT + 4 SHRUBS/UNIT

TOTAL REQUIRED: 264 TREES + 528 SHRUBS

PROVIDED: 2 TREES/UNIT + 4 SHRUBS/UNIT

TOTAL REQUIRED: 264 TREES + 528 SHRUBS

NOTE: ORNAMENTAL TREES LOCATED IN FRONT OF BUILDING WHEN POSSIBLE.
SHRUBS LOCATED IN FRONT OF BUILDING AS FOUNDATION PLANTING.

SEE PLANT LIST SHEET L2.1

STORMWATER:
SEED + PLUG MIX IN BASINS SURROUNDED

BY DECIDUOUS AND ORNAMENTAL TREES

EASEMENT:

NO EASEMENT

N

100 50 0 100 200

SCALE IN FEET

ZONE: RM-MULTIPLE FAMILY RES

BUFFER-A: 2675'

REQUIRED: 20' WIDE, 1 TREE/30' = 89.1 TREES

PROVIDED: HEAVILY WOODED AREA AND HEAVILY WOODED WETLAND WITH 5 DECIDUOUS AND 3
EVERGREEN TREES EXCEEDING REQUIREMENTS

ZONE: R-1C SINGLE FAMILY RES

BUFFER-B: 730'

REQUIRED: 20' WIDE, 1 TREE/20' (MIN 50% EVERGREEN) = 36.5 TREES

PROVIDED: HEAVILY WOODED WETLAND EXCEEDING REQUIREMENTS

48" INV
INV=670.23

POND 1

POND 2

POND 3

POND 4

POND 5

TYLER RD (66 FT WD)

FRONTAGE 730'-50' DRIVE=680'

REQUIRED: 1 DECIDUOUS OR EVERGREEN/40'= 17 TREES, 1
ORNAMENTAL/100'=6.8 TREES, 8 SHRUBS/40'= 136 SHRUBS

PROVIDED: 11 DECIDUOUS TREES, 6 EVERGREEN TREES, 7
ORNAMENTAL TREES, 136 SHRUBS

ZONE: R-1C SINGLE FAMILY RES

BUFFER-B 2675'

REQUIRED: 20' WIDE, 1 TREE/20' (MIN 50% EVERGREEN) = 133.75 TREES

PROVIDED: HEAVILY WOODED WETLAND WITH 6 DECIDUOUS AND 8 EVERGREEN TREES

MORTON TAYLOR RD

811
Know what's **below.**
Call before you dig.

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555 S. Saginaw Street, Suite 201
Flint, MI 48502
Ph: 810-239-2860
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

OVERALL LANDSCAPE PLAN
FOR
VAN BUREN TOWNSHIP MULT-FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO.
GPM2001.01F

SHEET
L1.0

GPM2001.01F VAN BUREN MULTI-FAMILY

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PROJECT MANAGER:
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\L1.0-PLTS-LLP-OVERALL LANDSCAPE PLAN.DWG - C3.0 - PLOTTED 11/30/2022 8:06 AM BY CLARK, VERONICA

FIELD BOOK INFORMATION:-

MATCHLINE SEE SHEET L1.2

POND 3

POND 4

VISITOR PARKING SCREENING

FOUNDATION PLANTING

GREEN GIANT ARBORVITAE SCREENING HEDGE, 5'-6' HEIGHT, 4' SPACING

DETENTION POND WITH SEED AND PLUG MIX

EVERGREEN TREE

DECIDUOUS SHADE TREE

ORNAMENTAL TREE

ENTRY SIGN AND LANDSCAPING

LAWN

TYLER RD (66 FT WD)

TYLER ROAD

R/W

UT

30 15 0 30 60

SCALE IN FEET

N

Know what's **below.**
Call before you dig.

PROJECT MANAGER:–
C:\PW_WORK\WADE-TRIM_VCLARK\D1129952\L1.1-PLTS-LLP-LANDSCAPE PLAN.DWG – L1.1 – PLOTTED 11/30/2022 8:08 AM BY CLARK, VERONICA

FIELD BOOK INFORMATION:–

REV#	DATE	DESCRIPTION	BY

WADE TRIM
555 S. Saginaw Street, Suite 201
Flint, MI 48502
810.785.3555
www.wadetrim.com

GARNER PROPERTY MANAGEMENT
23944 EUREKA ROAD, SUITE 105
TAYLOR, MI 48180

LANDSCAPE PLAN – I

FOR

VAN BUREN TOWNSHIP MULT–FAMILY RESIDENTIAL

ISSUED FOR:	DATE:	BY:
SPA	7/27/22	KPR
SPA	9/14/22	VBC

JOB NO. GPM2001.01F

SHEET L1.1

GPM2001.01F VAN BUREN MULTI-FAMILY

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MATCHLINE SEE SHEET L1.3

EVERGREEN TREE

LAWN

DENSE YEW SCREENING HEDGE, 4' HEIGHT, 4' SPACING

GREEN GIANT ARBORVITAE SCREENING HEDGE, 5'–6' HEIGHT, 4' SPACING

VISITOR PARKING SCREENING

FOUNDATION PLANTING

GREEN GIANT ARBORVITAE SCREENING HEDGE, 5'–6' HEIGHT, 4' SPACING

ORNAMENTAL TREE

DECIDUOUS SHADE TREE

DETENTION POND WITH SEED AND PLUG MIX

POND 3

MATCHLINE SEE SHEET L1.1

N

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FOR

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NORWAY SPRUCE SCREENING, 6'-8' HEIGHT, 12' SPACING

GREEN GIANT ARBORVITAE SCREENING HEDGE, 5'-6' HEIGHT, 4' SPACING

DECIDUOUS SHADE TREE

FOUNDATION PLANTING

ORNAMENTAL TREE

DETENTION POND WITH SEED AND PLUG MIX

POND 2

LAWN

CLUB HOUSE

GREEN GIANT ARBORVITAE SCREENING HEDGE, 5'-6' HEIGHT, 4' SPACING

NORWAY SPRUCE SCREENING, 6'-8' HEIGHT, 12' SPACING

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FOR

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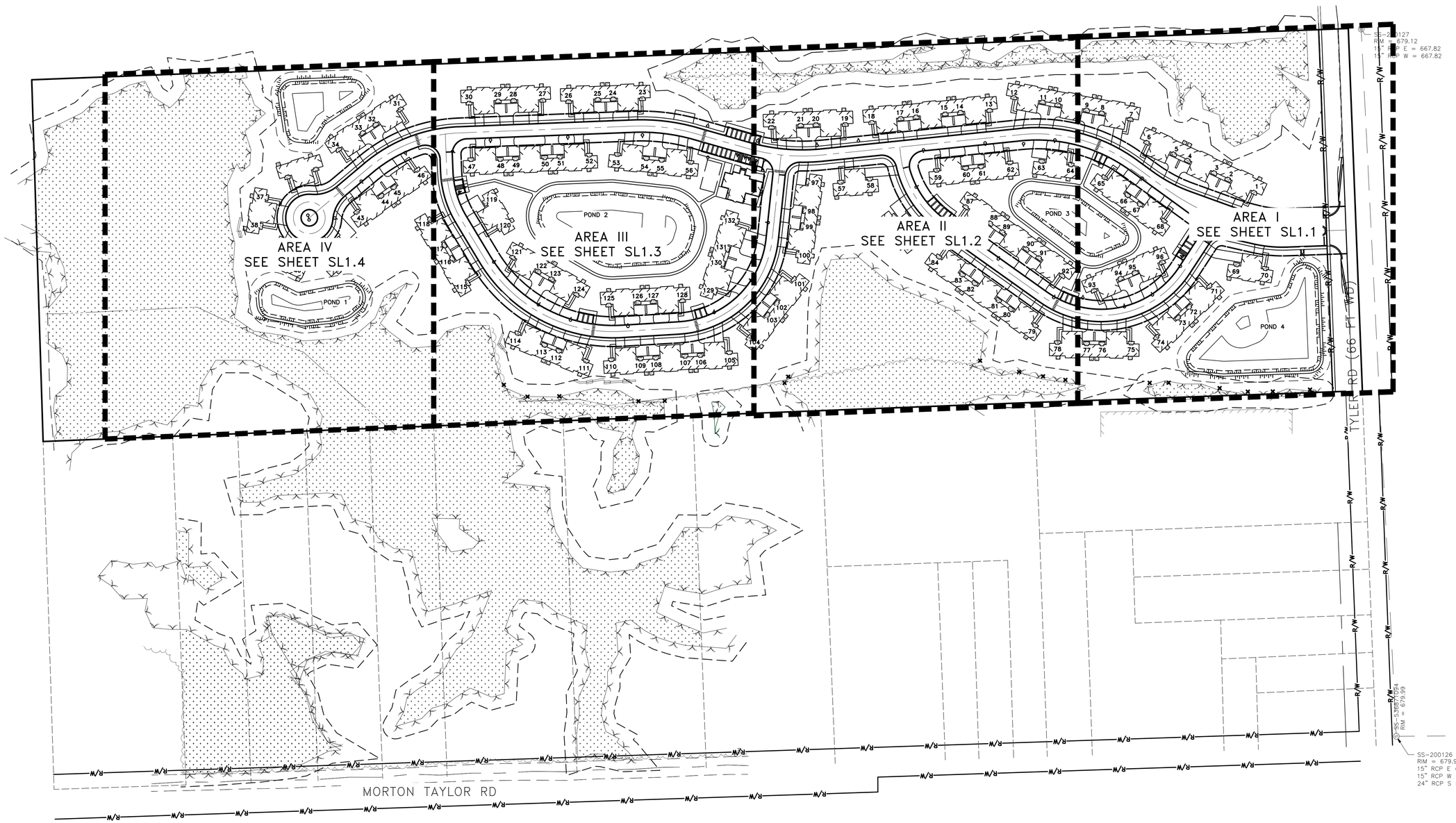

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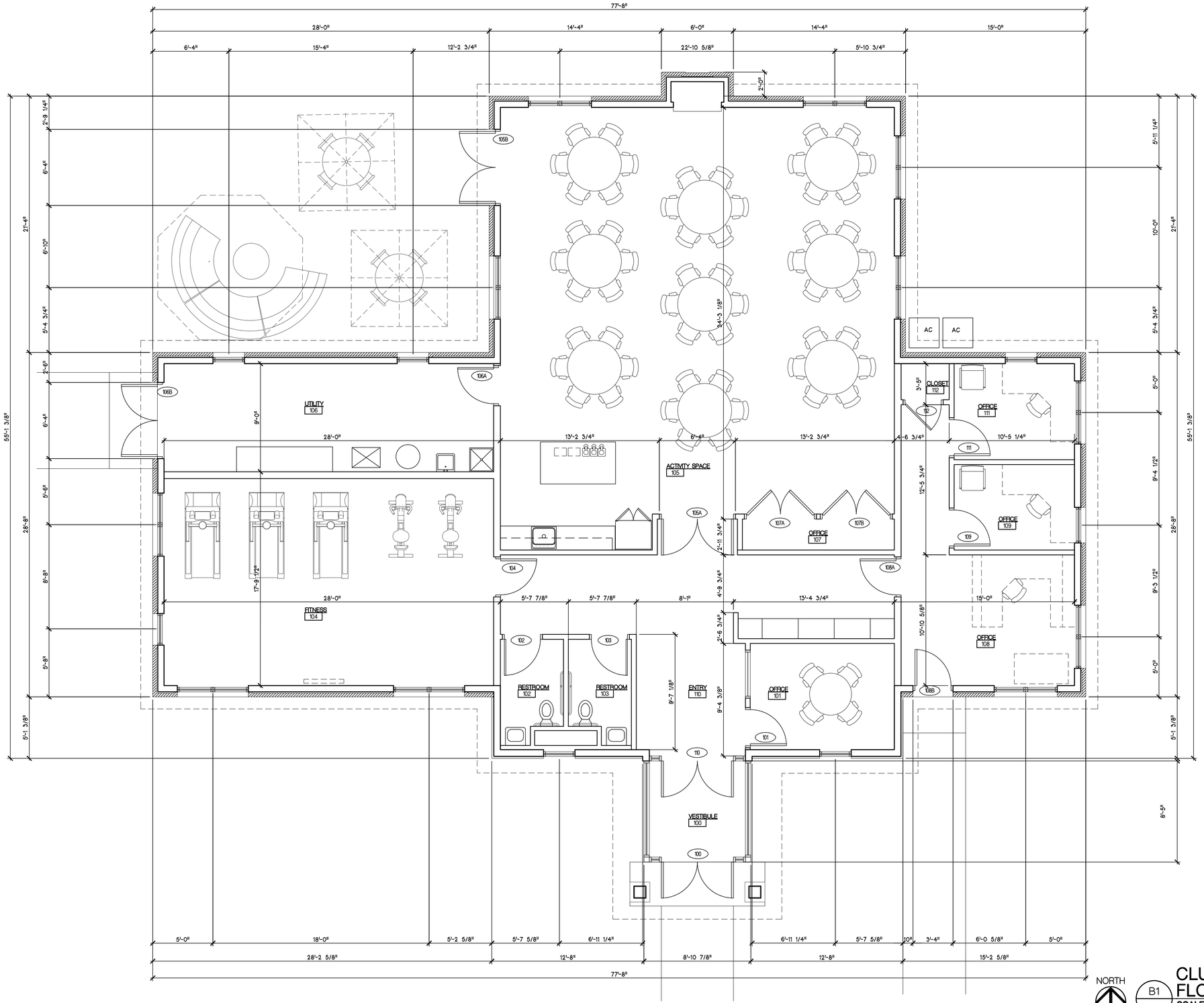

CLUBHOUSE FLOOR PLAN

B1
AC110
SASHAC110

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

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Van Buren Township, MI

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SHEET NUMBER

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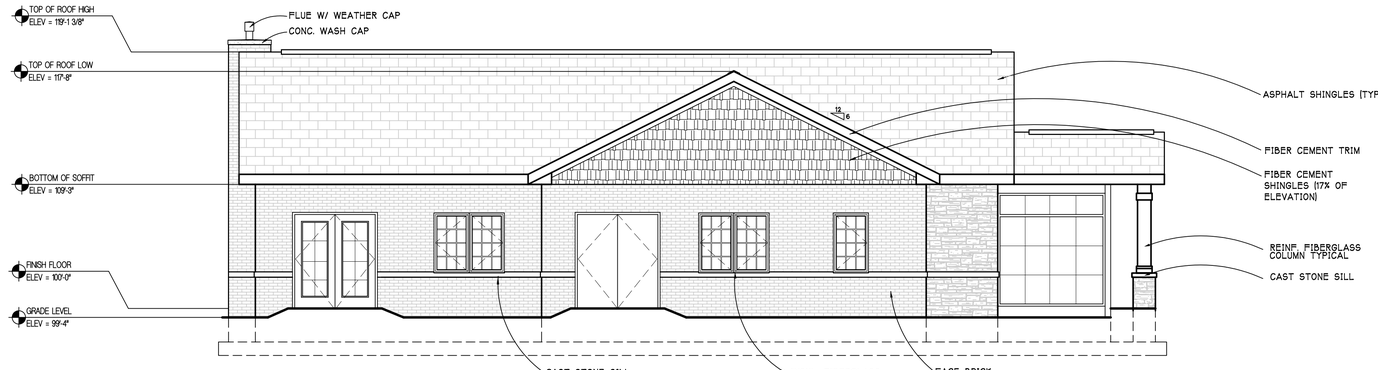
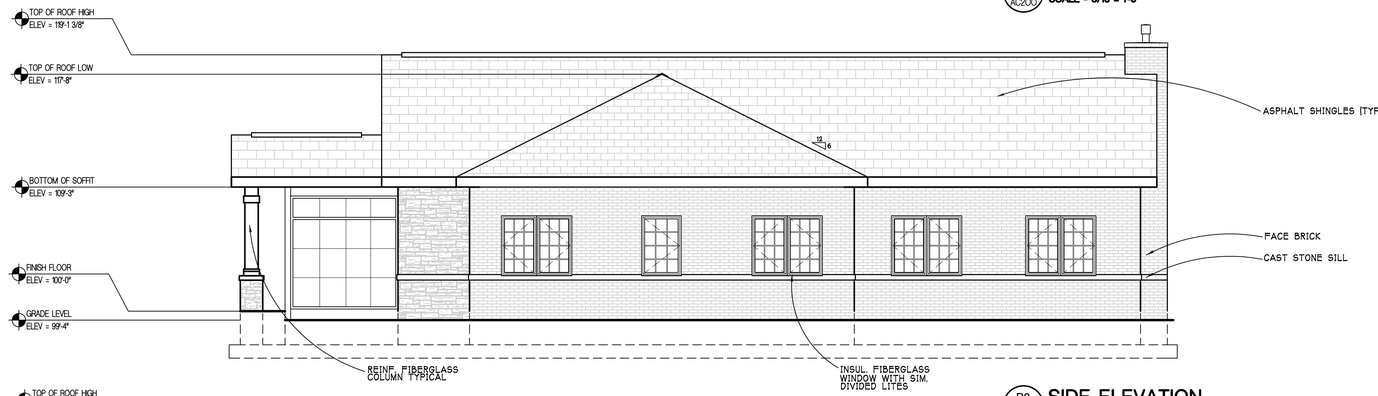
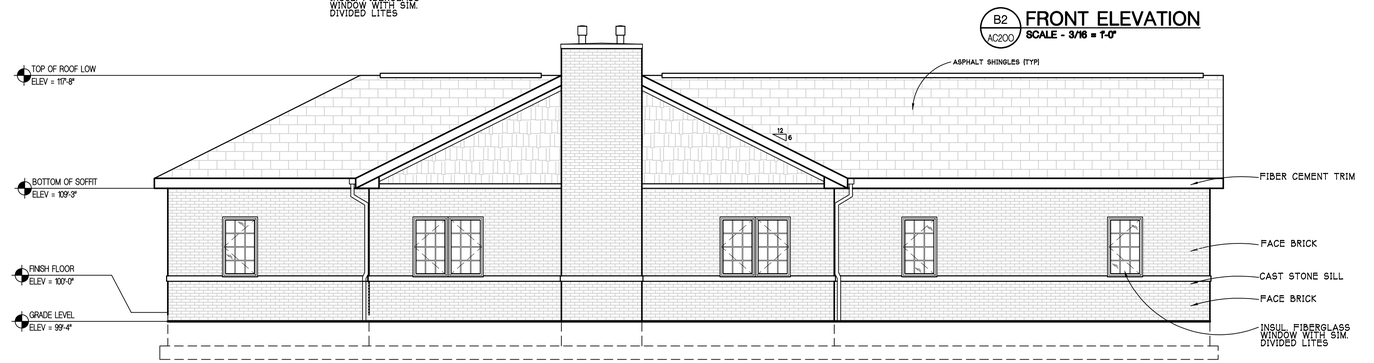


B5 AC200 **SIDE ELEVATION**
SCALE - 3/16 = 1'-0"



B3 AC200 **SIDE ELEVATION**
SCALE - 3/16 = 1'-0"

B2 AC200 **FRONT ELEVATION**
SCALE - 3/16 = 1'-0"



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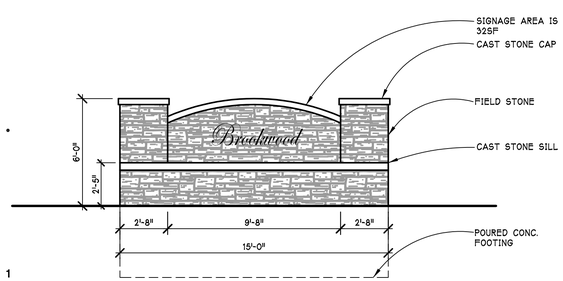
SCALE - 3/16 = 1'-0"



G1 AC200 **SIGN**
SCALE - 1/4 = 1'-0"

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BROOKWOOD DEVELOPMENT

Van Buren Township, MI

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CLUBHOUSE EXTERIOR ELEVATIONS

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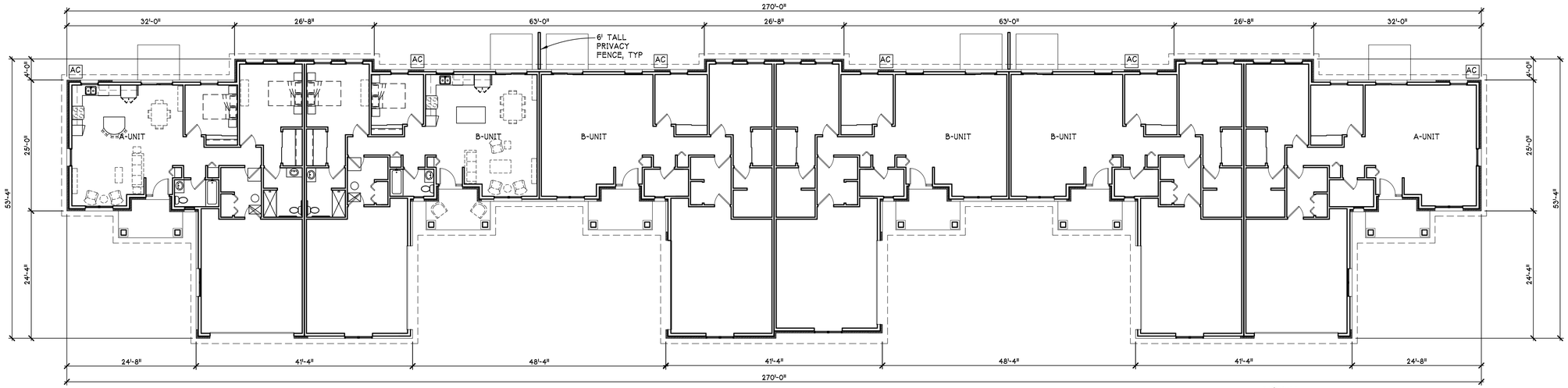
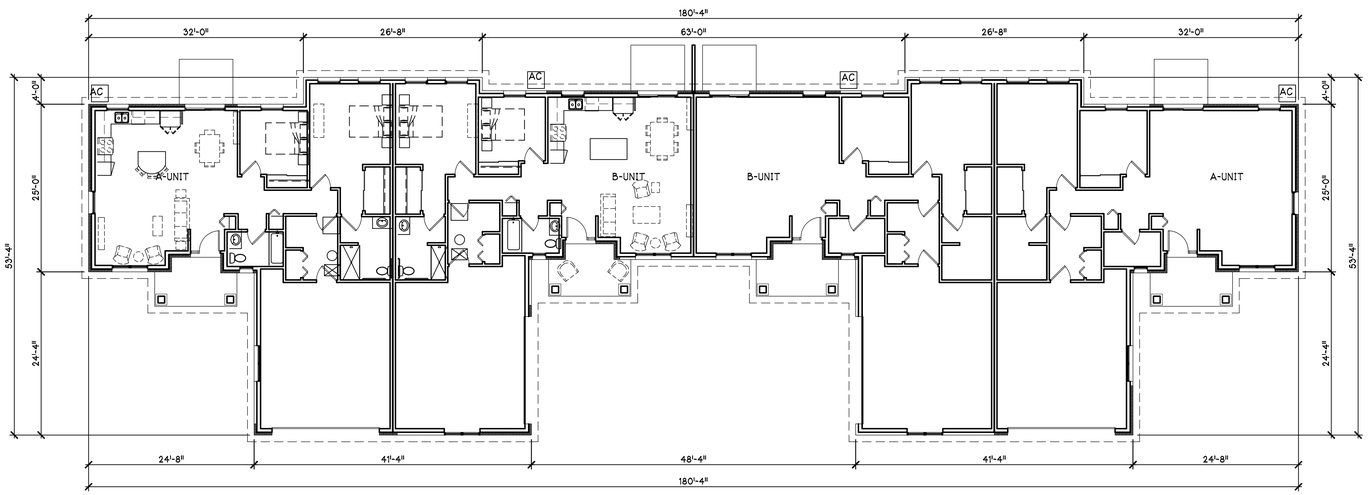


NORTH

B4 / AU100 **6 UNIT FLOOR PLAN**

SCALE - 3/32" = 1'-0"

SASHAU100

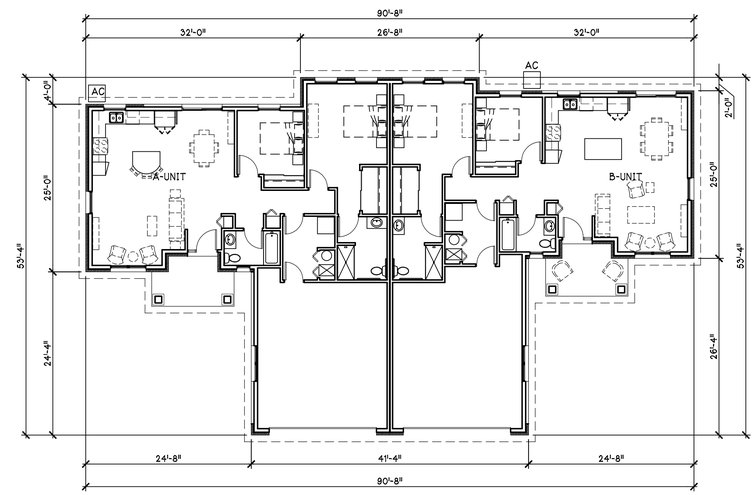


NORTH

D1 / AU100 **4 UNIT FLOOR PLAN**

SCALE - 3/32" = 1'-0"

SASHAU100



NORTH

A1 / AU100 **2 UNIT FLOOR PLAN**

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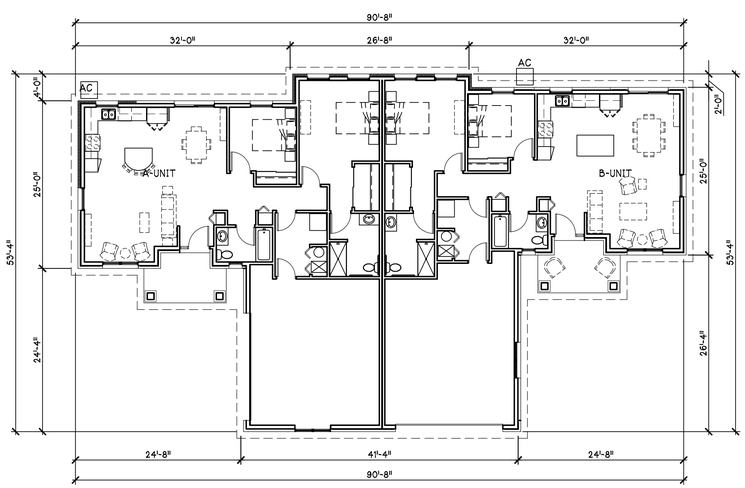
SASHAU100



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A1 / AU100 **2 UNIT FLOOR PLAN**

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SASHAU100

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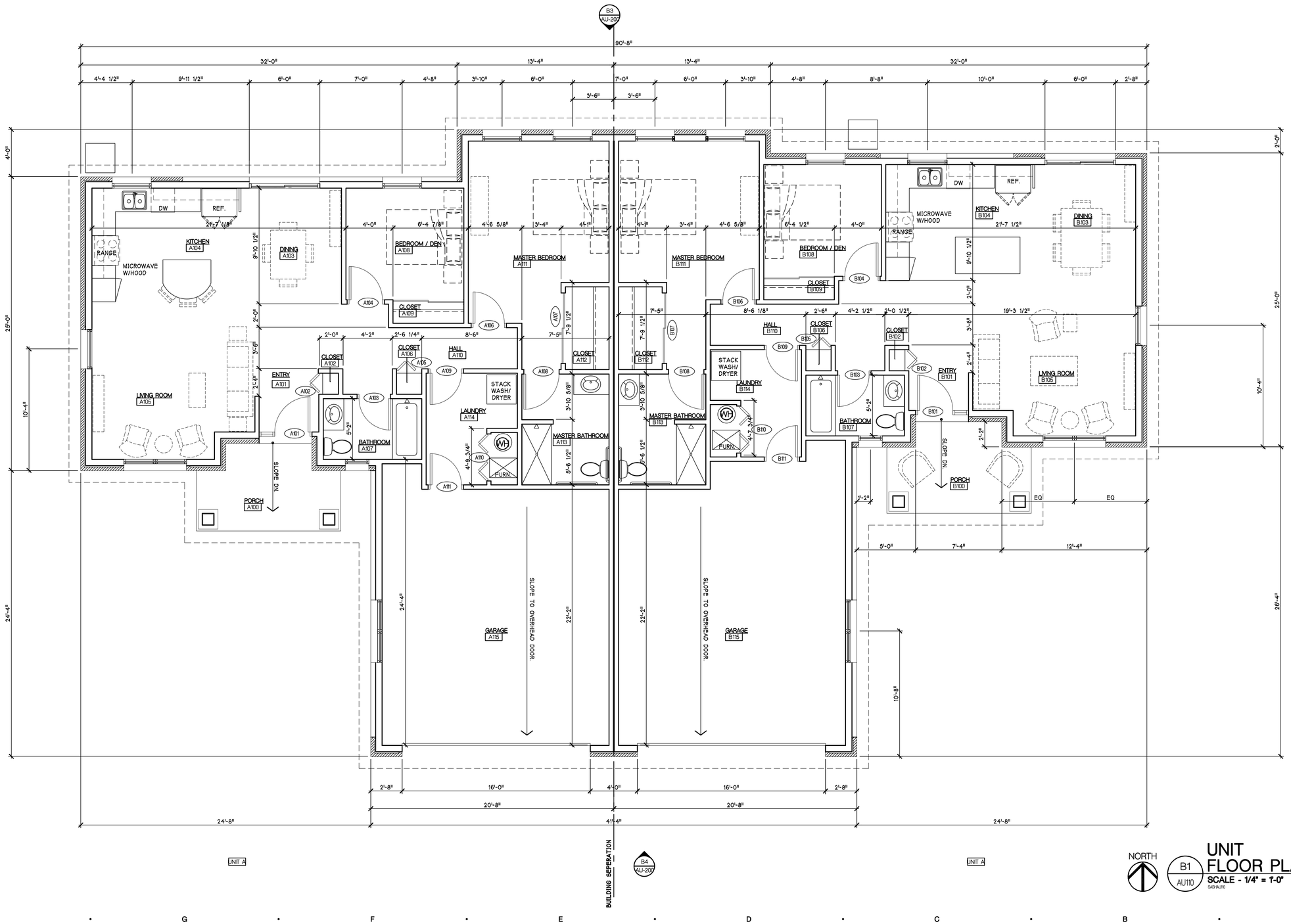

NORTH

B1 / AU110 — **UNIT FLOOR PLAN**

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FOUR-UNIT BUILDING FACADE MATERIAL CALCULATION:										
	FRONT		REAR		SIDE B		SIDE B		TOTAL	
	SF	%	SF	%	SF	%	SF	%	SF	%
MASONRY	970 SF	58%	670 SF	39%	325 SF	72%	325 SF	72%	2,290 SF	53%
SIDING	295 SF	18%	660 SF	38%	90 SF	20%	90 SF	20%	1,135 SF	26%
DOORS/WINDOWS	415 SF	24%	400 SF	23%	35 SF	8%	35 SF	8%	885 SF	21%
TOTAL	1,680 SF		1,730 SF		450 SF		450 SF		4,310 SF	

FRONT ELEVATION: 4-UNIT

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

SASHAU200

REAR ELEVATION: 4-UNIT

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

SASHAU200

SIDE A ELEVATION

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

SASHAU200

SIDE B ELEVATION

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

SASHAU200

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BROOKWOOD DEVELOPMENT

Van Buren Township, MI

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UNIT EXTERIOR ELEVATIONS

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PROJECT NUMBER

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SHEET NUMBER

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REAR ELEVATION: 2-UNIT

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

SASHAU201

TWO-UNIT BUILDING FACADE MATERIAL CALCULATION:										
	FRONT		REAR		SIDE A		SIDE B		TOTAL	
	SF	%	SF	%	SF	%	SF	%	SF	%
MASONRY	398 SF	44%	325 SF	39%	320 SF	64%	325 SF	72%	1,368 SF	51%
SIDING	224 SF	25%	280 SF	34%	90 SF	18%	90 SF	20%	684 SF	25%
DOORS/WINDOWS	288 SF	31%	230 SF	27%	90 SF	18%	35 SF	8%	643 SF	24%
TOTAL	910 SF		835 SF		500 SF		450 SF		2,695 SF	

SIX-UNIT BUILDING FACADE MATERIAL CALCULATION:										
	FRONT		REAR		SIDE B		SIDE B		TOTAL	
	SF	%	SF	%	SF	%	SF	%	SF	%
MASONRY	1,222 SF	51%	958 SF	40%	325 SF	64%	325 SF	72%	2,830 SF	50%
SIDING	572 SF	24%	750 SF	31%	90 SF	18%	90 SF	20%	1,502 SF	26%
DOORS/WINDOWS	604 SF	25%	700 SF	29%	35 SF	18%	35 SF	8%	1,374 SF	24%
TOTAL	2,398 SF		2,408 SF		450 SF		450 SF		5,706 SF	

FRONT ELEVATION: 2-UNIT A

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

SASHAU201

FRONT ELEVATION: 2-UNIT B

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

SASHAU201

FRONT ELEVATION: 6-UNIT

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

SASHAU201

REAR ELEVATION: 6-UNIT

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

SASHAU201

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Van Buren Township Hall
46425 Tyler Road

PRESENTATIONS:

Case 21-032:
Brookwood Multi-Family Senior Housing
(Revised Traffic Study)

Brookwood Development

TRAFFIC IMPACT STUDY

FINAL REPORT
November 30, 2022

WADE TRIM

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Appendix C. Existing Synchro Capacity Reports
Appendix D. Proposed Build Synchro Capacity Reports
Appendix E Validation Logs.
Appendix F Turn Lane Warrant Analyses.

DISCLAIMER

The contents of this report reflect the views of Wade Trim, Inc. who is responsible for the facts and accuracy of the data presented herein. The contents do not necessarily reflect the official views or policies of Garner Properties & Management Company, the Charter Township of Van Buren, the Wayne County Road Commission, or the Michigan Department of Transportation.

Acronyms	
AAATA	Ann Arbor Area Transportation Authority
AASHTO	American Association of State Highway and Transportation Officials
ADT	Average Daily Traffic
HCM	Highway Capacity Manual
ITE	Institute of Transportation Engineers
LOS	Level of Service
MDOT	Michigan Department of Transportation
MMUTCD	Michigan Manual on Uniform Traffic Control Devices (2011 Edition)
NCHRP	National Cooperative Highway Research Program
SCOOT	Split Cycle Offset Optimization Technique
TCAT	Traffic Crash Analysis Tool
TIA	Traffic Improvement Association

EXECUTIVE SUMMARY

Garner Properties & Management Company is proposing a new age-targeted residential development on the northeast quadrant of the Tyler Road and Morton Taylor Road intersection. The proposed development is expected to consist of a maximum of 132 age-targeted multi-family homes. This study examines the entire development in one phase.

The report analyzes and presents the traffic impacts that the proposed residential development will have on the following intersections in the project study area:

- Tyler Road and Morton Taylor Road
- Tyler Road and Haggerty Road
- Tyler Road and Springwood Boulevard/Lancaster Drive
- Morton Taylor Road and Heatherfield Boulevard

The above-mentioned intersections were analyzed for the morning and afternoon peak hours for the following conditions:

- Existing Year 2021 Conditions
- Projected Year 2023 Build Conditions

The elements to be covered in the traffic study were discussed with Van Buren Township Officials and their traffic engineering consultant prior to the study commencing.

Existing Year 2021 Conditions

Based on the intersection counts, the overall morning peak hour occurs between 7:15 a.m. and 8:15 a.m., while the afternoon peak hour occurs between 3:45 p.m. and 4:45 p.m. These time periods were selected for analysis of existing and build conditions.

The capacity analyses for existing conditions revealed that all study area intersections and movements operate at an acceptable level of service during the weekday morning and weekday afternoon peak hours.

Projected Year 2023 Build Conditions

The proposed residential development is expected to consist of 132 age-targeted multi-family units. Access to the residential development is proposed via one full movement access to Tyler Road.

New trips to be generated by the proposed residential development were estimated based on information and procedures contained in the Institute of Transportation Engineer's (ITE) report *Trip Generation, Eleventh Edition, September 2021.* Land Use Code 252 – Senior adult housing-multifamily was used to estimate the trips for the proposed site. The proposed development is

projected to generate a total of 26 weekday morning peak hour trips and 33 weekday afternoon peak hour trips. The estimated number of weekday morning and weekday afternoon peak hour trips was distributed to the surrounding roadway network using existing peak hour 2021 traffic volume distributions. Projected site generated trips were added to the existing traffic volumes to yield the Projected Year 2023 Build Conditions.

The study area intersections were evaluated with the projected build traffic volumes to determine the future intersection operations with the proposed residential development project on the existing road network. The capacity analysis for the projected build conditions indicated that all study area intersections and movements are expected to continue to operate at an acceptable level of service during the weekday morning and weekday afternoon peak hours. Comparing the projected build results to the existing results show that the impact from the additional residential traffic is minimal.

Wayne County Department of Public Services Standards for turn lane warrants were examined to determine if right or left turn lanes would be needed at the project driveway. Based on the warrants, the volumes do not warrant any turn lanes at the site access.

The capacity analysis for the proposed site driveway revealed that all movements at the site access are expected to operate acceptably.

Summary

This report assessed the traffic impacts that the new Brookwood residential development is expected to have on the adjacent roadways and study area intersections. The traffic impacts described in this report are based on existing traffic volumes and anticipated project traffic generated at full build out of the proposed development. A comparison of existing conditions to the projected build conditions was used to determine the traffic impacts of the proposed development upon the adjacent street system.

The existing conditions analyses revealed that all study area intersections and movements operate at an acceptable level of service during the morning peak hour and during the afternoon peak hour. Crash data was obtained for a five-year period, and it was determined that total crashes and individual crash types all have low frequency at the study area intersections.

The study area intersections were then evaluated with the proposed build traffic volumes to determine the future intersection operations with the proposed residential development project. Traffic volumes for the projected build were derived from developing the trip generation, distribution, and assignment for the proposed residential development and adding these trips to the existing volumes.

The capacity analysis for the projected build conditions revealed that all study area intersections and movements are expected to continue to operate at acceptable levels of service during the weekday morning and weekday afternoon peak hours. The need for right-turn and left-turn lanes was evaluated and found to not be warranted at the site access to the development.

No improvements are needed to accommodate the additional trips from the proposed Brookwood residential development on the local street system.

1.0 INTRODUCTION

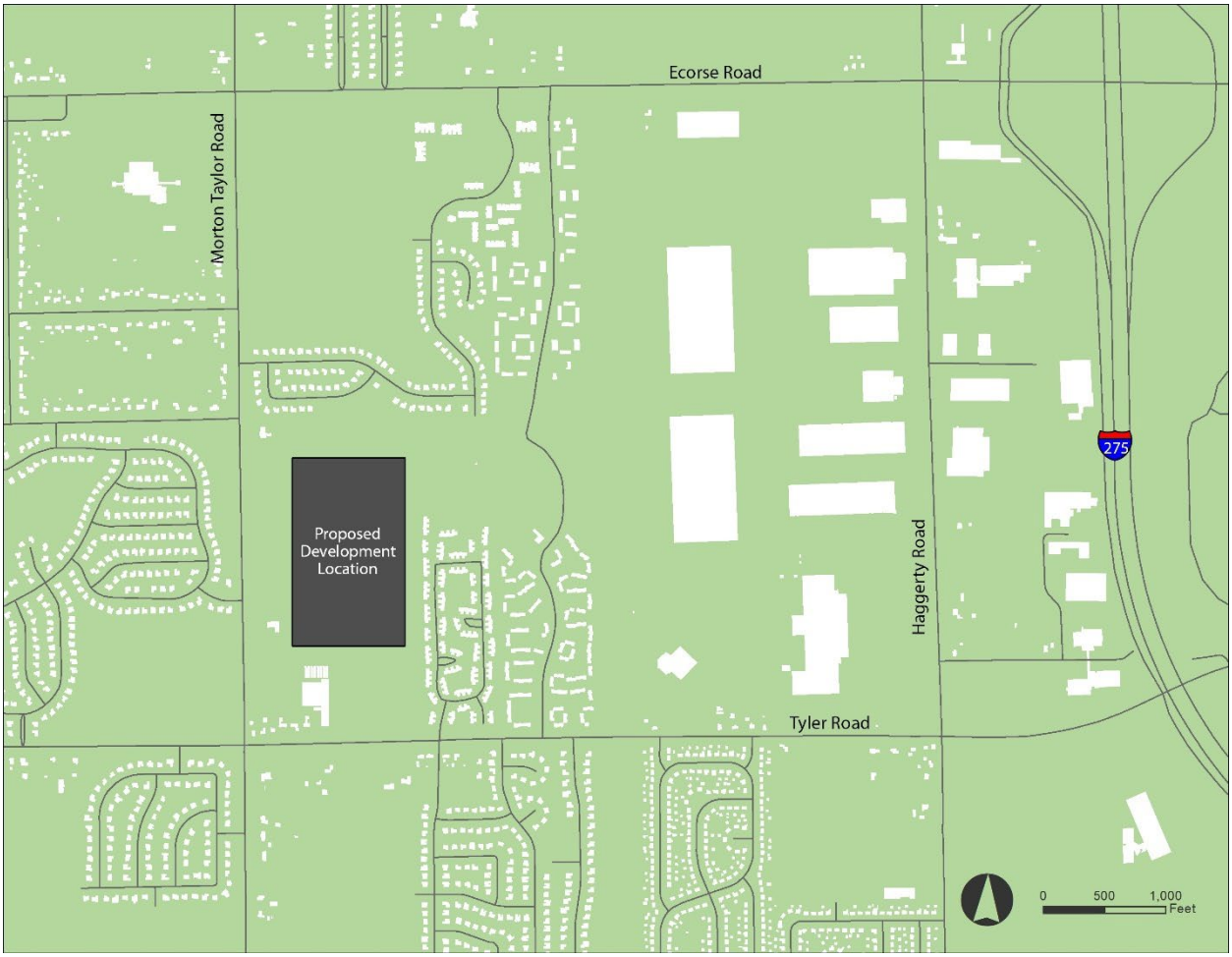
Garner Properties & Management Company is proposing to construct a new residential development in the northeast quadrant of the Tyler Road and Morton Taylor Road intersection in Van Buren Township, Wayne County, Michigan. The general location of the site is shown in **Figure 1-1 – Project Location Map,** while **Figure 1-2 – Project Area Map** provides context of the surrounding area and transportation networks. This traffic impact study is based on the preliminary schematic design which shows the proposed development consisting of a maximum of 132 residential units.

Access to the development is proposed via one full-movement driveway to Tyler Road. It is our understanding that the driveway will be designed to Van Buren Township standards during the design process. During the site plan review, the driveway will be checked to verify that the turning radii, pavement widths, sight distances, etc. are adequate to accommodate the site traffic, including emergency fire and rescue equipment.

This study examines the entire development as fully constructed and opened in one phase.

Figure 1-1 – Project Location Map.

Figure 1-2 – Project Area Map



1.1 OBJECTIVE AND SCOPE

The objective of this study was to determine the traffic impacts that the proposed development is expected to impose on the adjacent street network. The traffic impacts and mitigation measures described in this report are based on existing 2021 traffic volumes and operations; and anticipated future traffic generated at full buildout of the site. The scope of the study included the following items.

- Description of the study area and existing 2021 traffic operations of the street system.
- An evaluation of the morning and afternoon peak hour traffic conditions with and without the residential development, including a level of service evaluation of the study intersections.
- Evaluation of mitigation measures should traffic impacts due to the proposed development require street or intersection improvements.

- A crash analysis to identify any existing safety-related problems and list any corrective treatments for locations with safety problems.

The analysis examined the following conditions:

- Existing Conditions: Year 2021 traffic volumes and operations.

- Proposed Year 2023 Build Conditions: Future build traffic conditions that are anticipated upon full development of the property.

A comparison of existing 2021 conditions to proposed 2023 build conditions was used to determine the traffic impacts of the proposed residential development on the adjacent street system.

2.0 METHODOLOGY

The study involved the collection and review of geometric, traffic control, and traffic volume data for roadways and intersections potentially impacted by the proposed development. These data served as input for the highway capacity analyses that were conducted to estimate the traffic impacts of the proposed development. The information collected and the evaluation procedures used to conduct the analyses are described in this section.

2.1 TRAFFIC IMPACT STUDY AREA

Based on a review of the road network adjacent to the proposed site and conversations with the Charter Township of Van Buren, Planning and Economic Development Department of Public Services, and the Township traffic engineering Consultant, the impact area for this study was identified. It was established that the study area would include the following intersections:

- Tyler Road and Morton Taylor Road
- Tyler Road and Haggerty Road
- Tyler Road and Springwood Boulevard/Lancaster Drive
- Morton Taylor Road and Heatherfield Boulevard

The site configuration will be examined for the projected Year 2023 build conditions with one access point. The site access point will include a proposed site driveway on Tyler Road.

2.2 DATA COLLECTION

Data collection included collection of directional vehicle turning movements and approach truck counts for the morning and afternoon peak periods. Directional turning movement counts were conducted at the intersections of Tyler Road and Morton Taylor Road, Tyler Road and Haggerty Road, Tyler Road and Springwood Boulevard/Lancaster Drive, and Morton Taylor Road and Heatherfield Boulevard.

The directional turning movement counts were conducted by Quality Counts for the hours of 7:00 a.m. to 9:00 a.m. and 3:00 p.m. to 6:00 p.m. on Tuesday, October 26, 2021. The morning peak hour occurred between 7:15 a.m. and 8:15 a.m., while the afternoon peak hour occurred between 3:45 p.m. and 4:45 p.m. Passenger vehicles, heavy vehicles, pedestrians, and bicycles were counted, and all possible vehicle turning movements at these intersection approaches were recorded in 15-minute intervals. All existing turning movement data that were collected are summarized in Appendix A.

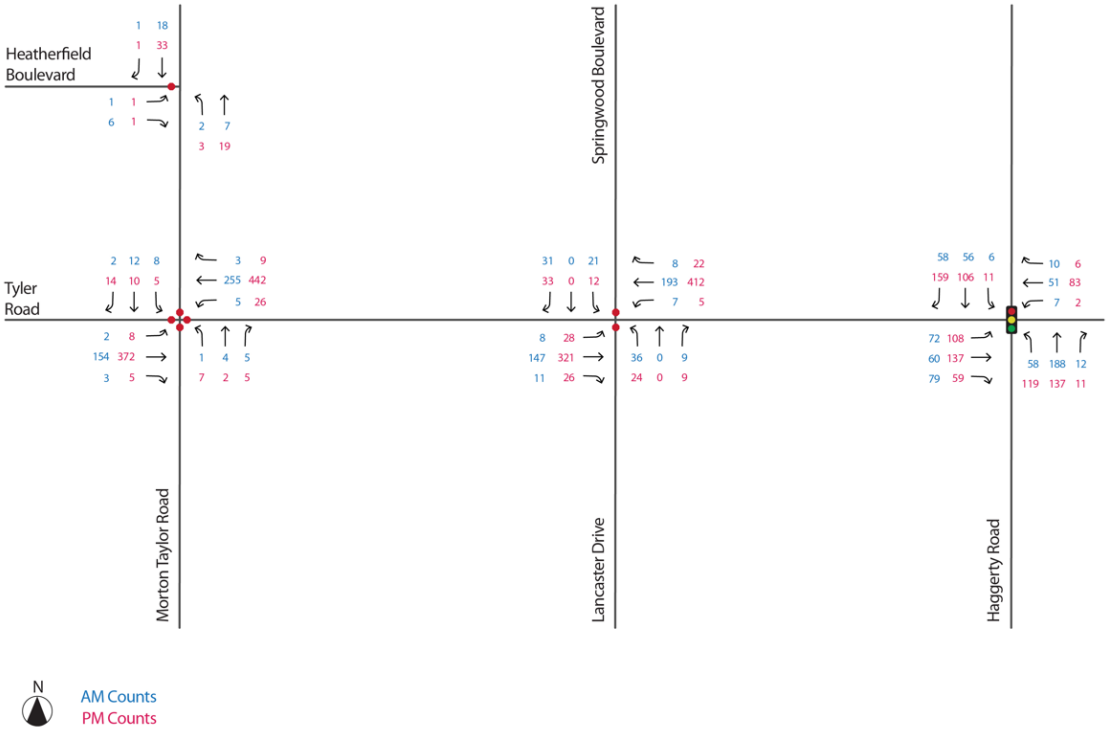
Due to the COVID-19 pandemic, traffic volumes were reduced on all roads in Michigan. To account for the effects of the pandemic, vehicle traffic volumes were compared to pre-COVID19 (historical data) including counts in the MDOT Transportation Data Management System and a previous traffic impact study completed in February 2020. As shown in Table 2-1, the counts on Tyler Road were generally higher in 2021 than in previous counts. So, the 2021 data on Tyler Road were considered to be no longer affected by the pandemic. However, the counts on Morton Taylor Road were about half of the previous volumes. To account for the effects of the Pandemic, the traffic volumes on Morton Taylor Road were doubled. Traffic volumes on the other roads in this area are very low. Previous counts were not available on Haggerty Road. Therefore, the analysis using Haggerty Road does not include an adjustment of the volumes on that roadway. No adjustments to volumes on the other roadways were considered necessary. The adjusted volumes utilized for Existing Conditions analyses are depicted in **Figure 2-1**.

Table 2-1 Comparison of traffic volumes before Covid-19 and 2021 volumes.

Intersection	COVID-19 Period AM	PM	Year 2021 Period AM	PM
Tyler Road at Morton Taylor Road	EB/WB 2019		EB/WB 2021	
	472	795	422	862
West of Morton Taylor Road, on Tyler Road	EB/WB 2018		EB/WB 2021	
	355	751	417	848
Morton Taylor Road at Tyler Road	NB/SB 2019		NB/SB 2021	
	69	66	24	37

A Traffic Impact Study was prepared by Traffic Engineering Consultants, Inc. in February 2020 for the Hampton Manor of Van Buren, located at the southeast quadrant of Tyler Road & Morton Taylor Road. This study has been furnished by the Township for use in this analysis, and additional trips anticipated by the Hampton Manor are included in the build conditions for the purposes of this study.

Figure 2-1 – Adjusted Peak Hour Traffic Volumes-2021.



The traffic signal timing permit needed for the network analysis was obtained from the Wayne County, Department of Public Services for the intersection of Tyler Road and Haggerty Road. The signal timing permit is included in Appendix B.

2.3 OPERATIONAL ANALYSIS PROCEDURES

The traffic impact analysis includes methodology for trip generation, distribution, and traffic assignment based on the Institute of Transportation Engineers (ITE) standard practices. Applicable technical standards such as the *2000*, *2010,* and *6th Edition Highway Capacity Manual*, Wayne County Standards, and the *2011 Michigan Manual on Uniform Traffic Control Devices (MMUTCD)* were also used.

2.3.1 Highway Capacity Analysis

Highway capacity analyses were conducted to determine the existing (2021) level of service of the study area intersections, and the level of service expected (2023 Build) when trips generated by the proposed development are added to the existing traffic volumes. *Synchro 11* was used to conduct the analyses.

Synchro 11 is a software package used for modeling and optimizing traffic signal timing at intersections. The program utilizes the methods of the *2000 Highway Capacity Manual (HCM)*, *2010 Highway Capacity Manual*, and *6th Edition Highway Capacity Manual* to calculate capacity. HCM 6th Edition was utilized for this analysis. The capacity worksheets for existing year 2021 conditions are provided in Appendix C. The worksheets for the projected 2023 build conditions are provided in Appendix D.

Capacity analyses were conducted to measure the performance of the intersections in terms of level of service. Level of service (LOS) ranges from LOS A, which represents the best traffic conditions, to LOS F, which is the worst condition. Operations at LOS A through D are generally considered acceptable for unsignalized intersections. Quantitative measures of level of service are given in the following paragraphs.

The level of service measurement for stop-controlled intersections is average control delay, which is also quantified in terms of seconds of delay per vehicle. Control delay includes the initial deceleration delay, queue move-up time, stopped delay, and acceleration delay. The level of service criteria for signalized intersections, taken from the *HCM 6Th Edition,* is shown in Table 2-1 and for unsignalized intersections the level of service is shown in Table 2-2.

Table 2-2. Level of Service Criteria for Signalized Intersections.		
Level of Service	Description	Average Control Delay, Seconds per vehicle
A	Little or no delay.	<10.0
B	Short traffic delays.	Between 10 and 20
C	Average traffic delays.	Between 20 and 35
D	Long traffic delays.	Between 35 and 55
E	Very long traffic delays.	Between 55 and 80
F	Demand exceeds capacity.	>80

Source: Transportation Research Board, Highway Capacity Manual 2000.

Table 2-3. Level of Service Criteria for Unsignalized Intersections.		
Level of Service	Description	Average Control Delay, Seconds per vehicle
A	Little or no delay.	<10.0
B	Short traffic delays.	Between 10 and 15
C	Average traffic delays.	Between 15 and 25
D	Long traffic delays.	Between 25 and 35
E	Very long traffic delays.	Between 35 and 50
F	Demand exceeds capacity.	>50

Source: Transportation Research Board, Highway Capacity Manual 2000.

One important factor used in calculating capacity at intersections is the peak hour factor. The peak hour factor is found by dividing the total hourly volume observed on a road or intersection by 4 times the highest 15-minute volume. Because manual traffic counts based on 15-minute data were collected for the study area intersections, the peak hour factors used in the existing condition analyses are based on actual counts. The peak hour factors are applied by intersection approach. The peak hour factors were kept the same for the proposed build analyses.

3.0 ANALYSIS

The traffic impact study included a review of the study area, an estimation of the amount of peak-period traffic generated by the proposed development, distribution of the site traffic onto the local streets, assignment of traffic volumes to the study area intersections, and capacity analyses to determine the impact of the proposed development on the level of service and operations. Traffic projections were made to estimate future traffic volumes on the area roads when the proposed residential development is completed.

3.1 EXISITING YEAR 2021 CONDITIONS

The existing transportation network in the vicinity of the project site is comprised of the road system and pedestrian facilities. A summary of the existing network is described below.

3.1.1 Road System

Tyler Road in the vicinity of the proposed development is a three-lane minor arterial roadway running east-west in Van Buren Township. Tyler Road has one travel lane in each direction and a shared two-way center left-turn lane. Sidewalks are present on both sides of the roadway, but sidewalks are not contiguous. The surrounding land use is primarily single-family residential and farmland/open space. Based on the MDOT counts taken in June 2021, the Average Daily Traffic (ADT) is estimated at approximately 9,280 vehicles per day. The speed limit is posted at 45 miles per hour.

Morton Taylor Road in the vicinity of the proposed development is a two-lane local roadway running north-south in Van Buren Township with one travel lane in each direction. North of Tyler Road, Morton Taylor Road is an unpaved road without striping. South of Tyler Road, Morton Taylor Road is a paved two-lane road with one travel lane in each direction. Sidewalks are present on the west side of the roadway, but sidewalks are not contiguous. The surrounding land use is primarily single family residential and farmland/open space. ADT counts were not available on this roadway. The speed limit is unposted at 55 miles per hour.

Haggerty Road in the vicinity of the proposed development is a curbed four-lane minor arterial roadway running north-south in Van Buren Township. Haggerty Road has two travel lanes in each direction. Sidewalks are present on both sides of the roadway, but sidewalks are not contiguous. The surrounding land use is primarily large-lot development setback from the roadway. Single family residential and farmland/open space are also present in the vicinity. Based on the MDOT counts taken north of Ecorse Road and estimated in 2020, the ADT is approximately 9,227 vehicles per day. The speed limit is posted at 45 miles per hour.

3.1.2 Intersection Geometry and Traffic Control

Tyler Road and Morton Taylor Road is an unsignalized intersection with four approaches. Traffic on the east and west bound approaches on Tyler Road as well as the northbound and southbound Morton Taylor Road approaches is controlled by STOP signs. At its intersection with Tyler Road, both

approaches of Morton Taylor Road consist of a single lane which share left, though, and right-turn movements. At its intersection with Morton Taylor Road, both approaches of Tyler Road consist of one left-turn lane and one shared through and right-turn lane.

Tyler Road and Haggerty Road is a signalized intersection with four approaches. At its intersection with Tyler Road, both approaches of Haggerty Road consist of one shared through and left-turn lane and one shared through and right-turn lane. There are no pavement arrows or signing that confirms these turning movements to the driver. At its intersection with Haggerty Road, both approaches of Tyler Road consist of one left-turn lane and one shared through and right-turn lane. Pedestrian signals are not present for crossing any of the intersection approaches.

3.1.3 Pedestrian Facilities

There are non-contiguous sidewalks present on both sides of Tyler Road in the study area. On the north side of Tyler Road sidewalk is present from Springwood Boulevard to approximately 250 west of the Tyler Elementary School driveway. Sidewalks are also present on the north side of Tyler Road between Ecorse Street and Haggerty Road. On the south side of Tyler Road sidewalk is present from Andover Drive to Van Buren Street. No marked midblock crosswalks are present within the limits of the study area on Tyler Road. Sidewalks are present on the west side of Morton Taylor Road, north of Heatherfield Boulevard, and south of Tyler Road.

3.1.4 Operational Analysis

The analysis of existing operations was initiated with the preparation of existing condition models using Synchro 11 and the aerial and field obtained geometric data. Highway capacity analyses were conducted for existing geometric conditions and traffic control. The capacity analysis included an examination of the weekday morning and weekday afternoon peak hours. The results of the capacity analyses for existing year 2021 conditions are summarized in **Table 3-1**, which provides the LOS, delay values, and volume to capacity ratios at each intersection for each movement and approach that currently exist throughout the study area

The capacity analyses for existing conditions revealed that all study area intersections and movements operate at an acceptable level of service during the weekday morning and weekday afternoon peak hours for Existing conditions. All approaches and intersection totals operate at an acceptable LOS D or better.

Table 3-1. Existing Year 2021 Synchro Analyses Results.

Intersection	Measure	AM Peak Hour					PM Peak Hour				
		EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
Tyler Road and Morton Taylor Road (All Way Stop)	LOS	A	B	A	A	B	C	C	A	A	C
	Delay (sec)	9.6	10.7	8.2	8.6	10.1	15.2	22.0	9.7	9.6	18.7
Tyler Road and Haggerty Road (Signal)	LOS	C	C	A	A	B	C	C	A	A	B
	Delay (sec)	29.0	25.7	6.2	5.7	15.0	33.2	26.0	6.9	6.1	18.2
Tyler Road and Springwood Boulevard/Lancaster Drive (Stop)	LOS	A	A	B	B	A	A	A	D	C	A
	Delay (sec)	0.4	0.3	13.8	11.9	2.8	0.7	0.1	25.4	17	2.2
Morton Taylor Road and Heatherfield Boulevard (Stop)	LOS	A	-	A	A	A	A	-	A	A	A
	Delay (sec)	8.5	-	1.7	0.0	1.7	8.8	-	1.0	0.0	0.7

3.1.5 SimTraffic Model Calibration and Validation

After completing the Synchro analysis for existing conditions, the SimTraffic models were calibrated and validated to ensure that they reflected actual field operations. This is an essential step in Synchro modeling and was conducted prior to the analysis and simulation of any future conditions.

The SimTraffic results for existing conditions were calibrated and validated for weekday morning and weekday afternoon peak hour conditions. The process involved comparing the actual traffic volumes collected at each intersection with the SimTraffic Volume Exited report. The models were considered validated when the field counts, and model results were within the greater of ±10 percent or ± 20 vehicles.

In order to meet the calibration targets, adjustments can be made to a number of simulation parameters including headway factors, actual link speeds, vehicle and driver options, mandatory lane change distances, and lost time values. When there are differences, changing one or more of these parameters often will bring the model values within the acceptable range of the vehicle counts.

Ten simulations of each peak period were performed and the average of the volumes for each turning movement was reported in a SimTraffic Performance Report. During both peak periods for each turning movement, the differences between the actual field counts and the average values from 10 simulation runs were within the acceptable range. The SimTraffic Performance Reports for the peak periods are provided in Appendix E.

3.2 PROPOSED YEAR 2023 BUILD CONDITIONS

The traffic impact analysis for the proposed year 2023 conditions with traffic from the proposed residential development began with the development of turning movement volumes for the weekday morning and weekday afternoon peak hours. These future traffic volumes were derived from developing the trip generation, distribution, and assignment for the proposed residential development and adding them to the existing traffic volumes. After conversations with the Township, no growth factor was used on the existing counts. Typically, MDOT uses a 0.05 growth factor per year for roadways in this area, therefore, not using a growth factor for a one-year period does not have a significant effect on traffic volumes. The proposed residential development will be located on the north side of Tyler Road east of Morton Taylor Road. The proposed development is expected to have a maximum of 132 age-targeted multifamily units. The traffic impact study for this proposed development examines full build of the development.

3.2.1 Site Access

Access to the development is proposed via one full-movement driveway on Tyler Road. The location of the driveway was previously shown in **Figure 1-1 – Project Location Map.**

3.2.2 Trip Generation

New trips to be generated by the proposed residential development were estimated based on information and procedures contained in the Institute of Transportation Engineer's (ITE) report *Trip Generation, Eleventh Edition (Web Application Version 6.0 - December 2021).* **Table 3-2** provides the morning and afternoon peak hour trip generation summary for vehicles.

The residential development is planned to have 132 units. Senior adult housing – multifamily was used to generate trips for this purpose (Land Use 252).

The proposed residential development is expected to generate a total of 26 new trips during the morning peak hour and 33 new trips during the afternoon peak hour. The estimated number of weekday morning and weekday afternoon peak hour trips were assigned to the surrounding roadway based on existing travel patterns. **Table 3-2** provides the morning and afternoon peak hour trip generation summary.

Table 3-2. Trip Generation – Motor Vehicles.

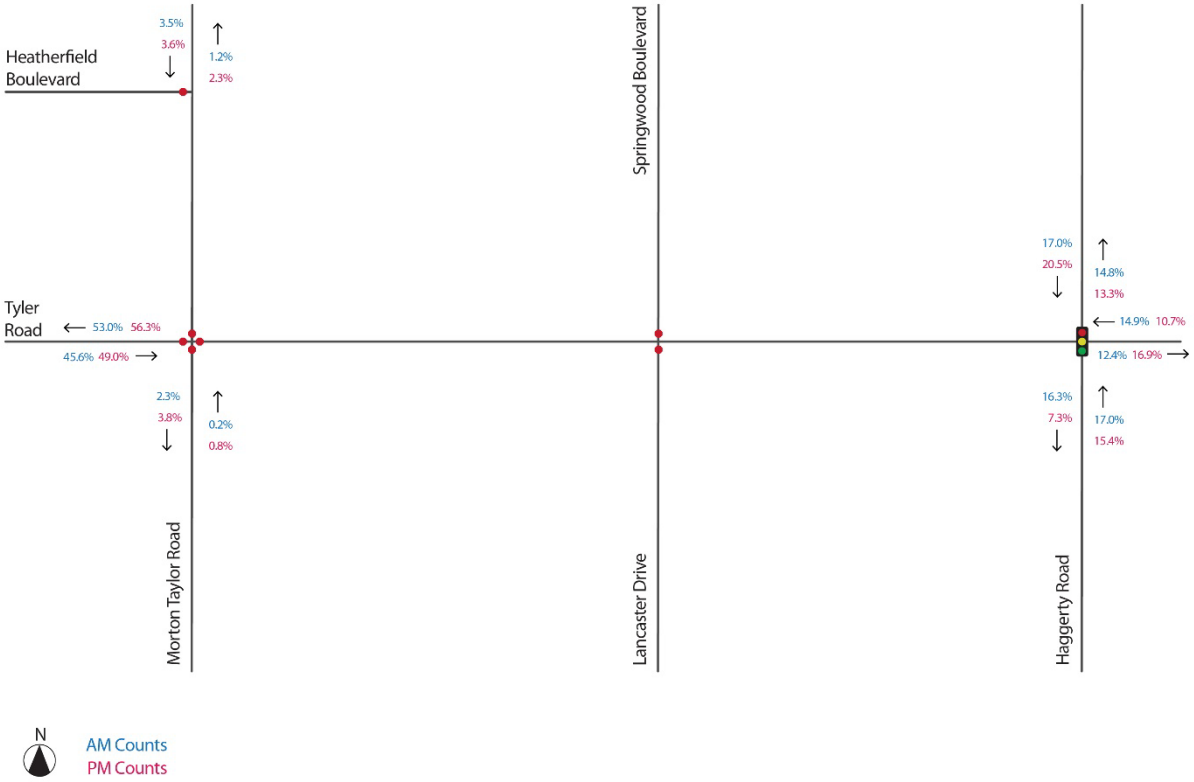
Land Use	Size	AM Peak Hour			PM Peak Hour		
		Total	In	Out	Total	In	Out
Senior Adult Housing (Multifamily)	132 UNITS	26	9	17	33	18	15

Source: Institute of Transportation Engineers, Trip Generation, 11th Edition

3.2.3 Directional Distribution and Trip Assignment

Trip distribution for the site was determined based on existing peak hour traffic volumes on the study area roadways, existing traffic control, site access, and the proposed site layout. When assigning traffic by direction, it is also important to consider what route a vehicle might take given the existing traffic conditions in the area. **Figure 3-1** shows the directional distribution of the existing peak hour traffic.

Figure 3-1 – Directional Distribution of Existing Peak Hour Traffic.



3.2.4 Proposed Year 2023 Build Traffic Volumes

The estimated number of weekday morning and afternoon peak hour trips was distributed to the surrounding roadway network using the above distributions. **Figure 3-2** shows the corresponding site generated traffic volumes distributed on the study area network at full build out of the development.

Projected site generated trips were added to the existing traffic volumes to yield the proposed Year 2023 build conditions. **Figure 3-3** illustrates the weekday morning and weekday afternoon peak hour traffic volumes for the proposed build conditions. The trips shown in Figure 3-3 also include the additional trips generated by the Hampton Manor of Van Buren.

3.2.5 Access Configuration

The site access from Tyler Road is proposed to consist of one inbound and one outbound lane. Wayne County turn-lane warrants were examined to determine if left- or right-turn lanes would be needed at the proposed site access along Tyler Road. Based on the warrants, it was found that neither left- nor right-turn lanes were warranted at the proposed driveway based on proposed build traffic volumes. The turning lane warrant analyses are included in Appendix F.

Figure 3-2 – Projected Build Peak Hour Site Generated Trips.

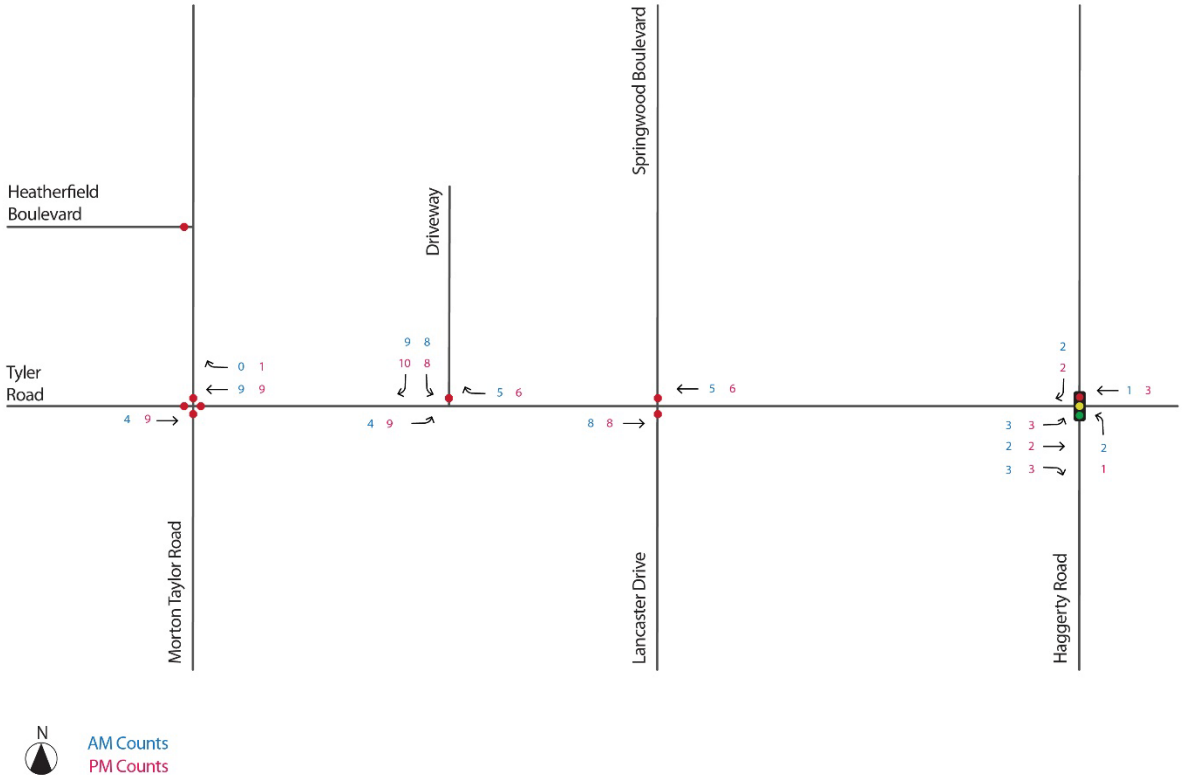
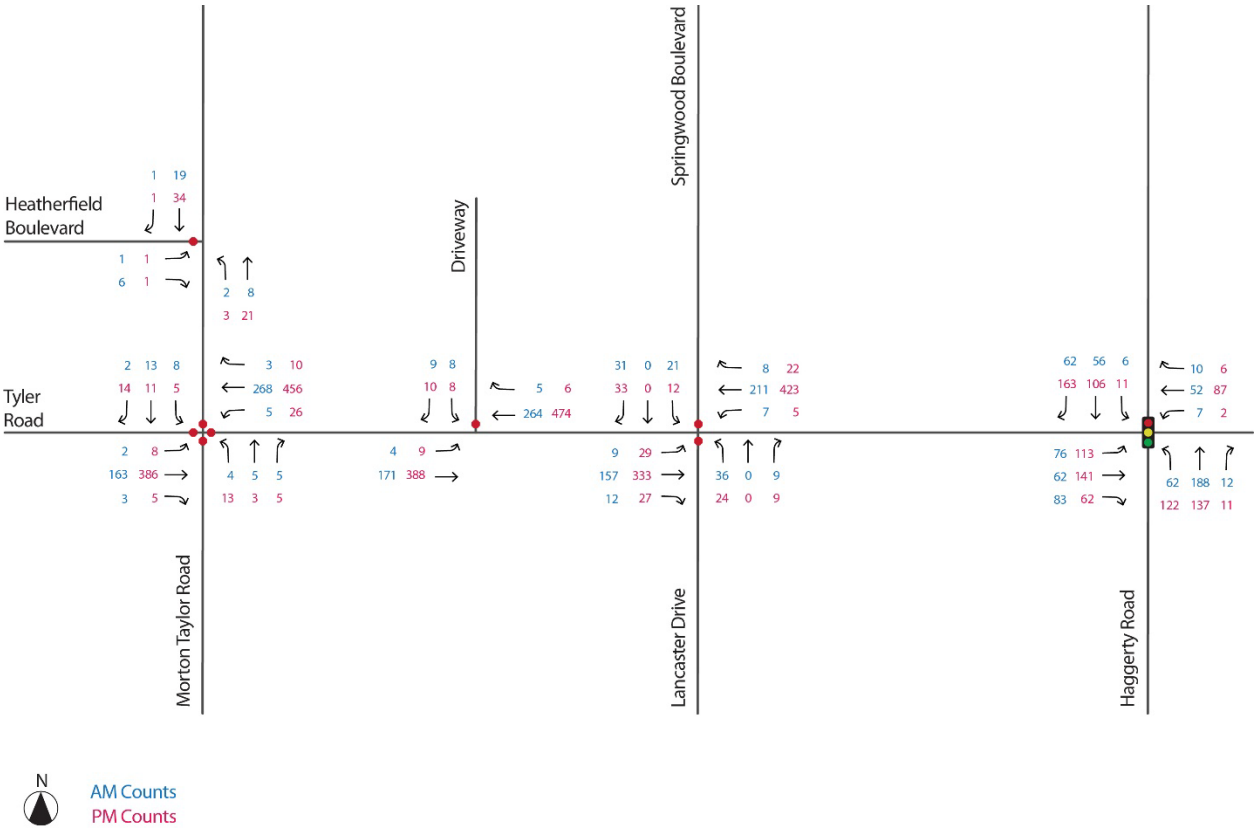


Figure 3-3 – Projected Build Peak Hour Traffic Volumes - Including Site Generated and Hampton Manor Trips.



3.2.6 Proposed Year 2023 Build Operational Analysis

Each of the existing study area intersections were evaluated with the projected build traffic volumes to determine the future intersection operations with the proposed residential development project. The existing signal timing was used, and no adjustments were made to the timing in this analysis. Highway capacity analyses were conducted for the existing year 2021 geometric conditions and traffic control, and projected traffic volumes for the future year 2023 conditions, and the results are summarized in Table 3-3.

The capacity analysis for the projected year 2023 build conditions indicated that all study area intersections and movements are expected to continue to operate at an acceptable level of service during the weekday morning and weekday afternoon peak hours. The capacity analysis for the intersections and approach movements are expected to experience negligible increase in delays of 1.8 seconds or less and are expected to continue operating at the same level of service as the existing scenario.

The capacity of the proposed site driveway was analyzed and is expected to operate at a LOS A or B or better for all movements during the morning and afternoon peak hours.

Table 3-3. Proposed Year 2023 Build Synchro Analyses Results.

Intersection	Measure	AM Peak Hour					PM Peak Hour				
		EB	WB	NB	SB	Total	EB	WB	NB	SB	Total
Tyler Road and Morton Taylor Road (All Way Stop)	LOS	A	B	A	A	B	C	C	B	A	C
	Delay (sec)	9.8	11.1	8.5	8.7	10.4	16.2	24.8	10.1	9.7	20.5
Tyler Road and Haggerty Road (Signal)	LOS	C	C	A	A	B	C	C	A	A	B
	Delay (sec)	29.3	25.7	6.2	5.7	15.2	33.9	26.2	7.0	6.1	18.7
Tyler Road and Springwood Boulevard/Lancaster Drive (Stop)	LOS	A	A	B	B	A	A	A	D	C	A
	Delay (sec)	0.4	0.2	14.4	12.3	2.7	0.7	0.1	26.6	17.5	2.2
Morton Taylor Road and Heatherfield Boulevard (Stop)	LOS	A	-	A	A	A	A	-	A	A	A
	Delay (sec)	8.5	-	1.5	0.0	1.6	8.8	-	0.9	0.0	0.7

Driveway and Tyler Road (Stop)	LOS	A	A	-	B	A	A	A	-	B	A
	Delay (sec)	0.2	0.0	-	10.8	0.4	0.2	0.0	-	13.6	0.3

In general, the capacity analysis indicates that the intersections in the study area are currently operating with acceptable levels of service. The year 2023 build capacity analysis for generated traffic accessing the site during the morning and afternoon peak hours is estimated to have minimal delays at the proposed site driveway.

3.3 CRASH ANALYSIS

To examine the crash history of the four study intersections, police crash data were obtained from Traffic Improvement Association's (TIA) Traffic Crash Analysis Tool (TCAT) website files for the five-year period of January 1, 2016, through December 31, 2020. The most recent five years of traffic crash data within a 250-foot radius of each intersection was reviewed to determine if any crash patterns were present. Further details of each crash are provided in the following intersection analysis.

3.4.1 Morton Taylor Road and Heatherfield Boulevard

The results of the analysis at the intersection of Morton Taylor Road at Heatherfield Boulevard are shown in **Table 3-4**. Between 2016 to 2020, there was one single motor vehicle crash, creating an average of 0.2 crashes per year. No crashes involving fatalities or injuries were recorded. No crashes involving a pedestrian or cyclist were reported during the analysis period.

Table 3-4. Intersection Crash Summary – Morton Taylor Road and Heatherfield Boulevard.

Crash Type	Number of Crashes	Number of Crashes / Year
Single Motor Vehicle	1	0.2
Total	**1**	**0.2**

3.4.2 Tyler Road and Morton Taylor Road

The results of the analysis at the intersection of Tyler Road at Morton Taylor Road are shown in **Table 3-5**. Between 2016 to 2020, there was an average of 3.6 crashes per year. There were 13 rear end crashes, 3 single motor vehicle crashes, one angle crash, and one sideswipe – same direction collision. Two Type B and three Type C crashes were recorded during the five years, and no fatalities or Type A crashes were recorded. No crashes involving a pedestrian or cyclist were reported during the analysis period.

Table 3-5. Intersection Crash Summary – Tyler Road and Morton Taylor Road.

Crash Type	Number of Crashes	Number of Crashes / Year
Rear End	13	2.6
Single Motor Vehicle	3	0.6
Angle	1	0.2
Sideswipe – Same Direction	1	0.2
Total	**18**	**3.6**

3.4.3 Tyler Road and Springwood Boulevard/Lancaster Drive

There were no reported crashes within 250 feet of the intersection of Tyler Road and Springwood Boulevard/Lancaster Drive between January 1, 2016, and December 31, 2020.

3.4.4 Tyler Road and Haggerty Road

The results of the analysis at the intersection of Tyler Road at Haggerty Road are shown in **Table 3-6**. Between 2016 to 2020, there was an average of 9.8 crashes per year. There were 20 angle crashes, 13 rear end crashes, five head on – left turn crashes, and four single motor vehicle crashes. One Type A, six Type B, and eleven Type C crashes were recorded during the five years, and no fatalities were recorded. No crashes involving a pedestrian or cyclist were reported during the analysis period. The small increase in traffic volumes at this intersection due to the residential development is not expected to have a significant impact on safety at this intersection.

Table 3-6. Intersection Crash Summary –Tyler Road and Haggerty Road.

Crash Type	Number of Crashes	Number of Crashes / Year
Angle	20	13.8
Rear End	13	2.6
Head On – Left Turn	5	1.0
Sideswipe – Same Direction	4	0.8
Single Motor Vehicle	2	0.4
Backing	1	0.2
Head On	1	0.2
Other	1	0.2
Rear End – Left Turn	1	0.2
Rear End – Right Turn	1	0.2
Total	**49**	**9.8**

4.0 CONCLUSION & RECOMMENDATIONS

This report assessed the traffic impacts that the new Brookwood residential development is expected to have on the adjacent roadways and study area intersections. The traffic impacts described in this report are based on existing year 2021 no build traffic volumes and anticipated projected year 2023 traffic generated at full build out of the proposed development. A comparison of existing no build conditions to the proposed build conditions was used to determine the traffic impacts of the proposed development upon the adjacent street system.

The existing conditions analyses revealed that all study area intersections and movements operate at an acceptable level of service during the morning peak hour and during the afternoon peak hour. The study area intersections were then evaluated with the proposed build traffic volumes to determine the intersection operations with the proposed residential development project. Traffic volumes for the projected year 2023 build were derived from developing the trip generation, distribution, and assignment for the proposed residential development and adding these trips to the existing traffic volumes.

The capacity analysis for the projected build conditions revealed that all study area intersections and movements are expected to continue to operate at an acceptable level of service during the weekday morning and weekday afternoon peak hours. Comparing the projected build results to the existing results show that the impact from the additional residential traffic is minimal.

Right turn and left turn lanes were evaluated and found to not be warranted at the proposed site driveway to the development.

No further improvements are needed to accommodate the additional vehicle trips from the proposed Brookwood residential development.

Appendix A.
Traffic Data

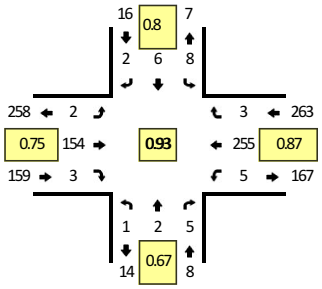
Type of peak hour being reported: Intersection Peak

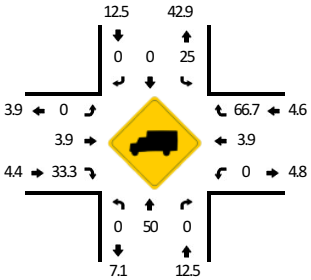
Method for determining peak hour: Total Entering Volume

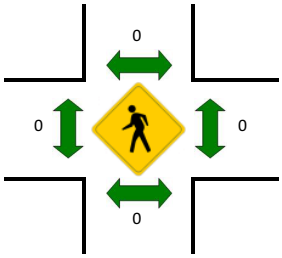
LOCATION: Morton Taylor Rd -- Tyler Rd
CITY/STATE: Wayne, MI

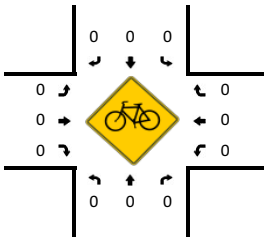
QC JOB #: 15596201
DATE: Tue, Oct 26 2021

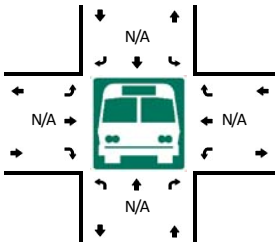
Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM

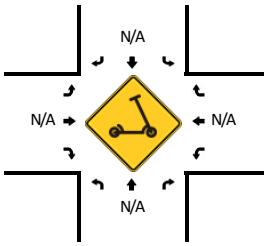












15-Min Count Period Beginning At	Morton Taylor Rd (Northbound)				Morton Taylor Rd (Southbound)				Tyler Rd (Eastbound)				Tyler Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	2	3	2	0	0	34	1	0	0	58	0	0	100	
7:15 AM	0	0	1	0	1	0	1	0	2	37	0	0	1	70	2	0	115	
7:30 AM	0	1	2	0	2	2	1	0	0	30	1	0	2	57	0	0	98	
7:45 AM	1	1	1	0	3	2	0	0	0	35	1	0	1	74	1	0	120	433
8:00 AM	0	0	1	0	2	2	0	0	0	52	1	0	1	54	0	0	113	446
8:15 AM	1	0	0	0	2	1	0	0	3	39	0	0	5	42	0	0	93	424
8:30 AM	0	1	1	0	0	1	2	0	1	41	2	0	4	60	1	0	114	440
8:45 AM	1	0	3	0	3	2	2	0	1	54	2	0	4	49	1	0	122	442

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	4	4	0	12	8	0	0	0	140	4	0	4	296	4	0	480
Heavy Trucks	0	0	0		4	0	0		0	0	4		0	20	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/3/2021 12:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

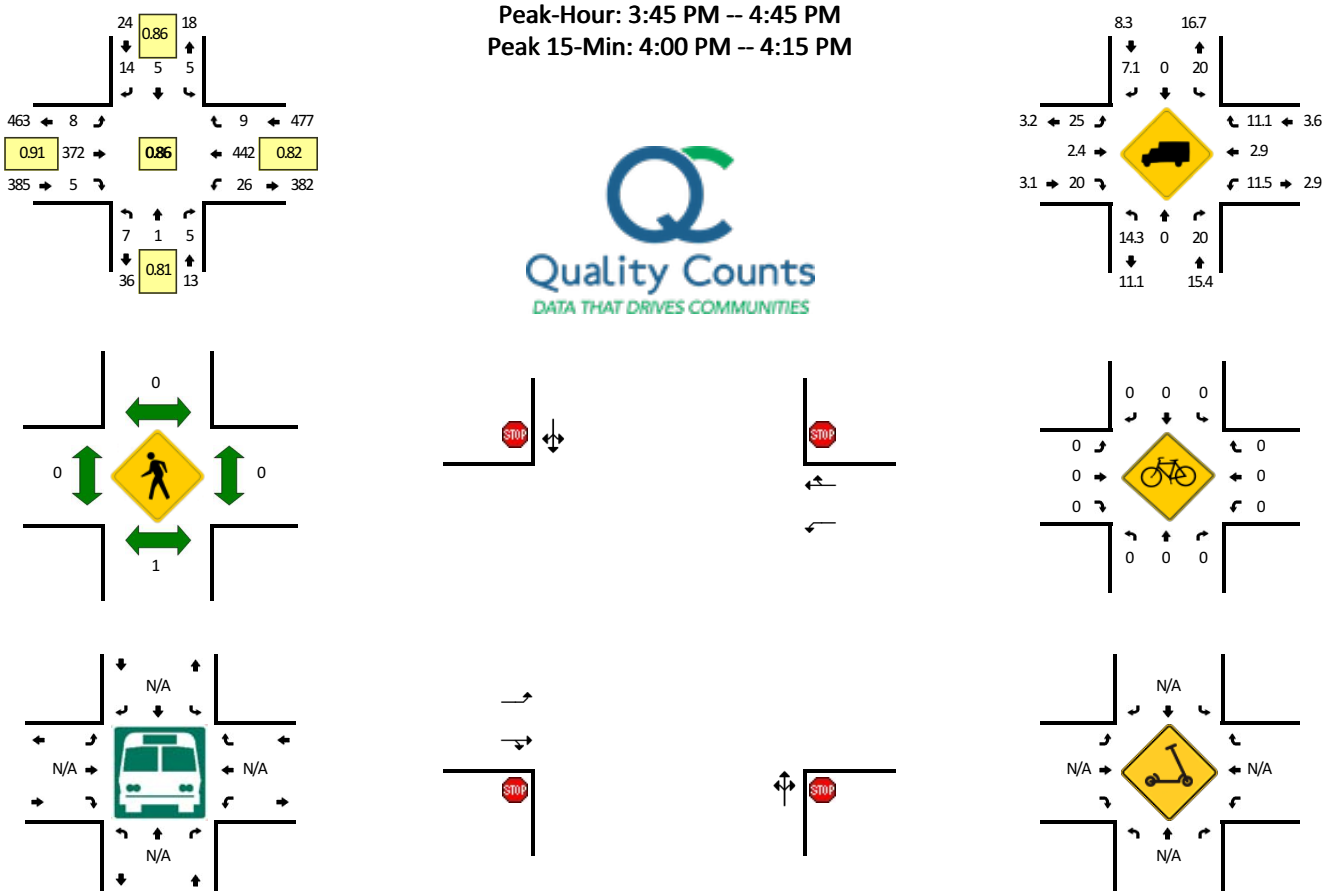
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Morton Taylor Rd -- Tyler Rd
CITY/STATE: Wayne, MI

QC JOB #: 15596202
DATE: Tue, Oct 26 2021

Peak-Hour: 3:45 PM -- 4:45 PM
Peak 15-Min: 4:00 PM -- 4:15 PM



15-Min Count Period Beginning At	Morton Taylor Rd (Northbound)				Morton Taylor Rd (Southbound)				Tyler Rd (Eastbound)				Tyler Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	3	2	0	2	0	1	0	2	65	0	0	8	71	2	0	156	
3:15 PM	1	0	1	0	3	1	1	0	1	85	2	0	8	92	1	0	196	
3:30 PM	1	1	2	0	3	0	1	0	4	69	3	0	6	103	1	0	194	
3:45 PM	2	1	1	0	2	2	1	0	2	90	3	0	6	92	2	0	204	750
4:00 PM	2	0	1	0	2	2	3	0	0	105	1	0	4	140	2	0	262	856
4:15 PM	1	0	2	0	1	0	6	0	3	84	1	0	8	110	2	0	218	878
4:30 PM	2	0	1	0	0	1	4	0	3	93	0	0	8	100	3	0	215	899
4:45 PM	1	1	0	0	2	2	2	0	4	63	5	0	6	97	4	0	187	882
5:00 PM	1	1	0	0	3	3	4	0	1	107	0	0	5	101	1	0	227	847
5:15 PM	2	1	0	0	2	1	1	0	4	84	1	0	6	95	2	0	199	828
5:30 PM	2	0	3	0	1	2	3	0	1	81	4	0	5	91	2	0	195	808
5:45 PM	0	0	0	0	0	3	2	0	3	79	2	0	3	91	5	0	188	809

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	4	0	8	8	12	0	0	420	4	0	16	560	8	0	1048
Heavy Trucks	0	0	0		4	0	0		0	12	0		0	12	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/3/2021 12:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

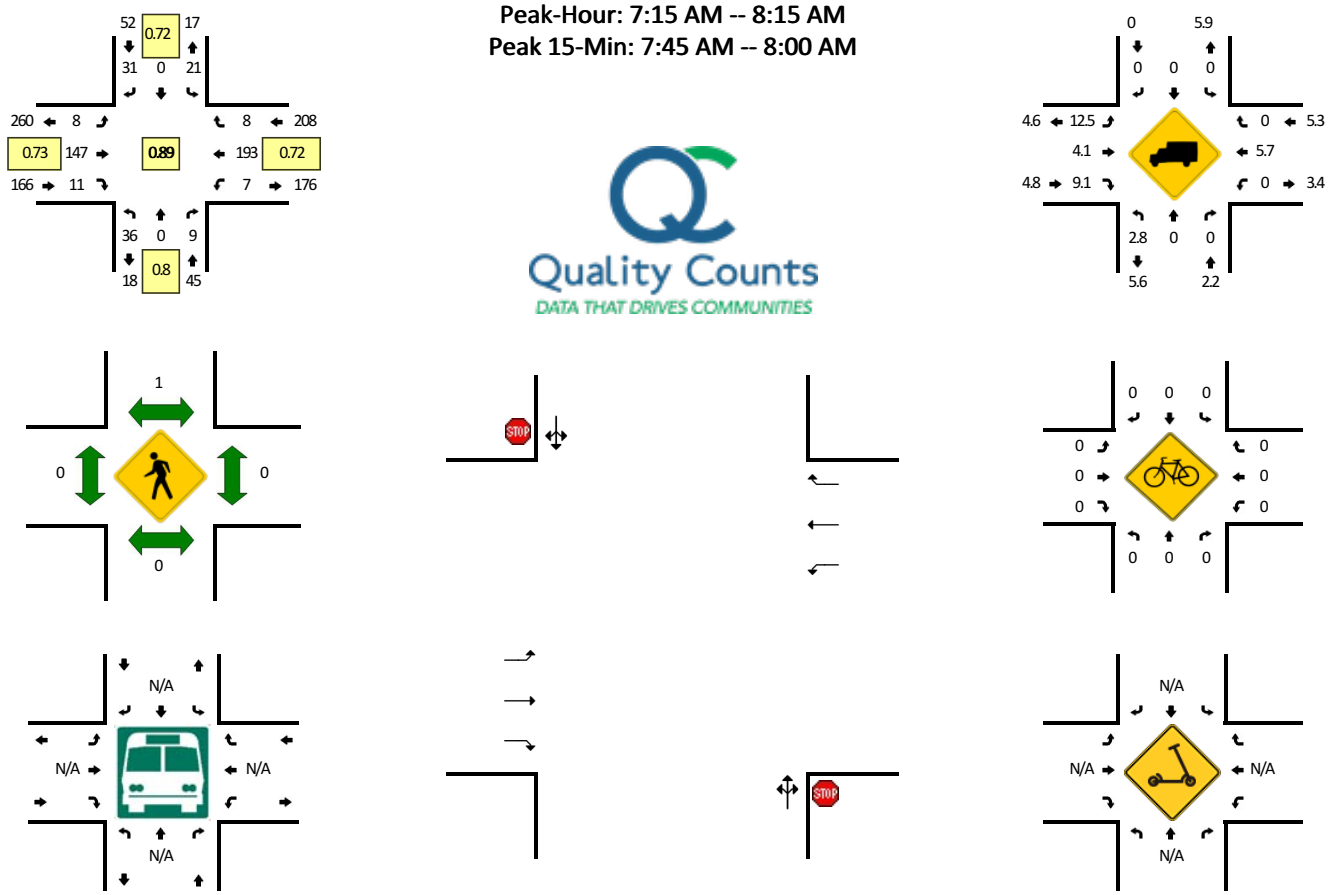
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Springwood Blvd/Lancaster Dr -- Tyler Rd
CITY/STATE: Wayne, MI

QC JOB #: 15596203
DATE: Tue, Oct 26 2021

Peak-Hour: 7:15 AM -- 8:15 AM
Peak 15-Min: 7:45 AM -- 8:00 AM



15-Min Count Period Beginning At	Springwood Blvd/Lancaster Dr (Northbound)				Springwood Blvd/Lancaster Dr (Southbound)				Tyler Rd (Eastbound)				Tyler Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	7	0	3	0	3	0	7	0	1	33	2	0	1	44	2	0	103	
7:15 AM	12	0	2	0	5	0	8	1	2	37	0	0	0	50	2	0	119	
7:30 AM	5	0	4	0	4	0	14	0	2	26	3	0	2	41	0	0	101	
7:45 AM	9	0	3	0	4	0	5	0	0	36	3	0	1	67	4	0	132	455
8:00 AM	10	0	0	0	7	0	4	0	4	48	5	0	4	35	2	0	119	471
8:15 AM	8	0	2	0	2	0	3	0	0	36	2	0	0	38	0	0	91	443
8:30 AM	5	0	0	0	0	0	2	0	3	39	1	0	0	55	2	0	107	449
8:45 AM	9	0	2	0	3	0	4	0	0	56	5	0	0	42	1	0	122	439

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	36	0	12	0	16	0	20	0	0	144	12	0	4	268	16	0	528
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	20	0		20
Buses																	
Pedestrians		0				4				0				0			4
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/3/2021 12:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

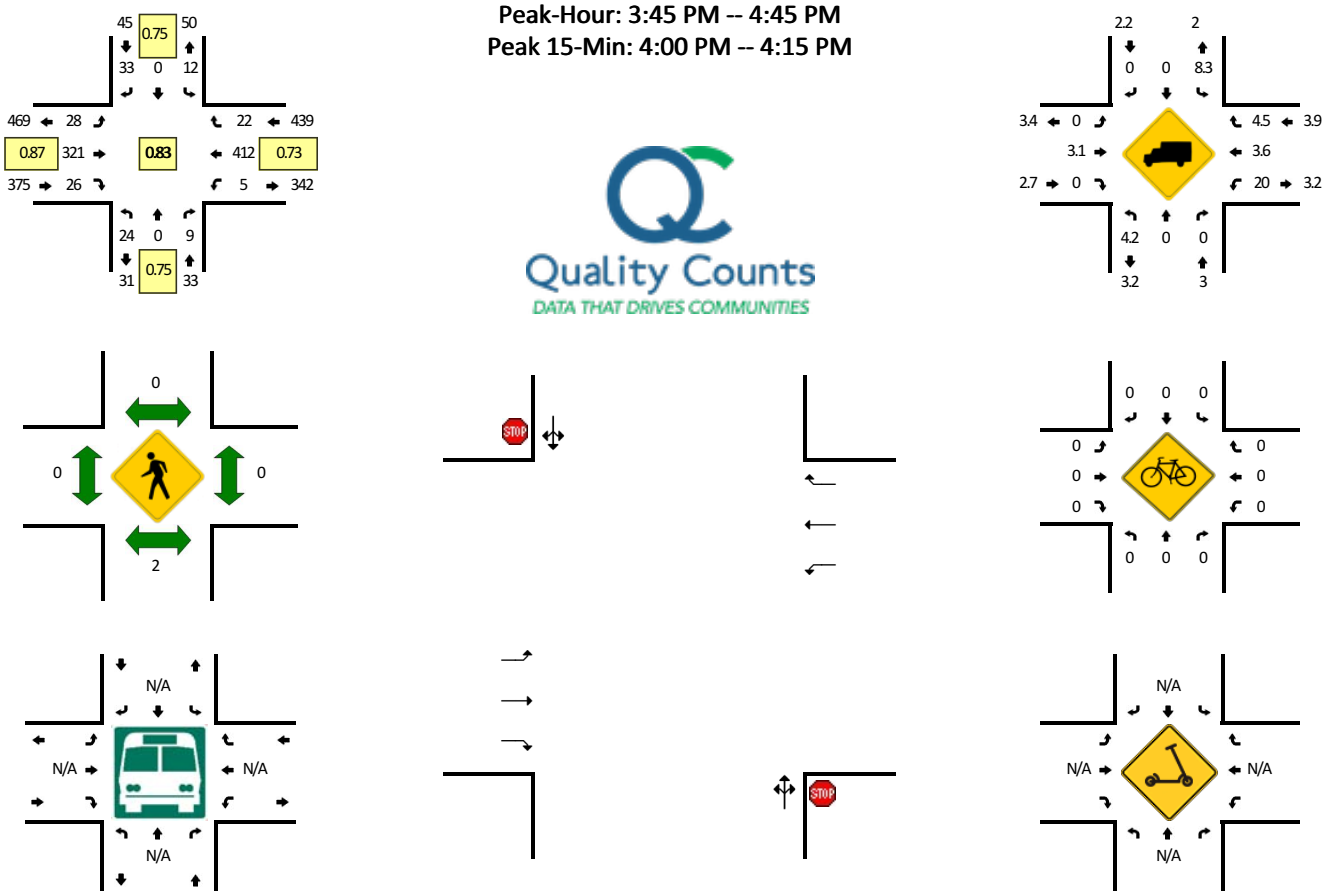
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Springwood Blvd/Lancaster Dr -- Tyler Rd
CITY/STATE: Wayne, MI

QC JOB #: 15596204
DATE: Tue, Oct 26 2021

Peak-Hour: 3:45 PM -- 4:45 PM
Peak 15-Min: 4:00 PM -- 4:15 PM



15-Min Count Period Beginning At	Springwood Blvd/Lancaster Dr (Northbound)				Springwood Blvd/Lancaster Dr (Southbound)				Tyler Rd (Eastbound)				Tyler Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	1	0	2	0	3	0	2	0	4	61	5	0	2	82	4	0	166	
3:15 PM	5	0	3	0	3	0	6	0	11	67	12	0	4	92	2	0	205	
3:30 PM	6	0	1	0	0	0	8	0	5	66	6	0	3	103	3	0	201	
3:45 PM	5	0	6	0	3	0	9	0	7	76	6	0	2	77	3	0	194	766
4:00 PM	2	0	1	0	1	0	7	0	6	93	9	0	3	139	9	0	270	870
4:15 PM	11	0	0	0	2	0	8	0	7	80	3	0	0	99	6	0	216	881
4:30 PM	6	0	2	0	6	0	9	0	8	72	8	0	0	97	4	0	212	892
4:45 PM	7	0	6	0	0	0	5	0	10	57	7	0	0	92	7	0	191	889
5:00 PM	2	0	2	0	2	0	3	0	9	93	7	0	8	100	2	0	228	847
5:15 PM	2	0	3	0	5	0	5	0	8	71	7	0	4	99	7	0	211	842
5:30 PM	10	0	1	0	2	0	6	0	5	67	9	0	4	81	9	0	194	824
5:45 PM	2	0	4	0	2	2	7	0	9	60	7	0	5	86	5	0	189	822

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	8	0	4	0	4	0	28	0	24	372	36	0	12	556	36	0	1080
Heavy Trucks	0	0	0		0	0	0		0	16	0		4	12	4		36
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/3/2021 12:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

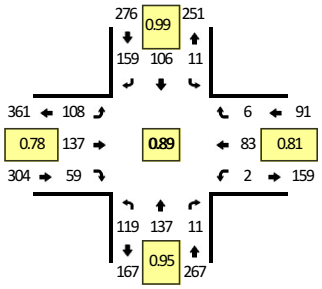
Type of peak hour being reported: Intersection Peak

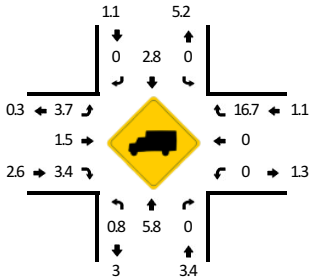
Method for determining peak hour: Total Entering Volume

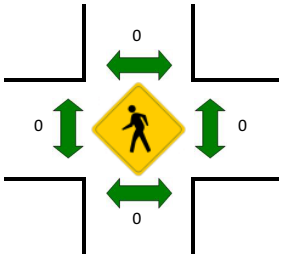
LOCATION: Haggerty Rd -- Tyler Rd
CITY/STATE: Wayne, MI

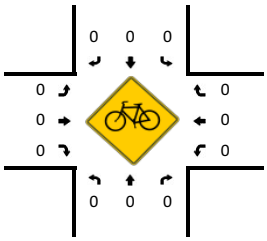
QC JOB #: 15596206
DATE: Wed, Dec 8 2021

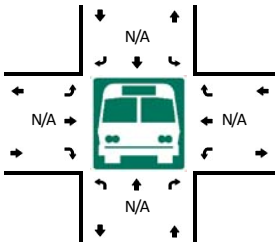
Peak-Hour: 4:00 PM -- 5:00 PM
Peak 15-Min: 4:00 PM -- 4:15 PM

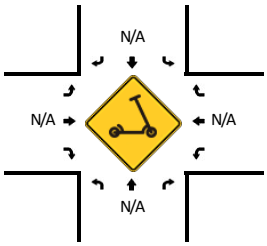












15-Min Count Period Beginning At	Haggerty Rd (Northbound)				Haggerty Rd (Southbound)				Tyler Rd (Eastbound)				Tyler Rd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	16	32	3	0	10	44	31	0	17	19	4	0	0	21	0	0	197	
3:15 PM	32	23	3	0	6	21	26	0	20	25	5	0	0	23	3	0	187	
3:30 PM	22	32	2	0	6	21	33	0	11	25	7	0	0	25	0	0	184	
3:45 PM	33	31	2	0	1	11	49	0	16	27	8	0	0	24	4	0	206	774
4:00 PM	33	33	1	0	1	29	40	0	38	41	19	0	1	26	1	0	263	840
4:15 PM	33	34	2	0	2	21	46	0	28	30	14	0	0	22	2	0	234	887
4:30 PM	19	39	3	0	1	36	33	0	17	26	11	0	0	13	2	0	200	903
4:45 PM	34	31	5	0	7	20	40	0	25	40	15	0	1	22	1	0	241	938
5:00 PM	26	34	3	0	4	27	40	0	30	30	7	0	2	20	3	0	226	901
5:15 PM	25	30	5	0	3	25	41	0	15	33	5	0	2	10	2	0	196	863
5:30 PM	27	24	4	0	2	15	46	0	13	22	8	0	0	22	1	0	184	847
5:45 PM	28	21	5	0	4	25	45	0	18	25	13	0	2	23	1	0	210	816

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	132	132	4	0	4	116	160	0	152	164	76	0	4	104	4	0	1052
Heavy Trucks	0	4	0		0	4	0		8	4	8		0	0	0		28
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 12/17/2021 12:51 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, MI
48180

Intersection: Tyler Rd and Haggerty Rd
Date: December 17, 2021
Counted by: Wade Trim
Job #: GPM2001

File Name : Tyler and Haggerty 12-17-21
Site Code : 00000000
Start Date : 12/17/2021
Page No : 1

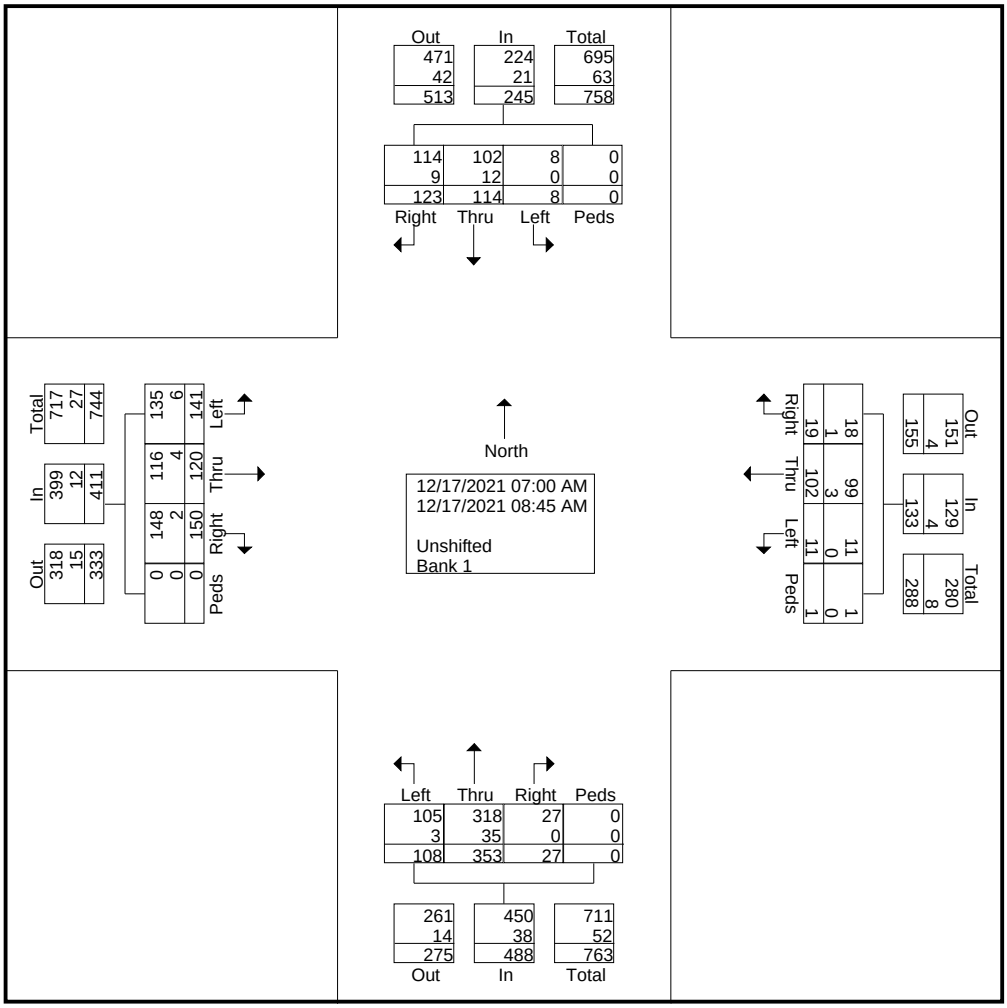
Groups Printed- Unshifted - Bank 1

	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
07:00 AM	8	14	1	0	23	5	10	1	0	16	4	42	9	0	55	21	14	17	0	52	146
07:15 AM	12	7	0	0	19	1	14	1	0	16	7	43	8	0	58	14	10	16	0	40	133
07:30 AM	15	9	2	0	26	2	17	4	0	23	1	48	3	0	52	22	9	19	0	50	151
07:45 AM	16	22	2	0	40	2	12	2	0	16	8	58	22	0	88	23	21	16	0	60	204
Total	51	52	5	0	108	10	53	8	0	71	20	191	42	0	253	80	54	68	0	202	634
08:00 AM	16	17	1	0	34	4	12	0	0	16	1	40	17	0	58	19	19	19	0	57	165
08:15 AM	11	8	1	0	20	2	10	1	0	13	2	42	16	0	60	15	11	18	0	44	137
08:30 AM	17	24	0	0	41	1	4	0	1	6	3	37	13	0	53	15	19	17	0	51	151
08:45 AM	28	13	1	0	42	2	23	2	0	27	1	43	20	0	64	21	17	19	0	57	190
Total	72	62	3	0	137	9	49	3	1	62	7	162	66	0	235	70	66	73	0	209	643
Grand Total	123	114	8	0	245	19	102	11	1	133	27	353	108	0	488	150	120	141	0	411	1277
Apprch %	50.2	46.5	3.3	0		14.3	76.7	8.3	0.8		5.5	72.3	22.1	0		36.5	29.2	34.3	0		
Total %	9.6	8.9	0.6	0	19.2	1.5	8	0.9	0.1	10.4	2.1	27.6	8.5	0	38.2	11.7	9.4	11	0	32.2	
Unshifted	114	102	8	0	224	18	99	11	1	129	27	318	105	0	450	148	116	135	0	399	1202
% Unshifted	92.7	89.5	100	0	91.4	94.7	97.1	100	100	97	100	90.1	97.2	0	92.2	98.7	96.7	95.7	0	97.1	94.1
Bank 1	9	12	0	0	21	1	3	0	0	4	0	35	3	0	38	2	4	6	0	12	75
% Bank 1	7.3	10.5	0	0	8.6	5.3	2.9	0	0	3	0	9.9	2.8	0	7.8	1.3	3.3	4.3	0	2.9	5.9

Wade Trim Associates, Inc.

25251 Northline Road
Taylor, MI
48180

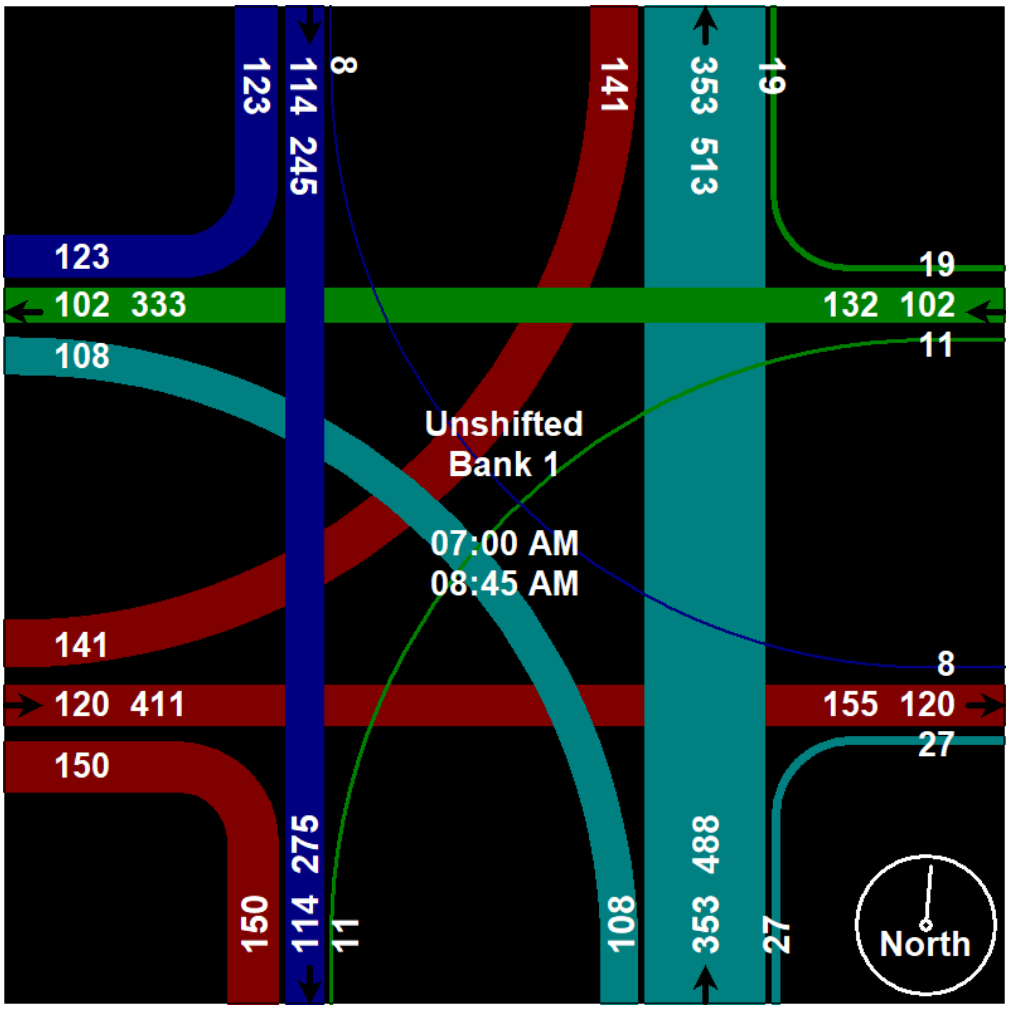
File Name : Tyler and Haggerty 12-17-21
Site Code : 00000000
Start Date : 12/17/2021
Page No : 2



Wade Trim Associates, Inc.

25251 Northline Road
Taylor, MI
48180

File Name : Tyler and Haggerty 12-17-21
Site Code : 00000000
Start Date : 12/17/2021
Page No : 3

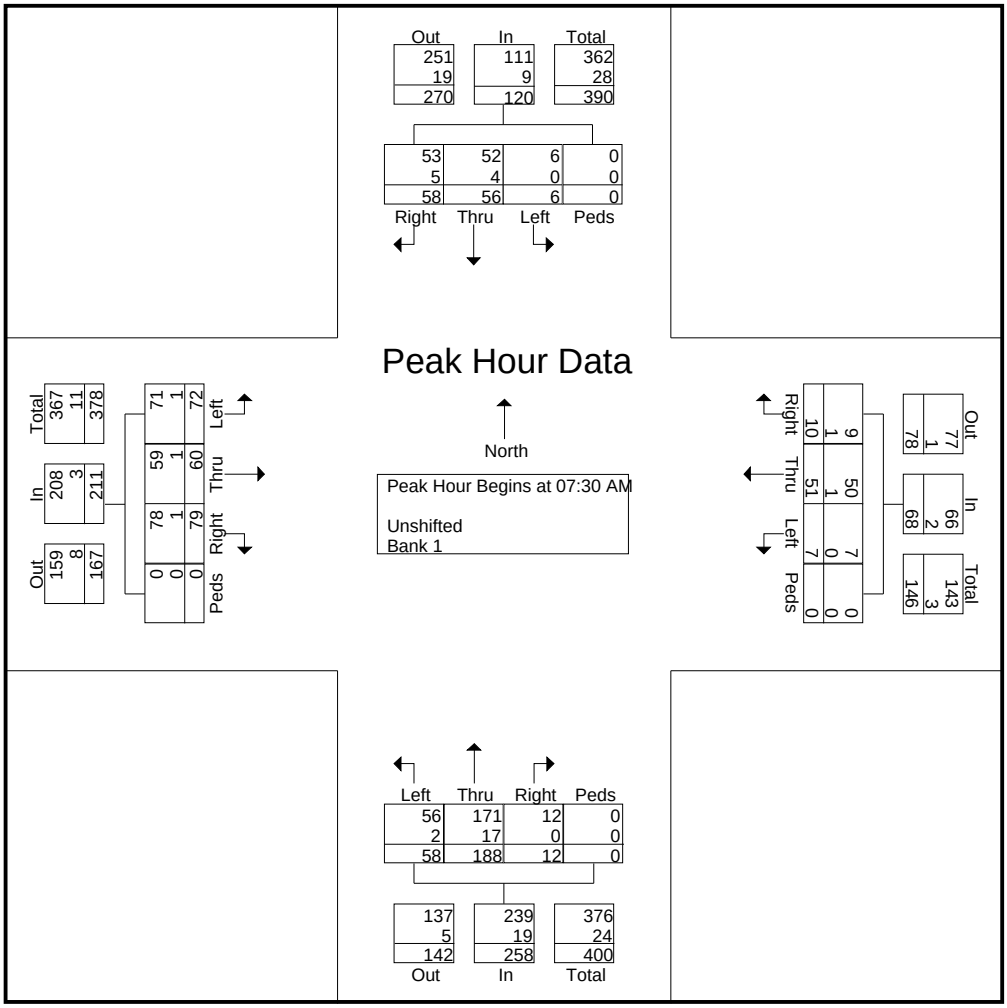


Wade Trim Associates, Inc.

25251 Northline Road
Taylor, MI
48180

File Name : Tyler and Haggerty 12-17-21
Site Code : 00000000
Start Date : 12/17/2021
Page No : 4

	Southbound					Westbound					Northbound					Eastbound					
Start Time	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Right	Thru	Left	Peds	App. Total	Int. Total
Peak Hour Analysis From 07:00 AM to 08:45 AM - Peak 1 of 1																					
Peak Hour for Entire Intersection Begins at 07:30 AM																					
07:30 AM	15	9	**2**	0	26	2	**17**	**4**	0	**23**	1	48	3	0	52	22	9	**19**	0	50	151
07:45 AM	**16**	**22**	2	0	**40**	2	12	2	0	16	**8**	**58**	**22**	0	**88**	**23**	**21**	16	0	**60**	**204**
08:00 AM	16	17	1	0	34	**4**	12	0	0	16	1	40	17	0	58	19	19	19	0	57	165
08:15 AM	11	8	1	0	20	2	10	1	0	13	2	42	16	0	60	15	11	18	0	44	137
Total Volume	58	56	6	0	120	10	51	7	0	68	12	188	58	0	258	79	60	72	0	211	657
% App. Total	48.3	46.7	5	0		14.7	75	10.3	0		4.7	72.9	22.5	0		37.4	28.4	34.1	0		
PHF	.906	.636	.750	.000	.750	.625	.750	.438	.000	.739	.375	.810	.659	.000	.733	.859	.714	.947	.000	.879	.805
Unshifted	53	52	6	0	111	9	50	7	0	66	12	171	56	0	239	78	59	71	0	208	624
% Unshifted	91.4	92.9	100	0	92.5	90.0	98.0	100	0	97.1	100	91.0	96.6	0	92.6	98.7	98.3	98.6	0	98.6	95.0
Bank 1	5	4	0	0	9	1	1	0	0	2	0	17	2	0	19	1	1	1	0	3	33
% Bank 1	8.6	7.1	0	0	7.5	10.0	2.0	0	0	2.9	0	9.0	3.4	0	7.4	1.3	1.7	1.4	0	1.4	5.0



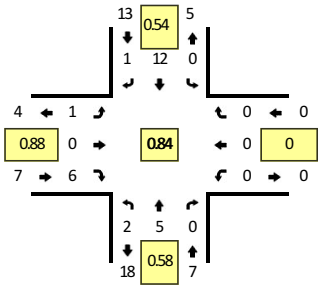
Type of peak hour being reported: Intersection Peak

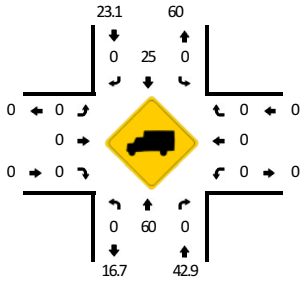
Method for determining peak hour: Total Entering Volume

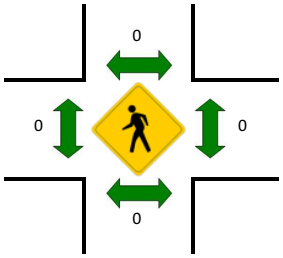
LOCATION: Morton Taylor Rd -- Heatherfield Blvd
CITY/STATE: Wayne, MI

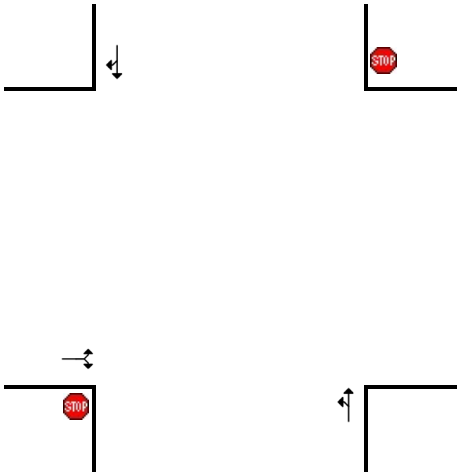
QC JOB #: 15596207
DATE: Tue, Oct 26 2021

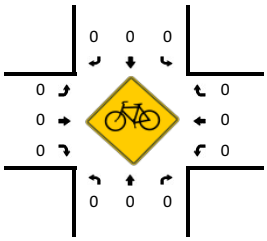
Peak-Hour: 7:00 AM -- 8:00 AM
Peak 15-Min: 7:00 AM -- 7:15 AM

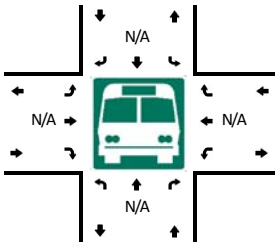


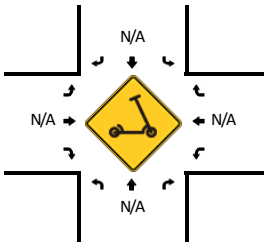












15-Min Count Period Beginning At	Morton Taylor Rd (Northbound)				Morton Taylor Rd (Southbound)				Heatherfield Blvd (Eastbound)				Heatherfield Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
7:00 AM	0	0	0	0	0	5	1	0	0	0	2	0	0	0	0	0	8	
7:15 AM	0	3	0	0	0	1	0	0	0	0	1	0	0	0	0	0	5	
7:30 AM	1	1	0	0	0	3	0	0	0	0	1	1	0	0	0	0	7	
7:45 AM	1	1	0	0	0	3	0	0	0	0	2	0	0	0	0	0	7	27
8:00 AM	1	0	0	0	0	3	0	0	1	0	1	0	0	0	0	0	6	25
8:15 AM	0	3	0	0	0	2	0	0	0	0	1	0	0	0	0	0	6	26
8:30 AM	1	2	0	0	0	3	0	0	0	0	1	0	0	0	0	0	7	26
8:45 AM	1	1	0	0	0	6	0	0	0	0	0	0	0	0	0	0	8	27

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	0	0	0	0	0	20	4	0	0	0	8	0	0	0	0	0	32
Heavy Trucks	0	0	0		0	4	0		0	0	0		0	0	0		4
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/3/2021 12:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

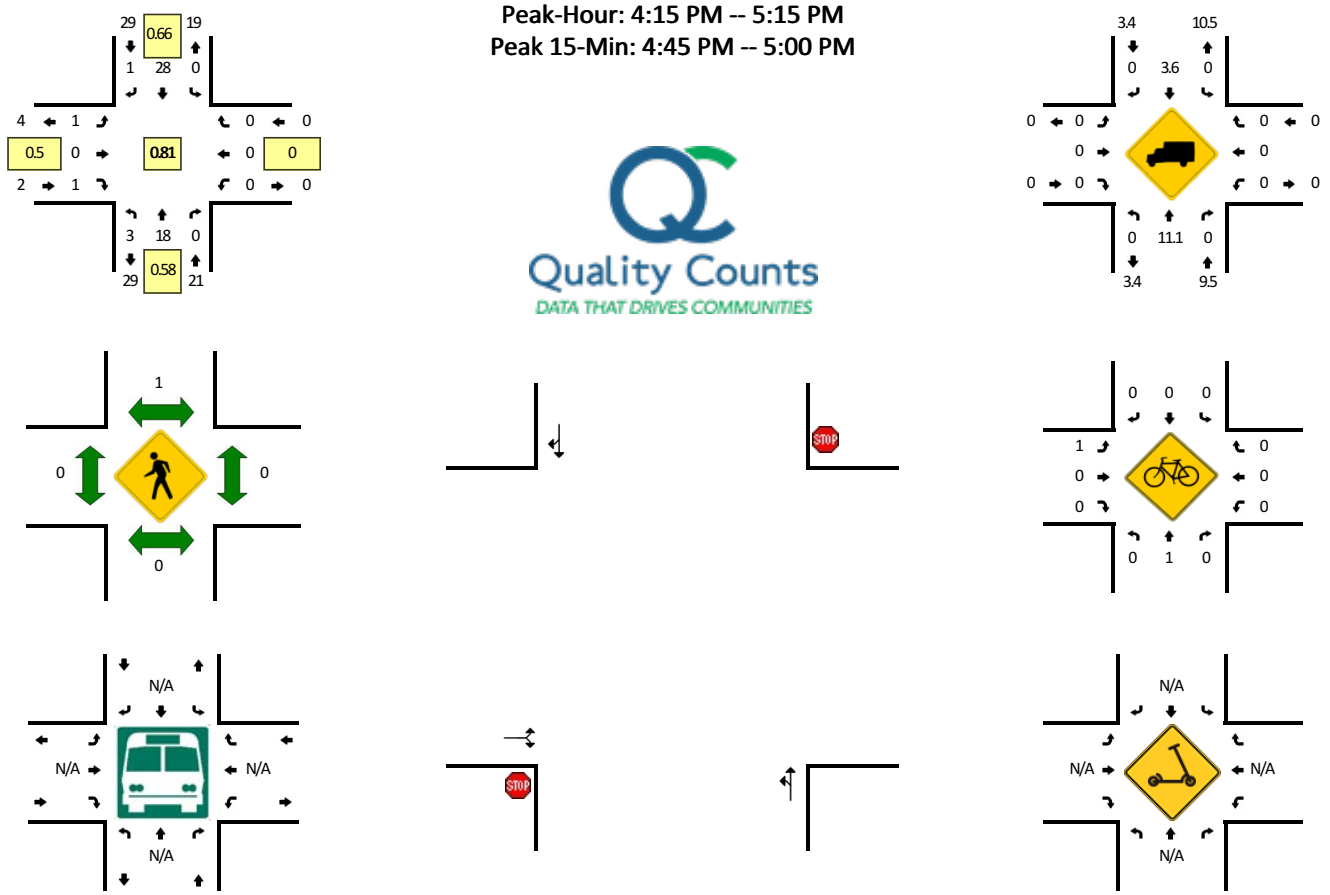
Type of peak hour being reported: Intersection Peak

Method for determining peak hour: Total Entering Volume

LOCATION: Morton Taylor Rd -- Heatherfield Blvd
CITY/STATE: Wayne, MI

QC JOB #: 15596208
DATE: Tue, Oct 26 2021

Peak-Hour: 4:15 PM -- 5:15 PM
Peak 15-Min: 4:45 PM -- 5:00 PM



15-Min Count Period Beginning At	Morton Taylor Rd (Northbound)				Morton Taylor Rd (Southbound)				Heatherfield Blvd (Eastbound)				Heatherfield Blvd (Westbound)				Total	Hourly Totals
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U		
3:00 PM	0	6	0	0	0	2	1	0	1	0	1	1	0	0	0	0	12	
3:15 PM	1	3	0	0	0	4	0	0	0	0	1	0	0	0	0	0	9	
3:30 PM	0	5	0	0	0	4	0	0	0	0	0	0	0	0	0	0	9	
3:45 PM	1	5	0	0	0	4	0	0	0	0	1	2	0	0	0	0	13	43
4:00 PM	0	2	0	0	0	5	1	0	1	0	1	1	0	0	0	0	11	42
4:15 PM	0	5	0	0	0	6	0	0	0	0	1	0	0	0	0	0	12	45
4:30 PM	2	3	0	0	0	6	0	0	0	0	0	0	0	0	0	0	11	47
4:45 PM	1	8	0	0	0	5	1	0	1	0	0	0	0	0	0	0	16	50
5:00 PM	0	2	0	0	0	11	0	0	0	0	0	0	0	0	0	0	13	52
5:15 PM	1	5	0	0	0	1	1	0	1	0	1	1	0	0	0	0	11	51
5:30 PM	0	2	0	1	0	4	0	0	1	0	3	0	0	0	0	0	11	51
5:45 PM	1	7	0	0	0	0	3	0	0	0	0	0	0	0	0	0	11	46

Peak 15-Min Flowrates	Northbound				Southbound				Eastbound				Westbound				Total
	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	Left	Thru	Right	U	
All Vehicles	4	32	0	0	0	20	4	0	4	0	0	0	0	0	0	0	64
Heavy Trucks	0	0	0		0	0	0		0	0	0		0	0	0		0
Buses																	
Pedestrians		0				0				0				0			0
Bicycles	0	0	0		0	0	0		0	0	0		0	0	0		0
Scooters																	

Comments:

Report generated on 11/3/2021 12:09 PM

SOURCE: Quality Counts, LLC (http://www.qualitycounts.net) 1-877-580-2212

Appendix B.
Signal Timing Permits

WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES - TRAFFIC SECTION
SOLID STATE TIMING PERMIT

CYCLE LENGTH	OFFSET	HOURS OF OPERATION	INTERVAL TIMING (SECONDS) 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24
SEC	SEC	MINIMUM TIME	3	3	1	1	4	0	3	3	1	1	4	0												
DIAL 1 / 80	0	6:00A–10:00P 7 DAYS	3.1	46.0	1.0	1.0	4.8	0.1	3.1	14.0	1.0	1.0	4.8	0.1												
DIAL 2																										
DIAL 3																										
DIAL 4																										

DESCRIPTION	SIGNAL PLAN -- CYCLE SEQUENCE CHART 1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	FLASH
HAGGERTY	G	G	G	G	Y	R	R	R	R	R	R	R													Y
TYLER	R	R	R	R	R	R	G	G	G	G	Y	R													R

REMARKS	LOCATION			FLASHER SCHEDULE	
	HAGGERTY - TYLER			10 P.M. – 6:00 A.M., 7 DAYS	
	S.L. NO. 1628 i	PREPARED BY JPM	ISSUED 03-20-06	INSTALLED 03-21-2006	RR PRE-EMPT FIRE PRE-EMPT INITIALIZE TIME = 10 SEC.
	ATS NO. 01681	APPROVED BY			PROM NUMBER STD2V2P

Appendix C.
Existing Synchro Capacity Reports

HCM 6th Signalized Intersection Summary
1001: Haggerty Road & Tyler Road

Existing AM -2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	72	60	79	7	51	10	58	188	12	6	56	58
Future Volume (veh/h)	72	60	79	7	51	10	58	188	12	6	56	58
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1856	1856	1856	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	89	74	98	9	69	14	79	258	16	8	75	77
Peak Hour Factor	0.81	0.81	0.81	0.74	0.74	0.74	0.73	0.73	0.73	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	3	3	3	7	7	7	7	7	7
Cap, veh/h	358	176	233	275	357	73	460	1482	94	118	1031	885
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1325	736	974	1203	1497	304	619	2321	147	107	1615	1385
Grp Volume(v), veh/h	89	0	172	9	0	83	177	0	176	83	0	77
Grp Sat Flow(s),veh/h/ln	1325	0	1710	1203	0	1801	1478	0	1608	1722	0	1385
Q Serve(g_s), s	4.6	0.0	6.8	0.5	0.0	2.9	0.9	0.0	3.5	0.0	0.0	1.7
Cycle Q Clear(g_c), s	7.5	0.0	6.8	7.3	0.0	2.9	3.3	0.0	3.5	1.4	0.0	1.7
Prop In Lane	1.00		0.57	1.00		0.17	0.45		0.09	0.10		1.00
Lane Grp Cap(c), veh/h	358	0	408	275	0	430	1009	0	1027	1149	0	885
V/C Ratio(X)	0.25	0.00	0.42	0.03	0.00	0.19	0.18	0.00	0.17	0.07	0.00	0.09
Avail Cap(c_a), veh/h	358	0	408	275	0	430	1009	0	1027	1149	0	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.3	0.0	25.8	28.9	0.0	24.3	5.8	0.0	5.9	5.5	0.0	5.5
Incr Delay (d2), s/veh	1.7	0.0	3.2	0.2	0.0	1.0	0.4	0.0	0.4	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.5	0.0	2.9	0.2	0.0	1.3	1.0	0.0	1.0	0.4	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.0	0.0	28.9	29.1	0.0	25.3	6.2	0.0	6.2	5.6	0.0	5.7
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		261			92			353			160	
Approach Delay, s/veh		29.0			25.7			6.2			5.7	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	56.0	24.0	56.0	24.0
Change Period (Y+Rc), s	* 4.9	* 4.9	* 4.9	* 4.9
Max Green Setting (Gmax), s	* 51	* 19	* 51	* 19
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	15.0
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	2	7	18	1
Future Vol, veh/h	1	6	2	7	18	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	60	60	60	60
Heavy Vehicles, %	0	0	43	43	23	23
Mvmt Flow	1	7	3	12	30	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	49	31	32	0	-	0
Stage 1	31	-	-	-	-	-
Stage 2	18	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.53	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.587	-	-	-
Pot Cap-1 Maneuver	965	1049	1352	-	-	-
Stage 1	997	-	-	-	-	-
Stage 2	1010	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	963	1049	1352	-	-	-
Mov Cap-2 Maneuver	963	-	-	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	1010	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	1.7	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1352	-	1036	-	-
HCM Lane V/C Ratio	0.002	-	0.008	-	-
HCM Control Delay (s)	7.7	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Intersection Delay, s/veh	10.1
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	154	3	5	255	3	1	4	5	8	12	2
Future Vol, veh/h	2	154	3	5	255	3	1	4	5	8	12	2
Peak Hour Factor	0.75	0.75	0.75	0.87	0.87	0.87	0.67	0.67	0.67	0.80	0.80	0.80
Heavy Vehicles, %	4	4	4	5	5	5	12	12	12	12	12	12
Mvmt Flow	3	205	4	6	293	3	1	6	7	10	15	3
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.6	10.7	8.2	8.6
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	10%	100%	0%	100%	0%	36%
Vol Thru, %	40%	0%	98%	0%	99%	55%
Vol Right, %	50%	0%	2%	0%	1%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	10	2	157	5	258	22
LT Vol	1	2	0	5	0	8
Through Vol	4	0	154	0	255	12
RT Vol	5	0	3	0	3	2
Lane Flow Rate	15	3	209	6	297	28
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.021	0.004	0.285	0.009	0.401	0.041
Departure Headway (Hd)	5.098	5.411	4.895	5.374	4.865	5.375
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	702	663	737	670	744	666
Service Time	3.13	3.128	2.613	3.074	2.565	3.406
HCM Lane V/C Ratio	0.021	0.005	0.284	0.009	0.399	0.042
HCM Control Delay	8.2	8.1	9.6	8.1	10.8	8.6
HCM Lane LOS	A	A	A	A	B	A
HCM 95th-tile Q	0.1	0	1.2	0	1.9	0.1

Intersection	
Int Delay, s/veh	2.8

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	147	11	7	193	8	36	0	9	21	0	31
Future Vol, veh/h	8	147	11	7	193	8	36	0	9	21	0	31
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	72	72	72	80	80	80	72	72	72
Heavy Vehicles, %	5	5	5	5	5	5	2	2	2	0	0	0
Mvmt Flow	11	201	15	10	268	11	45	0	11	29	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	280	0	0	216	0	0	546	531	209	531	533	275
Stage 1	-	-	-	-	-	-	231	231	-	295	295	-
Stage 2	-	-	-	-	-	-	315	300	-	236	238	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1266	-	-	1336	-	-	448	454	831	462	456	769
Stage 1	-	-	-	-	-	-	772	713	-	718	673	-
Stage 2	-	-	-	-	-	-	696	666	-	772	712	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1265	-	-	1336	-	-	418	446	831	450	448	768
Mov Cap-2 Maneuver	-	-	-	-	-	-	418	446	-	450	448	-
Stage 1	-	-	-	-	-	-	765	707	-	711	668	-
Stage 2	-	-	-	-	-	-	652	661	-	755	706	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.3	13.8	11.9
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	464	1265	-	-	1336	-	-	597
HCM Lane V/C Ratio	0.121	0.009	-	-	0.007	-	-	0.121
HCM Control Delay (s)	13.8	7.9	-	-	7.7	-	-	11.9
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.4

HCM 6th Signalized Intersection Summary
1001: Haggerty Road & Tyler Road

Existing PM - 2021

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	108	137	59	2	83	6	119	137	11	11	106	159
Future Volume (veh/h)	108	137	59	2	83	6	119	137	11	11	106	159
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1856	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	138	176	76	2	102	7	125	144	12	12	112	167
Peak Hour Factor	0.78	0.78	0.78	0.81	0.81	0.81	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	1	1	1	3	3	3	1	1	1
Cap, veh/h	334	293	127	217	416	29	714	1014	85	123	1093	929
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1274	1229	531	1137	1744	120	981	1587	134	115	1710	1454
Grp Volume(v), veh/h	138	0	252	2	0	109	132	0	149	124	0	167
Grp Sat Flow(s),veh/h/ln	1274	0	1760	1137	0	1864	1037	0	1664	1825	0	1454
Q Serve(g_s), s	7.9	0.0	10.2	0.1	0.0	3.8	4.2	0.0	2.8	0.0	0.0	3.8
Cycle Q Clear(g_c), s	11.6	0.0	10.2	10.3	0.0	3.8	7.9	0.0	2.8	2.0	0.0	3.8
Prop In Lane	1.00		0.30	1.00		0.06	0.95		0.08	0.10		1.00
Lane Grp Cap(c), veh/h	334	0	420	217	0	445	750	0	1063	1215	0	929
V/C Ratio(X)	0.41	0.00	0.60	0.01	0.00	0.24	0.18	0.00	0.14	0.10	0.00	0.18
Avail Cap(c_a), veh/h	334	0	420	217	0	445	750	0	1063	1215	0	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.3	0.0	27.1	31.6	0.0	24.6	7.4	0.0	5.7	5.6	0.0	5.9
Incr Delay (d2), s/veh	3.7	0.0	6.2	0.1	0.0	1.3	0.5	0.0	0.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.6	0.0	4.6	0.0	0.0	1.7	0.9	0.0	0.8	0.7	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.1	0.0	33.3	31.7	0.0	25.9	7.9	0.0	6.0	5.8	0.0	6.3
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		390			111			281			291	
Approach Delay, s/veh		33.2			26.0			6.9			6.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	56.0	24.0	56.0	24.0
Change Period (Y+Rc), s	* 4.9	* 4.9	* 4.9	* 4.9
Max Green Setting (Gmax), s	* 51	* 19	* 51	* 19
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	3	19	33	1
Future Vol, veh/h	1	1	3	19	33	1
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	60	60	66	66
Heavy Vehicles, %	0	0	9	9	4	4
Mvmt Flow	2	2	5	32	50	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	94	51	52	0	-	0
Stage 1	51	-	-	-	-	-
Stage 2	43	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.281	-	-	-
Pot Cap-1 Maneuver	911	1023	1510	-	-	-
Stage 1	977	-	-	-	-	-
Stage 2	985	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	908	1023	1510	-	-	-
Mov Cap-2 Maneuver	908	-	-	-	-	-
Stage 1	974	-	-	-	-	-
Stage 2	985	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	1	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1510	-	962	-	-
HCM Lane V/C Ratio	0.003	-	0.003	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Intersection Delay, s/veh	18.7
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	372	5	26	442	9	7	2	5	5	10	14
Future Vol, veh/h	8	372	5	26	442	9	7	2	5	5	10	14
Peak Hour Factor	0.91	0.91	0.91	0.82	0.82	0.82	0.81	0.81	0.81	0.86	0.86	0.86
Heavy Vehicles, %	3	3	3	4	4	4	15	15	15	8	8	8
Mvmt Flow	9	409	5	32	539	11	9	2	6	6	12	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	15.2	22	9.7	9.6
HCM LOS	C	C	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	50%	100%	0%	100%	0%	17%
Vol Thru, %	14%	0%	99%	0%	98%	34%
Vol Right, %	36%	0%	1%	0%	2%	48%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	8	377	26	451	29
LT Vol	7	8	0	26	0	5
Through Vol	2	0	372	0	442	10
RT Vol	5	0	5	0	9	14
Lane Flow Rate	17	9	414	32	550	34
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.031	0.014	0.595	0.049	0.771	0.057
Departure Headway (Hd)	6.509	5.684	5.171	5.564	5.047	6.101
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	553	628	696	642	715	582
Service Time	4.509	3.431	2.918	3.308	2.791	4.194
HCM Lane V/C Ratio	0.031	0.014	0.595	0.05	0.769	0.058
HCM Control Delay	9.7	8.5	15.3	8.6	22.8	9.6
HCM Lane LOS	A	A	C	A	C	A
HCM 95th-tile Q	0.1	0	4	0.2	7.4	0.2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	28	321	26	5	412	22	24	0	9	12	0	33
Future Vol, veh/h	28	321	26	5	412	22	24	0	9	12	0	33
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	73	73	73	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	4	4	4	3	3	3	2	2	2
Mvmt Flow	32	369	30	7	564	30	32	0	12	16	0	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	594	0	0	401	0	0	1065	1058	386	1047	1058	579
Stage 1	-	-	-	-	-	-	450	450	-	593	593	-
Stage 2	-	-	-	-	-	-	615	608	-	454	465	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.13	6.53	6.23	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.527	4.027	3.327	3.518	4.018	3.318
Pot Cap-1 Maneuver	977	-	-	1147	-	-	199	224	660	206	225	515
Stage 1	-	-	-	-	-	-	587	570	-	492	493	-
Stage 2	-	-	-	-	-	-	477	484	-	586	563	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	977	-	-	1145	-	-	176	215	659	196	216	515
Mov Cap-2 Maneuver	-	-	-	-	-	-	176	215	-	196	216	-
Stage 1	-	-	-	-	-	-	566	550	-	476	490	-
Stage 2	-	-	-	-	-	-	434	481	-	556	543	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	25.4	17
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	220	977	-	-	1145	-	-	359
HCM Lane V/C Ratio	0.2	0.033	-	-	0.006	-	-	0.167
HCM Control Delay (s)	25.4	8.8	-	-	8.2	-	-	17
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.7	0.1	-	-	0	-	-	0.6

Appendix D.
Proposed Build Synchro Capacity Reports

HCM 6th Signalized Intersection Summary
1001: Haggerty Road & Tyler Road

Proposed AM - 2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	76	62	83	7	52	10	62	188	12	6	56	62
Future Volume (veh/h)	76	62	83	7	52	10	62	188	12	6	56	62
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1885	1885	1885	1856	1856	1856	1796	1796	1796	1796	1796	1796
Adj Flow Rate, veh/h	94	77	102	9	70	14	85	258	16	8	75	83
Peak Hour Factor	0.81	0.81	0.81	0.74	0.74	0.74	0.73	0.73	0.73	0.75	0.75	0.75
Percent Heavy Veh, %	1	1	1	3	3	3	7	7	7	7	7	7
Cap, veh/h	357	176	233	269	358	72	482	1450	92	118	1031	885
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1324	736	974	1196	1501	300	651	2270	144	107	1615	1385
Grp Volume(v), veh/h	94	0	179	9	0	84	180	0	179	83	0	83
Grp Sat Flow(s),veh/h/ln	1324	0	1710	1196	0	1801	1456	0	1609	1722	0	1385
Q Serve(g_s), s	4.9	0.0	7.1	0.5	0.0	3.0	1.3	0.0	3.6	0.0	0.0	1.8
Cycle Q Clear(g_c), s	7.9	0.0	7.1	7.6	0.0	3.0	3.5	0.0	3.6	1.4	0.0	1.8
Prop In Lane	1.00		0.57	1.00		0.17	0.47		0.09	0.10		1.00
Lane Grp Cap(c), veh/h	357	0	408	269	0	430	996	0	1028	1149	0	885
V/C Ratio(X)	0.26	0.00	0.44	0.03	0.00	0.20	0.18	0.00	0.17	0.07	0.00	0.09
Avail Cap(c_a), veh/h	357	0	408	269	0	430	996	0	1028	1149	0	885
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	27.5	0.0	25.9	29.1	0.0	24.3	5.8	0.0	5.9	5.5	0.0	5.6
Incr Delay (d2), s/veh	1.8	0.0	3.4	0.2	0.0	1.0	0.4	0.0	0.4	0.1	0.0	0.2
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	1.6	0.0	3.1	0.2	0.0	1.3	1.0	0.0	1.0	0.4	0.0	0.4
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	29.2	0.0	29.3	29.4	0.0	25.3	6.2	0.0	6.2	5.6	0.0	5.8
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		273			93			359			166	
Approach Delay, s/veh		29.3			25.7			6.2			5.7	
Approach LOS		C			C			A			A	

Timer - Assigned Phs		2		4		6		8				
Phs Duration (G+Y+Rc), s		56.0		24.0		56.0		24.0				
Change Period (Y+Rc), s		* 4.9		* 4.9		* 4.9		* 4.9				
Max Green Setting (Gmax), s		* 51		* 19		* 51		* 19				
Max Q Clear Time (g_c+I1), s		0.0		0.0		0.0		0.0				
Green Ext Time (p_c), s		0.0		0.0		0.0		0.0				

Intersection Summary	
HCM 6th Ctrl Delay	15.2
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	1.6

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	6	2	8	19	1
Future Vol, veh/h	1	6	2	8	19	1
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	88	88	60	60	60	60
Heavy Vehicles, %	0	0	43	43	23	23
Mvmt Flow	1	7	3	13	32	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	52	33	34	0	-	0
Stage 1	33	-	-	-	-	-
Stage 2	19	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.53	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.587	-	-	-
Pot Cap-1 Maneuver	962	1046	1350	-	-	-
Stage 1	995	-	-	-	-	-
Stage 2	1009	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	960	1046	1350	-	-	-
Mov Cap-2 Maneuver	960	-	-	-	-	-
Stage 1	993	-	-	-	-	-
Stage 2	1009	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.5	1.5	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1350	-	1033	-	-
HCM Lane V/C Ratio	0.002	-	0.008	-	-
HCM Control Delay (s)	7.7	0	8.5	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Intersection Delay, s/veh	10.4
Intersection LOS	B

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	2	163	3	5	268	3	4	5	5	8	13	2
Future Vol, veh/h	2	163	3	5	268	3	4	5	5	8	13	2
Peak Hour Factor	0.75	0.75	0.75	0.87	0.87	0.87	0.67	0.67	0.67	0.80	0.80	0.80
Heavy Vehicles, %	4	4	4	5	5	5	12	12	12	12	12	12
Mvmt Flow	3	217	4	6	308	3	6	7	7	10	16	3
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	9.8	11.1	8.5	8.7
HCM LOS	A	B	A	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	29%	100%	0%	100%	0%	35%
Vol Thru, %	36%	0%	98%	0%	99%	57%
Vol Right, %	36%	0%	2%	0%	1%	9%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	14	2	166	5	271	23
LT Vol	4	2	0	5	0	8
Through Vol	5	0	163	0	268	13
RT Vol	5	0	3	0	3	2
Lane Flow Rate	21	3	221	6	311	29
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.031	0.004	0.303	0.009	0.423	0.044
Departure Headway (Hd)	5.29	5.448	4.933	5.393	4.884	5.45
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	676	658	730	665	738	657
Service Time	3.327	3.171	2.656	3.113	2.604	3.486
HCM Lane V/C Ratio	0.031	0.005	0.303	0.009	0.421	0.044
HCM Control Delay	8.5	8.2	9.8	8.2	11.2	8.7
HCM Lane LOS	A	A	A	A	B	A
HCM 95th-tile Q	0.1	0	1.3	0	2.1	0.1

Intersection	
Int Delay, s/veh	2.7

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	9	157	12	7	211	8	36	0	9	21	0	31
Future Vol, veh/h	9	157	12	7	211	8	36	0	9	21	0	31
Conflicting Peds, #/hr	1	0	0	0	0	1	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	73	73	73	72	72	72	80	80	80	72	72	72
Heavy Vehicles, %	5	5	5	5	5	5	2	2	2	0	0	0
Mvmt Flow	12	215	16	10	293	11	45	0	11	29	0	43

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	305	0	0	231	0	0	587	572	223	573	575	300
Stage 1	-	-	-	-	-	-	247	247	-	320	320	-
Stage 2	-	-	-	-	-	-	340	325	-	253	255	-
Critical Hdwy	4.15	-	-	4.15	-	-	7.12	6.52	6.22	7.1	6.5	6.2
Critical Hdwy Stg 1	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.12	5.52	-	6.1	5.5	-
Follow-up Hdwy	2.245	-	-	2.245	-	-	3.518	4.018	3.318	3.5	4	3.3
Pot Cap-1 Maneuver	1239	-	-	1319	-	-	421	430	817	433	431	744
Stage 1	-	-	-	-	-	-	757	702	-	696	656	-
Stage 2	-	-	-	-	-	-	675	649	-	756	700	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	1238	-	-	1319	-	-	392	422	817	421	423	743
Mov Cap-2 Maneuver	-	-	-	-	-	-	392	422	-	421	423	-
Stage 1	-	-	-	-	-	-	749	695	-	688	650	-
Stage 2	-	-	-	-	-	-	631	643	-	738	693	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.4	0.2	14.4	12.3
HCM LOS			B	B

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	438	1238	-	-	1319	-	-	568
HCM Lane V/C Ratio	0.128	0.01	-	-	0.007	-	-	0.127
HCM Control Delay (s)	14.4	7.9	-	-	7.8	-	-	12.3
HCM Lane LOS	B	A	-	-	A	-	-	B
HCM 95th %tile Q(veh)	0.4	0	-	-	0	-	-	0.4

Intersection	
Int Delay, s/veh	0.4

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	4	171	264	5	8	9
Future Vol, veh/h	4	171	264	5	8	9
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	74	74	80	80	92	92
Heavy Vehicles, %	0	5	5	0	0	0
Mvmt Flow	5	231	330	6	9	10

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	336	0	-	0	574	333
Stage 1	-	-	-	-	333	-
Stage 2	-	-	-	-	241	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	1235	-	-	-	484	713
Stage 1	-	-	-	-	731	-
Stage 2	-	-	-	-	804	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	1235	-	-	-	482	713
Mov Cap-2 Maneuver	-	-	-	-	567	-
Stage 1	-	-	-	-	728	-
Stage 2	-	-	-	-	804	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	10.8
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	1235	-	-	-	636
HCM Lane V/C Ratio	0.004	-	-	-	0.029
HCM Control Delay (s)	7.9	-	-	-	10.8
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

HCM 6th Signalized Intersection Summary
1001: Haggerty Road & Tyler Road

Proposed PM - 2023

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Volume (veh/h)	113	141	62	2	87	6	122	137	11	11	106	163
Future Volume (veh/h)	113	141	62	2	87	6	122	137	11	11	106	163
Initial Q (Qb), veh	0	0	0	0	0	0	0	0	0	0	0	0
Ped-Bike Adj(A_pbT)	1.00		1.00	1.00		1.00	1.00		1.00	1.00		1.00
Parking Bus, Adj	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Work Zone On Approach		No			No			No			No	
Adj Sat Flow, veh/h/ln	1856	1856	1856	1885	1885	1885	1856	1856	1856	1885	1885	1885
Adj Flow Rate, veh/h	145	181	79	2	107	7	128	144	12	12	112	172
Peak Hour Factor	0.78	0.78	0.78	0.81	0.81	0.81	0.95	0.95	0.95	0.95	0.95	0.95
Percent Heavy Veh, %	3	3	3	1	1	1	3	3	3	1	1	1
Cap, veh/h	330	292	128	210	418	27	717	1003	84	123	1093	929
Arrive On Green	0.24	0.24	0.24	0.24	0.24	0.24	0.64	0.64	0.64	0.64	0.64	0.64
Sat Flow, veh/h	1268	1225	535	1128	1750	114	984	1570	132	115	1710	1454
Grp Volume(v), veh/h	145	0	260	2	0	114	133	0	151	124	0	172
Grp Sat Flow(s),veh/h/ln	1268	0	1759	1128	0	1865	1021	0	1665	1825	0	1454
Q Serve(g_s), s	8.4	0.0	10.6	0.1	0.0	4.0	4.3	0.0	2.9	0.0	0.0	3.9
Cycle Q Clear(g_c), s	12.3	0.0	10.6	10.7	0.0	4.0	8.2	0.0	2.9	2.0	0.0	3.9
Prop In Lane	1.00		0.30	1.00		0.06	0.97		0.08	0.10		1.00
Lane Grp Cap(c), veh/h	330	0	420	210	0	445	741	0	1063	1215	0	929
V/C Ratio(X)	0.44	0.00	0.62	0.01	0.00	0.26	0.18	0.00	0.14	0.10	0.00	0.19
Avail Cap(c_a), veh/h	330	0	420	210	0	445	741	0	1063	1215	0	929
HCM Platoon Ratio	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00	1.00
Upstream Filter(I)	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00	1.00	0.00	1.00
Uniform Delay (d), s/veh	29.7	0.0	27.2	32.0	0.0	24.7	7.5	0.0	5.7	5.6	0.0	5.9
Incr Delay (d2), s/veh	4.2	0.0	6.7	0.1	0.0	1.4	0.5	0.0	0.3	0.2	0.0	0.4
Initial Q Delay(d3),s/veh	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
%ile BackOfQ(50%),veh/ln	2.8	0.0	4.8	0.0	0.0	1.8	0.9	0.0	0.8	0.7	0.0	1.0
Unsig. Movement Delay, s/veh												
LnGrp Delay(d),s/veh	33.9	0.0	33.9	32.1	0.0	26.1	8.1	0.0	6.0	5.8	0.0	6.4
LnGrp LOS	C	A	C	C	A	C	A	A	A	A	A	A
Approach Vol, veh/h		405			116			284			296	
Approach Delay, s/veh		33.9			26.2			7.0			6.1	
Approach LOS		C			C			A			A	

Timer - Assigned Phs	2	4	6	8
Phs Duration (G+Y+Rc), s	56.0	24.0	56.0	24.0
Change Period (Y+Rc), s	* 4.9	* 4.9	* 4.9	* 4.9
Max Green Setting (Gmax), s	* 51	* 19	* 51	* 19
Max Q Clear Time (g_c+I1), s	0.0	0.0	0.0	0.0
Green Ext Time (p_c), s	0.0	0.0	0.0	0.0

Intersection Summary	
HCM 6th Ctrl Delay	18.7
HCM 6th LOS	B

Notes

* HCM 6th computational engine requires equal clearance times for the phases crossing the barrier.

Intersection	
Int Delay, s/veh	0.7

Movement	EBL	EBR	NBL	NBT	SBT	SBR
Lane Configurations						
Traffic Vol, veh/h	1	1	3	21	34	1
Future Vol, veh/h	1	1	3	21	34	1
Conflicting Peds, #/hr	1	0	0	0	0	0
Sign Control	Stop	Stop	Free	Free	Free	Free
RT Channelized	-	None	-	None	-	None
Storage Length	0	-	-	-	-	-
Veh in Median Storage, #	0	-	-	0	0	-
Grade, %	0	-	-	0	0	-
Peak Hour Factor	60	60	60	60	66	66
Heavy Vehicles, %	0	0	9	9	4	4
Mvmt Flow	2	2	5	35	52	2

Major/Minor	Minor2		Major1		Major2	
Conflicting Flow All	99	53	54	0	-	0
Stage 1	53	-	-	-	-	-
Stage 2	46	-	-	-	-	-
Critical Hdwy	6.4	6.2	4.19	-	-	-
Critical Hdwy Stg 1	5.4	-	-	-	-	-
Critical Hdwy Stg 2	5.4	-	-	-	-	-
Follow-up Hdwy	3.5	3.3	2.281	-	-	-
Pot Cap-1 Maneuver	905	1020	1508	-	-	-
Stage 1	975	-	-	-	-	-
Stage 2	982	-	-	-	-	-
Platoon blocked, %				-	-	-
Mov Cap-1 Maneuver	902	1020	1508	-	-	-
Mov Cap-2 Maneuver	902	-	-	-	-	-
Stage 1	972	-	-	-	-	-
Stage 2	982	-	-	-	-	-

Approach	EB	NB	SB
HCM Control Delay, s	8.8	0.9	0
HCM LOS	A		

Minor Lane/Major Mvmt	NBL	NBT	EBLn1	SBT	SBR
Capacity (veh/h)	1508	-	957	-	-
HCM Lane V/C Ratio	0.003	-	0.003	-	-
HCM Control Delay (s)	7.4	0	8.8	-	-
HCM Lane LOS	A	A	A	-	-
HCM 95th %tile Q(veh)	0	-	0	-	-

Intersection	
Intersection Delay, s/veh	20.5
Intersection LOS	C

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	8	386	5	26	456	10	13	3	5	5	11	14
Future Vol, veh/h	8	386	5	26	456	10	13	3	5	5	11	14
Peak Hour Factor	0.91	0.91	0.91	0.82	0.82	0.82	0.81	0.81	0.81	0.86	0.86	0.86
Heavy Vehicles, %	3	3	3	4	4	4	15	15	15	8	8	8
Mvmt Flow	9	424	5	32	556	12	16	4	6	6	13	16
Number of Lanes	1	1	0	1	1	0	0	1	0	0	1	0

Approach	EB	WB	NB	SB
Opposing Approach	WB	EB	SB	NB
Opposing Lanes	2	2	1	1
Conflicting Approach Left	SB	NB	EB	WB
Conflicting Lanes Left	1	1	2	2
Conflicting Approach Right	NB	SB	WB	EB
Conflicting Lanes Right	1	1	2	2
HCM Control Delay	16.2	24.8	10.1	9.7
HCM LOS	C	C	B	A

Lane	NBLn1	EBLn1	EBLn2	WBLn1	WBLn2	SBLn1
Vol Left, %	62%	100%	0%	100%	0%	17%
Vol Thru, %	14%	0%	99%	0%	98%	37%
Vol Right, %	24%	0%	1%	0%	2%	47%
Sign Control	Stop	Stop	Stop	Stop	Stop	Stop
Traffic Vol by Lane	21	8	391	26	466	30
LT Vol	13	8	0	26	0	5
Through Vol	3	0	386	0	456	11
RT Vol	5	0	5	0	10	14
Lane Flow Rate	26	9	430	32	568	35
Geometry Grp	2	7	7	7	7	2
Degree of Util (X)	0.048	0.014	0.625	0.05	0.806	0.061
Departure Headway (Hd)	6.71	5.748	5.235	5.622	5.104	6.33
Convergence, Y/N	Yes	Yes	Yes	Yes	Yes	Yes
Cap	537	620	687	634	705	569
Service Time	4.712	3.507	2.995	3.377	2.859	4.332
HCM Lane V/C Ratio	0.048	0.015	0.626	0.05	0.806	0.062
HCM Control Delay	10.1	8.6	16.4	8.7	25.7	9.7
HCM Lane LOS	B	A	C	A	D	A
HCM 95th-tile Q	0.2	0	4.4	0.2	8.3	0.2

Intersection	
Int Delay, s/veh	2.2

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Lane Configurations												
Traffic Vol, veh/h	29	333	27	5	423	22	24	0	9	12	0	33
Future Vol, veh/h	29	333	27	5	423	22	24	0	9	12	0	33
Conflicting Peds, #/hr	0	0	2	2	0	0	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Free	Free	Stop	Stop	Stop	Stop	Stop	Stop
RT Channelized	-	-	None	-	-	None	-	-	None	-	-	None
Storage Length	200	-	-	200	-	-	-	-	-	-	-	-
Veh in Median Storage, #	-	0	-	-	0	-	-	0	-	-	0	-
Grade, %	-	0	-	-	0	-	-	0	-	-	0	-
Peak Hour Factor	87	87	87	73	73	73	75	75	75	75	75	75
Heavy Vehicles, %	3	3	3	4	4	4	3	3	3	2	2	2
Mvmt Flow	33	383	31	7	579	30	32	0	12	16	0	44

Major/Minor	Major1			Major2			Minor1			Minor2		
Conflicting Flow All	609	0	0	416	0	0	1097	1090	401	1079	1090	594
Stage 1	-	-	-	-	-	-	467	467	-	608	608	-
Stage 2	-	-	-	-	-	-	630	623	-	471	482	-
Critical Hdwy	4.13	-	-	4.14	-	-	7.13	6.53	6.23	7.12	6.52	6.22
Critical Hdwy Stg 1	-	-	-	-	-	-	6.13	5.53	-	6.12	5.52	-
Critical Hdwy Stg 2	-	-	-	-	-	-	6.13	5.53	-	6.12	5.52	-
Follow-up Hdwy	2.227	-	-	2.236	-	-	3.527	4.027	3.327	3.518	4.018	3.318
Pot Cap-1 Maneuver	965	-	-	1132	-	-	190	214	647	196	215	505
Stage 1	-	-	-	-	-	-	574	560	-	483	486	-
Stage 2	-	-	-	-	-	-	468	477	-	573	553	-
Platoon blocked, %		-	-		-	-						
Mov Cap-1 Maneuver	965	-	-	1130	-	-	168	205	646	186	206	505
Mov Cap-2 Maneuver	-	-	-	-	-	-	168	205	-	186	206	-
Stage 1	-	-	-	-	-	-	553	540	-	467	483	-
Stage 2	-	-	-	-	-	-	425	474	-	543	533	-

Approach	EB	WB	NB	SB
HCM Control Delay, s	0.7	0.1	26.6	17.5
HCM LOS			D	C

Minor Lane/Major Mvmt	NBLn1	EBL	EBT	EBR	WBL	WBT	WBR	SBLn1
Capacity (veh/h)	210	965	-	-	1130	-	-	347
HCM Lane V/C Ratio	0.21	0.035	-	-	0.006	-	-	0.173
HCM Control Delay (s)	26.6	8.9	-	-	8.2	-	-	17.5
HCM Lane LOS	D	A	-	-	A	-	-	C
HCM 95th %tile Q(veh)	0.8	0.1	-	-	0	-	-	0.6

Intersection	
Int Delay, s/veh	0.3

Movement	EBL	EBT	WBT	WBR	SBL	SBR
Lane Configurations						
Traffic Vol, veh/h	9	388	474	6	8	10
Future Vol, veh/h	9	388	474	6	8	10
Conflicting Peds, #/hr	0	0	0	0	0	0
Sign Control	Free	Free	Free	Free	Stop	Stop
RT Channelized	-	None	-	None	-	None
Storage Length	200	-	-	-	0	-
Veh in Median Storage, #	-	0	0	-	0	-
Grade, %	-	0	0	-	0	-
Peak Hour Factor	89	89	78	78	92	92
Heavy Vehicles, %	0	3	3	0	0	0
Mvmt Flow	10	436	608	8	9	11

Major/Minor	Major1		Major2		Minor2	
Conflicting Flow All	616	0	-	0	1068	612
Stage 1	-	-	-	-	612	-
Stage 2	-	-	-	-	456	-
Critical Hdwy	4.1	-	-	-	6.4	6.2
Critical Hdwy Stg 1	-	-	-	-	5.4	-
Critical Hdwy Stg 2	-	-	-	-	5.4	-
Follow-up Hdwy	2.2	-	-	-	3.5	3.3
Pot Cap-1 Maneuver	974	-	-	-	248	497
Stage 1	-	-	-	-	545	-
Stage 2	-	-	-	-	643	-
Platoon blocked, %		-	-	-		
Mov Cap-1 Maneuver	974	-	-	-	246	497
Mov Cap-2 Maneuver	-	-	-	-	379	-
Stage 1	-	-	-	-	540	-
Stage 2	-	-	-	-	643	-

Approach	EB	WB	SB
HCM Control Delay, s	0.2	0	13.6
HCM LOS			B

Minor Lane/Major Mvmt	EBL	EBT	WBT	WBR	SBLn1
Capacity (veh/h)	974	-	-	-	437
HCM Lane V/C Ratio	0.01	-	-	-	0.045
HCM Control Delay (s)	8.7	-	-	-	13.6
HCM Lane LOS	A	-	-	-	B
HCM 95th %tile Q(veh)	0	-	-	-	0.1

Appendix E.
Validation Logs

1001: Haggerty Road & Tyler Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	69	63	83	6	50	10	55	191	15	5	54	58
Vehicles Exited	70	62	83	6	51	10	55	191	15	5	54	58
Hourly Exit Rate	70	62	83	6	51	10	55	191	15	5	54	58
Input Volume	72	63	79	7	51	10	58	188	12	6	56	58
% of Volume	98	98	105	89	100	98	95	101	122	87	96	100

1001: Haggerty Road & Tyler Road Performance by movement

Movement	All
Vehicles Entered	659
Vehicles Exited	660
Hourly Exit Rate	660
Input Volume	661
% of Volume	100

9001: Morton Taylor Road & Heatherfield Boulevard Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	1	7	1	11	18	2	40
Vehicles Exited	1	7	1	12	18	2	41
Hourly Exit Rate	1	7	1	12	18	2	41
Input Volume	1	6	2	10	18	1	39
% of Volume	100	112	44	117	100	160	105

9002: Morton Taylor Road & Tyler Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	2	156	3	5	264	3	0	3	5	7	16	2
Vehicles Exited	2	156	3	5	265	3	0	4	5	7	16	2
Hourly Exit Rate	2	156	3	5	265	3	0	4	5	7	16	2
Input Volume	2	154	3	5	268	3	1	4	5	8	15	2
% of Volume	89	101	92	95	99	100	0	107	105	90	107	89

9002: Morton Taylor Road & Tyler Road Performance by movement

Movement	All
Vehicles Entered	466
Vehicles Exited	468
Hourly Exit Rate	468
Input Volume	471
% of Volume	99

9003: Lancaster Drive/Springwood Boulevard & Tyler Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	7	152	12	6	192	7	34	5	20	31	466
Vehicles Exited	7	152	12	6	192	8	34	5	20	31	467
Hourly Exit Rate	7	152	12	6	192	8	34	5	20	31	467
Input Volume	8	149	11	7	195	8	36	9	21	31	475
% of Volume	88	102	107	86	98	100	94	57	96	100	98

9004: Dummy B/Dummy A & Tyler Road Performance by movement

Movement	EBT	WBT	NBR	SBR	All
Vehicles Entered	183	166	35	40	424
Vehicles Exited	184	166	35	40	425
Hourly Exit Rate	184	166	35	40	425
Input Volume	184	170	34	41	429
% of Volume	100	98	103	97	99

Total Network Performance

Vehicles Entered	843
Vehicles Exited	850
Hourly Exit Rate	850
Input Volume	3290
% of Volume	26

1001: Haggerty Road & Tyler Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	100	145	60	1	83	8	123	138	11	12	105	164
Vehicles Exited	100	146	60	1	82	7	123	138	10	12	105	164
Hourly Exit Rate	100	146	60	1	82	7	123	138	10	12	105	164
Input Volume	108	144	59	2	83	6	119	137	11	11	106	159
% of Volume	93	101	102	50	98	112	103	101	89	107	99	103

1001: Haggerty Road & Tyler Road Performance by movement

Movement	All
Vehicles Entered	950
Vehicles Exited	948
Hourly Exit Rate	948
Input Volume	946
% of Volume	100

9001: Morton Taylor Road & Heatherfield Boulevard Performance by movement

Movement	EBL	EBR	NBL	NBT	SBT	SBR	All
Vehicles Entered	1	2	2	22	28	1	56
Vehicles Exited	1	2	2	22	28	1	56
Hourly Exit Rate	1	2	2	22	28	1	56
Input Volume	1	1	3	21	33	1	60
% of Volume	80	160	73	106	85	80	93

9002: Morton Taylor Road & Tyler Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBT	NBR	SBL	SBT	SBR
Vehicles Entered	8	359	5	25	458	9	5	2	6	4	14	13
Vehicles Exited	8	360	5	25	459	9	5	2	6	4	14	14
Hourly Exit Rate	8	360	5	25	459	9	5	2	6	4	14	14
Input Volume	8	372	5	26	457	9	7	2	5	5	16	14
% of Volume	97	97	100	96	100	103	74	100	114	76	89	102

9002: Morton Taylor Road & Tyler Road Performance by movement

Movement	All
Vehicles Entered	908
Vehicles Exited	911
Hourly Exit Rate	911
Input Volume	926
% of Volume	98

9003: Lancaster Drive/Springwood Boulevard & Tyler Road Performance by movement

Movement	EBL	EBT	EBR	WBL	WBT	WBR	NBL	NBR	SBL	SBR	All
Vehicles Entered	28	321	23	5	445	23	25	7	12	31	920
Vehicles Exited	28	321	23	5	444	23	26	7	12	31	920
Hourly Exit Rate	28	321	23	5	444	23	26	7	12	31	920
Input Volume	28	331	26	5	439	22	24	9	12	33	928
% of Volume	99	97	88	105	101	106	109	78	98	95	99

9004: Driveway B/Driveway A & Tyler Road Performance by movement

Movement	EBT	EBR	WBT	SBR	All
Vehicles Entered	302	35	380	78	795
Vehicles Exited	303	35	379	79	796
Hourly Exit Rate	303	35	379	79	796
Input Volume	310	38	370	78	796
% of Volume	98	93	102	101	100

Total Network Performance

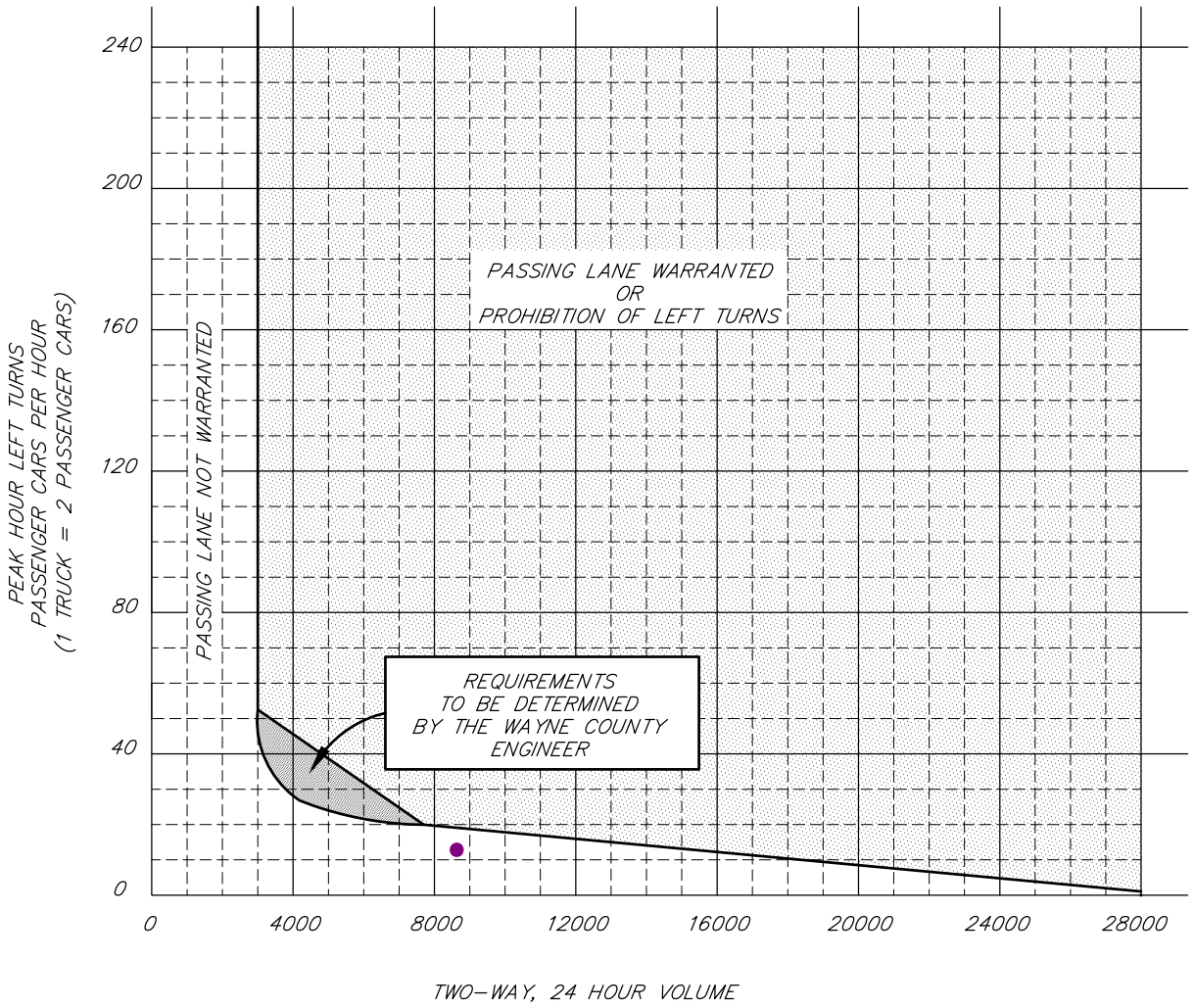
Vehicles Entered	1295
Vehicles Exited	1302
Hourly Exit Rate	1302
Input Volume	5315
% of Volume	24

Appendix F.
Turn Lane Warrant Analyses

WARRANT FOR LEFT TURN PASSING LANE

TWO-LANE HIGHWAY

(BASED ON ULTIMATE DEVELOPMENT)



REVISION DATE:		
DIRECTOR OF ENGINEERING	WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES ENGINEERING DIVISION/PERMIT OFFICE PERMIT STANDARDS	SCALE NOT TO SCALE
DIVISION PERMIT ENGINEER	WARRANT FOR LEFT TURN PASSING LANE	AL-1 SHEET 1 OF 1

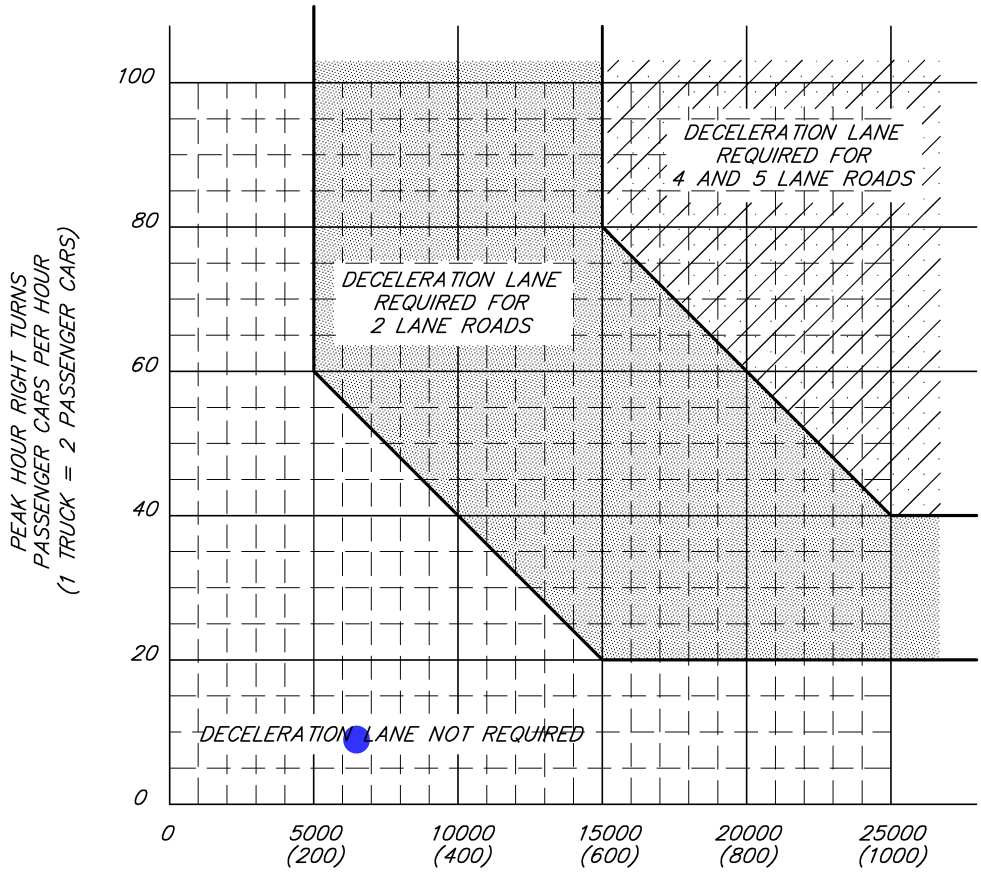
NOTE: THIS IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL SIGNED COPY FOR PUBLICATION IS KEPT ON FILE AT THE WAYNE COUNTY ENGINEERING OFFICES.

Tyler Right Turn Warrant (AM)

Tyer Right Turn Warrant (PM)

WARRANT FOR RIGHT TURN DECELERATION LANE

(BASED ON ULTIMATE DEVELOPMENT)



TWO-WAY, 24 HOUR TRAFFIC VOLUME
(PEAK TRAFFIC HOUR DIRECTIONAL)

REVISION DATE:		
DIRECTOR OF ENGINEERING	WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES ENGINEERING DIVISION/PERMIT OFFICE PERMIT STANDARDS	SCALE NOT TO SCALE
DIVISION PERMIT ENGINEER	WARRANT FOR RIGHT TURN DECELERATION LANE	AL-4 SHEET 1 OF 1

NOTE: THIS IS NOT A LEGAL ENGINEERING DOCUMENT BUT AN ELECTRONIC DUPLICATE. THE ORIGINAL SIGNED COPY FOR PUBLICATION IS KEPT ON FILE AT THE WAYNE COUNTY ENGINEERING OFFICES.

CHARTER TOWNSHIP OF VAN BUREN
PLANNING COMMISSION AGENDA
Wednesday, December 14th, 2022 – 5:30 PM
Van Buren Township Hall
46425 Tyler Road

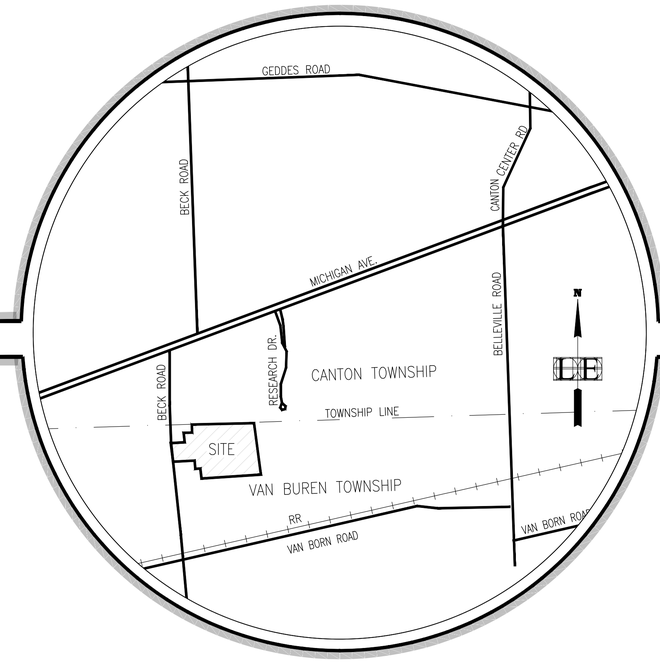
PRESENTATIONS:

Case 20-037:
5M Van Buren LLC/Integrity Component and Designs
(Plans)

PRELIMINARY SITE PLAN FOR
INTEGRITY COMPONENT & DESIGN
5925 BECK ROAD
VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN

Land Use Summary

Characteristic	Existing Conditions	Proposed Conditions
Total Development Area (ac)	13.06	13.06
Impervious Area (ac)	0.00	10.50
Total Pervious Area (ac)	13.06	2.56
Pervious Area Breakdown by Cover Type		
Meadow/fallow/natural areas (non-cultivated)	12.92 acres	0.00 acres
Predominant NRCS Soil Type (A, B, C, or D)	Type B	Type B
Improved areas (turf grass, landscape, row crops)	0.00 acres	2.42 acres
Predominant NRCS Soil Type (A, B, C, or D)	Type B	Type B
Wooded Areas	0.15 acres	0.14 acres
Predominant NRCS Soil Type (A, B, C, or D)	Type B	Type B
Calculated CPVC Volume (cubic feet)		38,191
CPVC Volume ***Provided*** (cubic feet)		38,191
CPRC Volume Provided (cubic feet)		72,563



LOCATION MAP
NOT TO SCALE

SITE DATA TABLE

ZONING:	
EXISTING/PROPOSED	M-1 (LIGHT INDUSTRIAL)
USE:	
EXISTING	VACANT
PROPOSED	MANUFACTURING WITH OUTDOOR STORAGE OF BUILDING SUPPLIES – LUMBER TRUSS PRODUCTS
SITE:	
GROSS AREA	21.34 AC±
NET AREA	21.15 AC± (921,364 SF±)
PROPOSED IMPERVIOUS AREA	443,017 SF± (10.17 AC±)
PROPOSED OPEN SPACE AREA	478,347 SF± (10.98 AC±)

SETBACKS:	REQUIRED (MIN)	PROVIDED
FRONT	50 FT	558.9 FT
LEAST SIDE	40 FT	81 FT
REAR	40 FT	320.4 FT

BUILDING:	
NUMBER OF OFFICES	1
NUMBER OF EMPLOYEES (MAX SHIFT)	30
NUMBER OF FLOORS	1
PROPOSED BUILDING AREA:	68,228 SF
MANUFACTURING	38,167 SF
WAREHOUSE	27,010 SF
OFFICE	3,051 SF
MAX BLDG HEIGHT	30', 2.5 STORIES (PROPOSED: 25')
MAX LOT COVERAGE	35% (PROPOSED: 7.41%)

PARKING DATA:

REQUIRED PARKING PER ZONING ORDINANCE SECTION 9.102

(E)(1) MANUFACTURING:
5 SPACES + EITHER 1 SPACE PER 550 SF GFA OR
1 SPACE PER EMPLOYEE AT PEAK SHIFT

(E)(3) WAREHOUSE STORAGE:
5 SPACES + 1 SPACE PER 1,750 SF GFA OF STORAGE
+ 1 SPACE PER 350 SF UFA OF OFFICE

CALCULATION:
(E)(1): 5 + 1 X 38,167/550 = 74.4 SPACES
or
5 + 1 X 30 EMPLOYEES = 35 SPACES

(E)(3): 5 + 1 X 27,010/1,750 = 20.4 SPACES
1 X 2,441/350 = 7.0 SPACES

TOTAL REQUIRED: 102 SPACES

TOTAL PROPOSED: 102 PARKING SPACES
INCL 5 ADA SPACES

LOADING SPACE REQUIREMENT:

REQUIRED LOADING SPACES PER ZONING ORDINANCE SECTION 9.105

OFFICE USE:
3,051 SF
1 10 FT X 25 FT SPACE FOR 0 – 10,000 SF

COMMERCIAL AND INDUSTRIAL USE:
65,177 SF
3 10 FT X 50 FT SPACES FOR OVER 50,000 SF

UTILITY DISCLAIMER

811 Know what's **below.** **Call** before you dig.

Utilities as shown indicate approximate location of facilities only, as described by the various companies and no guarantee is given either as to the completeness or accuracy thereof. Contractor shall call "MISS DIG" 1-800-482-7171 prior to the start of construction. Electric, gas, phone and television companies should be contacted prior to the commencement of field activities.

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE FOR PROTECTING ALL EXISTING AND PROPOSED UTILITIES FROM DAMAGE DURING ALL STAGES OF CONSTRUCTION.
2. THE ENGINEER AND APPLICABLE AGENCY MUST APPROVE, PRIOR TO CONSTRUCTION, ANY ALTERATION, OR VARIANCE FROM THESE PLANS.
3. THREE WORKING DAYS PRIOR TO ANY EXCAVATION, THE CONTRACTOR SHALL TELEPHONE MISS DIG (800-482-7171) FOR THE LOCATION OF UNDERGROUND UTILITIES AND SHALL ALSO NOTIFY REPRESENTATIVES OF OTHER UTILITIES LOCATED IN THE VICINITY OF THE WORK. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO VERIFY AND/OR OBTAIN ANY INFORMATION NECESSARY REGARDING THE PRESENCE OF UNDERGROUND UTILITIES WHICH MIGHT AFFECT THIS JOB.
4. PRIOR TO AND DURING CONSTRUCTION AN APPROVED FIRE APPARATUS ACCESS DRIVE SHALL BE CONSTRUCTED OF A MINIMUM 6" COMPACTED 21AA AGGREGATE.
5. FIRE APPARATUS ACCESS ROADS SHALL NOT BE OBSTRUCTED IN ANY MANNER, INCLUDING THE PARKING OF VEHICLES OR THE PLACEMENT OF CONSTRUCTION MATERIAL. THE REQUIRED NO PARKING FIRE LANE SIGNS SHALL BE INSTALLED PRIOR TO ANY BUILDING CONSTRUCTION.
6. TRASH FROM THE SITE IS DEPOSITED IN A DUMPSTER LOCATED ADJACENT TO THE PROPOSED BUILDING TRUCK DOCK AND EMPTIED ON A WEEKLY BASIS.
7. ALL WORK MUST BE DONE IN ACCORDANCE WITH THE CURRENT STANDARDS, SPECIFICATIONS AND GENERAL CONDITIONS OF VAN BUREN TOWNSHIP.
8. CALL MISS-DIG 72 HOURS IN ADVANCE OF ANY CONSTRUCTION.
9. A VARIANCE IS REQUESTED TO INCREASE THE STORED MATERIAL PILED HEIGHT TO TWELVE FEET DUE TO TYPICAL LUMBER BUNDLES BEING PACKAGED AND SHIPPED IN 4' HEIGHT INCREMENTS. BASED ON THIS VARIANCE REQUEST, IF APPROVED, ALL STORED MATERIALS WILL NOT BE PILED TO A HEIGHT OF MORE THAN TWELVE FEET, EXCEPT MATERIALS MAY BE STACKED TO A HEIGHT OF FOURTEEN FEET PROVIDED THE MATERIALS ABOVE TWELVE FEET IN HEIGHT ARE PACKAGED OR WRAPPED, NEATLY STACKED, NOT ACCESSIBLE TO CUSTOMERS, AND ARE ON A RACK DESIGNED TO SAFELY STORE THE MATERIALS.
10. MUD AND SIMILAR DEBRIS WILL NOT BE TRANSPORTED FROM THE SITE AND DEPOSITED ONTO ADJACENT ROADWAYS. ANY SUCH DEBRIS WILL BE PROMPTLY CLEANED UP.
11. ALL GATES SHALL BE EQUIPPED WITH A MEANS OF OPENING THE GATE BY FIRE DEPARTMENT PERSONNEL FOR EMERGENCY ACCESS, WHICH SHALL BE APPROVED BY THE FIRE CODE OFFICIAL.
12. IF A GATE IS TO BE INSTALLED, THE FOLLOWING SHALL APPLY:
    - AN ELECTRIC GATE SHALL HAVE A KNOX GATE KEY SWITCH INSTALLED FOR FIRE DEPARTMENT USE.
    - A MANUAL GATE SHALL HAVE A KNOX PADLOCK FOR USE BY THE FIRE DEPARTMENT.
13. EMERGENCY RESPONDER RADIO COVERAGE SYSTEM IS REQUIRED UNLESS IN CAN BE PROVEN AFTER THE BUILDING IS CONSTRUCTED AND OCCUPIED, THAT COVERAGE IS SUFFICIENT. THIS WILL BE VERIFIED BY AHJ PRIOR TO FINAL C/O.

ADJACENT PROPERTY TABLE

Direction	Lot	Zoning	Use
North	Vacant	GI	Vacant
North East	Mans Lumber	GI	Lumberyard
East	Vacant	M-1	Vacant
South West	Residential	M-1	Residential
South West	Residential	M-1	Residential
South	Vacant	M-1	Vacant
North West	Residential	M-1	Residential
North West	Residential	GI	Residential

LEGAL DESCRIPTION

LEGAL DESCRIPTION PROVIDED BY CEC, INC.'S ALTA SURVEY; DATED 3/10/2017 PROJECT NO:171-093

LEGAL DESCRIPTION PER CERTIFIED SURVEY SHEET 4 OF 5 DATED NOVEMBER 16, 2015.

PROPOSED PARCELS
PROPOSED PARCEL'A-1' (PARCESL 2, 3, 4 & 6)

A PARCEL OF LAND SITUATED IN THE NORTHWEST 1/4 OF SECTION 4, TOWN 3 SOUTH, RANGE 8 EAST, VAN BUREN TOWNSHIP, WAYNE COUNTY, MICHIGAN, BEING DESCRIBED AS COMMENCING AT THE NORTHWEST CORNER OF SAID SECTION 4, THENCE S06°27'47"E 4.53 FEET TO THE PCC (E-1); THENCE ALONG THE WEST LINE OF SECTION 4 AND THE NOMINAL CENTER-LINE OF BECK ROAD (66FT. WIDE R/W), S06°18'23"E 266.06 FEET TO THE POINT OF BEGINNING; THENCE N87°20'32"E 165.14 FEET; THENCE N06°30'25"W 179.81 FEET; THENCE N87°06'55"E 66.99 FEET; THENCE N06°30'25"W 86.20 FEET TO THE PCC SECTION LINE; THENCE ALONG SAID PCC LINE (E-1, F-1) N87°18'13"E 1087.38 FEET; THENCE S04°51'07"E 667.30 FEET; THENCE S04°51'07"E 167.79 FEET; THENCE S87°21'37"W 919.17 FEET; THENCE N11°03'56"W 169.49 FEET; THENCE S87°21'38"W 39.25 FEET; THENCE N04°22'20"W 150.60 FEET; THENCE S87°21'37"W 330.00 FEET; THENCE ALONG THE WEST LINE OF SAID SECTION 4, N06°18'23"W 249.96 FEET TO THE POINT OF BEGINNING. CONTAINING 929,615.63 SQUARE FEET OR 21.34 ACRES OF LAND. SUBJECT TO EASEMENTS AND/OR RESTRICTIONS, IF ANY.

DETAILED USE STATEMENT:

INTEGRITY COMPONENT AND DESIGN IS A PROPOSED ROOF AND FLOOR TRUSS MANUFACTURING FACILITY UTILIZING AUTOMATED PRODUCTION MACHINERY AND SERVING THE CONSTRUCTION INDUSTRY. THE PROPOSED BUILDING WILL HOUSE A MODEST OFFICE AREA FOR MANAGEMENT, DESIGN AND SUPPORT STAFF, A TRUSS PRODUCTION FLOOR AND A COLD STORAGE AREA. RAW MATERIAL AND FINISHED PRODUCTS FOR USE IN THE PRODUCTION AND SUPPLY OF BUILDING PRODUCTS ARE INTENDED TO BE STORED AND STAGED FOR PRODUCTION RUNS IN THE YARD ON THE EAST AND SOUTH SIDE OF THE BUILDING IN ACCORDANCE WITH SEC. 5.132 OF THE ZONING ORDINANCE. THE TRUSS PROCESS OPERATES IN A EAST-TO-WEST DIRECTION THROUGH THE BUILDING. FINISHED TRUSSES ARE CONVEYED OUT OF THE PLANT ON ROLLERS AT THE WEST SIDE OF THE BUILDING WHERE THEY ARE GROUPED AND PLACED IN THE SOUTH YARD WHILE AWAITING SHIPPING TO CUSTOMERS. THE COLD STORAGE PORTION OF THE BUILDING WILL BE USED TO STORE WEATHER SENSITIVE MATERIALS AND OTHER FINISHED PRODUCTS PRODUCED IN THE OVERALL FACILITY. THE BUILDING WILL ACCOMMODATE AN ESTIMATED EMPLOYEE POPULATION OF 30 PEOPLE AT FULL PRODUCTION, ON THE LARGEST SHIFT.

SITE TRAFFIC NARRATIVE

ALL COMMERCIAL SEMI-TRUCK TRAFFIC FOR THE SHIPPING AND RECEIVING OF GOODS AND MATERIALS SHALL BE ROUTED FROM MICHIGAN AVENUE THROUGH THE MANS LUMBER SITE (CANTON TWP.) VIA THE TWO CROSS-ACCESS DRIVE OPENINGS PROVIDED AT THE NORTH PROPERTY LINE (SEE SHEET 8.2, TRUCK CIRCULATION PLAN). NO SEMI-TRUCK TRAFFIC SHALL ENTER OR EXIT THE SITE VIA THE BECK ROAD ACCESS DRIVE.

THE BECK ROAD ACCESS DRIVE WILL BE FOR THE USE OF EMERGENCY, EMPLOYEE AND SERVICE VEHICLES (I.E.: UPS, FEDEX, TRASH COLLECTION, ETC.) ONLY.

SHEET INDEX

C1.0	COVER SHEET	LP-1	LANDSCAPE PLANTING PLAN
C2.0	EXISTING CONDITIONS & DEMOLITION PLAN	LP-2	LANDSCAPE NOTES & DETAILS
C2.1	TREE SURVEY		
C3.0	LAYOUT PLAN	P1	PHOTOMETRIC PLAN
C4.0	UTILITY PLAN		
C4.1	EASEMENT PLAN	A1	FLOOR PLAN
C5.0	GRADING PLAN	A2	ENLARGED OFFICE AREA PLAN
C5.1	SESC PLAN	A3	ELEVATIONS
C5.2	SESC DETAILS		
C6.0	STORM WATER MANAGEMENT PLAN		
C6.1	DETENTION CALCULATIONS & OUTLET DETAILS		
C7.0	DETAILS		
C8.0	FIRE PROTECTION PLAN		
C8.1	TRUCK MANEUVERING PLAN		
C8.2	TRUCK MANEUVERING PLAN CONT.		

LEGEND

	EXISTING	PROPOSED
SPOT GRADE	× 000.00	×000.00
CONTOUR	000	000
SANITARY SEWER	C.O. SAN	C.O. SAN
STORM SEWER	ST	ST
WATER	W	W
OVERHEAD		
FENCE	X	X
GAS	GAS	GAS
ELECTRIC	E	E
DRAINAGE AREA BOUNDARY		
LIMITS OF DISTURBANCE		
SILT FENCE		SF
SIGN		
LIGHT POLE		
UTILITY POLE		
DECIDUOUS TREE		
GATE VALVE IN WELL		

OWNER

5M Van Buren, LLC
3300 W. JEFFERSON
TRENTON, MI 48183
PHONE: 734.714.5800

INTEGRITY COMPONENT & DESIGN

DESIGN / BUILDER

RAND CONSTRUCTION
1270 RICKETT ROAD
BRIGHTON, MI 48116
PHONE: 810.227.7011

RAND CONSTRUCTION
www.randconstruction.com

ARCHITECT

PUCCI + VOLLMAR ARCHITECTS, PC
508 E. GRAND RIVER AVE., SUITE 100B
BRIGHTON, MI 48116
PHONE: 810.225.2930

LANDSCAPE ARCHITECT

NAGY DEVLIN LAND DESIGN, L.L.C.
31736 WEST CHICAGO AVENUE
LIVONIA, MICHIGAN 48150-2830
PHONE: (734) 634-9208

ENGINEER

LIVINGSTON ENGINEERING
CIVIL ENGINEERING SURVEYING PLANNING
3300 S. OLD U.S. 23, BRIGHTON, MI 48114
www.livingstoneng.com PHONE: (810) 225-7100 FAX: (810) 225-7699

INTEGRITY COMPONENT & DESIGN
5925 BECK ROAD
VAN BUREN TOWNSHIP
WAYNE COUNTY, MICHIGAN
PRELIMINARY SITE PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

PROJECT No. 19122-1
SHEET C1.0
DATE: JULY 01, 2022

ENGINEER'S SEAL
STATE OF MICHIGAN
TIMOTHY J. ZIMMER
ENGINEER
No. 6201042709
LICENSED PROFESSIONAL ENGINEER

WETLAND DELINEATION NOTE:

WETLAND BOUNDARIES, SHOWN, HEREON ARE PER DELINEATION FLAGGING BY BARR ON 4/14/2022 AND SURVEYED BY LIVINGSTON ENG. ON 4/19/2022.

SURVEY NOTE:

ELEVATIONS ON PLANS ARE BASED ON THE NAVD88 DATUM. TO CONVERT TO THE NGVD29 DATUM, ADD 0.49'.

SCS SOIL TYPES

BfA BLOUNT LOAM, ERIE-HURON LAKE PLAIN, 0 TO 2 PERCENT SLOPES
MeA METAMORA SANDY LOAM, 0 TO 3 PERCENT SLOPES
Pe PEWAMO LOAM

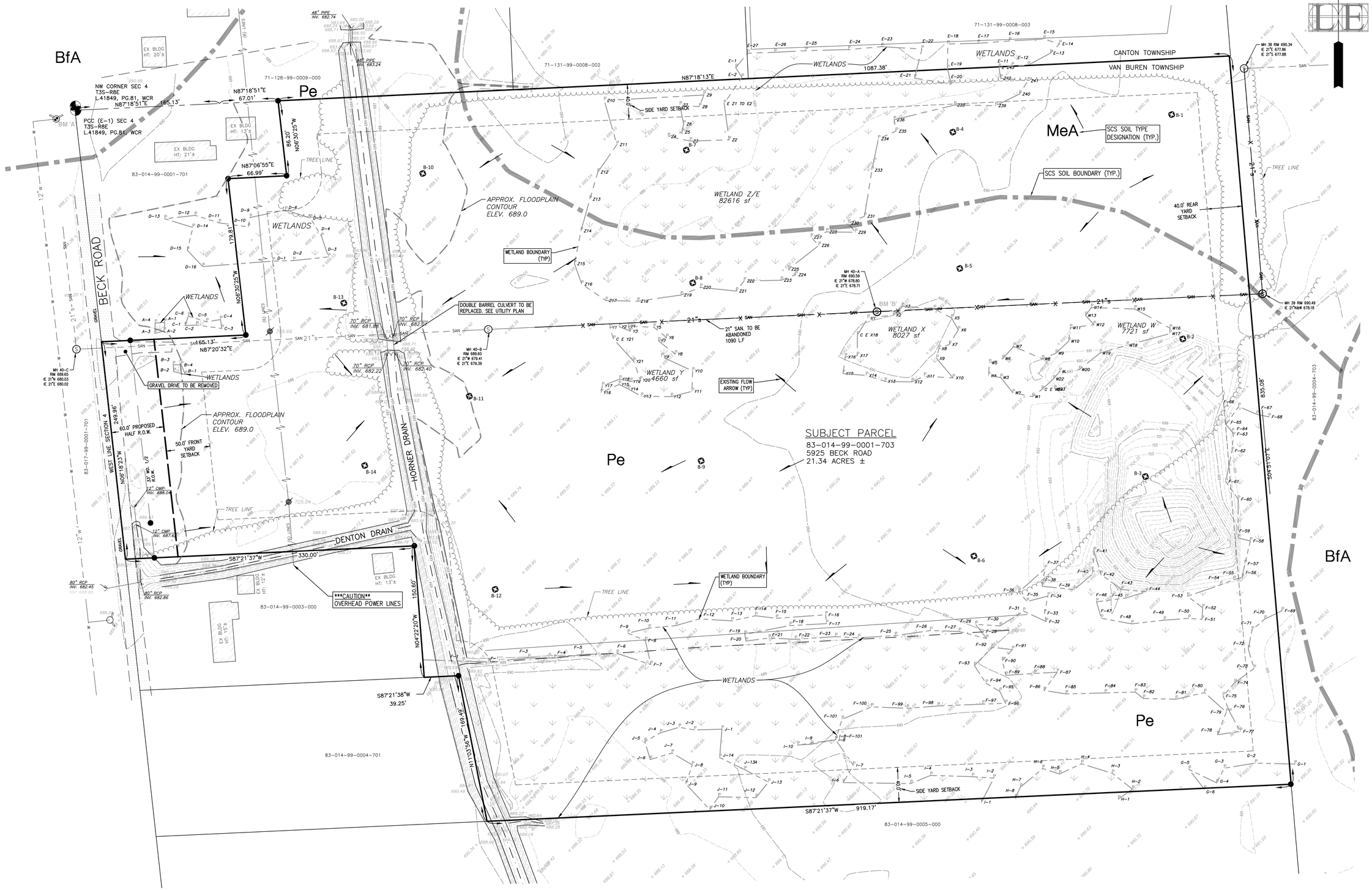
BM 'A'
ARROW ON HYDRANT
ELEVATION= 692.06

BM 'B'
'+' MARK ON E. RIM OF SANITARY MANHOLE
ELEVATION= 690.60

DATUM: NAVD88

0' 50' 100' 150'
1" = 50'

N



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LIVINGSTON ENGINEERING
PLANNING
CIVIL ENGINEERING SURVEYING
3300 S. OLD U.S. 23, BRIGHTON, MI 48114
PHONE: (810) 225-7100 FAX: (810) 225-7699
http://www.livingstoneng.com

Client
RAND CONSTRUCTION

INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI
PRELIMINARY SITE PLAN
EXISTING CONDITIONS & DEMOLITION PLAN

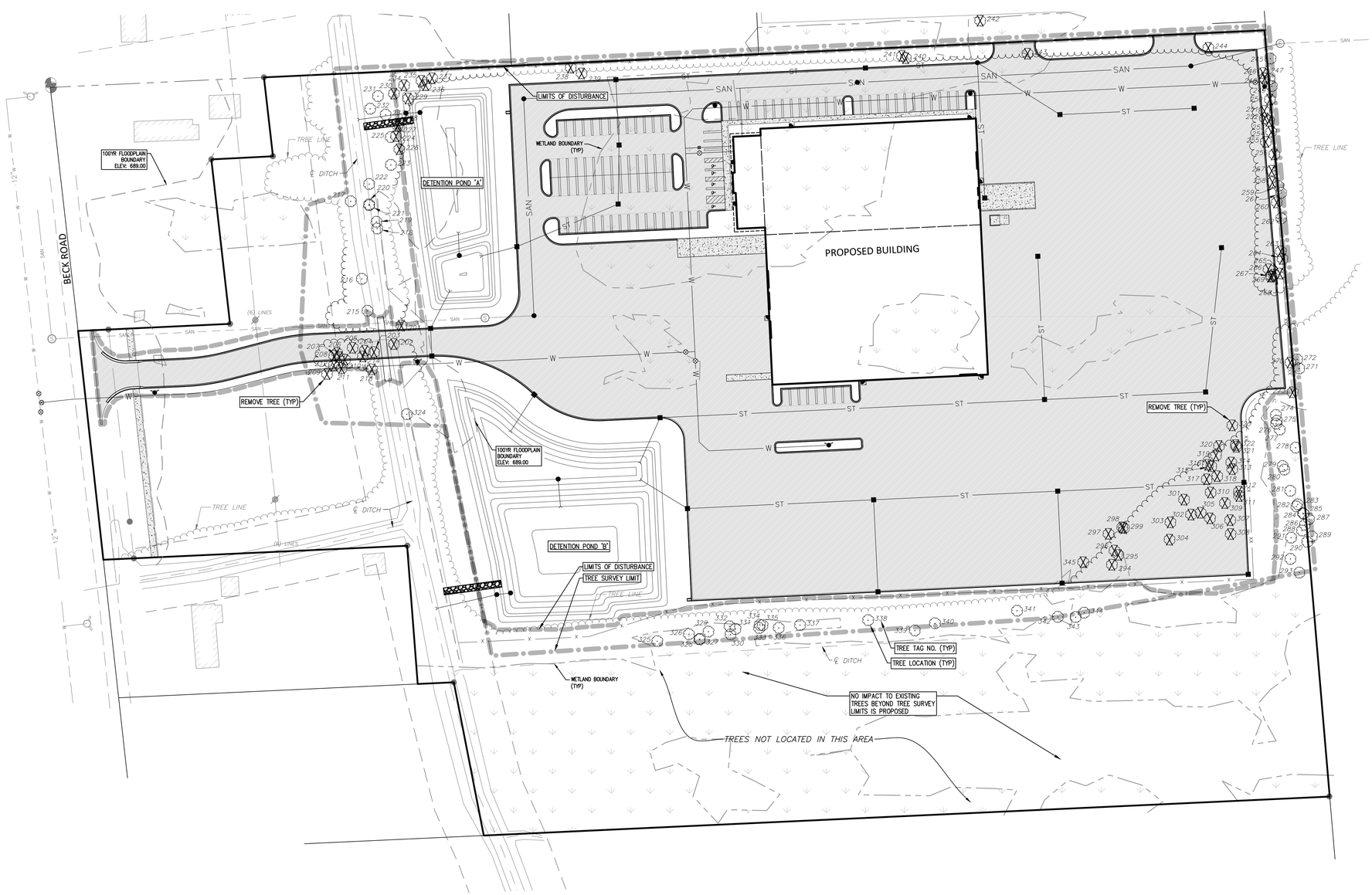
REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=50'

C2.0

FILE:C:\Users\Josh\Dropbox (Liveng)\Projects\2019\19122-1 Mans Van Buren\03 DWGS\Prelim Site Plan\19122-1_C2.0_Existing.dwg



TREE TO BE REMOVED (TYP)

TREE TABLE				
TAG #	DBH (in)	SPECIES	SCIENTIFIC NAME	CONDITION
201	16	WILLOW	Salix babylonica	GOOD
202	6	APPLE	Malus	GOOD
203	6	HACKBERRY	Celtis occidentalis	GOOD
204	TRIPLE 7"	BOXELDER	Acer negundo	GOOD
205	7	WHITE ASH	Fraxinus americana	DEAD
206	14	RED MAPLE	Acer rubrum	GOOD
207	5	RED MAPLE	Acer rubrum	GOOD
208	5	EASTERN COTTONWOOD	Populus deltoides	GOOD
209	8	RED MAPLE	Acer rubrum	GOOD
210	11	AMERICAN ELM	Ulmus americana	GOOD
211	11	EASTERN COTTONWOOD	Populus deltoides	GOOD
212	13	EASTERN COTTONWOOD	Populus deltoides	GOOD
213	9	BOXELDER	Acer negundo	GOOD
214	7	BOXELDER	Acer negundo	GOOD
215	11	BOXELDER	Acer negundo	POOR
216	DOUBLE 10"	AMERICAN ELM	Ulmus americana	DEAD
217	DOUBLE 10"	WHITE ASH	Fraxinus americana	DEAD
218	DOUBLE 7"	HAWTHORN	Crataegus douglasii	GOOD
219	DOUBLE 7"	BLACK HAWTHORN	Crataegus douglasii	GOOD
220	TRIPLE 14"	BOXELDER	Acer negundo	GOOD
221	8	WHITE ASH	Fraxinus americana	DEAD
222	7	APPLE	Malus	GOOD
223	7	AMERICAN ELM	Ulmus americana	GOOD
224	9	BOXELDER	Acer negundo	GOOD

TREE TABLE				
TAG #	DBH (in)	SPECIES	SCIENTIFIC NAME	CONDITION
225	6	AMERICAN ELM	Ulmus americana	GOOD
226	6	BOXELDER	Acer negundo	GOOD
227	5	AMERICAN ELM	Ulmus americana	GOOD
228	7	AMERICAN ELM	Ulmus americana	GOOD
229	7	AMERICAN ELM	Ulmus americana	GOOD
230	9	BOXELDER	Acer negundo	GOOD
231	8	BOXELDER	Acer negundo	GOOD
232	14	WHITE ASH	Fraxinus americana	GOOD
233	8	BOXELDER	Acer negundo	FAIR
234	DOUBLE 14"	BOXELDER	Acer negundo	GOOD
235	9	AMERICAN ELM	Ulmus americana	GOOD
236	8	BOXELDER	Acer negundo	GOOD
237	6	PIN OAK	Quercus palustris	GOOD
238	5	SHAGBARK HICKORY	Carya ovata	GOOD
239	8	AMERICAN ELM	Ulmus americana	GOOD
240	8	PIN OAK	Quercus palustris	GOOD
241	6	PIN OAK	Quercus palustris	GOOD
242	7	PIN OAK	Quercus palustris	GOOD
243	6	BOXELDER	Acer negundo	GOOD
244	13	EASTERN COTTONWOOD	Populus deltoides	GOOD
245	7	APPLE	Malus	GOOD
246	TRIPLE 8"	BLACK HAWTHORN	Crataegus douglasii	GOOD
247	TRIPLE 7"	BLACK HAWTHORN	Crataegus douglasii	GOOD
248	7	BLACK HAWTHORN	Crataegus douglasii	GOOD
249	10	BLACK CHERRY	Prunus serotina	GOOD

TREE TABLE				
TAG #	DBH (in)	SPECIES	SCIENTIFIC NAME	CONDITION
250	9	AMERICAN ELM	Ulmus americana	GOOD
251	8	PIN OAK	Quercus palustris	GOOD
252	6	PIN OAK	Quercus palustris	GOOD
253	6	AMERICAN ELM	Ulmus americana	GOOD
254	7	HACKBERRY	Celtis occidentalis	GOOD
255	9	PIN OAK	Quercus palustris	GOOD
256	TRIPLE 8"	BLACK HAWTHORN	Crataegus douglasii	GOOD
257	6	AMERICAN ELM	Ulmus americana	GOOD
258	20	WHITE OAK	Quercus alba	GOOD
259	16	WHITE OAK	Quercus alba	GOOD
260	22	WHITE OAK	Quercus alba	GOOD
261	7	WHITE OAK	Quercus alba	GOOD
262	11	WHITE OAK	Quercus alba	GOOD
263	11	WHITE OAK	Quercus alba	GOOD
264	9	BLACK HAWTHORN	Crataegus douglasii	GOOD
265	10	BLACK HAWTHORN	Crataegus douglasii	GOOD
266	12	WHITE OAK	Quercus alba	GOOD
267	8	WHITE OAK	Quercus alba	GOOD
268	6	WHITE OAK	Quercus alba	GOOD
269	10	WHITE OAK	Quercus alba	GOOD
270	10	WHITE OAK	Quercus alba	GOOD
271	11	WHITE OAK	Quercus alba	GOOD
272	12	AMERICAN ELM	Ulmus americana	DEAD
273	16	WHITE OAK	Quercus alba	GOOD
274	7	WHITE OAK	Quercus alba	GOOD

TREE TABLE				
TAG #	DBH (in)	SPECIES	SCIENTIFIC NAME	CONDITION
275	5	WHITE OAK	Quercus alba	GOOD
276	8	WHITE OAK	Quercus alba	GOOD
277	6	WHITE OAK	Quercus alba	GOOD
278	38	WHITE OAK	Quercus alba	GOOD
279	5	WHITE OAK	Quercus alba	GOOD
280	7	WHITE OAK	Quercus alba	FAIR
281	10	RED OAK	Quercus rubra	FAIR
282	36	WHITE OAK	Quercus alba	GOOD
283	5	SHAGBARK HICKORY	Carya ovata	GOOD
284	5	SHAGBARK HICKORY	Carya ovata	GOOD
285	5	SHAGBARK HICKORY	Carya ovata	GOOD
286	8	SHAGBARK HICKORY	Carya ovata	GOOD
287	11	WHITE OAK	Quercus alba	GOOD
288	13	WHITE OAK	Quercus alba	GOOD
289	9	WHITE OAK	Quercus alba	GOOD
290	7	BLACK HAWTHORN	Crataegus douglasii	GOOD
291	8	WHITE OAK	Quercus alba	GOOD
292	7	WHITE OAK	Quercus alba	GOOD
293	7	AMERICAN ELM	Ulmus americana	GOOD
294	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
295	5	EASTERN COTTONWOOD	Populus deltoides	GOOD
296	7	EASTERN COTTONWOOD	Populus deltoides	GOOD
297	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
298	9	EASTERN COTTONWOOD	Populus deltoides	GOOD
299	9	EASTERN COTTONWOOD	Populus deltoides	GOOD

TREE TABLE				
TAG #	DBH (in)	SPECIES	SCIENTIFIC NAME	CONDITION
301	9	AMERICAN ELM	Ulmus americana	GOOD
302	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
303	6	AMERICAN ELM	Ulmus americana	GOOD
304	7	EASTERN COTTONWOOD	Populus deltoides	GOOD
305	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
306	10	EASTERN COTTONWOOD	Populus deltoides	GOOD
307	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
308	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
309	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
310	7	EASTERN COTTONWOOD	Populus deltoides	GOOD
311	8	EASTERN COTTONWOOD	Populus deltoides	GOOD
312	6	AMERICAN ELM	Ulmus americana	GOOD
313	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
314	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
315	7	EASTERN COTTONWOOD	Populus deltoides	GOOD
316	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
317	5	EASTERN COTTONWOOD	Populus deltoides	GOOD
318	5	EASTERN COTTONWOOD	Populus deltoides	GOOD
319	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
320	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
321	5	EASTERN COTTONWOOD	Populus deltoides	GOOD
322	6	EASTERN COTTONWOOD	Populus deltoides	GOOD
323	5	EASTERN COTTONWOOD	Populus deltoides	GOOD
324	9	WHITE OAK	Quercus alba	GOOD
325	7	WHITE OAK	Quercus alba	GOOD

TREE TABLE				
TAG #	DBH (in)	SPECIES	SCIENTIFIC NAME	CONDITION
326	7	WHITE OAK	Quercus alba	GOOD
327	9	WHITE OAK	Quercus alba	GOOD
328	9	WHITE OAK	Quercus alba	GOOD
329	7	RED OAK	Quercus rubra	GOOD
330	7	WHITE OAK	Quercus alba	GOOD
331	7	AMERICAN ELM	Ulmus americana	GOOD
332	7	WHITE OAK	Quercus alba	GOOD
333	DOUBLE 10"	RED MAPLE	Acer rubrum	GOOD
334	DOUBLE 18"	EASTERN COTTONWOOD	Populus deltoides	GOOD
335	8	EASTERN COTTONWOOD	Populus deltoides	GOOD
336	6	WHITE OAK	Quercus alba	GOOD
337	7	WHITE OAK	Quercus alba	GOOD
338	9	WHITE OAK	Quercus alba	GOOD
339	15	RED OAK	Quercus rubra	GOOD
340	7	WHITE OAK	Quercus alba	GOOD
341	6	APPLE	Malus	GOOD
342	12	RED OAK	Quercus rubra	GOOD
343	5	WHITE OAK	Quercus alba	GOOD
344	6	WHITE OAK	Quercus alba	GOOD
345	6	BLACK HAWTHORN	Crataegus douglasii	GOOD

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Client: RAND CONSTRUCTION

INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI

PRELIMINARY SITE PLAN

TREE SURVEY

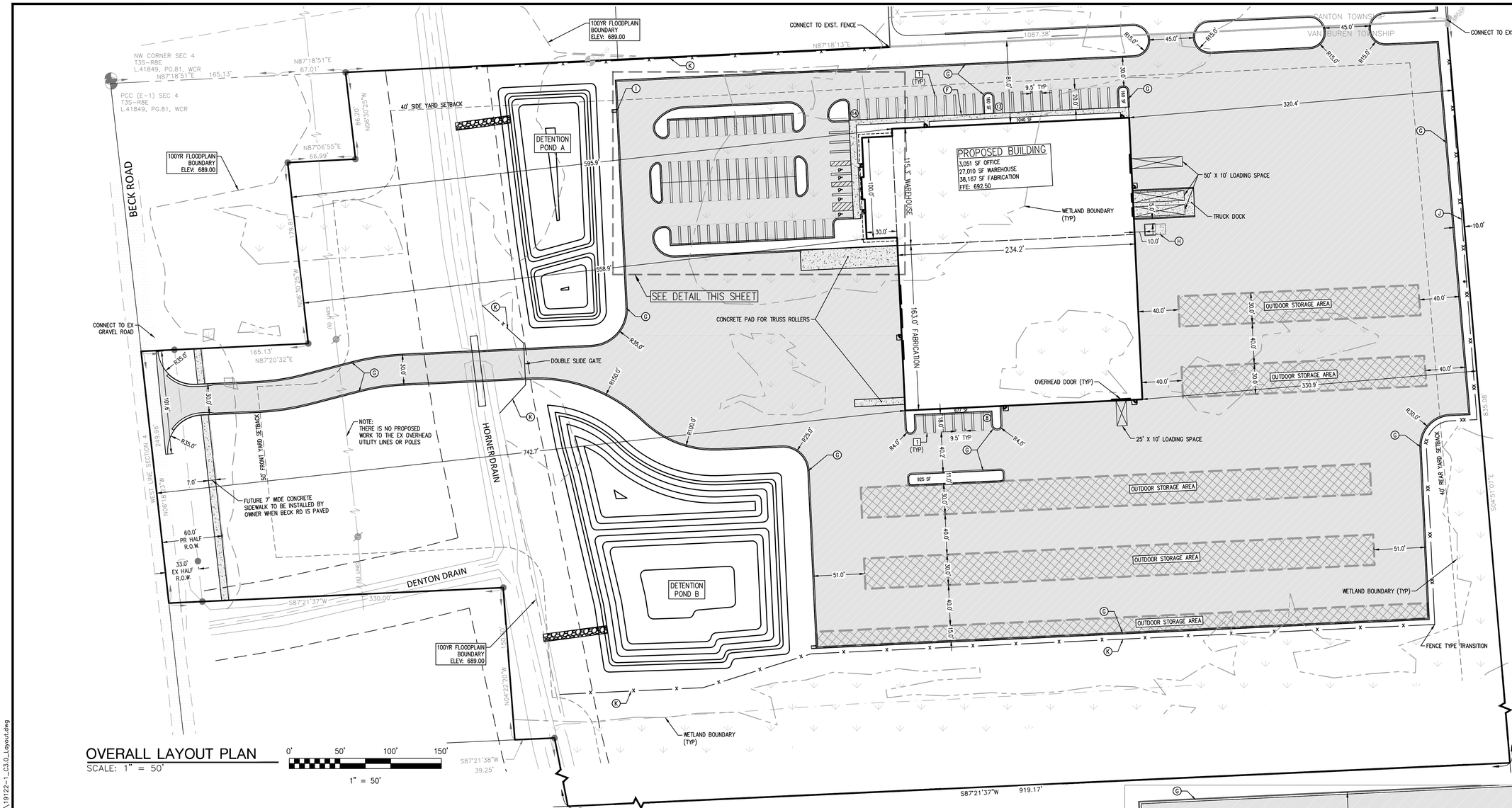
REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=60'

C2.1

FILE:C:\Users\josh\Dropbox (Livengj)\Projects\2019\19122-1 Mans Van Buren\03 DWGS\Prelim Site Plan\19122-1_C2.1_Tree Survey.dwg



OVERALL LAYOUT PLAN

SCALE: 1" = 50'

0' 50' 100' 150'

1" = 50'

KEYED NOTES:

- (D) SIDEWALK RAMP – MDOT TYPE R, SEE DETAIL D ON SHEET C7.0
- (E) BARRIER FREE SIGN WITH R7-8, SEE DETAIL E ON SHEET C7.0
- (E*) BARRIER FREE SIGN WITH R7-8a INCLUDED, SEE DETAIL E ON SHEET C7.0
- (F) CURB FACE WALK AT PROPOSED PAVEMENT, SEE DETAIL F ON SHEET C7.0
- (G) MDOT F-4 CONCRETE CURB, SEE DETAIL G ON SHEET C7.0
- (H) DUMPSTER SCREENING, SEE DETAIL H ON SHEET C7.0
- (I) CONCRETE SPILLWAY, SEE DETAIL I ON SHEET C7.0
- (J) ALUMINUM DECORATIVE FENCE (HEIGHT 6FT) SEE DETAIL J ON SHEET C7.0
- (K) CHAIN LINK FENCE (HEIGHT 6FT) SEE DETAIL K ON SHEET C7.0

PROPOSED PAVEMENT LEGEND:

ASPHALT PAVEMENT – PARKING LOT
SECTION PER DETAIL A1 ON SHEET C7.0

ASPHALT PAVEMENT – DRIVES
SECTION PER DETAIL A2 ON SHEET C7.0

CONCRETE PAVEMENT
DUMPSTER PAD SECTION PER DETAIL B1 ON SHEET C7.0
TRUCK WELL SECTION PER DETAIL B2 ON SHEET C7.0
PAVEMENT SECTION PER DETAIL B3 ON SHEET C7.0
SIDEWALK SECTION PER DETAIL C ON SHEET C7.0

KEYED PAVEMENT MARKINGS:

1. 4" DOUBLE SOLID LINE, WHITE
2. PAINTED INTERNATIONAL SYMBOL OF ACCESSIBILITY, BLUE ADA COMPLIANT
3. 4" DOUBLE SOLID LINE, BLUE
4. 4" SINGLE SOLID LINES, BLUE, 45° CROSS HATCH PATTERN (2' O.C.) WITH BORDER, ADA COMPLIANT

OUTDOOR STORAGE ACCESS

OUTDOOR STORAGE AREAS SHALL COMPLY WITH ALL FEDERAL, STATE, COUNTY, AND LOCAL FIRE SAFETY REGULATIONS. ADEQUATE EMERGENCY ACCESS LANES SHALL BE MAINTAINED AROUND AND THROUGH THE STORAGE AREAS AND TO THE BUILDING.

SEE SHEET C8.0 FOR FIRE TRUCK MANEUVERS & SHEET C8.1 TRUCK MANEUVERS

GENERAL NOTES:

1. ALL UTILITY COMPANIES SHALL BE CONTACTED PRIOR TO CONSTRUCTION AND ALL UTILITIES LOCATED. ANY DISCREPANCIES OR CONFLICTS SHALL BE REPORTED TO ENGINEER FOR RESOLUTION PRIOR TO COMMENCING CONSTRUCTION.
2. ALL DIMENSIONS TO CURB ARE MEASURED FROM FACE OF CURB
3. PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES AND SURFACES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY DESIGNED AND CONSTRUCTED. PARKING LOT STRIPING AND MARKINGS SHALL BE MAINTAINED IN A CLEARLY VISIBLE CONDITION.

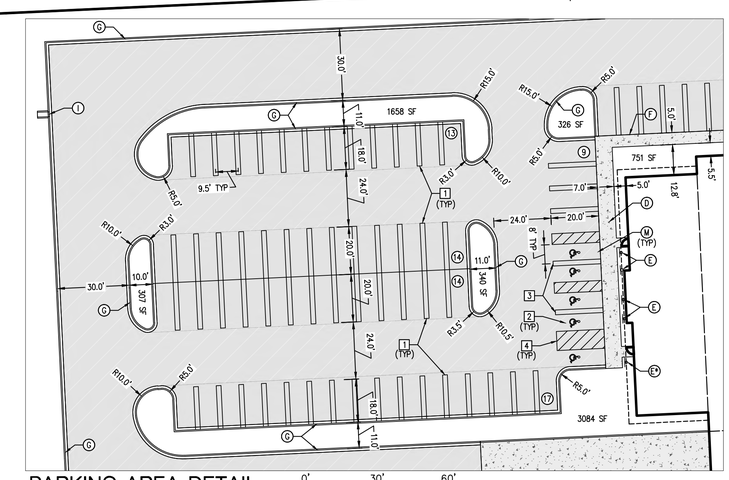
EGLE PERMITTING NOTE

A PERMIT APPLICATION TO EGLE IS IN PROGRESS FOR PROPOSED WORK WITHIN THE DRAIN, FLOODPLAIN, AND WETLANDS.

OUTDOOR STORAGE AREA

TOTAL OUTDOOR STORAGE AREA: 53,524SF
PRINCIPAL BUILDING GROUND FLOOR AREA: 68,228SF

OUTDOOR STORAGE
PERCENTAGE OF GROUND FLOOR AREA: 78.4%



PARKING AREA DETAIL

SCALE: 1" = 30'

0' 30' 60'

1" = 30'

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Client: RAND CONSTRUCTION

INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI
PRELIMINARY SITE PLAN
LAYOUT PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: AS NOTED

C3.0

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EGLE PERMITTING NOTE

A PERMIT APPLICATION TO EGLE IS IN PROGRESS FOR PROPOSED WORK WITHIN THE DRAIN, FLOODPLAIN, AND WETLANDS.

FIRE MARSHAL NOTES

1. THE BUILDING SHALL HAVE AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13, STANDARD FOR THE INSTALLATION OF AUTOMATIC SPRINKLER SYSTEMS.
2. HYDRANTS SHALL BE TWO 4 INCH STORTZ CONNECTIONS NON THREADED. THE FDC CONNECTION SHALL BE A 4 INCH STORTZ FITTING WITH A 30-DEGREE DOWNTURN AS REQUIRED BY THE AHJ.
3. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED AT THE NEAREST POINT OF FIRE DEPARTMENT APPARATUS ACCESSIBILITY OR AT A LOCATION APPROVED BY THE AUTHORITY HAVING JURISDICTION.
4. THE KNOX BOX SHALL PROVIDED.
5. EMERGENCY RESPONDER RADIO COVERAGE SYSTEM IS REQUIRED UNLESS IT CAN BE PROVEN AFTER THE BUILDING IS CONSTRUCTED AND CONSTRUCTED AND OCCUPIED, THAT COVERAGE IS SUFFICIENT. THIS WILL BE VERIFIED BY AHJ PRIOR TO FINAL C/O.

UTILITY NOTES

1. ALL CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS, SPECIFICATIONS AND GENERAL CONDITIONS OF VAN BUREN TOWNSHIP
2. THE OWNER IS RESPONSIBLE FOR RESOLVING ANY DRAINAGE PROBLEMS ON ADJACENT PROPERTIES WHICH ARE A RESULT OF THE PROPOSED DEVELOPMENT.
3. STORM SEWER TO BE RCP C76 CLIV UNLESS OTHERWISE NOTED.

0' 50' 100' 150'

1" = 50'

N

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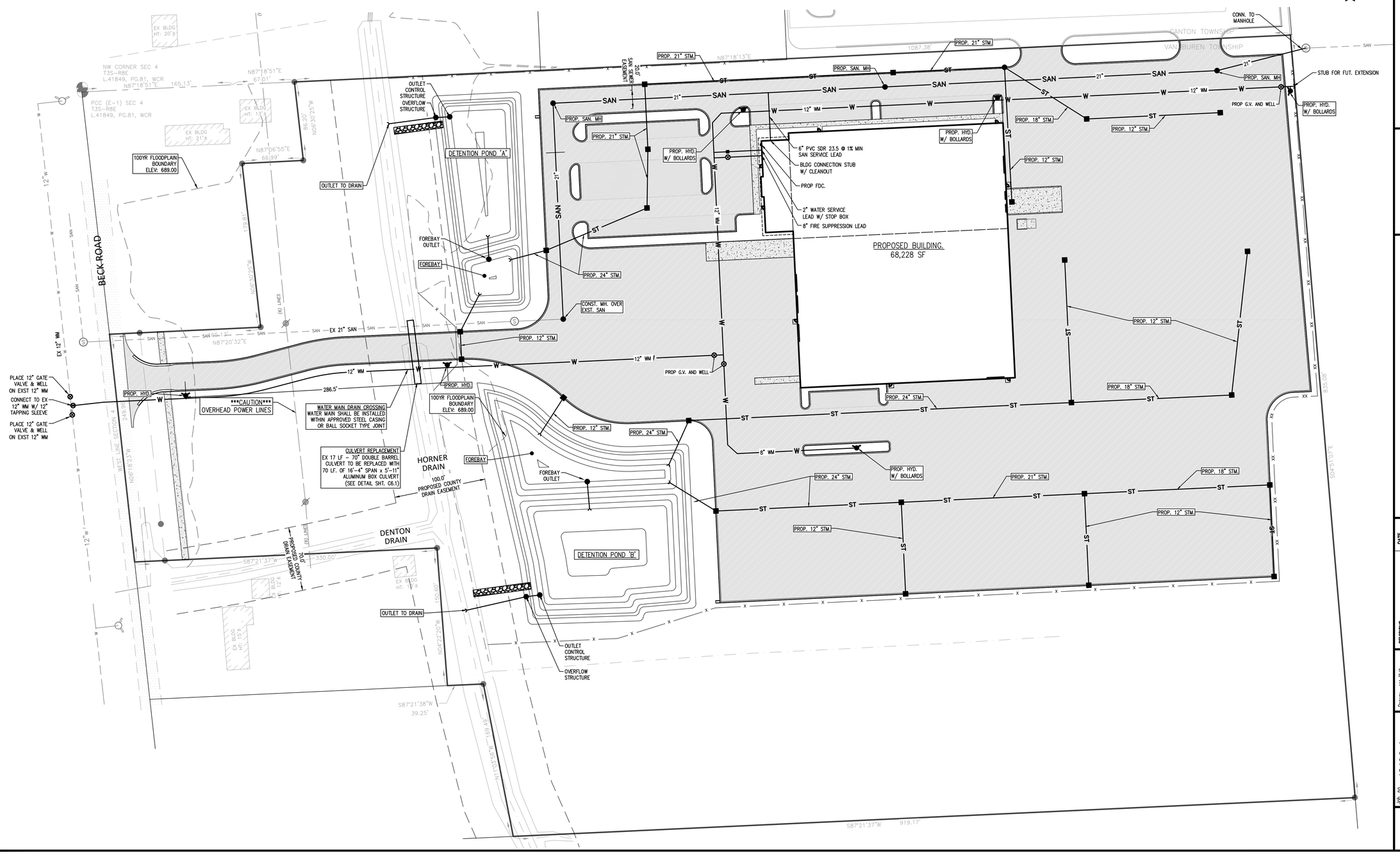

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INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI

PRELIMINARY SITE PLAN

UTILITY PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=50'

C4.0

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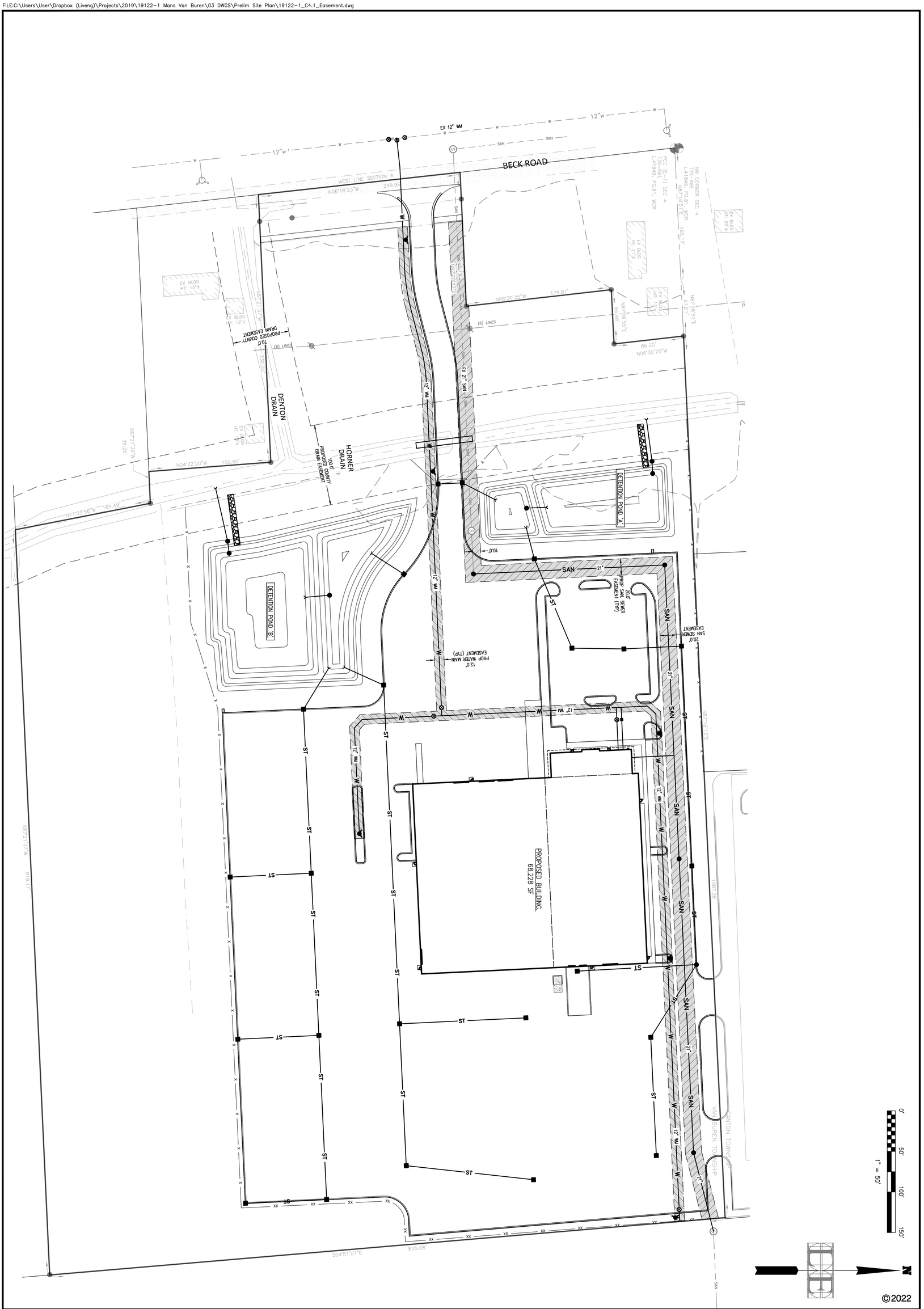

0' 50' 100' 150'
1" = 50'

N

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C4.1

Job. no. 19122-1	Drawn: MA/TJZ	REVISIONS	DATE
Scale:	Checked: TJZ	PER TOWNSHIP REVIEW COMMENTS	10/13/2022
Vertical:	Approved: TJZ		
Horizontal: 1"=50'	Date: 07-01-2022		

INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI

PRELIMINARY SITE PLAN

EASEMENT PLAN

Client

RAND CONSTRUCTION

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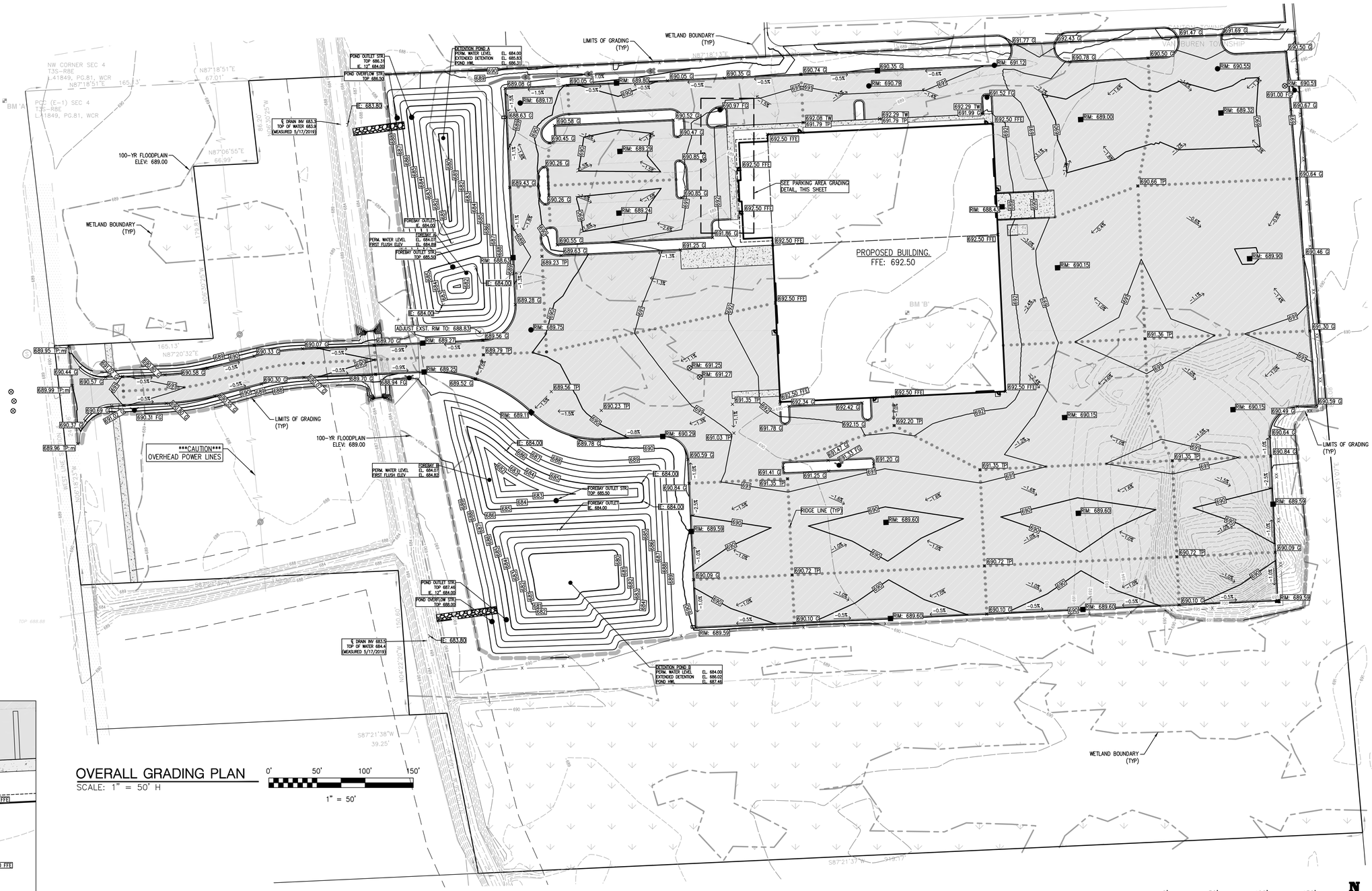
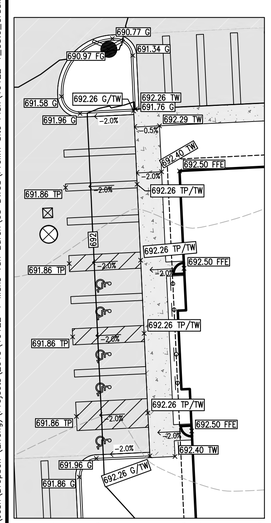


OVERALL GRADING PLAN

SCALE: 1" = 50' H

0' 50' 100' 150'

1" = 50'



PARKING AREA GRADING DETAIL

SCALE: 1" = 20' H

0' 20' 40'

1" = 20'

LEGEND

PR. SPOT GRADE	911.4 TP
PR. CONTOUR	615
DRAINAGE ARROW	
LIMITS OF GRADING	
RIDGE LINE	
SWALE LINE	

SPOT GRADE ABBREVIATIONS LIST

TP	=	TOP OF PAVEMENT
TW	=	TOP OF WALK
EM	=	EDGE OF METAL
TC	=	TOP OF CURB
m	=	MATCH EXISTING GRADE
FFE	=	FINISHED FLOOR ELEVATION
R.	=	RIM ELEVATION
FG	=	FINISHED GRADE

0' 50' 100' 150'

1" = 50'

BM 'A'
ARROW ON HYDRANT
ELEVATION= 692.06

BM 'B'
'+' MARK ON E. RIM OF SANITARY MANHOLE
ELEVATION= 690.60

DATUM: NAVD88

N

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Client: RAND CONSTRUCTION

INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI

PRELIMINARY SITE PLAN

GRADING PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=50'

C5.0

FILE:C:\Users\Josh\Dropbox (Liveng)\Projects\2019\19122-1 Mans Van Buren\03 DWGS\Prelim Site Plan\19122-1_C5.0_Grading.dwg

SESC LEGEND

- PR. CONTOUR — 615
- PR. SILT FENCE — SF
- LIMITS OF GRADING
- RIDGE LINE
- SWALE LINE
- LOW POINT INLET FILTER

TOTAL DISTURBED AREA
569,365 S.F. (12.98 AC.)

SITE MAINTENANCE NOTES:

1. DEBRIS IS TO BE PICKED UP WITHIN PROPERTY LIMITS WEEKLY OR AS NEEDED.

PROPOSED CONSTRUCTION SCHEDULE FOR THE YEAR 2023

ACTIVITY	AUG.	SEPT.	OCT.	NOV.	DEC.–MAR.	APR.	MAY
INSTALL TEMPORARY SESC MEASURES	—						
CLEAR & GRUB	—						
MASS GRADING	—	—					
UTILITIES & FINAL GRADING		—					
BUILDING CONSTRUCTION		—	—	—	—	—	
PAVING						—	—
FINAL STABILIZATION SEED & MULCH							—

SESC NOTES:

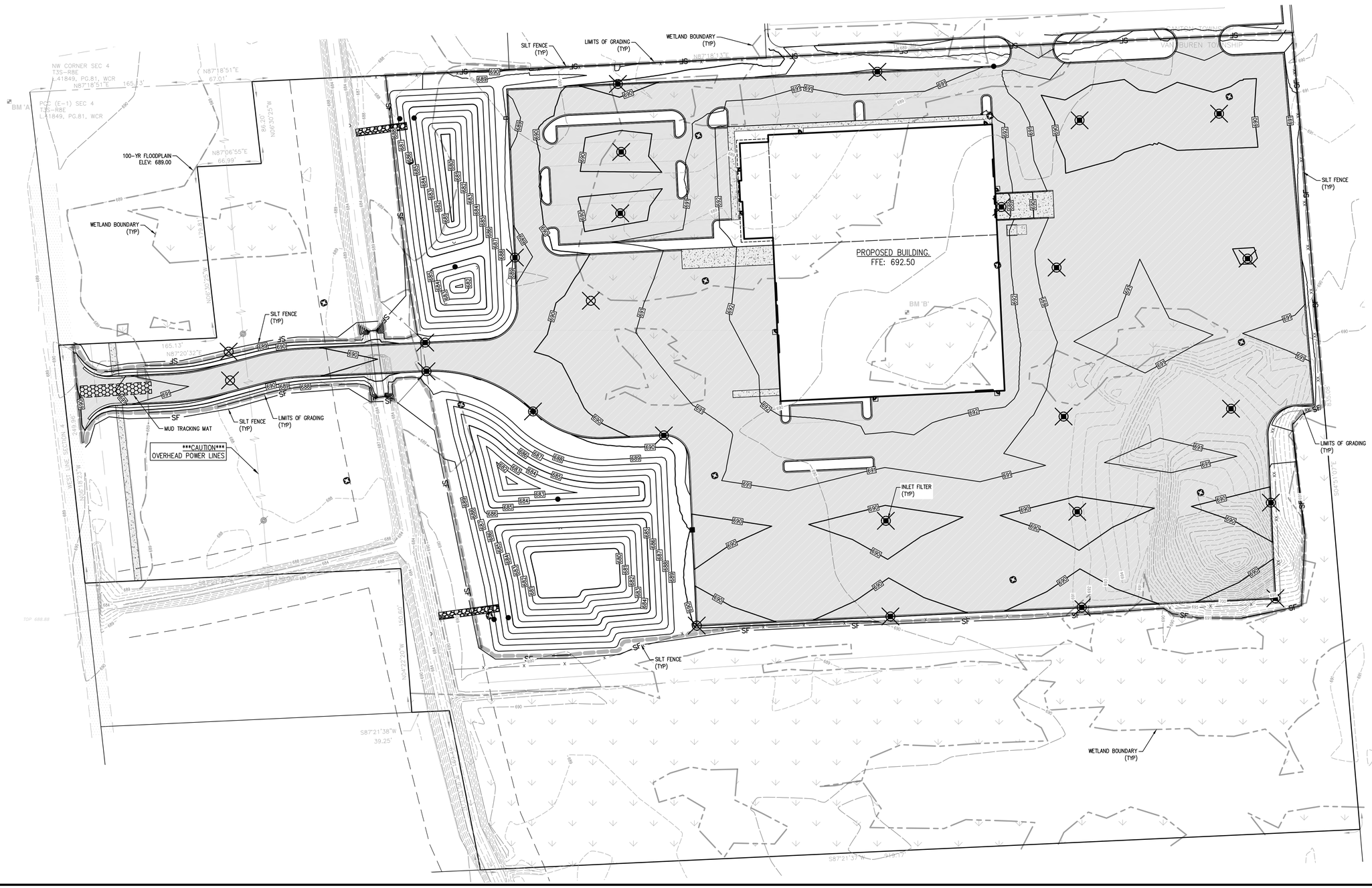
1. ALL SOIL EROSION AND SEDIMENTATION CONTROL WORK SHALL CONFORM TO WAYNE COUNTY ENVIRONMENTAL SERVICES (WCES) & VAN BUREN TOWNSHIP CURRENT STANDARDS AND SPECIFICATIONS.
2. ANY SIGNIFICANT AREAS OF LAWN RESTORATION NEAR FRONT OF PROPOSED BUILDING EXPANSION SHALL BE SODDED. MINOR AREAS OF DISTURBANCE IN FRONT OF BUILDING EXPANSION MAY BE SEEDED. ALL OTHER AREAS OF DISTURBANCE MAY BE SEEDED.
3. SEE SHEET C5.2 FOR SOIL EROSION DETAILS
4. SEE SHEET LP1 & LP2 FOR TREE PROTECTION FENCE LOCATIONS AND DETAILS.
5. SILT FENCE SHALL BE INSTALLED AND MAINTAINED AROUND THE PERIMETER OF SOIL STOCKPILE AREA IF THE STOCKPILE WILL BE LARGE AND AND IS EXPECTED TO BE ON SITE FOR A PERIOD OF TIME.
6. SILT SACKS SHALL BE PROVIDED FOR ALL EXISTING AND PROPOSED CATCH BASINS. FOR CURB STYLE CATCH BASINS, BEAVER DAMS SHALL BE PROVIDED IN ADDITION TO THE SILT SACKS.
7. SEED AND STABILIZE DETENTION BASIN IMMEDIATELY UPON ACHIEVING FINAL GRADE, AND FOLLOW WCES APPROVED SPECIFICATIONS AND PERMIT PROVISIONS.
8. STABILIZATION MUST BE STARTED WITHIN FIVE (5) DAYS OF FINAL GRADE. USE 4–INCHES OF TOPSOIL, MINIMUM.
9. STRAW MULCH BLANKETS SHALL BE USED ON SLOPES 3:1 OR GREATER (THREE FOOT HORIZ., ONE FOOT VERTICAL).
10. THE DETENTION BASIN SIDE SLOPES MUST BE STABILIZED, BY PLACING A MULCH BLANKET PEGGED IN PLACE OVER SEED. THE REMAINDER OF THE POND MAY BE SEEDED.
11. THE OWNER IS RESPONSIBLE FOR RESOLVING ANY DRAINAGE PROBLEMS ON ADJACENT PROPERTIES WHICH ARE A RESULT OF THE PROPOSED DEVELOPMENT.

0' 50' 100' 150'
1" = 50'

BM 'A'
ARROW ON HYDRANT
ELEVATION= 692.06

BM 'B'
'+' MARK ON E. RIM OF SANITARY MANHOLE
ELEVATION= 690.60

DATUM: NAVD88



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INTEGRITY COMPONENT & DESIGN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MI
PRELIMINARY SITE PLAN
SESC PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
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Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=50'

C5.1

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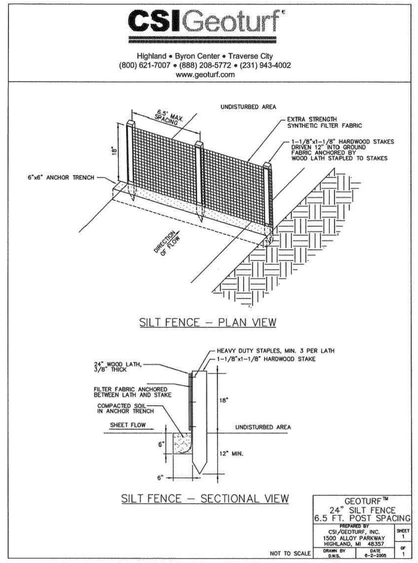
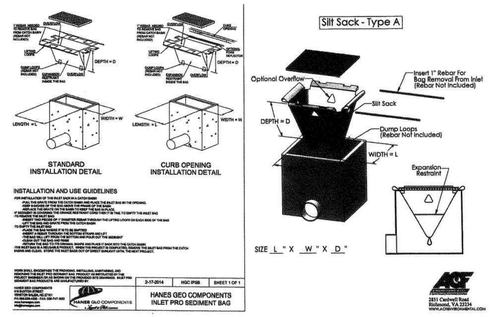


SILT FENCE



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• CIVIL SITE IMPROVEMENTS • EROSION & SEDIMENT CONTROL • STORMWATER MANAGEMENT • LANDSCAPE ENHANCEMENTS

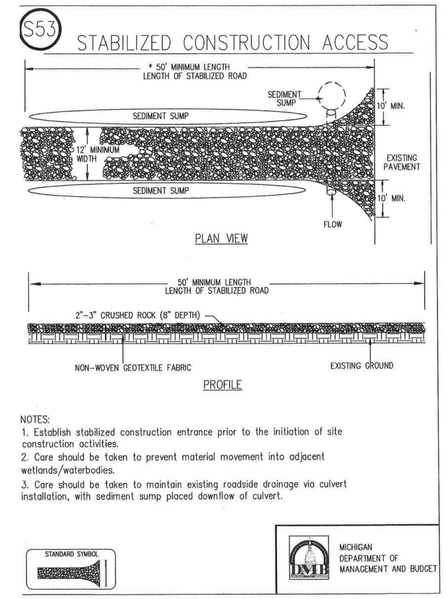
Geoturf® Filter Bag

Whenever accumulated water on a construction site must be pumped, utilize filter bags to ensure the water is properly filtered of silt and sediment prior to discharge into receiving bodies. Filter bags are constructed of strong, high quality nonwoven geotextile filter fabric with a fill port to accommodate a pump discharge hose. The filter bags permit a controlled outflow of water, while retaining harmful pollutants.

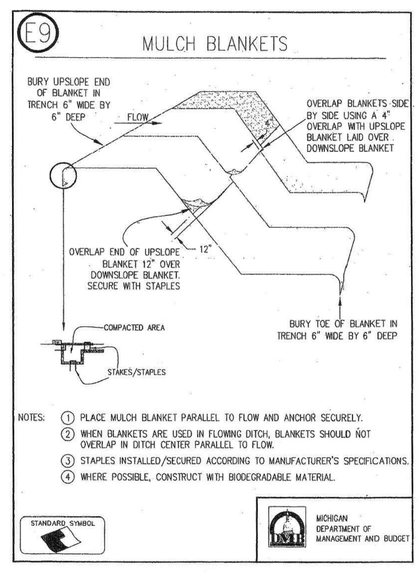
Size	15' x 20' x 8"
Snout Size	8"
Holding Capacity	15 Cubic Yds.

Meets the requirements of MDOT Item 208 Erosion Control Filter Bag

LOW POINT INLET FILTER



MUD TRACKING MAT



STRAW MULCH BLANKET

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http://www.livingstoneng.com

Client
RAND CONSTRUCTION

INTEGRITY COMPONENT & DESIGN

VAN BUREN TOWNSHIP, WAYNE COUNTY, MI

PRELIMINARY SITE PLAN

SESC DETAILS

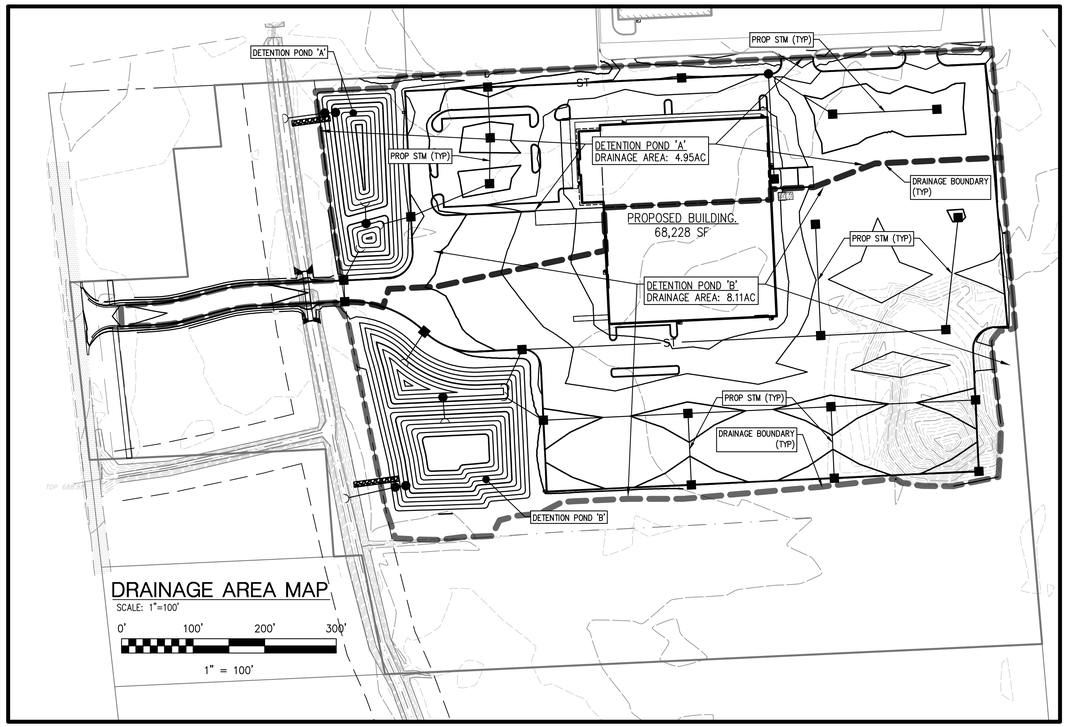
REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal:

C5.2

FILE:C:\Users\Josh\Dropbox (Liveng)\Projects\2019\19122-1 Mans Van Buren\03 DWGS\Prelim Site Plan\19122-1_C5.1_SESC.dwg



DRAINAGE AREA MAP

SCALE: 1"=100'

0' 100' 200' 300'

1" = 100'

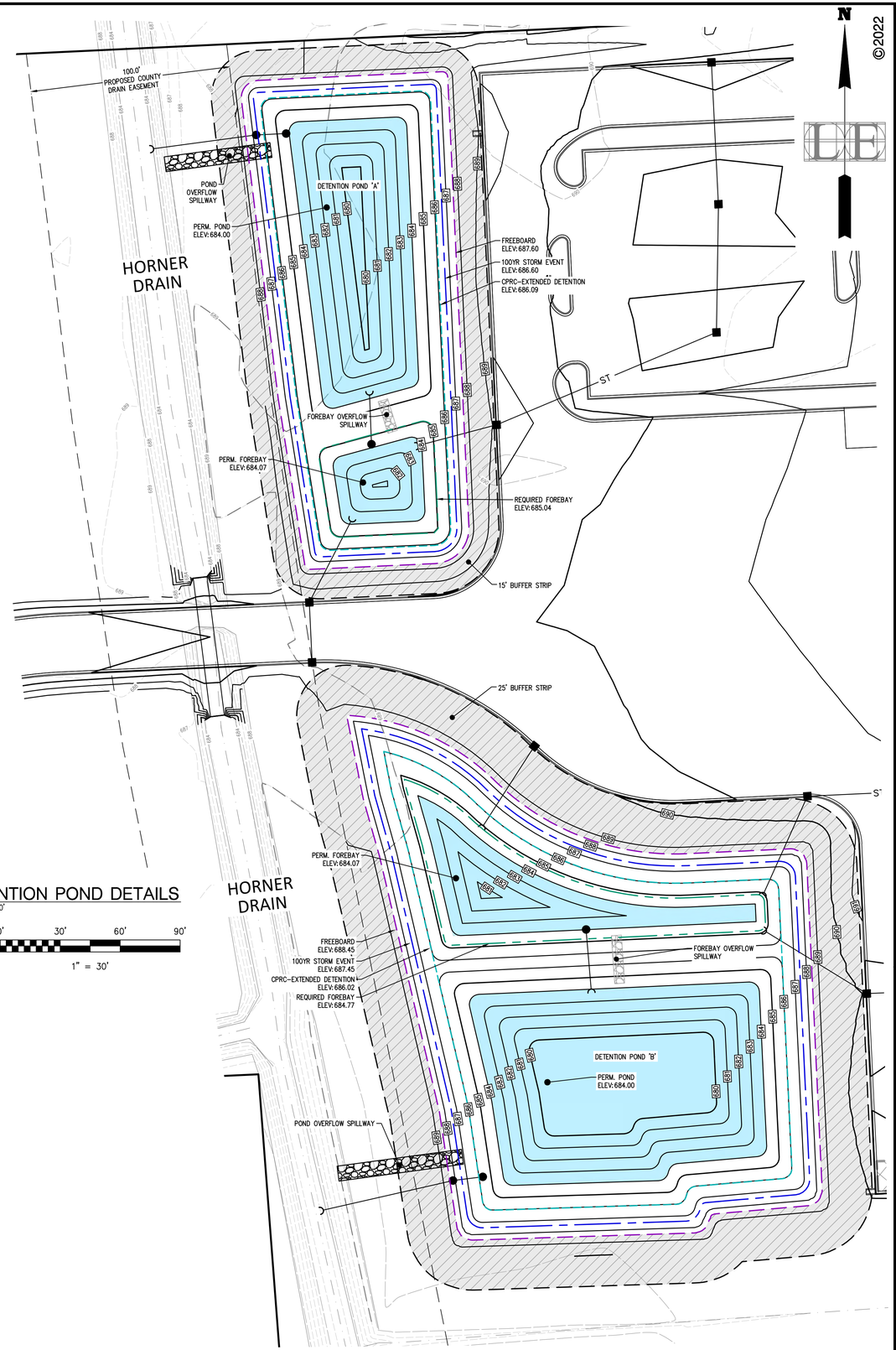
STORM WATER NARRATIVE

THE EXISTING DRAINAGE PATTERN FOR THE SITE PRIMARILY FLOWS INTO THE EXISTING HORNER DRAIN THAT BISECT THE PROPERTY AND WHICH FLOWS IN A SOUTHERLY DIRECTION ACROSS THE SITE. AN EXISTING 70" DOUBLE BARREL CULVERT PROVIDES ACCESS TO THE EASTERN PORTION OF THE SITE. EXISTING WETLANDS HAVE BEEN FLAGGED BY BARR AND THE BOUNDARIES ARE SHOWN ON THE PLANS.

TWO ONSITE DETENTION PONDS HAVE BEEN PROPOSED ON THE SITE, ALL ADJACENT TO THE APPLE RUN DRAIN. RUNOFF FROM ALL IMPERVIOUS SURFACES WILL BE DETAINED IN THE PONDS BY USE OF A RESTRICTED OUTLET STANDPIPE PER COUNTY STANDARDS. THE POND IS DESIGNED TO RETAIN THE FIRST FLUSH WATER QUALITY VOLUME RUNOFF FROM THE SITE FOR 24 HOURS MINIMUM TO ALLOW SUSPENDED SOLIDS TO SETTLE OUT PRIOR TO RELEASE AT A CONTROLLED, RESTRICTED RATE TO THE DOWNSTREAM SYSTEM.

THE EXISTING 70" DOUBLE BARREL CULVERT IS TO BE REPLACED BY AN ALUMINUM BOX CULVERT (SEE SHEET C7.0 FOR DETAILS)

THE STORM WATER MANAGEMENT SYSTEM FOR THE PROPOSED DEVELOPMENT ALSO INCLUDES A TYPICAL STORM WATER COLLECTION SYSTEM MADE UP OF CATCH BASINS AND PIPING THAT COLLECT AND CONVEY RUNOFF TO THE AFOREMENTIONED ONSITE DETENTION PONDS.



DETENTION POND DETAILS

SCALE: 1"=30'

0' 30' 60' 90'

1" = 30'

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PRELIMINARY SITE PLAN

STORM WATER MANAGEMENT PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: AS NOTED

C6.0

FILE:C:\Users\Joah\Dropbox (Livengl)\Projects\2019\19122-1 Mans Van Buren\03 DWGS\Prelim Site Plan\19122-1_C6.0_SWMP.dwg

POND A

Storm Water Detention Calculations
Project: Integrity Component & Design (Pond A)
LE Project Number: 19122-1
Wayne County Method

I	Composite Runoff Coefficient Calculations		
I.A	Runoff Coefficient Summary		
	Type of Surface	**C Factor**	**Area, ac**
	Water Surfaces	1	0.21
	Roofs	0.95	0.69
	Asphalt or Concrete Pavements	0.95	3.03
	Greenspace (Hydrologic Soil Group B)	0.2	1.02
I.B	Total Contributing Area, A	4.95	ac
I.C	Composite Runoff Coefficient, C	0.80	
II	Time of Concentration Calculations		
II.A	Sheet Flow, t_{sheet}		
	K =	0.48	
	Slope (S) =	2.16	%
	$V = K \times S^{0.5}$	0.71	ft/s
	L =	94	ft
	Flow time = L / (V x 60)	2.2	min
II.B	Shallow Flow (along roadway or swale, upstream of sewer), $t_{shallow}$		
	K =	1.2	
	Slope (S) =	1	%
	$V = K \times S^{0.5}$	1.20	ft/s
	L =	315	ft
	Flow time = L / (V x 60)	4.4	min
II.C	Sewer Flow, t_{sewer}		
	V (avg velocity from sewer flow)	2.50	ft/s
	L =	939	ft
	Flow time = L / (V x 60)	6.3	min
II.D	Time of Concentration		
	$t_c = t_{sheet} + t_{shallow} + t_{sewer}$	12.9	min
	*t_c = 10 minutes per county standard for sites that are 2 acres or less		
III	100-year Peak Intensity		
	$I_{100} = 101 / (12.33 + t_c)^{0.84}$	6.7	in/hr
IV	Channel Protection Control (CPVC), Site Runoff from First 1" of Rainfall, V_{CPVC}		
	V_{CPVC} = 1" x (1'/12") x (43,560 sf/acre) x C x A		
	V_{CPVC} = 3,630 x C x A	14,350	cf
V	Channel Protection Rate Control (CPRC), Extended Detention for the Site Runoff from a 1.9" Rainfall Event, V_{CPRC}		
V.A	V_{CPRC} = 1.9" x (1'/12") x (43,560 sf/acre) x C x A		
	V_{CPRC} = 6,897 x C x A	27,266	cf
V.B	Extended Detention Volume Discharge Rate, Q_{ED}		
	$Q_{ED} = V_{ED}/(48$ hr x 60 min x 60 sec)	0.16	cfs
VI	100 Year Allowable Peak Flow Rate, Q_{allow}		
	Q_{allow} = 1.10SS - 0.207ln(A)	0.77	in/hr
VII	100 Year Allowable Discharge Rate, Q_o		
	Q_o = Qallow x A	3.83	cfs
VIII	100-year Developed Site Peak Inflow into Pond, Q_i		
	$Q_i = C \times I_{100} \times A$	26.6	cfs
IX	100-Year Storage Volume, V_s		
IX.A	Allowable 100-year Post-Development Runoff Volume, V_r		
	V_r = 18,900 x C x A	74,717	cf
IX.B	$V_s = V_r \times [0.206 - 0.15\ln(Q_o/Q_i)]$	**37,085**	**cf**
X	First Flush (Sediment Forebay) Storage Volume, V_{ff}		
X.A	Forebay Min. Storage of 15% of V_{CPVC}		
	V_{ff} = 545 x C x A	**2,155**	**cf**
X.B	24-hour Average Allowablew Outflow Rate, $Q_{avg\ ff}$		
	$Q_{avg\ ff} = V_{ff}$ / 86,400	0.02	cfs
	The Site Plan must be designed to accommodate the following volumes		
	CPVC	14,350	cf
	CPRC, Extended Detention	27,266	cf
*	Flood Control	22,734	cf
*	**If the volume control requirement is met, the CPVC volume can be subtracted from (credited against) the 100-year flood volume.**		
	Design Requirements	**Volume**	
	CPVC	14,350	cf
	CPRC, Extended Detention	27,266	cf
*	Flood Control	27,266	cf
*	The minimum flood storage requirements on any site is the CPRC volume.		

Storm Water Detention Calculations
Project: Integrity Component & Design (Pond A)
LE Project Number: 19122-1
Charter Township of Van Buren

I	**Determination of Peak Flow Rate**		
I.A	Runoff Coefficient		
	Type of Surface	**C Factor**	**Area, ac**
	Water Surfaces	1	0.21
	Roofs	0.95	0.69
	Asphalt or Concrete Pavements	0.95	3.03
	Greenspace (Hydrologic Soil Group B)	0.25	1.02
I.A.1	Total Contributing Area, A	4.95	ac
I.A.2	Composite Runoff Coefficient, C	0.81	
II	**Storage Requirements**		
	Drainage areas greater than five acres	100-year	storm event
	Drainage areas of five acres or less	**10-year**	**storm event**
	Allowable release rate, Q_a		
	$Q_a = 0.10 \times A$	0.50	cfs
	Maximum outflow per acre imperviousness, Q_o		
	$Q_o = Q_a$ / A x C	0.12	cfs/acre imp
	Storage Time, T_{10}		
	$T_{10} = -19.9 + (4{,}530 / Q_o)^{0.5}$	171	minutes
	Maximum Volume of water stored per acre imperviousness, $V_{s\ 10}$		
	$V_{s\ 10} = [(9{,}108 \times T_{10}) / (T_{10} + 19.9)] - (40 \times Q_o \times T_{10})$	7,313	cf/acre imp
	Maximum Volume of Water Stored, $V_{s\ 10}$		
	$V_{s\ 10} = V_{s\ 10} \times A \times C$	29,280	cf

COUNTY STANDARDS: TOWNSHIP STANDARDS:

37,085 CF > 29,280 CF

COUNTY STANDARDS CONTROL

XI	**Proposed Basin Volumes**							
	Forebay			**Detention Pond**			**Total Accumulated Volume (cf)**	
	Elevation	**Area (sf)**	**Volume (cf)**	**Elevation**	**Area (sf)**	**Volume (cf)**	-	Below Top Forebay
	684.07	1,649	-	684.00	7,542	-		Embankment
	685.00	2,788	2,063	685.00	10,020	8,781	10,844	Elevation
	685.50	3,459	1,562	685.50	11,367	5,347	17,753	
				685.50	15,246	-	17,753	Above Top Forebay
				686.00	17,013	8,065	25,817	Embankment
				687.00	20,743	18,878	44,695	Elevation

XII	**Design Storm Elevations**						
The following interpolations determine the pond water elevations for the different storm events:							
XII.A	**First Flush Elevation, V_{ff}**						
Elevation	685.00	-	684.07	=	x_1	-	684.07
Volume	2063		0		2155		0
				Elev V_{ff} =	x_1	=	685.04

XII.B	**Extended Detention Elevation, Elev V_{CPRC}**						
Elevation	686.00	-	685.50	=	x_2	-	685.50
Volume	25817		17753		27266		17753
				Elev V_{CPRC} =	x_2	=	686.09

XII.C	**100-Year Storm Event Elevation, Elev V_{100O}**						
Elevation	687.00	-	686.00	=	x_3	-	686.00
Volume	44695		25817		37085		25817
				Elev V_{100O} =	x_3	=	686.60

POND B

Storm Water Detention Calculations
Project: Integrity Component & Design (Pond B)
LE Project Number: 19122-1
Wayne County Method

I	Composite Runoff Coefficient Calculations		
I.A	Runoff Coefficient Summary		
	Type of Surface	**C Factor**	**Area, ac**
	Water Surfaces	1	0.41
	Roofs	0.95	0.88
	Asphalt or Concrete Pavements	0.95	5.28
	Greenspace (Hydrologic Soil Group B)	0.2	1.54
I.B	Total Contributing Area, A	8.11	ac
I.C	Composite Runoff Coefficient, C	0.81	
II	Time of Concentration Calculations		
II.A	Sheet Flow, t_{sheet}		
	K =	0.48	
	Slope (S) =	0.73	%
	$V = K \times S^{0.5}$	0.41	ft/s
	L =	139	ft
	Flow time = L / (V x 60)	5.6	min
II.B	Shallow Flow (along roadway or swale, upstream of sewer), $t_{shallow}$		
	K =	1.2	
	Slope (S) =	9.8	%
	$V = K \times S^{0.5}$	3.76	ft/s
	L =	315	ft
	Flow time = L / (V x 60)	1.4	min
II.C	Sewer Flow, t_{sewer}		
	V (avg velocity from sewer flow)	2.50	ft/s
	L =	804	ft
	Flow time = L / (V x 60)	5.4	min
II.D	Time of Concentration		
	$t_c = t_{sheet} + t_{shallow} + t_{sewer}$	12.4	min
	*t_c = 10 minutes per county standard for sites that are 2 acres or less		
III	100-year Peak Intensity		
	$I_{100} = 101 / (12.33 + t_c)^{0.84}$	6.8	in/hr
IV	Channel Protection Control (CPVC), Site Runoff from First 1" of Rainfall, V_{CPVC}		
	V_{CPVC} = 1" x (1'/12") x (43,560 sf/acre) x C x A		
	V_{CPVC} = 3,630 x C x A	23,841	cf
V	Channel Protection Rate Control (CPRC), Extended Detention for the Site Runoff from a 1.9" Rainfall Event, V_{CPRC}		
V.A	V_{CPRC} = 1.9" x (1'/12") x (43,560 sf/acre) x C x A		
	V_{CPRC} = 6,897 x C x A	45,298	cf
V.B	Extended Detention Volume Discharge Rate, Q_{ED}		
	$Q_{ED} = V_{ED}/(48$ hr x 60 min x 60 sec)	0.26	cfs
VI	100 Year Allowable Peak Flow Rate, Q_{allow}		
	Q_{allow} = 1.10SS - 0.207ln(A)	0.67	in/hr
VII	100 Year Allowable Discharge Rate, Q_o		
	Q_o = Qallow x A	5.45	cfs
VIII	100-year Developed Site Peak Inflow into Pond, Q_i		
	$Q_i = C \times I_{100} \times A$	44.8	cfs
IX	100-Year Storage Volume, V_s		
IX.A	Allowable 100-year Post-Development Runoff Volume, V_r		
	V_r = 18,900 x C x A	124,130	cf
IX.B	$V_s = V_r \times [0.206 - 0.15\ln(Q_o/Q_i)]$	**64,791**	**cf**
X	First Flush (Sediment Forebay) Storage Volume, V_{ff}		
X.A	Forebay Min. Storage of 15% of V_{CPVC}		
	V_{ff} = 545 x C x A	**3,579**	**cf**
X.B	24-hour Average Allowablew Outflow Rate, $Q_{avg\ ff}$		
	$Q_{avg\ ff} = V_{ff}$ / 86,400	0.04	cfs
	The Site Plan must be designed to accommodate the following volumes		
	CPVC	23,841	cf
	CPRC, Extended Detention	45,298	cf
*	Flood Control	40,950	cf
*	**If the volume control requirement is met, the CPVC volume can be subtracted from (credited against) the 100-year flood volume.**		
	Design Requirements	**Volume**	
	CPVC	23,841	cf
	CPRC, Extended Detention	45,298	cf
*	Flood Control	45,298	cf
*	The minimum flood storage requirements on any site is the CPRC volume.		

Storm Water Detention Calculations
Project: Integrity Component & Design (Pond B)
LE Project Number: 19122-1
Charter Township of Van Buren

I	**Determination of Peak Flow Rate**		
I.A	Runoff Coefficient		
	Type of Surface	**C Factor**	**Area, ac**
	Water Surfaces	1	0.41
	Roofs	0.95	0.88
	Asphalt or Concrete Pavements	0.95	5.28
	Greenspace (Hydrologic Soil Group B)	0.25	1.54
I.A.1	Total Contributing Area, A	8.11	ac
I.A.2	Composite Runoff Coefficient, C	0.82	
II	**Storage Requirements**		
	Drainage areas greater than five acres	**100-year**	**storm event**
	Drainage areas of five acres or less	10-year	storm event
	Allowable release rate, Q_a		
	$Q_a = 0.10 \times A$	0.81	cfs
	Maximum outflow per acre imperviousness, Q_o		
	$Q_o = Q_a$ / A x C	0.12	cfs/acre imp
	Storage Time, T_{100}		
	$T_{100} = -45 + (19845 / Q_o)^{0.5}$	358	minutes
	Maximum Volume of water stored per acre imperviousness, $V_{s\ 100}$		
	$V_{s\ 100} = [(17{,}649 \times T_{100}) / (T_{100} + 45)] - (40 \times Q_o \times T_{100})$	13,930	cf/acre imp
	Maximum Volume of Water Stored, $V_{s\ 100}$		
	$V_{s\ 100} = V_{s\ 100} \times A \times C$	92,567	cf

COUNTY STANDARDS: TOWNSHIP STANDARDS:

64,791 CF < 92,567 CF

TOWNSHIP STANDARDS CONTROL

XI	**Proposed Basin Volumes**							
	Forebay			**Detention Pond**			**Total Accumulated Volume (cf)**	
	Elevation	**Area (sf)**	**Volume (cf)**	**Elevation**	**Area (sf)**	**Volume (cf)**	-	Below Top Forebay
	684.07	3,762	-	684.00	12,904	-		Embankment
	685.00	6,433	4,741	685.00	15,842	14,373	19,114	Elevation
	686.00	9,508	7,971	686.00	19,087	17,465	44,549	
				686.00	29,662	-	44,549	Above Top Forebay
				687.00	34,386	32,024	76,573	Embankment
				687.50	36,860	17,812	94,384	Elevation

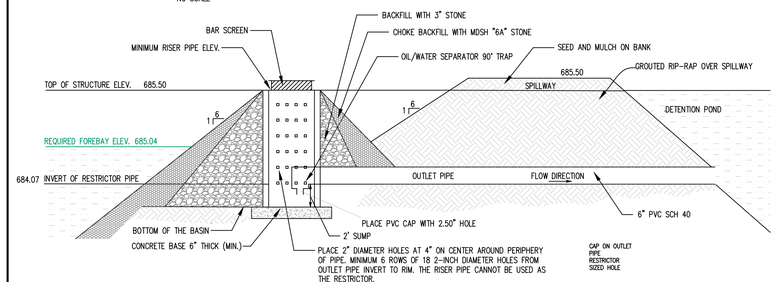
XII	**Design Storm Elevations**						
The following interpolations determine the pond water elevations for the different storm events:							
XII.A	**First Flush Elevation, V_{ff}**						
Elevation	685.00	-	684.07	=	x_1	-	684.07
Volume	4741		0		3579		0
				Elev V_{ff} =	x_1	=	684.77

XII.B	**Extended Detention Elevation, Elev V_{CPRC}**						
Elevation	687.00	-	686.00	=	x_2	-	686.00
Volume	76573		44549		45298		44549
				Elev V_{CPRC} =	x_2	=	686.02

XII.C	**100-Year Storm Event Elevation, Elev V_{100O}**						
Elevation	687.50	-	687.00	=	x_3	-	687.00
Volume	94384		76573		92567		76573
				Elev V_{100O} =	x_3	=	687.45

DETENTION POND A FOREBAY OUTLET STRUCTURE

NO SCALE



DETENTION BASIN A OUTLET STRUCTURE

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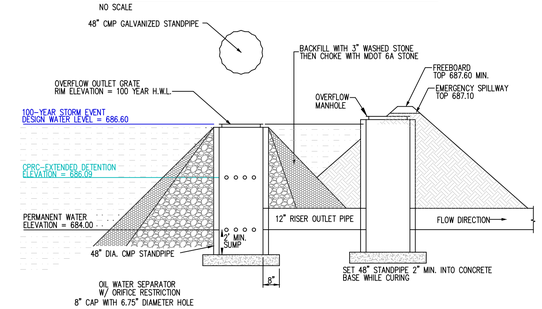

DETENTION POND B FOREBAY OUTLET STRUCTURE

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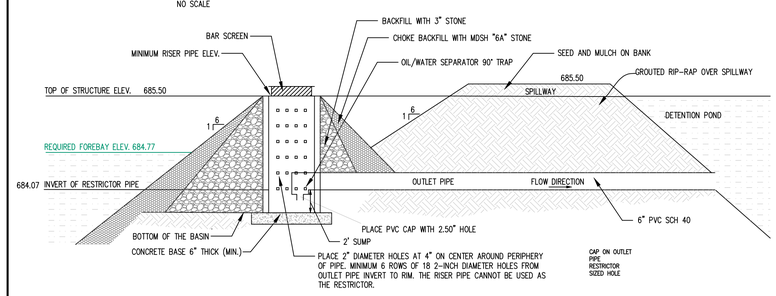

DETENTION BASIN B OUTLET STRUCTURE

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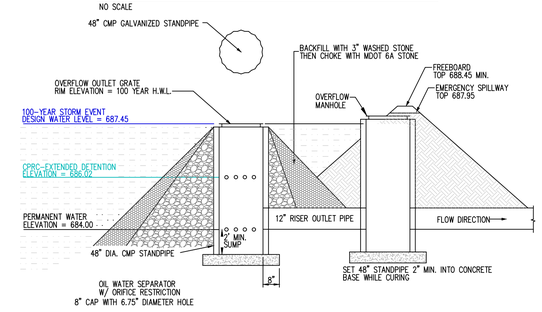

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PRELIMINARY SITE PLAN
DETENTION CALCULATIONS & OUTLET DETAILS

DATE	REVISIONS
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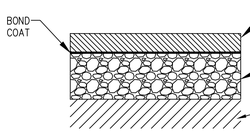
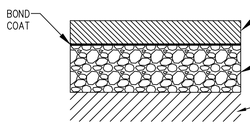
Horizontal:

C6.1

FILE:C:\Users\Josh\Dropbox (Liveng)\Projects\2019\19122-1 Mans Van Buren\03 DWGS\Prelim Site Plan\19122-1_C6.0_SWMP.dwg



A1 LIGHT DUTY ASPHALT PAVEMENT SECTION
NOT TO SCALE



A2 HEAVY DUTY ASPHALT PAVEMENT SECTION
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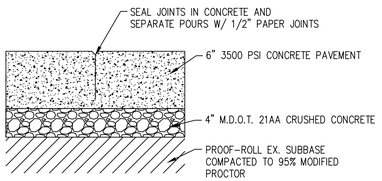
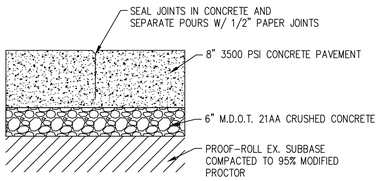


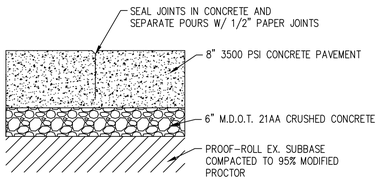
B1 CONCRETE PAVEMENT SECTION
DUMPSTER PAD

** FOR USE IN DUMPSTER PAD **
NOT TO SCALE

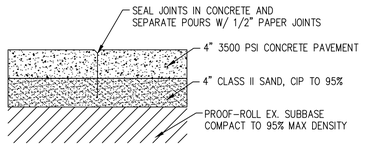


B2 CONCRETE PAVEMENT SECTION
TRUCK WELL

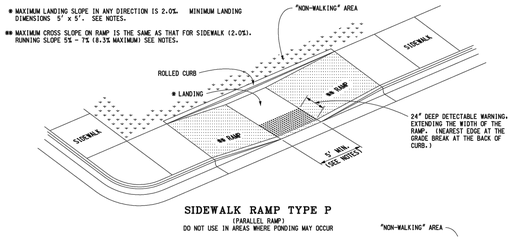
** FOR USE IN TRUCK WELL **
NOT TO SCALE



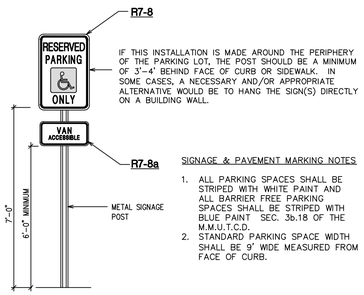
B3 CONCRETE PAVEMENT SECTION
NOT TO SCALE



C CONCRETE SIDEWALK SECTION
** FOR USE IN SIDEWALK AREAS THAT DO NOT ABUT PAVEMENT**
NOT TO SCALE



D SIDEWALK RAMP - MDOT TYPE P
NOT TO SCALE

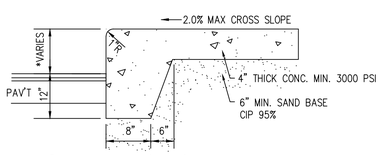


IF THIS INSTALLATION IS MADE AROUND THE PERIPHERY OF THE PARKING LOT, THE POST SHOULD BE A MINIMUM OF 3'-4' BEHIND FACE OF CURB OR SIDEWALK. IN SOME CASES, A NECESSARY AND/OR APPROPRIATE ALTERNATIVE WOULD BE TO HANG THE SIGN(S) DIRECTLY ON A BUILDING WALL.

SIGNAGE & PAVEMENT MARKING NOTES

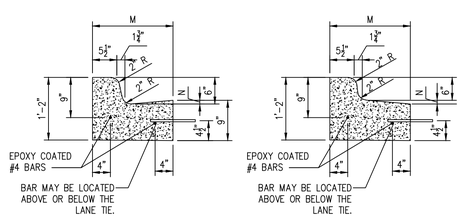
1. ALL PARKING SPACES SHALL BE STRIPED WITH WHITE PAINT AND ALL BARRIER FREE PARKING SPACES SHALL BE STRIPED WITH BLUE PAINT SEC. 3b.18 OF THE M.M.U.T.C.D.
2. STANDARD PARKING SPACE WIDTH SHALL BE 9' WIDE MEASURED FROM FACE OF CURB.

E BARRIER FREE SIGN
NOT TO SCALE



* NOTE: 0" IN AREAS WHERE T/P & T/W ARE FLUSH.
ALL OTHER AREAS WALK IS 6" ABOVE ADJACENT PAVEMENT.

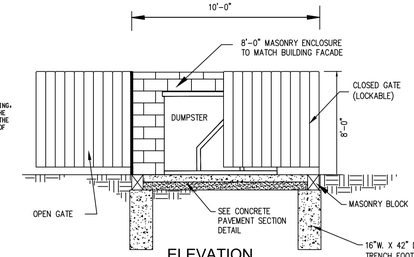
F CURB FACE WALK
NOT TO SCALE



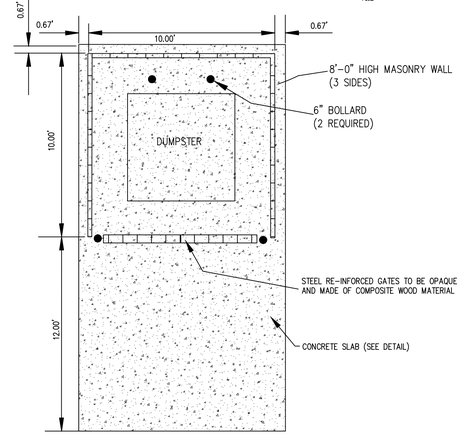
DETAIL	DIMENSIONS M	DIMENSIONS N	LANE TIES	CONCRETE CU. YD. / LIN. FT.
F1	1'-6"	7/8"	AS SHOWN	0.0484
F2	1'-6"	7/8"	OMITTED	0.0484
F3	2'-0"	1 3/8"	AS SHOWN	0.0610
F4	2'-0"	1 3/8"	OMITTED	0.0610
F5	2'-6"	1 7/8"	AS SHOWN	0.0737
F6	2'-6"	1 7/8"	OMITTED	0.0737

TO BE USED ON-SITE → F4

G MDOT "F" CONCRETE CURB
NOT TO SCALE

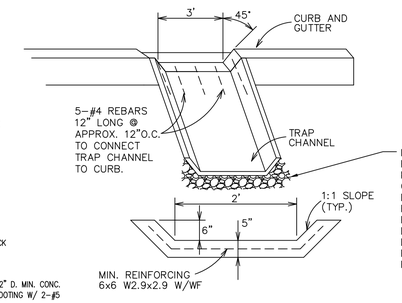


ELEVATION

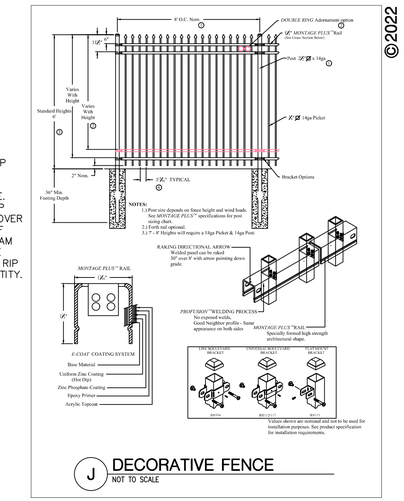


PLAN VIEW

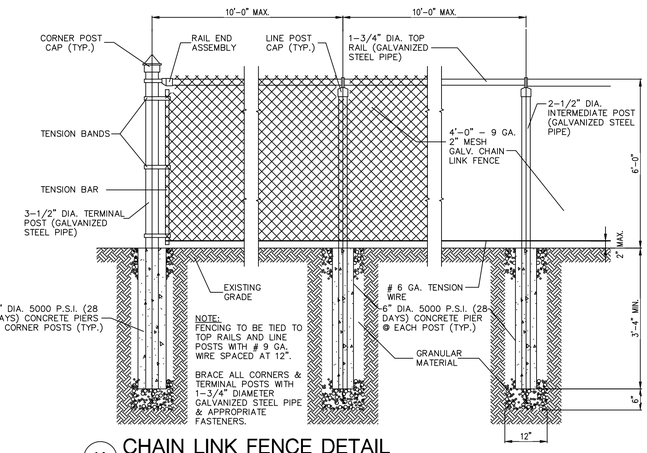
H SINGLE DUMPSTER SCREENING DETAIL
NOT TO SCALE



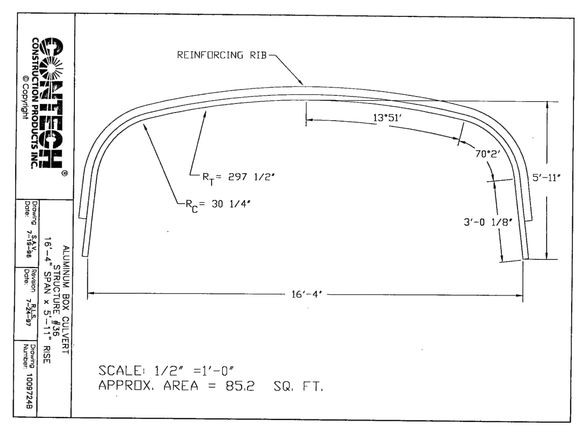
I CURB AND GUTTER SPILLWAY
NOT TO SCALE



J DECORATIVE FENCE
NOT TO SCALE

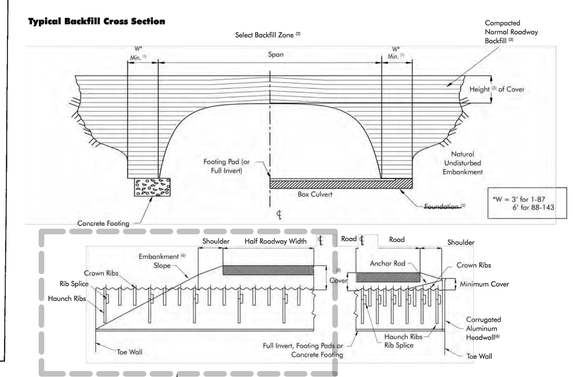


K CHAIN LINK FENCE DETAIL
NOT TO SCALE



16'-4" SPAN x 5'-11" RISE ALUMINUM BOX CULVERT DETAILS
NOT TO SCALE

THIS DETAIL IS FOR INFORMATIONAL PURPOSES ONLY. CULVERT MAY BE APPROVED EQUIVALENT. CONTRACTOR NOTE: MANUFACTURER TO PROVIDE CONTRACT DRAWINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION AND CONSTRUCTION.



PROPOSED END TREATMENT WITH FULL INVERT AND 1' EMBEDMENT BELOW DRAIN INVERT

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Client
RAND CONSTRUCTION

INTEGRITY COMPONENT & DESIGN
VAN BUREN TOWNSHIP, WAYNE COUNTY, MI
PRELIMINARY SITE PLAN
DETAILS

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no.: 19122-1
Scale:
Vertical:
Horizontal:

C7.0

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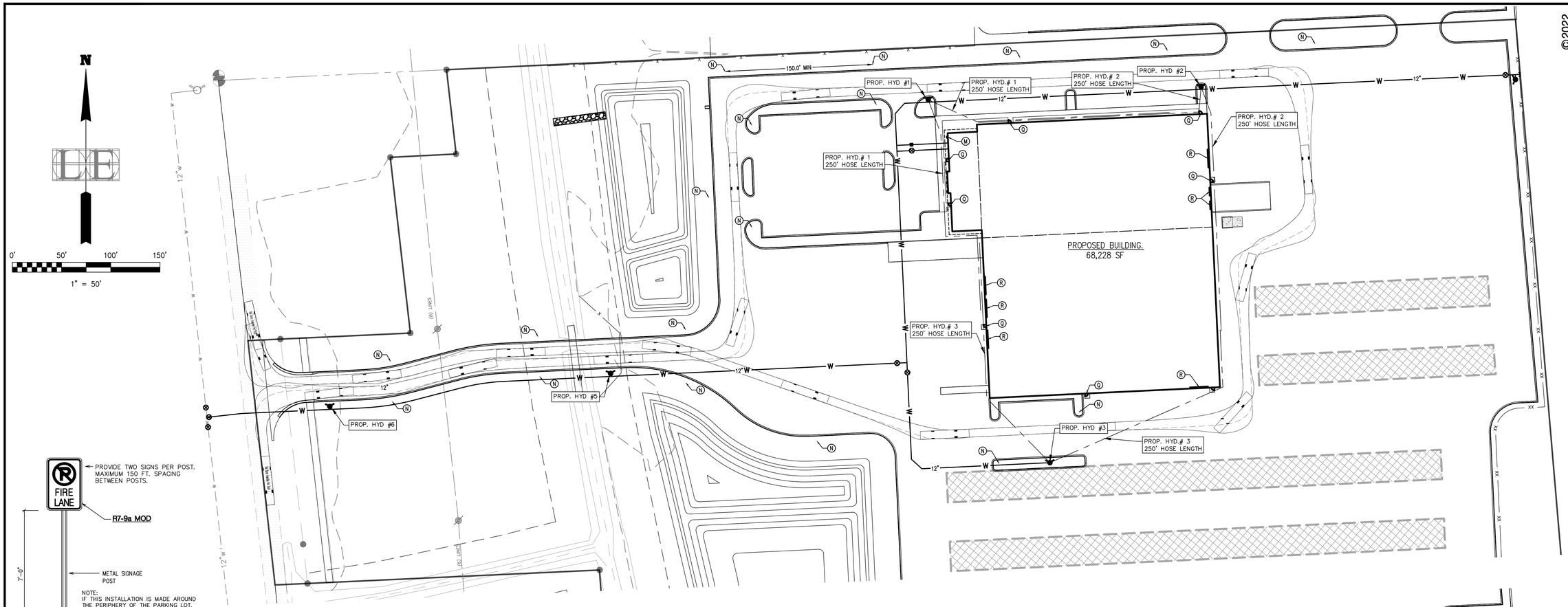
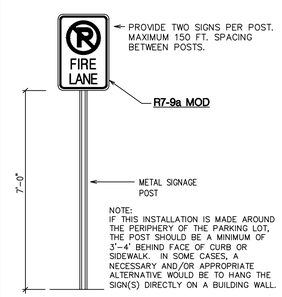


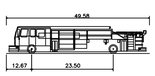
SITE LAYOUT & 250 FT FIRE HOSE LAY LINES

SCALE: 1" = 50'



FIRE LANE SIGN

N.T.S.



Overall Length	49.58 ft
Overall Width	8.33 ft
Overall Body Height	12.00 ft
Min Body Ground Clearance	2.33 ft
Track Width	8.33 ft
Lock-to-lock time	6 sec
Max Wheel Angle	45°

VAN-BUREN TOWNSHIP LADDER TRUCK

LEGEND

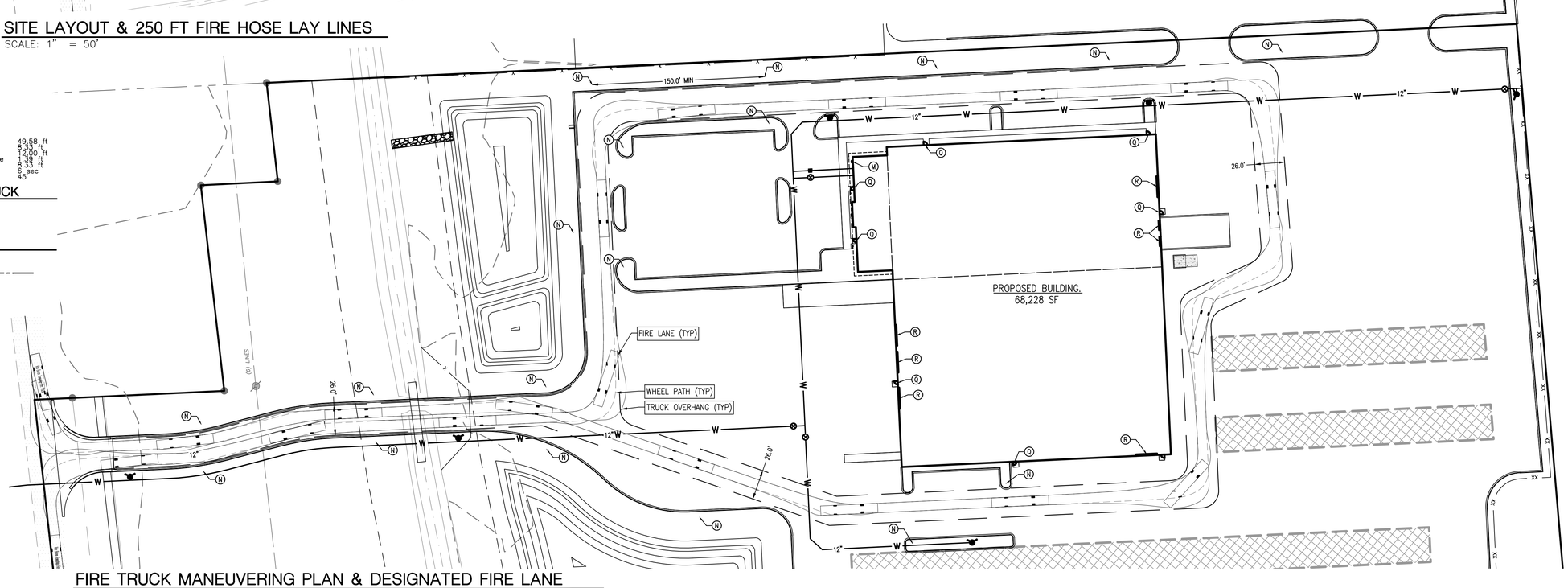
HOSE LAYING LENGTH

KEYED NOTES:

- (M) FIRE DEPARTMENT CONNECTION, AS DIRECTED BY VAN BUREN TWP FIRE DEPT.
- (N) PROPOSED "FIRE LANE, NO PARKING" SIGN, AS DIRECTED BY VAN BUREN TWP FIRE DEPT.
- (Q) EXTERIOR DOOR SEE ARCHITECTURAL PLANS
- (R) OVERHEAD DOOR SEE ARCHITECTURAL PLANS

FIRE MARSHAL NOTES

1. THE BUILDING SHALL BE PROVIDED WITH AN AUTOMATIC SPRINKLER SYSTEM IN ACCORDANCE WITH NFPA 13, STANDARD FOR THE INSTALLATION OF AUTOMATIC SPRINKLER SYSTEMS.
2. HYDRANTS SHALL BE TWO 4 INCH STORTZ CONNECTIONS NOT THREADED.
3. FIRE DEPARTMENT CONNECTIONS SHALL BE LOCATED AT THE NEAREST POINT OF FIRE DEPARTMENT APPARATUS ACCESSIBILITY OR AT A LOCATION APPROVED BY THE AUTHORITY HAVING JURISDICTION.
4. THE FDC CONNECTION SHALL BE A 4 INCH STORTZ FITTING WITH A 30-DEGREE DOWNTURN AS REQUIRED BY THE AHJ.
5. THE KNOX BOX SHALL BE AN ELOCK BOX OR APPROVED EQUAL.
6. EMERGENCY RESPONDER RADIO COVERAGE SYSTEM IS REQUIRED UNLESS IT CAN BE PROVEN AFTER THE BUILDING IS CONSTRUCTED AND CONSTRUCTED AND OCCUPIED, THAT COVERAGE IS SUFFICIENT. THIS WILL BE VERIFIED BY AHJ PRIOR TO FINAL C/O.



FIRE TRUCK MANEUVERING PLAN & DESIGNATED FIRE LANE

SCALE: 1" = 50'

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RAND CONSTRUCTION

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VAN BUREN TOWNSHIP, WAYNE COUNTY, MI
PRELIMINARY SITE PLAN
FIRE PROTECTION PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=50'

C8.0

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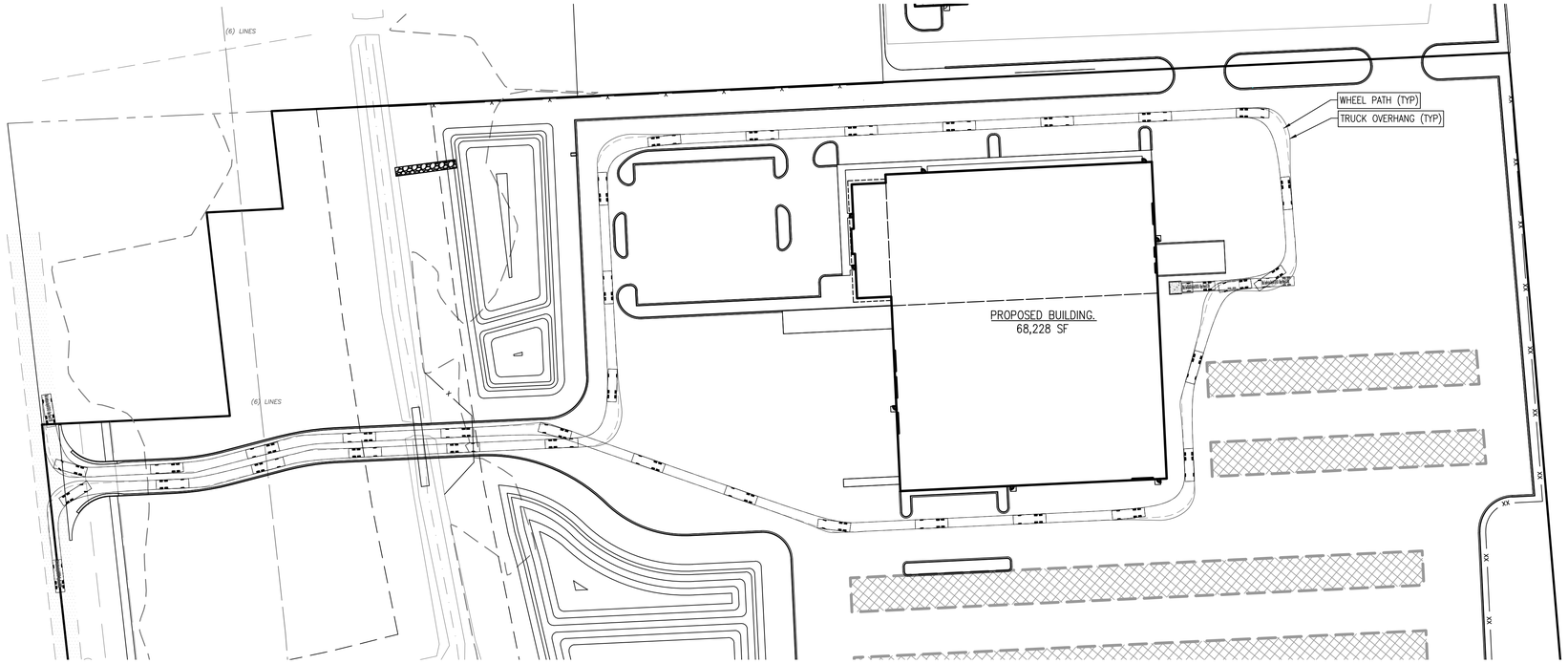
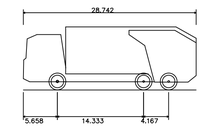


GARBAGE TRUCK MOVEMENT

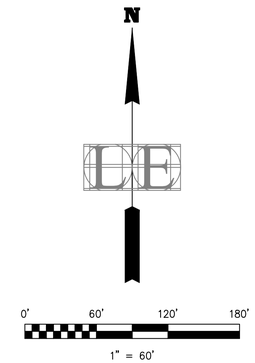
SCALE: 1" = 60'

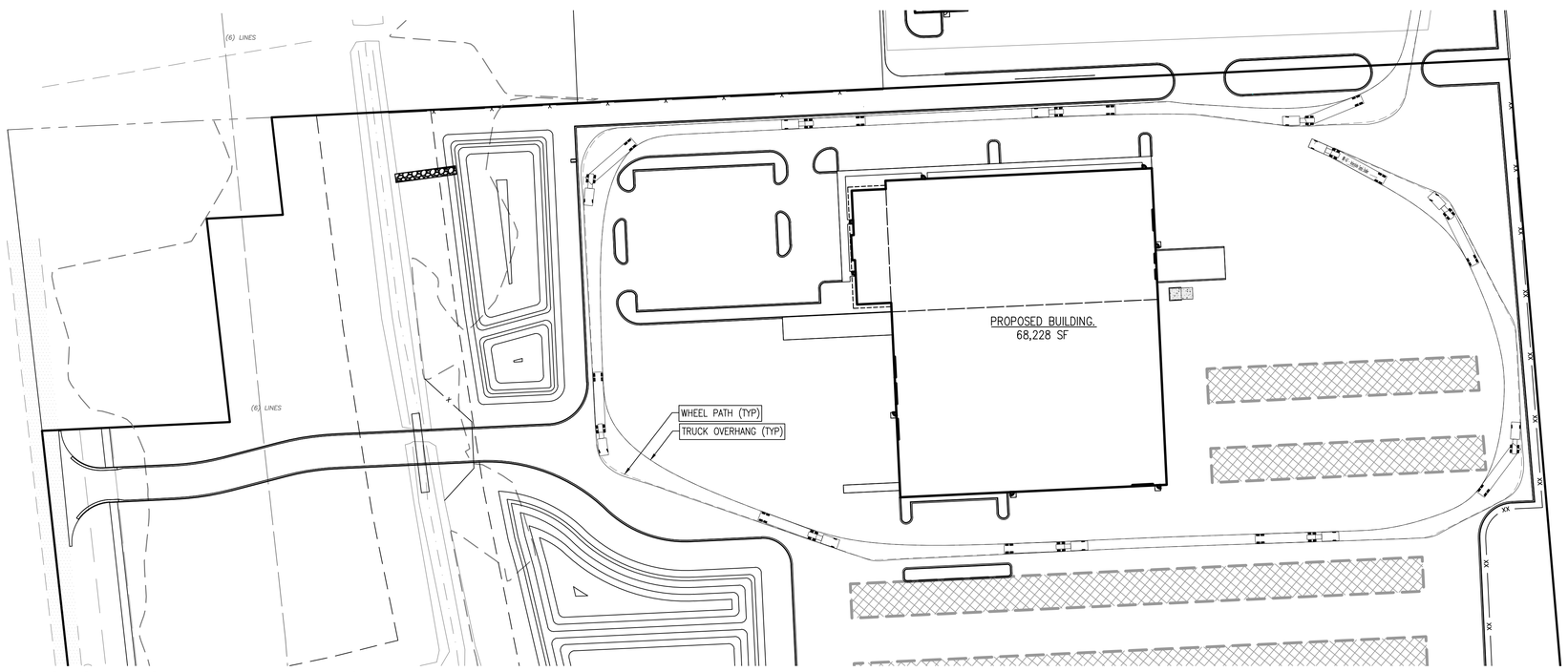


Mack TerraPro Low Entry 6x4 LEU 613 + Wayne Phoenix III 25Yd

Overall Length	28.742ft
Overall Width	8.000ft
Overall Body Height	10.481ft
Min Body Ground Clearance	1.311ft
Track Width	8.000ft
Lock-to-lock time	6.00s
Curb to Curb Turning Radius	34.000ft

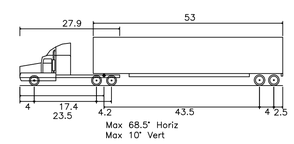
GARBAGE TRUCK PROFILE





TRUCK CIRCULATION AROUND BUILDING

SCALE: 1" = 60'



WB-67 – Interstate Semi-Trailer

Overall Length	73.501ft
Overall Width	8.500ft
Overall Body Height	13.500ft
Min Body Ground Clearance	1.334ft
Max Track Width	8.500ft
Lock-to-lock time	6.00s
Max Steering Angle (Virtual)	28.40°

WB-67 - INTERSTATE SEMI-TRAILER

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VAN BUREN TOWNSHIP, WAYNE COUNTY, MI

PRELIMINARY SITE PLAN

TRUCK MANUEVERING PLAN

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=60'

C8.1

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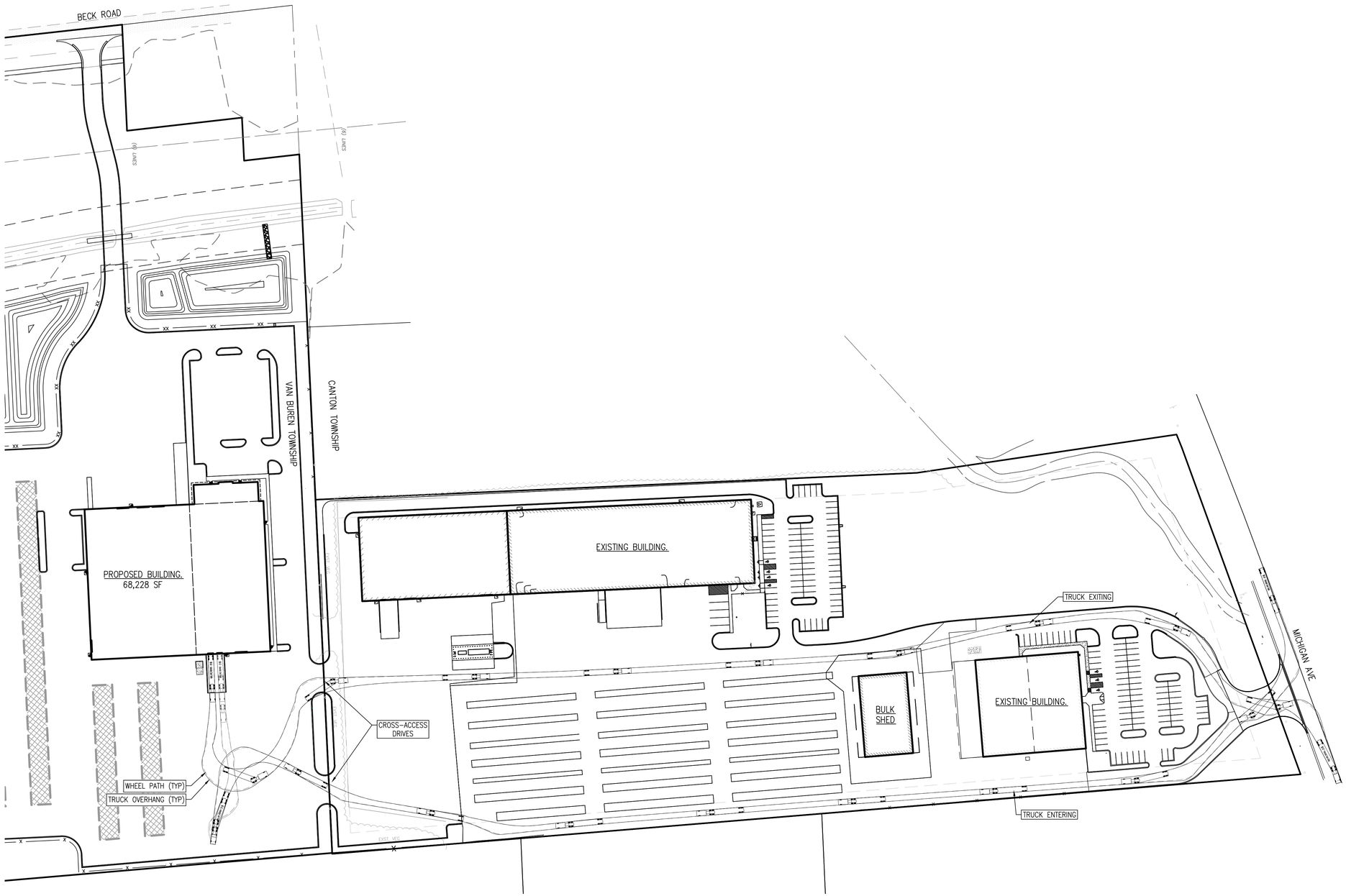
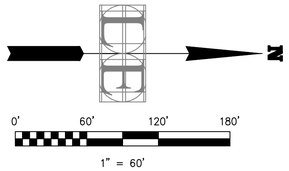
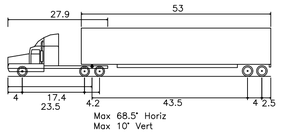


TRUCK ACCESS, TRUCK DOCK MANEUVERING AND EXIT

SCALE: 1" = 80'
NOTE:
ALL SEMI TRUCK ACCESS TO SITE SHALL BE VIA MICHIGAN AVENUE.





WB-67 - Interstate Semi-Trailer

Overall Length	73.501ft
Overall Width	8.500ft
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Max Steering Angle (Virtual)	28.40°

WB-67 - INTERSTATE SEMI-TRAILER

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VAN BUREN TOWNSHIP, WAYNE COUNTY, MI
PRELIMINARY SITE PLAN
TRUCK MANUEVERING PLAN CONT.

REVISIONS	DATE
PER TOWNSHIP REVIEW COMMENTS	10/13/2022

Drawn: MA/TJZ
Checked: TJZ
Approved: TJZ
Date: 07-01-2022

Job. no. 19122-1
Scale:
Vertical:
Horizontal: 1"=60'

C8.2

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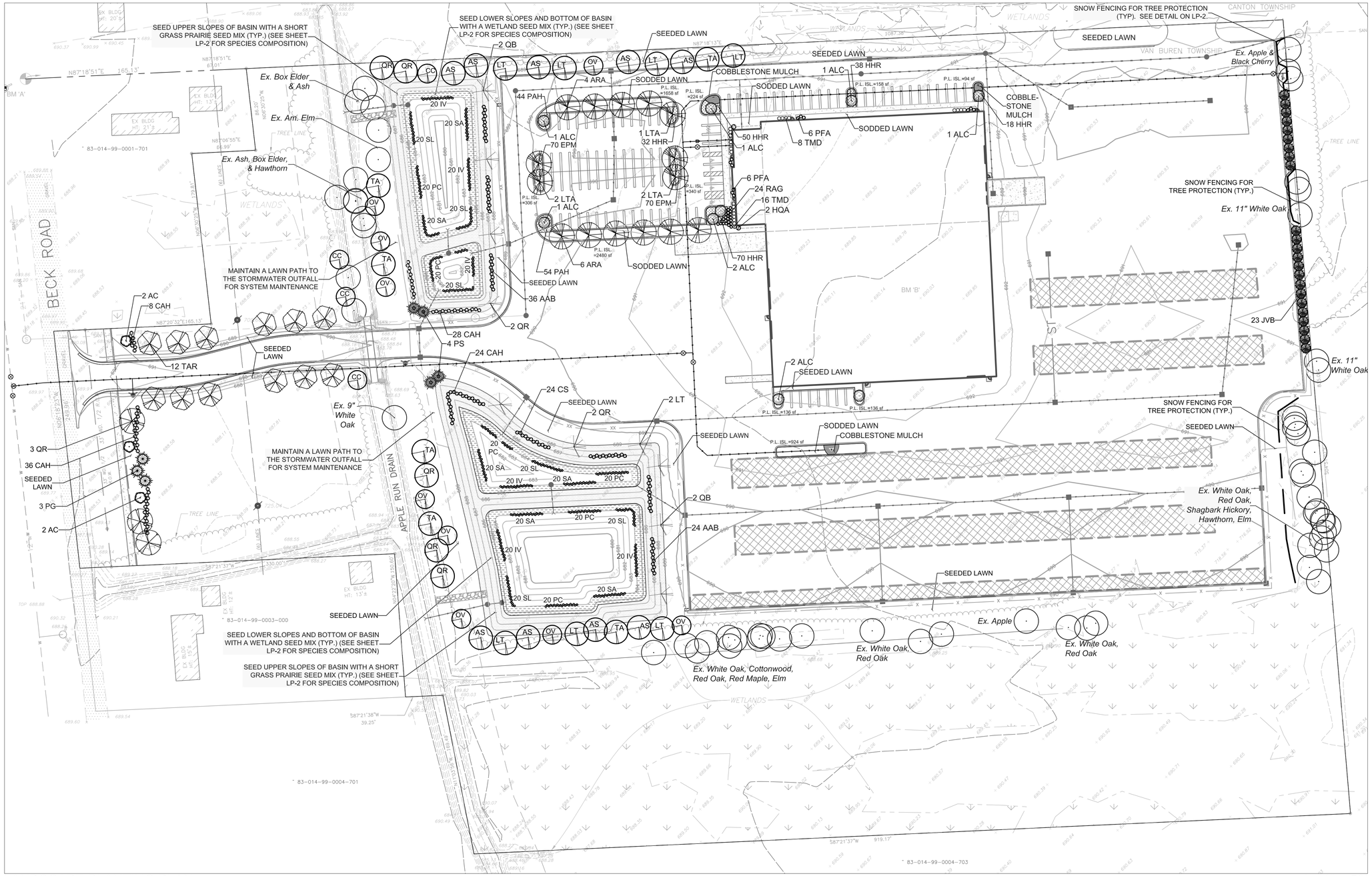


LANDSCAPE CALCULATIONS

FRONTAGE LANDSCAPING - Beck Road (220 l.f.)
* One (1) deciduous or evergreen tree / 40 l.f. = 5.5 = 6 trees
* One (1) ornamental tree / 100 l.f. = 2.20 trees = 3 trees
* Eight (8) shrubs / 40 l.f. = 44 shrubs

PARKING LOT LANDSCAPING (126,180 sq. ft. of parking area)
(Note: Square footage does not include outdoor storage area.)
* Interior landscaping shall account for a minimum of five percent of all paved parking areas
* 126,180 times .05 equals 6,309 sq. ft.
* Interior landscape area provided equals 6,456 sq. ft.
* One (1) deciduous tree shall be planted for each three hundred (300) sq. ft. or fraction thereof of interior landscaped area
* 6,309 divided by 300 = 21 trees
* Nursery stock trees provided equal 23 trees

OPEN SPACE LANDSCAPING (82,000 sq. ft.)
* One (1) deciduous or evergreen tree shall be planted per 3,000 sq. ft. of open area
* 82,000 divided by 3,000 equals 27 trees
* Nursery stock trees provided equal 11
* Existing trees to be counted as open space trees equal 16

STORMWATER BASIN LANDSCAPING
* The landscape treatment for the side slopes and bottom of the basin shall be planted with native plants consisting of a native seed mix and plugs
* Trees and shrubs shall be planted around the perimeter of the basin

REPLACEMENT TREES
* Forty (40) regulated trees to be removed with replacement required at a one to one ratio equals forty (40) replacement trees required

LEGEND

- PROPOSED FRONTAGE TREE
- PROPOSED PARKING LOT TREE
- PROPOSED OPEN SPACE TREE
- PROPOSED DETENTION POND TREE
- KEY — PROPOSED REPLACEMENT TREE
- PROPOSED ORNAMENTAL TREE
- PROPOSED DECIDUOUS SHRUB
- PROPOSED EVERGREEN SHRUB
- PROPOSED UPRIGHT EVERGREEN SHRUB
- PROPOSED PERENNIALS
- *Eisting Trees to be Preserved*

50' 0' 50' 100' 150' north
scale: 1" = 50'

NOTE:
* See Sheet LP-2 for landscape planting details, landscape development notes, parking lot island detail, tree protection detail, detention pond planting notes, and seed mix compositions.

date: June 27, 2022
revised:
09-20-2022 Revise for S.P. changes & Township review.

Know what's **below.** **Call** before you dig.

LANDSCAPE PLANTING PLAN scale: 1" = 50'

PLANT LIST

KEY	QTY.	BOTANICAL NAME	COMMON NAME	SIZE
FRONTAGE LANDSCAPING - Beck Road				
CAH	44	*Clethra alnifolia* 'Hummingbird'	Hummingbird Summersweet	36" ht., 5 gal. pot
AC	4	*Amelanchier canadensis*	Clump Serviceberry	2" cal. B&B
PG	3	*Picea glauca*	White Spruce	8' ht. B&B
QR	3	*Quercus rubra*	Red Oak	3" cal. B&B
INTERIOR PARKING LOT LANDSCAPING				
ALC	9	*Amelanchier laevis* 'Cumulus'	Cumulus Allegheny Serviceberry	8' - 10' ht. B&B
ARA	10	*Acer rubrum* 'Armstrong Gold'	Armstrong Gold Red Maple	3" cal. B&B
LTA	5	*Liriodendron tulipifera* 'Arnold'	Arnold Fastigiate Tuliptree	3" cal. B&B
EPM	140	*Echinacea purpurea* 'Magnus'	Magnus Purple Coneflower	1 gal. pot, 36" o.c.
HHR	208	*Hemerocallis sp.* 'Happy Returns'	Happy Returns Daylily	1 gal. pot, 36" o.c.
PAH	98	*Pennisetum alopecuroides* 'Hameln'	Hameln Fountain Grass	1 gal. pot, 36" o.c.
OPEN SPACE LANDSCAPING				
HQA	2	*Hydrangea quercifolia* 'Alice'	Alice Oakleaf Hydrangea	36" ht., 5 gal. pot
PFA	12	*Potentilla fruticosa* 'Abbottswood'	Abbottswood Shrub Cinquefoil	24" ht., 3 gal. pot
RAG	24	*Rhus aromatica* 'Gro-Low'	Gro-Low Fragrant Sumac	24" ht., 3 gal. pot
TAR	12	*Tilia americana* 'Redmond'	Redmond American Linden	3" cal. B&B
TMD	24	*Taxus* x *media* 'Densiformis'	Densiformis Yew	30" ht., B&B
STORMWATER BASIN LANDSCAPING				
AAB	60	*Aronia arbutifolia* 'Brilliantissima'	Brilliantissima Red Chokeberry	30" ht., 5 gal. pot
CAH	52	*Clethra alnifolia* 'Hummingbird'	Hummingbird Summersweet	30" ht., 5 gal. pot
CS	24	*Cornus sericea*	Red Twig Dogwood	30" ht., 5 gal. pot
LT	2	*Liriodendron tulipifera* 'Fastigiata'	Fastigiate Tuliptree	2-1/2" cal. B&B
QB	4	*Quercus bicolor*	Swamp White Oak	3" cal. B&B
QR	4	*Quercus rubra*	Red Oak	3" cal. B&B
Emergent Plantings				
IV	120	*Iris virginica*	Blue Flag Iris	Bare Root
PC	120	*Pontederia cordata*	Pickeral Weed	Bare Root
SA	120	*Scirpus acutus*	Hard-Stemmed Bulrush	Bare Root
SL	120	*Sagittaria latifolia*	Broad-Leaf Arrowhead	Bare Root
REPLACEMENT TREES				
AS	9	*Acer saccharum*	Sugar Maple	2-1/2" cal. B&B
CC	4	*Carpinus caroliniana*	American Hornbeam	2-1/2" cal. B&B
LT	7	*Liriodendron tulipifera* 'Fastigiata'	Fastigiate Tuliptree	2-1/2" cal. B&B
OV	9	*Ostrya virginiana*	American Hophornbeam	2-1/2" cal. B&B
QR	5	*Quercus rubra*	Red Oak	2-1/2" cal. B&B
TA	6	*Tilia americana* 'Redmond'	Redmond American Basswood	2-1/2" cal. B&B
PLANTING FOR A SCREEN ALONG THE EAST PROPERTY LINE				
JVB	23	*Juniperus virginiana* 'Burkii'	Burk Upright Juniper	5' ht. B&B

TREE SUMMARY

COLUMN 1:	Total:	24	Save:	9	Remove:	6	Remove*:	9
COLUMN 2:	Total:	25	Save:	7	Remove:	12	Remove*:	6
COLUMN 3:	Total:	25	Save:	6	Remove:	19	Remove*:	0
COLUMN 4:	Total:	25	Save:	19	Remove:	0	Remove*:	6
COLUMN 5:	Total:	25	Save:	2	Remove:	3	Remove*:	20
COLUMN 6:	Total:	20	Save:	20	Remove:	0	Remove*:	0
		144	Save:	63	Remove:	40	Remove*:	41

TOTALS

Save:	Trees to be saved:	63
Remove:	Trees to be removed with replacement required at a one to one ratio	40
Remove*:	Trees to be removed with replacement not required due to dead, very poor, or poor condition, undersize, or undesirable species	41
	Total Number of Existing Trees:	144
	Replacements required: Forty (40) trees removed at one to one replacement ratio	40

NOTE: Tree summary numbers from Civil Engineering Sheet 7: Tree Survey

LANDSCAPE PLAN FOR:
Livingston Engineering
3300 South Old U.S. 23
Brighton, Michigan 48114
(810) 225-7100

PROJECT LOCATION:
Integrity Components & Design
5925 Beck Road
Van Buren Twp., Michigan

STATE OF MICHIGAN J. BRIAN DEVLIN NO.1260 REGISTERED LANDSCAPE ARCHITECT

LANDSCAPE PLAN BY:
Nagy Devlin Land Design
31736 West Chicago Ave.
Livonia, Michigan 48150
(734) 634 9208

J. Brian Devlin
AUTOCAD SIGNATURE ORIGINAL IN BLUE

LP - 1: LANDSCAPE PLANTING PLAN

* Base data provided by Livingston Engineering.

LANDSCAPE PLANTING NOTES:

PLANTING

1. Installation of all plant material shall be in accordance with the latest edition of the *American Association of Nurserymen Standards for Nursery Stock* and with the specifications set forth by Van Buren Township, Michigan.
2. The plant materials shall conform to the type stated on the plant list. Sizes shall be the minimum stated on the plant list or larger. All measurements shall be in accordance with the latest edition of the *American Association of Nurserymen Standards for Nursery Stock.*
3. The plant material shall be nursery grown and inspected by the Owner's representative before planting. The Owner's representative reserves the right to reject any plant material at any time.
4. Plants designated "B&B" shall be balled and burlapped with firm balls of earth.
5. Dig shrub pits one foot (1') larger than the shrub rootball, tree pits three (3) times the width of the tree rootball and backfill with one (1) part topsoil and one (1) part soil from excavated pit. Plant trees and shrubs at the same grade level at which they were planted at the nursery. If wet, clay soils are evident, plant trees and shrubs slightly higher.
6. The Contractor is responsible for planting the materials at the correct grades and spacing. The plants shall be oriented to give the best appearance.
7. When the plant has been properly set, the pit shall be backfilled with the topsoil mixture, gradually filling, patting, and settling with water.
8. Trees in lawn areas to have a four foot (4') circle of mulch, four inches (4') deep, and three inches (3") away from the trunk. Shrub beds are to be mulched with shredded bark mulch to a minimum depth of three inches (3"). Perennial beds are to be mulched with shredded bark mulch to a minimum depth of two inches (2"). Only natural color, finely shredded hardwood bark mulch will be accepted.
9. Remove all twine, wire, and burlap from the top one third (1/3) of tree and shrub root balls and from tree trunks. Remove all non-biodegradable material such as plastic or nylon completely from branches and stems. All tree wrap, stakes, and guys are to be removed after one (1) winter season.
10. All plant materials shall be pruned and injuries repaired. The amount of pruning shall be limited to the removal of dead or injured limbs and to compensate for the loss of roots from transplanting. Cuts should be flush, leaving no stubs. Cuts over three quarters of an inch (3/4") shall be painted with tree paint. Shrubs along the site perimeter shall be allowed to grow together in a natural form.
11. Organic, friable topsoil shall be evenly distributed and fine graded over all areas to receive lawns at uniform depth of four inches (4") after settlement.
12. All lawn areas shall be sodded with a Grade A Kentucky Blue Grass blend over the topsoil.
13. All plantings shall be completed no later than November 30 in the fall season. The date of intended installation for landscape plant materials is approximately Fall, 2019.
14. Backfill directly behind all curbs and along sidewalks and compact to the top of curbs or walk to support vehicle and pedestrian weight without settling.
15. Conversion of all asphalt and gravel areas to landscape planting beds shall be done in the following manner: a. Remove all asphalt, gravel, and compacted earth to a depth of six inches to eighteen inches (6"-18") depending on the depth of the sub base and dispose of off site; b. Call the Township for an inspection prior to backfilling; c. Replace excavated material with good, medium-textured planting soil (loam or light yellow clay loam) to a minimum of two inches (2") above the top of the curb and sidewalk, add four inches to six inches (4"-6") of topsoil and crown to a minimum of six inches (6") above the adjacent curb and walk after earth settling, unless otherwise noted on the landscape plan.
   If conversion from asphalt to landscape occurs in or between an existing landscape area(s), replace excavated material from four inches to six inches (4"-6") below adjacent existing grade with good, medium-textured planting soil (loam or light yellow clay loam) and add four inches to six inches (4"-6") of topsoil to meet existing grades after earth settling.

MATERIALS

1. Required landscape material shall satisfy the criteria of the American Association of Nurserymen Standards for Nursery Stock and be: a.) Northern nursery grown; b.) State Department of Agriculture inspected; c.) No. 1 grade material with a straight, unscarred trunk, and well-developed uniform crown (park grade trees will not be accepted); d.) Staked, wrapped, watered, and mulched according to the details provided; and e.) Guaranteed for one (1) year.
2. Topsoil shall be friable, fertile soil of clayloam character containing at least five percent (5%) but not more than twenty percent (20%) by weight of organic matter with a pH range between 6.0 and 7.0. The topsoil shall be free from clay lumps, coarse sand, plant roots, sticks, and other foreign materials.
3. The seed mixture for the lawn areas in the street rights-of-way shall consist of a Kentucky Blue Grass blend and mulched with clean straw free of noxious weed seeds. Maintenance of the right-of-way lawn area shall consist of a regular cuttings as needed. Weed content of the seed mixture shall not exceed one percent (1%). The mix shall be applied at a rate of 200 pounds per acre.
4. Sod, if specified, shall be two (2) year old "Baron/Sheri/Adelphi" Kentucky Blue Grass blend grown in a sod nursery on loam soil.
5. Proposed perennials shall be full, well-rooted plants.
6. Cobblestone mulch shall consist of two inch to four inch (2" - 4") cobbles six inches (6") deep with geotextile fabric beneath.
7. Callery Pear (*Pyrus calleryana*) and Norway Maple (*Acer platanoides*) shall not be substituted for any tree species in the plant list. Contact the Landscape Architect for acceptable plant substitutions.

GENERAL

1. Do not plant deciduous or evergreen trees directly over utility lines or under overhead wires. Maintain a six foot (6') distance from the centerline of utilities and twenty feet (20') from the centerline of overhead wires for planting holes. Call MISS DIG forty-eight (48) hours prior to landscape construction for field location of utility lines.
2. The Contractor agrees to guarantee all plant material for a period of one (1) year. At that time, the Owner's representative reserves the right for a final inspection. Plant material with twenty-five percent (25%) die back, as determined by the Owner's representative shall be replaced. This guarantee includes the furnishing of new plants, labor, and materials. These new plants shall also be guaranteed for a period of one (1) year.
3. The work shall consist of providing all necessary materials, labor, equipment, tools, and supervision required for the completion as indicated on the drawings.
4. Landscape areas shall be irrigated by an automatic underground irrigation system. Lawns and shrub/landscape areas shall be watered by separate zones to minimize overwatering. Provide underground sleeving for irrigation lines to parking lot islands.
5. All written dimensions override scale dimensions on the plans.
6. All substitutions or deviations from the landscape plan must be approved by Van Buren Township prior to installation.
7. All bidders must inspect the site and report any discrepancies to the Owner's representative.
8. All specifications are subject to change due to existing conditions.
9. The Owner's representative reserves the right to approve all plant material.

MAINTENANCE

1. The Owner of the landscaping shall perpetually maintain such landscaping in good condition so as to present a healthy, neat, and orderly appearance, free from refuse and debris.
2. The Owner shall conduct a seasonal landscape maintenance program including regular lawn cutting (at least once per week during the growing season), pruning at appropriate times, watering, and snow removal during winter.
3. The Contractor is responsible for watering and maintenance of all seed areas until a minimum of ninety percent (90%) coverage, as determined by the Owner's representative.
4. All diseased and/or dead material shall be removed within sixty (60) days following notification and shall be replaced within the next appropriate planting season or within one (1) year, whichever comes first.
5. Any debris such as lawn clippings, fallen leaves, fallen limbs, and litter shall be removed from the site on a weekly basis at the appropriate season.
6. All planting beds shall be maintained by removing weeds, fertilizing, and replenishing mulch as needed.

DETENTION POND LANDSCAPE DEVELOPMENT NOTES:

PLANTING:

1. Follow the Supplier's recommended procedures for bed preparation, installation, and soil erosion control measures of the proposed seeded areas. After the plants germinate and begin to grow follow the maintenance guidelines included on this sheet.
2. Rototill four inches (4") of compost or topsoil into the top six inches (6") of the surface of the basin. (Compost may be obtained from the municipal facility at Six Mile and Ridge Roads. Call Onyx Environmental at 248 305-8377 or 248 349-7230 for hours of operation and general information.)
3. Provide a cover crop of annual rye at a rate of ten pounds (10#) per acre and seed oats at a rate of thirty pounds (30#) per acre over the entire area to be seeded.

MAINTENANCE OF THE DETENTION AREA

1. ESTABLISHMENT: During the first growing season, the native seed areas should be mowed two (2) to four (4) times to a height of four inches to six inches (4"-6") when the plants reach a height of ten inches to twelve inches (10"-12"). Hand pulling may be needed to control unwanted weed populations. If a mower cannot be set high enough, a string trimmer can be used. During the second growing season, the native seed areas should be mowed a few times to a height of about eight inches (8"), when the plants reach a height of ten inches to eighteen inches (10"-18"). Hand pulling may be needed to control unwanted weed populations. By the second growing season it should be apparent if some areas need reseeding. Long term management includes mowing and hand pulling of weeds. The native planting may be mowed to a short height and the clippings removed in the early Spring before birds begin nesting.
2. WATERING: Watering should be performed as needed. During the establishment period after the initial planting, watering is very important and should be conducted every two to three (2-3) days. The initial planting should be checked regularly for appropriate moisture availability. Two (2) methods for determining adequate moisture levels include the following: a.) if the plants wilt during the day when the temperature is at its highest, but revive during the night, then watering is not necessary, and b.) by testing the soil moisture at a depth of four inches (4") by inserting a small rod into the soil. If the rod is wet, then the soil is moist at a depth of four inches (4") and watering is not necessary.
3. EROSION CONTROL: Provide an erosion control blanket on the side slopes of the seeded areas detention area. The erosion control blanket shall be pegged in place.
4. EDGING: The edge of the detention area should be maintained to avoid grass growing into the detention area. The edge can be maintained with a V-notch cut edge. The channel should be maintained at four inches (4") or greater and renewed every six to eight (6-8) weeks.
5. CUTTING BACK: Tall wildflowers should be cut back by one-third. Early flowering plants can be cut back in late June or early July and late flowering plants in late October.
6. THINNING: After the detention area has become established and thriving, it may be necessary to thin perennials by dividing individual plants in Spring or Fall.
7. REPLACEMENT: Any plants that die or become diseased should be replaced. Plant health should be checked regularly with replanted material occurring in the Spring or Fall.
8. REMOVAL OF LITTER AND DEBRIS: Litter, trash, and debris should be removed on a regular basis to insure that inlets remain free flowing and to keep the area in a neat and attractive appearance.
9. INORGANIC APPLICATIONS: In general, detention areas do not need fertilization as nutrients from surrounding areas is usually at an elevated level. If soil fertility appears to be an issue, the soil should be tested and appropriate actions taken based on the results. Insecticides, herbicides, fungicides, and rodenticides should not be used in the detention area. If a plant is diseased or infested with insects, it should simply be removed and replaced.

SEED MIX COMPOSITIONS

WETLAND SEED MIX

MICHIGAN WILDFLOWER FARM

A composition of wildflowers, sedges, and grasses.
Application rate: 3 oz. per 1000 sq. ft. or
7 lbs. per acre

BOTANICAL NAME	COMMON NAME
Wildflowers	
Asclepias incarnata	Swamp Milkweed
Aster novae-anglae	New England Aster
Aster puniceus	Swamp Aster
Aster umbellatus	Flat-Top Aster
Eupatorium maculatum	Joe-Pye Weed
Eupatorium perfoliatum	Boneset
Euthamia graminifolia	Grassleaved Goldenrod
Liatris spicata	Marsh Blazing Star
Pedicularis lanceolata	Swamp Betony
Rudbeckia subtomentosa	Black-Eyed Susan
Silphium serfoliatum	Cupplant
Silphium terebinthinaceum	Prairie Dock
Solidago patula	Swamp Goldenrod
Solidago riddellii	Ridell's Goldenrod
Verbena hastata	Blue Vervain
Vernonia missurica	Ironweed
Veronicastrum virginicum	Culver's Root
Sedges/Grasses	
Andropogon scoparius	Little Bluestem
Carex crinita	Fringed Sedge
Carex stricta	Tussock Sedge
Scirpus cyperinus	Wool Grass

WETLAND SEED MIX

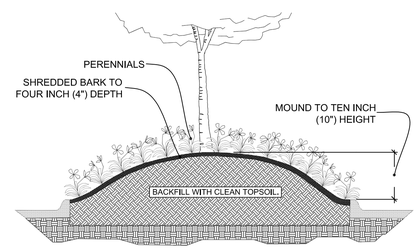
CUSTOM SHORT GRASS SEED MIX

Fifty percent (50%) Forbs/Fifty percent (50%) Grass.
Application rate: 5 oz. per 1000 sq. ft.
or 10 lbs. per acre

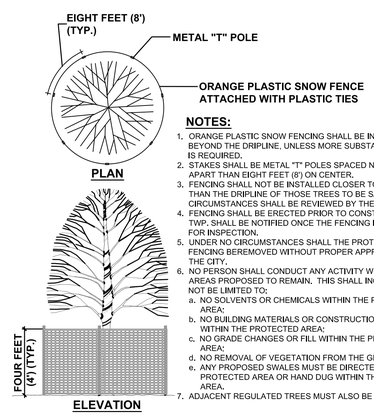
BOTANICAL NAME	COMMON NAME
Wildflowers	
Achillea millefolium	Yarrow
Aquilegia canadensis	Wild Columbine
Asclepias tuberosa	Butterflyweed
Aster laevis	Smooth Aster
Coreopsis lanceolata	Sand Tickseed
Echinacea purpurea	Purple Coneflower
Kuhnia eupatoroides	False Boneset
Monarda fistulosa	Bergamot
Penstemon digitalis	Fokglove Beardstongue
Rudbeckia hirta	Black-Eyed Susan
Solidago speciosa	Showy Goldenrod
Sedges/Grasses	
Schzachyrium scoparius	Little Bluestem
Bouteloua curtipendula	Side Oats Grama
Koeleria pyramidata	June Grass*
Sporobolus heterolepsis	Prairie Dropseed*

* Supplier to add these species to the mix.

MICHIGAN WILDFLOWER FARM
11770 Cutler Road
Portland, Michigan 48875-9452
Phone: (517) 647 6010
Fax: (517) 647 6072



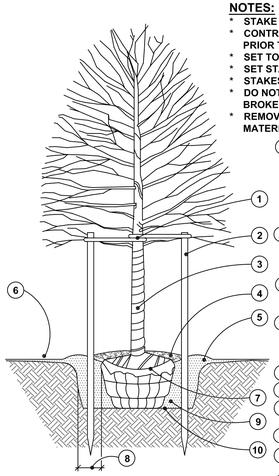
PARKING LOT ISLAND DETAIL not to scale



NOTES:

1. ORANGE PLASTIC SNOW FENCING SHALL BE INSTALLED AT OR BEYOND THE DRIPLINE, UNLESS MORE SUBSTANTIAL FENCING IS REQUIRED.
2. STAKES SHALL BE METAL "T" POLES SPACED NO FURTHER APART THAN EIGHT FEET (8') ON CENTER.
3. FENCING SHALL NOT BE INSTALLED CLOSER TO THE TREE THAN THE DRIPLINE OF THOSE TREES TO BE SAVED. SPECIAL CIRCUMSTANCES SHALL BE REVIEWED BY THE CITY.
4. FENCING SHALL BE ERECTED PRIOR TO CONSTRUCTION. THE TWP. SHALL BE NOTIFIED ONCE THE FENCING IS INSTALLED FOR INSPECTION.
5. UNDER NO CIRCUMSTANCES SHALL THE PROTECTIVE FENCING BEREMOVED WITHOUT PROPER APPROVAL FROM THE CITY.
6. NO PERSON SHALL CONDUCT ANY ACTIVITY WITHIN THE AREAS PROPOSED TO REMAIN. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO:
   a. NO SOLVENTS OR CHEMICALS WITHIN THE PROTECTED AREA;
   b. NO BUILDING MATERIALS OR CONSTRUCTION EQUIPMENT WITHIN THE PROTECTED AREA;
   c. NO GRADE CHANGES OR FILL WITHIN THE PROTECTED AREA;
   d. NO REMOVAL OF VEGETATION FROM THE GROUND UP;
   e. ANY PROPOSED SWALES MUST BE DIRECTED AROUND THE PROTECTED AREA OR HAND DUG WITHIN THE PROTECTED AREA.
7. ADJACENT REGULATED TREES MUST ALSO BE PROTECTED.

TREE PROTECTION DETAIL not to scale

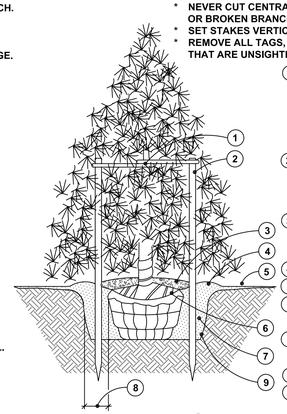


NOTES:

* STAKE TREES UNDER FOUR INCH (4") CALIPER.
* CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION.
* SET TOP OF BALL THREE INCHES (3") ABOVE FINISH GRADE.
* SET STAKES VERTICAL & EVENLY SPACED.
* STAKES OR GUYS TO BE SECURED ABOVE THE FIRST BRANCH.
* DO NOT PRUNE TERMINAL LEADER. PRUNE ONLY DEAD OR BROKEN BRANCHES.
* REMOVE ALL TAGS, STRING, PLASTICS, AND OTHER MATERIALS THAT ARE UNSIGHTLY OR COULD CAUSE DAMAGE.

1. STAKE TREE JUST BELOW FIRST BRANCH USING TWO INCH TO THREE INCH (2"-3") WIDE BELT-LIKE MATERIAL OF NYLON, PLASTIC, OR OTHER ACCEPTABLE MATERIAL. (NO WIRE OR HOSE TO BE USED TO GUY TREES.) THREE (3) GUYS EVENLY SPACED PER TREE. REMOVE AFTER ONE (1) WINTER SEASON.
2. 2 x 2 HARDWOOD STAKES. POSITION SIX INCHES TO EIGHT INCHES (6"-8") OUTSIDE OF ROOTBALL AND EXTEND EIGHTEEN INCHES (18") BELOW TREE PIT INTO UNDISTURBED SOIL.
3. APPLY TREE WRAP AND SECURE WITH A BIODEGRADABLE MATERIAL AT TOP AND BOTTOM. REMOVE AFTER ONE (1) WINTER.
4. SHREDDED BARK MULCH OF A NATURAL COLOR AT FOUR INCH (4") MINIMUM DEPTH. LEAVE A THREE INCH (3") CIRCLE OF BARE SOIL AT THE BASE OF THE TREE.
5. MOUND TO FORM TREE SAUCER.
6. FINISH GRADE SLOPED AWAY FROM TREE.
7. CUT AND REMOVE WIRE, BURLAP, AND BINDINGS FROM THE TOP ONE-THIRD (1/3) OF THE ROOTBALL.
8. WIDTH OF ROOTBALL ON EACH SIDE.
9. PLANTING MIX SHALL BE AMMENDED PER SITE CONDITIONS AND PLANT REQUIREMENTS.
10. SCARIFY BOTTOM AND SIDES OF PLANTING PIT TO FOUR INCH (4") DEPTH.

DECIDUOUS TREE



NOTES:

* STAKE ALL EVERGREEN TREES UNDER TWELVE FEET (12') HIGH. GUY ALL EVERGREEN TREES TWELVE FEET (12') HIGH AND OVER.
* CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION.
* NEVER CUT CENTRAL LEADER. PRUNE ONLY TO REMOVE DEAD OR BROKEN BRANCHES.
* SET STAKES VERTICAL AND EVENLY SPACED.
* REMOVE ALL TAGS, STRING, PLASTICS, AND OTHER MATERIALS THAT ARE UNSIGHTLY OR COULD CAUSE GIRDLING.

1. STAKE TREE AS INDICATED USING TWO INCH TO THREE INCH (2"-3") WIDE BELT-LIKE MATERIAL OF NYLON, PLASTIC, OR OTHER ACCEPTABLE MATERIAL. (NO WIRE OR HOSE TO BE USED TO GUY TREES.) THREE (3) GUYS EVENLY SPACED PER TREE. REMOVE AFTER ONE (1) WINTER SEASON.
2. 2 x 2 HARDWOOD STAKES. POSITION SIX INCHES TO EIGHT INCHES (6"-8") OUTSIDE OF ROOTBALL AND EXTEND EIGHTEEN INCHES (18") BELOW TREE PIT INTO UNDISTURBED SOIL.
3. SHREDDED BARK MULCH OF A NATURAL COLOR AT FOUR INCH (4") MINIMUM DEPTH. LEAVE A THREE INCH (3") CIRCLE OF BARE SOIL AT THE BASE OF THE TREE.
4. MOUND TO FORM TREE SAUCER.
5. FINISH GRADE SLOPED AWAY FROM TREE.
6. CUT AND REMOVE WIRE, BURLAP, AND BINDINGS FROM THE TOP ONE-THIRD (1/3) OF THE ROOTBALL.
7. PLANTING MIX SHALL BE AMMENDED PER SITE CONDITIONS AND PLANT REQUIREMENTS.
8. WIDTH OF ROOTBALL ON EACH SIDE.
9. SCARIFY BOTTOM AND SIDES OF PLANTING PIT TO FOUR INCH (4") DEPTH.

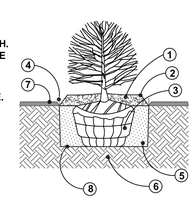
EVERGREEN TREE

GENERAL NOTES FOR ALL PLANTINGS:

* DO NOT CUT CENTRAL LEADER.
* REMOVE ALL TAGS, STRINGS,PLASTICS, AND ANY OTHER NON-BIODEGRADABLE MATERIALS (EXCEPT LABEL FOR PLANT NAME) FROM PLANT STEMS OR CROWN WHICH ARE UNSIGHTLY OR COULD CAUSE GIRDLING.
* PLANTS SHALL BEAR THE SAME RELATION TO FINISH GRADE AS IT BORE TO THE PREVIOUS GRADE IN THE NURSERY. SET THE BASE OF THE PLANT SLIGHTLY HIGHER THAN EXISTING GRADE IF PLANTING IN CLAY SOILS.
* CENTER THE ROOTBALL IN THE PLANTING HOLE. LEAVE THE BOTTOM OF THE PLANTING HOLE FIRM. USE WATER TO SETTLE THE PLANTING MIX AND REMOVE ANY AIR POCKETS AND FIRMLY SET THE TREE OR SHRUB. GENTLY TAMP IF NEEDED.

NOTE:

* CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION.

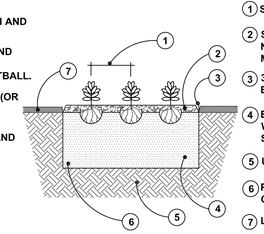


1. SHREDDED BARK MULCH AT FOUR INCH (4") MINIMUM DEPTH. MULCH SHALL BE NATURAL IN COLOR.
2. FORM A SAUCER WITH MULCH AND SOIL AROUND SHRUB BED.
3. CUT AND REMOVE BURLAP AND BINDINGS FROM THE TOP ONE-THIRD (1/3) OF THE ROOTBALL.
4. 3/16" x 4" ALUMINUM EDGING (OR APPROVED EQUIVALENT) OR SPADED EDGE.
5. EXCAVATE PLANTING HOLE AND BACKFILL WITH PREPARED PLANTING MIX.
6. UNDISTURBED SUBGRADE.
7. LAWN.
8. SCARIFY SUBGRADE.

SHRUB

NOTE:

* CONTRACTOR TO VERIFY PERCOLATION OF PLANTING PIT PRIOR TO INSTALLATION.
* PERENNIALS TO BE PLANTED UP TO THE EDGE OF THE SAUCER AROUND A TREE OR SHRUB BED.



1. SEE PLANT LIST FOR SPACING DISTANCE.
2. SHREDDED HARDWOOD BARK OF A NATURAL COLOR MULCH AT FOUR INCH (4") MINIMUM DEPTH.
3. 3/16" x 4" ALUMINUM EDGING (OR APPROVED EQUIVALENT) OR SPADED EDGE.
4. EXCAVATE PLANTING BED AND BACKFILL WITH PREPARED PLANTING MIX AT A SIX INCH (6") DEPTH.
5. UNDISTURBED SUBGRADE.
6. PLANTING MIX TO CONSIST OF EQUAL PARTS OF SAND, LEAF COMPOST, AND NATIVE SOIL.
7. LAWN.

ANNUAL / PERENNIAL / GROUNDCOVER

PLANTING DETAILS not to scale

NOTE:

* See Sheet LP-1 for landscape planting plan, plant list, summary of landscape requirements, and existing tree summary chart.

date: June 27, 2022
revised:
09-20-2022 Revise for S.P. changes & Township review.

Know what's **below.** **Call** before you dig.

LANDSCAPE PLAN FOR:
Livingston Engineering
3300 South Old U.S. 23
Brighton, Michigan 48114
(810) 225-7100

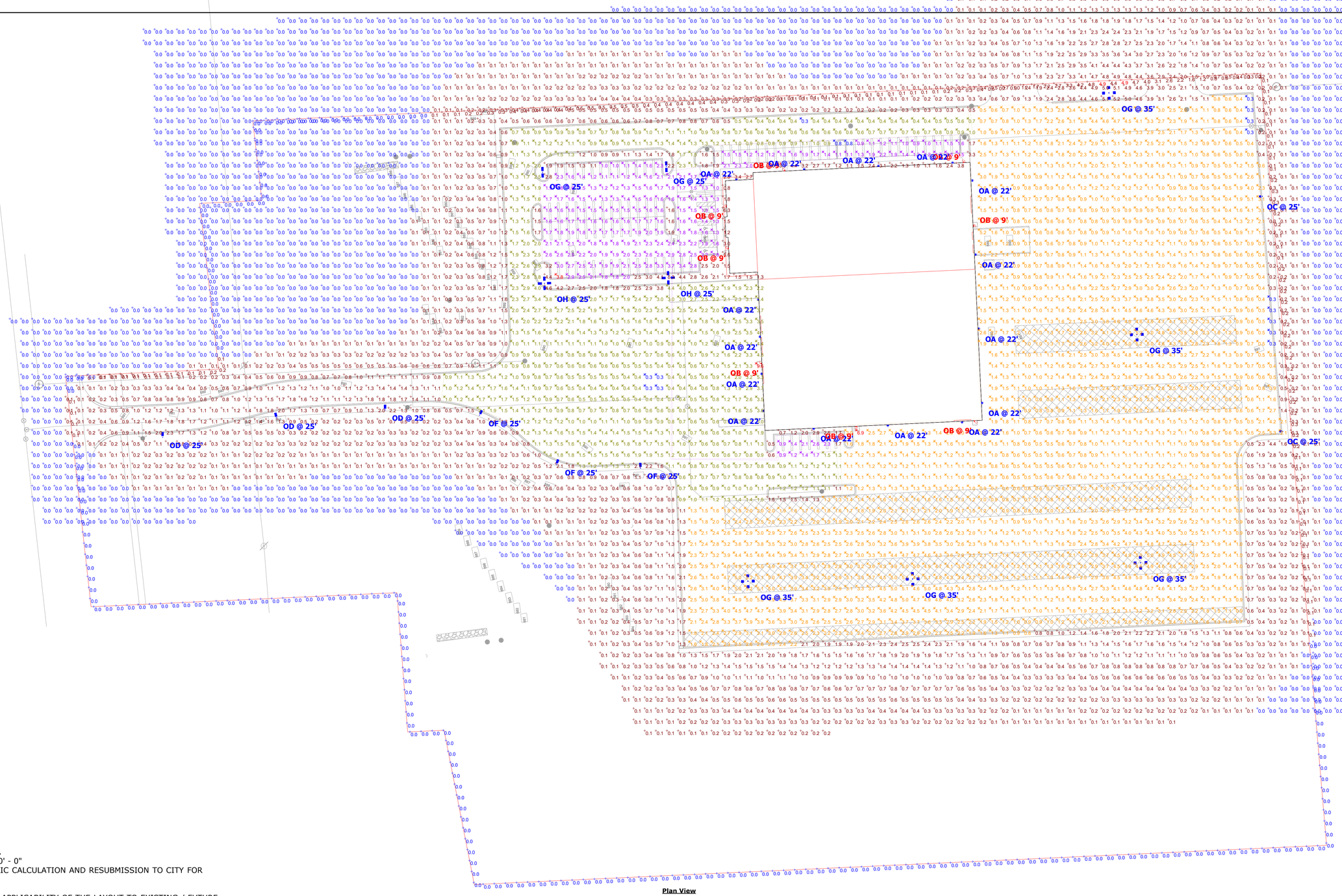
PROJECT LOCATION:
Integrity Components & Design
5925 Beck Road
Van Buren Twp., Michigan

LANDSCAPE PLAN BY:
Nagy Devlin Land Design
31736 West Chicago Ave.
Livonia, Michigan 48150
(734) 634 9208

STATE OF MICHIGAN J. BRIAN DEVLIN NO.1260 REGISTERED LANDSCAPE ARCHITECT

AUTOCAD SIGNATURE ORIGINAL IN BLUE

LP - 2: LANDSCAPE NOTES & DETAILS



Plan View
Scale - 1" = 50ft

General Note

1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0"
3. LIGHTING ALTERNATES REQUIRE NEW PHOTOMETRIC CALCULATION AND RESUBMISSION TO CITY FOR APPROVAL.

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.

FOR ORDERING INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

Statistics

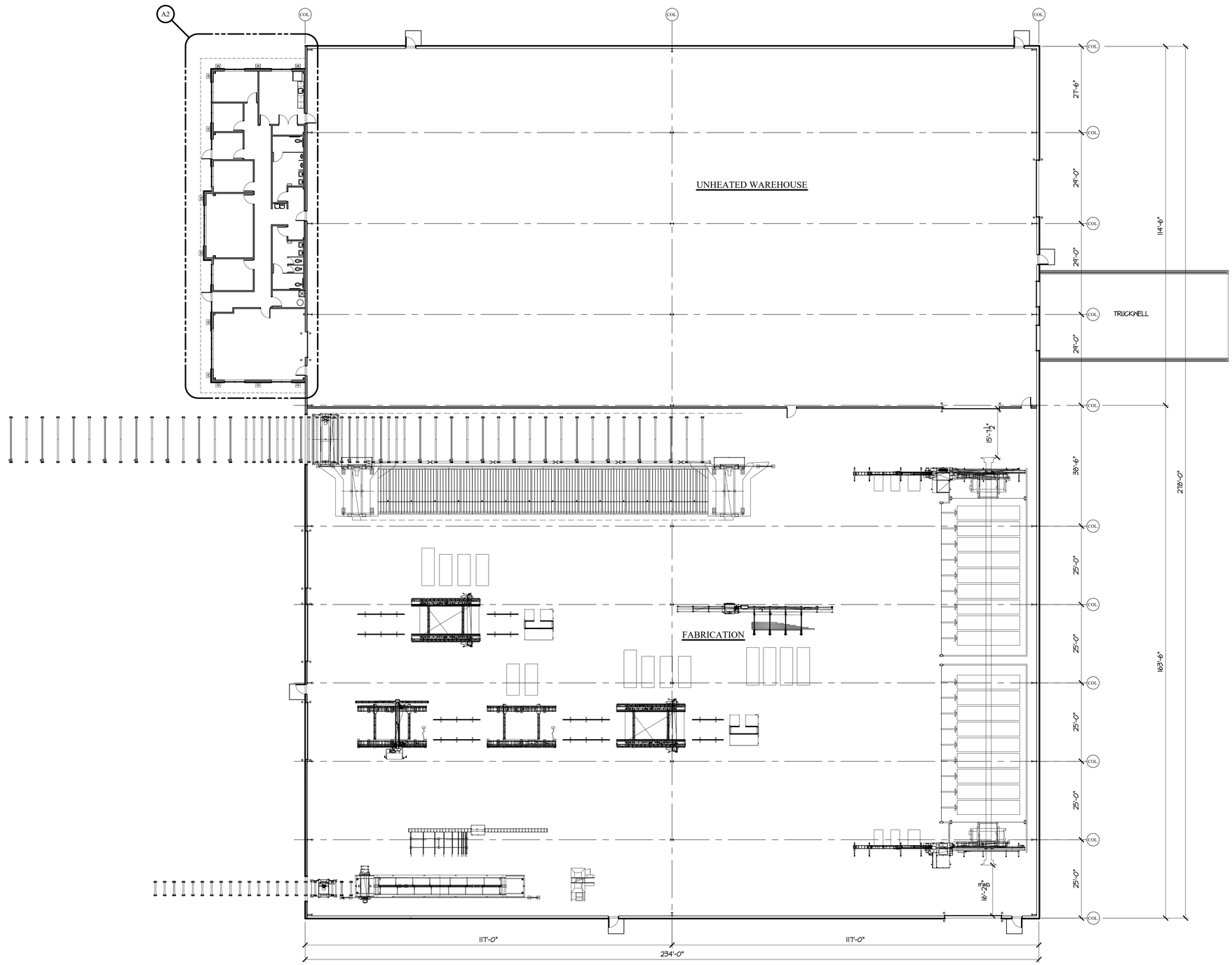
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max
overall	+	1.0 fc	9.6 fc	0.0 fc	N/A	N/A	0.1:1
PARKING	✳	1.8 fc	3.8 fc	0.8 fc	4.8:1	2.3:1	0.5:1
PROPERTY LINE	+	0.2 fc	4.9 fc	0.0 fc	N/A	N/A	0.0:1
SITE CIRCULATION	✳	1.3 fc	9.6 fc	0.3 fc	32.0:1	4.3:1	0.1:1
STORAGE AREA	✳	2.0 fc	6.9 fc	0.3 fc	23.0:1	6.7:1	0.3:1

Schedule

Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Lumens Per Lamp	Light Loss Factor	Wattage
	OA	15	Lithonia Lighting	WDGE3 LED P1 70CRI RFT 40K	WDGE3 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 70CRI, FORWARD THROW OPTIC	7592	0.9	51.1717
	OB	8	Lithonia Lighting	WDGE1 LED P1 40K 80CRI VW	WDGE1 LED WITH P1 - PERFORMANCE PACKAGE, 4000K, 80CRI, VISUAL COMFORT WIDE OPTIC	1229	0.9	10.0002
	OD	3	Lithonia Lighting	DSX0 LED P5 40K T3M MVOLT	DSX0 LED P5 40K T3M MVOLT	11346	0.9	89
	OF	3	Lithonia Lighting	DSX0 LED P5 40K TFTM MVOLT	DSX0 LED P5 40K TFTM MVOLT	11680	0.9	89
	OG	2	Lithonia Lighting	DSX0 LED P5 40K T5W MVOLT	DSX0 LED P5 40K T5W MVOLT	12047	0.9	178
	OG	5	Lithonia Lighting	RSX2 LED P6 40K R5	RSX Area Fixture Size 2 P6 Lumen Package 4000K CCT Type R5 Distribution	31073	0.9	986.52
	OH	2	Lithonia Lighting	DSX0 LED P5 40K T5W MVOLT	DSX0 LED P5 40K T5W MVOLT	12047	0.9	356
	OC	2	Lithonia Lighting	RSX2 LED P1 40K R2 HS	RSX LED Area Luminaire Size 2 P1 Lumen Package 4000K CCT Type R2 Distribution with HS shield	8340	0.9	72.06

INTEGRITY COMPONENT AND DESIGN
PHOTOMETRIC SITE PLAN
GASSER BUSH ASSOCIATES
WWW.GASSERBUSH.COM

Designer
DB
Date
10/14/2022
Scale
Not to Scale
Drawing No.
#20-56175-V4
1 of 1



NORTH

FLOOR PLAN

SCALE: 1/16" = 1'-0"
65,355 S.F.

P+V A

PUCCI + VOLLMAR ARCHITECTS, PC
ARCHITECTURE + DESIGN + PLANNING
508 E. GRAND RIVER AVE., SUITE 100B, BRIGHTON, MI 48116-1566
PHONE (810) 225-5930 www.pv-architects.com

FOR:
RAND CONSTRUCTION
1270 RICKETT ROAD
BRIGHTON, MI 48116
PHONE: 810-227-7011

STATE OF MICHIGAN
KARL VOLLMAR
No. 1039372
LICENSED ARCHITECT

PROJECT
INTEGRITY COMPONENT & DESIGN
5425 BECK ROAD
INTEGRITY VAN BUREN TWP., MICHIGAN

SHEET TITLE
FLOOR PLAN

DATE:	ISSUED FOR:
10-13-2022	RESPONSE TO SUBMITTAL PACKAGE #3 REVIEW
11-14-2021	FOR OWNER REVIEW
11-1-2021	RAND REVIEW
10-8-2021	RAND REVIEW

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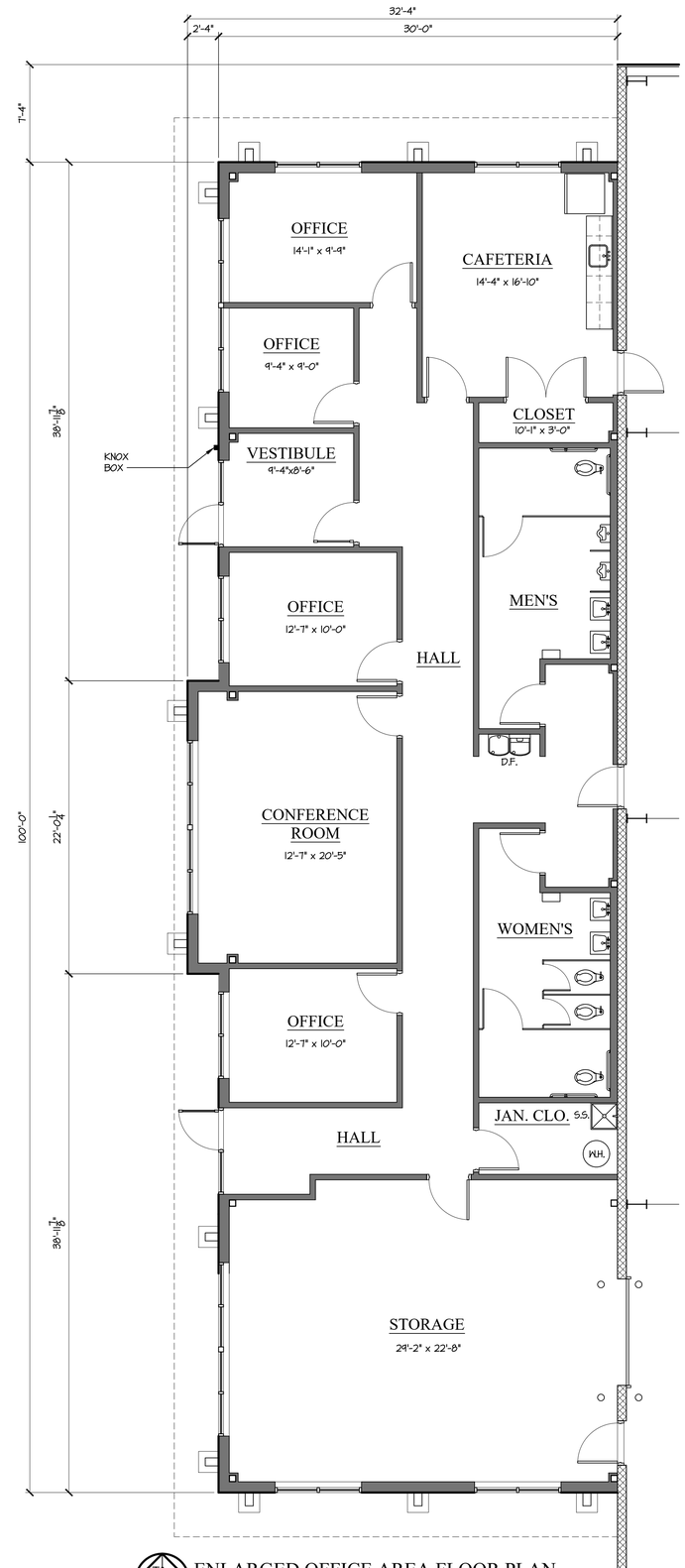
APPROVED BY: KV

PROJECT: 2136

SHEET:
A1



NORTH

ENLARGED OFFICE AREA FLOOR PLAN

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

P+V A

PUCCI + VOLLMAR ARCHITECTS, PC

ARCHITECTURE + DESIGN + PLANNING

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STATE OF MICHIGAN
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No. 1039372

PROJECT

INTEGRITY COMPONENT & DESIGN
5425 BECK ROAD
INTEGRITY VAN BUREN TWP., MICHIGAN

SHEET TITLE

ENLARGED OFFICE AREA PLAN

DATE	
10-13-2022	RESPONSE TO SUBMITTAL PACKAGE #3 REVIEW
11-14-2021	FOR OWNER REVIEW
11-11-2021	RAND REVIEW
10-5-2021	RAND REVIEW
DATE:	ISSUED FOR:

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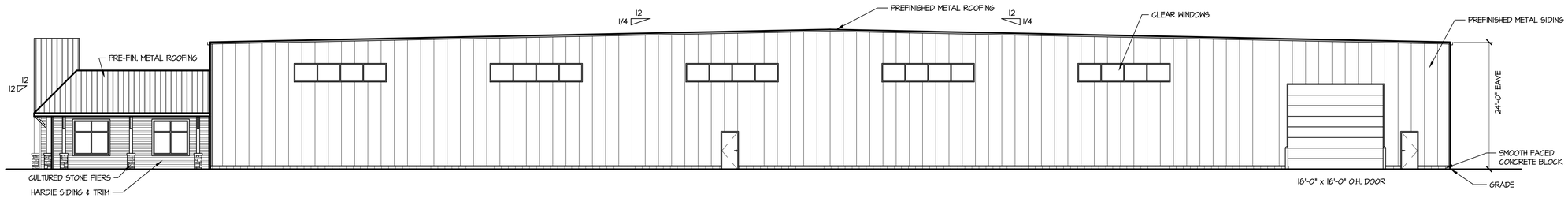
APPROVED BY: KV

PROJECT: 2136

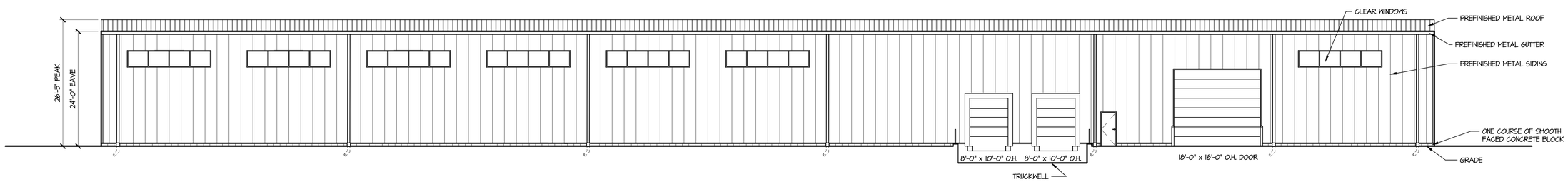
SHEET:

A2



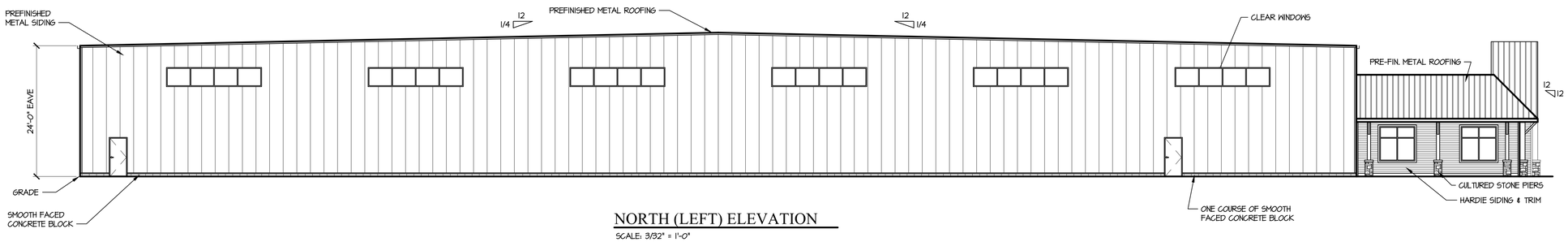
SOUTH (RIGHT) ELEVATION

SCALE: 3/32" = 1'-0"



EAST (REAR) ELEVATION

SCALE: 3/32" = 1'-0"



NORTH (LEFT) ELEVATION

SCALE: 3/32" = 1'-0"

MATERIALS:

CONCRETE BLOCK PRODUCTS BY GRAND BLANC:
SPLIT-FACED FIELD: "BOARDMAN".
SMOOTH-FACED ACCENT BAND: "LIGHT GREY".

PRE-FINISHED METAL PANELS: BUTLER THERMAWALL, "COOL SOLAR WHITE" WITH,
PRE-FINISHED METAL GUTTER AND DOWNSPOUTS TO MATCH,
OVERHEAD DOORS, FINISH TO MATCH, AND
PERSONELL DOORS, PAINTED TO MATCH.

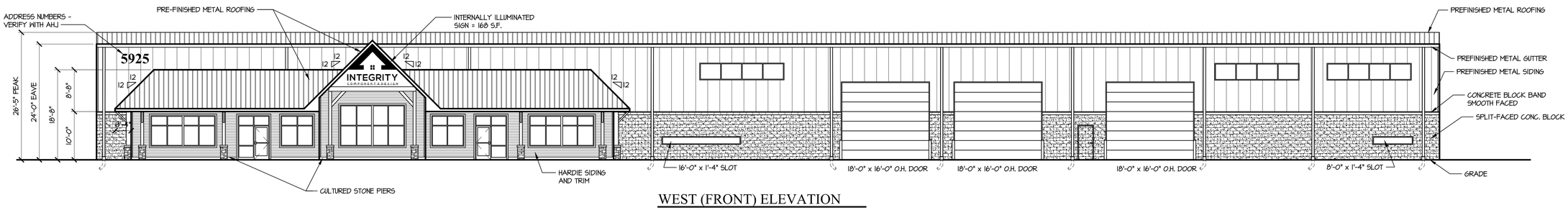
JAMES HARDIE PRODUCTS:
LAP SIDING: "LIGHT MIST".
SHAKE SIDING: "IRON GRAY".
TRIM: "ARCTIC WHITE".

ASPHALT SHINGLES: ARCHITECTURAL PROFILE, "BLACK".

WINDOWS: 1" INSULATED LOW-E GLASS WITH A GRAY TINT
IN CLEAR ANODIZED ALUMINUM FRAMES.

NOTES:

ZONED M-1 (LIGHT INDUSTRIAL)
1.) MAX HEIGHT ALLOWED: 30'-0"
PROPOSED HEIGHT: 26'-5" = COMPLIES!.)
2.) SIGNAGE:
AREA = 3 S.F. PER 1 L.F. OF FRONTAGE, UP TO 200 S.F. MAX.
~~3 x 278' = 834 S.F.~~ = 200 S.F. MAX.
PROPOSED = 168 S.F. (COMPLIES)
PROJECTION = 18" MAX.
3.) THERE IS NO ROOF TOP MECHANICAL EQUIPMENT PROPOSED.
4.) ALL LIGHTING SHALL BE DIRECTED DOWNWARD AND
SHIELDED.



WEST (FRONT) ELEVATION

SCALE: 3/32" = 1'-0"

P+V A
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STATE OF MICHIGAN
KARL K. VOLLMAR
ARCHITECT
No. 1101039372
LICENSED ARCHITECT

PROJECT
INTEGRITY COMPONENT & DESIGN
5925 BECK ROAD
INTEGRITY VAN BUREN TWP., MICHIGAN

SHEET TITLE
ELEVATIONS

DATE:	ISSUED FOR:
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APPROVED BY: KV

PROJECT: 2136

SHEET:
A3

CHARTER TOWNSHIP OF VAN BUREN
PLANNING COMMISSION AGENDA
Wednesday, December 14th, 2022 – 5:30 PM
Van Buren Township Hall
46425 Tyler Road

PRESENTATIONS:

Case 20-037:
Night Hawk Properties LLC/Zippy Auto Wash
(Plans)

SITE PLAN
ZIPPY AUTO WASH

Belleville Rd.
Van Buren Township, Michigan

ABBREVIATIONS

A	A.F.F.	ABOVE FINISH FLOOR
	AC.	ACRE
	A/C	AIR CONDITION
	ALUM.	ALUMINUM
	ASPH.	ASPHALT
	B.F.F.	BELOW FINISH FLOOR
B	BIT.	BITUMINOUS
	BLDG.	BUILDING
C	CB	CATCH BASIN
	C.O.	CLEAN OUT
	COMP.	COMPRESSOR
	CONC.	CONCRETE
	CMU	CONCRETE MASONRY UNIT
	C.J.	CONTROL JOINT
D	DIA.	DIAMETER
	DIM.	DIMENSION
	DWG.	DRAWING
	D.I.	DUCTILE IRON
E	EA.	EACH
	ELEC.	ELECTRIC
	EL. / ELEV.	ELEVATION
	EQ.	EQUAL
	EXIST. / EX.	EXISTING
	EXP.	EXPANSION
	E.J.	EXPANSION JOINT
	EXT.	EXTERIOR
F	FT.	FEET
	F.F.	FINISH FLOOR
	F.H.	FIRE HYDRANT
	FIXT.	FIXTURE
	FLR.	FLOOR
	F.A.R.	FLOOR/AREA RATIO
G	GA.	GAUGE
	GALV.	GALVANIZED
	GL.	GLASS
H	HT.	HEIGHT
	H.P.	HIGH POINT
	H.M.	HOLLOW METAL
	HORIZ.	HORIZONTAL
I	I.D.	INSIDE DIAMETER
	INT.	INTERIOR
	INV.	INVERT
J	JT.	JOINT
L	L.L.	LIVE LOAD
	L.L.H.	LONG LEG HORIZONTAL
	L.L.V.	LONG LEG VERTICAL
	L.P.	LOW POINT
M	MFR.	MANUFACTURER
	MH	MANHOLE
	MAS.	MASONRY
	M.O.	MASONRY OPENING
	MAX.	MAXIMUM
	MIL.	MILLIMETER
	MIN.	MINIMUM
	MTD	MOUNTED
N	NOM.	NOMINAL
	N.I.C.	NOT IN CONTRACT
	NO.	NUMBER
O	O.C.	ON CENTER
	O.D.	OUTSIDE DIAMETER
	O.H.	OVERHEAD
	OE	OVERHEAD ELECTRIC
	OTE	OVERHEAD TELEPHONE & ELECTRIC
P	PTD.	PAINTED
	PSF	POUNDS PER SQUARE FOOT
	PSI	POUNDS PER SQUARE INCH
	PEMB	PRE-ENGINEERED METAL BUILDING
	PREFAB.	PREFABRICATED
R	RAD.	RADIUS
	REV.	REVISED
	R.O.W.	RIGHT OF WAY
	RTU	ROOF TOP UNIT
	RM.	ROOM
S	SAN.	SANITARY
	SCHED./SCH.	SCHEDULE
	SIM.	SIMILAR
	S.P.A.	SITE PLAN APPROVAL
	SQ. FT./ S.F.	SQUARE FEET
	STD.	STANDARD
	ST. MH	STORM MANHOLE
T	TV&S	TAPPING VALVE & SLEEVE
	T/C	TOP OF CURB
	T/P	TOP OF PAVEMENT
	T/W	TOP OF WALK
	TBR	TO BE REMOVED
	TYP.	TYPICAL
U	UE	UNDERGROUND ELECTRICAL
	UTE	UNDERGROUND TELEPHONE & ELECTRICAL
	U.N.O.	UNLESS NOTED OTHERWISE
	U.P.	UTILITY POLE
V	VERT.	VERTICAL
W	W/	WITH
	W/O	WITHOUT

LEGAL DESCRIPTION

PROPERTY TAX ID: 83-081-99-0004-709
EXISTING PARCEL
A portion of the following: A parcel of land in the Northeast 1/4 of Section 21, T3S, R8E, Van Buren Township, Wayne County, Michigan, said parcel is further described as: Commencing at the Northeast corner of said Section 21; thence South 00°39'24" East along the East line of said Section 21 and the centerline of Belleville Road (120 feet wide) 990.55 feet; thence South 89°20'36" West 60.00 feet to the Point of Beginning; thence South 00°39'24" East 275.00 feet along the West right of way line of said Belleville Road; thence South 89°20'36" West 210.00 feet; thence North 89°47'57" West 318.08 feet; thence South 85°40'06" West 450.00 feet; thence North 00°17'00" East 282.48 feet; thence North 89°20'36" East 971.80 feet to the Point of Beginning; subject to and together with a storm sewer and water main easement recorded in Liber 23658, Pages 26 and 30, Wayne County Records; also subject to and together with a storm sewer agreement recorded in Liber 23607, Page 202, Wayne County Records.

PROPOSED PARCEL A-1:
Part of the Northeast 1/4 of Section 21, T3S-R8E, Van Buren Township, Wayne County, Michigan, more particularly described as follows: Commencing at the Northeast Corner of Section 21; thence along the centerline of Belleville Road (120 foot wide Right of Way) and the East line of Section 21; S 01°53'29" E (recorded as S 00°39'24" E), 990.55 feet; thence S 88°06'31" W (recorded as S 89°20'36" W), 60.00 feet, to the POINT OF BEGINNING of the Parcel to be described; thence along the West line of Belleville Road, S 01°53'29" E (recorded as S 00°39'24" E), 275.00 feet; thence S 88°06'31" W (recorded as S 89°20'36" W), 210.00 feet; thence N 88°02'02" W (recorded as N 86°47'57" W), 51.57 feet; thence N 01°53'29" W, 271.53 feet; thence N 88°06'31" E (recorded as N 89°20'36" E), 261.45 feet, to the POINT OF BEGINNING, containing 1.65 acres, more or less, and including the use of Belleville Road. Also subject to and including the use of a 60 foot wide Easement for ingress and egress, as described below. Also subject to any other easements or restrictions of record.

PROPOSED ACCESS EASEMENT (60 FOOT WIDE):
Part of the Northeast 1/4 of Section 21, T3S-R8E, Van Buren Township, Wayne County, Michigan, more particularly described as follows: Commencing at the Northeast Corner of Section 21; thence along the centerline of Belleville Road (120 foot wide Right of Way) and the East line of Section 21; S 01°53'29" E (recorded as S 00°39'24" E), 990.55 feet; thence S 88°06'31" W (recorded as S 89°20'36" W), 66.00 feet; thence along the West line of Belleville Road, S 01°53'29" E (recorded as S 00°39'24" E), 79.00 feet, to the POINT OF BEGINNING of the Easement to be described; thence continuing along the West line of Belleville Road, S 01°53'29" E (recorded as S 00°39'24" E), 60.00 feet; thence S 88°06'31" W, 34.05 feet; thence N 47°33'36" W, 113.05 feet; thence S 88°06'31" W, 146.54 feet; thence N 01°53'29" W, 60.00 feet; thence N 88°06'31" E, 170.98 feet; thence S 47°33'36" E, 113.05 feet; thence N 88°06'31" E, 9.60 feet, to the POINT OF BEGINNING.

PROJECT DESCRIPTION

The proposed use is a modern express exterior auto wash – defined as a conveyorized wash with automated pay terminals, unlimited plans, free vacuums, free floor mat wash & dry, and other complimentary services. The proposed site plan is substantially similar to other operational Zippy Auto Wash sites in the nearby Ann Arbor / Ypsilanti area. The proposed site plan consists of a 4900 square foot building. Including a 150 foot automated wash process with high power, heated drying, 2 automated pay terminals located south of the building, 10+ stacking spaces located at the pay terminals. 12 vacuum stations located adjacent to the building, and customer & employee parking, also located behind the building. The entrance & exit slabs adjacent to the building shall be heated to prevent freezing; areas beyond the slabs shall be deiced regularly to prevent freezing. Lastly, the site plan includes a state-of-the-art process water recycling system for facility use.

GENERAL NOTES:

1. All site work shall meet all applicable codes, laws and regulations including Michigan Barrier-Free Design Requirements and ADA Accessibility Guidelines (ADAAG).
2. Verify existing conditions on site. Notify architect/engineer of discrepancies prior to proceeding with construction.
3. Provide signs per Michigan Barrier-Free Requirements at handicapped spaces. Van spaces shall have an additional sign, "VAN ACCESSIBLE" per ADAAG requirements.
4. All work in R.O.W. shall conform to MDOT and/or County Standards and permitting guidelines.
5. All roads leading to the site are designated Class A for all season travel.
6. All work done shall be performed in accordance with the Township's current ordinances, standards and regulations.
7. Existing utility information and locations are per existing records and may or may not have been field verified.

UTILITY NOTES

The existing utilities shown on the drawings represent the best information available as obtained by field surveys and from existing records. This information does not relieve the contractor of the responsibility to contact Miss Dig or to satisfy himself as to the accuracy of the location shown.

SEWER AND WATER
Van Buren Township
Municipal Services
46425 Tyler Rd.
Van Buren Twp., MI 48111
734-394-5160

TELEPHONE
AT&T
5500 South Maple Road
Ann Arbor, Michigan 48103
(734) 996-5351

ELECTRIC
DTE
8001 Haggerty Road
Bellleville, MI 48112
(734) 332-3322

GAS
DTE Gas
3150 East Michigan Avenue
Ypsilanti, Michigan 48198
(734) 485-8230

For protection of underground utilities, the contractor shall notify the Miss Dig Utility Location Service a minimum of 72 hours prior to excavation.

The improvements covered by these plans shall be done in accordance with the City/Townsip's standards and supplemental specifications.

811 Know what's below. Call before you dig.

SITE INFORMATION

CURRENT ZONING: C-2: Extensive Highway Business District
SITE AREA: 1.65 AC. – 71,810 sq.ft. Proposed Split
EXISTING USE: VACANT/ Proposed Lot Split
PROPOSED BUILDING USE: Automatic Car Wash
PROPOSED BUILDING AREA: 4,900 SF – 1 Story

	REQUIRED	PROPOSED
MIN. LOT AREA	NA	1.65 Acres
MIN. LOT WIDTH	NA	136'
LOT COVERAGE	NA	9.5%
MAX. BUILDING HEIGHT	40' max., 4 stories	25', 1 story
FRONT SETBACK	35'	46.0'
SIDE SETBACK	25'	62.5'/85.2'
REAR SETBACK	20'	85.3'

PARKING & LOADING:
Parking Spaces Required:
One (1) per employee on the largest work shift. Stacking for at least five (5) vehicles per car wash lane, plus two (2) parking spaces for each washing stall.

Total Required Parking Spaces: 3 employee spaces, plus 5 stacking spaces, plus 2 spaces
Parking Spaces Provided:
5 parking spaces are provided, 10+ Stacking spaces provided
12 vacuum spaces, Including 1 barrier-free space,
Loading Spaces:
1 Loading Space Provided.

SOILS INFORMATION:
BfA Blount loam, Erie-Huron Lake Plain, 0 to 2 percent slopes
MeA Metamora sandy loam, 0 to 3 percent slopes

NATURAL FEATURES:
The site is generally flat and contains a few trees, no wetlands, and no floodplain.

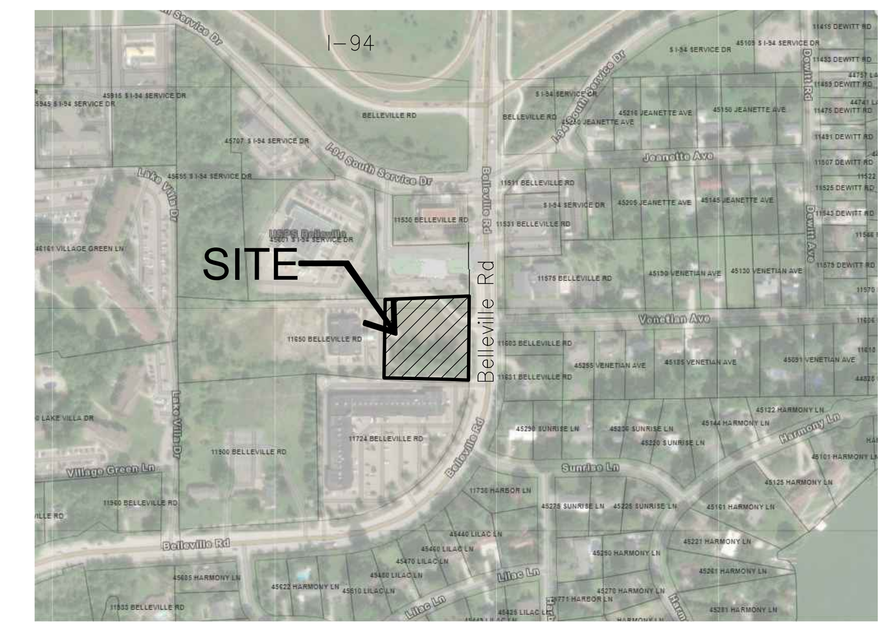
BENCHMARK 201:
CHISELED X NW SIDE OF LIGHT POST IN THE CENTER OF THE SITE
ELEV = 684.90 FEET (NGVD 29)

BENCHMARK 202:
NAIL/TAG SE SIDE OF 12"TREE NW OF SITE
ELEV = 683.00 FEET (NGVD 29)

BENCHMARK 203:
ARROW ON HYDRANT SOUTH OF SITE
ELEV = 683.62 FEET (NGVD 29)

SANITARY SEWER BASIS OF DESIGN
AVERAGE DAILY FLOWS OF 6,600 GPD OF WATER IS USED IN THIS FACILITY. THE AVERAGE FLOW RATE DURING HOURS OF OPERATION IS EQUAL TO 0.025 CFS WITH A PEAK RATE OF 0.065 CFS.

PERMIT APPROVALS
WAYNE COUNTY DPS PERMIT -X/X/22
WAYNE COUNTY SESC PERMIT -X/X/22



NORTH
LOCATION MAP
SCALE: 1" = 500'-0"

GENERAL INFORMATION

PROPERTY LOCATION:
11650 Belleville Rd.
Van Buren Twp., MI 48111

DEVELOPER/OWNER:
Corey & Michelle Weaver, Zippy Auto Wash LLC
P.O. Box 550
Saline, Michigan 48176
734-904-3869

SITE PLANNER/ENGINEER/CONTRACTOR:
Vanston/O'Brien, Inc.
8150 Jackson Road, Ste. A
Ann Arbor, MI 48103
(734) 424-0661

DRAWING INDEX:

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C-2	EXISTING CONDITIONS
C-3	SITE PLAN
C-4	GRADING PLAN
C-5	LANDSCAPE PLAN
C-6	LIGHTING PLAN
C-7	DETAIL SHEET
C-8	DRAINAGE PLAN
A-1	FLOOR PLAN & ELEVATIONS
A-2	CONCEPTUAL RENDERINGS

STATE OF MICHIGAN GREGORY HEIM ENGINEER No. 56447 LICENSED PROFESSIONAL ENGINEER

ZIPPY BELLEVILLE

DESIGNERS
Vanston/O'Brien, Inc.
BUILDERS
8150 Jackson Road, Ste. A
Ann Arbor, MI 48103
e-mail: design@vanston.com
Tel: (734) 424-0661
Fax: (734) 424-0677
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Zippy Auto Wash
Belleville Rd.
Van Buren Township, Michigan

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	6-17-22
REVISED	8-10-22
REVISED	10-18-22
REVISED	11-22-22

DRAWN BY: GAH
JOB NO.: 2967

TITLE SHEET

SHEET NO.
C-1

STORM SEWER INVENTORY:

STORM MH #1
RIM=680.55
INV. W=673.53 (24" RCP)
INV. E=673.79 (15" RCP)
INV. N=673.75 (15" RCP)

STORM MH #2
RIM=680.17
INV. W=675.07 (15" RCP)
INV. E=675.25 (15" RCP)

STORM CB #1
RIM=680.09
INV. W=675.96 (15" RCP)
INV. E=676.14 (15" RCP)
INV. N=676.09 (15" RCP)

STORM CB #2
RIM=679.87
INV. S=676.27 (15" RCP)
INV. NE=676.47 (12" RCP)

STORM CB #3
RIM=682.21
INV. SW=676.69 (12" RCP)
INV. E=676.89 (12" RCP)

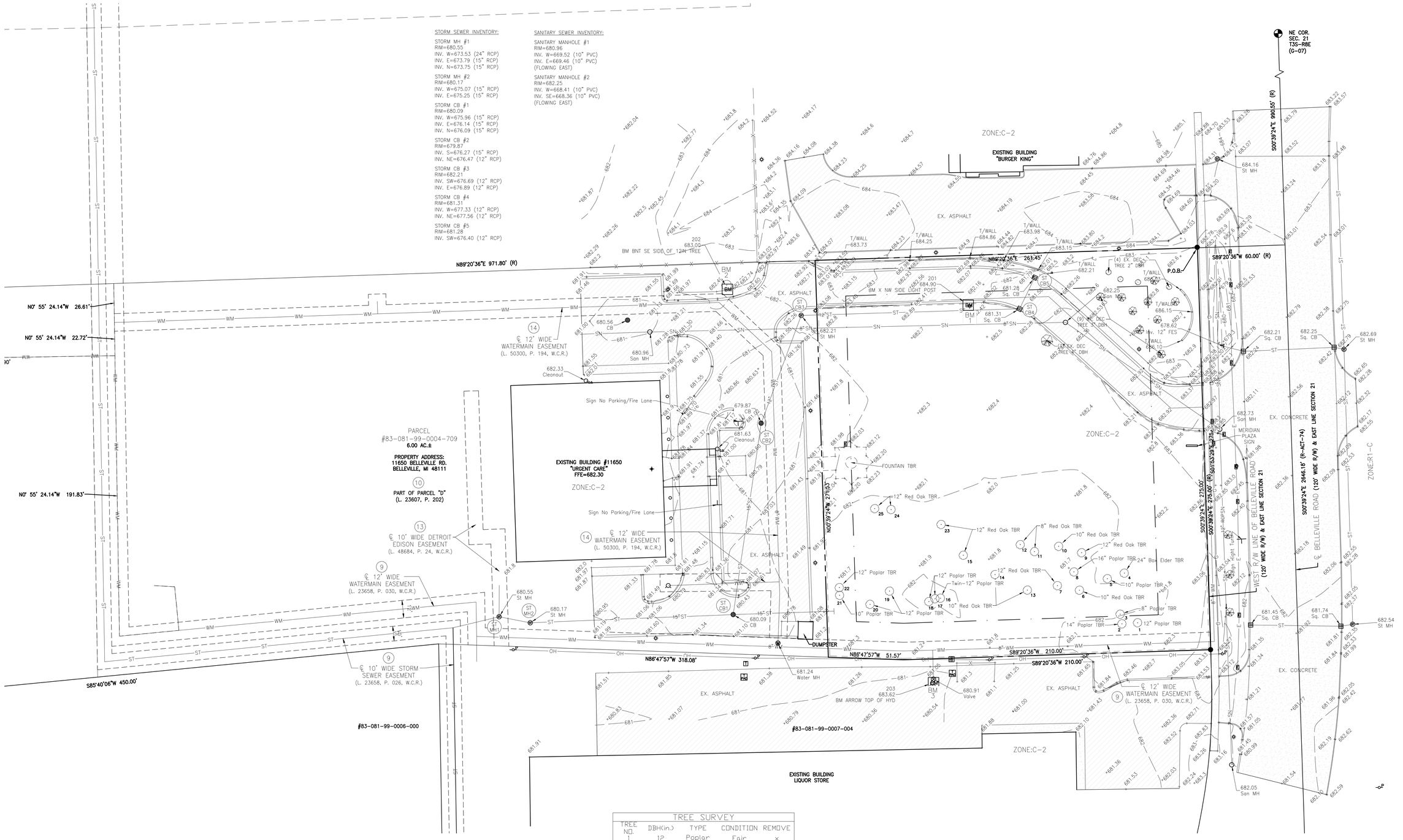
STORM CB #4
RIM=681.31
INV. W=677.33 (12" RCP)
INV. NE=677.56 (12" RCP)

STORM CB #5
RIM=681.28
INV. SW=676.40 (12" RCP)

SANITARY SEWER INVENTORY:

SANITARY MANHOLE #1
RIM=680.96
INV. W=669.52 (10" PVC)
INV. E=669.46 (10" PVC)
(FLOWING EAST)

SANITARY MANHOLE #2
RIM=682.25
INV. W=668.41 (10" PVC)
INV. SE=668.36 (10" PVC)
(FLOWING EAST)



TREE SURVEY				
TREE NO.	DBH(in.)	TYPE	CONDITION	REMOVE
1	12	Poplar	Fair	x
2	14	Poplar	Fair	x
3	8	Poplar	Fair	x
4	24	Box Elder	Fair	x
5	10	Poplar	Fair	x
6	10	Red Oak	Good	x
7	12	Red Oak	Good	x
8	16	Poplar	Fair	x
9	12	Red Oak	Good	x
10	10	Red Oak	Good	x
11	8	Red Oak	Good	x
12	8	Red Oak	Good	x
13	10	Red Oak	Good	x
14	10	Red Oak	Good	x
15	12	Red Oak	Good	x
16	twin 12	Poplar	Fair	x
17	12	Poplar	Fair	x
18	12	Poplar	Fair	x
19	12	Poplar	Fair	x
20	12	Poplar	Fair	x
21	10	Poplar	Fair	x
22	12	Poplar	Fair	x
23	12	Red Oak	Good	x
24	12	Red Oak	Good	x
25	12	Red Oak	Good	x

TREE MITIGATION - M	Remove	Replace
Number of Protected Trees being removed	12	12
Red Oaks are the protected Trees		
Being replaced with 2-3inch d.b.h. size 1:1 ratio		
Trees to be removed not requiring replacement	13	0
Total Trees	25	12

EXISTING CONDITIONS PLAN

SCALE: 1" = 30'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC
PROPOSED GAS
PROPOSED SANITARY
EXISTING STORM
EXISTING WATER
EXISTING ELECTRIC
EXISTING GAS
EXISTING SANITARY
EXISTING CENTERLINE OF DITCH
EXISTING CONTOUR
PROPOSED CONTOUR
SILT FENCE/GRADING LIMIT
DRAINAGE AREA

NEW SOFFIT LIGHTING
NEW BUILDING MOUNTED LIGHTING
NEW POLE-MOUNTED LIGHT
EXISTING UTILITY POLE
EXISTING MANHOLE
EXISTING CATCH BASIN
PROPOSED MANHOLE
NEW CATCH BASIN
EXISTING FIRE HYDRANT
NEW FIRE HYDRANT
PROPOSED ELEVATION
EXISTING ELEVATION

EXISTING BUILDING
EXISTING ASPHALT PAVING
EXISTING CONCRETE PAVING
EXISTING GRAVEL PAVING
PROPOSED CONCRETE
PROPOSED BUILDING

ZIPPY BELLEVILLE

DESIGNERS
Vanston/O'Brien, Inc.
BUILDERS
8150 Jackson Road, Ste. A
Ann Arbor, MI 48103
Tel: (734) 424-0661
Fax: (734) 424-0677
email: design@vanston.com ♦ www.vanston.com

ZIPPY AUTO WASH
Belleville Rd.
Van Buren Township, Michigan

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EXISTING CONDITIONS PLAN

SHEET NO.

C-2

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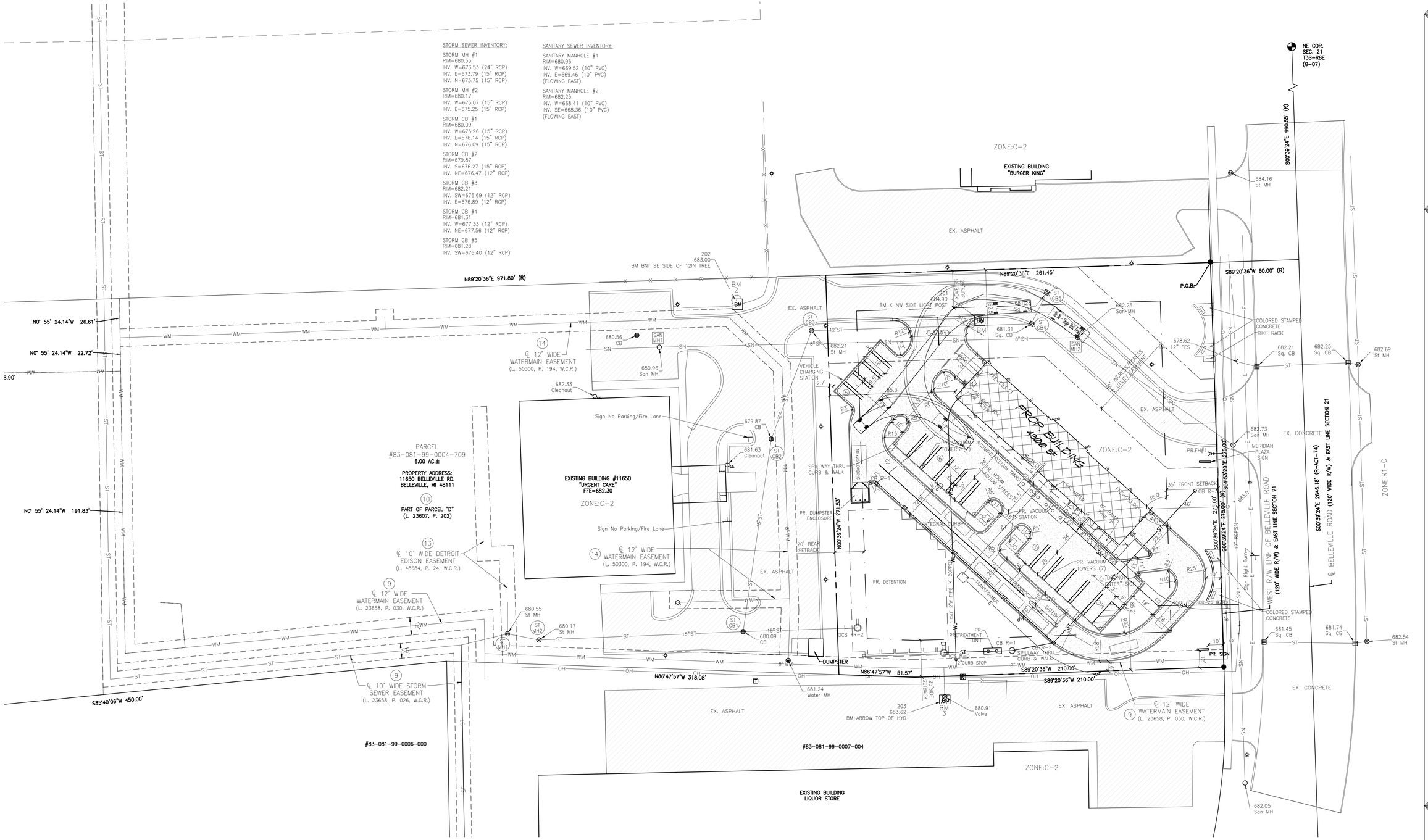

SITE PLAN

SCALE: 1" = 30'-0"

LEGEND

	PROPERTY LINE
	SETBACK
	EASEMENT
ST	PROPOSED STORM
WM	PROPOSED WATER
UE	PROPOSED UNDERGROUND ELECTRIC
G	PROPOSED GAS
SN	PROPOSED SANITARY
ST	EXISTING STORM
WM	EXISTING WATER
OH	EXISTING ELECTRIC
G	EXISTING GAS
SN	EXISTING SANITARY
	EXISTING CENTERLINE OF DITCH
910	EXISTING CONTOUR
910	PROPOSED CONTOUR
	SILT FENCE/GRADING LIMIT
	DRAINAGE AREA
	NEW SOFFIT LIGHTING
	NEW BUILDING MOUNTED LIGHTING
	NEW POLE-MOUNTED LIGHT
	EXISTING UTILITY POLE
ex.mh	EXISTING MANHOLE
ex.cb	EXISTING CATCH BASIN
MH S-1	PROPOSED MANHOLE
CB R-1	NEW CATCH BASIN
EX. FH	EXISTING FIRE HYDRANT
NEW FH #3	NEW FIRE HYDRANT
1/A 832.20	PROPOSED ELEVATION
x 660.90	EXISTING ELEVATION
	EXISTING BUILDING
	EXISTING ASPHALT PAVING
	EXISTING CONCRETE PAVING
	EXISTING GRAVEL PAVING
	PROPOSED CONCRETE
	PROPOSED BUILDING

ZIPPY BELLEVILLE

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REVISED	9-1-22
REVISED	10-18-22
REVISED	11-22-22

DRAWN BY: GAH
JOB NO.: 2967

SITE PLAN

SHEET NO.

C-3

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SOIL EROSION CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL WORK SHALL CONFORM TO THE STANDARDS AND SPECIFICATIONS OF WAYNE COUNTY.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR FOR EFFECTIVENESS OF EROSION AND SEDIMENTATION CONTROL MEASURES AND WHEN NECESSARY, REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. EROSION AND ANY SEDIMENTATION FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS, WHICH INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. EROSION AND SEDIMENT CONTROL MEASURES ARE TO BE PLACED PRIOR TO OR AS THE FIRST STEP IN CONSTRUCTION - SEDIMENT CONTROL PRACTICES WILL BE APPLIED AS A PERIMETER DEFENSE AGAINST ANY TRANSPORTING OF SILT OFF THIS SITE.
5. THE OWNER SHALL OBTAIN OR CAUSE HIS CONTRACTOR TO OBTAIN ALL REQUIRED PERMITS, PAY ALL FEES AND POST ALL BONDS TO EACH AND ALL GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER EROSION CONTROL MEASURES ON THIS PROJECT.
6. THE CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES WHEN REQUIRED AND AS DIRECTED ON THIS PLAN - HE SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER CHANGES HAVE BEEN ACCOMPLISHED.
7. SILT FENCE SHALL BE INSTALLED & MAINTAINED AROUND THE PERIMETER OF TOP SOIL STOCK PILE, AND BROUGHT IN FILL AREA IF STOCK PILE WILL BE LARGE AND IS EXPECTED TO BE ON-SITE FOR A PERIOD OF TIME.
8. TOP SOIL STOCK PILE SHALL BE SEEDED FOR TEMPORARY STABILIZATION AND WRAPPED WITH SILT FENCE DURING THE FILL OPERATION. AT THE COMPLETION OF THE FILL OPERATION THE FILL SHALL BE LEVELED OUT AND SEEDED WITH A MIN. 4" OF TOPSOIL.
9. ALL MUD, DIRT AND DEBRIS TRACKED ONTO EXISTING ROADS FROM THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR AND/OR BUILDER. ALL MUD, DIRT AND DEBRIS TRACKED OR SPILLED ONTO PAVED SURFACES WITHIN THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR AND/OR BUILDER.
10. ANY SOIL EROSION CONTROL MEASURES DAMAGED BY THEIR CONTRACTOR'S OPERATION SHALL BE REPLACED THE SAME DAY.
11. THE CONTRACTOR IS TO PROTECT AS MUCH EXISTING VEGETATION AS POSSIBLE. WHERE EXCAVATION HAS BEEN THROUGH LAWN AREAS, THE CONTRACTOR SHALL RESTORE THE DISTURBED AREA BY PLACING TOPSOIL AND SEEDING OR SODDING OVER FINAL BACKFILL MATERIAL.
12. THE CONTINUED MAINTENANCE OF THE PERMANENT EROSION CONTROL DEVICES WILL INCLUDE REMOVAL OF ANY SEDIMENT IN THE CATCH BASIN SUMPS AND IN THE SEDIMENTATION BASIN ON A YEARLY BASIS OR AS REQUIRED. THE MAINTENANCE WILL BE PERFORMED BY THE OWNER WE EXPECT THAT ONCE THE VEGETATIVE COVER IS ESTABLISHED THAT LITTLE, IF ANY, MAINTENANCE OF THE PERMANENT EROSION CONTROL DEVICES WILL BE REQUIRED.
13. LONG TERM MAINTENANCE OF THE RETENTION BASIN AND FOREBAY: SEDIMENT REMOVAL FROM THE FOREBAY SHALL OCCUR WHEN THE SEDIMENT REACHES 1 FOOT IN DEPTH. BASIN WILL ALSO REQUIRE PERIODIC REMOVAL OF SCRUB VEGETATION. COSTS ASSOCIATED WITH REMOVAL SHOULD BE APPROX. $25.00, BUT WILL VARY BASED ON EXTENT.
14. AREA OF DISTURBANCE EQUALS 1.30 AC.
15. SEE LANDSCAPE PLAN FOR SITE STABILIZATION DETAILS (C-5), AND DETAIL SHEET C-7 FOR ADDITIONAL SEDIMENTATION AND EROSION CONTROL DETAILS AND MAINTENANCE PLAN.

SOIL EROSION & SEDIMENTATION CONTROL MEASURES

KEY	DETAIL	CHARACTERISTICS
6	Seeding with Mulch and/or Matting	Facilitates establishment of vegetative cover. Effective for drainageways with low velocity. Easily placed in small quantities by inexperienced personnel. Should include prepared topsoil bed.
15	Paving	Protects areas which cannot otherwise be protected, but, increases runoff volume and velocity. Irregular surface will help slow velocity.
54	Inlet Filter	Inexpensive and easy to construct. Filters sediment from runoff. May be repaired if damaged. Silt sack with beaver dam for curb inlets.
55	Geotextile Silt Fence	Uses geotextile and posts or poles. May be constructed or pre packaged. Easy to construct and locate as necessary.

OWNER/OPERATOR:
ZIPPY AUTO WASH, LLC.
P.O. Box 550
Saline, MI 48176
Contact: COREY & MICHELLE WEAVER

OWNER ABOVE IS RESPONSIBLE FOR THE CONTINUED MAINTENANCE OF ALL PERMANENT BEST MEASURES THAT REMAIN AFTER PROJECT COMPLETION.

STORM SEWER INVENTORY:

STORM MH #1
RIM=680.55
INV. W=673.53 (24" RCP)
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INV. W=669.52 (10" PVC)
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(FLOWING EAST)

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INV. SE=668.36 (10" PVC)
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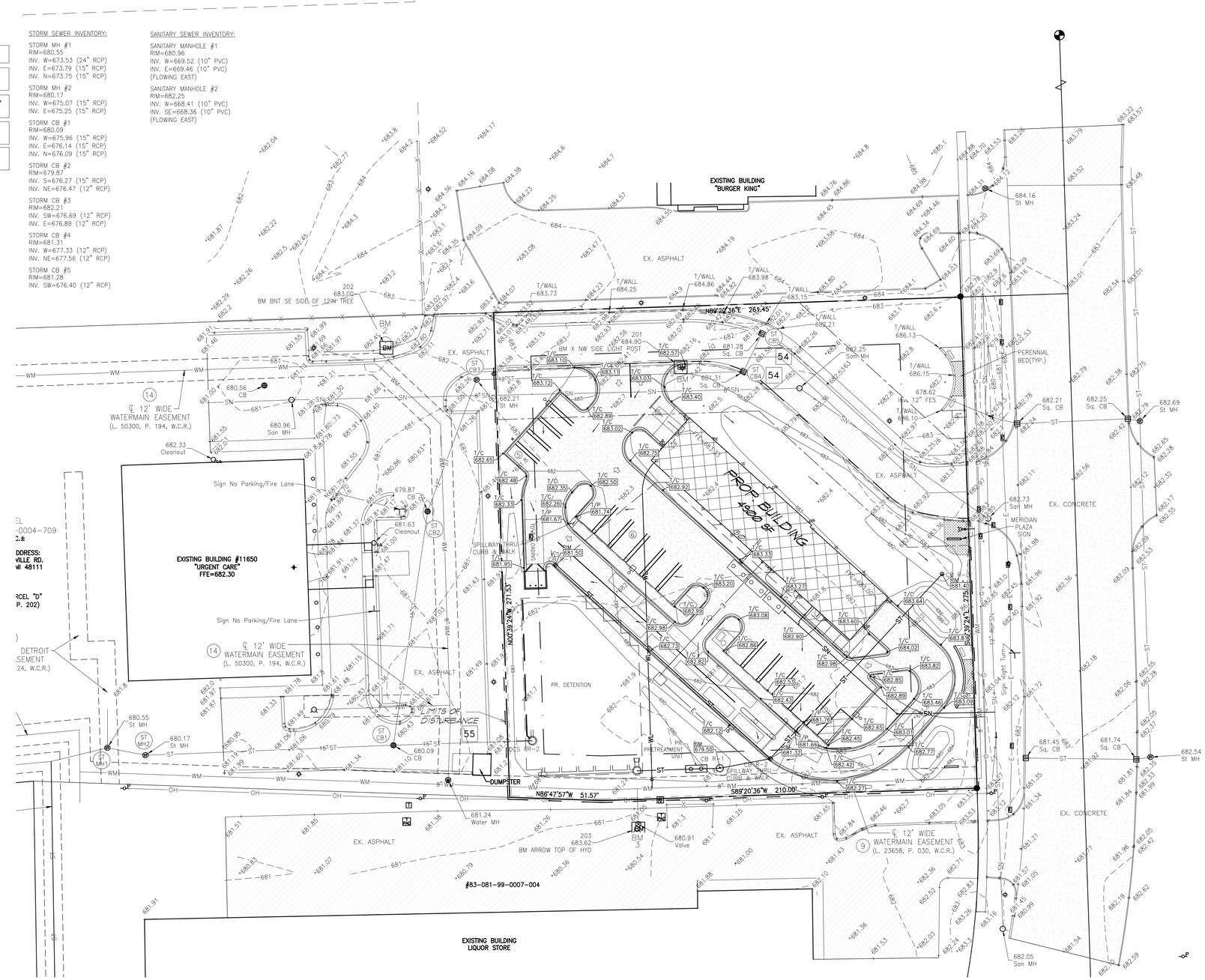

PERMENANT MAINTENANCE TASKS AND SCHEDULE:

OWNER'S RESPONSIBILITY TASKS / COMPONENTS	STORM DRAINAGE SYSTEM	CATCH BASIN SUMPS	CATCH BASIN INLET CASTINGS	CHANNELS	OUTFLOW CONTROL STRUCTURES	RIP-RAP	FILTRATION BASIN	INFILTRATION/DETENTION BASINS	WETLANDS	EMERGENCY OVERFLOW	SCHEDULE
INSPECT FOR PROPER OPERATION						X	X	X			AFTER STORM EVENTS OF 1" OR MORE
INSPECT FOR SEDIMENT ACCUMULATION		X	X		X	X	X	X			ANNUALLY
REMOVAL OF SEDIMENT ACCUMULATION		X	X		X	X	X	X			EVERY 5-10 YEARS AS NEEDED (SEE NOTE)
INSPECT FOR FLOATABLES AND DEBRIS		X	X	X	X	X	X	X			ANNUALLY
CLEANING FOR FLOATABLES AND DEBRIS		X	X	X	X	X	X	X			ANNUALLY
INSPECT FOR EROSION					X	X	X	X			AS NEEDED (SEE NOTE)
REESTABLISH PERMANENT VEGETATION ON ERODED SLOPES					X		X	X			EVERY 3-5 YEARS AS NEEDED (SEE NOTE)
REPLACEMENT OF GRAVEL JOINTS						X					SEMI-ANNUALLY
MOWING					X		X	X			0 TO 2 TIMES PER YEAR
INSPECT STRUCTURAL ELEMENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS (BY PROFESSIONAL ENGINEER REPORTING TO THE OWNER)		X	X	X	X	X	X	X	X	X	ANNUALLY
MAKE ADJUSTMENTS OR REPLACEMENTS AS DETERMINED BY ANNUAL WET WEATHER INSPECTION		X	X	X	X	X	X	X	X	X	AS NEEDED (SEE NOTE)
KEEP RECORDS OF ALL INSPECTIONS AND MAINTENANCE ACTIVITIES AND REPORT TO OWNER		X	X	X	X	X	X	X	X	X	ANUALLY
KEEP RECORDS OF ALL COSTS FOR INSPECTIONS, MAINTENANCE AND REPAIRS. REPORT TO OWNER		X	X	X	X	X	X	X	X	X	ANNUALLY
REVIEW COST EFFECTIVENESS OF THE PREVENTATIVE MAINTENANCE PROGRAM AND MAKE ADJUSTMENTS AS NEEDED		X	X	X	X	X	X	X	X	X	ANNUALLY
OWNER TO HAVE A PROFESSIONAL ENGINEER CARRY OUT EMERGENCY INSPECTIONS UPON IDENTIFICATION OF SEVERE PROBLEMS.		X	X	X	X	X	X	X	X	X	AS NEEDED (SEE NOTE)

NOTE: "AS NEEDED" MEANS WHEN SEDIMENT HAS ACCUMULATED TO A MAXIMUM OF ONE FOOT DEPTH OR THE JACKET HAS BEEN CLOGGED WITH SEDIMENT DUE TO CONSTRUCTION ACTIVITIES.
NO CHEMICALS SHALL BE USED WITHIN STORM WATER FEATURES OR BUFFER ZONES EXCEPT FOR INVASIVE SPECIES MAY BE TREATED BY A CERTIFIED APPLICATOR. MOWING IS ONLY ALLOWED TWICE PER YEAR

RESPONSIBILITY AND MAINTAINENCE
A. DURING CONSTRUCTION, IT IS THE DEVELOPER'S RESPONSIBILITY TO PERFORM THE MAINTAINENCE.
B. FOLLOWING CONSTRUCTION IT WILL BE THE RESPONSIBILITY OF THE OWNER TO PERFORM MAINTENANCE.
C. ROUTINE MAINTENANCE SHALL BE COMPLETED WITHIN 45 DAYS OF RECEIPT OF WRITTEN NOTIFICATION THAT ACTION IS REQUIRED, UNLESS OTHER ACCEPTABLE ARRANGEMENTS ARE MADE WITH THE TOWNSHIP/CITY OR COUNTY COMMISIONER. EMERGENCY MAINTENANCE SHALL BE PERFORMED IMMEDIATELY UPON RECEIPT OF WRITTEN NOTICE. SHOULD THE OWNER FAIL TO ACT WITHIN THESE TIME FRAMES, THE TOWNSHIP/CITY OR COUNTY MAY PERFORM THE NEEDED MAINTENANCE AND ASSESS THE COSTS AGAINST THE OWNER.

MAINTENANCE TASKS AND SCHEDULE DURING CONSTRUCTION:

CONTRACTOR'S RESPONSIBILITY TASKS / COMPONENTS	STORM DRAINAGE SYSTEM	CATCH BASIN SUMPS	CATCH BASIN INLET CASTINGS	CHANNELS	OUTFLOW CONTROL STRUCTURES	RIP-RAP	FILTRATION BASIN	INFILTRATION/DETENTION BASINS	WETLANDS	EMERGENCY OVERFLOW	SCHEDULE
INSPECT FOR SEDIMENT ACCUMULATION	X	X		X	X		X	X			WEEKLY
REMOVAL OF SEDIMENT ACCUMULATION	X	X		X	X		X	X			AS NEEDED (SEE NOTE) & PRIOR TO TURNOVER
INSPECT FOR FLOATABLES AND DEBRIS			X	X	X		X	X			QUATERLY
CLEANING FOR FLOATABLES AND DEBRIS			X	X	X		X	X			QUATERLY & AT TURNOVER
INSPECT FOR EROSION				X	X		X	X			WEEKLY
REESTABLISH PERMANENT VEGETATION ON ERODED SLOPES				X			X	X			AS NEEDED (SEE NOTE) & PRIOR TO TURNOVER
REPLACEMENT OF GRAVEL JOINTS					X						AS NEEDED (SEE NOTE)
MOWING				X	X	X	X	X			0 TO 2 TIMES PER YEAR
INSPECT STRUCTURAL ELEMENTS DURING WET WEATHER AND COMPARE TO AS-BUILT PLANS (BY PROFESSIONAL ENGINEER REPORTING TO THE OWNER)				X	X		X	X			ANNUALLY & AT TURNOVER
MAKE ADJUSTMENTS OR REPLACEMENTS AS DETERMINED	X	X	X	X	X	X	X	X	X	X	AS NEEDED (SEE NOTE)

NOTE: "AS NEEDED" MEANS WHEN SEDIMENT HAS ACCUMULATED TO A MAXIMUM OF ONE FOOT DEPTH OR THE JACKET HAS BEEN CLOGGED WITH SEDIMENT DUE TO CONSTRUCTION ACTIVITIES.
NO CHEMICALS SHALL BE USED WITHIN STORM WATER FEATURES OR BUFFER ZONES EXCEPT FOR INVASIVE SPECIES MAY BE TREATED BY A CERTIFIED APPLICATOR. MOWING IS ONLY ALLOWED TWICE PER YEAR

SOIL EROSION CONTROL SEQUENCE:

1. Install all perimeter erosion and sedimentation control measures. 2. Install storm drainage system, including rip-rap and parking lot inlet filter.
3. Rough grade site, stock pile top soil in location approved by owner and engineer.
4. Install sanitary sewer and water services.
5. Maintain Erosion and Sedimentation control measures, as required.
6. Install all utilities (Phone, Gas and Electric).
7. Bring pavement areas to sub-base grade and install concrete curb and gutter.
8. Install pavement complete, repair or replace inlet filter as required.
9. Finish grade, redistribute top soil, seed and mulch in all distributed areas.
10. Complete construction of building.
11. Remove all temporary soil erosion and sedimentation control measures after stabilization.

MAINTENANCE PLAN BUDGET:

Annual inspection for sedimentation accumulation	$ 100.00
Removal of sediment accumulation every 5 years as needed	$ 1000.00
Inspect for floatables and debris annually and after major storms	$ 100.00
Removal of floatables and debris annually and after major storms	$ 150.00
Inspect system for erosion annually and after major storms	$ 100.00
Reestablish permanent vegetation of eroded slopes as needed	$ 350.00
Replacement of gravel jackets every 3-5 years as needed	$ 400.00
Mowing 0-2 times per year	$ 100.00
Inspect structural elements during wet weather and compare to as built plans every 2 years.	$ 150.00
Make structural adjustments or replacements as determined by inspection as needed	$ 400.00
Have Professional Engineer carry out emergency inspections upon indentification of severe problems.	$ 200.00
TOTAL ANNUAL BUDGET:	$ 3,050.00

GRADING PLAN

SCALE: 1" = 30'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC
PROPOSED GAS
PROPOSED SANITARY
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REVISED	10-18-22
REVISED	11-22-22

DRAWN BY: GAH
JOB NO.: 2967

GRADING PLAN

SHEET NO.
C-4

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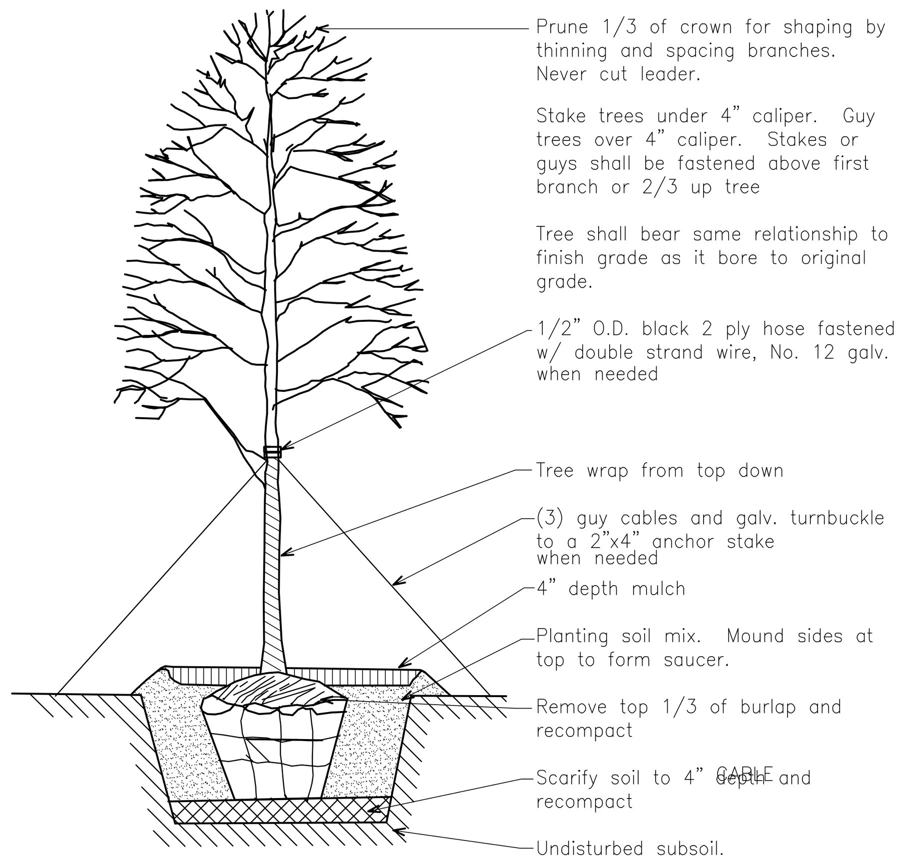


DECIDUOUS TREE PLANTING DETAIL

Landscape Notes

1. All plant material shall meet current American Association of Nurserymen, Inc. (AAN) standard for nursery stock. (ANSI 260.1 – 1973)
2. Landscape installation shall be in accordance with the American Association of Nursery standards and with the Township/City's landscape requirements.
3. Planting schedules:
   1) Deciduous material shall be planted from March 15 for spring planting and from October 1 until the ground freezes for fall planting.
   2) Evergreen material shall be planted from March 1 through May 31 for Spring plantings and from August 1 through September 30 for all fall planting.
4. Mulch plant beds, individual tree and shrub planting pits uniform depth of 4 inches.
5. Provide weed mat for greenbelt and foundation plantings.
6. All planting beds are to be edged. Recommended either "Permaloc Aluminum" edging or "Black Diamond" plastic edging.
7. All areas with stone cover shall have weed mat.
8. All landscaping to be continuously maintained.
9. All site improvements detailed on this plan are to be completed prior to issuance of final certificate of occupancy.
10. All construction to conform to the latest applicable Township/City regulations.
11. R.O.W. areas to be seeded or sod.
12. Tree protection consists or:
    A. Yellow ribbon barriers for large areas not disturbed by construction.
    B. Stakes 10' on center and wood snow fence around individual and groups of individual trees.
    C. Trees to be removed will be tagged with red ribbon. The barrier or fence surrounding the tree or group of trees shall be located no closer to the tree than the tree's drip line. If this is not possible, the barrier shall be no closer than 6 feet from the trunk of the tree or group of trees.
13. There will be no outside storage on site.
14. Seed Mix

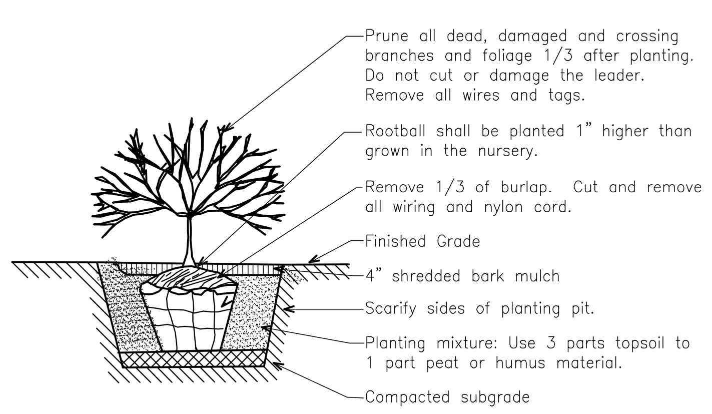
* Temporary planting mixture for erosion control.

–Seed Oats	30 pounds per acre
–Annual Rye	10 pounds per acre

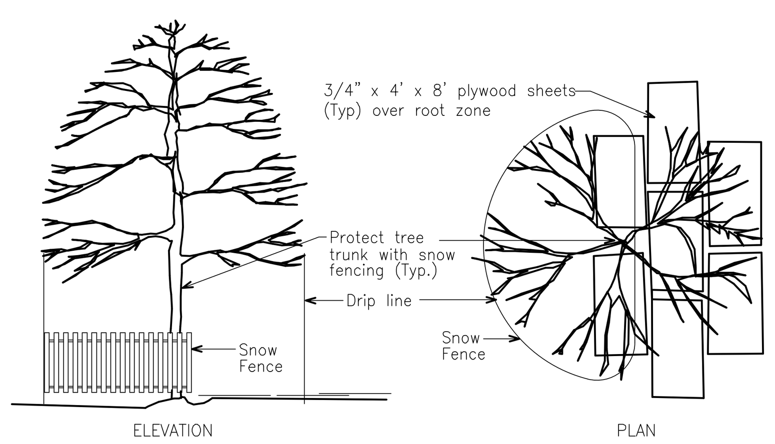
* Permanent planting mixture on all disturbed areas excluding BMPs.

–Scaldis Hard Fescue	12 pounds per acre
–Danson's Creeping Red Fescue	6 pounds per acre
–Perennial Rye	20 pounds per acre
–Buffalo Grass	20 pounds per acre
–Creeping Bent	0.5 pounds per acre
–Little Blue Stem	20 pounds per acre
–Sheep Fescue	15 pounds per acre

Existing soil nutrient levels shall be tested by an independent soil testing laboratory before fertilizers are appied.

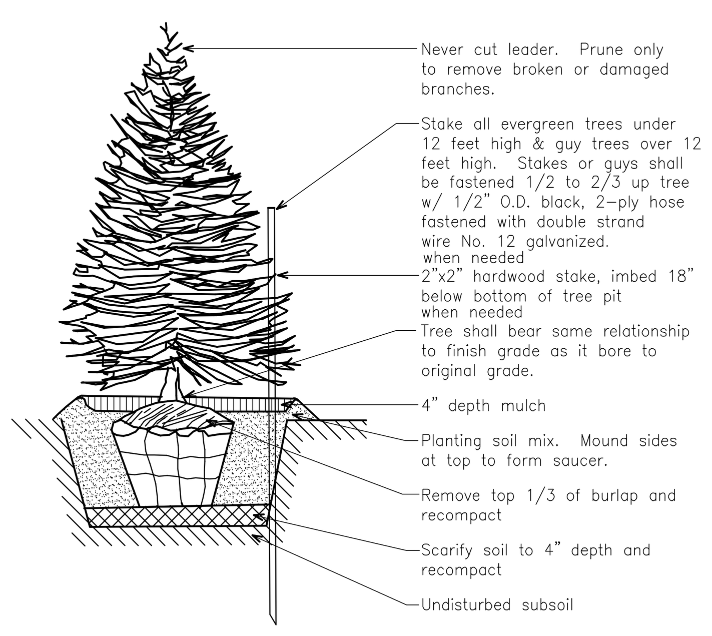


SHRUB BED PLANTING DETAIL



STANDARD TREE PROTECTION

NOTE: Pull back fencing to install plywood when access in root zone is necessary.

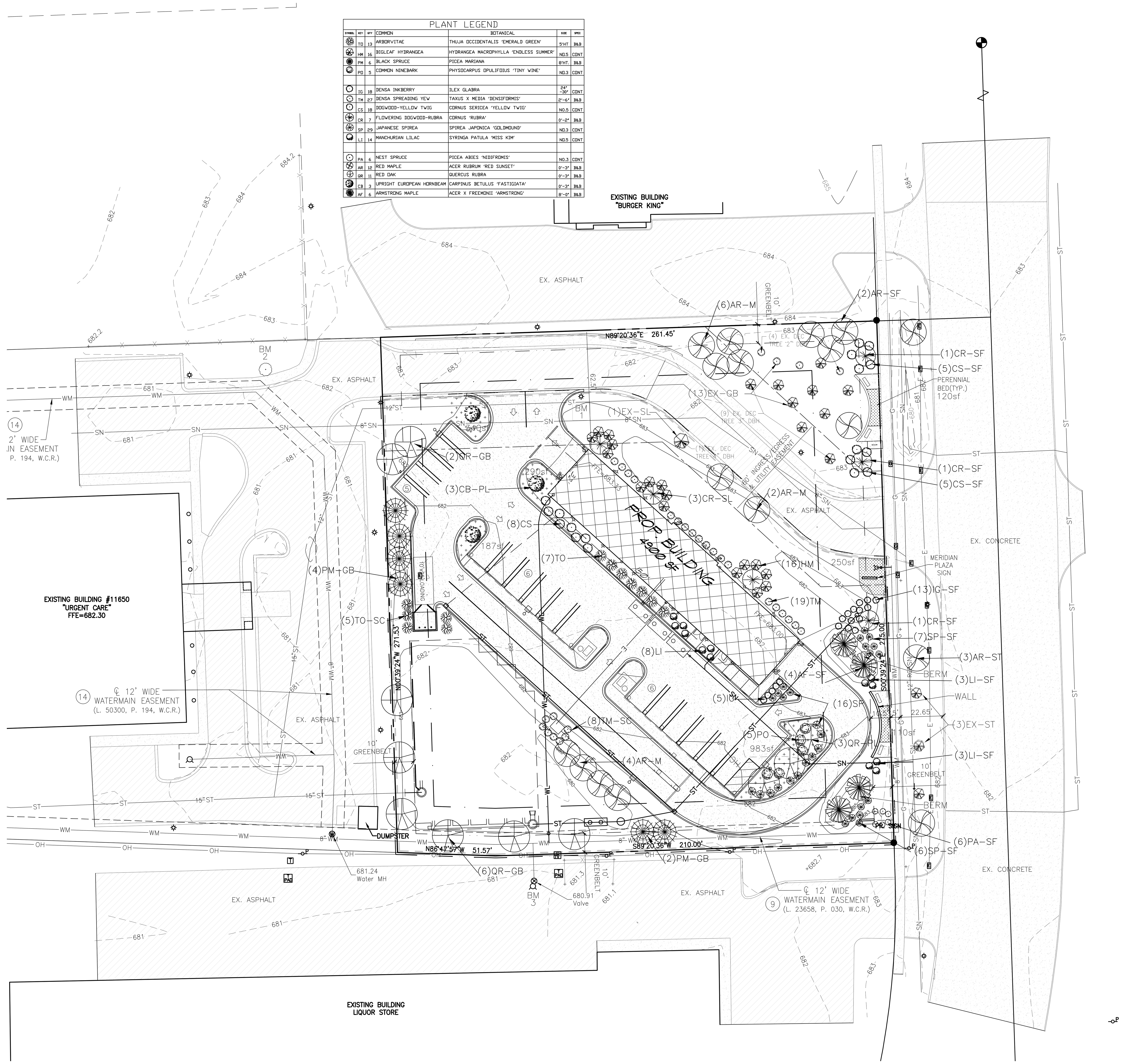


EVERGREEN TREE PLANTING DETAIL

LANDSCAPE REQUIREMENT CHART					
		Required	Existing	Proposed	Provided
STREET FRONTAGE: SF	240 LF				
1 Deciduous tree per 40 LF	Trees	6	0	6	6
1 Ornamental tree per 100 LF	Orn. Trees	3	0	3	3
8 shrubs per 40 LF	Shrubs	48	0	48	48
STREET TREES	240LF				
1 Deciduous tree per 40 LF less curb cut	Trees	6	3	3	6
Perennial beds 20% landscape frontage		480SF			480SF
MITIGATION - M					
Number of Protected Trees being removed					
Red Oaks are the protected Trees	12				
Being replaced with 2-3inch d.b.h. size 1:1 ratio		12		12	12
Note: M on the plan denotes mitigation tree					
tree to be removed not requiring replacement	13	0		0	0
total removed trees	25				
SITE LANDSCAPING: Site Area SL					
1 Tree Per 3000 SF open area min 35% dec tree	12,000 SF	4	1	3	4
SCREENING LANDSCAPING - SC	Shrubs			14	14
Parking Landscape area -PL					
5% of paved interior area	sf	921		1800	
1 dec tree per 300 sf interior area		4		6	6
Green Belt Buffering - GB					
A 10' wide buffer with 1 tree per 30 lf	795	27	13	14	27

PLANT LEGEND

SYMBOL	KEY	QTY	COMMON	BOTANICAL	SIZE	SPEC
	TO	13	ARBORVITAE	THUJA OCCIDENTALIS 'EMERALD GREEN'	5'HT	B&B
	HM	16	BIGLEAF HYDRANGEA	HYDRANGEA MACROPHYLLA 'ENDLESS SUMMER'	NO.5	CONT
	PM	6	BLACK SPRUCE	PICEA MARIANA	8'HT.	B&B
	PO	5	COMMON NINEBARK	PHYSOCARPUS OPULIFOIUS 'TINY WINE'	NO.3	CONT
	IG	18	DENSA INKBERRY	ILEX GLABRA	24"-30"	CONT
	TM	27	DENSA SPREADING YEW	TAXUS X MEDIA 'DENSIFORMIS'	2'-6"	B&B
	CS	18	DOGWOOD-YELLOW TWIG	CORNUS SERICEA 'YELLOW TWIG'	NO.5	CONT
	CR	7	FLOWERING DOGWOOD-RUBRA	CORNUS 'RUBRA'	0'-2"	B&B
	SP	29	JAPANESE SPIREA	SPIREA JAPONICA 'GOLDMOUND'	NO.3	CONT
	LI	14	MANCHURIAN LILAC	SYRINGA PATULA 'MISS KIM'	NO.5	CONT
	PA	6	NEST SPRUCE	PICEA ABIES 'NIDIFROMIS'	NO.3	CONT
	AR	12	RED MAPLE	ACER RUBRUM 'RED SUNSET'	0'-3"	B&B
	QR	11	RED OAK	QUERCUS RUBRA	0'-3"	B&B
	CB	3	UPRIGHT EUROPEAN HORNBEAM	CARPINUS BETULUS 'FASTIGIATA'	0'-3"	B&B
	AF	6	ARMSTRONG MAPLE	ACER X FREEMONII 'ARMSTRONG'	8'-0"	B&B



LANDSCAPE PLAN

SCALE: 1" = 30'-0"

LEGEND

PROPERTY LINE	NEW SOFFIT LIGHTING
SETBACK	NEW BUILDING MOUNTED LIGHTING
EASEMENT	NEW POLE-MOUNTED LIGHT
PROPOSED STORM	EXISTING UTILITY POLE
PROPOSED WATER	ex.mh EXISTING MANHOLE
PROPOSED UNDERGROUND ELECTRIC	ex.cb EXISTING CATCH BASIN
PROPOSED GAS	MH S-1 PROPOSED MANHOLE
PROPOSED SANITARY	CB R-1 NEW CATCH BASIN
EXISTING STORM	EX. FH EXISTING FIRE HYDRANT
EXISTING WATER	NEW FH #3 NEW FIRE HYDRANT
EXISTING ELECTRIC	T/A 832.20 PROPOSED ELEVATION
EXISTING GAS	x 660.90 EXISTING ELEVATION
EXISTING SANITARY	EXISTING BUILDING
EXISTING CENTERLINE OF DITCH	EXISTING ASPHALT PAVING
EXISTING CONTOUR	EXISTING CONCRETE PAVING
PROPOSED CONTOUR	EXISTING GRAVEL PAVING
SILT FENCE/GRADING LIMIT	PROPOSED CONCRETE
DRAINAGE AREA	PROPOSED BUILDING

DESIGNERS
Vanston/O'Brien, Inc.
BUILDERS
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Tel: (734) 424-0661
Fax: (734) 424-0677
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Zippy Auto Wash

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	1-17-22
REVISED	8-10-22
REVISED	10-18-22
REVISED	11-22-22

DRAWN BY: GAH
JOB NO.: 2967

LANDSCAPE PLAN

SHEET NO.

C-5

LITHONIA LIGHTING®

Catalog Number	
Notes	B
Type	

FEATURES & SPECIFICATIONS

INTENDED USE
Provides years of maintenance-free illumination for outdoor use in residential & commercial applications. Ideal for applications such as lighting walkways and stairways for safety and security.

CONSTRUCTION
Cast aluminum housing with corrosion-resistant paint in either dark bronze or white finish.
ADA compliant.

OPTICS
4000K CCT LEDs.
Polycarbonate lens protects the LED from moisture, dirt and other contaminants.
LUMEN MAINTENANCE: The LED will deliver 70% of its initial lumens at 50,000 hour average LED life. See Lighting Facts label on page 2 for performance details.

ELECTRICAL
MVOLT driver operates on any line voltage from 120-277V
Operating temperature: -30°C to 40°C.
1KV surge protection standard.

INSTALLATION
Surface mounts to universal junction box (provided by others).

LISTINGS
UL Listed to U.S. and Canadian safety standards for wet locations.
Tested in accordance with IESNA LM-79 and LM-80 standards.

WARRANTY — 5-year limited warranty. This is the only warranty provided and no other statements in this specification sheet create any warranty of any kind. All other express and implied warranties are disclaimed. Complete warranty terms located at:
www.acuitybrands.com/support/customer-support/terms-and-conditions

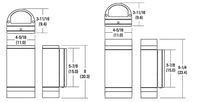
Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

Outdoor General Purpose

OLLWD & OLLWU

LED WALL CYLINDER LIGHT

Specifications
All dimensions are inches (centimeters)



ORDERING INFORMATION — For shortest lead times, configure products using **bolded options.**

Example: OLLWD LED P1 40K MVOLT DDB

Series	Performance Package	Color temperature (CCT)	Voltage	Finish
OLLWD LED Downlight **OLLWU LED** Up & downlight	**P1**	**40K** 4000K	**MVOLT** 120V-277V **120** 120V	**DDB** Dark bronze **WH** White[2]

Notes
1. Only available with OLLWD and in DDB.
2. Only available with OLLWU.

LITHONIA LIGHTING®

Catalog Number	
Notes	C
Type	

FEATURES & SPECIFICATIONS

INTENDED USE — Our recessed LED module is the most economical means to create a well lit environment with exceptional energy efficiency and near zero maintenance. Great for retrofit into existing downlight cans or new construction and remodel applications. Unique torsion spring and friction clip retention allows flatness into nearly 100% of installed cans. The LED module maintains at least 70% light output for 50,000 hours.

CONSTRUCTION — Aluminum die cast reflector with deep baffle configuration for reduced glare. Combined LED and driver printed circuit board attached. Inner reflector cone funnels light through the pressed-in diffused lens.
Baffle and open trim inserts are available in multiple finishes.

OPTICS — Diffused lens at end of mixing chamber to provide even light distribution for general illumination, equivalent to 65W BR30 or 100W BR30 lamp.
Wide flood beam angle at > 45°.

ELECTRICAL — Center 2 Edge™ (patent pending) technology created for a single point source. Primary power disconnect provided for simple connection to a dedicated LED connector in the housing.
Dimming down to 10%. For compatible dimmers, refer to Compatible Dimmers Chart.
725-lumen P series has an input wattage of 12.7 watts, 57 lumens per watt, equivalent to 65-watt incandescent.
P Series' patent pending driven has zero inrush, which allows power leads to be calculated with actual rated wattages.
Example: 47 units of 6BPMW LED fixtures can be installed in line with a 600-watt dimmer. 600W/12.7W = 47 fixtures.
950-lumen P series has an input wattage of 15.2 watts, 63 lumens per watt, equivalent to 100-watt incandescent.

INSTALLATION — Suitable for installation in standard and shallow-height rough-in sections.
E26 socket adapter (except in the state of California on 6BP fixtures) and splice kit ships standard. This enables easy installation or permanent conversion to an LED source for Title 24 compliance.
Twin torsion springs ensure easy installation.
Friction clips included to allow fitment into cans without torsion brackets from an inside diameter of 6.0" to 7.0".

LISTINGS — CSA certified to US and Canadian safety standards. California T24 compliant. Wet location listed for indoor use only. NEMA, ASTM E283 for Air-Tight (with IC housings). ENERGY STAR® certified product.

WARRANTY — 5-year limited warranty. Complete warranty terms located at
www.acuitybrands.com/CustomerResources/Terms_and_conditions.aspx

Note: Actual performance may differ as a result of end-user environment and application.
All values are design or typical values, measured under laboratory conditions at 25 °C.
Specifications subject to change without notice.

PATENTS PENDING.

LED Recessed Downlighting

6BP/60P

Torsion mount shown

6" LED Module
IC/Non-IC
Retrofit

Friction clip shown (included)

E26 adaptor

Splice kit (included)

Specifications

Aperture: 5-7/8 (14.9)
Ceiling opening: Determined by rough-in
Overlap trim: 7-5/8 (19.4)
Height: 3-7/8 (9.8)
All dimensions are inches (centimeters) unless otherwise indicated.

ORDERING INFORMATION — Lead times will vary depending on options selected. Consult with your sales representative.

Example: 6BP TRIMW LED 27K 90CRI

Series/Finish[4]		Lamp	CCT / CRI / W / Lumens[1]		Voltage		Options	
6BPMW	6" Baffle LED module, matte white	LED	(blank)	3000 K / 83 CRI / 12.7W / 725L	(blank)	120V	L7RLED T24	New construction rough-in LED base
6BP TRIMW	6" Baffle LED module, black baffle, matte white flange		27K 90CRI	2700 K / 90 CRI / 10.25W / 600L			L7RRLED T24	Remodel rough-in LED base
6BPBN	6" Baffle LED module, brushed nickel		30K 90CRI	3000 K / 93 CRI / 10.25W / 600L			LCILED T24	New construction rough-in LED base
6BPORB	6" Baffle LED module, oil-rubbed bronze						L7R	New construction rough-in[3]
		HL LED	(blank)	3000 K / 83 CRI / 15.2W / 950L			L7RR	Remodel rough-in[3]
			27K 90CRI	2700 K / 90 CRI / 16.7W / 860L			L7RPR	New construction shallow rough-in[3]
			30K 90CRI	3000 K / 93 CRI / 16.7W / 860L			L7RS	Remodel shallow rough-in[3]
							LCP	New construction shallow rough-in[3]
							LSRTWHIP	No E26 Adapter (EA only)[2]
6OPA	6" Open LED module, clear diffuse	LED	(blank)	3000 K / 83 CRI / 12.7W / 725L	(blank)	120V	L7RLED T24	New construction rough-in LED base
6OPA2	6" Open LED module, clear specular		27K 90CRI	2700 K / 90 CRI / 10.25W / 600L			L7RRLED T24	Remodel rough-in LED base
6OPA TRIMW	6" Open LED module, clear diffuse, matte white flange		30K 90CRI	3000 K / 93 CRI / 10.25W / 600L			LCILED T24	New construction rough-in LED base
6OPA2 TRIMW	6" Open LED module, clear specular, matte white flange	HL LED	(blank)	3000 K / 83 CRI / 15.2W / 950L			L7R	New construction rough-in[3]
			27K 90CRI	2700 K / 90 CRI / 16.7W / 860L			L7RR	Remodel rough-in[3]
			30K 90CRI	3000 K / 93 CRI / 16.7W / 860L			L7RPR	New construction shallow rough-in[3]
							L7RS	Remodel shallow rough-in[3]
							LCP	New construction rough-in[3]
							LCP	New construction shallow rough-in[3]

Accessories: Order as separate catalog number.		
TSAB	Makes new bracket housing compatible with the LED module; ships as units, 10 or 25	RKT CCG2270 E26 ADAPTER/MALE PLUG BAL DISC ASM E26 Adapter
PLJ6ZB	Makes L7RX housings compatible with the LED module	

Notes
1 Total system delivered lumens.
2 Must be ordered as a separate line.
3 This option must be selected for product shipping to California.
4 Energy Star valid with MW finish only.

See page 2 for Trim Inserts.

CS CONTRACTOR SELECT — LITHONIA LIGHTING

Catalog Number	
Notes	A
Type	

Contractor Select™

ESX1 LED

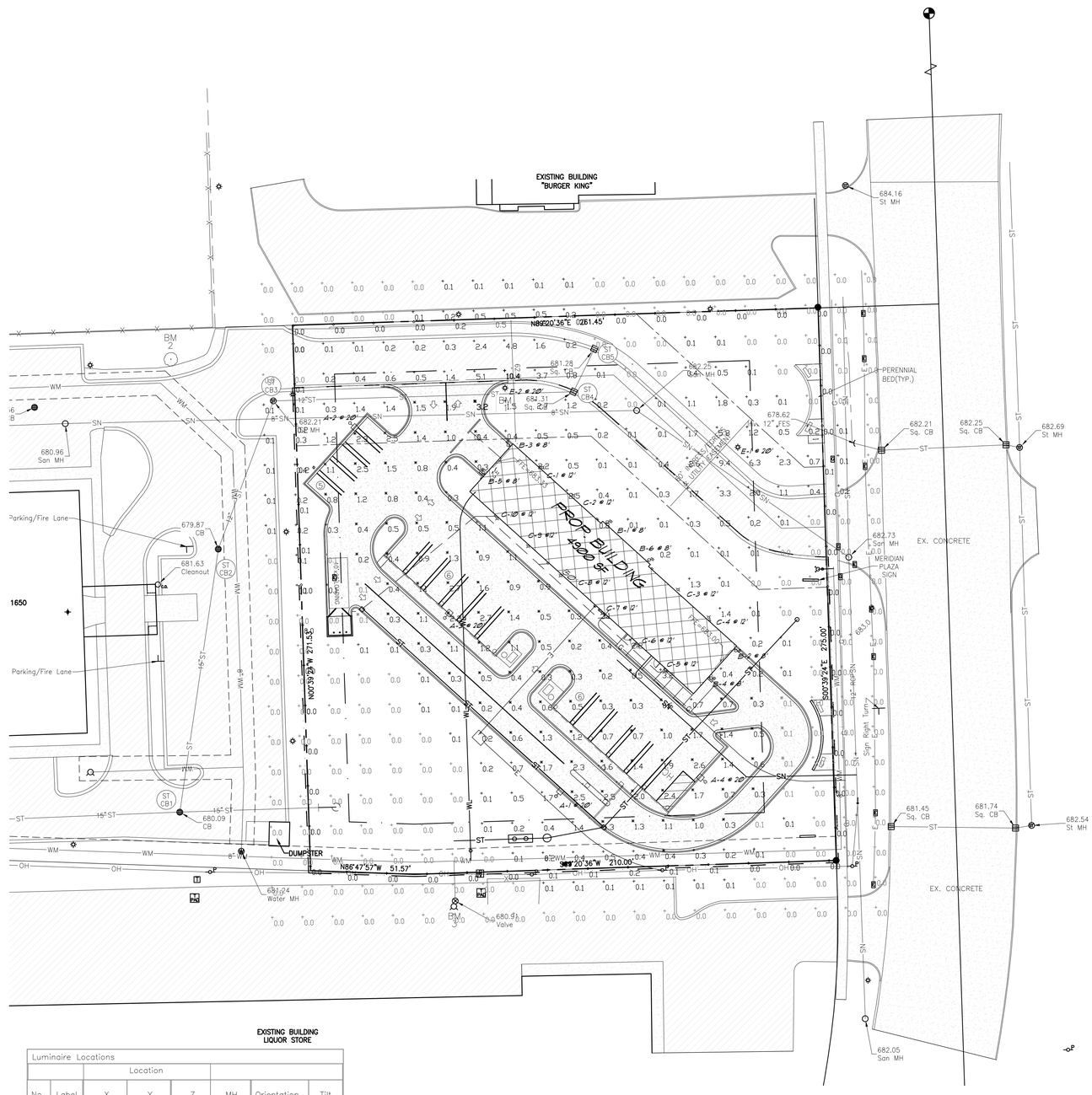
Area Luminaire

The ESX1 LED area luminaire provides the combination of best product, best price and best delivery and is ideal for replacing 150W to 400W HID luminaires. ESX provides up to 76% energy savings, long service life and fast payback. All ESX1 luminaires feature adjustable light output, providing two light levels from each luminaire, allowing greater flexibility in the field and on distributors' shelves. ESX LED is competitively priced and always in stock for quick delivery.

FEATURES:
- Replaces 150W to 400W HID
- 8,000 to 25,000 lumens
- Adjustable Light Output (ALO) technology (default set to high)
- Type 3 optic available in 4000K and 5000K
- Reversible arm mounts onto minimum 3.5" round and square poles

Luminaire Package	CCT	High Lumens	High Watts	Low Lumens	Low Watts	Finish	Voltage	Catalog Number	CI Code	UPC	Pallet qty.	Replaces Up To
ESX1 LED P2	4000K	14,000	98W	8,000	50W	DARK BRONZE	120-277V	ESX1 LED P2 40K R3 MVOLT UPA BLS DDBXD M2	*26WPG3	00194994038302	80	150W to 250W
	5000K	14,000	98W	8,000	50W	DARK BRONZE	120-277V	ESX1 LED P2 50K R3 MVOLT UPA BLS DDBXD M2	*26WPC9	00194994038355	80	
ESX1 LED P4	4000K	25,000	190W	21,000	146W	DARK BRONZE	120-277V	ESX1 LED P4 40K R3 MVOLT UPA BLS DDBXD M2	*26WPG8	00194994038349	80	400W
	5000K	25,000	190W	21,000	146W	DARK BRONZE	120-277V	ESX1 LED P4 50K R3 MVOLT UPA BLS DDBXD M2	*26WPH1	00194994038531	80	

Note: Not all ESX1 configuration options are included in the Contractor Select program. More configurations are available. Click here or visit www.acuitybrands.com and search for ESX1 LED.
All luminaires feature adjustable light output, a reversible arm for mounting on round and square poles and dark bronze finish. The lumen output and input watts shown are nominal values.



EXISTING BUILDING
LIQUOR STORE

Schedule									
Symbol	Label	Quantity	Manufacturer	Catalog Number	Description	Number Lamps	Lumens Per Lamp	Light Loss Factor	Wattage
	A	4	Lithonia Lighting	ESX1 LED P1 40K R3	Contractor Select ESX LED Area Luminaire Size 1 P1 Lumen Package 4000K CCT Type R3 Distribution	1	7874	0.82	49.58
	B	6	Lithonia Lighting	OLLWD LED P1 40K MVOLT	OUTDOOR LED WALL CYLINDER DOWN LIGHT & 4000K NICHIA 219C	1	576	0.82	9.02
	C	10	Lithonia Lighting	6BPMW HL LED	6" 3000K CCT, 950 Lumens 120v Matte White LED Module, 80CRI	1	944	0.82	15.26

Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
SITE #1	+	0.5 fc	10.4 fc	0.0 fc	N/A	N/A
Property Line	◇	0.0 fc	0.5 fc	0.0 fc	N/A	N/A
Parking	✕	1.0 fc	3.2 fc	0.1 fc	32.0:1	10.0:1

Luminaire Locations								
		Location						
No.	Label	X	Y	Z	MH	Orientation	Tilt
1	A	120.54	35.46	20.00	20.00	43.33	0.00
2	A	21.17	222.10	20.00	20.00	131.49	0.00
1	B	147.64	169.54	8.00	8.00	43.62	0.00
2	B	210.12	106.80	8.00	8.00	132.95	0.00
3	B	100.48	209.34	8.00	8.00	312.17	0.00
1	C	116.37	198.52	12.00	12.00	0.00	0.00
2	C	131.40	184.41	12.00	12.00	0.00	0.00
3	C	182.57	136.59	12.00	12.00	0.00	0.00
4	C	197.69	122.58	12.00	12.00	0.00	0.00
5	C	175.62	96.85	12.00	12.00	0.00	0.00
6	C	162.16	109.25	12.00	12.00	0.00	0.00
7	C	144.78	125.67	12.00	12.00	0.00	0.00
8	C	124.42	144.67	12.00	12.00	0.00	0.00
9	C	108.41	159.60	12.00	12.00	0.00	0.00
10	C	93.33	173.58	12.00	12.00	0.00	0.00
3	A	66.38	124.65	20.00	20.00	45.46	0.00
4	A	194.64	40.75	20.00	20.00	313.49	0.00
4	B	197.37	93.18	8.00	8.00	132.95	0.00
5	B	87.73	195.72	8.00	8.00	312.17	0.00
6	B	167.01	151.42	8.00	8.00	43.62	0.00

LIGHTING PLAN

SCALE: 1" = 30'-0"

LEGEND

- PROPERTY LINE
- SETBACK
- EASEMENT
- ST — PROPOSED STORM
- WM — PROPOSED WATER
- UE — PROPOSED UNDERGROUND ELECTRIC
- G — PROPOSED GAS
- SN — PROPOSED SANITARY
- ST — EXISTING STORM
- WM — EXISTING WATER
- OH — EXISTING ELECTRIC
- G — EXISTING GAS
- SN — EXISTING SANITARY
- EXISTING CENTERLINE OF DITCH
- 910 — EXISTING CONTOUR
- 910 — PROPOSED CONTOUR
- SILT FENCE/GRADING LIMIT
- DRAINAGE AREA
- NEW SOFFIT LIGHTING
- NEW BUILDING MOUNTED LIGHTING
- NEW POLE-MOUNTED LIGHT
- EXISTING UTILITY POLE
- ex.mh EXISTING MANHOLE
- ex.cb EXISTING CATCH BASIN
- MH S-1 PROPOSED MANHOLE
- CB R-1 NEW CATCH BASIN
- EX. FH EXISTING FIRE HYDRANT
- NEW FH #3 NEW FIRE HYDRANT
- T/A 832.20 PROPOSED ELEVATION
- x 660.90 EXISTING ELEVATION
- EXISTING BUILDING
- EXISTING ASPHALT PAVING
- EXISTING CONCRETE PAVING
- EXISTING GRAVEL PAVING
- PROPOSED CONCRETE
- PROPOSED BUILDING

ZIPPY BELLEVILLE

DESIGNERS
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BUILDERS
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email: design@vanston.com
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Zippy Auto Wash

Belleville Rd.

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	6-17-22
REVISED	8-10-22
REVISED	10-18-22
REVISED	11-22-22

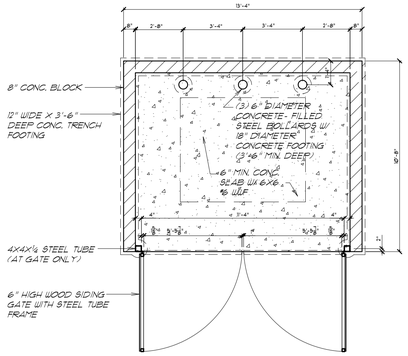
DRAWN BY: GAH
JOB NO.: 2967

LIGHTING PLAN

SHEET NO.

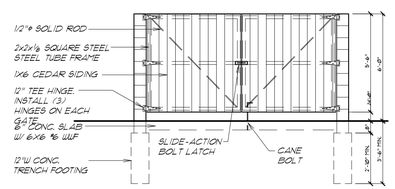
C-6

\\FILESERVER1\DesignDept\PROJECT FILES\2967 Zippy 6 Belleville\AUTOCAD\35ite\C-6.dwg, 11/23/2022 10:16:51 AM



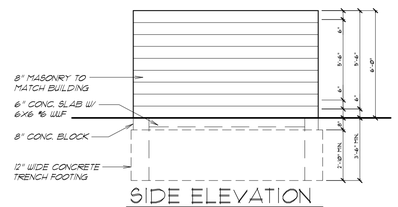
REFUSE STATION PLAN

SCALE: NONE



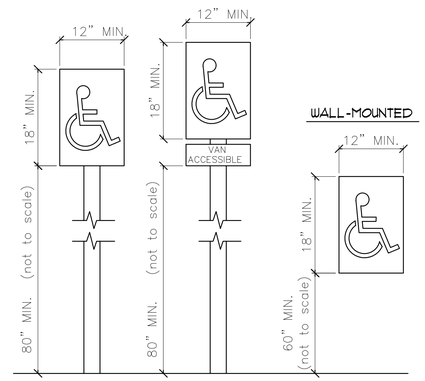
FRONT ELEVATION

SCALE: NONE



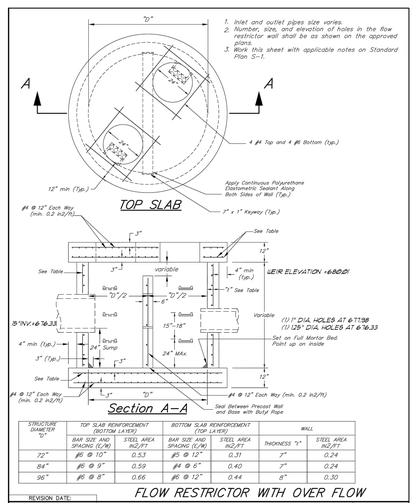
SIDE ELEVATION

SCALE: NONE



NOTE: EACH ACCESSIBLE PARKING SPACE IS REQUIRED TO HAVE A SIGN. THE SIGN SHALL BE CENTERED IN THE PARKING SPACE. VAN ACCESSIBLE SPACES SHALL BE DESIGNATED "VAN ACCESSIBLE" ON THE FACE OF THE SIGN OR SHALL HAVE AN ADDITIONAL SIGN "VAN ACCESSIBLE" MOUNTED BELOW THE REQUIRED SIGN.

BARRIER-FREE PARKING SIGN



STRUCTURE DIAMETER "D"	TOP SLAB REINFORCEMENT (BOTTOM LAYER)		BOTTOM SLAB REINFORCEMENT (TOP LAYER)		WALL	
	BAR SIZE AND SPACING (L/W)	STEEL AREA IN2/FT	BAR SIZE AND SPACING (L/W)	STEEL AREA IN2/FT	THICKNESS "T"	STEEL AREA IN2/FT
72"	#5 @ 10"	0.53	#5 @ 12"	0.31	7"	0.24
84"	#5 @ 9"	0.59	#4 @ 6"	0.40	7"	0.24
96"	#5 @ 8"	0.66	#5 @ 12"	0.44	8"	0.30

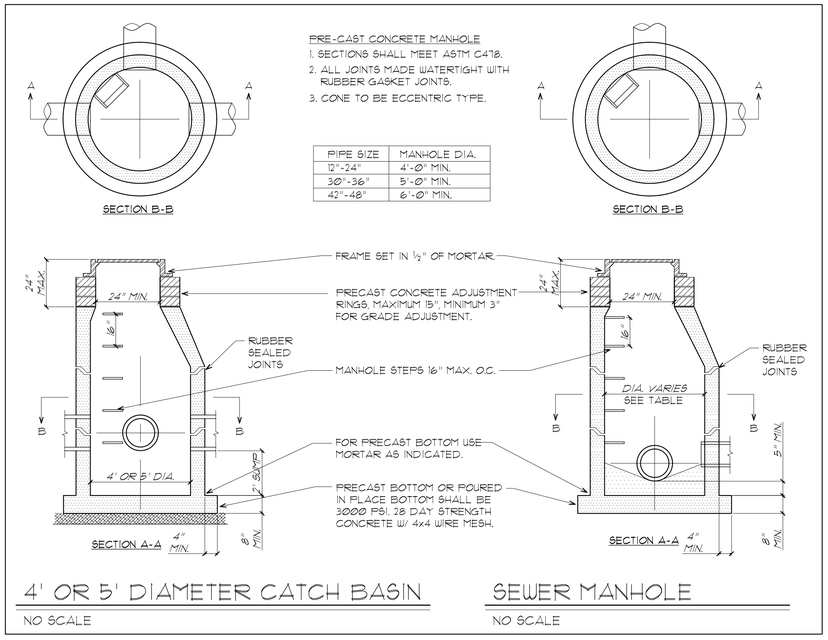
FLOW RESTRICTOR WITH OVER FLOW

REVISION DATE:
DIRECTOR OF ENGINEERING
DIVISION PERMIT ENGINEER

WAYNE COUNTY DEPARTMENT OF PUBLIC SERVICES
ENGINEERING DIVISION/PERMIT OFFICE
PERMIT STANDARDS

PRECAST FLOW RESTRICTOR STRUCTURE

SCALE NOT TO SCALE
FR-2
SHEET 1 OF 1



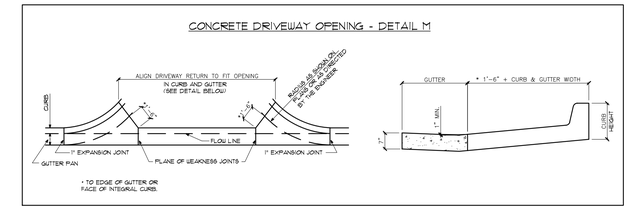
PIPE SIZE	MANHOLE DIA.
12"-24"	4'-0" MIN.
30"-36"	5'-0" MIN.
42"-48"	6'-0" MIN.

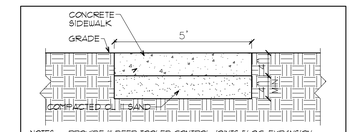
4' OR 5' DIAMETER CATCH BASIN

NO SCALE

SEWER MANHOLE

NO SCALE

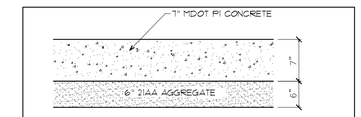




NOTES: PROVIDE 1" DEEP TOOLED CONTROL JOINTS 5' O.C. EXPANSION JOINTS ONE-HALF INCH (1/2") THICKNESS COMPOSED OF SOME SUITABLE INERT MATERIAL THOROUGHLY IMPREGNATED WITH BITUMINOUS OR ASPHALTIC COMPOUND. SHALL BE PLACED BETWEEN WALKS, CURBS, DRIVEWAYS AND AT ALL PLACES WHERE THEY MEET AND IN INTERMEDIATE JOINTS AT DISTANCES NOT EXCEEDING FIFTY FEET (50') AND SHALL EXTEND FROM THE FINISHED SIDEWALK SURFACE FOR THE FULL DEPTH OF THE SIDEWALK.

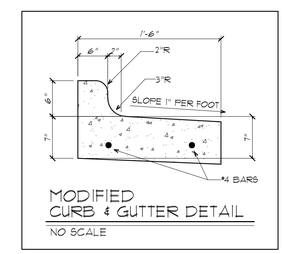
CONCRETE SIDEWALK DETAIL

NO SCALE



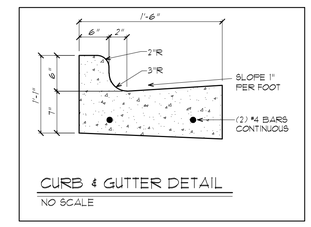
TYPICAL CONC. PAVEMENT SECTION

NO SCALE



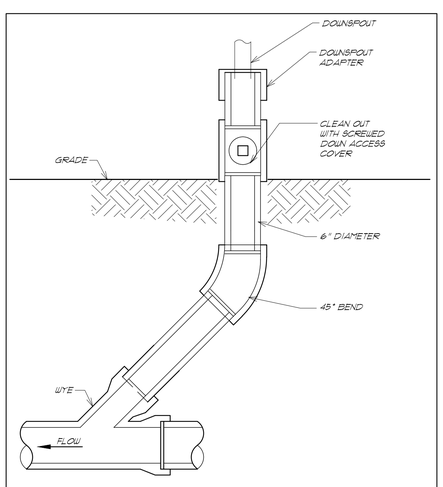
MODIFIED CURB & GUTTER DETAIL

NO SCALE



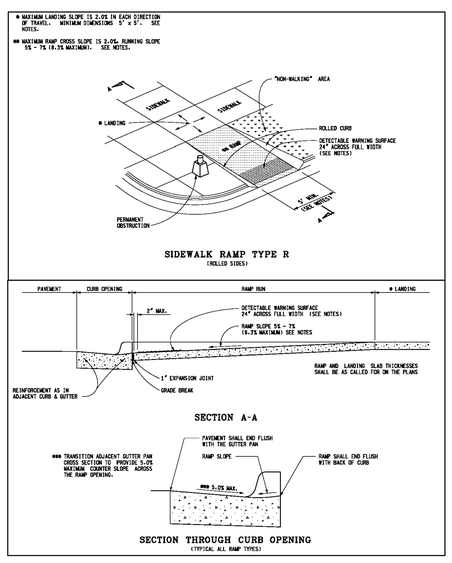
CURB & GUTTER DETAIL

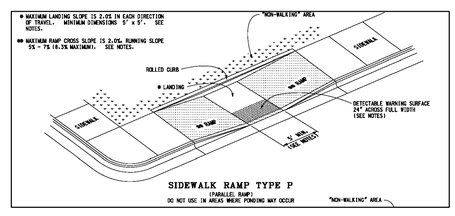
NO SCALE

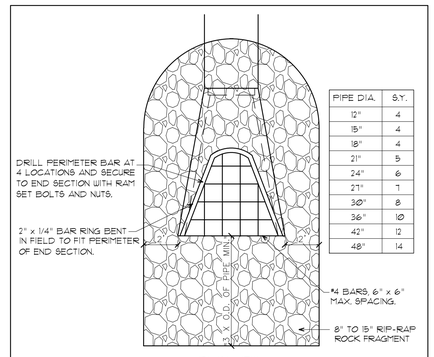


DOWNSPOUT RISER DETAIL

NO SCALE







PIPE DIA.	S.Y.
12"	4
15"	4
18"	4
21"	5
24"	6
27"	7
30"	8
36"	10
42"	12
48"	14

PLAN VIEW

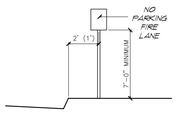
NOTE: MINIMUM REQUIREMENTS FOR RIP-RAP MATERIAL SHALL MEET MDOT SPECIFICATION 8.19.02.

STONE RIP-RAP

NOT TO SCALE

LATERAL CLEARANCE

IN URBAN AREAS, A MINIMUM CLEARANCE OF TWO FEET BETWEEN CURB FACE AND SIGN INSTALLATION SHOULD BE MAINTAINED, BUT A CLEARANCE OF ONE FOOT FROM CURB FACE IS PERMISSIBLE WHERE SIDEWALK WIDTH IS LIMITED OR WHERE EXISTING POLES ARE CLOSE TO THE CURB.



NOTE: SIGNS TO BE ERECTED PARALLEL TO DRIVE.

POSTS AND MOUNTING

SIGN SUPPORTS SHOULD BE OF A BREAKAWAY OR YIELDING DESIGN. CONCRETE BASES FOR SIGN SUPPORTS SHOULD BE FLUSH WITH GROUND LEVEL.

NO PARKING - FIRE LANE

NO SCALE

ZIPPY BELLEVILLE

DESIGNERS
Vanston/O'Brien, Inc.
BUILD
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Ann Arbor, MI 48103
Tel: (734) 424-0661
Fax: (734) 424-0677
email: design@vanston.com ◆ www.vanston.com

Zippy Auto Wash
Belleville Rd.
Van Buren Township, Michigan

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ISSUED FOR:	DATE:
PRELIMINARY SITE PLAN	1-17-22
REVISED	8-10-22
REVISED	10-18-22
REVISED	11-22-22

DRAWN BY: GAH
JOB NO.: 2967

DETAIL SHEET

SHEET NO.
C-7

\\FILESERVER1\DesignDept\PROJECT FILES\2967 Zippy 6 Belleville\AUTOCAD\3Site\C-7.dwg, 11/23/2022 10:17:06 AM

Storm Water Control Design Calculations

Characteristic	Existing Conditions	Proposed Conditions
Total Development Area (ac)	1.25	1.25
Impervious Area (ac)	0.00	0.63
Total Pervious Area (ac)	1.25	0.62
Pervious Area Breakdown by Cover Type		
Meadow/fallow/natural areas (non-cultivated)	0 acres	0 acres
Predominant NRCS Soil Type (A, B, C, or D)	D	D
Improved areas (turf grass, landscape, row crops)	1.25 acres	0.62 acres
Predominant NRCS Soil Type (A, B, C, or D)	D	D
Wooded Areas	0.00 acres	0.00 acres
	D	D
Calculated CPVC Volume (cubic feet)		2844 CF
CPVC Volume Provided (cubic feet)		0 CF
CPRC Volume Provided (cubic feet)		5404 CF

DETENTION BASIN VOLUME CALCULATIONS & OUTLET DESIGN FOR ON-SITE RUNOFF

	C VALUE	Area (FT^2)	Area (ACRES)
Surface Water	1	0	0.00
Impervious	0.95	27397	0.63
Pervious	0.3	27001	0.62
C=	0.63	A=	1.25 ACRES

100 YEAR FLOOD VOLUME REQUIRED

Time of Concentration	T_{IN} =	10.0 MIN.
100-yr Peak Intensity	$I_{100} = 101 / (12.33+T)^{0.84}$	7.435 in/hr
100-yr Allowable Release Rate	Q_a (allowable) =	0.100 CFS/AC
100-yr Peak Allowable Discharge	$Q_O = Q_a \times A$ =	0.125 CFS
100-yr Peak Pond Inflow	$Q_i = C \times I_{100} \times A$ =	5.825 CFS
100-yr Peak Runoff Volume	V_r =18,900 x C x A =	14807 CF
Storage Ratio	$V_s / V_r = 0.206 - 0.15 \ln(Q_o / Q_a)$ =	0.782
100-yr Required Storage Volume	**$V_s = V_r$ x storage ratio**	**11585 CF**

CHANNEL PROTECTION VOLUME CONTROL (CPVC)

V_{CPVC} = 3630 x A x C= **2844 CF** **0 CF PROVIDED**

The on-site clay soils are not feasible for providing infiltration therefore this volume shall not be discounted from the 100 year outlet.

CHANNEL PROTECTION RATE CONTROL (CPRC)

V_{CPRC} = 6897 x A x C= **5404 CF**

$Q_{CPRC} = V_{CPRC}$ / 172.800 = 0.031 CFS

100 Year FLOOD CONTROL (V_{100})

$V_{100} = V_s - V_{CPVC}$ = **11585 CF**

FIRST FLUSH VOLUME

V_{FF} = 545 x A x C= **427** CF

Mechanical Pretreatment shall be provided.

CPRC X_{CPRC} = 677.98

100 YEAR X_{100} = 680.01

OUTLET CONTROL STRUCTURE

CPRC DISHARGE

THE AVERAGE DISCHARGE RATE FOR CPRC FROM SITE IN 48 HRS.

$Q_{CPRC} = V_{CPRC}$ / 172.800 = 0.031 CFS

PLACE OPENINGS IN STANDPIPE AT BOTTOM OF BASIN = 676.83

TO DETERMINE THE APPROPRIATE SIZE ORIFICE TO RELEASE THE VOLUME, AN AVERAGE HEAD VALUE MUST BE USED IN THE ORIFICE EQUATION. IF THE BASIN IS DESIGNED TO BE TRAPEZOIDAL IN SHAPE, 2/3 OF THE TOTAL HEAD IS AN ACCEPTABLE APPROXIMATION FOR THE AVERAGE HEAD.

$h_{AVE} = 0.5 \times (X_{CPRC}$ - BOTTOM BASIN ELEV.)= 0.57 FT

$A = Q_{RF} / (0.62 \times (2 \times 32.2 \times h_{AVE})^{0.5})$ = 0.0083 FT^2

A	1.25	INCH DIAMETER ORIFICE HAS AN AREA OF		0.0085 SF
A/ 0.0085		=	0.97	
THEREFORE, USE	1	1.25 INCH DIA. HOLES AT ELEV. =	676.83	

100 YEAR FLOOD

Q_o = ALLOWABLE DISCHARGE= 0.125 CFS

Q_o IS A PEAK OR MAXIMUM FLOW. CALCULATE THE MAXIMUM FLOW PASSING THROUGH CPRC ORIFICES, USING THE TOTAL HEAD, AND SUBTRACT FROM Q_o TO DETERMINE THE ORIFICE SIZE TO RELEASE THE 100 YEAR STORM VOLUME:

$Q_{CPRC} = 0.62 \times \#HOLES_{CPRC} \times AREA$ EACH HOLE$\times(2*32.2*(X_{100}-X_{BOTTOM\ BASIN})^{0.5}$

Q_{CPRC} = 0.076 CFS

$Q_o - Q_{CPRC}$= 0.049 CFS

$A = Q_o / (0.62 * (2 * 32.2 * (X_{100}-X_{CPRC})^{0.5})$ = 0.007 SF

A	1.00	INCH DIAMETER ORIFICE HAS AN AREA OF	0.005	SF
A/ 0.005		=	1.27	
THEREFORE, USE	1	1.00 INCH DIA. HOLES AT ELEV. =	677.98	

Project: Zippy Belleville

Chamber Model -	DC-780	
Units -	Imperial	
	100	
Number of Chambers -	153	
Voids in the stone (porosity) -	30	%
Base of Stone Elevation -	676.33	ft
Amount of Stone Above Chambers -	6	in
Amount of Stone Below Chambers -	9	in
Area of system -	6000	sf Min. Area - 5172 sf min. area

ADS StormTech

StormTech DC-780 Cumulative Storage Volumes

Height of System (inches)	Incremental Single Chamber (cubic feet)	Incremental Total Chamber (cubic feet)	Incremental Stone (cubic feet)	Incremental Ch & St (cubic feet)	Cumulative Chamber (cubic feet)	Elevation (feet)
45	0.00	0.00	150.00	150.00	11705.33	680.08
44	0.00	0.00	150.00	150.00	11555.33	680.00
43	0.00	0.00	150.00	150.00	11405.33	679.91
42	0.00	0.00	150.00	150.00	11255.33	679.83
41	0.00	0.00	150.00	150.00	11105.33	679.75
40	0.00	0.00	150.00	150.00	10955.33	679.66
39	0.06	8.86	147.34	156.20	10805.33	679.58
38	0.17	25.51	142.35	167.85	10649.13	679.50
37	0.29	43.85	136.84	180.70	10481.28	679.41
36	0.61	93.49	121.95	215.44	10300.58	679.33
35	0.81	123.99	112.80	236.79	10085.14	679.25
34	0.96	146.74	105.98	252.71	9848.35	679.16
33	1.08	165.70	100.29	265.99	9595.63	679.08
32	1.19	181.71	95.49	277.20	9329.65	679.00
31	1.27	194.92	91.52	286.44	9052.45	678.91
30	1.36	208.70	87.39	296.09	8766.00	678.83
29	1.45	222.52	83.24	305.77	8469.91	678.75
28	1.53	233.64	79.91	313.55	8164.15	678.66
27	1.59	243.43	76.97	320.40	7850.60	678.58
26	1.65	252.68	74.20	326.88	7530.20	678.50
25	1.71	261.46	71.56	333.02	7203.32	678.41
24	1.76	269.68	69.10	338.78	6870.30	678.33
23	1.81	277.39	66.78	344.17	6531.53	678.25
22	1.86	284.62	64.62	349.23	6187.35	678.16
21	1.90	291.40	62.58	353.98	5838.12	678.08
20	1.95	297.76	60.67	358.43	5484.14	678.00
19	1.99	303.74	58.88	362.62	5125.71	677.91
18	2.02	309.35	57.19	366.55	4763.09	677.83
17	2.06	314.61	55.62	370.23	4396.54	677.75
16	2.09	319.54	54.14	373.68	4026.32	677.66
15	2.12	324.14	52.76	376.90	3652.64	677.58
14	2.15	328.43	51.47	379.90	3275.74	677.50
13	2.17	332.42	50.27	382.69	2895.84	677.41
12	2.20	336.12	49.16	385.28	2513.15	677.33
11	2.22	339.54	48.14	387.68	2127.87	677.25
10	2.24	343.13	47.06	390.19	1740.19	677.16
9	0.00	0.00	150.00	150.00	1350.00	677.08
8	0.00	0.00	150.00	150.00	1200.00	677.00
7	0.00	0.00	150.00	150.00	1050.00	676.91
6	0.00	0.00	150.00	150.00	900.00	676.83
5	0.00	0.00	150.00	150.00	750.00	676.75
4	0.00	0.00	150.00	150.00	600.00	676.66
3	0.00	0.00	150.00	150.00	450.00	676.58
2	0.00	0.00	150.00	150.00	300.00	676.50
1	0.00	0.00	150.00	150.00	150.00	676.41

STORM SEWER INVENTORY:

STORM MH #1
RIM=680.55
INV. W=673.53 (24" RCP)
INV. E=673.79 (15" RCP)
INV. N=673.75 (15" RCP)

STORM MH #2
RIM=680.17
INV. W=675.07 (15" RCP)
INV. E=675.25 (15" RCP)

STORM CB #1
RIM=680.09
INV. W=675.96 (15" RCP)
INV. E=676.14 (15" RCP)
INV. N=676.09 (15" RCP)

STORM CB #2
RIM=679.87
INV. S=676.27 (15" RCP)
INV. NE=676.47 (12" RCP)

STORM CB #3
RIM=682.21
INV. SW=676.69 (12" RCP)
INV. E=676.89 (12" RCP)

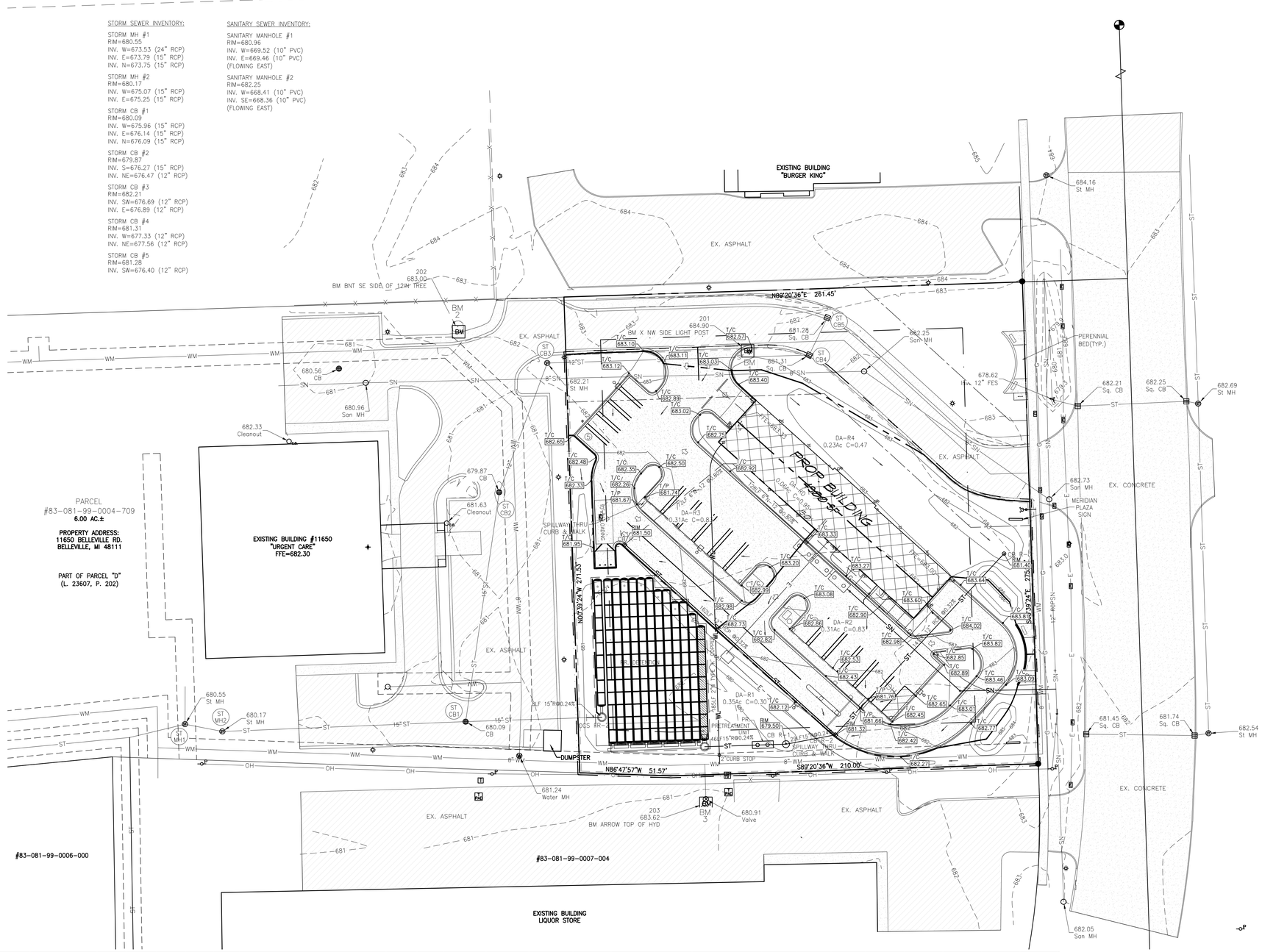
STORM CB #4
RIM=681.31
INV. W=677.33 (12" RCP)
INV. NE=677.56 (12" RCP)

STORM CB #5
RIM=681.28
INV. SW=676.40 (12" RCP)

SANITARY SEWER INVENTORY:

SANITARY MANHOLE #1
RIM=680.96
INV. W=669.52 (10" PVC)
INV. E=669.46 (10" PVC)
(FLOWING EAST)

SANITARY MANHOLE #2
RIM=682.25
INV. W=668.41 (10" PVC)
INV. SE=668.36 (10" PVC)
(FLOWING EAST)



STORM SEWER DESIGN COMPUTATIONS

FROM	TO	ACRES A	AREA IMPERV 0.95	AREA PERV 0.3	RUNOFF COEFF C	EQUIV. AREA A * C	CUMM. AREA A*C	INTEN-SITY I	TIME OF CONC. TC	ADD'L RUNOFF A*C*I	RUNOFF (CFS) Q	PIPE LENGTH (LF)	PIPE DIA. (IN)	PIPE SLOPE	MANNING'S COEFF. n	MANNING FLOW CAPACITY	VELOCITY PIPE FLOWING FULL >2.5(FT/S)	TIME (MIN)	RUNOFF VELOCITY (FT/S)	HYDRAULIC GRADIENT SLOPE %	HG ELEV UPPER END	HG ELEV LOWER END	RIM ELEV UPPER END	INVERT UPPER END	INVERT LOWER END	RIM-INV	RIM-HG >2	PIPE COVER SPRINGLINE >3.0	FLOW THRU CASTING	STRUCTURE DIA FT
RD	R-3	0.056	0.056	0.000	0.95	0.053	0.053	4.38	15.00		0.23	200	6	0.80%	0.011	0.59	3.03	1.10	1.2	0.12%	680.30	678.70	683.00	679.90	678.30	3.10	2.70	2.85	0.23	
R-3	R-2	0.308	0.250	0.058	0.83	0.255	0.255	4.26	16.10		1.32	162	12	0.32%	0.013	2.02	2.57	1.05	1.7	0.14%	678.70	678.18	681.50	677.90	677.38	3.60	2.80	2.95	1.08	4
R-2	R-1	0.311	0.253	0.058	0.83	0.258	0.512	4.15	17.15	0.44	2.82	29	15	0.24%	0.013	3.17	2.59	0.19	2.3	0.19%	678.18	678.11	681.32	677.18	677.11	4.14	3.14	3.44	1.07	4
R-1	R-0	0.349	0.000	0.349	0.30	0.105	0.617	4.13	17.34		3.26	46	15	0.24%	0.011	3.75	3.06	0.25	2.7	0.18%	678.11	678.00	679.50	677.11	677.00	2.39	1.39	1.76	0.43	5
R-4	R-2	0.226	0.058	0.168	0.47	0.105	0.105	4.38	15.00		0.46	141	12	0.32%	0.013	2.02	2.57	0.91	0.6	0.02%	678.43	677.98	681.40	677.63	677.18	3.77	2.97	3.27	0.46	2

DRAINAGE PLAN

SCALE: 1" = 30'-0"

LEGEND

PROPERTY LINE
SETBACK
EASEMENT
PROPOSED STORM
PROPOSED WATER
PROPOSED UNDERGROUND ELECTRIC
PROPOSED GAS
PROPOSED SANITARY
EXISTING STORM
EXISTING WATER
EXISTING ELECTRIC
EXISTING GAS
EXISTING SANITARY
EXISTING CENTERLINE OF DITCH
EXISTING CONTOUR
PROPOSED CONTOUR
SILT FENCE/GRADING LIMIT
DRAINAGE AREA

NEW SOFFIT LIGHTING
NEW BUILDING MOUNTED LIGHTING
NEW POLE-MOUNTED LIGHT
EXISTING UTILITY POLE
EXISTING MANHOLE
EXISTING CATCH BASIN
PROPOSED MANHOLE
NEW CATCH BASIN
EXISTING FIRE HYDRANT
NEW FIRE HYDRANT
PROPOSED ELEVATION
EXISTING ELEVATION

EXISTING BUILDING
EXISTING ASPHALT PAVING
EXISTING CONCRETE PAVING
EXISTING GRAVEL PAVING
PROPOSED CONCRETE
PROPOSED BUILDING

ZIPPY BELLEVILLE

DESIGNERS
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DRAWN BY: GAH
JOB NO.: 2967

DRAINAGE PLAN

SHEET NO.
C-8

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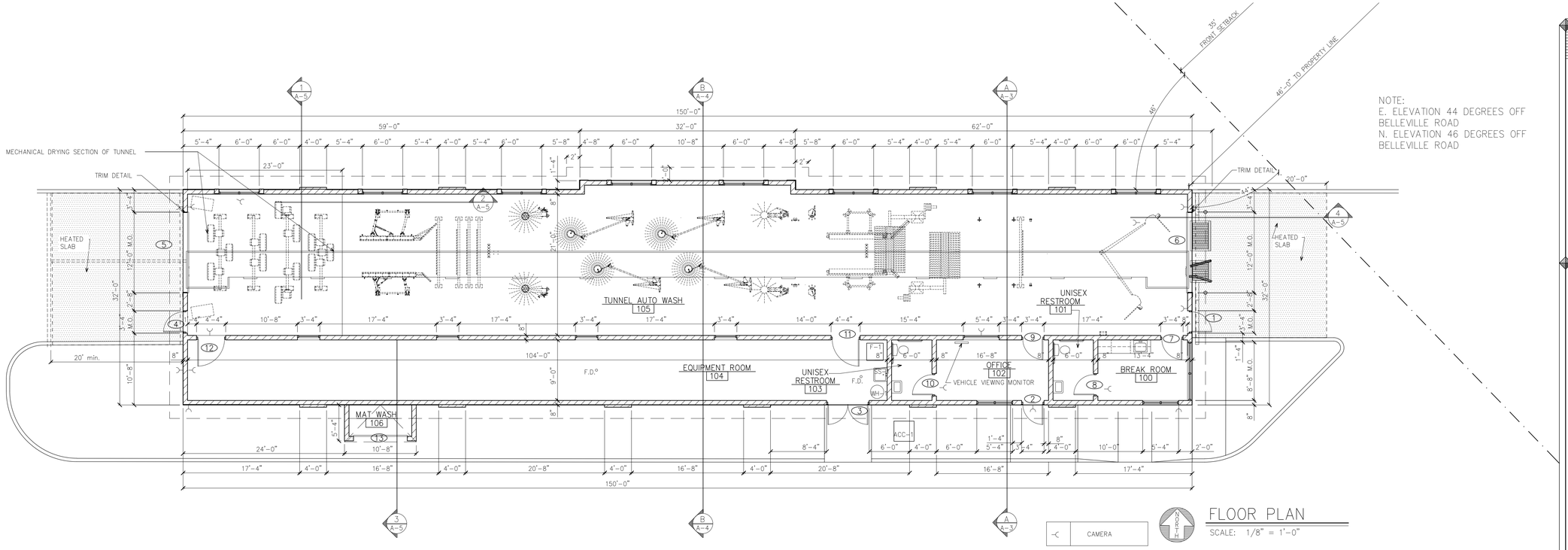
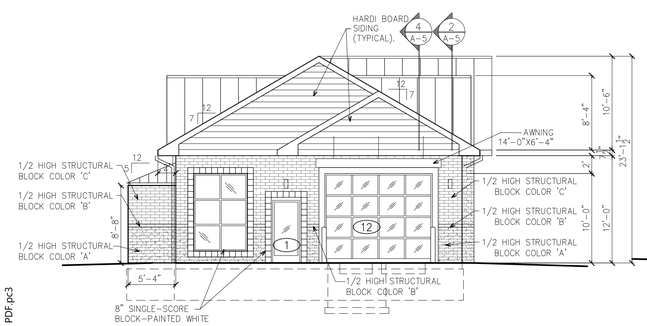
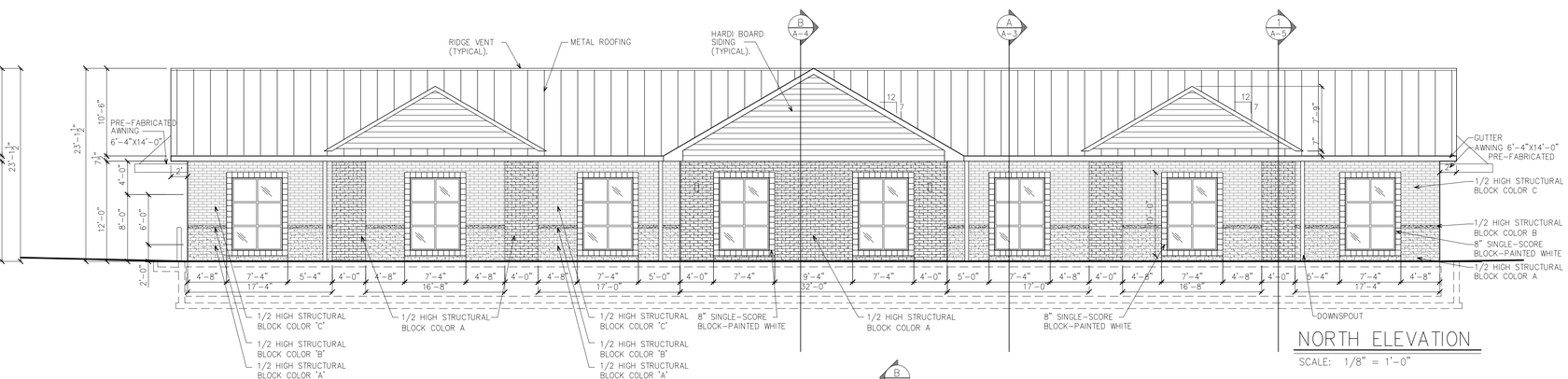


NOTE:
E. ELEVATION 44 DEGREES OFF BELLEVILLE ROAD
N. ELEVATION 46 DEGREES OFF BELLEVILLE ROAD

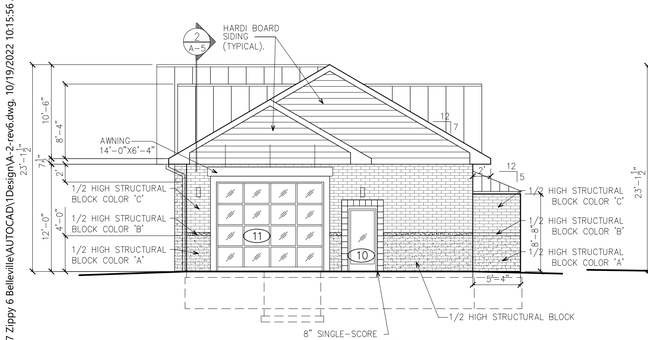
FLOOR PLAN
SCALE: 1/8" = 1'-0"



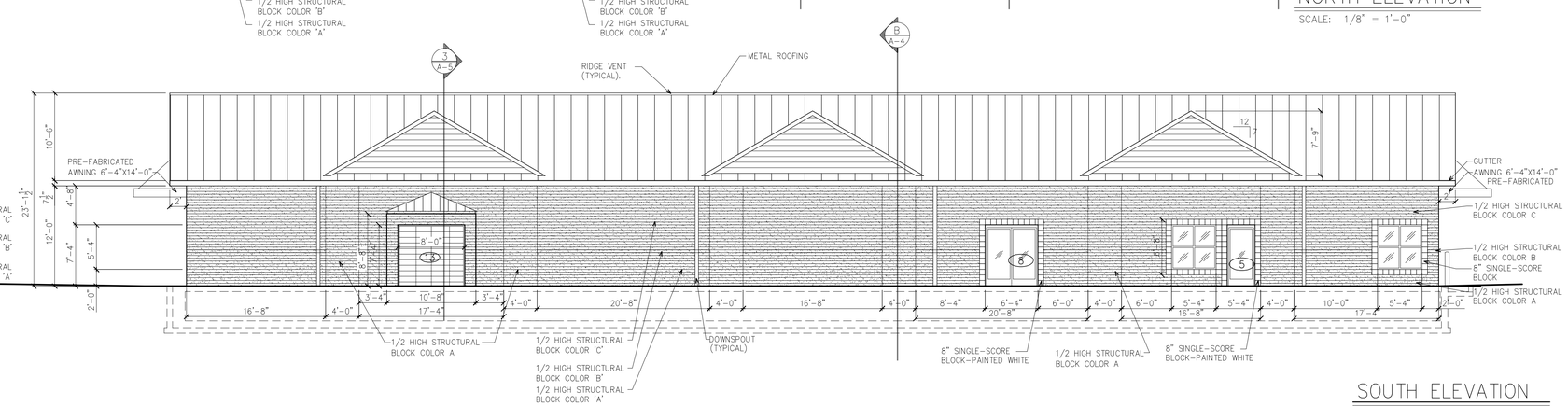
EAST ELEVATION
SCALE: 1/8" = 1'-0"



NORTH ELEVATION
SCALE: 1/8" = 1'-0"



WEST ELEVATION
SCALE: 1/8" = 1'-0"



SOUTH ELEVATION
SCALE: 1/8" = 1'-0"

MATERIALS CHART	
MATERIAL	
1/2 HIGH – STRUCTURAL BLOCK	MATCH FENDT BUILDERS SUPPLY COLOR 408 COLOR A,B,C
GLASS	CLEAR – W/ ALUM ANODIZED FRAMES
SINGLE SCORE BLOCK	SINGLE SCORE 8" – WATERBORNE WHITE EPOXY
HARDI–BOARD SIDING TRIM	WHITE HARDI– BOARD
ROOFING	JENSEN OCEAN BLUE
SOFFIT	WHITE ALUMINUM – VENTED
TRIM	WATER BORN WHITE EPOXY

MATERIALS CHART												
MATERIAL	EAST		WEST		NORTH		SOUTH		TOTAL	
	SFT	%	SFT	%	SFT	%	SFT	%	SFT	%
1/2 HIGH STRUCTURAL	126	33	204	53	1216	67.5	1539	85.5	3,085	70.5
GLASS	196	51	144	38	416	23.1	201	11.2	957	22
SINGLE SCORE BLOCK	62	16	36	9	168	9.4	60	3.3	326	7.5
SIDING/HARDI TRIM*	198		198		346		246		396	
FACADE SFT	384 SFT		384 SFT		1800 SFT		1800 SFT		4,368 SFT	

SIDING/HARDI TRIM* – NOT PART OF 50% GLASS REQUIREMENT, PART OF ROOF ELEVATION

ZIPPY – BELLEVILLE

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ISSUED FOR:	DATE:
PRELIMINARY SITE REVIEW	6-17-22
REV #1 SITE REVIEW	7-27-22
PLANNING REVIEW	09-06-22
PLANNING REVIEW	10-19-22

DRAWN BY: RL
JOB NO.: 2967

BUILDING FLOOR PLAN & ELEVATIONS

SHEET NO.
A-1

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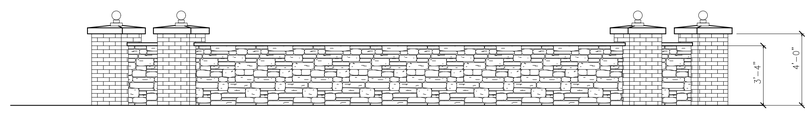
SOUTH EAST ABOVE

NORTH EAST ABOVE

BELLEVILLE ROAD

BELLEVILLE ROAD NO STREET TREES

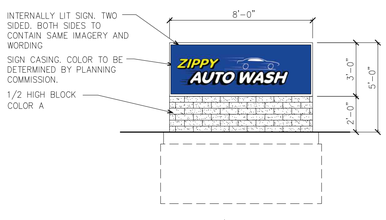


SCREEN WALL ELEVATION
TO MATCH EXISTING

SCALE: 1/4" = 1'-0"

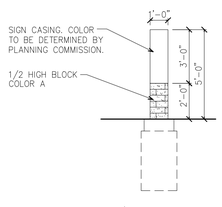
SIGN CALCULATIONS FOR C-2 DISTRICT:
GROUND MONUMENT SIGN:
MAX HEIGHT = 8'-0" PROVIDED : 5'-0" TOTAL
MAX AREA = 30 SQ FT PROVIDED : 24 SQFT
BASE MIN 2'-0" HEIGHT MASONRY PROVIDED : 2'-0" MASONRY BASE

WALL SIGN: NOT PROVIDED AT THIS TIME.
3 SF PER 1 LN FT BLDG FRONT MAX 300 SF
150x3=450 SF = MAX 300 SQ FT.



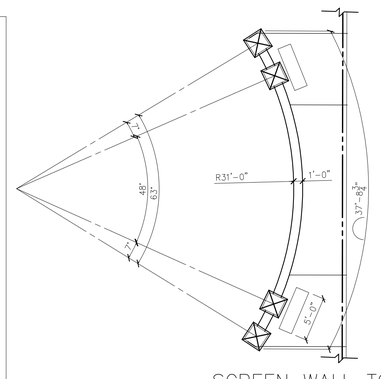
NORTH/SOIUTH
MONUMENT SIGN

SCALE: 1/4" = 1'-0"



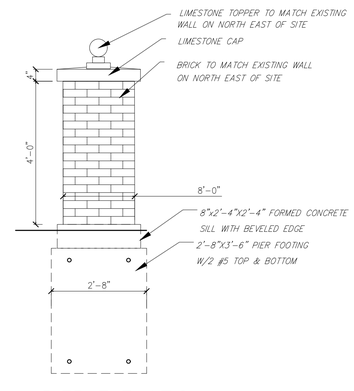
EAST/WEST
MONUMENT SIGN

SCALE: 1/4" = 1'-0"



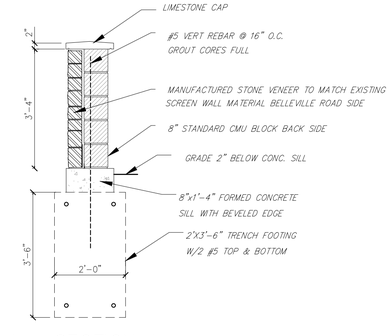
SCREEN WALL TO
MATCH EXISTING

SCALE: 1/8" = 1'-0"



PIER ELEVATION

1/2"=1'-0"



WALL SECTION 1

1/2"=1'-0"

PROPOSED BENCH CONCEPT

FINAL SELECTION TO BE APPROVED BY TOWNSHIP

ZIPPY - BELLEVILLE

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ISSUED FOR:	DATE:
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PLANNING REVIEW	10-19-22

DRAWN BY: RL
JOB NO.: 2967

CONCEPTUAL RENDERINGS

SHEET NO.

A-2

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