

OFFICE/RETAIL SPACE

PID# 18-24-400-021

N. SAGINAW RD

VIENNA TOWNSHIP

GENESEE COUNTY

SEC 24, T9N-R6E

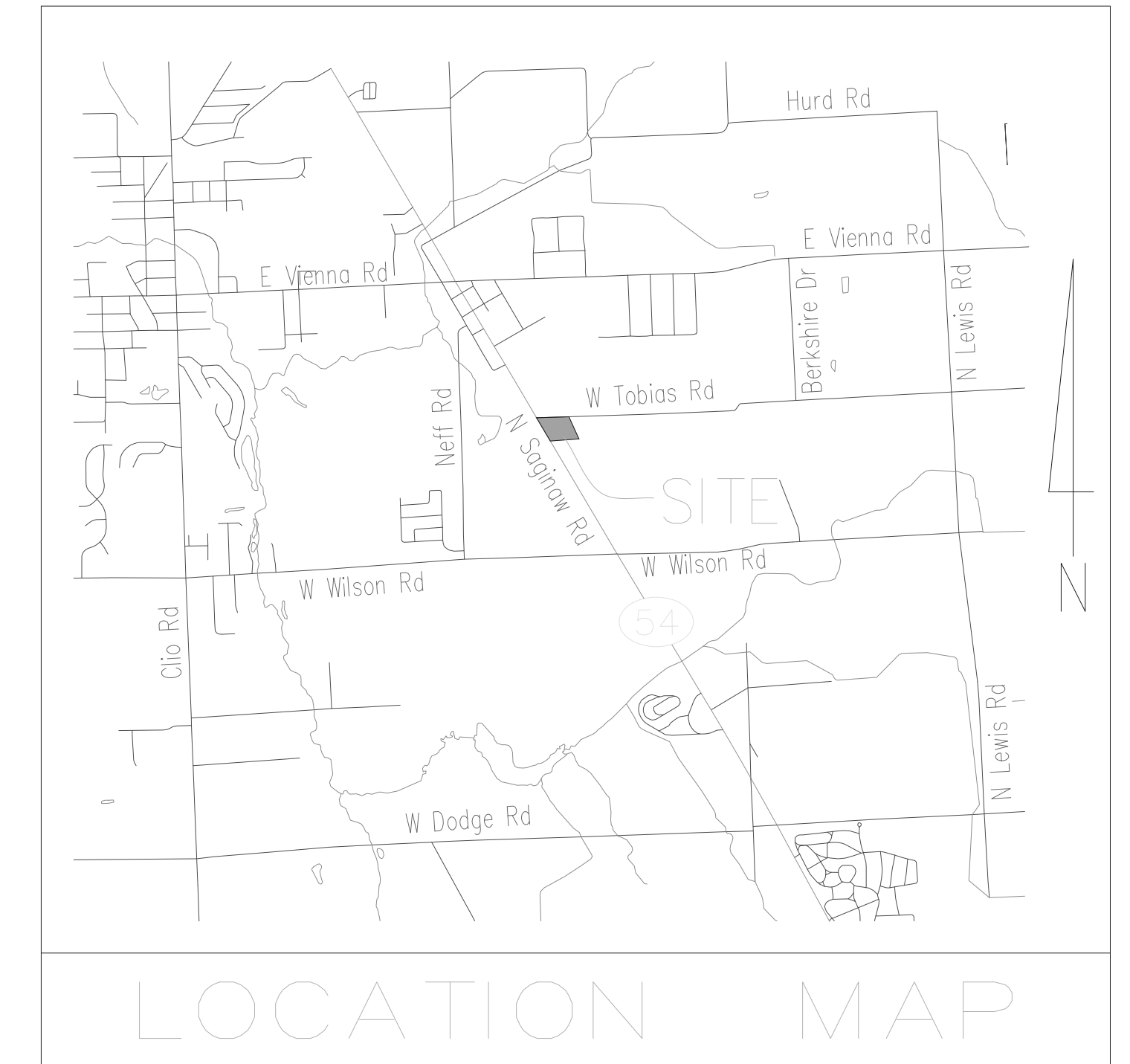
FOR:

STEVE GROSS

1267 FARRAND ROAD

CLIO, MI 48420

810-691-1461



GCDC-WWS 10 STANDARD NOTES

- EXTENSION OF PUBLIC UTILITIES: All public sanitary sewer and/or watermain SHALL be extended to the furthest limits of the property, including corner lots, with the pipe size and material approved by GCDC-WWS. This is necessary for plan approval. For water service of 1" or less or a building corner lot, the requirements to extend the public watermain and/or sanitary sewer along both property lines will be reviewed. Final determination shall be made by GCDC-WWS.
- WATERMAIN LOOPING: All public watermain shall be looped whenever possible. The pipe size requirements shall be approved by GCDC-WWS.
- INDUSTRIAL PRETREATMENT PROGRAM (IPP): This permit is required for all commercial (non-residential) and industrial discharges. The OWNER shall obtain an Industrial Pretreatment Discharge Permit prior to the issuance of a Sewer Connection Permit. Industrial Discharge Permits are non-transferable. Changes in facility use will require a new Industrial Discharge Permit. For more information call Anthony Ragnone Treatment Plant at (810) 232-7662.
- SOIL EROSION: The DEVELOPER and/or OWNER shall submit a detailed Soil Erosion and Sedimentation Control plan and obtain an Act 451 Part 91, Soil Erosion and Sedimentation Control permit. This includes the payment of fees and the providing of necessary bonds. No earth changes or excavation shall be started prior to the issuance of this permit. The DEVELOPER and/or Owner shall protect all existing and proposed storm sewer facilities on and adjacent to the site during excavation and construction. All sediment shall be contained on site. Any silt in county drains, storm sewer, culverts, etc. as a result of this project, shall be removed by the DEVELOPER and/or OWNER at the cost of the DEVELOPER and/or OWNER.
- FLOOD PLAIN OR WETLAND CONSTRUCTION: The DEVELOPER and/or OWNER shall apply to EGLE for a permit for the alteration and/or occupation of a flood plain or floodway, as required under PA 451. Evidence of this permit may be required prior to plan approval by GCDC-WWS.
- NPDES STORM WATER DISCHARGE PERMIT: The owner of the property shall obtain a NPDES Storm Water Discharge permit for construction activities from EGLE as required under Public Act 451. The notice of coverage form shall be submitted through GCDC-WWS with the Soil Erosion Control permit application. All EGLE fees shall accompany the Notice of Coverage. Evidence of this permit may be required prior to plan approval by GCDC-WWS.
- GENESEE COUNTY PERMIT TO CONSTRUCT A PUBLIC UTILITY: After the approval of this preliminary plot or site plan, the DEVELOPER shall submit a detailed plan for construction of all public sanitary sewer and watermain. The plans must have GCDC-WWS approval, a S-permit issued, and approval from EGLE prior to beginning construction.
- GENESEE COUNTY ROAD COMMISSION PERMIT: The DEVELOPER shall obtain a permit from the Genesee County Road Commission to perform work within the Genesee County Road Commission Right-of-Way. All Fees for the permit, bonds and insurances are the responsibility of the developer.
- MUNICIPALITY SANITARY SEWER AND WATER PERMIT: Prior to the issuance of a building permit by the local municipality, the developer shall be required to obtain a sanitary sewer and/or water tap-in permit from the local municipality, if authorized, or GCDC-WWS.
- STATE CONSTRUCTION PERMITS: The sanitary sewer and watermain construction permits from the Michigan Department of Energy, Great Lakes and Environment shall be submitted to the EGLE after approval of GCDC-WWS. Construction shall not begin until these state permits are issued.

INDEX OF SHEETS:

- SHEET 1 - NATURAL FEATURES PLAN
- SHEET 2 - SITE/UTILITY PLAN
- SHEET 3 - STORM WATER PLAN
- SHEET 4 - STORM CALCULATION SHEET
- SHEET 5 - SOIL EROSION CONTROL PLAN
- SHEET 6 - SOIL EROSION DETAILS
- SHEET 7 - LANDSCAPING PLAN
- SHEET 8 - TRAFFIC FLOW
- SHEET 9 - ENTRANCE OFF TOBIAS RD.
- SHEET 10 - LIGHTING PLAN
- SHEET 11 - DETAIL SHEET
- SHEET 12 - GCDC-WWS STANDARD DETAILS
- SHEET 13 - GCDC PRESSURE PIPE DETAILS
- SHEET 14 - GCDC-WWS STANDARD NOTES

PROPERTY DESCRIPTION

LAND SITUATED IN VIENNA TOWNSHIP, GENESEE COUNTY, MICHIGAN TO-WIT:

A PARCEL OF LAND BEGINNING SOUTH 01°02'41" WEST, 2649.93 FEET AND NORTH 88°55'21" WEST, 759.92 FEET FROM THE NORTH 1/4 CORNER OF SECTION 24, TOWNSHIP 9 NORTH, RANGE 6 EAST; THENCE SOUTH 27°45'41" EAST, 371.01 FEET; THENCE NORTH 88°55'21" WEST, 418.49 FEET; THENCE NORTH 27°45'41" WEST, 371.01 FEET; THENCE SOUTH 88°55'21" EAST, 418.49 FEET TO THE POINT OF BEGINNING.

EASEMENT STATEMENT

ALL PUBLIC SANITARY SEWERS AND PUBLIC WATERMAINS SHALL HAVE AN EASEMENT GRANTED TO GENESEE COUNTY DRAIN COMMISSION FOR MAINTENANCE, REPAIR/OR REPLACEMENT. FOR CONDOMINIUMS, THE EASEMENT SHALL BE RECORDED ON THE MASTER DEED.

NOTE: THIS PROJECT HAS BEEN DESIGNED IMPLEMENTING THE LATEST GENESEE TOWNSHIP AND GCDC-WWS DESIGN SPECIFICATIONS. CAREFULLY REVIEW THE NOTES, DETAILS AND DESIGN PRIOR TO SUBMITTING A BID. FULL COMPLIANCE WITH THE NEW STANDARDS WILL BE REQUIRED.

DISTURBED AREA = 2.63 ± ACRES

A NPDES N.O.C. PERMIT IS NOT REQUIRED AFTER RECEIPT OF SESC PERMIT FROM GCDC

Surveyor does not guarantee that all utilities are shown or their locations. It is the responsibility of the contractor and developer to contact Miss Dig and any other involved agencies to locate all utilities prior to construction. Removal, relocation and/or replacement is the responsibility of the contractor.

CAUTION!!!

THE LOCATION AND ELEVATIONS OF EXISTING UNDERGROUND UTILITIES SHOWN ON THIS DRAWING ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY OF THIS INFORMATION. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT UTILITY LOCATIONS AND ELEVATIONS PRIOR TO THE START OF CONSTRUCTION.

BENCHMARK NO. 1

CHISLED 'X' IN NORTH CORNER OF CONC WALK/SLAB, NORTH RIM OF SANITARY MH AT SOUTHEAST CORNER OF N SAGINAW & W TOBIAS ROADS, AS SHOWN ELEVATION - 739.87 (NAVD88)

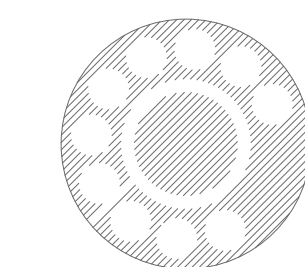
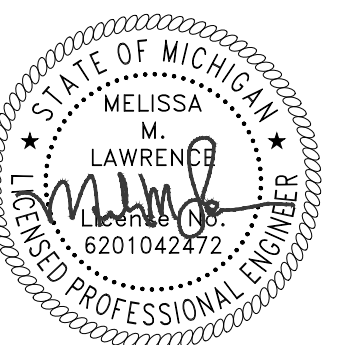
BENCHMARK NO. 2

ARROW ON TOP OF HYDRANT ALONG EAST SIDE OF N SAGINAW ROAD, AS SHOWN ELEVATION - 748.78 (NAVD88)

DATE: 10-13-2025

REVISION DATE: 5-4-2026

PLAN DISTRIBUTION LIST	CONTACT	DATES SUBMITTED	STATUS
GENESEE COUNTY DRAIN COMMISSIONER DIVISION OF WATER & WASTE SERVICES G-4610 BEECHER ROAD FLINT, MI 48532 PHONE: 810.732.7870 EMAIL: LMEINZ@GDCWWS.COM	LYN/NETTE MEINZ	12/18/2025 1/20/2026 3/18/2026 5/5/2026	UNDER REVIEW
GENESEE COUNTY DRAIN COMMISSIONER SURFACE WATER MANAGEMENT G-4610 BEECHER ROAD FLINT, MI 48532 PHONE: 810.732.1590 EMAIL: EULLAH@GDCWWS.COM	HEATHER KRONENBERG	10/13/2025 1/20/2026 3/18/2026	Approved 9-30-2026
GENESEE COUNTY DRAIN COMMISSIONER SOIL EROSION AND SEDIMENTATION CONTROL G-4610 BEECHER ROAD FLINT, MI 48532 PHONE: 810.732.1590 EMAIL: DBURROUGHS@GDCWWS.COM	DION BURROUGHS	12/18/2025 1/20/2026	Approved 12/22/2025
GENESEE COUNTY ROAD COMMISSION 221 WEST OAK STREET FLINT, MI 48902 PHONE: 810.767.4920 Email: mlande@gcrrc.org	Matt Lande	10/13/2025 1/20/2026 3/18/2026 4/1/2026	UNDER REVIEW
NATURAL GAS CONSUMERS ENERGY GAS 3202 E. COURT STREET, FLINT, MI 48906 PHONE: 810.760.3486 EMAIL: TONNA.WILCOX@CVMSENERGY.COM	TONNA WILCOX		
UNDERGROUND ELECTRIC CONSUMERS ENERGY GAS 3202 E. COURT STREET, FLINT, MI 48906 PHONE: 517.204.9018 EMAIL: PBOBOX3PTY_LVDEZ6@CVMSENERGY.COM	TRACY M. MAHAR		
VIENNA TOWNSHIP SAMANTHA MERCHANT 3400 W. VIENNA ROAD CLIO, MI 48420 PHONE: 810-554-7053 EMAIL: SMERCHANT@VIENNA.TWP.GOV	SAMANTHA MERCHANT	10/13/2025 1/20/2026 3/18/2026 5/5/2026	UNDER REVIEW
MSDOT STEVEN GASSER MOOT DAVIS/SON TSC DAVISON, MI 48423 PHONE: 810.614.0223 EMAIL: GASSERS@MICHIGAN.GOV	STEVEN GASSER	3/1/2026 3/18/2026 3/25/2026	Approved 3/24/2026



3 WORKING DAYS (72 HOURS)
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
(TOLL-FREE) FOR THE LOCATION
OF UNDERGROUND UTILITIES

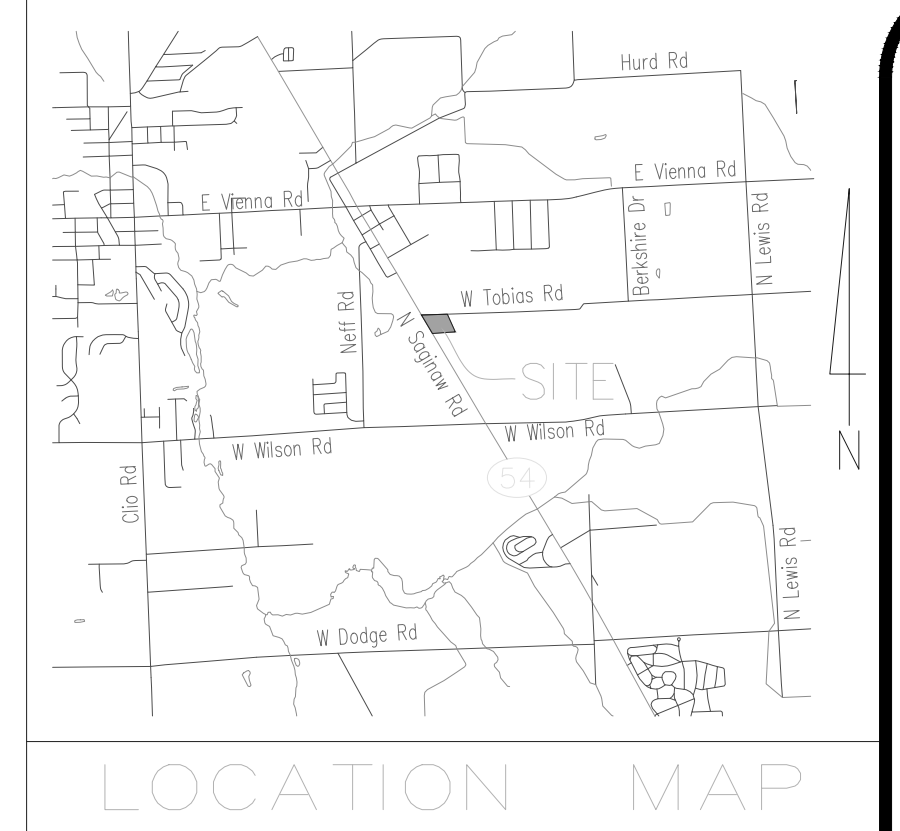
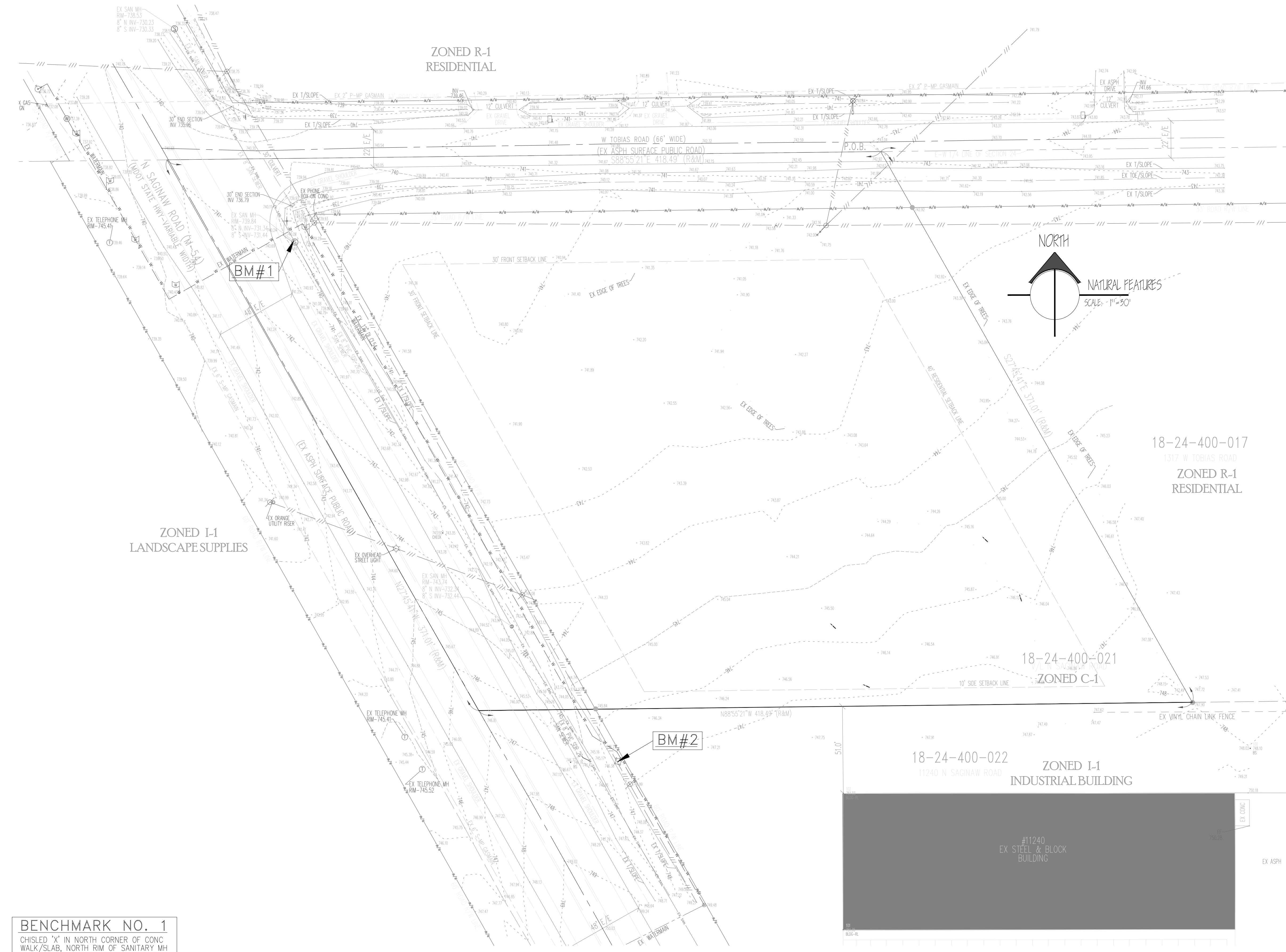


LAWRENCE ENGINEERING P.C.
CIVIL ENGINEERING - SURVEYING
4344 SILVER LAKE RD, LINDEN, MI 48451
PHONE: (810) 750-5280 Email: 1996lepc@gmail.com

PROPERTY DESCRIPTION

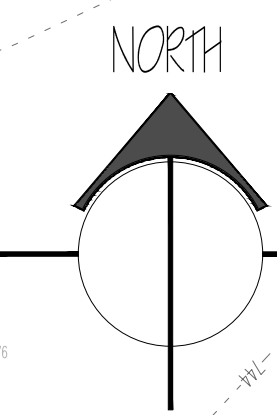
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LEGEND

- | | | | |
|-----|-----------------------------|-------------|--------------------------|
| ○ | SET IRON #55012 | — w — w — w | EX WATERMAIN |
| ● | FOUND IRON | ⊕ | EX FIRE HYDRANT |
| ■ | FOUND CONCRETE MONUMENT | ⊙ | EX WATER MANHOLE |
| ⊕ | SECTION CORNER | ⊕ | EX GATEVALVE |
| ⊙ | MEASURED | ⊕ | EX WATER MARKER |
| (R) | RECORDED | — 745.04 — | EX SURFACE ELEVATION |
| FND | FOUND | — 745 — | EX SURFACE CONTOUR |
| ⊕ | EX UTILITY POLE W/GUY WIRE | EX | EXISTING |
| ⊕ | EX UTILITY POLE W/LIGHT | ASPH | ASPHALT |
| ⊕ | EX LIGHT POLE | CONC | CONCRETE |
| ⊕ | EX OVERHEAD POWERLINES | E/E | EDGE TO EDGE |
| ⊕ | EX UTILITY PEDISTAL | FF, FFE | FINISHED FLOOR ELEVATION |
| ⊕ | EX ROAD SIGN | R/W | RIGHT OF WAY |
| ⊕ | EX MAILBOX | P.O.B. | POINT OF BEGINNING |
| ⊕ | EX STORM MANHOLE/CATCHBASIN | ▬ | EX BUILDING AREA |
| ⊕ | EX STORM SEWER | ▬ | EX PAVEMENT AREAS |
| ⊕ | EX SANITARY MANHOLE | ▬ | EX CONC AREAS |
| ⊕ | EX SANITARY CLEANOUT | | |
| ⊕ | EX SANITARY SEWER | | |
| ⊕ | EX TELEPHONE MANHOLE | | |
| ⊕ | EX WATER WELL | | |
| ⊕ | EX GASMAIN | | |
| ⊕ | EX GASMAN MARKER | | |
| ⊕ | EX GAS/ELEC METER | | |



NATURAL FEATURES
SCALE: 1"=50'

EXISTING VEGETATION NOTE:
EXISTING VEGETATION CONSISTS OF SMALL TREES AND SCRUB BRUSH. ALL EXISTING VEGETATION WILL BE CLEARED FROM THE SITE.

EXISTING ZONING INFORMATION:
ACCORDING TO THE CURRENT VIENNA TOWNSHIP ZONING ORDINANCE THIS PROPERTY IS CURRENTLY ZONED C-1 (NEIGHBORHOOD COMMERCIAL), AND IS SUBJECT TO THE FOLLOWING CONDITIONS:

- 1) MINIMUM LOT AREA = NONE SPECIFIED
- 2) MINIMUM LOT FRONTAGE = NONE SPECIFIED
- 3) FRONT SETBACK = 30 FEET
- 4) SIDE SETBACK = 10 FEET (SEE FOOTNOTE k)
- 5) REAR SETBACK = 40 FEET (SEE FOOTNOTE k)
- 6) MAXIMUM BUILDING HEIGHT = 45 FEET

FLOOD PLAIN NOTE:
THIS PROPERTY IS IN ZONE "X" (AREAS OF MINIMAL FLOODING) OF THE FLOOD INSURANCE RATE MAP COMMUNITY PANEL NO. 26049C00620D WHICH BEARS AN EFFECTIVE DATE OF SEPTEMBER 25, 2009, AND IS NOT IN A SPECIAL FLOOD HAZARD AREA.

SURVEYOR NOTES:

1. DATE OF LAST FIELD WORK: AUGUST 07, 2025.
2. THE BEARINGS ARE RELATIVE TO THE DESCRIPTION, AS PROVIDED BY CLIENT.
3. THE VERTICAL DATUM IS NORTH AMERICAN VERTICAL DATUM 1988 (NAVD88).
4. REFERENCED A SURVEY BY DAWSON LAND SURVEYING, JOB NO. 05-171, DATED 06-16-05 AND MDOT RIGHT OF WAY MAP, FILE NO. 25-R-2, SHEET NO. 89, AND TOBIAS ROAD SURVEY BY ROWE INCORPORATED, PLAN NO. 02C0021, DATED MARCH 2002.

UTILITY STATEMENT
THE UNDERGROUND UTILITIES SHOWN HAVE BEEN LOCATED FROM FIELD SURVEY INFORMATION AND EXISTING DRAWINGS, IF AVAILABLE. THE SURVEYOR AND/OR ENGINEER MAKES NO GUARANTEES THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. THE SURVEYOR AND/OR ENGINEER FURTHER DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR AND/OR ENGINEER HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES.

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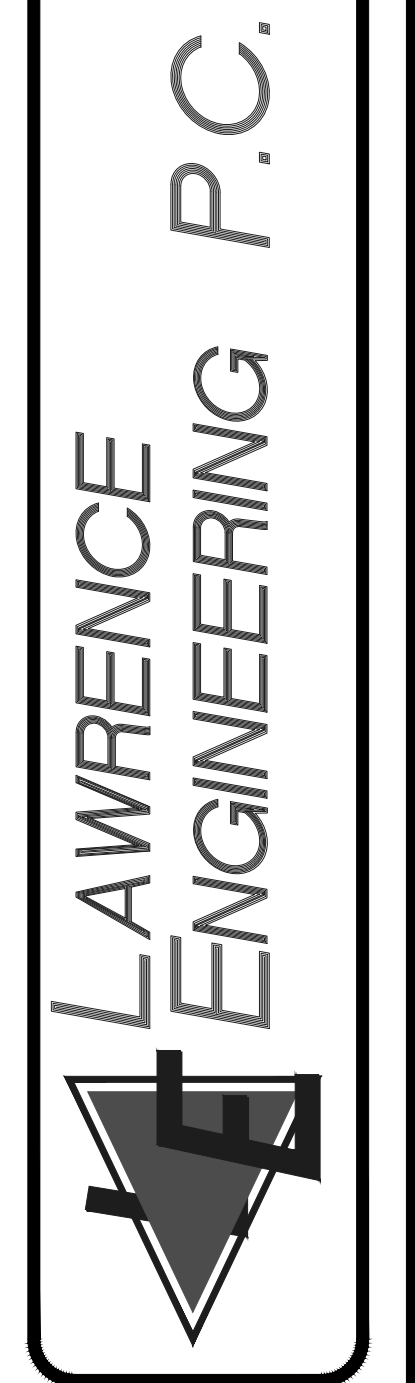
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ARROW ON TOP OF HYDRANT ALONG EAST SIDE OF N SAGINAW ROAD, AS SHOWN ELEVATION -748.78 (NAVD88)



NO.	REVISION/ISSUE	DATE	BY
1.	2025-01-13	1/20/26	BLB
2.	2025-01-13	3/2/26	BLB
3.	2025-01-13	3/2/26	BLB
4.	2025-01-13	3/2/26	BLB
5.	2025-01-13	3/2/26	BLB

SHEET TITLE:
NATURAL FEATURES PLAN

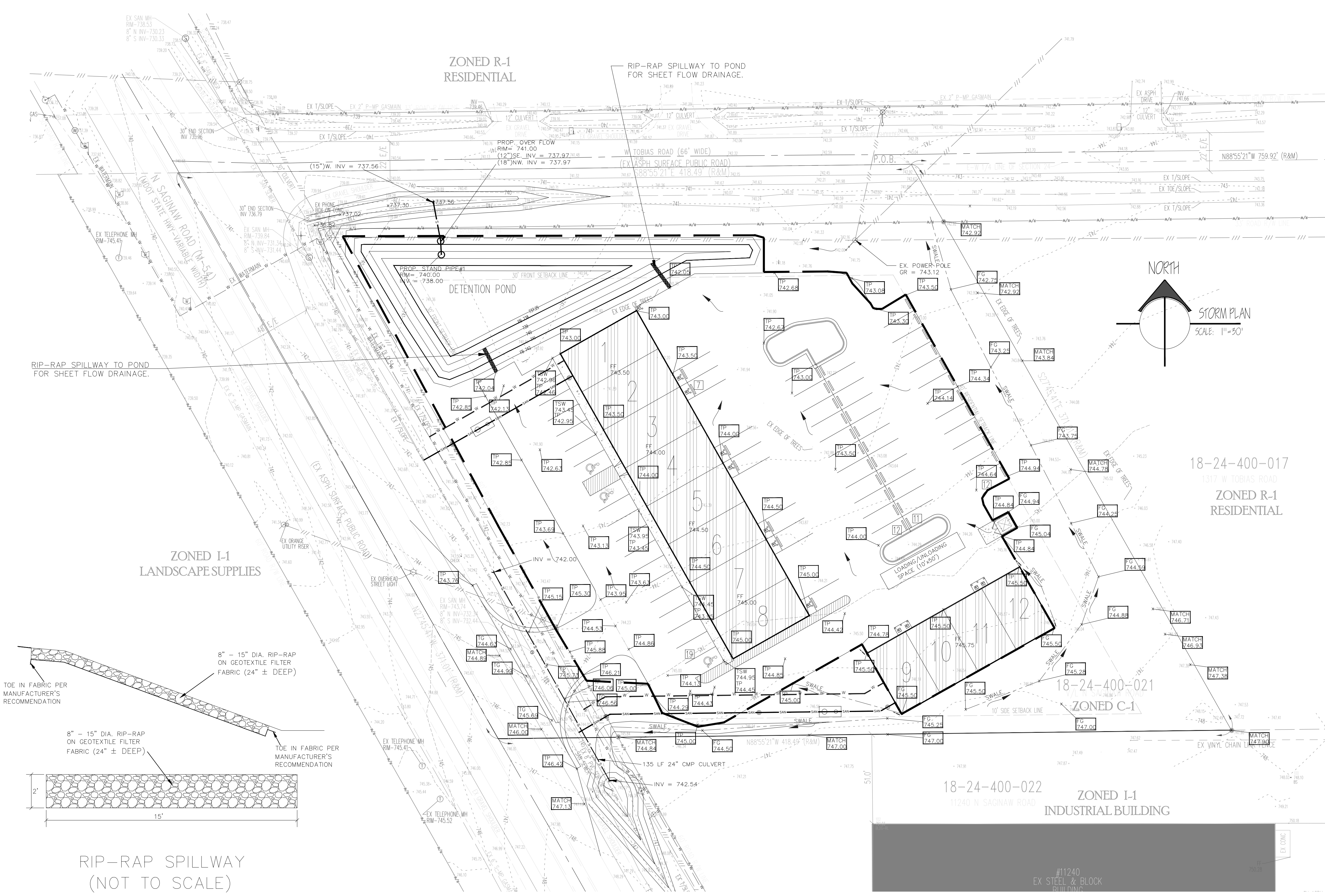
PROJECT:
4344 SILVER LAKE RD
LINDEN, MI 48451
OFFICE: (810)750-5280
FAX: (810)750-5283



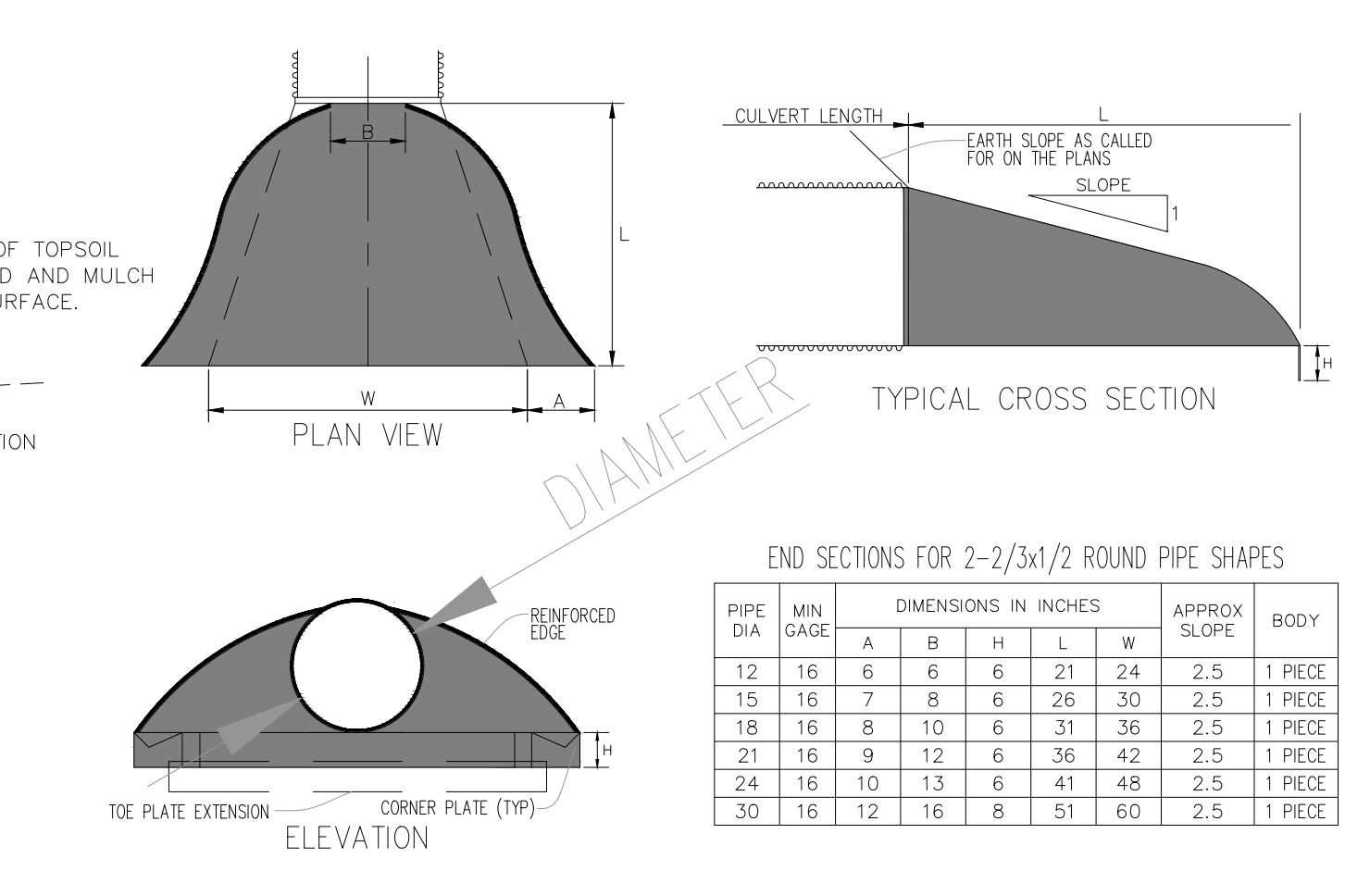
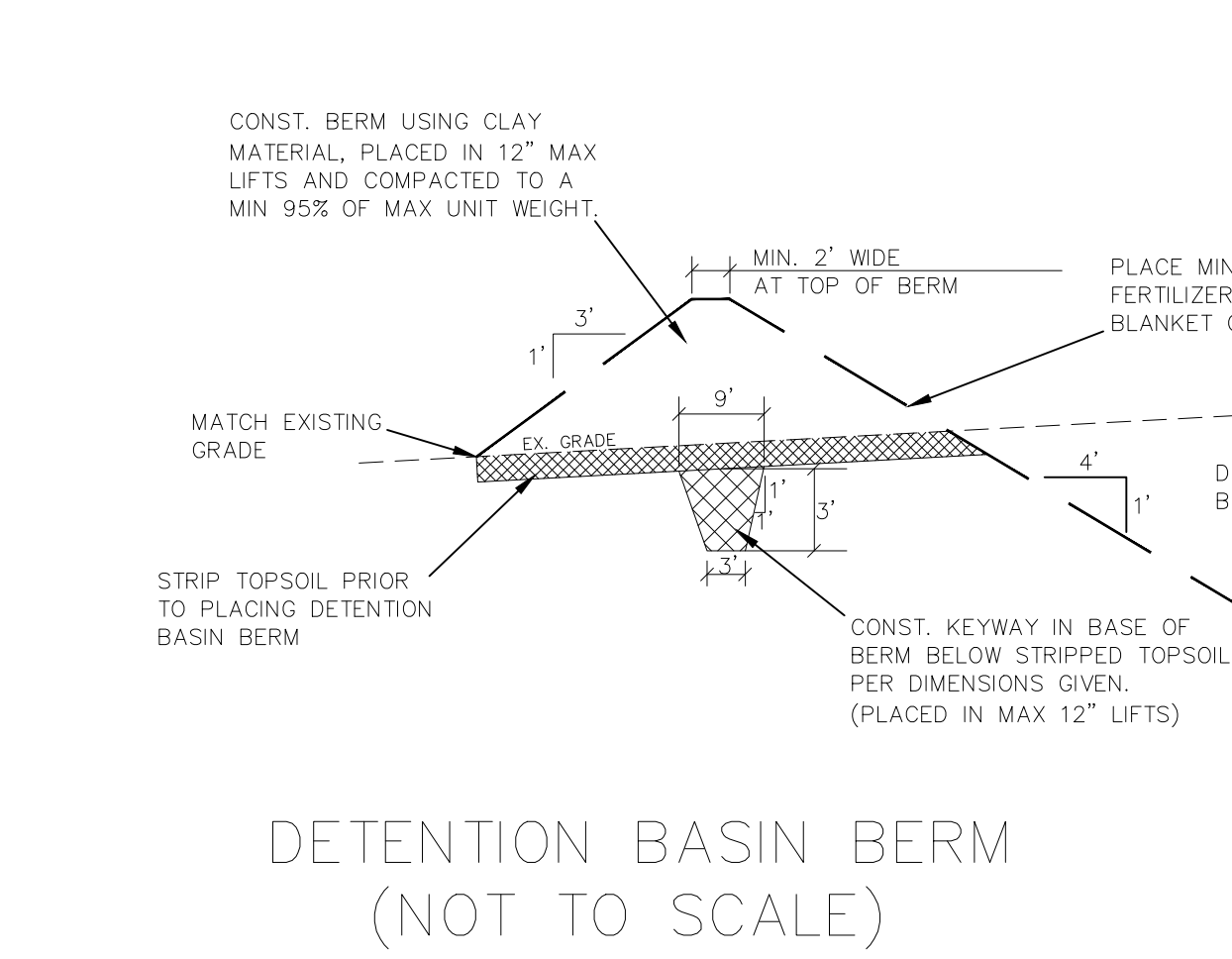
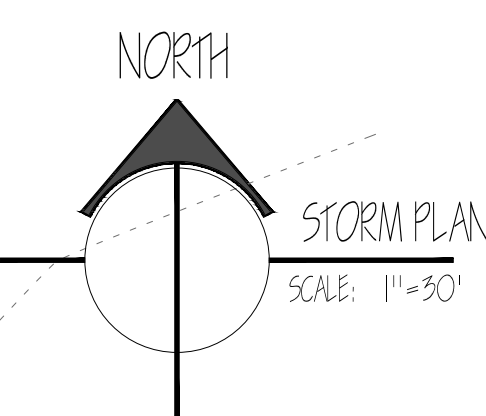
PROJECT:
OFFICE/RETAIL SPACE FOR
STEVE GROSS
1267 E. FARRAND RD.
CLLD, MI 48420
(810)691-1461

JOB NO.	DATE	DRAWN BY	CHECKED BY
2025-011	10-13-2025	BLB	MAL

SHEET: 1 OF 14



- ### LEGEND
- SET IRON #55012
 - FOUND IRON
 - ⊙ FOUND CONCRETE MONUMENT
 - ⊙ SECTION CORNER
 - (M) MEASURED
 - (R) RECORDED
 - FND FOUND
 - EX UTILITY POLE W/GUY WIRE
 - EX UTILITY POLE W/LIGHT
 - EX LIGHT POLE
 - EX OVERHEAD POWERLINES
 - EX UTILITY PEDISTAL
 - EX ROAD SIGN
 - EX MAILBOX
 - EX STORM MANHOLE/CATCHBASIN
 - EX STORM SEWER
 - EX SANITARY MANHOLE
 - EX SANITARY CLEANOUT
 - EX SANITARY SEWER
 - EX TELEPHONE MANHOLE
 - EX WATER WELL
 - EX GASMAIN
 - EX GASMAIN MARKER
 - EX GAS/ELEC METER
 - PROP. INTERIOR ASPHALT
 - PROP. BUILDING
 - PROP. ASPHALT INSIDE THE R.O.W
 - PROP. CONCRETE
 - PROP. GRAVEL
 - SITE DRAINAGE DISTRICT LINE
 - EX WATERMAIN
 - EX FIRE HYDRANT
 - EX WATER MANHOLE
 - EX GATEVALVE
 - EX WATER MARKER
 - EX SURFACE ELEVATION
 - EX SURFACE CONTOUR
 - EX EXISTING
 - ASPH ASPHALT
 - CONC CONCRETE
 - E/E EDGE TO EDGE
 - FF, FFE FINISHED FLOOR ELEVATION
 - R/W RIGHT OF WAY
 - P.O.B. POINT OF BEGINNING
 - EX BUILDING AREA
 - EX PAVEMENT AREAS
 - EX CONC AREAS
 - PROP. 6" SANITARY LEAD
 - PROP. SANITARY CLEAN-OUT
 - PROP. 2" WATER LEAD
 - PROP. DRAINAGE ARROW
 - PROP. SPOT ELEVATION
 - # PARKING SPACES



NOTES FOR ALL END SECTIONS:

ALL 3-PC. BODIES TO HAVE 12 GA. SIDES AND 10-GA. CENTER PANELS. MULTIPLE PANEL BODIES TO HAVE LAP SEAMS WHICH ARE TO BE TIGHTLY JOINED BY GALVANIZED RIVETS OR BOLTS.

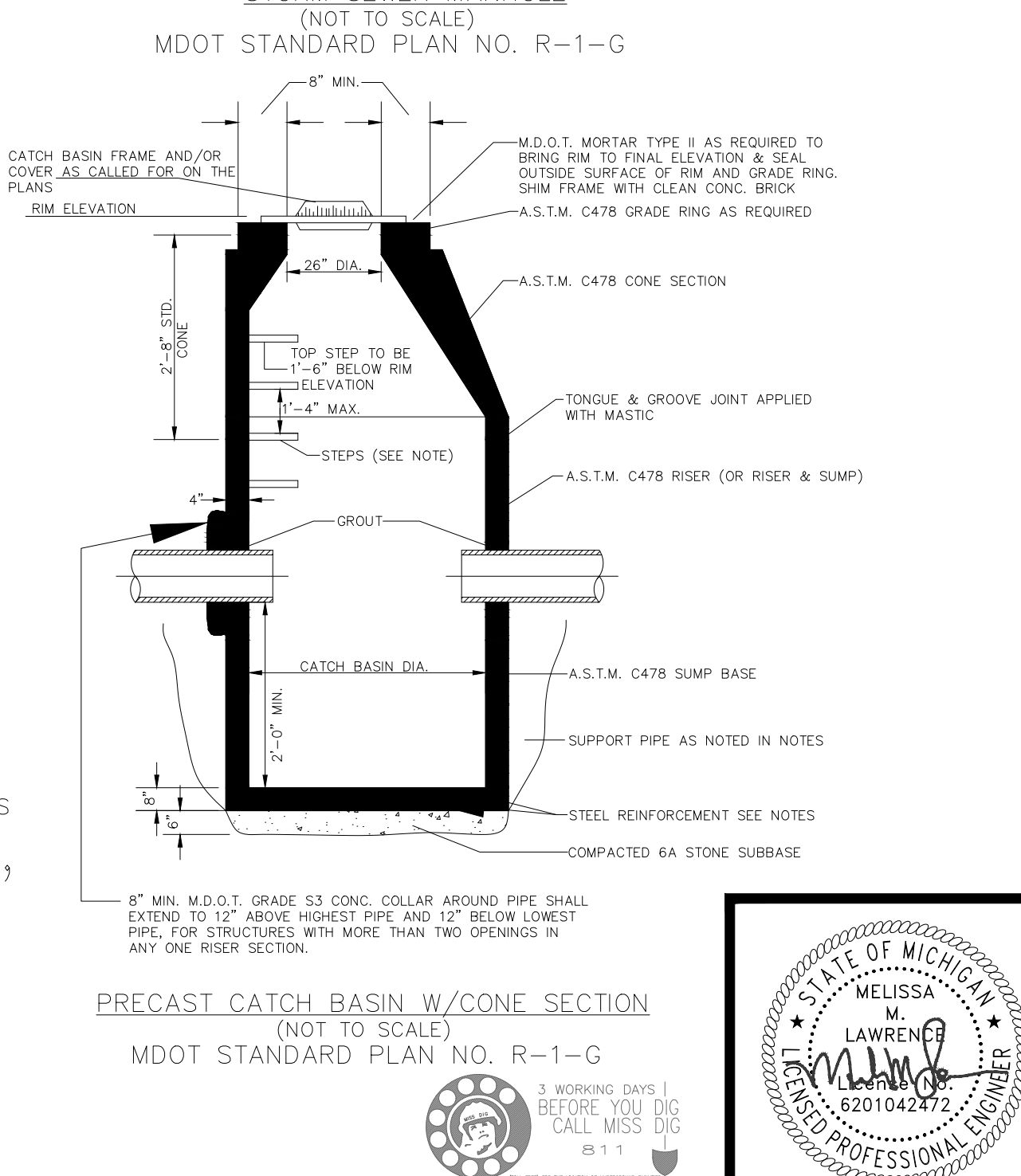
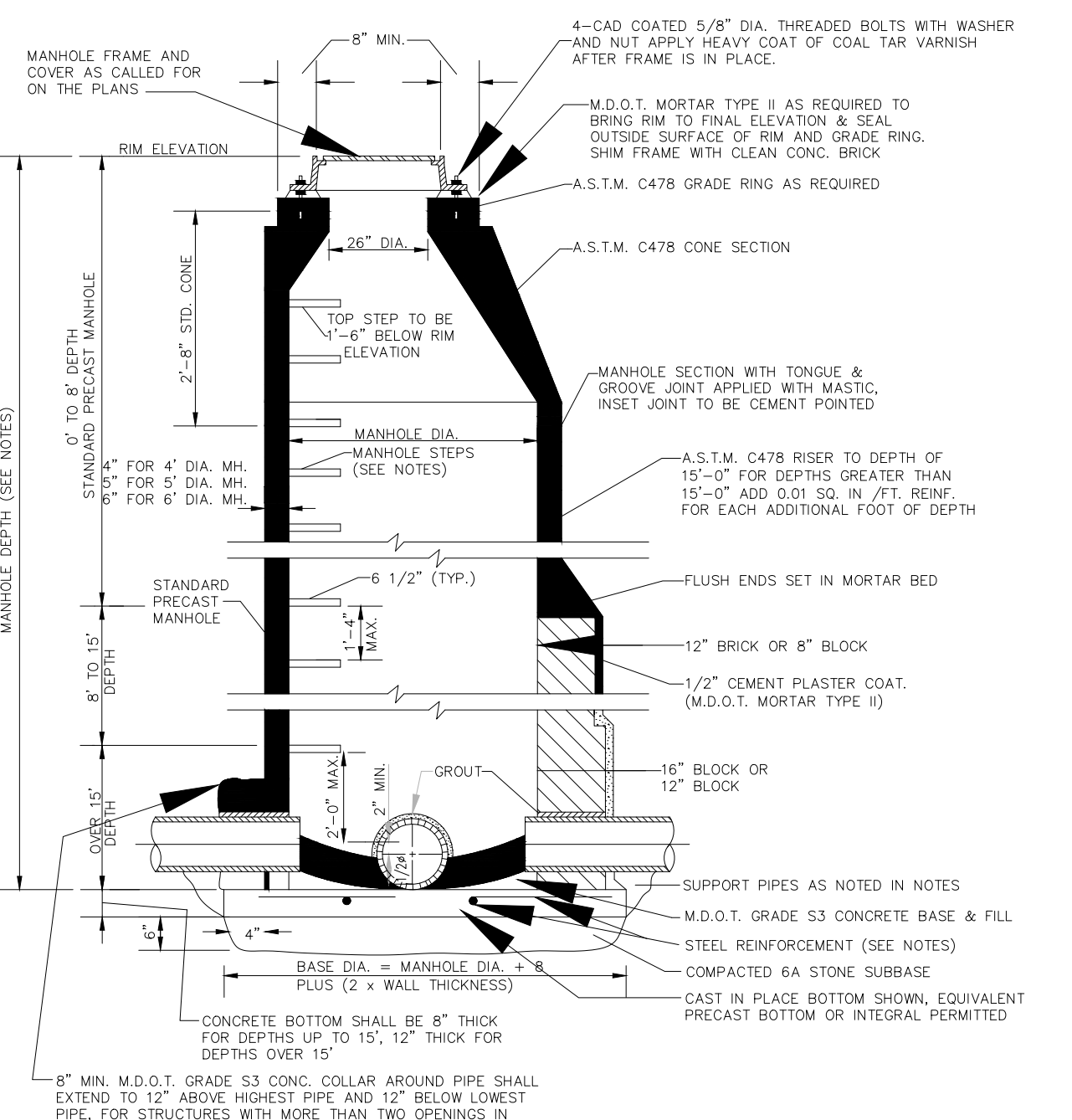
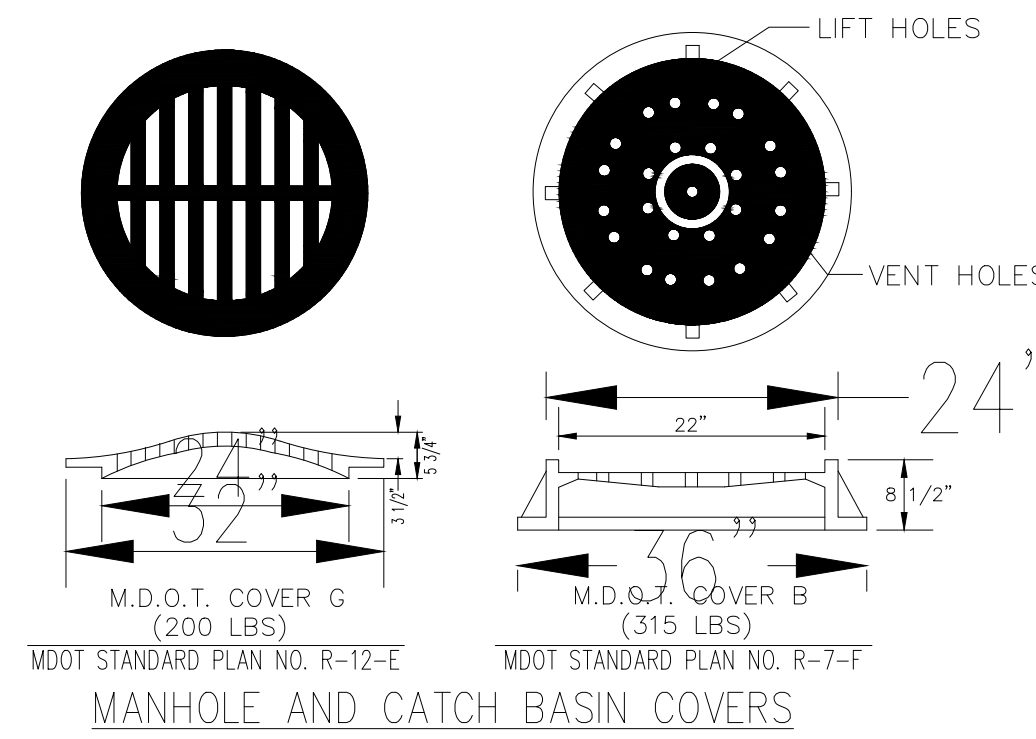
FOR 60" THRU 84" SIZES, REINFORCED EDGES TO BE SUPPLEMENTED WITH GALVANIZED STIFFENER ANGLES. THE ANGLES TO BE ATTACHED BY GALVANIZED NUTS AND BOLTS.

FOR THE 66" AND 72" EQUIVALENT ROUND PIPE ARCH SIZES, REINFORCED EDGE TO BE SUPPLEMENTED BY GALVANIZED ANGLES. THE ANGLES TO BE ATTACHED BY GALVANIZED NUTS AND BOLTS.

ANGLE REINFORCEMENT WILL BE PLACED UNDER THE CENTER PANEL SEAMS ON THE 66" AND 72" EQUIVALENT ROUND PIPE ARCH SIZES.

GALVANIZED TOE PLATE TO BE AVAILABLE AS AN ACCESSORY, WHEN SPECIFIED ON THE ORDER, AND WILL BE THE SAME GAGE AS THE END SECTION.

PIPE DIA.	MIN GAGE	DIMENSIONS IN INCHES				APPROX SLOPE	BODY
A	B	H	L	W			
12	16	6	6	6	21	2.5	1 PIECE
15	16	7	9	6	26	2.5	1 PIECE
18	16	8	10	6	31	2.5	1 PIECE
21	16	9	12	6	36	2.5	1 PIECE
24	16	10	13	6	41	2.5	1 PIECE
30	16	12	16	8	51	2.5	1 PIECE



NO.	REVISION/ISSUE	DATE
1	MODIFY REVISIONS	1/20/26 B.L.B.
2	MODIFY REVISIONS	3/2/26 B.L.B.
3	MODIFY REVISIONS	3/2/26 B.L.B.
4	MODIFY REVISIONS	3/2/26 B.L.B.
5	MODIFY REVISIONS	3/2/26 B.L.B.

SHEET TITLE: **STORM PLAN**

LAWRENCE ENGINEERING P.C.

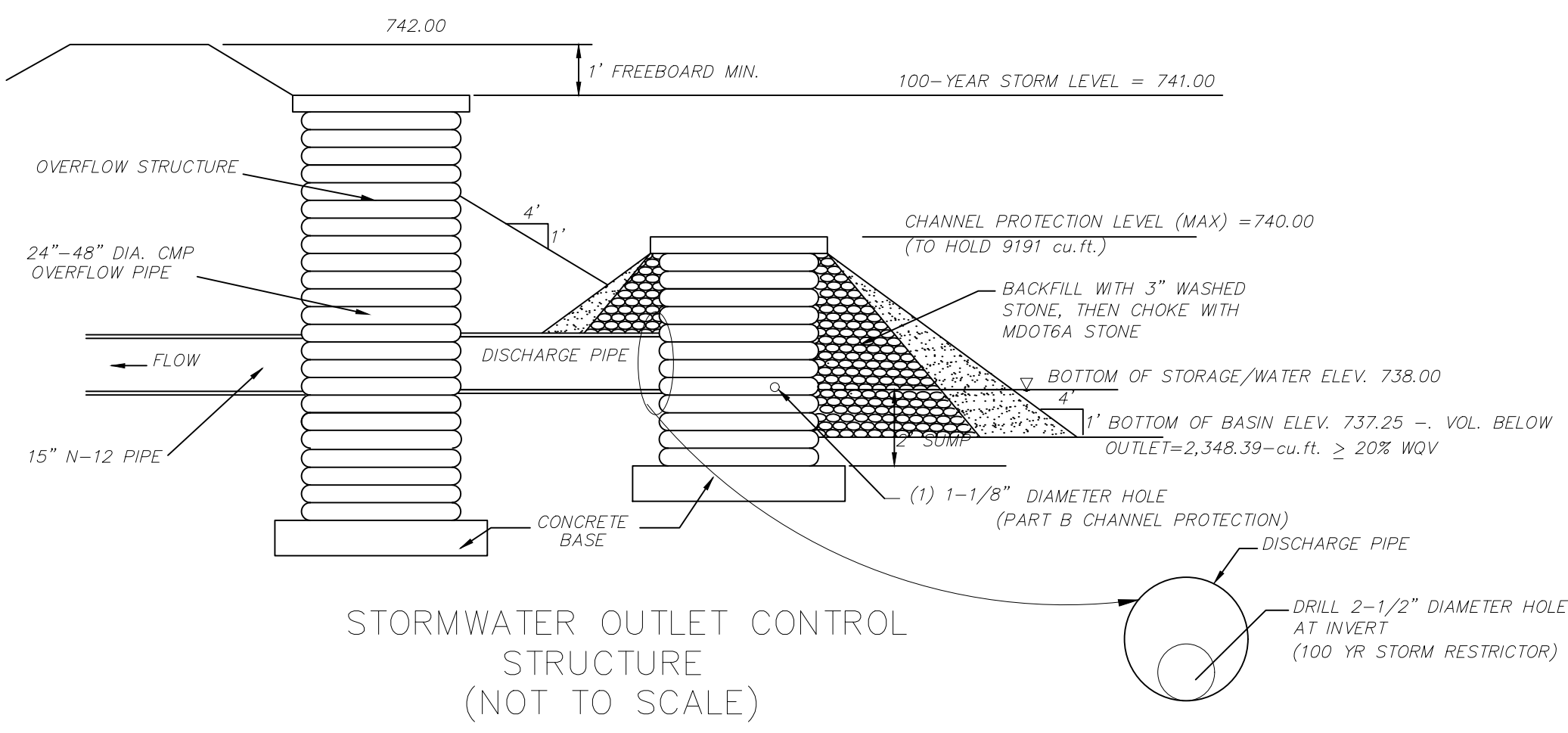
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JOB NO: 2025-011
DATE: 10-13-2025
DRAWN BY: B.L.B.
CHECKED BY: M.M.L.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 811





STORMWATER OUTLET CONTROL STRUCTURE (NOT TO SCALE)

PART A SEDIMENT TREATMENT

IMPERVIOUS AREA: 1.49 ACRES
 TRIBUTARY AREA: 1.63 ACRES
 PERCENT IMPERVIOUS: 0.79 = 91%
 $R_v = 0.05 + 0.009(MP)$
 $= 0.05 + 0.009(91) = 0.869$
 $P = 0.9$ INCHES FOR 'Detroit Metro' AREA
 $WQV = P \cdot R_v \cdot A(sq.ft.) = (0.9)(0.869)(1.63)(43,560)$
 $= 4,627.61$ cu.ft.

FIND Q_p
 $Q_p = (qu)(A)(WQV)$
 WHERE Q_p = PEAK DISCHARGE, cfs
 qu = UNIT PEAK DISCHARGE, cfs/sq.mi./in
 A = DRAINAGE AREA, sq.mi.
 AND WQV = WATER QUALITY VOLUME IN WATERSHED INCHES

FIND qu FROM EXHIBIT 4-II TR-55
 T_c FOR SMALL SITE ~ 10 min = 0.17 hrs
 SO $qu \sim 840$ cfs/sq.mi./in

FIND A : $A = (1.69 \text{ ac}) \left(\frac{sq.mi.}{640 \text{ ac}} \right) = 0.0026$ sq.mi
 FIND WQV IN INCHES: $\frac{4,627 \text{ cu.ft.}}{(1.63 \text{ ac})(43,560 \text{ sq.ft./ac})} = 0.065$ in = 0.782 in
 $Q_p = (840 \text{ cfs/sq.mi./in})(0.0026 \text{ sq.mi})(0.782 \text{ in}) = 1.71$ cfs

PART B CHANNEL PROTECTION

Calculations for Stormwater Runoff Volume Control

SITE NAME: Tobias/Saginaw Roads

Total Site Disturbed Area: 1.63 acres

2-Year, 24-Hour Rainfall: 2.26 in (See Rainfall Tab for regional rainfall value or site specific rainfall event may be substituted with DNR approval)

Pre-Development Conditions

Cover Type	Soil Type	Area (sf)	Area (ac)	CN (from TR-55)	S	Q Runoff (in)	Runoff Volume (ft³)
Woods / Meadow	A	23086.8	0.63	30	23.3	0.276778	632.4936168
Open Space	A	0	0	39	15.6	0.051026	0
Woods	B	0	0	55	8.2	0.044168	0
Meadow	B	23086.8	0.63	58	7.2	0.081819	167.411842
Open Space	B	0	0	61	6.4	0.130677	0
Woods	C	0	0	70	4.3	0.346968	0
Meadow	C	0	0.00	71	4.1	0.376761	0
Open Space	C	0	0	74	3.5	0.478262	0
Woods	D	0	0	77	3.0	0.594508	0
Meadow	D	24829.2	0.57	78	2.8	0.638004	1317.611165
Open Space	D	0	0	80	2.5	0.727116	0
Impervious	N/A	0	0.00	98	0.20	2.032289	0
Other:		0	0			NA	NA
TOTAL:	N/A	71002.8	1.63	N/A	N/A	N/A	2,008

Post-Development Conditions

Cover Type	Soil Type	Area (sf)	Area (ac)	CN*	S	Q Runoff (in)	Runoff Volume (ft³)
Impervious	N/A	64904.4	1.49	98	0.2	2.032289	10992.04319
Good Grass	A	6098.4	0.14	71	4.1	0.376761	191.4660968
		0	0			0	0
		0	0			0	0
TOTAL:	N/A		1.63	N/A	N/A	N/A	11,184

Runoff Volume Increase (ft³): 9,176

Runoff Volume Increase = (Post-Dev. Runoff Volume) MINUS (Pre-Dev. Runoff Volume)

1. Runoff (in) = $Q = (P - I_a)^2 / (P - I_a) + S$ Where: P = 2-Year, 24-Hour Rainfall (in)
 $I_a = 0.25$ therefore: S = 1000/CN - 10
 Runoff (in) = $Q = (P - 0.25)^2 / (P + 0.85)$ CN = Curve Number
 Q = Runoff (in)

2. Runoff Volume (ft³) = $Q \times 1/12 \times \text{Area}$ Area = Area of specific land cover (ft²)
 * Runoff Volume must be calculated separately for pervious and impervious areas (without using a weighted CN)

PART C FLOOD PROTECTION

100YR STORM STORAGE

Total Drainage Area: 1,630 acres
 Bldgs / Pavement Area: 1,250 acres
 Good Grass Cover: 0,140 acres
 Detention Pond: 0,240 acres

N drive area not going to pond: 0.03 ac
 1.63 ac - 0.09 ac = 1.54 ac
 use 1.54 ac for Qa calc

Calculate Cw

1,250 acres	* 0.95	1,187.5
0,140 acres	* 0.25	0,0350
0,240 acres	* 1	0,2400
		1,462.5
		1,630.0
		0.8972

CwA = 1.4625 Cw = 0.2 Qa = 1.54 Qb = 0.308

Tc (min)	I (in/hr)	CwA (acres)	Qin (cfs)	Qout (cfs)	Qin-Qout (cfs)	xTc * 60 (ft³)
5	7.6	1,462.5	11,115.0	0,308.0	10,807.0	3,242,100.0
10	6	1,462.5	8,775.0	0,308.0	8,467.0	5,080,200.0
15	5.3	1,462.5	7,751.3	0,308.0	7,443.3	6,998,925.0
20	4.7	1,462.5	6,878.8	0,308.0	6,570.8	7,878,900.0
30	3.8	1,462.5	5,575.5	0,308.0	5,267.5	9,449,100.0
40	3.4	1,462.5	4,925.5	0,308.0	4,617.5	11,194,800.0
50	2.95	1,462.5	4,314.4	0,308.0	4,006.4	12,019,125.0
60	2.6	1,462.5	3,802.5	0,308.0	3,494.5	12,580,200.0
90	2.15	1,462.5	3,144.4	0,308.0	2,836.4	15,316,425.0
120	1.75	1,462.5	2,559.4	0,308.0	2,251.4	16,209,900.0
150	1.5	1,462.5	2,193.8	0,308.0	1,885.8	16,971,750.0
180	1.3	1,462.5	1,903.3	0,308.0	1,595.3	17,207,100.0
240	0.94	1,462.5	1,374.8	0,308.0	1,066.8	15,361,200.0
300	0.72	1,462.5	1,053.0	0,308.0	0,745.0	13,410,000.0
360	0.63	1,462.5	0,921.4	0,308.0	0,613.4	13,248,900.0
480	0.5	1,462.5	0,731.3	0,308.0	0,423.3	12,189,600.0
600	0.43	1,462.5	0,628.9	0,308.0	0,320.9	11,551,500.0
720	0.35	1,462.5	0,511.9	0,308.0	0,203.9	8,607,400.0

Peak Storage = 17,207,100 ft³ = 0.40 ac-ft

100_YR DETENTION POND SUMMARY
 req'd V(T) = 17,207.10 cu. ft.
 FREEBOARD = 742.00'
 TOP OF POND = 741.00'
 STORAGE BOTTOM OF POND = 738.00'
 DEPTH = 3.00'
 provided V(t) = 17,461.28 cu. ft.
 SLOPE = 1:4

Drainage Calculations, Job Name: Tobias/Saginaw Roads

3/23/2026

Area	Point From	Point To	A Area (Acres)	C Runoff Coeff	AxC Acres	AxC Total	Travel Time (Min)	T.C Conc (Min)	I Intensity (In./Hr)	Q Discharge (CFS)	L Lgth (Ft)	V Velocity (FPS)	Pipe Dia	Grade (%)	Pipe Area (SF)	Capacity (CFS)	Capacity (FPS)	Roughness N
1	overflow	outlet	1.64	0.91	1.4924	1.4924	0.08	20	3.89	5.80	22	4.729344	15	1.86%	1.227185	10.42	8.49	0.011
Culvert	Inlet	Outlet	7.5	0.25	1.875	1.875	0.97	20	3.89	7.29	135	2.32101	24	0.40%	3.141593	7.75	2.47	0.024

STAGE STORAGE TABLE ABOVE OUTLET

ELEV	AREA (sq. ft.)	DEPTH (ft)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
738.000	3,581.33	N/A	N/A	0.00
738.250	3,901.38	0.250	935.05	935.05
738.500	4,234.71	0.250	1016.73	1951.78
738.750	4,581.35	0.250	1101.72	3053.50
739.000	4,941.16	0.250	1190.03	4243.53
739.250	5,314.06	0.250	1281.62	5525.15
739.500	5,700.03	0.250	1376.48	6901.63
739.750	6,099.08	0.250	1474.61	8376.24
740.000	6,523.83	0.250	1577.57	9953.81
740.250	7,009.29	0.250	1691.28	11645.08
740.500	7,503.38	0.250	1813.73	13458.82
740.750	8,004.51	0.250	1938.15	15396.97
741.000	8,512.60	0.250	2064.31	17461.28

STAGE STORAGE TABLE BELOW OUTLET

ELEV	AREA (sq. ft.)	DEPTH (ft)	CONIC INC. VOL. (cu. ft.)	CONIC TOTAL VOL. (cu. ft.)
737.250	2,701.22	N/A	N/A	0.00
737.500	2,981.13	0.250	710.01	710.01
737.750	3,274.58	0.250	781.68	1491.68
738.000	3,581.33	0.250	856.70	2348.39

- NOTES:
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR MEASURING FOR THEM SELF THE HEIGHTS OF ALL STRUCTURES BASED UPON FINAL LOCATION IN THE FIELD. THE CONTRACTOR IS CAUTIONED NOT TO ORDER THE STRUCTURE MATERIALS BASED ON PLAN INFORMATION.
 - ALL PRECAST MANHOLE AND CATCH BASIN COMPONENTS SHALL BE IN ACCORDANCE WITH A.S.T.M. C 478 CURRENT EDITION.
 - CONIC SECTIONS SHALL BE ECCENTRIC CONE SECTIONS AS SHOWN. CONCENTRIC CONES AND FLAT SLAB TOPS MAY BE SUBSTITUTED ONLY UPON RECEIPT OF PRIOR WRITTEN APPROVAL FROM THE OWNER. STANDARD CONE HEIGHTS SHALL BE AS SHOWN. SHORTER CONES MAY BE SUBSTITUTED ONLY UPON PRIOR WRITTEN APPROVAL FROM THE OWNER. SHORTER CONES SHALL BE FABRICATED IN ACCORDANCE WITH M.D.O.T. STANDARD PLANS, CURRENT EDITION. CONES SHALL BE FURNISHED WITH 4 5/8" DIA. THREADED INSERTS CAST INTEGRALLY WITH ALL FRAMES.
 - SPACING BETWEEN PIPE OPENINGS IN A RISER SHALL BE 6" MINIMUM. OPENINGS MAY BE CONSTRUCTED BY CASTING, REMOVING THE GREEN CONCRETE OR BY DRILLING THE OPENINGS IN CURED CONCRETE.
 - THE TOP OF MASONRY AND PRECAST STRUCTURES SHALL BE SUFFICIENTLY LOW TO PERMIT PROPER ADJUSTMENTS OF COVER TO GRADE WITH MORTAR.
 - M.D.O.T. GRANULAR MATERIAL CLASS # COMPACTED TO 90% DENSITY SHALL BE USED IN BACKFILLING AROUND ALL STRUCTURES THAT FALL WITHIN THE 1' ON 1' INFLUENCE LINES FROM THE EDGE OF PAVEMENT OR BACK OF CURB OR FROM STRUCTURE FOOTINGS.
 - CAST IN PLACE AND PRECAST CONCRETE BOTTOMS (FOOTINGS) SHALL BE REINFORCED WITH #4 STEEL BARS SPACED AT 1'-0" BOTH WAYS OR TWO LAYERS OF WELDED WIRE FABRIC OF EQUIVALENT CROSS SECTIONAL AREA LAID AT RIGHT ANGLES AND WIRE TOGETHER. REINFORCEMENT SHALL BE PLACED IN TOP OF FOOTING AND SHALL BE MARKED. PROVIDE 3" CLEARANCE FOR REINFORCING. FOOTINGS SHALL BE SUPPORTED BY A COMPACTED 6" GRANULAR SUBBASE.
 - PRECAST BOTTOMS SHALL BE SET LEVEL AND A MINIMUM OF 2" BELOW THE BOTTOM OF THE SEWER.
 - THE BELL SHALL BE REMOVED FOR THE FIRST LENGTH OF OUTLET PIPE PROJECTING THRU THE WALL OF THE MANHOLE.
 - POUR M.D.O.T. GRADE S3 (3000 PSI) CONCRETE UNDER SEWER PIPE FROM UNDISTURBED SOIL TO THE SPRING LINE. THE MINIMUM WIDTH OF CONCRETE SHALL BE 0.0 - 12".
 - MORTAR FOR BRICK, BLOCK AND PARKING, POINTING AND BEDDING OF CASTING FRAMES SHALL BE IN ACCORDANCE WITH M.D.O.T. STANDARD SPECIFICATIONS FOR MORTAR TYPE II.
 - ALL LEFT PIN HOLES SHALL BE FILLED WITH MORTAR.
 - ALL BRICK AND BLOCK USED IN MANHOLE OR CATCH BASIN CONSTRUCTION SHALL BE SOLID.
 - MANHOLE AND CATCH BASIN DIAMETERS (EXCEPT WHERE OTHERWISE NOTED) SHALL BE AS FOLLOWS:
 PIPE DIA. REQUIRED MH & CB DIA. MINIMUM PRECAST WALL THICKNESS
 24" OR LESS 4" 4"
 27" THRU 36" 5" 5"
 42" & 48" 6" 6"
 54" THRU 72" 8" 8"
 - STEPS SHALL BE INSTALLED IN ALL STRUCTURES MORE THAN 4' DEEP AND SHALL HAVE A MINIMUM 3" EMBEDMENT. STEPS SHALL BE FABRICATED OF CAST IRON MEETING THE REQUIREMENTS OF A.A.S.H.T.O. M100 CLASS NO. 35, AND SHALL BE CAST INTEGRALLY WITH THE STRUCTURE. STEPS SHALL BE DESIGNED IN ACCORDANCE WITH CURRENT O.S.H.A. REGULATIONS AND SHALL NOT BE LESS THAN 10" CLEAR LENGTH. STEPS SHALL BE CAPABLE OF SUPPORTING 300 LBS AND COATED WITH COAL TAR PITCH VARNISH. STEPS SHALL NOT BE PLACED OVER ANY OTHER CHANNEL.
 - FRAME AND COVER CASTING SHOP DRAWINGS SHALL BE APPROVED BY THE OWNER BEFORE MANUFACTURING.
 - THE MANHOLE FRAME AND COVER SHALL MEET THE REQUIREMENTS OF THE CURRENT STANDARD SPECIFICATIONS FOR GRAY-IRON CASTINGS A.A.S.H.T.O. M100, AND SHALL HAVE A MINIMUM STRENGTH AS PROVIDED FOR CLASS NO. 30 GRAY IRON CASTINGS. THE MANHOLE FRAME SHALL BE BOLTED TO THE CONE WITH 4-5/8" DIA. BOLTS WITH 3/4" X 2" X 1/8" FLAT WASHERS AND NUTS. ALL CADMIUM COATED AND SUPPLIED BY THE FRAME SUPPLIER.

Outlet Control Part A Sediment Treatment

Orifice Calculations
 The Sediment Treatment (first flush) outlet control is designed so that the first flush volume will release at a rate which will empty the pond as close to a 24-hr period as possible.

Allowable release rate

$Q = C \cdot O_v(2^*g^*h)$

Definitions

1.630	A	Existing drainage area (acres)
-		Allowable outfall rate (ft³/s/acre)
0.5360	Q _{ff}	First Flush Outfall Rate (ft³/s) (4,627.61/24/3600)
0.0531	Q _{cp}	Channel Prot. outfall rate (ft³/s) (9,176/48/3600)
0.308	Q _a	Flood Protect. Total Allowable outfall rate (ft³/s)
0.620	C	Orifice Coefficient
O		area of Orifice (ft²)
32.200	g	Acceleration due to gravity (ft/s²)
1.250	h	Maximum head condition at the design storage level (ft)

Maximum Head Condition

739.25	h _{max}	Maximum head elevation (to hold WQV)
738.00	h _{min}	Minimum head elevation

$h = h_{max} - h_{min}$
 $h = 1.25$ ft

Solve for Area

Q _{ff}	
$O = CV(2^*g^*h)$	
Q _{ff}	0.0536 ft³/sec
O	0.0096 sf
O	1.388 in²

Use the Following **Note don't use this - use channel protection outlet control**

Diameter	1-1/4 in
Area	1.23 in²
No. of holes	1
Total Area	1.23 in²
Q _{actual}	0.047 ft³/sec

Outlet Control Part B Channel Protection

Orifice Calculations
 The Channel Protection outlet control is designed so that the Channel Protection volume will release at a rate which will empty the pond as close to a 48-hr period as possible.

Allowable release rate

$Q = C \cdot O_v(2^*g^*h)$

Definitions

1.630	A	Existing drainage area (acres)
-		Allowable outfall rate (ft³/s/acre)
0.0536	Q _{ff}	First Flush Outfall Rate (ft³/s) (4,627.61/24/3600)
0.0531	Q _{cp}	Channel Protect. outfall rate (ft³/s) (9,176/48/3600)
0.308	Q _a	Flood Protection Total Allowable outfall rate (ft³/s)
0.620	C	Orifice Coefficient
O		area of Orifice (ft²)
32.200	g	Acceleration due to gravity (ft/s²)
2.000	h	Maximum head condition at the design storage level (ft)

Maximum Head Condition

740.00	h _{max}	Max head elevation (to hold Channel Protection Vol)
738.00	h _{min}	Minimum head elevation

$h = h_{max} - h_{min}$
 $h = 2$

Solve for Area

Q _{cp}	
$O = CV(2^*g^*h)$	
Q _{cp}	0.0531 ft³/sec
O	0.0075 sf
O	1.09 in²

Use the Following

Diameter	1-1/8 in
Area	0.994 in²
No. of holes	1
Total Area	0.994 in²
Q _{actual}	0.049 ft³/sec

Outlet Control Part C Flood Protection (100-yr)

Orifice Calculations
 The 100-yr orifice has been designed so that the total outfall of the first flush plus the bank full plus this orifice does not exceed the TOTAL ALLOWABLE outfall rate as noted below. The goal is to have this pond emptied within 12 hrs

Allowable release rate

$Q = C \cdot O_v(2^*g^*h)$

Definitions

1.630	A	Existing drainage area (acres)
-		Allowable outfall rate (ft³/s/acre)
0.0536	Q _{ff}	First Flush Outfall Rate (ft³/s)
0.0531	Q _{cp}	Channel Protect. Outfall Rate (ft³/s)
0.308	Q _a	Flood Protection Total Allowable outfall rate (ft³/s)
0.620	C	Orifice Coefficient
O		area of Orifice (ft²)
32.200	g	Acceleration due to gravity (ft/s²)
3.000	h	Maximum head condition at the design storage level (ft)

Maximum Head Condition

741.00	h _{max}	Maximum head elevation
738.00	h _{min}	Minimum head elevation

$h = h_{max} - h_{min}$
 $h = 3.00$ ft

Solve for Area

Q _a	
$O = CV(2^*g^*h)$	
Q _a	0.308
O	0.0357 ft²
O	5.15 in²

Use the Following

Diameter	2-1/2 in
Area	4.91 in²
No. of holes	1
Total Area	4.91 in²
Q _{actual}	0.294 ft³/sec

PROJECT: OFFICE/RETAIL SPACE FOR STEVE GROSS 1267 E. FARRAND RD. CLUID, MI 48420 (810)591-1461

SHEET: 4 OF 14

JOB NO: 2025-011 DATE: 10-13-2025 DRAWN BY: BLB CHECKED BY: MML

REVISIONS/TITLE: 1. 1/20/26 B.L.B. 2. 3/2/26 B.L.B. 3. 3/2/26 B.L.B. 4. 3/2/26 B.L.B. 5. 3/2/26 B.L.B.

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 620104272
 PROFESSIONAL ENGINEER

LAWRENCE ENGINEERING P.C.
 4344 SILVER LAKE RD LINDEN, MI 48451 OFFICE:(810)750-5280 FAX:(810)750-5283

GRADING NOTES

1. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE CURRENT GENESSEE COUNTY WATER AND WASTE STANDARDS AND SPECIFICATIONS.
2. SPOT ELEVATIONS INDICATE TOP OF PAVEMENT UNLESS OTHERWISE INDICATED.
3. VEGETATION STABILIZATION WITH BE DONE WITH GRASS SEED AND MULCH.

MINIMUM REQUIREMENTS FOR SEEDING

TOP SOIL - 3 INCHES IN DEPTH
 GRASS SEED - 210 LBS. PER ACRE
 FERTILIZER - 150 LBS. PER ACRE
 STRAW MULCH - 3" IN DEPTH, 1.5 TO 2 TONS PER ACRE. (ALL MULCH MUST HAVE A TIE-DOWN, SUCH AS TACKIFIER, NET BINDING, ETC.)
 HYDRO-SEEDING - HYDRO-SEEDING IS NOT ACCEPTABLE FOR SLOPES EXCEEDING 1%. ON SLOPES OVER 1%, STABILIZATION SHALL BE DONE WITH SEED AND STRAW MULCH WITH TACKIFIER, OR STRAW BLANKETS PEGGED IN PLACE.

BENCHMARK NO. 1

CHISEL 'X' IN NORTH CORNER OF CONC WALK/SLAB, NORTH RIM OF SANITARY MH AT SOUTHEAST CORNER OF N SAGINAW & W TOBIAS ROADS, AS SHOWN ELEVATION=739.87 (NAVD88)

BENCHMARK NO. 2

ARROW ON TOP OF HYDRANT ALONG EAST SIDE OF N SAGINAW ROAD, AS SHOWN ELEVATION=748.78 (NAVD88)

DISTURBED AREA = 2.63 ± ACRES
 A NPDES N.O.C. PERMIT IS NOT REQUIRED AFTER RECEIPT OF SESC PERMIT FROM GCDC

GENERAL NOTES

1. REFER TO ARCHITECTURAL PLANS TO VERIFY BUILDING DIMENSIONS.
2. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL PERMITS AND POST ALL BONDS PRIOR TO CONSTRUCTION, OR ENSURE THAT ALL REQUIRED PERMITS AND BONDS HAVE BEEN OBTAINED PRIOR TO CONSTRUCTION.
3. THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR THE LOCATION AND PROTECTION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL VERIFY ALL UTILITY LOCATIONS PRIOR TO CONSTRUCTION BY CALLING MISS-DIG AT 1-800-482-7171 AT LEAST 3 WORKING DAYS PRIOR TO EXCAVATION.
4. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE REPAIRED WITH LIKE MATERIAL. THE EXACT LOCATION OF EXISTING UTILITIES SHALL BE LOCATED BY HAND DIGGING.
5. PRIOR TO COMPLETION OF THE PROJECT THE STONE AROUND THE STANDPIPE STRUCTURE SHALL BE REFRESHED WITH CLEAN STONE.
6. DETENTION/RETENTION AND SEDIMENTATION BASINS SHALL BE EXCAVATED, TOP SOILED, SEEDED, MULCHED AND TACKED PRIOR TO THE START OF MASSIVE EARTH DISRUPTION.
7. ALL RIP-RAP MUST BE PLACED OVER KEYED IN GEO-FABRIC.

MAINTENANCE NOTES

1. **SOIL STOCKPILES**
 PERIODIC INSPECTIONS SHOULD BE DONE TO ENSURE EXCESSIVE EROSION HAS NOT OCCURRED. IF RUNOFF OR WIND EROSION HAS OCCURRED, REDUCE THE SIDE SLOPES OF THE SPOIL PILE, OR RE-STABILIZE THE STOCKPILE BY PROVIDING TEMPORARY SEEDING.
 WHEN FILTER FENCING IS USED AROUND A SPOIL PILE, PERIODIC CHECKS SHOULD BE MADE TO ENSURE THAT PIPING HAS NOT OCCURRED UNDER THE FENCING, AND TO ENSURE THE FENCE HAS NOT COLLAPSED DUE TO SOIL SLIPPAGE OR ACCESS BY CONSTRUCTION EQUIPMENT. REPAIR ANY DAMAGED FENCING IMMEDIATELY.
 BERMS AT THE BASE OF THE SPOIL PILE WHICH BECOME DAMAGED SHOULD BE REPLACED.
2. **DUST CONTROL**
 TO PREVENT DUST FROM BECOMING A PUBLIC NUISANCE AND CAUSING OFF-SITE DAMAGES, DUST CONTROL SHOULD BE ONGOING DURING EARTH CHANGE ACTIVITIES.
3. **SILT FENCE**
 SILT FENCE SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.
 SILT FENCES SHOULD BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND SEVERAL TIMES DURING PROLONGED RAINFALLS.
 IF THE FENCE IS SAGGING OR THE SOIL HAS REACHED ONE HALF (1/2) THE HEIGHT OF THE FABRIC, THE SOIL BEHIND THE FABRIC MUST BE REMOVED AND DISPOSED OF IN A STABLE UPLAND SITE. THE SOIL CAN BE ADDED TO THE SOIL STOCKPILE.
 IF THE FABRIC IS BEING UNDERCUT (I.E. IF WATER IS SEEPING UNDER THE FENCE), THE FENCE SHOULD BE REMOVED AND REINSTALLED FOLLOWING THE PROCEDURES GIVEN ABOVE.
 FABRIC WHICH DECOMPOSES OR OTHERWISE BECOMES INEFFECTIVE SHOULD BE REMOVED AND REPLACED WITH NEW FILTER FABRIC IMMEDIATELY.
 SILT FENCES SHOULD BE REMOVED ONCE VEGETATION IS WELL ESTABLISHED AND THE UP-SLOPE AREA IS FULLY STABILIZED.

4. SEEDING

NEWLY SEEDED AREAS NEED TO BE INSPECTED FREQUENTLY FOR THE FIRST FEW MONTHS TO ENSURE THE GRASS IS GROWING. IF THE SEEDED AREA IS DAMAGED DUE TO RUNOFF, ADDITIONAL STORMWATER MEASURES MAY BE NEEDED. SPOT SEEDING CAN BE DONE ON SMALL AREAS TO FILL IN BARE SPOTS WHERE GRASS DIDN'T GROW PROPERLY.

5. MULCHING

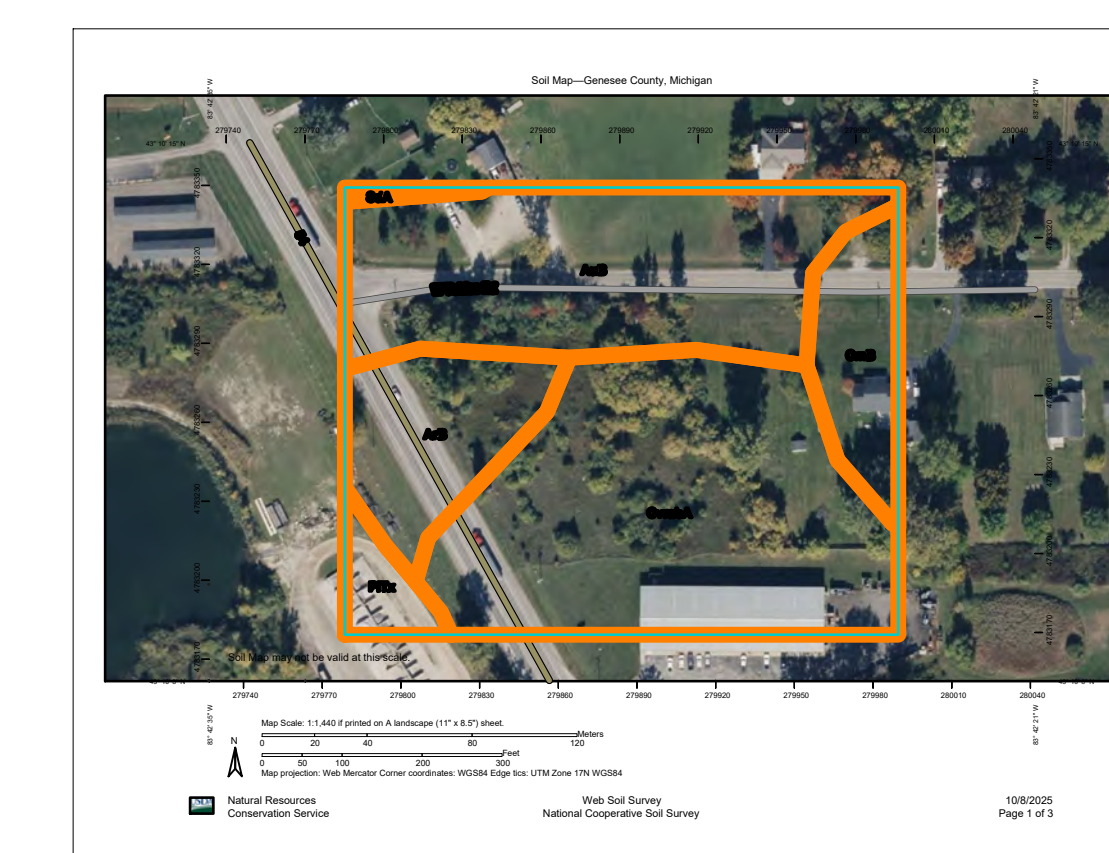
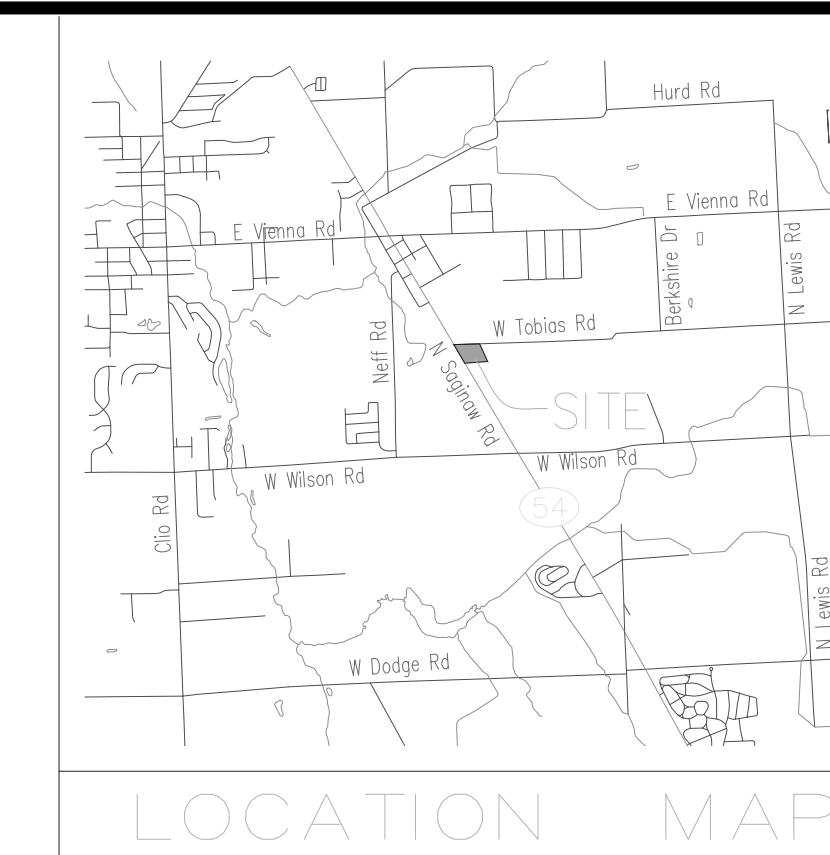
MULCHED AREAS SHOULD BE CHECKED FOLLOWING EACH RAIN TO ENSURE THE MULCH IS STAYING IN PLACE. ADDITIONAL TACKING MATERIALS OR NETTING MAY NEED TO BE APPLIED TO HOLD THE MULCH IN PLACE.

6. CONSTRUCTION ENTRANCE

PROPER MAINTENANCE MAY INCLUDE ADDING ADDITIONAL LAYERS OF STONE WHEN THE ORIGINAL STONE BECOMES COVERED WITH MUD. AFTER EACH STORM EVENT, INSPECT THE ROAD FOR EROSION AND MAKE ANY NECESSARY REPAIRS. ALL SEDIMENT DROPPED OR ERODED ONTO PUBLIC RIGHT-OF-WAY SHOULD BE REMOVED IMMEDIATELY BY SWEEPING.

SOIL EROSION & SEDIMENTATION CONTROL NOTES

1. ALL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH GENESSEE COUNTY WATER AND WASTE STANDARDS AND SPECIFICATIONS.
2. DAILY INSPECTIONS SHALL BE MADE BY THE CONTRACTOR TO DETERMINE THE EFFECTIVENESS OF EROSION AND SEDIMENT CONTROL MEASURES. ANY NECESSARY REPAIRS SHALL BE PERFORMED WITHOUT DELAY.
3. ANY EROSION OR SEDIMENT FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT ALLOWED TO COLLECT ON ANY OFF-SITE AREAS OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
4. CONTRACTOR SHALL APPLY TEMPORARY EROSION AND SEDIMENTATION CONTROL MEASURES AS REQUIRED AND AS DIRECTED ON THESE PLANS. CONTRACTOR SHALL REMOVE TEMPORARY MEASURES AS SOON AS PERMANENT STABILIZATION OF SLOPES, DITCHES AND OTHER EARTH CHANGES HAVE BEEN ESTABLISHED.
5. AFTER ALL TEMPORARY EROSION CONTROL MEASURES HAVE BEEN INSTALLED, THE CONTRACTOR SHALL CONTACT GENESSEE COUNTY DRAIN COMMISSION OFFICE FOR AN INSTALLATION INSPECTION.
6. DUST CONTROL SHALL BE EXERCISED AT ALL TIMES WITHIN THE PROJECT BY THE CONTRACTOR.
7. ALL MUD, DIRT AND DEBRIS TRACKED ONTO EXISTING ROADS SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR NO LESS THAN ON A DAILY BASIS. ALL MUD, DIRT AND DEBRIS TRACKED OR SPILLED ONTO PAVED SURFACES WITHIN THIS SITE SHALL BE PROMPTLY REMOVED BY THE CONTRACTOR.
8. PERMANENT EROSION CONTROL MEASURES SHALL BE COMPLETED WITHIN 15 CALENDAR DAYS AFTER FINAL GRADING OR EARTH MOVING ACTIVITY HAS BEEN COMPLETED. A FINAL INSPECTION SHALL BE SCHEDULED BY THE CONTRACTOR.
9. GENESSEE COUNTY DRAIN COMMISSION SHALL INSPECT ALL SOIL EROSION CONTROL MEASURES. UPON THEIR DIRECTION, ADDITIONAL MEASURES SHALL BE CONSTRUCTED AND MAINTENANCE WORK SHALL BE PERFORMED TO ENSURE COMPLIANCE WITH ALL PERMIT REQUIREMENTS.



Map Unit Legend

Map Unit Symbol	Map Unit Name	Area in ACR	Percent of ACR
13	Strip & Stockpile Topsoil / Rough Grade	1.1	19.0%
2	Storm System	2.0	36.0%
4	Foundation / Bldg. Construction	0.9	16.0%
54	Sanitary Sewer and Water Leads	3.8	68.0%
60	Install All Other Utilities	0.2	3.0%
54	Site Construction & Pavement	0.2	3.0%
54	Permanent Erosion Control Measures	0.3	5.0%
54	Finish Grading	0.3	5.0%
54	Landscaping	0.3	5.0%
Total for Area of Interest		8.9	100.0%

SOIL EROSION & SEDIMENTATION CONTROL OPERATION TIME SCHEDULE

CONSTRUCTION SEQUENCE	APR 2026	MAY	JUN	JUL	AUG	SEP
TEMPORARY EROSION CONTROL MEASURES	█					
STRIP & STOCKPILE TOPSOIL / ROUGH GRADE	█					
STORM SYSTEM		█				
FOUNDATION / BLDG. CONSTRUCTION			█			
SANITARY SEWER AND WATER LEADS				█		
INSTALL ALL OTHER UTILITIES					█	
SITE CONSTRUCTION & PAVEMENT						█
PERMANENT EROSION CONTROL MEASURES						█
FINISH GRADING						█
LANDSCAPING						█

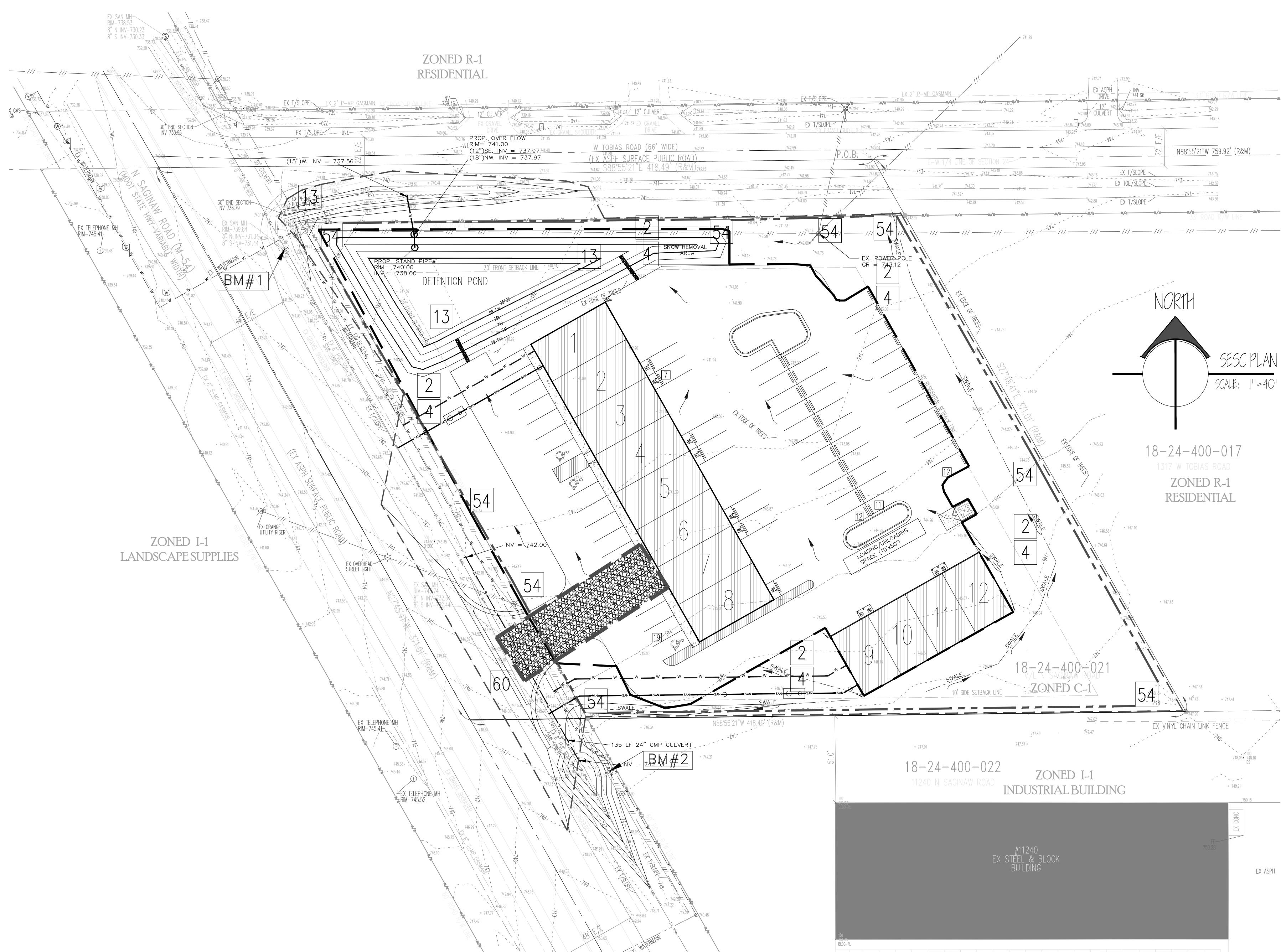
DISTURBED AREA = 2.63 ACRES

SOIL EROSION CONTROL MEASURES

54		USES GEOTEXTILE FABRIC AND POSTS OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY.
60		CONSTRUCTION ENTRANCE
13		RIP-RAP
2		WATER CAN BE DIVERTED TO MINIMIZE EROSION. FLATTER SLOPES EASE EROSION PROBLEMS.
4		TEMPORARY AND PERMANENT SEED APPLICATIONS

LEGEND

- LIMITS OF GRADING
- SILT FENCE
- TRACKING MAT



LAWRENCE ENGINEERING P.C.

PROJECT: OFFICE/RETAIL SPACE FOR STEVE GROSS 1267 E. FARRAND RD. CLID, MI 48420 (810)691-1461

DATE: 10-13-2025
 DRAWN BY: BLB
 CHECKED BY: MML

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG

STATE OF MICHIGAN
 M. LAWRENCE
 #20104272
 PROFESSIONAL ENGINEER

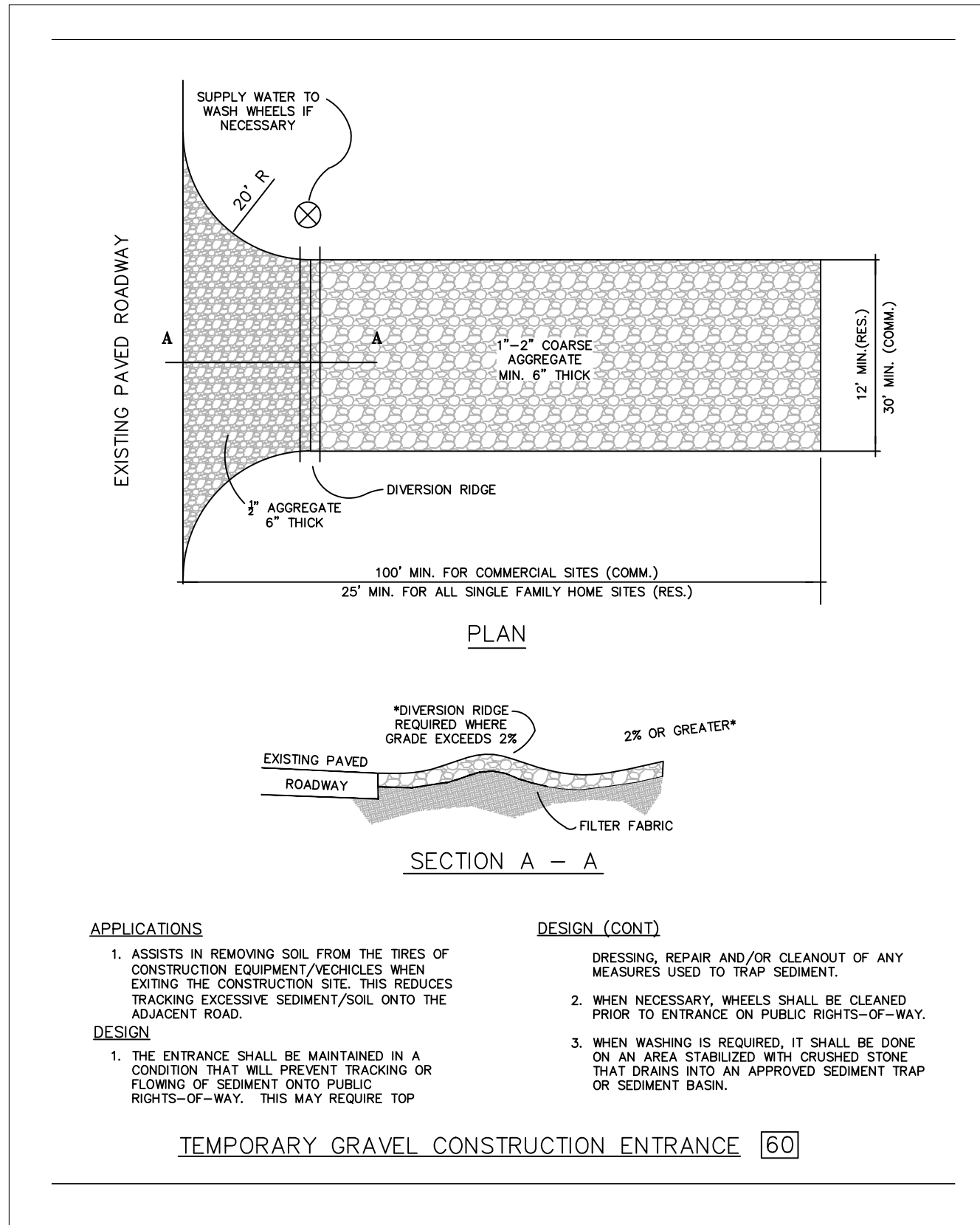
4344 SILVER LAKE RD
 LINDEN, MI 48451
 OFFICE: (810)750-5280
 FAX: (810)750-5283

REVISIONS/ISSUE
 1. 1/20/26 B.L.B.
 2. 1/20/26 B.L.B.
 3. 3/2/26 B.L.B.
 4. 3/2/26 B.L.B.
 5. 3/2/26 B.L.B.

SHEET TITLE: SOIL EROSION CONTROL PLAN

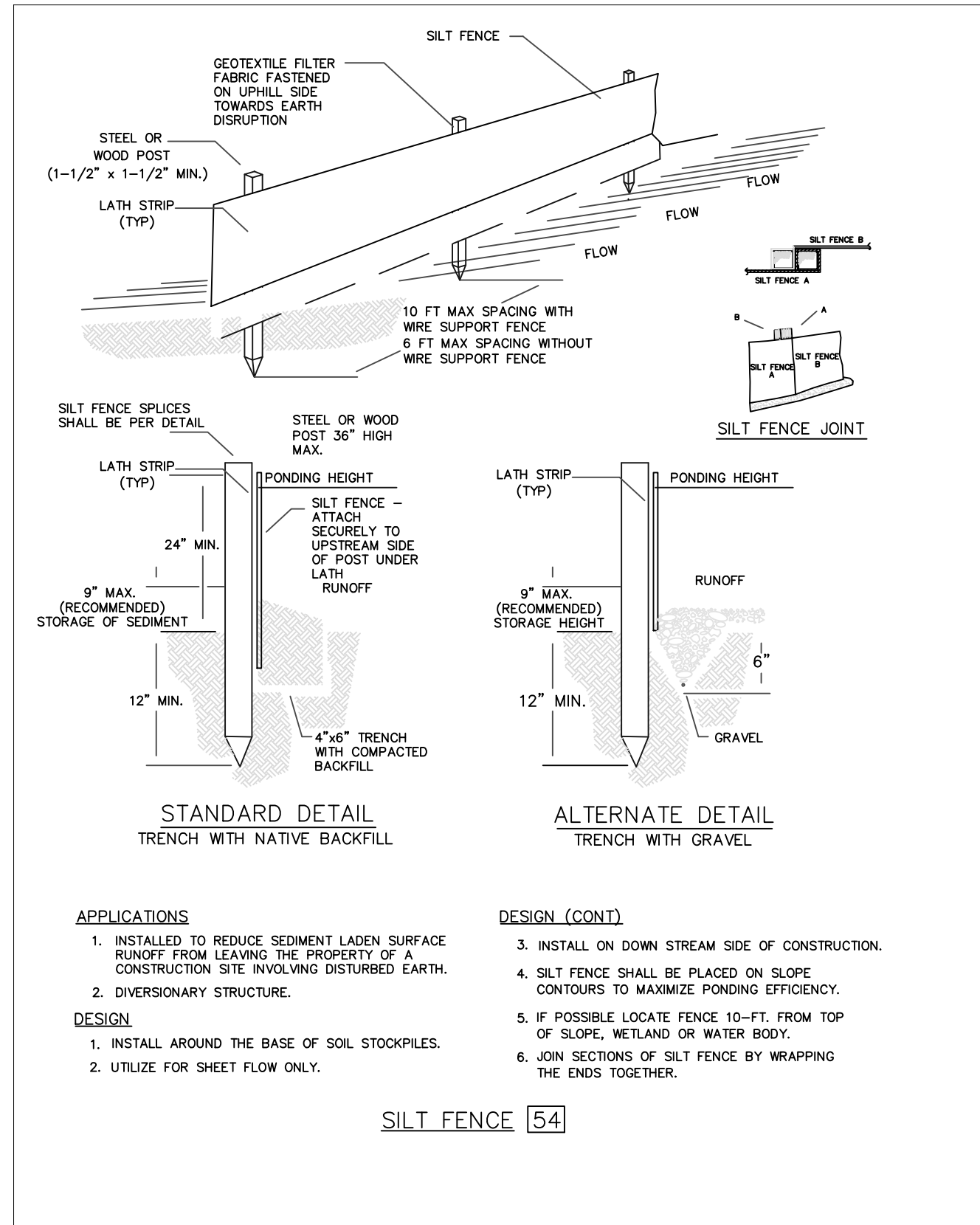
JOB NO: 2025-011
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SHEET: 5 OF 14



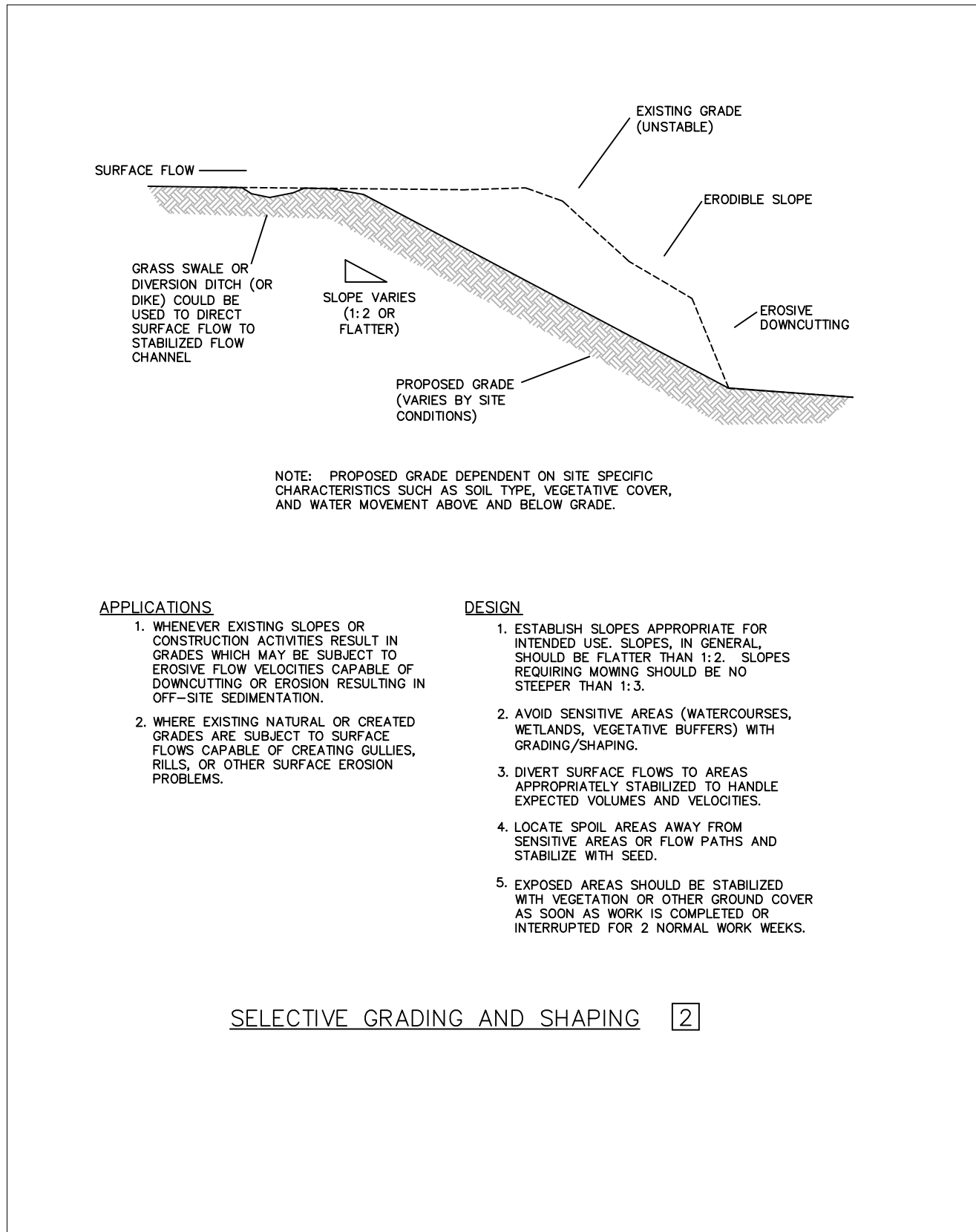
- APPLICATIONS**
1. ASSISTS IN REMOVING SOIL FROM THE TIRES OF CONSTRUCTION EQUIPMENT/VEHICLES WHEN EXITING THE CONSTRUCTION SITE. THIS REDUCES TRACKING EXCESSIVE SEDIMENT/SOIL ONTO THE ADJACENT ROAD.
 1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
 2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ON PUBLIC RIGHTS-OF-WAY.
 3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.
- DESIGN**
1. THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE TOP DRESSING, REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT.
 2. WHEN NECESSARY, WHEELS SHALL BE CLEANED PRIOR TO ENTRANCE ON PUBLIC RIGHTS-OF-WAY.
 3. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP OR SEDIMENT BASIN.

TEMPORARY GRAVEL CONSTRUCTION ENTRANCE [60]



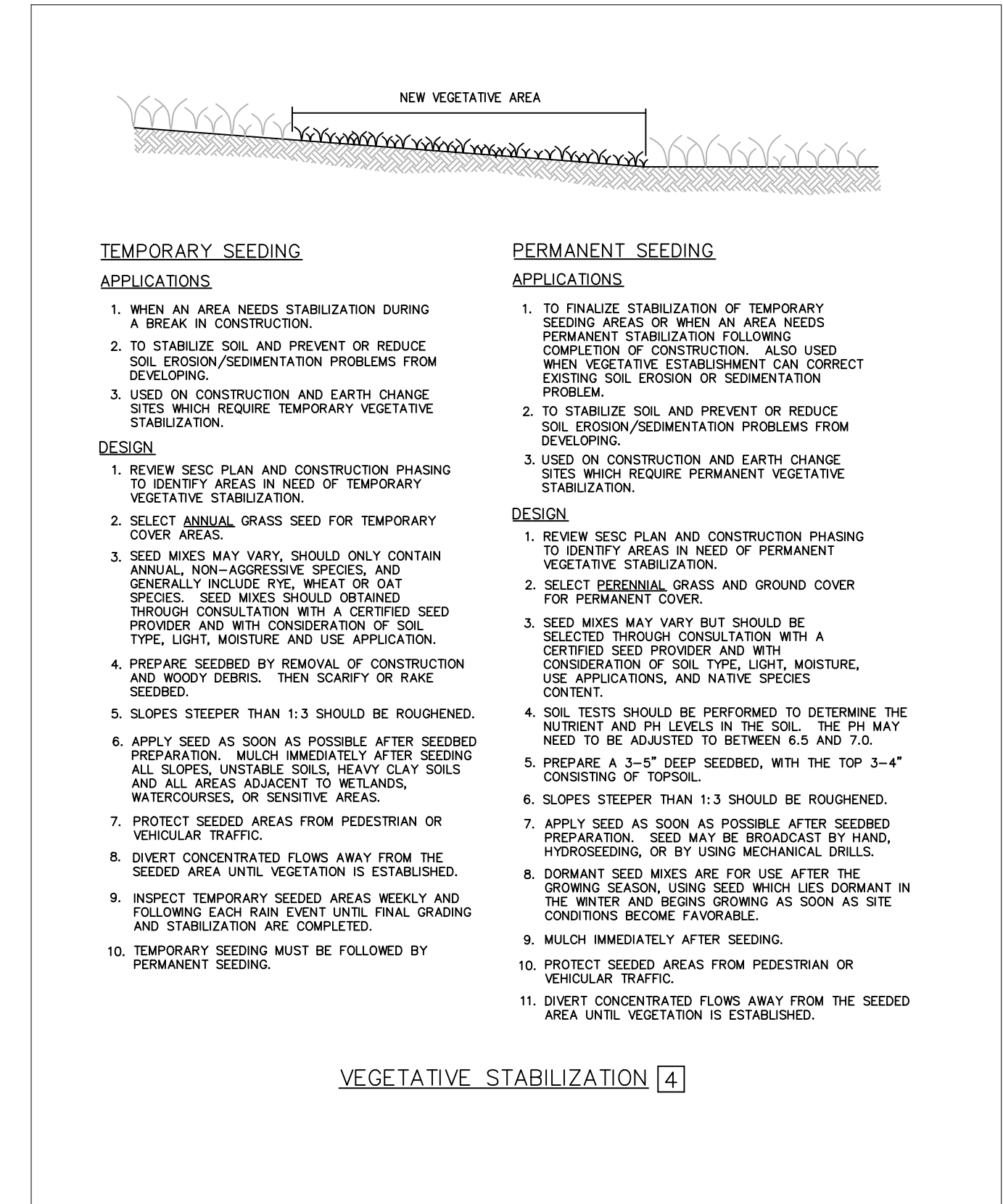
- APPLICATIONS**
1. INSTALLED TO REDUCE SEDIMENT LADEN SURFACE RUNOFF FROM LEAVING THE PROPERTY OF A CONSTRUCTION SITE INVOLVING DISTURBED EARTH.
 2. DIVERSIONARY STRUCTURE.
 3. INSTALL ON DOWN STREAM SIDE OF CONSTRUCTION.
 4. SILT FENCE SHALL BE PLACED ON SLOPE CONTOURS TO MAXIMIZE PONDING EFFICIENCY.
 5. IF POSSIBLE LOCATE FENCE 10-15 FT. FROM TOP OF SLOPE, WETLAND OR WATER BODY.
 6. JOIN SECTIONS OF SILT FENCE BY WRAPPING THE ENDS TOGETHER.
- DESIGN**
1. INSTALL AROUND THE BASE OF SOIL STOCKPILES.
 2. UTILIZE FOR SHEET FLOW ONLY.
 3. WHENEVER EXISTING SLOPES OR CONSTRUCTION ACTIVITIES RESULT IN GRASSES WHICH MAY BE SUBJECT TO EROSION FLOW VELOCITIES CAPABLE OF DOWNCUTTING OR EROSION RESULTING IN OFF-SITE SEDIMENTATION.
 4. WHERE EXISTING NATURAL OR CREATED GRASSES ARE SUBJECT TO SURFACE FLOWS CAPABLE OF CREATING GULLIES, RILLS OR OTHER SURFACE EROSION PROBLEMS.
 5. ESTABLISH SLOPES APPROPRIATE FOR INTENDED USE. SLOPES, IN GENERAL, SHOULD BE FLATTER THAN 1:2. SLOPES REQUIRING MOWING SHOULD BE NO STEEPER THAN 1:3.
 6. AVOID SENSITIVE AREAS (WATERCOURSES, WETLANDS, VEGETATIVE BUFFERS) WITH GRADING/SHAPING.
 7. DIVERT SURFACE FLOWS TO AREAS APPROPRIATELY STABILIZED TO HANDLE EXPECTED VOLUMES AND VELOCITIES.
 8. LOCATE SPILL AREAS AWAY FROM SENSITIVE AREAS OR FLOW PATHS AND STABILIZE WITH SEED.
 9. EXPOSED AREAS SHOULD BE STABILIZED WITH VEGETATION OR OTHER GROUND COVER AS SOON AS WORK IS COMPLETED OR INTERRUPTED FOR 2 NORMAL WORK WEEKS.

SILT FENCE [54]



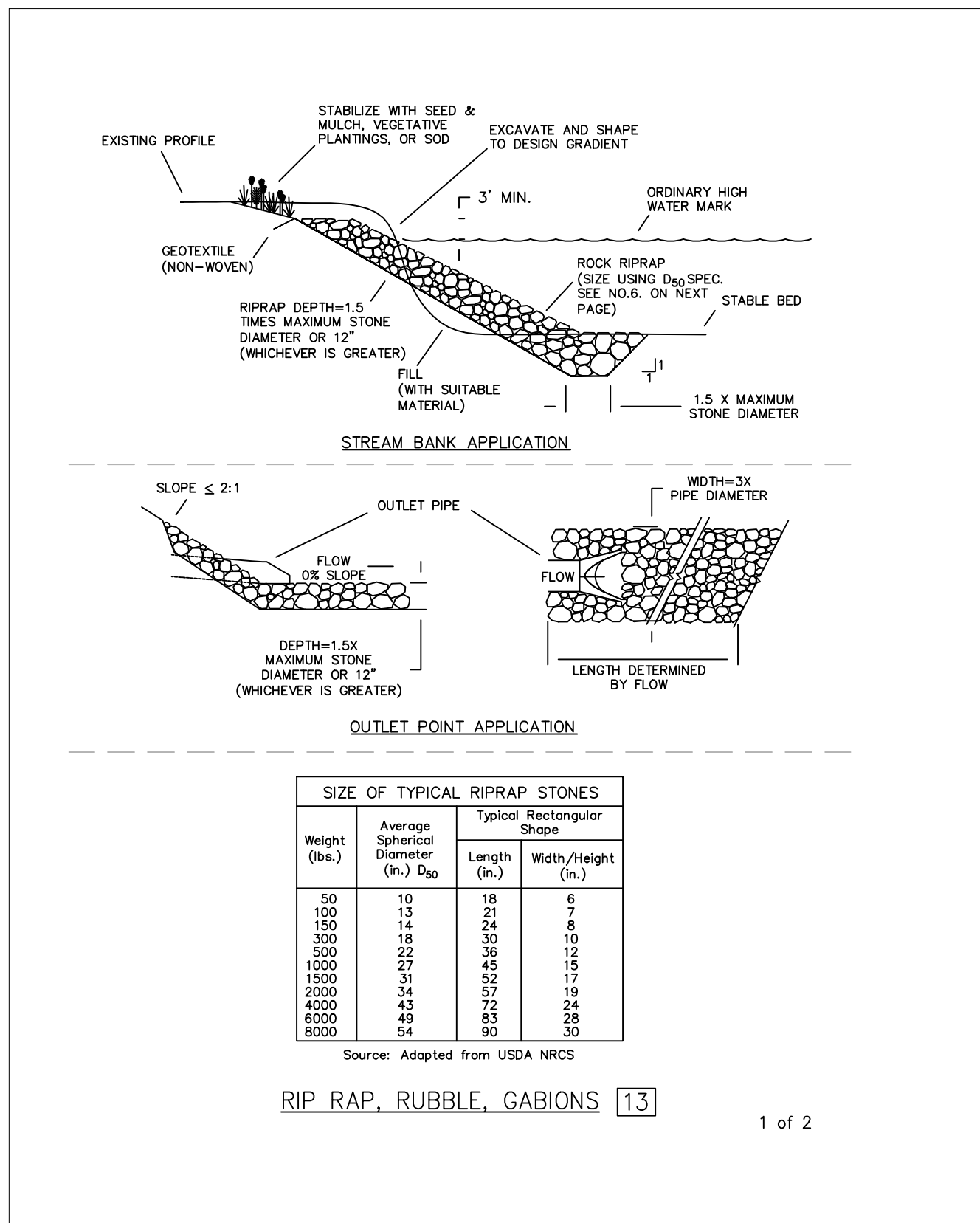
- APPLICATIONS**
1. WHENEVER EXISTING SLOPES OR CONSTRUCTION ACTIVITIES RESULT IN GRASSES WHICH MAY BE SUBJECT TO EROSION FLOW VELOCITIES CAPABLE OF DOWNCUTTING OR EROSION RESULTING IN OFF-SITE SEDIMENTATION.
 2. WHERE EXISTING NATURAL OR CREATED GRASSES ARE SUBJECT TO SURFACE FLOWS CAPABLE OF CREATING GULLIES, RILLS OR OTHER SURFACE EROSION PROBLEMS.
- DESIGN**
1. ESTABLISH SLOPES APPROPRIATE FOR INTENDED USE. SLOPES, IN GENERAL, SHOULD BE FLATTER THAN 1:2. SLOPES REQUIRING MOWING SHOULD BE NO STEEPER THAN 1:3.
 2. AVOID SENSITIVE AREAS (WATERCOURSES, WETLANDS, VEGETATIVE BUFFERS) WITH GRADING/SHAPING.
 3. DIVERT SURFACE FLOWS TO AREAS APPROPRIATELY STABILIZED TO HANDLE EXPECTED VOLUMES AND VELOCITIES.
 4. LOCATE SPILL AREAS AWAY FROM SENSITIVE AREAS OR FLOW PATHS AND STABILIZE WITH SEED.
 5. EXPOSED AREAS SHOULD BE STABILIZED WITH VEGETATION OR OTHER GROUND COVER AS SOON AS WORK IS COMPLETED OR INTERRUPTED FOR 2 NORMAL WORK WEEKS.

SELECTIVE GRADING AND SHAPING [2]



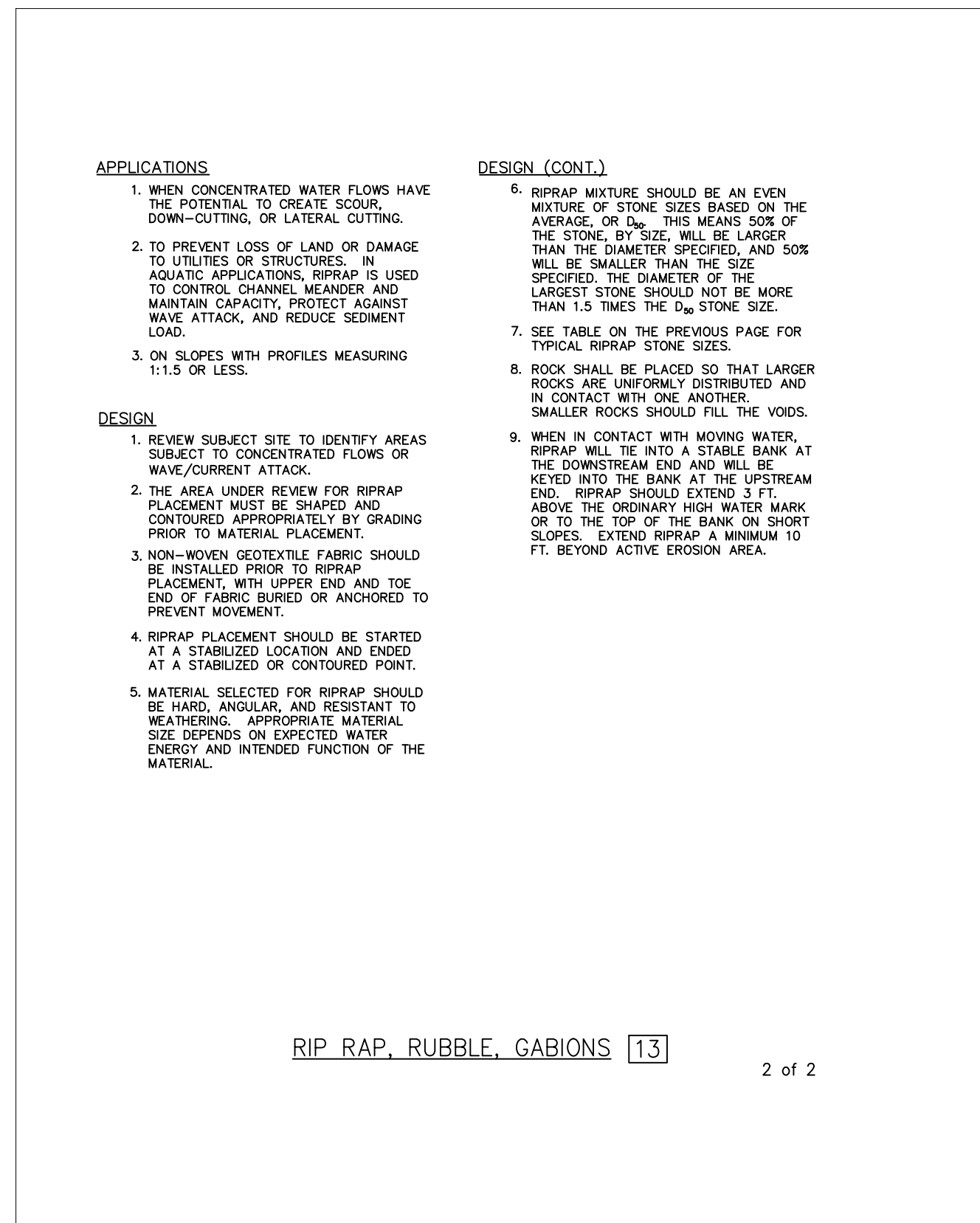
- TEMPORARY SEEDING APPLICATIONS**
1. WHEN AN AREA NEEDS STABILIZATION DURING A BREAK IN CONSTRUCTION.
 2. TO STABILIZE SOIL AND PREVENT OR REDUCE SOIL EROSION/SEDIMENTATION PROBLEMS FROM DEVELOPING.
 3. USED ON CONSTRUCTION AND EARTH CHANGE SITES WHICH REQUIRE TEMPORARY VEGETATIVE STABILIZATION.
- DESIGN**
1. REVIEW SESS PLAN AND CONSTRUCTION PHASING TO IDENTIFY AREAS IN NEED OF TEMPORARY VEGETATIVE STABILIZATION.
 2. SELECT ANNUAL GRASS SEED FOR TEMPORARY COVER AREAS.
 3. SEED MIXES MAY VARY, SHOULD ONLY CONTAIN ANNUAL, NON-AGGRESSIVE SPECIES, AND GENERALLY INCLUDE RYE, WHEAT OR OAT SPECIES. SEED MIXES SHOULD BE OBTAINED THROUGH CONSULTATION WITH A CERTIFIED SEED PROVIDER AND WITH CONSIDERATION OF SOIL TYPE, LIGHT, MOISTURE AND USE APPLICATION.
 4. PREPARE SEEDBED BY REMOVAL OF CONSTRUCTION AND WOODY DEBRIS. THEN SCARIFY OR RAKE SEEDBED.
 5. SLOPES STEEPER THAN 1:3 SHOULD BE ROUGHENED.
 6. APPLY SEED AS SOON AS POSSIBLE AFTER SEEDBED PREPARATION. MULCH IMMEDIATELY AFTER SEEDING ALL SLOPES UNSTABLE SOILS, HEAVY CLAY SOILS, WATERCOURSES, OR SENSITIVE AREAS.
 7. PROTECT SEEDBED AREAS FROM PEDESTRIAN OR VEHICULAR TRAFFIC.
 8. DIVERT CONCENTRATED FLOWS AWAY FROM THE SEEDBED AREA UNTIL VEGETATION IS ESTABLISHED.
 9. INSPECT TEMPORARY SEEDBED AREAS WEEKLY AND FOLLOWING EACH RAIN EVENT UNTIL FINAL GRADING AND STABILIZATION ARE COMPLETED.
 10. TEMPORARY SEEDING MUST BE FOLLOWED BY PERMANENT SEEDING.
- PERMANENT SEEDING APPLICATIONS**
1. TO FINALIZE STABILIZATION OF TEMPORARY SEEDING AREAS OR WHEN AN AREA NEEDS PERMANENT STABILIZATION FOLLOWING COMPLETION OF CONSTRUCTION. ALSO USED WHEN VEGETATIVE ESTABLISHMENT CAN CORRECT EXISTING SOIL EROSION OR SEDIMENTATION PROBLEMS.
 2. TO STABILIZE SOIL AND PREVENT OR REDUCE SOIL EROSION/SEDIMENTATION PROBLEMS FROM DEVELOPING.
 3. USED ON CONSTRUCTION AND EARTH CHANGE SITES WHICH REQUIRE PERMANENT VEGETATIVE STABILIZATION.
- DESIGN**
1. REVIEW SESS PLAN AND CONSTRUCTION PHASING TO IDENTIFY AREAS IN NEED OF PERMANENT VEGETATIVE STABILIZATION.
 2. SELECT PERENNIAL GRASS AND GROUND COVER FOR PERMANENT COVER.
 3. SEED MIXES MAY VARY BUT SHOULD BE SELECTED THROUGH CONSULTATION WITH A CERTIFIED SEED PROVIDER AND WITH CONSIDERATION OF SOIL TYPE, LIGHT, MOISTURE, USE APPLICATIONS, AND NATIVE SPECIES CONTENT.
 4. SOIL TESTS SHOULD BE PERFORMED TO DETERMINE THE NUTRIENT AND PH LEVELS IN THE SOIL. THE PH MAY NEED TO BE ADJUSTED TO BETWEEN 6.5 AND 7.0.
 5. PREPARE A 3-5" DEEP SEEDBED, WITH THE TOP 3-4" CONSISTING OF TOPSOIL.
 6. SLOPES STEEPER THAN 1:3 SHOULD BE ROUGHENED.
 7. APPLY SEED AS SOON AS POSSIBLE AFTER SEEDBED PREPARATION. SEED MAY BE BROADCAST BY HAND, HYDROSEEDING, OR BY USING MECHANICAL DRILLS.
 8. DORMANT SEED MIXES ARE FOR USE AFTER THE GROWING SEASON. USING SEED WHICH LIES DORMANT IN THE WINTER AND BEGINS GROWING AS SOON AS SITE CONDITIONS BECOME FAVORABLE.
 9. MULCH IMMEDIATELY AFTER SEEDING.
 10. PROTECT SEEDBED AREAS FROM PEDESTRIAN OR VEHICULAR TRAFFIC.
 11. DIVERT CONCENTRATED FLOWS AWAY FROM THE SEEDBED AREA UNTIL VEGETATION IS ESTABLISHED.

VEGETATIVE STABILIZATION [4]



Weight (lbs.)	Average Spherical Diameter (in.)		Typical Rectangular Shape	
	Length (in.)	Width/Height (in.)	Length (in.)	Width/Height (in.)
50	10	18	6	6
100	13	21	8	8
150	14	24	10	10
300	18	30	12	12
500	22	36	15	15
1000	27	45	17	17
1500	31	52	19	19
2000	34	57	22	22
4000	43	72	24	24
6000	49	83	28	28
8000	54	90	30	30

RIP RAP, RUBBLE, GABIONS [13]



- APPLICATIONS**
1. WHEN CONCENTRATED WATER FLOWS HAVE THE POTENTIAL TO CREATE SCOUR, DOWN-CUTTING, OR LATERAL CUTTING.
 2. TO PREVENT LOSS OF LAND OR DAMAGE TO UTILITIES OR STRUCTURES. IN AQUATIC APPLICATIONS, RIPRAP IS USED TO CONTROL CHANNEL MEANDER AND MAINTAIN CAPACITY, PROTECT AGAINST WAVE ATTACK, AND REDUCE SEDIMENT LOAD.
 3. ON SLOPES WITH PROFILES MEASURING 1:1.5 OR LESS.
 6. RIPRAP MIXTURE SHOULD BE AN EVEN MIXTURE OF STONE SIZES BASED ON THE AVERAGE, OR D_{50} . THIS MEANS SIZE OF THE STONE, BY SIZE, WILL BE LARGER THAN THE DIAMETER SPECIFIED, AND SIZE WILL BE SMALLER THAN THE SIZE SPECIFIED. THE DIAMETER OF THE LARGEST STONE SHOULD NOT BE MORE THAN 1.5 TIMES THE D_{50} STONE SIZE.
 7. SEE TABLE ON THE PREVIOUS PAGE FOR TYPICAL RIPRAP STONE SIZES.
 8. ROCK SHALL BE PLACED SO THAT LARGER ROCKS ARE UNIFORMLY DISTRIBUTED AND IN CONTACT WITH ONE ANOTHER. SMALLER ROCKS SHOULD FILL THE VOIDS.
 9. WHEN IN CONTACT WITH MOVING WATER, RIPRAP WILL TEND TO A STABLE BANK AT THE DOWNSTREAM END AND WILL BE HEAVED INTO THE BANK AT THE UPSTREAM END. RIPRAP SHOULD EXTEND 3 FT. ABOVE THE ORDINARY HIGH WATER MARK OR TO THE TOP OF THE BANK ON SHORT SLOPES. EXTEND RIPRAP A MINIMUM 10 FT. BEYOND ACTIVE EROSION AREA.
- DESIGN**
1. REVIEW SUBJECT SITE TO IDENTIFY AREAS SUBJECT TO CONCENTRATED FLOWS OR WAVE/CURRENT ATTACK.
 2. THE AREA UNDER REVIEW FOR RIPRAP PLACEMENT MUST BE SHAPED AND CONTOURED APPROPRIATELY BY GRADING PRIOR TO MATERIAL PLACEMENT.
 3. NON-WOVEN GEOTEXTILE FABRIC SHOULD BE INSTALLED PRIOR TO RIPRAP PLACEMENT, WITH UPPER END AND THE END OF FABRIC BURIED OR ANCHORED TO PREVENT MOVEMENT.
 4. RIPRAP PLACEMENT SHOULD BE STARTED AT A STABILIZED LOCATION AND ENDED AT A STABILIZED OR CONTOURED POINT.
 5. MATERIAL SELECTED FOR RIPRAP SHOULD BE HARD, ANGULAR, AND RESISTANT TO WEATHERING. APPROPRIATE MATERIAL SIZE DEPENDS ON EXPECTED WATER ENERGY AND INTENDED FUNCTION OF THE MATERIAL.

RIP RAP, RUBBLE, GABIONS [13]

NO.	REVISION/ISSUE	DATE	BY
1.	ISSUE FOR TAKE OFF	1/20/26	BLB
2.	MOD. TOP REVISIONS	3/2/26	BLB
3.	MOD. EXP. REVISIONS	3/2/26	BLB
4.	MOD. EXP. REVISIONS	3/2/26	BLB
5.	MOD. EXP. REVISIONS	3/2/26	BLB

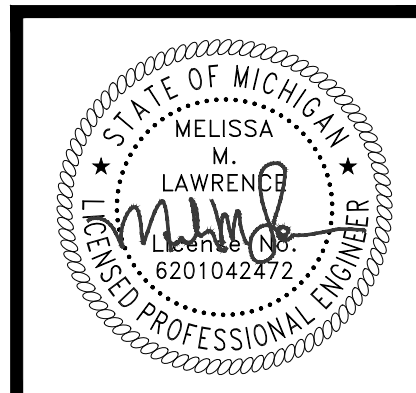
SHEET TITLE:
SOIL EROSION CONTROL
DETAILS

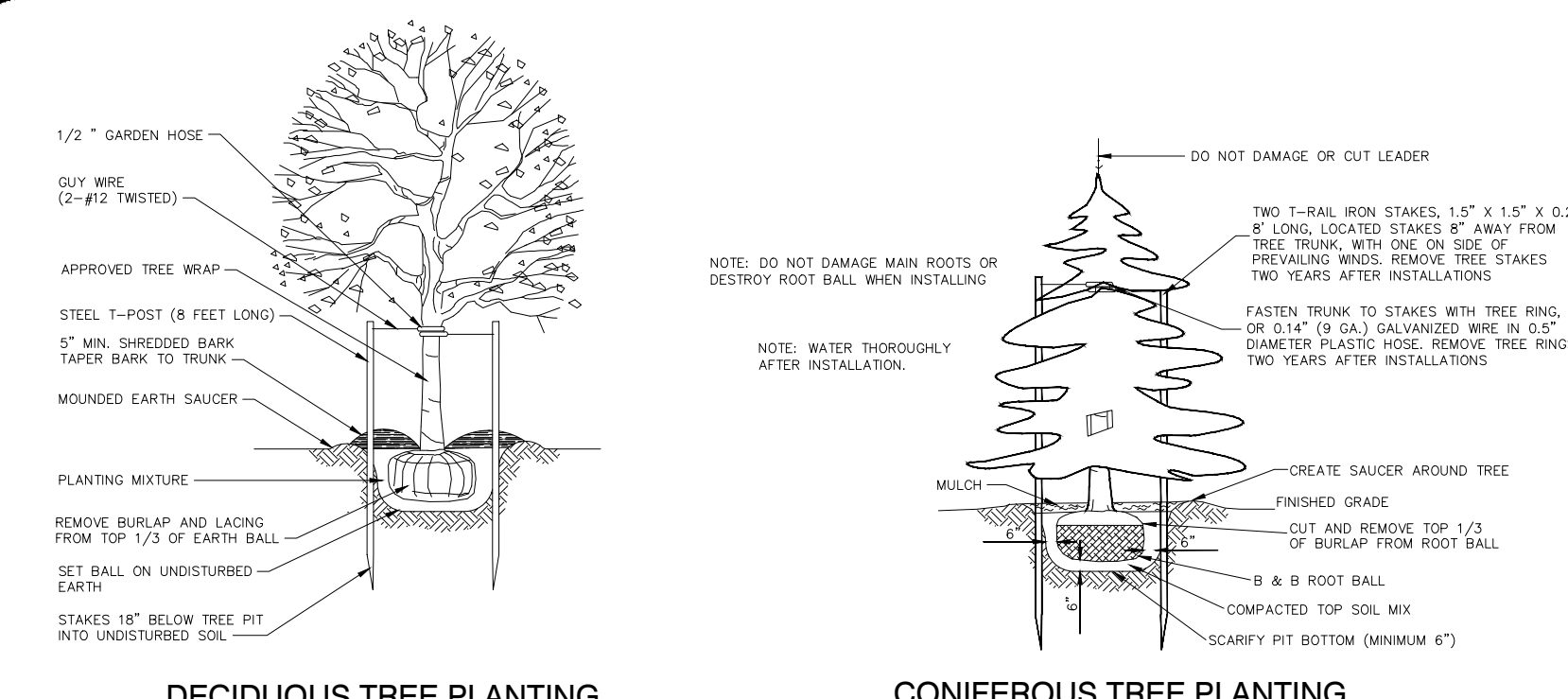
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FOR
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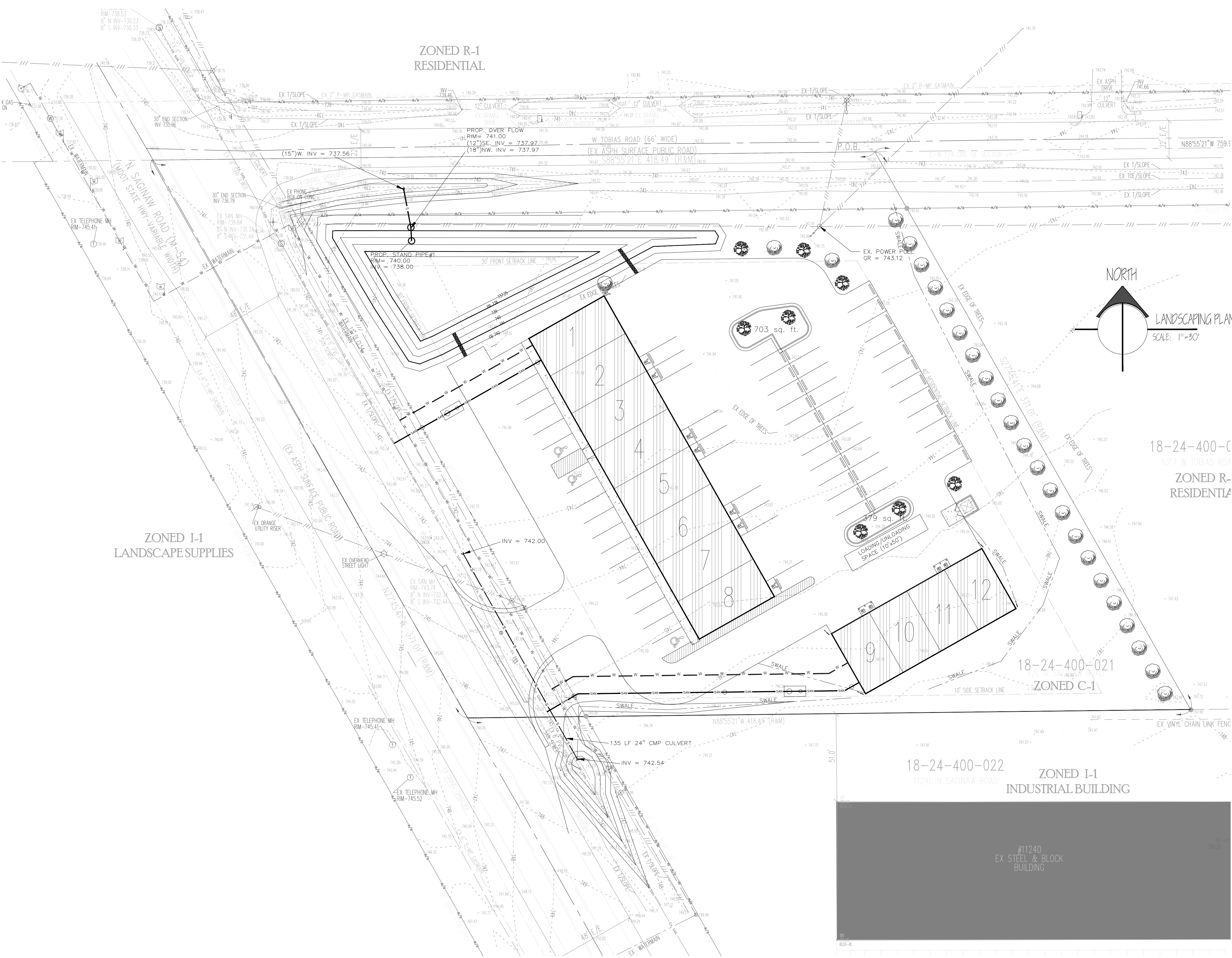
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DATE: 10-13-2025
SHEET: 6 OF 14





DECIDUOUS TREE PLANTING
SCALE: NONE

CONIFEROUS TREE PLANTING
SCALE: NONE



LANDSCAPE SCHEDULE

AMT.	SYMBOL	COMMON NAME	SCIENTIFIC NAME	SIZE	MAX. ON-CENTER SPACING (FEET)
27		SPRUCE	PICEA PUNGENS	MIN 6" IN HEIGHT	15'
8		HOP HORNBEAM (DECIDUOUS)	OSTRYA VIRGINIANA	MIN 2" TO 3" CALIPER	

EXISTING VEGETATION NOTE:
EXISTING VEGETATION CONSISTS OF SMALL TREES AND SCRUB BRUSH. ALL EXISTING VEGETATION WILL BE CLEARED FROM THE SITE.

- LANDSCAPING REQUIREMENTS**
- PARKING LOT FOR EVERY 20 PARKING SPACES AN AREA SHALL BE USED FOR INTERIOR LANDSCAPING. PARKING LOT LANDSCAPING SHALL NOT BE LESS THAN 150 SQ. FT. ISLAND, NOT MORE THAN TWO (2) LANDSCAPED UNITS OF 150 SQUARE FEET MAY BE COMBINED TO MEET MINIMUM REQUIREMENTS. A MINIMUM OF ONE (1) DECIDUOUS TREE SHALL BE PLANTED IN EACH LANDSCAPED AREA.
REQUIRED = THREE (3) DECIDUOUS TREES 450 SQ. FT. INTERIOR LANDSCAPE SPACE
PROVIDED = THREE (4) DECIDUOUS TREES (703 sq ft + 349 sq.ft.) = 1,082 SQ. FT. INTERIOR LANDSCAPE SPACE
 - SCREENING WALLS.
C1 AND C2 DISTRICTS ADJACENT TO R1-A, R-1, R-2 OR MH DISTRICTS. 6 FOOT HIGH WALL OR FENCE REQUIRED.
PROPOSED USING A GREENBELT OF 24 SPRUCE TREES SPACE 15' ON CENTER TO PROVIDE SCREENING.

- LANDSCAPE NOTES**
- PLANTINGS SHALL BE DONE WITHIN SIX (6) MONTHS FROM THE DATE OF CONSTRUCTION COMPLETION AND THEREAFTER BE REASONABLY MAINTAINED.
 - ALL LANDSCAPING SHALL BE MAINTAINED IN A HEALTHY, NEAT AND ORDERLY STATE FREE FROM REFUSE AND DEBRIS. ANY DEAD OR DISEASED PLANTS SHALL BE REMOVED AND REPLACED WITHIN SIX (6) MONTHS.
 - TREE STAKES, GUY WIRES AND TREE WRAP ARE TO BE REMOVED AFTER ONE (1) YEAR.
 - ALL LANDSCAPED AREAS SHALL BE PROVIDED WITH A READILY AVAILABLE AND ACCEPTABLE WATER SUPPLY, OR WITH AT LEAST ONE (1) OUTLET LOCATED WITHIN ONE HUNDRED (100) FEET OF ALL PLANTED MATERIAL TO BE MAINTAINED.
 - INSTALL 3" X 12" GA. EDGING TO SEPARATE LAWN FROM PLANTING BED.
 - ALL PLANTING BEDS MUST HAVE WEED BARRIER AND BE COMPLETELY MULCHED.
 - CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO PLANT MATERIAL LOCATIONS IN FIELD, AS NECESSARY. THE LOCATION OF ALL PLANT MATERIAL SHALL BE SUBJECT TO APPROVAL BY THE OWNER'S AUTHORIZED REPRESENTATIVE.
 - ALL PLANT MATERIAL SHALL BE OF THE SIZES CALLED FOR IN THE LANDSCAPING SCHEDULE. ANY PLANT MATERIAL NOT MEETING THE SIZES AND/OR QUALITY AS CALLED FOR SHALL BE REMOVED FROM SITE. ALL TREES SHALL BE INSPECTED AND APPROVED BY THE OWNER'S AUTHORIZED REPRESENTATIVE. NO SUBSTITUTIONS OF PLANT MATERIAL SHALL BE MADE WITHOUT APPROVAL FROM THE OWNER'S AUTHORIZED REPRESENTATIVE.
 - ALL PROPOSED TREES OVER 2" CAL. SHALL BE GUIDED/STAKED SECURE.
 - CONTRACTOR SHALL DETERMINE APPROPRIATE PLANTING BACKFILL MIXES (BASED ON SOILS/SUBSURFACE CONDITIONS) AND REVIEW ALTERNATIVES WITH OWNER'S AUTHORIZED REPRESENTATIVE PRIOR TO INSTALLATION.
 - LANDSCAPED AREAS SHALL BE COVERED BY GRASS, LIVING GROUND COVER OR MULCH.
 - TREES REQUIRED ON THE SITE PLAN MUST BE MAINTAINED TO REMAIN IN COMPLIANCE WITH THE SITE PLAN. UNHEALTHY VEGETATION MUST BE REPLACED. REQUIRED LANDSCAPING SHALL NOT BE REMOVED UNLESS APPROVED AS A SITE PLAN AMENDMENT.
 - LANDSCAPING SHALL BE INSTALLED SUCH THAT, WHEN MATURE, IT DOES NOT OBSCURE TRAFFIC SIGNS, FIRE HYDRANTS, LIGHTING, DRAINAGE PATTERNS ON SITE OR ADJACENT PROPERTIES, OR OBSTRUCT VISION FOR SAFETY OF INGRESS OR EGRESS.
 - PROPERTY OWNERS SHALL BE RESPONSIBLE FOR MAINTAINING THE LAWN AREA AND ANY LANDSCAPING WITHIN THE ROAD RIGHT-OF-WAY THAT ABUTS THE LOT'S FRONTAGE IN GOOD CONDITION, INCLUDING ANY ROAD DITCH.
 - UPON COMPLETION OF LANDSCAPE IMPROVEMENTS AND PLANTING, THE APPLICANT SHALL NOTIFY THE CITY AND REQUEST A FIELD INSPECTION BY THE CITY.

NO.	REVISION/ISSUE	DATE	BY
1.	ISSUE	1/20/26	BLB
2.	REVISED	3/2/26	BLB
3.	REVISED	3/18/26	BLB
4.	REVISED	3/23/26	BLB
5.	REVISED	3/24/26	BLB

SHEET TITLE:
LANDSCAPING PLAN

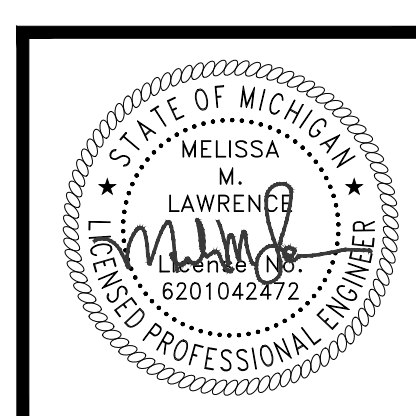
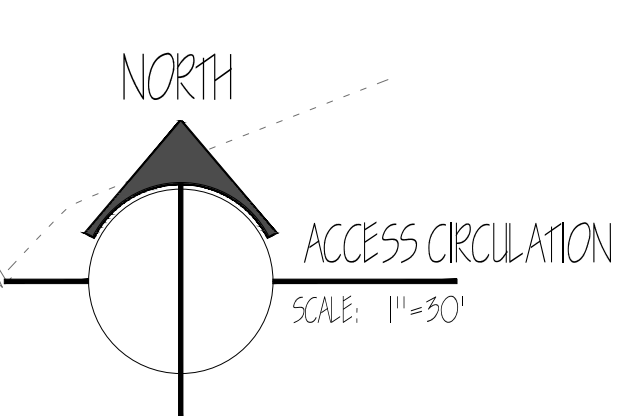
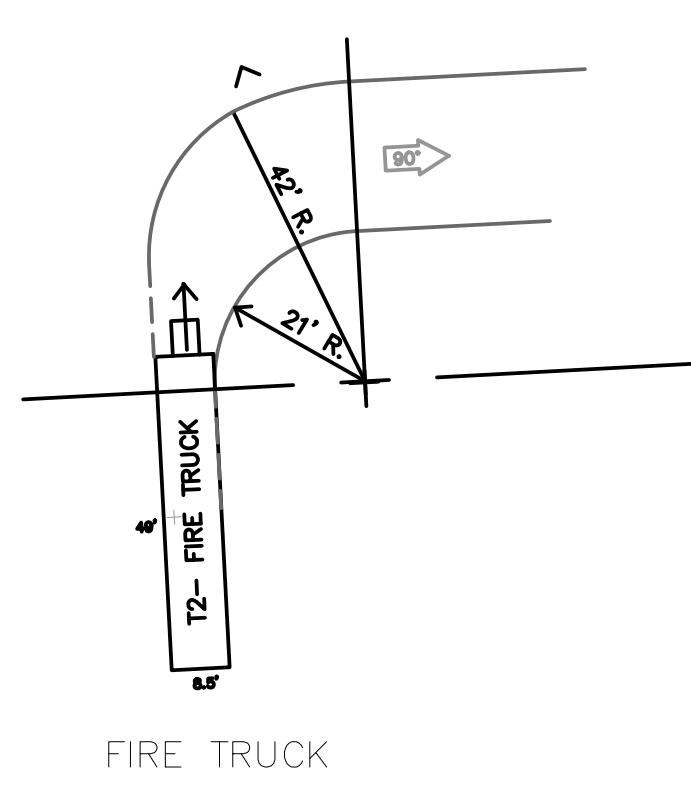
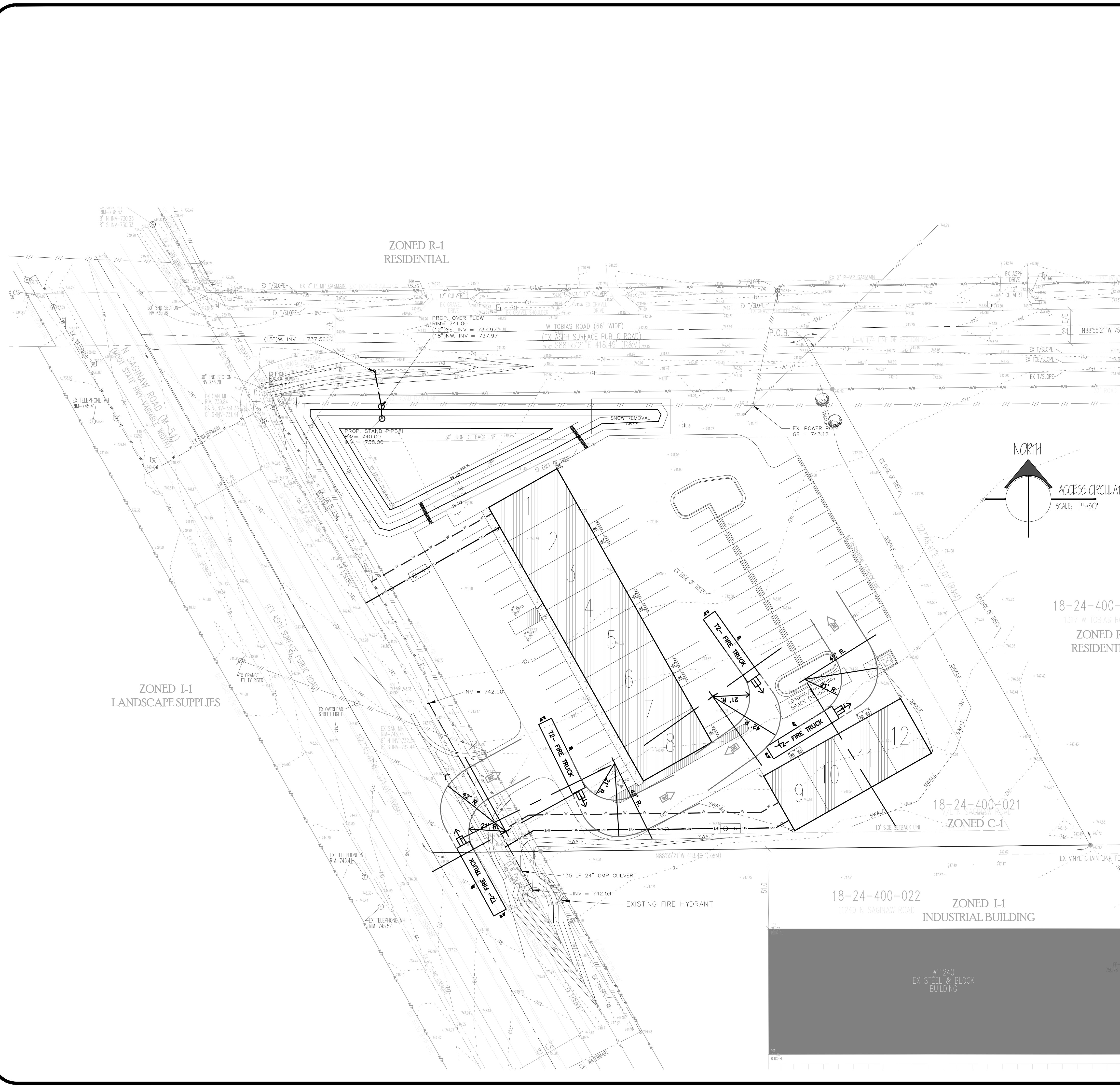
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3	REVISION	3/18/26	BLB
4	REVISION	3/23/26	BLB
5	REVISION	3/24/26	BLB

SHEET TITLE:
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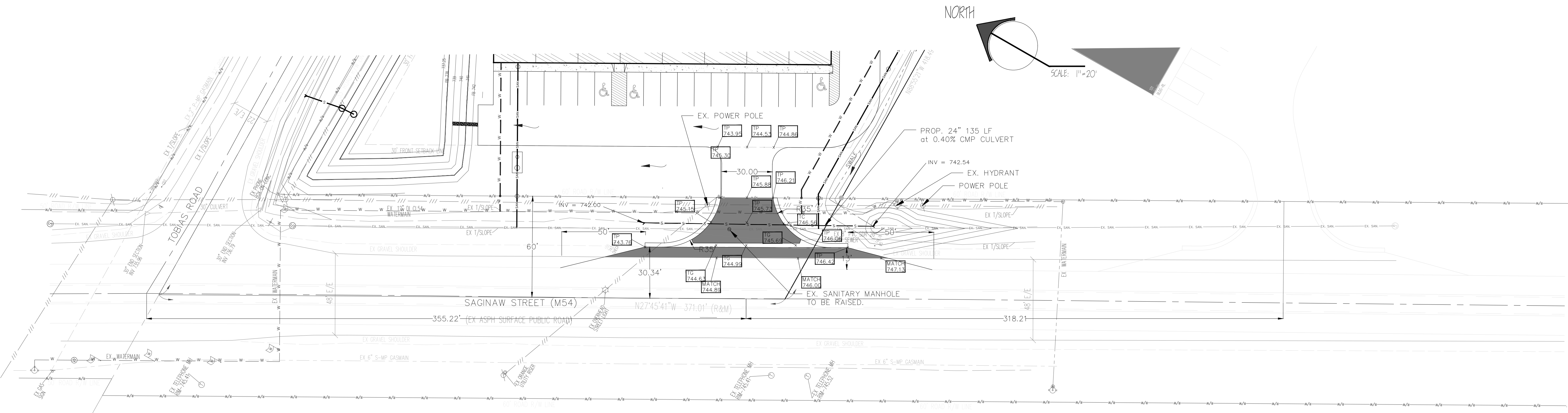
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REV.	REVISION/ISSUE	DATE
1	ISSUE FOR PERMITS	12/20/26
2	MODIFY TYP REVISIONS	3/2/26
3	MODIFY TYP REVISIONS	3/2/26
4	MODIFY TYP REVISIONS	3/2/26
5	MODIFY TYP REVISIONS	3/2/26

SHEET TITLE
**SAGINAW STREET
 ENTRANCE**

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 LINDEN, MI 48451
 OFFICE (810)750-5280
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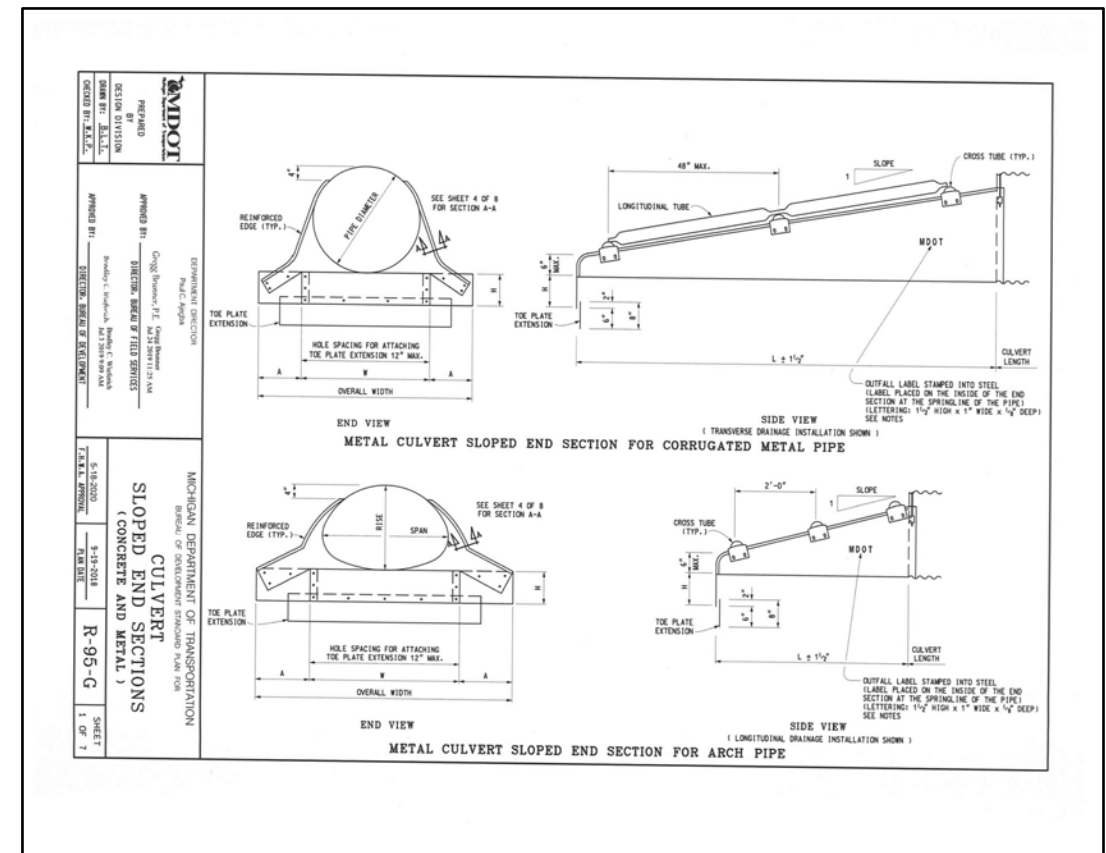
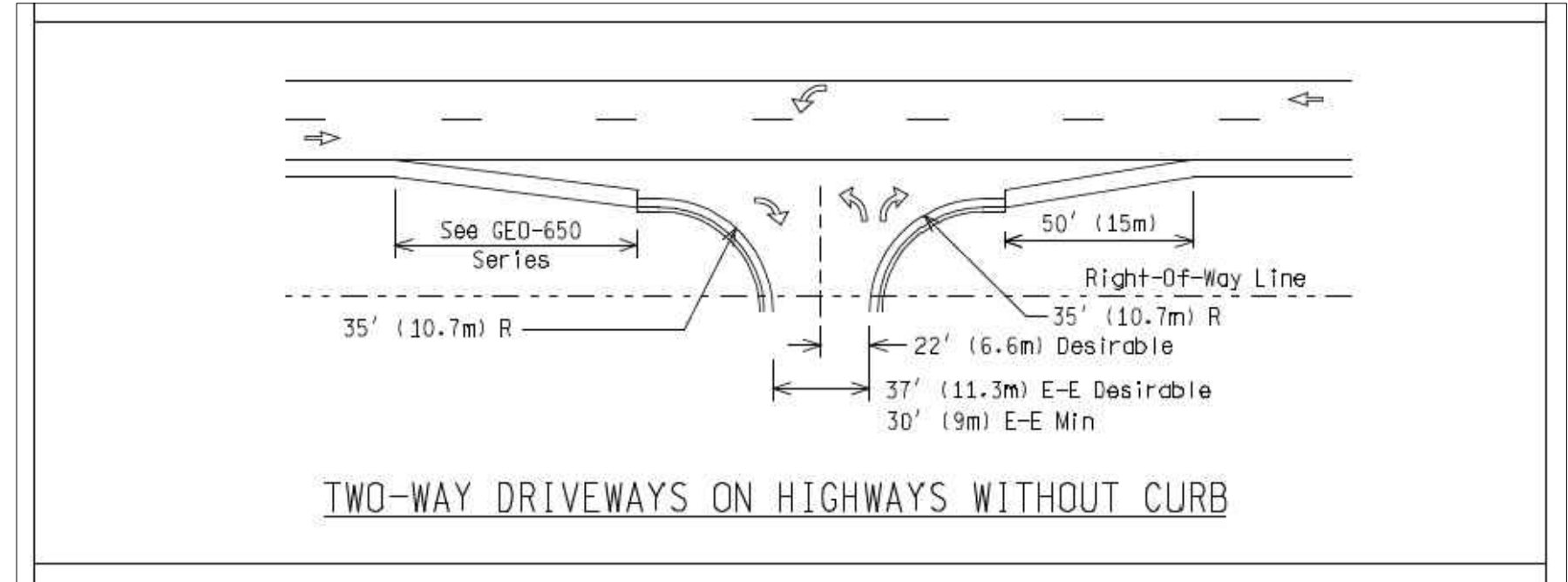
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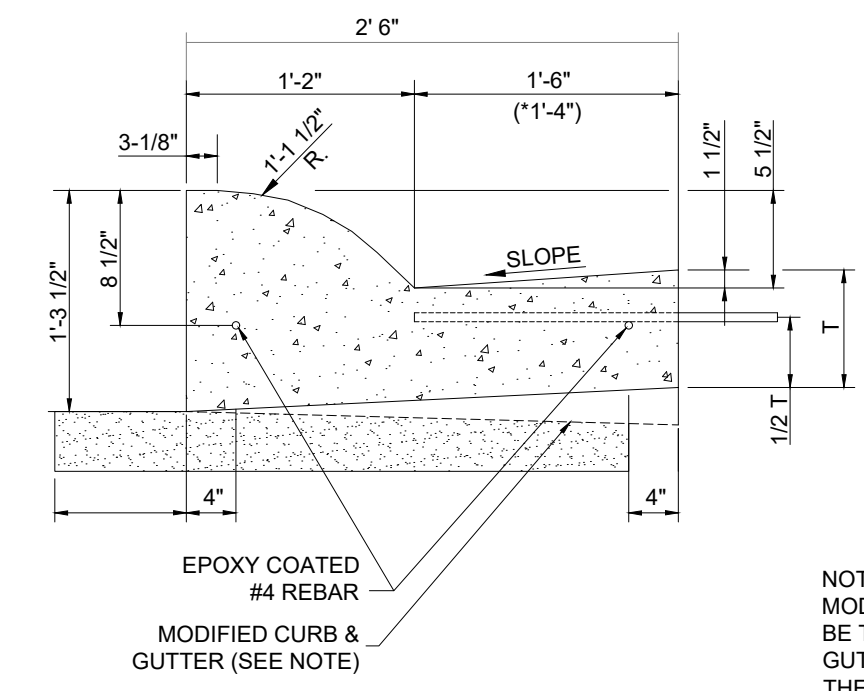
- CONCRETE NOTES**
- ALL CONCRETE SHALL BE 4500 PSI CONCRETE MIX UNLESS OTHERWISE NOTED.
 - ALL POLY FIBER REINFORCED CONCRETE SHALL HAVE A MIX RATIO OF 1.5 LBS OF POLY FIBER PER 1.0 CYD OF CONCRETE.
- CONCRETE JOINTS**
- THE CONTRACTOR MUST PREPARE A JOINTING PLAN AND SUBMIT TO ENGINEER AS A SHOP DRAWING FOR APPROVAL PRIOR TO PLACEMENT OF CONCRETE.
 - BEGIN SAW CUTS AFTER THE CONCRETE HAS HARDENED ENOUGH TO PERMIT SAWING WITH OUT RAVELING OR MOVING AGGREGATES.
 - IF CRACKS DEVELOP AHEAD OF A SAW, STOP SAWING THAT JOINT. LATER USE CRACK SAWS TO FORM JOINT SEALANT RESERVOIRS ALONG THE CRACK LINE.
 - JOINT SPACING:
 - MAXIMUM SLAB SIZE = 2 X SLAB THICKNESS (INCHES TO FEET). I.E. 2 X 6 INCHES = 12 FEET - 15 FEET IS ABSOLUTE MAX.
 - RECOMMENDED MAXIMUM JOINT SPACING (SMALLER IS BETTER)
 - 4" SLAB: 6 FEET
 - 6" SLAB: 10 FEET
 - 8" SLAB: 14 FEET
 - 9" SLAB: 15 FEET
 - CATCH BASIN AND MANHOLE CASTINGS REQUIRE A BOXOUT OR ISOLATION TO ALLOW FOR VERTICAL AND HORIZONTAL SLAB MOVEMENT.
 - SAWCUT JOINTS SHALL BE CONTINUOUS ACROSS THE SLAB AND SHALL MATCH LOCATION OF JOINTS ON ADJUTING CONCRETE SLABS.
 - CONTRACTOR SHALL PROVIDE ISOLATION/EXPANSION JOINTS BETWEEN SLABS OR AT STRUCTURES.
 - THE CONTRACTOR SHALL PROVIDE CONSTRUCTION JOINTS AT EDGE OF POURS OR FORM LINES.
 - THE CONTRACTOR SHALL PROVIDE CONTRACTION JOINTS (SAW CUTS OR TOOLED) EQUALLY SPACED AS IDENTIFIED IN NOTE 4 THIS SHEET.

- CONCRETE CURBING**
- WHERE THE DRAINAGE FLOWS AWAY FROM THE CURB AND GUTTER THE CONTRACTOR MODIFY THE CURB AND GUTTER DETAIL TO SLOPE AWAY FROM THE CURB FACE @ 1" PER FOOT.
 - THE CONTRACTOR SHALL NOT GRADE SITE SO THAT STORM WATER FLOWS TOWARDS OR AGAINST STRAIGHT CURB OR THICKENED EDGE SIDEWALK.
 - ALL REBAR FOR CONCRETE CURB AND GUTTER SHALL BE #4 EPOXY COATED.
 - PLACE 1" FIBER JOINT FILLER AT 40' MAXIMUM INTERVALS.
 - PLACE 1" FIBER JOINT FILLER AT SPRING POINTS IF CURB RETURNS (AND INTERSECTION STREETS).
 - PLACE 1" FIBER JOINT FILLER IN ADJACENT CONTRACTION JOINTS EACH SIDE OF CATCH BASINS.
 - PLACE CONTRACTION JOINTS AT 40' MAXIMUM INTERVALS (NO SAW CUT JOINTS ALLOWED).
- ASPHALT**
- THE LEVELING COURSE SHALL BE MDOT 4E1 OR APPROVED EQUAL (13A LVSP).
 - THE WEARING COURSE SHALL BE MDOT 5E OR APPROVED EQUAL (36A).
 - THE ASPHALT BINDER SHALL BE PG 58-28.
- MATERIALS**
- GRANULAR MATERIAL - MDOT CLASS II SAND
 - OPEN GRADED AGGREGATE - MDOT 6A OR AASHTO #57
 - DENSE GRADED AGGREGATE - MDOT 21AA CRUSHED LIMESTONE
 - CONTRACTOR CAN USE CRUSHED CONCRETE/ASPHALT MEETING MDOT 21AA SPECIFICATIONS AS AGGREGATE BASE MATERIAL. CONTRACTORS SHALL INCREASE BASE THICKNESS BY 25%.

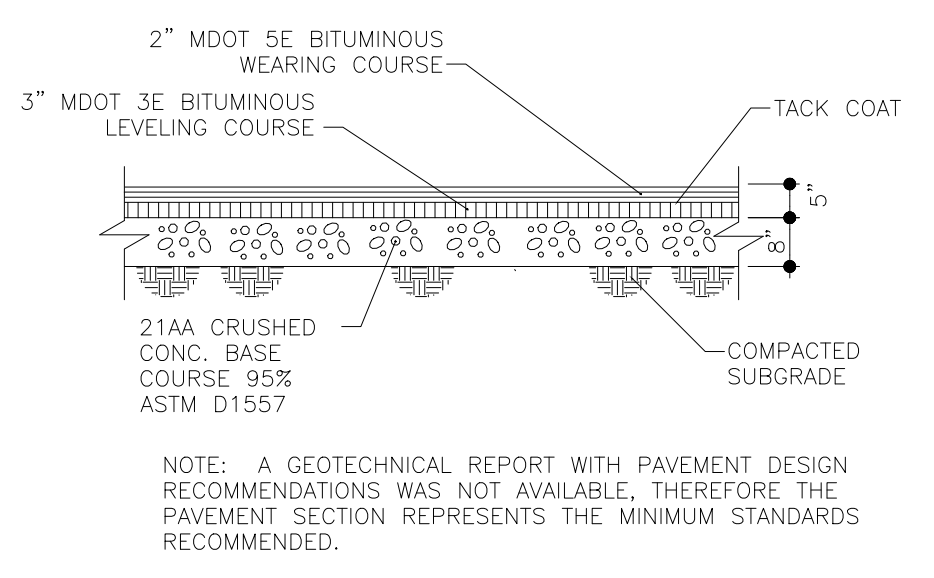


DETAIL	DIMENSIONS	LANE TIES	CONCRETE CYD/LFT	CONCRETE CYD/LFT
B1	9"	AS SHOWN	0.0900	(*0.0855)
B2	9"	OMITTED	0.0900	(*0.0855)
B3	10"	AS SHOWN	0.0941	(*0.0894)

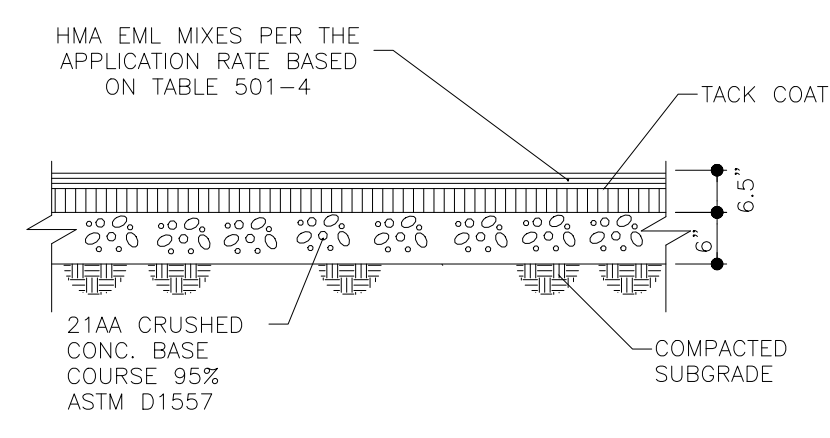
(* GUTTER PAN WIDTH MAY BE REDUCED WHEN APPROVED BY THE ENGINEER)



NOTE: MODIFIED CURB & GUTTER SHALL BE THE SAME DETAIL BUT THE GUTTER SHALL SLOPE AWAY FROM THE CURB FACE @ 1" FT.



BITUMINOUS PAVEMENT PARKING LOT
 NO SCALE

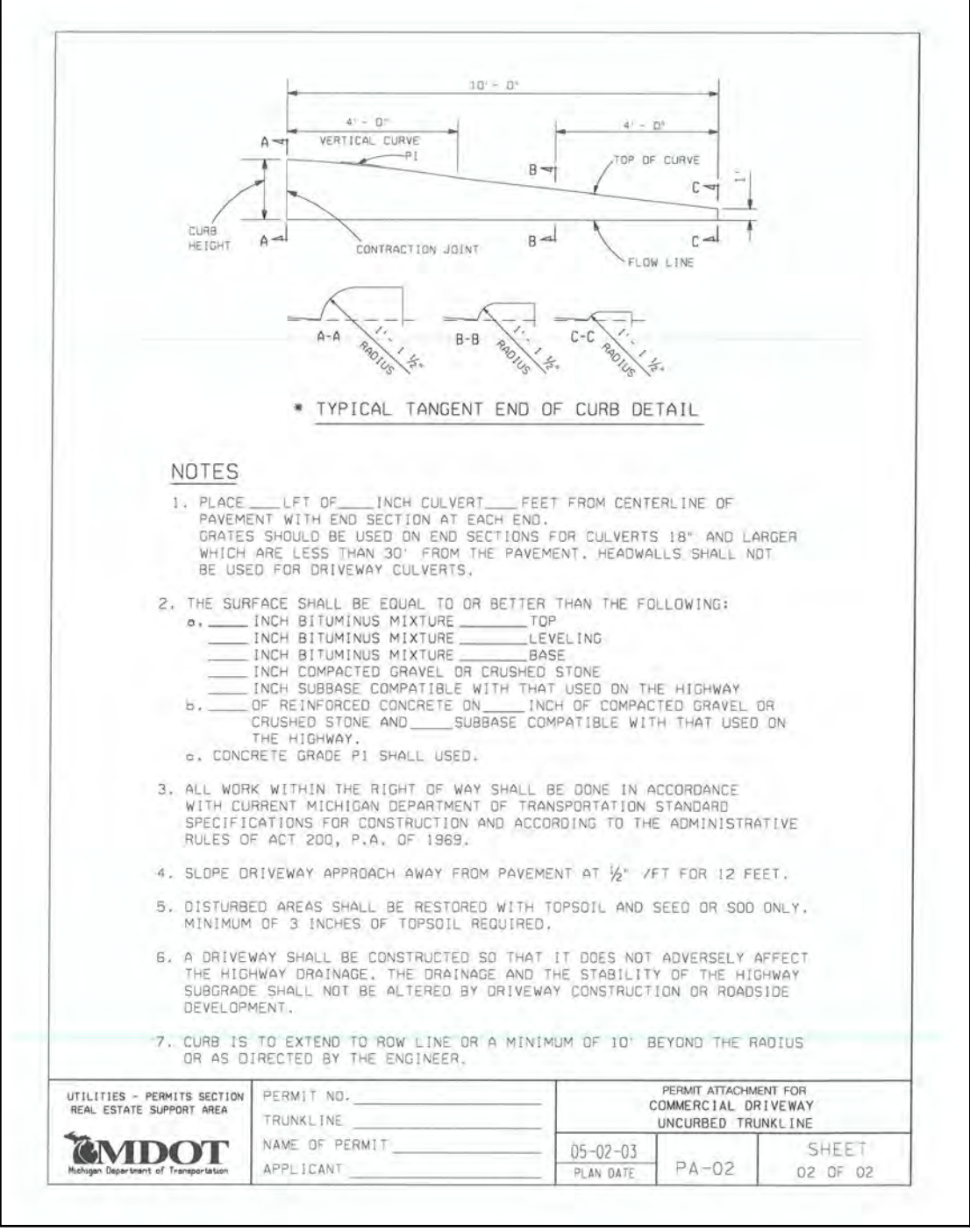
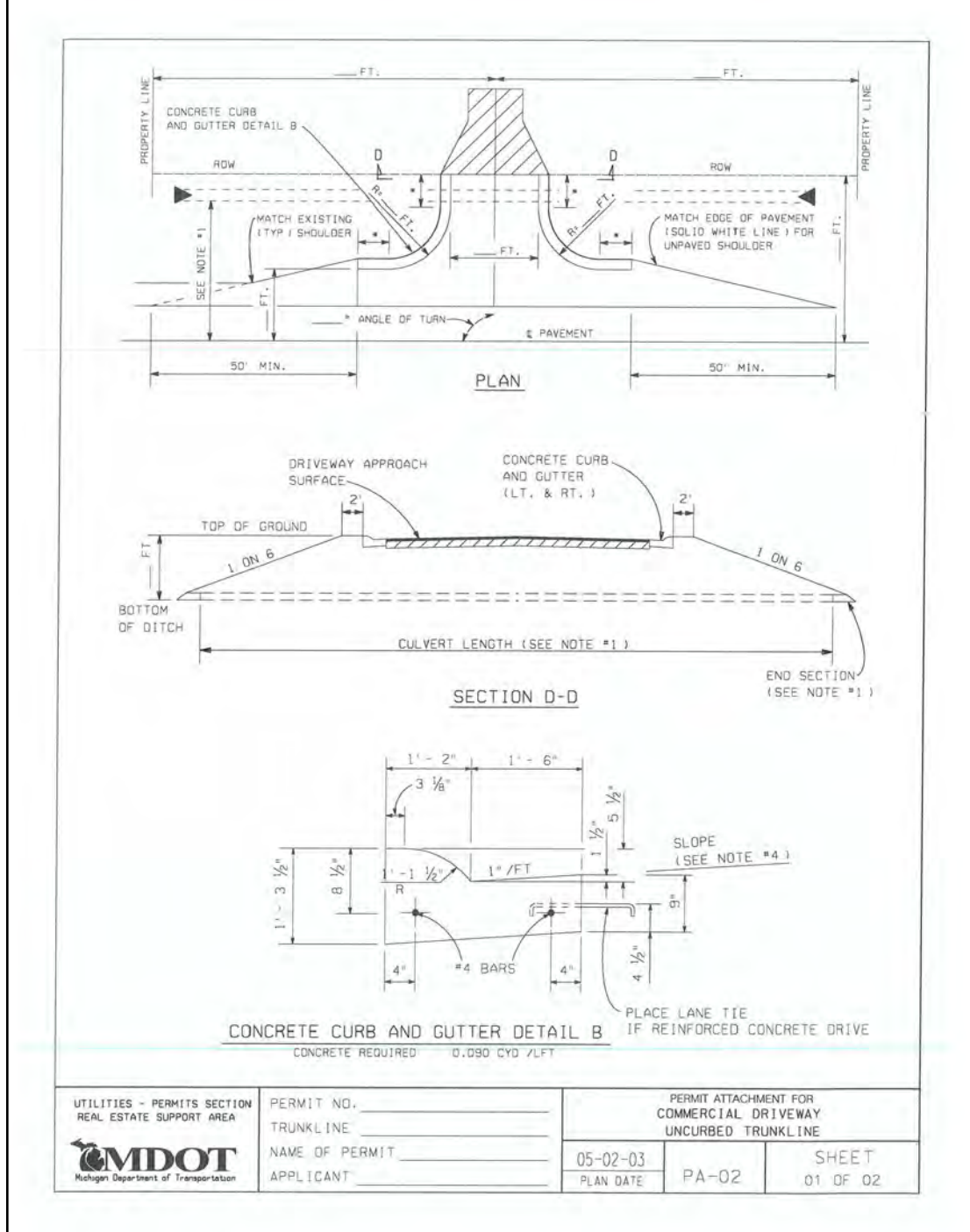


BITUMINOUS DRIVEWAY APPROACH SHOULDER WIDENING DETAIL
 NO SCALE

Table 501-4: HMA Application Rates

Mix Number ^(a)	Course Application	Application Rate (lb/yd ³) minimum - maximum ^(b)
2	Base	435-550
3	Base leveling	335-415
4	Leveling top	220-275
5	Top	165-220

(a) See Table 501-1 for the mix number design parameters.
 (b) Minimum application rates do not apply to wearing courses.



UTILITIES - PERMITS SECTION
 NON-UTILITY APPROVAL AREA

PERMIT NO. _____
 TRUNK LINE _____
 NAME OF PERMIT _____
 APPLICANT _____

PRINT ATTACHMENT FOR COMMERCIAL DRIVEWAY UNCURBED TRUNK LINE

05-02-01
 PLAN DATE PA-02

SHEET 7 OF 02

UTILITIES - PERMITS SECTION
 NON-UTILITY APPROVAL AREA

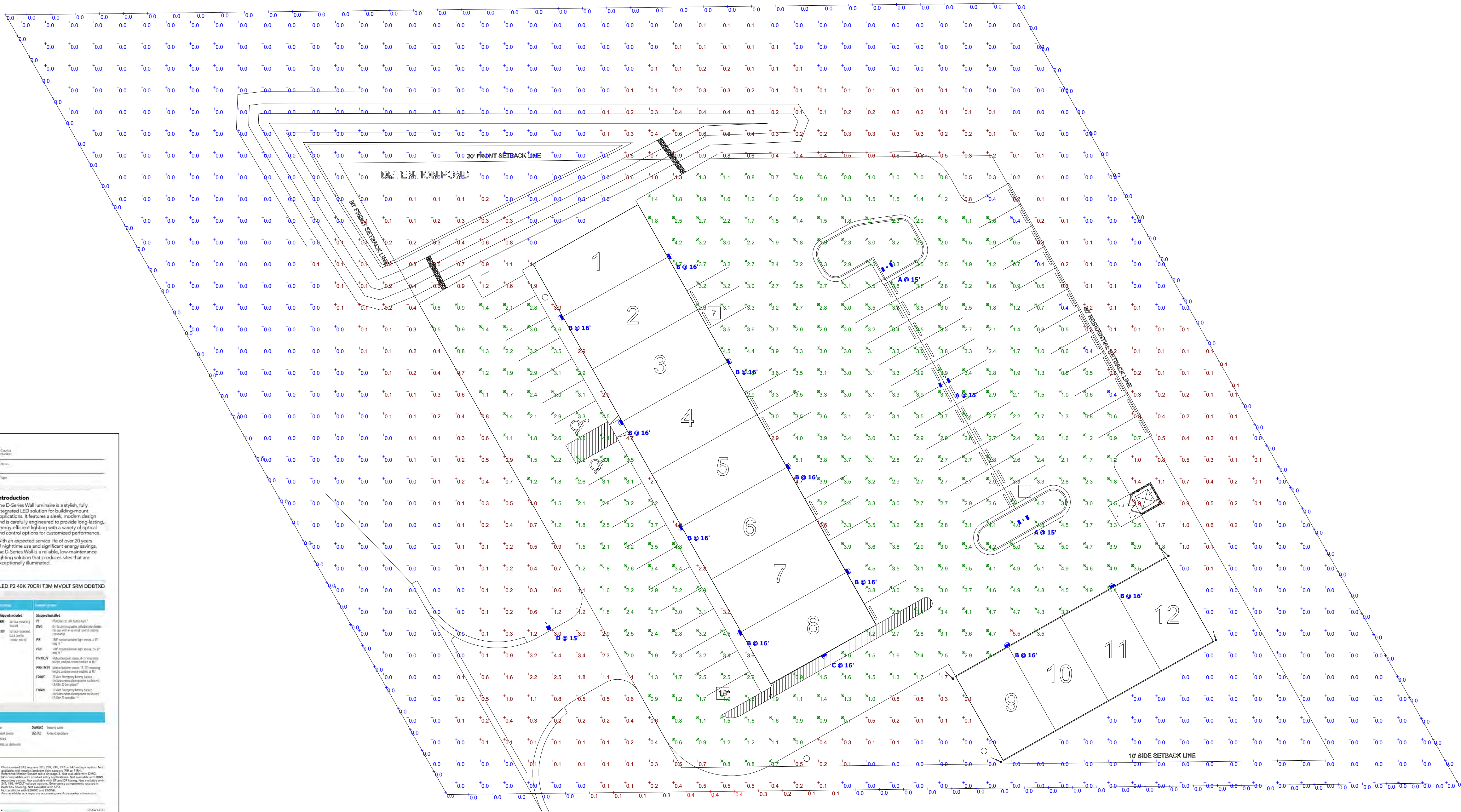
PERMIT NO. _____
 TRUNK LINE _____
 NAME OF PERMIT _____
 APPLICANT _____

PRINT ATTACHMENT FOR COMMERCIAL DRIVEWAY UNCURBED TRUNK LINE

05-02-01
 PLAN DATE PA-02

SHEET 1 OF 02





Plan View
Scale - 1" = 25ft

D-Series Size 1 LED Wall Luminaire

Specifications
Luminaire: 15.25" W x 12.5" H x 4.5" D
Depth: 4.5" (114.3 mm)
Height: 6.5" (165.1 mm)

Back Box (BBW, E20WC)
Width: 15.25" (386.7 mm)
Height: 12.5" (317.5 mm)
Depth: 4.5" (114.3 mm)

Introduction
The D-Series Wall Luminaire is a stylish, fully integrated LED solution for building mount applications. It features a sleek, modern design and is carefully engineered to provide long lasting, energy-efficient lighting with a variety of control and control options for customized performance. With an expected service life of over 20 years of nighttime use and significant energy savings, the D-Series Wall is a reliable, low maintenance lighting solution that produces sites that are exceptionally illuminated.

Ordering Information
EXAMPLE: DSXW1 LED P2 40K 70CRI T3M MVOLT SRM DBDXTD

Item	Item #	Qty	Notes
DSXW1 LED P1	238	2000	4000K CCT
DSXW1 LED P2	239	2000	4000K CCT
DSXW1 LED P3	240	2000	4000K CCT
DSXW1 LED P4	241	2000	4000K CCT
DSXW1 LED P5	242	2000	4000K CCT
DSXW1 LED P6	243	2000	4000K CCT
DSXW1 LED P7	244	2000	4000K CCT

Accessories

One Luminaire Qty. • Carton, Georgia 3013 • Phone: 1-800-351-9779 • Lithonia LED
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RSX1 LED Area Luminaire

Specifications
EPA (lm/ft²): 0.57 ft (10.0 lm/ft²)
Length: 21.8" (54.9 cm)
Width: 13.1" (33.3 cm)
Height: 3.0" (7.6 cm) (with 4" arm)
Weight (SPA mount): 22.0 lbs (10.0 kg)

Introduction
The new RSX1 LED Area family delivers maximum value by providing significant energy savings, long life and outstanding photometric performance at an affordable price. The RSX1 delivers 1,000 to 12,000 lumens allowing it to replace 70W to 400W HID luminaires. The RSX1 features an integral universal mounting mechanism that allows the luminaire to be mounted on most existing drill hole patterns. This "no-drill" installation process significantly reduces labor costs. An easy access door on the bottom of mounting arm allows for wiring without opening the electrical compartment. A mast arm, adjustable, adjustable integral diffuser and other mounting configurations are available.

Ordering Information
EXAMPLE: RSX1 LED P4 40K R3 MVOLT SPA DBDXTD

Item	Item #	Qty	Notes
RSX1 LED P1	245	2000	4000K CCT
RSX1 LED P2	246	2000	4000K CCT
RSX1 LED P3	247	2000	4000K CCT
RSX1 LED P4	248	2000	4000K CCT
RSX1 LED P5	249	2000	4000K CCT
RSX1 LED P6	250	2000	4000K CCT
RSX1 LED P7	251	2000	4000K CCT

Accessories

One Luminaire Qty. • Carton, Georgia 3013 • Phone: 1-800-351-9779 • Lithonia LED
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Statistics						
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min
Overall Site	+	1.0 fc	5.5 fc	0.0 fc	N/A	N/A
Parking & Drive Lanes	X	2.6 fc	5.5 fc	0.4 fc	13.8:1	6.5:1
Property Line	+	0.0 fc	0.4 fc	0.0 fc	N/A	N/A

Schedule									
Symbol	Label	QTY	Manufacturer	Catalog	Description	Lamp Output	LLF	Input Power	Mounting Height
A	3	Lithonia Lighting	RSX1 LED P1 40K R5	RSX Area Fixture Size 1 P1 Lumen Package 4000K CCT Type R5 Distribution	7285	0.9	102.68	15'	
B	10	Lithonia Lighting	DSXW1 P7 40K T4M	10000 4000K 70CRI Type 4 Medium	10385	0.9	72.52	16'	
C	1	Lithonia Lighting	DSXW1 P4 40K T2M	5000 4000K 70CRI Type 2 Medium	4266	0.9	28.68	16'	
D	1	Lithonia Lighting	RSX1 LED P1 40K R4 HS	RSX LED Area Luminaire Size 1 P1 Lumen Package 4000K CCT Type R4 Distribution with HS shield	4725	0.9	51.34	15'	

General Note
1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
2. SEE LUMINAIRE SCHEDULE FOR LIGHT LOSS FACTOR.
3. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 0' - 0"

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.

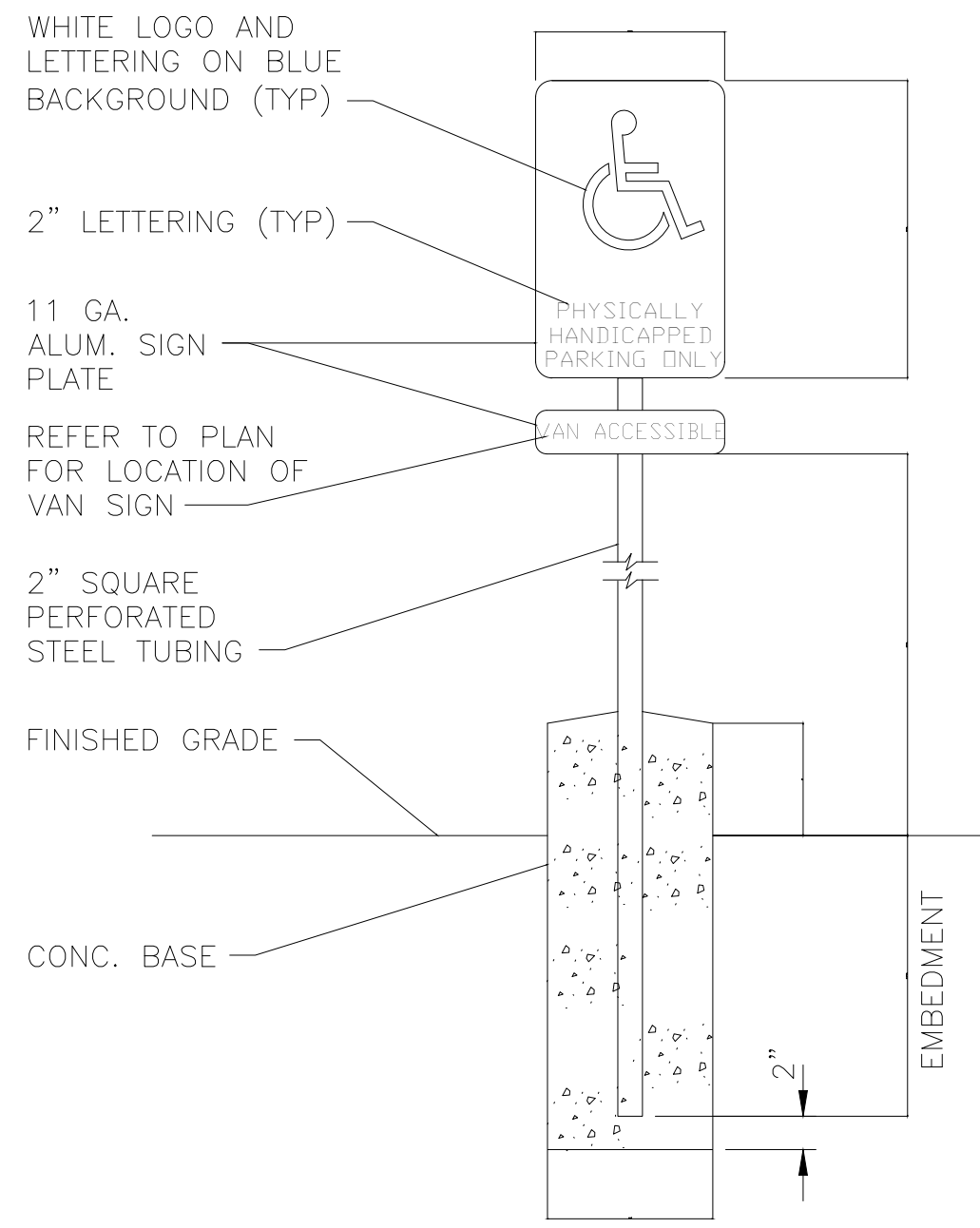
THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIREMENTS DEFINED IN ASHRAE 90.1 2019. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT CONTROLS@GASSERBUSH.COM OR 734-266-6705.

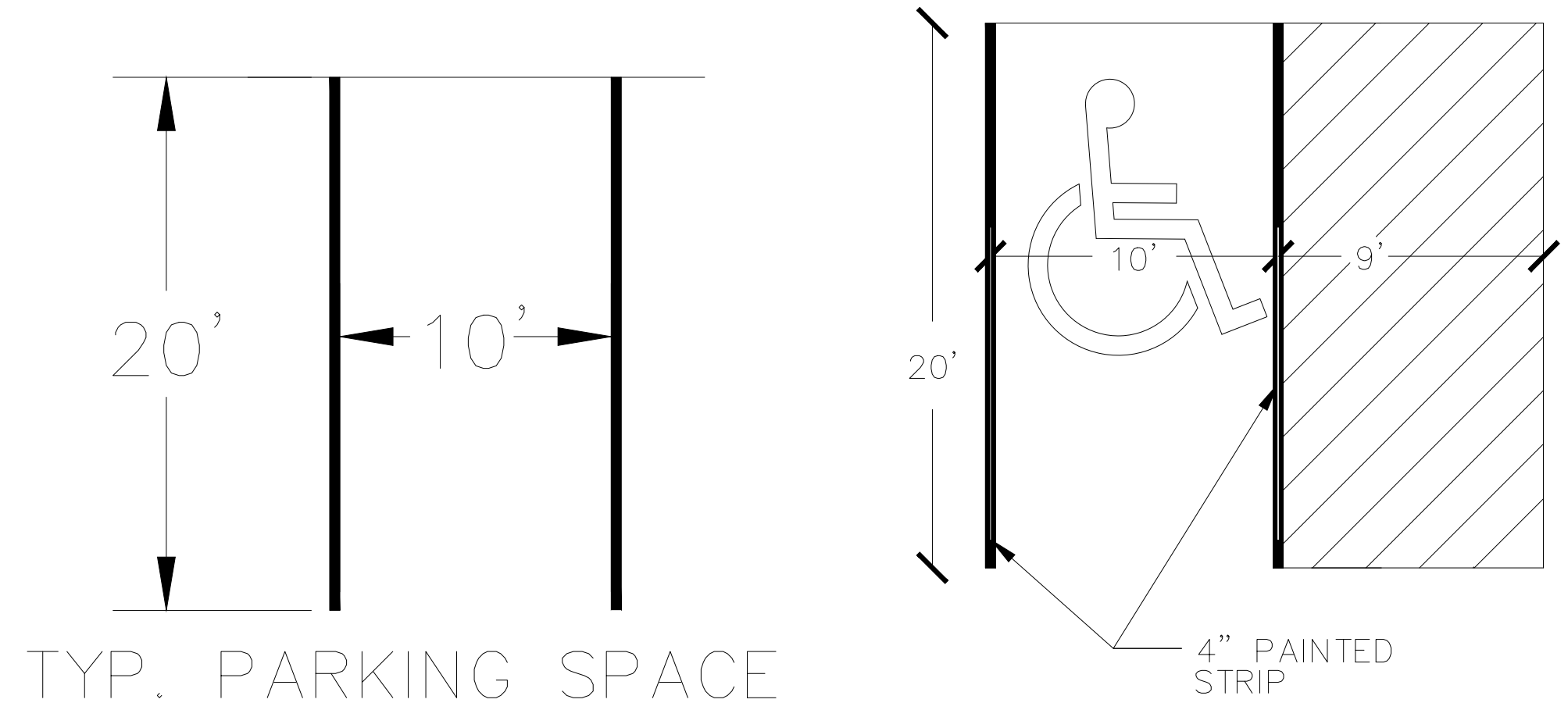
Alternates Note
THE USE OF FIXTURE ALTERNATES MUST BE RESUBMITTED TO THE CITY FOR APPROVAL.

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

Ordering Note
FOR INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.
Mounting Height Note
MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

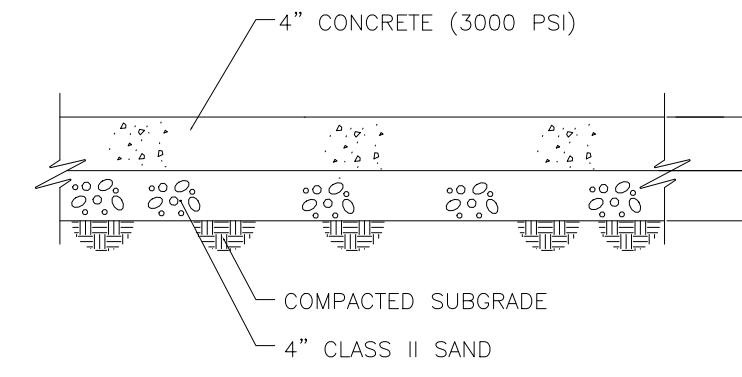


TYPICAL HANDICAP SIGN
NO SCALE



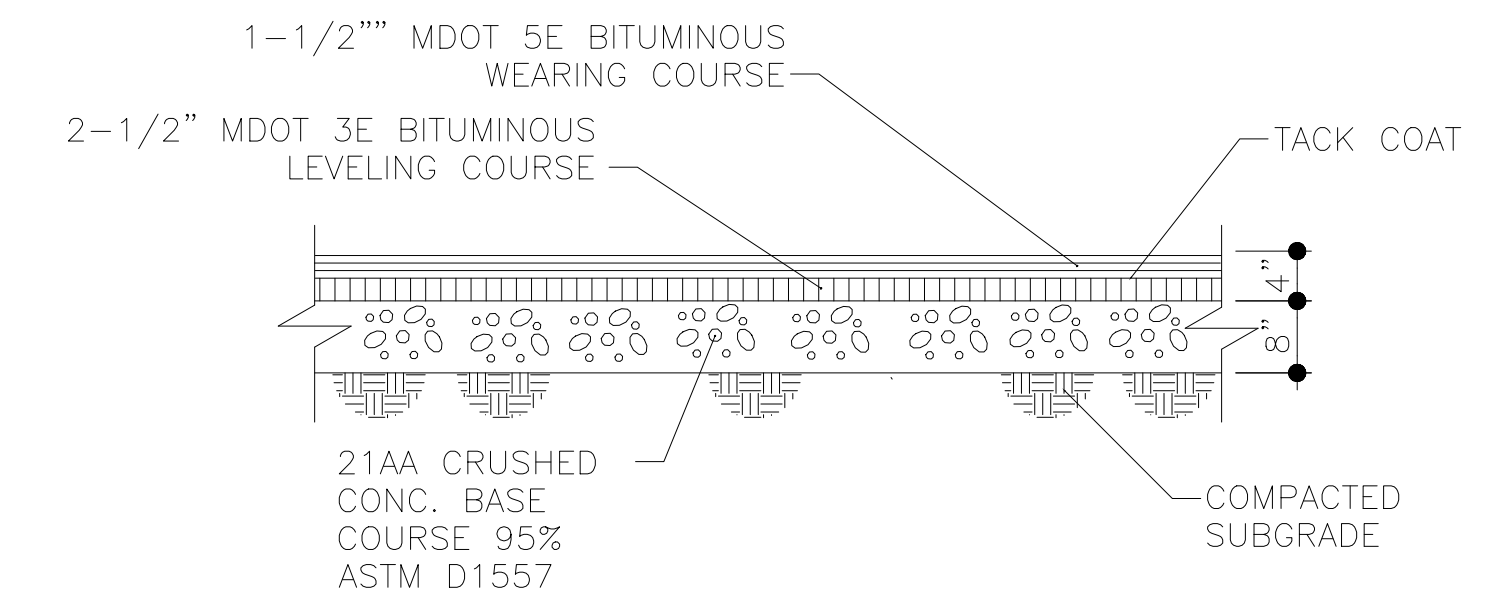
TYP. PARKING SPACE
(NO SCALE)

HANDICAP PARKING DETAIL
(NO SCALE)



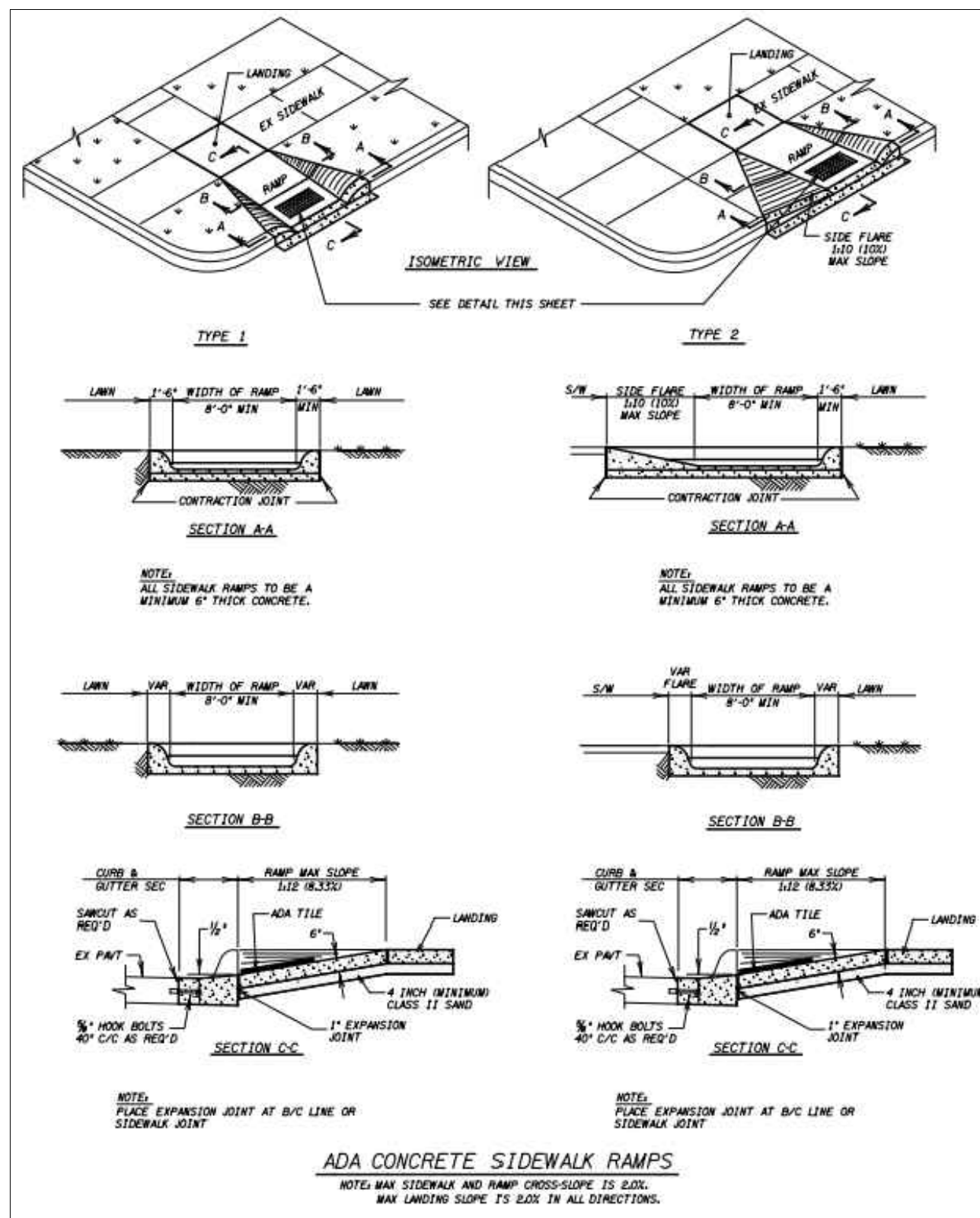
NOTE:
CONTRACTION JOINT SHALL BE 1/4"x2 3/4" DEEP, SPACED AT 5'-0" INTERVALS. EXPANSION JOINTS SHALL BE 1/2" PREMOLDED FILLER, SPACED AT A MAXIMUM 30' APART. EXPANSION JOINTS TO BE PLACED BETWEEN NEW AND EXISTING CONCRETE.

CONCRETE WALK
NO SCALE

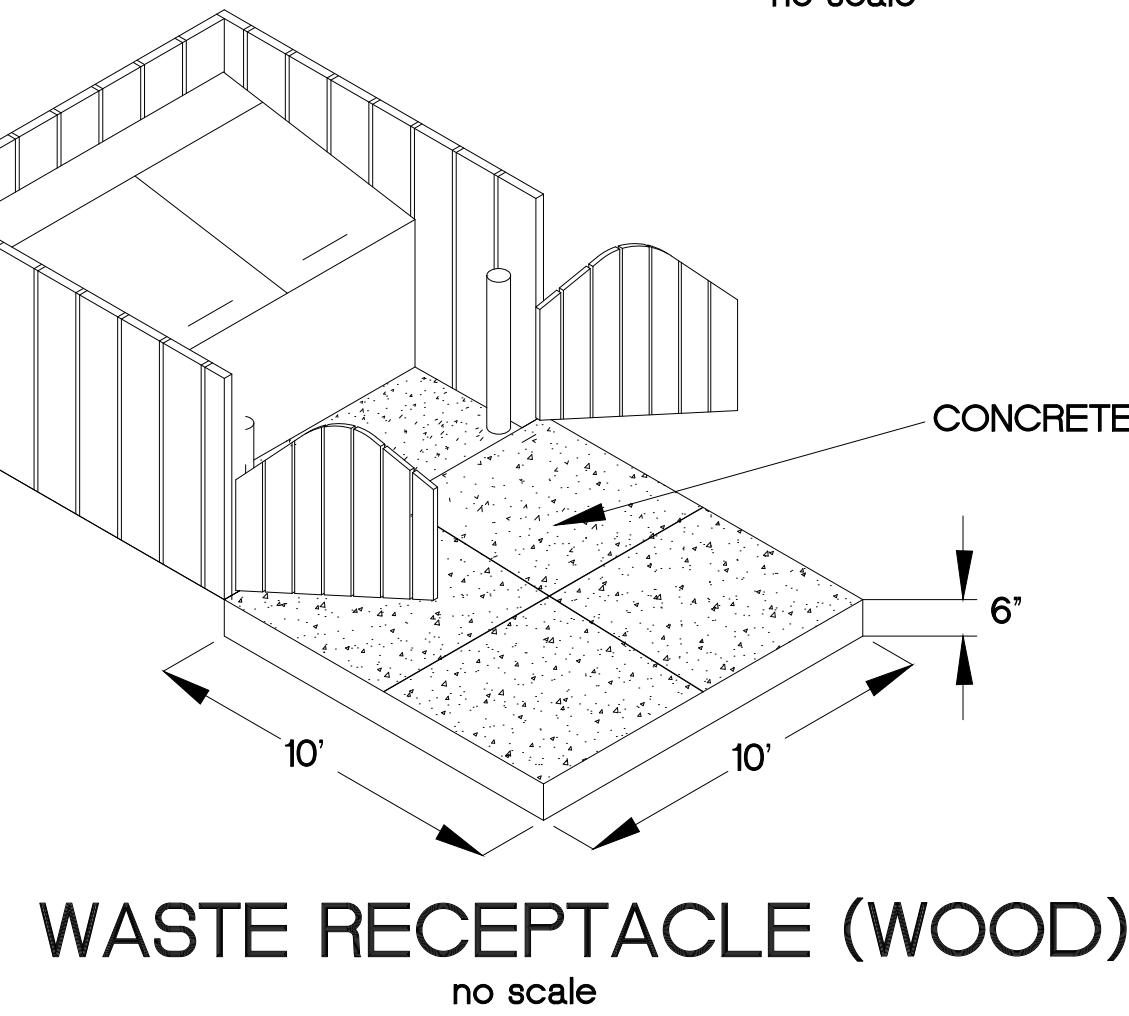
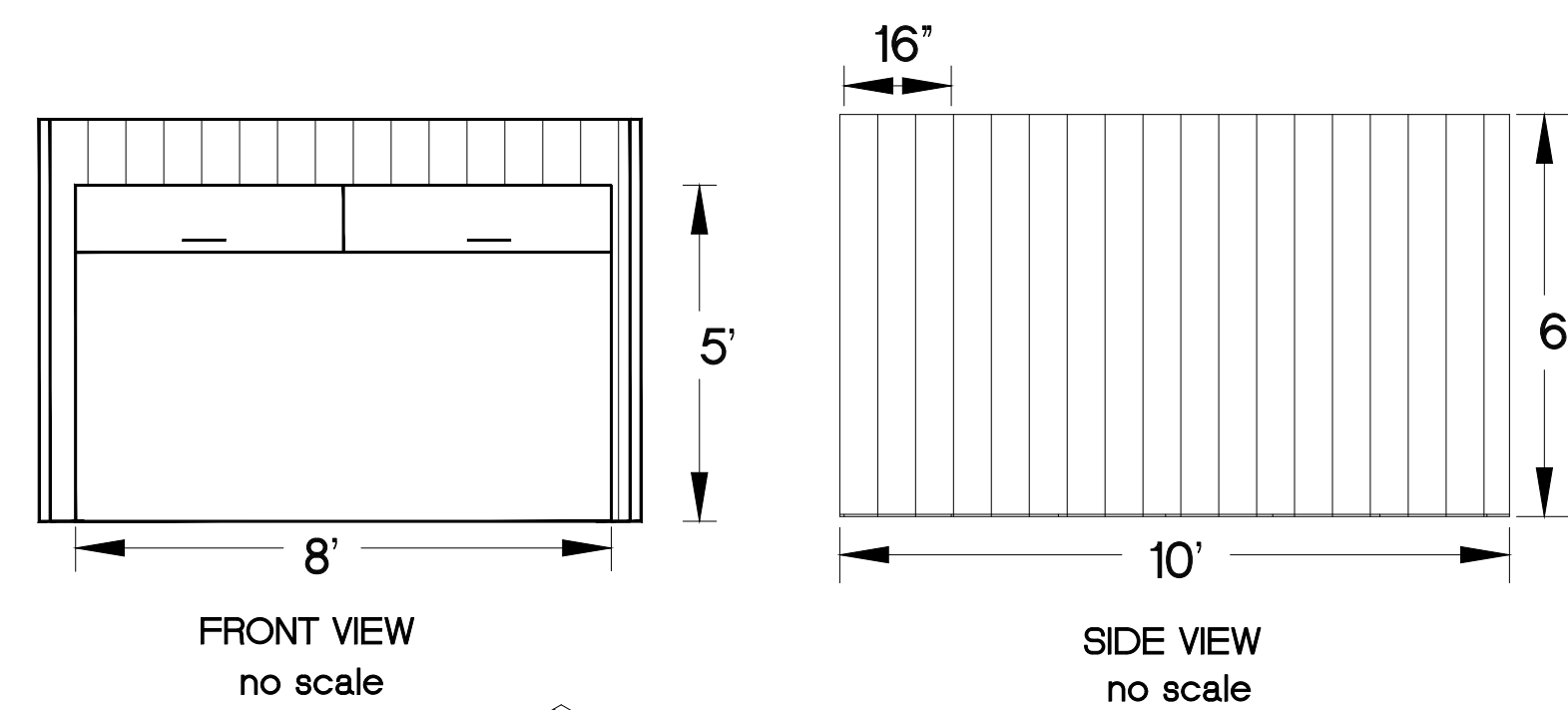


NOTE: A GEOTECHNICAL REPORT WITH PAVEMENT DESIGN RECOMMENDATIONS WAS NOT AVAILABLE, THEREFORE THE PAVEMENT SECTION REPRESENTS THE MINIMUM STANDARDS RECOMMENDED.

BITUMINOUS PAVEMENT
NO SCALE



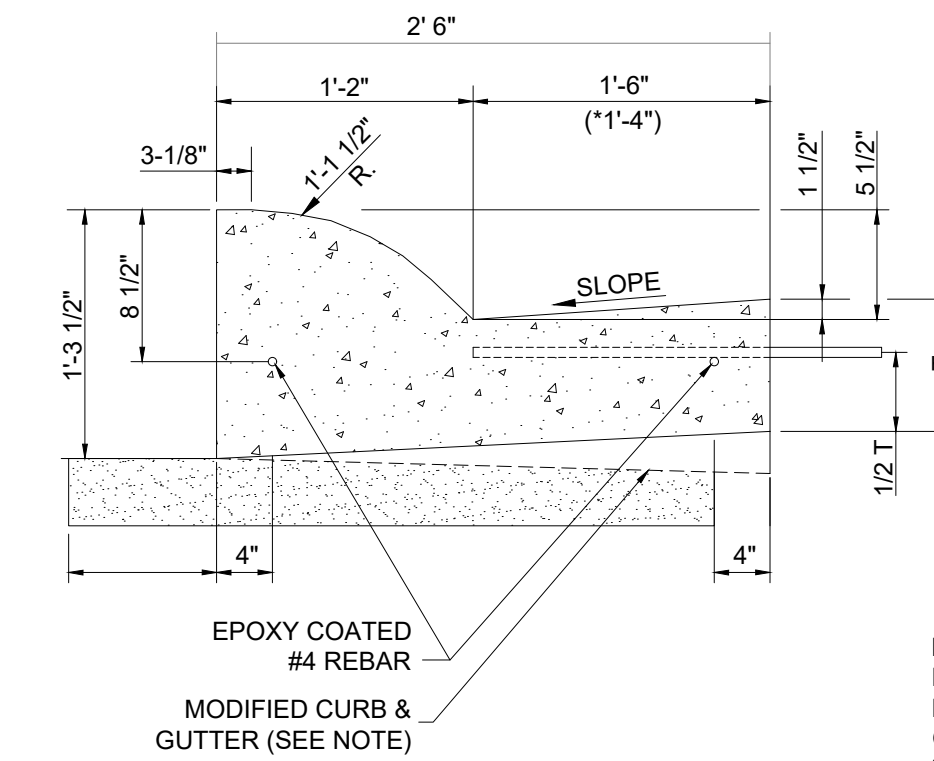
ADA CONCRETE SIDEWALK RAMP
NOTE: MAX SIDEWALK AND RAMP CROSS-SLOPE IS 1/4\"/>



WASTE RECEPTACLE (WOOD)
no scale

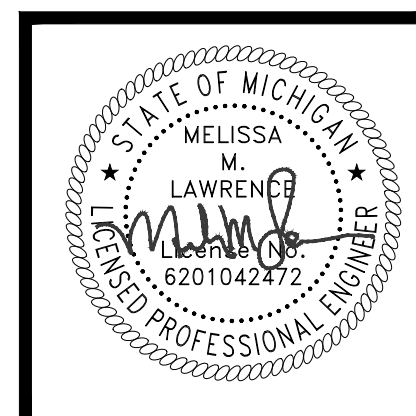
DETAIL	DIMENSIONS T	LANE TIES	CONCRETE CYD/LFT	CONCRETE CYD/LFT
B1	9"	AS SHOWN	0.0900	(*0.0855)
B2	9"	OMITTED	0.0900	(*0.0855)
B3	10"	AS SHOWN	0.0941	(*0.0894)

(* GUTTER PAN WIDTH MAY BE REDUCED WHEN APPROVED BY THE ENGINEER)



NOTE:
MODIFIED CURB & GUTTER SHALL BE THE SAME DETAIL BUT THE GUTTER SHALL SLOPE AWAY FROM THE CURB FACE @ 1"/FT.

MDOT B2 CONCRETE CURB AND GUTTER
NOT TO SCALE



NO.	REVISION/ISSUE	DATE	BY
1.	MDOT 3-WAY VAN SIGN	1/20/26	BLB
2.	MDOT 3-WAY VAN SIGN	3/2/26	BLB
3.	MDOT REVISIONS	3/2/26	BLB
4.	MDOT REVISIONS	3/2/26	BLB
5.	SECURE VAN SIGN POSITION	3/2/26	BLB

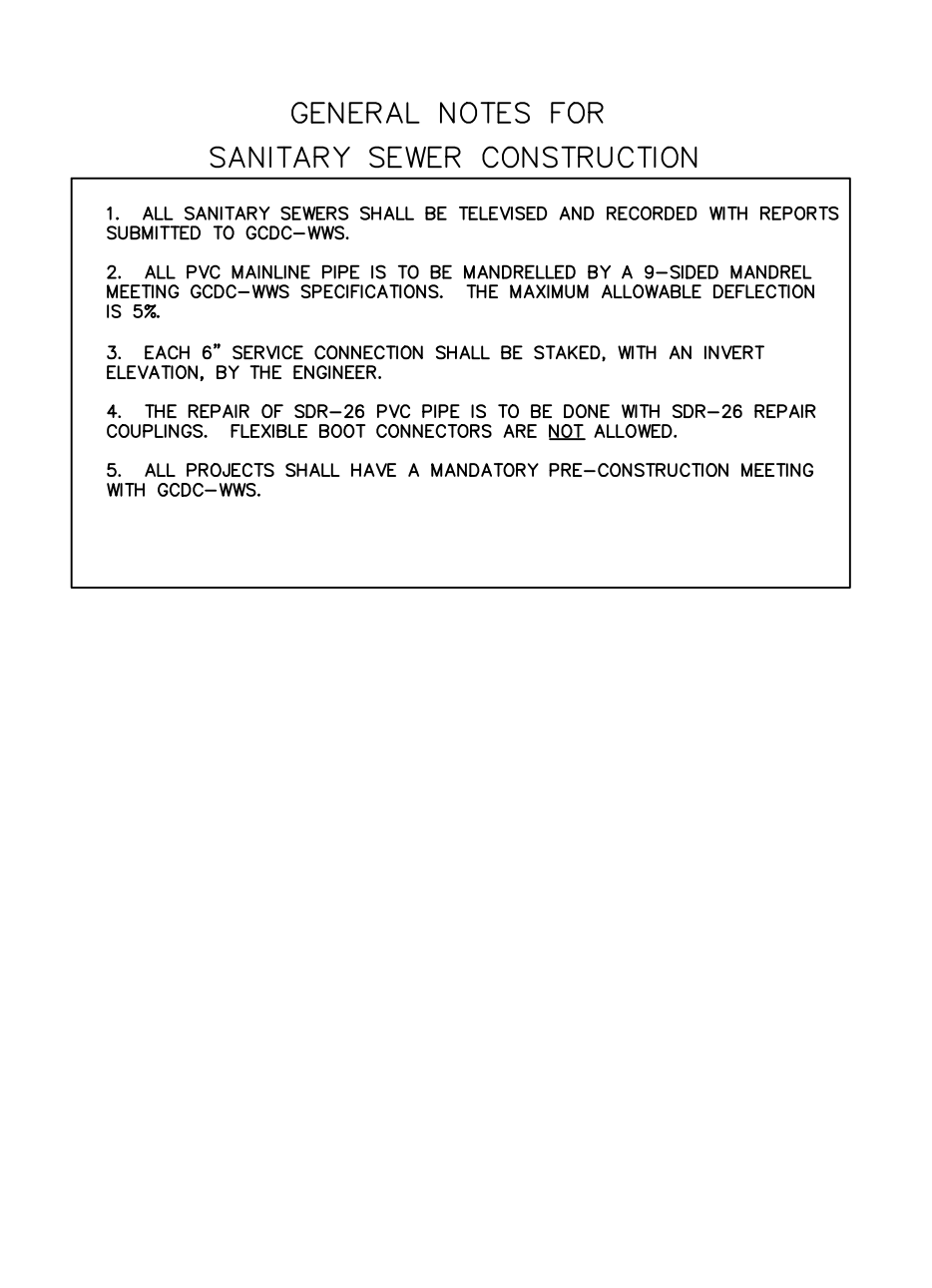
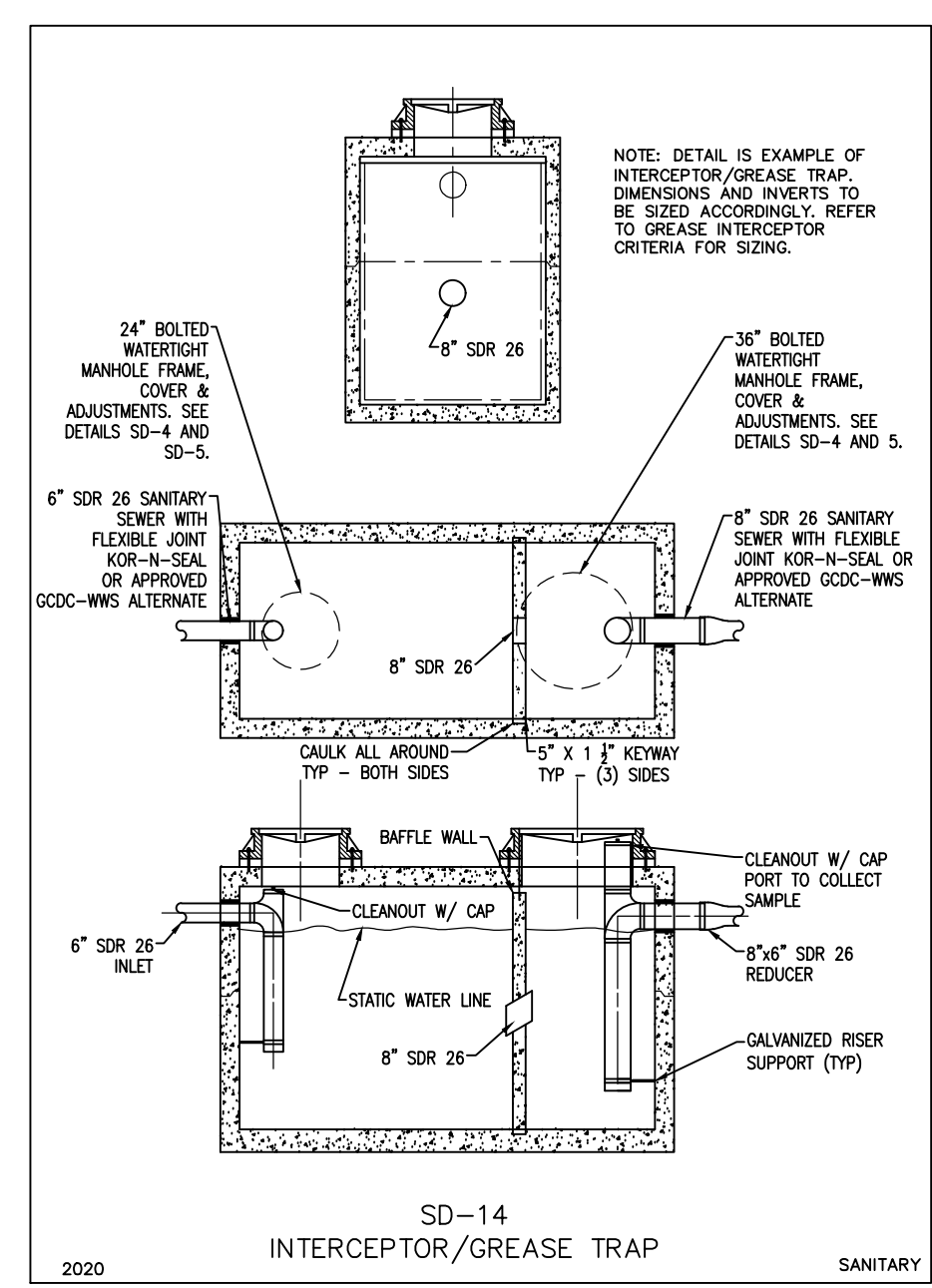
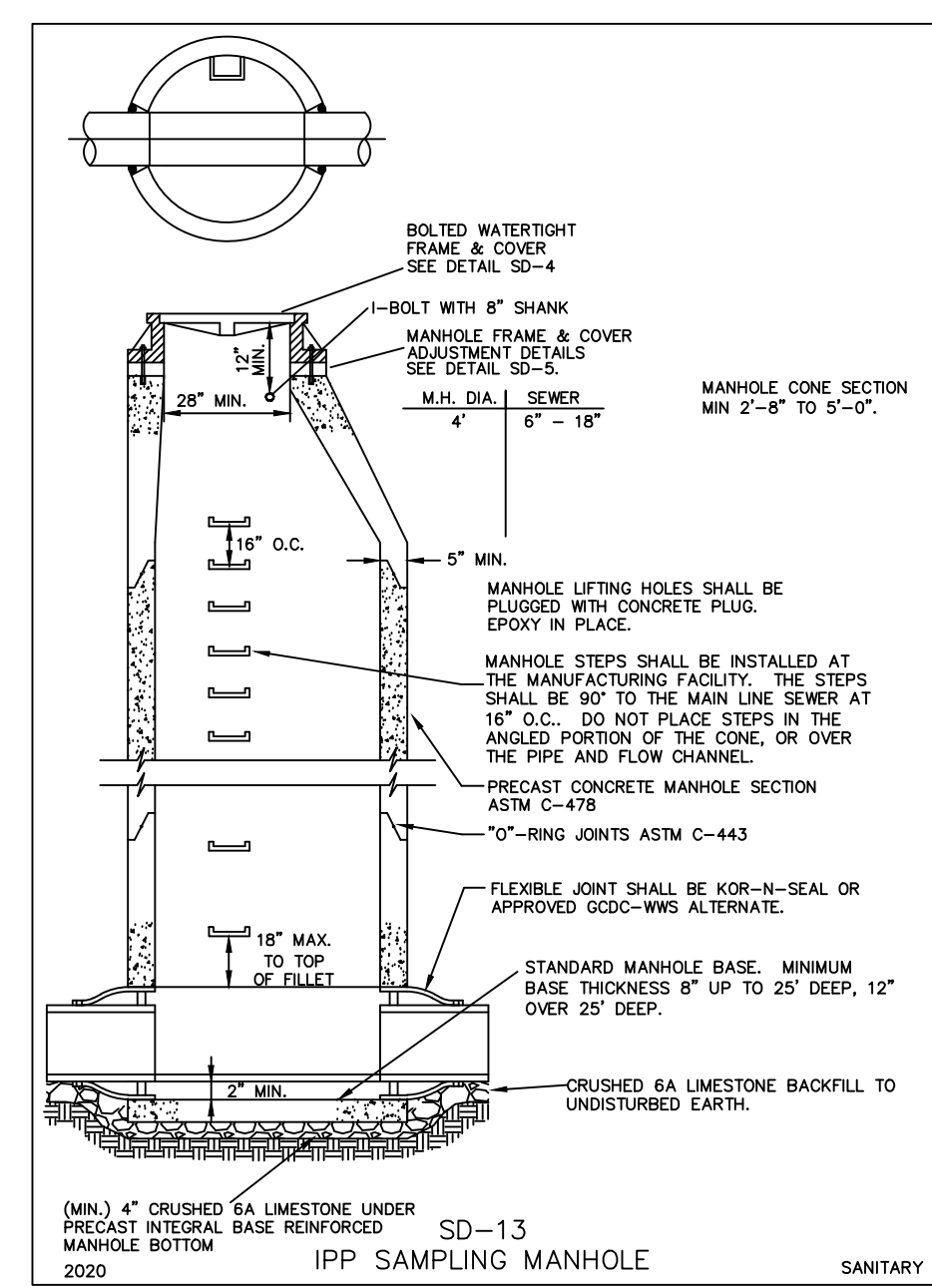
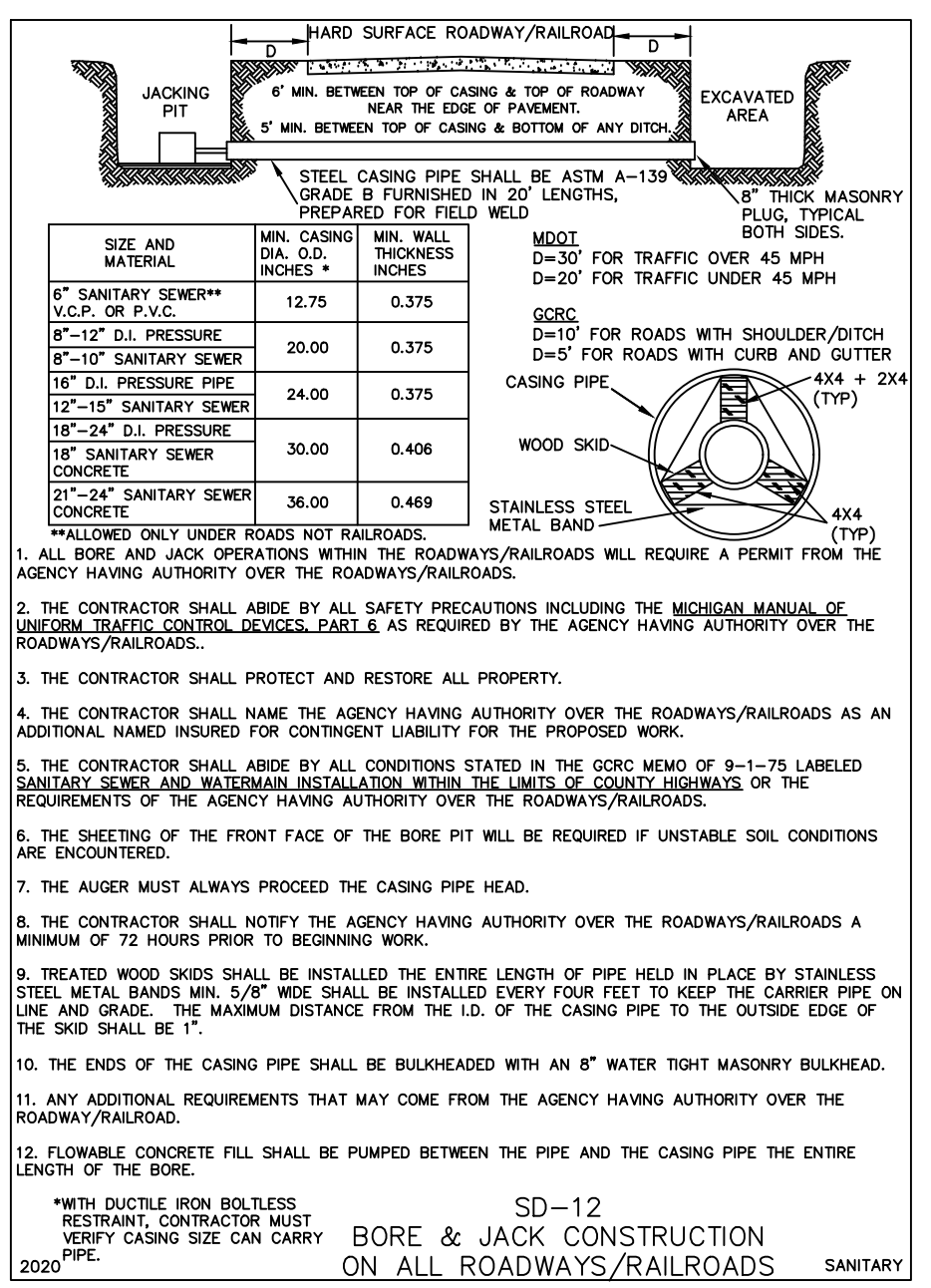
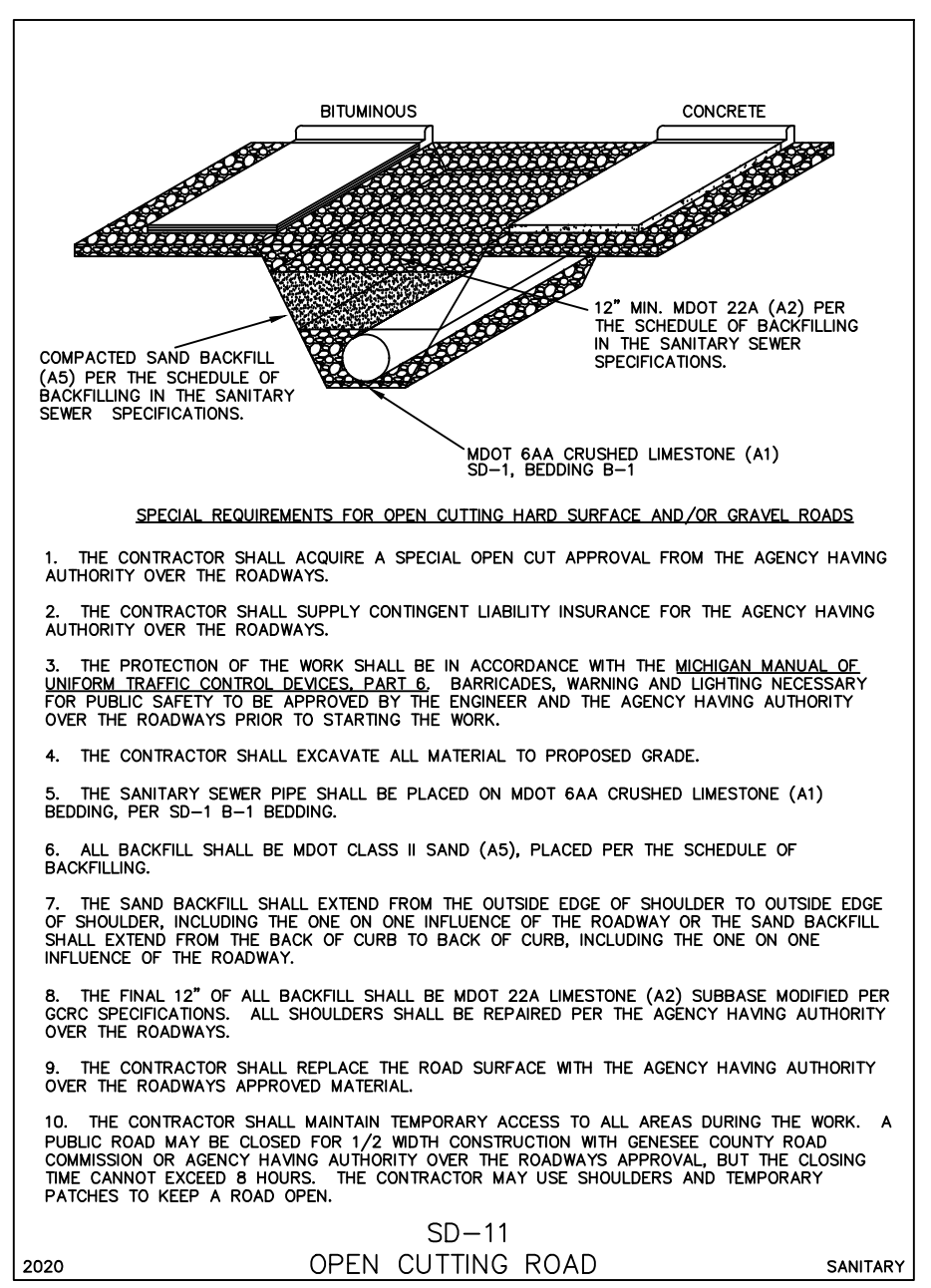
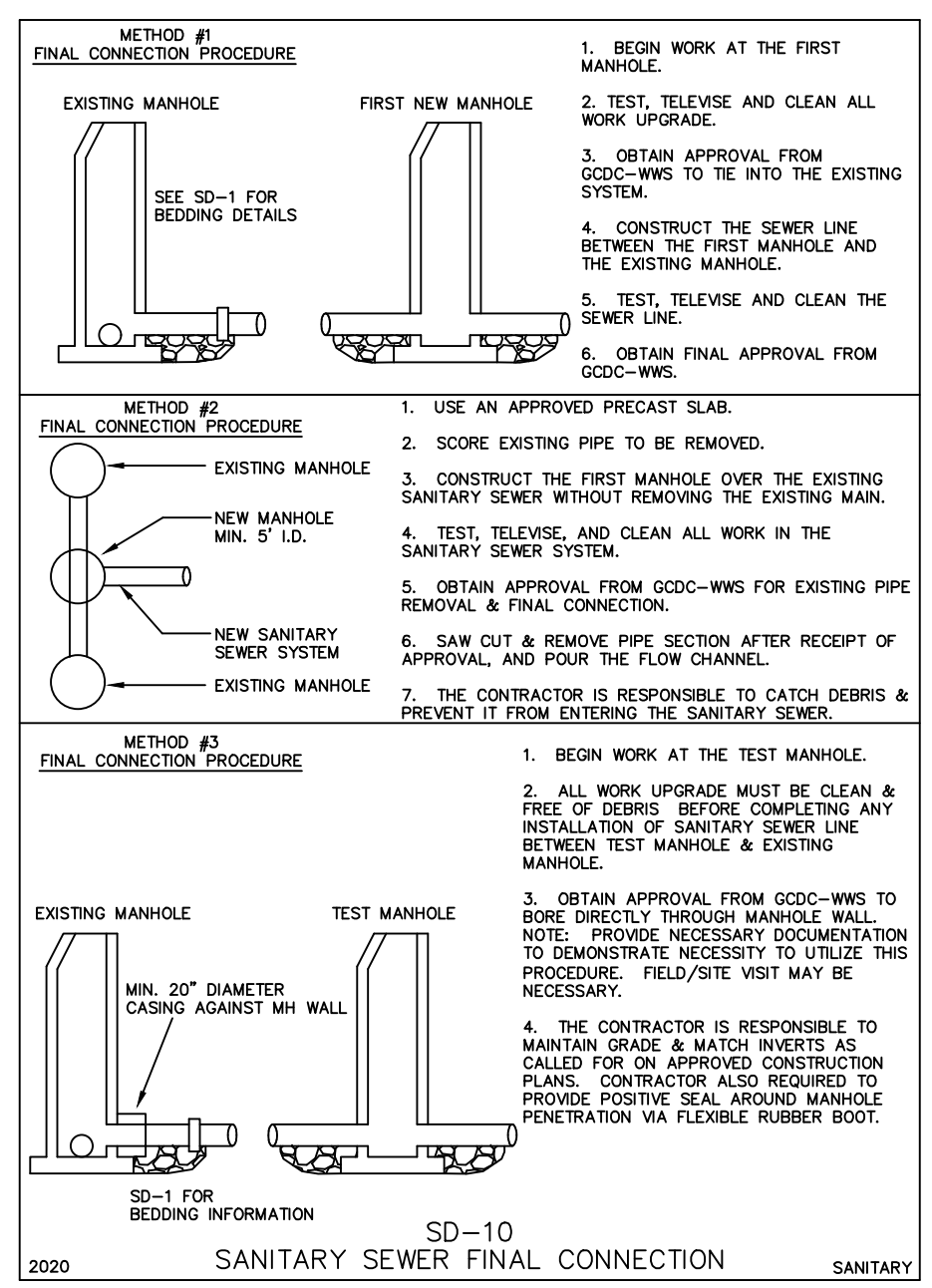
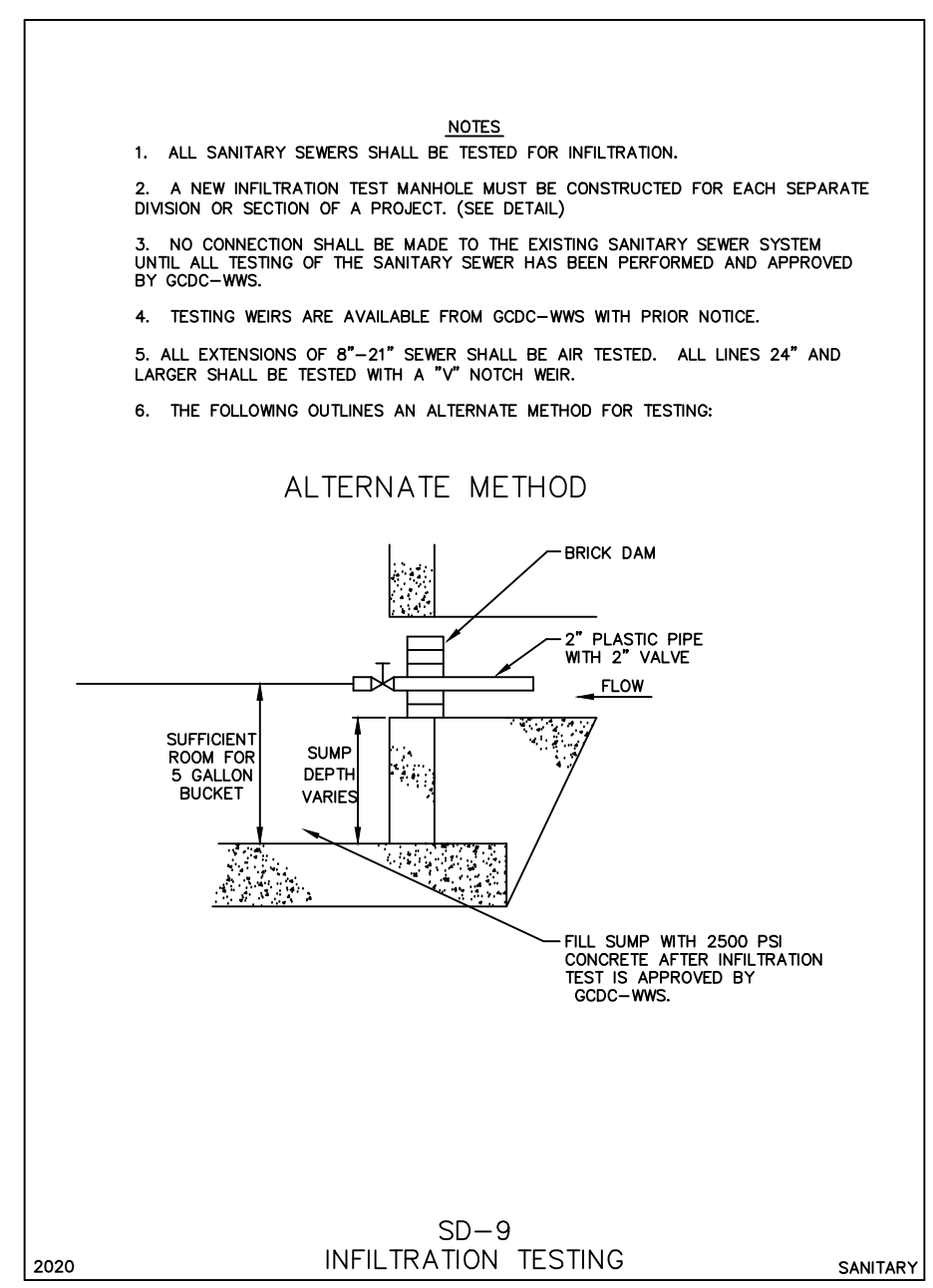
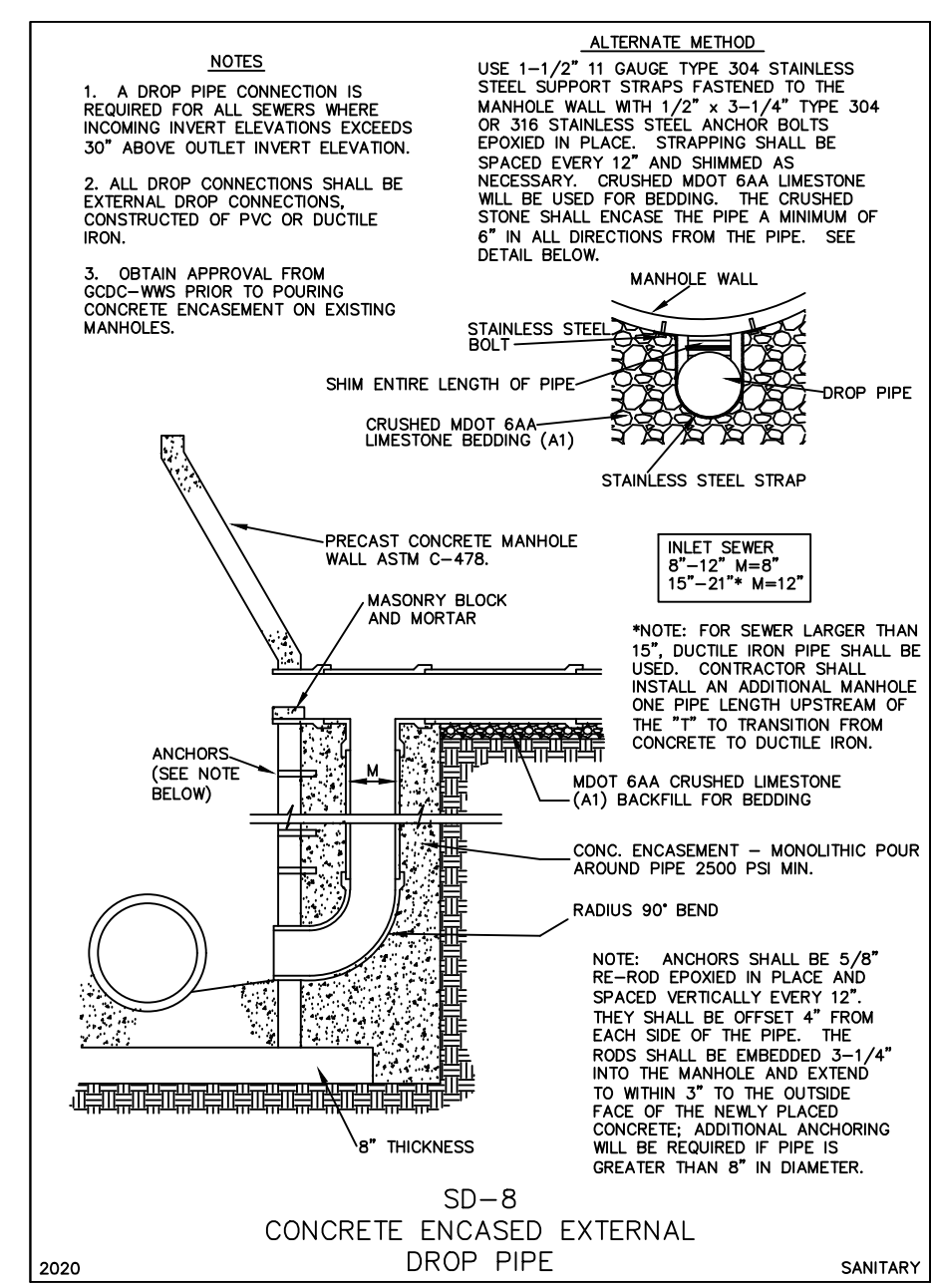
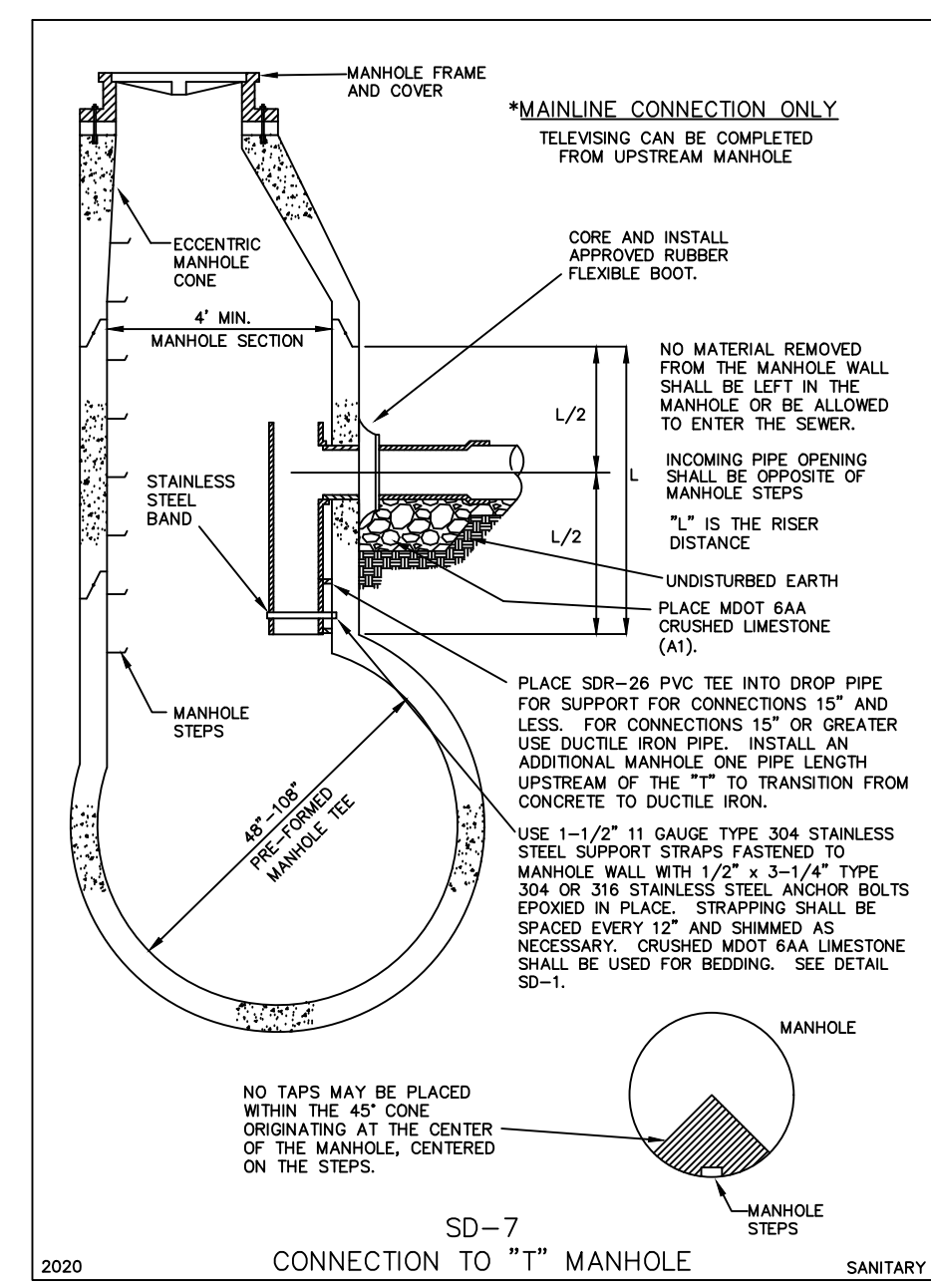
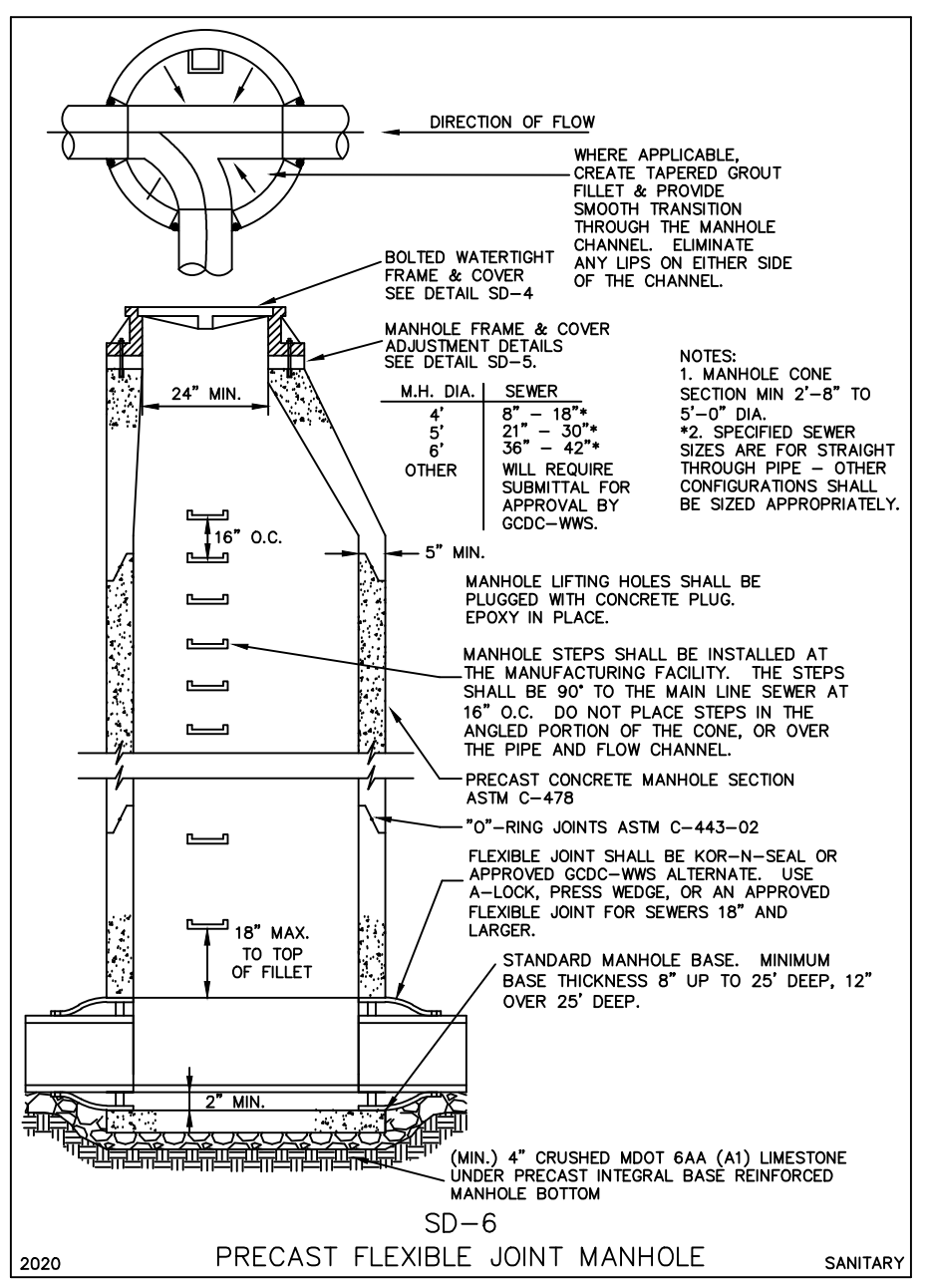
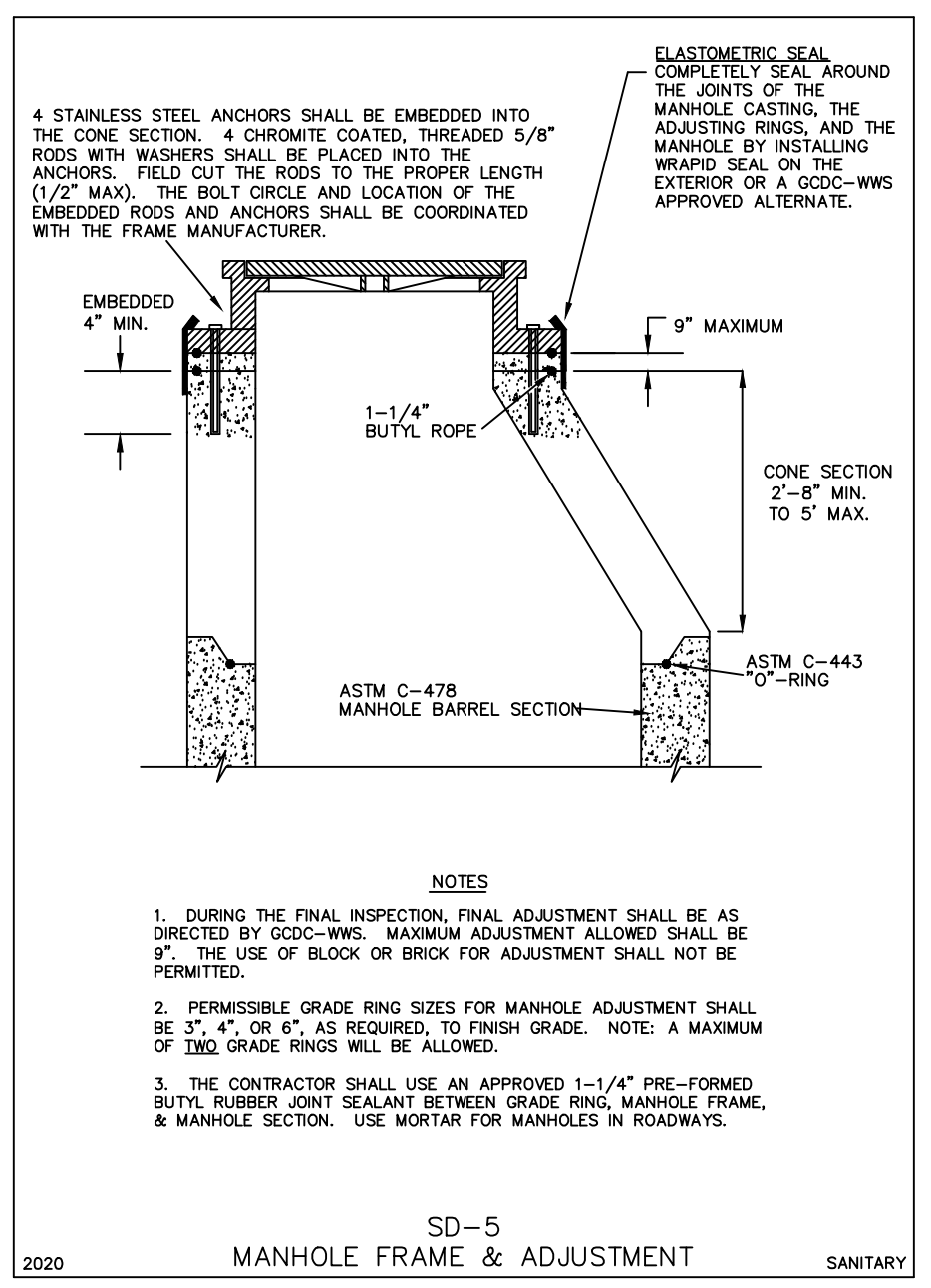
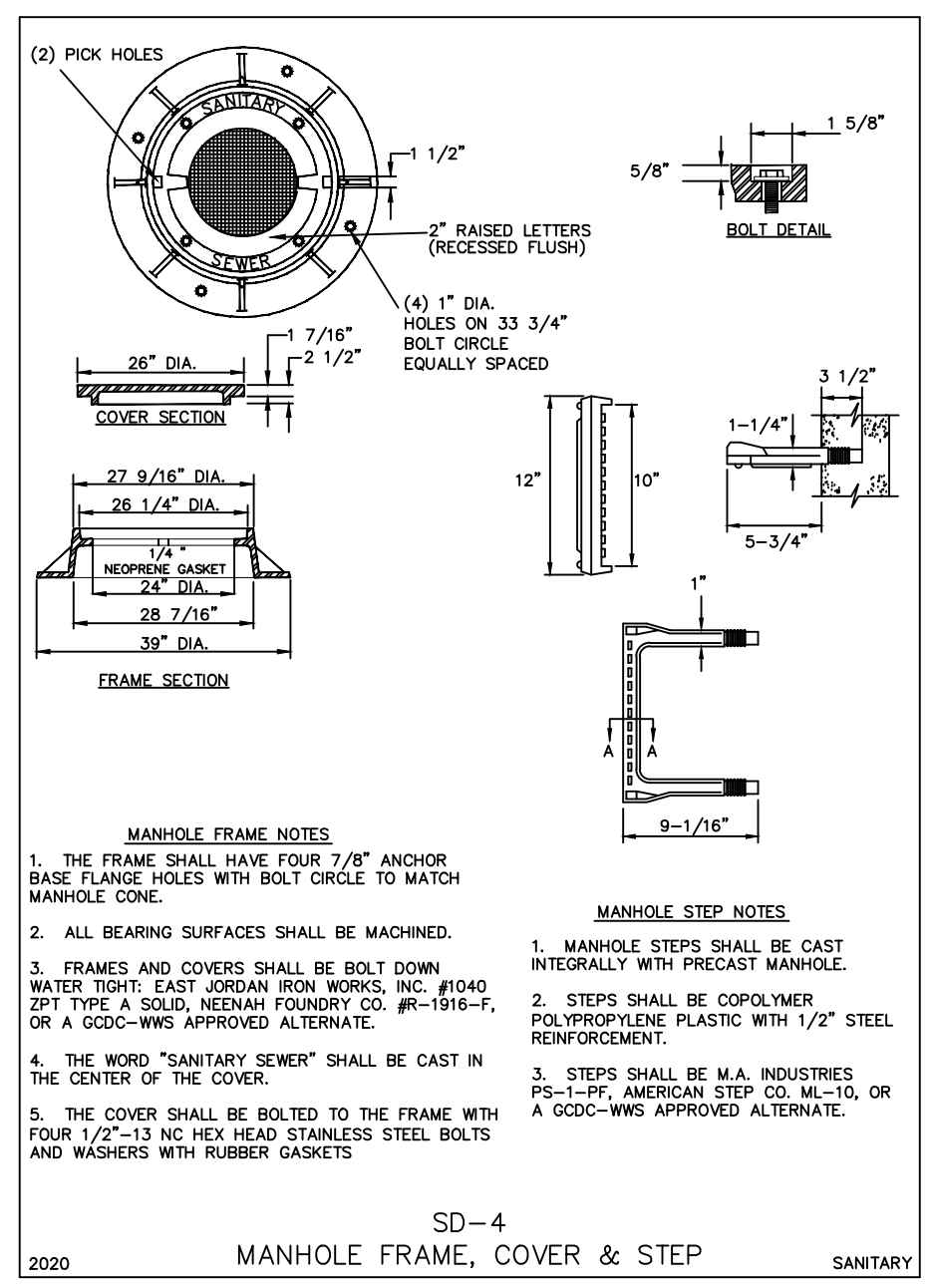
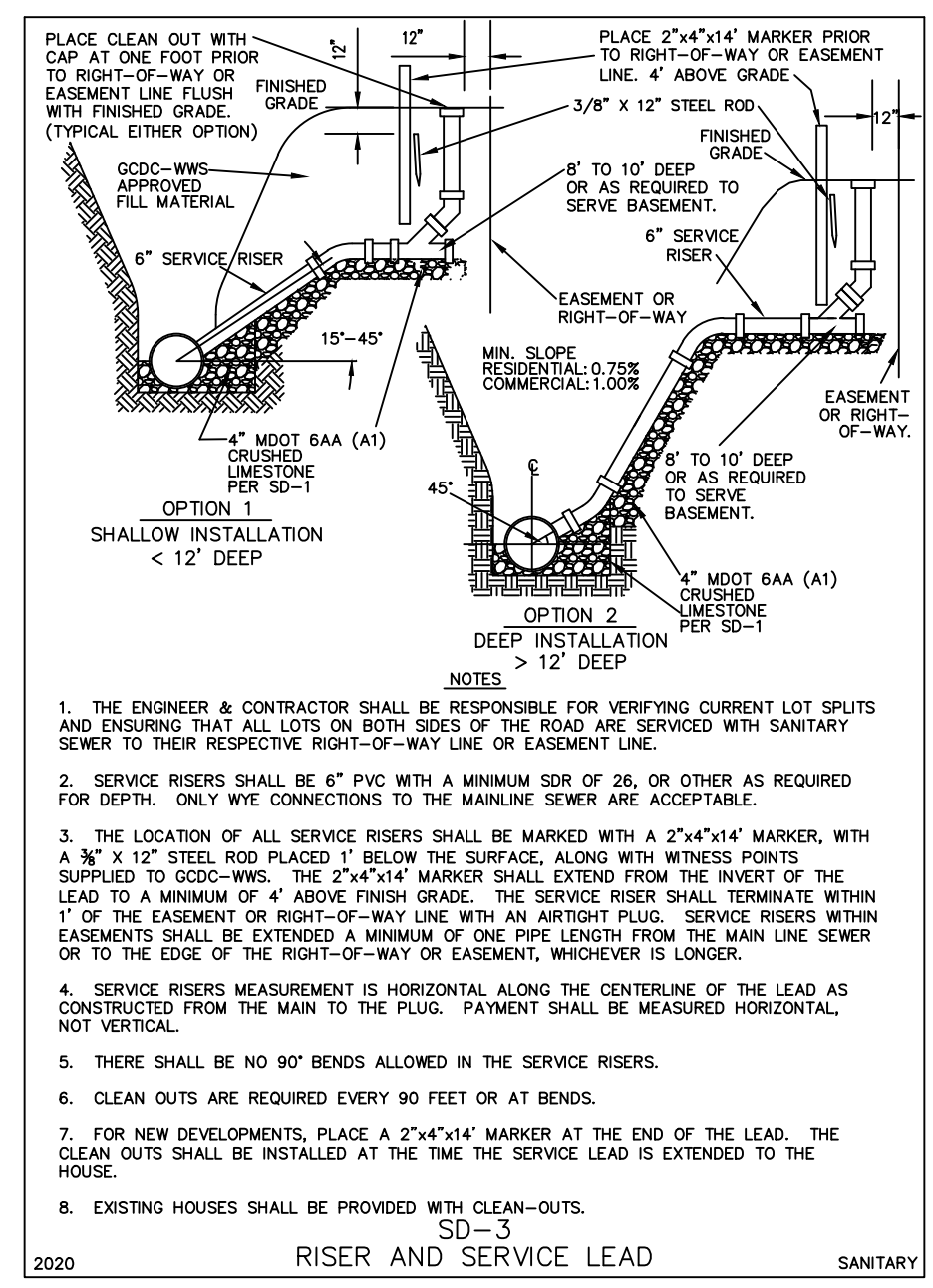
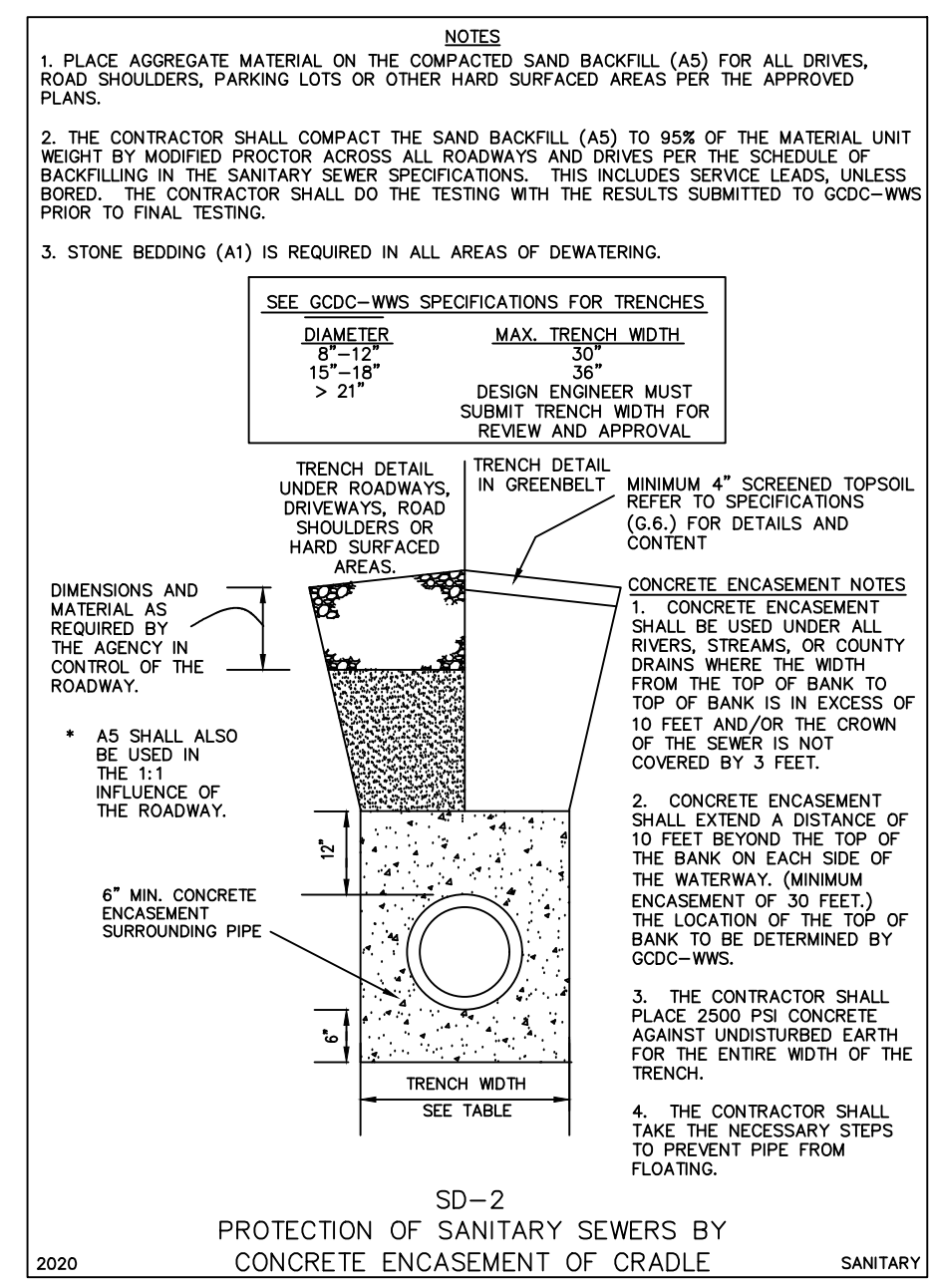
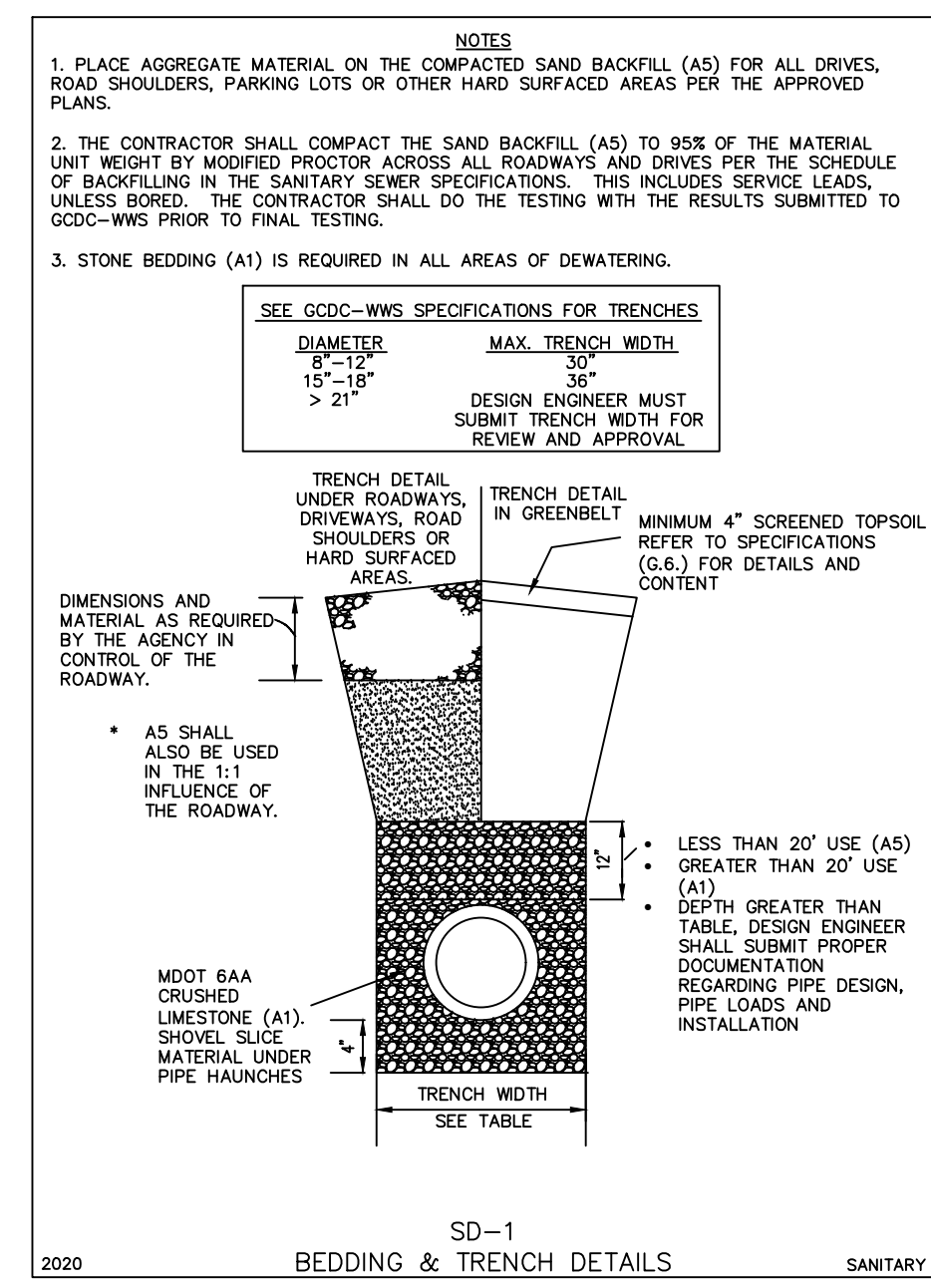
SHEET TITLE:
SOIL EROSION CONTROL DETAILS

4344 SILVER LAKE RD
LINDEN, MI 48451
OFFICE: (810)750-5280
FAX: (810)750-5283

LAWRENCE ENGINEERING P.C.

PROJECT:
OFFICE/RETAIL SPACE
FOR
STEVE GROSS
1267 E. FARRAND RD.
CLIO, MI 48420
(810)691-1461

JOB NO.: 2025-011
DATE: 10-13-2025
DRAWN BY: BLB
CHECKED BY: JMAL
SHEET: 11 OF 14



GENERAL CONSTRUCTION NOTES

1. STANDARD SPECIFICATIONS & DETAILS

ALL CONSTRUCTION AND MATERIALS SHALL CONFORM TO THE LATEST GENEESE COUNTY STANDARD SPECIFICATIONS AND STANDARD DETAILS FOR SANITARY SEWER, PRESSURE PIPE, AND PUMP STATION CONSTRUCTION. ANY DEVIATIONS FROM THE GDCD-WWS APPROVED PLANS WILL NOT BE PERMITTED. IF IT BECOMES NECESSARY TO REVISE THE PLAN, THEY SHALL BE RESUBMITTED TO GDCD-WWS FOR APPROVAL.

2. PRE-CONSTRUCTION MEETING

A PRE-CONSTRUCTION MEETING SHALL BE HELD AT THE GDCD-WWS OFFICE PRIOR TO BEGINNING THE WORK. NO PRE-CONSTRUCTION MEETING SHALL BE HELD PRIOR TO OBTAINING THE STATE CONSTRUCTION PERMITS. THE MEETING'S TIME, PLACE, AND ATTENDEES SHALL BE ARRANGED BY THE ENGINEER FOR THE PROJECT. GDCD-WWS, GDCD-SWM, THE MUNICIPALITY, THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS, PROJECT OWNER, CONTRACTOR, AND ANY AFFECTED UTILITIES SHALL BE INVITED, AS A MINIMUM, TO THE PRE-CONSTRUCTION MEETING.

3. MISS DIG 811 UTILITY ALERT

THREE (3) WORKING DAYS PRIOR TO BEGINNING THE WORK, IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO CONTACT MISS DIG 811 UTILITY PROTECTION SERVICE (1-800-482-7771 OR 811) TO VERIFY THE LOCATION OF ALL EXISTING UTILITIES. THE CONTRACTOR SHALL ASSUME RESPONSIBILITY FOR THE PROTECTION OF ALL EXISTING UTILITIES DURING CONSTRUCTION. ALL UTILITIES DAMAGED DURING CONSTRUCTION SHALL BE PROPERLY REPAIRED IN ACCORDANCE WITH THE UTILITY OWNER'S REQUIREMENTS.

4. FIELD LOCATION OF UTILITIES

PRIOR TO BEGINNING THE WORK, THE CONTRACTOR SHALL BE REQUIRED TO EXPOSE ALL EXISTING UTILITIES THAT CROSS THE PROPOSED CONSTRUCTION, SO THE ENGINEER MAY DETERMINE IF A VERTICAL CONFLICT EXISTS BETWEEN AN EXISTING UTILITY AND THE PROPOSED WORK. ALL LABOR REQUIRED TO UNCOVER THE EXISTING UTILITY SHALL BE CONSIDERED INCLUDED IN THE LINEAL FEET OF PRESSURE PIPE OR SANITARY SEWER PIPE INSTALLED. THE CONTRACTOR SHALL VERIFY THE DEPTH AND HORIZONTAL LOCATIONS OF ALL UTILITIES IN SUFFICIENT TIME SUCH THAT ANY CONFLICTS CAN BE RESOLVED BEFORE WORK IS STARTED IN THAT PORTION OF THE PROJECT. THE CONTRACTOR SHALL ARRANGE FOR THE VARIOUS UTILITY OWNERS TO LOCATE, REMOVE, AND REPLACE, OR RELOCATE THEIR FACILITIES. ALL COSTS FOR THIS SHALL BE INCLUDED IN THE CONTRACT PRICE FOR THE PROJECT.

5. SUBSURFACE SOIL CONDITIONS

PRIOR TO BIDDING, THE CONTRACTOR AND SUBCONTRACTORS SHALL MAKE A PERSONAL INVESTIGATION OF THE SITE AND EXISTING SURFACE AND SUBSURFACE CONDITIONS. THE CONTRACTOR SHALL ACQUAINT ITSELF WITH CONDITIONS OF THE WORK AREA. THE CONTRACTOR IS ADVISED TO DETERMINE THE SUBSURFACE SOIL AND GROUND WATER CONDITIONS. DEWATERING, IF DETERMINED NECESSARY BY THE CONTRACTOR AND IF NOT SPECIFICALLY REQUIRED BY THE CONTRACT DOCUMENTS, WILL BE INCIDENTAL TO THE COST OF INSTALLATION.

6. PERMITS AND FEES

THE CONTRACTOR/DEVELOPER SHALL OBTAIN ALL PERMITS, INCLUDING THE PAYMENT OF ANY FEES OR BONDS, REQUIRED BY ANY FEDERAL, STATE, COUNTY, LOCAL, OR PRIVATE ORGANIZATIONS PRIOR TO COMMENCING WORK.

7. GDCD-WWS INSPECTION FEES

THE DEVELOPER SHALL PAY FOR ALL SANITARY SEWER AND PRESSURE PIPE INSPECTION FEES AND WATER USAGE FEES PRIOR TO THE PRE-CONSTRUCTION MEETING.

8. SOIL EROSION CONTROL, PART 91 OF P.A. 451 OF 1994

THE CONTRACTOR/DEVELOPER SHALL COMPLY WITH ALL PROVISIONS OF PART 91, ACT 451 OF P.A. 1994 FOR SOIL EROSION AND SEDIMENTATION CONTROL AND WILL BE RESPONSIBLE FOR ALL MAINTENANCE UNTIL THE FINAL ACCEPTANCE OF THE PERMANENT CONTROL MEASURES BY GDCD-WWS. THE CONTRACTOR/DEVELOPER IS REQUIRED BY GDCD-WWS TO PREPARE AND SUBMIT A SOIL EROSION AND SEDIMENTATION CONTROL PLAN IN ORDER TO OBTAIN THE SOIL EROSION AND SEDIMENTATION CONTROL PERMIT AND TO PAY ANY APPLICATION FEES AND BOND FEES NECESSARY TO OBTAIN THE PERMIT.

9. STATE CONSTRUCTIONS PERMITS

THE CONSTRUCTION OF PUBLIC SANITARY SEWERS OR PRESSURE PIPES SHALL NOT BEGIN UNTIL THE REQUIRED STATE CONSTRUCTION PERMITS HAVE BEEN OBTAINED. NOTE: SOIL EROSION AND CONSTRUCTION PLAN APPROVAL ARE SEPARATE APPROVALS AT GDCD-WWS.

10. ROADWAY PERMITS

A PERMIT FROM THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS IS REQUIRED FOR ALL CONSTRUCTION WITHIN ANY ROAD RIGHT-OF-WAY. IT IS THE CONTRACTOR'S RESPONSIBILITY TO SECURE ALL NECESSARY PERMITS, POST ALL NECESSARY BONDS, PAY ALL FEES, AND OBTAIN ANY REQUIRED INSURANCES IN CONNECTION THERE WITH.

11. WORK OBSERVATION

ALL WORK SHALL BE PERFORMED UNDER THE OBSERVATION OF A CONSTRUCTION OBSERVER FROM GDCD-WWS OR LOCAL MUNICIPALITY HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY THE OBSERVING AGENCIES THREE (3) WORKING DAYS OR 72 HOURS PRIOR TO STARTING CONSTRUCTION TO ARRANGE FOR ON-SITE OBSERVATION AND TESTING. CUT SHEETS FOR ALL PIPE INSTALLATION AND REDITCHING SHALL BE PROVIDED TO THE GDCD-WWS CONSTRUCTION OPERATOR'S SUPERVISOR A MINIMUM OF 24 HOURS PRIOR TO STARTING THE WORK WITH RESPECT TO THAT UTILITY. GDCD-WWS OR THE LOCAL MUNICIPALITY HAVING JURISDICTION SHALL BE NOTIFIED FOR A FINAL INSPECTION.

12. CONTRACTOR'S MINIMUM WAGE & USE OF IN-COUNTY LABOR

THE CONTRACTOR SHALL EMPLOY COMPETENT AND SKILLED WORKERS THROUGHOUT THE COURSE OF THE PROJECT. THE CONTRACTOR SHALL STRIVE TO USE GENEESE COUNTY RESIDENTS WHEN FEASIBLE. THE CONTRACTOR SHALL BE REQUIRED TO PAY THE PREVAILING WAGE RATES AS ESTABLISHED BY THE BUILDING AND CONSTRUCTION TRADES DEPARTMENT OF THE AMERICAN FEDERATION OF LABOR WHICH APPLIES TO THE COUNTY OF GENEESE. THESE RATES CAN BE OBTAINED BY CONTACTING THE MICHIGAN DEPARTMENT OF CONSUMER AND INDUSTRIAL SERVICES.

13. MIOSHA SAFETY REQUIREMENTS

ALL WORK, WORK PRACTICE, AND MATERIALS SHALL COMPLY WITH ALL APPLICABLE STATE AND FEDERAL SAFETY GUIDELINES, OCCUPATION, HEALTH AND ENVIRONMENTAL REGULATIONS, AND ALSO NFPA AND ANSI CODES AS APPLICABLE. ALL WORK INSIDE A CONFINED SPACE, SUCH AS MANHOLES OR OTHER UNDERGROUND STRUCTURES, SHALL BE COORDINATED WITH THE UTILITY OWNER, AND ALL WORKER SAFETY REQUIREMENTS STRICTLY ENFORCED. THE CONTRACTOR SHALL HAVE ITS SAFETY PLAN ON FILE WITH GDCD-WWS AND ONE COPY ON SITE AT ALL TIMES.

14. ROADWAY REQUIREMENTS FOR UTILITY CONSTRUCTION

THE CONTRACTOR SHALL COMPLY WITH ALL OF THE REQUIREMENTS OF THE GCRC OR LOCAL MUNICIPALITY REGARDING THE CONSTRUCTION OF PRESSURE PIPE AND SEWER MAINS, MAINTAINING TRAFFIC, BARRICADING, BORING, BACKFILLING AND RESTORATION WITHIN THE ROAD RIGHT-OF-WAY.

15. OPEN CUTTING OF COUNTY/LOCAL ROADS

WHEN OPEN CUTTING OF GRAVEL OR HARD SURFACED ROADS ARE INCORPORATED INTO THE PROJECT, THE CONTRACTOR SHALL OBTAIN THE APPROVAL AND COMPLY WITH ALL OF THE REQUIREMENTS OF THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS, AND BY THE SPECIFICATIONS OF GDCD-WWS.

16. GRAVEL ROAD CONTAMINATION BY THE WORK

IF IT IS DETERMINED BY THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS THAT GRAVEL ROADS HAVE BECOME CONTAMINATED DURING THE WORK, THE ROAD MUST BE REPAIRED PER THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS. WHERE THE EXISTING ROAD GRAVEL IS REMOVED BECAUSE OF THE WORK, ALL WORK AND MATERIALS SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS OF THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS.

17. RESTORATION OF GRAVEL SHOULDERS

IF IT IS DETERMINED BY THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS THAT GRAVEL SHOULDERS HAVE BEEN CONTAMINATED BY THE WORK, THE CONTRACTOR SHALL RE-GRAVEL PER THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS. ALL WORK AND MATERIALS SHALL MEET THE REQUIREMENTS AND SPECIFICATIONS OF THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS.

18. COMPACTED GRANULAR BACKFILL FOR ROADWAYS, DRIVES, ETC.

ALL TRENCH EXCAVATION WITHIN A ONE-ON-ONE INFLUENCE OF A ROADWAY, DRIVEWAY, DRIVEWAY, PARKING LOTS OR AS OTHERWISE NOTED ON THE PLANS, SHALL BE BACKFILLED WITH COMPACTED SAND MDOT CLASS II (A5) PER THE SCHEDULE OF BACKFILLING, FOUND IN THE SPECIFICATIONS. IN ADDITION, SEE THE SPECIFICATIONS FOR THE REQUIREMENTS FOR THE COMPACTION PLAN. THIS STANDARD ALSO INCLUDES SERVICE LEADS UNLESS BORED.

19. SURFACE RESTORATION

ALL DISTURBED AREAS SHALL BE COMPLETELY RESTORED IN STRICT COMPLIANCE WITH THE SOIL EROSION AND SEDIMENTATION SPECIFICATIONS AND TO THE SATISFACTION OF GDCD-WWS, GDCD-SWM, GCRC, MDOT, THE LOCAL MUNICIPALITY, AND THE PROPERTY OWNER. ALL COSTS FOR THE CLEANUP, RESTORATION WORK, AND OTHER INTERMEDIATE OPERATIONS INCLUDING BUT NOT LIMITED TO, CONSTRUCTION SIGNAGE, STRIP, SWEEPING, AND MAINTAINING EXISTING UTILITIES, SHALL BE CONSIDERED INCLUSIVE AND AT NO ADDITIONAL COST TO GDCD-WWS. AREAS DISTURBED DURING THE WORK SHALL RECEIVE A 4" APPLICATION OF SCREENED TOPSOIL, FERTILIZED AND SEED. ALL EXCESS MATERIALS, DEBRIS, AND SIMILAR ITEMS SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF IN ACCORDANCE WITH THE LAW. ALL GROUND SURFACES SHALL BE RESTORED TO ORIGINAL CONDITION OR BETTER PRIOR TO FINAL APPROVAL.

20. TRAFFIC CONTROL

THE CONTRACTOR SHALL EXECUTE THE WORK IN A MANNER SUCH THAT TRAFFIC IS MAINTAINED AND ACCESS IS PROVIDED TO ALL RESIDENCES, BUSINESSES, AND COMMERCIAL ESTABLISHMENTS. TRAFFIC SHALL BE MAINTAINED IN ACCORDANCE WITH THE TRAFFIC CONTROL PLANS AND THE LATEST EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 6, AND THE REQUIREMENTS OF THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS, OR AS DIRECTED BY THE ENGINEER.

21. SIGNING AND BARRICADING

SIGNING AND BARRICADING SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE DETAILS ON THE PLANS, THE LATEST EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES, PART 6, AND THE REQUIREMENTS OF THE AGENCY HAVING AUTHORITY OVER THE ROADWAYS. SIGNS AND BARRICADES LEFT IN PLACE AFTER DARK SHALL BE LIGHTED.

22. PROTECTION OF HAZARDOUS AREAS

EXCAVATION AND HAZARDOUS AREAS SHALL BE PROTECTED BY BARRICADES, SNOW FENCE, OR OTHER APPROPRIATE MEANS. BARRICADES LEFT IN PLACE AFTER DARK SHALL BE LIGHTED.

23. STORM WATER DRAINAGE DURING THE WORK

THE CONTRACTOR/DEVELOPER SHALL OBTAIN THE SERVICES OF A CERTIFIED STORM WATER OPERATOR AND COMPLY WITH THE PROVISIONS OF THE NPDES AND SESC PERMITS. THE CONTRACTOR SHALL MAINTAIN DITCH DRAINAGE DURING CONSTRUCTION AND SHALL NOT OBSTRUCT SUMP PUMP LEADS DISCHARGING INTO THE DITCH. THE CONTRACTOR SHALL TAKE ALL NECESSARY MEASURES TO PROTECT ALL STORM SEWER FACILITIES, SUCH AS CATCH BASINS AND CULVERTS, DURING THE WORK. CULVERTS AND CATCH BASINS CONTAMINATED DURING THE WORK SHALL BE CLEANED.

24. UTILITY INFORMATION

UTILITY INFORMATION IS PROVIDED IN ACCORDANCE WITH THE LOCATIONS PROVIDED BY UTILITY OWNERS. THE ENGINEER IS NOT RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION OR THE LOCATION AT WHICH THESE SERVICES EXIST. DIFFERING FIELD CONDITIONS SHALL IMMEDIATELY BE BROUGHT TO THE ATTENTION OF THE ENGINEER AND GDCD-WWS.

25. EXISTING UTILITIES

THE CONTRACTOR SHALL MAINTAIN ALL EXISTING SANITARY SEWER, PRESSURE PIPE, OR STORM SEWER CONNECTIONS IN SERVICE THROUGHOUT THE WORK. THE CONTRACTOR SHALL PROVIDE OR ARRANGE FOR THE TEMPORARY SUPPORT OF GAS MAIN, TELEPHONE, FIBER OPTIC CABLE, PRESSURE PIPE, SANITARY SEWER, STORM SEWER, AND UTILITY POLES WHERE NEEDED. ALL STORM SEWERS DAMAGED OR REMOVED, OR RELOCATED BY THE CONTRACTOR, SHALL BE REPLACED WITH THE SAME SIZE AND QUALITY PIPE BY THE CONTRACTOR AT CONTRACTOR'S SOLE EXPENSE. ALL UTILITIES UNDERMINED BY THE EXCAVATION SHALL HAVE COMPACTED SAND BACKFILL PLACED UNDER THEM, UNLESS MDOT 6A CRUSHED LIMESTONE (A1) OR MDOT 22A GRAVEL (A2) IS SHOWN ON THE CONSTRUCTION PLANS. ALL WORK, INCLUDING THE REBORING OF SANITARY SEWER SERVICE LEADS AND WATERMAIN LEADS TO ACCOMMODATE CONSTRUCTION TO CLEAR EXISTING SERVICES, SHALL BE INCLUSIVE TO THE PROJECT.

26. SHOP DRAWINGS

PRIOR TO THE START OF THE WORK, THE CONTRACTOR SHALL FURNISH TO GDCD-WWS SHOP DRAWINGS AND/OR CATALOG CUTS FOR ALL MATERIALS AND EQUIPMENT ITEMS PER THE STANDARD SPECIFICATIONS.

27. MATERIAL CERTIFICATIONS

PRIOR TO THE START OF THE WORK, THE CONTRACTOR SHALL FURNISH TO GDCD-WWS MATERIALS CERTIFICATES FOR ALL MATERIALS USED DURING THE WORK.

28. NON-STOPPAGE CLAUSE

THE CONTRACTOR SHALL BE REQUIRED TO COMPLETE ALL WORK IN AN EXPEDITIOUS MANNER AND SHALL NOT STOP THE WORK FOR EXTENDED PERIODS ONCE THE WORK HAS BEGUN WITHOUT WRITTEN APPROVAL OF GDCD-WWS.

29. DISPOSAL OF EXCESS EXCAVATED MATERIAL

ALL EXCESS EXCAVATED MATERIAL SHALL BE DISPOSED OF BY THE CONTRACTOR, WITH ALL PERMITS, PERMISSIONS, AND LOCATIONS PROVIDED BY THE CONTRACTOR. ADJACENT PROPERTY OWNERS SHALL BE GIVEN PREFERENCE FOR DISPOSAL SITES. WRITTEN PERMISSION FOR DISPOSAL ON ADJACENT PROPERTY OWNERS SHALL BE PROVIDED TO GDCD-WWS.

30. CONSTRUCTION STAKING

THE CONTRACTOR SHALL, AT ITS OWN EXPENSE, PROVIDE A PROFESSIONAL LAND SURVEYOR, LICENSED IN THE STATE OF MICHIGAN, TO PROVIDE ALIGNMENT AND GRADE STAKES, AND CUT SHEETS. THE SURVEYOR SHALL PROVIDE GRADE STAKES AND CUT SHEETS AT ALL STRUCTURES AND AT A MAXIMUM OF 50' INTERVALS BETWEEN STRUCTURES.

31. FINAL ELEVATIONS OF SURFACE UTILITIES

ALL FINAL ELEVATIONS OF MANHOLE CASTINGS, HYDRANTS, VALVES, AND VALVE BOXES SHALL BE APPROVED BY THE GDCD-WWS REPRESENTATIVE IN THE FIELD. ANY ADJUSTMENTS THAT ARE MADE SHALL BE AT THE CONTRACTOR'S SOLE EXPENSE.

32. PROJECT RECORD DOCUMENTS

UPON COMPLETION OF THE WORK AND PRIOR TO FINAL APPROVAL FROM GDCD-WWS, THE OWNER/DEVELOPER SHALL FURNISH GDCD-WWS WITH ONE COMPLETE SET OF PROJECT RECORD DOCUMENTS. THESE PROJECT RECORD DOCUMENTS ARE COMPRISED OF DRAWINGS ON MYLAR AND AN ELECTRONIC DATA SET.

THE MYLAR PROJECT RECORD DOCUMENTS SHALL BE SUBMITTED TO GDCD-WWS ON 4 MIL MYLAR FOR THE REVIEW AND APPROVAL OF GDCD-WWS. THE MYLAR PROJECT RECORD DOCUMENTS SHALL INCLUDE BUT NOT BE LIMITED TO: INVERT OF PIPES, LOCATION OF MANHOLES, PIPE LENGTHS, SLOPES OF PIPE, LOCATION OF SERVICE LEADS, LOCATION OF MAINLINE VALVES, LOCATION OF BENDS, TEES CROSSES, AND LOCATION OF CURB BOXES. THIS INFORMATION SHALL BE GATHERED BY THE OWNER/DEVELOPER AT ITS SOLE EXPENSE. THESE PROJECT RECORD DOCUMENTS SHALL ALSO INCLUDE ANY ADDITIONAL INFORMATION COLLECTED BY THE GDCD-WWS OR MUNICIPAL CONSTRUCTION OBSERVER.

IN ADDITION TO THE AS-BUILT MYLARS, THE OWNER/DEVELOPER SHALL PROVIDE TO GDCD-WWS AN ELECTRONIC DATA SET IN A MICROSOFT EXCEL SPREADSHEET DETAILING THE FOLLOWING ITEMS IN THEIR AS-BUILT LOCATIONS DEPICTED IN MICHIGAN STATE PLANE SOUTH COORDINATES (NAD83) AND ELEVATIONS (USGS/NGVD): ALL MANHOLES (WATER AND SANITARY), ALL HYDRANTS, ALL VALVES, AND ALL SERVICE RISERS (WATER AND SANITARY) AT THEIR TERMINUS, ALL METER PITS, AND ALL PUMP STATIONS.

33. 2-YEAR MAINTENANCE AND GUARANTEE BOND

UPON COMPLETION OF THE WORK AND PRIOR TO FINAL APPROVAL, THE CONTRACTOR SHALL FURNISH THE GDCD-WWS WITH A 2-YEAR MAINTENANCE AND GUARANTEE BOND.

34. SOIL EROSION AND SEDIMENTATION CONTROL RELEASE

PRIOR TO FINAL ACCEPTANCE BY GDCD-WWS, THE CONTRACTOR SHALL REQUEST A FINAL INSPECTION OF ALL SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AND RECEIVE WRITTEN APPROVAL FROM GDCD-WWS. THE SOIL EROSION AND SEDIMENTATION CONTROL BOND WILL BE RELEASED UPON GDCD-WWS FINAL APPROVAL.

35. ORDER OF PRECEDENCE

IN RESOLVING INCONSISTENCIES BETWEEN TWO OR MORE SECTIONS OF THE CONTRACT DOCUMENTS, PRECEDENCE SHALL BE GIVEN IN THE FOLLOWING ORDER FROM (A) THROUGH (G):

- A. AGREEMENT AND ANY CONTRACT MODIFICATIONS (WITH GDCD-WWS)
- B. BID
- C. SUPPLEMENTARY CONDITIONS
- D. INSTRUCTION TO BIDDERS
- E. GENERAL CONDITIONS OF THE CONTRACT
- F. SPECIFICATIONS
- G. DRAWINGS

SANITARY CONSTRUCTION NOTES

1. ALL MATERIAL AND WORK SHALL COMPLY WITH THE LATEST GDCD-WWS SPECIFICATIONS AND STANDARD DETAILS.

2. NO CONNECTION TO AN EXISTING SANITARY SEWER SHALL BE MADE WITHOUT THE PRIOR APPROVAL OF GDCD-WWS. GDCD-WWS SHALL HAVE FINAL INSPECTION AUTHORITY AND APPROVAL FOR UNDERGROUND SANITARY SEWER FACILITIES.

3. THE MATERIAL FOR THE SANITARY SEWER SHALL BE SPECIFIED ON THE CONSTRUCTION DRAWINGS. THE FOLLOWING MATERIALS ARE ACCEPTABLE TO GDCD-WWS:

- A. 8" TO 15", PVC WITH A MINIMUM SDR OF 26 CONFORMING TO ASTM D-3034-00 GASKETED SEWER PIPE.
- B. LARGER THAN 15", REINFORCED CONCRETE PIPE CONFORMING TO ASTM C-76-03. JOINTS SHALL BE MODIFIED TONGUE & GROOVE TYPE WITH SOLID RUBBER GASKETS CONFORMING TO ASTM C-443-02. MINIMUM SIZE SHALL BE CLASS III, WALL B AS RECOMMENDED BY THE ENGINEER.

4. ALL SANITARY SEWER SERVICE RISERS SHALL BE 6" INTERNAL DIAMETER SDR-26 PVC OR LOWER CONFORMING TO ASTM D-3034-00. JOINTS SHALL BE RUBBER GASKET JOINTS OR SOLVENT WELD BELL JOINTS. RISERS SHALL BE LEFT AT 8'-10" DEEP AT THE RIGHT-OF-WAY OR EASEMENT LINE, OR AS DEEP TO SERVICE BASEMENTS. SERVICE RISERS WITHIN EASEMENTS SHALL BE EXTENDED A MINIMUM OF ONE PIPE LENGTH FROM THE MAINLINE SEWER OR TO THE EDGE OF THE EASEMENT, WHICH EVER IS LONGER. WEEP TILE, PERIMETER DRAINS, DOWN SPOUTS, OR ANY OTHER SOURCE OF WATER, SHALL NOT BE CONNECTED TO THE SANITARY SEWER.

5. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C-478-03 WITH RUBBER JOINTS CONFORMING TO ASTM C-443-02. ALL FINAL ELEVATIONS OF MANHOLE CASTINGS SHALL BE DETERMINED BY GDCD-WWS. MANHOLE FRAMES AND COVERS SHALL BE BOLT-DOWN, WATER TIGHT EAST JORDAN 1040 ZPT, NEEDHAM FOUNDRY COMPANY R-1916F, OR GDCD-WWS APPROVED ALTERNATE. STEPS SHALL BE M.A. INDUSTRIES PS-1-PF, AMERICAN STEP CO. ML-10, OR A GDCD-WWS APPROVED ALTERNATE.

6. ALL SANITARY SEWERS SHALL BE INSTALLED PURSUANT TO THE SANITARY SEWER STANDARD DETAILS. DEEPER SEWERS, EXCESSIVE TRENCH WIDTH, AND WHERE NOTED, THE CONTRACTOR SHALL ADHERE TO THE REQUIREMENTS SPECIFIED.

7. WHERE MANHOLE ADJUSTMENT IS REQUIRED, THE MAXIMUM AMOUNT OF ADJUSTMENT BETWEEN THE CASTING AND THE CONE SHALL BE 9". A MAXIMUM OF TWO ADJUSTMENT RINGS ARE ALLOWED. ONLY 3", 4", OR 6" CONCRETE ADJUSTMENT RINGS SHALL BE USED. THE MANHOLE SHALL BE WRAPPED PER SD-5 OF THE SANITARY SEWER DETAILS.

8. ALL SANITARY SEWERS 8" THROUGH 21" DIAMETER, INCLUDING SERVICE LEADS CONSTRUCTED AS PART OF WORK, SHALL UNDERGO A LOW PRESSURE AIR TEST AND AN INFILTRATION TEST, IN CONFORMANCE WITH ASTM C-924-02 OR C-989-02, PRIOR TO FINAL ACCEPTANCE. SANITARY SEWER SYSTEMS LARGER THAN 21" SHALL UNDERGO AN INFILTRATION TEST. THE MAXIMUM ALLOWABLE INFILTRATION FOR PVC SYSTEMS SHALL BE 0 GALLONS PER INCH DIAMETER, PER MILE, PER 24 HOURS, AND CONCRETE SYSTEMS SHALL BE 100 GALLONS PER INCH DIAMETER, PER MILE.

9. ALL PUBLIC SANITARY SEWERS 8" OR LARGER SHALL BE INTERNALLY TELEVISED (PAN/TILT) BY THE CONTRACTOR. THE TELEVISED REPORT, INCLUDING THE DVD, SHALL BE GIVEN TO GDCD-WWS PRIOR TO A REQUEST FOR FINAL INSPECTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CLEANING (JET/VAC) THE LINE AND ASSURING ALL DIRT AND DEBRIS HAS BEEN REMOVED PRIOR TO TELEVISION. PRIOR TO TELEVISIONING THE LINE, WATER SHALL BE PLACED IN THE MAIN FROM THE UPSTREAM MANHOLE UNTIL IT COMES OUT OF THE DOWNSTREAM MANHOLE. THE TELEVISED REPORT SHALL LIST THE DISTANCE A HOUSE LEAD IS LOCATED FROM A MANHOLE, ALL SHEAR BREAKS IN THE MAIN OR SERVICE LEADS, ALL LONGITUDINAL CRACKS, BROKEN PIPE, DIPS, OR HIGH POINTS IN THE LINE, ETC. THE CONTRACTOR SHALL REPAIR DAMAGED PIPE BY EXCAVATING THE PIPE AND REPLACING THE LENGTH OF PIPE IN AN APPROVED METHOD. LEAKING JOINTS SHALL BE REPAIRED BY THE CONTRACTOR BY GROUTING. A LEAKING JOINT IS DEFINED AS HAVING SUFFICIENT INFILTRATION TO WET THE INTERIOR OF THE JOINT. GDCD-WWS SHALL BE NOTIFIED WHEN THE LINE IS TO BE TELEVISED AND SHALL BE PRESENT TO INSPECT REPAIRS.

10. SANITARY MANHOLES SHALL BE PLACED CLOSEST TO PROPERTY CORNERS WHEN FEASIBLE.

11. PRIOR TO PERFORMING ANY TESTING, THE CONTRACTOR SHALL BE REQUIRED TO DO THE FOLLOWING:

- A. CONDUCT PRELIMINARY TESTS ON THE SYSTEM.
- B. PROVIDE THE RESULTS FROM THE PRELIMINARY TESTS ON THE SYSTEM.
- C. PROVIDE RESULTS OF DENSITY CHECKS ON COMPACTED SAND BACKFILL FROM A CERTIFIED TESTING AGENCY.
- D. FURNISH A COMPLETED TWO-YEAR MAINTENANCE & GUARANTEE BOND.
- E. COMPLETE FINAL ADJUSTMENTS ON ANY SANITARY SEWER STRUCTURES.

12. PRIOR TO FINAL APPROVAL, THE FOLLOWING ITEMS MUST BE COMPLETED BY THE CONTRACTOR:

- A. THE FINAL TESTING SHALL CONSIST OF VISUAL INSPECTION OF MANHOLES, TELEVISION OF SANITARY MAIN, LOW PRESSURE AIR TEST, AND/OR INFILTRATION TEST DEPENDENT ON THE SIZE OF THE SANITARY MAIN (SEE #8 ABOVE), AND PASSING AN APPROPRIATE SIZED MANDREL 30 DAYS AFTER THE MAIN HAS BEEN INSTALLED.
- B. PROVIDE MATERIAL CERTIFICATES.
- C. PROVIDE RECORDED COPIES OF ALL EASEMENTS FOR THE MASTER DEED REFLECTING FINAL PROJECT RECORD DOCUMENT LOCATIONS.

PRESSURE PIPE CONSTRUCTION NOTES

1. ALL MATERIAL AND WORK SHALL COMPLY WITH THE LATEST GDCD-WWS SPECIFICATIONS AND STANDARD DETAILS.

2. ALL PUBLIC PRESSURE PIPE SHALL BE DUCTILE IRON. THE PIPE SHALL BE BELL AND SPIGOT OR RESTRAINED JOINT FITTINGS FITTED WITH A RUBBER GASKET. FITTINGS MAY BE GRAY IRON OR DUCTILE IRON MEETING CLASS 350 PSI RATING. FOR 3" OR SMALLER SANITARY SEWER FORCEMAIN, SDR-21 PVC MAY BE UTILIZED.

3. ALL PIPES, VALVES, AND FITTINGS SHALL BE POLYWRAPPED, EXCEPT IN MANHOLES. CIRCUMFERENTIAL WRAPS OF MANUFACTURER RECOMMENDED TAPE SHALL BE PLACED AT NO GREATER THAN 4' INTERVALS ALONG THE BARRON OF THE PIPE, WITH THE EXCESS FOLDED OVER THE TOP TO TAKE OUT EXCESS SLACK, HELPING TO MINIMIZE THE SPACE BETWEEN THE POLYETHYLENE AND THE PIPE. COMPLETE THE INSTALLATION BY OVERLAPPING THE POLYETHYLENE TUBE WRAP AT EACH END AND SEAL ENDS PER THE MOST CURRENT VERSION OF AWWA C105/A21.5 STANDARD. WRAPPING PVC PIPE IS NOT REQUIRED.

4. WHERE SANITARY SERVICE LEADS OR OTHER UTILITIES ARE ENCOUNTERED, THE CONTRACTOR SHALL MAKE ADJUSTMENTS TO PROVIDE CONTINUOUS SERVICE TO PROPERTIES ALONG THE ROUTE OF CONSTRUCTION. ALL WORK, INCLUDING THE REBORING OF SANITARY SEWER SERVICE RISERS TO ACCOMMODATE CONSTRUCTION, OR ADJUSTING PRESSURE PIPE INSTALLATION TO CLEAR EXISTING SERVICES, SHALL BE INCLUSIVE TO CONSTRUCTION.

5. ALL PRESSURE PIPES SHALL HAVE A MINIMUM COVER OVER THE TOP OF THE PIPE OF 5' FROM FINISHED GRADE, 5' CLEARANCE UNDER DRAINS, 5' CLEARANCE BELOW EXISTING DITCHES, AND/OR A MINIMUM 5' BELOW THE EXISTING ROAD. THE STANDARD LAYING CONDITIONS FOR PRESSURE PIPE SHALL BE A 30" TRENCH WIDTH, OR PIPE DIAMETER PLUS 12". THE PIPE SHALL BE LAID ON MDOT CLASS II SAND (A5) A MINIMUM OF 4" WITH RECESSES TO ACCOMMODATE PIPE BELLS OR AS SHOWN ON THE PLANS.

6. ALL TRENCH EXCAVATION, UNDER OR WITHIN THE ONE-ON-ONE INFLUENCE OF THE EXISTING OR PROPOSED PAVING, SHALL BE BACK FILLED WITH COMPACTED MDOT CLASS II SAND (A5).

7. THE CONTRACTOR SHALL RESTRAIN ALL THRUST IN THE SYSTEM BY THE USE OF GDCD-WWS APPROVED RESTRAINED JOINTS AND THRUST BLOCKS. DURING THE INSTALLATION OF WATERMAIN, ALL HYDRANTS, TEES, VERTICAL OR HORIZONTAL BENDS AND FUTURE VALVE CONNECTIONS SHALL BE RESTRAINED. THE RESTRAINT SYSTEM AND LOCATION IN THE FIELD SHALL BE DESIGNATED ON THE PLANS.

8. THE CONTRACTOR SHALL ENCASE THE PRESSURE PIPE IN CONCRETE WHERE THE VERTICAL SEPARATION BETWEEN THE SANITARY SEWER OR STORM SEWER AND THE WATERMAIN IS LESS THAN 18" INCHES.

9. DATE VALVES SHALL BE RESILIENT SEATED CONFORMING TO THE MOST CURRENT VERSION OF AWWA C509 OR C515 STANDARDS. VALVES SHALL HAVE A VERTICAL, NON-RISING STEM, AND OPEN CLOCKWISE, OR AS SPECIFIED BY LOCAL MUNICIPALITY HAVING JURISDICTION.

10. FIRE HYDRANTS SHALL CONFORM TO THE MOST CURRENT VERSION OF AWWA C502 STANDARD. ALL HYDRANTS SHALL BE TRAFFIC MODELS WITH BREAKAWAY FLANGES, AND SHALL HAVE THE DRAIN HOLES FACTORY PLUGGED. ALL THE FIRE HYDRANT ASSEMBLIES FROM THE TEE THROUGH THE HYDRANT, SHALL BE RESTRAINED BY A GDCD-WWS APPROVED METHOD. FIRE HYDRANTS SHALL BE PLACED AT PROPERTY CORNERS AND WITHIN THE RIGHT-OF-WAY WHEN POSSIBLE AND SHALL BE PAINTED YELLOW WITH THE CAP COLOR CODED IN ACCORDANCE WITH THE STANDARD DETAILS. FINAL ELEVATIONS AND ADJUSTMENTS TO GRADE, USING EXTENSION PIECES IF REQUIRED, SHALL BE ACCOMPLISHED BY THE CONTRACTOR AT THE CONTRACTOR'S SOLE EXPENSE. FIRE HYDRANTS SHALL HAVE A 5 1/4" VALVE OPENING. FIRE HYDRANTS SHALL BE EAST JORDAN 589 250, AMERICAN FLOW CONTROL WATEROUS PACER WB67-250, OR A GDCD-WWS APPROVED ALTERNATE.

11. PRESSURE TAPS TO EXISTING WATERMAIN, AND CONNECTIONS TO EXISTING VALVES, SHALL BE MADE ONLY UNDER GDCD-WWS OR THE LOCAL MUNICIPALITY HAVING JURISDICTION. ALL VALVE OPENING AND CLOSING SHALL BE BY THE OPERATIONAL AUTHORITY. (ONLY A GDCD-WWS APPROVED TAPPING SLEEVE IS ALLOWED FOR ALL PRESSURE TAPS.) A CONCRETE MANHOLE SHALL BE REQUIRED AROUND ALL PRESSURE TAPS. SEE PRESSURE PIPE DETAILS.

12. THE CONTRACTOR SHALL HAVE THE OPTION OF PRESSURE TESTING THE WATERMAIN AGAINST THE EXISTING VALVE AT THE POINT OF BEGINNING OF THE PROJECT OR PLACING A CAP WITHIN 10' OF THE EXISTING VALVE AND STUB. IF TESTING AGAINST THE EXISTING VALVE AND IT LEAKS, THE CONTRACTOR SHALL MAKE REPAIRS AND REPEAT THE PRESSURE TEST AGAINST THE EXISTING VALVE. AT THE CONTRACTOR'S SOLE EXPENSE. IF A CAP HAS BEEN PLACED, THEN THE CONTRACTOR SHALL PERFORM THE SYSTEM TEST, AND IF THE TESTS ARE SATISFACTORY TO GDCD-WWS, THEN THE FINAL CONNECTION SHALL BE MADE.

13. WATERMAIN SHALL BE TESTED IN ACCORDANCE WITH MOST CURRENT VERSION OF AWWA C600 STANDARD, AND CHLORINATED IN ACCORDANCE WITH THE LATEST GENEESE COUNTY STANDARD SPECIFICATIONS. WATERMAIN SHALL BE TESTED TO 150 PSI AS MEASURED AT THE HIGH POINT IN THE WATER LINE. WATERMAIN CHLORINATION SHALL BE OBSERVED AND MONITORED BY GDCD-WWS OR THE LOCAL MUNICIPALITY HAVING JURISDICTION. CHLORINATION AND TESTING SHALL BE AT THE CONTRACTOR'S SOLE EXPENSE. A LETTER OF APPROVAL FROM THE AGENCY HAVING AUTHORITY SHALL BE ISSUED PRIOR TO THE WATER BEING USED FOR HUMAN CONSUMPTION.

14. WHEN SPECIFIED BY THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL SUPPLY ALL WATER SERVICE LEADS. THESE LEADS SHALL BE "K" COPPER AND SHALL BE A MINIMUM OF 3/4" IN DIAMETER. THEY SHALL BE INSTALLED IN ACCORDANCE WITH THE WATERMAIN STANDARD DETAIL. ALL CORPORATIONS SHALL BE BRONZE. ALL APPURTENANCES THAT COME IN CONTACT WITH PORTABLE WATER SHALL BE LEAD FREE ACCORDING TO NSF/ANSI STANDARD 372.

15. THE CONTRACTOR SHALL INSTALL, AS A MINIMUM, 2" CORPORATIONS ON THE PRESSURE PIPE FOR PRESSURE TESTING, CHLORINE ADDITION, AND FOR BLOW-OFF PURPOSES. THE CORPORATIONS SHALL HAVE COPPER PIPE EXTENDING TO THE GROUND SURFACE. THE CONTRACTOR SHALL REMOVE THE CORPORATIONS AND COPPER LINES UPON A SATISFACTORY TEST AND INSTALL BRONZE PLUGS PRIOR TO FINAL ACCEPTANCE.

16. PRIOR TO REQUESTING ANY FINAL PRESSURE TESTING AND GATHERING THE REQUIRED BACTERIA SAMPLES (FOR WATERMAIN ONLY), THE CONTRACTOR SHALL PERFORM THE FOLLOWING ITEMS:

- A. CONDUCT A PRELIMINARY PRESSURE TEST ON THE SYSTEM.
- B. PROVIDE THE RESULTS FROM THE PRELIMINARY TESTS ON THE SYSTEM.
- C. PROVIDE PROPER CAP COLOR ON THE FIRE HYDRANTS (FOR WATERMAIN ONLY).

17. PRIOR TO FINAL APPROVAL, THE FOLLOWING ITEMS SHALL BE COMPLETED BY THE CONTRACTOR:

- A. FURNISH A COMPLETED TWO-YEAR MAINTENANCE & GUARANTEE BOND.
- B. PROVIDE MATERIAL CERTIFICATES.
- C. COMPLETE FINAL ADJUSTMENTS OF FIRE HYDRANTS (FOR WATERMAIN ONLY), VALVES, AND MANHOLES.
- D. PROVIDE RESULTS OF DENSITY CHECKS ON COMPACTED SAND BACKFILL FROM A CERTIFIED TESTING AGENCY.
- E. PROVIDE RECORDED COPIES OF ALL EASEMENTS FOR THE MASTER DEED REFLECTING FINAL PROJECT RECORD DOCUMENT LOCATIONS.

NO.	DATE	DESCRIPTION
1	2020	EIGHTH EDITION

DIVISION OF
WATER & WASTE SERVICES

STANDARD CONSTRUCTION NOTES

STANDARD DETAILS

For the Construction of Sanitary Sewers & Watermain in Genesee County

