

THE GROVE AT LEE'S SUMMIT

MASS GRADING AND STORMWATER PLAN

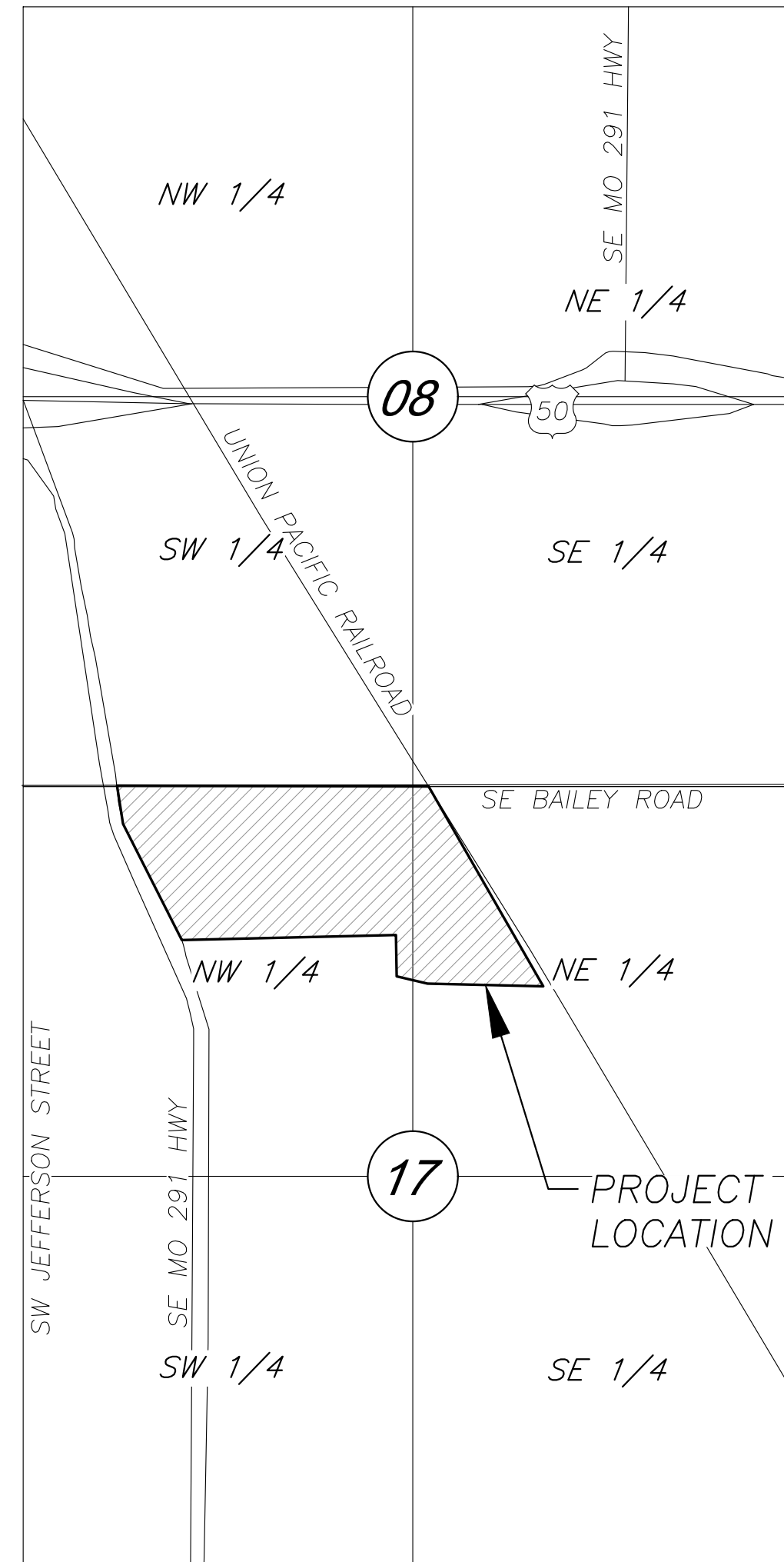
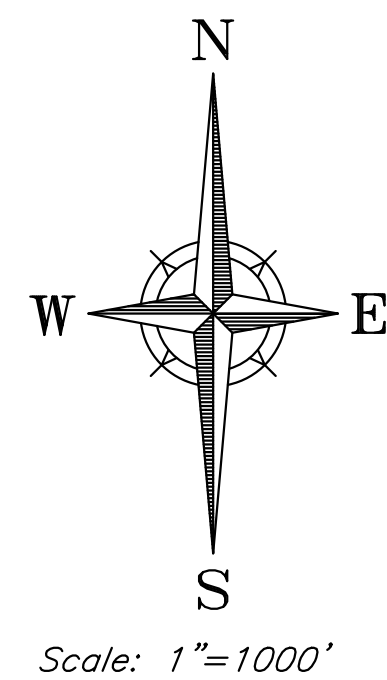
MISSOURI HWY 291 & SE BAILEY RD
LEE'S SUMMIT, MISSOURI
SECTIONS 8 & 17, TOWNSHIP 47 NORTH, RANGE 31 WEST

GBA
engineers

9801 Renner Boulevard
Lenexa, Kansas 66219
913.492.0400
www.gbateam.com

GENERAL NOTES

- ALL WORK IN PUBLIC EASEMENT AND RIGHT-OF-WAY SHALL BE INSTALLED PER THE REQUIREMENTS AND SPECIFICATIONS OF THE CITY OF LEE'S SUMMIT.
- ALL EXISTING TOPOGRAPHIC, SURVEY, AND UTILITY INFORMATION SHOWN WAS PROVIDED TO GBA IN THE FORM OF A TOPOGRAPHIC SURVEY PREPARED BY BHC RHODES SURVEY AND DATED MARCH 27TH, 2017. GBA MAKES NO GUARANTIES AS TO THE ACCURACY OF THE EXISTING INFORMATION SHOWN HEREON. CONTRACTORS SHALL SATISFY THEMSELVES AS TO THE EXISTING CONDITIONS OF THE SITE AND HAVE ALL UTILITIES LOCATED PRIOR TO COMMENCING CONSTRUCTION.
- THE CONTRACTOR SHALL BE REQUIRED TO OBTAIN ALL FEDERAL, STATE, AND LOCAL PERMITS REQUIRED FOR THIS PROJECT PRIOR TO COMMENCING CONSTRUCTION.
- ANY WORK ADJACENT TO OR CROSSING EXISTING STREETS REQUIRES PROPER TRAFFIC CONTROL DEVICES. TRAFFIC CONTROL DEVICES SHALL BE PLACED IN ACCORDANCE WITH THE MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).
- THE CONTRACTOR SHALL NOT DISRUPT ANY OPERATIONS OF ADJACENT PROPERTIES DURING CONSTRUCTION. IF DISRUPTION IS NECESSARY TO FACILITATE CONSTRUCTION, CONTRACTOR IS TO CONTACT ENGINEER FOR COORDINATION.
- ANY UNFORESEEN CONDITIONS, SITE DISCOVERIES, OR INTERACTION WITH ADJACENT PROPERTY OWNERS OR THE CITY SHALL BE BROUGHT UP WITH THE ENGINEER IMMEDIATELY FOR REMEDY AND DOCUMENTATION. ANY MODIFICATION TO THE PLANS MUST BE AUTHORIZED BY THE ENGINEER WHERE APPLICABLE.
- THE CONTRACTOR SHALL BE REQUIRED TO DEMOLISH, REMOVE AND DISPOSE OF ALL EXISTING STRUCTURES, PAVEMENTS, AND FEATURES NECESSARY TO CONSTRUCT THE IMPROVEMENTS SHOWN HEREON. ANY WASTE MATERIALS GENERATED DURING CONSTRUCTION SHALL BE REMOVED FROM THE SITE BY THE CONTRACTOR AND DISPOSED OF IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS GOVERNING SUCH DISPOSAL.
- THE CONTRACTOR SHALL PREVENT ANY TRASH, DEBRIS, OR LIQUID WASTES FROM BEING DISPOSED OF IN SANITARY SEWERS, STORM SEWERS, OR OPEN DRAINAGE SYSTEMS.
- THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR DAMAGE CAUSED TO OTHER PROPERTIES DURING CONSTRUCTION. IN THE EVENT OF DAMAGE TO ADJACENT PROPERTY, STRUCTURES, OR IMPROVEMENTS, THE CONTRACTOR SHALL REPAIR OR REPLACE SUCH DAMAGE TO THE PRECONSTRUCTION CONDITION AT THE CONTRACTOR'S EXPENSE.
- CONTRACTORS AT THE SITE SHALL BE SOLELY RESPONSIBLE FOR JOBSITE SAFETY FOR ALL ASPECTS OF WORK SHOWN HEREON.
- ALL WORK AND MATERIALS USED IN THE CONSTRUCTION OF THE IMPROVEMENTS SHOWN HEREON SHALL COMPLY WITH ALL REFERENCED STANDARDS, SPECIFICATIONS, AND PLAN NOTES.
- ALL BUILDINGS ARE SHOWN AS A REFERENCE ONLY. ALL BUILDINGS SHALL BE LOCATED AND CONSTRUCTED PER THE ARCHITECTURAL DRAWINGS PREPARED BY OTHERS.
- CONTRACTOR SHALL BE RESPONSIBLE FOR CONTACTING ALL UTILITY COMPANIES FOR FIELD LOCATIONS OF UNDERGROUND UTILITIES AFFECTED BY THE CONTRACT. ALL EXISTING UTILITIES INDICATED ON THESE PLANS ARE ACCORDING TO THE BEST INFORMATION AVAILABLE TO THE ENGINEER; HOWEVER, ALL UTILITIES ACTUALLY EXISTING MAY NOT BE SHOWN. UTILITIES DAMAGED THROUGH THE NEGLIGENCE OF THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AT THE EXPENSE OF THE CONTRACTOR.
- ANY AND ALL HAZARDS SHALL BE PROPERLY IDENTIFIED AND BARRICADED FROM ACCESS DURING ALL NON-CONSTRUCTION PERIODS. ALL EXCAVATIONS AND HAZARDOUS AREAS SHALL BE FENCED OFF OR OTHERWISE SECURED AS TO NOT PRESENT A HAZARD TO THE GENERAL PUBLIC, AT A MINIMUM AT THE END OF EACH WORKING DAY. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR JOBSITE SAFETY.
- UNLESS SPECIFIED OTHERWISE, ALL CONSTRUCTION SHALL MEET THE REQUIREMENTS OF THE CITY OF LEE'S SUMMIT STANDARD SPECIFICATIONS, EXCEPT AS MODIFIED BY THESE PLANS.
- PRIVATE EROSION & SEDIMENT CONTROL INSPECTIONS ARE REQUIRED IN ACCORDANCE WITH NPDES SCHEDULE AND REQUIREMENTS. AFTER INSPECTIONS, PROVIDE THE CITY OF LEE'S SUMMIT WITH REPORTS AND DOCUMENTATION.
- A RIGHT-OF-WAY PERMIT IS REQUIRED FROM THE CITY OF LEE'S SUMMIT PUBLIC WORKS DEPARTMENT FOR ANY WORK WITHIN THE PUBLIC RIGHT-OF-WAY.
- WORKING HOURS SHALL BE FROM 7AM TO 7PM MONDAY THROUGH SATURDAY, WITH NO WORK ON SUNDAY WITHOUT PRIOR WRITTEN PERMISSION FROM THE CITY OF LEE'S SUMMIT.
- CONTRACTOR SHALL PROVIDE ONE CHEMICALLY-TREATED PORTABLE TOILET FOR EVERY 20 EMPLOYEES ON THE JOB SITE.
- FOLLOWING SUBSTANTIAL COMPLETION OF SITE/BUILDING IMPROVEMENTS, THE CONTRACTOR SHALL CONTACT THE ENGINEER TO PERFORM A CHECKLIST OF SITE IMPROVEMENTS PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.
- GRADING PROPOSED IN AREAS UNDER CORPS OF ENGINEERS JURISDICTION SHALL NOT BE PERFORMED UNTIL 404 PERMIT IS ISSUED BY THE CORPS OF ENGINEERS FOR THIS PROJECT.
- CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION SHALL CONFORM TO THE REQUIREMENTS OF THE STORMWATER POLLUTION PREVENTION PLAN (SWPPP) A COPY OF WHICH SHALL BE MAINTAINED AND UPDATED ON SITE BY THE CONTRACTOR.
- REFER TO PRELIMINARY SUBSURFACE EXPLORATION - PROPOSED INDUSTRIAL DEVELOPMENT - THE GROVE - LEE'S SUMMIT, MISSOURI, DATED MARCH 10, 2017 PREPARED BY GEOTECHNOLOGY INC. FOR GRADING AND PAVEMENT RECOMMENDATIONS AND BORING LOGS. ALL EARTHWORK SHALL CONFORM TO THE RECOMMENDATIONS OF THE REPORT.



VICINITY MAP
Section 17-T13N-R31W

UTILITIES

SANITARY & WATER
CITY OF LEE'S SUMMIT
JEFF THORN
220 SE GREEN STREET
LEE'S SUMMIT, MO 64063
PHONE (816) 969-1200

AT&T
RONALD GIPFERT
500 E 8TH STREET
KANSAS CITY, MO 64106
PHONE (816) 275-1550

STORM WATER
CITY OF LEE'S SUMMIT
GENE WILLIAMS
220 SE GREEN STREET
LEE'S SUMMIT, MO 64063
PHONE (816) 969-1200

MISSOURI GAS ENERGY
RICHARD FROCK
3025 SW CLOVER DRIVE
LEE'S SUMMIT, MO 64082
PHONE (816) 472-3489

SHEET INDEX

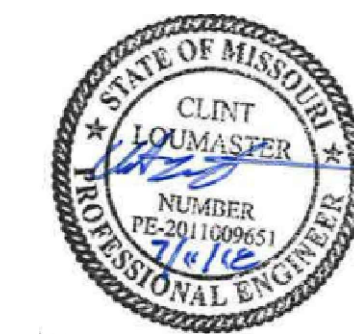
CVR	COVER SHEET
C1.1	EROSION CONTROL-EXISTING
C1.2	EROSION CONTROL-DEVELOPED
C2.1	SURVEYED INFORMATION (1)
C2.2	SURVEYED INFORMATION (2)
C3.0	SITE PLAN
C4.0	MASS GRADING PLAN
C4.1	RETENTION BASIN GRADING PLAN Δ
C4.2	CULVERT OUTFLOW PLAN
C5.1	STORM PLAN AND PROFILE (1)
C5.2	STORM PLAN AND PROFILE (2)
C5.3	STORM PLAN AND PROFILE (3)
C5.4	STORM PLAN AND PROFILE (4)
C5.5	STORM PLAN AND PROFILE (5)
C5.6	DRAINAGE CALCULATIONS
C6.0	WATER MAIN RELOCATION PLAN
C6.1	WATER LINE RELOCATION PROFILE
C7.1	CIVIL DETAILS (1)
C7.2	CIVIL DETAILS (2)
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C7.4	CIVIL DETAILS (4)
C7.5	CIVIL DETAILS (5)
C7.6	CIVIL DETAILS (6)
C7.7	CIVIL DETAILS (7)
C7.8	CIVIL DETAILS (8)
C8.0	SE 16TH STREET ALIGNMENT Δ

DEVELOPER

THE GROVE AT LEE'S SUMMIT LLC.
P.O. BOX 57
LEE'S SUMMIT, MISSOURI 64063
CONTACT: ROBERT DUNN

PREPARED & SUBMITTED BY:

GBA
LENEXA, KANSAS



CLINT LOUMASTER, P.E.
MISSOURI P.E. NO. 2011009651

DATE

APPROVED BY:

CITY OF LEE'S SUMMIT, MISSOURI

AUTHORIZING POSITION

DATE

PROJECT CONTROL POINTS				
CONTROL POINT NO.	GROUND NORTHING	GROUND EASTING	ELEV.	DESC.
10*	993776.70*	2824302.03*	1041.48'	1/2" IRON BAR W/PLASTIC CAP MARKED "CONTROL POINT"
11	993764.02	2825337.32	1030.08'	1/2" IRON BAR W/PLASTIC CAP MARKED "CONTROL POINT"
13	992502.46	2826068.40	1005.93'	1/2" IRON BAR W/PLASTIC CAP MARKED "CONTROL POINT"
139	992864.11	2824688.84	1027.56'	1/2" IRON BAR W/CAP MARKED "ASC MLS76D KLS3" (PROP. COR.)
5162	993565.88	2826359.68	1024.05'	1/2" IRON BAR W/CAP MARKED "SKW LS000008" (PROP. COR.)

*GROUND COORDINATE = STATE PLANE COORDINATE (MISSOURI STATE PLANE, WEST ZONE, NAD83, U.S. SURVEY FEET). ALL OTHER COORDINATES SHOWN ARE GROUND. COMBINED GRID FACTOR: 0.999893. ELEVATIONS ARE NAVD88

FEMA INFORMATION:

THE SITE IS NOT LOCATED WITHIN ANY SPECIAL FLOOD HAZARD AREAS (SFHA) PER FEMA FIRM MAP 29095C0438G-PANEL 438 OF 625; EFFECTIVE DATE OF JANUARY 20, 2017. NO LETTERS OF MAP AMENDMENT OR REVISIONS ARE BEING PROPOSED.

PROPOSED FACILITY FOR:
THE GROVE AT LEE'S SUMMIT
MASS GRADING AND STORMWATER
MISSOURI HWY 291 & 16TH STREET
LEE'S SUMMIT, MISSOURI

Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION

Δ City Comments 6/14/18

PROJECT NUMBER

13958.00

DATE

7/11/18

DESIGNED

DRAWN

REVIEWED

SHEET TITLE

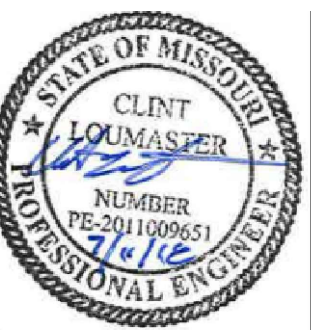
COVER SHEET

SHEET NUMBER

CVR

© George Butler Associates, Inc. 2018
Engineering CO# 000133
Architecture CO# 000212
Land Surveying CO# 000059

G:\13958\Civil 3D\Production Drawings\Mass Grading and Stormwater Plans\021730-FDP1A-MASSGRAD-SHIFTS-ERSN-1.dwg Layout: EROSION CONTROL-EXISTING -- Wednesday July 11, 2018, 3:18pm -- Copyright 2018, George Butler Associates, Inc.



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION
City Comments 6/14/18

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13958.00
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EROSION CONTROL-EXISTING

SHEET NUMBER
C1.1



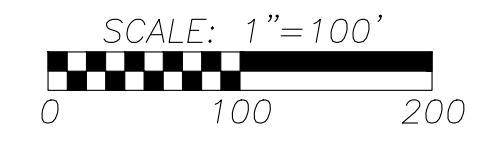
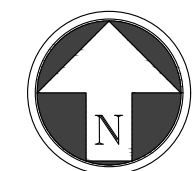
LEGEND

- 980 — EXISTING GRADE 5' CONTOURS
- 980 — EXISTING GRADE 1' CONTOURS
- R/W — RIGHT-OF-WAY LINE
- P — PROPERTY LINE
- [Hatched Box] SEDIMENT BASIN
- [Circle with Dots] TEMPORARY SEDIMENT BASIN RISER
- SF --- SILT FENCE
- [Cross-hatched Box] CONSTRUCTION ENTRANCE

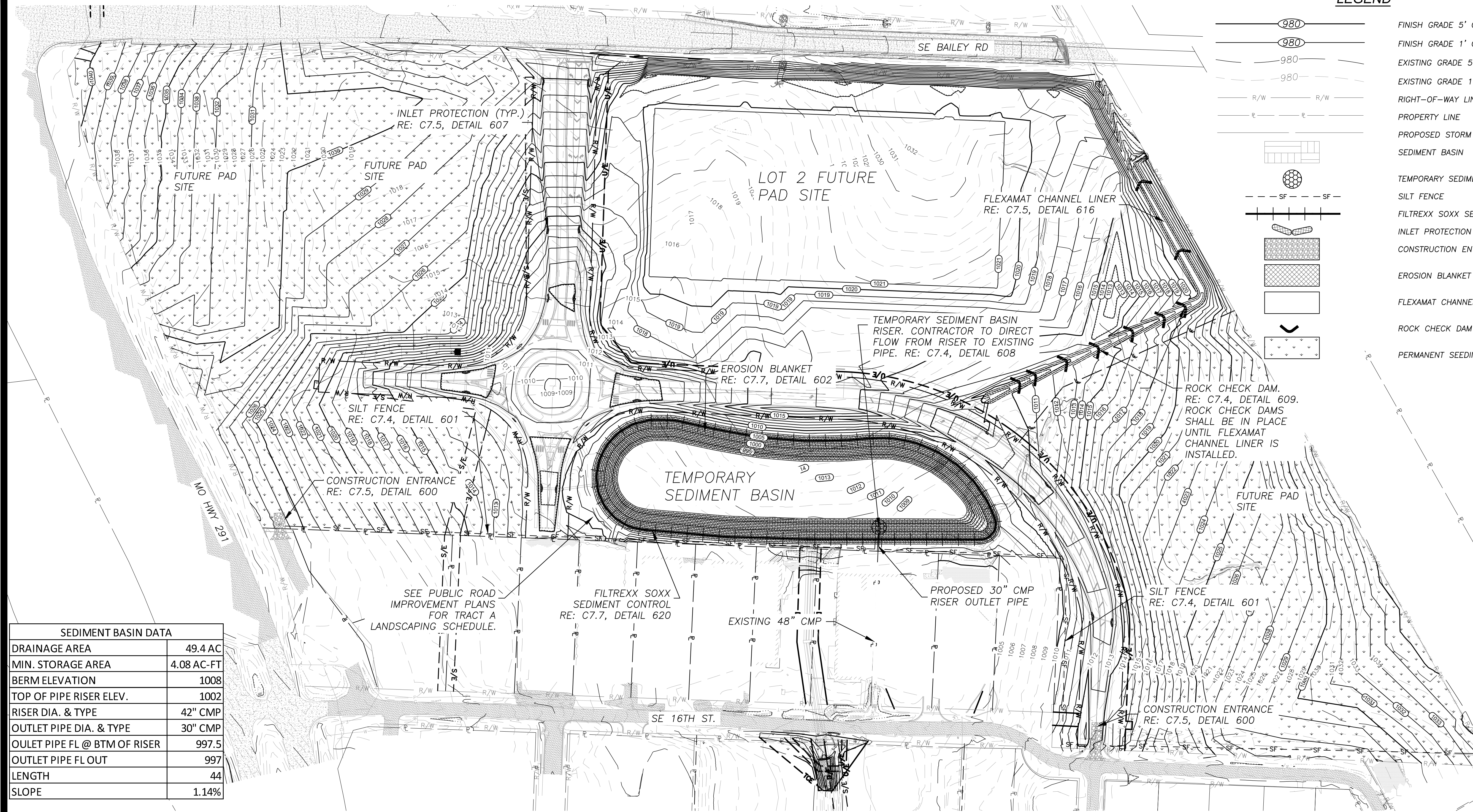
SEDIMENT BASIN DATA	
DRAINAGE AREA	49.4 AC
MIN. STORAGE AREA	4.08 AC-FT
BERM ELEVATION	1008
TOP OF PIPE RISER ELEV.	1002
RISER DIA. & TYPE	42" CMP
OUTLET PIPE DIA. & TYPE	30" CMP
OUTLET PIPE FL @ BTM OF RISER	997.5
OUTLET PIPE FLOW	997
LENGTH	44
SLOPE	1.14%

EROSION AND SEDIMENT CONTROL GENERAL NOTES

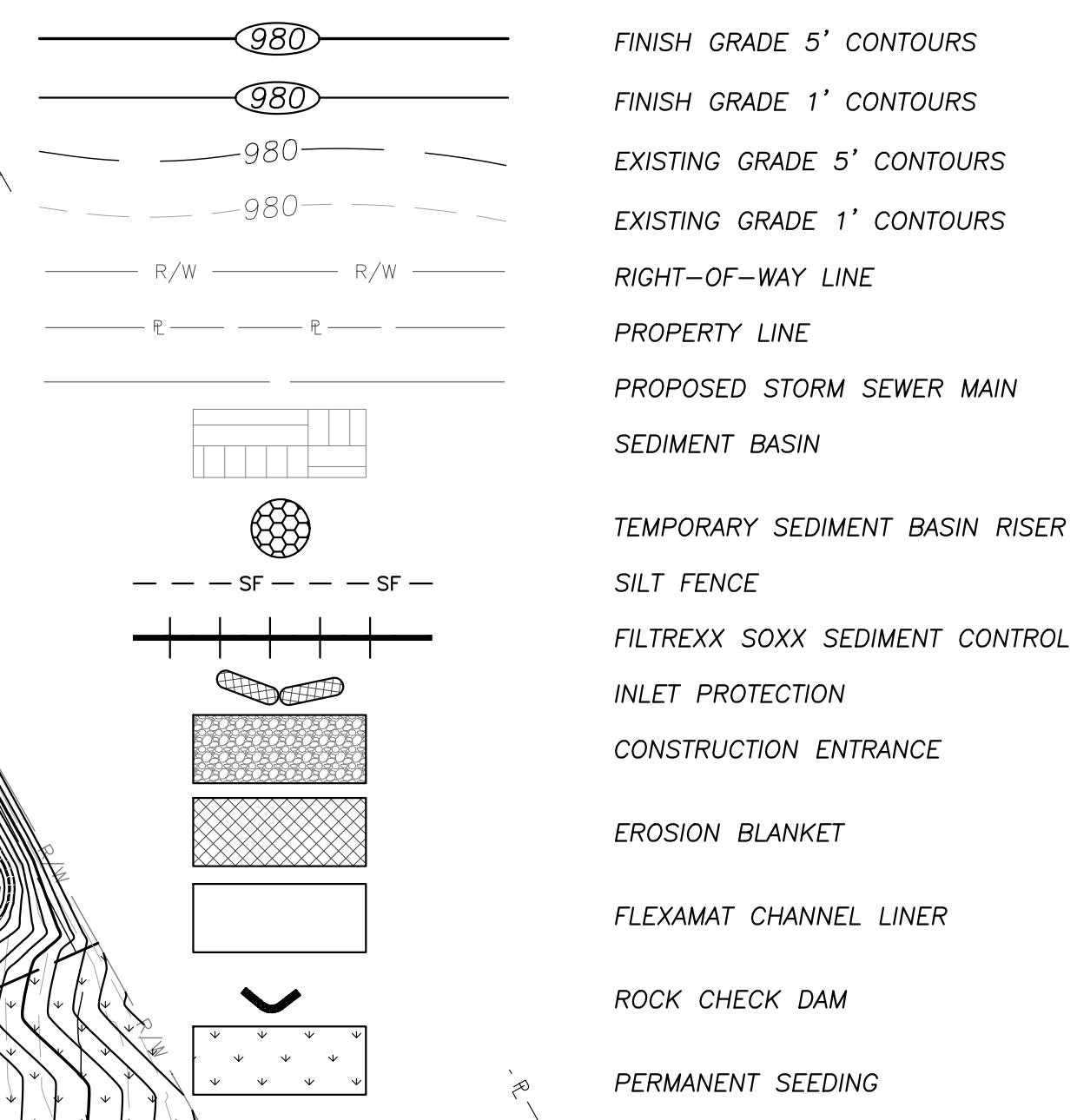
- Prior to Land Disturbance activities, the contractor shall:
 - Delineate the outer limits of any natural stream corridor designated with construction fencing.
 - Construct a stabilized entrance/parking/delivery area.
 - Install perimeter controls and request the inspection of the pre-construction erosion and sediment control measures designated on the approved erosion and sediment control plan. Land disturbance work shall not proceed until there is a satisfactory inspection.
- Identify the limits of construction on the ground with easily recognizable indications such as construction staking, construction fencing, and placement of physical barriers or other means acceptable to the City inspector and in conformance with the erosion and sediment control plan.
 - The contractor shall seed, mulch, or otherwise stabilize any disturbed area where the land disturbance activity has ceased for more than 14 days.
 - The contractor shall perform inspections of erosion and sediment control measures at the following minimum intervals:
 - During active construction phases - at least once per week
 - During periods of inactivity - at least once per 14 days
 - After each rainfall event of 1/8 inch or more - within 24 hours of the rain event
 - The contractor shall maintain an inspection log including the inspector's name, date of inspection, observations as to the effectiveness of the erosion and sediment control measures, actions necessary to correct deficiencies, when the deficiencies were corrected, and the signature of the person performing the inspection. The inspection log shall be available for review by the regulatory authority.
 - The contractor shall have the erosion and sediment control plan routinely updated to show all changes and amendments to the plan. A copy of the erosion and sediment control plan shall be kept on site and made available for review by the regulatory authority.
- Unless otherwise noted in the plans, all seeding must conform to Division II—Construction and Materials Specification—Section 2150 published by the Kansas City Metropolitan Chapter of the American Public Works Association dated May 21, 2008. Permanent seeding shall be installed after completion of final grading except when seeding will occur outside of the acceptable seeding season as specified in Section 2150. When temporary seeding is installed, permanent seeding shall be installed at the next seeding season. Temporary seeding shall not be used as a stabilization measure for a period exceeding 12 months. The Permit will not be closed until permanent seeding has been established to a minimum of 70% density over the entire disturbed area.
- The contractor shall maintain installed erosion and sediment control devices in a manner that preserves their effectiveness for preventing sediment from leaving the site or entering a sensitive area such as a natural stream corridor, areas of the site intended to be left undisturbed, a storm sewer, or an on-site drainage channel.
- The contractor is responsible for providing erosion and sediment control for the duration of a project. If the City determines that the BMPs in place do not provide adequate erosion and sediment control at any time during the project, the contractor shall install additional or alternate measures that provide effective control.
- Concrete wash or rinse water from concrete mixing equipment, tools and/or ready-mix trucks, tools, etc. may not be discharged into or be allowed to run directly into any existing water body or storm inlet. One or more locations for concrete wash out will be designated on site, such that discharges during concrete washout will be contained in a small area where waste concrete can solidify in place.
- Chemicals or materials capable of causing pollution may only be stored onsite in their original container. Materials stored outside must be in closed and sealed water-proof containers and located outside of drainage ways or areas subject to flooding. Locks and other means to prevent or reduce vandalism shall be used. Spills will be reported as required by law and immediate actions taken to contain them.
- Silt fences and erosion control BMPs which are shown along the back of curb must be installed within two weeks of curb backfill and prior to placement of base asphalt. Exact locations of these erosion control methods may be field adjusted to minimize conflicts with utility construction; however, anticipated disturbance by utility construction shall not delay installation.
- Interior Silt Fence as necessary during construction. Portions may be limited as vegetation is established and hardscape is installed. Entire length may be installed at the contractor's option to aid in stabilizing slopes.
- Private Erosion & Sediment Control inspections are required in accordance with NPDES schedule and requirements.



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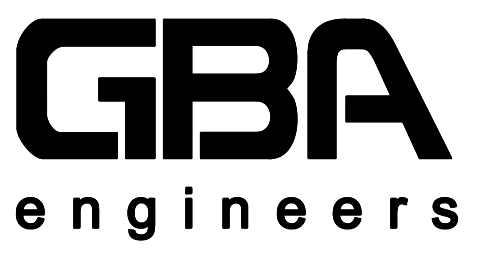
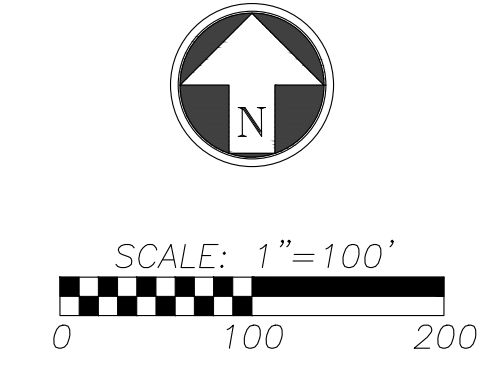
LEGEND



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 - Install perimeter controls and request the inspection of the pre-construction erosion and sediment control measures designated on the approved erosion and sediment control plan. Land disturbance work shall not proceed until there is a satisfactory inspection.
 - Identify the limits of construction on the ground with easily recognizable indications such as construction staking, construction fencing, and placement of physical barriers or other means acceptable to the City inspector and in conformance with the erosion and sediment control plan.
- The contractor shall comply with all requirements of the Missouri Water Pollution Control and NPDES Stormwater Runoff from Construction Sites General Permit, KC-APWA Specifications Section 2150, including but not limited to:
 - The contractor shall seed, mulch, or otherwise stabilize any disturbed area where the land disturbance activity has ceased for more than 14 days.
 - The contractor shall perform inspections of erosion and sediment control measures at the following minimum intervals:
 - During active construction phases - at least once per week
 - During periods of inactivity - at least once per 14 days
 - After each rainfall event of 1/2 inch or more - within 24 hours of the rain event
 - The contractor shall maintain an inspection log including the inspector's name, date of inspection, observations as to the effectiveness of the erosion and sediment control measures, actions necessary to correct deficiencies, when the deficiencies were corrected, and the signature of the person performing the inspection. The inspection log shall be available for review by the regulatory authority.
 - The contractor shall have the erosion and sediment control plan routinely updated to show all changes and amendments to the plan. A copy of the erosion and sediment control plan shall be kept on site and made available for review by the regulatory authority.
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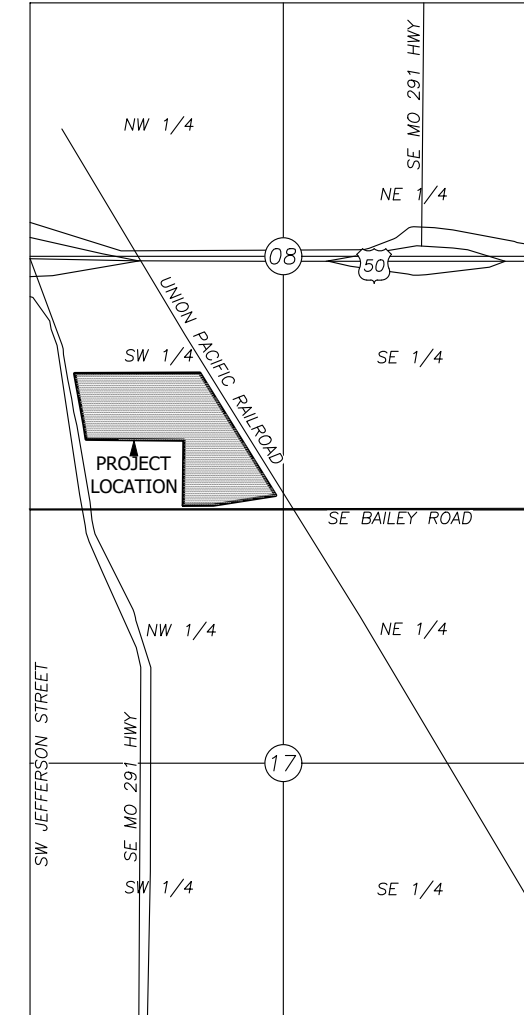
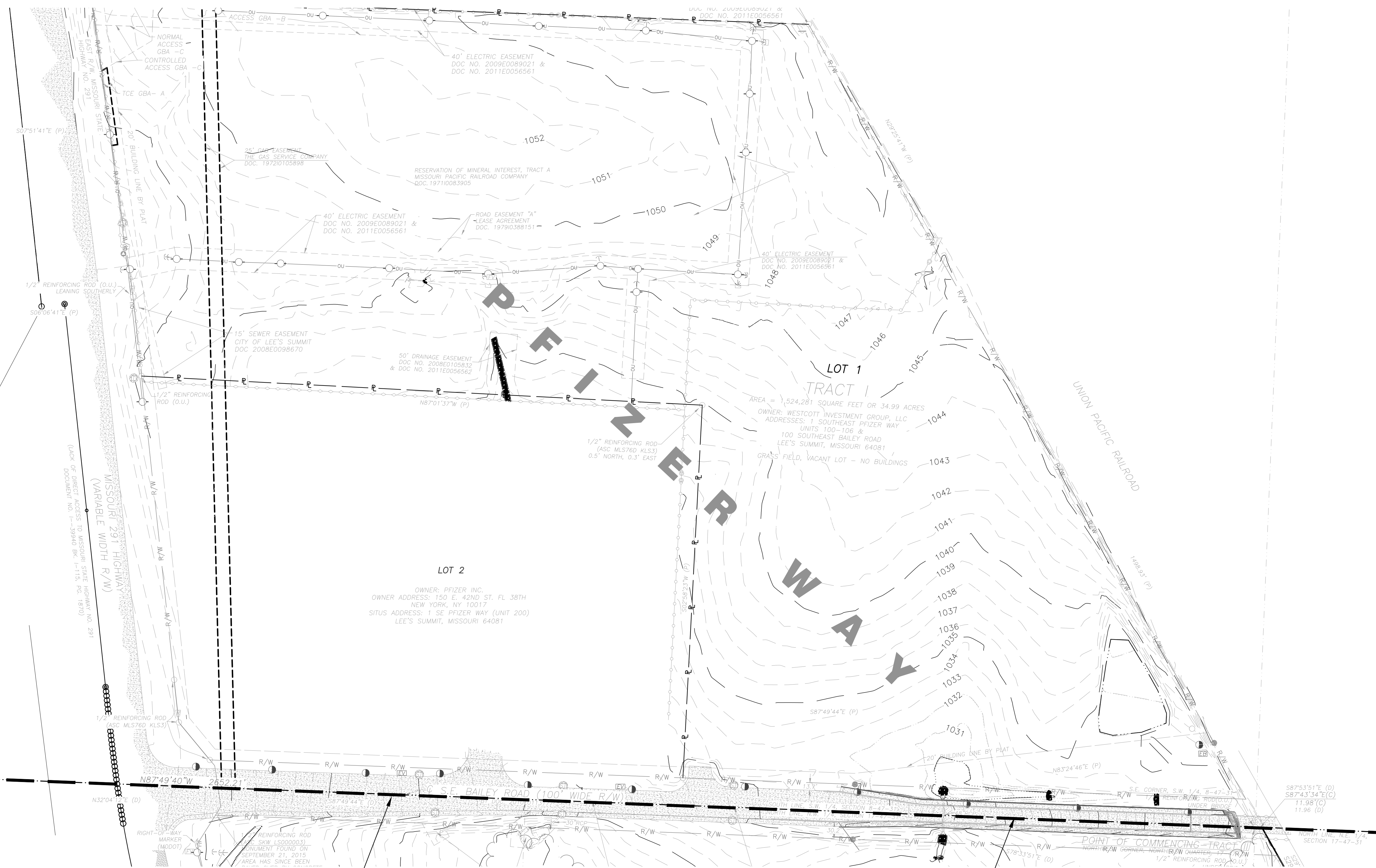
PROJECT NUMBER
13958.00
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EROSION CONTROL-DEVELOPED

SHEET NUMBER
C1.2

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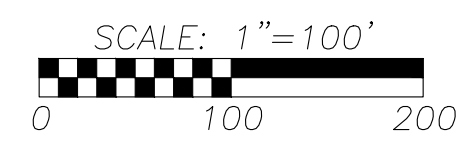
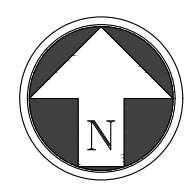


SECTION MAP
SECTIONS 8 & 17-T47N-R31W

NOTE:
THIS SHEET SHOWS
SURVEY INFORMATION AS
COLLECTED BY OTHERS.
GBA DOES NOT WARRANT
THE ACCURACY OF THIS
DATA.

LEGEND

○	Found Survey Monument	RCP	Reinforced Concrete Pipe
(o.u.)	Origin Unknown	—○—○—	Wood Fence
⊠	Found Survey Monument in Box	—○—○—	Chain Link Fence
⊠	Found Right-of-Way Marker	—○—○—	Iron or Metal Fence
—ou—	Overhead Utility Line/s	⊙	Gate Post
○	Utility Pole	⊙	Single Pole Sign
⊥	Guy Anchor	●	Concrete or Metal Bollard
⊙	Utility Pole w/Light	⊙	Center Line
⊙	Light Pole	R=	Radius
⊠	Electric Access Vault	L=	Arc Length
⊠	Electric Access Box (Mounted)	CB	Chord Bearing
⊠	Telephone Pedestal	Δ	Interior Angle (Delta)
⊠	Telephone Manhole	R/W	Right-of-Way
⊠	Underground Fiber Optic Line Marker	(M)	Monumented
⊠	Fiber Optic Vault	(D)	Deeded
⊠	Storm Sewer Manhole	(P)	Platted
		(C)	Calculated
		DOC.	Document Number
			Not To Scale
		⊙	Schedule B Note Identifier
		⊠	Encroachment Identifier



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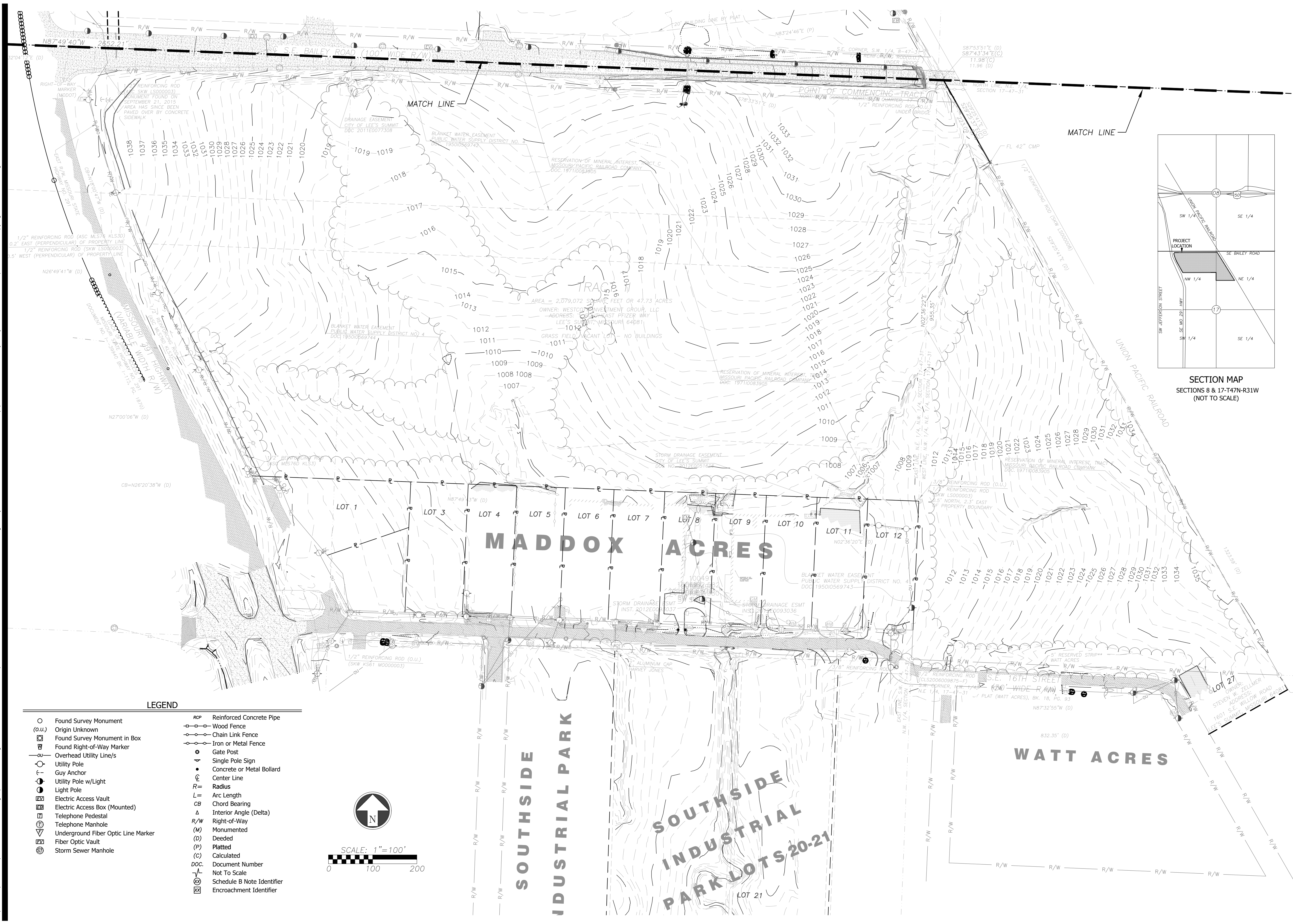
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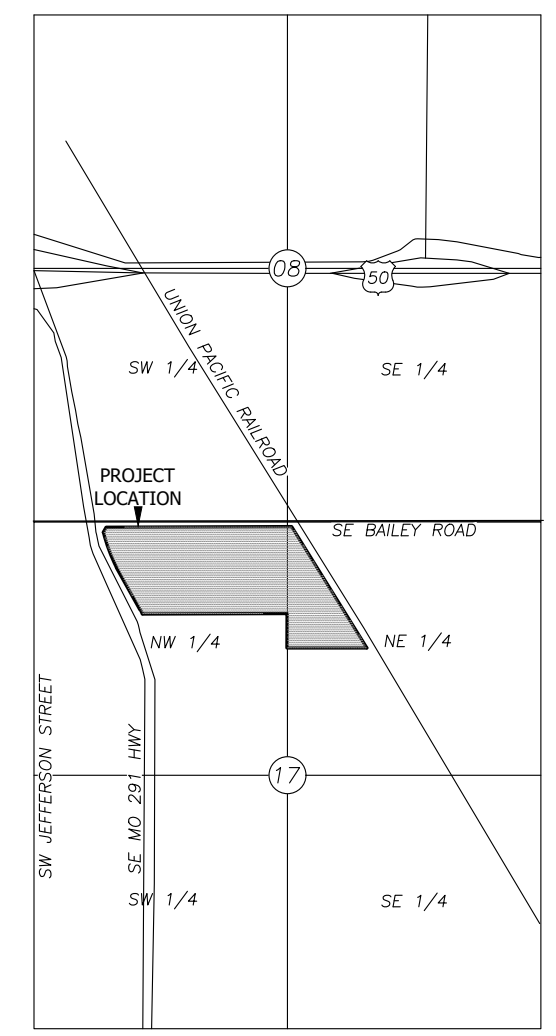
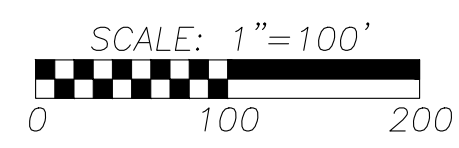
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Engineering CO# 000133
Architecture CO# 000212
Land Surveying CO# 000059



LEGEND

- | | | | |
|--------|-------------------------------------|------|----------------------------|
| ○ | Found Survey Monument | ○ | Reinforced Concrete Pipe |
| (o.u.) | Origin Unknown | — | Wood Fence |
| ⊠ | Found Survey Monument in Box | — | Chain Link Fence |
| ⊡ | Found Right-of-Way Marker | — | Iron or Metal Fence |
| — | Overhead Utility Line/s | ○ | Gate Post |
| ○ | Utility Pole | ○ | Single Pole Sign |
| — | Guy Anchor | ● | Concrete or Metal Bollard |
| ○ | Utility Pole w/Light | — | Center Line |
| ○ | Light Pole | R= | Radius |
| ⊠ | Electric Access Vault | L= | Arc Length |
| ⊡ | Electric Access Box (Mounted) | CB | Chord Bearing |
| ⊠ | Telephone Pedestal | Δ | Interior Angle (Delta) |
| ⊡ | Telephone Manhole | R/W | Right-of-Way |
| — | Underground Fiber Optic Line Marker | (M) | Monumented |
| ⊠ | Fiber Optic Vault | (D) | Deeded |
| ⊡ | Storm Sewer Manhole | (P) | Platted |
| | | (C) | Calculated |
| | | DOC. | Document Number |
| | | — | Not To Scale |
| | | — | Schedule B Note Identifier |
| | | ⊠ | Encroachment Identifier |



SECTION MAP
SECTIONS 8 & 17-T47N-R31W
(NOT TO SCALE)

PROPOSED FACILITY FOR:
THE GROVE AT LEE'S SUMMIT
MASS GRADING AND STORMWATER
MISSOURI HWY 291 & 16TH STREET
LEE'S SUMMIT, MISSOURI



Clint Loumaster
Professional Engineer
License No. PE-2011009651

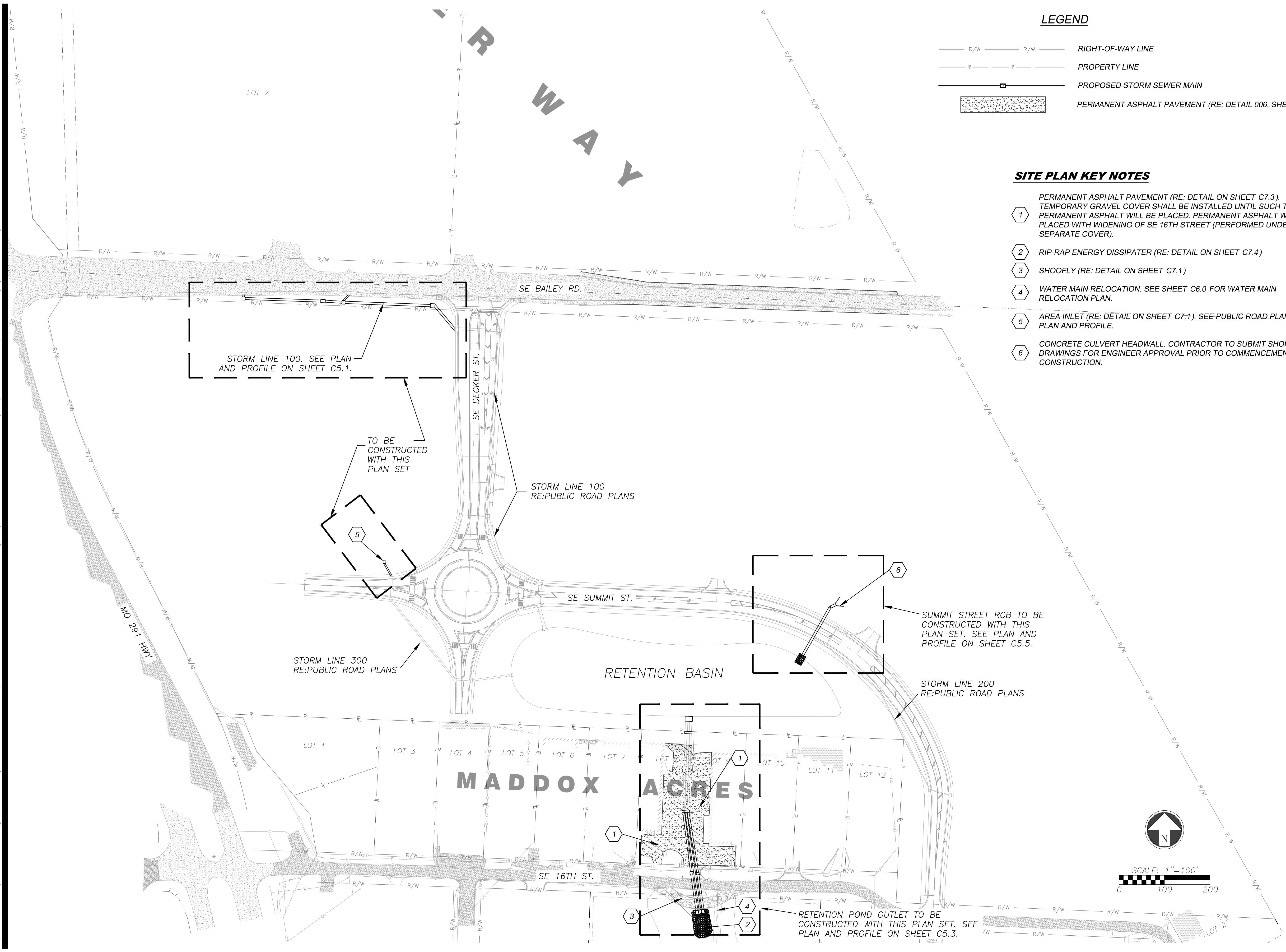
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SHEET TITLE
SURVEYED INFORMATION (2)

SHEET NUMBER
C2.2

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LEGEND

- R/W R/W RIGHT-OF-WAY LINE
- P P PROPERTY LINE
- PROPOSED STORM SEWER MAIN
- PERMANENT ASPHALT PAVEMENT (RE: DETAIL 006, SHEET C7.3)

SITE PLAN KEY NOTES

- 1 PERMANENT ASPHALT PAVEMENT (RE: DETAIL ON SHEET C7.3). TEMPORARY GRAVEL COVER SHALL BE INSTALLED UNTIL SUCH TIME AS PERMANENT ASPHALT WILL BE PLACED. PERMANENT ASPHALT WILL BE PLACED WITH WIDENING OF SE 16TH STREET (PERFORMED UNDER SEPARATE COVER).
- 2 RIP-RAP ENERGY DISSIPATER (RE: DETAIL ON SHEET C7.4)
- 3 SHOOFLY (RE: DETAIL ON SHEET C7.1)
- 4 WATER MAIN RELOCATION. SEE SHEET C6.0 FOR WATER MAIN RELOCATION PLAN.
- 5 AREA INLET (RE: DETAIL ON SHEET C7.1). SEE PUBLIC ROAD PLANS FOR PLAN AND PROFILE.
- 6 CONCRETE CULVERT HEADWALL. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR ENGINEER APPROVAL PRIOR TO COMMENCEMENT OF CONSTRUCTION.

STORM LINE 100. SEE PLAN AND PROFILE ON SHEET C5.1.

TO BE CONSTRUCTED WITH THIS PLAN SET

STORM LINE 100 RE:PUBLIC ROAD PLANS

STORM LINE 300 RE:PUBLIC ROAD PLANS

SUMMIT STREET RCB TO BE CONSTRUCTED WITH THIS PLAN SET. SEE PLAN AND PROFILE ON SHEET C5.5.

STORM LINE 200 RE:PUBLIC ROAD PLANS

RETENTION POND OUTLET TO BE CONSTRUCTED WITH THIS PLAN SET. SEE PLAN AND PROFILE ON SHEET C5.3.

PROPOSED FACILITY FOR:

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 MISSOURI HWY 291 & 16TH STREET
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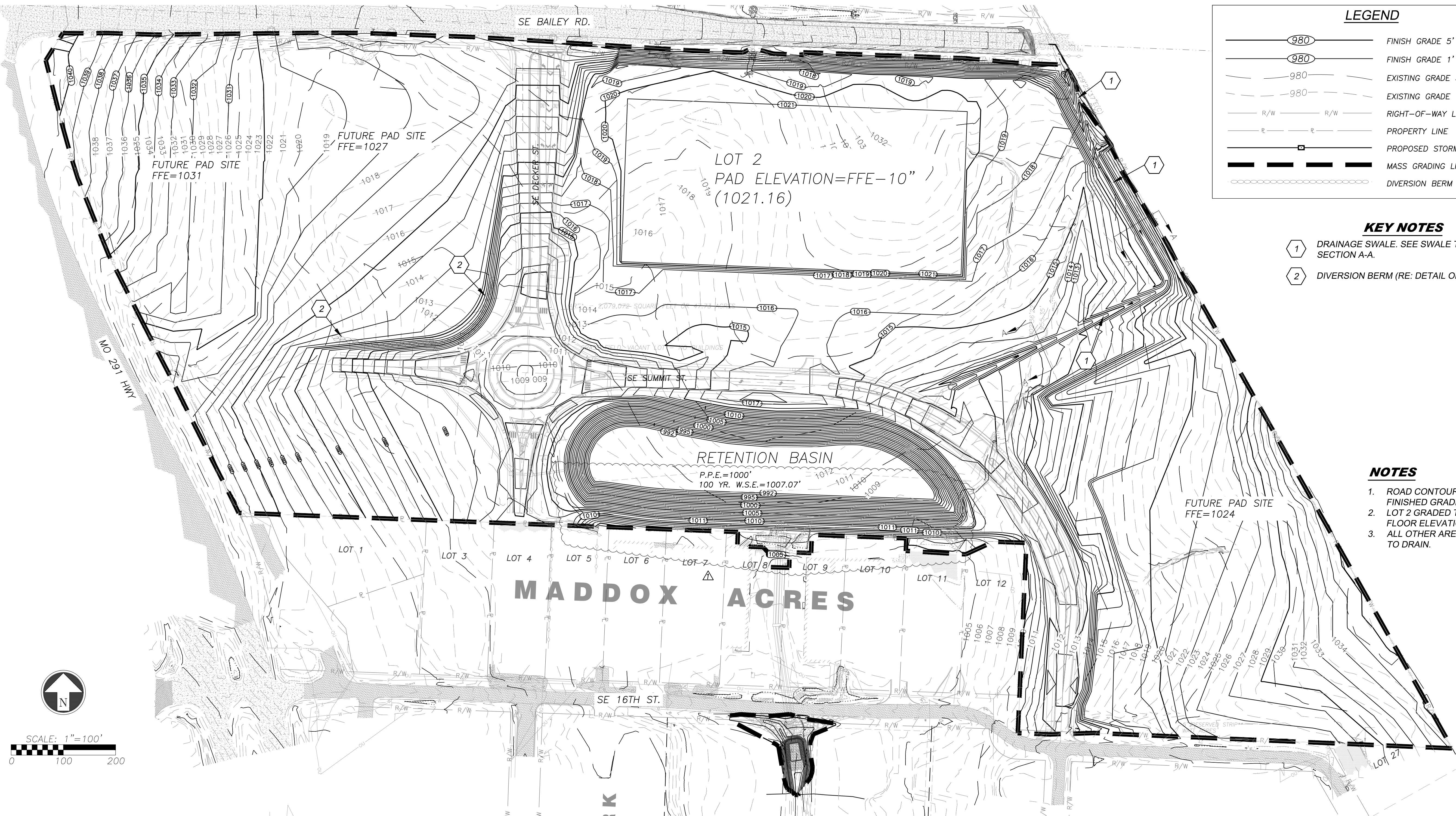
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 13958.00
 DATE
 7/11/18

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 SITE PLAN

SHEET NUMBER
C3.0

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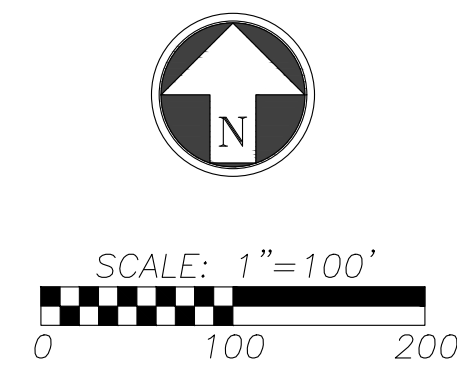
LEGEND

	FINISH GRADE 5' CONTOURS
	FINISH GRADE 1' CONTOURS
	EXISTING GRADE 5' CONTOURS
	EXISTING GRADE 1' CONTOURS
	RIGHT-OF-WAY LINE
	PROPERTY LINE
	PROPOSED STORM SEWER MAIN
	MASS GRADING LIMITS
	DIVERSION BERM

- KEY NOTES**
- ① DRAINAGE SWALE. SEE SWALE TYPICAL SECTION A-A.
 - ② DIVERSION BERM (RE: DETAIL ON SHEET C7.3)

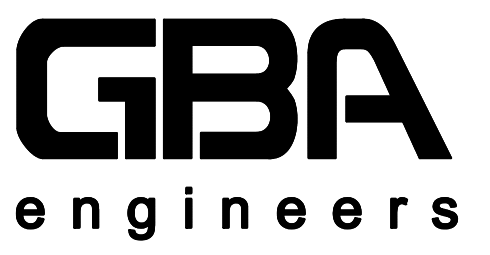
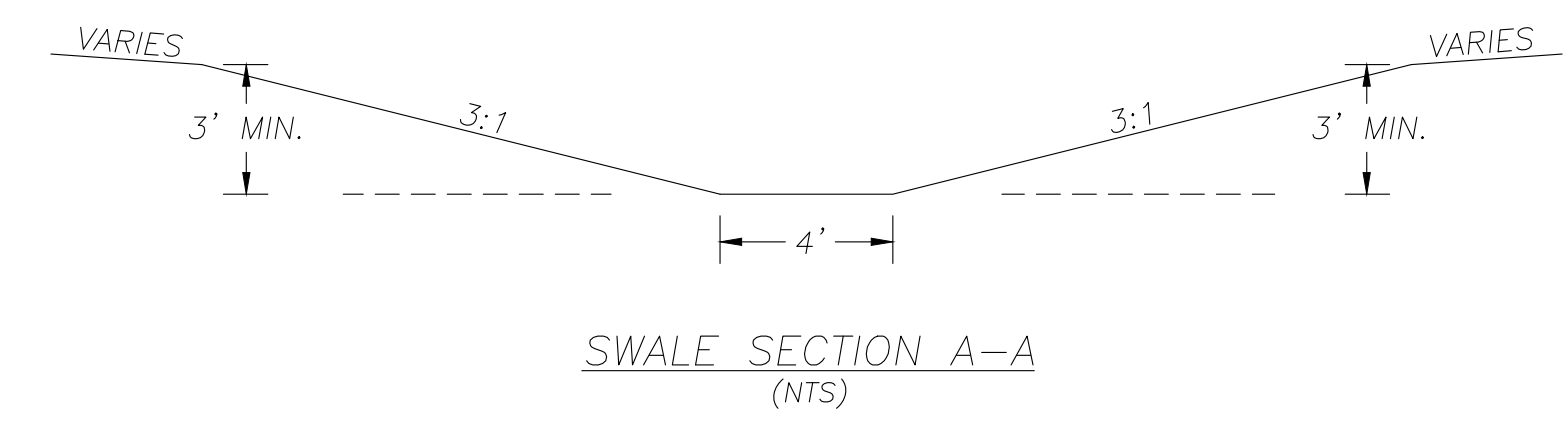
NOTES

1. ROAD CONTOURS SHOWN AT FINISHED GRADE MINUS 12".
2. LOT 2 GRADED TO FINISH FLOOR ELEVATION MINUS 10".
3. ALL OTHER AREAS GRADED TO DRAIN.



GRADING NOTES

1. CONTRACTOR SHALL OBTAIN A COPY OF THE PRELIMINARY SUBSURFACE EXPLORATION - PROPOSED INDUSTRIAL DEVELOPMENT - THE GROVE - LEE'S SUMMIT, MISSOURI, DATED MARCH 10, 2017 PREPARED BY GEOTECHNOLOGY INC. AND SATISFY HIMSELF AS TO THE EXISTING CONDITIONS AND RECOMMENDATIONS CONTAINED IN THE REPORT.
2. AS DISCUSSED IN THE GEOTECHNICAL REPORT, OVER EXCAVATION OF EXISTING UNSUITABLE SOILS WILL BE REQUIRED UNDER BUILDING AND PAVEMENT AREAS. CONTRACTOR SHALL PERFORM OVER EXCAVATION OF UNSUITABLE SOILS AS A PART OF THIS WORK.
3. ALL MATERIAL UNDER PAVEMENT SURFACES AND BUILDING SLABS SHALL BE REMEDIATED IN ACCORDANCE WITH THE GEOTECHNICAL REPORT.
4. ALL TOPSOIL, VEGETATION, ROOT STRUCTURES, AND DELETERIOUS MATERIALS SHALL BE STRIPPED FROM THE GROUND SURFACE PRIOR TO THE PLACEMENT OF EMBANKMENTS.
5. ALL DISTURBED AREAS THAT ARE NOT TO BE PAVED (GREEN SPACES) SHALL BE FINISH GRADED WITH A MINIMUM OF SIX INCHES OF TOPSOIL.
6. ALL EXCAVATION AND EMBANKMENTS SHALL COMPLY WITH THE RECOMMENDATIONS PROVIDED BY THE GEOTECHNICAL ENGINEER.
7. PRIOR TO PLACING ANY CONCRETE OR ASPHALT PAVEMENT THE CONTRACTOR SHALL PERFORM A PROOF ROLL OF THE PAVEMENT SUB-GRADE WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK. THE PROOF ROLL SHALL BE CONDUCTED IN THE PRESENCE OF THE ENGINEER AND THE ON-SITE GEOTECHNICAL REPRESENTATIVE. AREAS THAT DISPLAY RUTTING OR PUMPING THAT ARE UNSATISFACTORY TO THE ENGINEER SHALL BE RE-WORKED AND A FOLLOW-UP PROOF ROLL SHALL BE CONDUCTED PRIOR TO ACCEPTANCE OF THE SUB-GRADE FOR PAVING. THE CONTRACTOR MAY, AT ITS OWN EXPENSE, STABILIZE THE SUB-GRADE USING CLASS C FLY ASH OR QUICKLIME.
8. FINISHED GRADES SHALL NOT BE STEEPER THAN 3:1.
9. ALL GRADING WORK SHALL BE CONSIDERED UNCLASSIFIED. NO ADDITIONAL PAYMENTS SHALL BE MADE FOR ROCK EXCAVATION. CONTRACTOR SHALL SATISFY HIMSELF AS TO ANY ROCK EXCAVATION REQUIRED TO ACCOMPLISH THE IMPROVEMENTS SHOWN HEREON.



9801 Renner Boulevard
Lenexa, Kansas 66219
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PROPOSED FACILITY FOR:
THE GROVE AT LEE'S SUMMIT
MASS GRADING AND STORMWATER
MISSOURI HWY 291 & 16TH STREET
LEE'S SUMMIT, MISSOURI



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION
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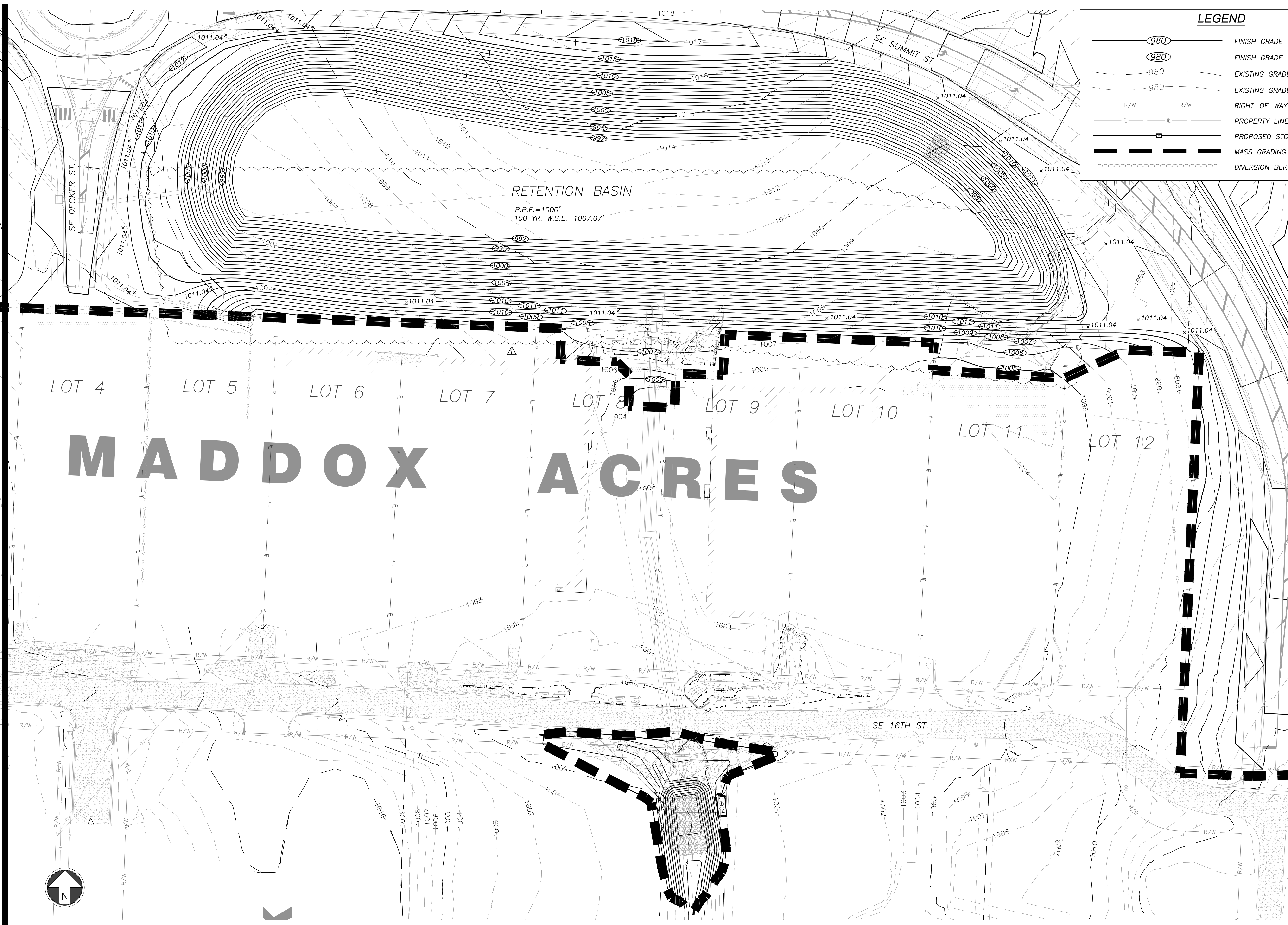
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DATE
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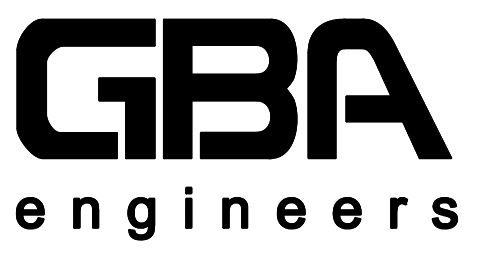
SHEET TITLE
MASS GRADING PLAN

SHEET NUMBER
C4.0

G:\13958\Civil\3D\Production Drawings\Mass Grading and Stormwater Plans\021730-FDPIA-MSSGRAD-SHITS-GRAD.dwg Layout: C4.1 RETENTION BASIN GRADING PLAN -- Wednesday July 11, 2018, 3:20pm -- Copyright 2018, George Butler Associates, Inc.



LEGEND	
	FINISH GRADE 5' CONTOURS
	FINISH GRADE 1' CONTOURS
	EXISTING GRADE 5' CONTOURS
	EXISTING GRADE 1' CONTOURS
	R/W R/W RIGHT-OF-WAY LINE
	PROPERTY LINE
	PROPOSED STORM SEWER MAIN
	MASS GRADING LIMITS
	DIVERSION BERM



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PROPOSED FACILITY FOR:
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 MASS GRADING AND STORMWATER
 MISSOURI HWY 291 & 16TH STREET
 LEE'S SUMMIT, MISSOURI



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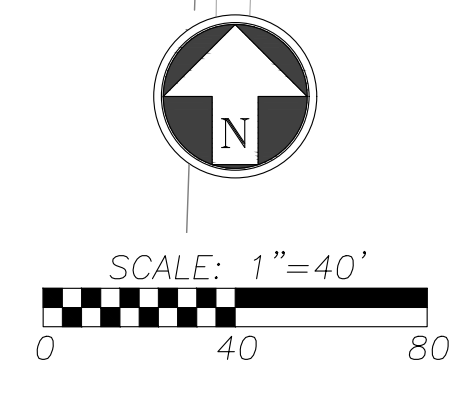
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RETENTION BASIN GRADING PLAN

SHEET NUMBER
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 Architecture CO# 000212
 Land Surveying CO# 000059



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LEGEND

- 980
- 980
- 980
- R/W
- R/W
- R/W
- R/W
- R/W
- R/W

GBA
engineers

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PROPOSED FACILITY FOR:

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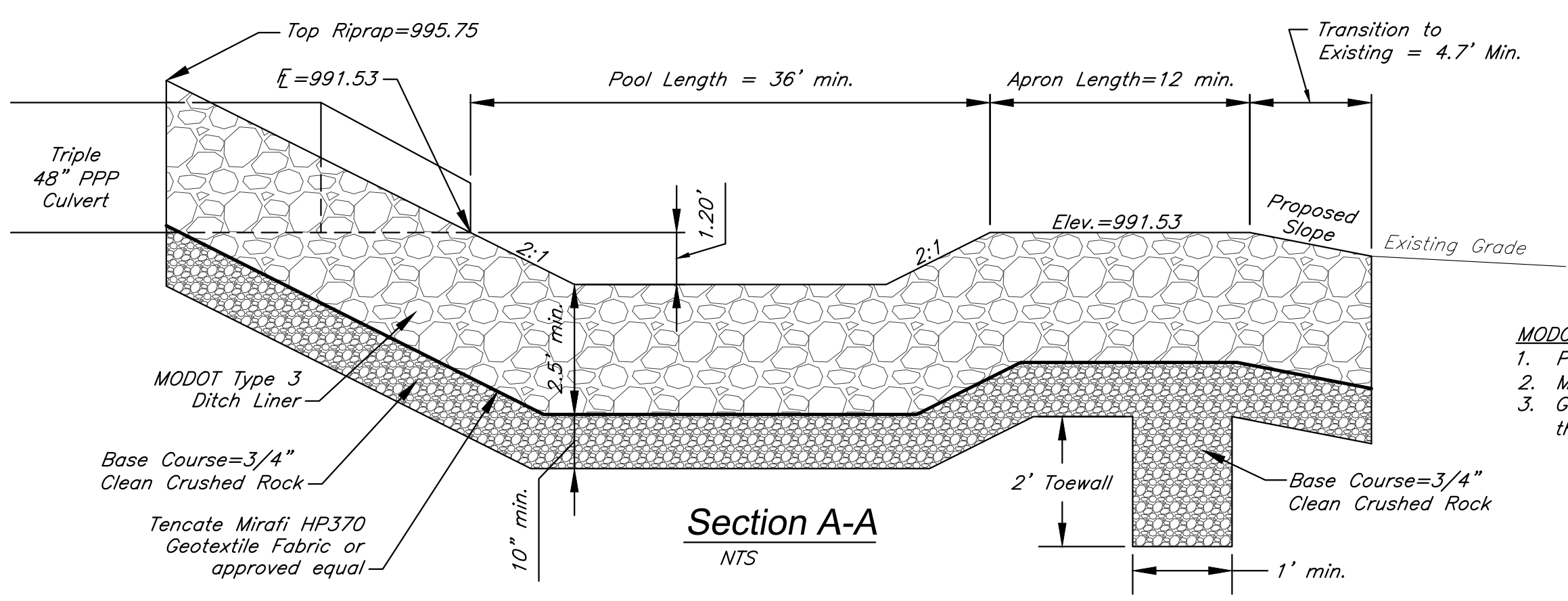
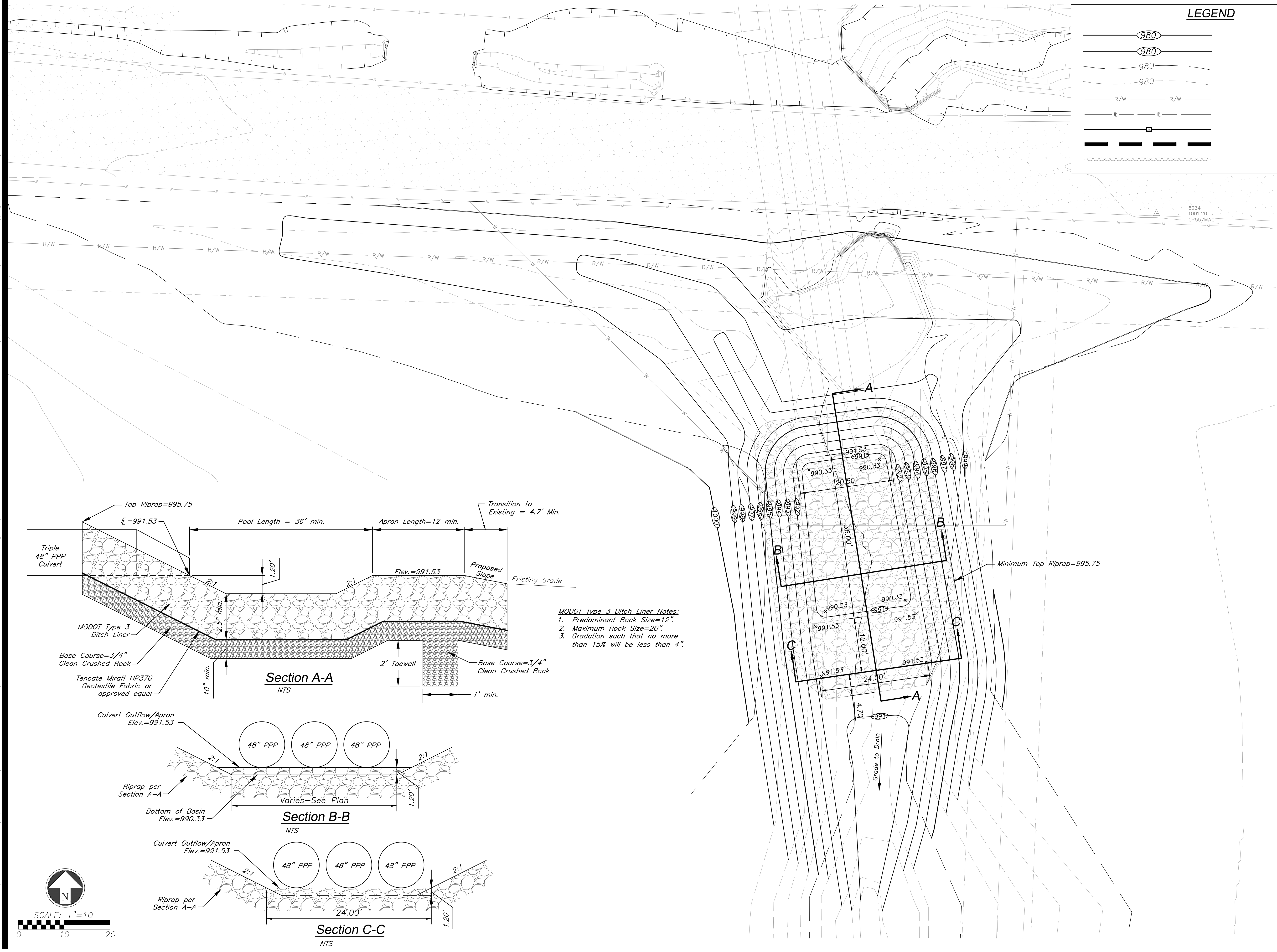
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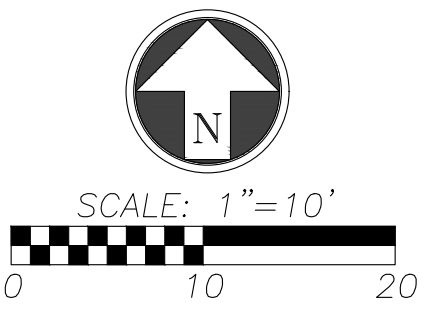
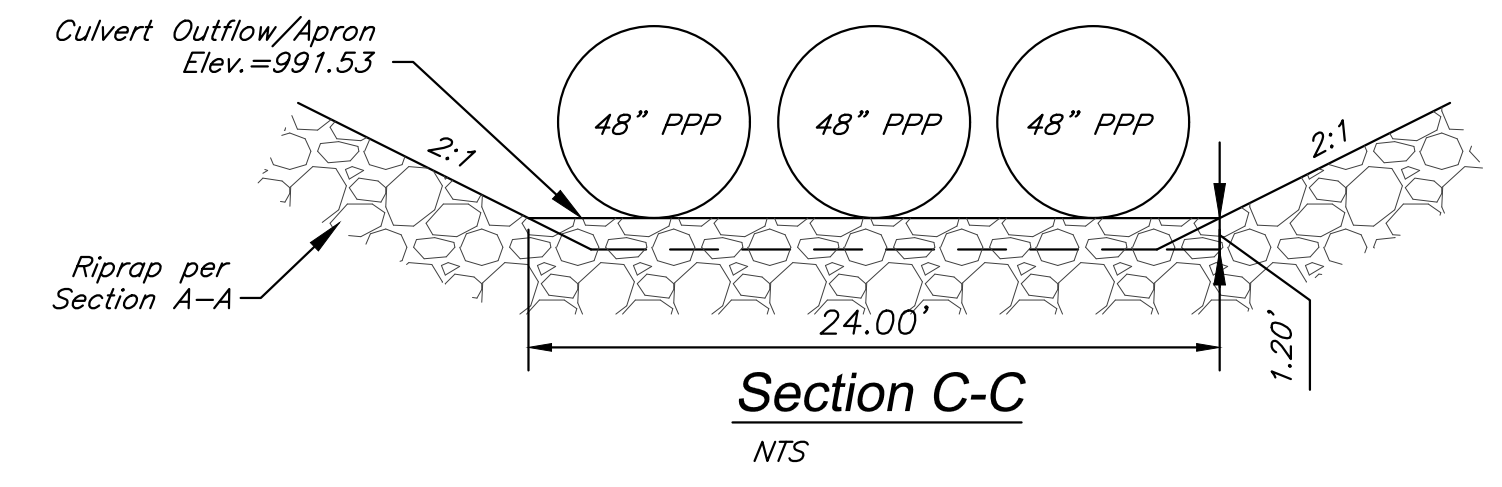
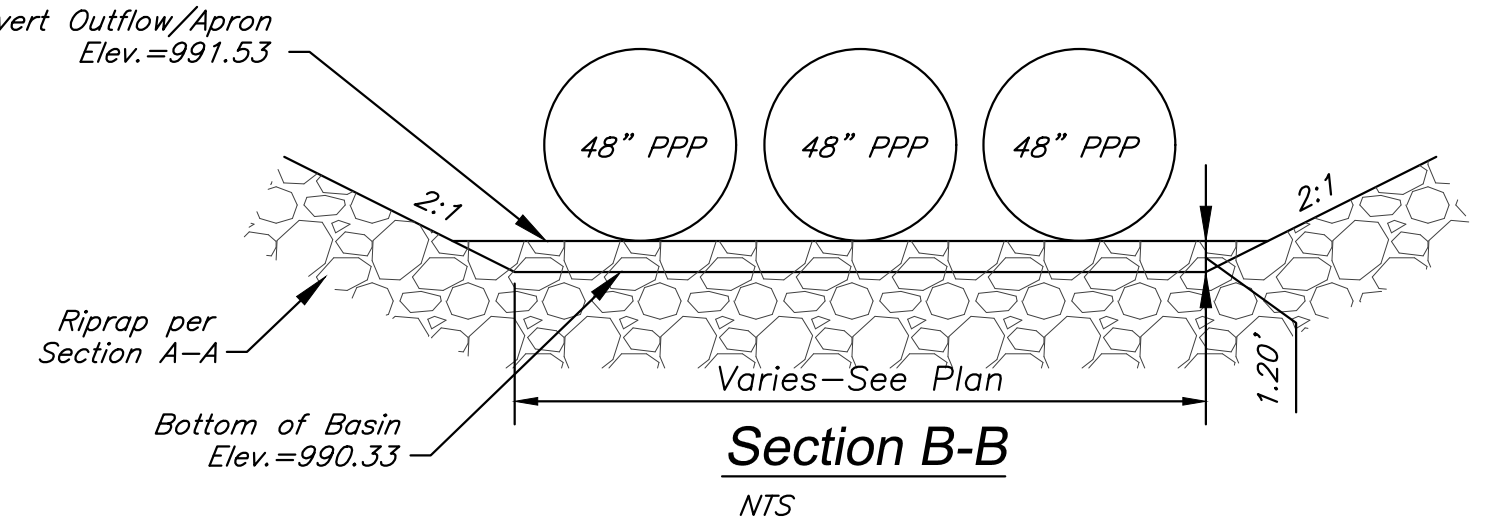
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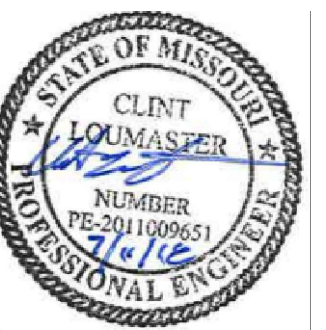
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MODOT Type 3 Ditch Liner Notes:
1. Predominant Rock Size=12".
2. Maximum Rock Size=20".
3. Gradation such that no more than 15% will be less than 4".





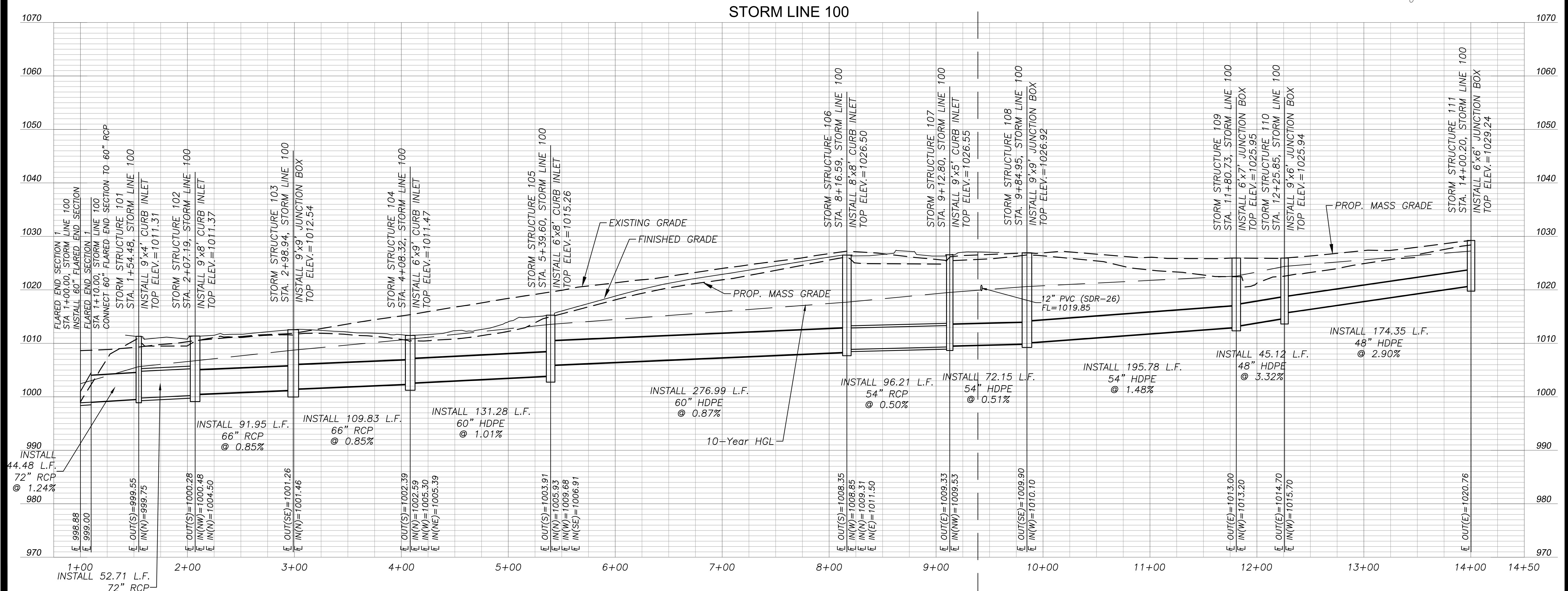
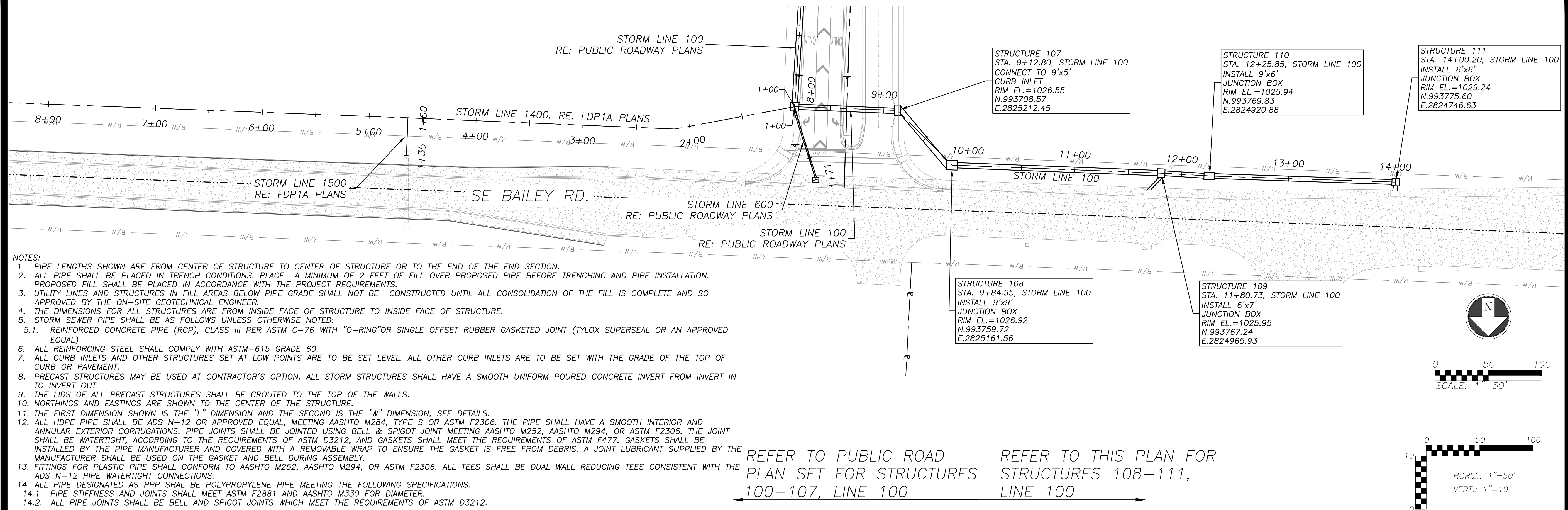
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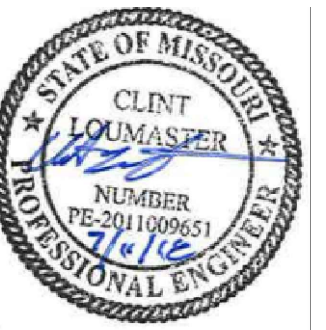
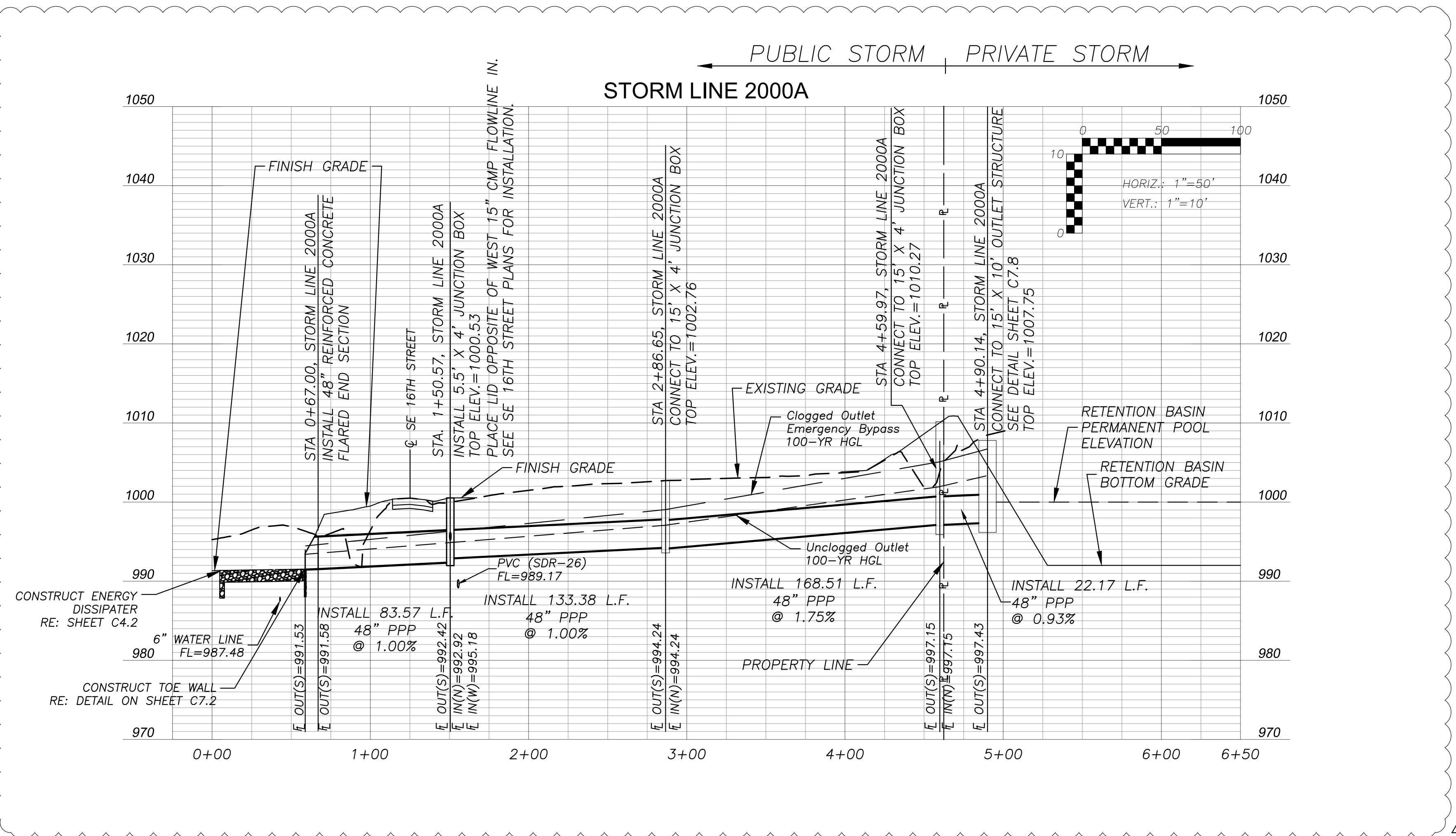
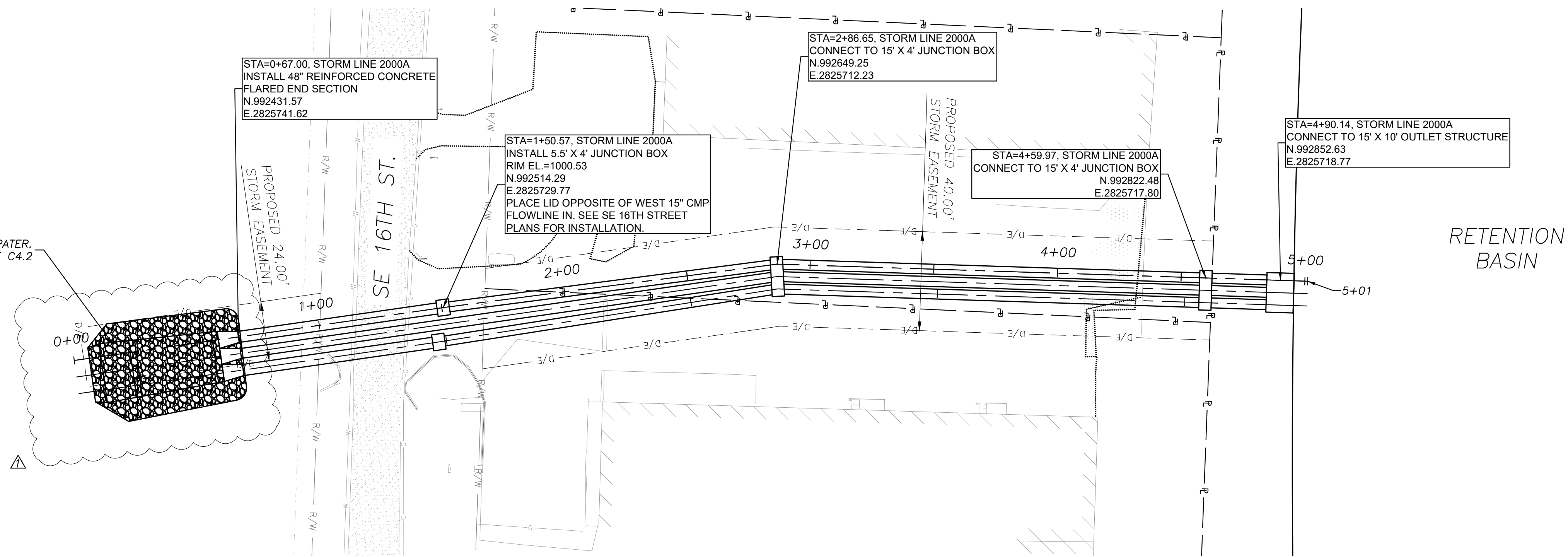
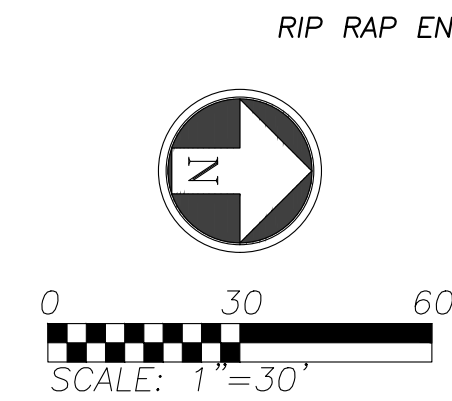
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STORM PLAN AND PROFILE (1)

SHEET NUMBER
C5.1



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- NOTES:
- PIPE LENGTHS SHOWN ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE OR TO THE END OF THE END SECTION. ALL PIPES SHALL BE FIELD STAKED TO THE INSIDE WALL FACE OF THE STRUCTURE.
 - ALL PIPE SHALL BE PLACED IN TRENCH CONDITIONS. PLACE A MINIMUM OF 2 FEET OF FILL OVER PROPOSED PIPE BEFORE TRENCHING AND PIPE INSTALLATION. PROPOSED FILL SHALL BE PLACED IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.
 - UTILITY LINES AND STRUCTURES IN FILL AREAS BELOW PIPE GRADE SHALL NOT BE CONSTRUCTED UNTIL ALL CONSOLIDATION OF THE FILL IS COMPLETE AND SO APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER.
 - THE DIMENSIONS FOR ALL STRUCTURES ARE FROM INSIDE FACE OF STRUCTURE TO INSIDE FACE OF STRUCTURE.
 - STORM SEWER PIPE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:
 - REINFORCED CONCRETE PIPE (RCP), CLASS III PER ASTM C-76 WITH "O-RING" OR SINGLE OFFSET RUBBER GASKETED JOINT (TYLOX SUPERSEAL OR AN APPROVED EQUAL)
 - ALL REINFORCING STEEL SHALL COMPLY WITH ASTM-615 GRADE 60.
 - ALL CURB INLETS AND OTHER STRUCTURES SET AT LOW POINTS ARE TO BE SET LEVEL. ALL OTHER CURB INLETS ARE TO BE SET WITH THE GRADE OF THE TOP OF CURB OR PAVEMENT.
 - PRECAST STRUCTURES MAY BE USED AT CONTRACTOR'S OPTION. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED CONCRETE INVERT FROM INVERT IN TO INVERT OUT.
 - THE LIDS OF ALL PRECAST STRUCTURES SHALL BE GROUTED TO THE TOP OF THE WALLS.
 - NORTHINGS AND EASTINGS ARE SHOWN TO THE CENTER OF THE STRUCTURE.
 - THE FIRST DIMENSION SHOWN IS THE "L" DIMENSION AND THE SECOND IS THE "W" DIMENSION, SEE DETAILS.
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 - FITTINGS FOR PLASTIC PIPE SHALL CONFORM TO AASHTO M252, AASHTO M294, OR ASTM F2306. ALL TEES SHALL BE DUAL WALL REDUCING TEES CONSISTENT WITH THE ADS N-12 PIPE WATERTIGHT CONNECTIONS.
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 - ALL PIPE JOINTS SHALL BE BELL AND SPIGOT JOINTS WHICH MEET THE REQUIREMENTS OF ASTM D3212.



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Professional Engineer
License No. PE-2011009651

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STORM PLAN AND PROFILE (2)

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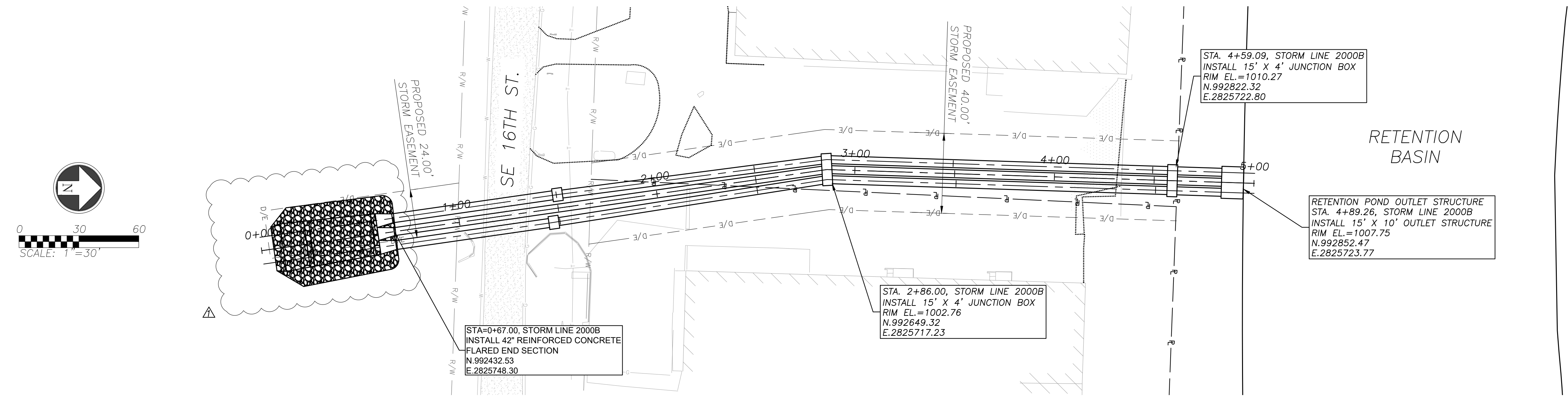
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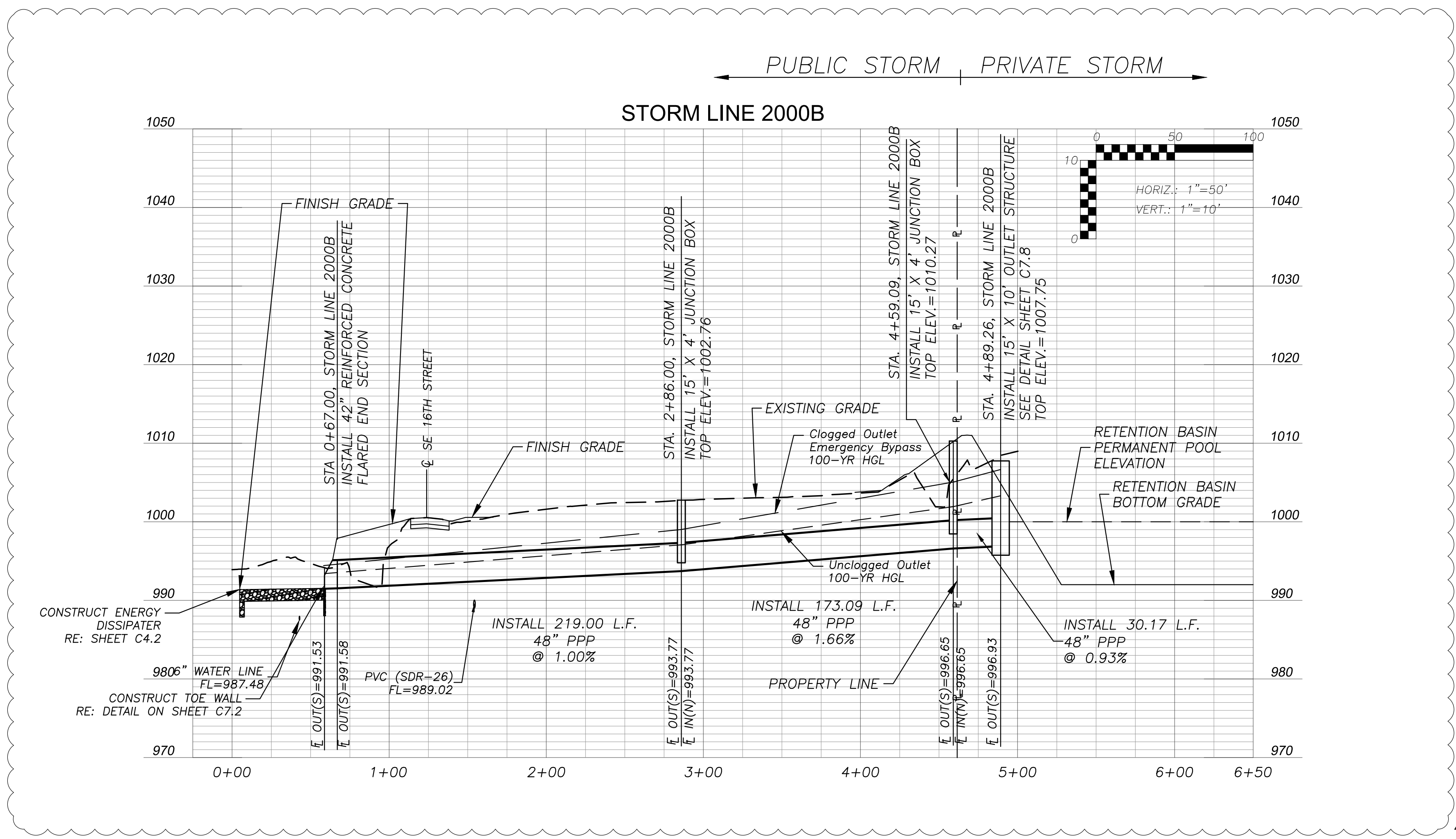
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STORM PLAN AND PROFILE (3)

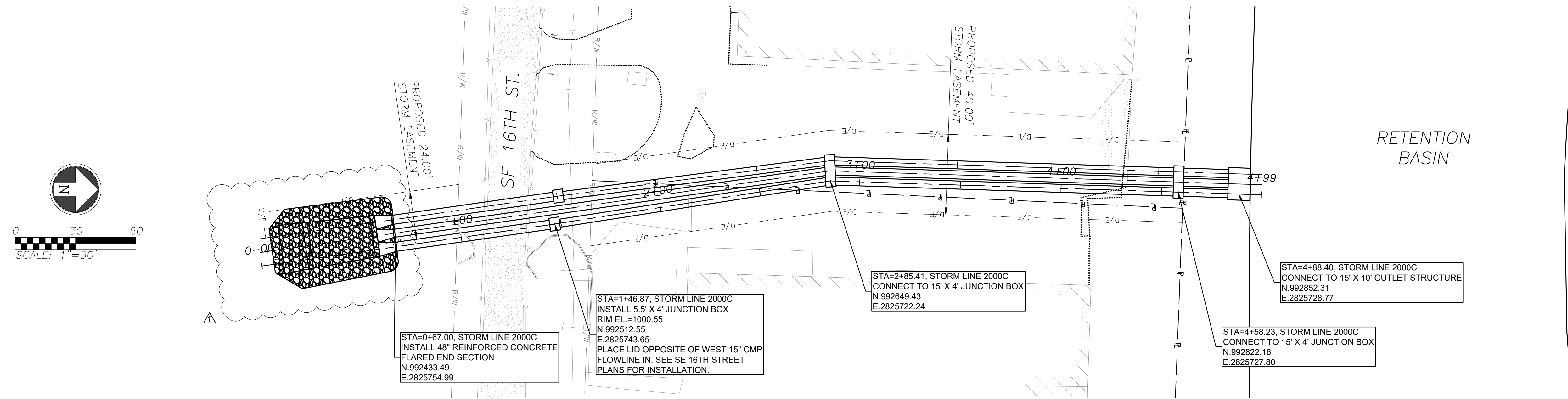
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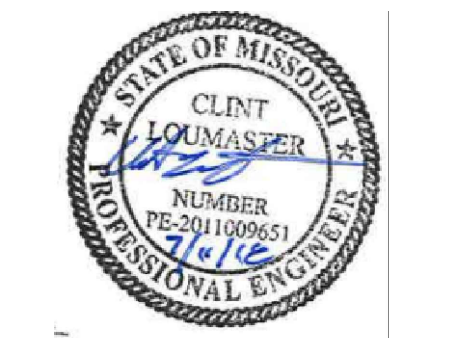
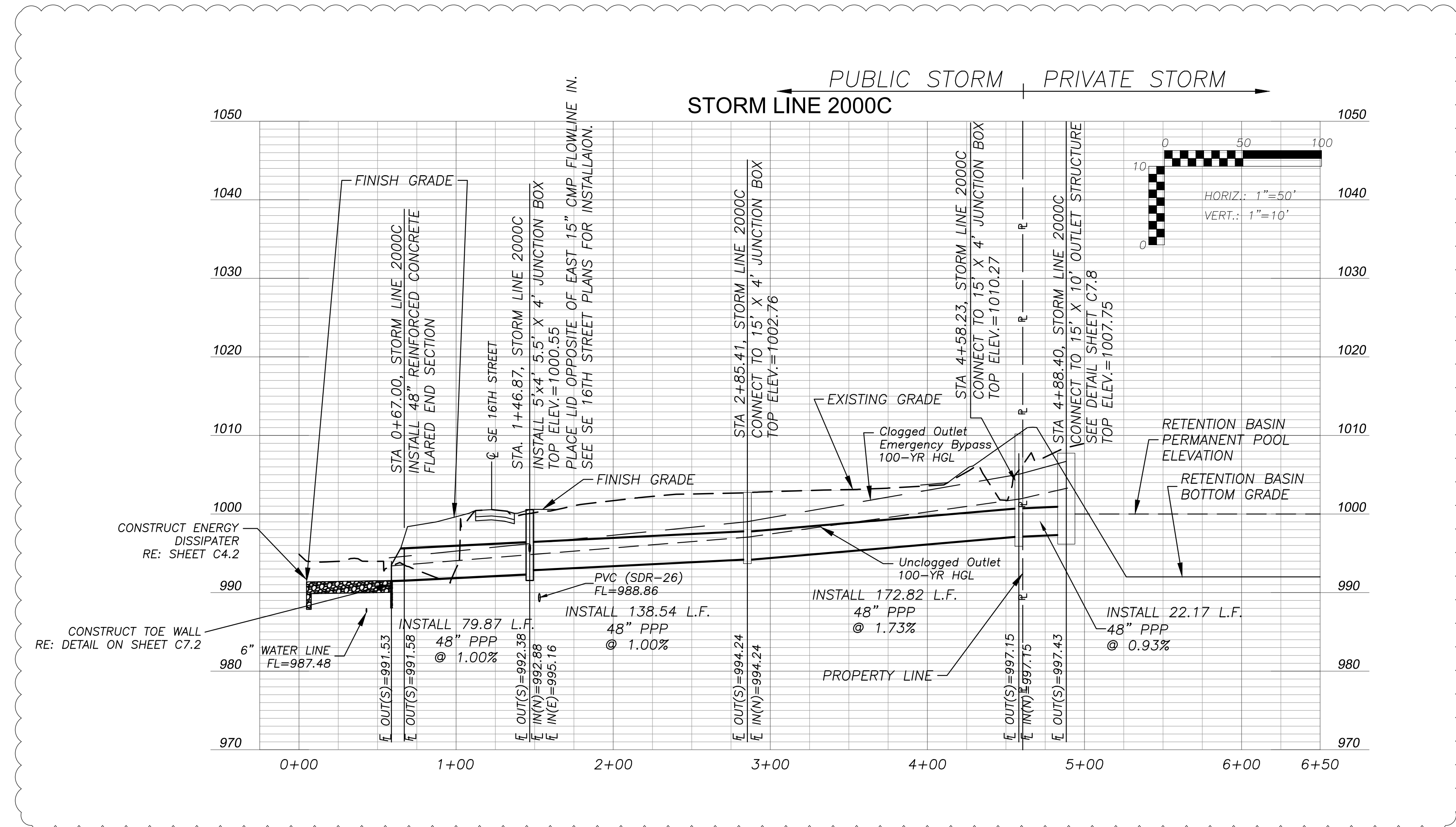
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 - THE DIMENSIONS FOR ALL STRUCTURES ARE FROM INSIDE FACE OF STRUCTURE TO INSIDE FACE OF STRUCTURE.
 - STORM SEWER PIPE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:
 - REINFORCED CONCRETE PIPE (RCP), CLASS III PER ASTM C-76 WITH "O-RING" OR SINGLE OFFSET RUBBER GASKETED JOINT (TYLOX SUPERSEAL OR AN APPROVED EQUAL)
 - ALL REINFORCING STEEL SHALL COMPLY WITH ASTM-615 GRADE 60.
 - ALL CURB INLETS AND OTHER STRUCTURES SET AT LOW POINTS ARE TO BE SET LEVEL. ALL OTHER CURB INLETS ARE TO BE SET WITH THE GRADE OF THE TOP OF CURB OR PAVEMENT.
 - PRECAST STRUCTURES MAY BE USED AT CONTRACTOR'S OPTION. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED CONCRETE INVERT FROM INVERT IN TO INVERT OUT.
 - THE LIDS OF ALL PRECAST STRUCTURES SHALL BE GROUTED TO THE TOP OF THE WALLS.
 - NORTHINGS AND EASTINGS ARE SHOWN TO THE CENTER OF THE STRUCTURE.
 - THE FIRST DIMENSION SHOWN IS THE "L" DIMENSION AND THE SECOND IS THE "W" DIMENSION. SEE DETAILS.
 - ALL HDPE PIPE SHALL BE ADS N-12 OR APPROVED EQUAL, MEETING AASHTO M284, TYPE S OR ASTM F2306. THE PIPE SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. PIPE JOINTS SHALL BE JOINTED USING BELL & SPIGOT JOINT MEETING AASHTO M252, AASHTO M294, OR ASTM F2306. THE JOINT SHALL BE WATER TIGHT, ACCORDING TO THE REQUIREMENTS OF ASTM D3212, AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. GASKETS SHALL BE INSTALLED BY THE PIPE MANUFACTURER AND COVERED WITH A REMOVABLE WRAP TO ENSURE THE GASKET IS FREE FROM DEBRIS. A JOINT LUBRICANT SUPPLIED BY THE MANUFACTURER SHALL BE USED ON THE GASKET AND BELL DURING ASSEMBLY.
 - FITTINGS FOR PLASTIC PIPE SHALL CONFORM TO AASHTO M252, AASHTO M294, OR ASTM F2306. ALL TEES SHALL BE DUAL WALL REDUCING TEES CONSISTENT WITH THE ADS N-12 PIPE WATER TIGHT CONNECTIONS.
 - ALL PIPE DESIGNATED AS PPP SHALL BE POLYPROPYLENE PIPE MEETING THE FOLLOWING SPECIFICATIONS:
 - PIPE STIFFNESS AND JOINTS SHALL MEET ASTM F2881 AND AASHTO M330 FOR DIAMETER.
 - ALL PIPE JOINTS SHALL BE BELL AND SPIGOT JOINTS WHICH MEET THE REQUIREMENTS OF ASTM D3212.



Clint Loumaster
Professional Engineer
License No. PE-2011009651

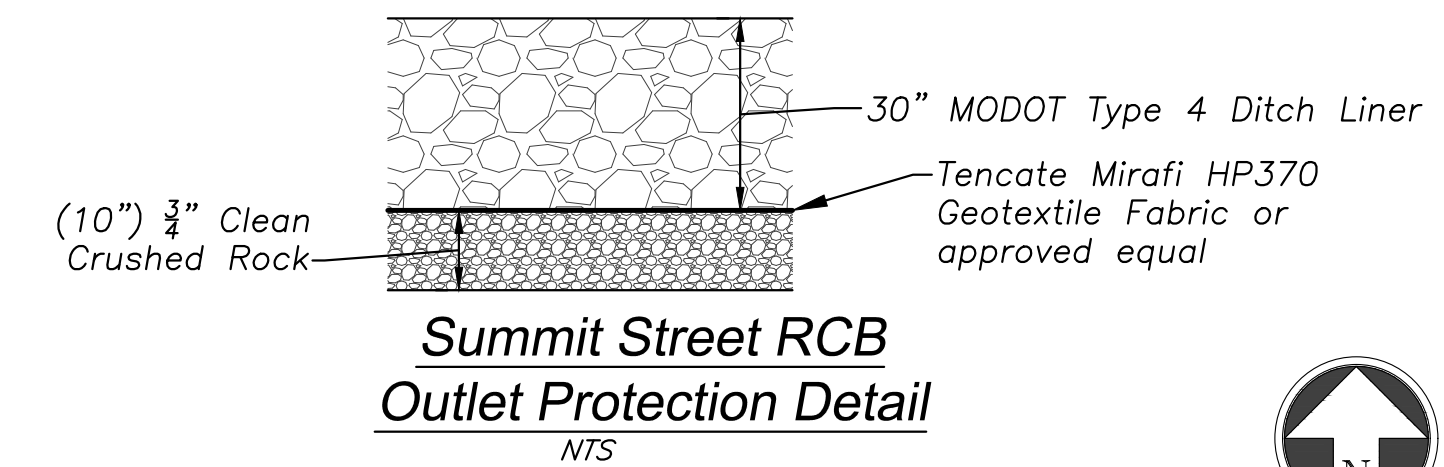
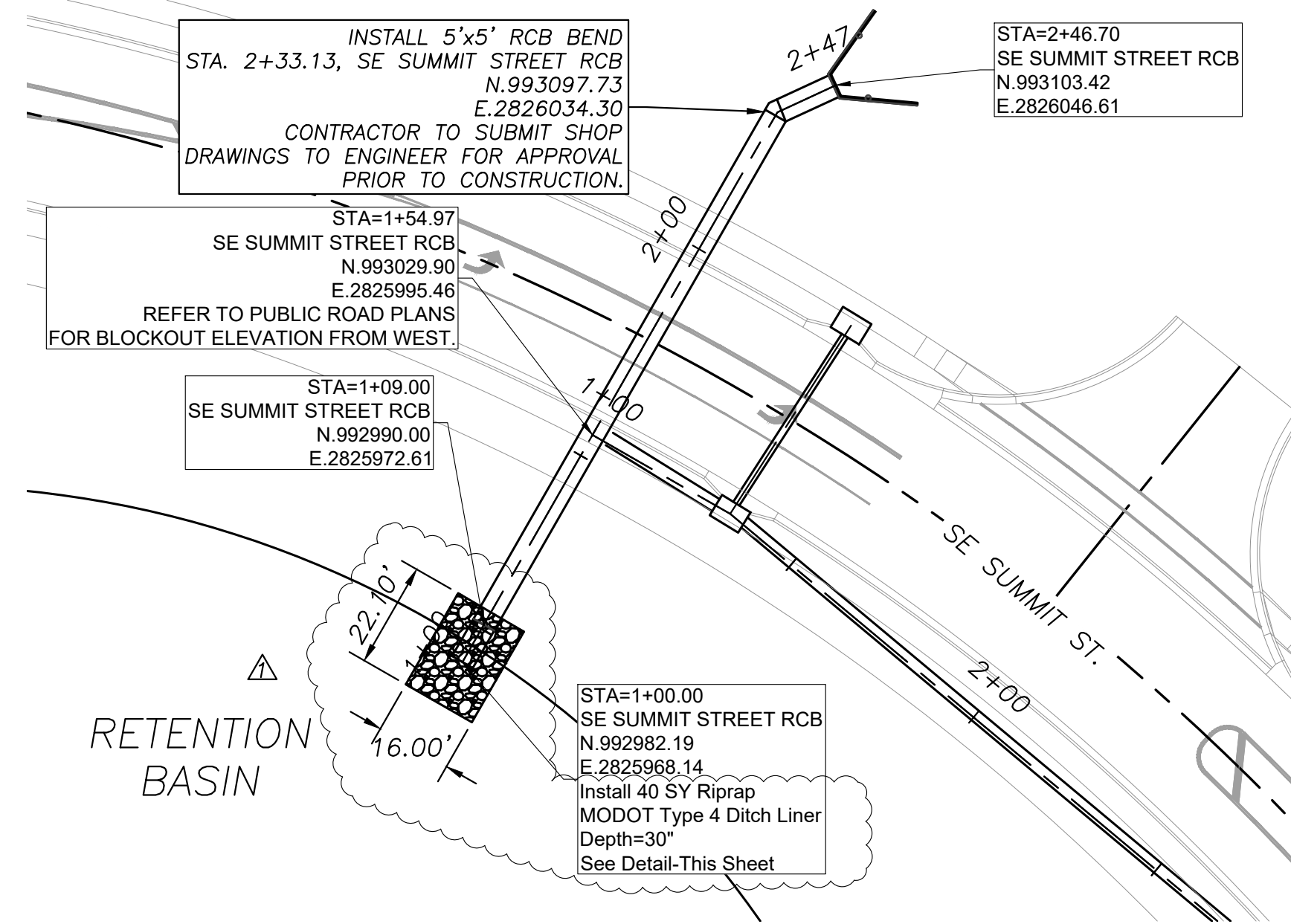
REVISION
City Comments 6/14/18

PROJECT NUMBER
13958.00
DATE
7/11/18
DESIGNED
DRAWN
REVIEWED
SHEET TITLE
STORM PLAN AND PROFILE (4)

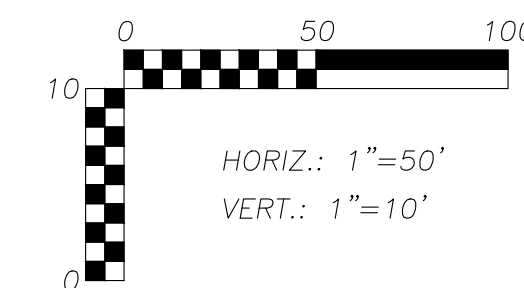
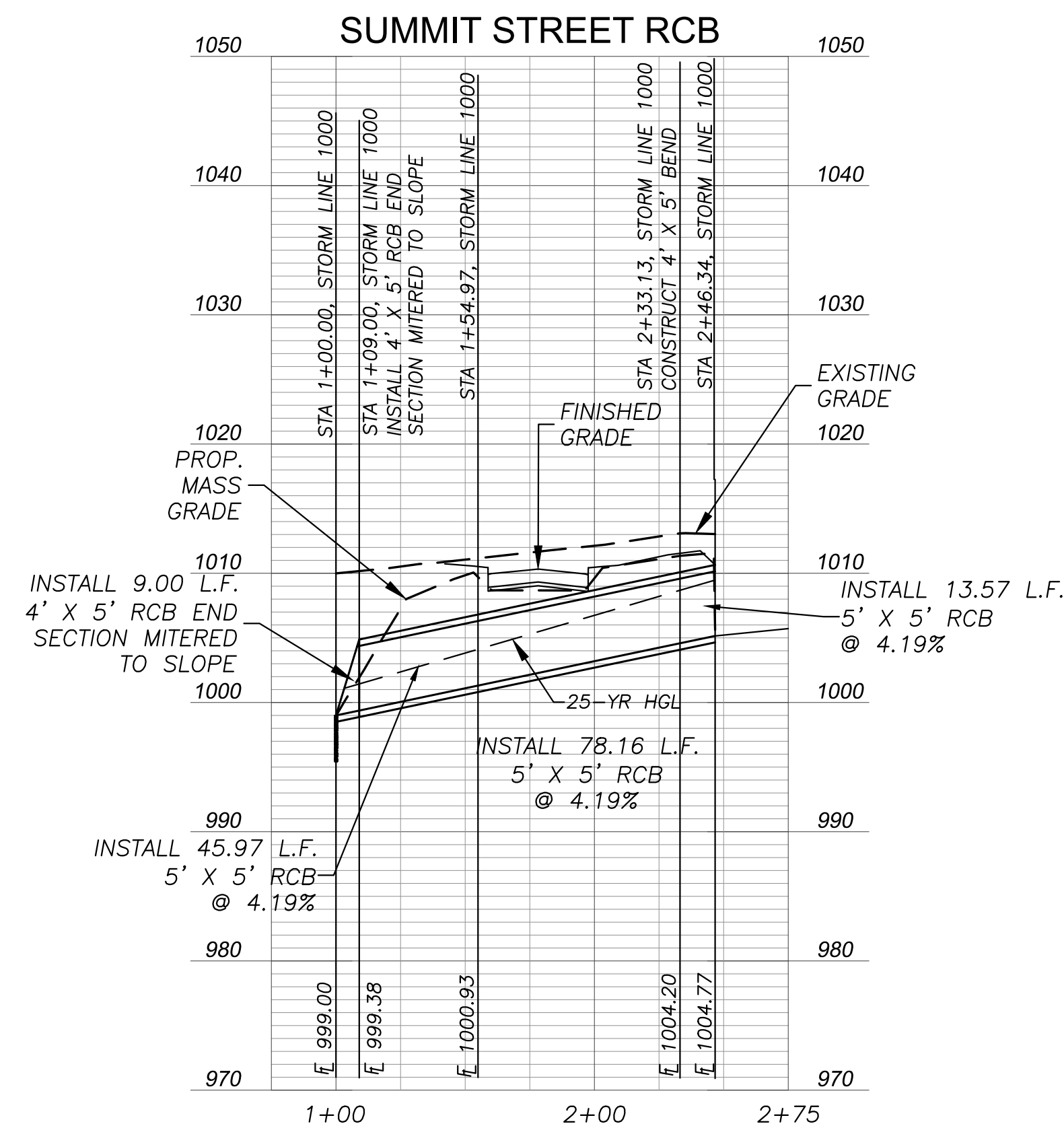
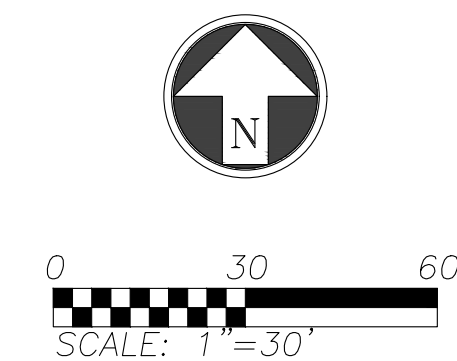
SHEET NUMBER
C5.4

NOTES:

- PIPE LENGTHS SHOWN ARE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE OR TO THE END OF THE END SECTION. ALL PIPES SHALL BE FIELD STAKED TO THE INSIDE WALL FACE OF THE STRUCTURE.
- ALL PIPE SHALL BE PLACED IN TRENCH CONDITIONS. PLACE A MINIMUM OF 2 FEET OF FILL OVER PROPOSED PIPE BEFORE TRENCHING AND PIPE INSTALLATION. PROPOSED FILL SHALL BE PLACED IN ACCORDANCE WITH THE PROJECT REQUIREMENTS.
- UTILITY LINES AND STRUCTURES IN FILL AREAS BELOW PIPE GRADE SHALL NOT BE CONSTRUCTED UNTIL ALL CONSOLIDATION OF THE FILL IS COMPLETE AND SO APPROVED BY THE ON-SITE GEOTECHNICAL ENGINEER.
- THE DIMENSIONS FOR ALL STRUCTURES ARE FROM INSIDE FACE OF STRUCTURE TO INSIDE FACE OF STRUCTURE.
- STORM SEWER PIPE SHALL BE AS FOLLOWS UNLESS OTHERWISE NOTED:
 - REINFORCED CONCRETE PIPE (RCP), CLASS III PER ASTM C-76 WITH "O-RING" OR SINGLE OFFSET RUBBER GASKETED JOINT (TYLOX SUPERSEAL OR AN APPROVED EQUAL)
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- PRECAST STRUCTURES MAY BE USED AT CONTRACTOR'S OPTION. ALL STORM STRUCTURES SHALL HAVE A SMOOTH UNIFORM POURED CONCRETE INVERT FROM INVERT IN TO INVERT OUT.
- THE LIDS OF ALL PRECAST STRUCTURES SHALL BE GROUTED TO THE TOP OF THE WALLS.
- NORTHINGS AND EASTINGS ARE SHOWN TO THE CENTER OF THE STRUCTURE.
- THE FIRST DIMENSION SHOWN IS THE "L" DIMENSION AND THE SECOND IS THE "W" DIMENSION. SEE DETAILS.
- ALL HDPE PIPE SHALL BE ADS N-12 OR APPROVED EQUAL, MEETING AASHTO M284, TYPE S OR ASTM F2306. THE PIPE SHALL HAVE A SMOOTH INTERIOR AND ANNULAR EXTERIOR CORRUGATIONS. PIPE JOINTS SHALL BE JOINTED USING BELL & SPIGOT JOINT MEETING AASHTO M252, AASHTO M294, OR ASTM F2306. THE JOINT SHALL BE WATERTIGHT, ACCORDING TO THE REQUIREMENTS OF ASTM D3212, AND GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477. GASKETS SHALL BE INSTALLED BY THE PIPE MANUFACTURER AND COVERED WITH A REMOVABLE WRAP TO ENSURE THE GASKET IS FREE FROM DEBRIS. A JOINT LUBRICANT SUPPLIED BY THE MANUFACTURER SHALL BE USED ON THE GASKET AND BELL DURING ASSEMBLY.
- FITTINGS FOR PLASTIC PIPE SHALL CONFORM TO AASHTO M252, AASHTO M294, OR ASTM F2306. ALL TEES SHALL BE DUAL WALL REDUCING TEES CONSISTENT WITH THE ADS N-12 PIPE WATERTIGHT CONNECTIONS.
- ALL PIPE DESIGNATED AS PPP SHALL BE POLYPROPYLENE PIPE MEETING THE FOLLOWING SPECIFICATIONS:
 - PIPE STIFFNESS AND JOINTS SHALL MEET ASTM F2881 AND AASHTO M330 FOR DIAMETER.
 - ALL PIPE JOINTS SHALL BE BELL AND SPIGOT JOINTS WHICH MEET THE REQUIREMENTS OF ASTM D3212.



- MODOT Type 4 Ditch Liner Notes:
- Predominant Rock Size=19".
 - Maximum Rock Size=28".
 - Gradation such that no more than 15% will be less than 6".



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION
City Comments 6/14/18

PROJECT NUMBER
13958.00
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7/11/18

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SHEET TITLE

STORM PLAN AND PROFILE (5)

SHEET NUMBER
C5.5

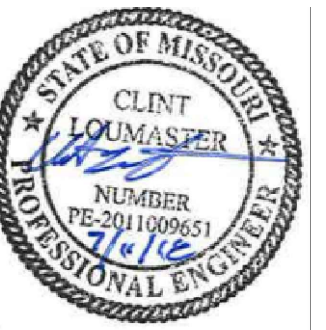
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		10 Year Storm										Pipe Design										Design Checks												
Structures		Runoff Calculations										Pipe Design										Design Checks										Comments		
From	To	Direct Area (acre)	Line In (acre)	Total Area (acre)	C	K	Tc (min)	Flow Time (min)	Intensity (in/hr)	Design Q (cfs)	Description	Pipe length (lin ft)	Pipe Slope (%)	Pipe dia (in)	Manning's n	Q full (cfs)	Pipe Area (sf)	V full (fps)	Design V (fps)	Hw/D	outlet head (ft)	HW Inlet Control (ft)	HW Outlet Control (ft)	Inlet Top Elevation	Upstream flowline	Downstream flowline	Inlet Drop (ft)	Downstream Water Elevation	Hydraulic Grade Elev. (Calculated)	Hydraulic Grade (Allowable)	Comments			
Line 100	111	29.74		0.66	1.00	12.00			5.68	111.5	Junction Box																							
	110	0.00		29.74	0.66	1.00	12.00	0.13	5.68	111.5	HDPE	174.35	2.90	48	0.01	318.86	12.57	25.37	22.96	1.5	2.84	1026.57	1026.65	1029.24	1020.76	1015.70		1023.81	1026.65	1028.74				
	109	0.83		29.74	0.66	1.00	12.13	0.03	7.35	0.0	Junction Box	45.12	3.32	48	0.01	341.17	12.57	27.15	24.22	1.4	1.81	1020.49	1023.81	1025.94	1014.70	1013.20	1	1022.00	1023.81	1025.44				
	108	0.00		30.57	0.66	1.00	12.16	0.18	7.35	4.8	Junction Box	195.78	1.48	54	0.01	311.84	15.90	19.61	18.12	1.1	1.84	1018.09	1022.00	1025.95	1013.00	1010.10	0.2	1020.16	1022.00	1025.45				
	107	0.28		30.57	0.66	1.00	12.34	0.10	7.35	0.0	Junction Box	72.15	0.51	54	0.01	183.06	15.90	11.51	11.92	1.1	1.27	1014.96	1020.16	1026.92	1009.90	1009.54	0.2	1018.89	1020.16	1026.42				
	106	0.76	15.79		30.85	0.66	1.00	12.44	0.14	5.60	114.8	RCP	96.21	0.50	54	0.013	139.43	15.90	8.77	11.84	1.1	1.70	1014.43	1018.89	1026.55	1009.34	1008.85	0.2	1017.19	1018.89	1026.05			
	105	0.36	1.30		47.40	0.70	1.00	12.57	0.28	7.35	4.4	Curb Inlet	276.99	0.87	60	0.01	316.65	19.63	16.13	16.59	1.4	3.53	1015.29	1017.19	1026.50	1008.35	1005.94	0.5	1013.66	1017.19	1026.00	Lines 600 and 1400 In		
	104	0.53	0.68		49.06	0.71	1.00	12.85	0.12	7.35	2.1	Curb Inlet	131.28	1.01	60	0.01	341.18	19.63	17.38	17.71	1.4	2.71	1011.08	1013.66	1015.26	1003.92	1002.60	2.02	1010.95	1013.66	1014.76	Lines 500 and 1300 In		
	103	0.00			50.27	0.71	1.00	12.98	0.11	5.51	196.3	RCP	109.83	0.85	66	0.013	310.43	23.76	13.07	16.58	1.2	2.10	1008.80	1010.95	1011.47	1002.40	1001.47	0.2	1008.85	1010.95	1010.97	Lines 400 and 1200 In		
	102	0.65	1.41		50.27	0.71	1.00	13.09	0.09	7.35	0.0	Junction Box	91.95	0.85	66	0.013	310.43	23.76	13.07	16.56	1.2	1.95	1007.65	1008.85	1012.54	1001.27	1000.48	0.2	1006.90	1008.85	1012.04			
	101	0.32			52.33	0.71	1.00	13.18	0.06	5.49	195.6	RCP	52.71	1.01	72	0.013	426.77	28.27	15.09	14.73	1.0	1.24	1006.37	1006.90	1011.37	1000.28	999.75	0.2	1005.66	1006.90	1010.87	Line 1100 In		
	100				52.65	0.71	1.00	13.24	0.04	7.35	1.8	Curb Inlet	44.48	1.24	72	0.013	472.87	28.27	16.72	19.59	1.0	1.21	1005.66	1003.21	1011.31	999.55	999.00	0.2	1002.00	1005.66	1010.81			
										5.46	204.8	RCP																						
	Line 200	204	1.93		0.78	1.00	5.00			7.35	11.1	Curb Inlet																						
		203	0.18		0.78	1.00	5.00	0.06		7.35	11.1	RCP	47.78	6.74	24	0.013	58.89	3.14	18.75	14.36	0.9	0.48	1012.24	1011.05	1014.35	1010.40	1007.18		1010.56	1012.24	1013.85			
202		0.19	3.00		0.78	1.00	5.06	0.50	7.35	1.0	Curb Inlet	245.77	0.78	24	0.01	26.04	3.14	8.29	8.12	1.0	1.19	1009.11	1010.56	1014.34	1007.18	1005.27	0	1009.37	1010.56	1013.84				
201		0.32	1.80		0.78	1.00	5.56	0.23	7.35	1.1	Curb Inlet	151.82	0.92	30	0.01	51.28	4.91	10.45	10.81	1.3	1.72	1007.90	1009.37	1011.66	1007.18	1003.37	0.5	1009.37	1009.37	1011.16	Line 800 In			
200					0.78	1.00	5.00	0.04	7.35	1.8	Curb Inlet	29.74	1.11	30	0.01	56.33	4.91	11.48	12.50	1.8	1.97	1007.65	1006.06	1010.26	1004.77	1003.37	0.2	1007.65	1007.65	1009.76	Line 700 In			
									7.12	41.2	HDPE																							
Line 300	305	9.67		0.66	1.00	5.00			7.35	46.9	Area Inlet																							
	304	1.09		0.66	1.00	5.00	0.04		7.35	46.9	HDPE	36.70	1.25	36	0.01	97.20	7.07	13.75	13.60	1.3	1.06	1009.52	1010.11	1016.58	1005.75	1005.29		1009.05	1010.11	1016.08				
	303	0.85		0.67	1.00	5.04	0.04		7.35	6.3	Curb Inlet	46.91	3.97	36	0.013	133.25	7.07	18.85	17.75	1.4	1.71	1009.05	1007.93	1011.26	1004.79	1002.93	0.5	1006.23	1009.05	1010.76				
	302	0.82		0.68	1.00	5.09	0.32		7.35	4.9	Curb Inlet	224.22	0.75	42	0.01	113.57	9.62	11.80	11.83	1.1	1.64	1006.22	1006.23	1011.35	1002.43	1000.75	0.5	1004.58	1006.23	1010.85				
	301	0.20		0.69	1.00	5.40	0.06		7.35	4.7	Curb Inlet	40.31	0.75	42	0.013	87.37	9.62	9.08	12.03	1.1	1.10	1004.23	1004.58	1010.69	1002.43	999.95	0.5	1003.48	1004.58	1010.19				
	300			0.69	1.00	5.46	0.13		7.35	1.1	Curb Inlet	82.97	0.49	42	0.01	91.80	9.62	9.54	10.25	1.2	1.21	1003.48	1002.00	1010.66	999.45	999.04	0.5	1000.79	1003.48	1010.16				
										7.21	62.7	HDPE																						
Line 400	401	0.59		0.78	1.00	5.00			7.35	3.4	Curb Inlet																							
	104			0.59	0.78	1.00	5.00	0.23	7.35	3.4	RCP	60.41	0.58	15	0.013	4.93	1.23	4.02	4.33	0.9	0.51	1006.79	1006.43	1011.69	1005.65	1005.30		1005.93	1006.43	1011.19	Connect to Line 100			
Line 500	501	0.51		0.78	1.00	5.00			7.35	2.9	Curb Inlet																							
	105			0.51	0.78	1.00	5.00	0.30	7.35	2.9	RCP	69.77	0.50	15	0.013	4.58	1.23	3.73	3.94	0.9	0.42	1011.09	1010.73	1015.31	1010.03	1009.68		1010.31	1010.73	1011.09	1014.81	Connect to Line 100		
Line 600	601	0.80		0.78	1.00	5.00			7.35	4.6	Curb Inlet																							
	106			0.80	0.78	1.00	5.00	0.23	7.35	4.6	RCP	71.16	0.79	15	0.013	5.76	1.23	4.69	5.20	1.1	1.05	1011.27	1010.99	1028.78	1009.87	1009.31		1009.94	1010.99	1028.28	Connect to Line 100			
Line 700	701	1.80		0.78	1.00	5.00			7.35	10.3	Curb Inlet																							
	201			0.78	1.00	5.00	0.12		7.35	10.3	RCP	47.01	1.00	18	0.013	10.53	1.77	5.96	6.78	1.6	1.64	1007.20	1006.76	1010.25	1004.84	1004.37		1005.12	1006.76	1009.75	Connect to Line 200			
Line 800	801	3.00		0.78	1.00	5.00			7.35	17.2	Curb Inlet																							
	202			0.78	1.00	5.00	0.10		7.35	17.2	RCP	47.04	1.00	24	0.013	22.68	3.14	7.22	7.92	1.3	1.16	1008.27	1007.42	1011.67	1005.73	1005.26		1006.26	1007.42	1011.17	Connect to Line 200			
Line 1000 RCB (25 Yr)	1002	25.05		0.66	1.00	11.28			6.75	111.6	RCB Headwall																							
	1001	0.00		0.66	1.00	11.28	0.01		6.75	111.6	RCP	13.57	4.19	5'x5' RCB	0.013	501.99	20.00	25.10	16.64	1.5	1.65	1010.59	1010.42	N/A	1004.77	1004.20		1008.77	1009.13	1012.50				
	1000	0.00		0.66	1.00	11.29	0.08		6.75	111.5	RCP	78.16	4.19	5'x5' RCB	0.013	501.99	20.00	25.10	16.64	1.5	2.51	1010.02	1003.51	N/A	1004.20	1000.93	0	1001.00	1008.77	N/A				
	1001	0.00		0.66	1.00	11.29	0.08		6.75	111.5	RCP	45.97	4.19	5'x5' RCB	0.013	501.99	20.00	25.10	16.64	1.5	2.07	1												

G:\13958\Civil 3D\Production Drawings\Mass Grading and Stormwater Plans\021730-FDPIA-MASSGRAD-SHITS-WATR-PLAN.dwg Layout: WATER RELOCATION PLAN -- Wednesday July 11, 2018, 3:22pm -- Copyright 2018, George Butler Associates, Inc.

THE GROVE AT LEE'S SUMMIT
MASS GRADING AND STORMWATER
MISSOURI HWY 291 & 16TH STREET
LEE'S SUMMIT, MISSOURI

PROPOSED FACILITY FOR:



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION

City Comments 6/14/18

PROJECT NUMBER
13958.00
DATE
7/11/18

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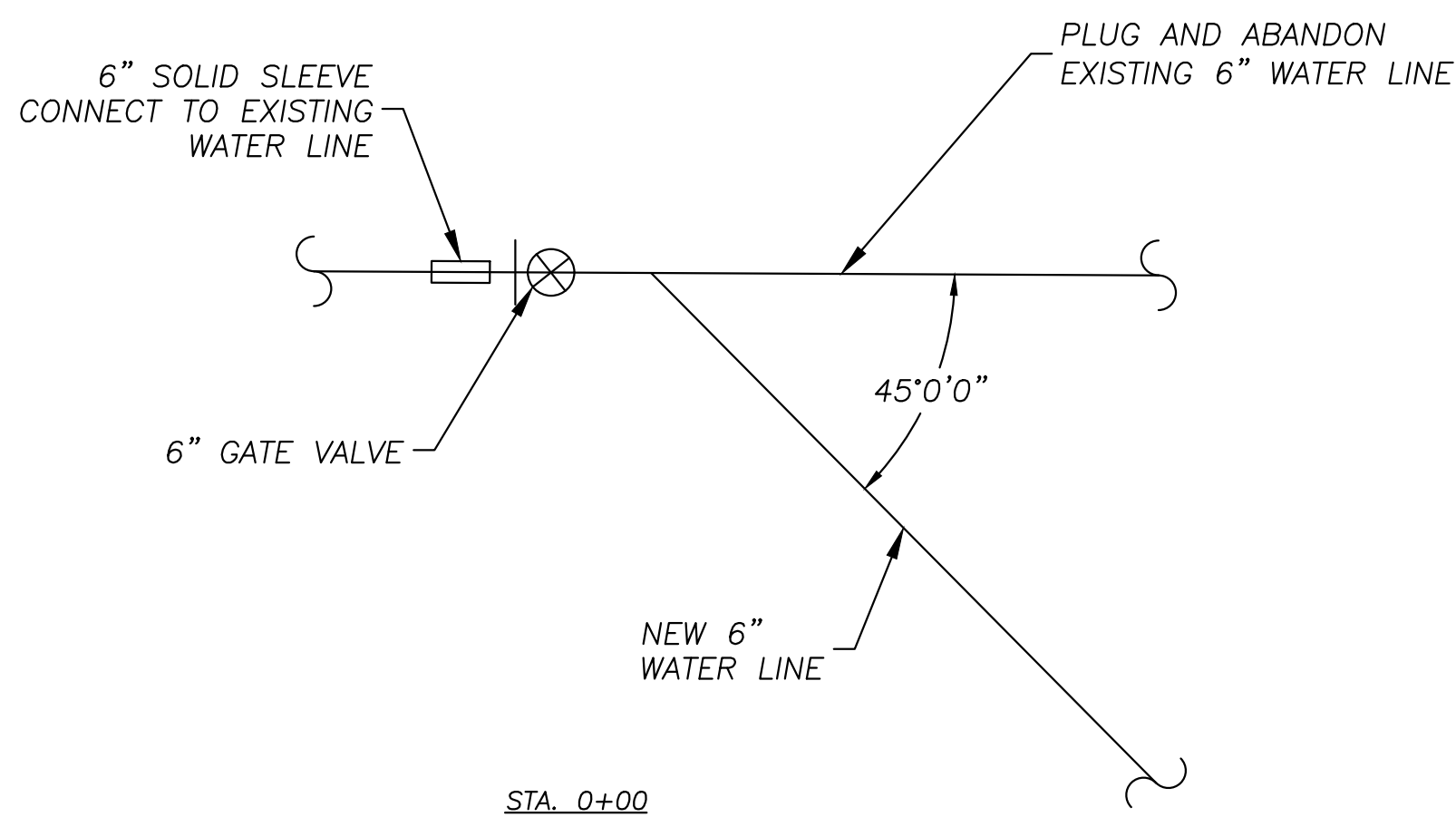
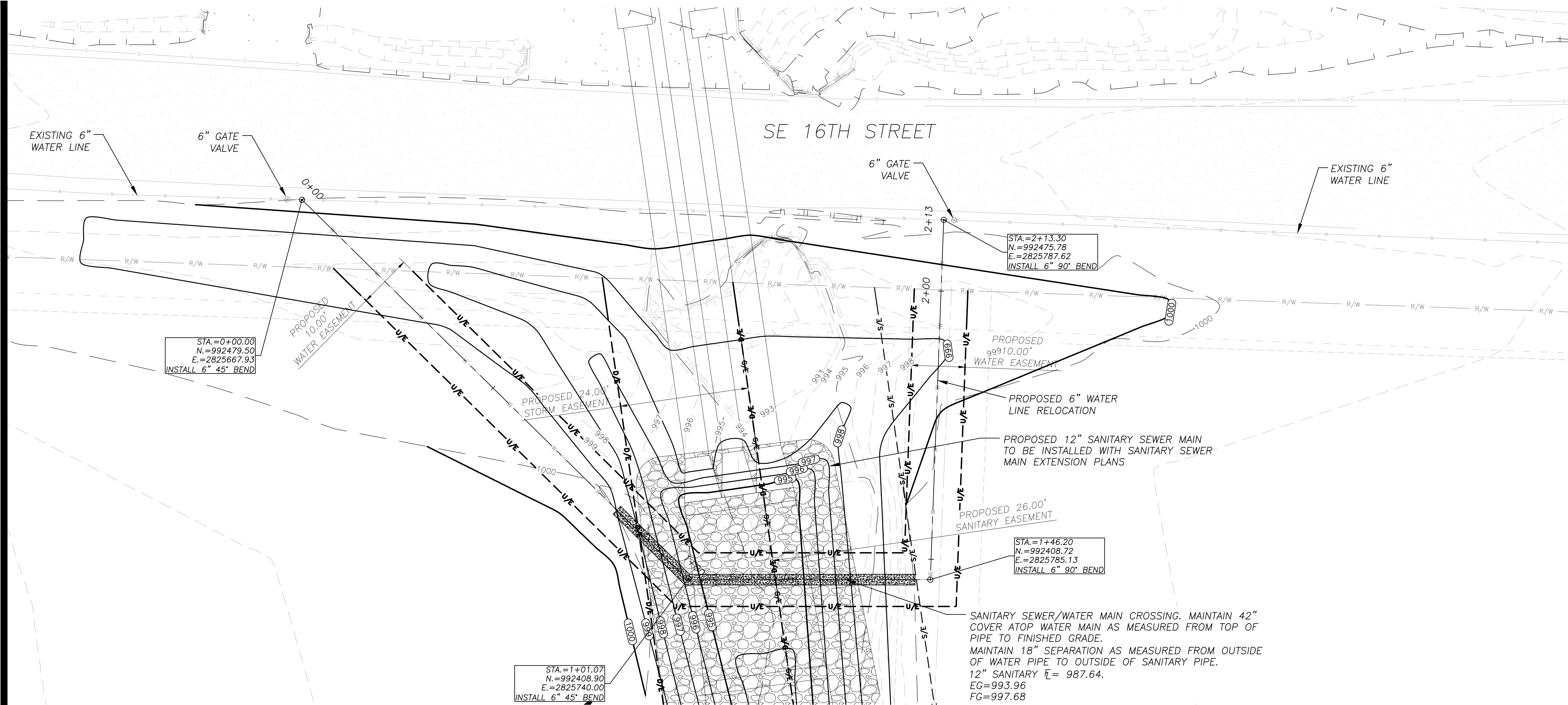
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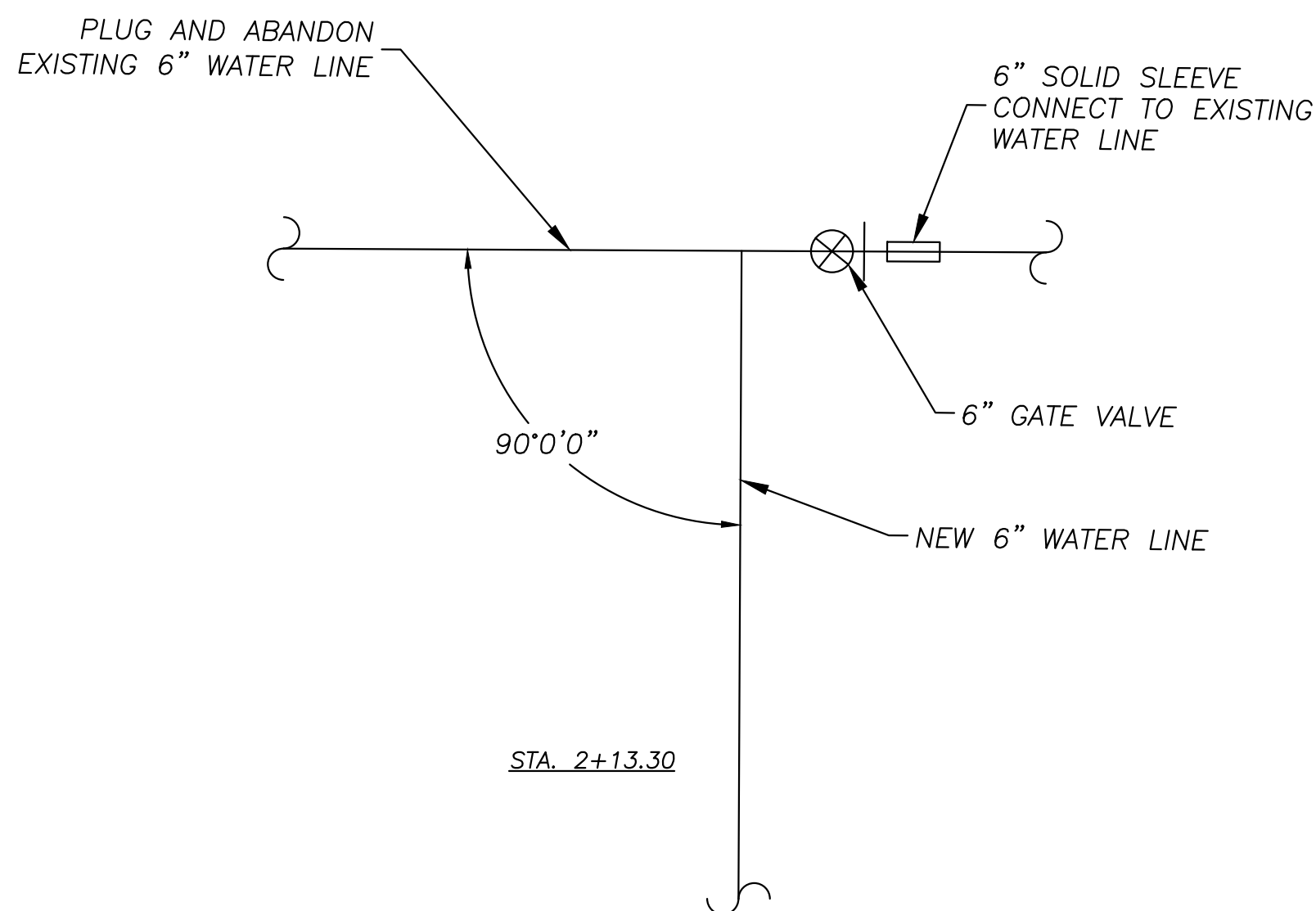
WATER MAIN RELOCATION PLAN

SHEET NUMBER

C6.0



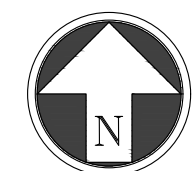
WATER MAIN CONNECTION DETAIL
NOT TO SCALE



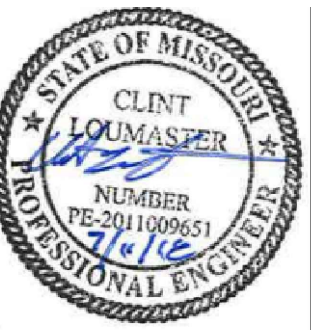
LEGEND

- CONCRETE ENCASEMENT
- ENERGY DISSIPATER (RE: DETAIL 605, C7.4)
- FINISH GRADE 5' CONTOURS
- FINISH GRADE 1' CONTOURS
- EXISTING GRADE 5' CONTOURS
- EXISTING GRADE 1' CONTOURS

NOTE:
A MINIMUM OF 42 INCHES OF COVER SHALL BE MAINTAINED OVER THE TOP OF THE RELOCATED WATER MAIN AS MEASURED FROM THE TOP OF THE PIPE TO THE FINISHED GRADE.



SCALE: 1"=10'
0 10 20



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION

City Comments 6/14/18

PROJECT NUMBER
13958.00

DATE
7/11/18

DESIGNED

DRAWN

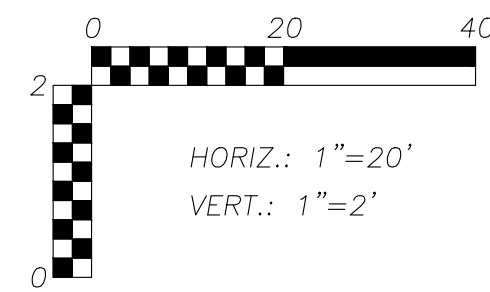
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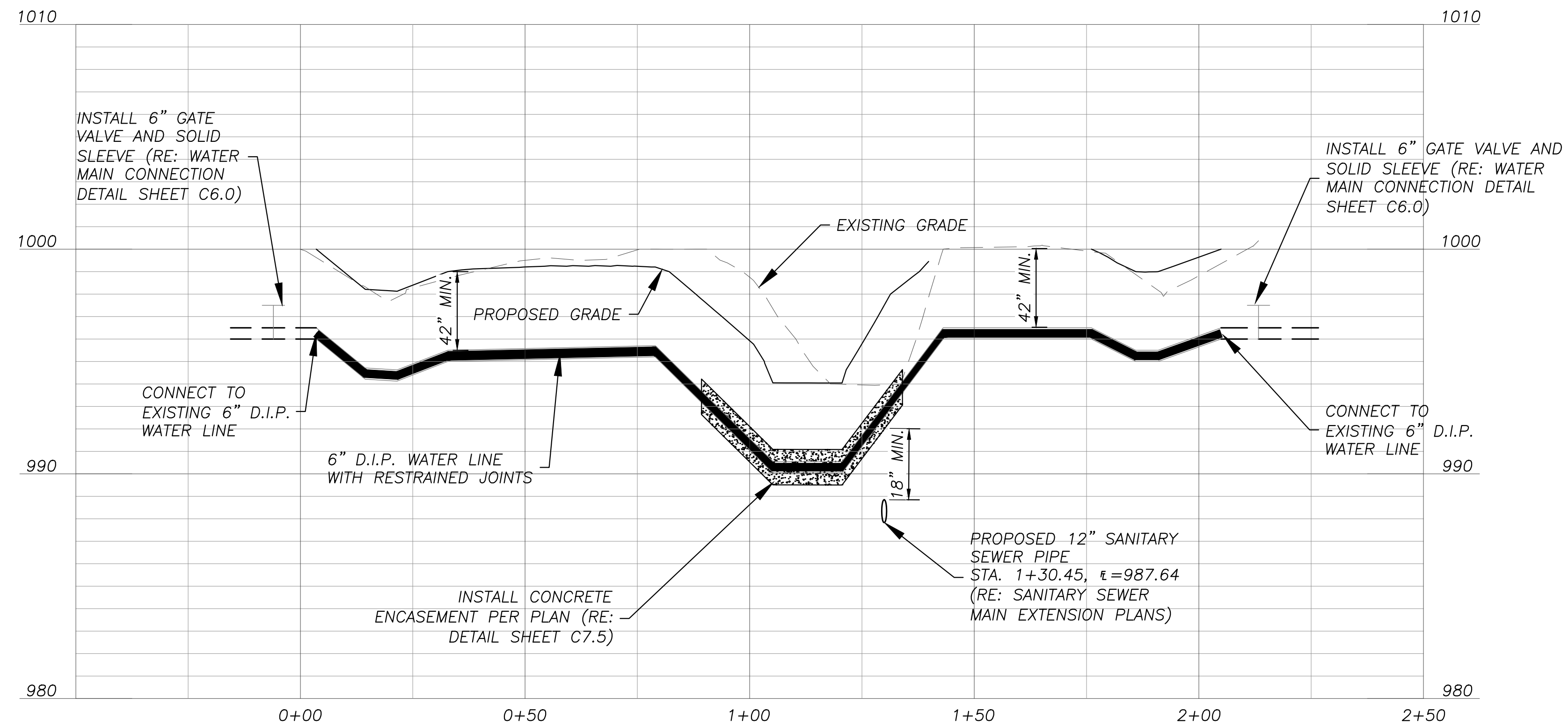
WATER LINE RELOCATION PROFILE

SHEET NUMBER

C6.1

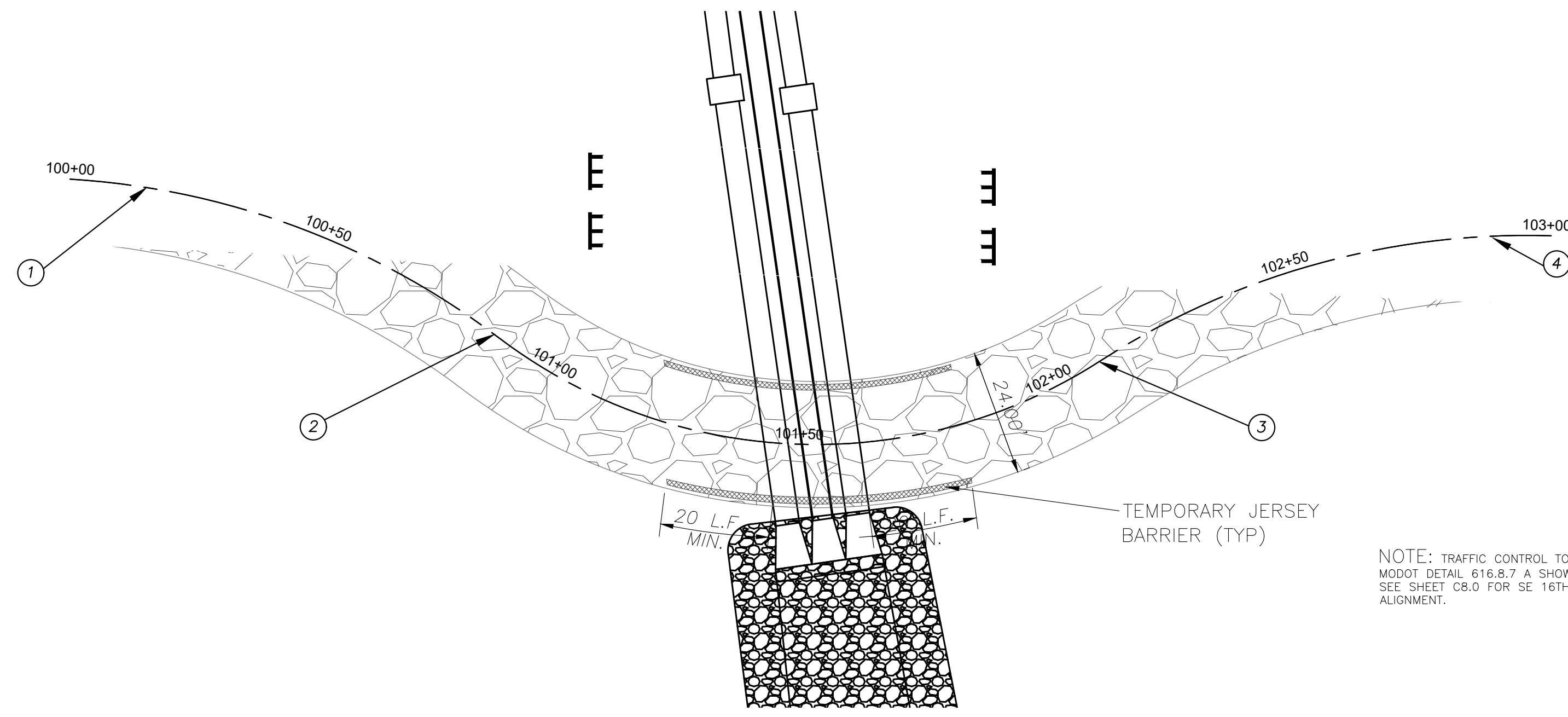


6" Water Line Profile



LEGEND

- CONCRETE ENCASEMENT
- ENERGY DISSIPATER (RE: DETAIL 605, C7.4)
- FINISH GRADE 5' CONTOURS
- FINISH GRADE 1' CONTOURS
- EXISTING GRADE 5' CONTOURS
- EXISTING GRADE 1' CONTOURS

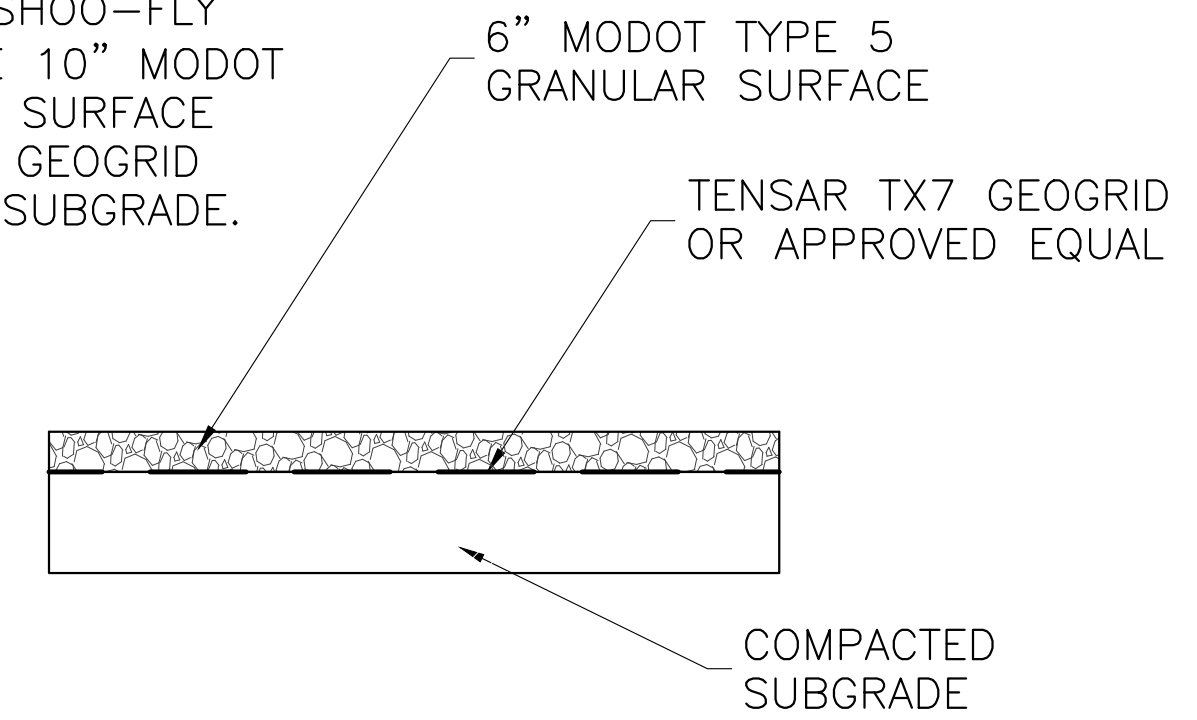


Temporary Shoo-Fly Detail
Not to Scale

NOTE: REFER TO 16TH ST ROADWAY PLAN FOR ALIGNMENT DETAILS

SE 16TH STREET TEMPORARY SHOO-FLY DATA							
POINT	STATION	NORTHING	EASTING	ELEMENT	LENGTH	RADIUS	BEARING
①	P.C.	100+00	992496.39	2825621.15	CURVE	71.37'	150.00' S 66°04'22.26" E
②	P.R.C.	100+71.36	992467.72	2825685.77	CURVE	122.84	S 87°24'51.16" E
③	P.R.C.	101+94.20	992462.52	2825800.92	CURVE	79.57'	N 72°33'30.69" E
④	P.T.	102+73.78	992486.09	2825875.95			

NOTE: ALTERNATE SHOO-FLY SECTION MAY HAVE 10" MODOT TYPE 5 GRANULAR SURFACE OVER TENSAR TX5 GEOGRID OVER COMPACTED SUBGRADE.



008 Temporary Shoo-Fly Section
Not to Scale

616.8.7 (TA-7) Road Closure with a Diversion - DE/CM www.invarion.com

SPEED Permanent Posted (mph)	SIGN SPACING (ft.)		TAPER LENGTH (ft.)		OPTIONAL BUFFER LENGTH (ft.) (B)	CHANNELIZER SPACING (ft.) Tapers	CHANELIZER SPACING (ft.) Buffer/ Work Areas
	Undivided (S)	Divided (S)	Shoulder (1) (T1)	Lane (2) (T2)			
0-35	200	-	70	245	280	35	40
40-45	350	-	150	540	400	40	80
50-55	500	-	185	660	560	50	80
60-70	1000	-	235	840	840	60	120

1 Shoulder taper length based on 10 ft. (standard shoulder width) offset. 2. Lane taper length based on 12 ft. (standard lane width) offset.

Work Zone Speed Limit shall be 15 MPH.

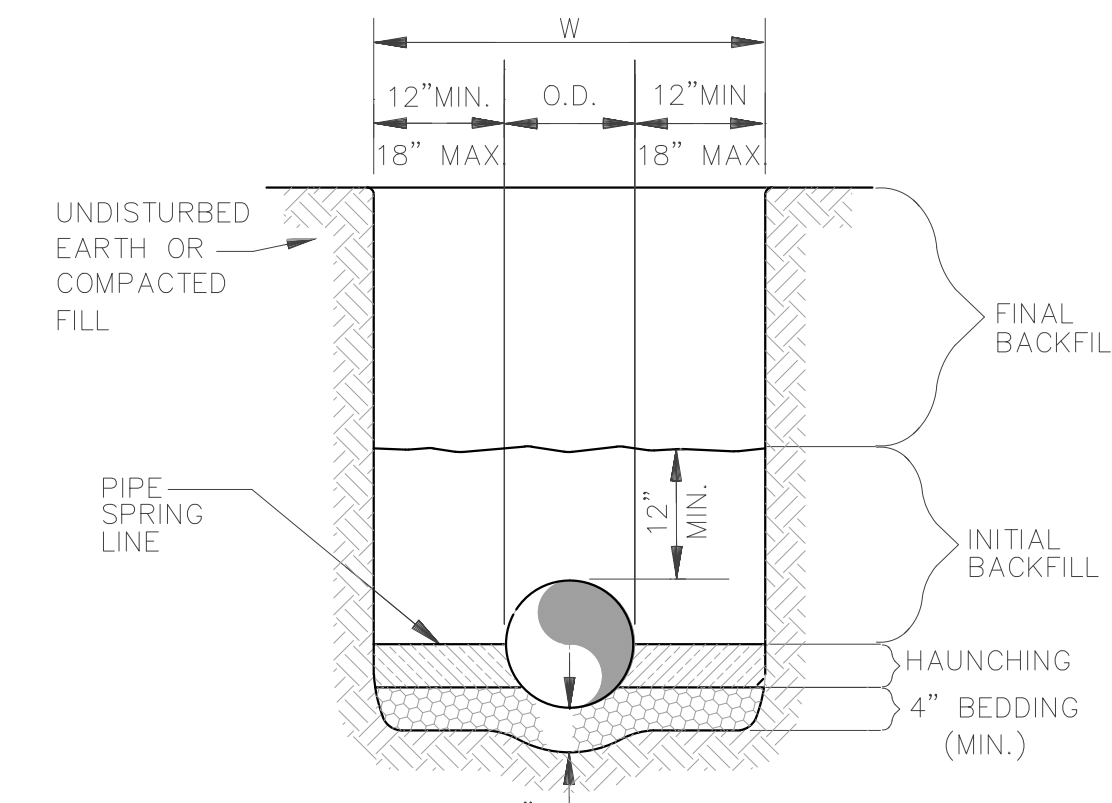
NOTES:
See EPG 616.12 Work Zone Speed Limits for Speed Limits Guidelines.
ROAD WORK AHEAD sign not needed if diversion is located within the limits of an activity area where another ROAD WORK AHEAD sign is already used.
(3) Arrow signs and reverse curve or turn signs as determined by diversion geometrics. Additional warning signs may also be needed.
(4) Type 3 object markers used with temporary bridges or culverts. Additional protective devices (e.g. guardrail, end terminals, etc.) or additional type 3 object markers may be needed. If used, end terminals shall be crashworthy.
(5) Pavement marking is not used on non-paved surfaces.
(6) Signs located in order to provide sufficient advance warning.
(7) See Standard Plan 616.10 for signing and barricade requirements.
If rumble strips are used, review EPG 616.6.87 RUMBLE STRIPS.
For flags and advance warning rail system, refer to EPG 616.6.2.2 Flags and Advance Warning Rail System.
Pavement markings no longer applicable to the traffic pattern of the roadway shall be removed or obliterated before any new traffic patterns are open to traffic.

Use WO24-1 instead

1/16

GENERAL NOTES

- BEDDING SHALL BE ASTM C33 #57 ROCK WORKED BY HAND. COMPACTED TO 90% STANDARD PROCTOR.
- HAUNCHING SHALL BE WORKED AROUND THE PIPE BY HAND TO ELIMINATE VOIDS AND SHALL BE ASTM C33 #57 ROCK COMPACTED TO 90% STANDARD PROCTOR.
- INITIAL BACKFILL SHALL BE ASTM C33 #57 ROCK WORKED BY HAND & SHALL BE COMPACTED TO 95 % STANDARD PROCTOR.
- INITIAL BACKFILL NOT UNDER PAVED AREAS CAN BE SOIL AS CLASSIFIED GM, GC, SM, OR SC AND COMPACTED TO 95% STANDARD PROCTOR.
- FINAL BACKFILL SHALL BE ASTM C33 #57 ROCK & COMPACTED AS NOTED IN NOTES 3. AND 4.
- FINAL BACKFILL NOT UNDER PAVED AREAS CAN BE SOILS AS CLASSIFIED GM, GC, SM, SC, ML, OR CL COMPACTED TO 95% STANDARD PROCTOR.
- ALL MATERIALS ARE CLASSIFIED IN ACCORDANCE WITH ASTM D 2321-LATEST EDITION.
- ALL MATERIALS SHALL BE INSTALLED IN MAXIMUM 8" LOOSE LIFTS IN ACCORDANCE WITH ASTM D 698. CLASS III AND IV-A MATERIALS (SEE NOTE 6) SHALL BE COMPACTED NEAR OPTIMUM MOISTURE CONTENT.
- FILL SALVAGED FROM EXCAVATION SHALL BE FREE OF DEBRIS, ORGANICS AND ROCKS LARGER THAN 3".
- ALL TRENCH EXCAVATIONS SHALL BE SLOPED, SHORED, SHEETED, BRACED, OR OTHERWISE SUPPORTED IN COMPLIANCE WITH OSHA REGULATIONS AND LOCAL ORDINANCES. (SEE SPECIFICATIONS)

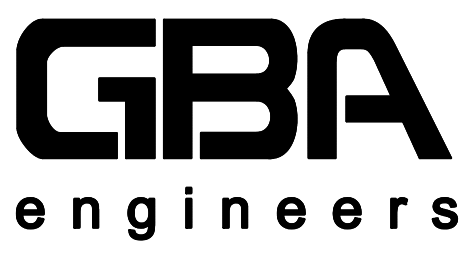


REINFORCED CONCRETE PIPE (RCP),
PVC ROOF DRAIN,
AND CORRUGATED METAL PIPE (CMP)
SMALLER THAN 60" Ø

TABLE OF BEDDING DEPTHS

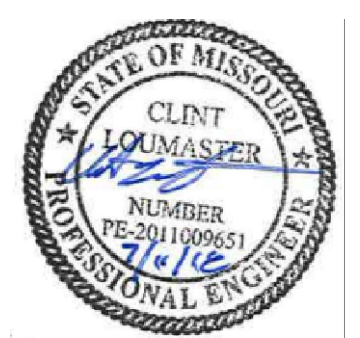
d	ROCK	SOIL
27" & SMALLER	6"	4"
30" TO 60"	9"	5"
66" & LARGER	12"	6"

306 Pipe Bedding
Not to Scale



9801 Renner Boulevard
Lenexa, Kansas 66219
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www.gbateam.com

PROPOSED FACILITY FOR:
THE GROVE AT LEE'S SUMMIT
MASS GRADING AND STORMWATER
MISSOURI HWY 291 & 16TH STREET
LEE'S SUMMIT, MISSOURI



Clint Loumaster
Professional Engineer
License No. PE-2011009651

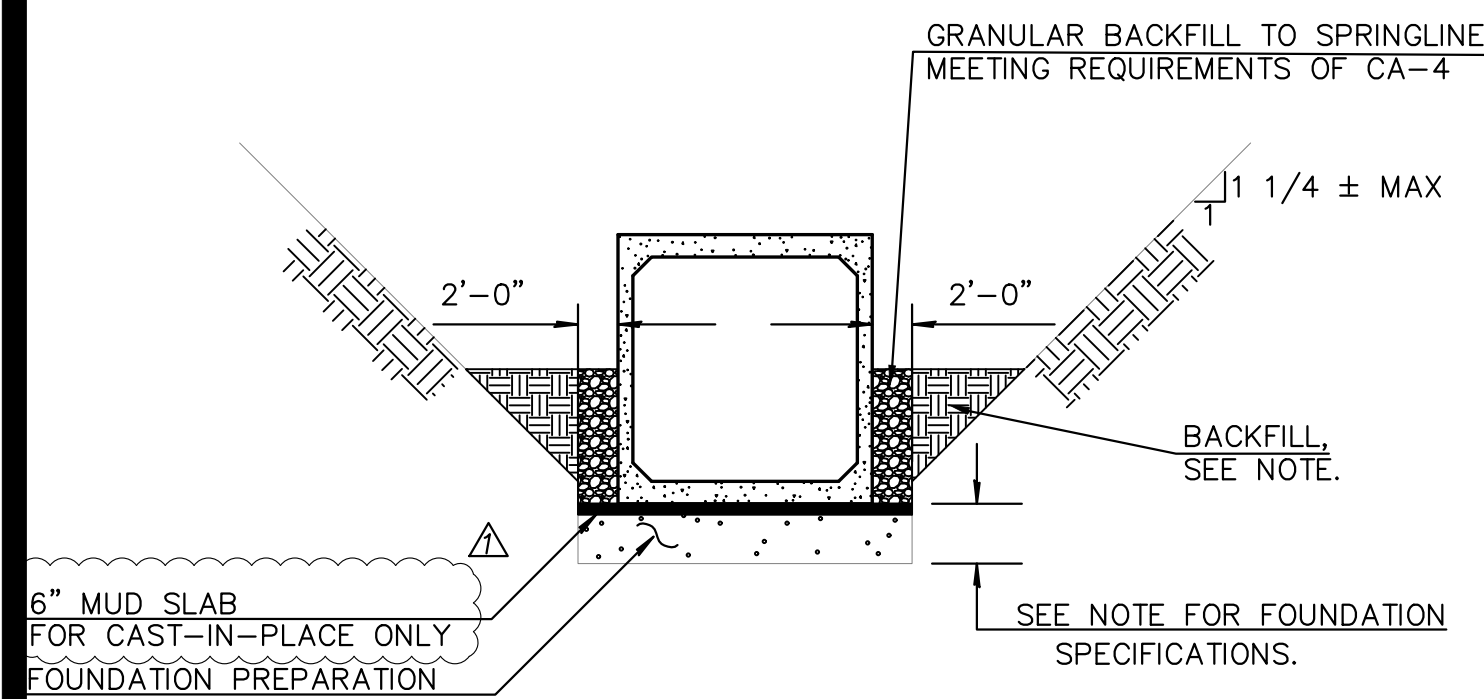
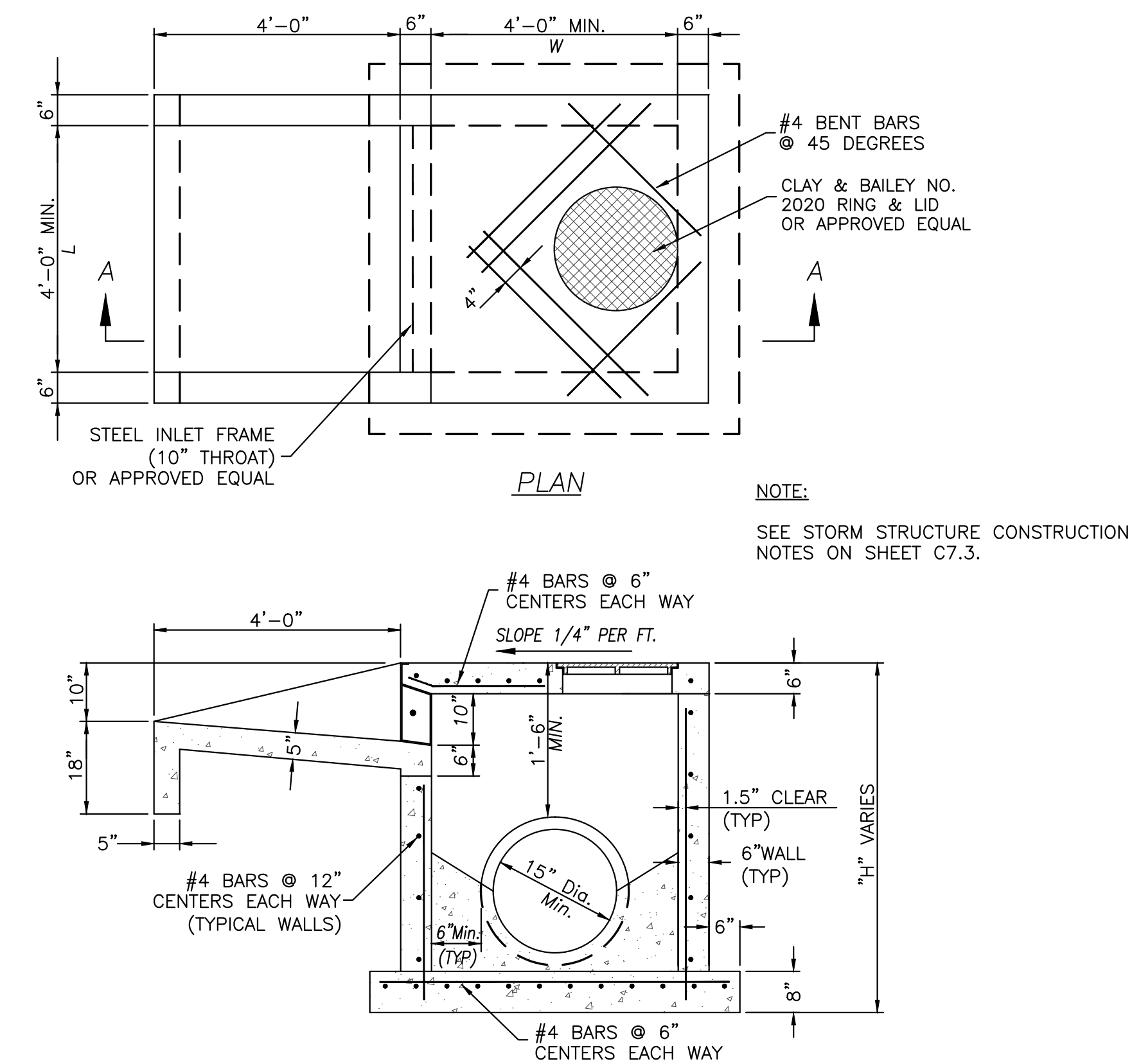
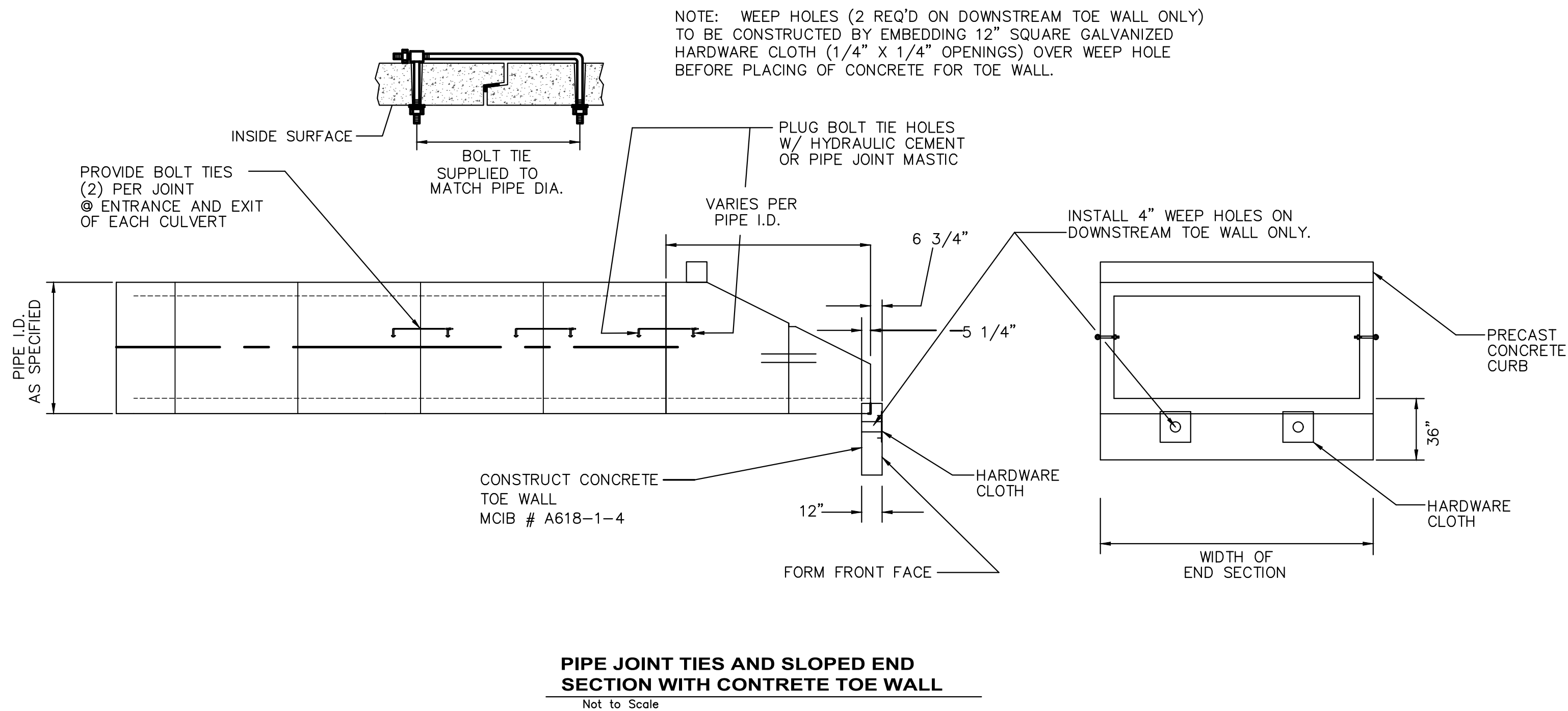
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City Comments 6/14/18

PROJECT NUMBER
13958.00
DATE
7/11/18

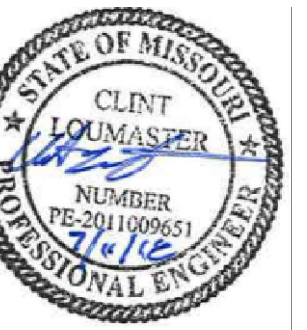
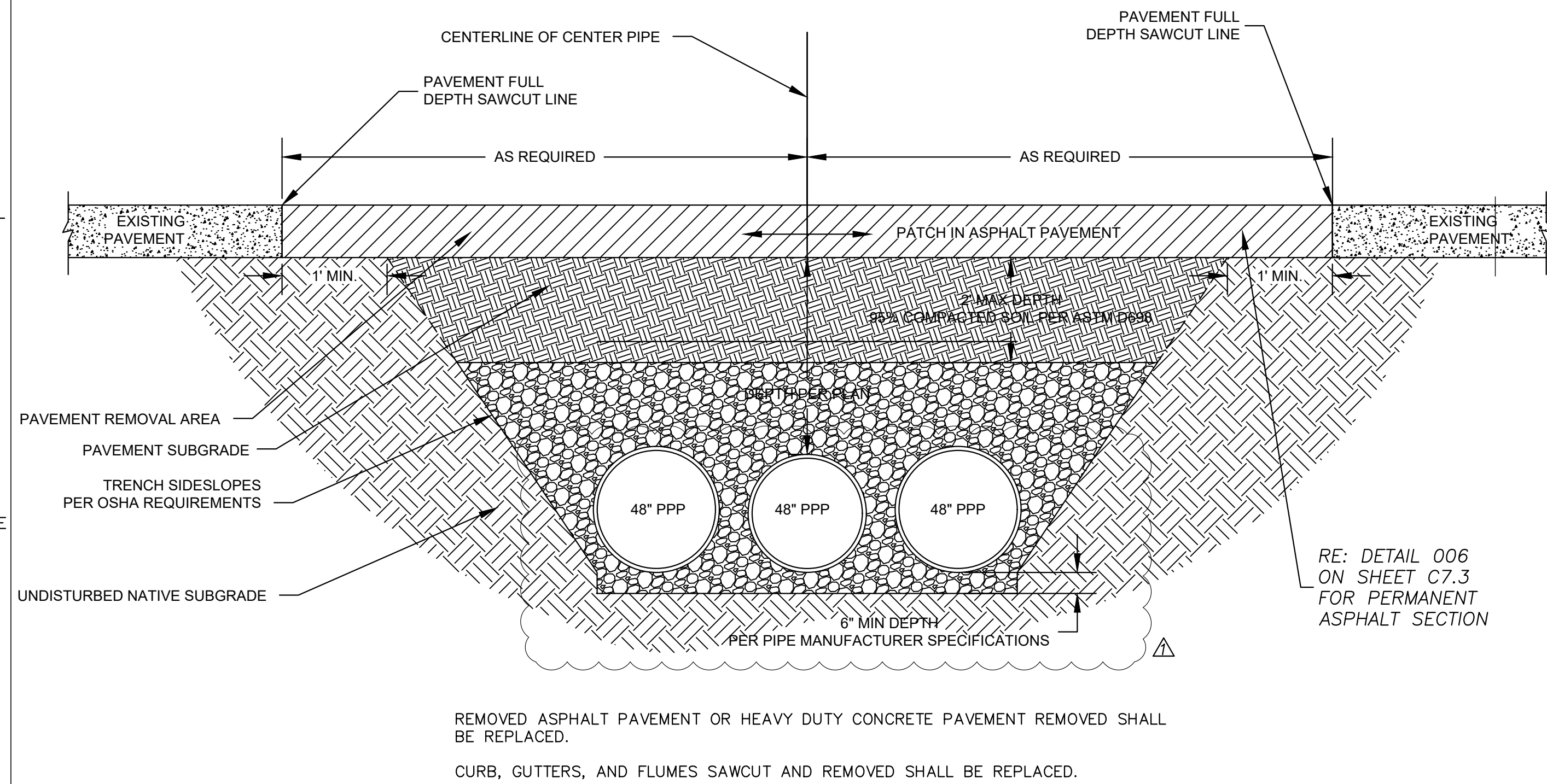
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DRAWN
REVIEWED
SHEET TITLE
CIVIL DETAILS (1)

SHEET NUMBER
C7.1

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- GENERAL NOTES**
- FOUNDATION PREPARATION:**
1. SUBGRADE OF MUD SLAB SHALL MEET THE REQUIREMENTS OF THE INITIAL SITE PREPARATION FOR UNDERCUTTING, PROOFROLLING, COMPACTION AND MOISTURE CONDITIONING AS SPECIFIED FOR RECEIVING STRUCTURAL FILL.
 2. ONSITE GEOTECHNICAL ENGINEER SHALL APPROVE LEVEL TO WHICH UNDERCUTTING IS REQUIRED.
 3. THE EXPOSED GRADE SHOULD BE SCARIFIED TO A DEPTH OF 9 INCHES AND MOISTURE CONDITIONED TO 0 TO 4 PERCENT OF THE MATERIAL'S MAXIMUM DRY DENSITY AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY.
 4. STRUCTURAL FILL MEETING BACKFILL REQUIREMENTS SHALL BE BROUGHT FROM THE UNDERCUT ELEVATION UP TO THE BASE OF THE MUD SLAB.
- BACKFILL:**
1. BACKFILL SHOULD BE COMPACTED TO A MINIMUM OF 95 PERCENT OF THE STANDARD PROCTOR DENSITY. THE MOISTURE CONTENT AT TIME OF COMPACTION SHOULD BE WITHIN A RANGE OF 0 TO 4 PERCENT ABOVE OPTIMUM MOISTURE CONTENT AS DEFINED BY THE STANDARD PROCTOR COMPACTION PROCEDURE.
- PRECAST DESIGN NOTE:**
1. HL-93 DESIGN LOADING.
 2. DRY UNIT WEIGHT OF SOIL ±99.6 LBS/CU. FT.



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Professional Engineer
License No. PE-2011009651

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City Comments 6/14/18

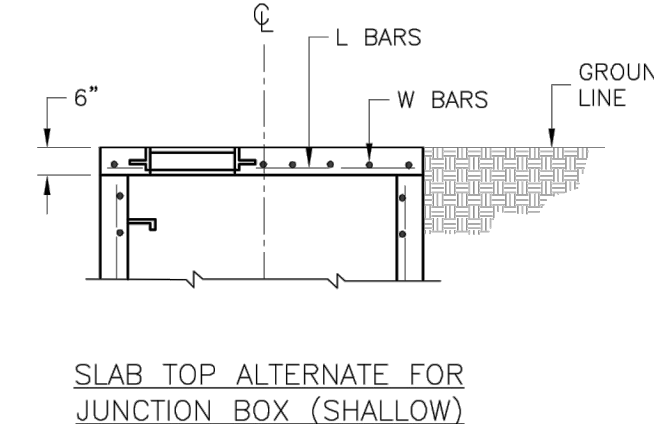
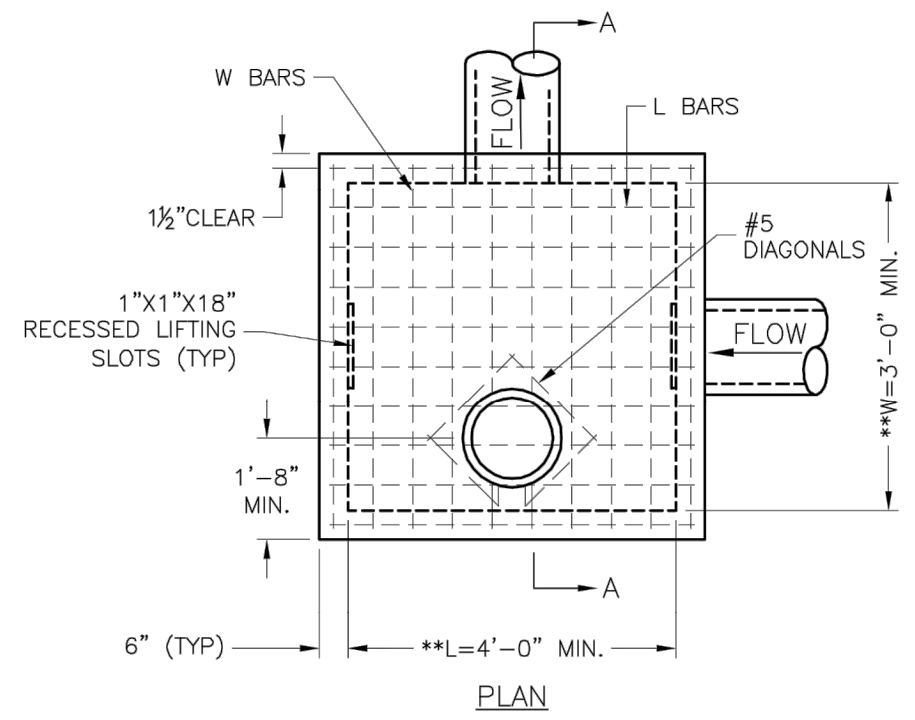
PROJECT NUMBER
13958.00
DATE
7/11/18

DESIGNED
DRAWN
REVIEWED

SHEET TITLE
CIVIL DETAILS (2)

SHEET NUMBER
C7.2

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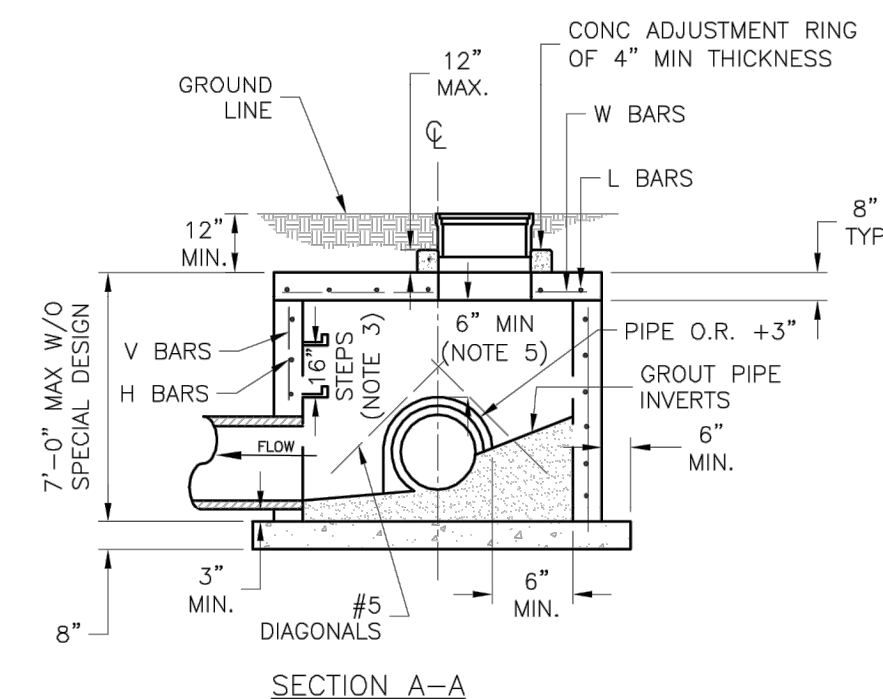
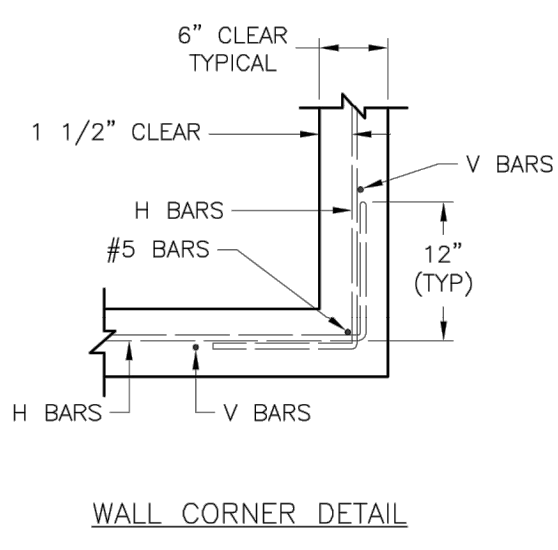


** INCREASE IN MULTIPLES OF 6" (7'-0") MAX WITHOUT SPECIAL DESIGN. (SEE PROJECT PLANS FOR DETAILS)

REINFORCING

BAR	BAR SIZE	SPACING (IN.)
H	4	12
V	4	12
L	5	6
W	5	6

- GENERAL NOTES:
1. LOCATE RING AND COVER ON BLANK WALL.
 2. USE 3/4" CHAMFER STRIP OR 1/2" R EDGER TOOL ON ALL EXPOSED CONCRETE CORNERS.
 3. STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 4' ON BLANK WALL IF POSSIBLE.
 4. BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH THE CORNERS OF THE STRUCTURE AND THE MINIMUM DISTANCE BETWEEN BOXOUTS IS 6".
 5. THE MINIMUM REINFORCING SHALL BE 1 H-BAR OVER A CAST-IN-PLACE PIPE AND 2 H-BARS OVER A PRECAST BOXOUT.
 6. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON-SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
 7. REINFORCING OF COVERS IN STREETS REQUIRE SPECIAL DESIGN.
 8. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.
 9. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR ALL REINFORCED CONCRETE STRUCTURES TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.



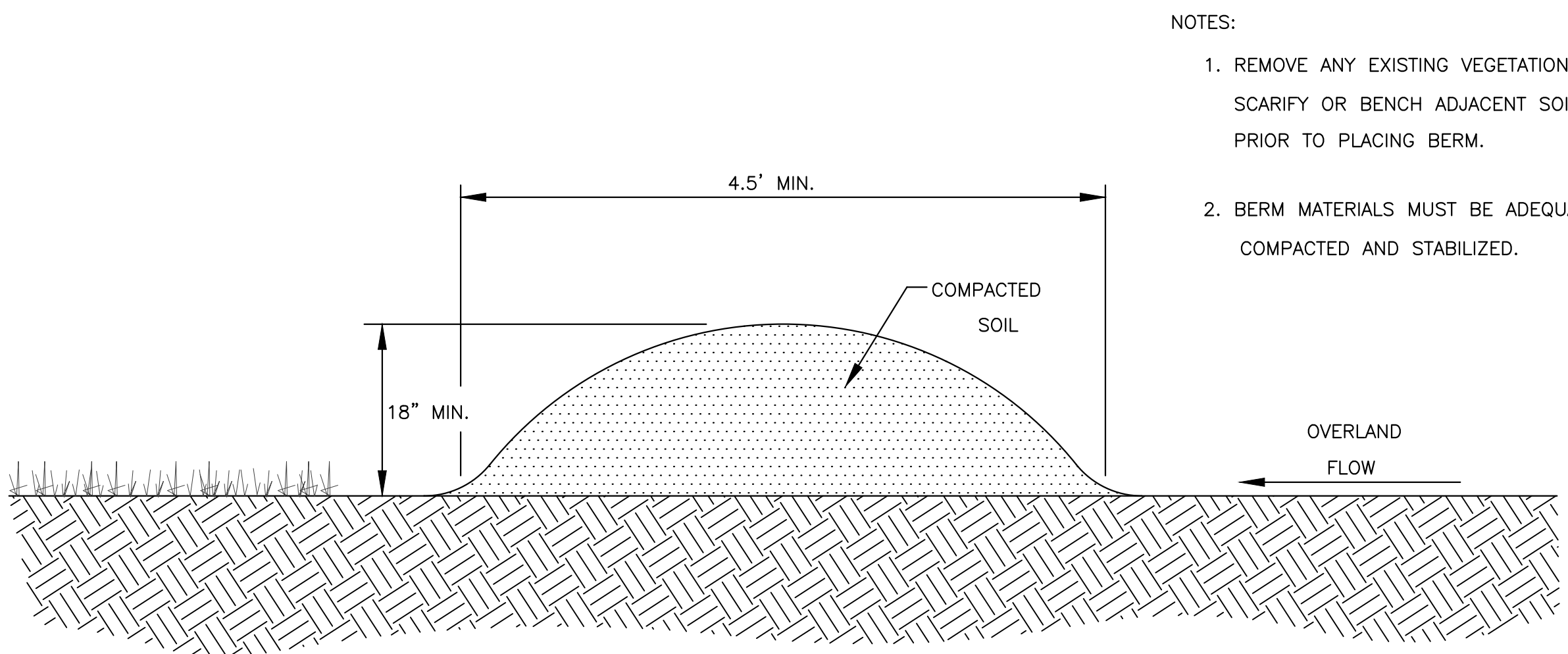
1. USE MODOT CLASS B-1 (AE) CONCRETE THROUGHOUT. AGGREGATES FOR CONCRETE SHALL BE IN ACCORDANCE WITH DIVISION 1000 OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
2. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION.
3. FLOOR OF INLET SHALL BE SHAPED WITH NON-REINFORCED, MODOT CLASS B CONCRETE.
4. EXPANSION JOINTS SHALL BE EITHER HOT OR COLD POURED JOINT SEALING COMPOUND, OR PREMOLD EXPANSION JOINT FILLER.
5. STEEL INLET FRAME SPACERS SHALL BE PLACED AT EQUAL SPACINGS NOT TO EXCEED 4'-0".
6. STEEL CORE STEPS SHALL BE USED (M.A. IND., INC. NO. PS1-PF, PS2-PF, OR APPROVED EQUAL). STEPS SHALL BE SPACED AT 1'-4" O.C. VERTICALLY. THE DISTANCE FROM THE LAST STEP TO THE TOP OF CONCRETE INVERT SHOULD BE A MAXIMUM OF 24".
7. BEVEL ALL EXPOSED EDGES WITH 3/4" TRIANGULAR MOLDING.
8. ON-GRADE INLETS SHALL CONFORM TO THE STREET GRADE AND SUMP INLETS SHALL BE LEVEL. FIELD INLETS SHOULD BE GRADED TO IMPOUND WATER TO A MINIMUM DEPTH OF 6" ABOVE INLET TOP.
9. ALL STORM SEWER STRUCTURES SHALL BE PRECAST. PRECAST SHOP DRAWINGS ARE TO BE REVIEWED BY THE ENGINEER PRIOR TO FABRICATION.
10. ALL CONCRETE CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF THE MISSOURI STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
11. REINFORCING STEEL SHALL BE NEW BILLET, MINIMUM GRADE 60 AS PER ASTM A615, AND SHALL BE BENT COLD.
12. ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERLINE OF BARS. 1.5" CLEARANCE SHALL BE PROVIDED THROUGHOUT UNLESS NOTED OTHERWISE. TOLERANCE OF +/- 1/8" SHALL BE PERMITTED.
13. ALL LAP SPLICES NOT SHOWN SHALL BE A MINIMUM 40 BAR DIAMETERS IN LENGTH.
14. ALL DOWELS SHALL BE ACCURATELY PLACED AND SECURELY TIED IN PLACE PRIOR TO PLACEMENT OF BOTTOM SLAB CONCRETE. STICKING OF DOWELS INTO FRESH OR PARTIALLY HARDENED CONCRETE WILL NOT BE ACCEPTABLE.
15. ALL REINFORCING STEEL SHALL BE SUPPORTED ON FABRICATED STEEL BAR SUPPORTS @ 3" MAXIMUM SPACING.
16. DO NOT SCALE THESE DRAWINGS FOR DIMENSIONS OR CLEARANCES. ANY QUESTIONS REGARDING DIMENSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE OWNER'S REPRESENTATIVE PRIOR TO CONSTRUCTION.
17. ALL CURB INLETS TOPS ARE TO BE CONSTRUCTED AFTER FINAL CURB STRING LINE HAS BEEN APPROVED BY THE OWNER'S REPRESENTATIVE AND PRIOR TO CURB CONSTRUCTION.
18. RCP CONNECTIONS TO PRECAST STRUCTURES SHALL HAVE A MINIMUM OF 6" OF CONCRETE AROUND THE ENTIRE PIPE WITHIN 2' OF THE STRUCTURE.
19. ALL STRUCTURES SHALL BE DESIGNED TO MEET AASHTO H20 LOADING.
20. GEOTEXTILE FABRIC AROUND WEEPS SHALL BE AASHTO M288 CLASS A OR AN APPROVED EQUAL.
21. PRIOR TO SETTING OF STRUCTURES OR LAYING OF PIPE, ANY UTILITY CROSSINGS SHALL BE EXPOSED TO CONFIRM NO CONFLICTS EXIST WITH PROPOSED INSTALLATION.
22. ALL METAL SURFACES, AFTER BEING CLEANED OF DUST, MILL SCALE & WELD SCALE SHALL BE UNIFORMLY COATED WITH 1 COAT OF RED EPOXY PRIMER #66-1211 AS MFG'D BY TNMEC CO., THE PRIMER SHALL BE APPLIED TO A DRY FILM THICKNESS OF 4-6 MILS. APPLIED AT THE RATE RECOMMENDED BY THE MANUFACTURER (APPROX. 250 SF/GAL), OR METAL SURFACES MAY BE ZINC COATED.
23. CURB CONTRACTOR SHALL HAND FORM AND FINISH GUTTER WITHIN THE INLET THROAT TO THE REAR OR FRONT INLET WALL AT THE TIME FINISHING NORMAL CURB IS ACCOMPLISHED.
24. THE INVERT SHALL HAVE A TROWEL FINISH TO SECURE SMOOTH INVERT SLOPING TO THE OUTLET PIPE.

Storm Structure Construction Notes

STM-3

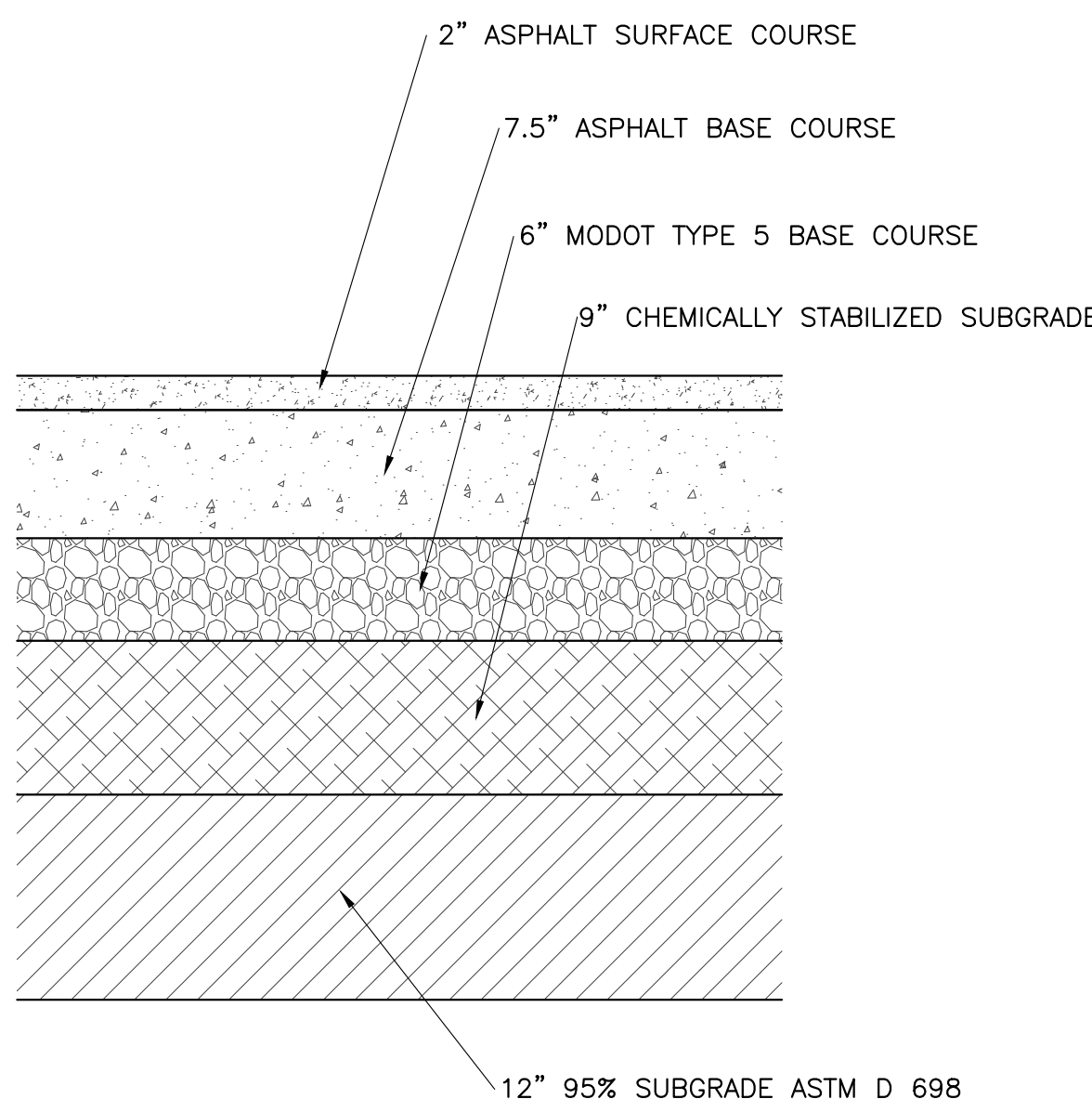
LEE'S SUMMIT MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 1200 SE GREEN STREET | LEE'S SUMMIT, MO 64683

Project: STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
Sheet Name: JUNCTION BOX DETAIL
Drawn By: MJP
Checked By: DL
Date: 04/17
Proj. #: STM-3

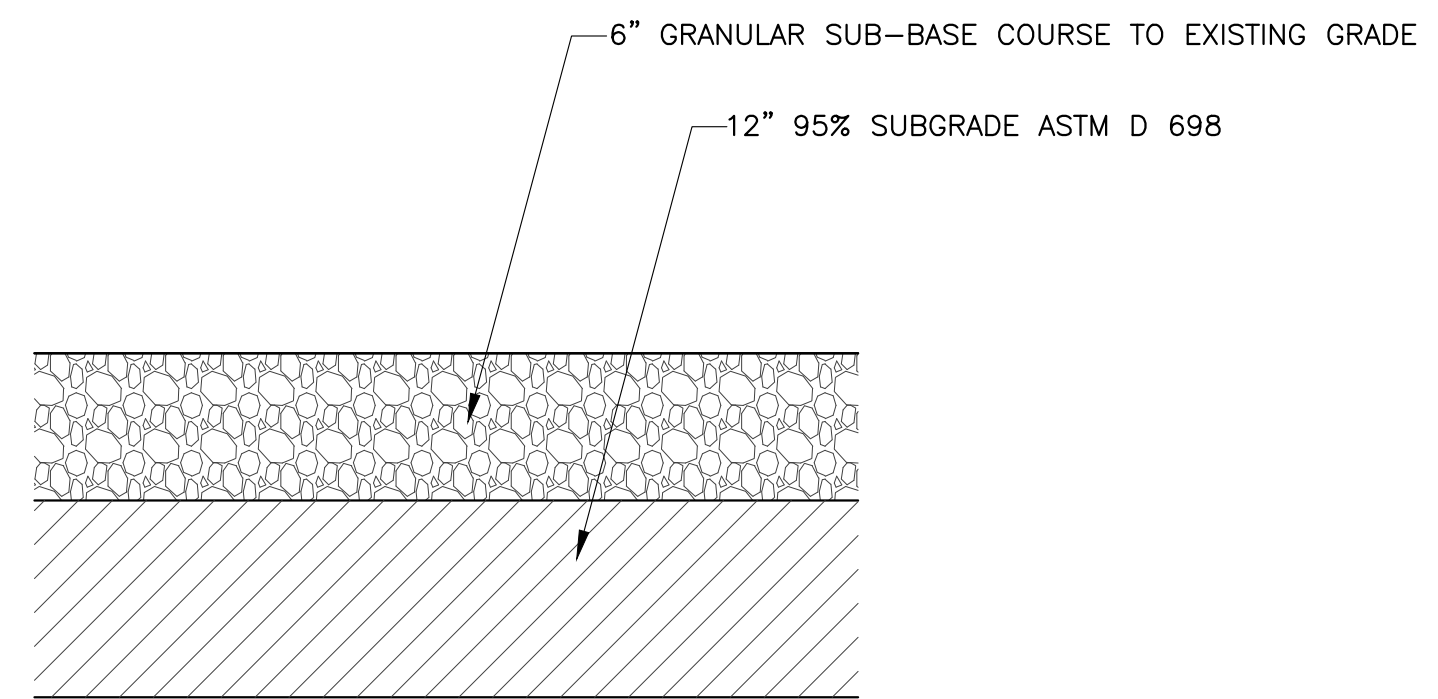


- NOTES:
1. REMOVE ANY EXISTING VEGETATION AND SCARIFY OR BENCH ADJACENT SOILS PRIOR TO PLACING BERM.
 2. BERM MATERIALS MUST BE ADEQUATELY COMPACTED AND STABILIZED.

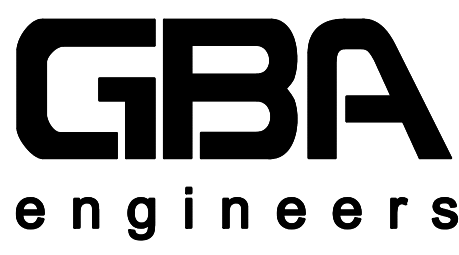
615 **TEMPORARY DIVERSION BERM**
Not to Scale



006 **Permanent Asphalt Section**
Not to Scale

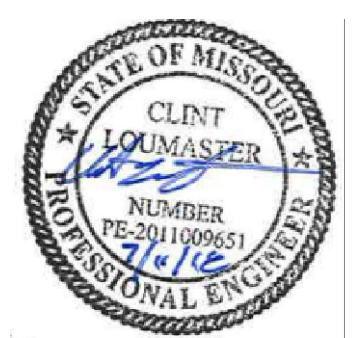


005 **Temporary Granular Fill Section**
Not to Scale



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PROPOSED FACILITY FOR:
THE GROVE AT LEE'S SUMMIT
MASS GRADING AND STORMWATER
MISSOURI HWY 291 & 16TH STREET
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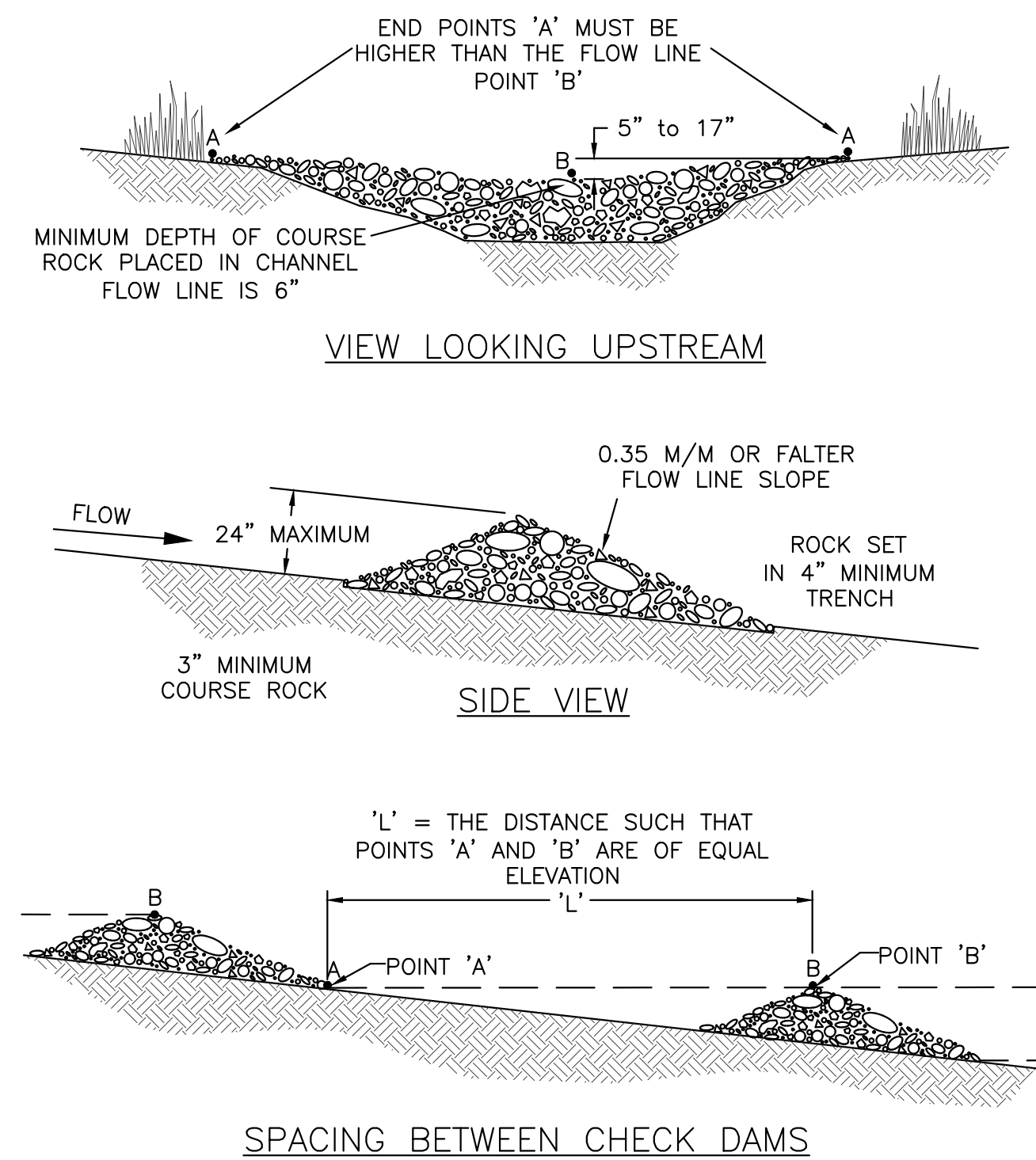
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City Comments 6/14/18

PROJECT NUMBER
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DATE
7/11/18

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SHEET TITLE
CIVIL DETAILS (3)

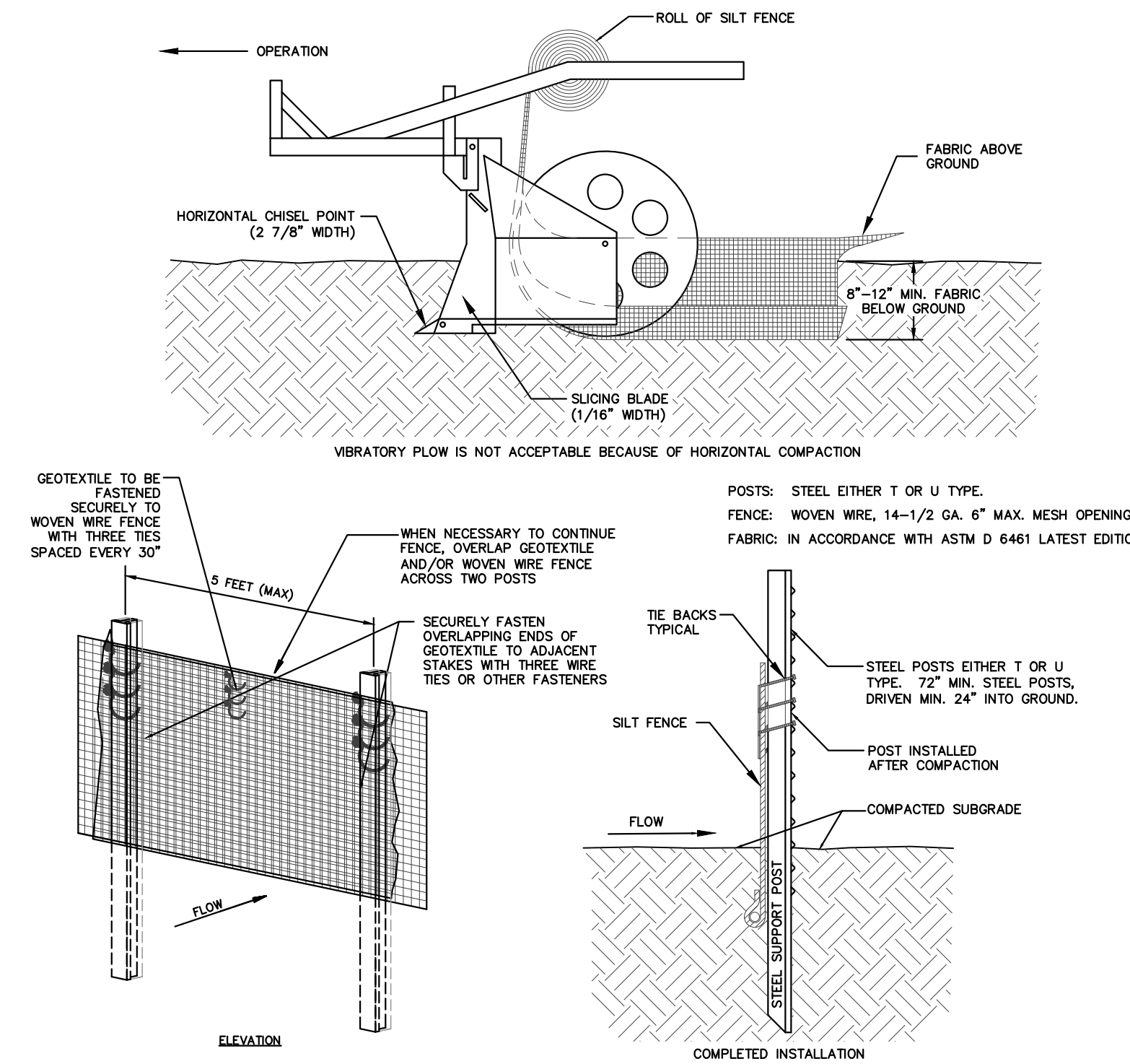
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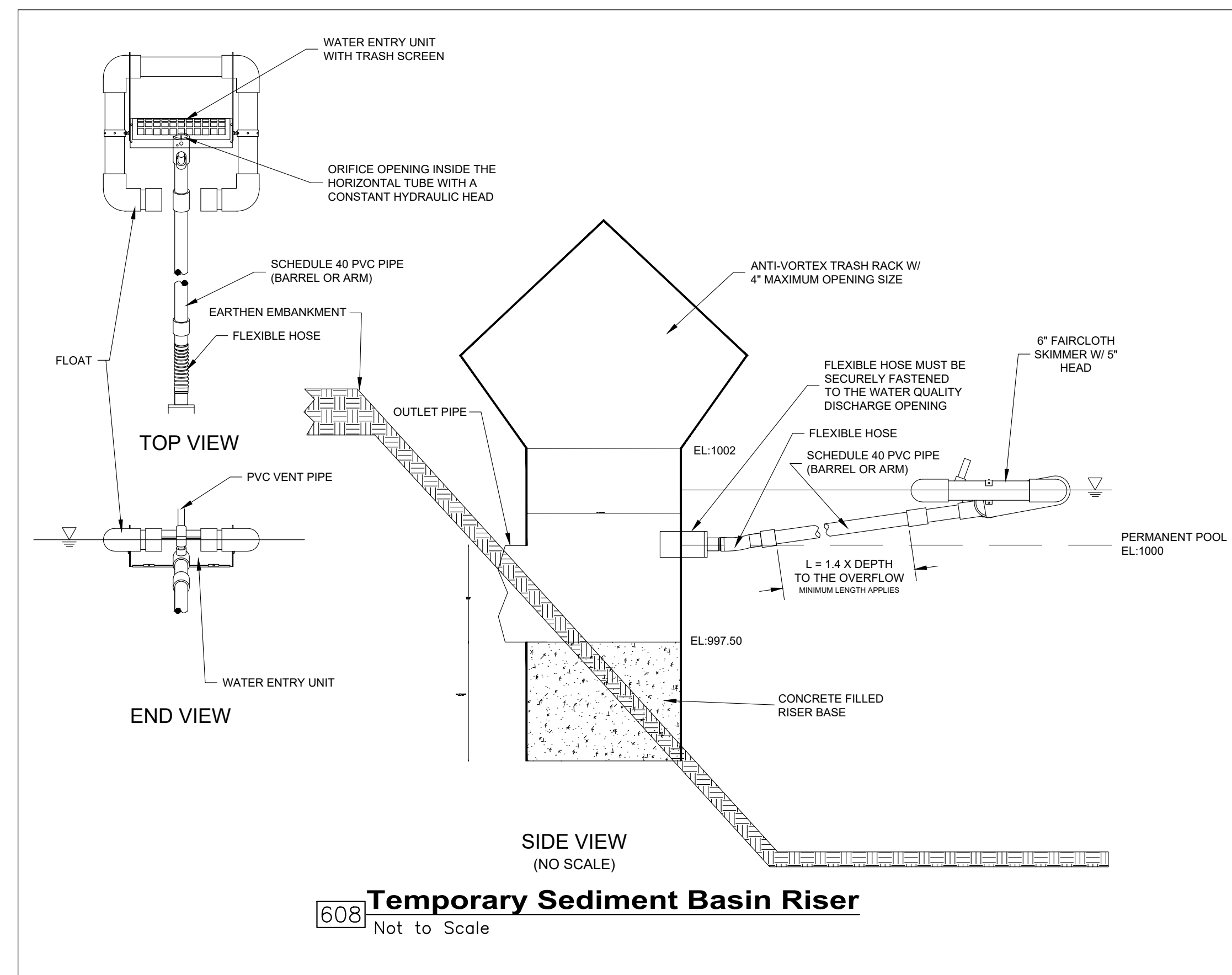


D-50 OF ROCK (MM)	DOWNSTREAM FLOWLINE SLOPE OF STRUCTURE (M / M)					
	0.35	0.30	0.25	0.20	0.15	0.10
75	15	18	20	25	33	48
150	30	36	41	50	66	100

609 Rock Check Dam
 Not to Scale



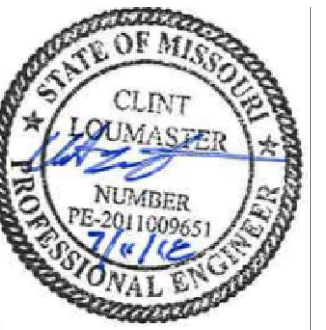
601 Silt Fence
 Not to Scale



608 Temporary Sediment Basin Riser
 Not to Scale

SPECIFICATIONS FOR STATIC SLICING METHOD FOR SILT FENCE INSTALLATION

- STATIC SLICING MUST BE USED TO ANCHOR SILT FENCE FABRIC IN ORDER TO NOT USE THE WIRE BACKING. OTHER FABRIC ANCHORING METHODS ARE NOT ACCEPTABLE SUBSTITUTES WHEN USING THIS DETAILED INSTALLATION.
- SILT FENCE SHALL BE INSTALLED PER ASTM D-6462-03 LATEST EDITION.
 - INSTALL POSTS AT A MAXIMUM OF 5'-0" APART.
 - INSTALL POSTS AT A MINIMUM DEPTH OF 24" ON THE DOWNSTREAM SIDE OF THE SILT FENCE, AND AS CLOSE AS POSSIBLE TO THE FABRIC, ENABLING POSTS TO SUPPORT THE FABRIC FROM UPSTREAM WATER PRESSURE.
 - INSTALL POSTS WITH THE NIPPLES FACING AWAY FROM THE SILT FENCE FABRIC.
 - ATTACH THE FABRIC TO EACH POST WITH THREE TIES, ALL SPACED WITHIN THE TOP 8" OF THE FABRIC. ATTACH EACH TIE DIAGONALLY 45 DEGREES THROUGH THE FABRIC, WITH EACH PUNCTURE AT LEAST 1" VERTICALLY APART. ALSO, EACH TIE SHOULD BE POSITIONED TO HANG ON A POST NIPPLE WHEN TIGHTENED TO PREVENT SAGGING.
 - WRAP APPROXIMATELY 6" OF FABRIC AROUND THE END POSTS AND SECURE WITH 3 TIES.
 - WHEN NECESSARY TO CONTINUE FENCE, OVERLAP GEOTEXTILE ACROSS TWO POSTS.
 - NO MORE THAN 24" OF A 36" FABRIC IS ALLOWED ABOVE GROUND LEVEL.
 - DRIVE POST A MINIMUM OF 24" INTO THE GROUND.
 - THE INSTALLATION SHOULD BE CHECKED AND CORRECTED FOR ANY DEVIATIONS BEFORE COMPACTION. USE A FLAT-BLADED SHOVEL TO TUCK FABRIC DEEPER INTO THE SILT IF NECESSARY.
 - COMPACTION IS VITALLY IMPORTANT FOR EFFECTIVE RESULTS. COMPACT THE SOIL IMMEDIATELY NEXT TO THE SILT FENCE FABRIC WITH THE FRONT WHEEL OF THE TRACTOR, SKID STEER, OR ROLLER EXERTING AT LEAST 60 POUNDS PER SQ. INCH. COMPACT THE UPSTREAM SIDE FIRST, AND THEN EACH SIDE TWICE FOR A TOTAL OF FOUR TRIPS.
 - MAINTENANCE SHALL BE PERFORMED AS NOTED IN THE SWPPP. DEPTH OF ACCUMULATED SEDIMENTS MAY NOT EXCEED 1/2 THE HEIGHT OF THE FENCE. MAINTENANCE CLEANOUT MUST BE CONDUCTED REGULARLY TO PREVENT ACCUMULATED SEDIMENTS FROM REACHING 1/2 THE HEIGHT OF THE FENCE FABRIC ABOVE GRADE.
 - WHEN TWO SECTIONS OF GEOTEXTILE ADJOIN EACH OTHER THEY SHALL BE OVERLAPPED ACROSS TWO POSTS, 60" MIN. AS SHOWN.
 - ADD POST CAPS AS NEEDED BASED ON SITE CONDITIONS AND APPLICABLE AGENCY REQUIREMENTS.

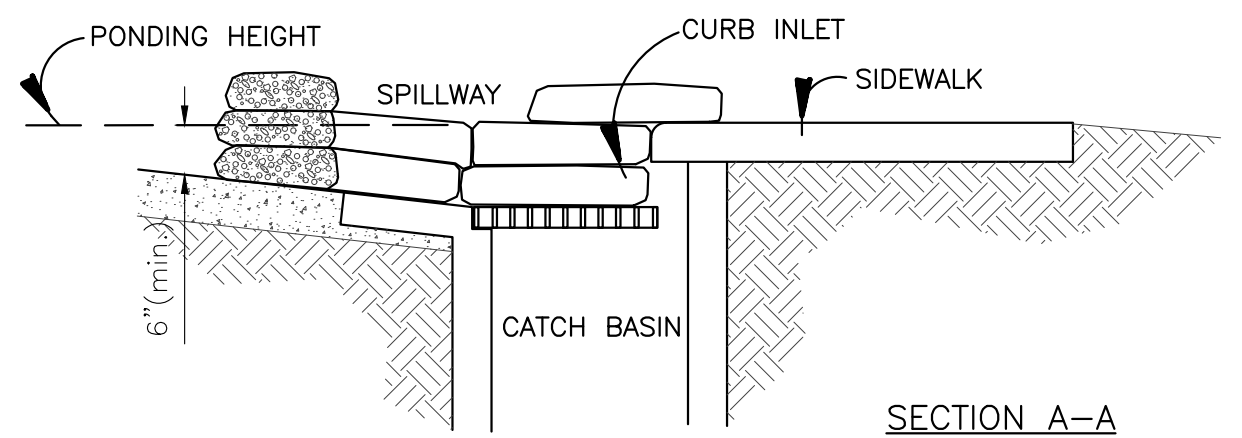
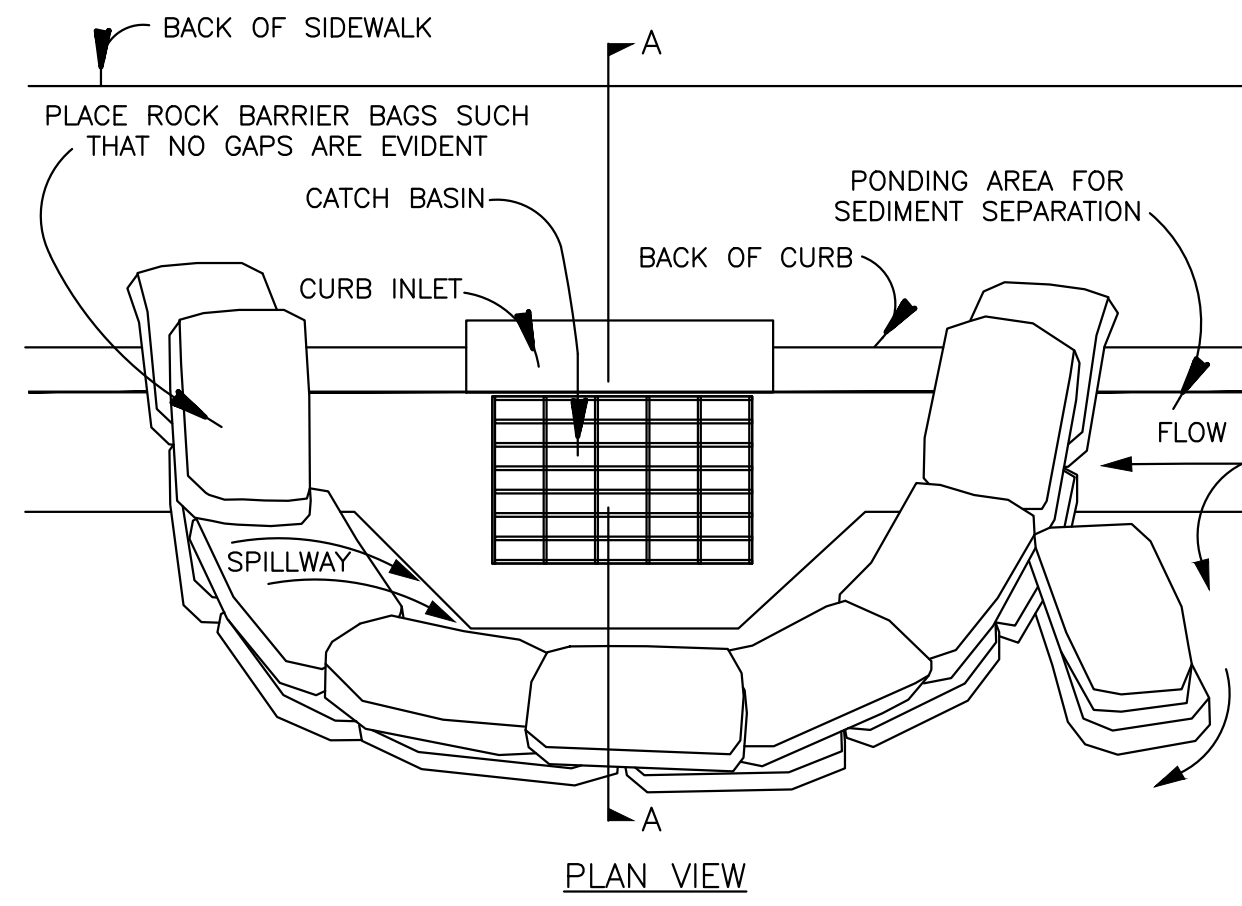


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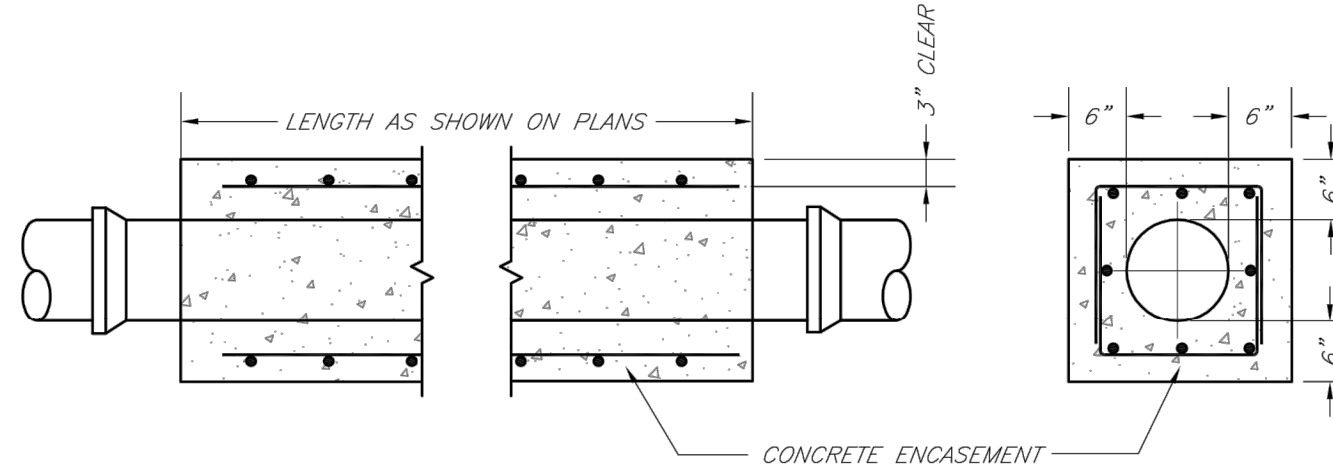
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 DATE
 7/11/18
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 REVIEWED
 SHEET TITLE
 CIVIL DETAILS (4)

SHEET NUMBER
C7.4



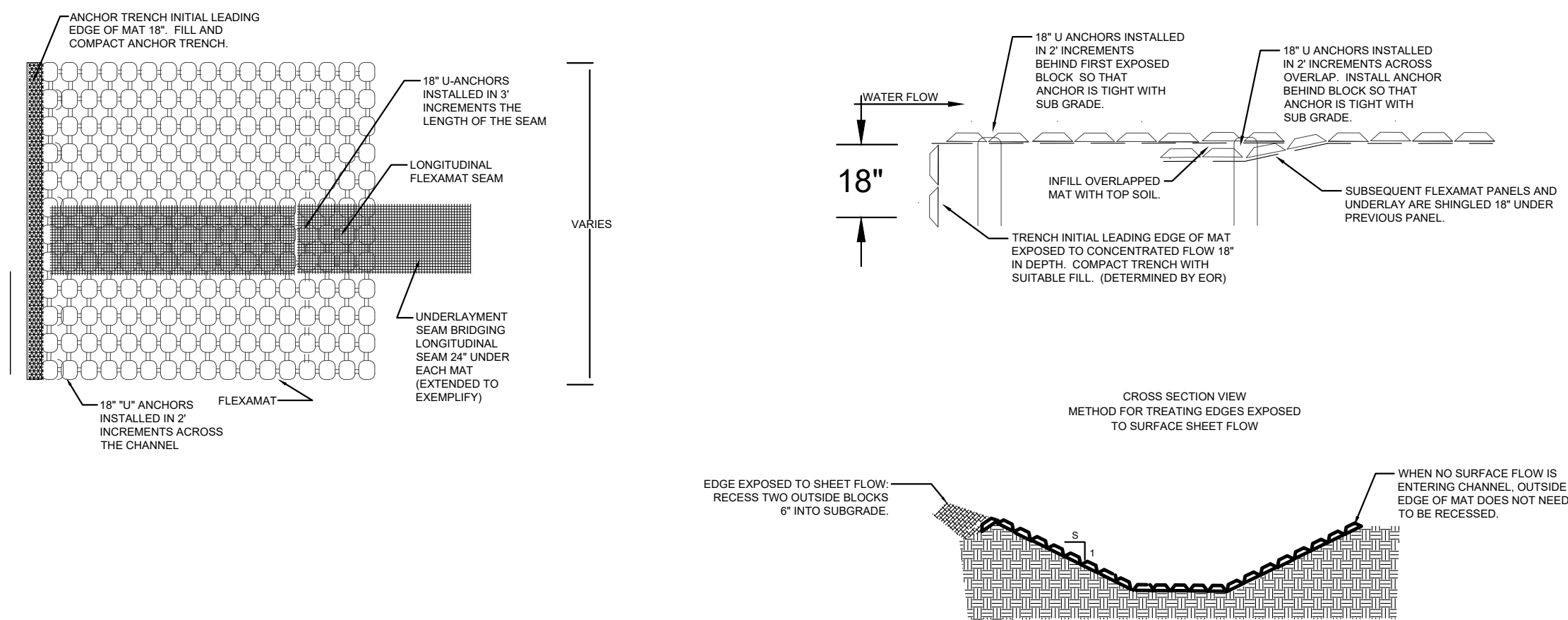
- NOTES:**
1. ALL ROCK BAG BARRIERS MUST AGREE WITH THE NOTES ON PREVIOUS PAGE.
 2. PLACE CURB TYPE ROCK BAG BARRIER ON GENTLY SLOPING STREET, WHERE WATER CAN POND AND ALLOW SEDIMENT TO SEPARATE FROM RUNOFF.
 3. BAGS OF WOVEN GEOTEXTILE FABRIC, FILLED WITH GRAVEL MUST BE LAYERED SUCH THAT NO GAPS ARE EVIDENT.
 4. LEAVE ONE SANDBAG GAP IN THE TOP ROW ON THE SIDE AWAY FROM FLOW, TO PROVIDE A SPILLWAY; OR IN THE CENTER IF PONDING IS NEEDED ON BOTH SIDES.
 5. INSPECT BARRIERS AND REMOVE SEDIMENT AFTER EACH STORM EVENT, SEDIMENT AND GRAVEL MUST BE REMOVED FROM THE TRAVELED WAY IMMEDIATELY

607 Rock Bag Curb Inlet Barrier
Not to Scale



- NOTES:**
1. INTERMEDIATE BELLS SHALL BE ENCASED.
 2. REINFORCING STEEL SHALL BE #4 @ 12" O.C. EACH WAY WITH A MINIMUM REBAR LAP OF 12".
 3. THIS DETAIL IS FOR PIPES 12" AND SMALLER.

LS	LEE'S SUMMIT MISSOURI	Date: 02/13
	PUBLIC WORKS ENGINEERING DIVISION 220 SE GREEN STREET LEE'S SUMMIT, MO 64063	Drawn By: JN
	WATER PIPE ENCASEMENT	Checked By: DL
		FILE: WAT-4
		Rev: 1/14



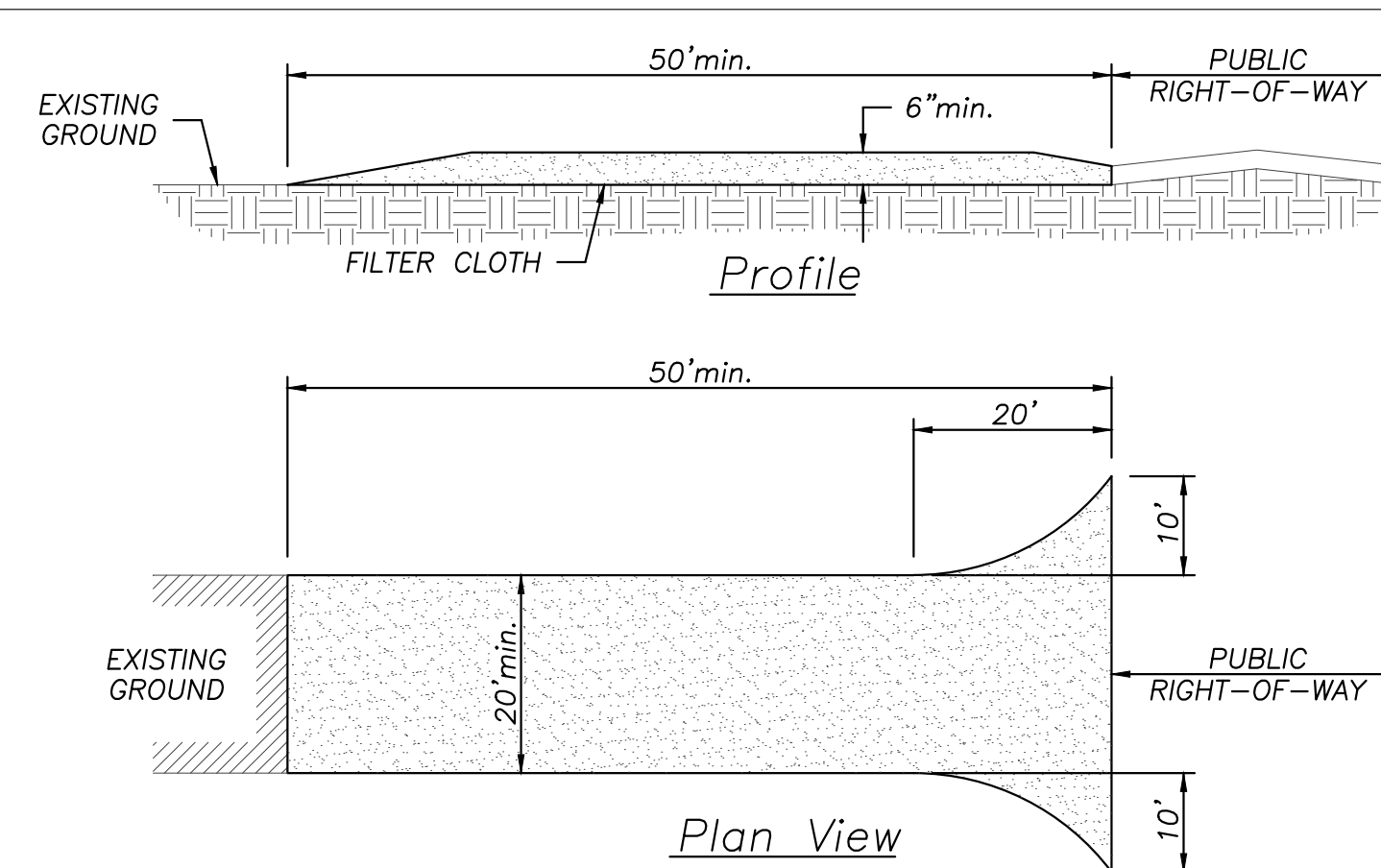
FLEXAMAT INFORMATION

Manufacturer: Molz Enterprises, Inc.
Product Name: Flexamat®
Address: 3153 Madison Road
Cincinnati, Ohio 45209
Telephone: 513-772-MOTZ (6689)
Fax: 513-772-6690
Contact: Matt Molz
Email: Matt@Flexamat.com
Website: www.Flexamat.com

CONSTRUCTION NOTES:

1. GRADE CHANNEL SO THAT WATER WILL FLOW DOWN THE CENTER OF THE CHANNEL AND BE CONTAINED TO THE CHANNEL. ALL SUBGRADE SURFACES PREPARED FOR PLACEMENT OF MATS SHALL BE SMOOTH AND FREE OF ALL ROCKS, STICKS, ROOTS, OTHER PROTRUSIONS, OR DEBRIS OF ANY KIND. THE PREPARED SURFACE SHALL PROVIDE A FIRM UNYIELDING FOUNDATION FOR THE MATS.
2. APPLY SEED DIRECTLY TO THE PREPARED SOIL PRIOR TO FLEXAMAT INSTALLATION. USE SEED PER PROJECT SPECIFICATIONS.
3. INSTALL FLEXAMAT ROLLS. AVAILABLE WIDTHS ARE 4', 5.5', 8', 10', 12' & 16'.
 - 3.1. TO ACHIEVE WIDER WIDTHS, INSTALL MATS ADJACENT TO ONE ANOTHER. BRIDGE LONGITUDINAL SEAM WITH 48" UNDERLAYMENT SEAM. 24" OF UNDERLAYMENT SHALL BE UNDER EACH MAT AND DIRECTLY AGAINST THE SUBGRADE.
 - 3.2. FLIP FLEXAMAT SECTIONS BACK INTO PLACE SO THAT THEY FIT TIGHTLY.
 - 3.3. INSTALL 18" U-ANCHORS IN 3' INCREMENTS THE LENGTH OF THE LONGITUDINAL SEAM. U-ANCHORS CONSIST OF #3 REBAR SHAPED INTO A U SHAPE WITH 18" LEGS.
4. AT THE BEGINNING OF CHANNEL, THE INITIAL LEADING EDGE OF FLEXAMAT EXPOSED TO CONCENTRATED FLOWS SHALL BE EMBEDDED 18" VERTICALLY INTO THE SUB GRADE TO SERVE AS AN ANCHOR TRENCH. THE TRENCH SHALL BE FILLED AND COMPACTED WITH SUITABLE FILL OR OTHER (AS SPECIFIED BY EOR).
5. INSTALL 18" U-ANCHORS IN 2' INCREMENTS BEHIND THE FIRST ROW OF BLOCKS EXTENDING FROM ANCHOR TRENCH. INSTALL ANCHORS DIRECTLY BEHIND BLOCKS.
6. FOR ADDITIONAL SECTIONS OF MAT, OVERLAP THE DOWNSTREAM SECTION 18" WITH UPSTREAM SECTION OF MAT. PRIOR TO INSTALLING OVERLAP, FLIP UPSTREAM MAT BACK 24". EXCAVATE 2.25" OF SOIL 18" FROM END OF UPSTREAM MAT. DOWNSTREAM SECTION IS LAID IN THE SHALLOW TRENCH. LIGHTLY SPREAD TOPSOIL OVER INITIAL EDGE. FLIP END OF UPSTREAM MAT OVER THE SOIL COVERED INITIAL LEADING EDGE OF DOWNSTREAM MAT.
7. INSTALL 18" U-ANCHORS IN 2' INCREMENTS ACROSS THE OVERLAP. INSTALL ANCHORS DIRECTLY BEHIND BLOCKS.
8. OUTSIDE EDGES OF THE MAT EXPOSED TO SURFACE FLOW SHALL HAVE THE OUTSIDE BLOCK RECESSED 6" IN SUBGRADE.

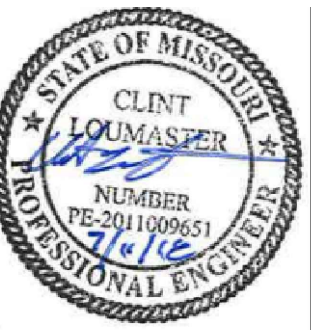
616 Flexamat® Channel - Wider Than 16' Installation Detail
Not to Scale



CONSTRUCTION SPECIFICATIONS:

1. STONE SIZE - USE (2) INCH STONE, OR RECLAIMED OR RECYCLED EQUIVALENT.
2. LENGTH - AS REQUIRED, BUT NOT LESS THAN (50) FEET.
3. THICKNESS - NOT LESS THAN SIX (6) INCHES.
4. WIDTH - TWENTY (20) FOOT MINIMUM, BUT NOT LESS THAN THE FULL WIDTH AT POINTS WHERE INGRESS OR EGRESS OCCURS.
5. FILTER CLOTH - WILL BE PLACED OVER THE ENTIRE AREA PRIOR TO PLACING OF STONE.
6. SURFACE WATER - ALL SURFACE WATER FLOWING OR DIVERTED TOWARD CONSTRUCTION ENTRANCES SHALL BE PIPED ACROSS THE ENTRANCE. IF PIPING IS IMPRACTICAL, A MOUNTABLE BERM WITH 3:1 SLOPES WILL BE PERMITTED.
7. MAINTENANCE - THE ENTRANCE SHALL BE MAINTAINED IN A CONDITION WHICH WILL PREVENT TRACKING OR FLOWING OF SEDIMENT ONTO PUBLIC RIGHTS-OF-WAY. THIS MAY REQUIRE PERIODIC TOP DRESSING WITH ADDITIONAL STONE AS CONDITIONS DEMAND AND REPAIR AND/OR CLEANOUT OF ANY MEASURES USED TO TRAP SEDIMENT. ALL SEDIMENT SPILLED, DROPPED, WASHED OR TRACKED ONTO PUBLIC RIGHTS-OF-WAY MUST BE REMOVED IMMEDIATELY.
8. WASHING - WHEELS SHALL BE CLEANED TO REMOVE SEDIMENT PRIOR TO ENTRANCE ONTO PUBLIC RIGHTS-OF-WAY. WHEN WASHING IS REQUIRED, IT SHALL BE DONE ON AN AREA STABILIZED WITH STONE AND WHICH DRAINS INTO AN APPROVED SEDIMENT TRAPPING DEVICE.
9. PERIODIC INSPECTION AS NEEDED MAINTENANCE SHALL BE PROVIDED AFTER EACH RAIN.

600 Temporary Construction Entrance
Not to Scale



Clint Loumaster
Professional Engineer
License No. PE-2011009651

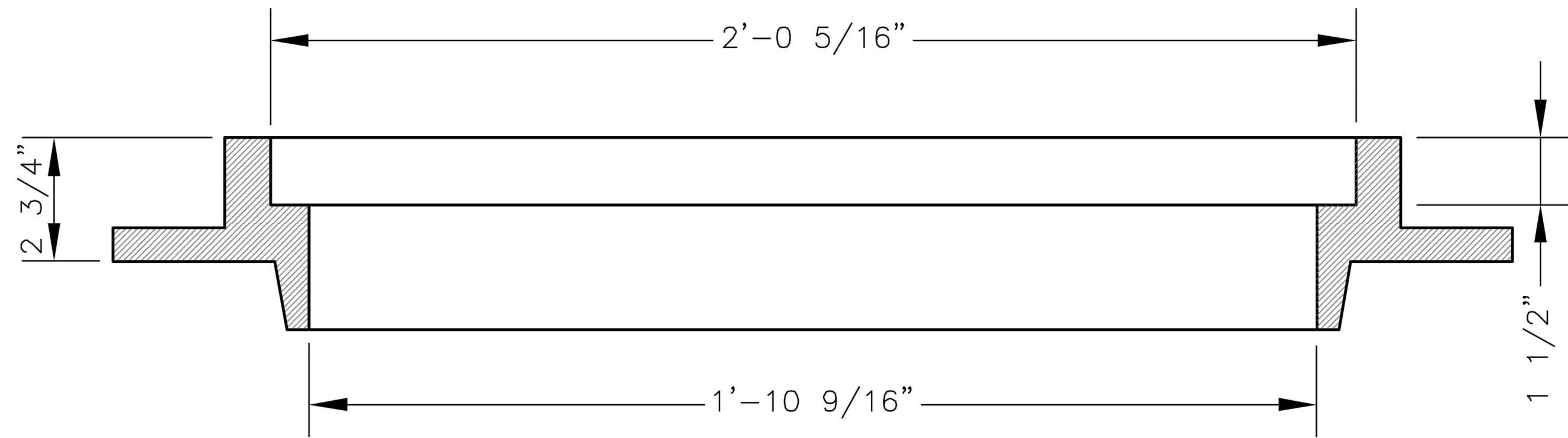
REVISION
City Comments 6/14/18

PROJECT NUMBER
13958.00
DATE
7/11/18

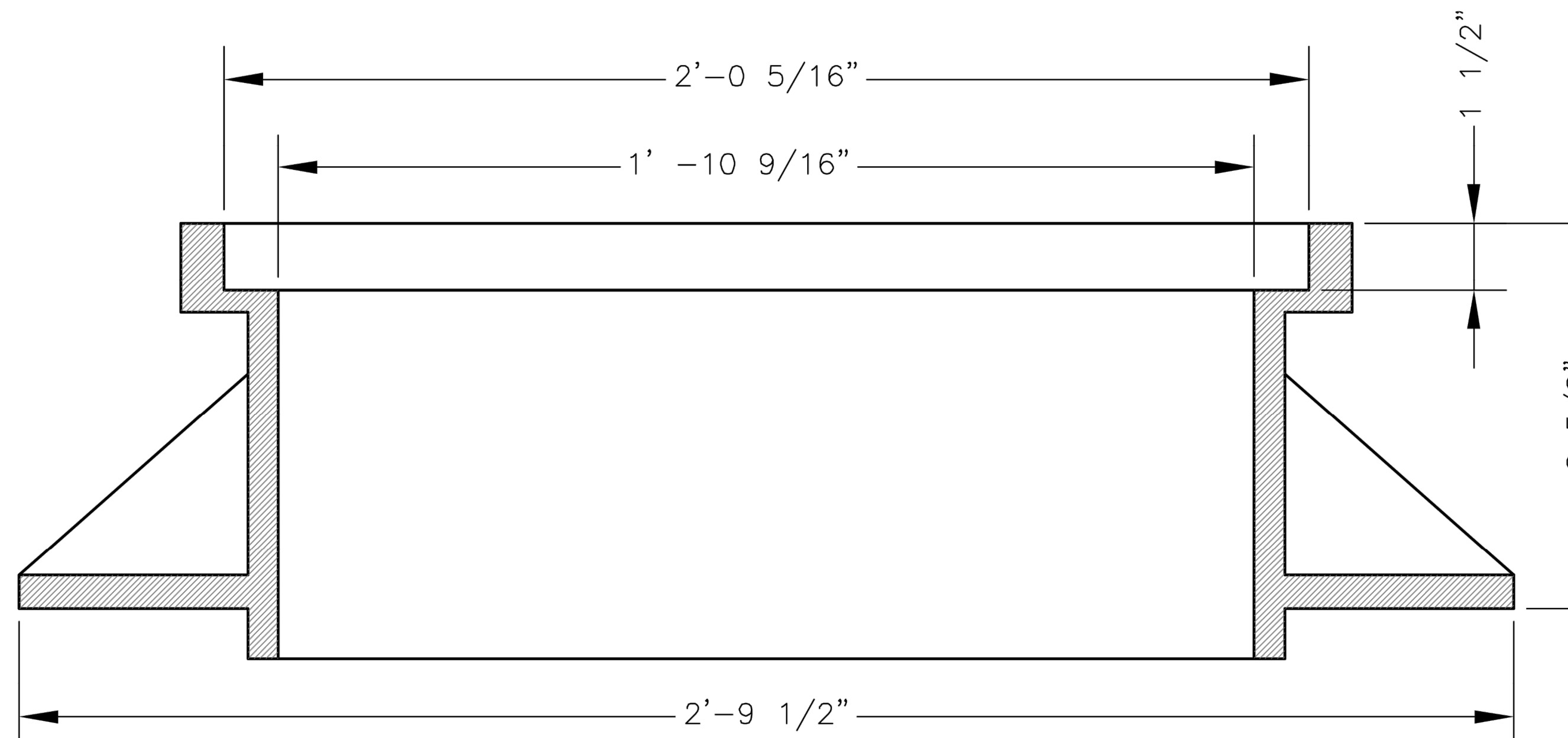
DESIGNED
DRAWN
REVIEWED
SHEET TITLE
CIVIL DETAILS (S)

SHEET NUMBER
C7.5

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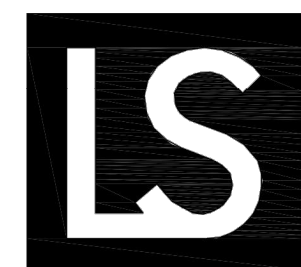


SLAB MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS103A
MINIMUM WEIGHT = 145 LB



STANDARD 24" MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS101A
MINIMUM WEIGHT = 250 LB

*COVER AND FRAME MODEL INFORMATION REFER TO THE STORMWATER APPROVED PRODUCTS LIST.

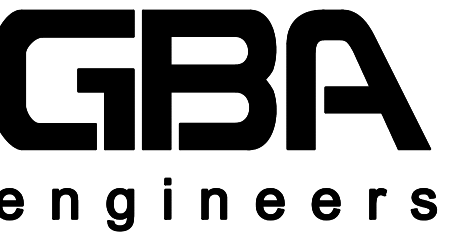


LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

STORM MANHOLE FRAME DETAIL

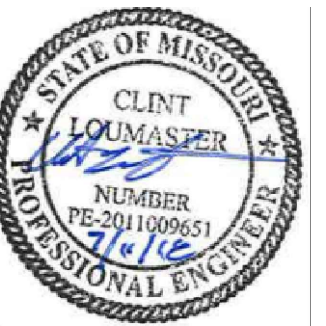
Date: 04/17
Drawn By: MJF
Checked By: DL

STM-7



9801 Renner Boulevard
Lenexa, Kansas 66219
913.492.0400
www.gbateam.com

PROPOSED FACILITY FOR:
THE GROVE AT LEE'S SUMMIT
 MASS GRADING AND STORMWATER
 MISSOURI HWY 291 & 16TH STREET
 LEE'S SUMMIT, MISSOURI



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION

City Comments 6/14/18

PROJECT NUMBER
13958.00

DATE
7/11/18

DESIGNED

DRAWN

REVIEWED

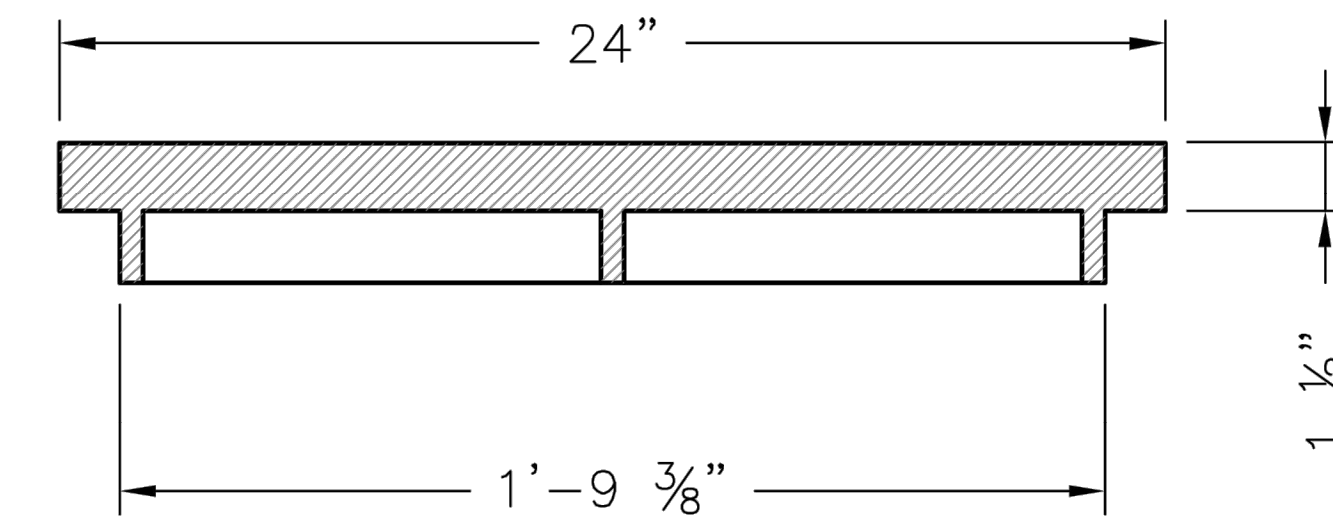
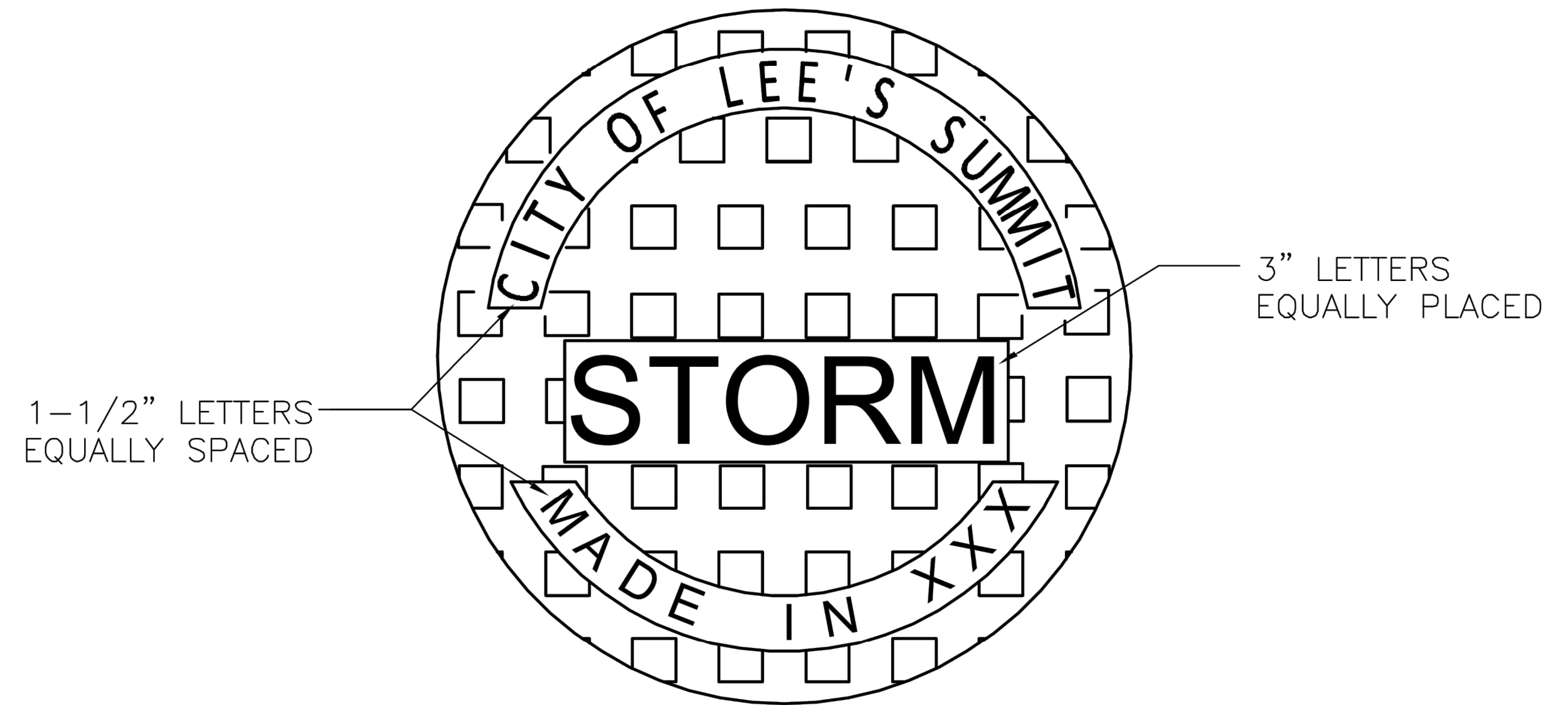
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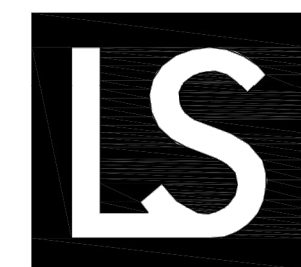
C7.6

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Engineering CO# 000133
Architecture CO# 000212
Land Surveying CO# 000059



STANDARD 24" MANHOLE COVER
MINIMUM WEIGHT = 160 LB
NOTE: PICK HOLES NOT SHOWN

*COVER AND FRAME MODEL INFORMATION REFER TO THE STORMWATER APPROVED PRODUCT LIST.



LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

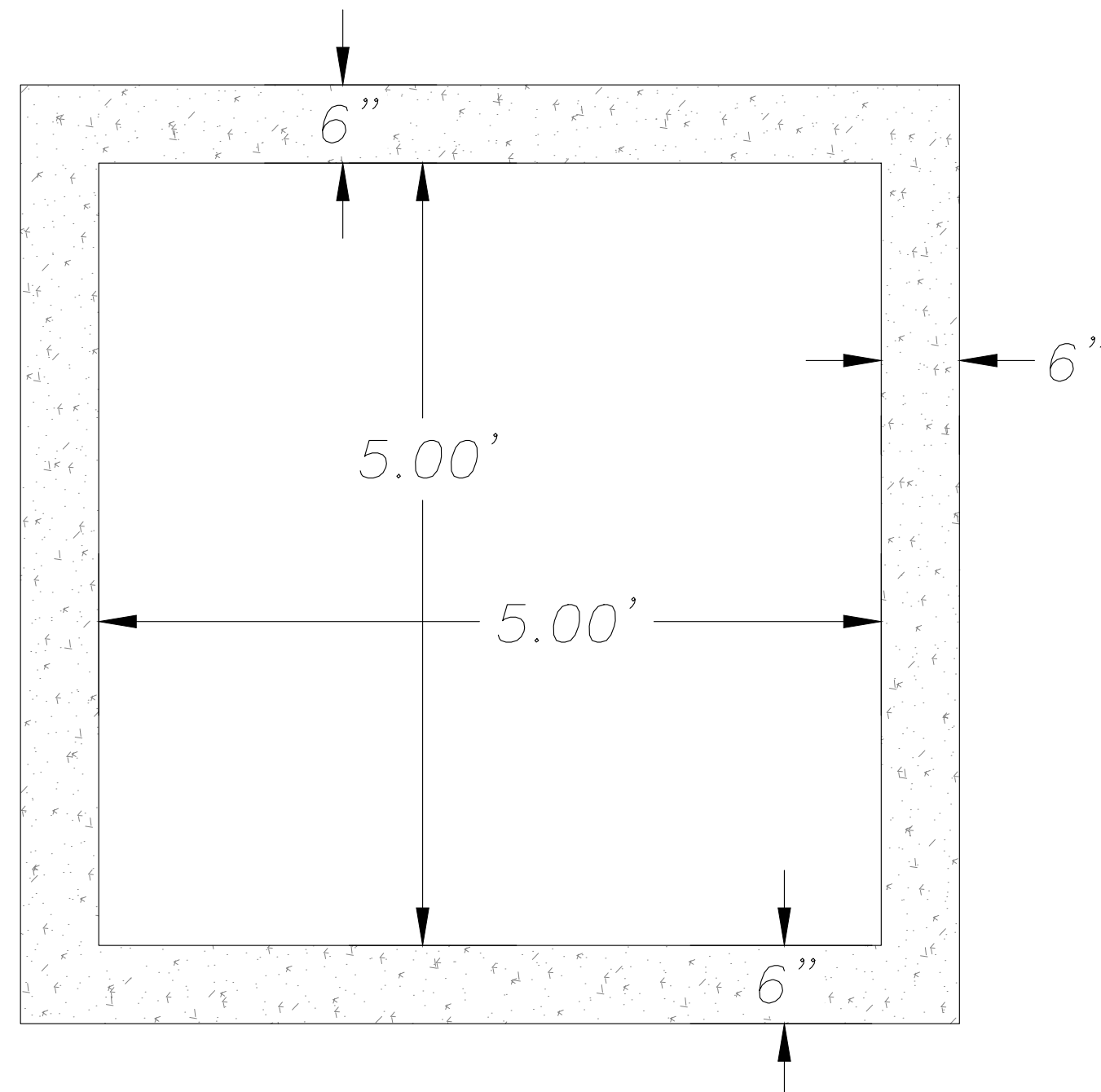
STORM MANHOLE COVER DETAIL

Date: 04/17
Drawn By: MJF
Checked By: DL

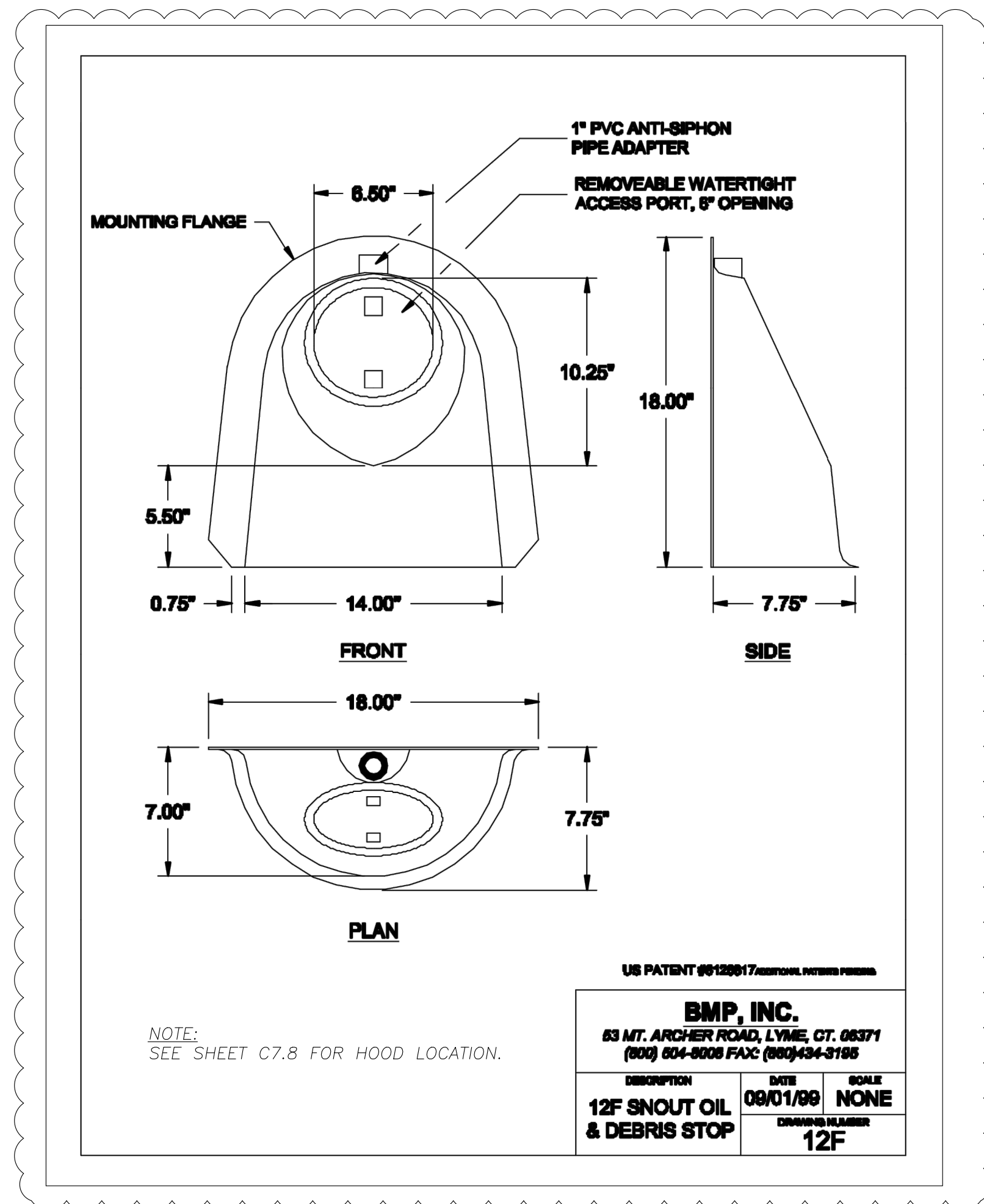
STM-6

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NOTE:
 CONTRACTOR SHALL SUBMIT REINFORCED CONCRETE BOX SHOP DRAWINGS TO BOTH THE ENGINEER AND THE CITY FOR REVIEW. ULTIMATE APPROVAL SHALL BE AT THE DISCRETION OF THE ENGINEER. SHOP DRAWINGS SHALL MEET REQUIREMENTS SET FORTH IN SECTION 5700 OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.



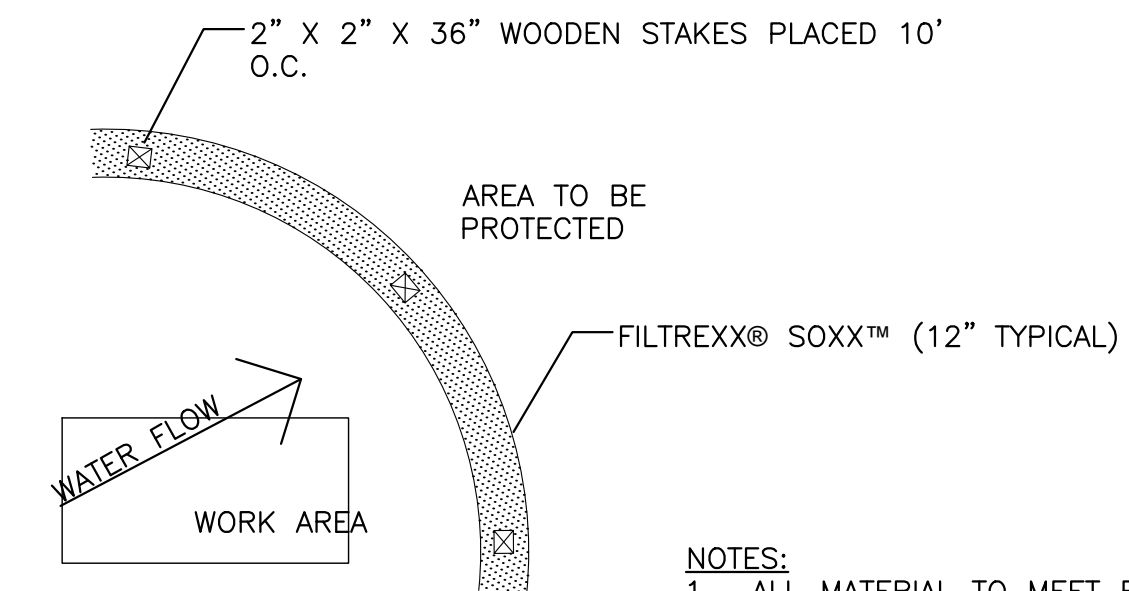
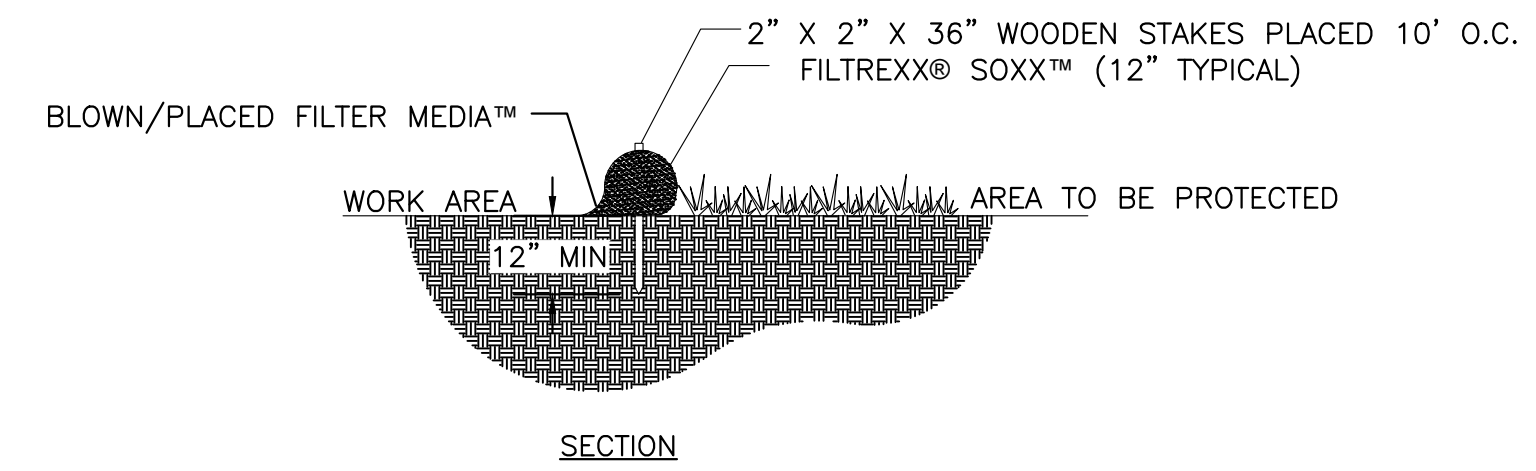
5' X 5' REINFORCED CONCRETE BOX



US PATENT #6120017

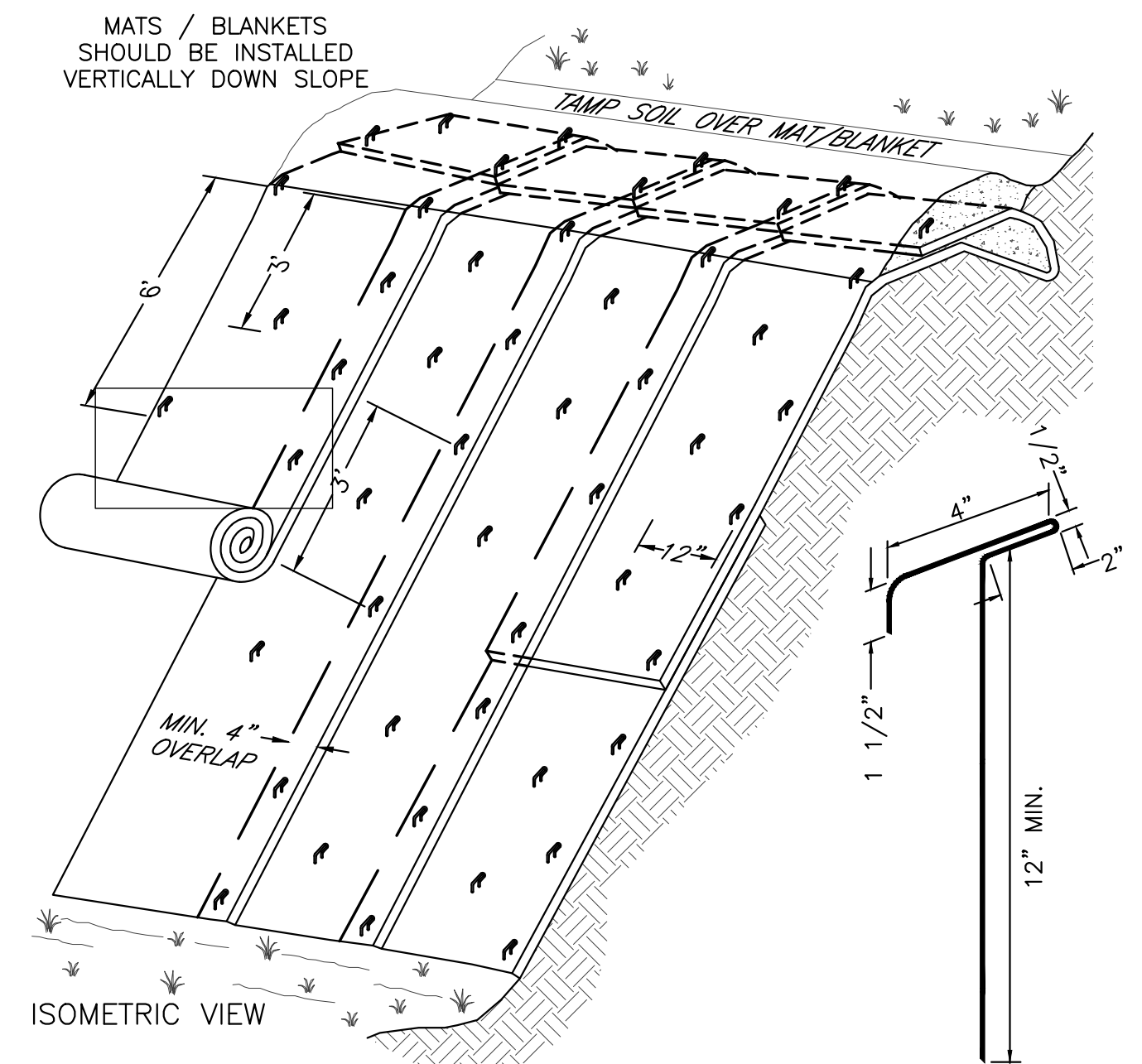
BMP, INC.
 63 MT. ARCHER ROAD, LYME, CT, 06371
 (800) 604-8008 FAX: (860) 434-9106

DESCRIPTION	DATE	SCALE
12F SNOOT OIL & DEBRIS STOP	06/01/09	NONE
		12F



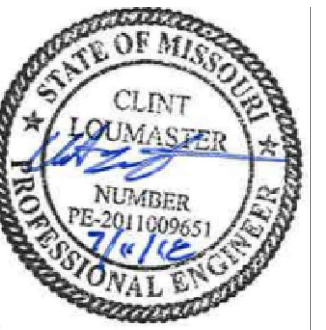
- NOTES:**
1. ALL MATERIAL TO MEET FILTREXX® SPECIFICATIONS.
 2. FILTER MEDIA™ FILL TO MEET APPLICATION REQUIREMENTS.
 3. COMPOST MATERIAL TO BE DISPERSED ON SITE, AS DETERMINED BY ENGINEER.

620 FILTREXX® SOXX SEDIMENT CONTROL
 Not to Scale



- NOTES:**
1. SLOPE SURFACE SHALL BE FREE OF ROCKS CLODS, STICKS AND GRASS. MATS/BLANKETS SHALL HAVE GOOD SOIL CONTACT.
 2. APPLY PERMANENT SEEDING BEFORE PLACING BLANKETS.
 3. LAY BLANKETS LOOSELY AND STAKE OR STAPLE TO MAINTAIN DIRECT CONTACT WITH THE SOIL. DO NOT STRETCH.

602 Slope Installation Erosion Blanket/Turf Mats
 Not to Scale



Clint Loumaster
 Professional Engineer
 License No. PE-2011009651

REVISION
 City Comments 6/14/18

PROJECT NUMBER
 13958.00
 DATE
 7/11/18

DESIGNED

DRAWN

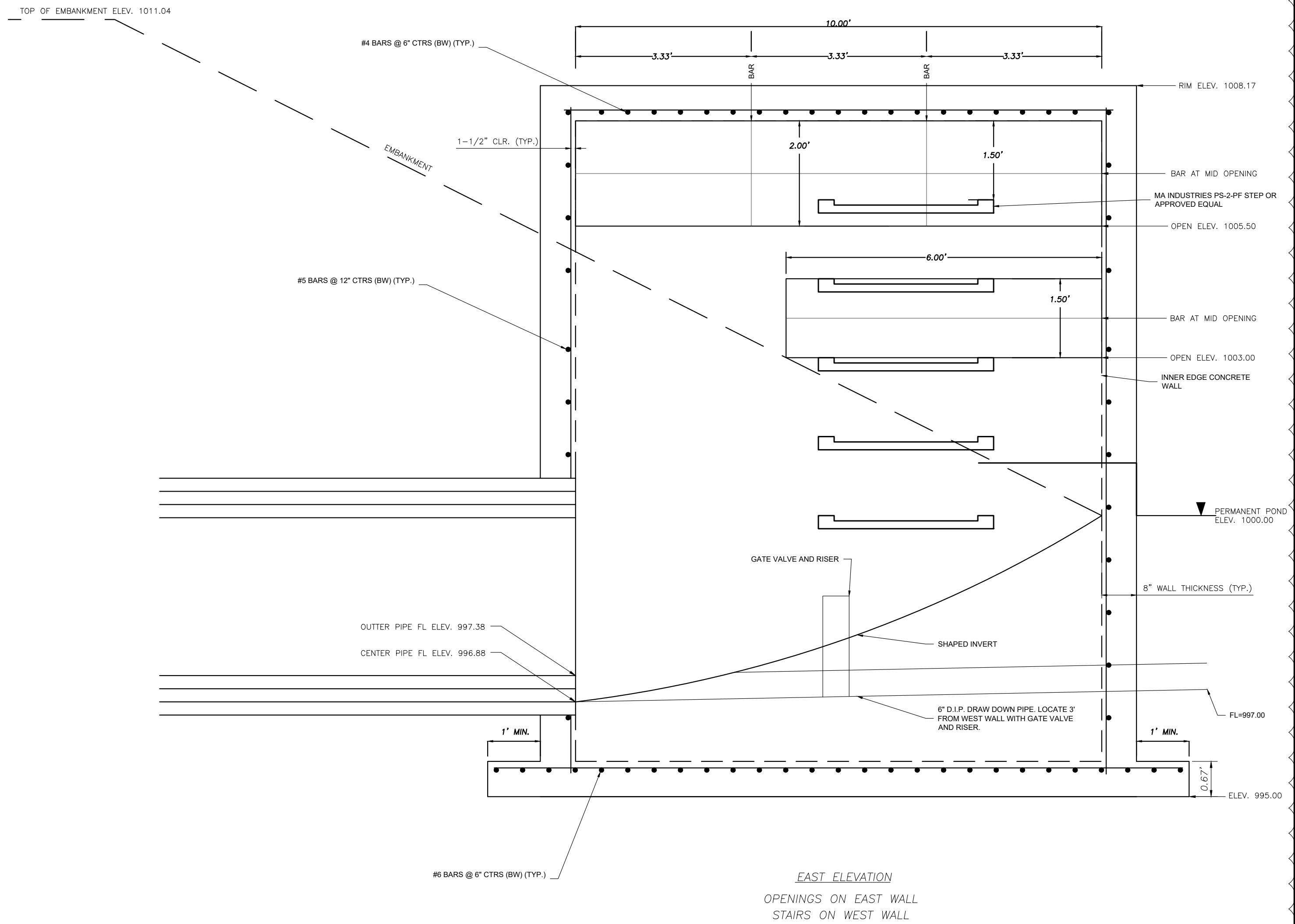
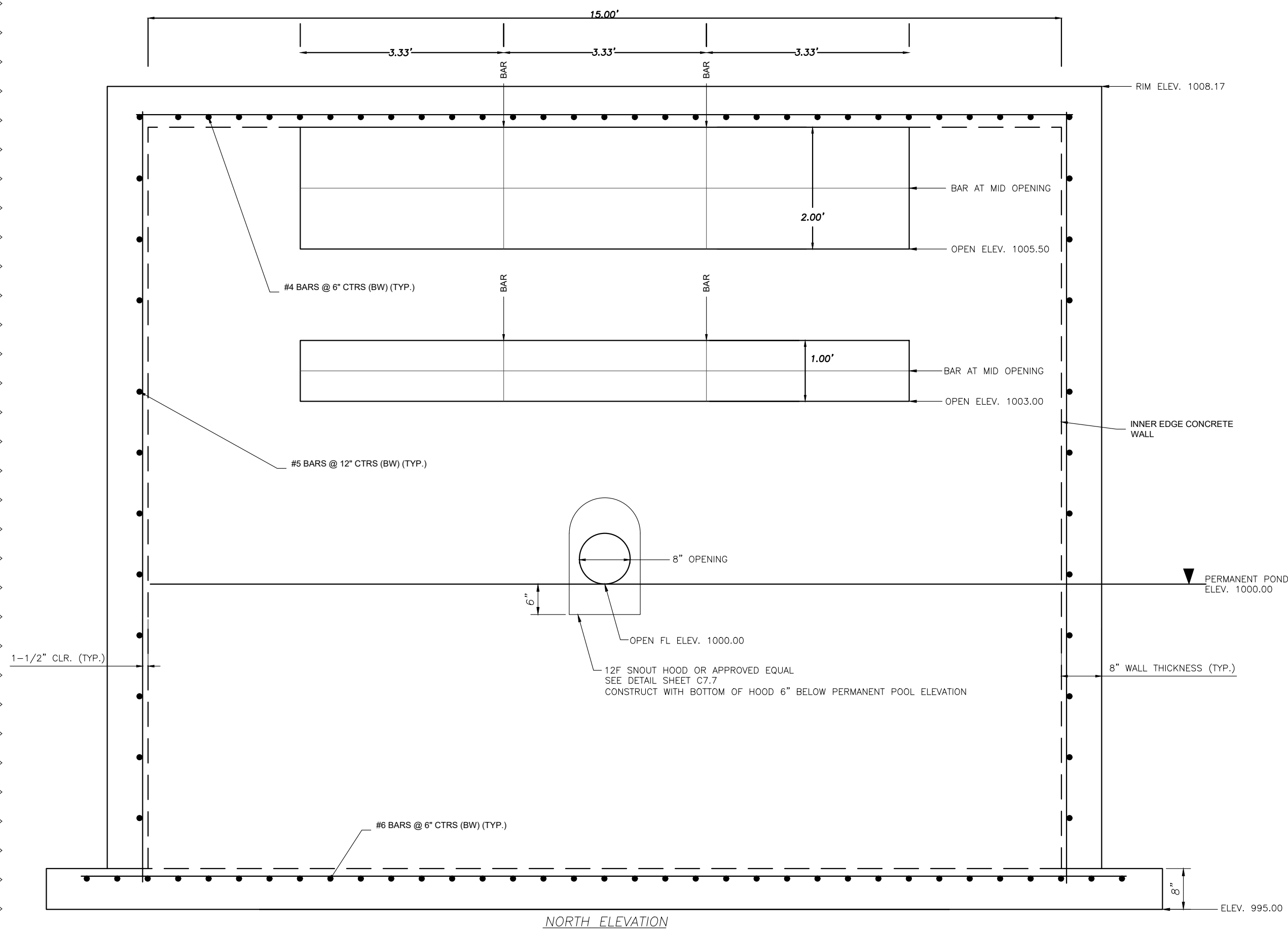
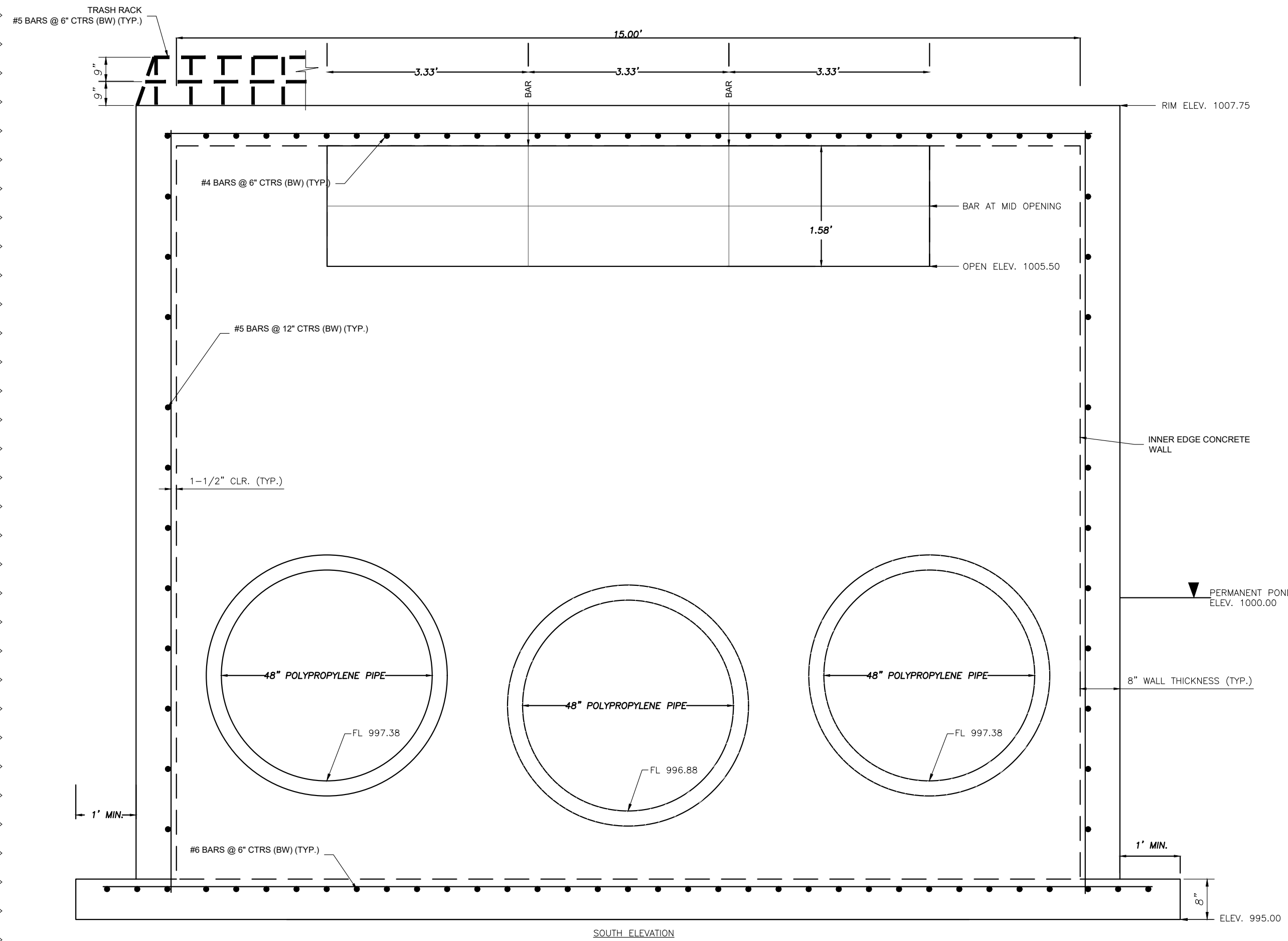
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SHEET NUMBER

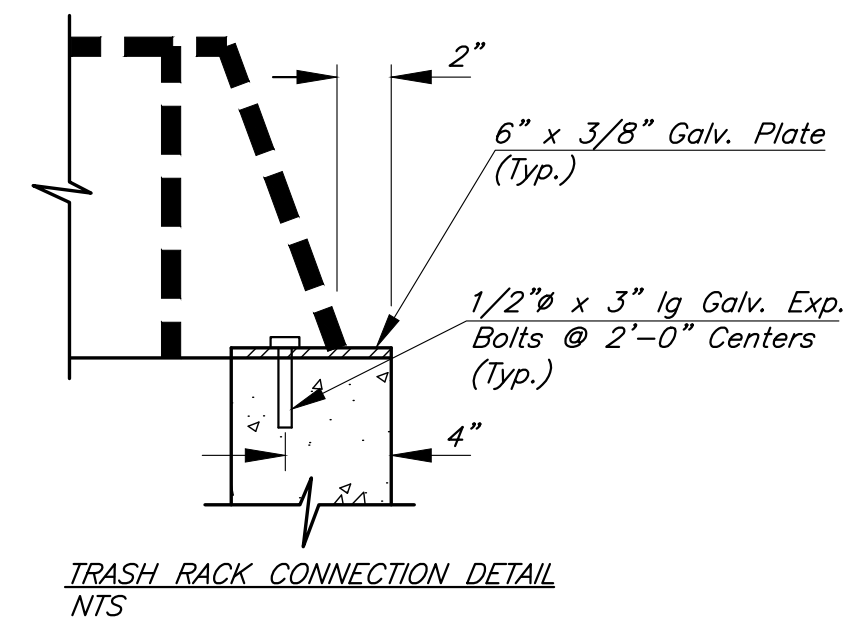
C7.7

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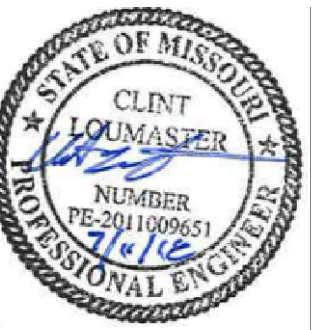
NOTES:

1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS TO ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.
2. WATER STOPS AT ALL JOINT LOCATIONS.
3. STRUCTURE AND CONNECTION TO OUTLET PIPES SHALL BE WATERTIGHT.
4. SEE STORM STRUCTURE NOTES ON SHEET C7.3.
5. THERE ARE NO OPENINGS ON STRUCTURE WEST WALL.



RETENTION POND OUTLET STRUCTURE

318 Not to Scale



Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION
City Comments 6/14/18

PROJECT NUMBER
13958.00

DATE
7/11/18

DESIGNED

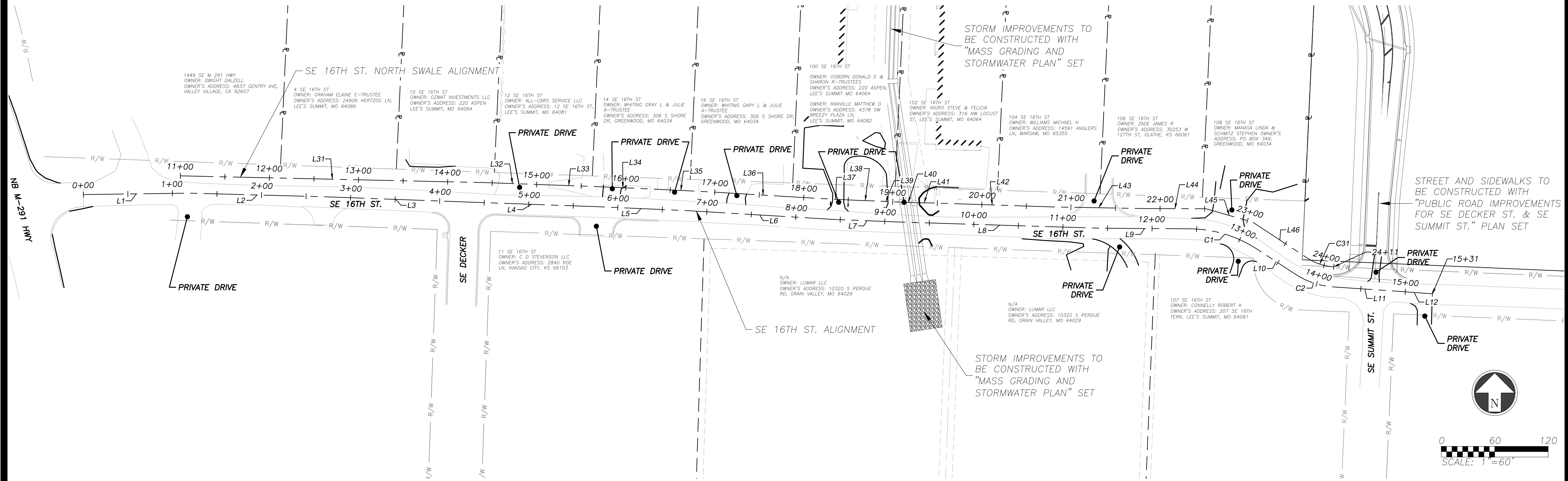
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REVIEWED

SHEET TITLE
CIVIL DETAILS (8)

SHEET NUMBER
C7.8

G:\13958\Civil_3D\Production Drawings\16th Street Widening\021730-SHFS-2234-16TH-PLN-ROAD.dwg Layout: ALIGNMENT DETAILS --- Friday June 08, 2018, 12:55:22pm --- Copyright 2018, George Butler Associates, Inc.



SE 16TH ST.									
NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	START STATION	START NORTHING	START EASTING	END STATION	END NORTHING	END EASTING
L1	118.86		N89° 14' 54.57"E	0+00.00	992522.26	2824811.14	1+18.86	992523.82	2824930.00
L2	152.40		S88° 28' 15.50"E	1+18.86	992523.82	2824930.00	2+71.26	992519.75	2825082.34
L3	159.05		S87° 53' 32.44"E	2+71.26	992519.75	2825082.34	4+30.31	992513.90	2825241.28
L4	145.44		S87° 57' 05.94"E	4+30.31	992513.90	2825241.28	5+75.76	992508.71	2825386.63
L5	100.52		S87° 29' 58.65"E	5+75.76	992508.71	2825386.63	6+76.27	992504.32	2825487.05
L6	166.60		S86° 34' 25.50"E	6+76.27	992504.32	2825487.05	8+42.87	992494.36	2825653.36
L7	74.18		S87° 42' 47.56"E	8+42.87	992494.36	2825653.36	9+17.06	992491.40	2825727.48
L8	223.65		S88° 14' 05.13"E	9+17.06	992491.40	2825727.48	11+40.70	992484.51	2825951.02
L9	101.40		S89° 37' 11.41"E	11+40.70	992484.51	2825951.02	12+42.11	992483.84	2826052.42
C1	80.20	140.00	S73° 12' 33.56"E	12+42.11	992483.84	2826052.42	13+22.30	992460.99	2826128.15
L10	50.96		S56° 47' 55.71"E	13+22.30	992460.99	2826128.15	13+73.26	992433.08	2826170.80
C2	46.13	90.00	S71° 28' 53.90"E	13+73.26	992433.08	2826170.80	14+19.39	992418.59	2826214.06
L11	70.25		S86° 09' 52.09"E	14+19.39	992418.59	2826214.06	14+89.64	992413.89	2826284.15
L12	40.91		S85° 49' 01.85"E	14+89.64	992413.89	2826284.15	15+30.55	992410.91	2826324.95

SE 16TH ST. NORTH SWALE									
NUMBER	LENGTH	RADIUS	LINE/CHORD DIRECTION	START STATION	START NORTHING	START EASTING	END STATION	END NORTHING	END EASTING
L31	341.41		S88° 43' 59.32"E	11+00.00	992543.25	2824920.00	14+41.41	992535.70	2825261.33
L32	62.75		S87° 57' 05.93"E	14+41.41	992535.70	2825261.33	15+04.16	992533.46	2825324.04
L33	63.52		S87° 57' 05.95"E	15+04.16	992533.46	2825324.04	15+67.69	992531.19	2825387.53
L34	58.23		S87° 29' 58.65"E	15+67.69	992531.19	2825387.53	16+25.92	992528.65	2825445.70
L35	71.83		S87° 09' 48.61"E	16+25.92	992528.65	2825445.70	16+97.75	992525.09	2825517.45
L36	113.00		S86° 31' 12.30"E	16+97.75	992525.09	2825517.45	18+10.75	992518.23	2825630.24
L37	50.13		S87° 09' 58.14"E	18+10.75	992518.23	2825630.24	18+60.88	992515.76	2825680.31
L38	16.34		S87° 58' 46.29"E	18+60.88	992515.76	2825680.31	18+77.22	992515.18	2825696.63
L39	29.94		S87° 25' 24.77"E	18+77.22	992515.18	2825696.63	19+07.16	992513.83	2825726.55
L40	20.34		S87° 41' 17.50"E	19+07.16	992513.83	2825726.55	19+27.50	992513.01	2825746.87
L41	15.53		S89° 32' 14.77"E	19+27.50	992513.01	2825746.87	19+43.03	992512.89	2825762.40
L42	137.19		S88° 06' 39.16"E	19+43.03	992512.89	2825762.40	20+80.21	992508.37	2825899.51
L43	102.01		S88° 58' 20.34"E	20+80.21	992508.37	2825899.51	21+82.22	992506.54	2826001.50
L44	69.06		S89° 52' 30.85"E	21+82.22	992506.54	2826001.50	22+51.29	992506.39	2826070.57
L45	55.02		S73° 58' 33.72"E	22+51.29	992506.39	2826070.57	23+06.31	992491.20	2826123.45
L46	72.57		S56° 38' 19.45"E	23+06.31	992491.20	2826123.45	23+78.88	992451.29	2826184.06
C31	32.21	62.50	S71° 24' 05.77"E	23+78.88	992451.29	2826184.06	24+11.09	992441.13	2826214.25

For Reference Only

Clint Loumaster
Professional Engineer
License No. PE-2011009651

REVISION

PROJECT NUMBER
13958.00
DATE
4/XX/18

DESIGNED

DRAWN

REVIEWED

SHEET TITLE

STREET ALIGNMENT PLAN

SHEET NUMBER

C8.0