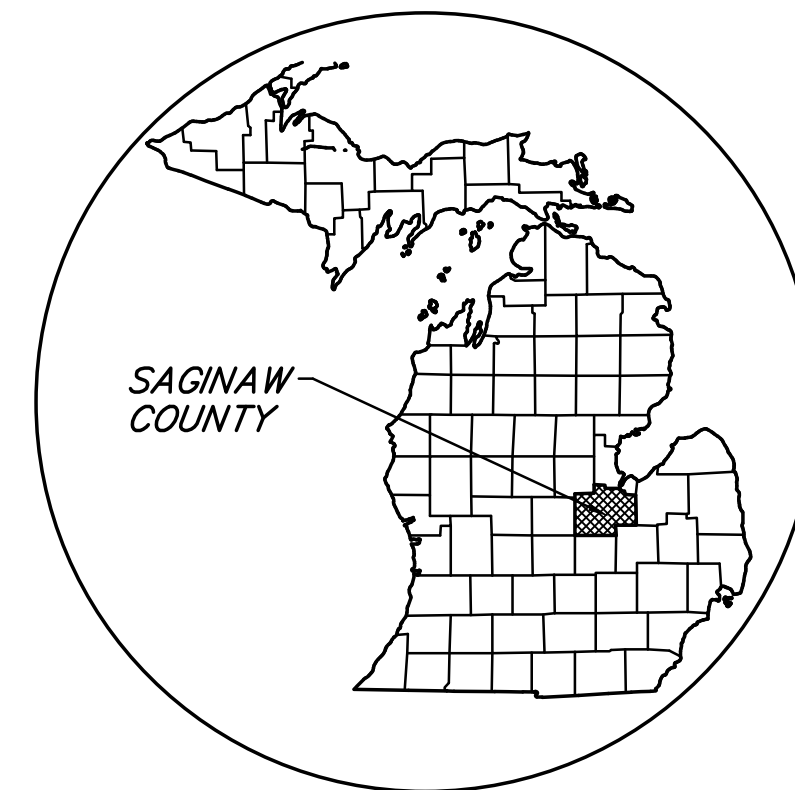


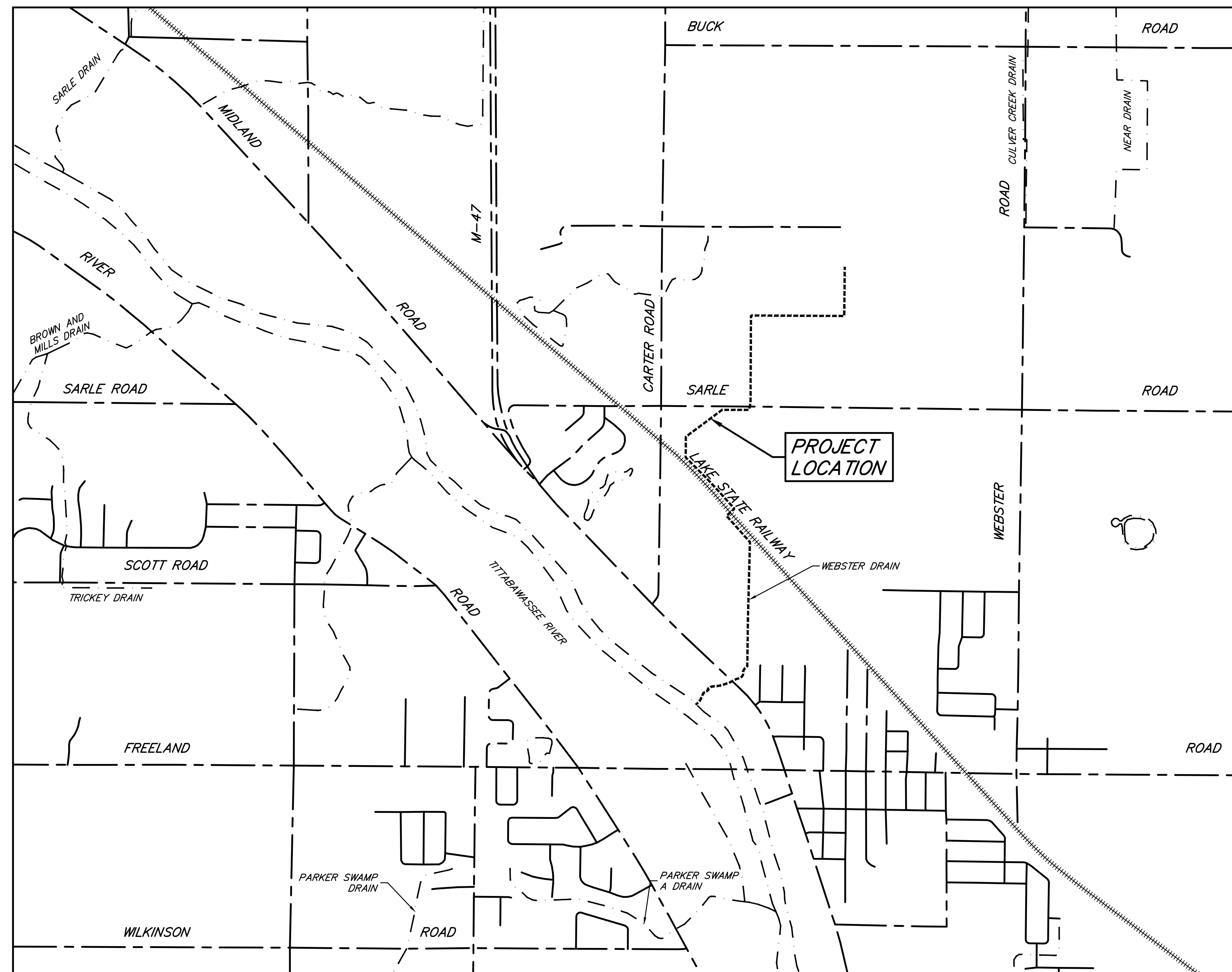
WEBSTER DRAIN

SAGINAW COUNTY PUBLIC WORKS COMMISSIONER - BRIAN J. WENDLING

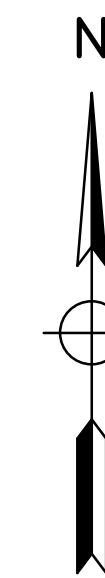


AREA MAP
NOT TO SCALE

| PLAN INDEX | | |
|------------|--|-----|
| FILE NO. | DESCRIPTION | NO. |
| DR-3179-01 | COVER SHEET | 1 |
| DR-3179-02 | GENERAL NOTES | 2 |
| DR-3179-03 | DISTRICT MAP | 3 |
| DR-3179-04 | PLAN AND PROFILE - WEBSTER DRAIN - STA -0+50 TO STA 25+00 | 4 |
| DR-3179-05 | PLAN AND PROFILE - WEBSTER DRAIN - STA 25+00 TO STA 50+00 | 5 |
| DR-3179-06 | PLAN AND PROFILE - WEBSTER DRAIN - STA 50+00 TO STA 74+38 | 6 |
| DR-3179-07 | LOWER REACH PLAN VIEW - WEBSTER DRAIN - STA -0+00 TO STA 11+00 | 7 |
| DR-3179-08 | CROSS SECTIONS - WEBSTER DRAIN - STA 0+62 TO STA 70+00 | 8 |
| DR-3179-09 | NATURAL AREA | 9 |
| DR-3179-10 | MISCELLANEOUS DETAILS | 10 |
| DR-3179-11 | MISCELLANEOUS DETAILS | 11 |
| DR-3179-12 | ALTERNATE BID ITEMS | 12 |
| DW-1556 | WATER MAIN STANDARD DETAILS | 13 |



LOCATION MAP
NOT TO SCALE



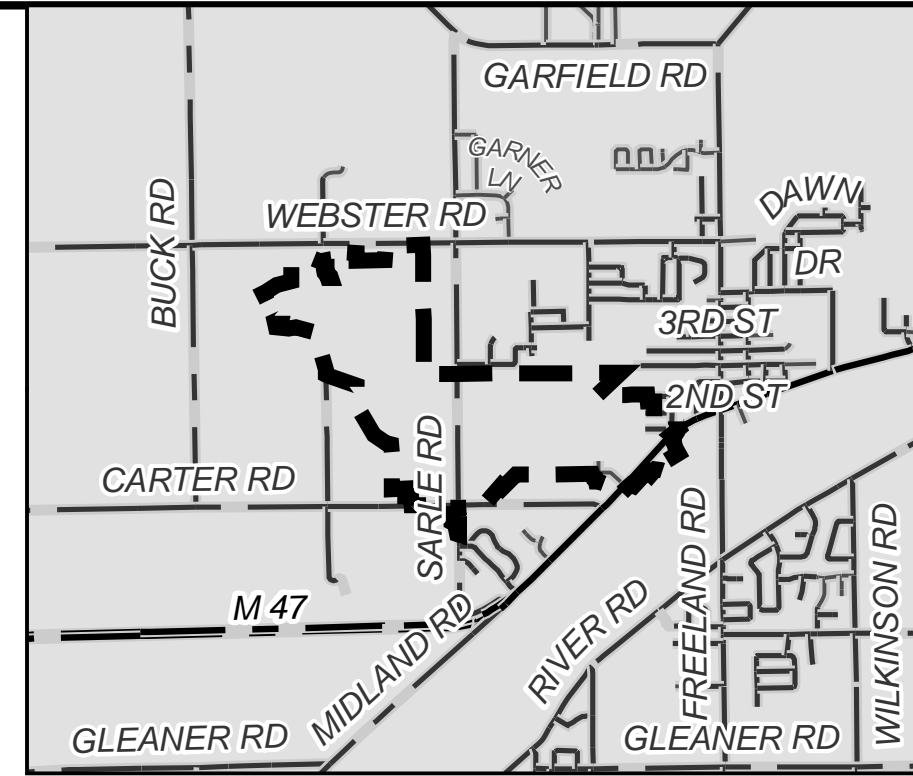
SECTIONS 8-9, 16-17, T.13N.-R.3E.,
TITTABAWASSEE TOWNSHIP,
SAGINAW COUNTY, MICHIGAN

| BY | MARK | REVISIONS | DATE |
|---|------|---|------|
| <small>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</small> | | | |
| WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN | | | |
| COVER SHEET | | | |
| | | <small>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com</small> | |
| DE. BY: POC/LDO DR. BY: CBP | | CH. BY: LDO APP. BY: RBH | |
| | | PROJECT NO. 122778SG2015 | |
| STDs. | | SHEET 1 OF 13 | |
| DATE: SEPTEMBER, 2020 SCALE: NOT TO SCALE | | FILE NO. DR-3179-01 | |
| | | DR 1 | |

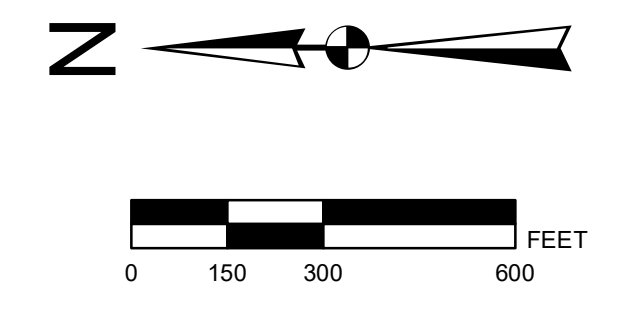


WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN

BRIAN J. WENDLING - SAGINAW COUNTY PUBLIC WORKS COMMISSIONER

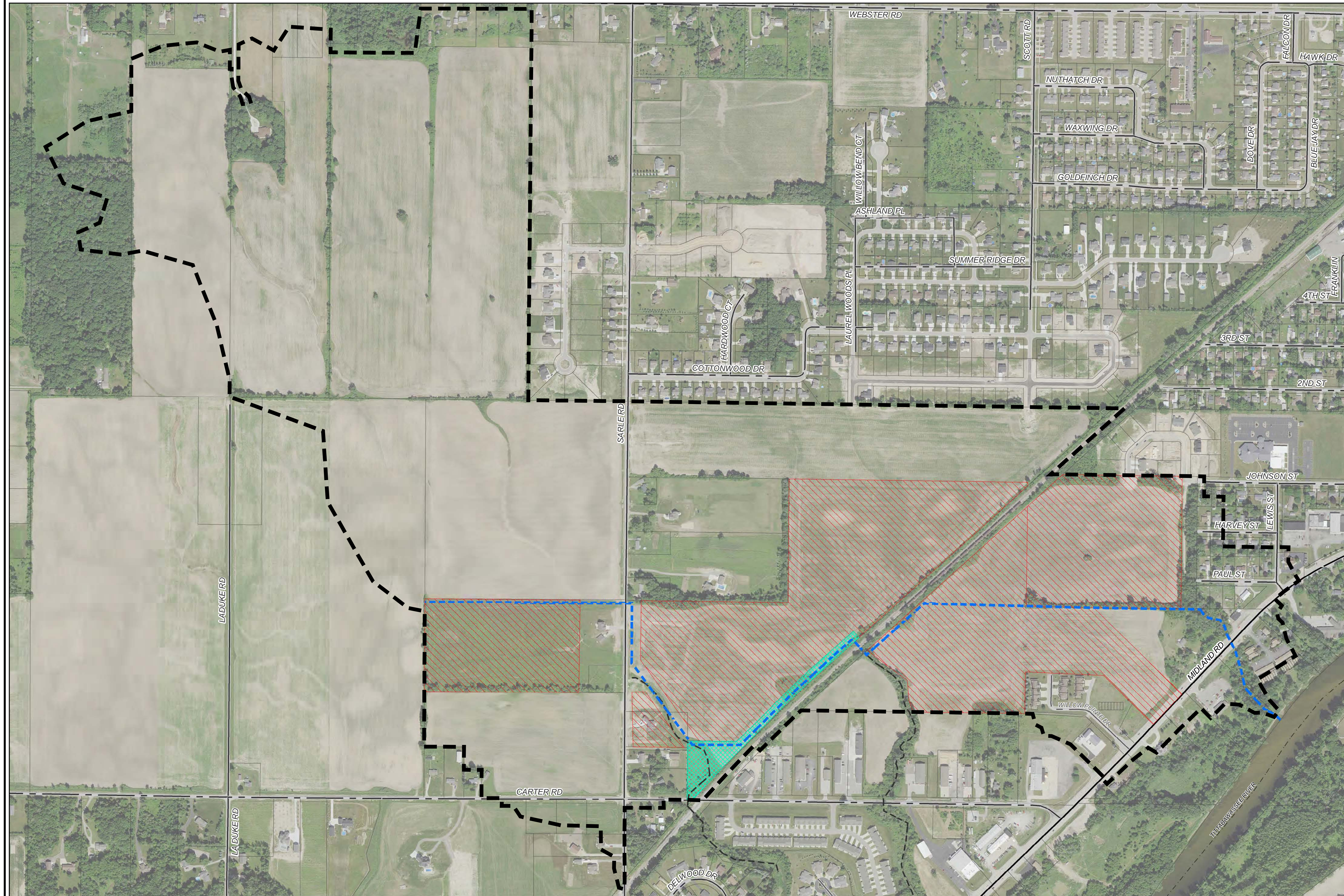


AREA MAP
NOT TO SCALE



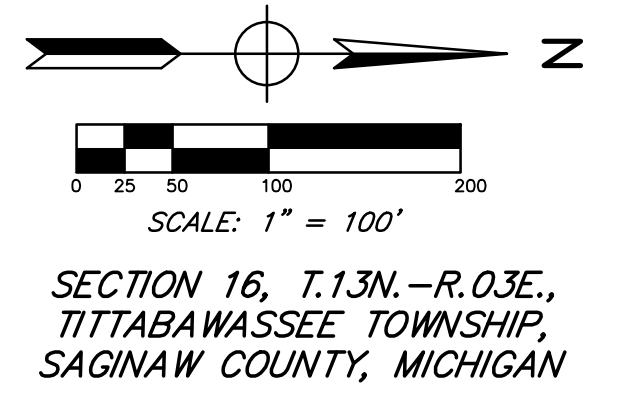
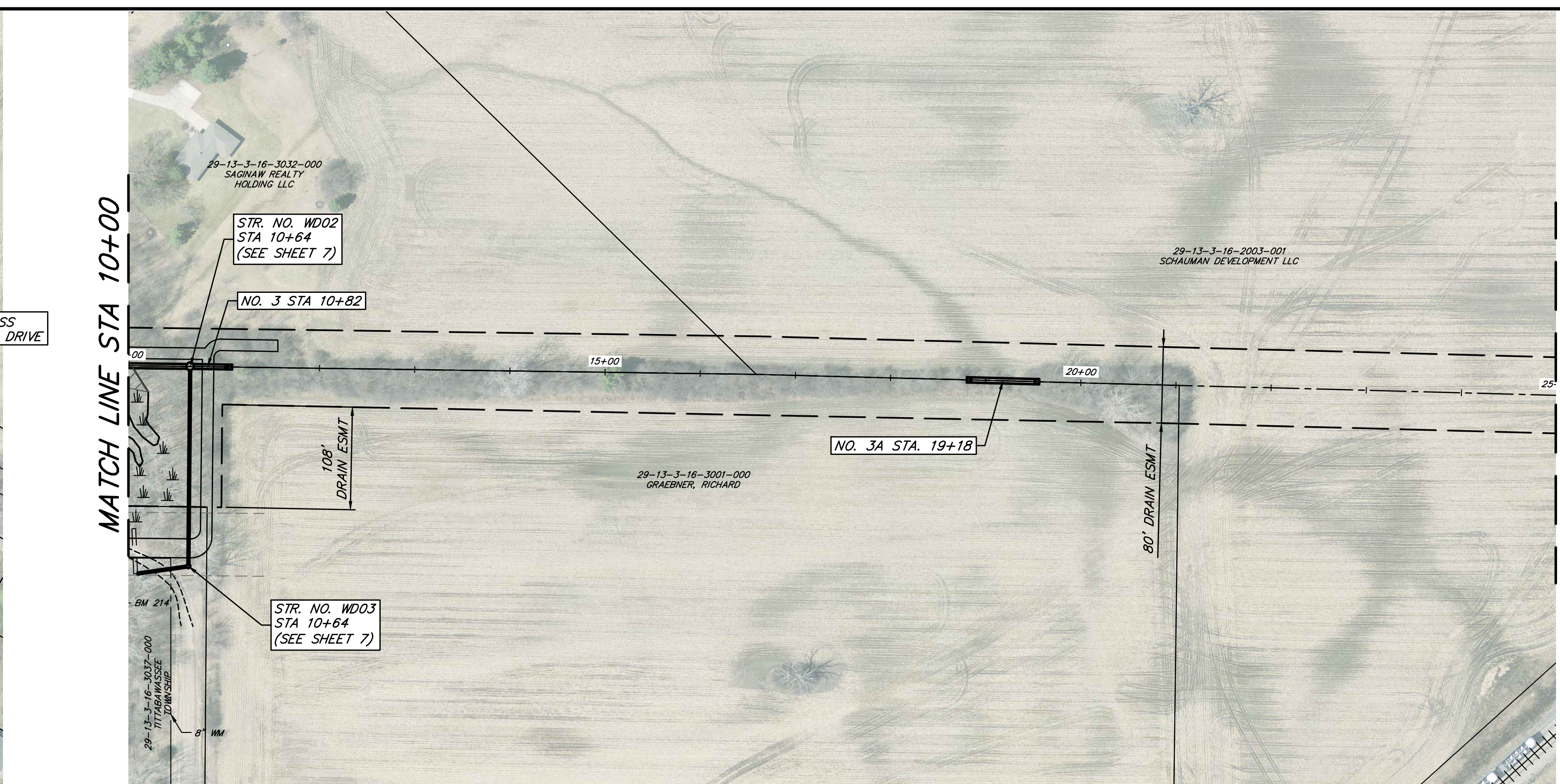
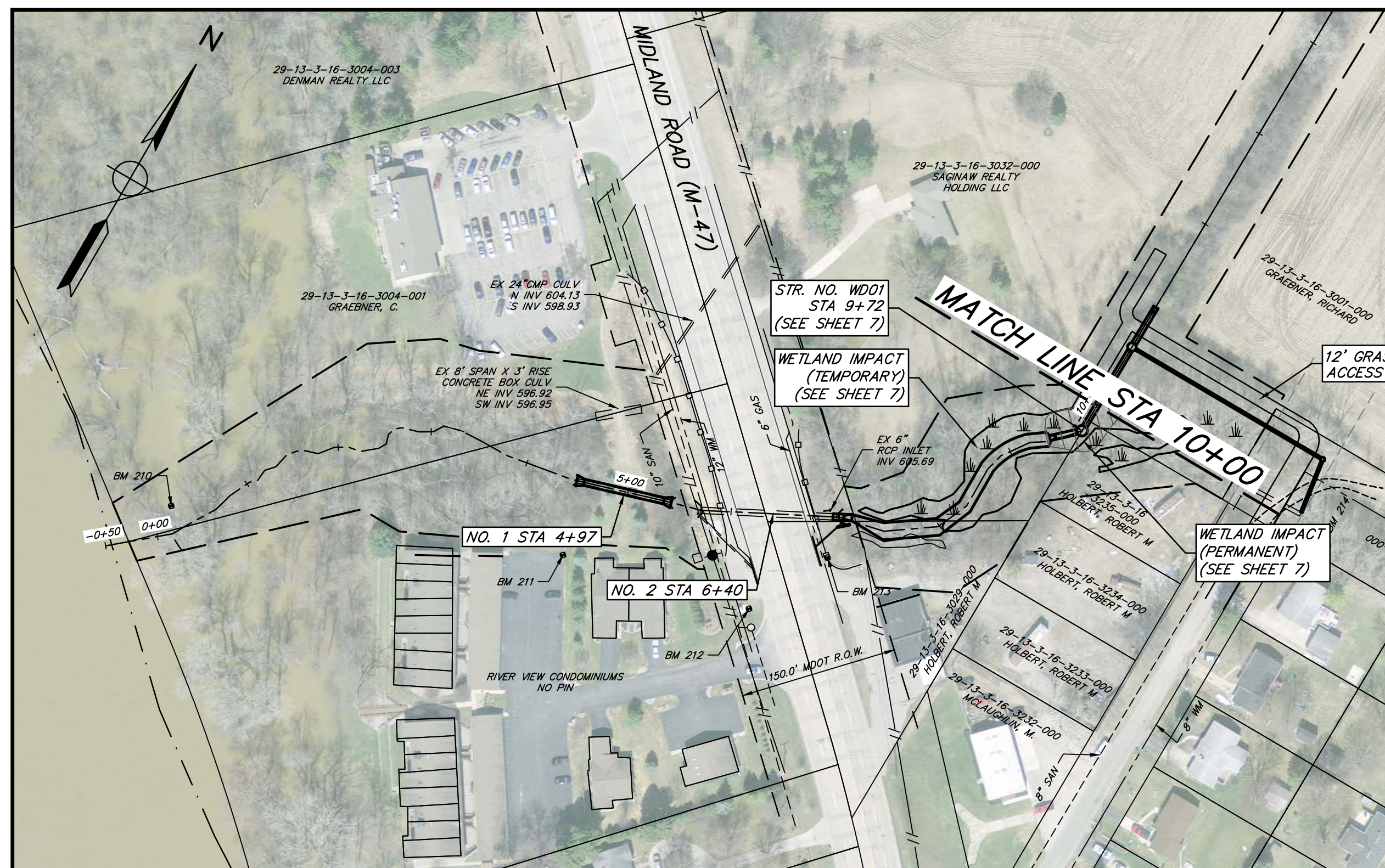
LEGEND

- DRAINAGE DISTRICT BOUNDARY (439 ACRES)
- APPROXIMATE DRAIN LOCATION
- PROPOSED NATURAL AREA
- SPOIL LEVELING AREA
- STATE ROADS
- COUNTY ROADS
- LOCAL ROADS
- EXISTING WATERWAY, GULLY, OR STREAM

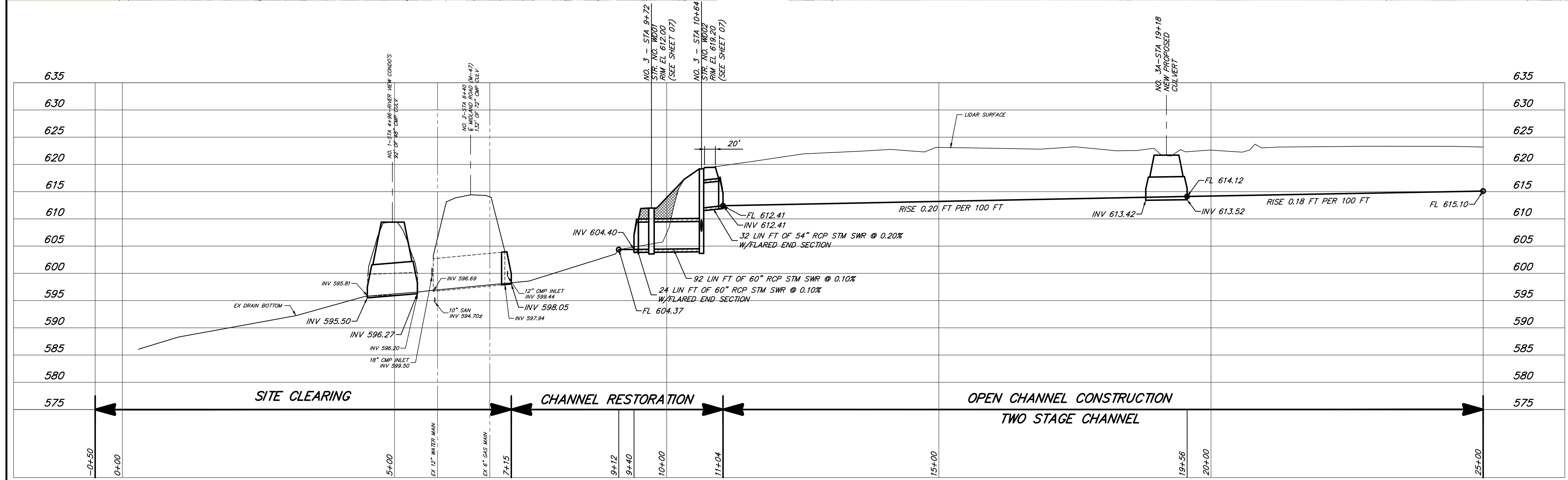


| BY | MARK | REVISIONS | DATE |
|---|---------------|--|------|
| <p>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</p> | | | |
| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> | | | |
| <p>DRAINAGE DISTRICT MAP</p> | | | |
| | | <p>SAGINAW OFFICE 230 S Washington Ave Saginaw, MI 48607 Tel. 989-754-4747 www.SpicerGroup.com</p> | |
| DE. BY: CDV | CH. BY: LDO | PROJECT NO. | |
| DR. BY: CDV | APP. BY: RBH | 122778SG2015 | |
| STDS. | SHEET 3 OF 13 | DR | |
| DATE: JUNE 2020 | FILE NO. | 03 | |
| SCALE: 1" = 300' | | | |

PATH: G:\PROJ\122778SG2015 - WEBSTER DRAIN\GIS\DISTRICT MAPS\A00 - PRINTED ON 6/28/2020, BY: LUKED



SECTION 16, T.13N.-R.03E.,
TITTABAWASSEE TOWNSHIP,
SAGINAW COUNTY, MICHIGAN



NO. 1 - STA 4+96 - RIVER VIEW CONDOMINIUMS REMOVE EXISTING CROSSING, INSTALL 92 LIN FT OF 72" CMP (3"x1" CORR., 10 GA.) WITH FLARED END SECTIONS. RESTORE NATIVE DRIVE.

NO. 2 - STA 6+40 - MIDLAND ROAD (M-47) EXTEND AND LINE CULVERT WITH GEOPOLYMER LINER. (SEE SHEET 7 FOR DETAILS)

NO. 3 - STA 10+82 - DROP STRUCTURE (SEE SHEET 7 FOR DETAILS)

NO. 3A - STA 19+18 - NEW PROPOSED CULVERT INSTALL 76 LIN FT OF 66" SPAN X 51" RISE CMPA (3"x1" CORR., 12 GA.) CONSTRUCT GRAVEL CROSSING DRIVE.

| KEY* | FROM STATION | TO STATION | SIDE | DESCRIPTION | QTY |
|------|--------------------------------------|------------|------|---|------------------|
| 1 P | 0+00 | 25+00 | BOTH | SEEDING OF ALL DISTURBED | LUMP SUM |
| 2 P | 0+00 | 25+00 | BOTH | MULCHING OF ALL DISTURBED AREAS | 2500 LIN FT |
| 8 P | AS STAKED BY ENGINEER | BOTH | BOTH | RIPRAP TOE OF SLOPE PROTECTION | 220 LIN FT |
| 14 P | AS STAKED BY ENGINEER | BOTH | BOTH | SURFACE OUTLET TUBE (35 LIN FT) | - |
| 15 P | AS STAKED BY ENGINEER | BOTH | BOTH | RIPRAP SPILLWAY | 50 LIN FT |
| 16 P | AS STAKED BY ENGINEER | BOTH | BOTH | GRASS SPILLWAY | 30 LIN FT |
| 8 P | ALL EX FIELD TILE OUTLETS AND S.O.T. | BOTH | BOTH | SPLASH PAD | 5 EA |
| 8 P | CROSSINGS 1-3A | BOTH | BOTH | INSTALL RIPRAP PROTECTION AT INLET & OUTLET OF CROSSING | 130 SQ YDS TOTAL |

| STATION FROM | STATION TO | DETAIL | SIDE TO EXCAVATE FROM |
|--------------|------------|---------------|-----------------------|
| -0+50 | 7+15 | CLEARING ONLY | BOTH |
| 7+15 | 11+09 | "C" | BOTH |
| 11+09 | 25+00 | "A" | BOTH |

NOTE: COORDINATE INSTALLATION OF EROSION CONTROL STRUCTURES WITH ENGINEER PRIOR TO CONSTRUCTION. LOCATIONS, QUANTITIES, OR TYPES MAY VARY BASED ON FIELD DECISIONS.

CONSTRUCTION NOTES

- STA 7+15 TO STA 25+00 - CONTRACTOR TO PILE SPOILS FROM CHANNEL EXCAVATION IN TEMPORARY SPOIL LEVELING EASEMENT FOR PARCELS 29-13-3-16-3001-000 AND 29-13-3-16-2003-001 AS DIRECTED BY LANDOWNER AND ENGINEER.

RIGHT OF WAY

PERMANENT EASEMENT AS SHOWN ON PLAN VIEW.
TEMPORARY SPOIL LEVELING EASEMENTS OBTAINED OVER THE FOLLOWING PARCELS:

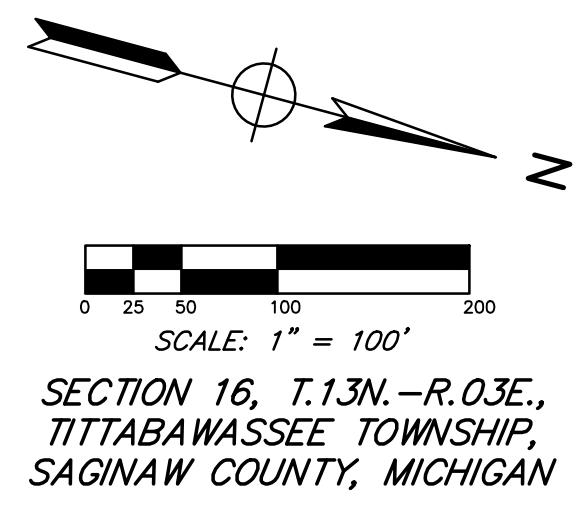
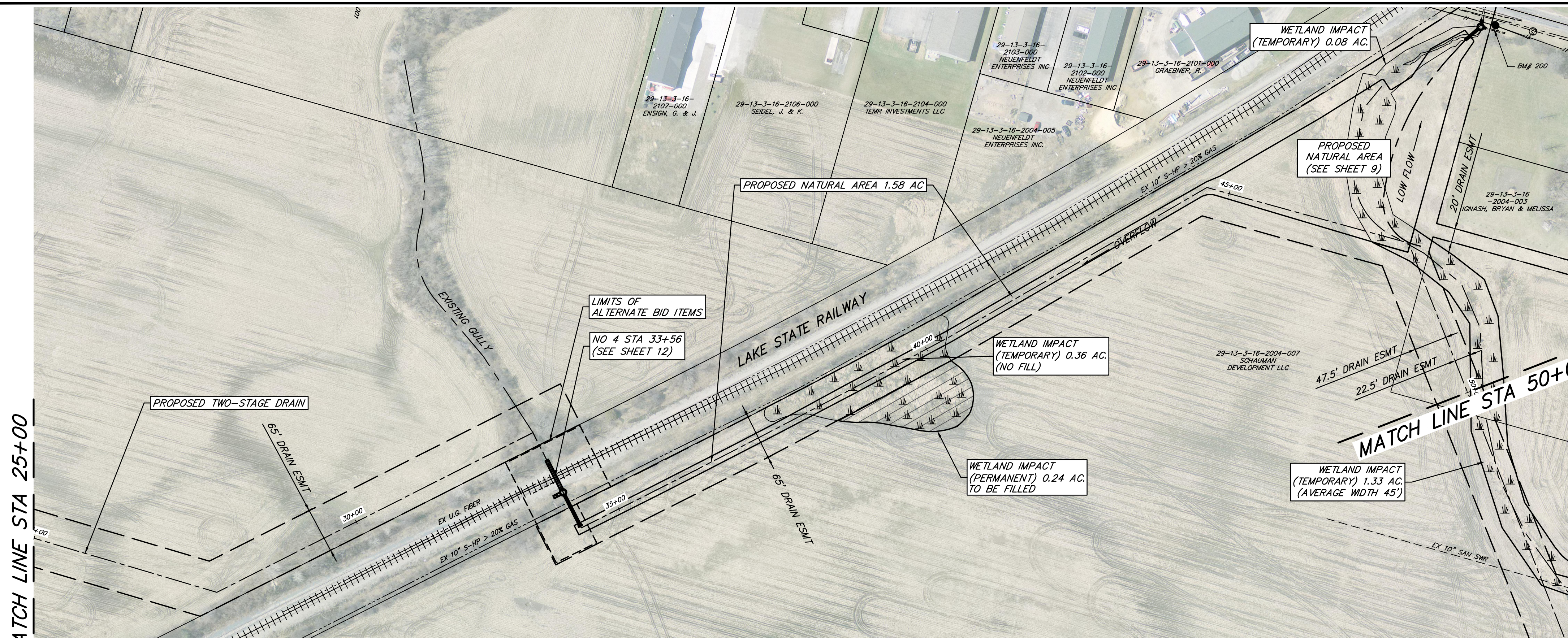
- 29-13-3-16-3001-000
- 29-13-3-16-2003-001
- 29-13-3-16-2004-007

BENCHMARKS

- BM 210 - SET HUB NORTH SIDE OF DRAIN WHERE TIES INTO TITTABAWASSEE RIVER. EL 589.74
- BM 211 - SET MAG NAIL IN NORTHEAST CORNER OF PARKING LOT TO APARTMENTS ON SOUTH SIDE OF DRAIN. EL 614.79
- BM 212 - SET CHISELED 'X' ON EAST SIDE OF CONCRETE PAD FOR PUMP STATION AT M-47 CROSSING ON WEST SIDE OF ROAD. EL 615.31
- BM 213 - SET GEAR SPIKE IN TOP OF GUARDRAIL POST ON EAST SIDE OF M-47, SOUTH OF DRAIN AT GUARDRAIL SPRING POINT. EL 617.48
- BM 214 - SET CHISELED 'X' ON LOWER EASTERLY FLANGE BOLT ON SOUTH SIDE OF DRAIN AT PAUL ROAD END. EL 617.26

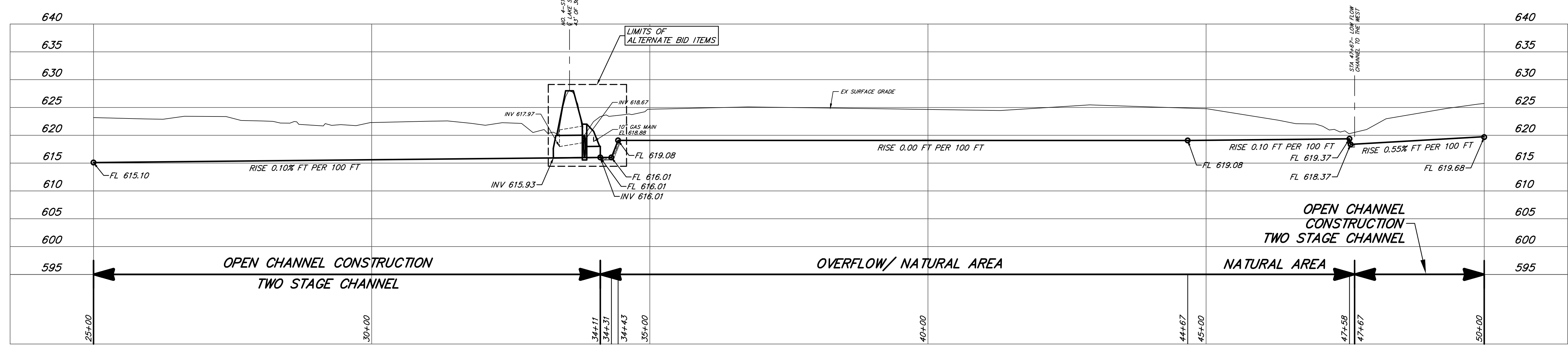
| | | | |
|---|-----------------------------|--|------|
| BY | MARK | REVISIONS | DATE |
| <small>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</small> | | | |
| WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN | | | |
| PLAN AND PROFILE WEBSTER DRAIN STA. -0+50 TO STA. 25+00 | | | |
| | | SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com | |
| DE. BY: POC/LDO | CH. BY: LDO | PROJECT NO. 122778SG2015 | |
| DR. BY: CBP | APP. BY: RBH | SHEET 4 OF 13 | |
| STDS. | FILE NO. DR-3179-04 | DR 4 | |
| DATE: SEPTEMBER, 2020 | SCALE: H: 1"=100' V: 1"=10' | | |

PLOTTING SCALE: RET. F.B. PG. ACAD FILE:



MATCH LINE STA 25+00

MATCH LINE STA 50+00



NO 4 - STA 33+56 - LAKE STATE RAILWAY.
ALTERNATE BID ITEMS.
(SEE SHEET 12 FOR DETAILS)

| STATION FROM | STATION TO | DETAIL | SIDE TO EXCAVATE FROM |
|--------------|------------|--------------|-----------------------|
| 25+00 | 34+11 | "A" | BOTH |
| 34+11 | 44+72 | "B" | BOTH |
| 44+72 | 47+77 | NATURAL AREA | BOTH |
| 47+77 | 50+00 | "A" | BOTH |

| EROSION CONTROL TABLE | | | | | |
|-----------------------|--------------------------------------|------------|------|---|-----------------|
| KEY* | FROM STATION | TO STATION | SIDE | DESCRIPTION | QTY |
| 1 P | 25+00 | 50+00 | BOTH | SEEDING OF ALL DISTURBED | LUMP SUM |
| 2 T | 25+00 | 50+00 | BOTH | MULCHING OF ALL DISTURBED AREAS | 2500 LIN FT |
| 2 T | 32+85 | - | LEFT | 18" CMP SURFACE OUTLET TUBE (35 LIN FT) | 1 EA |
| 8 P | AS STAKED BY ENGINEER | | BOTH | RIPRAP TOE OF SLOPE PROTECTION | 130 LIN FT |
| 14 P | AS STAKED BY ENGINEER | | BOTH | SURFACE OUTLET TUBE (35 LIN FT) | - |
| 15 P | AS STAKED BY ENGINEER | | BOTH | RIPRAP SPILLWAY | 100 LIN FT |
| 16 P | AS STAKED BY ENGINEER | | BOTH | GRASS SPILLWAY | - |
| 9 P | ALL EX FIELD TILE OUTLETS AND S.O.T. | | BOTH | SPLASH PAD | 3 EA |
| 8 P | CROSSINGS 4 | | BOTH | INSTALL RIPRAP PROTECTION AT INLET & OUTLET OF CROSSING | 40 SQ YDS TOTAL |

NOTE: COORDINATE INSTALLATION OF EROSION CONTROL STRUCTURES WITH ENGINEER PRIOR TO CONSTRUCTION. LOCATIONS, QUANTITIES, OR TYPES MAY VARY BASED ON FIELD DECISIONS.

- CONSTRUCTION NOTES**
- STA 25+00 TO STA 50+00 - CONTRACTOR TO PILE SPOILS FROM CHANNEL EXCAVATION IN TEMPORARY SPOIL LEVELING EASEMENT FOR PARCELS 29-13-3-2003-001 AND 29-13-3-16-2004-007 AS DIRECTED BY LANDOWNER AND ENGINEER.
 - STA 47+67 TO STA 50+00 - CONTRACTOR TO LEVEL SPOILS ADJACENT TO DRAIN AS INSTRUCTED BY LANDOWNER AND ENGINEER. COST TO BE INCLUDED IN UNIT PRICE BID FOR SPOILS MANAGEMENT.

BENCHMARKS

NO 200 - SET GEAR SPIKE IN W. FACE OF POWER POLE ± 30' EAST OF & CARTER STREET ± 118' NORTH OF & RAIL ROAD TRACKS
EL 624.99

RIGHT OF WAY

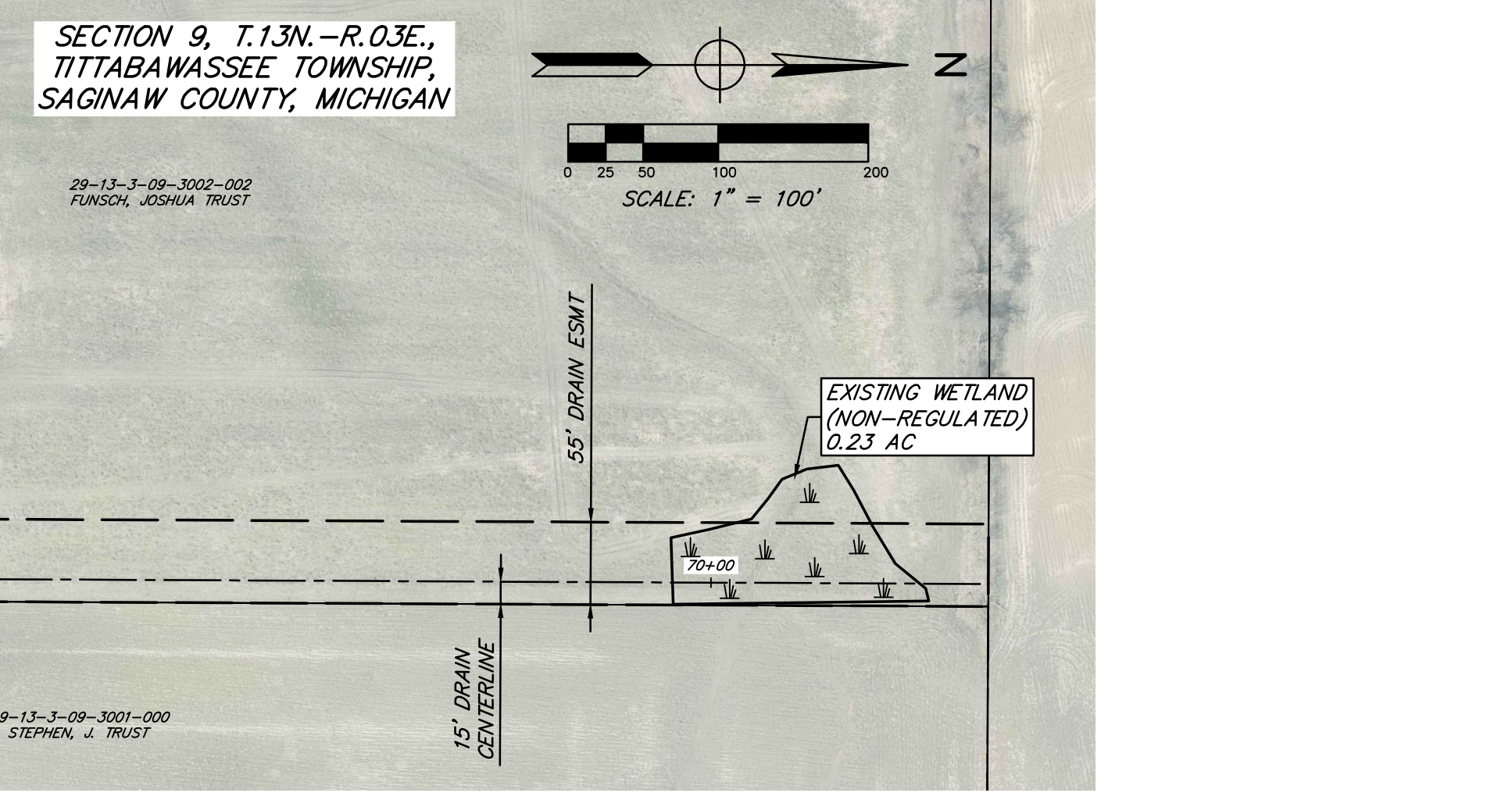
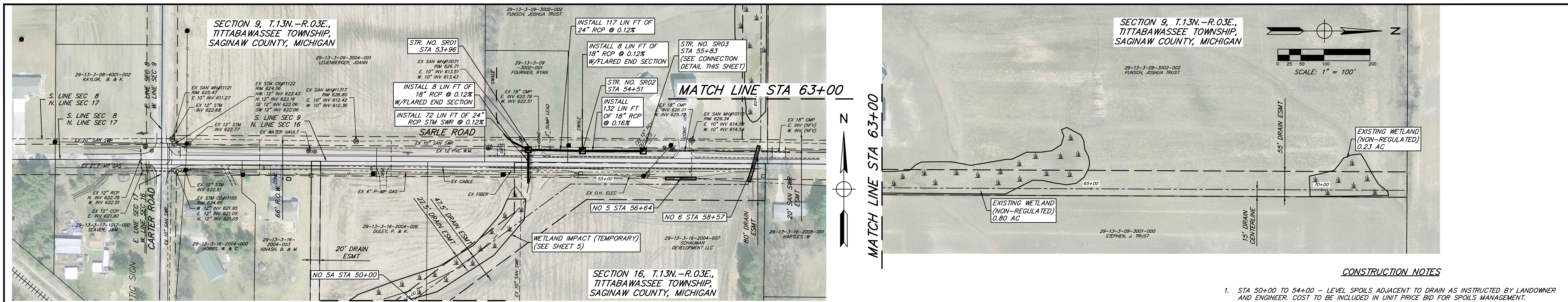
PERMANENT EASEMENT AS SHOWN ON PLAN VIEW.

TEMPORARY SPOIL LEVELING EASEMENTS OBTAINED OVER THE FOLLOWING PARCELS:

- 29-13-3-16-3001-000
- 29-13-3-16-2003-001
- 29-13-3-16-2004-007
- 29-13-3-16-2004-006

| BY | MARK | REVISIONS | DATE |
|---|------|-------------------------------------|------|
| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> <p>PLAN AND PROFILE WEBSTER DRAIN STA 25+00 TO STA 50+00</p> | | | |
| | | | |
| <p>DE. BY: POC/LDO DR. BY: CBP</p> | | <p>CH. BY: LDO APP. BY: RBH</p> | |
| <p>STDS.</p> | | <p>PROJECT NO. 122778SG2015</p> | |
| <p>DATE: SEPTEMBER, 2020 SCALE: H: 1"=100' V: 1"=10'</p> | | <p>FILE NO. DR-3179-05</p> | |
| <p>SHEET 5 OF 13</p> | | <p>DR 5</p> | |

PLOTING SCALE: RET. F.B. PG. ACAD FILE:



- CONSTRUCTION NOTES**
- STA 50+00 TO 54+00 - LEVEL SPOILS ADJACENT TO DRAIN AS INSTRUCTED BY LANDOWNER AND ENGINEER. COST TO BE INCLUDED IN UNIT PRICE BID FOR SPOILS MANAGEMENT.
 - STA 53+70 TO STA 74+38 - CONTRACTOR TO PILE SPOILS FROM CHANNEL EXCAVATION IN TEMPORARY SPOIL LEVELING EASEMENT FOR PARCELS 29-13-3-16-2004-007 AND 29-13-3-09-3002-002 AS DIRECTED BY LANDOWNER AND ENGINEER.
 - STA 55+77 TO STA 61+48 - FILL IN EXISTING ROAD SIDE DITCH ALONG THE NORTH SIDE OF SARLE ROAD. PROVIDE POSITIVE DRAINAGE TO PROPOSED STRUCTURES AND WEBSTER DRAIN.
 - STA 59+32, 65.5' LT - ABANDON EXISTING 18" CMP IN PLACE WITH FLOWABLE FILL.
 - STA 55+86 AND STA 58+35 - ALONG NORTH SIDE OF SARLE ROAD - CONTRACTOR TO LOCATE, VERIFY ELEVATION OF EXISTING 12" WATERMAIN PRIOR TO INSTALLATION OF PROPOSED STRUCTURES AND STORM SEWER.
 - STA 61+43 - CONTRACTOR TO LOCATE, VERIFY ELEVATION OF EXISTING 12" WATERMAIN AND LOWER IF DETERMINED NECESSARY PRIOR TO INSTALLATION OF PROPOSED CULVERTS.
 - STA 64+50 - CONTRACTOR TO LOCATE AND VERIFY ELEVATION OF TILE MAIN PRIOR TO CHANNEL CONSTRUCTION.

BENCHMARKS

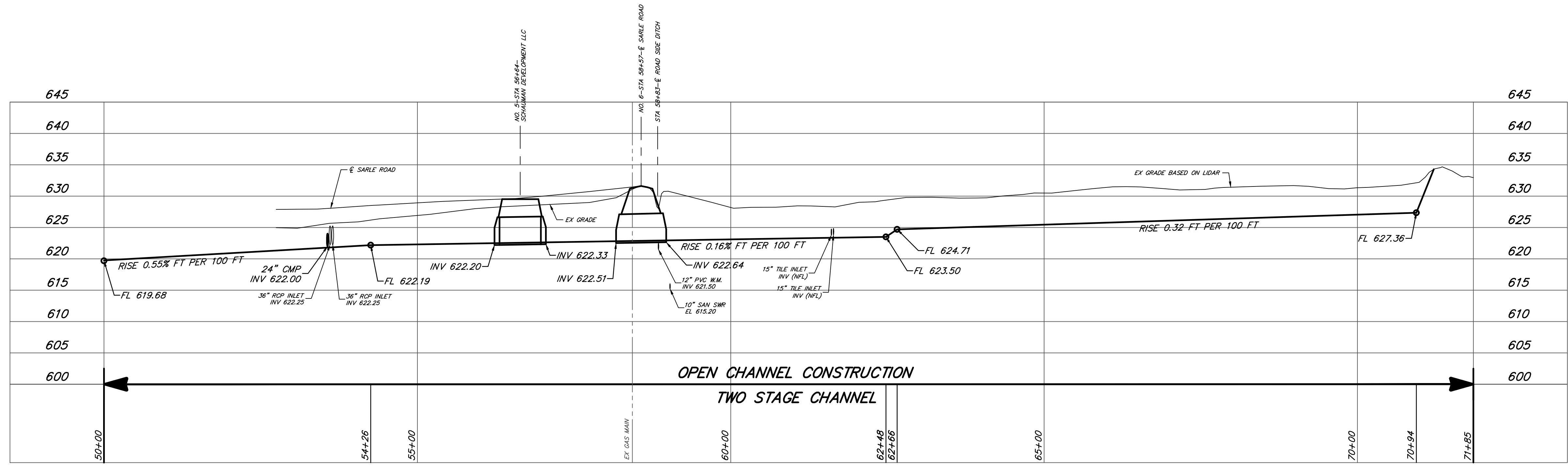
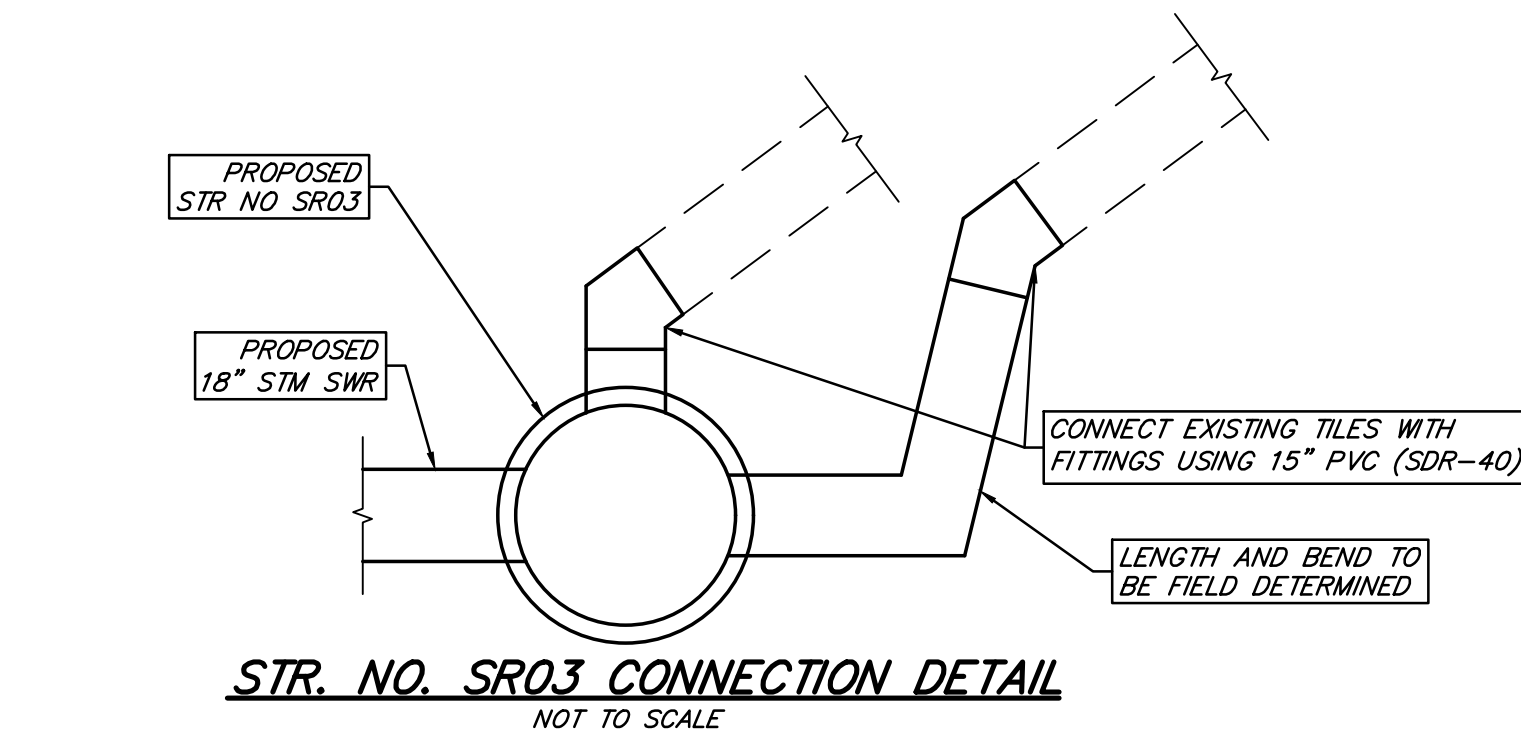
NO 200 - SET GEAR SPIKE IN W. FACE OF POWER POLE ± 30' EAST OF CARTER STREET ± 118' NORTH OF RAIL ROAD TRACKS

RIGHT OF WAY

PERMANENT EASEMENT AS SHOWN ON PLAN VIEW.

TEMPORARY SPOIL LEVELING EASEMENTS OBTAINED OVER THE FOLLOWING PARCELS:

- 29-13-3-16-3001-000
- 29-13-3-16-2003-001
- 29-13-3-16-2004-007
- 29-13-3-09-3002-002
- 29-13-3-16-2004-006



NO 5A - STA 50+00 - DULEY, P & K
INSTALL WOODEN FOOTBRIDGE (SEE DETAIL SHEET 12)

NO 5 - STA 56+64 - SCHAUMAN DEVELOPMENT LLC
INSTALL 64 LIN FT OF 72" SPAN X 55" RISE ERCP.
RESTORE BITUMINOUS DRIVE.

NO 6 - STA 58+57 - SARLE ROAD
INSTALL 80 LIN FT OF 73" SPAN X 55" RISE CMPA
(3"x1" CORR., 10 GA.) RESTORE BITUMINOUS DRIVE.

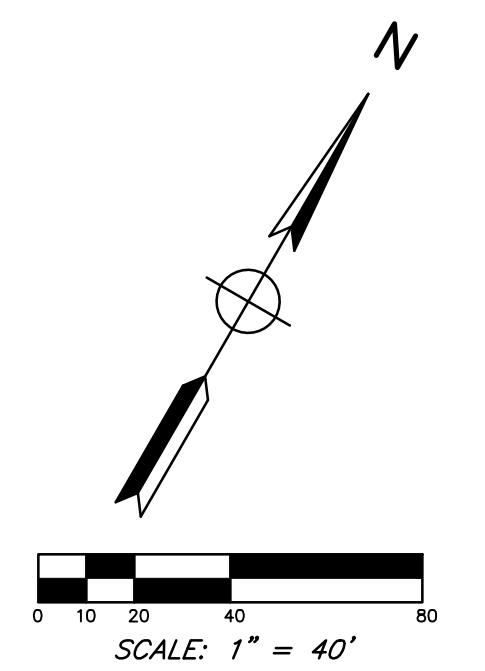
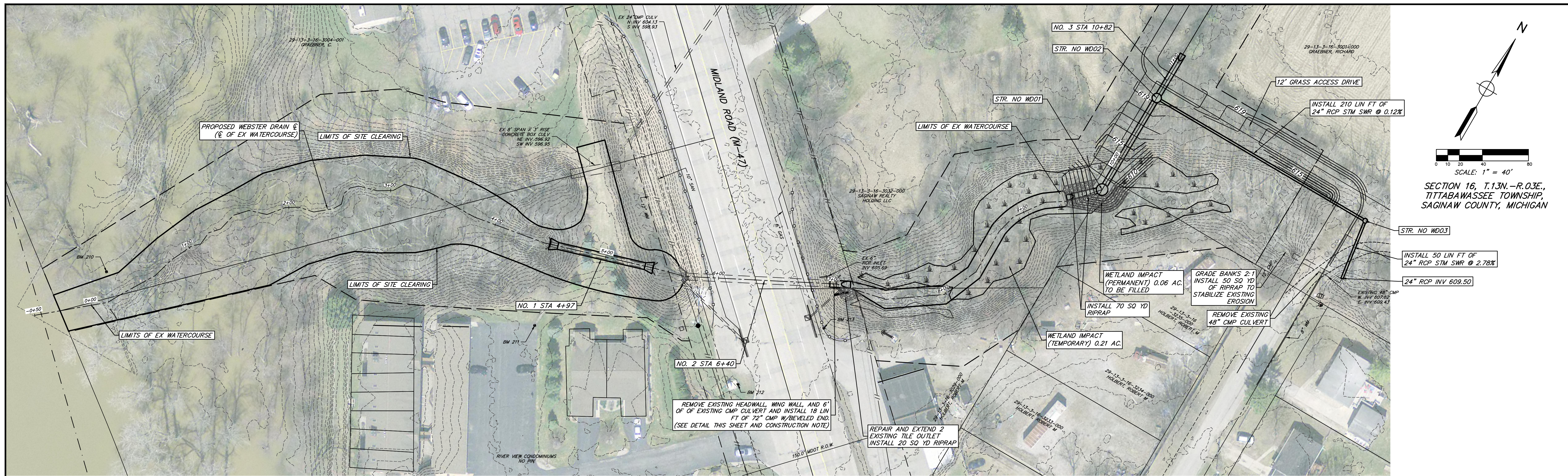
| EROSION CONTROL TABLE | | | | | |
|-----------------------|--------------------------------------|------------|------|---|-----------------|
| KEY* | FROM STATION | TO STATION | SIDE | DESCRIPTION | QTY |
| 1 | 50+00 | 75+00 | BOTH | SEEDING OF ALL DISTURBED | LUMP SUM |
| 2 | 50+00 | 75+00 | BOTH | MULCHING OF ALL DISTURBED AREAS | 2500 LIN FT |
| 8 | AS STAKED BY ENGINEER | BOTH | BOTH | RIPRAP TOE OF SLOPE PROTECTION | 250 LIN FT |
| 14 | AS STAKED BY ENGINEER | BOTH | BOTH | SURFACE OUTLET TUBE (35 LIN FT) | 2 EA |
| 15 | AS STAKED BY ENGINEER | BOTH | BOTH | RIPRAP SPILLWAY | 40 LIN FT |
| 16 | AS STAKED BY ENGINEER | BOTH | BOTH | GRASS SPILLWAY | - |
| 9 | ALL EX FIELD TILE OUTLETS AND S.O.T. | BOTH | BOTH | SPLASH PAD | 5 EA |
| 8 | CROSSINGS 5-6 | BOTH | BOTH | INSTALL RIPRAP PROTECTION AT INLET & OUTLET OF CROSSING | 40 SQ YDS TOTAL |

| PROPOSED STORM SEWER STRUCTURE TABLE | | | | | |
|--------------------------------------|------------------|-----------|---------|--|-----------------------------|
| STRUCTURE NO. | LOCATION/OFFSET | SIZE/TYPE | RIM EL. | INVERT | EJ FRAME W/TYPE GRATE COVER |
| SR01 | 53+96/114.60' LT | 5' MH/CB | 626.40 | 24" RCP E. INV 622.08 24" RCP S. INV 621.99 18" RCP NW. INV 622.08 | 1045 W/ N OVAL GRATE |
| SR02 | 54+51/72.10' LT. | 4' MH/CB | 626.58 | 18" RCP E. INV 622.22 18" RCP W. INV 622.22 18" RCP N. INV 622.80 | 1045 W/ N OVAL GRATE |
| SR03 | 55+83/72.10' LT. | 4' MH/CB | 626.75 | 15" PVC E. INV 623.83 15" PVC W. INV 623.26 18" RCP W. INV 622.43 | 1045 W/ N OVAL GRATE |

| EXCAVATION TABLE | | | |
|------------------|------------|--------|-----------------------|
| STATION FROM | STATION TO | DETAIL | SIDE TO EXCAVATE FROM |
| 50+00 | 51+50 | "A" | BOTH |
| 51+50 | 53+67 | HAUL | RIGHT |
| 53+67 | 61+48 | "A" | RIGHT |
| 61+48 | 75+00 | "A" | LEFT |

NOTE: COORDINATE INSTALLATION OF EROSION CONTROL STRUCTURES WITH ENGINEER PRIOR TO CONSTRUCTION. LOCATIONS, QUANTITIES, OR TYPES MAY VARY BASED ON FIELD DECISIONS.

| BY | MARK | REVISIONS | DATE |
|---|------|--|------|
| <p>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</p> <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> <p>PLAN AND PROFILE WEBSTER DRAIN STA 50+00 TO STA 74+38</p> | | | |
| | | <p>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4117 Fax. 989-754-4440 www.SpicerGroup.com</p> | |
| <p>DE. BY: POC/LDO CH. BY: LDO DR. BY: CBF APP. BY: RBH</p> | | <p>PROJECT NO. 122778SG2015</p> | |
| <p>STDS.</p> | | <p>SHEET 6 OF 13</p> | |
| <p>DATE SEPTEMBER, 2020 SCALE H: 1"=100' V: 1"=10'</p> | | <p>FILE NO. DR-3179-06</p> | |
| | | <p>DR 6</p> | |



SECTION 16, T.13N.-R.03E.,
TITABAWASSEE TOWNSHIP,
SAGINAW COUNTY, MICHIGAN

RIPRAP TOE OF SLOPE PROTECTION TABLE

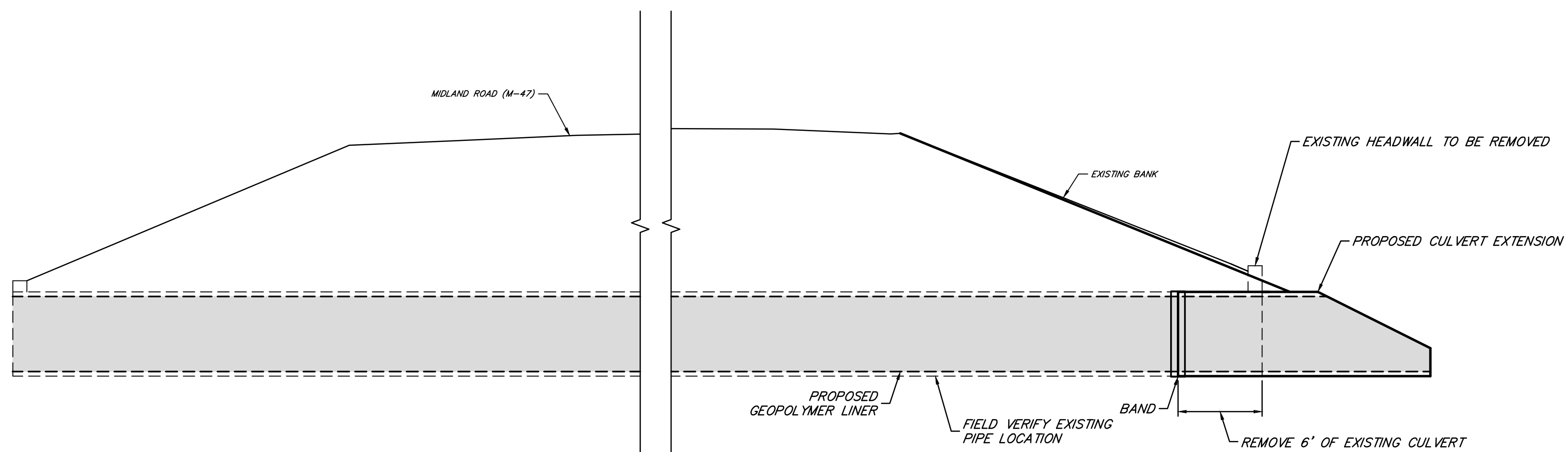
| FROM STATION | TO STATION | SIDE |
|--------------|------------|-------|
| 7+15 | 8+45 | RIGHT |
| 8+45 | 9+35 | LEFT |

FOR EROSION REPAIR SEE CHANNEL RESTORATION. (SEE SHEET 10)

PROPOSED STORM SEWER STRUCTURE TABLE - CROSSING NO. 3

| STRUCTURE NO. | LOCATION/OFFSET | SIZE/TYPE | RIM EL. | INVERT | EJ FRAME W/TYPE GRATE COVER |
|---------------|-----------------|-----------|---------|---|-----------------------------|
| WD01 | 9+72/0' | 10' MH | 612.00 | 60" RCP N. INV 604.43 60" RCP SW. INV 604.43 | 1045 W/ N OVAL GRATE |
| WD02 | 10+64/0' | 8' MH | 619.20 | 24" RCP E. INV 607.75 54" RCP N. INV 612.00 60" RCP S. INV 604.52 | 1045 W/ N OVAL GRATE |
| WD03 | 10+64/210' RT | 4' MH/CB | 616.65 | 24" RCP W. INV 608.00 24" RCP SE. INV 608.00 | 1045 W/ N OVAL GRATE |

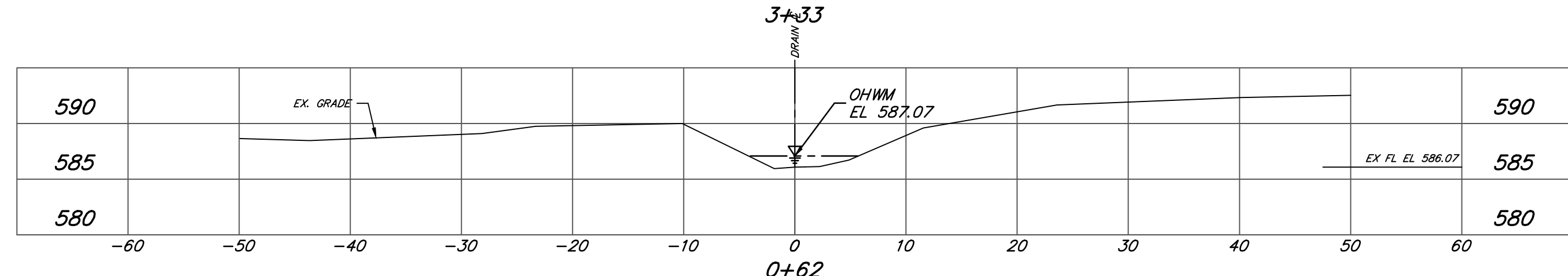
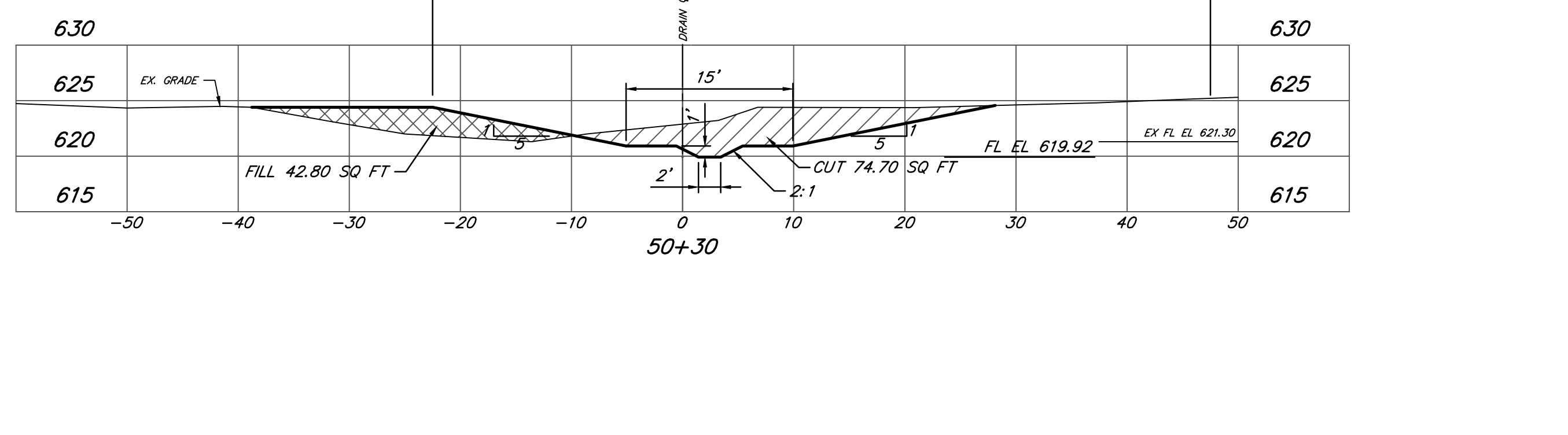
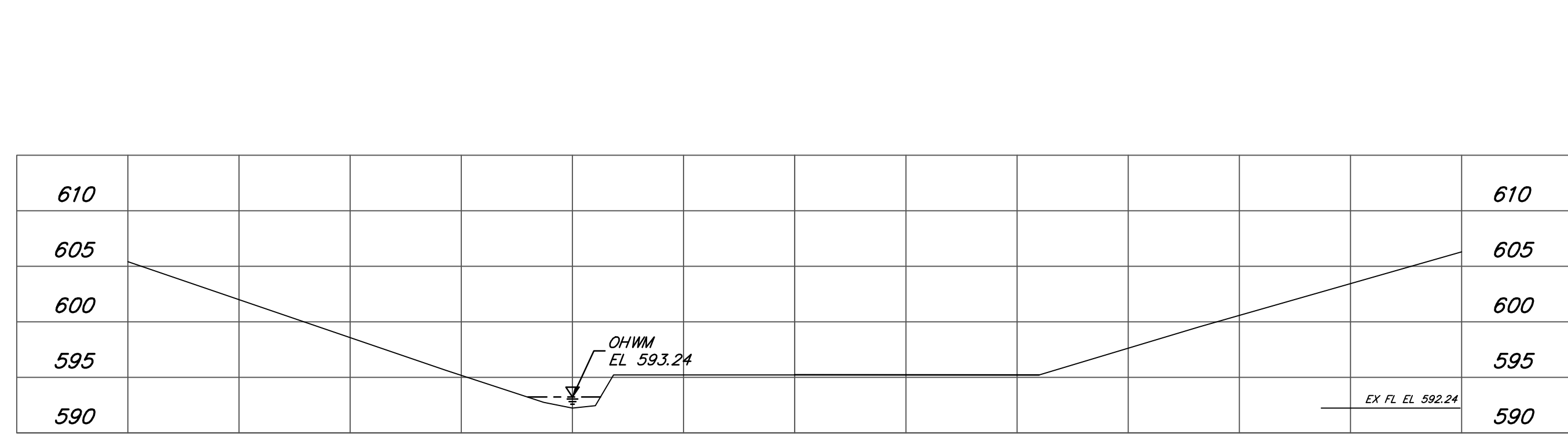
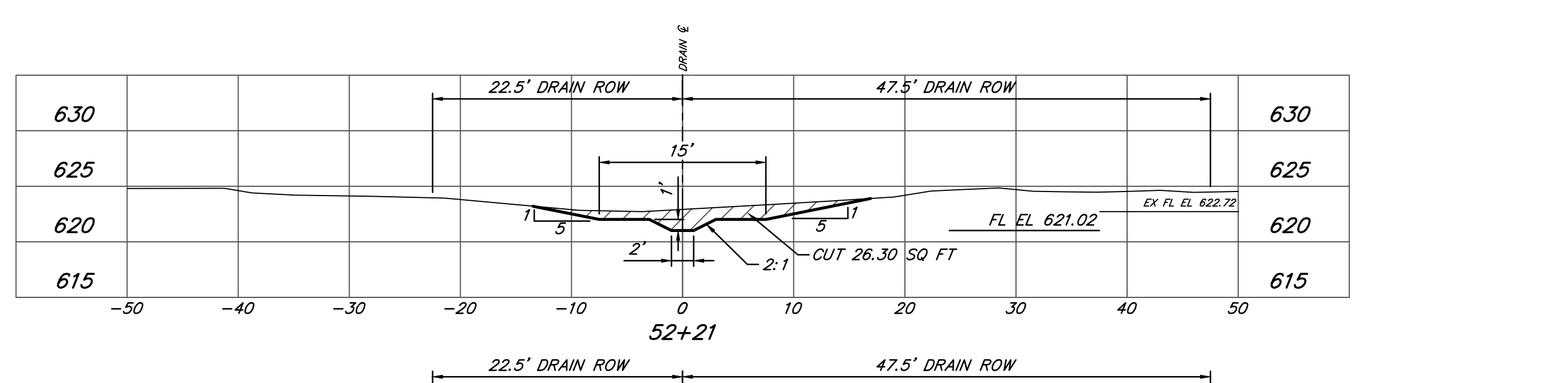
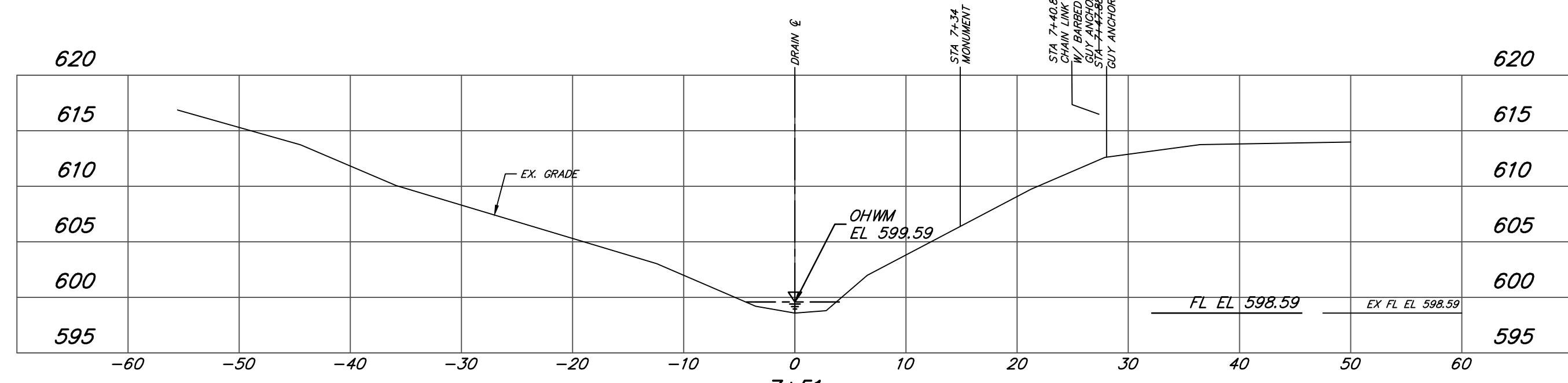
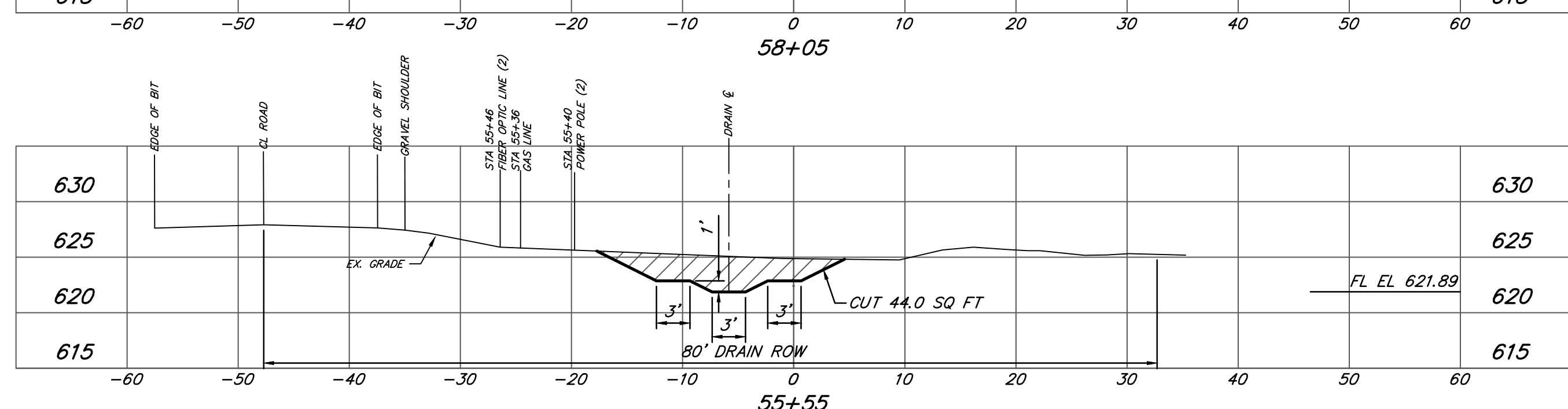
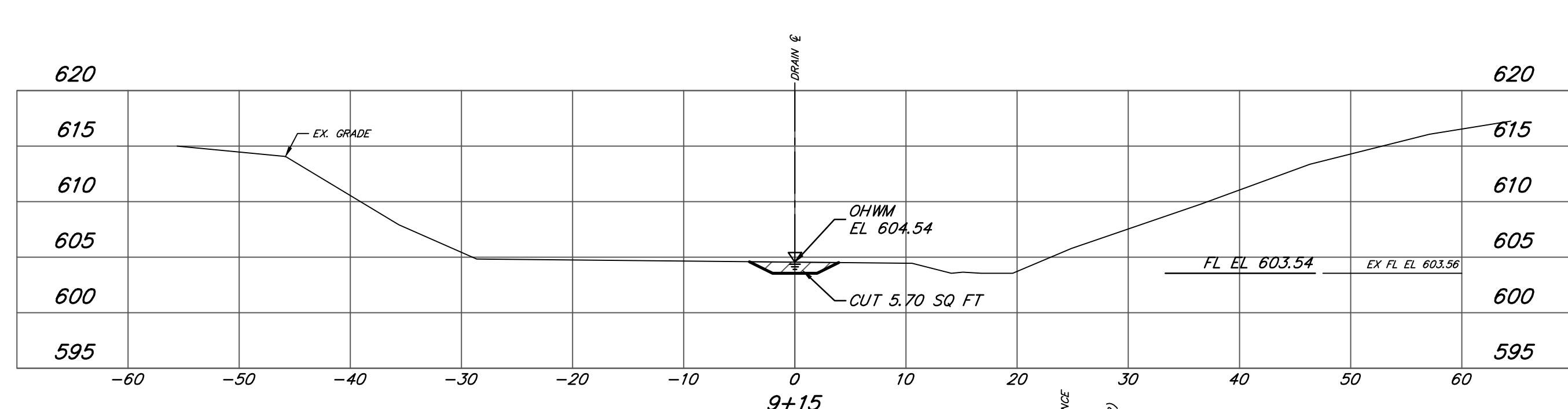
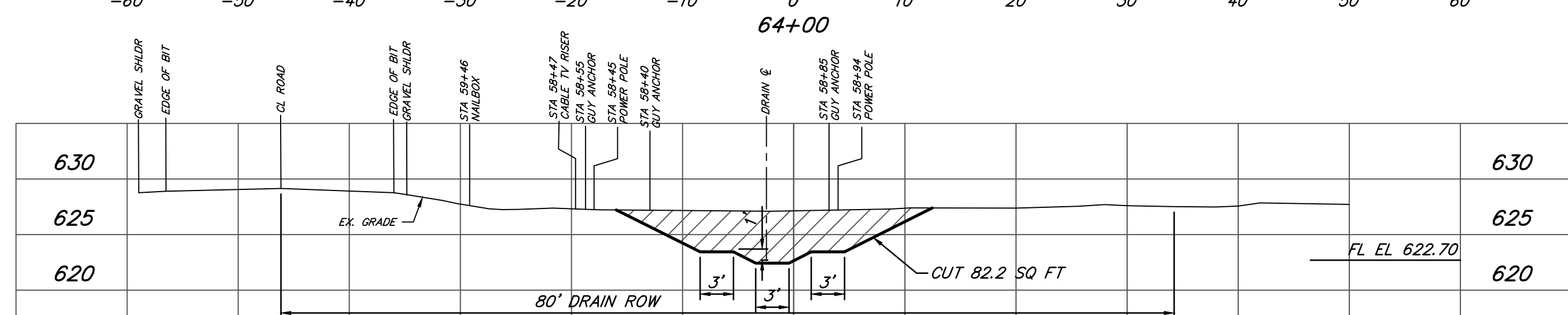
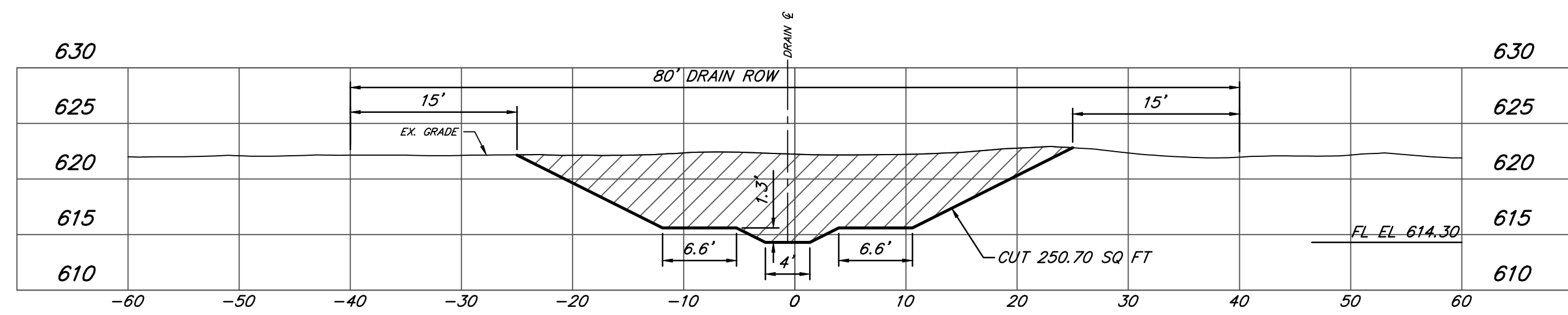
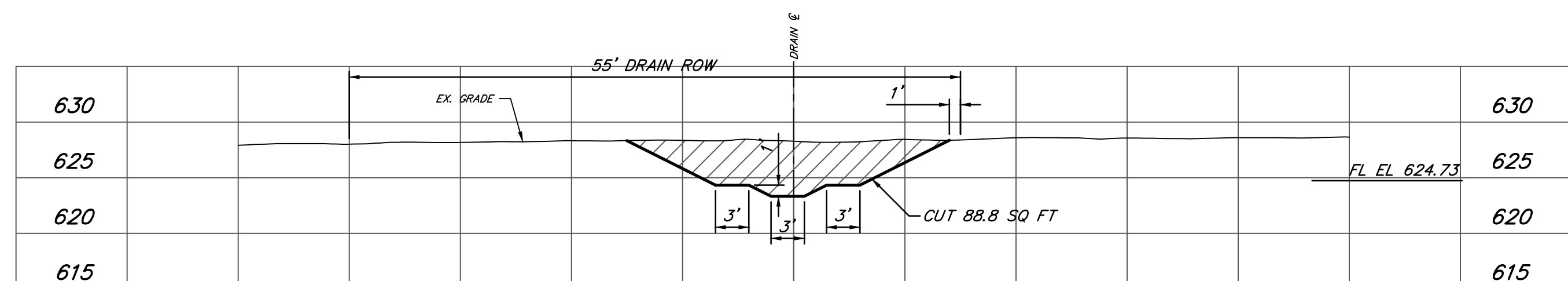
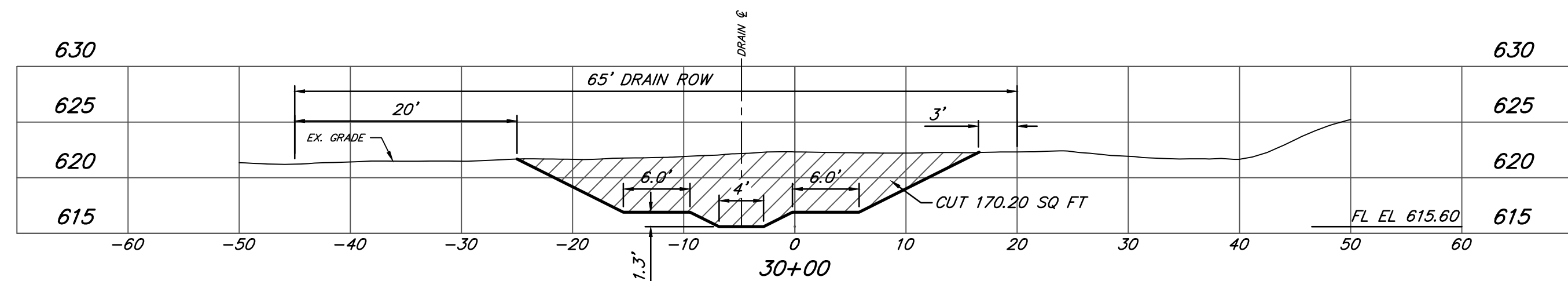
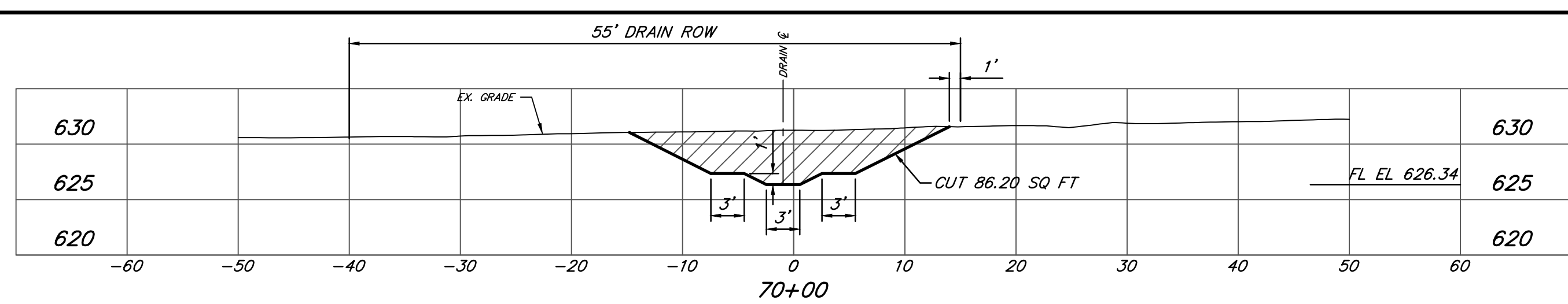
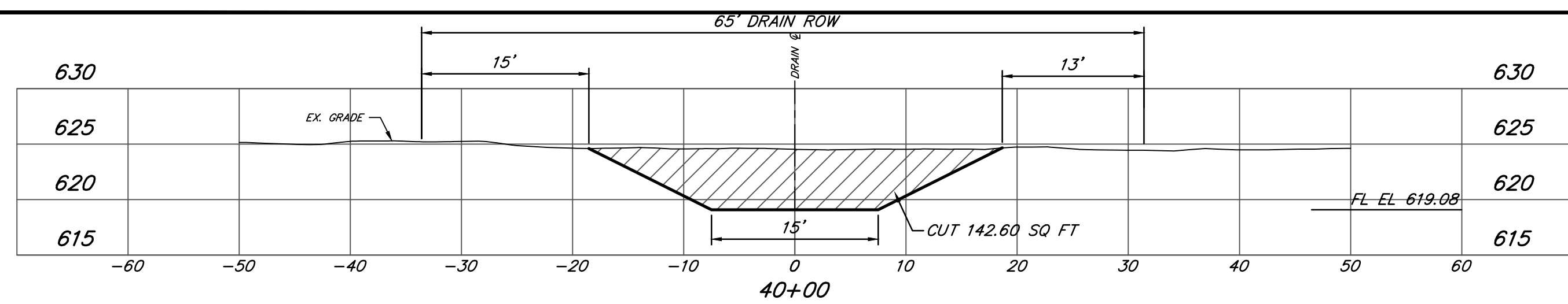
- CONSTRUCTION NOTES**
- STA 7+15 TO STA 25+00 - CONTRACTOR TO PILE SPOILS FROM CHANNEL EXCAVATION IN TEMPORARY SPOIL LEVELING EASEMENT FOR PARCELS 29-13-3-3001-000 AND 29-13-3-16-2003-001 AS DIRECTED BY LANDOWNER AND ENGINEER.
 - CONTRACTOR TO USE BAND TO CONNECT PROPOSED EXTENSION MATCHING INTO EXISTING CULVERT AND UPON COMPLETION OF EXTENSION INSTALL GEOPOLYMER LINER THROUGH ENTIRE CROSSING.
 - CONTRACTOR TO LOCATE EXISTING OUTLET TILES AND EXTEND TILE OUTLETS TO DAY LIGHT UPSTREAM OF PROPOSED CULVERT EXTENSION. TO BE PAID FOR AS TILE OUTLET REPAIR.
 - CONTRACTOR TO SUBMIT DETAILED PLAN ON ALL REPAIRS TO BE COMPLETED TO EXISTING CULVERT ALONG WITH PRE-INSTALLATION VIDEO FOR REVIEW BY ENGINEER PRIOR TO COMPLETING REPAIRS AND INSTALLING LINER.



CULVERT EXTENSION AND GEOPOLYMER LINER DETAIL
NOT TO SCALE

| BY | MARK | REVISIONS | DATE |
|---|---------------------|--|------|
| <p>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</p> | | | |
| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> | | | |
| <p>LOWER REACH PLAN VIEW WEBSTER DRAIN STA -0+50 TO STA 11+00</p> | | | |
| | | <p>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com</p> | |
| DE. BY: POC/LDO | CH. BY: LDO | PROJECT NO. 122778SG2015 | |
| DR. BY: CBP | APP. BY: RBH | | |
| STDS. | SHEET 7 OF 13 | DR | |
| DATE SEPTEMBER, 2020 | FILE NO. DR-3179-07 | 7 | |
| SCALE AS SHOWN | | | |

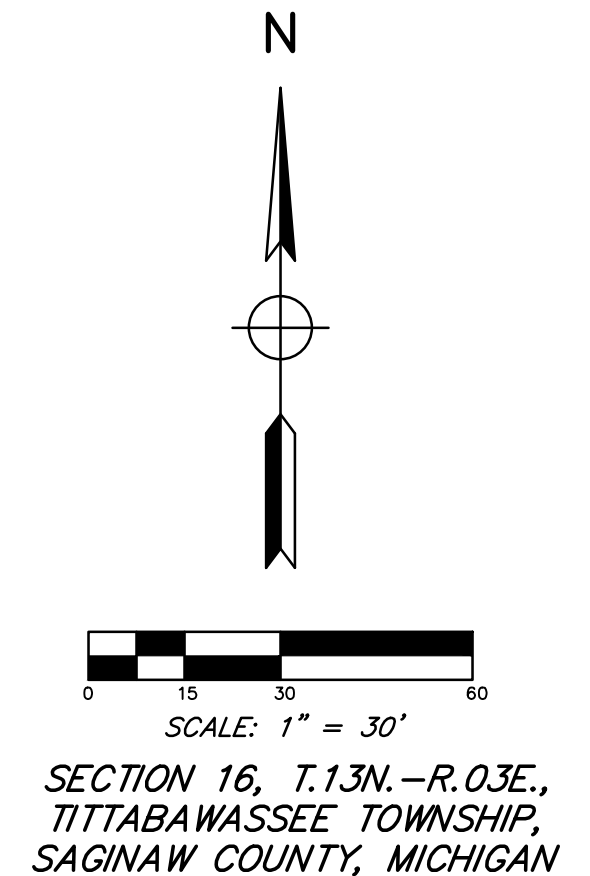
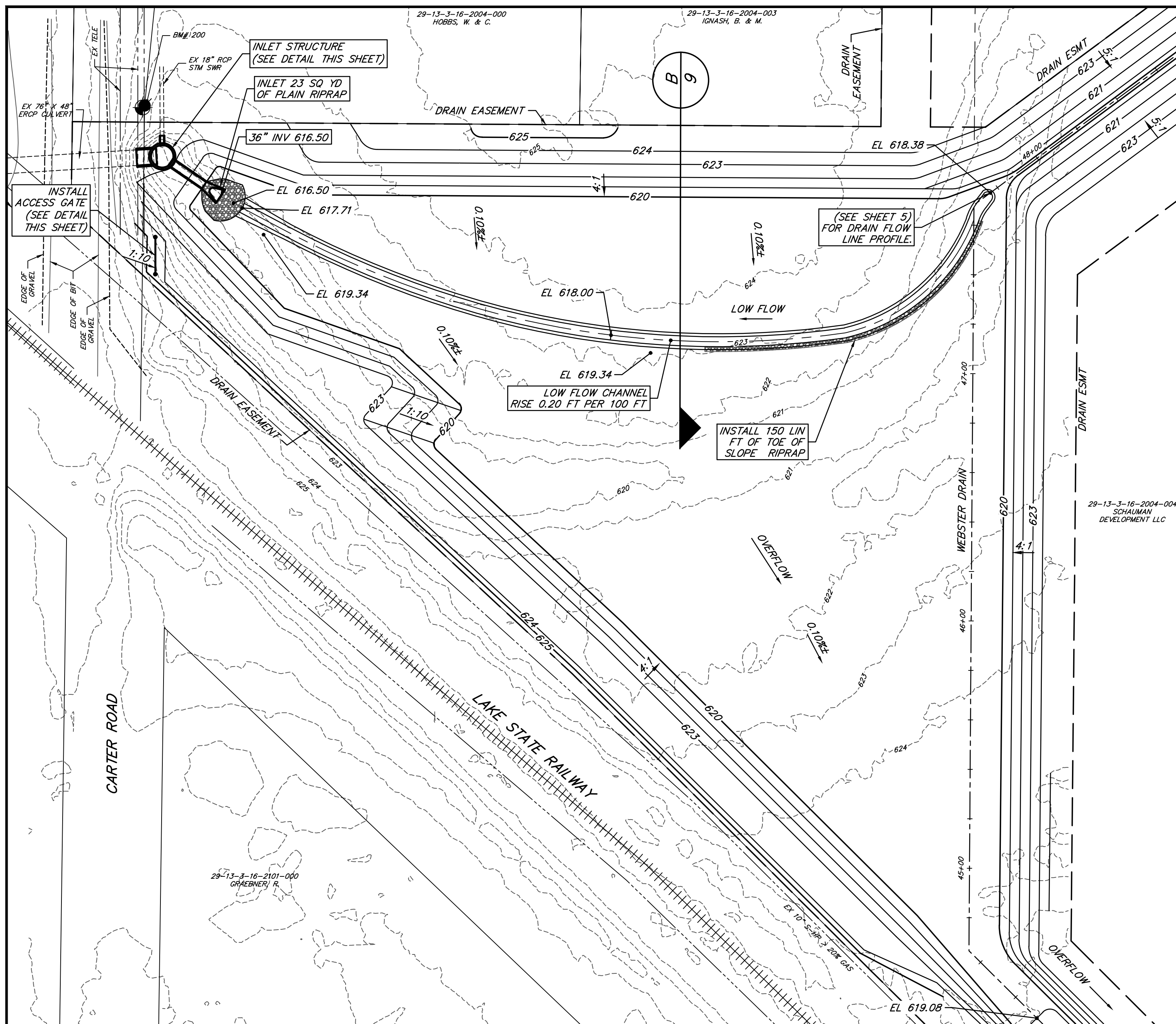
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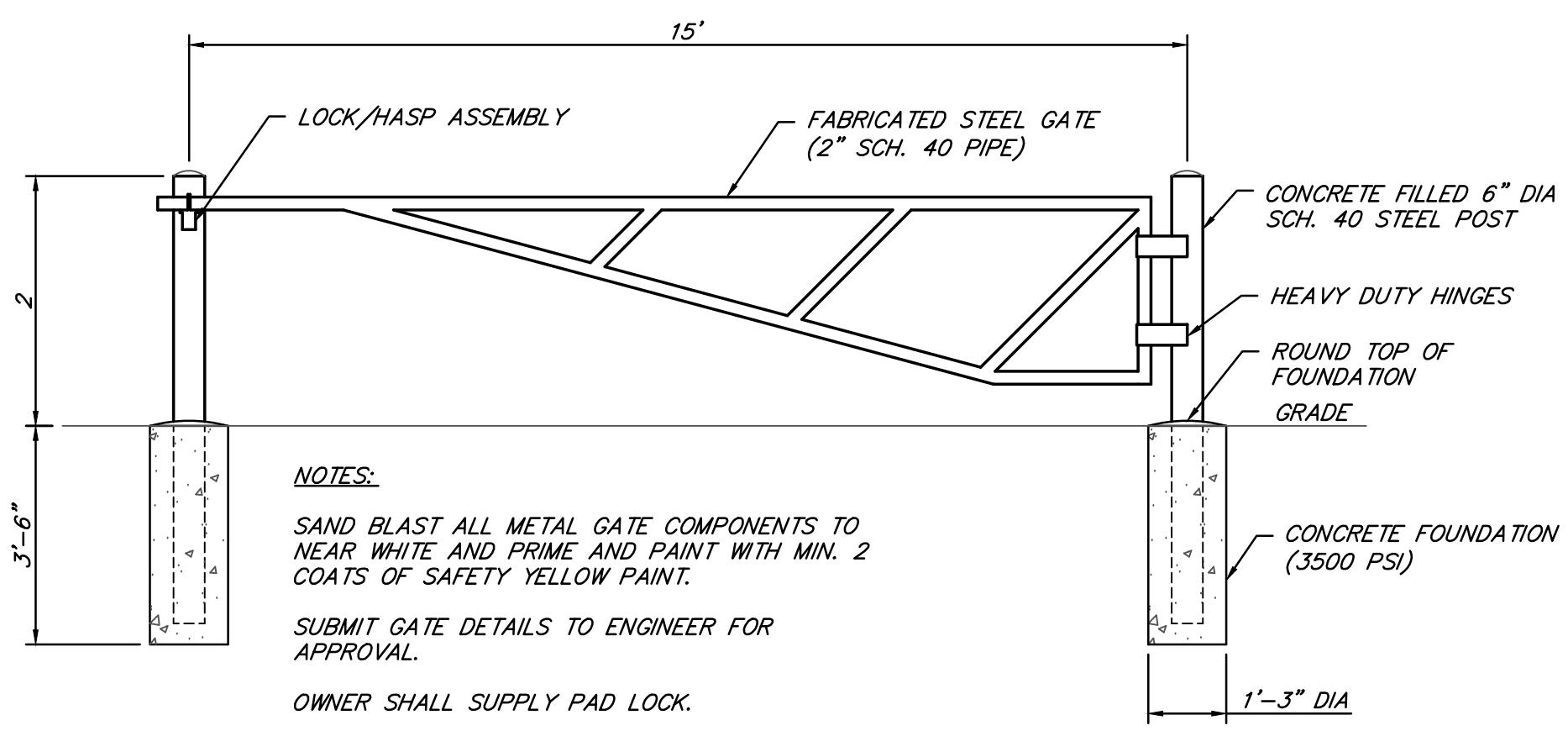
| BY | MARK | REVISIONS | DATE |
|---|-----------------------|--|---------|
| <p>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREON IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</p> | | | |
| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> | | | |
| <p>CROSS SECTIONS WEBSTER DRAIN STA 0+62 TO STA 70+00</p> | | | |
| | | <p>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com</p> | |
| DE. BY: POC/LDO | CH. BY: LDO | PROJECT NO. 122778SG2015 | |
| DR. BY: CBP | APP. BY: RBH | SHEET 8 OF 13 | |
| STDS. | DATE: SEPTEMBER, 2020 | FILE NO. DR-3179-08 | DR 8 |
| SCALE: 1"=10' | | | |

PLOTTING SCALE: RET. F.B. PC. ACAD FILE:

C:\p02115\122778SG2015 - Webster Drain.dwg (2/17/20) - AS.dwg 9/23/2020 8:00:31 AM, plotter:

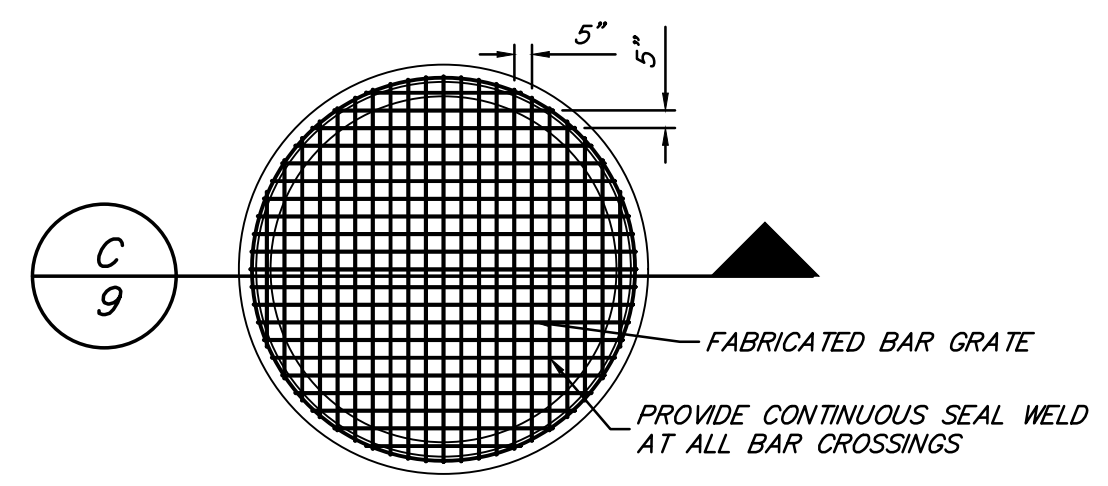


SECTION 16, T.13N.-R.03E.,
TITTABAWASSEE TOWNSHIP,
SAGINAW COUNTY, MICHIGAN



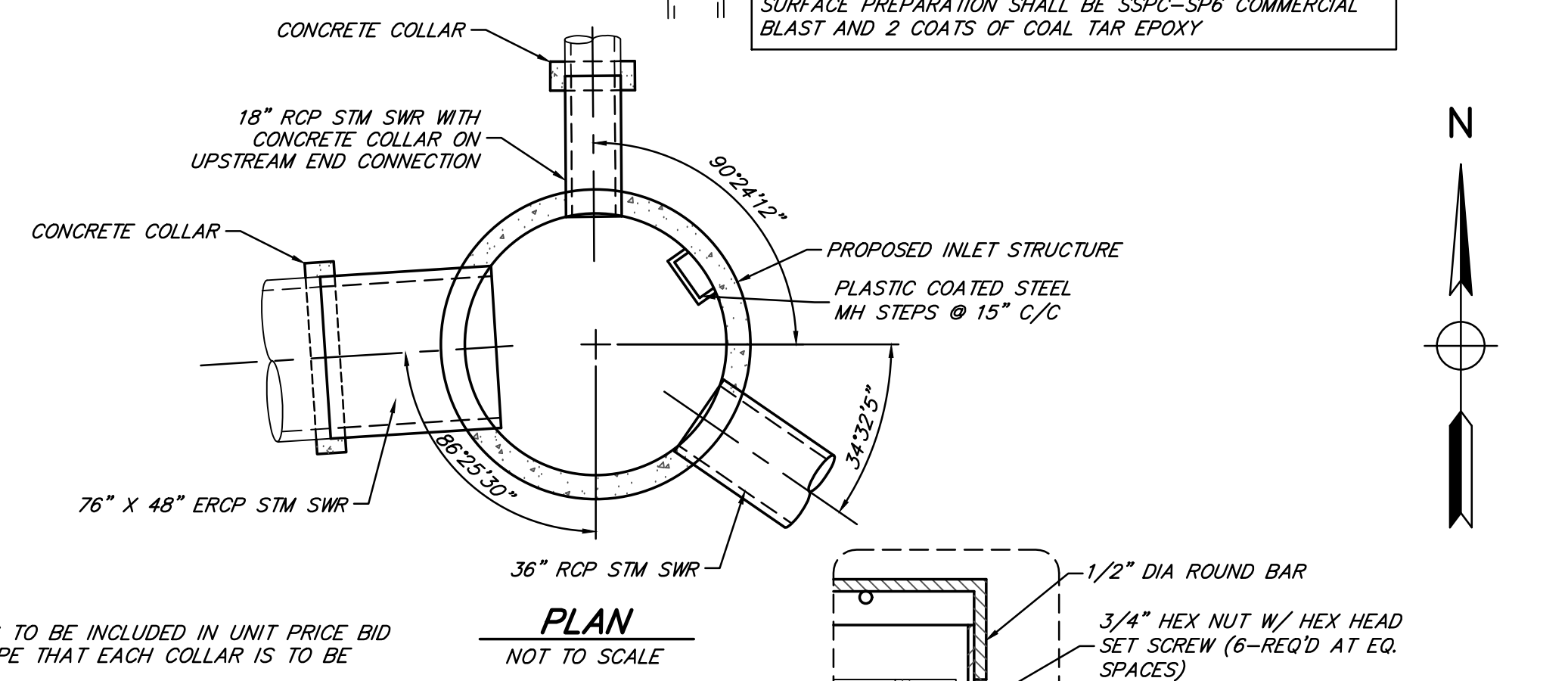
NOTES:
SAND BLAST ALL METAL GATE COMPONENTS TO NEAR WHITE AND PRIME AND PAINT WITH MIN. 2 COATS OF SAFETY YELLOW PAINT.
SUBMIT GATE DETAILS TO ENGINEER FOR APPROVAL.
OWNER SHALL SUPPLY PAD LOCK.

GATE DETAIL
NOT TO SCALE



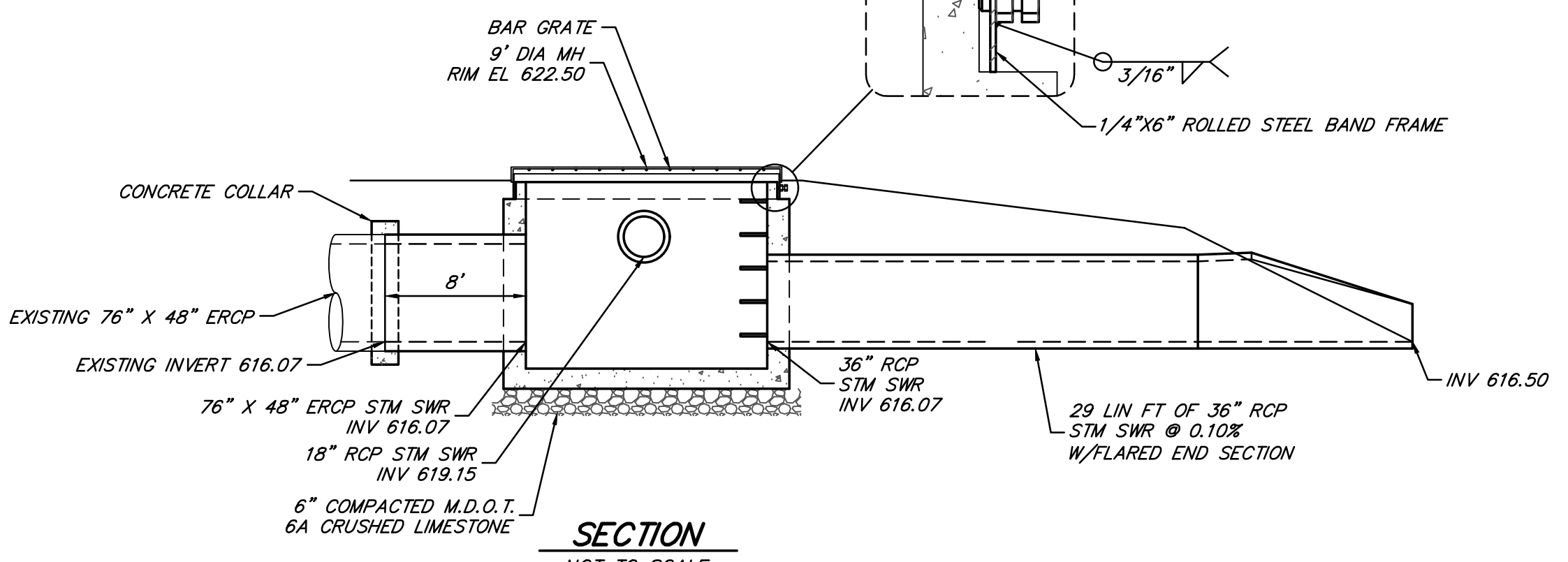
BAR GRATE DETAIL
NOT TO SCALE

BAR GRATE COATING SYSTEM
SURFACE PREPARATION SHALL BE SSPC-SP6 COMMERCIAL BLAST AND 2 COATS OF COAL TAR EPOXY



PLAN
NOT TO SCALE

NOTE:
CONCRETE COLLARS TO BE INCLUDED IN UNIT PRICE BID FOR RESPECTIVE PIPE THAT EACH COLLAR IS TO BE INSTALLED ON.

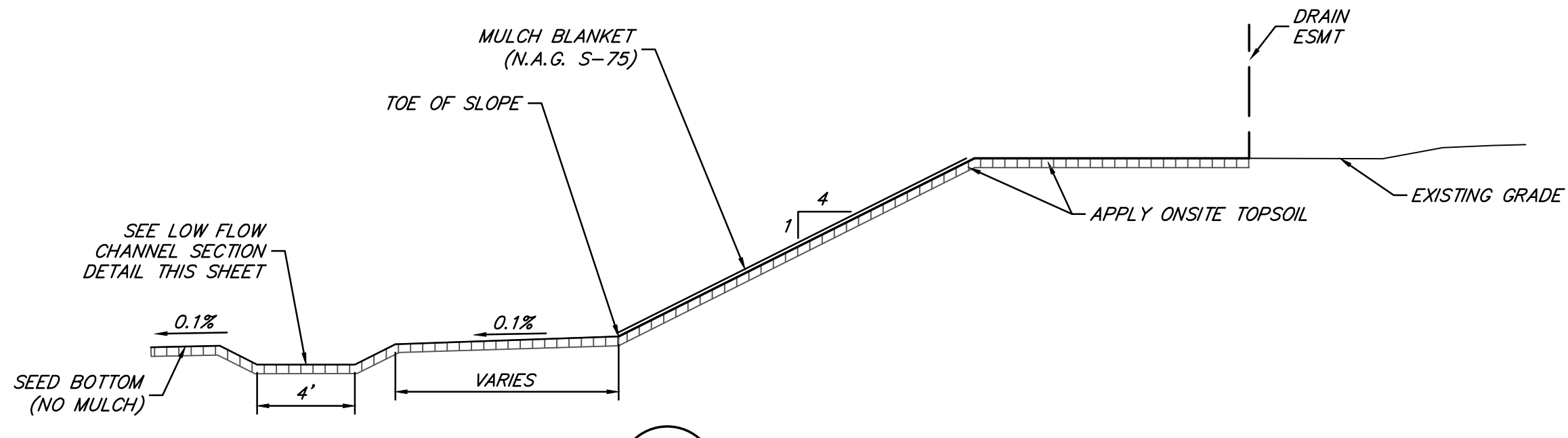


SECTION
NOT TO SCALE

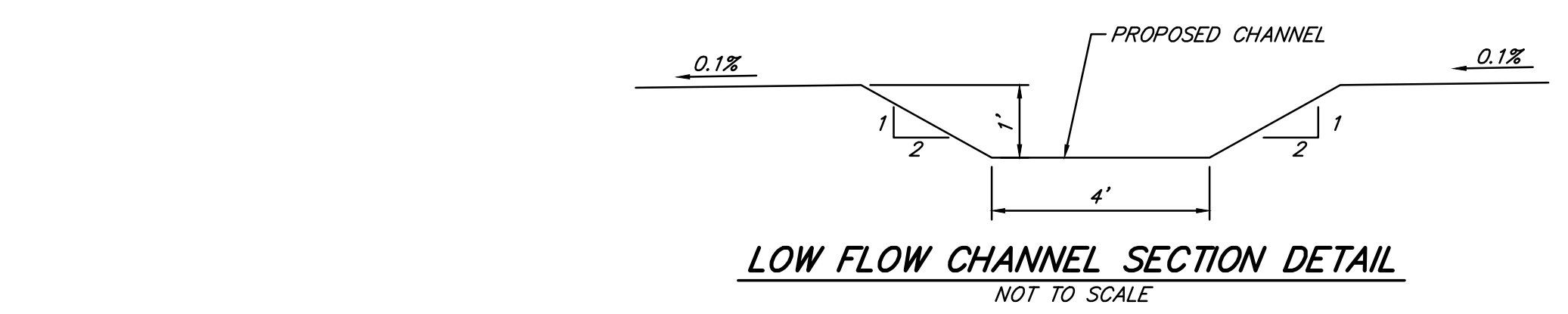
INLET STRUCTURE DETAIL WITH BAR GRATE
NOT TO SCALE

| QUANTITIES THIS SHEET | | |
|-----------------------------|--------|-------|
| ITEM | UNIT | QTY. |
| 18" RCP STM SWR | LIN FT | 8 |
| 36" RCP STM SWR | LIN FT | 29 |
| 36" RCP END SECTION | EACH | 1 |
| 76" X 48" ERCP STM SWR | LIN FT | 8 |
| 9" DIA INLET STRUCTURE | EACH | 1 |
| EARTH EXCAVATION | CYD | 13500 |
| MISCELLANEOUS RIPRAP | SYD | 23 |
| TOE OF SLOPE RIPRAP | LIN FT | 150 |
| MULCH BLANKET (N.A.G. S-75) | SYD | 3200 |

| EROSION CONTROL TABLE | | |
|-----------------------|------------------------------|---|
| KEY* | DESCRIPTION | LOCATION |
| (1) P | SEEDING | ALL GRASS AREAS DISTURBED DURING CONSTRUCTION |
| (2) T | MULCH | ALL GRASS AREAS DISTURBED DURING CONSTRUCTION |
| (6) T | EROSION CONTROL BLANKET | BASIN SIDE SLOPES |
| (7) P | RIPRAP | WHERE CONCENTRATED FLOWS OCCUR, SLOWS VELOCITY, REDUCES EROSION AND SEDIMENT LOAD. |
| (17) P | DUST CONTROL | ALL DISTURBED AREAS |
| (26) T | CATCH BASIN | AS SHOWN |
| (41) P | STORM DRAIN INLET PROTECTION | ALL CATCH BASINS AND DRAIN BASINS AFFECTED BY PROJECT, BOTH EXISTING AND PROPOSED |
| (ER) | EROSION CONTROL STRUCTURES | COORDINATE INSTALLATION OF EROSION CONTROL STRUCTURES WITH ENGINEER PRIOR TO CONSTRUCTION. LOCATIONS, QUANTITIES, OR TYPES MAY VARY BASED ON FIELD DECISIONS. |



NATURAL AREA SIDE SLOPE DETAIL
NOT TO SCALE



LOW FLOW CHANNEL SECTION DETAIL
NOT TO SCALE

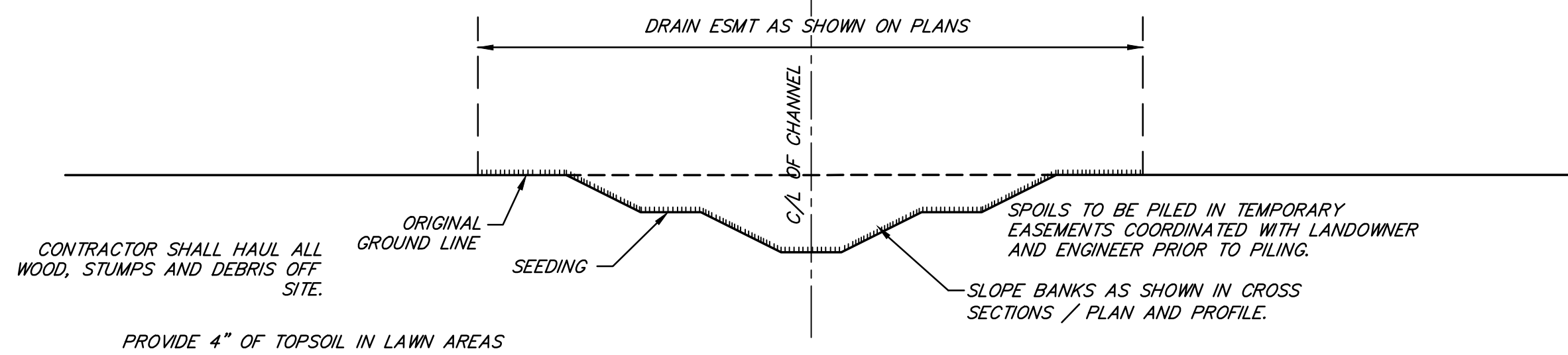
NOTE:
EXCAVATION OF LOW FLOW CHANNEL TO BE INCLUDED IN THE LUMP SUM PRICE BID FOR EXCAVATION.

| BY | MARK | REVISIONS | DATE |
|---|------|-------------------------------------|------|
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| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> | | | |
| <p>NATURAL AREA</p> | | | |
| <p>DE. BY: POC/LDO DR. BY: CBP</p> | | <p>CH. BY: LDO APP. BY: RBH</p> | |
| <p>PROJECT NO. 122778SG2015</p> | | <p>SHEET 09 OF 13</p> | |
| <p>DATE: SEPTEMBER 2020 SCALE: AS SHOWN</p> | | <p>FILE NO. DR-3179-09</p> | |
| <p>STDS.</p> | | <p>DR 09</p> | |

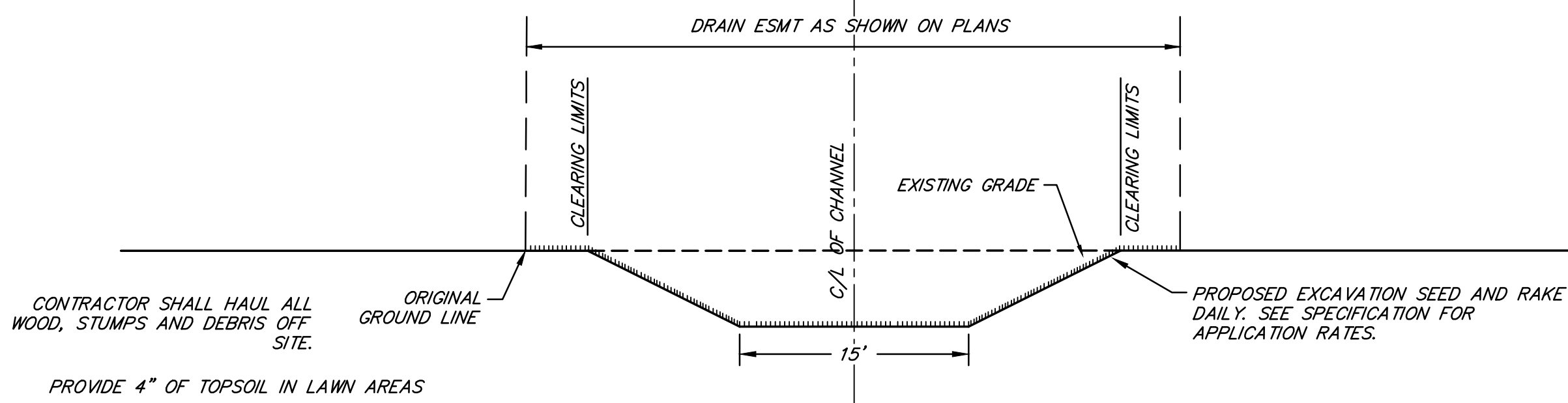
Spicer Group
SAGINAW OFFICE
230 S. Washington Ave.
Saginaw, MI 48607
Tel. 989-754-4717
Fax. 989-754-4440
www.SpicerGroup.com

PLOTTING SCALE: RET. F.B. PC. ACAD FILE:

C:\p02\15122778SG2015 - Webster Drain.dwg (3/17/20) BLSM.dwg 9/22/2020 10:02 PM paths

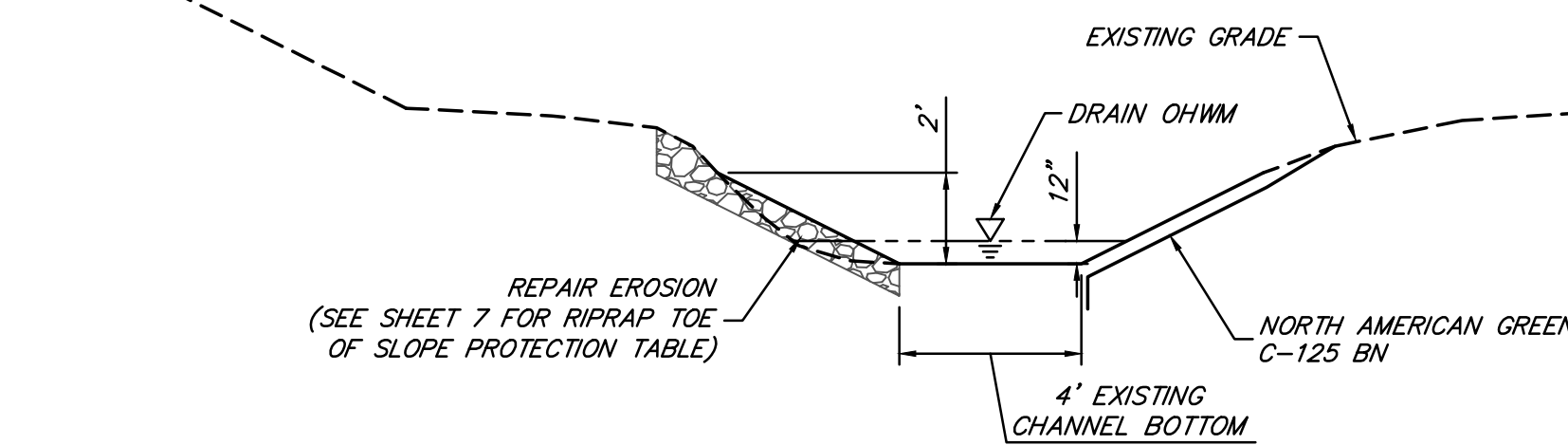


TWO STAGE CHANNEL - DETAIL "A"
NOT TO SCALE

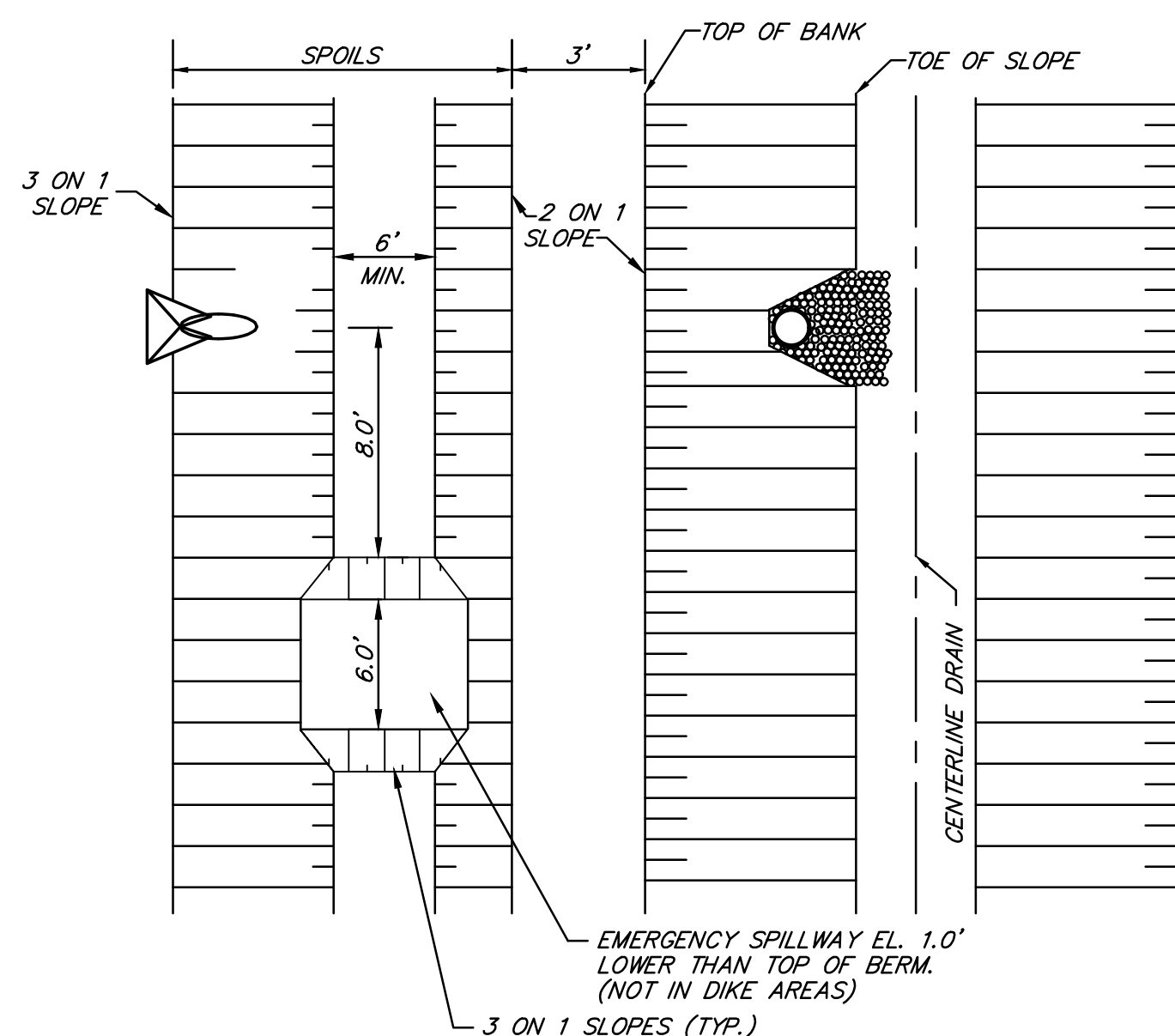


OVERFLOW - DETAIL "B"
NOT TO SCALE

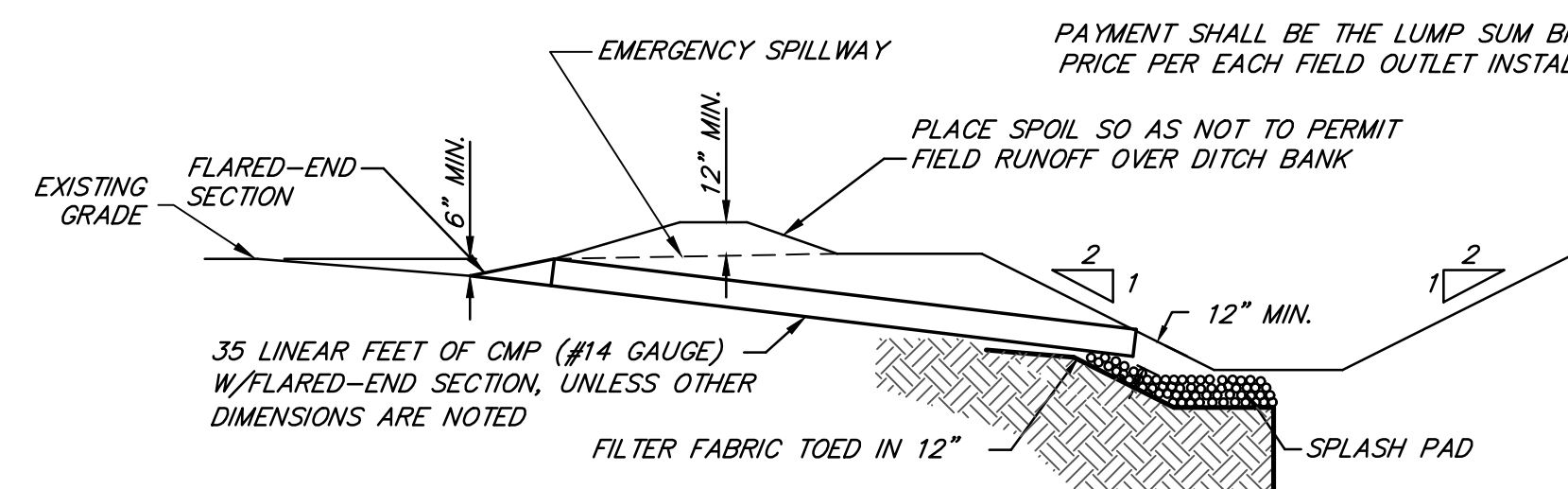
NOTE:
1. PROPOSED WORK IN THE CHANNEL ONLY.
2. SPOILS TO BE LEVELED IN DESIGNATED SPOIL LEVELING AREA AS SHOWN ON SHEET 7.



CHANNEL RESTORATION - DETAIL "C"
NOT TO SCALE

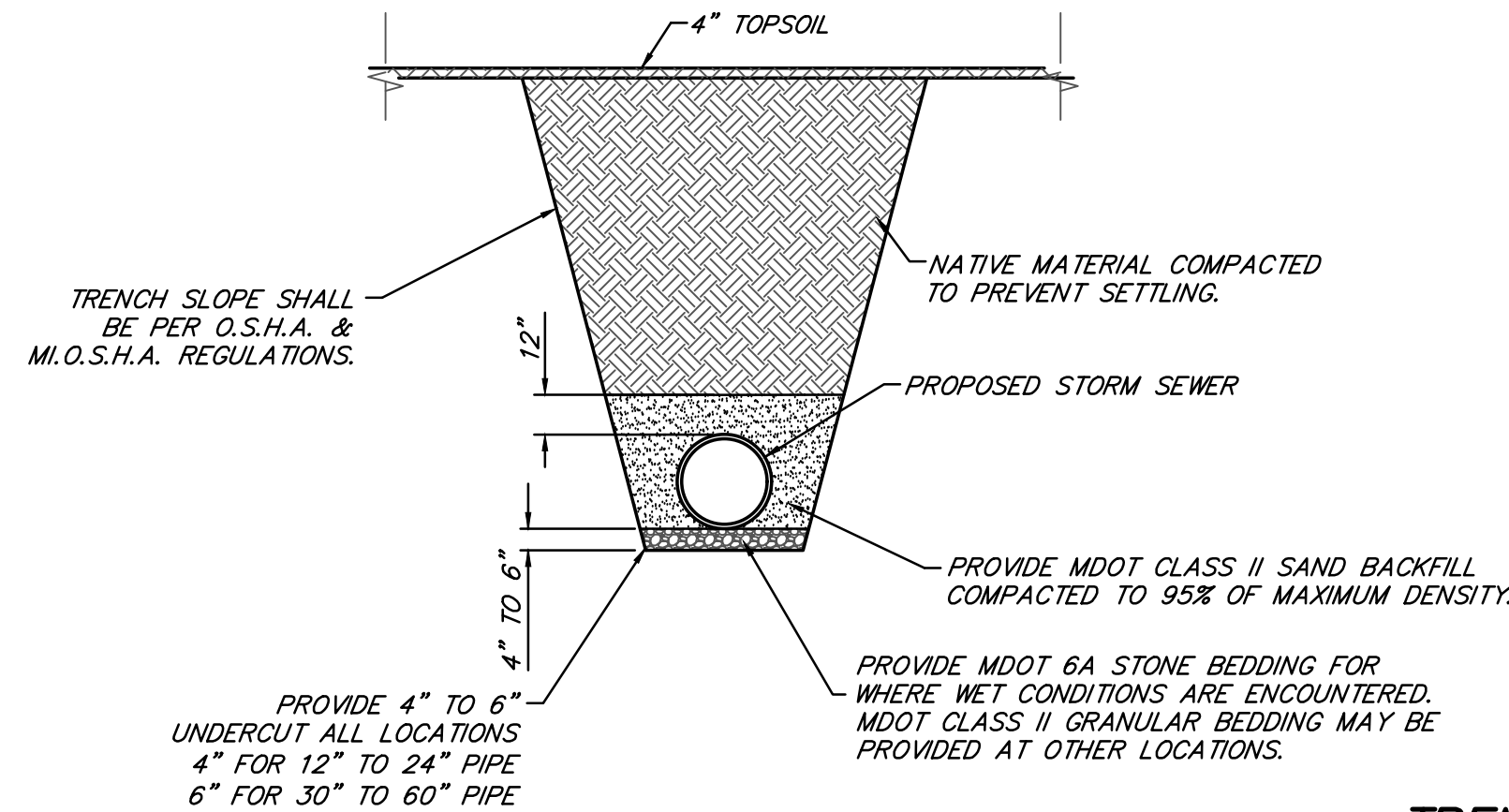


**SURFACE OUTLET TUBE DETAIL
EROSION CONTROL STRUCTURE TYPE II**
NOT TO SCALE

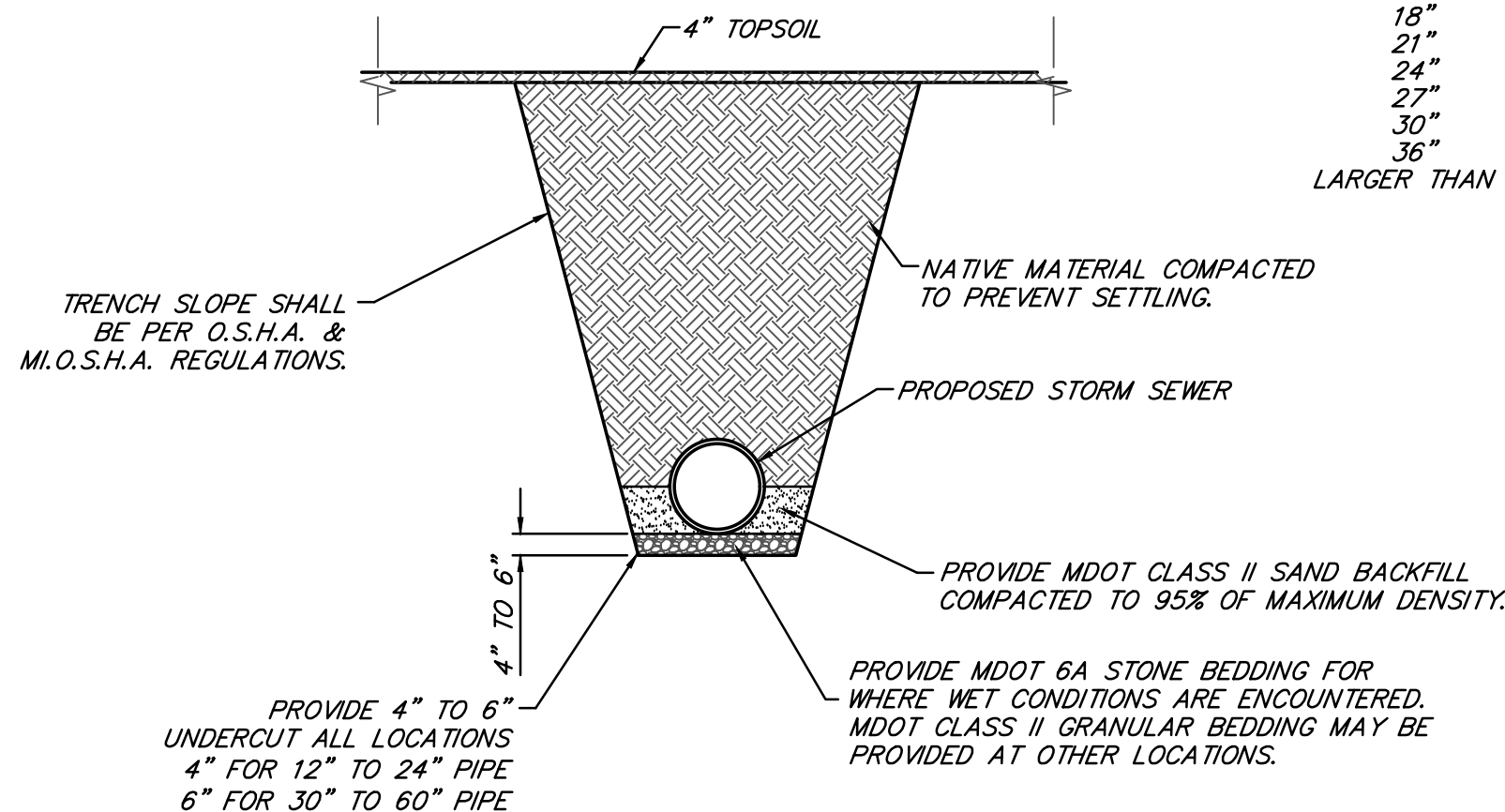


**FIELD TILE OUTLET DETAIL &
SPLASH PAD DETAIL**
NOT TO SCALE

RECESS INVERTS BELOW FLOW LINE:
LARGER THAN 72" - RECESS 0.30 FT.
48" TO 72" - RECESS 0.20 FT.
12" TO 42" - RECESS 0.10 FT.
UNLESS OTHERWISE NOTED ON PLANS.



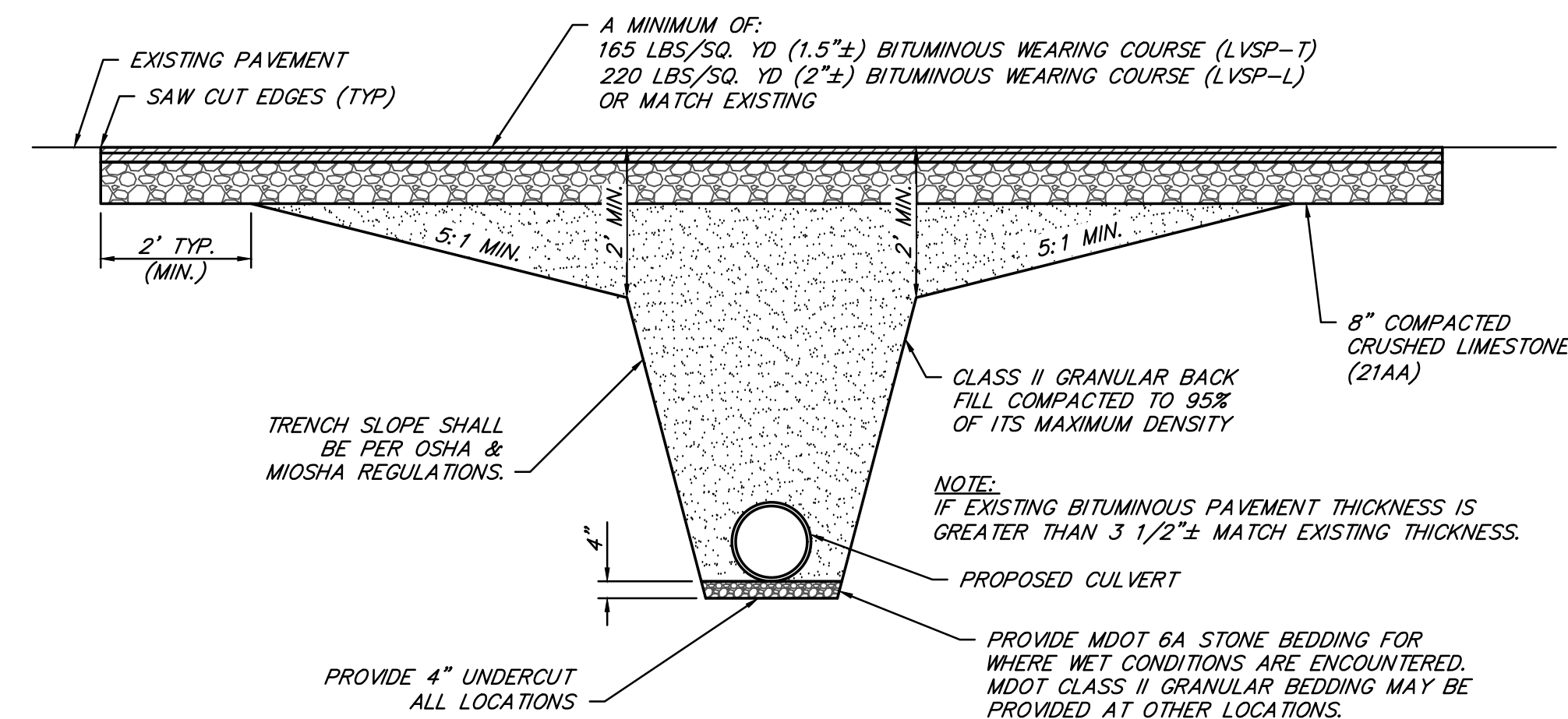
TYPICAL HP STORM SEWER TRENCH DETAIL
NOT TO SCALE



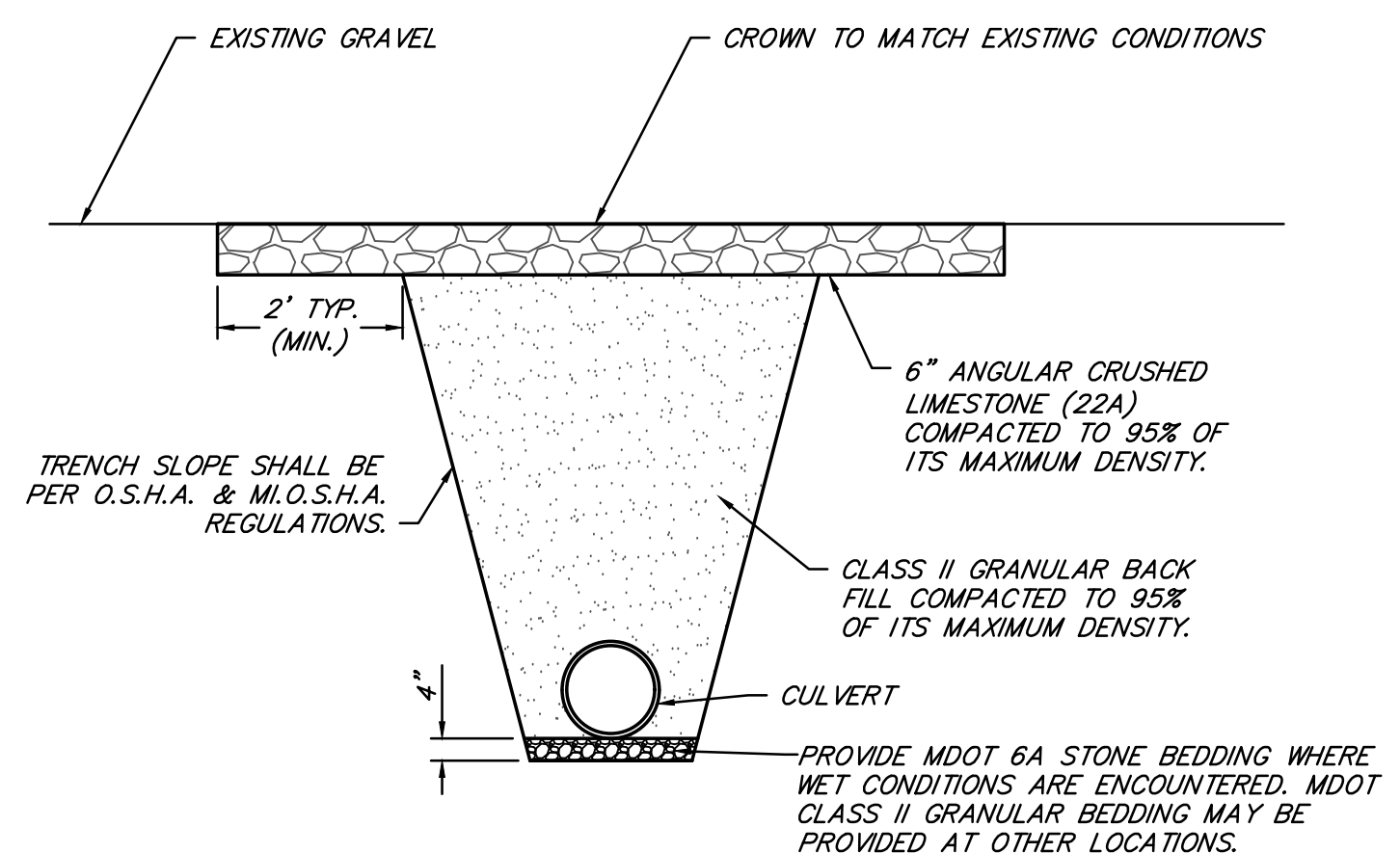
TYPICAL RCP STORM SEWER TRENCH DETAIL
NOT TO SCALE

TRENCH WIDTH CHART

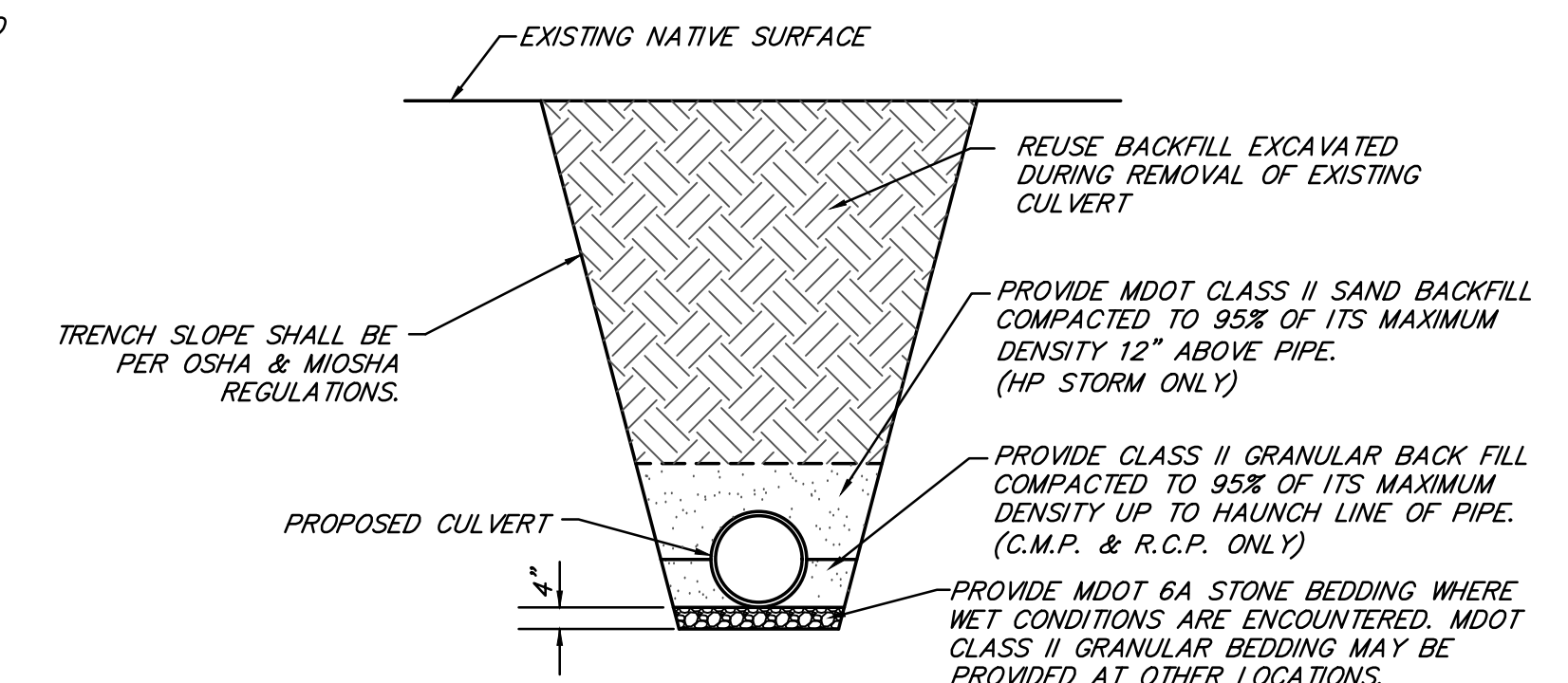
| PIPE SIZE | MINIMUM | MAXIMUM |
|-----------------|-----------|-----------|
| 8" & 10" | 24" | 30" |
| 12" & 15" | 30" | 36" |
| 18" | 34" | 40" |
| 21" | 38" | 42" |
| 24" | 42" | 46" |
| 27" | 45" | 49" |
| 30" | 49" | 53" |
| 36" | 56" | 60" |
| LARGER THAN 36" | I.D. +20" | I.D. +24" |



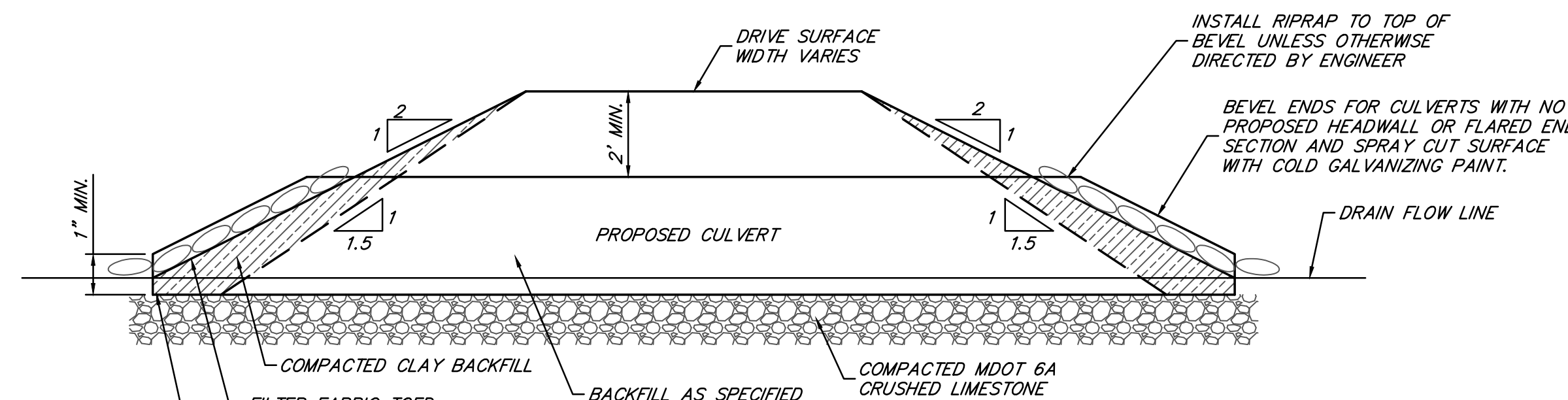
SCRC BITUMINOUS PAVEMENT RESTORATION
NOT TO SCALE



**TYPICAL GRAVEL DRIVE
CROSSING DETAIL**
NOT TO SCALE



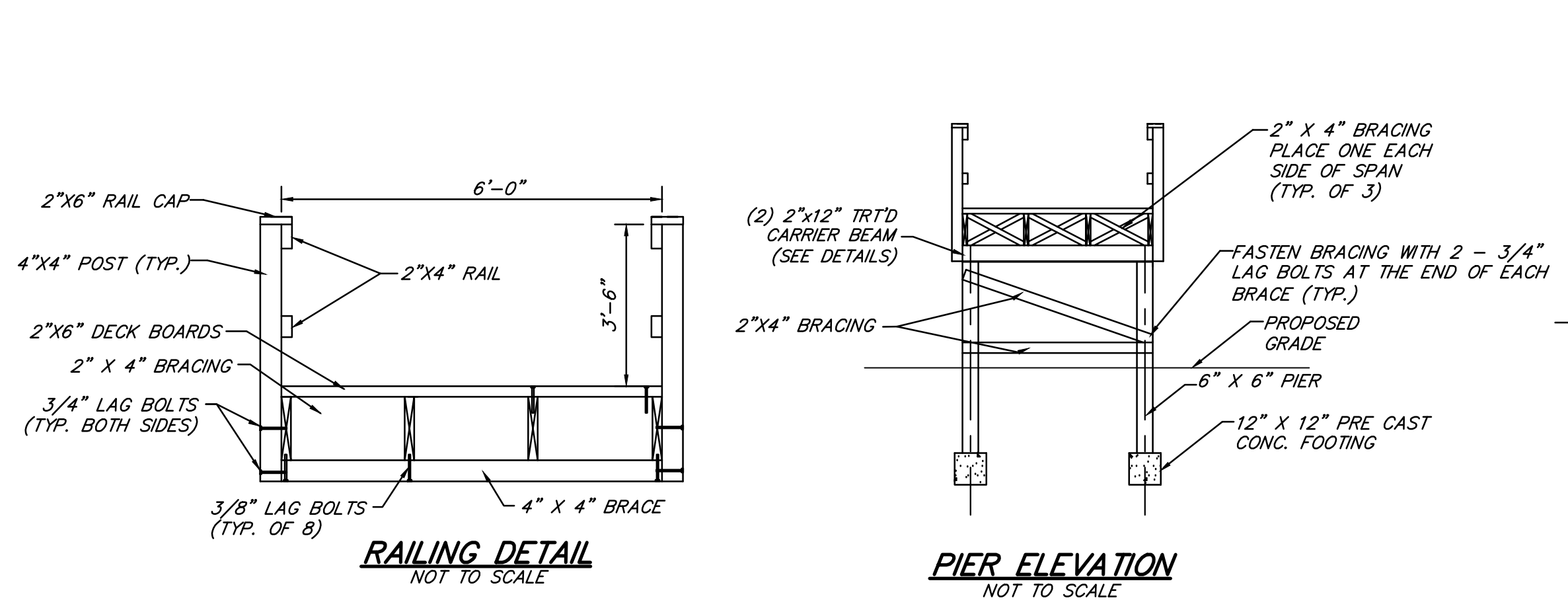
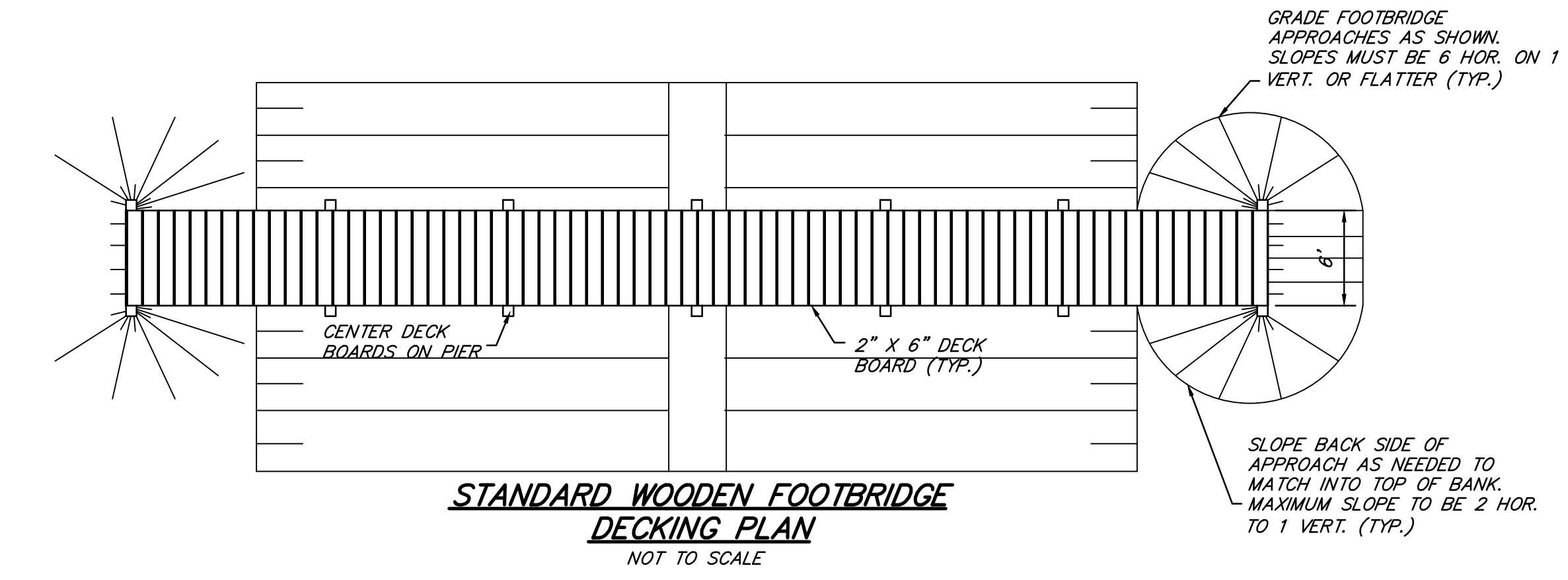
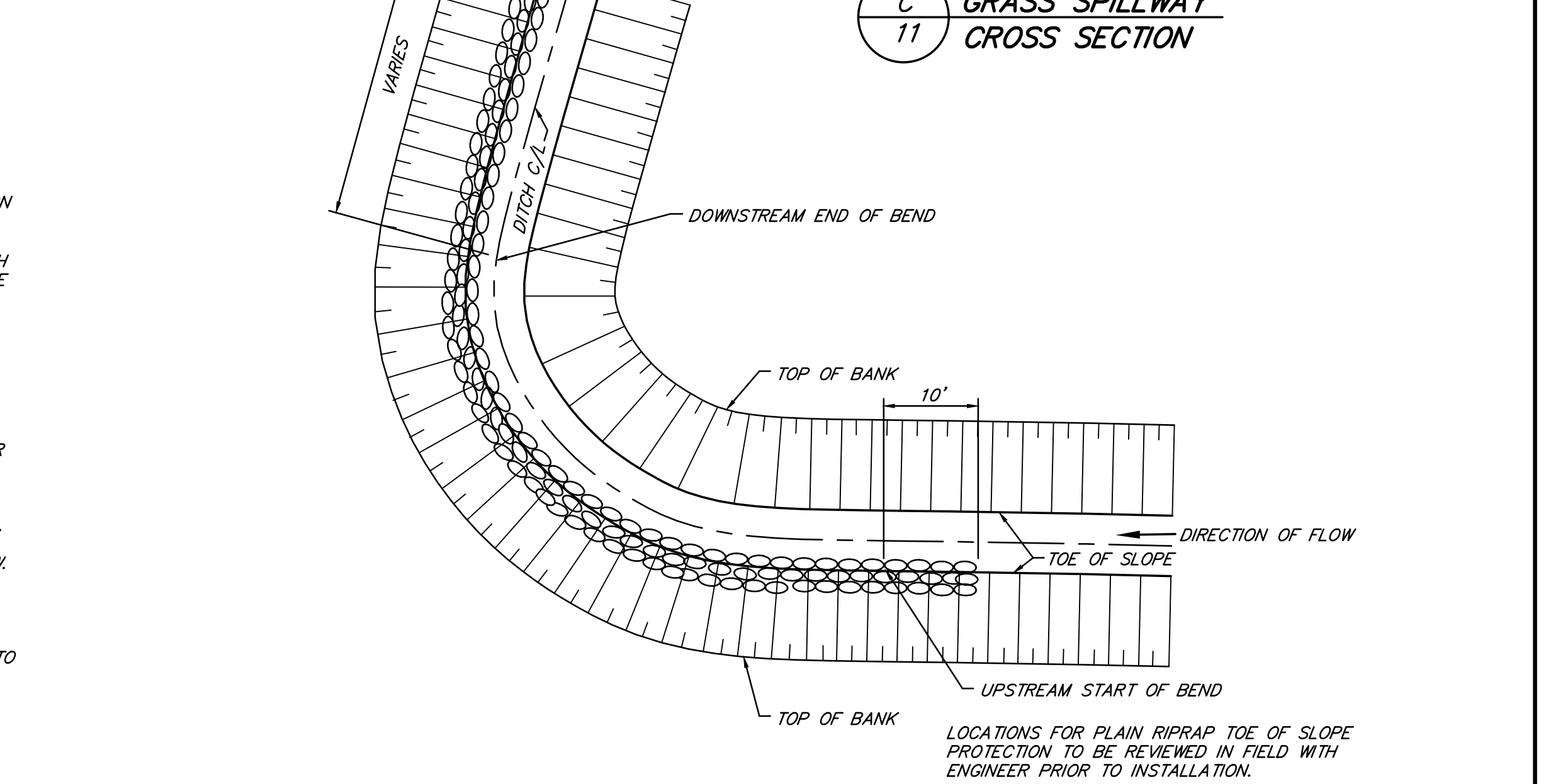
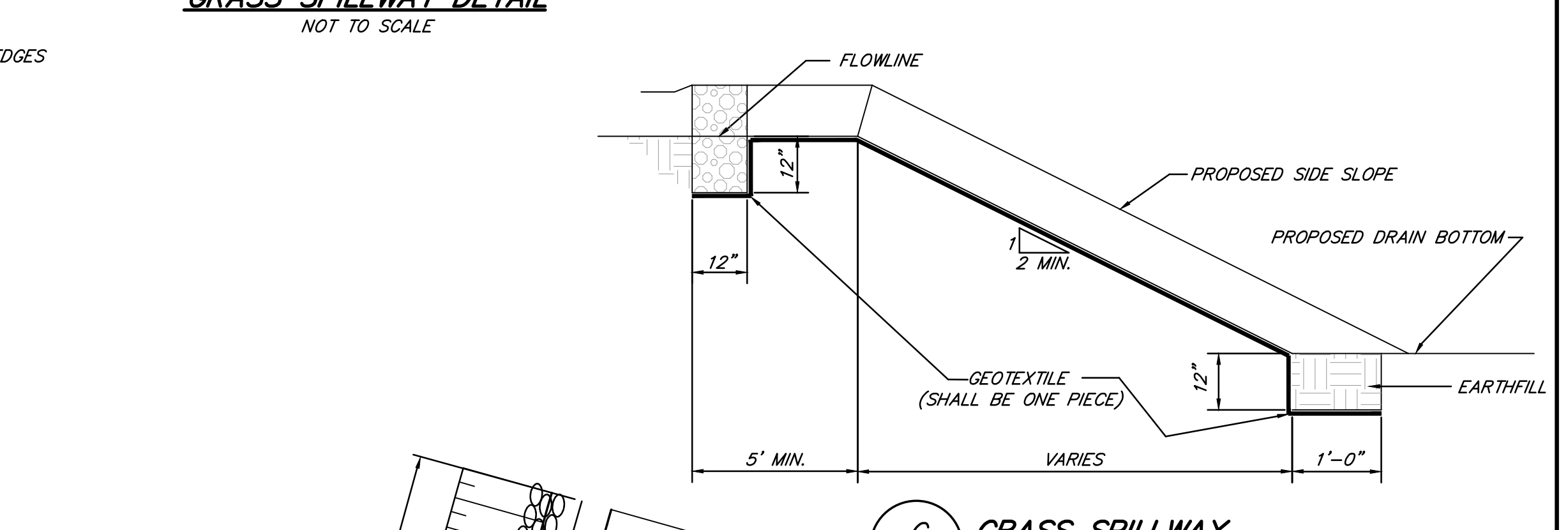
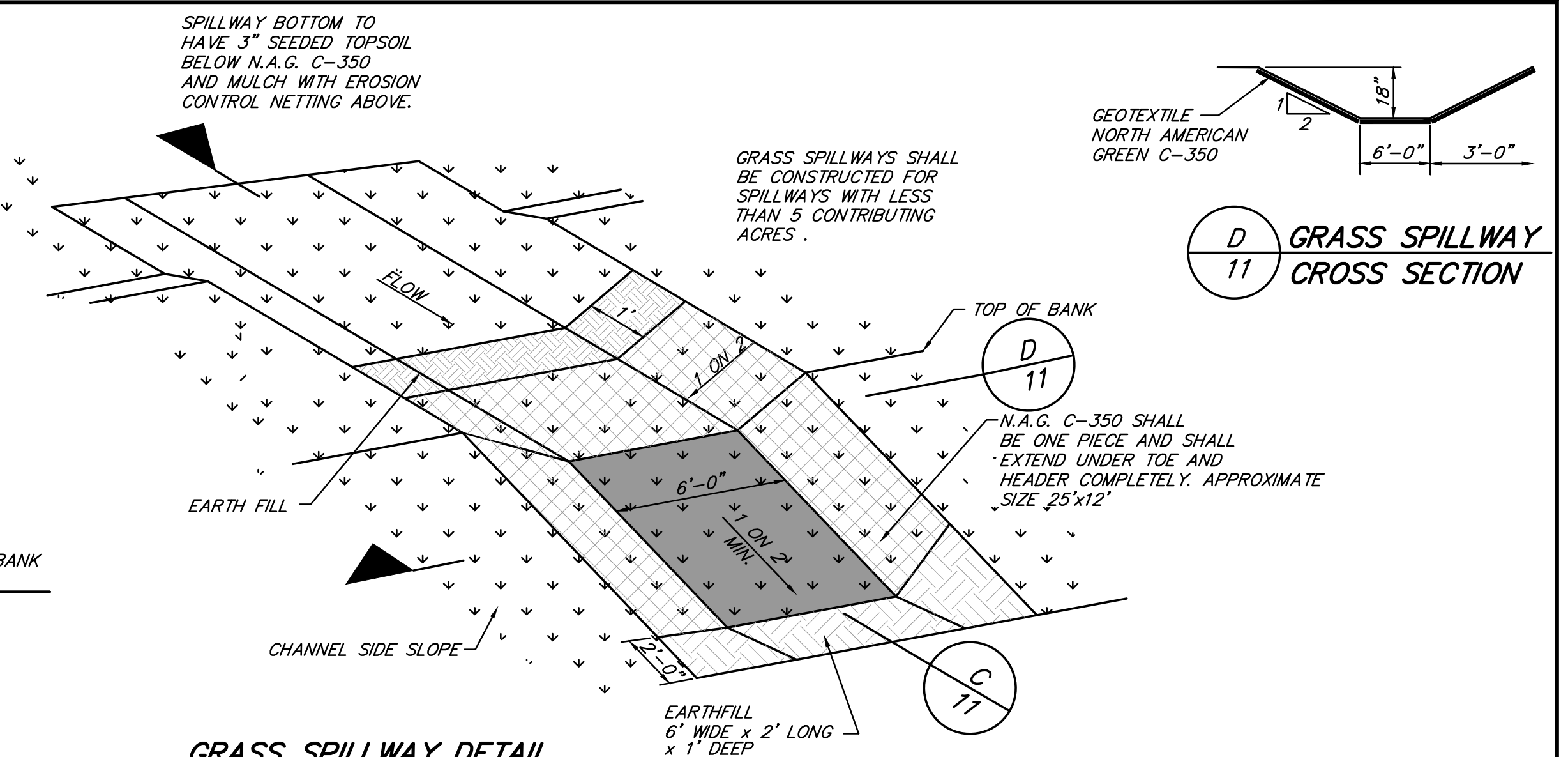
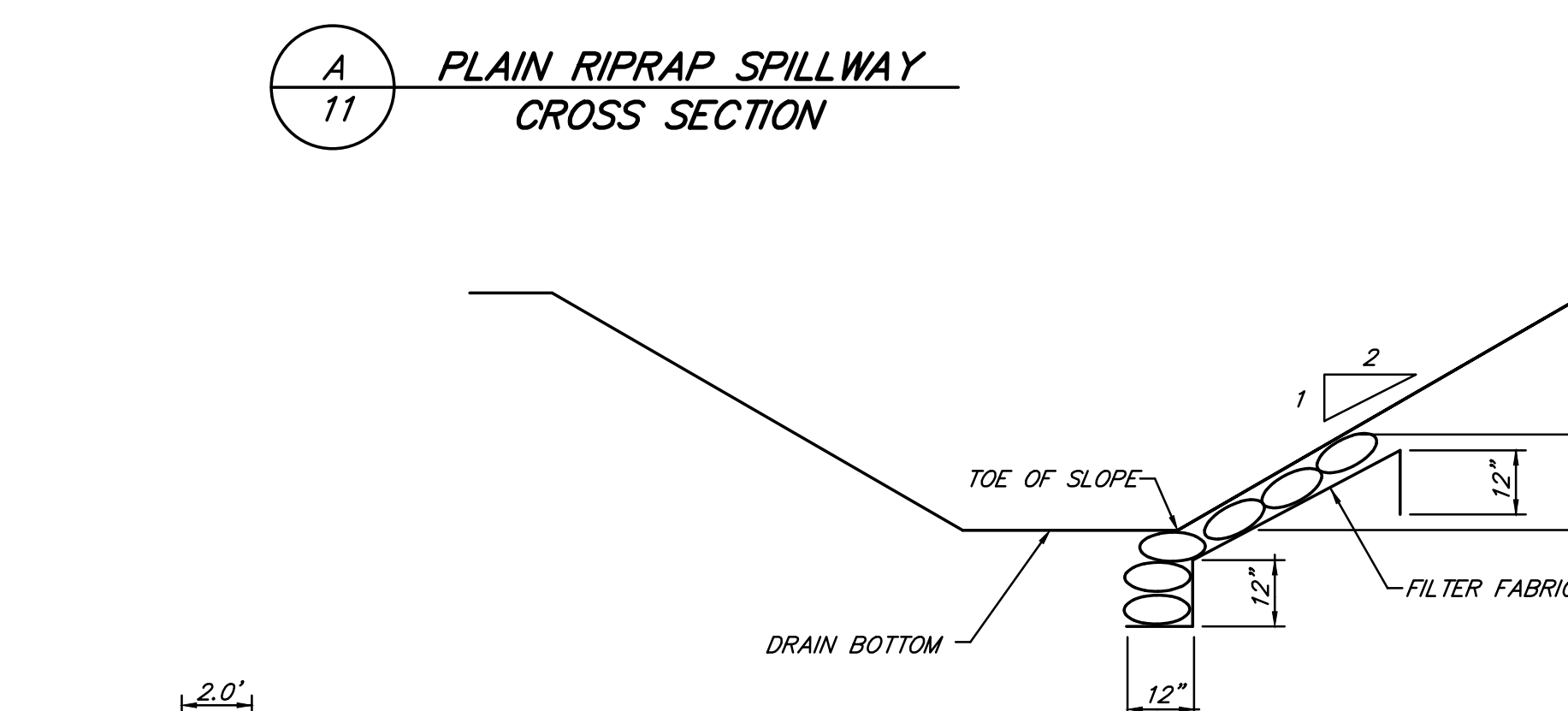
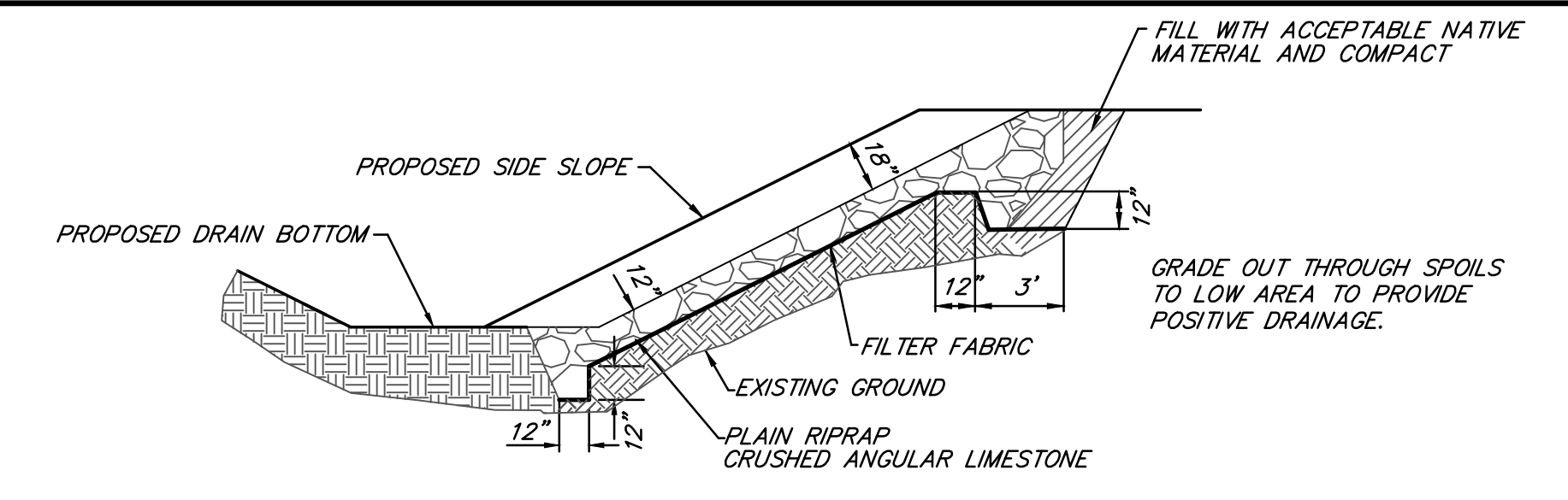
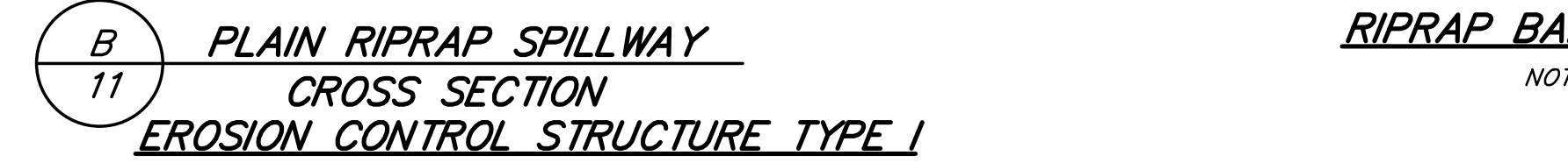
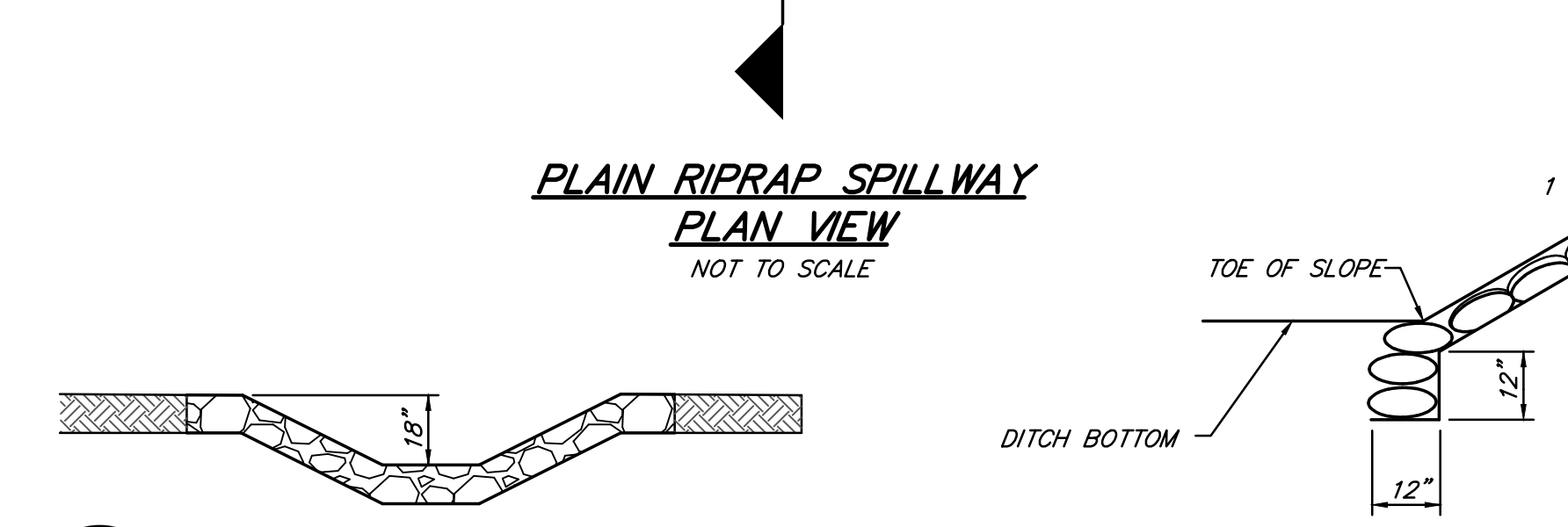
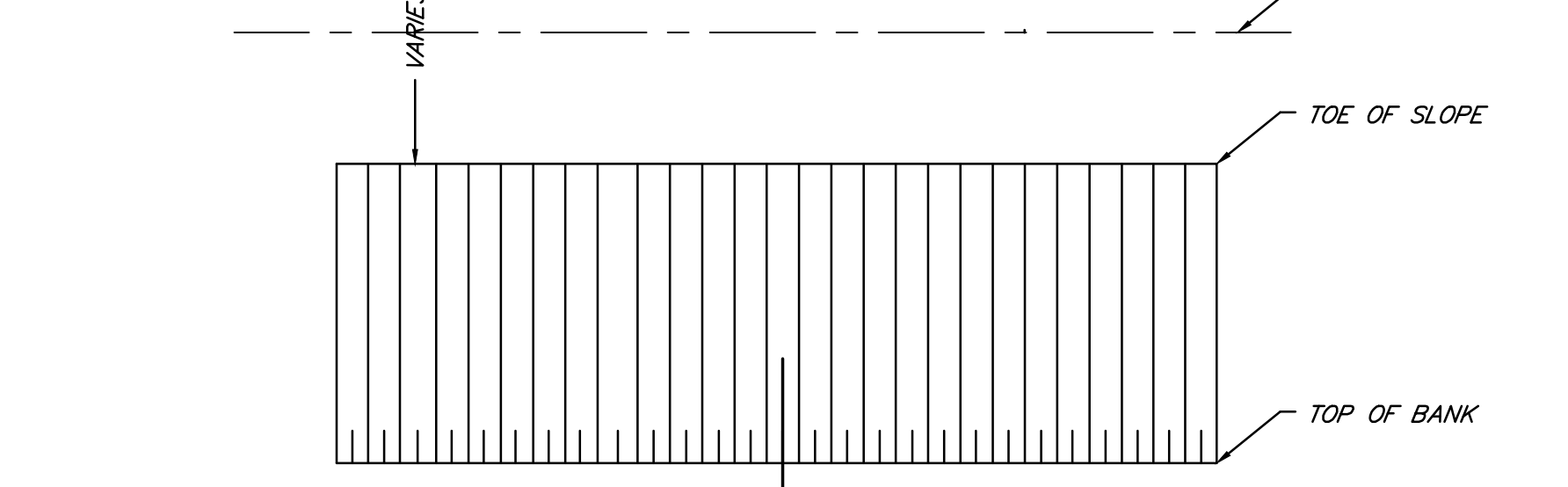
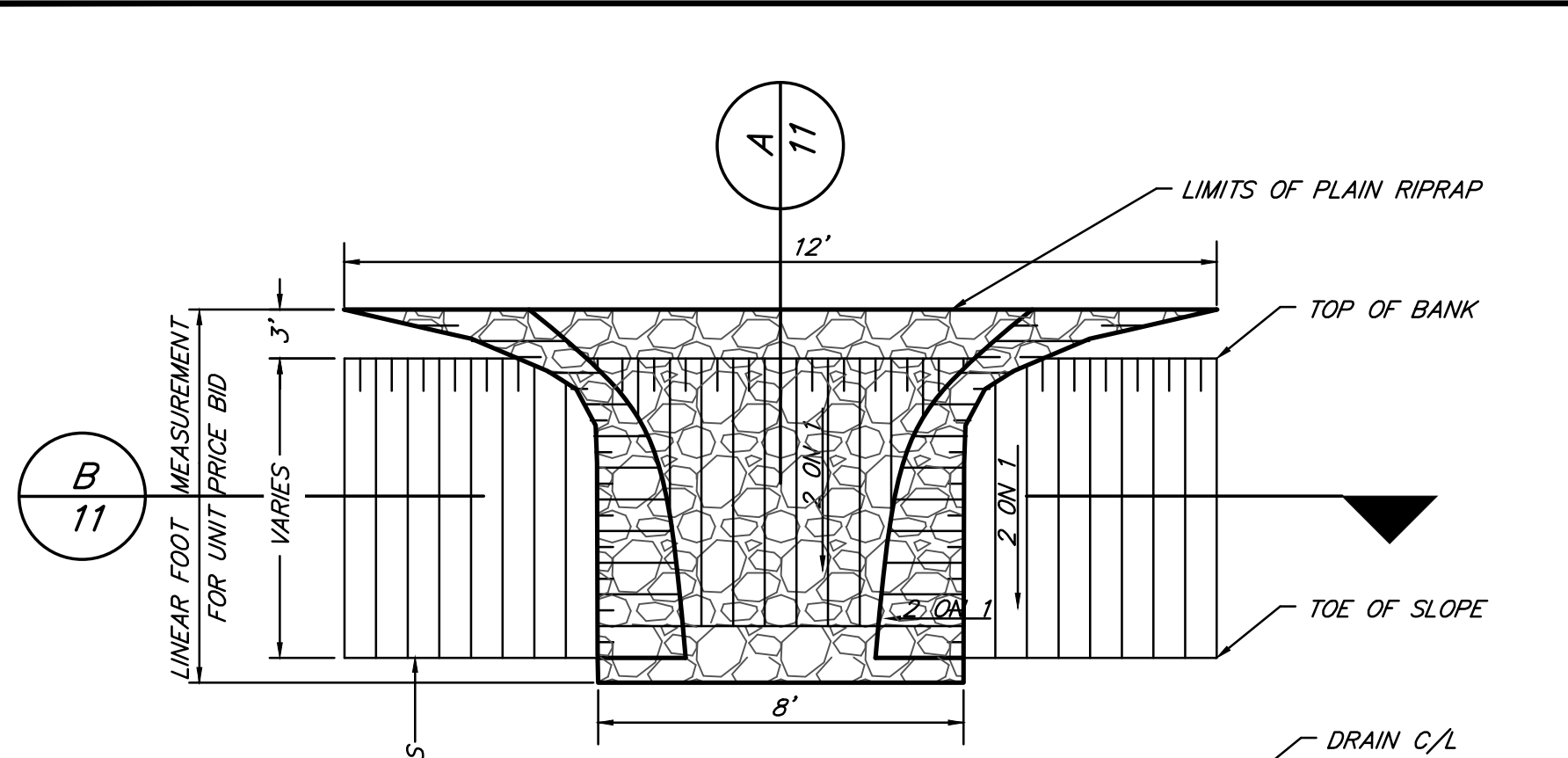
**TYPICAL NATIVE DRIVE
CROSSING DETAIL**
NOT TO SCALE



CMP CROSSING DETAIL
NOT TO SCALE

| BY | MARK | REVISIONS | DATE |
|---|---------------------|--------------------------|------|
| <p>THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREIN IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE.</p> | | | |
| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> | | | |
| <p>MISCELLANEOUS DETAILS</p> | | | |
| <p>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com</p> | | | |
| DE. BY: POC | CH. BY: LDO | PROJECT NO. 122778SG2015 | |
| DR. BY: POC | APP. BY: RBH | DR. 10 | |
| STDS. | SHEET 10 OF 13 | DR. 10 | |
| DATE: SEPTEMBER, 2020 | FILE NO. DR-3179-10 | SCALE: NOT TO SCALE | |

PLOTTING SCALE: RET. F.B. PG. ACAD FILE:



FOOTBRIDGE CONSTRUCTION NOTES

ALL TIMBER FOR THE FOOT BRIDGE AND HANDRAIL SYSTEM SHALL BE #1 SOUTHERN YELLOW PINE, EXCEPT 6" X 6" TIMBER, WHICH CAN BE #2. MOISTURE CONTENT SHALL NOT EXCEED 19 PERCENT. ALL SUBSTRUCTURE 6" X 6" TIMBER SHALL BE PRESSURE TREATED WITH TO A MINIMUM PENETRATION OF .60, AND ALL OTHER TIMBER PRESSURE TREATED TO A MINIMUM PENETRATION OF 0.40. ALL TIMBER FOR SHALL BE TREATED IN ACCORDANCE WITH AWPA U1 (SPECIFICATIONS A OR F) AREAS OF TIMBER THAT ARE FIELD CUT, DRILLED OR MACHINED SHALL RECEIVE TWO COATS OF APPROVED BRUSH ON PRESERVATIVE. SIX MONTHS AFTER FOOT BRIDGE COMPLETION THE CONTRACTOR SHALL APPLY ONE COAT OF AN APPROVED WOOD SEALER.

PRE DRILL HOLES IN TIMBER FOR LAG SCREWS AS NECESSARY.

ALL LAG AND TURN BOLTS SHALL BE HOT DIPPED GALVANIZED.

ALL DECK SCREWS SHALL BE HOT DIPPED GALVANIZED.

ALL ANCHOR BOLTS SHALL BE HOT DIPPED GALVANIZED. DECK BOARDS SHALL SPAN PERPENDICULAR TO THE DIRECTION OF THE TRAVELED WAY AND BE CONTINUOUS WITH NO SPLICES ALLOWED. DECK BOARDS SHALL BE ATTACHED WITH 3 DECK SCREWS AT EACH POINT OF CONTACT.

HANDRAIL RAILS SHALL ONLY BE SPLICED AT A VERTICAL POST LOCATION AND SHALL BE STAGGERED.

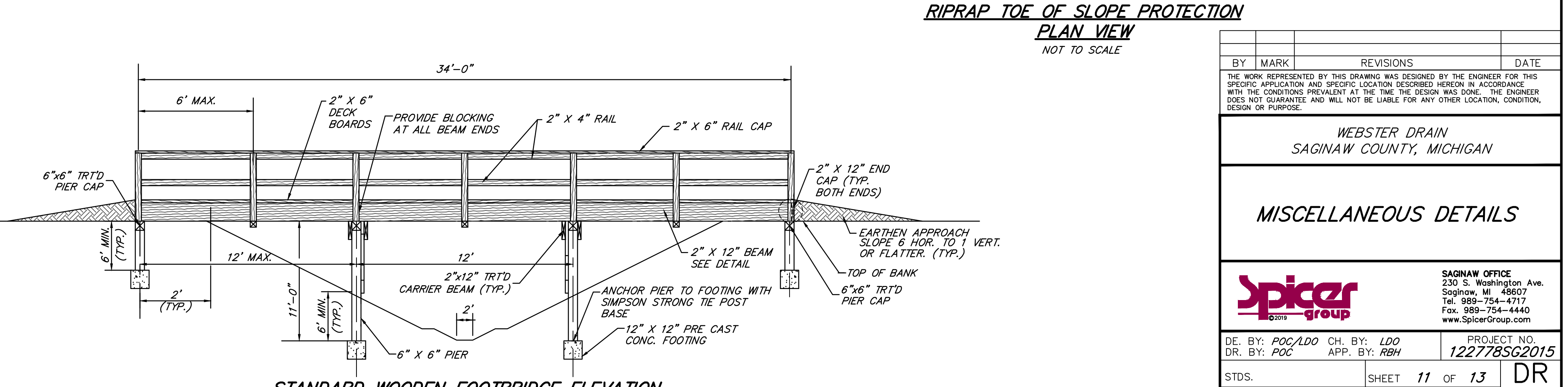
CONTRACTOR SHALL SUBMIT COMPLETE SHOP DRAWINGS ON BRIDGE SYSTEM TO ENGINEER FOR REVIEW.

CONTRACTOR TO FIELD VERIFY FOOTBRIDGE DIMENSIONS WITH ENGINEER PRIOR TO FABRICATION OF FOOTBRIDGES.

FOOTBRIDGE LOW CHORD IS TO MATCH HIGHEST TOP OF BANK. GRADE OPPOSITE BANK AS NEEDED TO MATCH THE HIGH TOP OF BANK ELEVATION.

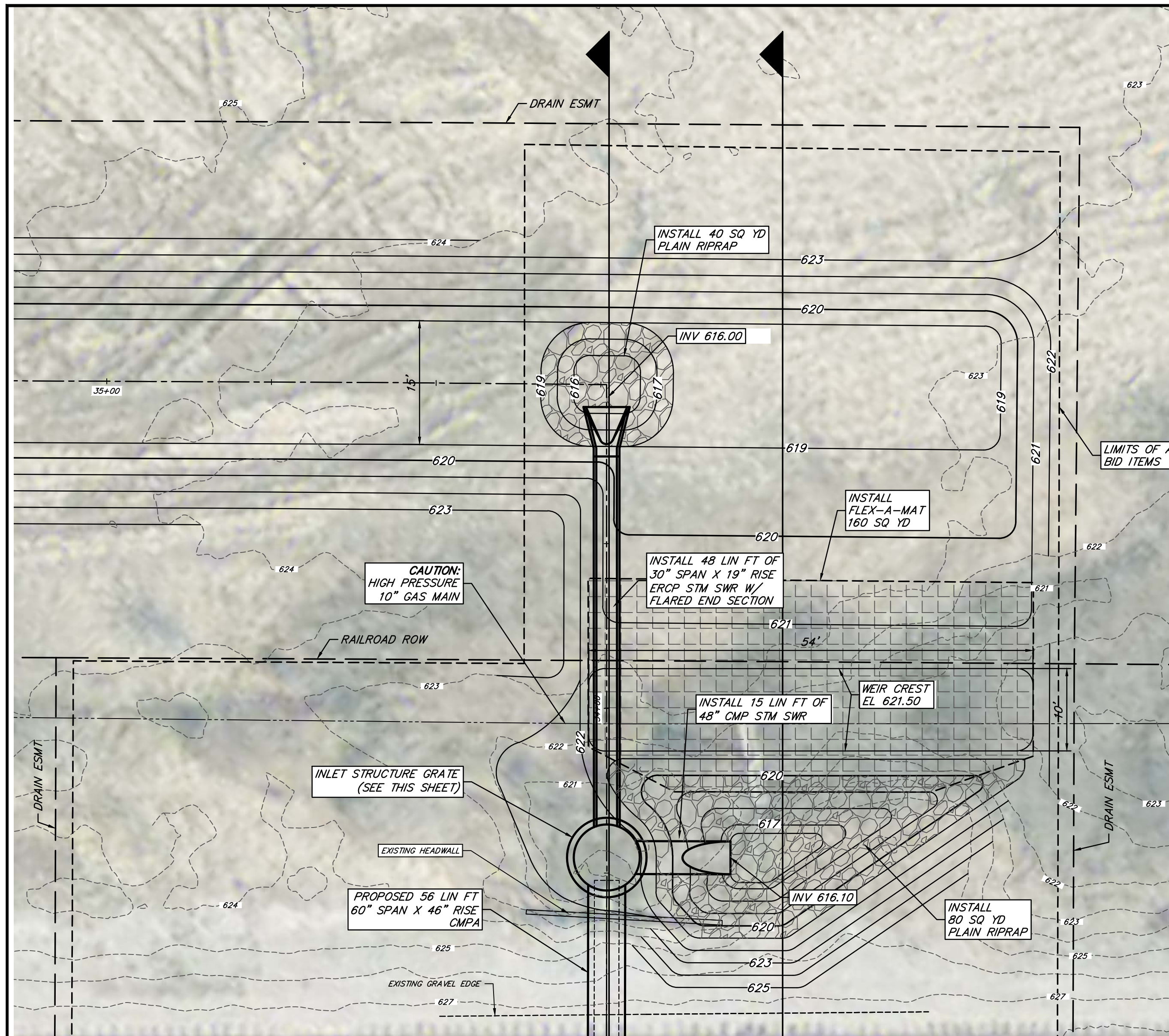
FOOTBRIDGE HAS BEEN DESIGNED FOR PEDESTRIAN LOADING WITH A UNIFORM LIVE LOAD OF 85 PSF.

CONTRACTOR SHALL FIELD VERIFY MINIMUM SOIL BEARING CAPACITY OF 1500 PSF.

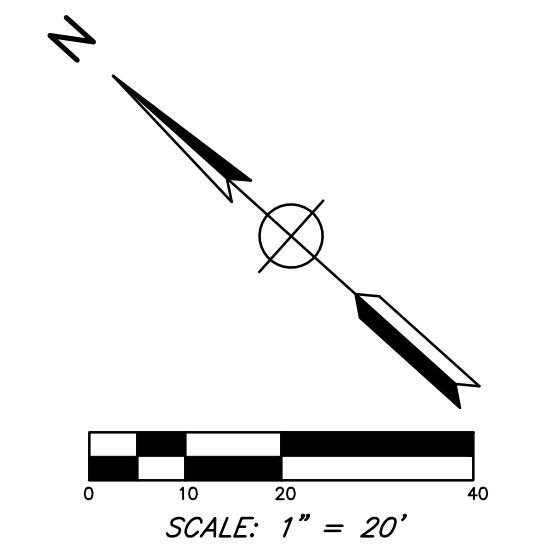


| BY | MARK | REVISIONS | DATE |
|--|------|---------------------|------|
| <p>WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN</p> <p>MISCELLANEOUS DETAILS</p> | | | |
| <p>DE. BY: POC/LDO CH. BY: LDO PROJECT NO. 122778SG2015 DR. BY: POC APP. BY: RBH</p> | | | |
| <p>SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com</p> | | | |
| STDS. | | SHEET 11 OF 13 | |
| DATE: SEPTEMBER, 2020 | | FILE NO. DR-3179-11 | |
| SCALE: NOT TO SCALE | | DR 11 | |

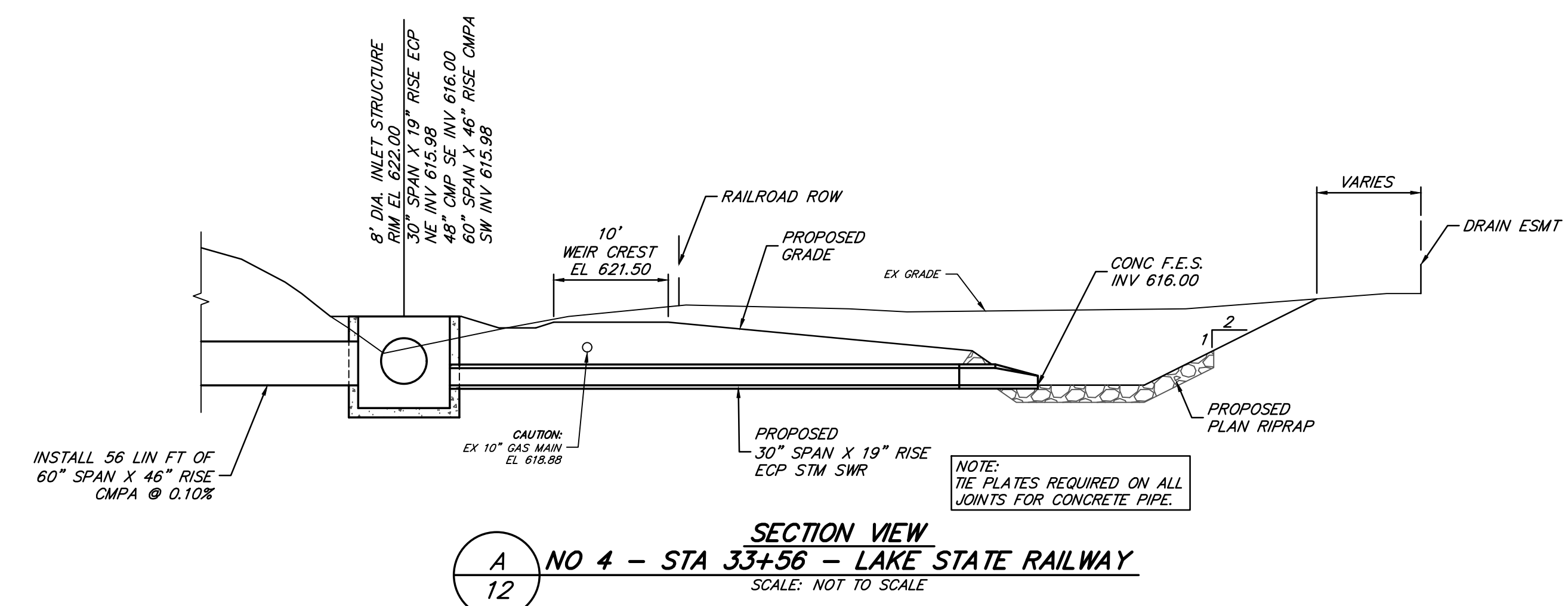
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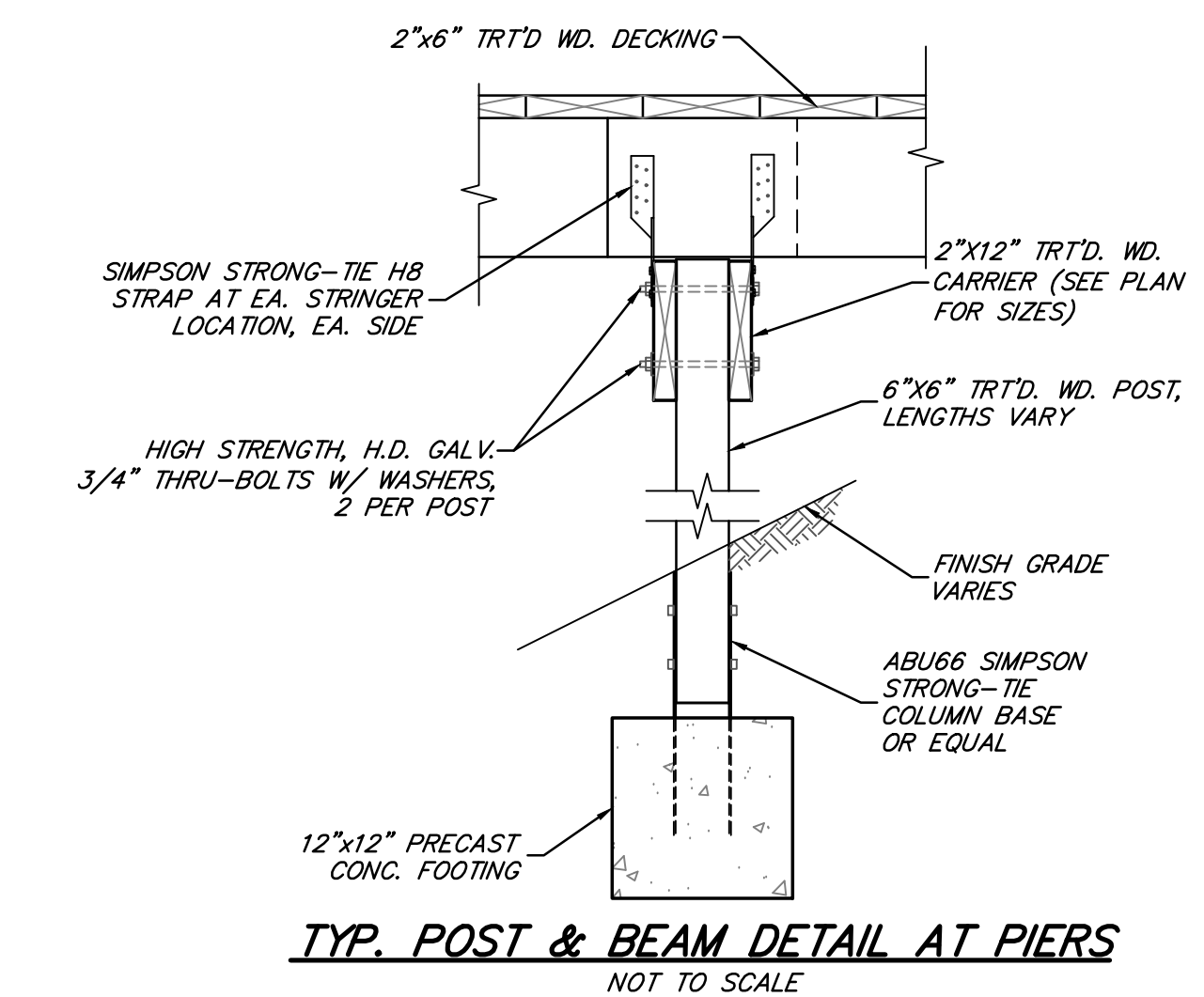
NO 4 - STA 33+56 - LAKE STATE RAILWAY
SCALE: 1" = 20'



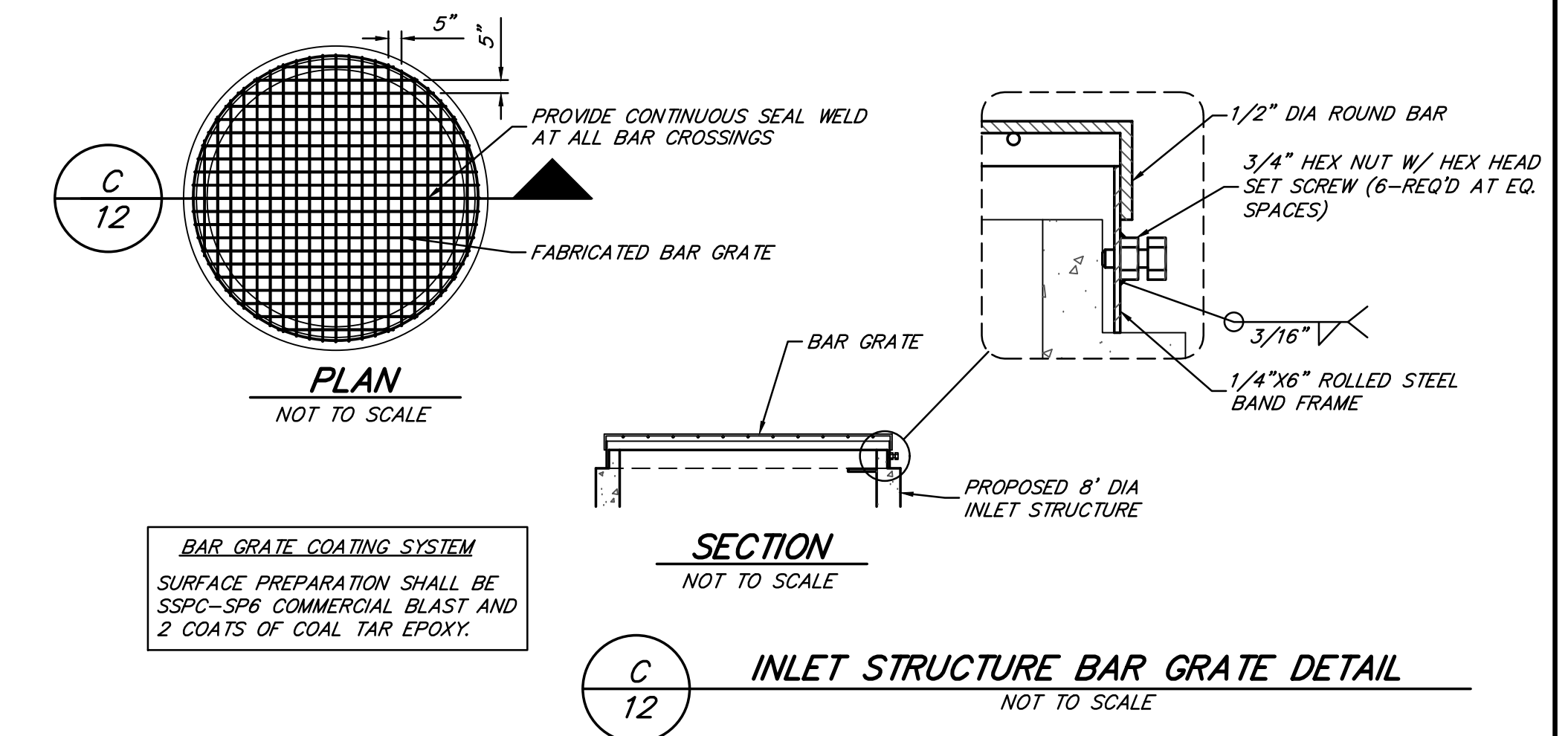
SECTION 16, T.13N.-R.03E.,
TITTABAWASSEE TOWNSHIP,
SAGINAW COUNTY, MICHIGAN



SECTION VIEW
NO 4 - STA 33+56 - LAKE STATE RAILWAY
SCALE: NOT TO SCALE

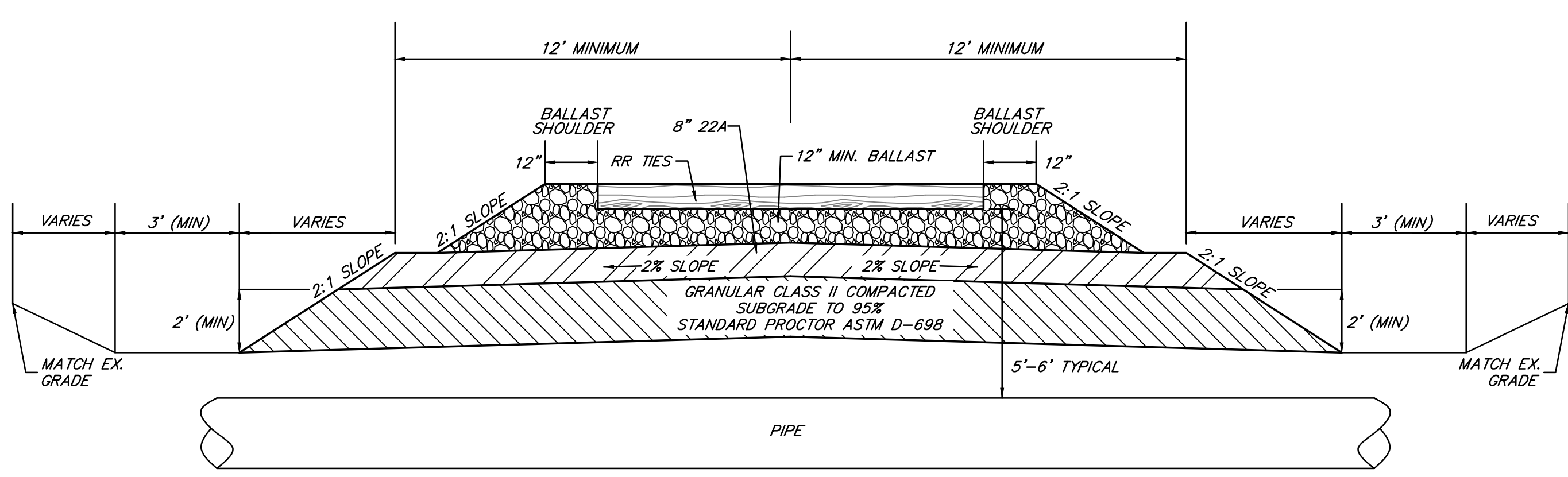


TYP. POST & BEAM DETAIL AT PIERS
NOT TO SCALE

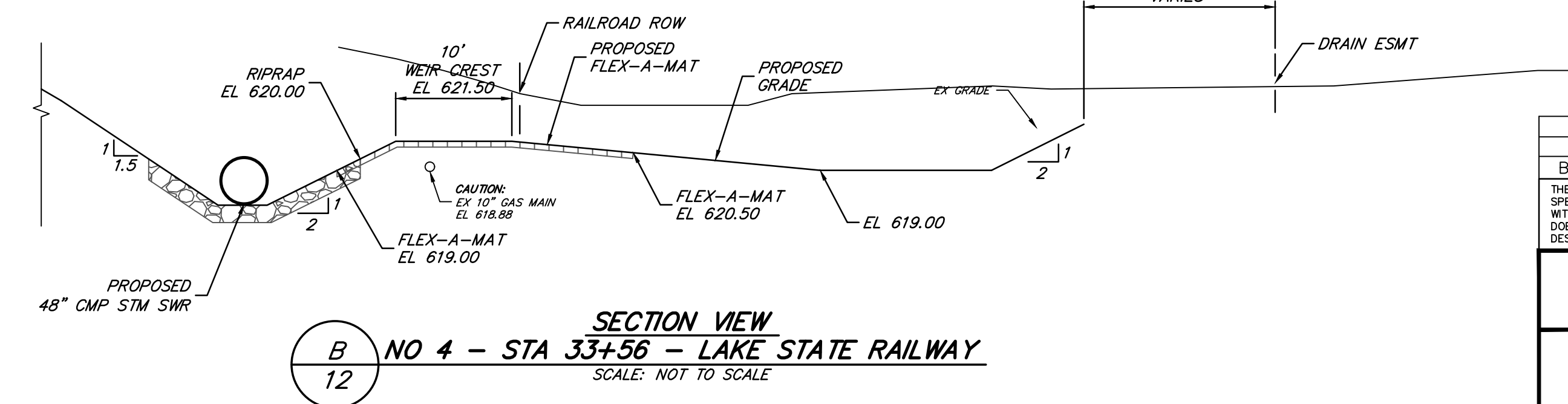


BAR GRATE COATING SYSTEM
SURFACE PREPARATION SHALL BE SSPC-SP6 COMMERCIAL BLAST AND 2 COATS OF COAL TAR EPOXY.

INLET STRUCTURE BAR GRATE DETAIL
NOT TO SCALE



TYPICAL TRACK CROSS SECTION
NOT TO SCALE

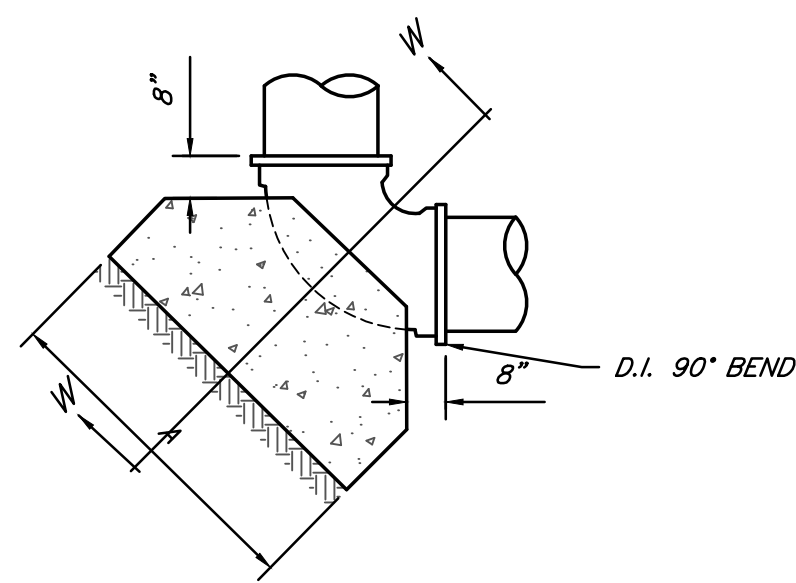


SECTION VIEW
NO 4 - STA 33+56 - LAKE STATE RAILWAY
SCALE: NOT TO SCALE

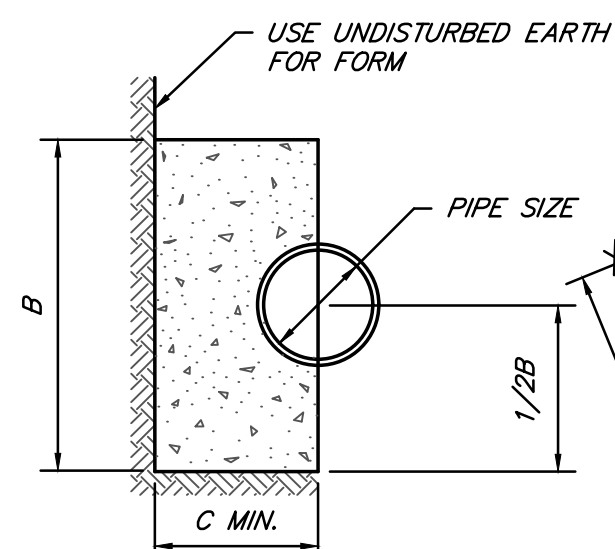
NOTE: ALL ITEMS ON THIS SHEET ARE ALTERNATE BID ITEMS

| BY | MARK | REVISIONS | DATE |
|--|------|------------------------------------|------|
| WEBSTER DRAIN SAGINAW COUNTY, MICHIGAN | | | |
| ALTERNATE BID ITEMS | | | |
| | | | |
| DE. BY: POC/LDO DR. BY: CBP | | CH. BY: LDO APP. BY: RBH | |
| PROJECT NO. 122778SG2015 | | SHEET 12 OF 13 | |
| DATE: SEPTEMBER, 2020 SCALE: AS SHOWN | | FILE NO. DR-3179-012 | |
| DR. BY: POC/LDO DR. BY: CBP | | PROJECT NO. 122778SG2015 | |
| SHEET 12 OF 13 | | DR 12 | |

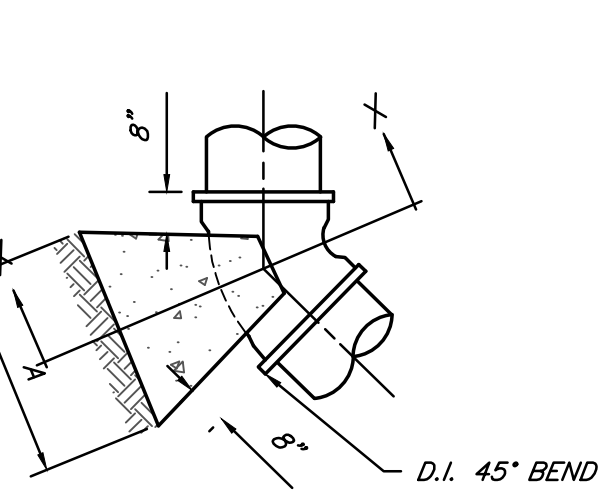
PLOTTING SCALE: RET. F.B. PG. ACAD FILE:



PLAN
 DETAIL OF BLOCK FOR 90° BEND OR TEE
 Q - MIN. CU. YD. CONCRETE PER BLOCK

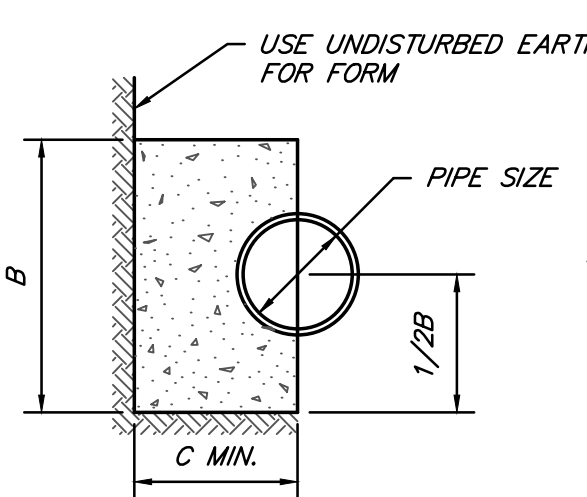


SEC. W-W

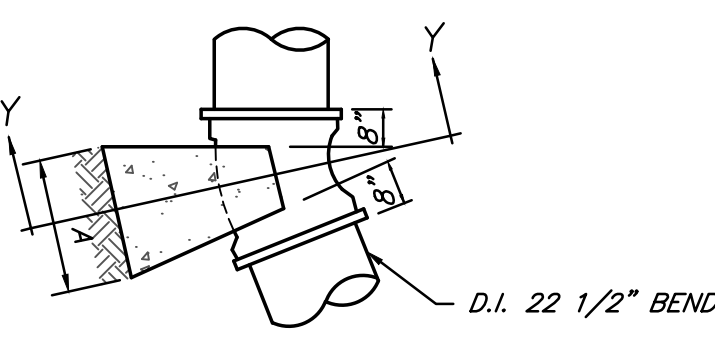


PLAN

DETAIL OF BLOCK FOR 45° BEND
 Q - MIN. CU. YD. CONCRETE PER BLOCK

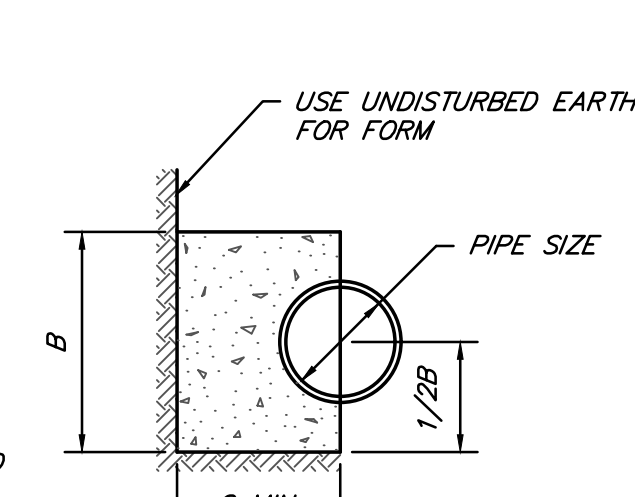


SEC. X-X

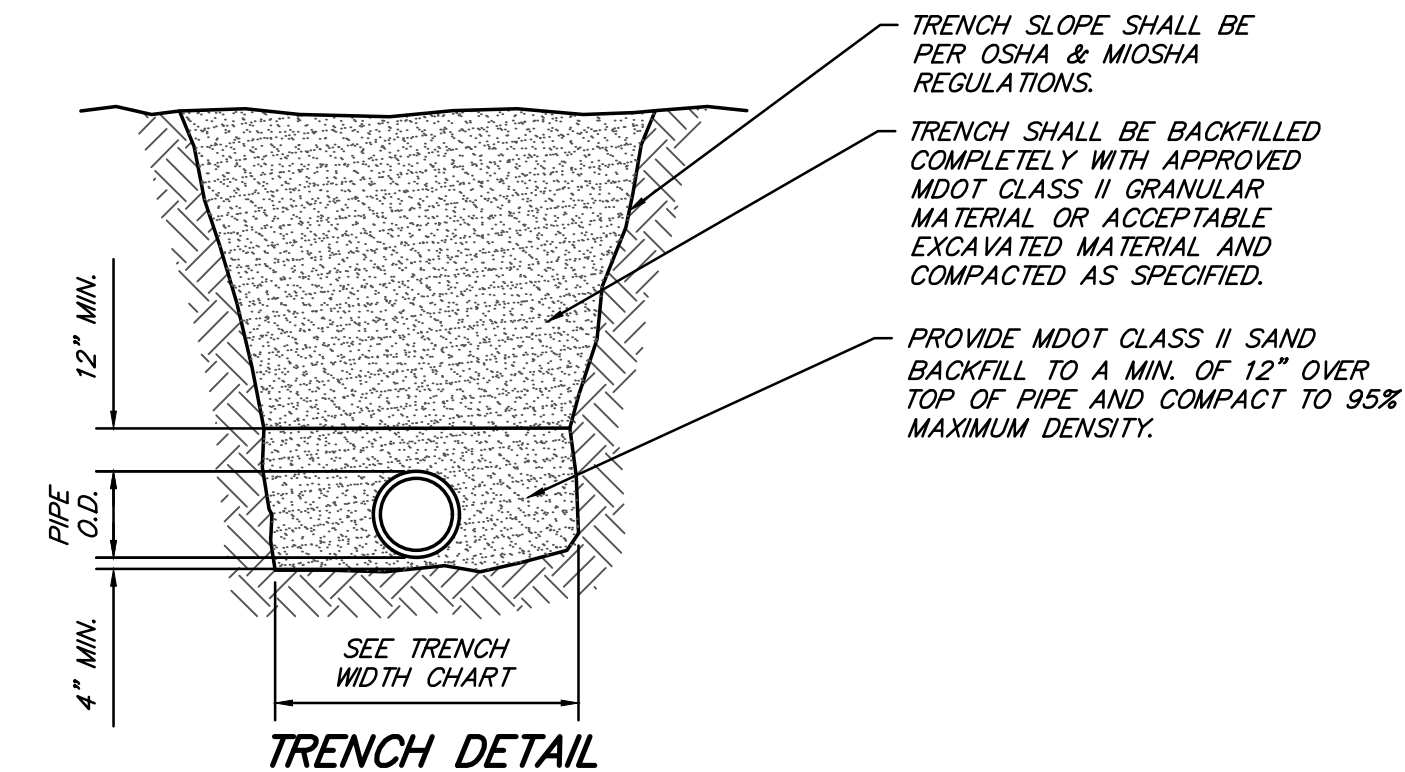


PLAN

DETAIL OF BLOCK FOR 22 1/2° BEND
 Q - MIN. CU. YD. CONCRETE PER BLOCK

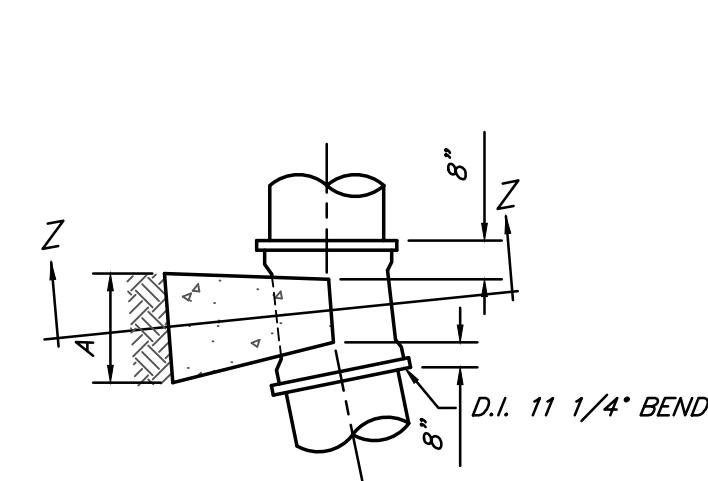


SEC. Y-Y



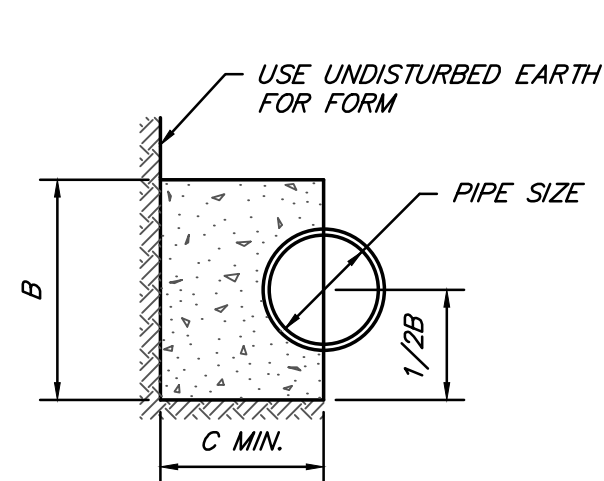
TRENCH DETAIL

| TRENCH WIDTH CHART | | |
|--------------------|--------------|------------|
| PIPE SIZE | TRENCH WIDTH | |
| | MINIMUM | MAXIMUM |
| 6" | 18" | 24" |
| 8" & 10" | 24" | 30" |
| 12" & 15" | 30" | 36" |
| 18" | 34" | 40" |
| 21" | 38" | 42" |
| 24" | 42" | 46" |
| 27" | 45" | 49" |
| 30" | 49" | 53" |
| 36" | 56" | 60" |
| LARGER THAN 36" | I.D. + 20" | I.D. + 24" |

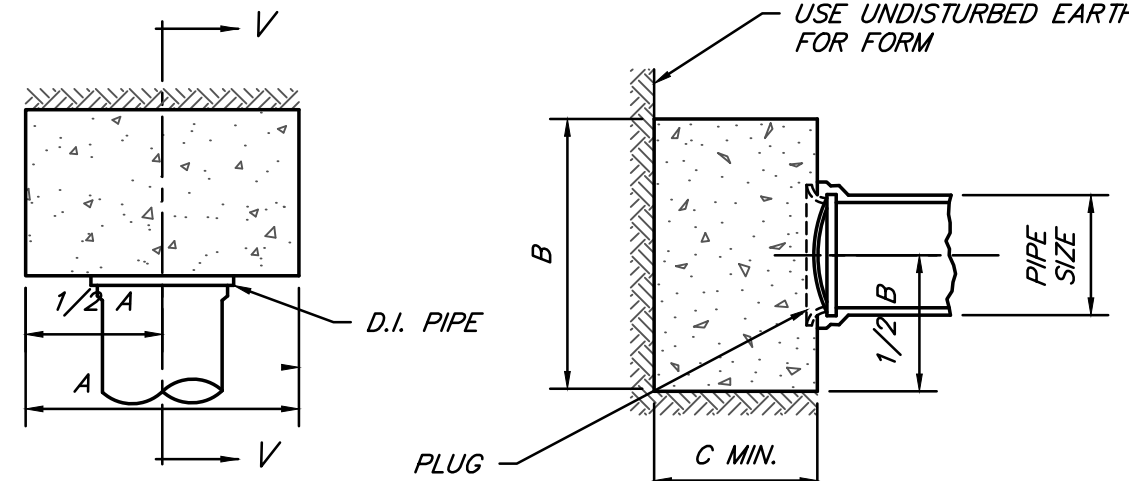


PLAN

DETAIL OF BLOCK FOR 11 1/4° BEND
 Q - MIN. CU. YD. CONCRETE PER BLOCK



SEC. Z-Z



PLAN

SEC. V-V

DETAIL OF BLOCK FOR PLUG
 Q - MIN. CU. YD. CONCRETE PER BLOCK

| PIPE SIZE | 90° BEND OR TEE | | | | 45° BEND | | | | 22 1/2° BEND | | | | 11 1/4° BEND | | | | PLUG | | | |
|--------------|-----------------|-------|-------|-------|----------|-------|-------|------|--------------|-------|-------|------|--------------|--------|-------|------|-------|-------|-------|-------|
| | A | B | C | Q | A | B | C | Q | A | B | C | Q | A | B | C | Q | A | B | C | Q |
| 6", 8" & 10" | 3'-0" | 2'-0" | 1'-3" | 0.3 | 2'-0" | 1'-6" | 1'-3" | 0.1 | 1'-6" | 1'-0" | 1'-3" | 0.1 | 1'-0" | 1'-0" | 1'-3" | 0.1 | 2'-0" | 2'-0" | 1'-6" | 0.2 |
| 12" | 3'-0" | 2'-6" | 1'-6" | 0.4 | 2'-0" | 2'-0" | 1'-6" | 0.2 | 2'-0" | 1'-0" | 1'-6" | 0.1 | 1'-0" | 1'-0" | 1'-6" | 0.1 | 2'-0" | 2'-6" | 1'-6" | 0.3 |
| 16" | 4'-0" | 3'-0" | 2'-0" | 0.9 | 3'-0" | 3'-0" | 2'-0" | 0.5 | 2'-0" | 2'-0" | 2'-0" | 0.2 | 1'-0" | 2'-0" | 2'-0" | 0.1 | 3'-0" | 3'-6" | 1'-9" | 0.7 |
| 20" | 5'-0" | 4'-6" | 2'-6" | 1.23 | 4'-0" | 3'-0" | 2'-6" | 0.82 | 3'-0" | 2'-6" | 2'-6" | 0.58 | 2'-0" | 1'-10" | 2'-6" | 0.3 | 4'-0" | 4'-0" | 2'-6" | 1.45 |
| 24" | 6'-0" | 5'-6" | 3'-0" | 2.74 | 4'-0" | 4'-0" | 3'-0" | 1.21 | 3'-0" | 3'-0" | 3'-0" | 0.8 | 2'-6" | 2'-2" | 3'-0" | 0.42 | 5'-0" | 5'-0" | 3'-0" | 2.78 |
| 30" | 7'-0" | 7'-0" | 3'-9" | 5.39 | 5'-6" | 5'-0" | 3'-9" | 2.14 | 4'-0" | 3'-0" | 3'-9" | 1.35 | 3'-0" | 2'-8" | 3'-9" | 0.98 | 6'-0" | 6'-0" | 3'-9" | 4.96 |
| 36" | 8'-0" | 7'-6" | 4'-6" | 8.12 | 6'-0" | 6'-0" | 4'-6" | 4.03 | 5'-0" | 4'-0" | 4'-6" | 2.77 | 3'-0" | 3'-2" | 4'-6" | 1.36 | 8'-0" | 6'-0" | 4'-6" | 8.00 |
| 42" | 9'-0" | 8'-0" | 5'-3" | 11.58 | 7'-7" | 7'-0" | 5'-3" | 6.43 | 5'-0" | 5'-0" | 5'-3" | 3.85 | 4'-0" | 3'-9" | 5'-3" | 2.17 | 8'-0" | 8'-0" | 5'-3" | 12.44 |

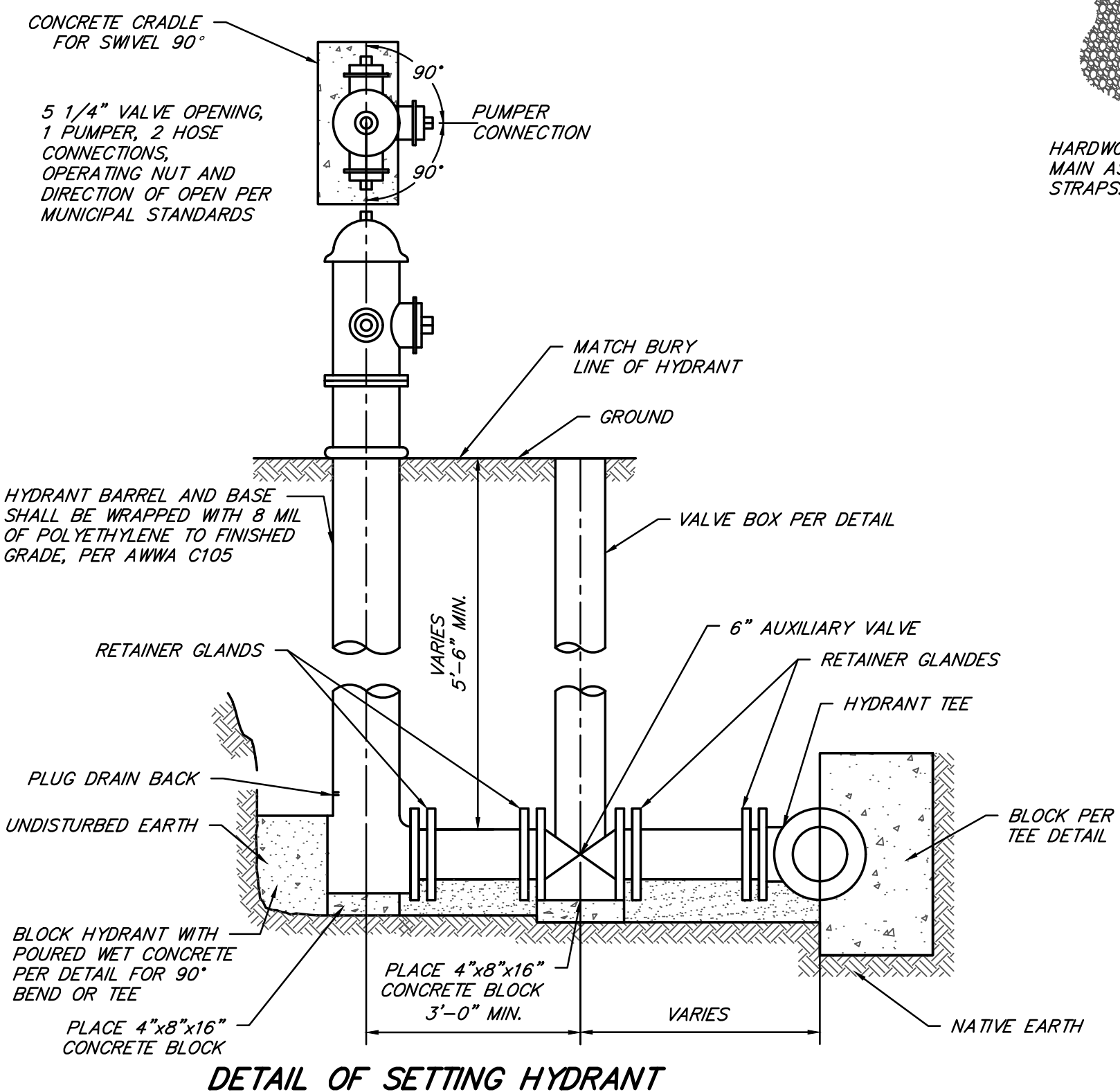
NOTE:

THE CONTRACTOR SHALL SECURE ALL MECHANICAL JOINT FITTINGS WITH RETAINER GLANDS IN ADDITION TO THRUST BLOCKING. RETAINER GLANDS SHALL BE MEGA-LUG AS MANUFACTURED BY EBAA IRON OR APPROVED EQUAL.

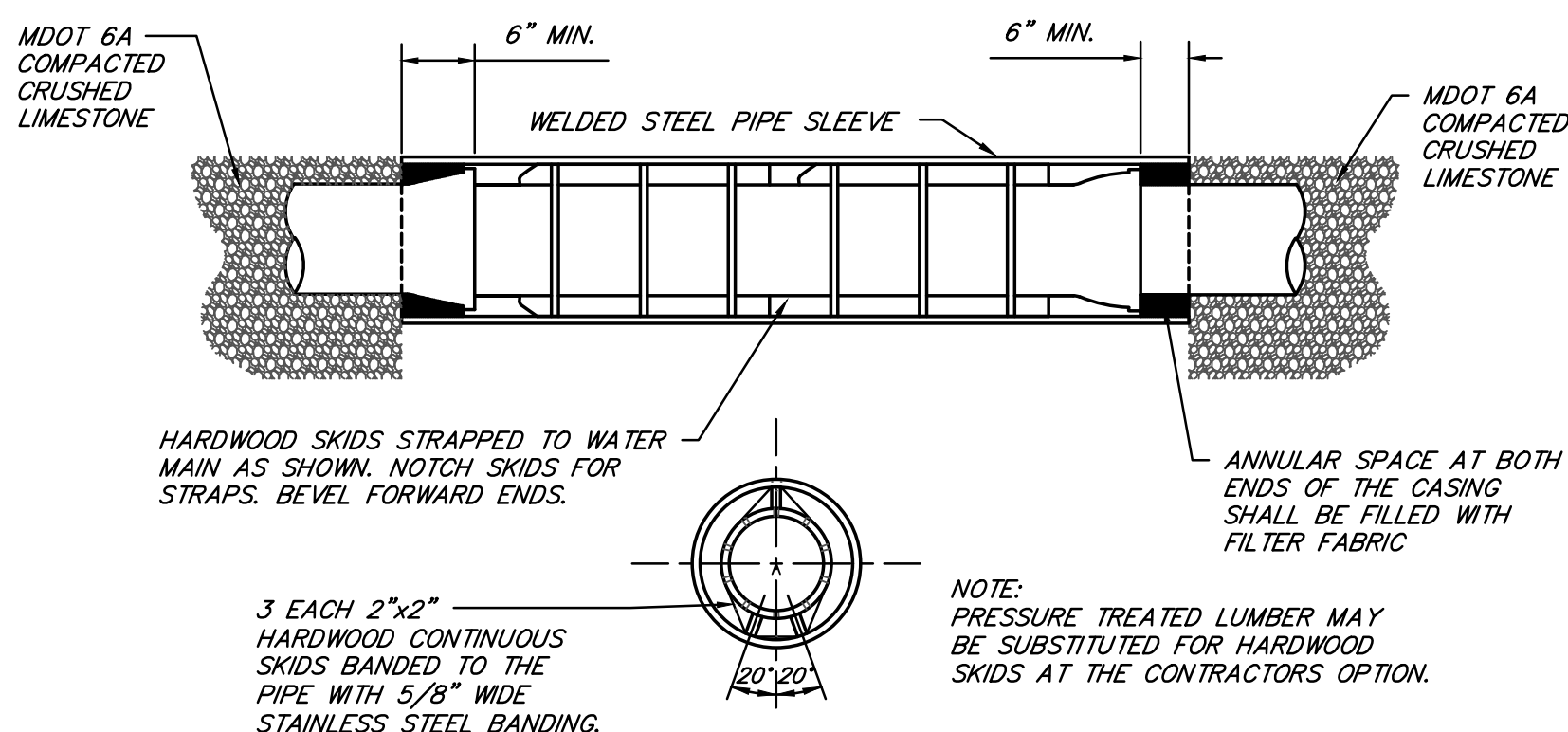
ALTERNATE FOR HYDRANTS: TWO 3/4" THREADED RESTRAINING RODS MAY BE USED AT HYDRANTS IN ADDITION TO ALL BLOCKING. RODS SHALL RECEIVE A MINIMUM DRY FILM OF 15 MILS (DTM) OF COAL TAR EPOXY. ALL COSTS ASSOCIATED WITH THIS WORK SHALL BE INCLUDED IN THE UNIT PRICE BID PER EACH HYDRANT INSTALLED.

WRAP ALL FITTINGS, VALVES, HYDRANTS, AND ALL D.I. PIPE IN 8 MIL POLYETHYLENE SHEET PER AWWA C105

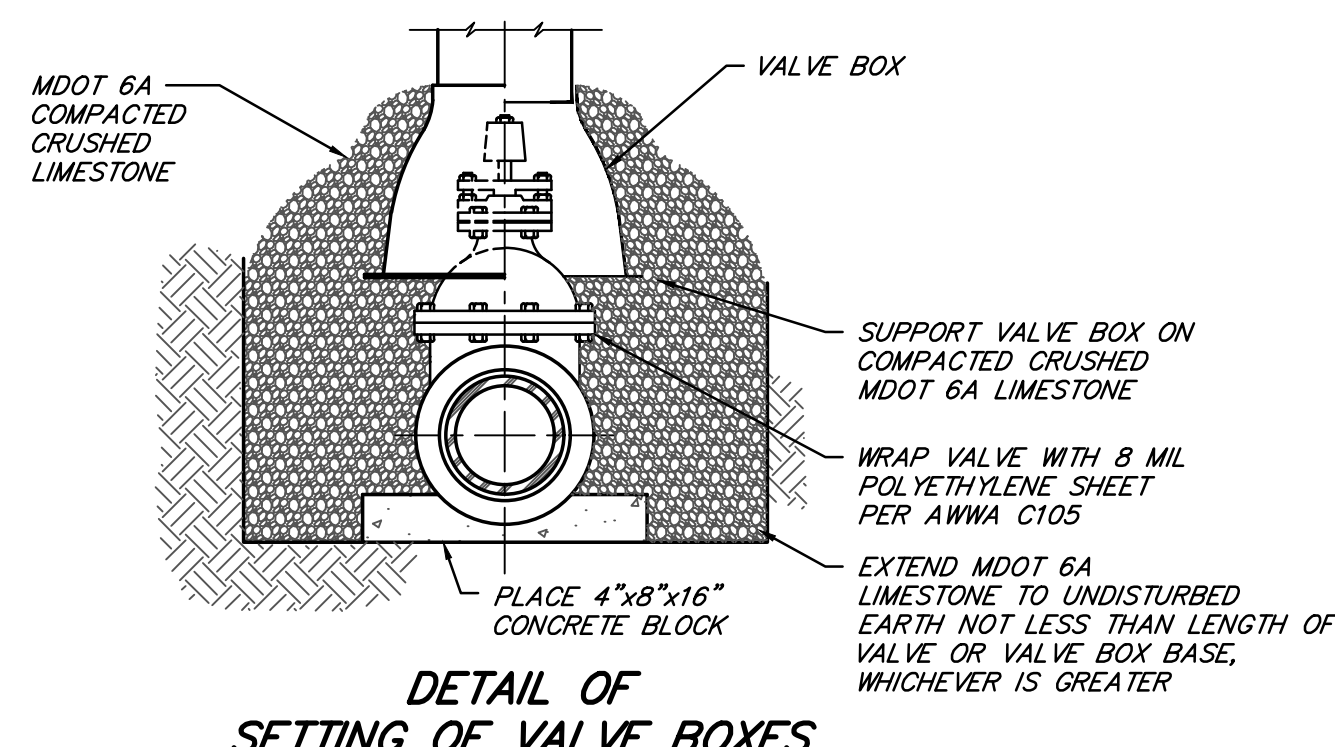
THE CONCRETE USED FOR BLOCKING SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3500 PSI IN 28 DAYS.



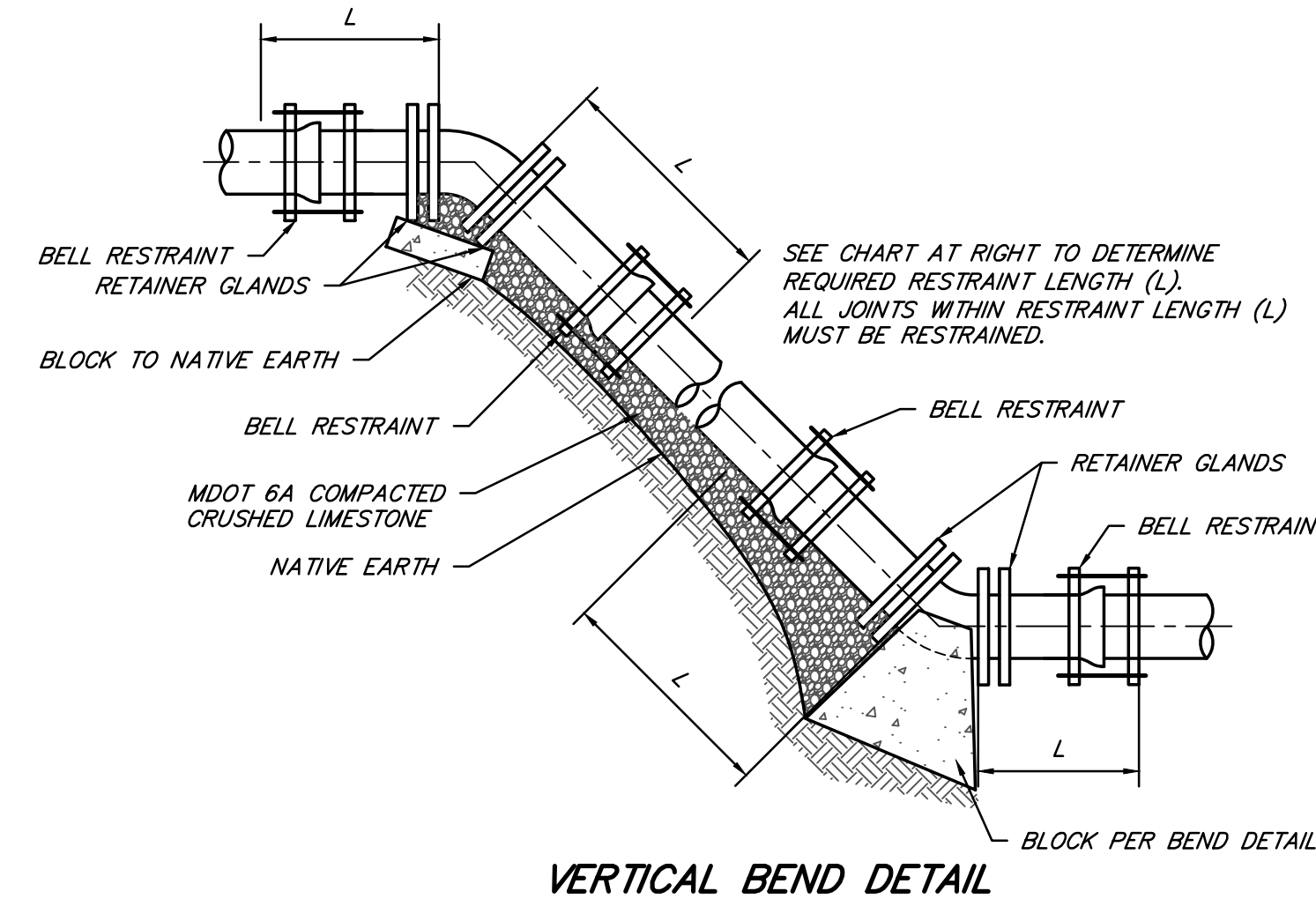
DETAIL OF SETTING HYDRANT



WATER MAIN IN SLEEVE DETAIL

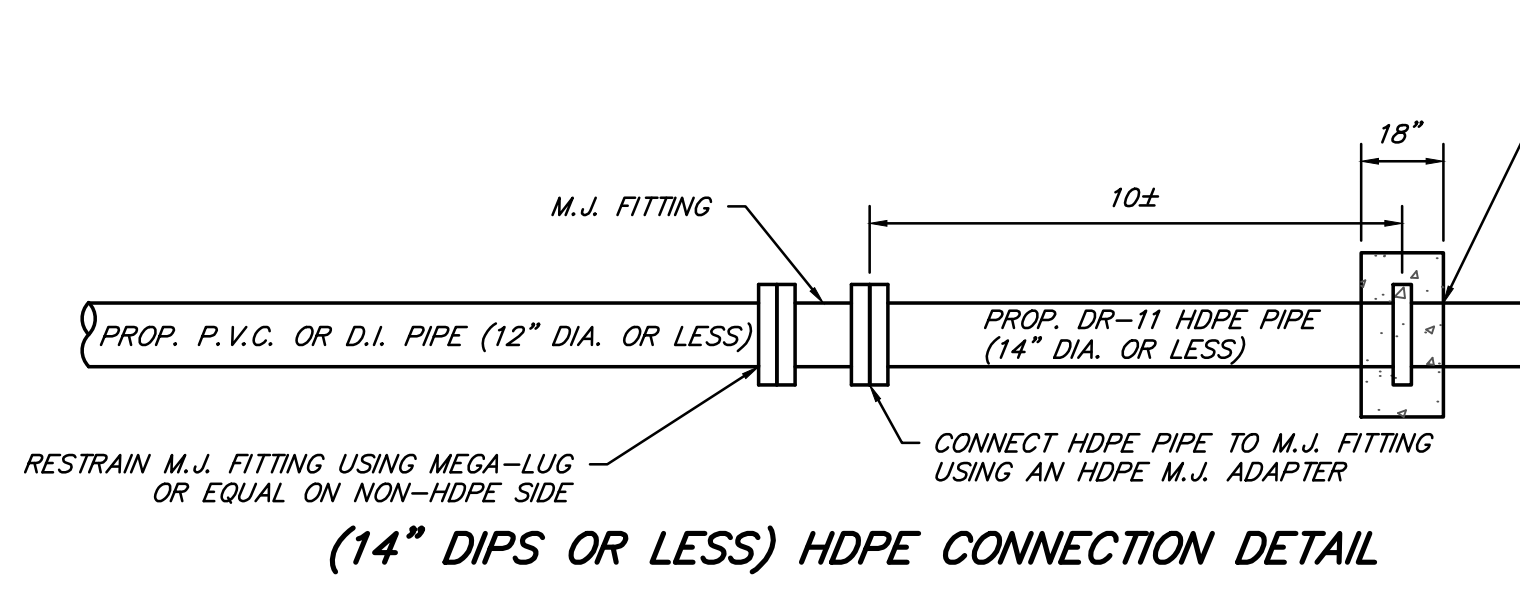


DETAIL OF SETTING OF VALVE BOXES



VERTICAL BEND DETAIL

| PIPE RESTRAINT SCHEDULE FOR GROUND BURIED PRESSURE PIPES | | | | | | | |
|--|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|---------------------|
| LENGTH (L) OF RESTRAINT REQUIRED (IN FEET) | | | | | | | |
| DEFLECTION ANGLE | 11-1/4" AND 22-1/2" | | 33-3/4" | 45" | 56-1/4" | 67-1/2" | 78-3/4" |
| | 90° TEE OR DEAD END | 90° TEE OR DEAD END | 90° TEE OR DEAD END | 90° TEE OR DEAD END | 90° TEE OR DEAD END | 90° TEE OR DEAD END | 90° TEE OR DEAD END |
| PIPE | 11-1/4" AND 22-1/2" | 33-3/4" | 45" | 56-1/4" | 67-1/2" | 78-3/4" | 90° TEE OR DEAD END |
| 6" | 8 | 12 | 16 | 20 | 25 | 31 | 59 |
| 8" | 10 | 15 | 20 | 26 | 33 | 40 | 77 |
| 10" | 12 | 18 | 25 | 32 | 40 | 49 | 93 |
| 12" | 14 | 21 | 29 | 37 | 47 | 57 | 109 |
| 14" | 16 | 24 | 33 | 41 | 54 | 66 | 125 |
| 16" | 18 | 27 | 37 | 47 | 60 | 74 | 141 |
| 18" | 20 | 30 | 41 | 53 | 67 | 82 | 157 |
| 20" | 22 | 33 | 45 | 58 | 73 | 90 | 172 |
| 24" | 25 | 39 | 53 | 68 | 85 | 105 | 202 |
| 30" | 30 | 46 | 63 | 82 | 102 | 126 | 244 |
| 36" | 35 | 54 | 74 | 95 | 119 | 146 | 283 |
| 42" | 40 | 61 | 83 | 107 | 133 | 164 | 320 |
| 48" | 44 | 67 | 92 | 118 | 148 | 181 | 356 |



(14" DIPS OR LESS) HDPE CONNECTION DETAIL

PROVIDE 36"x36"x18" ANCHOR BLOCK APPROX 10' FROM CONNECTION TO OTHER PIPE MATERIAL. M.J. FITTING OR MANHOLE ANCHOR BLOCK SHALL BE FORMED WITH PLYWOOD AND USE 3000 PSI @ 28 DAYS CONCRETE. HDPE ANCHOR RING SHALL BE FULLY FUSED OR INTEGRALLY FORMED TO THE HDPE PIPE. FLEX RESTRAINT AS MANUFACTURED BY CENTRAL PLASTICS IS AN ACCEPTABLE ANCHORING DEVICE. THE TYPE AND NUMBER OF RESTRAINT DEVICES SHALL BE SUBMITTED PER SECTION 01 33 00 OF THE SPECIFICATIONS

| | | |
|--|--------------|-------------|
| NO. | REVISIONS | 8-21-17 |
| BY | MARK | DATE |
| THE WORK REPRESENTED BY THIS DRAWING WAS DESIGNED BY THE ENGINEER FOR THIS SPECIFIC APPLICATION AND SPECIFIC LOCATION DESCRIBED HEREON IN ACCORDANCE WITH THE CONDITIONS PREVALENT AT THE TIME THE DESIGN WAS DONE. THE ENGINEER DOES NOT GUARANTEE AND WILL NOT BE LIABLE FOR ANY OTHER LOCATION, CONDITION, DESIGN OR PURPOSE. | | |
| STANDARD WATER MAIN DETAILS | | |
| WATER MAIN STANDARD DETAILS | | |
| SAGINAW OFFICE 230 S. Washington Ave. Saginaw, MI 48607 Tel. 989-754-4717 Fax. 989-754-4440 www.SpicerGroup.com | | |
| DE. BY: SGJ | CH. BY: SGJ | PROJECT NO. |
| DR. BY: SGJ | APP. BY: SGJ | |
| STDS. | SHEET 1 OF 1 | |
| DATE: FEBRUARY, 2006 | FILE NO. | |
| SCALE: NOT TO SCALE | DW-1556 | |

ACAD FILE: DW1556
 PLOT SCALE: 1"=1'
 F.B. PG.