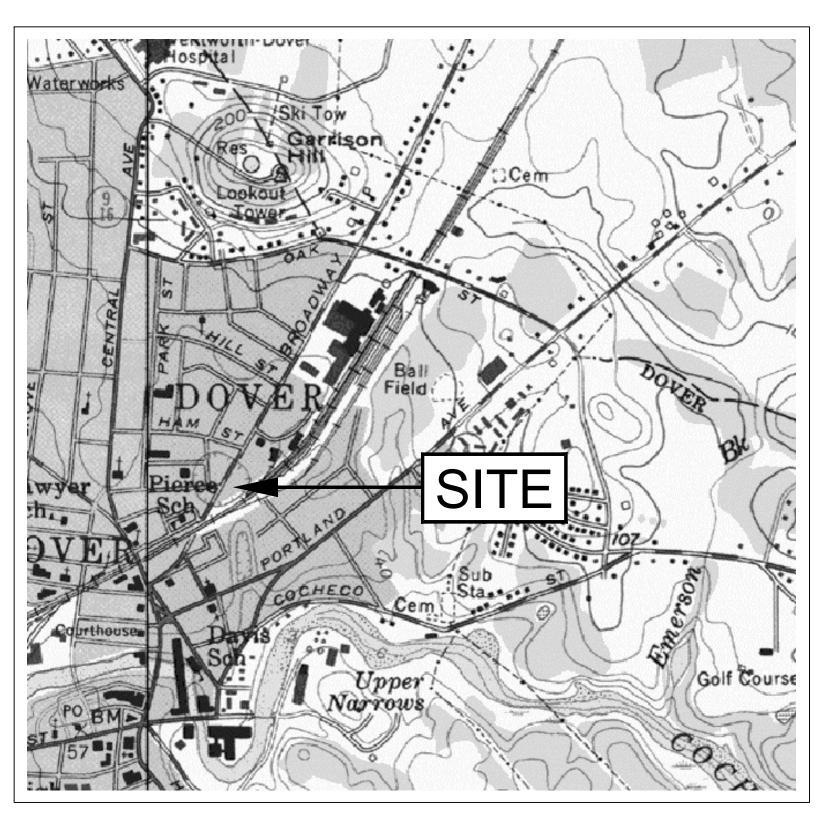
BROADWAY STREET RAILROAD CULVERT CITY OF DOVER, NEW HAMPSHIRE

CWSRF NO. CS-330200-09



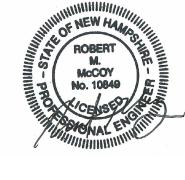
AUGUST 2018



LOCUS PLAN

NOT TO SCALE





LIST OF DRAWINGS

SHEET NUMBER DRAWING TITLE

8

1	LEGEND AND GENERAL NOTES
2	EXISTING CONDITIONS PLAN
3	GENERAL PLAN
4 - 4A	DRAIN PROFILES
5	DRAINAGE DETAILS
6 - 6A	STRUCTURE DETAILS
7 - 7A	MISCELLANEOUS DETAILS

BID SET

WORK ZONE MANAGEMENT PLAN

WORK ZONE STAGING PLAN

LEGEND: PROPOSED **EXISTING** ROAD SIGN STORM DRAIN (18" AND UNDER) MAIL BOX CATCH BASIN GRATE OOOOOOOOOOO STONE WALL CATCH BASIN DRAIN MANHOLE/CATCH BASIN ----- PROPERTY LINE UTILITY POLE MANHOLE STORM DRAIN/CULVERT (ABOVE 18") WATER LINE FLAGPOLE SEWER LINE ———— SANITARY SEWER RESIDENTIAL LAMP STORM DRAIN SANITARY SEWER MANHOLE IRON PIN FOUND STORM DRAIN BOUND FOUND —/—/—/— SILT FENCE HYDRANT OVERHEAD WIRES _____ OHW ____ STONE FILL GAS GATE/SHUT-OFF TREELINE · www..... GROUND SURFACE OR STRUCTURE WATER GATE/SHUT-OFF DEFORMATION MONITORING POINT APPROX. BORING LOCATION TELEPHONE PEDESTAL CATV PEDESTAL B-2 (MW)APPROX. BORING LOCATION ELECTRIC TRANSFORMER/HANDHOLE/METER WITH MONITORING WELL ELECTRIC PULLBOX (MANHOLE) **VALVE** SEWER MANHOLE CAP OR PLUG DRAIN MANHOLE For Con DECIDUOUS TREE TEMPORARY BENCHMARK SWALE CONIFEROUS TREE LEDGE **LEDGE** ROCK CRUSHED STONE TEST BORING NUMBER LANDSCAPING CONCRETE PATTERN GROUND SURFACE AT BORING/PROBE WETLANDS WETLAND FLAGS \sim → N-VALUE TOTAL VERTICAL DISTANCE BELOW SURFACE PIPE LEGEND (18' BG) ASBESTOS CEMENT DI DUCTILE IRON OBSERVED WATER LEVEL (BORING ONLY) CMP CORRUGATED METAL PIPE PVC POLYVINYL CHLORIDE RCP REINFORCED CONCRETE PIPE HDPE HIGH DENSITY POLYETHYLENE INSIDE PIPE DIAMETER **OUTSIDE PIPE DIAMETER** (NOTE THIS IS NOT INTENDED TO BE A COMPLETE BOTTOM OF BORING (32' BG) ■ BOTTOM OF TEST BORING/PROBE LIST)

TYPICAL BORING/PROBE SCHEMATIC SCALE: N.T.S.

RECOMMENDED SEQUENCE OF CONSTRUCTION

- 1. INSTALL TEMPORARY BYPASS PIPING AROUND DMH 1 CONSTRUCTION AREA AND INSTALL BRICK AND MORTAR BULKHEAD IN EXISTING BOX CULVERT.
- 2. REMOVE AND DISPOSE EXISTING BOX CULVERT INTERFERING WITH CONSTRUCTION.
- 3. CONSTRUCT JACKING AND RECEIVING PITS AND 84" RCP JACKING.
- 4. CONSTRUCT DMH 1. CONNECT DMH 1 TO EXISTING GRANITE BOX CULVERT
- 5. CONSTRUCT 84" RCP FROM LIMITS OF PIPE JACKING TO DMH 2. CONSTRUCT DMH 2.
- 6. INSTALL TEMPORARY BYPASS PIPING FROM EXISTING BOX CULVERT TO DMH 2 AND INSTALL BRICK AND MORTAR BULKHEAD IN EXISTING BOX CULVERT. REMOVE TEMPORARY BYPASS PIPING AROUND DMH 1.
- 7. CONSTRUCT 84" RCP FROM DMH 2 TO DMH 3 AND CONSTRUCT DMH 3. CONSTRUCT REMAINDER OF PROJECT. CONCRETE FLOWABLE FILL SHALL NOT BE PLACED IN THE EXISTING BOX CULVERT UNTIL ALL NEW DRAIN PIPE AND DRAIN MANHOLES HAVE BEEN CONSTRUCTED AND ARE PLACED IN ACTIVE SERVICE.

GENERAL NOTES:

- 1. BASE MAP INFORMATION WAS PROVIDED BY MCENEANEY SURVEY ASSOCIATES, INC. P.O. BOX 681, 17 PORTLAND AVE. DOVER, NH 03820. PHYSICAL FEATURES SHOWN WERE LOCATED IN JUNE 1999, AUGUST THRU SEPTEMBER 2003, JUNE 2004, AND RECONFIRMED BY MCENEANEY SURVEY ASSOCIATES IN FEBRUARY 2016.
- 2. HORIZONTAL COORDINATE SYSTEM AND VERTICAL DATUM ARE BASED ON NAD'83 NH STATE PLANE AND NAVD'88, RESPECTIVELY.
- 3. WETLANDS "A" & "B" WERE DELINEATED BY DAMON BURT, NHCWS #163 OF FRAGGLEROCK ENVIRONMENTAL SERVICES IN JANUARY 2016 AND LOCATED BY MCENEANEY SURVEY ASSOCIATES, INC.
- 4. FOR BORING LOGS REFER TO SPECIFICATIONS. BORING LOCATIONS SHOWN ON DRAWINGS ARE APPROXIMATE.
- 5. ALL WORK SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE AND FEDERAL CODES.
- 6. THE CONTRACTOR SHALL SECURE ALL REQUIRED PERMITS FROM APPLICABLE GOVERNMENT AGENCIES, INCLUDING THE OWNER, PRIOR TO CONSTRUCTION.
- 7. THE UTILITY INFORMATION SHOWN WAS COMPILED BASED ON FIELD SURVEY DATA AND RECORD INFORMATION. THE LOCATION OF UNDERGROUND UTILITIES HAVE BEEN ESTABLISHED FROM SURFACE FEATURES OBSERVED DURING THE SURVEY, AND RECORD PLANS. THE LOCATION OF UNDERGROUND UTILITIES AND STRUCTURES ARE APPROXIMATE ONLY AND MAY VARY FROM THE LOCATIONS SHOWN HEREON. ADDITIONAL UNDERGROUND UTILITIES AND/OR STRUCTURES MAY BE ENCOUNTERED. SIZE, MATERIAL, AND LOCATION OF EXISTING UTILITIES IN PROJECT VICINITY SHALL BE FIELD VERIFIED BY THE CONTRACTOR. RECORD DRAWINGS PREPARED BY THE CONTRACTOR FOR THIS PROJECT SHALL INCLUDE THIS FIELD VERIFIED INFORMATION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND APPROPRIATE UTILITY AUTHORITY IN WRITING OF ANY DISCREPANCY WITH THE DRAWINGS. NEITHER THE ENGINEER NOR THE OWNER WARRANTS OR GUARANTEES THE CONDITIONS SHOWN ON THE DRAWINGS.
- 8. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL SUBSURFACE STRUCTURES AND UTILITIES THROUGH THE APPROPRIATE AGENCY. THE CONTRACTOR SHALL VERIFY THE LOCATION OF ALL EXISTING UTILITIES PRIOR TO ANY EXCAVATION.
- 9. CONTRACTOR SHALL BE RESPONSIBLE FOR PERFORMING TEST PITS TO LOCATE AND CONFIRM UTILITY SIZING, ELEVATIONS AND MATERIAL AND FOR POTENTIAL UTILITY CONFLICTS. TEST PITS SHALL BE PERFORMED WELL IN ADVANCE OF CONSTRUCTION OPERATIONS SO THAT ANY CHANGES IN ALIGNMENT AND/OR GRADE OF THE PROPOSED WORK OR UTILITY LOCATIONS MAY BE DETERMINED. CONTRACTOR SHALL NOTIFY THE RELEVANT UTILITY OWNERS INVOLVED AT LEAST 72 HOURS PRIOR TO EXCAVATION OF THE TEST PITS.
- 10. THE CONTRACTOR SHALL CALL THE DIG-SAFE CENTER (1.888.344.7233) AT LEAST 72 HOURS PRIOR TO ANY EXCAVATION.
- 11. THE CONTRACTOR SHALL COORDINATE ALL CONSTRUCTION ACTIVITY WITH THE VARIOUS AFFECTED UTILITIES IN ORDER TO PREVENT UNNECESSARY DELAY OF WORK OR INTERRUPTION OF SERVICES.
- 12. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING AND SUPPORTING, RELOCATING AND/OR REPLACING ALL UTILITIES AND UTILITY POLES AFFECTED BY CONSTRUCTION AND FOR COORDINATING WITH THE APPROPRIATE UTILITY AUTHORITY. ADDITIONAL NOTES ON THE DRAWINGS IDENTIFYING SPECIFIC SUPPORT AND PROTECTION, RELOCATION, OR REPLACEMENT EFFORTS ARE PROVIDED FOR CONTRACTOR'S CONVENIENCE ONLY AND DO NOT ALLEVIATE CONTRACTOR'S GENERAL OBLIGATION TO MEET THIS REQUIREMENT FOR ALL EXISTING UTILITIES, THE METHOD OF WHICH MAY VARY ACCORDING TO THE CONTRACTOR'S MEANS AND METHODS. UNLESS PROVIDED FOR OTHERWISE IN THE BID SCHEDULE AND MEASUREMENT AND PAYMENT, ALL COSTS FOR THIS WORK SHALL BE DEEMED INCLUDED IN THE UNIT PRICES BID. UTILITIES OR UTILITY POLES DESTROYED OR DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED OR REPLACED AS DIRECTED BY THE UTILITY AUTHORITY AT NO ADDITIONAL COST TO THE OWNER.
- 13. THE CONTRACTOR SHALL COORDINATE WITH OWNER REGARDING OPERATION OF ALL WATER VALVES. THE CONTRACTOR SHALL PROVIDE AT LEAST 48 HOUR NOTIFICATION PRIOR TO VALVE OPERATION.
- 14. THE CONTRACTOR SHALL MAINTAIN TRAFFIC IN A SAFE MANNER AT ALL TIMES DURING CONSTRUCTION
- 15. DURING NON-WORKING HOURS, CONTRACTOR SHALL PROPERLY SECURE ALL EQUIPMENT AND MATERIALS WITHIN THE LIMIT OF WORK.
- 16. THE CONTRACTOR SHALL CONFINE ALL OPERATIONS AND ACTIVITIES FOR CONSTRUCTION PURPOSES WITHIN THE EXISTING ROADWAY, THE RIGHT-OF-WAY OF AFFECTED STREETS, WITHIN THE SEWER EASEMENT OR WITHIN THE LIMITS OF TEMPORARY EASEMENTS. THE CONTRACTOR SHALL EMPLOY AT HIS OWN EXPENSE, A REGISTERED LAND SURVEYOR TO VERIFY RIGHT-OF-WAY LOCATIONS. THE CONTRACTOR SHALL LOCATE STAGING AREAS WITHIN THE LIMITS OF WORK SHOWN ON THE DRAWINGS. THE CONTRACTOR MAY ALSO, THROUGH AGREEMENTS WITH PROPERTY OWNERS, PROVIDE ALTERNATE MEANS TO STORE MATERIAL AT OTHER LOCATIONS AS REQUIRED.
- 17. ALL AREAS BEYOND THE LIMITS OF WORK WHICH ARE DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO ADDITIONAL COST TO THE OWNER.
- 18. THE CONTRACTOR SHALL TAKE PRECAUTIONS DURING CONSTRUCTION TO MINIMIZE THE AMOUNT OF DEBRIS THAT COLLECTS IN CATCH BASINS, CULVERTS AND MANHOLES. THE CONTRACTOR SHALL CLEAN ALL CATCH BASINS, CULVERTS AND MANHOLES AFFECTED BY CONSTRUCTION IN ORDER TO MAINTAIN AN OPERATING
- 19. WHERE ITEMS ARE NOT SPECIFICALLY REFERENCED FOR REMOVAL, BUT SUCH REMOVAL IS REQUIRED FOR THE CONTRACTOR TO PERFORM THE PROPOSED CONSTRUCTION, THE CONTRACTOR SHALL REMOVE AND DISPOSE OF SUCH ITEMS AT NO ADDITIONAL COST TO THE OWNER.
- 20. ALL EXISTING STRUCTURES REMOVED BY THE CONTRACTOR SHALL BE INSPECTED BY THE OWNER. THE OWNER RESERVES THE RIGHT TO RETAIN OWNERSHIP AND MAY DIRECT THE CONTRACTOR TO SALVAGE AND STOCKPILE ANY EXISTING STRUCTURES AT NO ADDITIONAL COST TO THE OWNER. ANY EXISTING STRUCTURES
- THE OWNER CHOOSES NOT TO RETAIN OWNERSHIP OF SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

 21. MINIMUM CLEARANCES BETWEEN NEW STORM DRAINS AND OTHER UTILITIES SHALL BE AS FOLLOWS: CLEARANCES SHALL BE MEASURED FROM OUTSIDE OF MAIN

UTILITY	<u>HORIZONTAL</u>	<u>VERTICAL</u>
ELECTRIC, TELEPHONE, GAS, CABLE	8'-0"	1'-6"
WATER MAIN	5'-0"	1'-6"
SANITARY SEWER	5'-0"	1'-6"

- 22. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING ADEQUATE SHORING FOR THE SOIL CONDITIONS AND DEPTHS ENCOUNTERED DURING UTILITY CONSTRUCTION (REFER TO SPECIFICATION SECTION 02160).
- 23. THE CONTRACTOR SHALL VERIFY ALL RELEVANT ANGLES, LENGTHS, ELEVATIONS, AND INVERTS PRIOR TO CONSTRUCTION.
- 24. NO WORK SHALL TAKE PLACE WITHIN WETLAND BOUNDARIES WITHOUT WRITTEN AUTHORIZATION FROM THE ENGINEER.
- 25. THE CONTRACTOR SHALL INSTALL AND MAINTAIN TEMPORARY BYPASS PIPING OR UTILITIES AS NEEDED TO MAINTAIN EXISTING DRAINAGE FLOWS, SANITARY SEWAGE FLOWS, AND POTABLE WATER SERVICE. CONTRACTOR SHALL COORDINATE WITH PRIVATE UTILITIES TO MAINTAIN EXISTING GAS SERVICE, ELECTRIC SERVICE, CABLE/DATA SERVICE AND ANY OTHER UTILITY SERVICE.
- 26. ALL EXISTING UTILITIES AND SEWER AND WATER SERVICES SHALL REMAIN OPERATIONAL THROUGHOUT CONSTRUCTION. CONTRACTOR SHALL PREPARE A CONSTRUCTION SEQUENCE PLAN TO ENSURE THAT ALL CUSTOMERS HAVE CONTINUOUS SEWER AND WATER SERVICE DURING CONSTRUCTION. CONTRACTOR SHALL COORDINATE WITH PROPERTY OWNERS AS NECESSARY TO COORDINATE CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR ALL BYPASS PIPING, PUMPING, OR OTHER MEANS APPROVED BY ENGINEER, TO MAINTAIN CONTINUOUS SERVICE. CONTRACTOR SHALL SET UP BYPASS PIPING TO ALLOW PROPERTY OWNER ACCESS TO THEIR DRIVEWAYS. CONSTRUCTION SEQUENCE AND BYPASS PIPING AND PUMPING PLANS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO ANY EXCAVATION.
- 27. THE CONTRACTOR SHALL COORDINATE ALL PIPE JACKING RELATED WORK WITH THE RAILROAD COMPANY'S INSPECTORS, FLAGGERS AND OTHER REQUIRED PERSONNEL. CONTRACTOR SHALL PAY ALL FEES ASSOCIATED WITH RAILROAD COMPANY'S INSPECTORS AND FLAGGERS, ETC.
- 28. THE CONTRACTOR SHALL PROVIDE IMPERVIOUS CLAY TRENCH DAMS EVERY 300 FEET FOR ALL DRAIN PIPES BELOW THE SEASONAL HIGH GROUND WATER LEVEL, BUT IN NO CASE SHALL LESS THAN ONE (1) TRENCH DAM BE PROVIDED BETWEEN THE FOLLOWING LOCATIONS:

 STA 102+25
 AND
 DMH 2;

 DMH 3
 AND
 DMH 4;

 DMH 3
 AND
 DMH 5

TO OUTSIDE OF UTILITY:

TRENCH DAMS SHALL NOT BE SPACED CLOSER THAN 100 FEET APART.

- 29. CONTRACTOR IS REQUIRED TO COORDINATE WITH THE SCHOOL, POLICE AND FIRE DEPARTMENTS IN ORDER TO MAINTAIN SCHOOL BUS SCHEDULE AND EMERGENCY VEHICLE ACCESS THROUGHOUT PROJECT DURATION.
- 30. CONTRACTOR SHALL REMOVE AND REPLACE SIDEWALKS, DRIVEWAYS, AND CURB WHERE NECESSARY TO CONSTRUCT THE PROPOSED ITEMS OF WORK.
- 31. ALL PIPE LENGTHS AND PIPE SLOPES SHOWN ON THE DRAWINGS ARE MEASURED FROM MANHOLE CENTERLINE TO MANHOLE CENTERLINE. INVERTS ON DRAWINGS SHALL GOVERN.
- 32. ALL CONSTRUCTION ACTIVITIES SHALL BE PERFORMED IN COMPLIANCE WITH THE SPECIFICATIONS, NHDES WETLANDS PERMIT, AND ALL OTHER APPLICABLE PERMITS.
- 33. CONTRACTOR SHALL PROVIDE ALL EROSION AND SEDIMENT CONTROL DEVICES AS INDICATED ON THE PLANS, OR AS DIRECTED BY THE ENGINEER. CONSTRUCTION SHALL NOT COMMENCE UNTIL THESE MEASURES HAVE BEEN APPROVED BY THE ENGINEER.
- 34. SILT SACKS SHALL BE FURNISHED, INSTALLED AND MAINTAINED IN ALL CATCH BASINS WITHIN THE PROJECT AREA AND IN CATCH BASINS OUTSIDE OF THE PROJECT AREA THAT COLLECT CONSTRUCTION RUNOFF. DEBRIS COLLECTED IN SILT SACKS TO BE REMOVED AND LEGALLY DISPOSED OF OFF—SITE ON A WEEKLY BASIS THROUGHOUT PROJECT DURATION. UPON COMPLETION OF THE PROJECT AND AS DIRECTED BY THE ENGINEER, THE CONTRACTOR IS RESPONSIBLE FOR REMOVAL AND LEGALLY DISPOSING OF THE SILT SACKS AND DEBRIS OFF—SITE.
- 35. CONTRACTOR SHALL STOCKPILE SUFFICIENT SOIL EROSION AND SEDIMENT CONTROL MATERIALS ON SITE TO REPAIR ANY AND ALL DAMAGE TO SOIL EROSION
- AND SEDIMENT CONTROL MEASURES.

 36. THE CONTRACTOR SHALL COMPLY WITH ALL REQUIREMENTS OF THE ASSOCIATED NPDES PERMIT.
- 37. NO CONSTRUCTION SHALL TAKE PLACE UNLESS THE OWNER'S REPRESENTATIVE IS PRESENT. THE OWNER RESERVES THE RIGHT TO REJECT ANY AND ALL WORK NOT MEETING THIS REQUIREMENT.
- 38. BORINGS WERE TAKEN FOR THE PURPOSE OF DESIGN AND INDICATE CONDITIONS AT THE LOCATION OF THE BORING ONLY. SUBSURFACE CONDITIONS ENCOUNTERED DURING CONSTRUCTION MAY VARY FROM THOSE SHOWN IN THE BORING LOGS. GROUNDWATER LEVELS INDICATED ON THE BORING LOGS WERE OBSERVED AT THE TIME THE BORINGS WERE TAKEN, AND DO NOT REPRESENT PERMANENT GROUNDWATER LEVELS.
- 39. CONTRACTOR SHALL CONDUCT A TEST BORING (WITH SPLIT—SPOON SAMPLING) AT DMH 3 PRIOR TO CONSTRUCTION TO VERIFY SOIL CONDITIONS AND SHALL PROVIDE BORING LOG TO ENGINEER WITH THE DMH 3 SHOP DRAWING SUBMITTAL.



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LEGEND AND GENERAL NOTES

BROADWAY STREET RAILROAD CULVERT

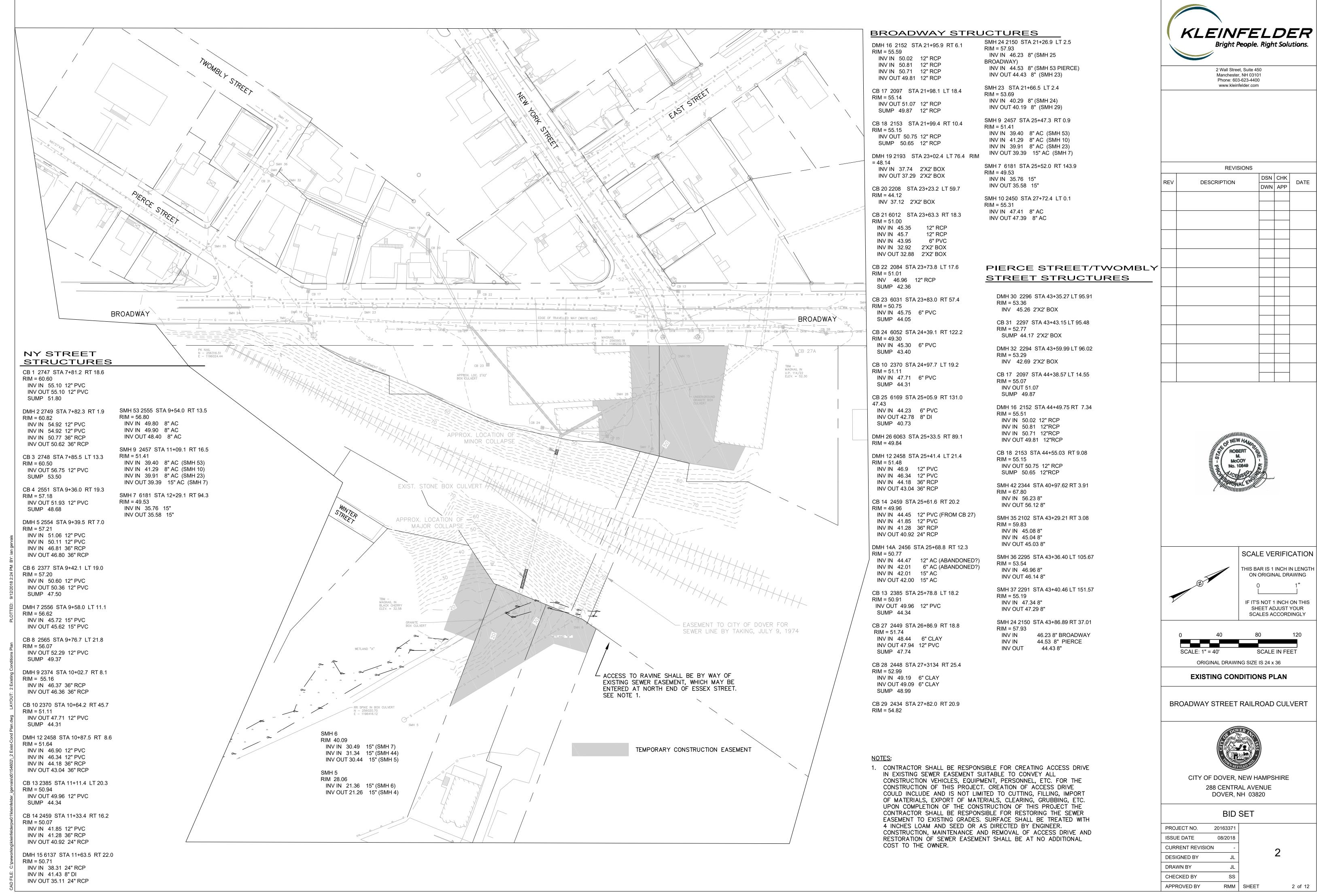


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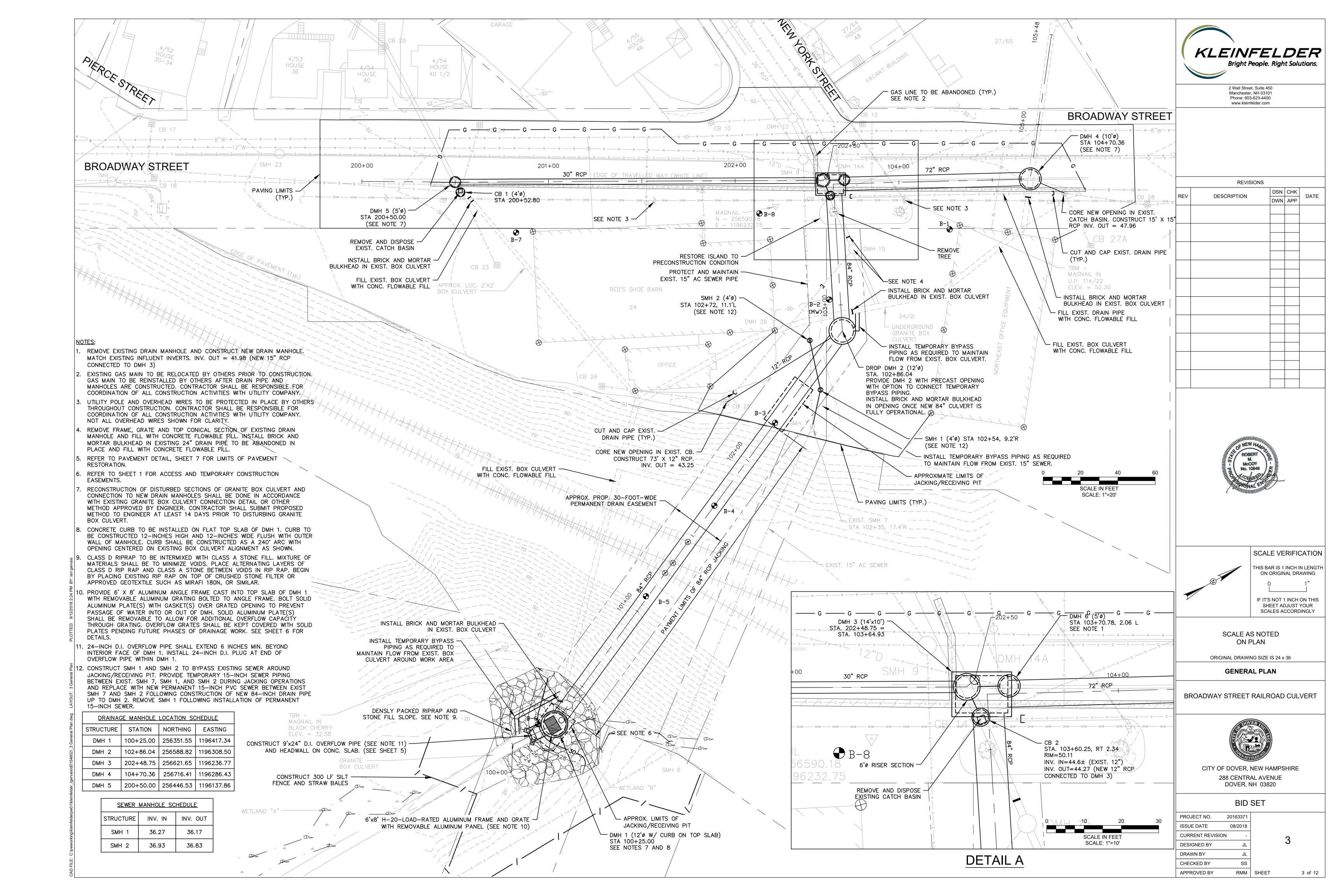
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APPROVED BY	RMM	SHEET

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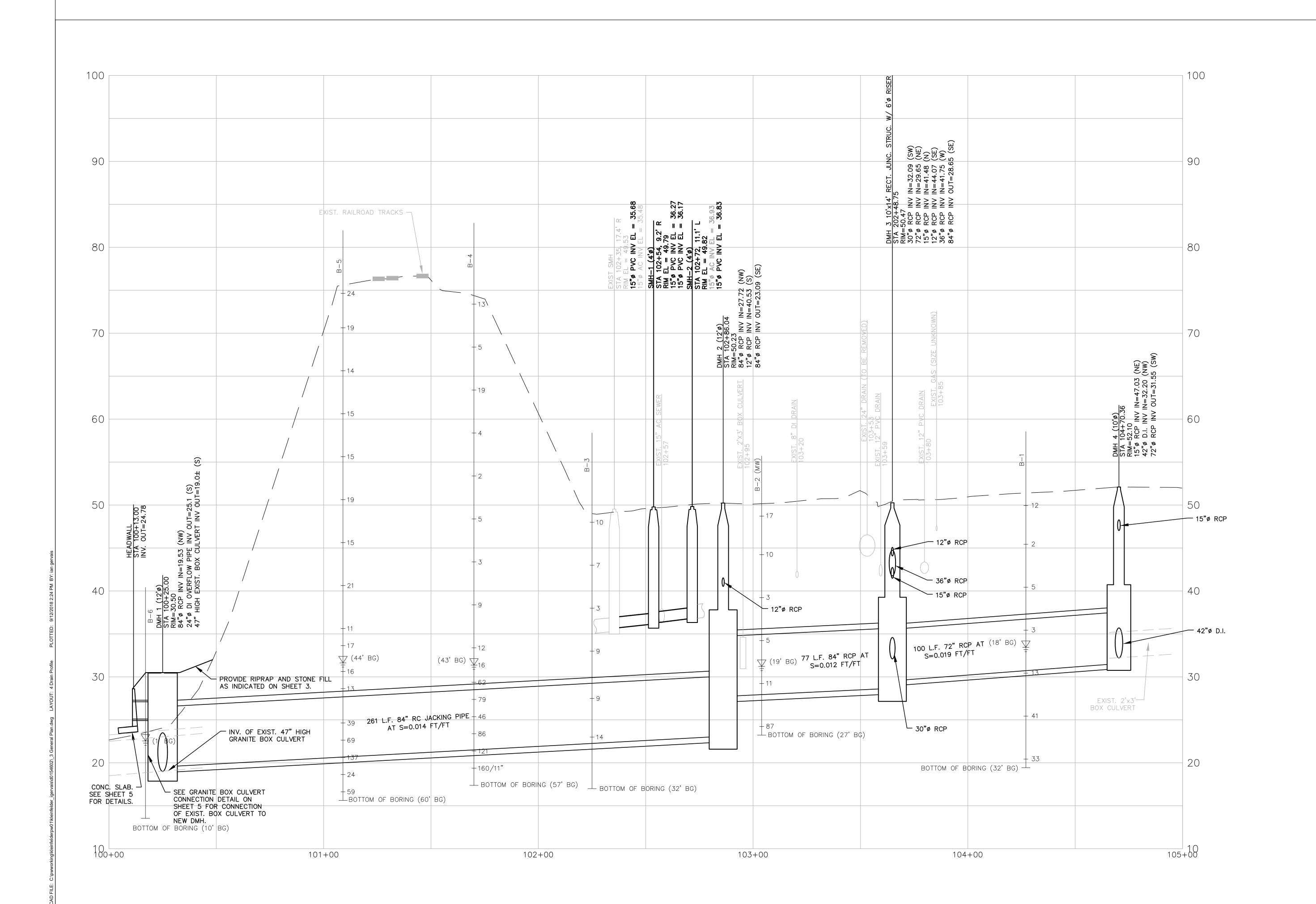


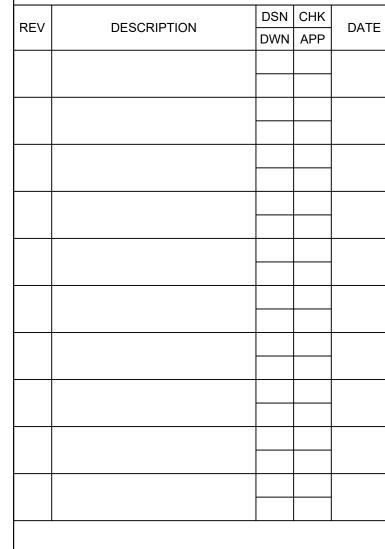


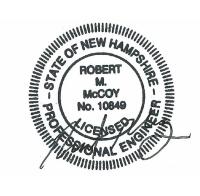


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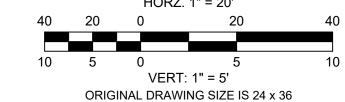
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BROADWAY STREET RAILROAD CULVERT

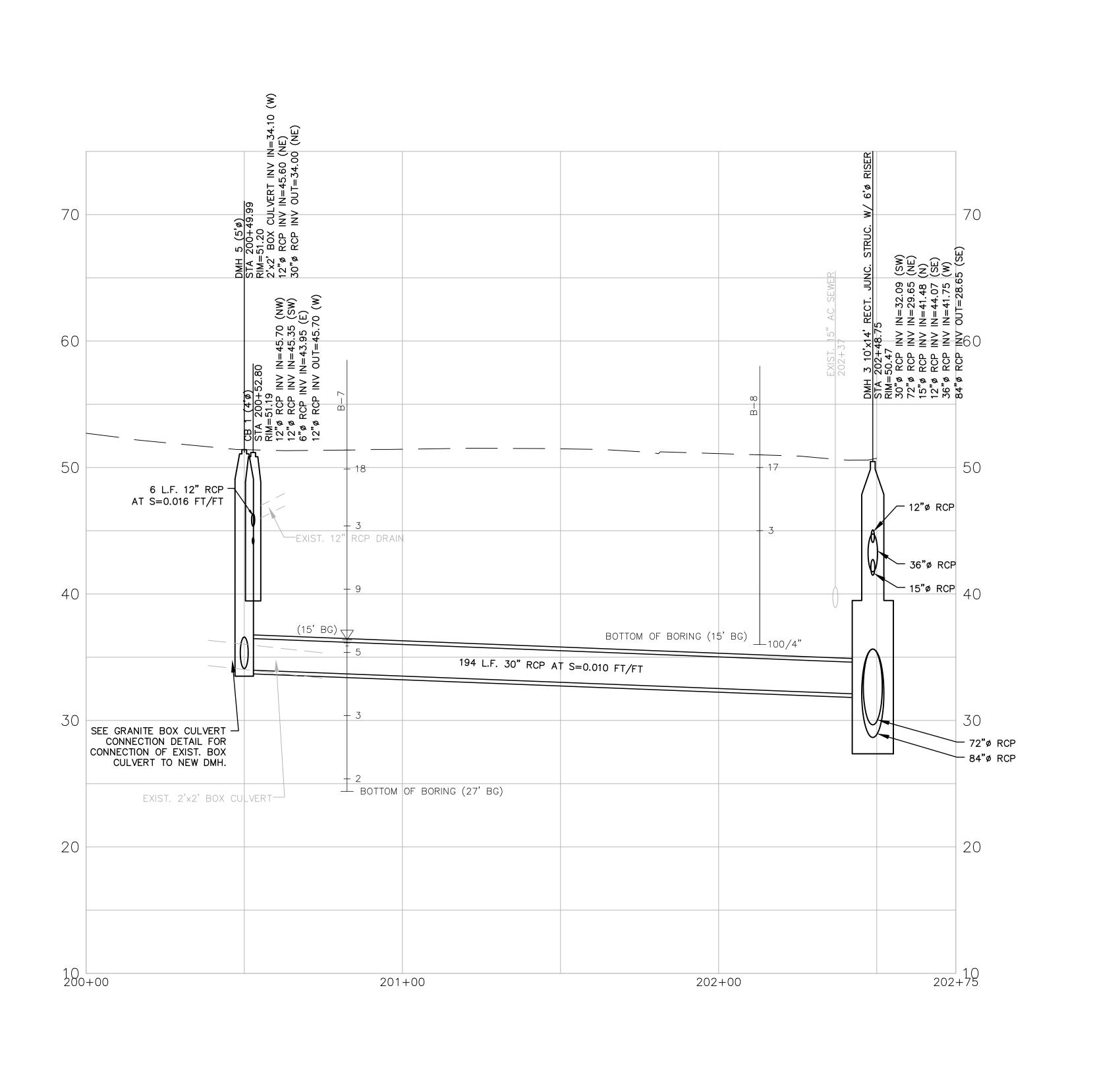


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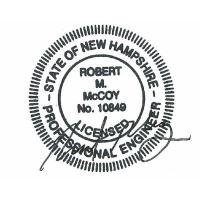
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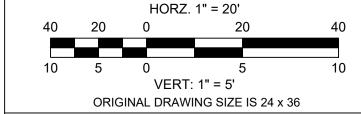


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BROADWAY STREET RAILROAD CULVERT

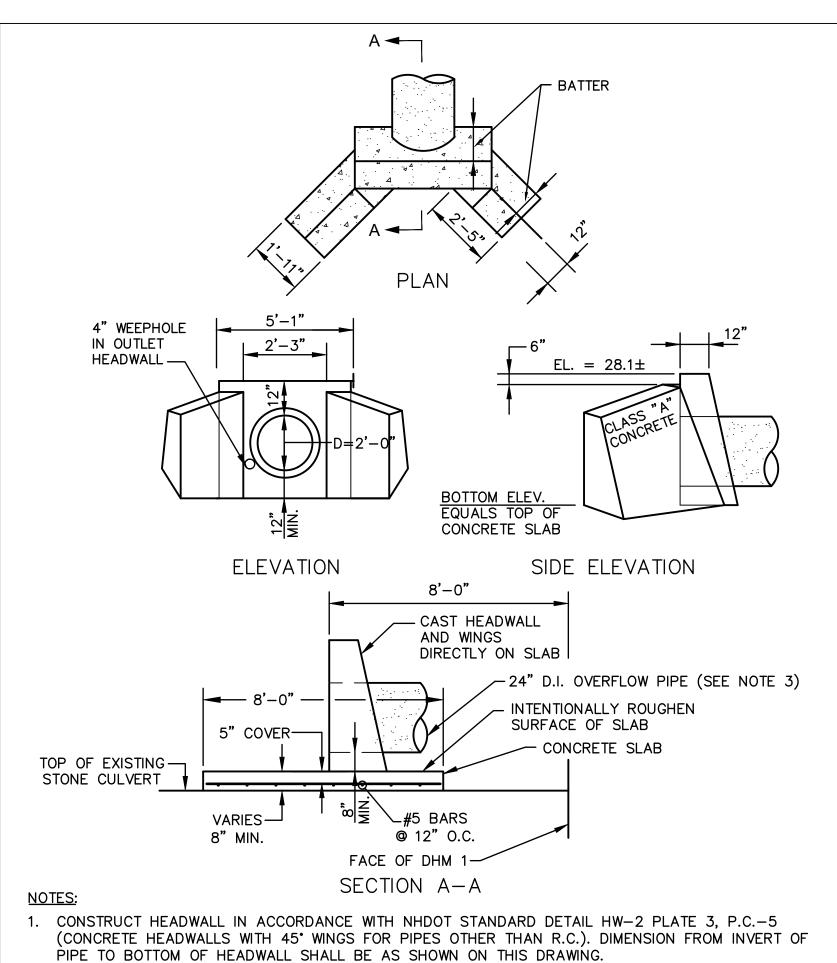


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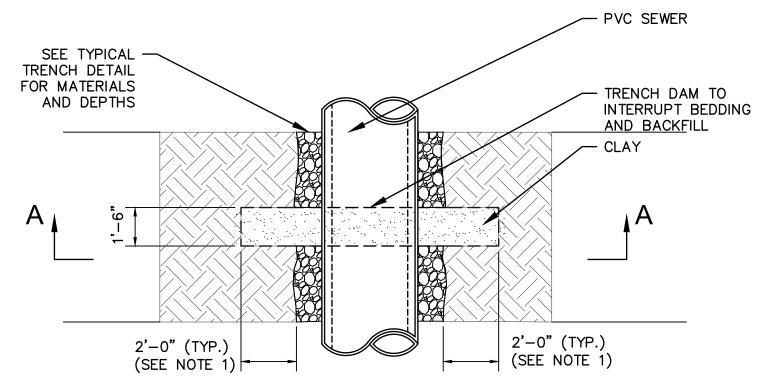
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- 2. CONCRETE HEADWALL AND WINGS TO BE SET IN ON TOP OF THE CONCRETE SLAB. WIDTH OF CONCRETE SLAB SHALL MATCH WIDTH OF EXISTING CULVERT.
- 3. PROVIDE 34" CRUSHED STONE ALL AROUND PIPE (WITHIN 12" OF PIPE).

HEADWALL WITH 45 DEGREE WINGS

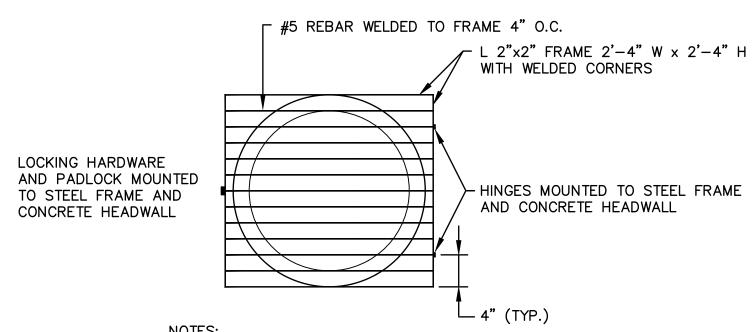
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TRENCH DAM (PLAN)
SCALE: N.T.S. 1. NOTCH TRENCH DAM A MINIMUM OF 2'-0" BEYOND UNDISTURBED MATERIAL ON SIDES AND BOTTOM OF TRENCH. TRENCH DETAIL FOR MATERIALS AND DEPTHS EXISTING GRADE EDGE OF TRENCH -EXCAVATION DEPTH OF TRENCH DAM VARIES **VARIES** GROUND WATER (SEE NOTE 1) CLAY AROUND UNDISTURBED MATERIAL ON BOTH PIPE TO 2' SIDES AND BOTTOM OF TRENCH MATERIAL ON SIDES AND BOTTOM OF

- 1. THE TOP OF THE TRENCH DAM SHALL EXTEND A MINIMUM OF 5'-0" ABOVE THE GROUND WATER LEVEL, AS DETERMINED BY THE NEAREST BORING OR BY THE ENGINEER BUT SHALL NOT BE LESS THAN A MINIMUM DEPTH OF 1'-0" BELOW FINISHED GRADE.
- 2. TRENCH DAMS SHALL BE INSTALLED AS INDICATED ON THE CONTRACT DRAWINGS OR AS DIRECTED BY THE ENGINEER. SEE NOTE 28 ON SHEET 1.

TRENCH DAM (SECTION A-A)



- 1. GATE AND HARDWARE SHALL BE INCIDENTAL TO
- HEADWALL 2. ALL HARDWARE, HINGES, NUTS, BOLTS AND WASHERS SHALL BE STAINLESS STEEL.

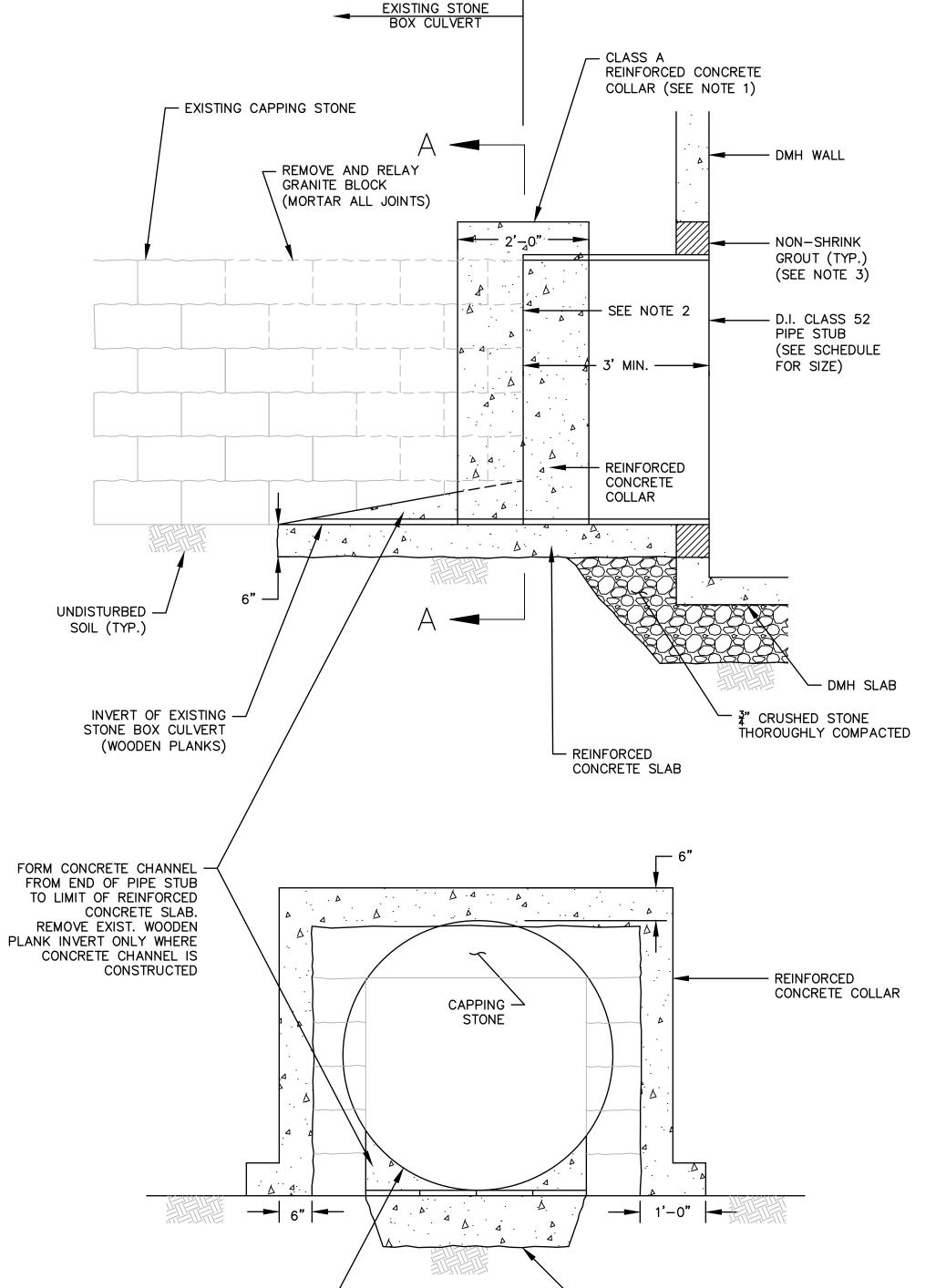
HEADWALL SECURITY GATE DETAIL

NOT TO SCALE

SECTION UNDER GRASS SECTION UNDER PAVEMENT SEE NOTE 2 — LOAM & SEED 4" MIN. SUITABLE EXCAVATED MATERIAL, GRAVEL OR SAND. COMPACT IN 12" LAYERS TRENCH WIDTH SEE NOTE 1 GRANULAR FILL. COMPACT IN 12" LAYERS —— DIAMETER 3/4" CRUSHED STONE THOROUGHLY COMPACT (SEE NOTE 3) — WITH RAM OR PNEUMATIC TAMPER. COMPACT IN 12" MIN. 4" LAYERS. REPLACE EXCAVATED ──► UNSUITABLE MATERIAL - PAY LIMIT FOR ORDERED WITH CRUSHED STONE. EXCAVATION OF UNSUITABLE DEPTH SHALL BE AS MATERIAL DIRECTED BY ENGINEER. – UNDISTURBED TRENCH MATERIAL - PAY LIMIT FOR LEDGE

- 1. FOR PIPE LESS THAN 24" IN DIAMETER, MAXIMUM ALLOWABLE TRENCH WIDTH 12" ABOVE TOP OF PIPE SHALL BE THE GREATER OF 36" OR 24" PLUS THE NOMINAL PIPE DIAMETER. FOR PIPE GREATER THAN OR EQUAL TO 24" IN DIAMETER, MAXIMUM ALLOWABLE TRENCH WIDTH 12" ABOVE TOP OF PIPE SHALL BE THE OUTSIDE PIPE DIAMETER PLUS 48".
- WHERE NO GRASS OCCURS, MATCH EXISTING MATERIALS AND DEPTHS. PLACE A MINIMUM OF 6" OF GRAVEL.
- BEDDING SHALL BE WRAPPED WITH FILTER FABRIC IN LOCATIONS WHERE EXISTING SOIL IS CONSIDERED UNSUITABLE BY THE ENGINEER.

TYPICAL DRAIN PIPE TRENCH DETAIL NOT TO SCALE



SECTION A-A

REINFORCED

CONCRETE SLAB

REINFORCING STEEL TO BE DETERMINED BASED ON ACTUAL STONE BOX CULVERT DIMENSIONS. CONTRACTOR SHALL PROVIDE CULVERT DIMENSIONS TO ENGINEER AND ENGINEER SHALL PROVIDE REINFORCING STEEL SIZE AND LOCATION.

APPLY EPOXY COATING

CONCRETE SURFACES (SAME COATING USED

ON NEW DRAIN MANHOLES)

TO ALL EXPOSED

- 2. CONTRACTOR SHALL PROVIDE COMPLETE SHOP DRAWING SUBMITTAL OF EXISTING CULVERT CONNECTION TO ENGINEER FOR REVIEW PRIOR TO CONSTRUCTION.
- 3. FOR DMH 1, PROVIDE BRICK AND MORTAR TO FILL THE ANNULAR SPACE BETWEEN THE 54" D.I. OUTLET PIPE AND THE PRECAST 84" OPENING.

DMH NO.	D.I. PIPE STUB DIAMETER (IN.)
1	54
4	42
5	30

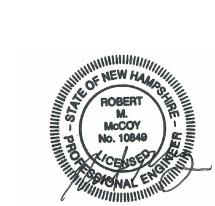
TYPICAL GRANITE BOX CULVERT CONNECTION DETAIL NOT TO SCALE



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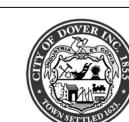
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SCALES ACCORDINGLY

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DRAINAGE DETAILS 1

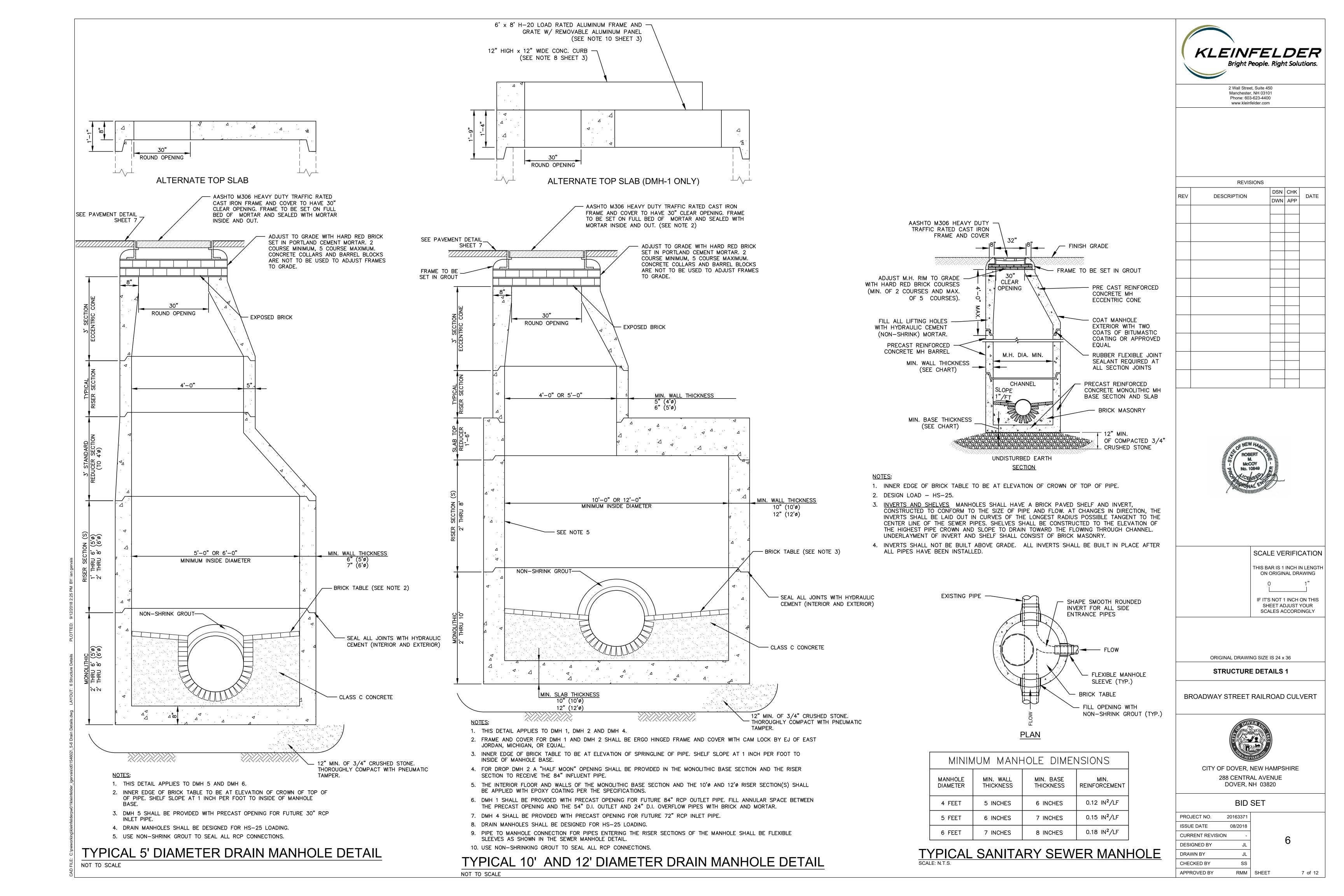
BROADWAY STREET RAILROAD CULVERT

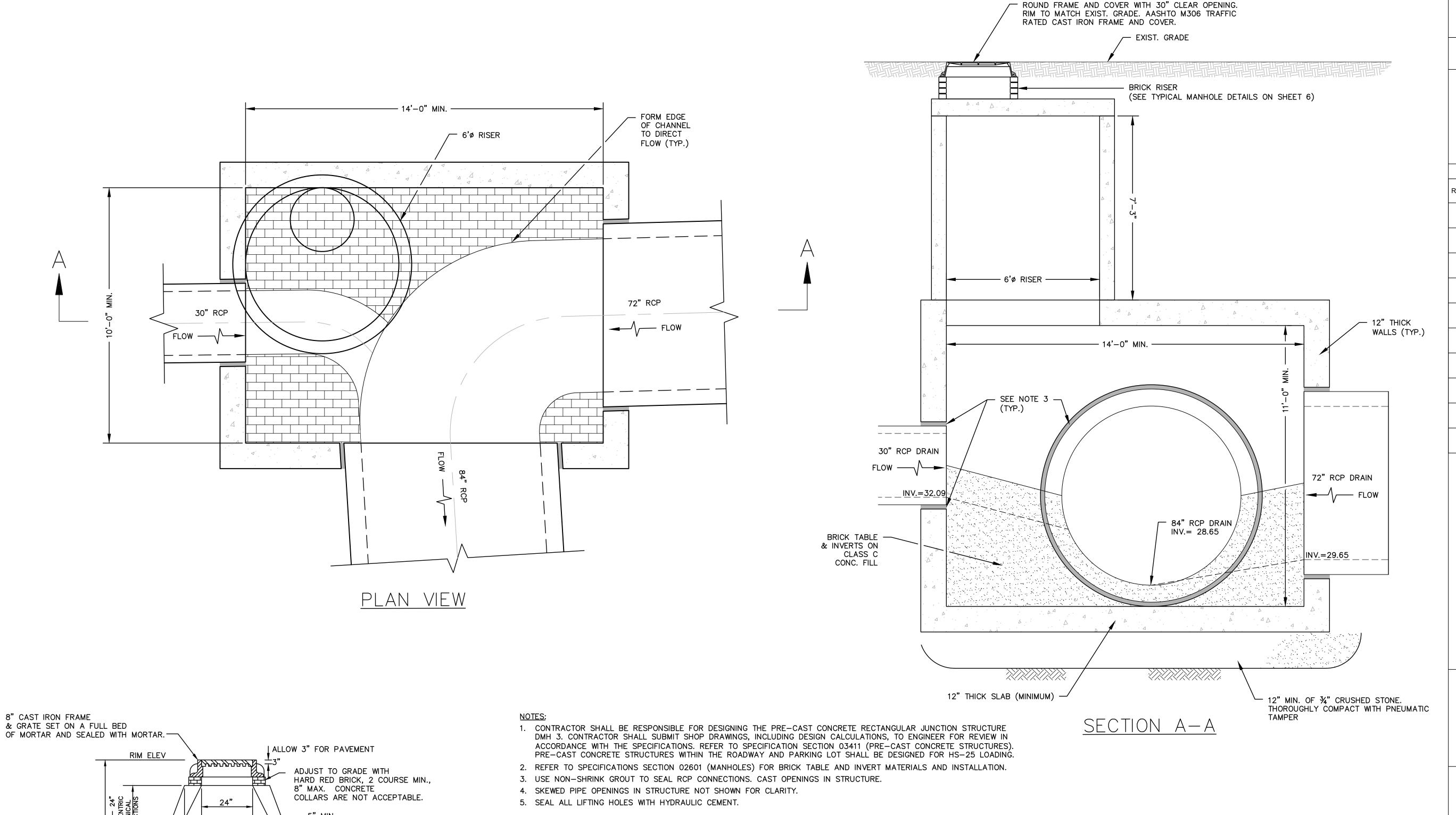


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BID SET

PROJECT NO. 20163371 ISSUE DATE 08/2018 CURRENT REVISION DESIGNED BY DRAWN BY CHECKED BY





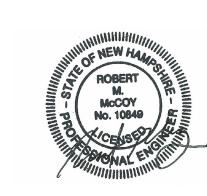
PRE-CAST RECTANGULAR JUNCTION STRUCTURE DMH 3 SCALE: N.T.S.



2 Wall Street, Suite 450 Manchester, NH 03101 Phone: 603-623-4400 www.kleinfelder.com

REVISIONS

DSN CHK
DWN APP DESCRIPTION



SCALE VERIFICATION THIS BAR IS 1 INCH IN LENGTH

ON ORIGINAL DRAWING

IF IT'S NOT 1 INCH ON THIS SHEET ADJUST YOUR SCALES ACCORDINGLY

ORIGINAL DRAWING SIZE IS 24 x 36

STRUCTURE DETAILS

BROADWAY STREET RAILROAD CULVERT



CITY OF DOVER, NEW HAMPSHIRE 288 CENTRAL AVENUE DOVER, NH 03820

BID SET PROJECT NO. 20163371 ISSUE DATE 08/2018 CURRENT REVISION DESIGNED BY DRAWN BY CHECKED BY

RMM SHEET

PRECAST CONCRETE CATCH BASIN DETAIL NOT TO SCALE

— 8" MIN

48" DIAMETER

SUMP

MORTAR

ALL JOINTS

FLUSH WITH _ INSIDE WALLS

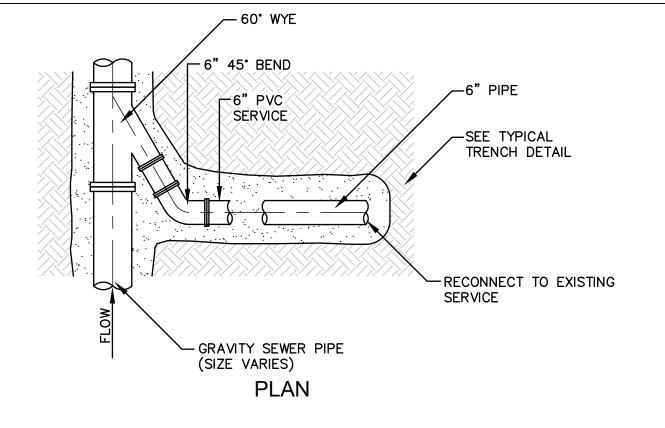
__NON-SHRINK GROUT

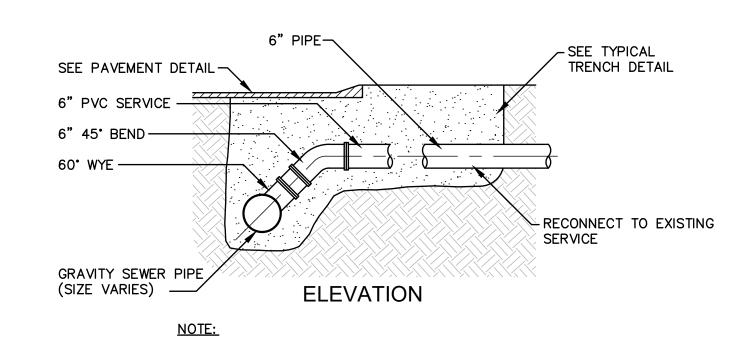
MIN 0.12 SQ IN STEEL PER VERTICAL FOOT PLACED

ACCORDING TO AASHTO

DESIGNATION M199

REINFORCED PRECAST CONCRETE SECTIONS





TYPICAL SEWER SERVICE CONNECTION DETAIL

1. PIPE SIZES AND DEPTHS VARY.

- FINISHED GRADE PROPERTY LINE VALVE BOX (SEE NOTE 3) CORPORATION STOP -CURB STOP AND BOX (SEE NOTE 5) -(SEE NOTE 4) TYPE K COPPER SERVICE —2 CUBIC FEET OF CRUSHED STONE - WATER MAIN

- 1. CONTRACTOR SHALL PROVIDE TIES TO SERVICE TAP.
- 2. SERVICE SHALL RUN PERPENDICULAR TO ROADWAY. SNAKING AROUND OBSTRUCTIONS SHALL NOT BE PERMITTED.
- 3. THE VALVE BOX SHOWN IS REQUIRED ONLY WHERE THE CURB STOP IS LOCATED IN A PAVED AREA. IF THE CURB STOP IS LOCATED IN AN AREA THAT IS NOT PAVED, THEN NO VALVE BOX SHALL BE USED AND THE SERVICE BOX PLUG COVER SHALL EXTEND TO AND BE FLUSH WITH GRADE.
- 4. CONNECT TO EXISTING SERVICE. REDUCE AS REQUIRED.
- 5. DOUBLE STRAP SERVICE SADDLES SHALL BE REQUIRED FOR ANY SERVICE TAP ON PIPE 4 INCHES OR LESS IN DIAMETER.

TYPICAL WATER SERVICE CONNECTION DETAIL NOT TO SCALE

FILTER FABRIC-

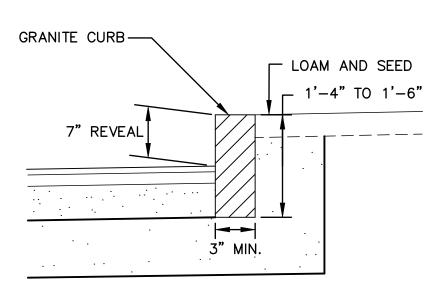
EXISTING GRADE-

SECURE FABRIC IN TRENCH

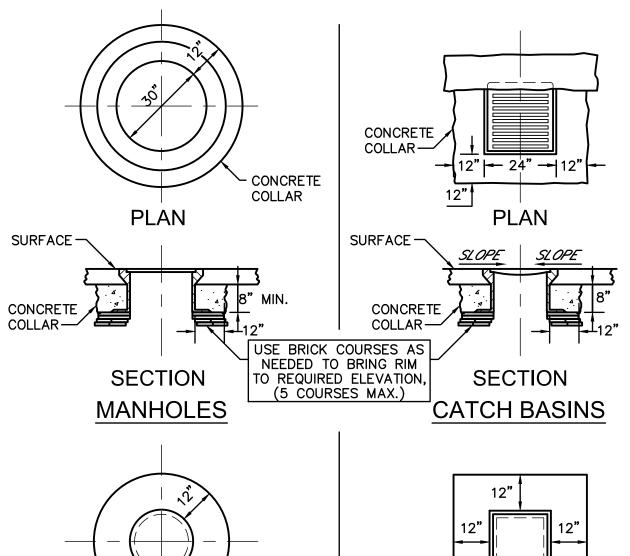
WITH COMPACTED BACKFILL-

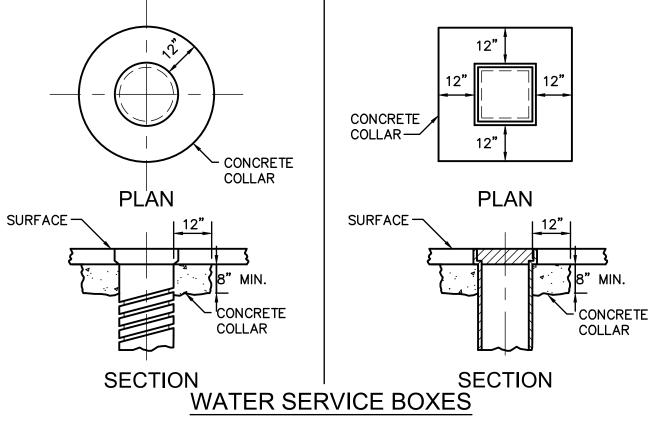
2"X2"X4' STAKE -

___ 4" MIN.

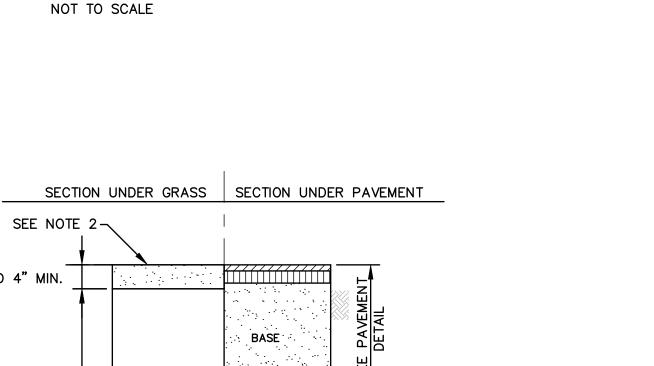


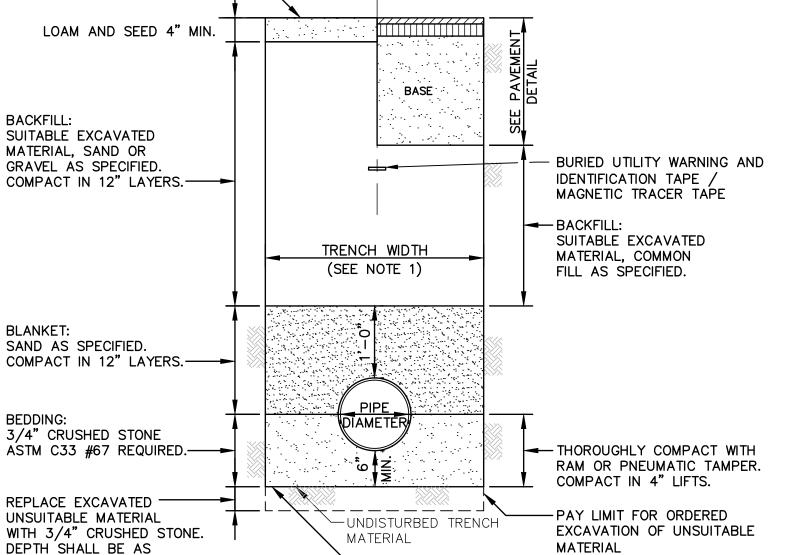
GRANITE CURB DETAIL NOT TO SCALE





DETAILS FOR RAISING CASTINGS





1. IN TRENCH DIMENSIONS SHALL BE AS FOLLOWS:

DIRECTED BY ENGINEER.

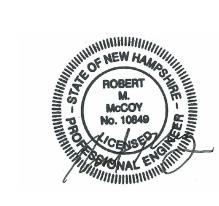
NOTES:

- (a) FOR PIPE LESS THAN OR EQUAL TO 12 INCHES IN DIAMETER, MAXIMUM ALLOWABLE TRENCH WIDTH AT PLANE 12 INCHES ABOVE PIPE SHALL BE NO MORE THAN 36 INCHES.
- (b) FOR PIPE GREATER THAN 12 INCHES IN DIAMETER THE MAXIMUM ALLOWABLE TRENCH WIDTH SHALL BE EQUAL TO THE PIPE OUTSIDE DIAMETER PLUS 24 INCHES.

PAY LIMIT FOR LEDGE

- 2. WHERE NO GRASS OCCURS, MATCH EXISTING MATERIALS AND DEPTHS. PLACE A MINIMUM OF 6" OF GRAVEL.
- 3. BEDDING SHALL BE WRAPPED WITH FILTER FABRIC IN LOCATIONS WHERE EXISTING SOIL IS CONSIDERED UNSUITABLE BY THE ENGINEER.

TYPICAL SEWER TRENCH DETAIL NOT TO SCALE



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ORIGINAL DRAWING SIZE IS 24 x 36

MISCELLANEOUS DETAILS

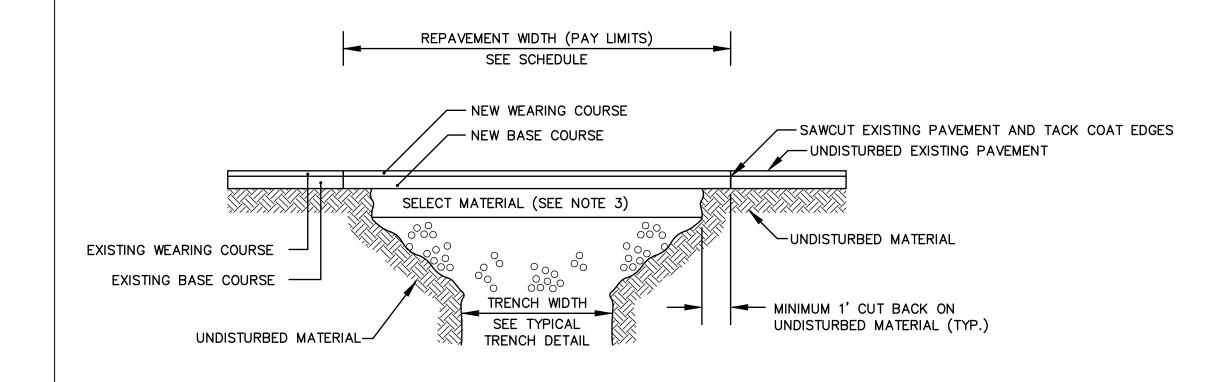
BROADWAY STREET RAILROAD CULVERT



CITY OF DOVER, NEW HAMPSHIRE 288 CENTRAL AVENUE DOVER, NH 03820

BID SET

PROJECT NO.	20163371			
ISSUE DATE	08/2018			
CURRENT REVISION	-		7	
DESIGNED BY	JL		1	
DRAWN BY	JL			
CHECKED BY	SS			
APPROVED BY	RMM	SHEET		9 of



NOTES:

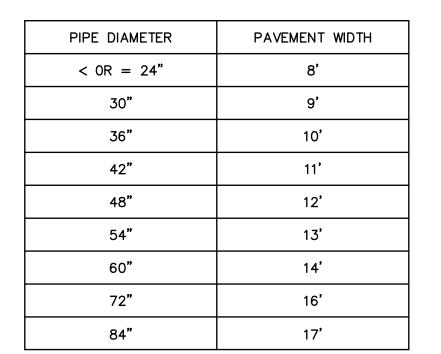
NOT TO SCALE

1. DEPTH OF PERMANENT PAVEMENT SHALL NOT BE LESS THAN DEPTH OF EXISTING PAVEMENT. MINIMUM PAVEMENT REQUIREMENTS FOLLOWING CONSTRUCTION SHALL BE AS FOLLOWS:

COURSE	COMPACTED THICKNESS
TEMPORARY PAVEMENT	2 INCH
PERMANENT BASE COURSE (BROADWAY STREET R.O.W.)	2 1/2 INCH
PERMANENT OVERLAY WEARING COURSE (BROADWAY STREET R.O.W.)	1 1/2 INCH
PERMANENT BASE COURSE (PARKING LOT OUTSIDE R.O.W.)	2 INCH
PERMANENT WEARING COURSE (PARKING LOT OUTSIDE R.O.W.)	1 INCH

- 2. ROAD ELEVATION TO MATCH EXISTING.
- 3. SELECT MATERIAL BELOW PAVEMENT SHALL BE AS FOLLOWS: BROADWAY STREET R.O.W. = 12" GRAVEL AND 6" CRUSHED GRAVEL PARKING LOTS OUTSIDE R.O.W. = 8" CRUSHED GRAVEL
- 4. PAVEMENT RESTORATION SHALL PROCEED AS FOLLOWS:
- a. TEMPORARY PAVEMENT SHALL BE PROVIDED SAME WEEK
- b. PRIOR TO NOVEMBER 15TH, REMOVE TEMPORARY PAVEMENT AND PROVIDE PERMANENT BASE COURSE WITHIN TRENCH
- c. AFTER APRIL 15TH OF FOLLOWING SPRING, COLD PLANE 1½-INCH IN BROADWAY STREET R.O.W. AND 1-INCH IN PARKING LOT OUTSIDE THE R.O.W. (WITHIN PAVING LIMITS SHOWN ON SHEET 3), AND PROVIDE 11/2-INCH AND 1-INCH OVERLAY WEARING COURSE RESPECTIVELY.

PAVEMENT DETAIL



REPAVEMENT WIDTH SCHEDULE

-2"X2"X4' POST 10'-0" MAXIMUM FILTER FABRIC

SECTION

— 30" TYP.

√12" MIN. TYP

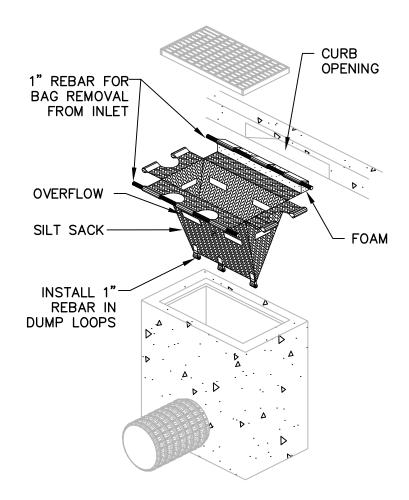
1. FABRIC TO BE ATTACHED TO STAKES WITH STAPLES.

ELEVATION

- 2. FABRIC TO BE UV RESISTANT POLYPROPYLENE WITH A MINIMUM WEIGHT OF 2.5 OZ./S.Y.
- 3. USE SILT FENCE OR HAYBALES WHERE INDICATED OR AS DIRECTED BY ENGINEER
- 4. WHERE HAYBALES ARE USED, TRENCH A MINIMUM OF 4" INTO EXISTING GRADE.
- 5. A MINIMUM OF 2 WOODEN OR METAL STAKES PER HAYBALE. DRIVE STAKES A MINIMUM OF 12" INTO
- 6. THE FABRIC SHALL BE EMBEDDED A MINIMUM OF 8 INCHES INTO THE GROUND AND THE SOIL COMPACTED OVER THE EMBEDDED FABRIC.

SILT FENCE DETAIL NOT TO SCALE

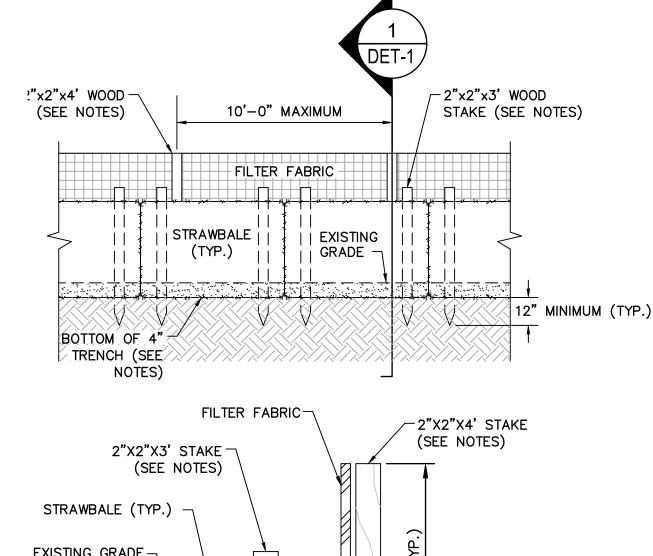
NOT TO SCALE

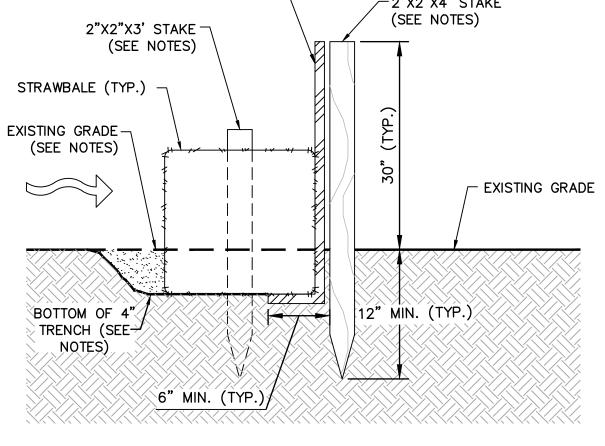


NOTES FOR EROSION CONTROL:

- CONTRACTOR SHALL REMOVE SEDIMENT AS NECESSARY TO MAINTAIN LEVEL BELOW OVERFLOW HOLES IN SILT SACK.
- 2. SILT SACK SHALL BE USED ON EXISTING CATCH BASINS WITHIN THE PROJECT AREA AND CATCH BASINS THAT CONVEY PROJECT AREA RUNOFF
- 3. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SEDIMENTATION BARRIERS THROUGHOUT THE DURATION OF THE PROJECT.
- 4. CONTRACTOR SHALL REMOVE AND LEGALLY DISPOSE OF SEDIMENT AS REQUIRED.
- 5. CONTRACTOR SHALL REMOVE SILT SACKS, STRAW BALES AND SILT FENCE AND LEGALLY DISPOSE OF THEM OFF-SITE UPON COMPLETION OF THE PROJECT AND AS REQUIRED.

SILT SACK DETAIL





DETAIL

- 1. FABRIC TO BE UV RESISTANT POLYPROPYLENE WITH A MINIMUM WEIGHT OF 2.5 OZ./S.Y. 2.
- 2. FABRIC TO BE ATTACHED TO STAKES WITH STAPLES.
- 3. USE SILT FENCE AND STRAWBALES WHERE INDICATED OR AS DIRECTED BY ENGINEER.
- 4. WHERE STRAWBALES ARE USED, TRENCH A MINIMUM OF 4" INTO EXISTING GRADE.
- 5. A MINIMUM OF TWO (2) WOODEN OR METAL STAKES PER STRAWBALE. DRIVE STAKES A MINIMUM OF 12" INTO GROUND.

SILT FENCE WITH STRAWBALE DETAIL

3" WOOD BARK MULCH - 3" SAUCER, PLANT MIX, MIN. 3" FORM WITH ALL AROUND PLANT MIX SET SHRUB AT SAME GRADE AS IN NURSEY REMOVE BURLAP FROM TOP HALF OF BALL AND ALL NON-BIODEGRADEABLE MATERIALS - COMPACT SUBSOIL PEDESTAL TO PREVENT SETTLING, 6" MIN. GRADE COMPACTED SUBGRADE

WHEN CROSSING UNDER EXISTING UTILITY LINES, CONTRACTOR TO

LIMIT LENGTH OF TRENCH EXCAVATION AND PROVIDE SUPPORT OF

EXISTING UTILITIES. HAND EXCAVATION MAY BE REQUIRED TO

MAY INCLUDE BUT NOT BE LIMITED TO PIPE, CABLE, CONDUIT,

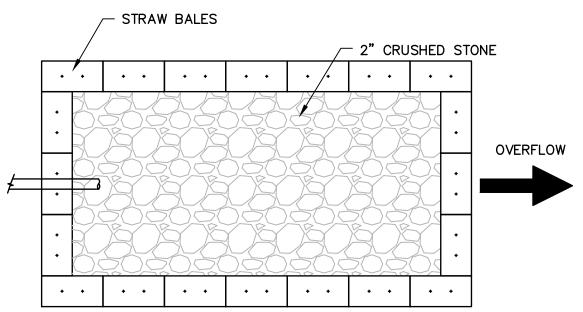
CONCRETE DUCTS, OR PIPE ENCASEMENTS.

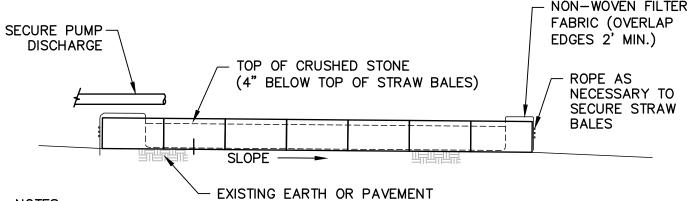
SUPPORT BEAM - NUMBER-AND SIZE TO BE DETERMINED

BY CONTRACTOR

SHRUB PLANTING

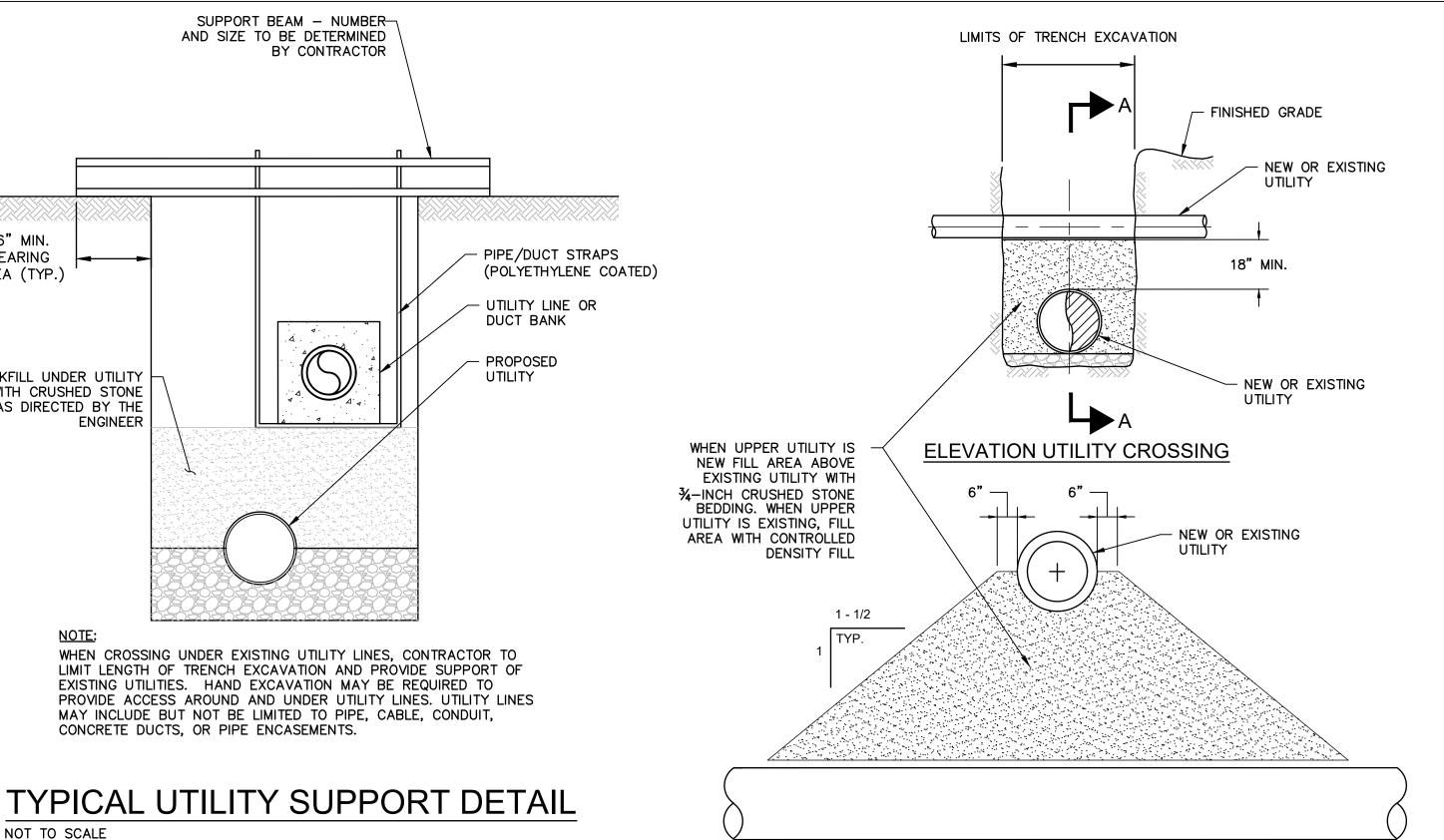
NOT TO SCALE





- 2. ANY DISTURBED AREAS SHALL BE RESTORED TO PRE-CONSTRUCTION CONDITION IN ACCORDANCE WITH THE TECHNICAL SPECIFICATIONS, SECTION 02498, RESTORATION OF

NOT TO SCALE



1. WHERE NEW UTILITIES CROSS UNDER EXISTING WATER MAINS, CONTRACTOR SHALL WRAP EXISTING WATER MAIN WITH 8 MILS OF POLY WRAP.

NEW OR EXISTING UTILITY

LEADER SHOULD NOT BE CUT

PRUNE AS DIRECTED BY

LANDSCAPE ARCHITECT

TWO-PLY REINFORCED RUBBER HOSE WITH CABLE OR GALV. WIRE

AT 120° INTERVALS

-3/8"x 6" GALV. STEEL TURNBUCKLE

TURN DOWN TOP 1/3 OF

∠2x4x36" WOOD STAKE

UNDISTURBED OR COMPACTED SUBGRADE MATERIAL

FLUSH WITH GROUND

(SEE SPEC.) SOIL MIX

GRADE

BURLAP

OR DAMAGED

SECTION A-A

2. CONTRACTOR SHALL PROVIDE A SUBMITTAL FOR REVIEW BY THE OWNER AND ENGINEER THAT DESCRIBES IN DETAIL HIS OR HER PROPOSED MEANS AND METHOD FOR SECURING AND PROTECTING EXISTING WATER AND SEWER MAINS AT ALL CROSSINGS. INFORMATION TO BE INCLUDED IN THE SUBMITTAL SHALL INCLUDE, BUT NOT BE LIMITED TO: DEPTH OF EXCAVATION; EARTH RETENTION SYSTEM DETAILS; MATERIALS AND PROCEDURES FOR SUPPORTING EXISTING MAINS; AND BACKFILL MATERIALS AND METHODS.

TYPICAL SECTION AT UTILITY CROSSING NOT TO SCALE

WRAP

(SEE

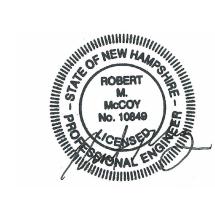
TREE PLANTING DETAIL

2" SHREDDED -

MULCH

NOT TO SCALE

HEMLOCK BARK



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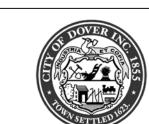
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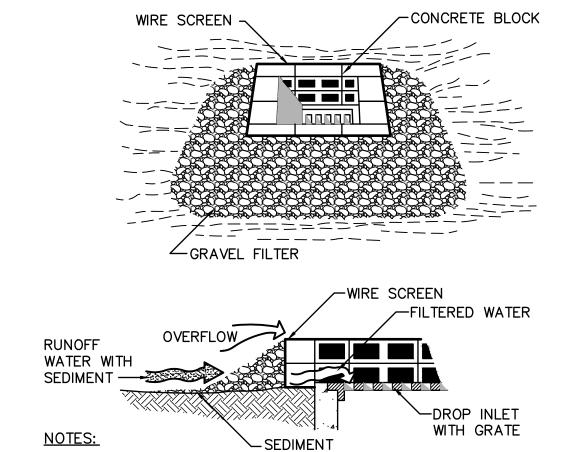
BROADWAY STREET RAILROAD CULVERT



CITY OF DOVER, NEW HAMPSHIRE 288 CENTRAL AVENUE DOVER, NH 03820

BID SET

PROJECT NO. 20163371 ISSUE DATE 08/2018 **CURRENT REVISION** 7A **DESIGNED BY** DRAWN BY CHECKED BY APPROVED BY RMM | SHEET 10 of 12



- 1. CONCRETE BLOCKS SHOULD BE PLACED LENGTHWISE ON THEIR SIDES IN A SINGLE ROW AROUND THE PERIMETER OF THE INLET. THE ENDS OF EACH BLOCK SHOULD BE ABUTTING. THE HEIGHT OF THE BARRIER CAN BE VARIED DEPENDING ON THE DESIGN BY STACKING VARIOUS COMBINATIONS OF DIFFERENT SIZED BLOCKS. THE BARRIER SHOULD BE A MINIMUM OF 12 INCHES HIGH AND A MAXIMUM OF 24 INCHES HIGH.
- 2. HARDWARE CLOTH OR WIRE MESH SHOULD BE PLACED OVER THE OPENINGS OF THE CONCRETE BLOCKS AND EXTEND AT LEAST 12 INCHES AROUND THE OPENING TO PREVENT AGGREGATE FROM BEING TRANSPORTED THROUGH THE OPENINGS IN THE BLOCK.
- 3. SEWER STONE OR OTHER CLEAN COARSE AGGREGATE SHOULD BE PLACED AGAINST THE BLOCK TO THE TOP OF THE BARRIER.

BLOCK AND GRAVEL SEDIMENT FILTER AT CATCH BASIN

NOT TO SCALE

16" MIN.

BEARING

BACKFILL UNDER UTILITY

NOT TO SCALE

AS DIRECTED BY THE

ENGINEER

LINE WITH CRUSHED STONE

AREA (TYP.)

NON-WOVEN FILTER

- 1. REMOVE TRAP WHEN SILT COVERS CRUSHED STONE AND DISPOSE OF IN A MANNER THAT IS CONSISTENT WITH STATE AND LOCAL REGULATIONS.
- 3. REFER TO SPECIFICATION SECTION 02140 FOR OTHER ACCEPTABLE METHODS FOR TREATING DEWATERING DISCHARGE.

TEMPORARY SEDIMENT TRAP FOR DEWATERING

