

MICHAEL & MARTHA MULHERN

THE CROSSINGS SUBDIVISION

DURHAM, NH & MADBURY, NH
 15 SEPTEMBER 2021
 RESUBMITTED 05 OCTOBER 2021

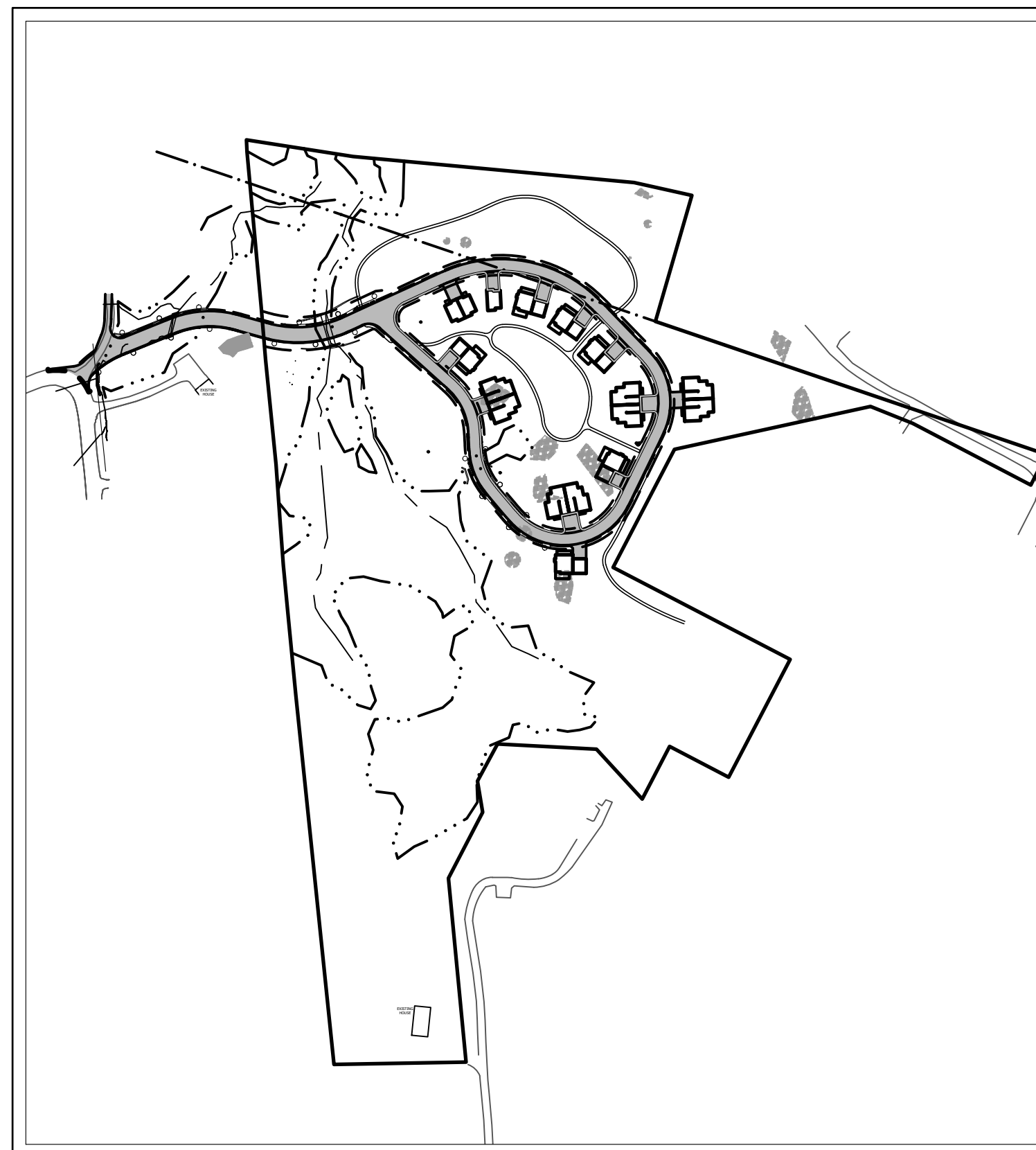
OWNER:

MICHAEL & MARTI MULHERN
 91 BAGDAD ROAD
 DURHAM, NH

ENGINEER:

horizons
Engineering

5 RAILROAD ST
 NEWMARKET, NH 03857
 (603) 444-4111



LEGEND

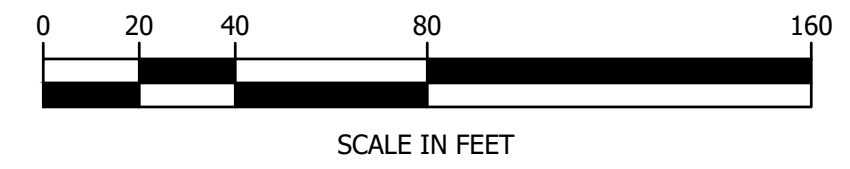
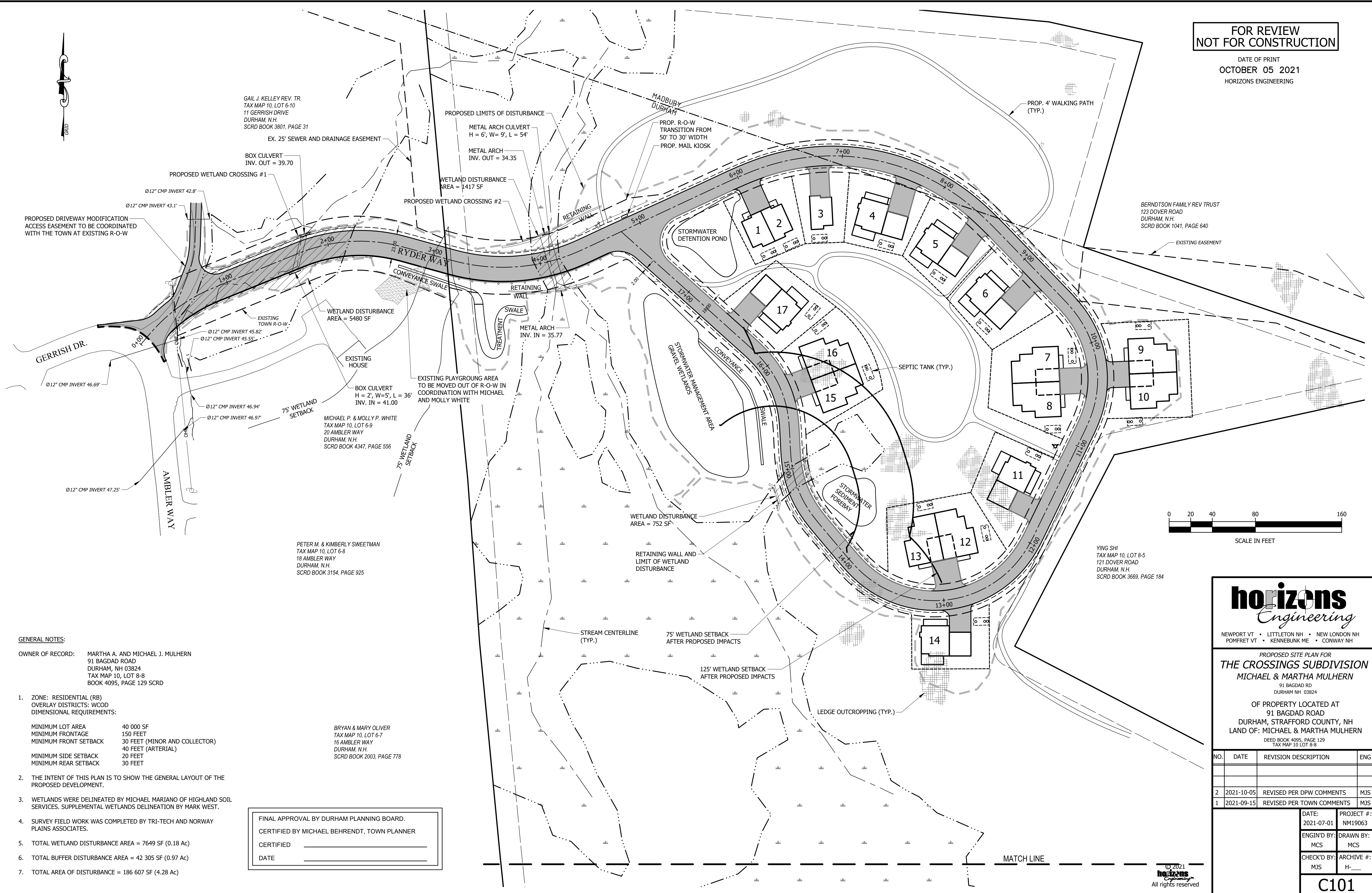
EXISTING	PROPOSED	DESCRIPTION
---	---	INDEX CONTOUR (10 FOOT)
---	---	INTERMEDIATE CONTOUR (2 FOOT)
---	---	SUPPLEMENTARY CONTOUR
---	---	WETLAND BOUNDARY
---	---	STORM DRAINLINE OR CULVERT
---	---	GUARDRAIL
⊙	⊙	SANITARY SEWER MANHOLE
⊙	⊙	FIRE HYDRANT
⊙	⊙	RIP RAP
⊙	⊙	EXPOSED LEDGE
⊙	⊙	POWER POLE

ABBREVIATIONS

CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
HDPE	HIGH DENSITY POLYETHYLENE
SFB	SEDIMENT FOREBAY
SGW	SUBSURFACE GRAVEL WETLAND

FOR REVIEW
NOT FOR CONSTRUCTION

DATE OF PRINT
OCTOBER 05 2021
HORIZONS ENGINEERING



GENERAL NOTES:

- OWNER OF RECORD: MARTHA A. AND MICHAEL J. MULHERN
91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCR D
- ZONE: RESIDENTIAL (RB)
OVERLAY DISTRICTS: WCOD
DIMENSIONAL REQUIREMENTS:
MINIMUM LOT AREA 40 000 SF
MINIMUM FRONTAGE 150 FEET
MINIMUM FRONT SETBACK 30 FEET (MINOR AND COLLECTOR)
40 FEET (ARTERIAL)
MINIMUM SIDE SETBACK 20 FEET
MINIMUM REAR SETBACK 30 FEET
 - THE INTENT OF THIS PLAN IS TO SHOW THE GENERAL LAYOUT OF THE PROPOSED DEVELOPMENT.
 - WETLANDS WERE DELINEATED BY MICHAEL MARIANO OF HIGHLAND SOIL SERVICES. SUPPLEMENTAL WETLANDS DELINEATION BY MARK WEST.
 - SURVEY FIELD WORK WAS COMPLETED BY TRI-TECH AND NORWAY PLAINS ASSOCIATES.
 - TOTAL WETLAND DISTURBANCE AREA = 7649 SF (0.18 Ac)
 - TOTAL BUFFER DISTURBANCE AREA = 42 305 SF (0.97 Ac)
 - TOTAL AREA OF DISTURBANCE = 186 607 SF (4.28 Ac)

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____

BRYAN & MARY OLIVER
TAX MAP 10, LOT 6-7
16 AMBLER WAY
DURHAM, N.H.
SCR D BOOK 2003, PAGE 778



PROPOSED SITE PLAN FOR
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
91 BAGDAD RD
DURHAM NH 03824
OF PROPERTY LOCATED AT
91 BAGDAD ROAD
DURHAM, STRAFFORD COUNTY, NH
LAND OF: MICHAEL & MARTHA MULHERN
DEED BOOK 4095, PAGE 129
TAX MAP 10 LOT 8-8

NO.	DATE	REVISION DESCRIPTION	ENG
2	2021-10-05	REVISED PER DPW COMMENTS	MJS
1	2021-09-15	REVISED PER TOWN COMMENTS	MJS

DATE:	PROJECT #:
2021-07-01	NM19063
ENGIN'D BY:	DRAWN BY:
MCS	MCS
CHECK'D BY:	ARCHIVE #:
MJS	H-___

C101



DANIEL SHANK
TAX MAP 10, LOT 6-61
3012 TULE AVE, APT 3214
FORT WORTH, TX 76116
SCRD BOOK 3445, PAGE 410

JUDITH K. GETCHEL
TAX MAP 10, LOT 6-6
12 AMBLER WAY
DURHAM, N.H.
SCRD BOOK 2624, PAGE 342

SOPHIE LANE HOMEOWNERS ASSOCIATION
P.O. BOX 370
PORTSMOUTH, N.H.
SCRD BOOK 3516, PAGE 59

GREG A. IMBRIE
93 BAGDAD ROAD
DURHAM, N.H.
SCRD BOOK 4605, PAGE 287

MATTHEW ANCTIL & MELANIE HARVEY
107 DOVER ROAD
DURHAM, N.H.
SCRD BOOK 4317, PAGE 554

GEOFFREY DIXON & SUZANNE YOUNG
103 DOVER ROAD
DURHAM, N.H.
SCRD BOOK 2556, PAGE 522

JUAN & AMANDA NIEVES
95 BAGDAD ROAD
DURHAM, N.H.
SCRD BOOK 4369, PAGE 791

TIMOTHY & DENISE DAY
89 BAGDAD ROAD
DURHAM, N.H.
SCRD BOOK 1808, PAGE 353
TIMOTHY & DENISE DAY
89 BAGDAD ROAD
DURHAM, N.H.
SCRD BOOK 1808, PAGE 353

STELLA BROWN
111 DOVER ROAD
DURHAM, N.H.
SCRD BOOK 2362, PAGE 425

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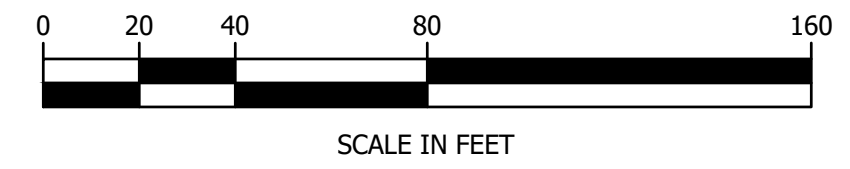
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HORIZONS ENGINEERING

MATCH LINE

75' WETLAND
SETBACK

125' WETLAND
SETBACK

EXISTING
HOUSE
18

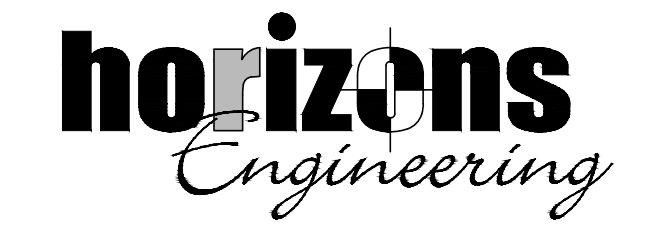


GENERAL NOTES:

OWNER OF RECORD: MARTHA A. AND MICHAEL J. MULHERN
91 BAGDAD ROAD
DURHAM, NH 03824
TAX MAP 10, LOT 8-8
BOOK 4095, PAGE 129 SCRD

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DATE _____



NEWPORT VT • LITTLETON NH • NEW LONDON NH
POMFRET VT • KENNEBUNK ME • CONWAY NH

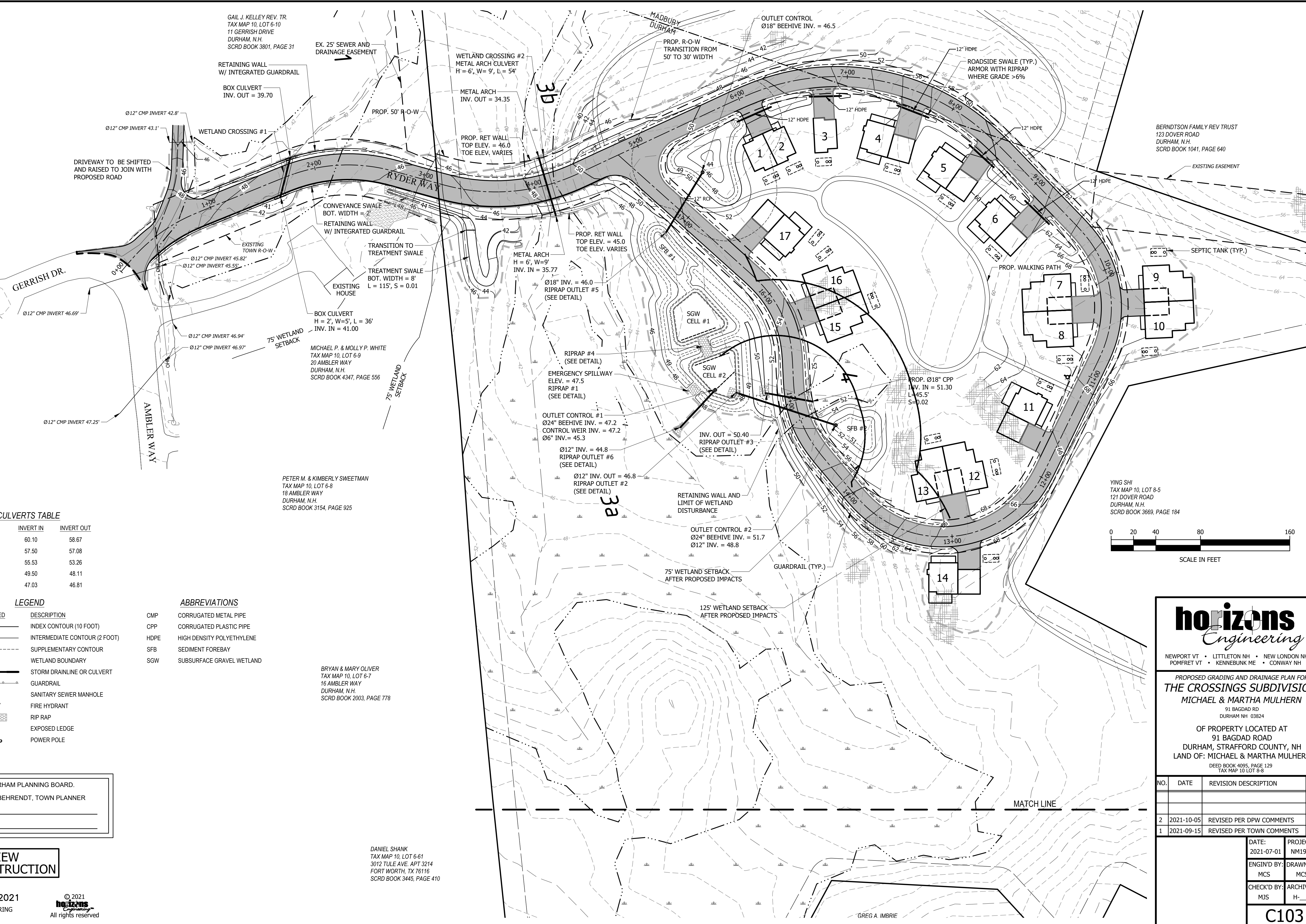
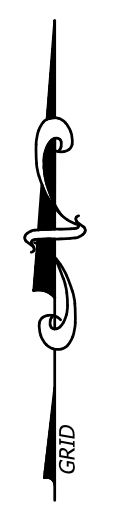
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MICHAEL & MARTHA MULHERN

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DURHAM NH 03824
OF PROPERTY LOCATED AT
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DURHAM, STRAFFORD COUNTY, NH
LAND OF: MICHAEL & MARTHA MULHERN
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C102



BERNDTSON FAMILY REV TRUST
123 DOVER ROAD
DURHAM, N.H.
SCRD BOOK 1041, PAGE 640

YING SHI
TAX MAP 10, LOT 8-5
121 DOVER ROAD
DURHAM, N.H.
SCRD BOOK 3669, PAGE 184

GAIL J. KELLEY REV. TR.
TAX MAP 10, LOT 6-10
11 GERRISH DRIVE
DURHAM, N.H.
SCRD BOOK 3801, PAGE 31

RETAINING WALL
W/ INTEGRATED GUARDRAIL
BOX CULVERT
INV. OUT = 39.70

WETLAND CROSSING #2
METAL ARCH CULVERT
H = 6', W = 9', L = 54'

CONVEYANCE SWALE
BOT. WIDTH = 2'

RETAINING WALL
W/ INTEGRATED GUARDRAIL

TRANSITION TO
TREATMENT SWALE

TREATMENT SWALE
BOT. WIDTH = 8'
L = 115', S = 0.01

EXISTING HOUSE

BOX CULVERT
H = 2', W = 5', L = 36'
INV. IN = 41.00

PETER M. & KIMBERLY SWEETMAN
TAX MAP 10, LOT 6-9
20 AMBLER WAY
DURHAM, N.H.
SCRD BOOK 4347, PAGE 556

METAL ARCH
H = 6', W = 9'
INV. IN = 35.77

PROP. RET WALL
TOP ELEV. = 45.0
TOE ELEV. VARIES

Ø18" INV. = 46.0
RIPRAP OUTLET #5
(SEE DETAIL)

EMERGENCY SPILLWAY
ELEV. = 47.5
RIPRAP #1
(SEE DETAIL)

OUTLET CONTROL #1
Ø24" BEEHIVE INV. = 47.2
CONTROL WEIR INV. = 47.2
Ø6" INV. = 45.3

Ø12" INV. = 44.8
RIPRAP OUTLET #6
(SEE DETAIL)

Ø12" INV. OUT = 46.8
RIPRAP OUTLET #2
(SEE DETAIL)

OUTLET CONTROL #2
Ø24" BEEHIVE INV. = 51.7
Ø12" INV. = 48.8

RETAINING WALL AND
LIMIT OF WETLAND
DISTURBANCE

75' WETLAND SETBACK
AFTER PROPOSED IMPACTS

125' WETLAND SETBACK
AFTER PROPOSED IMPACTS

DRIVEWAY CULVERTS TABLE

LOCATION	DIAMETER	INVERT IN	INVERT OUT
BLDG 6	12 INCH	60.10	58.67
BLDG 5	12 INCH	57.50	57.08
BLDG 4	12 INCH	55.53	53.26
BLDG 3	12 INCH	49.50	48.11
BLDG 1&2	12 INCH	47.03	46.81

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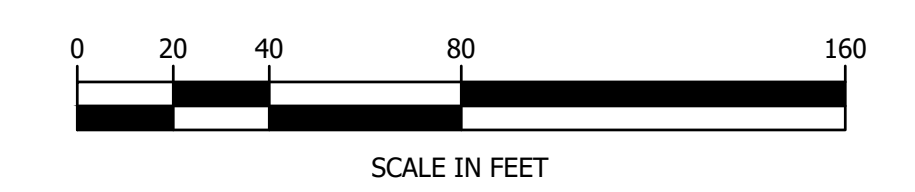
ABBREVIATIONS

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SFB	SEDIMENT FOREBAY
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DURHAM, N.H.
SCRD BOOK 2003, PAGE 778

DANIEL SHANK
TAX MAP 10, LOT 6-61
3012 TULE AVE. APT 3214
FORT WORTH, TX 76116
SCRD BOOK 3445, PAGE 410

GREG A. IMBRIE



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PROPOSED GRADING AND DRAINAGE PLAN FOR
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
91 BAGDAD RD
DURHAM NH 03824

OF PROPERTY LOCATED AT
91 BAGDAD ROAD
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C103

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SCRD BOOK 3801, PAGE 31

BERNDTSON FAMILY REV TRUST
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DURHAM, N.H.
SCRD BOOK 1041, PAGE 640

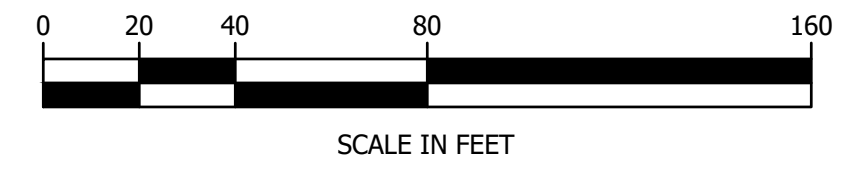
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SCRD BOOK 3154, PAGE 925

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SCRD BOOK 2003, PAGE 778

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TAX MAP 10, LOT 6-61
3012 TULE AVE. APT 3214
FORT WORTH, TX 76116
SCRD BOOK 3445, PAGE 410

GREG A. IMBRIE



POTABLE WATER NOTES

1. EACH UNIT WILL RECEIVE WATER FROM THE DURHAM MUNICIPAL WATER SYSTEM.

SEWER NOTES

2. EACH BUILDING WILL BE CONNECTED A SEPTIC TANK EQUIPPED WITH PUMP FOR LOW PRESSURE SEWER.

ELECTRICAL NOTES

3. THE PROPOSED UNITS WILL BE SERVICED BY EVERSOURCE ENERGY.

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PROPOSED UTILITIES PLAN FOR
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
91 BAGDAD RD
DURHAM NH 03824

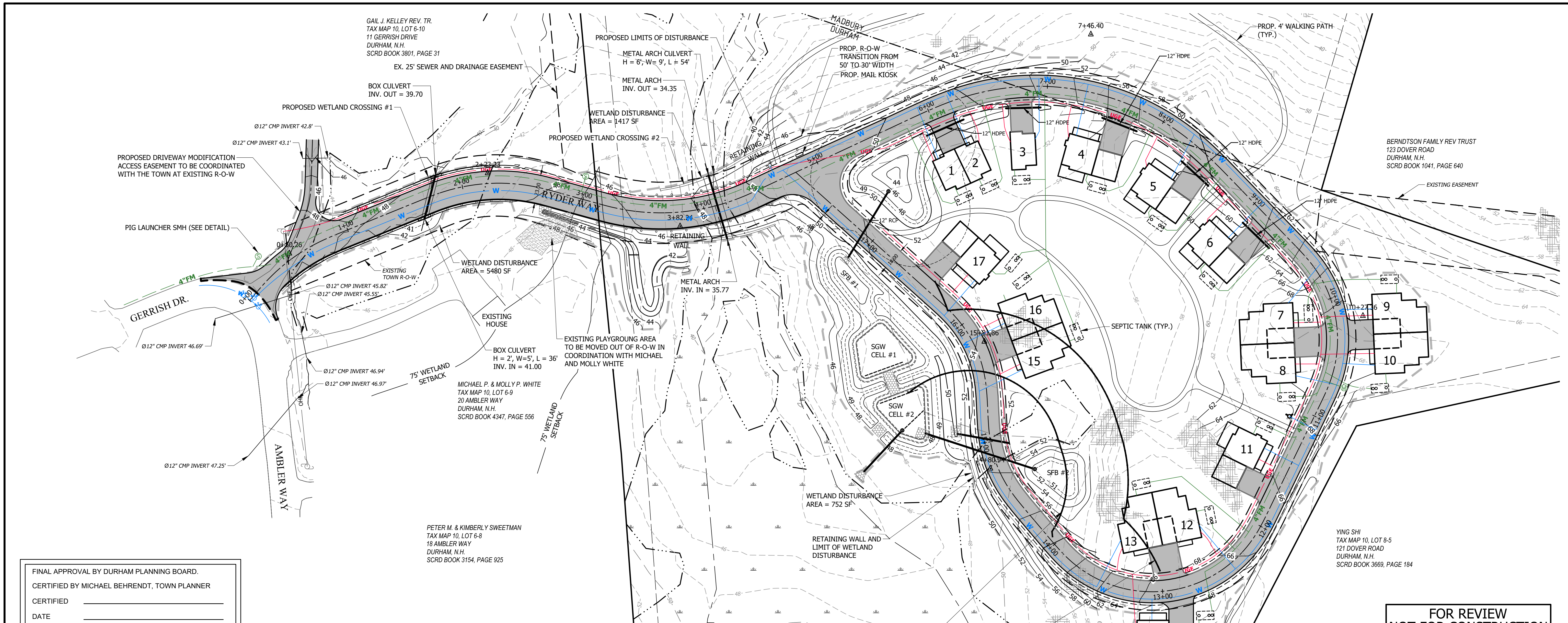
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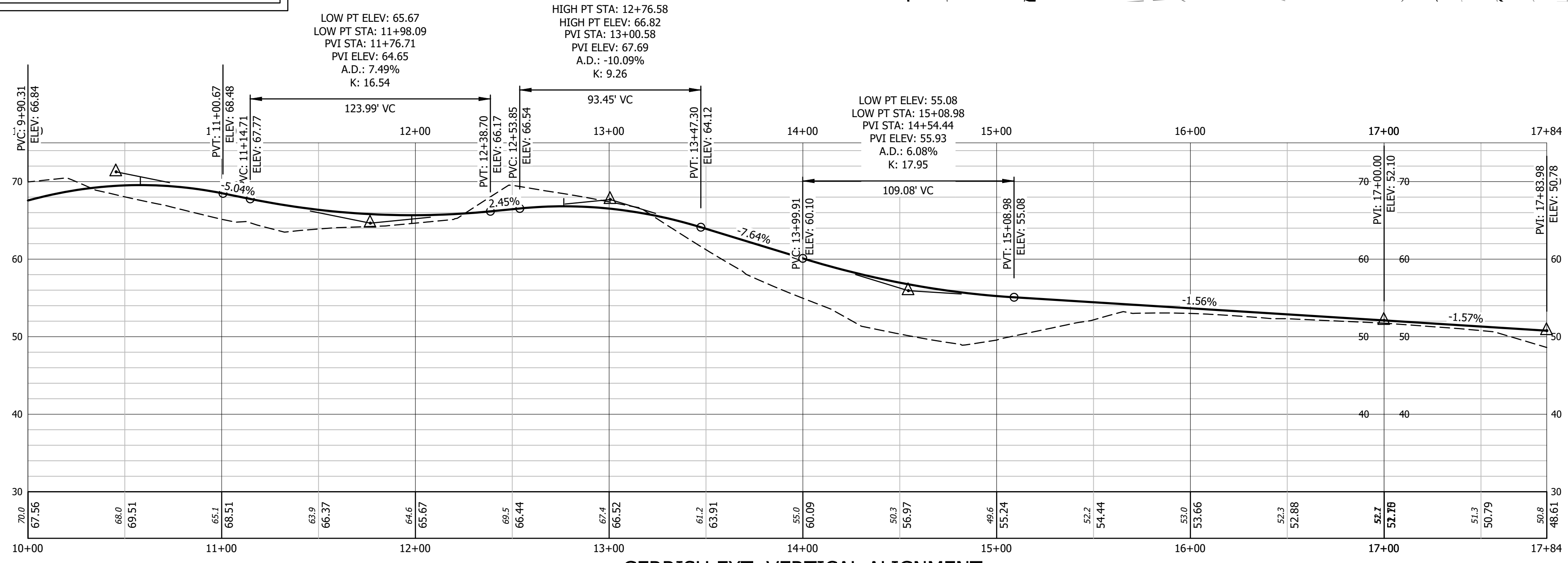
C104

MATCH LINE



FINAL APPROVAL BY DURHAM PLANNING BOARD.
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GERRISH EXT. VERTICAL ALIGNMENT
 STA: 17+00 TO STA: 17+84

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PROPOSED ROAD PROFILE 0+00 TO 17+84
THE CROSSINGS SUBDIVISION
 MICHAEL & MARTHA MULHERN
 91 BAGDAD RD
 DURHAM NH 03824

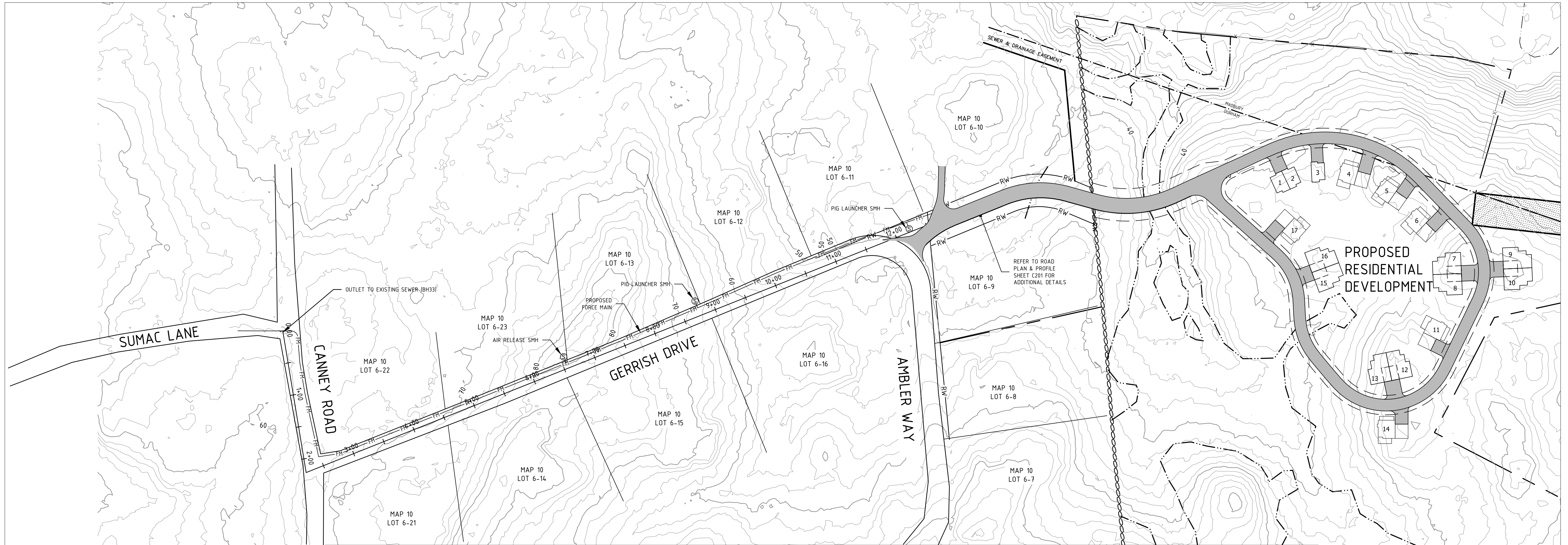
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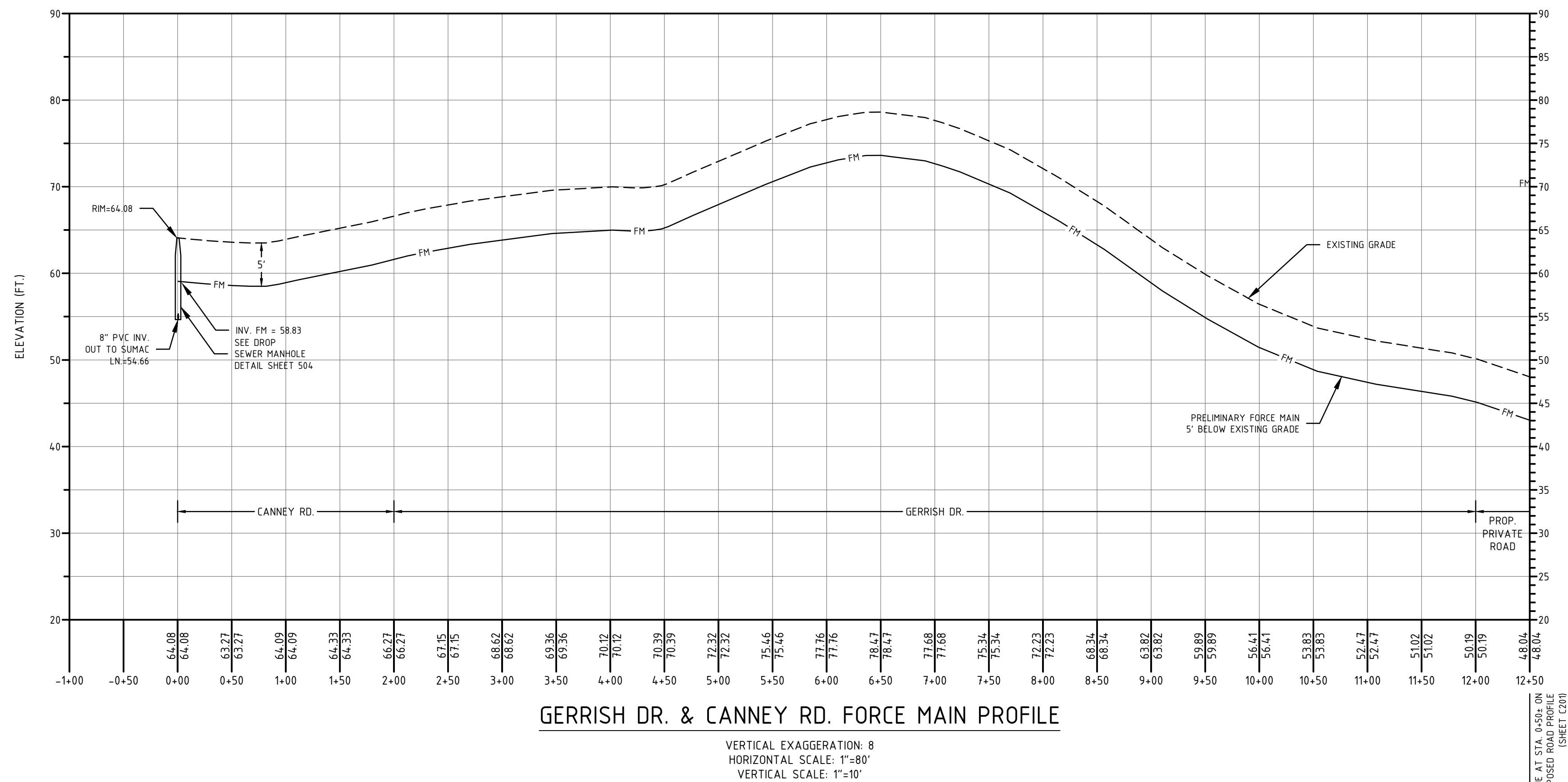
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 ENGIN'D BY: MCS DRAWN BY: MCS
 CHECK'D BY: MCS ARCHIVE #: H-____

C202

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 DATE _____



- NOTES:
1. THE PURPOSE OF THIS DRAWING IS TO SHOW THE APPROXIMATE EXISTING ELEVATIONS ALONG A CONCEPTUAL FORCE MAIN FOR EVALUATION PURPOSES ONLY.
 2. VERTICAL DATA IS TAKEN FROM LIDAR DATA COLLECTED IN 2011 AND ACCESSED FROM GRANITNH.

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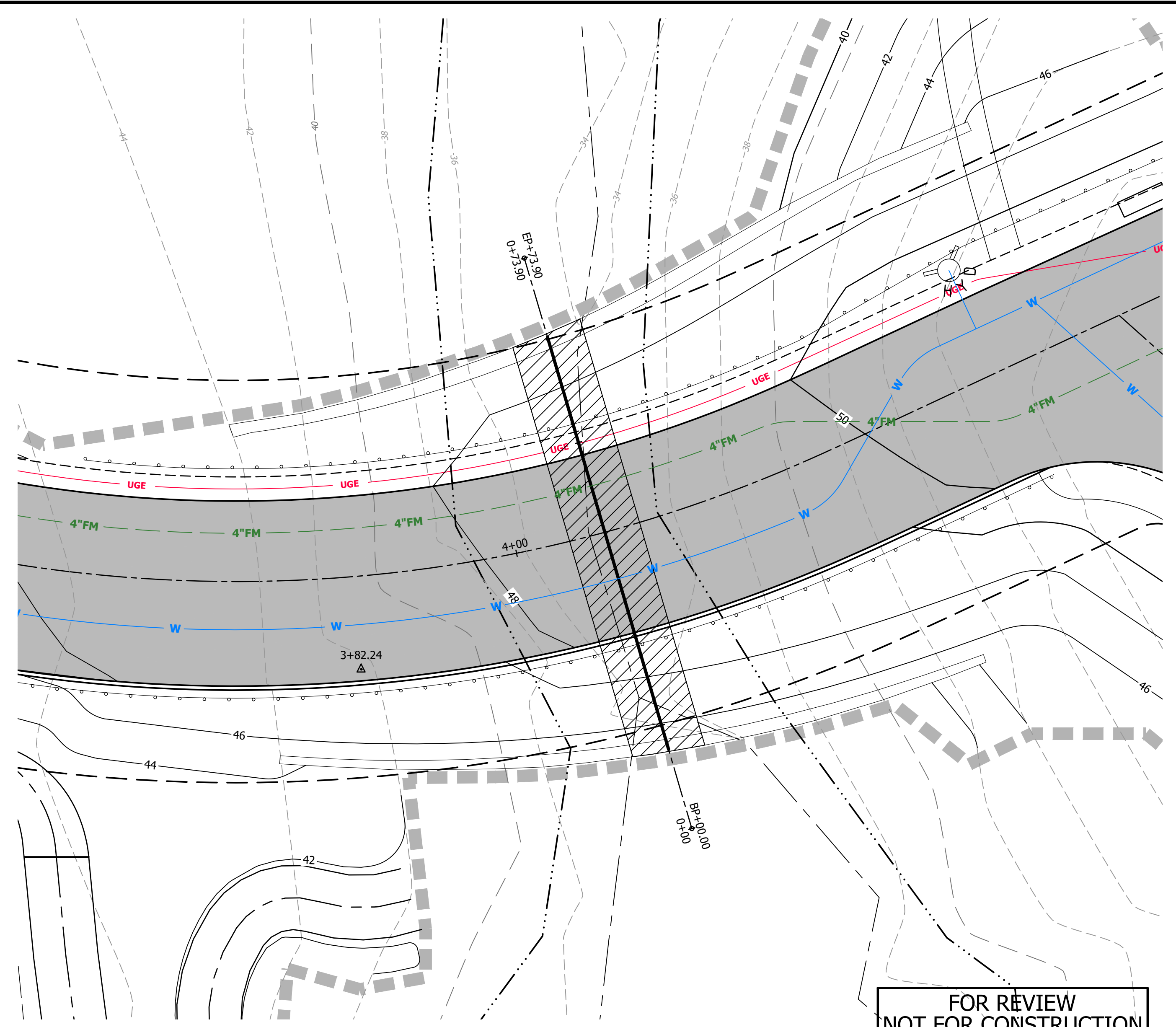
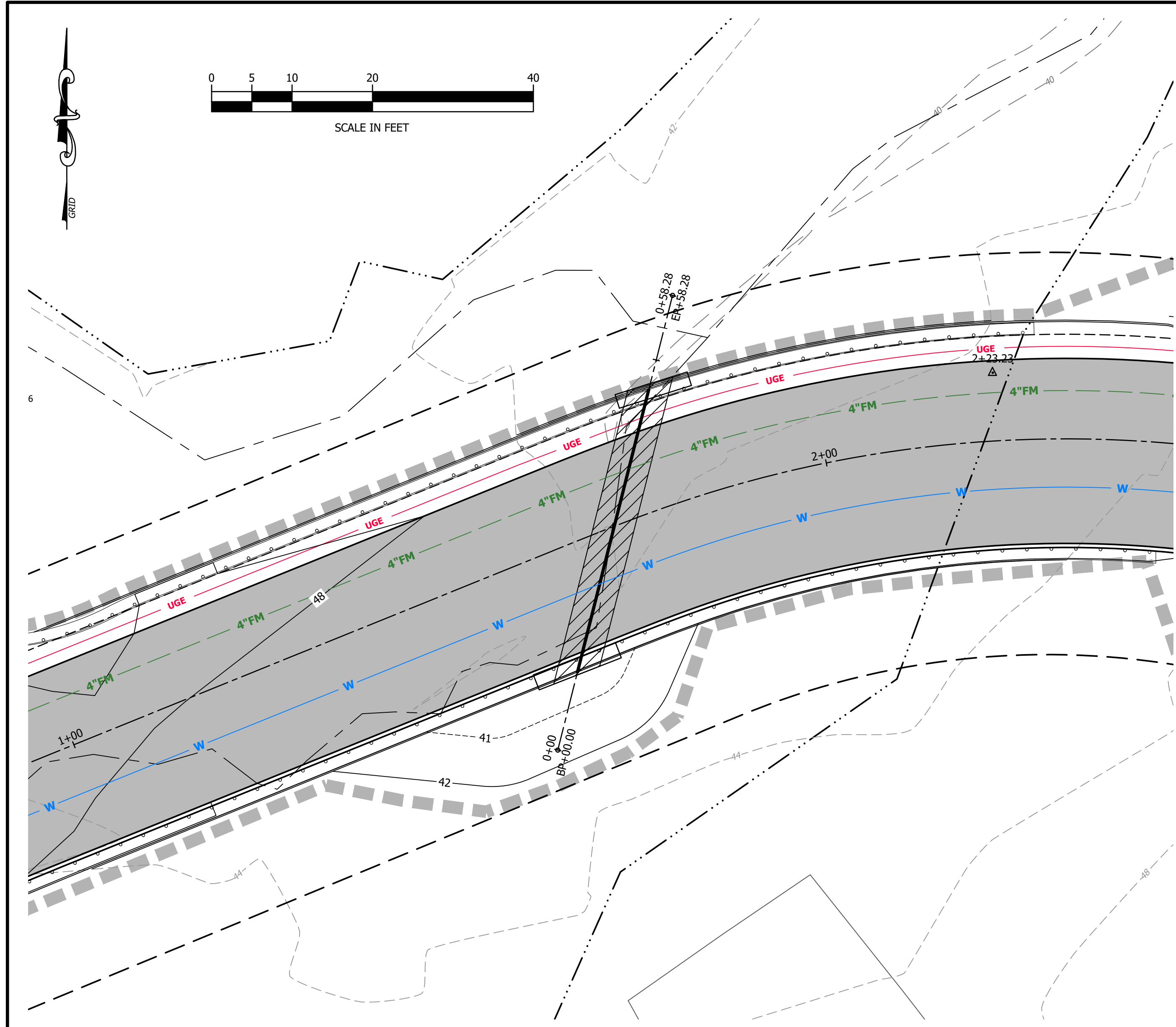
**GERRISH DRIVE PROFILE
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN**
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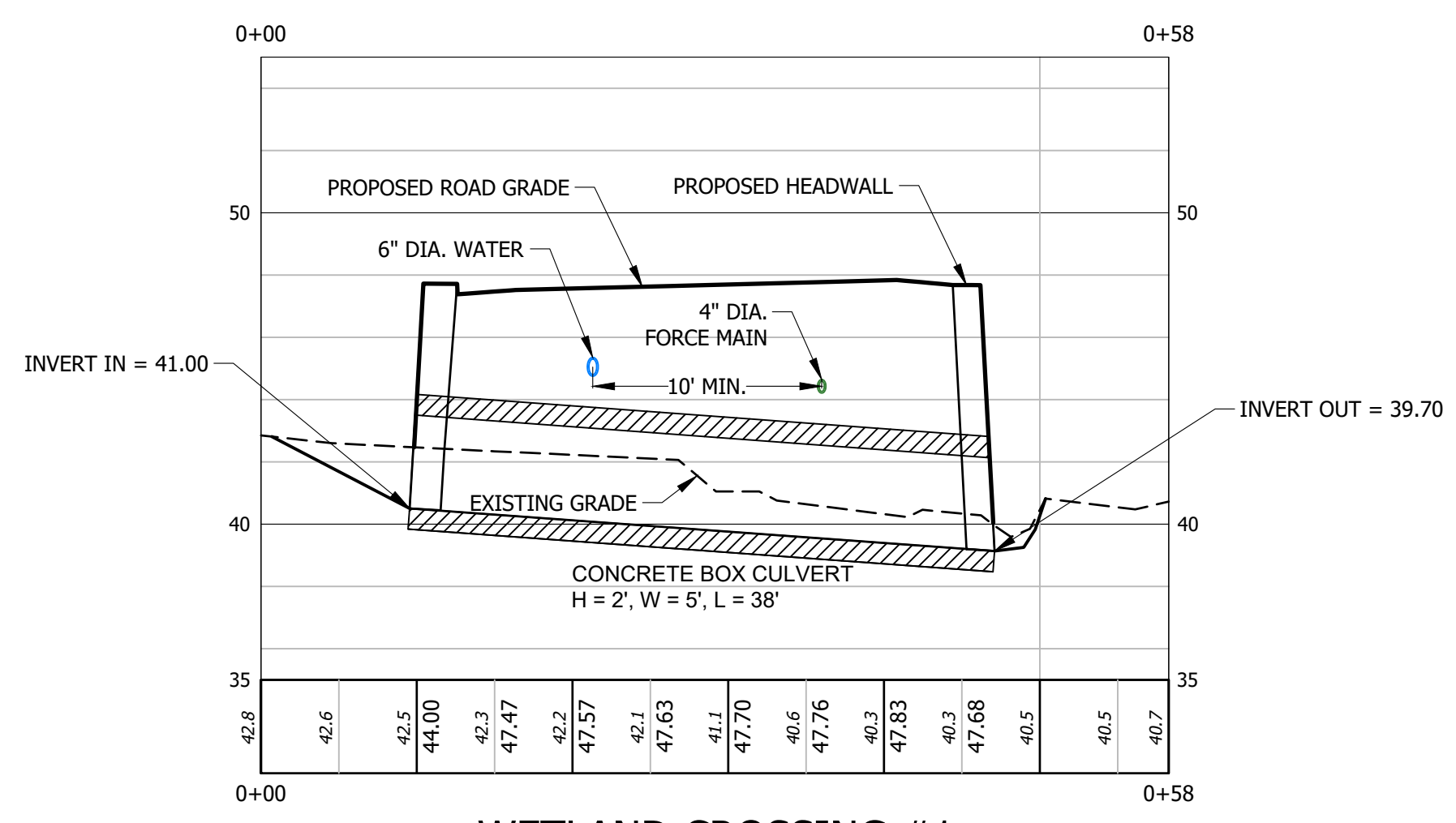
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C203



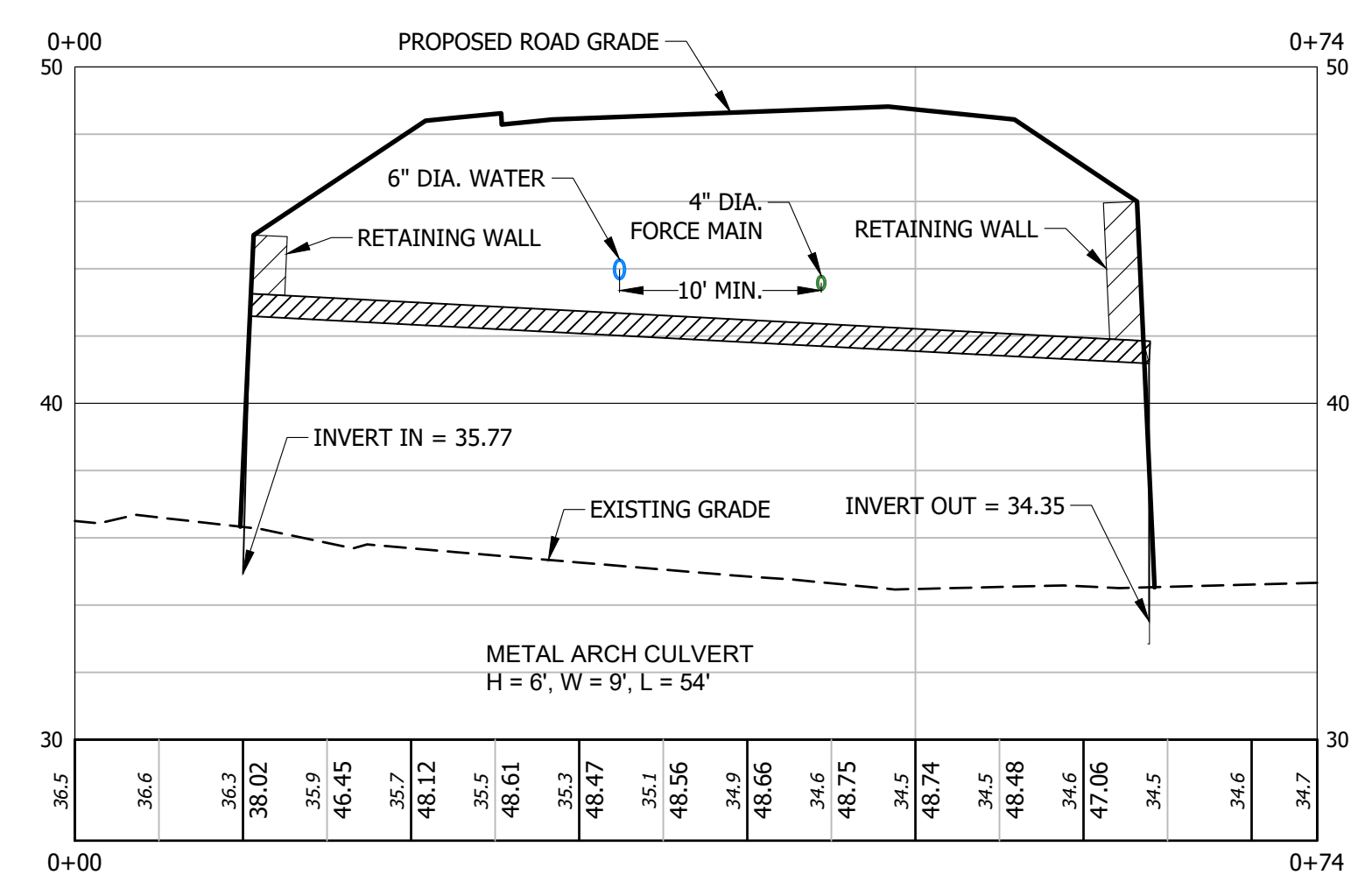
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WETLAND CROSSING #1
STA: 0+00 to STA: 0+58

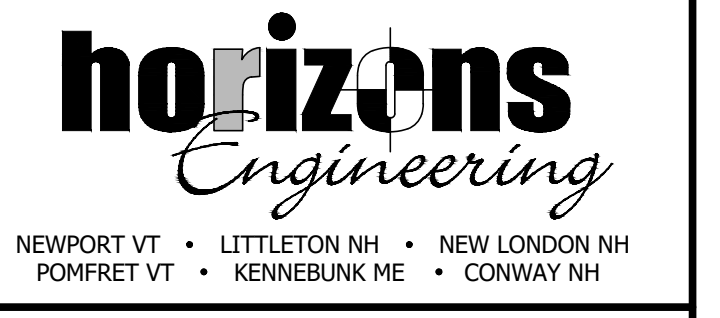
NOTE:
SEWER FORCE MAIN AND WATER
MAIN TO BE INSULATED ACROSS
CULVERT (SEE DETAIL)

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WETLAND CROSSING #2
STA: 0+00 to STA: 0+74

NOTE:
SEWER FORCE MAIN AND WATER
MAIN TO BE INSULATED ACROSS
CULVERT (SEE DETAIL)



NEWPORT VT • LITTLETON NH • NEW LONDON NH
POMFRET VT • KENNEBUNK ME • CONWAY NH

WETLAND CROSSING SECTIONS
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
91 BAGDAD RD
DURHAM NH 03824

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C301

CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES:

AREA OF DISTURBANCE/STABILIZATION

- A. THE SMALLEST PRACTICAL AREA SHALL BE DISTURBED DURING CONSTRUCTION, BUT IN NO CASE SHALL THE AREA OF UNSTABILIZED SOIL EXCEED 5 ACRES AT ANY ONE TIME BEFORE THE AREA IS STABILIZED.
- B. AN AREA SHALL BE CONSIDERED STABLE IF ONE OF THE FOLLOWING HAS OCCURRED:
 - 1. IN AREAS TO BE PAVED, BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, ITEM NO. 304.1 OR 304.2 HAVE BEEN INSTALLED;
 - 2. IN AREAS NOT TO BE PAVED:
 - 2.A. A MINIMUM OF 85% VEGETATED GROWTH HAS BEEN ESTABLISHED;
 - 2.B. A MINIMUM OF 3" OF NON-EROSIVE MATERIAL SUCH AS STONE OR RIPRAP HAS BEEN INSTALLED;
 - 2.C. EROSION CONTROL BLANKETS HAVE BEEN INSTALLED IN ACCORDANCE WITH ENV-WQ 1506.03.
- C. DISTURBED AREAS SHALL BE TEMPORARILY STABILIZED WITHIN 45 DAYS AND PERMANENTLY STABILIZED NO LATER THAN 3 DAYS AFTER FINAL GRADING.

EROSION CONTROL PRACTICES:

- A. INSTALLATION:
 - 1. INSTALL ALL EROSION CONTROLS AS SHOWN ON THE GRADING PLAN, TYPICAL DETAILS, AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE.
- B. INSPECTION:
 - 1. INSPECT ALL EROSION CONTROLS WEEKLY AND AFTER EVERY RAIN EVENT OF 0.5 INCHES OR GREATER UNLESS OTHERWISE NOTED.
 - 2. TEMPORARY STABILIZATION PRACTICES SHALL BE INSPECTED ONCE PER WEEK DURING CONSTRUCTION UNTIL EXPOSED SURFACES ARE STABILIZED.
 - 3. ANY SIGNS OF RILL OR GULLY EROSION SHALL BE IMMEDIATELY REPAIRED.
- C. MAINTENANCE:
 - 1. MAINTAIN EROSION CONTROLS PER THE TYPICAL DETAILS AND IN CONFORMANCE WITH THE EROSION AND SEDIMENT CONTROL NOTES ON THIS PAGE.
- D. REMOVAL:
 - 1. ALL TEMPORARY EROSION CONTROL MEASURES SHALL BE REMOVED ONCE 85% VEGETATIVE COVER HAS BEEN ESTABLISHED.
 - 2. AFTER REMOVAL, ALL DISTURBED AREAS SHALL BE REGRADED, FERTILIZED, AND RESEEDED. MONITOR TO ENSURE VEGETATIVE GROWTH IS ESTABLISHED AND REPAIR AS NEEDED UNTIL MINIMUM OF 85% VEGETATIVE COVER IS ESTABLISHED.

COLD WEATHER SITE STABILIZATION

- A. TO ADEQUATELY PROTECT WATER QUALITY DURING COLD WEATHER AND DURING SPRING RUNOFF, THE ADDITIONAL STABILIZATION TECHNIQUES SPECIFIED IN THIS SECTION SHALL BE EMPLOYED DURING THE PERIOD FROM OCTOBER 15 THROUGH MAY 1.
- B. SUBJECT TO (C), BELOW, THE AREA OF EXPOSED, UNSTABILIZED SOIL SHALL BE:
 - 1. LIMITED TO ONE ACRE; AND
 - 2. PROTECTED AGAINST EROSION BY THE METHODS DESCRIBED IN THIS SECTION PRIOR TO ANY THAW OR SPRING MELT EVENT.
- C. THE ALLOWABLE AREA OF EXPOSED SOIL MAY BE INCREASED IF A WINTER CONSTRUCTION PLAN IS DEVELOPED BY A QUALIFIED ENGINEER OR A CPESC SPECIALIST AND SUBMITTED TO THE DEPARTMENT FOR APPROVAL AS A REQUEST TO WAIVE THE ONE-ACRE LIMIT.
- D. SUBJECT TO (F) AND (G), BELOW, ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF LESS THAN 15% THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH 3 TO 4 TONS OF HAY OR STRAW MULCH PER ACRE SECURED WITH ANCHORED NETTING OR TACKIFIER OR WITH AT LEAST 2 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(B).
- E. SUBJECT TO (F) AND (G), BELOW, ALL PROPOSED VEGETATED AREAS HAVING A SLOPE OF 15% OR GREATER THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE SEEDED AND COVERED WITH A PROPERLY INSTALLED AND ANCHORED EROSION CONTROL BLANKET OR WITH AT LEAST 4 INCHES OF EROSION CONTROL MIX MEETING THE CRITERIA OF ENV-WQ 1506.05(B).
- F. ANCHORED HAY MULCH OR EROSION CONTROL MIX THAT MEETS THE CRITERIA OF ENV-WQ 1506.05(B) SHALL NOT BE INSTALLED OVER SNOW GREATER THAN ONE INCH IN DEPTH. EROSION CONTROL BLANKETS SHALL NOT BE INSTALLED OVER SNOW GREATER THAN ONE INCH IN DEPTH OR ON FROZEN GROUND.
- H. ALL PROPOSED STABILIZATION IN ACCORDANCE WITH (D) OR (E), ABOVE, SHALL BE COMPLETED WITHIN A DAY OF ESTABLISHING THE GRADE THAT IS FINAL OR THAT OTHERWISE WILL EXIST FOR MORE THAN 5 DAYS.
- I. ALL DITCHES OR SWALES THAT DO NOT EXHIBIT A MINIMUM OF 85% VEGETATIVE GROWTH BY OCTOBER 15, OR THAT ARE DISTURBED AFTER OCTOBER 15, SHALL BE STABILIZED TEMPORARILY WITH STONE OR EROSION CONTROL BLANKETS APPROPRIATE FOR THE DESIGN FLOW CONDITIONS, AS DETERMINED BY THE OWNER'S ENGINEERING CONSULTANT.
- J. AFTER OCTOBER 15, INCOMPLETE ROAD OR PARKING AREAS WHERE ACTIVE CONSTRUCTION OF THE ROAD OR PARKING AREA HAS STOPPED FOR THE WINTER SEASON SHALL BE PROTECTED WITH A MINIMUM 3-INCH LAYER OF BASE COURSE GRAVELS MEETING THE GRADATION REQUIREMENTS OF NHDOT STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, 2016, TABLE 304-1, ITEM NO. 304.1, 304.2, OR 304.3, AVAILABLE AS NOTED IN APPENDIX B.

TEMPORARY VEGETATION

- A. SITE PREPARATION
 - 1. INSTALL EROSION AND SEDIMENT CONTROL MEASURES AS SPECIFIED ABOVE.
 - 2. ENSURE RUNOFF IS DIVERTED FROM SEEDED AREA.
 - 3. ON SLOPES OF 4:1 OR STEEPER, CREATE HORIZONTAL GROOVES PERPENDICULAR TO THE DIRECTION OF THE SLOPE TO CATCH SEED AND REDUCE RUNOFF.
- B. SEED BED PREPARATION
 - 1. REMOVE STONES AND TRASH FROM AREA TO BE SEED.
 - 2. COMPACTED SOIL SHALL BE LOOSENEED TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME, AND SEED.
 - 3. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
- C. SEEDING
 - 1. SEED PER THE FOLLOWING RECOMMENDATIONS

SEASON	APPLICATION DATE	MIXTURE TYPE	QUANTITY (lb./Ac.)
EARLY SPRING	NO LATER THAN 5/15	OATS	80
LATE SPRING/ FALL	4/1 TO 6/1 & 8/15 TO 9/15	PERENNIAL RYE	30
EARLY SPRING/ FALL	4/1 TO 5/15 & 8/15 TO 9/15	ANNUAL RYE	40
FALL	8/15 TO 9/15	WINTER RYE	112

 - 2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
 - 3. TEMPORARY SEEDING SHALL OCCUR PRIOR TO SEPTEMBER 15TH IN THE YEAR IN WHICH THE AREA BEING SEEDING WAS DISTURBED.
 - 4. AREAS SEEDING BETWEEN MAY 15TH AND AUGUST 15TH SHALL BE COVERED WITH HAY OR STRAW MULCH MEETING THE FOLLOWING CRITERIA:
 - 4.A. HAY AND STRAW MULCHES SHALL BE ANCHORED WITH MULCH NETTING OR TACKIFIER SO THAT THEY ARE NOT BLOWN AWAY BY WIND OR WASHED AWAY BY FLOWING WATER;
 - 4.B. MULCH MATERIALS SHALL BE SELECTED BASED UPON SOILS, SLOPE, FLOW CONDITIONS, AND TIME OF YEAR;
 - 4.C. HAY OR STRAW MULCH SHALL BE APPLIED AT A RATE OF 1.5 TO 2 TONS PER ACRE, EQUIVALENT TO 70 TO 90 POUNDS PER 1,000 SQUARE FEET;
 - 4.D. IF VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA IS NOT ACHIEVED PRIOR TO OCTOBER 15TH, ONE OR MORE ADDITIONAL EROSION CONTROL METHODS SHALL BE IMPLEMENTED.
- D. MAINTENANCE
 - 1. TEMPORARY SEEDING SHOULD BE INSPECTED WEEKLY AND AFTER ANY RAINFALL EXCEEDING 1/2 INCH IN 24 HOURS ON ACTIVE CONSTRUCTION SITES. TEMPORARY SEEDING SHOULD ALSO BE INSPECTED JUST PRIOR TO SEPTEMBER 15, TO ASCERTAIN WHETHER ADDITIONAL SEEDING IS REQUIRED TO PROVIDE STABILIZATION OVER THE WINTER PERIOD.
 - 2. BASED ON INSPECTION, AREAS SHOULD BE RESEEDED TO ACHIEVE FULL STABILIZATION OF EXPOSED SOILS. IF IT IS TOO LATE IN THE PLANTING SEASON TO APPLY ADDITIONAL SEED, THEN OTHER TEMPORARY STABILIZATION MEASURES SHOULD BE IMPLEMENTED.
 - 3. AT A MINIMUM, 85% OF THE SOIL SURFACE SHOULD BE COVERED BY VEGETATION.
 - 4. IF ANY EVIDENCE OF EROSION OR SEDIMENTATION IS APPARENT, REPAIRS SHOULD BE MADE AND AREAS SHOULD BE RESEEDED, WITH OTHER TEMPORARY MEASURES (E.G., MULCH) USED TO PROVIDE EROSION PROTECTION DURING THE PERIOD OF VEGETATION ESTABLISHMENT.

PERMANENT VEGETATION

- A. SITE PREPARATION
 - 1. REFER TO SITE PREPARATION FOR TEMPORARY SEEDING.
- B. SEED BED PREPARATION
 - 1. REFER TO SEED BED PREPARATION FOR TEMPORARY SEEDING IN CONJUNCTION WITH THESE NOTES.
 - 2. WORK LIME AND FERTILIZER INTO THE SOIL AS NEARLY AS PRACTICAL TO A DEPTH OF 4 INCHES WITH A DISC, SPRING TOOTH HARROW OR OTHER SUITABLE EQUIPMENT. THE FINAL HARROWING OPERATION SHOULD BE ON THE GENERAL CONTOUR. CONTINUE TILLAGE UNTIL A REASONABLY UNIFORM, FINE SEEDBED IS PREPARED. ALL BUT CLAY OR SILTY SOILS AND COARSE SANDS SHOULD BE ROLLED TO FIRM THE SEEDBED WHEREVER FEASIBLE.
 - 3. REMOVE FROM THE SURFACE ALL STONES 2 INCHES OR LARGER IN ANY DIMENSION. REMOVE ALL OTHER DEBRIS, SUCH AS WIRE, CABLE, TREE ROOTS, CONCRETE, CLODS, LUMPS, TRASH OR OTHER UNSUITABLE MATERIAL.
 - 4. INSPECT SEEDBED JUST BEFORE SEEDING. IF TRAFFIC HAS LEFT THE SOIL COMPACTED; THE AREA MUST BE TILLED AND FIRMED AS ABOVE.
 - 5. WHERE THE SOIL HAS BEEN COMPACTED BY CONSTRUCTION OPERATIONS, LOOSEN SOIL TO A DEPTH OF 2 INCHES BEFORE APPLYING FERTILIZER, LIME AND SEED.
 - 6. APPLY FERTILIZER AT A RATE OF 600 LBS PER ACRE OF 10-10-10. APPLY LIMESTONE (EQUIVALENT TO 50 PERCENT CALCIUM PLUS MAGNESIUM OXIDE) AT A RATE OF 3 TONS PER ACRE.
- C. SEEDING
 - 1. UNLESS OTHERWISE NOTED, GRASS SEED MIXTURE 'C' SHALL BE APPLIED AT THE SPECIFIED RATE AS NOTED IN THE 'SEED MIXTURES FOR PERMANENT VEGETATION' TABLE.
 - 2. APPLY SEED UNIFORMLY BY HAND, CYCLONE SEEDER, DRILL, CULTPACKER TYPE SEEDER OR HYDROSEEDER (SLURRY INCLUDING SEED AND FERTILIZER). NORMAL SEEDING DEPTH IS FROM 1/4 TO 1/2 INCH. HYDROSEEDING THAT INCLUDES MULCH MAY BE LEFT ON SOIL SURFACE.
 - 3. WHERE FEASIBLE, EXCEPT WHERE EITHER A CULTPACKER TYPE SEEDER OR HYDROSEEDER IS USED, THE SEEDBED SHOULD BE FIRMED FOLLOWING SEEDING OPERATIONS WITH A ROLLER, OR LIGHT DRAG.
 - 4. WHEN HYDROSEEDING (HYDRAULIC APPLICATION), PREPARE THE SEEDBED AS SPECIFIED ABOVE OR BY HAND RAKING TO LOOSEN AND SMOOTH THE SOIL AND TO REMOVE SURFACE STONES LARGER THAN 2 INCHES IN DIAMETER.
 - 5. SLOPES MUST BE NO STEEPER THAN 2 TO 1.
 - 6. WHEN HYDROSEEDING, LIME AND FERTILIZER MAY BE APPLIED SIMULTANEOUSLY WITH THE SEED. THE USE OF FIBER MULCH ON CRITICAL AREAS IS NOT RECOMMENDED (UNLESS IT IS USED TO HOLD STRAW OR HAY). BETTER PROTECTION IS GAINED BY USING STRAW MULCH AND HOLDING IT WITH ADHESIVE MATERIALS OR 500 POUNDS PER ACRE OF WOOD FIBER MULCH.
 - 7. SEEDING RATES MUST BE INCREASED 10% WHEN HYDROSEEDING.
 - 8. TEMPORARY SEEDING SHALL OCCUR PRIOR TO SEPTEMBER 15TH IN THE YEAR IN WHICH THE AREA BEING SEEDING WAS DISTURBED.
 - 9. AREAS SEEDING BETWEEN MAY 15TH AND AUGUST 15TH SHALL BE COVERED WITH HAY OR STRAW MULCH MEETING THE FOLLOWING CRITERIA:
 - 9.A. HAY AND STRAW MULCHES SHALL BE ANCHORED WITH MULCH NETTING OR TACKIFIER SO THAT THEY ARE NOT BLOWN AWAY BY WIND OR WASHED AWAY BY FLOWING WATER;
 - 9.A. MULCH MATERIALS SHALL BE SELECTED BASED UPON SOILS, SLOPE, FLOW CONDITIONS, AND TIME OF YEAR;
 - 9.B. HAY OR STRAW MULCH SHALL BE APPLIED AT A RATE OF 1.5 TO 2 TONS PER ACRE, EQUIVALENT TO 70 TO 90 POUNDS PER 1,000 SQUARE FEET;
 - 9.C. HAY OR STRAW MULCH SHALL BE APPLIED AT A RATE OF 1.5 TO 2 TONS PER ACRE, EQUIVALENT TO 70 TO 90 POUNDS PER 1,000 SQUARE FEET;
 - 10. IF VEGETATED GROWTH COVERING AT LEAST 85% OF THE DISTURBED AREA IS NOT ACHIEVED PRIOR TO OCTOBER 15TH, ONE OR MORE ADDITIONAL EROSION CONTROL METHODS SHALL BE IMPLEMENTED.
- D. MAINTENANCE
 - 1. PERMANENTLY SEEDING AREAS SHOULD BE INSPECTED MONTHLY.
 - 2. MOW SEEDING AREAS AS NECESSARY.
 - 3. BASED ON INSPECTION, AREAS SHOULD BE REPAIRED AND/OR RESEEDING TO ENSURE 85% OF THE SOIL SURFACE IS COVERED BY VEGETATION.

MULCHING & EROSION CONTROL MATTING

- A. GENERAL
 - 1. APPLY PRIOR TO A STORM EVENT. CLOSELY MONITOR THE WEATHER TO HAVE ADEQUATE WARNING OF SIGNIFICANT STORMS.
 - 2. MULCHING WITHIN A SPECIFIED TIME PERIOD FROM ORIGINAL SOIL EXPOSURE
 - 2.A. WITHIN 100 FEET OF WETLANDS THE TIME PERIOD SHOULD BE NO GREATER THAN 7 DAYS.
 - 2.B. IN OTHER AREAS IT SHALL BE NO GREATER THAN 14 DAYS.
 - 3. MULCH MATERIALS SHALL BE SELECTED BASED UPON SOILS, FLOW CONDITIONS, AND TIME OF YEAR.
 - B. TEMPORARY MULCHING
 - 1. HAY OR STRAW MULCHES
 - 1.A. ORGANIC MULCHES INCLUDING HAY AND STRAW SHALL BE AIR-DRIED, FREE OF UNDESIRABLE SEEDS AND COARSE MATERIALS.
 - 1.B. APPLICATION RATE SHALL BE 2 BALES/1,000 SF (70-90 POUNDS) OR 1.5-2.0 TONS/ACRE TO COVER 75-90% OF THE GROUND.
 - 1.C. ANCHORING SHALL BE ONE OF THE FOLLOWING:
 - 1.C.1. NETTING SHALL BE JUTE, WOOD FIBER, OR BIODEGRADABLE PLASTIC NETTING INSTALLED PER MANUFACTURER'S SPECIFICATIONS.
 - 1.C.2. TACKIFIER: APPLY POLYMER OR ORGANIC TACKIFIER TO ANCHOR HAY OR STRAW MULCH. APPLY PER MANUFACTURER'S SPECIFICATIONS. TYPICAL APPLICATION RATES ARE 40-60 LBS/ACRE FOR POLYMER MATERIAL AND 80-120 LBS/ACRE FOR ORGANIC LIQUID.
 - 1.D. WINTER APPLICATION: APPLY TO A DEPTH OF 4 INCHES OR DOUBLE THE ABOVE LISTED APPLICATION RATE. NOTE THAT IF SEEDING IS NECESSARY, MULCH WILL NEED TO BE REMOVED AND THE AREA SEEDING AND MULCHED IN THE SPRING.
 - 1.E. MAINTENANCE
 - 1.E.1. INSPECT PERIODICALLY AND AFTER RAIN STORMS FOR RILLS OR DISPLACEMENT OF MULCH. REPAIR AS NECESSARY. CONTINUE INSPECTIONS UNTIL 85% VEGETATIVE COVER IS ESTABLISHED.
 - 2. EROSION CONTROL BLANKET OR MATTING
 - 2.A. REFER TO PLANS FOR TYPICAL EROSION CONTROL MATTING DETAIL. INSTALL PER MANUFACTURER'S SPECIFICATIONS.
 - 2.B. APPLICATION AND TIMING
 - 2.B.1. DURING THE GROWING SEASON (APRIL 15 - SEPTEMBER 15) USE ON THE BASE OF GRASSED WATERWAYS, STEEP SLOPES (15% OR GREATER), ANY DISTURBED SOIL WITHIN 100 FEET OF LAKES, STREAMS, AND WETLANDS.
 - 2.B.2. DURING THE LATE FALL AND WINTER (SEPTEMBER 15 - APRIL 15) IN ADDITION TO THOSE LISTED ABOVE USE ON SIDE SLOPES OF GRASSED WATERWAYS AND MODERATE SLOPES (GREATER THAN 8%).
 - 3. MAINTENANCE
 - 3.A. INSPECT PERIODICALLY AND BEFORE AND AFTER STORM EVENTS TO ENSURE CONTACT WITH THE SOIL UNTIL 85% VEGETATIVE COVER IS ESTABLISHED. REPAIR AND RESTAPLE AS NECESSARY.
- C. PERMANENT MULCHING
 - 1. WOOD CHIPS OR GROUND BARK
 - 1.A. APPLY TO A THICKNESS OF 2 TO 6 INCHES. APPLICATION RATES ARE 10-20 TONS/ACRE OR 460-920 POUNDS/1,000 SF.
 - 1.B. MAINTENANCE: INSPECT ANNUALLY AND AFTER RAIN EVENTS OF 2.5 INCHES OR MORE IN A 24 HOUR PERIOD. REPAIR/REPLACE AS NECESSARY.
 - 2. EROSION CONTROL MIX
 - 2.A. SHALL BE PLACED AT A THICKNESS OF 2 INCHES OR MORE FOR MULCHING.
 - 2.B. COMPOSITION OF THE MIX SHALL BE AS FOLLOWS:
 - 2.B.1. ORGANIC MATTER CONTENT SHALL BE BETWEEN 25-65% DRY WEIGHT BASIS.
 - 2.B.2. PARTICLE SIZE BY WEIGHT SHOULD BE 100% PASSING THE 3" SCREEN, 90-100% PASSING THE 1" SCREEN, 70-100% PASSING THE 0.75 INCH SCREEN, AND 30-75% PASSING THE 0.25 INCH SCREEN.
 - 2.B.3. THE ORGANIC PORTION SHALL BE ELONGATED AND FIBROUS SUCH AS FROM SHREDDED BARK, STUMP GRINDINGS, COMPOSTED BARK, OR EQUIVALENT MANUFACTURED PRODUCTS. IT SHALL NOT CONTAIN WOOD AND BARK GROUND CONSTRUCTION DEBRIS OR REPROCESSED WOOD PRODUCTS.
 - 2.B.4. THE MIX SHALL NOT CONTAIN SILTS, CLAYS, OR FINE SANDS.
 - 2.B.5. SOLUBLE SALTS CONTENT SHALL BE < 4.0MMHOS/CM AND A pH OF 5.0-8.0.
 - 2.C. PLACEMENT OF BERM
 - 2.C.1. PLACE BERM ALONG A LEVEL CONTOUR. BERM MUST BE A MINIMUM OF 12" HIGH ON THE UPHILL SIDE AND 2 FEET WIDE. UPSLOPE AREA MUST HAVE A SLOPE OF LESS THAN 5%.
 - 2.C.2. MAINTENANCE: INSPECT PERIODICALLY AND AUGMENT AS NEEDED TO MAINTAIN INITIAL THICKNESS. REPLACE IF NO LONGER FUNCTIONING AS INTENDED.

SOIL STOCKPILES

- A. GENERAL
 - 1. STOCKPILES MUST BE LOCATED 50 FEET FROM DITCHES AND CULVERT INLETS.
- B. PROTECTION OF STOCKPILES
 - 1. PROTECT SOIL AND AGGREGATE STOCKPILES WITH TEMPORARY PERIMETER SEDIMENT BARRIER SUCH AS SILT FENCE OR SILT SOCK.
 - 2. COVER ACTIVE STOCKPILES WITH ANCHORED PROTECTIVE COVERING PRIOR TO EXPECTED STORM EVENTS.
 - 3. INACTIVE STOCKPILES SHALL BE COVERED WITH ANCHORED TARPS OR TEMPORARILY SEEDED AND MULCHED PER THE TEMPORARY VEGETATION AND MULCHING NOTES ON THIS PAGE.
 - 4. STOCKPILES THAT ARE A SOURCE OF DUST SHALL BE COVERED.

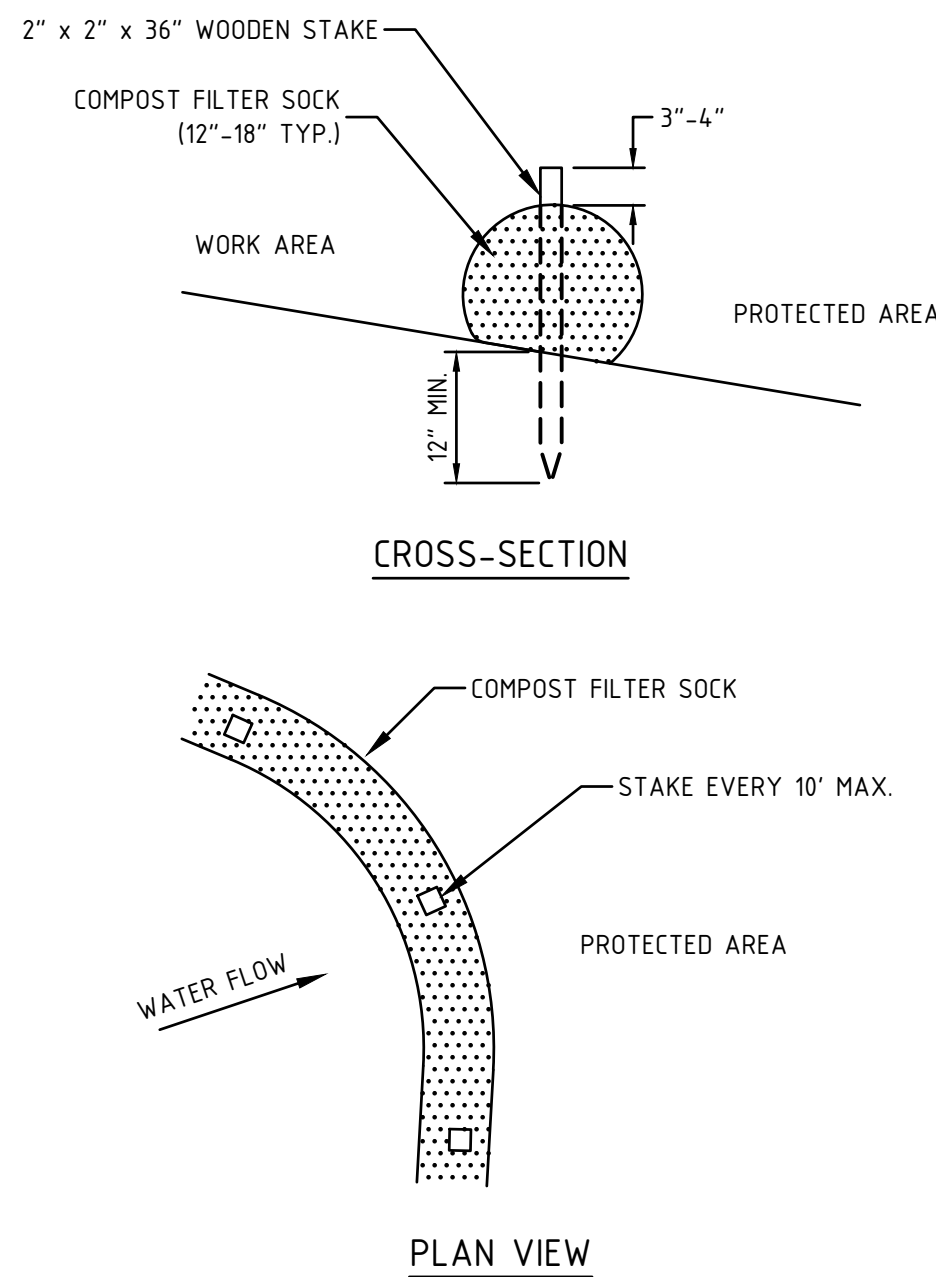
DUST CONTROL

- A. DUST SHALL BE CONTROLLED ON SITE DURING CONSTRUCTION BY IMPLEMENTING THE FOLLOWING DUST CONTROL MEASURES:
 - 1. MULCHING AND VEGETATIVE COVER TO REDUCE DUST.
 - 2. MECHANICAL SWEEPERS AND FINE WATER SPRAYS.
 - 3. COVER SURFACES WITH CRUSHED STONE OR COARSE GRAVEL.

SEED MIXTURE SELECTION BASED ON SOIL TYPE				
USE	SEEDING MIXTURE	SOIL DRAINAGE		
		DROUGHTY	WELL DRAINED	MODERATELY WELL DRAINED
STEEP CUTS AND FILLS, BORROW AND DISPOSAL AREAS	A	FAIR	GOOD	GOOD
	B	POOR	GOOD	FAIR
	C	POOR	GOOD	EXCELLENT
	D	FAIR	EXCELLENT	EXCELLENT
WATERWAYS, EMERGENCY SPILLWAYS, AND OTHER CHANNELS WITH FLOWING WATER.	A	GOOD	GOOD	GOOD
	C	GOOD	EXCELLENT	EXCELLENT
	F	GOOD	EXCELLENT	EXCELLENT
LIGHTLY USED PARKING LOTS, ODD AREAS, UNUSED LANDS, AND LOW INTENSITY USE RECREATION SITES.	A	GOOD	GOOD	GOOD
	B	GOOD	GOOD	FAIR
	C	GOOD	EXCELLENT	EXCELLENT
PLAY AREAS AND ATHLETIC FIELDS. (TOPSOIL IS ESSENTIAL FOR GOOD TURF.)	E	FAIR	EXCELLENT	EXCELLENT
	F	FAIR	EXCELLENT	EXCELLENT
	F	FAIR	EXCELLENT	EXCELLENT

NOTE: POORLY DRAINED SOILS ARE NOT DESIRABLE FOR USE AS PLAYING AREAS AND ATHLETIC FIELDS.

SEED MIXTURES FOR PERMANENT VEGETATION			
MIXTURE	SPECIES	POUNDS PER ACRE	POUNDS PER 1,000 SF
A	TALL FESCUE	20	0.45
	CREeping RED FESCUE	20	0.45
	REIDTOP	2	0.05
	TOTAL	42	0.95
B	TALL FESCUE	15	0.35
	CREeping RED FESCUE	15	0.35
	CROWN VETCH	15	0.35
	TOTAL	45	1.05
C	TALL FESCUE	20	0.45
	CREeping RED FESCUE	20	0.45
	BIRDFOOT TREFOIL	8	0.20
	TOTAL	48	1.10
D	TALL FESCUE	20	0.45
	FLATPEA	30	0.75
	TOTAL	50	1.20
	E	CREeping RED FESCUE	50
KENTUCKY BLUEGRASS		50	1.15
TOTAL		100	2.30
F		TALL FESCUE	150



- NOTES:
- 1. ALL COMPOST MATERIAL TO MEET MANUFACTURER'S SPECIFICATIONS.
 - 2. FILTER SOCKS SHOULD BE INSTALLED FOLLOWING EXISTING CONTOURS.

COMPOST FILTER SOCK DETAIL

NTS

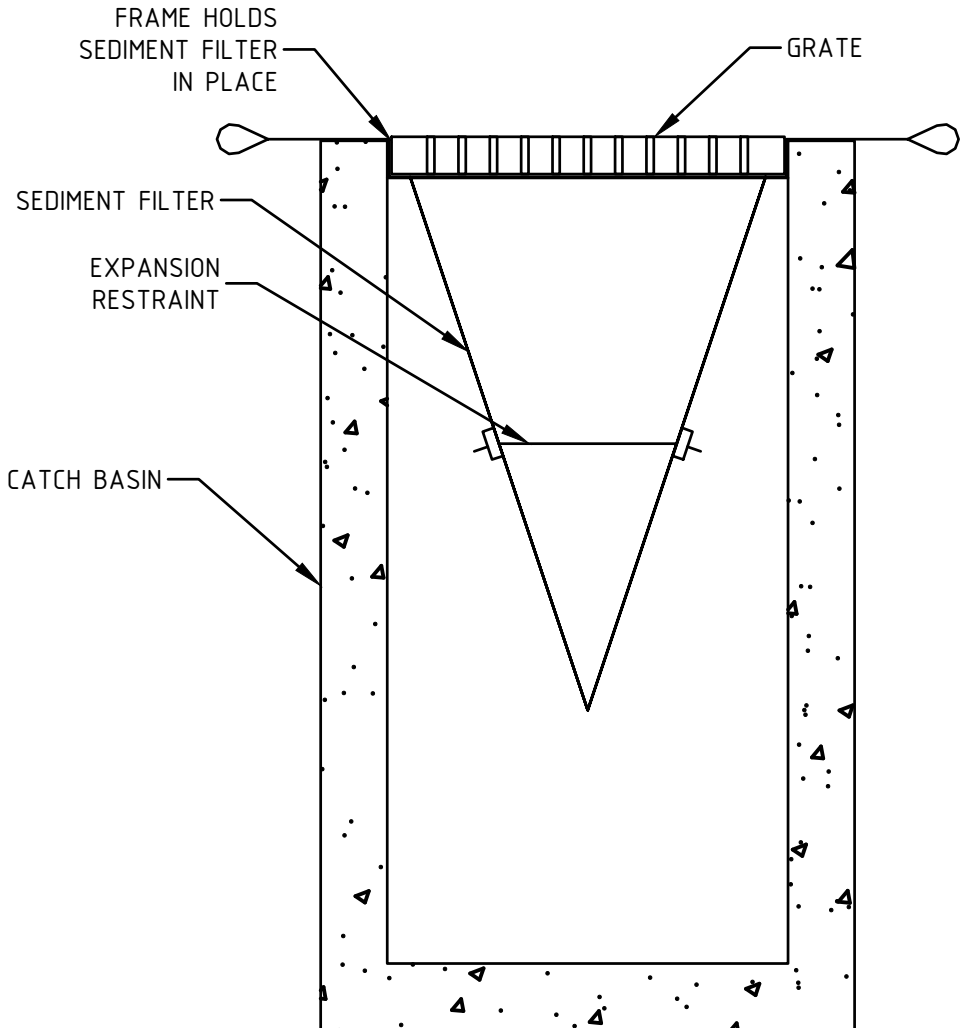
CONSTRUCTION SEQUENCING:

- 1. SCHEDULE A PRE-CONSTRUCTION MEETING WITH CITY OFFICIALS, OWNER, AND CONTRACTORS IF REQUIRED BY THE CONDITIONS OF APPROVAL PRIOR TO BEGINNING CONSTRUCTION.
- 2. CONTACT DIG-SAFE, INDIVIDUAL UTILITIES, AND CITY DEPARTMENTS TO GET ALL UTILITIES MARKED PRIOR TO START OF CONSTRUCTION.
- 3. INSTALL PERIMETER CONTROLS PRIOR TO ALL EARTHMOVING WORK.
- 4. CLEAR/GRUB ONLY WITHIN THE LIMITS OF GRADING AS SHOWN ON THE PLANS. REMOVE ORGANICS ONLY FROM THOSE AREAS THAT CAN BE WORKED AND STABILIZED WITHIN 45 DAYS OF REMOVAL.
- 5. THE PROJECT IS TO BE MANAGED IN A MANNER THAT MEETS THE REQUIREMENTS AND INTENT OF RSA 430:53 AND CHAPTER AGR 3800 RELATIVE TO INVASIVE SPECIES.
- 6. MAINTAIN ACCESS TO ALL OTHER PROPERTIES AT ALL TIMES UNLESS OTHER ARRANGEMENTS HAVE BEEN MADE PRIOR TO ANY CLOSURE.
- 7. CLEAR AND GRUB THE ROADWAY BEGINNING FROM THE EDGE OF GERRISH DR. AT STATION 0+00 AND PROCEED INTO THE SITE TO THE RAVINE. PREPARE TEMPORARY ACCESS ROAD FOR CONSTRUCTION PURPOSES.
 - A. STUMPS MAY BE DISPOSED ON-SITE IN ACCORDANCE WITH LOCAL AND STATE REGULATIONS.
- 8. STOCKPILES
 - A. STOCKPILE LOAM FOR RE-USE AS NEEDED.
 - B. TEMPORARILY STABILIZE LOAM STOCKPILES WITH:
 - 1. WINTER RYE GRASS- PRIOR TO SEPTEMBER 15TH
 - 2. MULCH- FROM SEPTEMBER 15TH TO MAY 1ST
- 9. CONSTRUCT AND STABILIZE ALL TEMPORARY AND PERMANENT SEDIMENT, EROSION, AND STORMWATER CONTROL FACILITIES AS LISTED ABOVE.
 - A. THESE SHALL BE INSTALLED BEFORE ANY MAJOR EARTH MOVING OPERATIONS.
 - B. RUNOFF MUST BE DIRECTED TO TEMPORARY PRACTICES UNTIL STORMWATER BMPs ARE STABILIZED. REFER TO SEDIMENT TRAP DETAIL.
 - C. STORMWATER PONDS, INFILTRATION BASINS, AND SWALES MUST BE STABILIZED PRIOR TO DIRECTING RUNOFF TO THEM.
 - D. REFER TO INDIVIDUAL DETAILS FOR CONSTRUCTION REQUIREMENTS.
- 10. ROAD CONSTRUCTION PHASE 1: BEGIN ROAD CONSTRUCTION AT STATION 0+00 AND PROCEED INTO SITE TO RAVINE CROSSING. COMPLETE ROAD CONSTRUCTION FROM 0+00 TO RAVINE CROSSING PRIOR TO BEGINNING PHASE 2 ROAD CONSTRUCTION PAST RAVINE.
 - A. CUTS AND FILLS:
 - 1. CONSTRUCT IN LOCATIONS AND TO GRADES AS SHOWN ON THE PLANS.
 - 2. FILLS:
 - A. PLACE MAXIMUM 12" LIFTS AND COMPACT TO 95% MAXIMUM DRY DENSITY.
 - B. ALL MATERIAL BASED ON PROCTOR TEST SHALL BE FREE OF DELETERIOUS MATERIALS SUCH AS LOAM, STUMPS, BRUSH, AND ROCKS LARGER THAN 3/4 THE DEPTH OF THE LIFT BEING PLACED.
 - 3. LOAM AND SEED SLOPES WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
 - B. DRAINAGE AND UTILITY STRUCTURES
 - 1. INSTALL AS SHOWN IN ACCORDANCE WITH DETAILS AND DRY STABILIZE.
 - C. BASE MATERIALS: BANK RUN AND CRUSHED GRAVEL SHALL BE PLACED IN 6" LIFTS AND COMPACTED TO 95% MAXIMUM DRY DENSITY TO THE DEPTHS SPECIFIED IN THE PARKING LOTS CROSS-SECTION DETAILS.
 - D. STABILIZE ALL MARKING AREAS WITHIN 72 HOURS OF ACHIEVING FINISHED GRADE.
- 11. INSPECT, MAINTAIN, AND IF NECESSARY, REPAIR ALL EROSION AND SEDIMENT CONTROL MEASURES AS STATED IN EROSION CONTROL NOTES ON THIS SHEET.
- 12. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES ONCE INITIAL GROWTH IS ESTABLISHED.

ADDITIONAL NOTES:

- 1. NO FUEL SHALL BE STORED ON SITE DURING CONSTRUCTION.
- 2. DURING CONSTRUCTION DUST SHALL BE PREVENTED FROM BECOMING A SAFETY OR HEALTH HAZARD BY THE IMPLEMENTATION OF ACCEPTED CONTROL METHODS SUCH AS WATERING.
- 3. ALL CONSTRUCTION MATERIALS THAT ARE SPILLED OR DEPOSITED ON THE PUBLIC ROADWAYS SHALL BE REMOVED BY THE CONTRACTOR.
- 4. DO NOT BEGIN CONSTRUCTION UNTIL ALL LOCAL, STATE, AND FEDERAL PERMITS HAVE BEEN APPLIED FOR AND RECEIVED.
- 5. THE GENERAL CONTRACTOR IS RESPONSIBLE TO VERIFY ALL DIMENSIONS, ELEVATIONS AND CONDITIONS AT THE SITE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE DESIGN ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE WORK.

FINAL APPROVAL BY DURHAM PLANNING BOARD.
 CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
 CERTIFIED _____
 DATE _____



- NOTES:
- 1. SEDIMENT FILTER TRAP SHALL BE ACF REGULAR FLOW SILTSACK OR APPROVED EQUAL.
 - 2. FILTERS SHALL BE INSPECTED AFTER EVERY RAIN EVENT OF 0.25" OR GREATER AND SEDIMENTS SHALL BE REMOVED FROM TRAP WHEN SEDIMENT HAS REACHED TWO THIRDS OF THE DEPTH OF THE TRAP, OR IF PONDING OF WATER AT SURFACE BEGINS TO OCCUR. DO NOT PUNCTURE FILTER TRAP TO MITIGATE PONDING.

CATCH BASIN SEDIMENT FILTER DETAIL

NTS

NEWPORT VT • LITTLETON NH • NEW LONDON NH
 POMFRET VT • KENNEBUNK ME • CONWAY NH

CONSTRUCTION DETAILS FOR
THE CROSSINGS SUBDIVISION
 MICHAEL & MARTHA MULHERN

91 BAGDAD RD
 DURHAM NH 03824

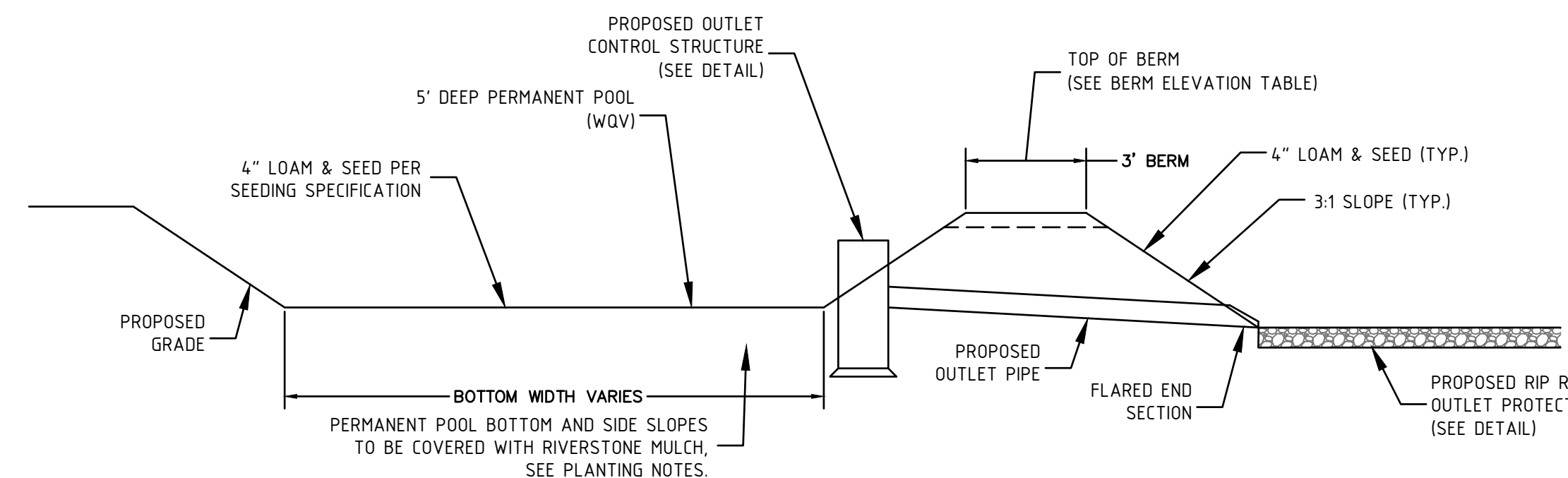
OF PROPERTY LOCATED AT
 91 BAGDAD ROAD
 DURHAM, STRAFFORD COUNTY, NH
 LAND OF: MICHAEL & MARTHA MULHERN

DEED BOOK 4095, PAGE 129
 TAX MAP 10 LOT 8-8

NO.	DATE	REVISION DESCRIPTION	ENG
2	2021-10-05	REVISED PER DPW COMMENTS	MJS
1	2021-09-15	REVISED PER TOWN COMMENTS	MJS

DATE: 2021-07-01	PROJECT #: NM19063
ENGINE'D BY: MJS	DRAWN BY: MJS
CHECK'D BY: MJS	ARCHIVE #: H-___

C501



CONSTRUCTION NOTES:

- DO NOT PLACE STORMWATER POND INTO SERVICE UNTIL THE BMP HAS BEEN SEEDDED AND STABILIZED. ALL CONTRIBUTING AREAS SHALL BE FULLY STABILIZED.
- CLEAR AND GRUB THE AREA WHERE THE STORMWATER POND IS TO BE LOCATED. STOCKPILE LOAM FOR REUSE LATER.
- THE FOUNDATION AREA SHALL BE SCARIFIED PRIOR TO PLACING FILL. ALL UNSUITABLE MATERIAL UNDER THE BERM SHALL BE REMOVED AND REPLACED WITH SUITABLE FOUNDATION MATERIAL.
- THE BERM SHALL BE CONSTRUCTED BEGINNING FROM THE LOWEST POINT UNIFORMLY ALONG ITS ENTIRE LENGTH. PLACE MATERIALS IN MAXIMUM 12" LOOSE LIFTS COMPACTED TO 95% MAXIMUM DRY DENSITY. EMBANKMENT SOIL SHALL HAVE NO ORGANIC MATTER OR FROZEN MATERIAL AND NO STONES LARGER THAN 2/3 OF THE MAXIMUM LOOSE LIFT THICKNESS. STONES AROUND ANY STRUCTURES AND/OR CONDUITS SHALL NOT EXCEED 3 INCHES. EMBANKMENT FILL MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

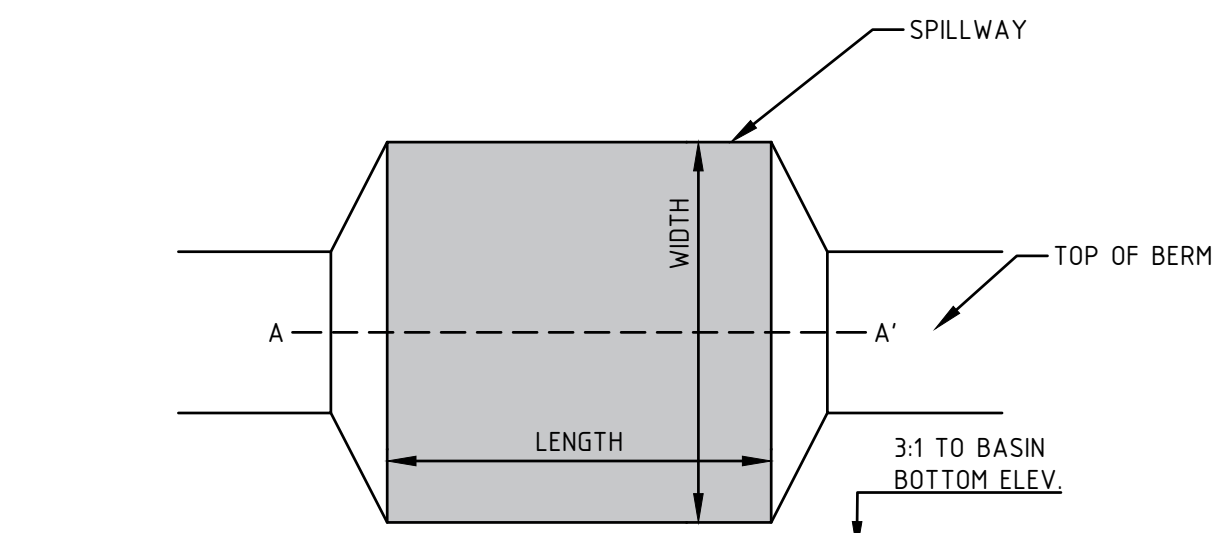
SIEVE SIZE:	% PASSING:
#4	80-90
#40	50-80
#100	30-45
#200	15-30

- ALL PIPE TO PIPE CONNECTIONS SHALL BE WATER-TIGHT.
 - ALL DISTURBED AREAS SHALL RECEIVE FOUR INCHES OF LOAM AND SEED PER THE CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES.
- PLANTING NOTES:**
- PERMANENT POOL BOTTOM AND SIDE SLOPES TO BE COVERED WITH 2" DEEP RIVERSTONE (1-1/2" TO 2" STONES).
 - POND BOTTOM**
POND BOTTOM EXCLUDING PERMANENT POOL TO BE SEEDDED WITH NEW ENGLAND EROSION CONTROL/RESTORATION MIX FOR DETENTION BASINS AND MOIST SITES (50 LBS./ACRE).
 - POND BERM AND SIDE SLOPES**
BERM AND SIDE SLOPES EXCLUDING PERMANENT POOL SHALL BE SEEDDED WITH NEW ENGLAND CONSERVATION/WILDLIFE MIX (30 LBS PER ACRE).

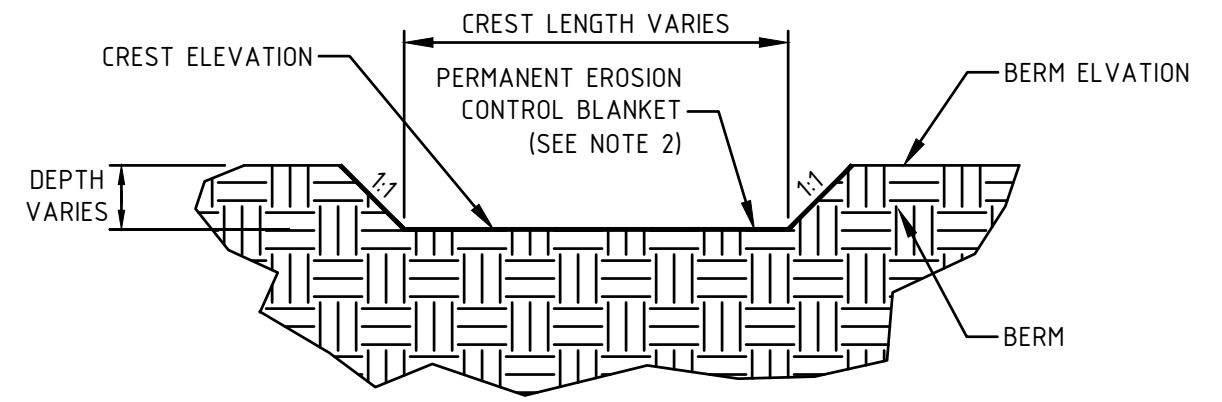
AVAILABLE FROM:
NEW ENGLAND WETLAND PLANTS, INC.
820 WEST STREET
AMHERST, MA 01002
(413)-548-8000

TYPICAL STORMWATER POND DETAIL
NTS

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
CERTIFIED _____
DATE _____



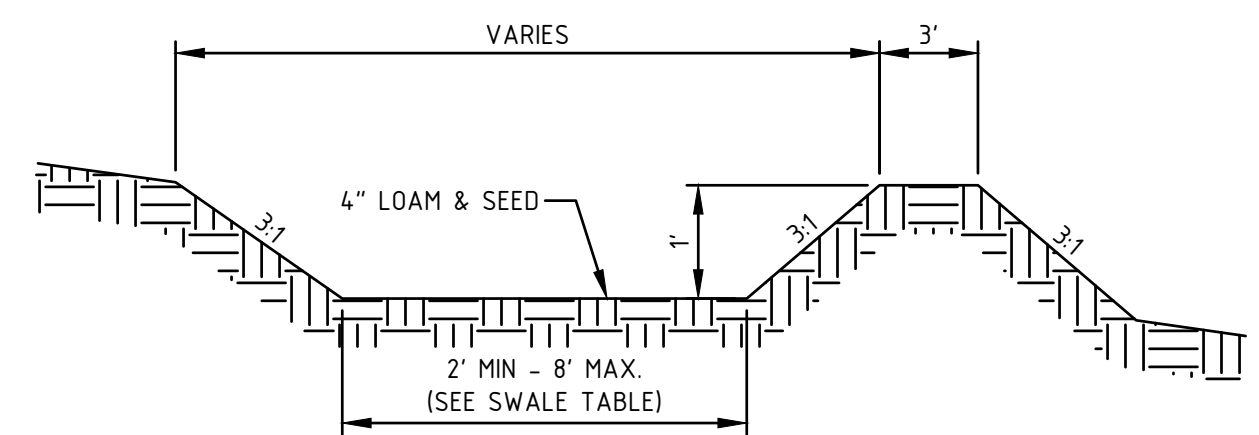
PLAN VIEW



CROSS-SECTION A-A'

- NOTES:**
- SPILLWAYS ARE LOCATED AT SEDIMENT FOREBAY OUTLETS, STORMWATER POND AND INFILTRATION BASIN.
 - PERMANENT EROSION CONTROL BLANKET SHOULD BE TENSAR P300 OR APPROVED EQUAL
 - INSTALL TURF REINFORCEMENT PER MANUFACTURER'S SPECIFICATIONS.

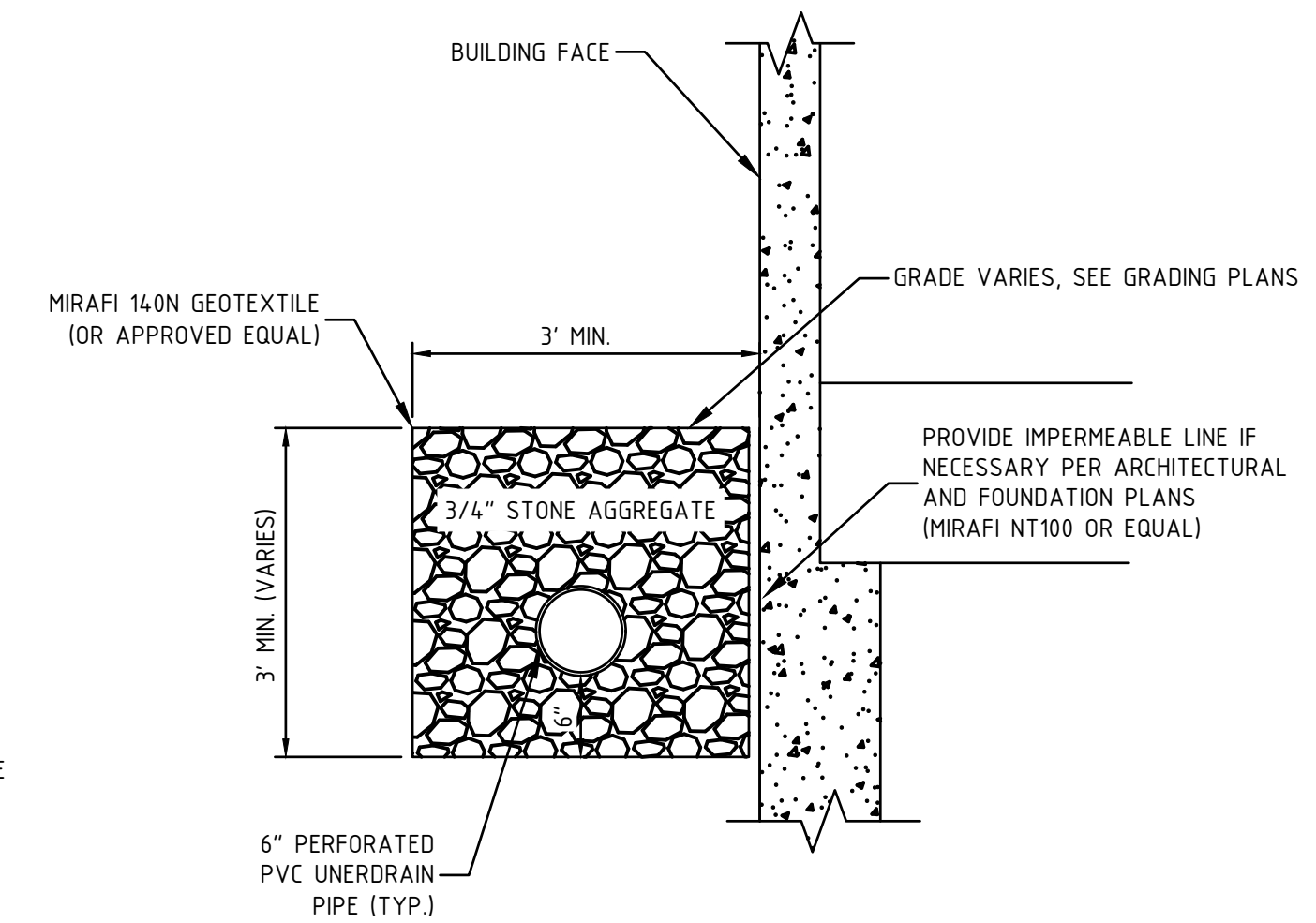
TYPICAL SPILLWAY DETAIL
NTS



- CONSTRUCTION NOTES:**
- REFER TO BERM CONSTRUCTION NOTES IN STORMWATER POND DETAIL FOR BERM CONSTRUCTION REQUIREMENTS.
 - SWALE SHALL HAVE GREATER THAN 85% VEGETATIVE GROWTH PRIOR TO RECEIVING RUNOFF.
 - BOTTOM OF THE SWALE MUST BE ABOVE SEASON HIGH WATER TABLE.

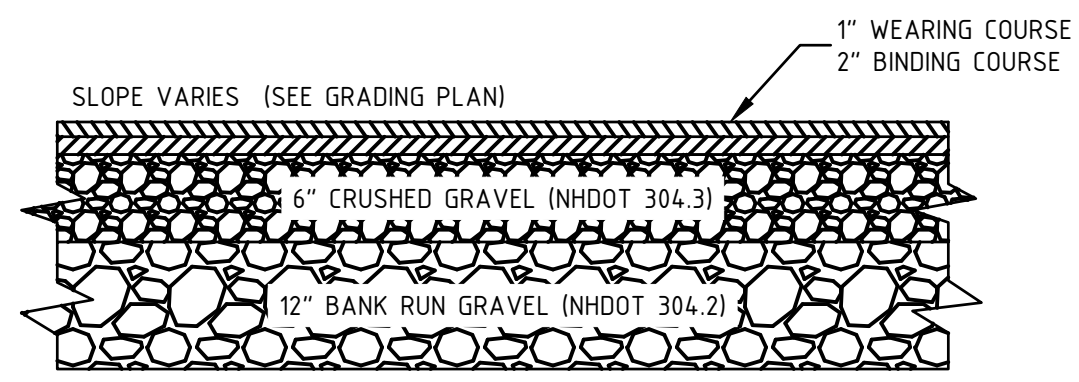
- MAINTENANCE NOTES:**
- INSPECT ANNUALLY FOR EROSION, SEDIMENT ACCUMULATION, VEGETATION LOSS, AND PRESENCE OF INVASIVE SPECIES.
 - PERFORM PERIODIC MOWING. DO NOT MOW GRASS SHORTER THAN 4 INCHES.
 - REMOVE DEBRIS AND ACCUMULATED SEDIMENT BASED ON INSPECTION.
 - REPAIR ERODED AREAS, REMOVE INVASIVE SPECIES AND DEAD VEGETATION, AND RESEED WITH APPLICABLE GRASS MIX AS WARRANTED BY INSPECTION.

CONVEYANCE SWALE DETAIL
NTS



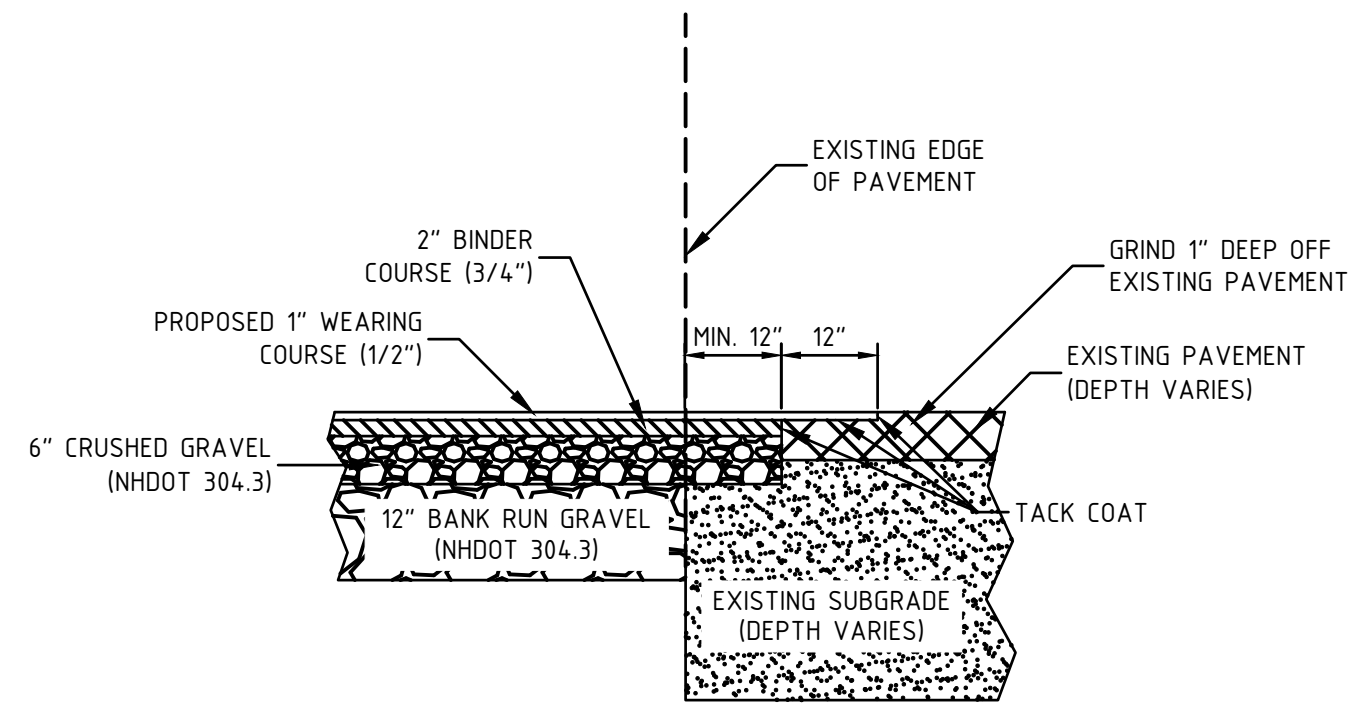
- NOTES:**
- SEE PLANS FOR LOCATION.

DRIP STRIP DETAIL
NTS



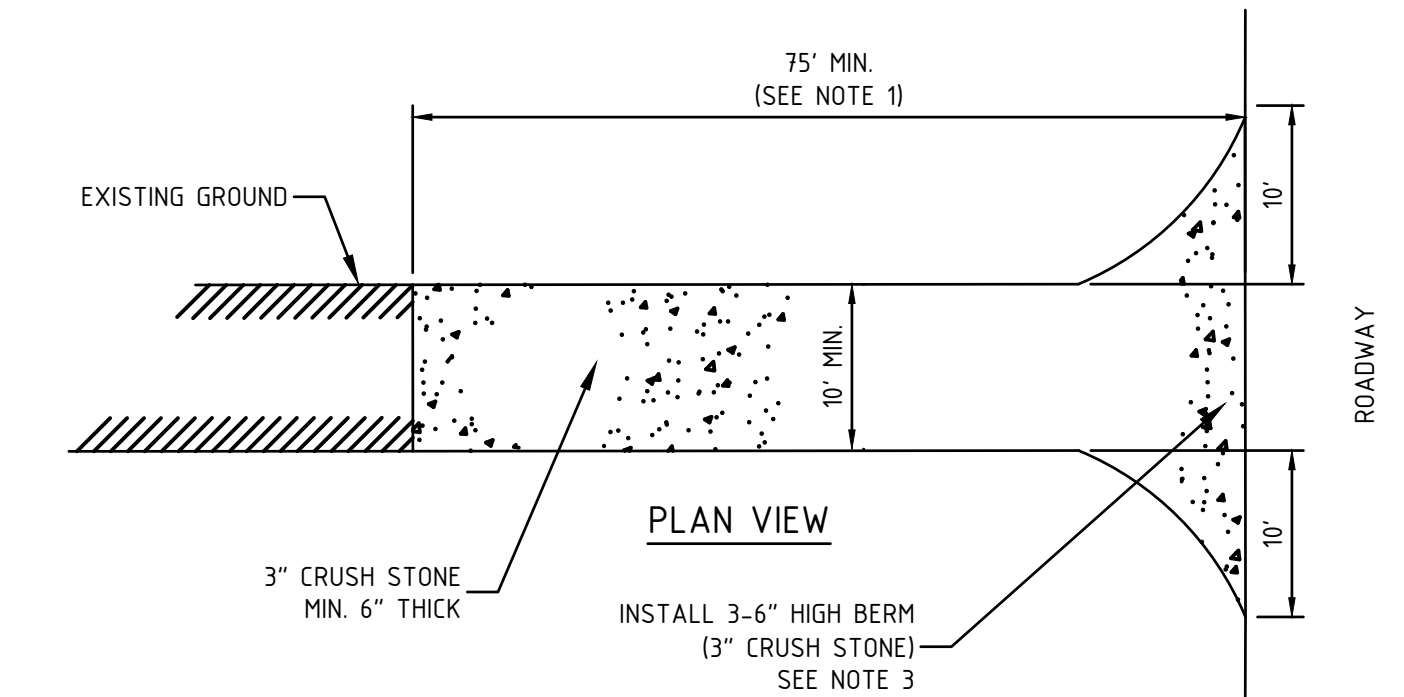
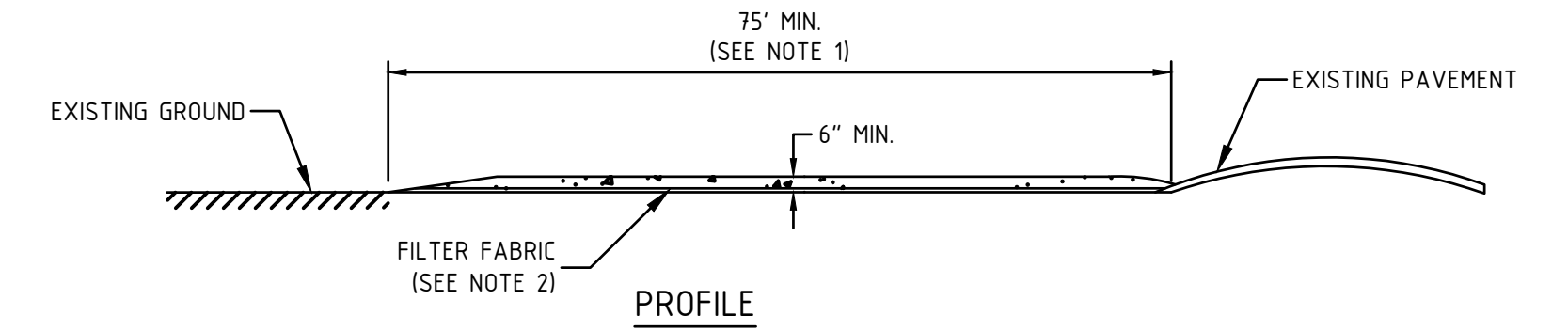
- NOTES:**
- DETERIORIOUS MATERIALS ENCOUNTERED BELOW PARKING AREA SHALL BE COMPLETELY REMOVED.
 - COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR.

TYPICAL PAVEMENT CROSS-SECTION
NTS



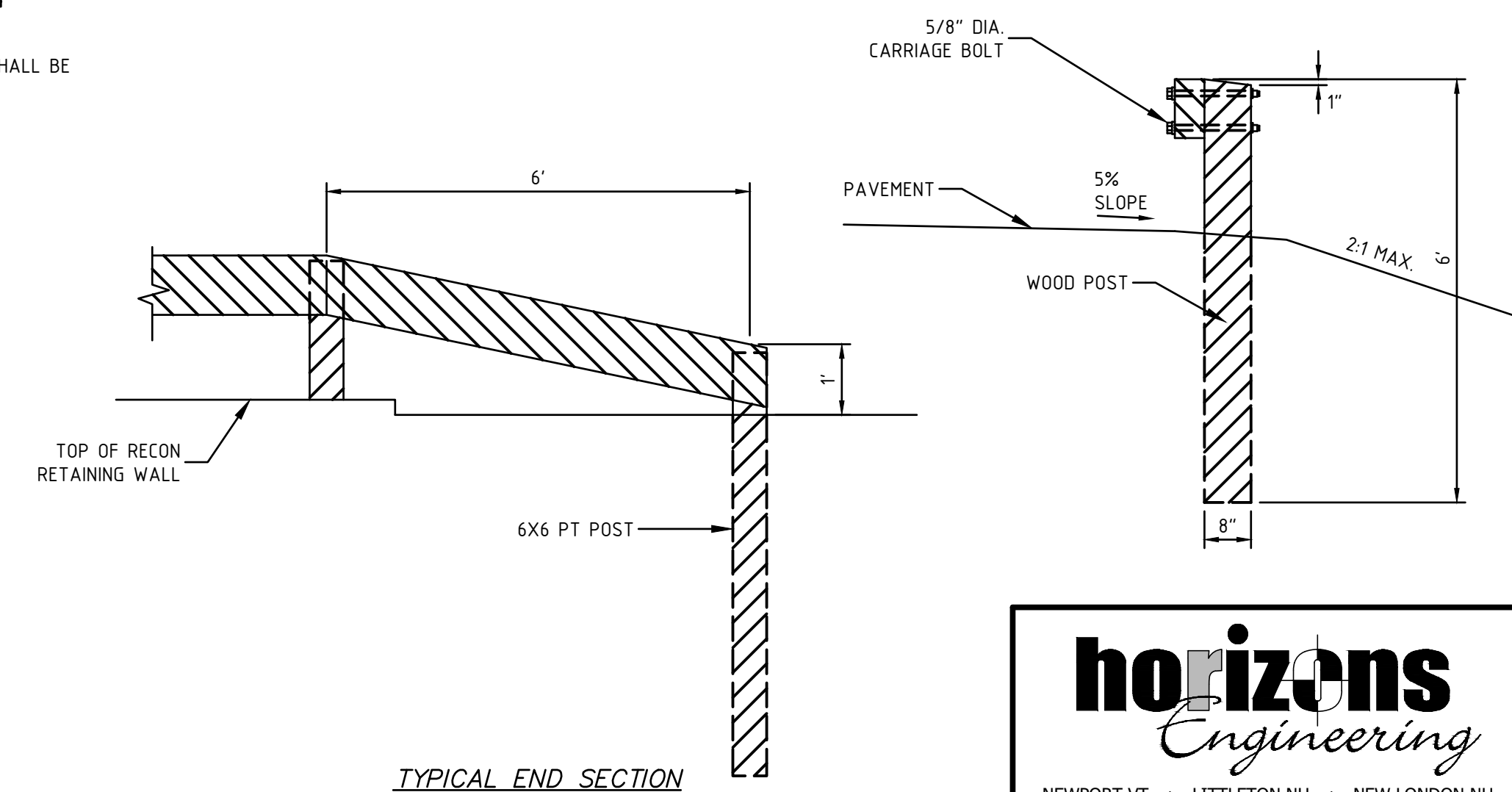
- NOTES:**
- SAWCUT THROUGH DEPTH OF PAVEMENT AT LEAST 1 FT. FROM EDGE OR GREATER IF REQUIRED BY NHDOT.
 - INSTALL AND COMPACT CRUSHED GRAVEL TO GRADE.
 - PLACE BINDER COURSE.
 - GRIND EXISTING PAVEMENT 1 FT. WIDE TO A DEPTH NECESSARY TO PROPERLY MATCH NEW WEARING COURSE PAVEMENT.
 - TACK COAT ALL EXISTING PAVEMENT SURFACES WITH EMULSIFIED ASPHALT (MS-1) PRIOR TO PLACING NEW PAVEMENT.

TYPICAL PAVEMENT SAWCUT DETAIL
NTS

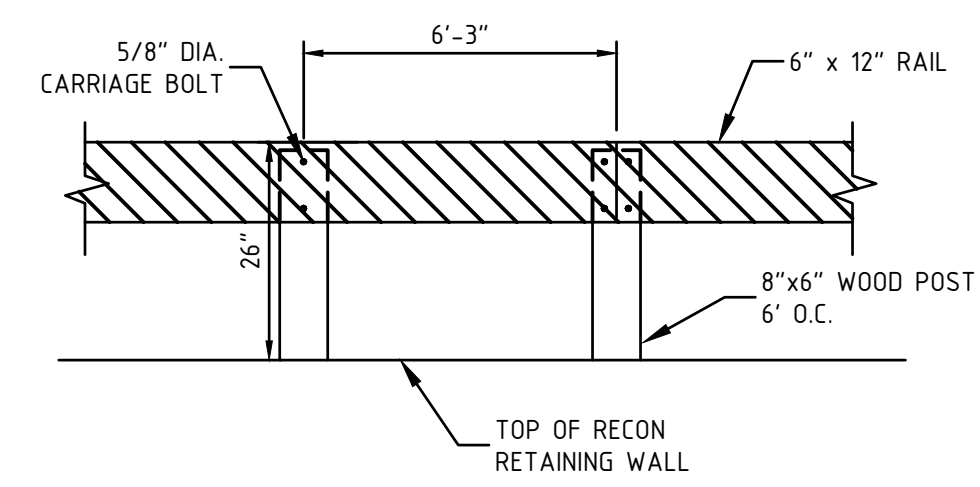


- NOTES:**
- LENGTH OF ENTRANCE MAY BE 50' WHERE DIVERSION RIDGE IS PROVIDED.
 - GRADE AND COMPACT ACCESS ROAD ENTRANCE AS NECESSARY. PLACE FILTER FABRIC AND 6" OF 3" CRUSHED STONE TO MATCH SLOPE OF EXISTING ROAD.
 - PROVIDE NECESSARY SWALES OR DIVERSIONS TO MINIMIZE DIRECT FLOW OF WATER ONTO STONE AREA.
 - CONSTRUCTION ENTRANCE SHALL BE MAINTAINED AS NECESSARY TO REMOVE SILT FROM TIRES PRIOR TO ENTERING PUBLIC ROADS. A SMALL SWALE SHALL BE CONSTRUCTED ON THE DOWN GRADIENT SIDE TO TRAP ANY SILT WASHED FROM THE STONE ENTRANCE.

STABILIZED CONSTRUCTION ENTRANCE DETAIL
NTS



TYPICAL END SECTION



- NOTE:**
- ALL MATERIAL AND INSTALLATION METHODS SHALL CONFORM W/NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 606-GUARDRAIL.
 - REFER TO SHEET C102 FOR LOCATION AND GRADING AROUND GUARD RAIL.
 - REFER TO SHEET C505 FOR SPECIFIC CONSTRUCTION DETAIL ON BLOCK RETAINING WALL.

REFERENCE:
TIMBER BRIDGE DESIGN, CONSTRUCTION, INSPECTION, AND MAINTENANCE PUBLISHED BY THE UNITED STATES DEPARTMENT OF AGRICULTURE FOREST SERVICE.

GUARD RAIL DETAIL
NTS

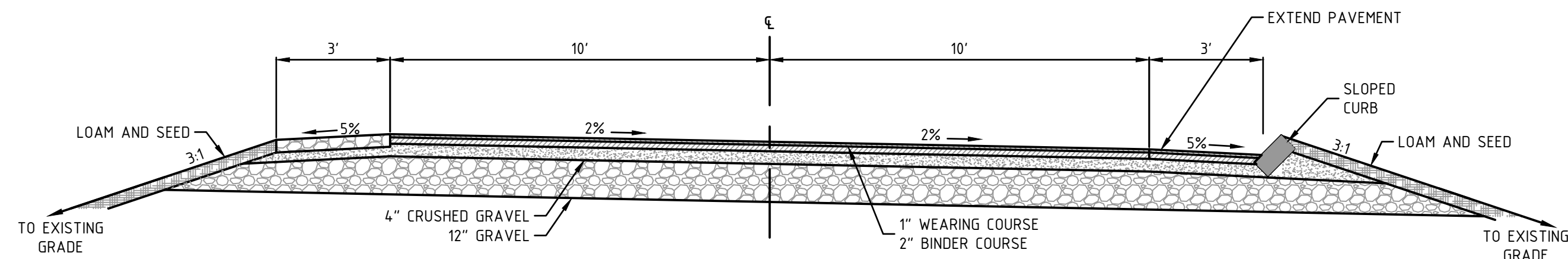
horizons
Engineering
NEWPORT VT • LITTLETON NH • NEW LONDON NH
POMFRET VT • KENNEBUNK ME • CONWAY NH

CONSTRUCTION DETAILS FOR
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
91 BAGDAD RD
DURHAM NH 03824
OF PROPERTY LOCATED AT
91 BAGDAD ROAD
DURHAM, STRAFFORD COUNTY, NH
LAND OF: MICHAEL & MARTHA MULHERN
DEED BOOK 4095, PAGE 129
TAX MAP 10 LOT 8-8

NO.	DATE	REVISION DESCRIPTION	ENG
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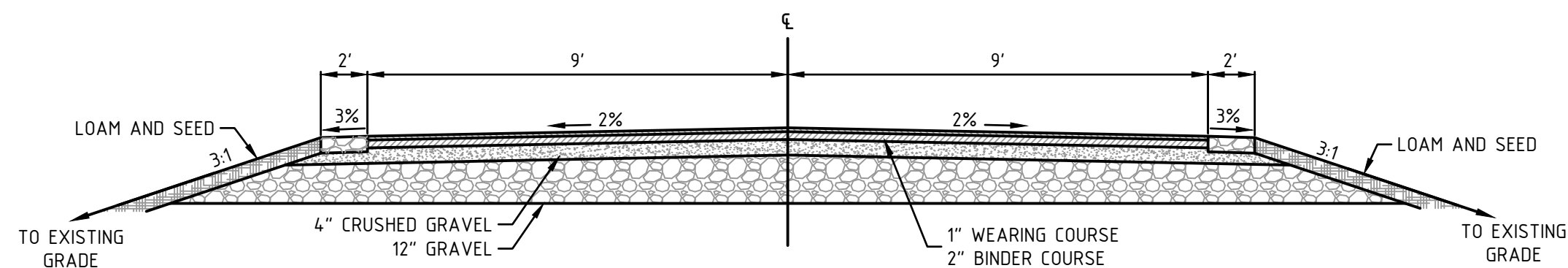
DATE: 2021-07-01	PROJECT #: NM19063
ENGIN'D BY: MJS	DRAWN BY: MCS
CHECK'D BY: MJS	ARCHIVE #: H-___

C502



TYPICAL MAIN ACCESS ROAD CROSS-SECTION

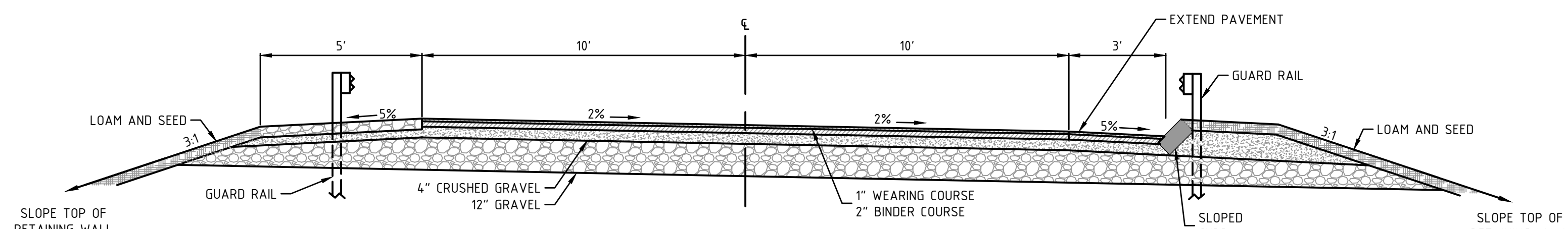
NTS



TYPICAL LOOP ROAD CROSS-SECTION

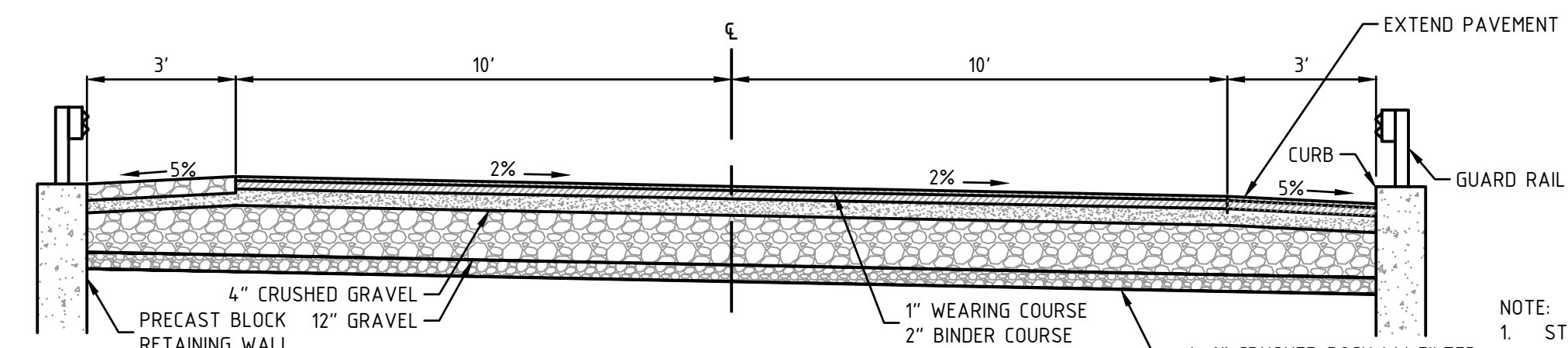
NTS

NOTE:
1. SOME SECTION OF LOOP ROAD ARE SUPERELEVATED. (SEE GRADING PLAN)



WETLAND CROSSING #2 ROAD CROSS-SECTION

NTS

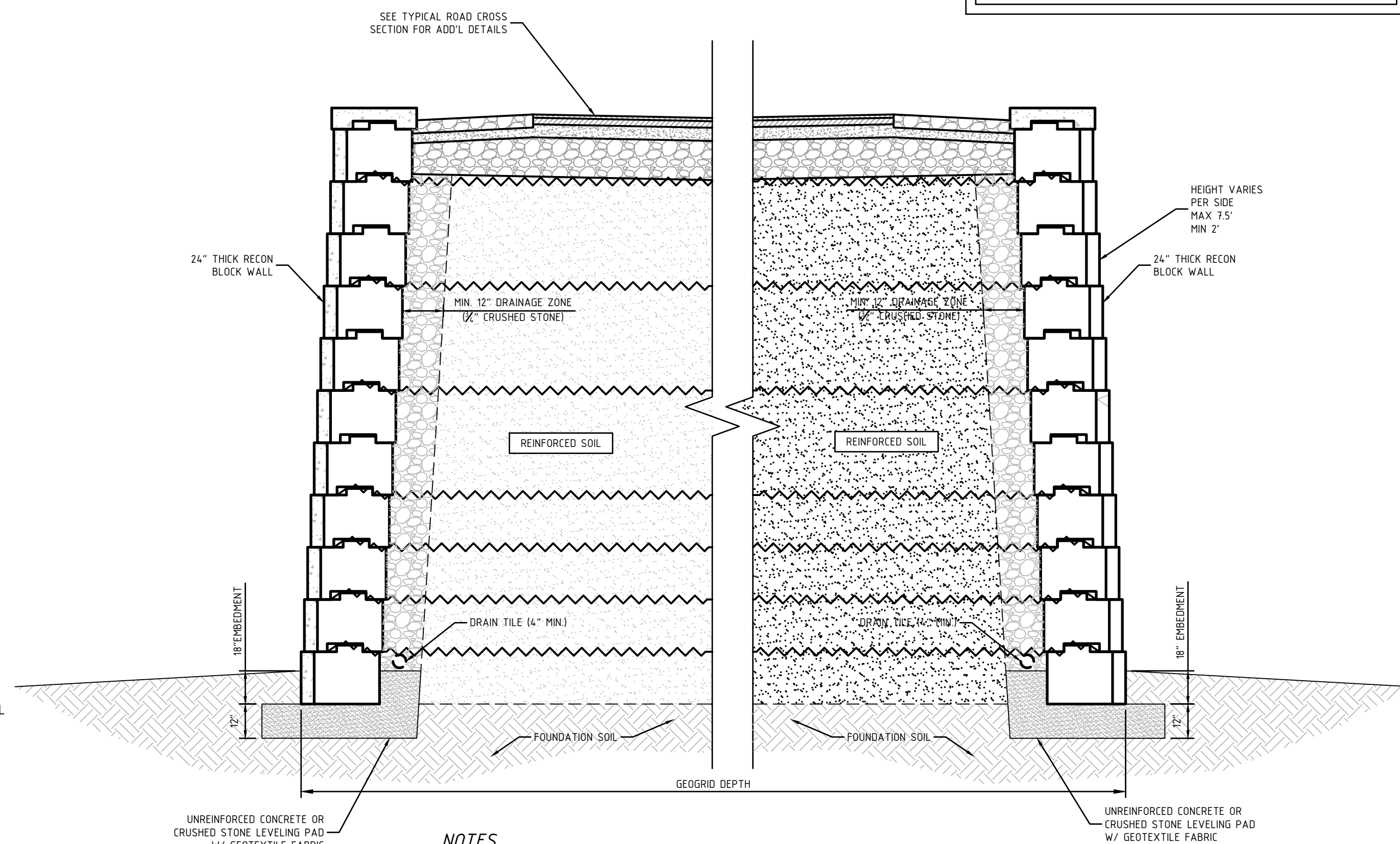


TYPICAL MAIN ACCESS ROAD WITH RETAINING WALLS CROSS-SECTION

NTS

NOTE:
1. STA. RT 0+25 TO 2+25
2. STA. LT 0+98 TO 2+20

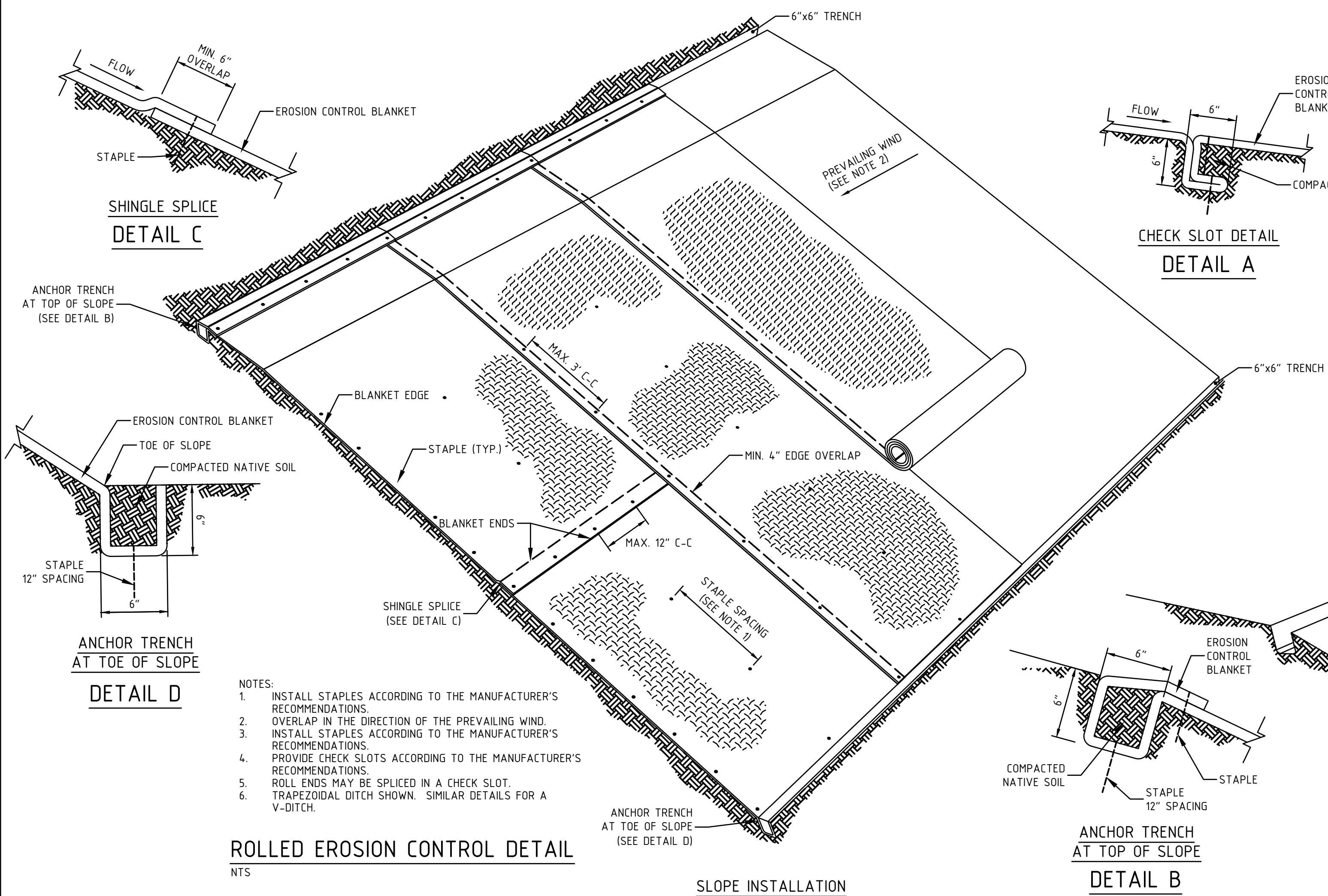
FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENT, TOWN PLANNER
DATE _____



NOTES
1. SOIL BORINGS ARE RECOMMENDED PRIOR TO FINAL WALL DESIGN

MSE WALL FOR WETLAND CROSSING #1

NTS



NOTES:
1. INSTALL STAPLES ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
2. OVERLAP IN THE DIRECTION OF THE PREVAILING WIND.
3. INSTALL STAPLES ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
4. PROVIDE CHECK SLOTS ACCORDING TO THE MANUFACTURER'S RECOMMENDATIONS.
5. ROLL ENDS MAY BE SPLICED IN A CHECK SLOT.
6. TRAPEZOIDAL DITCH SHOWN. SIMILAR DETAILS FOR A V-DITCH.

ROLLED EROSION CONTROL DETAIL

NTS

horizons
Engineering

NEWPORT VT • LITTLETON NH • NEW LONDON NH
POMFRET VT • KENNEBUNK ME • CONWAY NH

CONSTRUCTION DETAILS FOR
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
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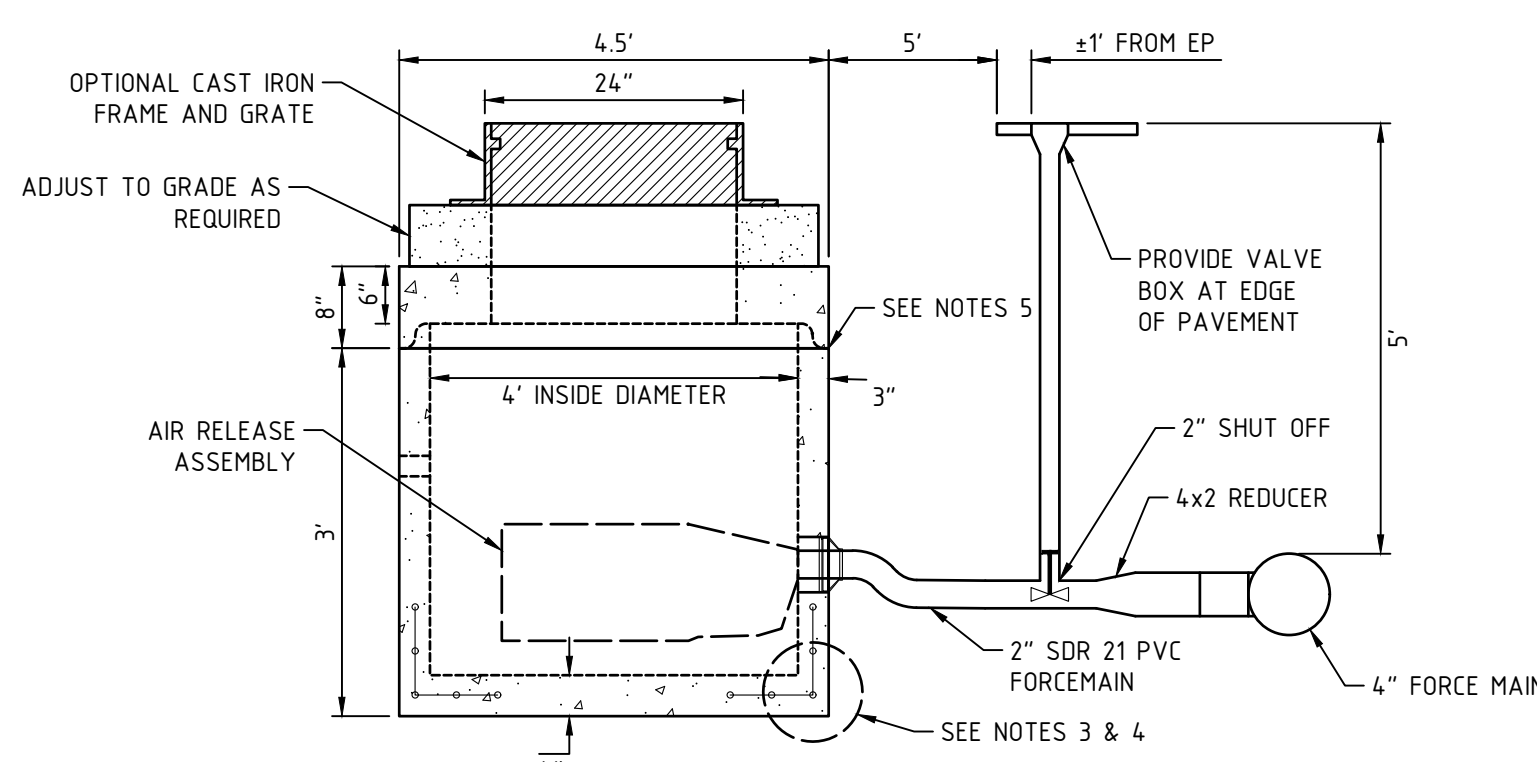
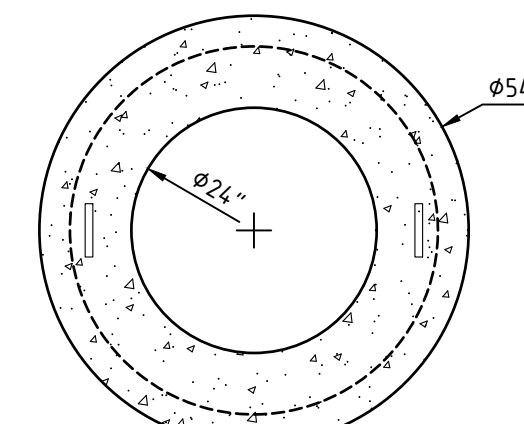
OF PROPERTY LOCATED AT
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DURHAM, STRAFFORD COUNTY, NH
LAND OF: MICHAEL & MARTHA MULHERN
DEED BOOK 4095, PAGE 129
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C503

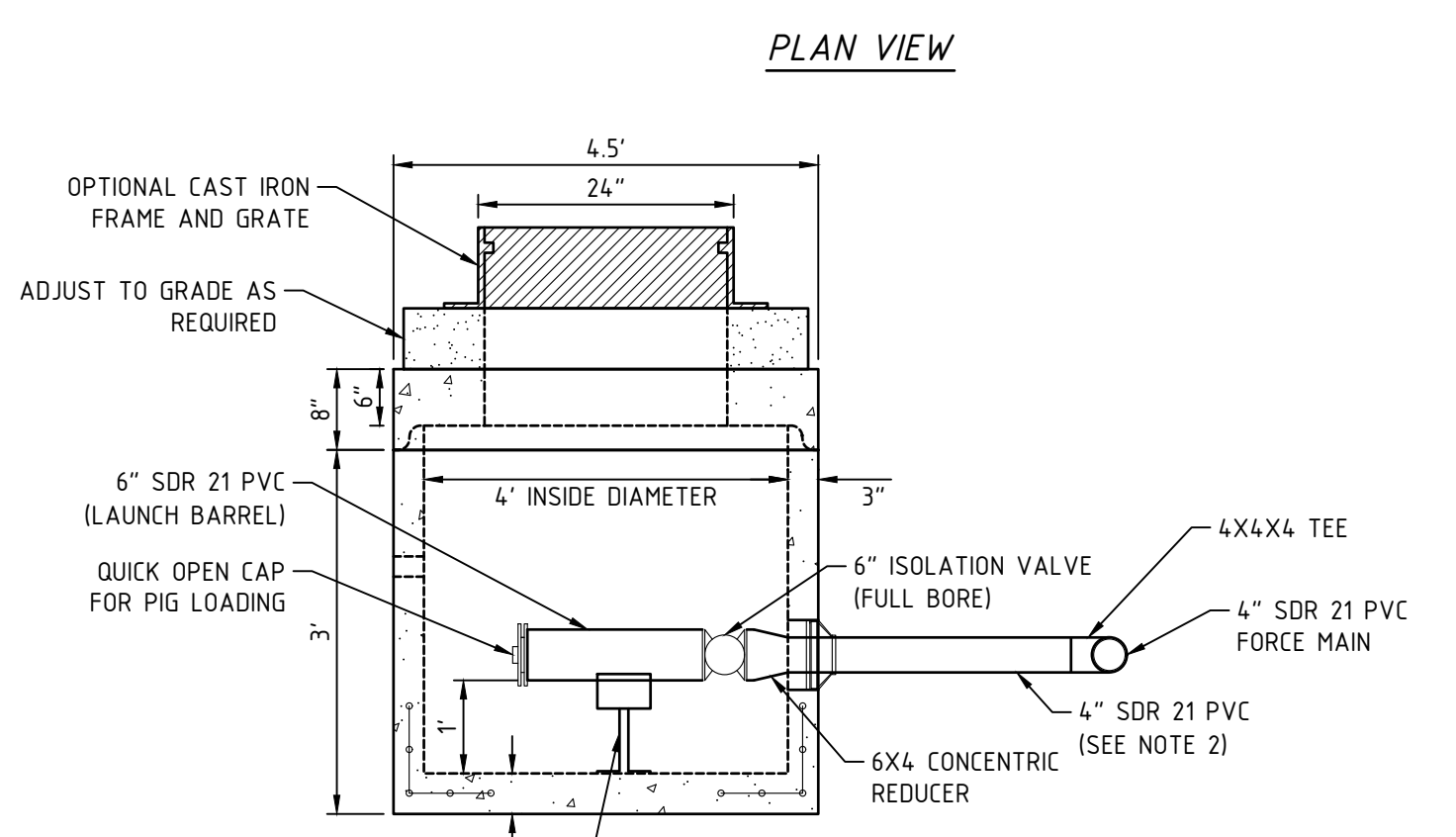
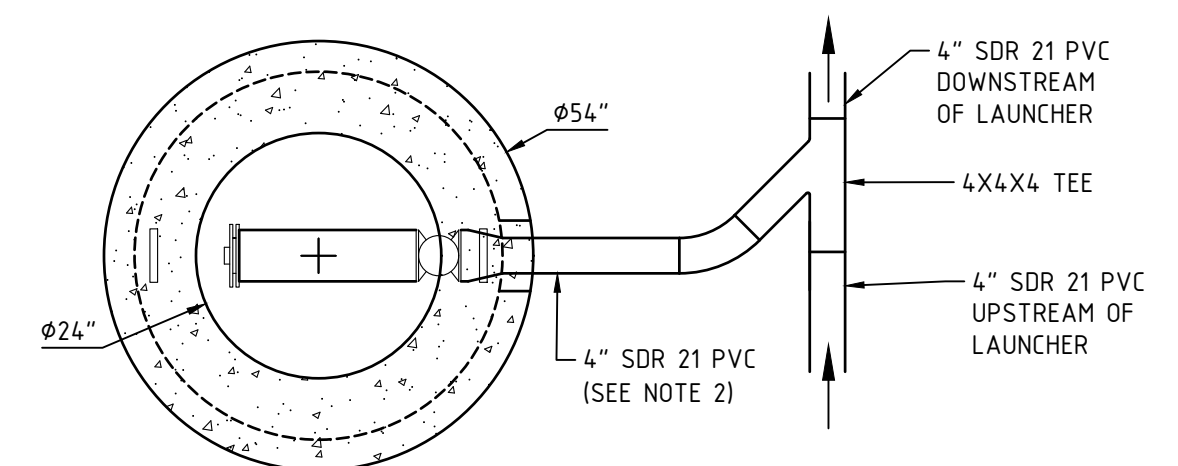
P:\19\pro 19-063\Internal\dwg\NM19063_Detail_02.dwg
2021-10-05 14:22



- NOTES**
1. CONCRETE: FC = 4,000 PSI @ 28 DAYS MINIMUM, TYPE III CEMENT
 2. HS-20 DESIGN LOADING CONFORMS TO LATEST SPECIFICATIONS ASTM C478, AASHTO M199 PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
 3. ONE POUR MONOLITHIC BASE SECTION
 4. STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATION: ASTM A615, GRADE 60 BLACK DEFORMED BARS
ASTM A185 WELDED WIRE FABRIC
 5. BUTYL RUBBER JOINT SEALANT PROVIDED CONFORMS TO ASTM C990 AND FEDERAL SPEC SS-5-210A
 6. HOLES & ELEVATIONS TBD
 7. BOOTED PIPE CONNECTIONS (IF USED) CONFORM TO ASTM C923.
 8. PLASTIC MANHOLE STEPS (IF REQUIRED) ARE STEEL REINFORCED CONFORMING TO ASTM C478
 9. ASPHALTIC EXTERIOR COATING AVAILABLE.
 10. ALL INTERIOR PIPING AND VALVES TO BE CONFIRMED WITH DESIGN ENGINEER PRIOR TO START OF PROJECT.
 11. MANHOLES TO BE SET ON MINIMUM 6" COMPACTED CRUSHED STONE (3/4") FOR SALES CONTACT.

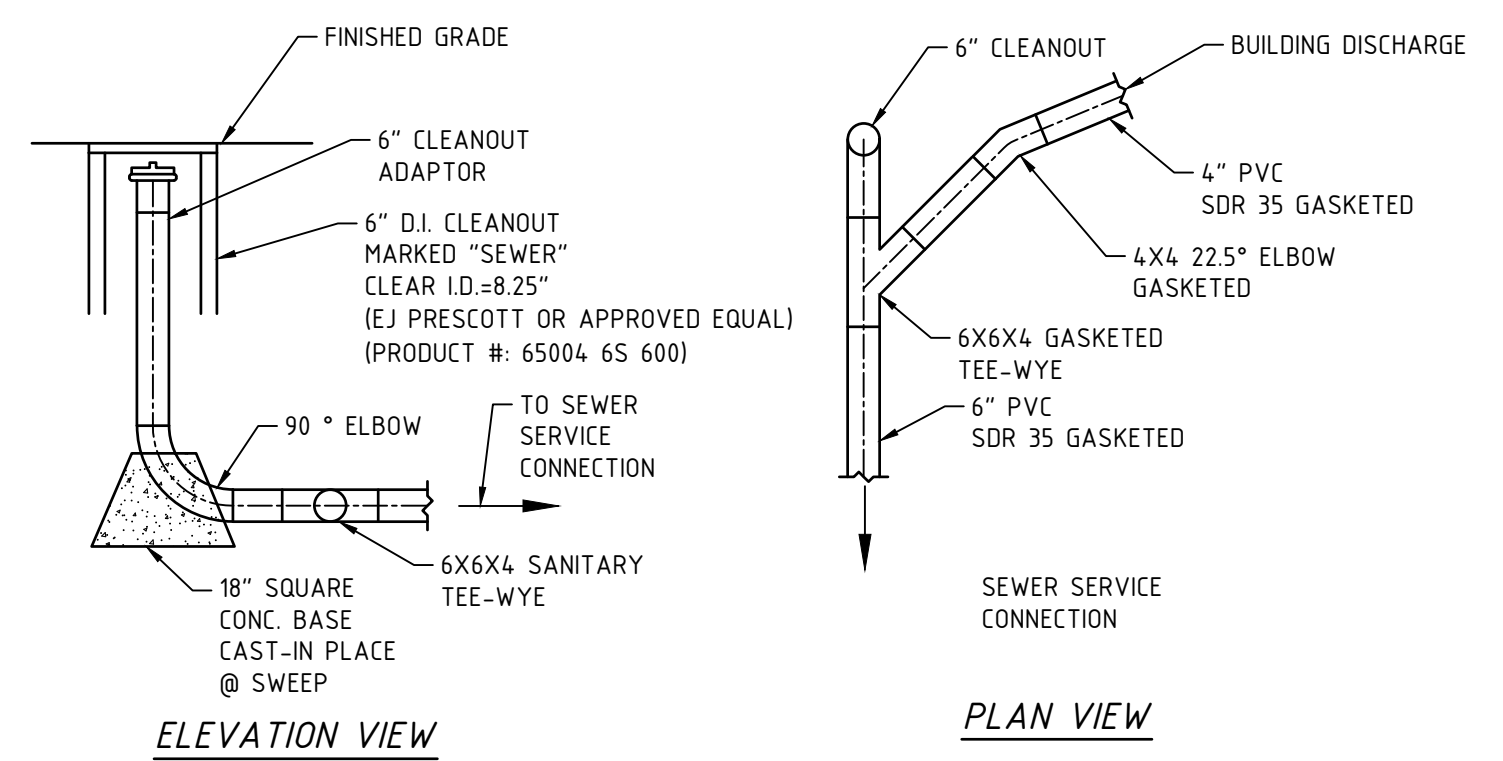
PHOENIX PRECAST PRODUCTS
77 REGIONAL DRIVE
CONCORD, NH 03301
1-800-639-2199

AIR RELEASE VALVE ASSEMBLY
N.T.S.

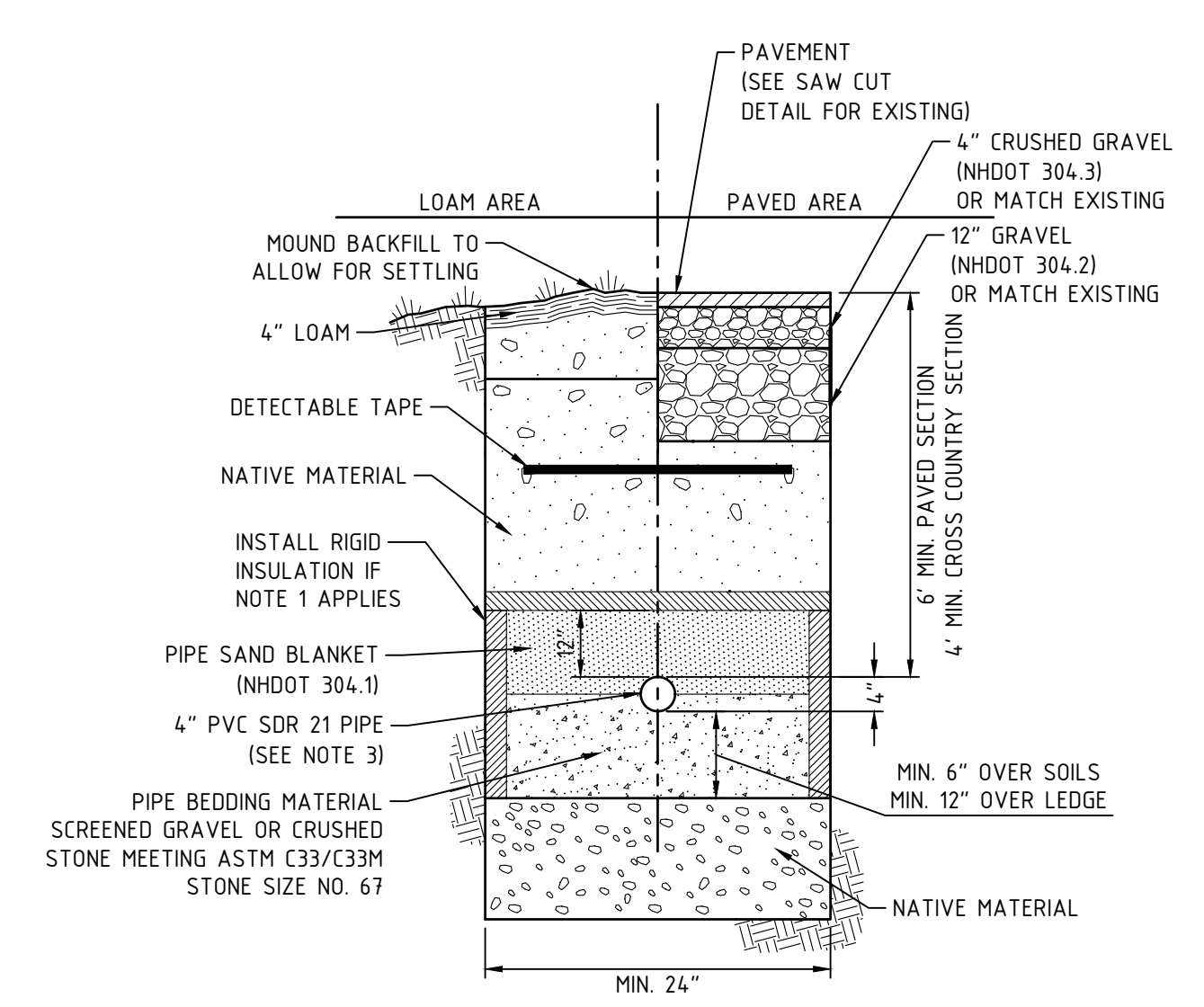


- NOTES**
1. ALL PIPING MUST HAVE A PRESSURE CLASS RATING OF 200 PSI OR GREATER AT 23 °C.
 2. INSIDE DIAMETERS OF THE FORCE MAIN AND THE PRESSURE PIPE AFTER THE 6X4 REDUCER MUST BE EQUAL.
 3. ALL VALVES MUST HAVE A FULL BORE TO ALLOW PIG TO PASS THROUGH. CONTRACTOR MUST CONFIRM WITH THE VALVE MANUFACTURER THAT VALVES USED ARE PIGGABLE.

PIG LAUNCHING STATION DETAIL
N.T.S.

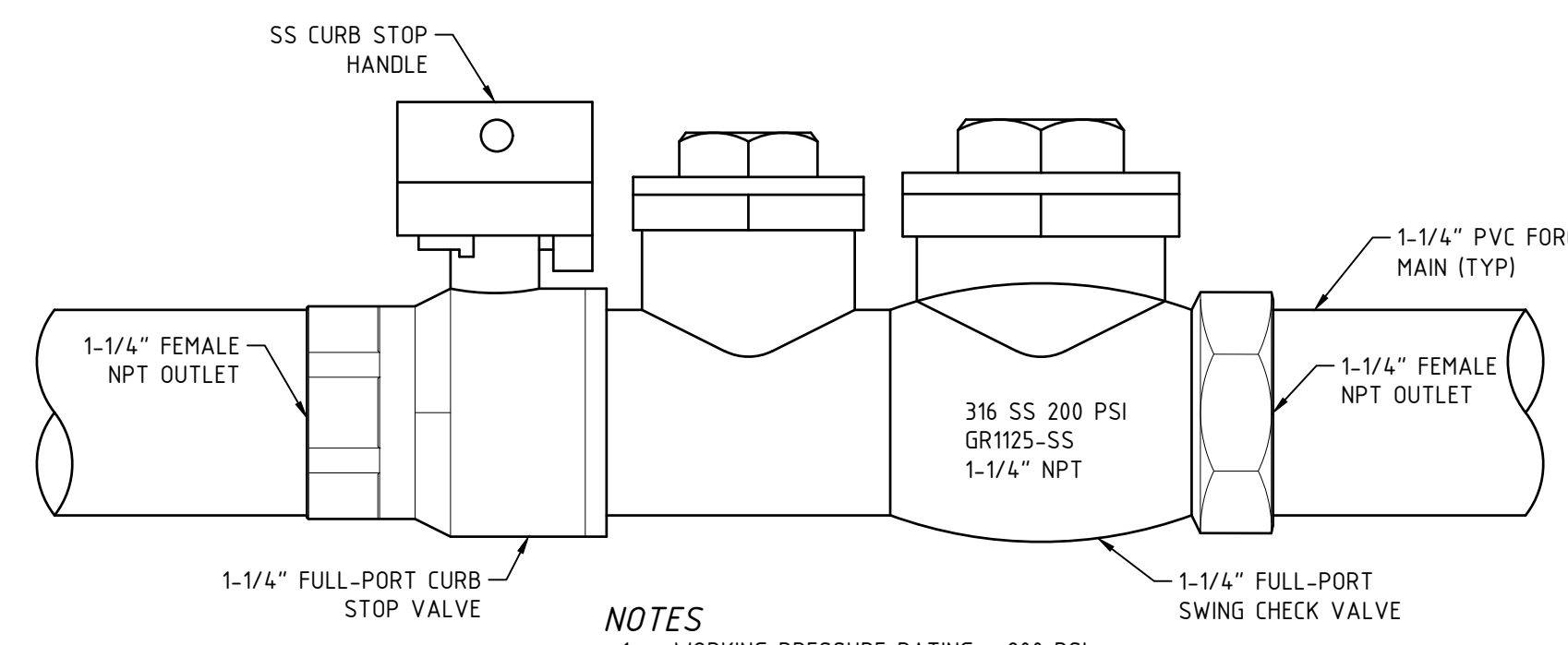


CLEANOUT DETAIL
N.T.S.



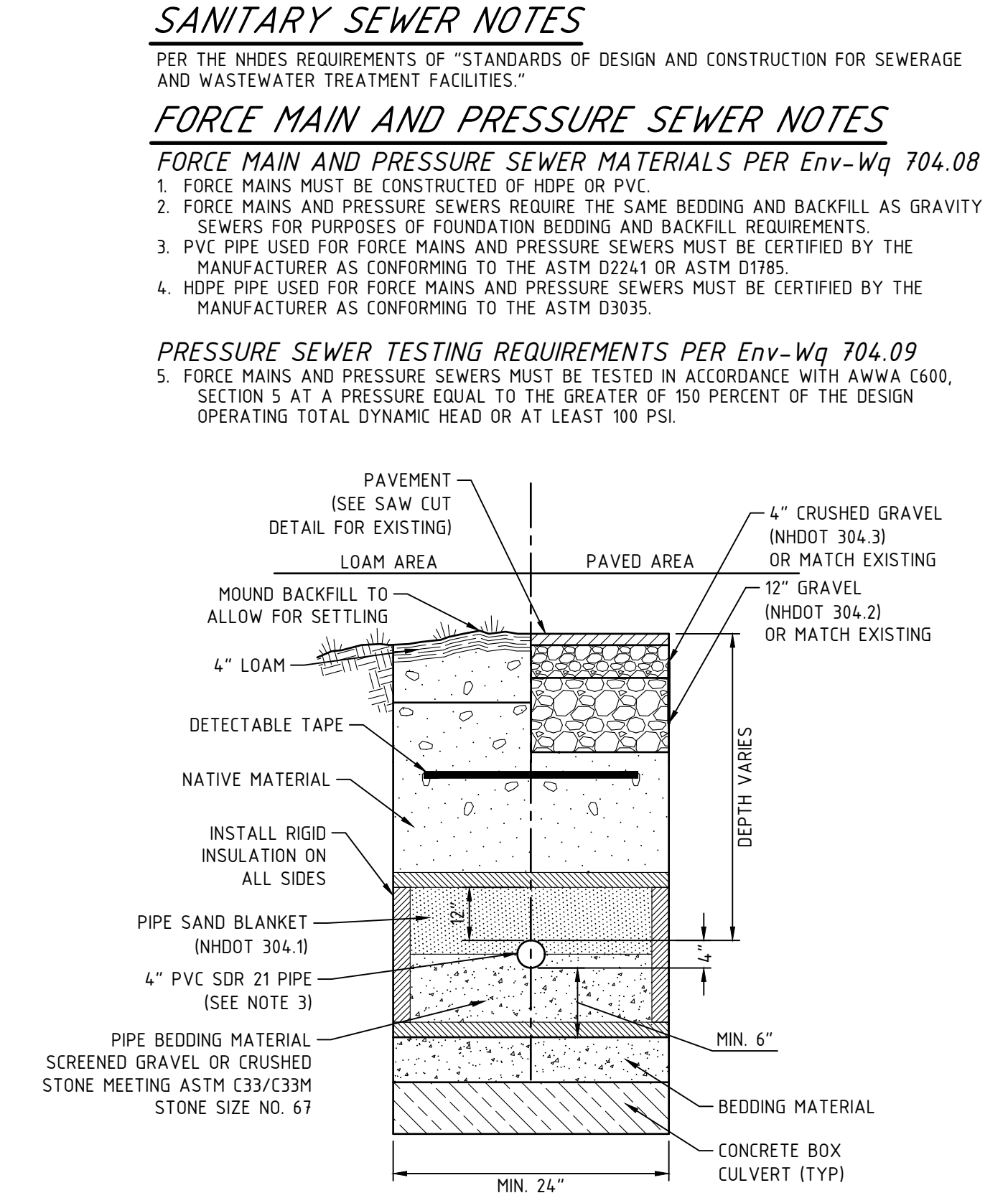
- NOTES**
1. USE RIGID INSULATION AS SHOWN IF PIPE COVER IS LESS THAN 6" UNDER PAVED SECTION OR 4" UNDER CROSS COUNTRY SECTION.
 2. THERE SHALL BE NO GLUE JOINTS ON THE FORCE MAIN.
 3. FORCE MAIN PIPES MUST HAVE A PRESSURE CLASS RATING OF 200 PSI OR GREATER AT 23 °C.

SEWER FORCEMAIN TRENCH
N.T.S.



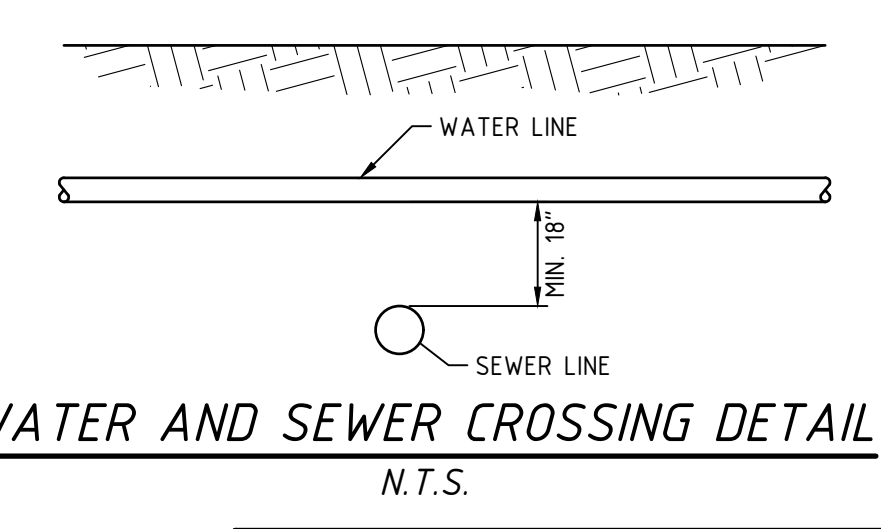
- NOTES**
1. WORKING PRESSURE RATING = 200 PSI
 2. 316 SS MATERIAL
 3. 1-1/4" NPT OUTLETS

LATERAL ASSEMBLY DETAIL
N.T.S.

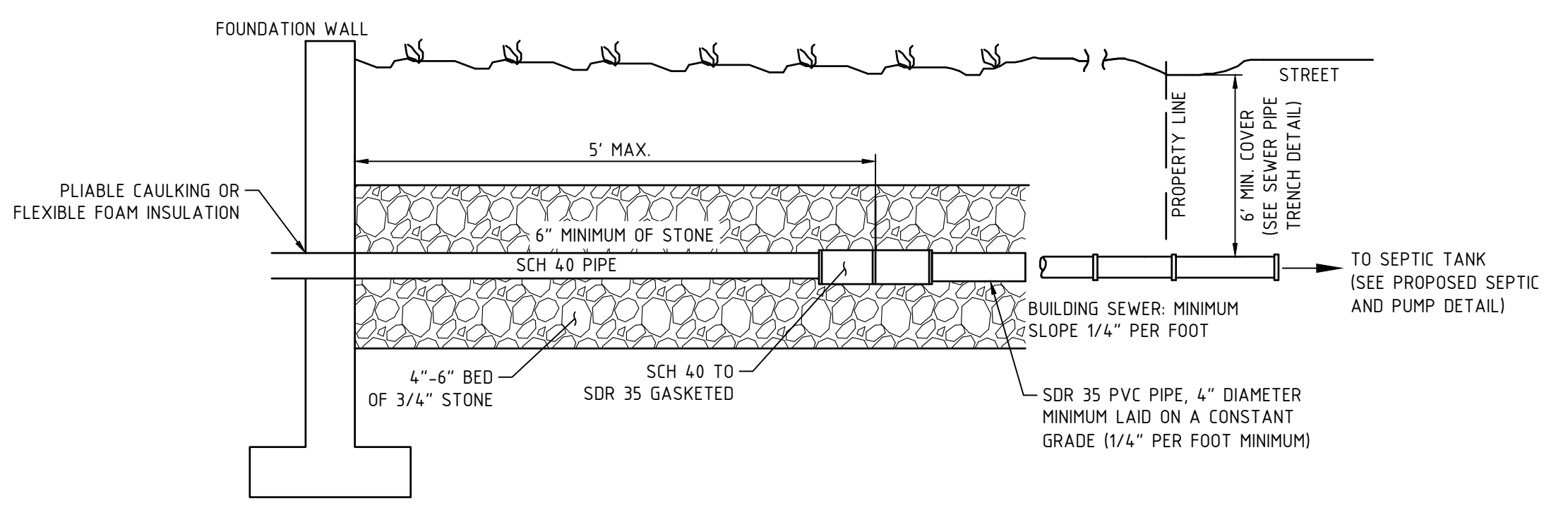


- NOTES**
1. THERE SHALL BE NO GLUE JOINTS ON THE FORCE MAIN.
 2. FORCE MAIN PIPES MUST HAVE A PRESSURE CLASS RATING OF 200 PSI OR GREATER AT 23 °C.

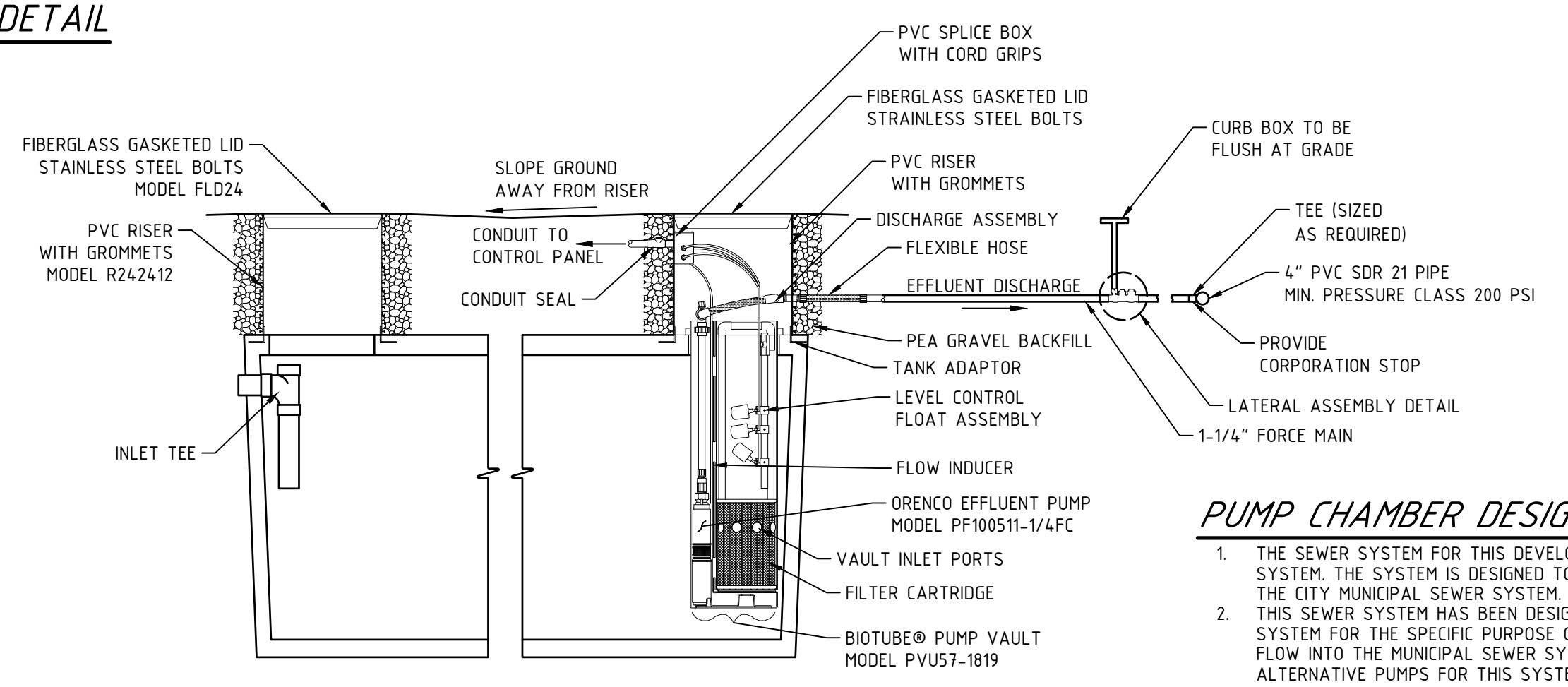
SEWER FORCEMAIN TRENCH AT CULVERT CROSSING
N.T.S.



WATER AND SEWER CROSSING DETAIL
N.T.S.



TYPICAL BUILDING TO LOW PRESSURE SEWER CONNECTION
N.T.S.



- NOTES**
1. SEPTIC TANK MUST BE 1250 GAL + 500 GAL

PROPOSED SEPTIC AND PUMP DETAIL
N.T.S.

PUMP CHAMBER DESIGN SPECIFICATIONS

1. THE SEWER SYSTEM FOR THIS DEVELOPMENT IS A LOW PRESSURE FORCE MAIN SEWER SYSTEM. THE SYSTEM IS DESIGNED TO PUMP WASTEWATER EFFLUENT FROM EACH LOT TO THE CITY MUNICIPAL SEWER SYSTEM.
2. THIS SEWER SYSTEM HAS BEEN DESIGNED USING THE ORENCO PROPACK EFFLUENT PUMP SYSTEM FOR THE SPECIFIC PURPOSE OF PUMPING A LOW VOLUME TO MINIMIZE THE PEAK FLOW INTO THE MUNICIPAL SEWER SYSTEM. THERE WILL BE NO SUBSTITUTIONS FOR ALTERNATIVE PUMPS FOR THIS SYSTEM WITHOUT ADDITIONAL APPROVAL.
3. EACH UNIT WILL BE CONSTRUCTED WITH A 2-COMPARTMENT SEPTIC/PUMP TANK AS SHOWN. EACH UNIT OWNER WILL BE RESPONSIBLE TO PUMP THEIR SEPTIC TANK TO INSURE THAT SLUDGE DOES NOT ACCUMULATE TO GREATER THAN 1/4 THE DEPTH OF THE TANK. THIS IS APPROXIMATELY ONCE EVERY 3 YEARS.
4. PUMP CHAMBER ELEVATIONS AND PUMP "ON", "OFF", AND "ALARM" ELEVATIONS TO BE SET BASED ON EXACT PUMP CHAMBER LOCATIONS (TO BE DETERMINED DURING UNIT BUILD OUT).
5. CONTACT JOSH SCOTTON AT RCM PUMPS FOR EQUIPMENT, SPECIFICATIONS AND INSTALLATION REQUIREMENTS.



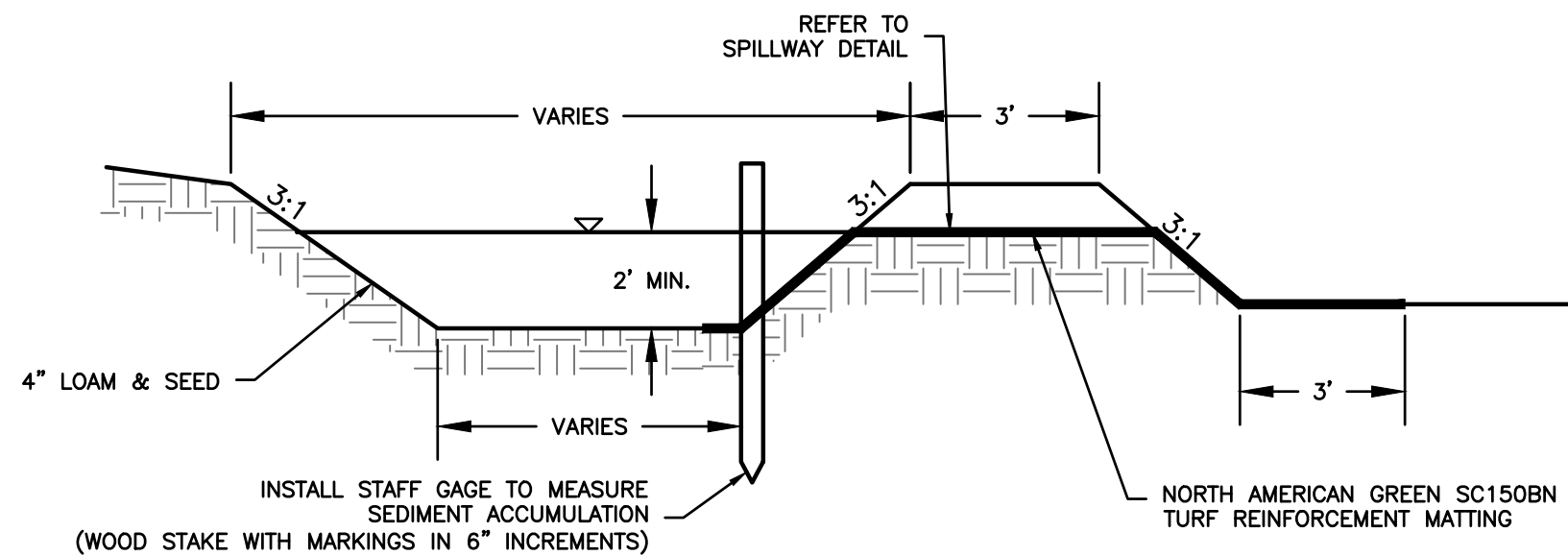
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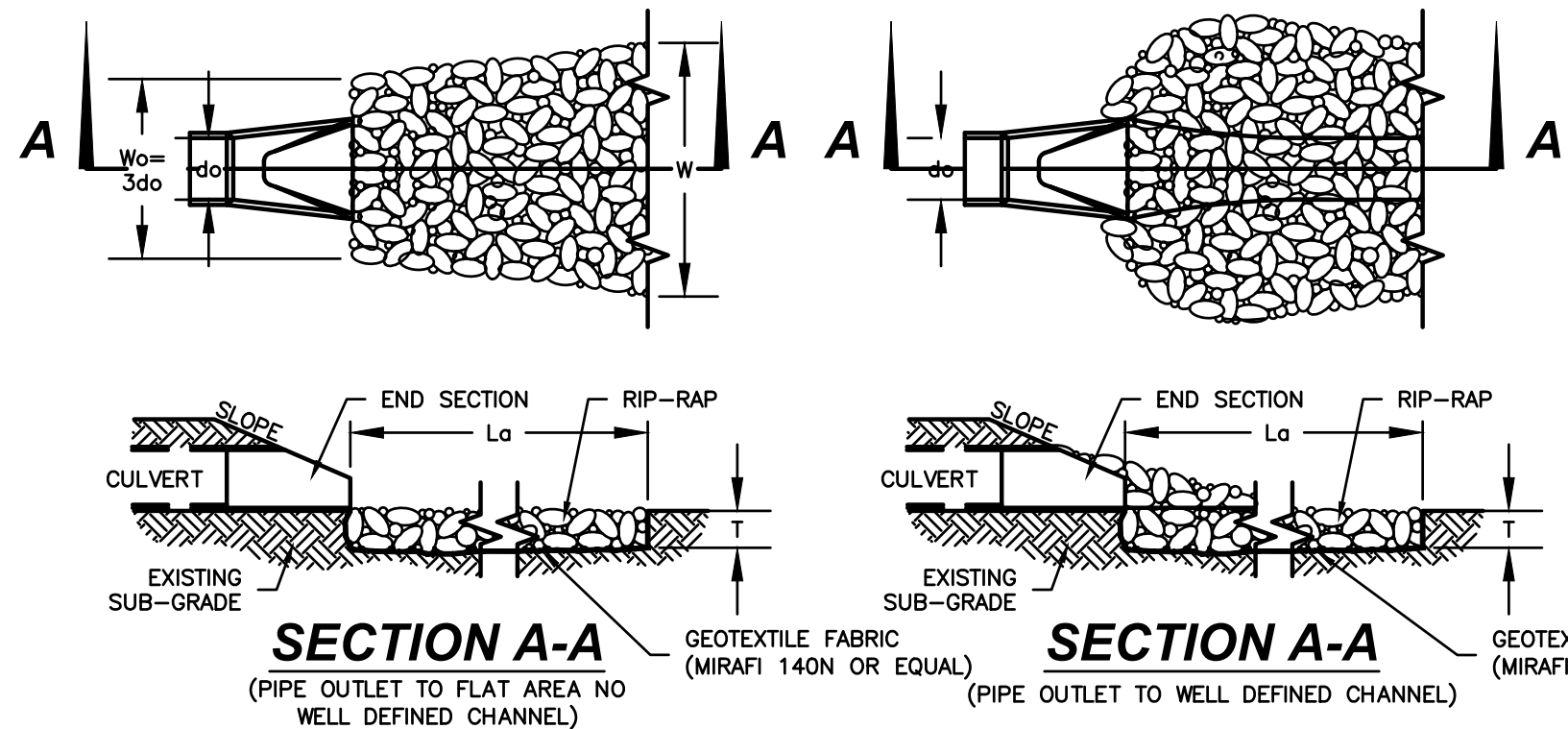
DATE:	PROJECT #:
2021-07-01	NM19063
ENGINE'D BY:	DRAWN BY:
MJS	MCS
CHECK'D BY:	ARCHIVE #:
MJS	H-

C504



SEDIMENT FOREBAY TYPICAL CROSS SECTION DETAIL
NTS

- NOTES:**
- REFER TO BERM CONSTRUCTION NOTES IN BIORETENTION SYSTEM DETAIL FOR BERM CONSTRUCTION REQUIREMENTS.
 - REFER TO SPILLWAY CROSS SECTION DETAIL FOR SPILLWAY CONSTRUCTION REQUIREMENTS.
 - THE SEDIMENT FOREBAY SHALL BE MOWED WITH THE REST OF THE SITES LAWN AREAS TO PROMOTE HEALTHY GROWTH AND PREVENT THE ENCROACHMENT OF WEEDS AND WOODY VEGETATION.
 - INSTALL STAFF GAGE TO MEASURE SEDIMENT ACCUMULATION. SEDIMENT SHALL BE REMOVED AFTER SEDIMENT ACCUMULATES TO A DEPTH OF 1 FOOT.



RIP-RAP GRADATION

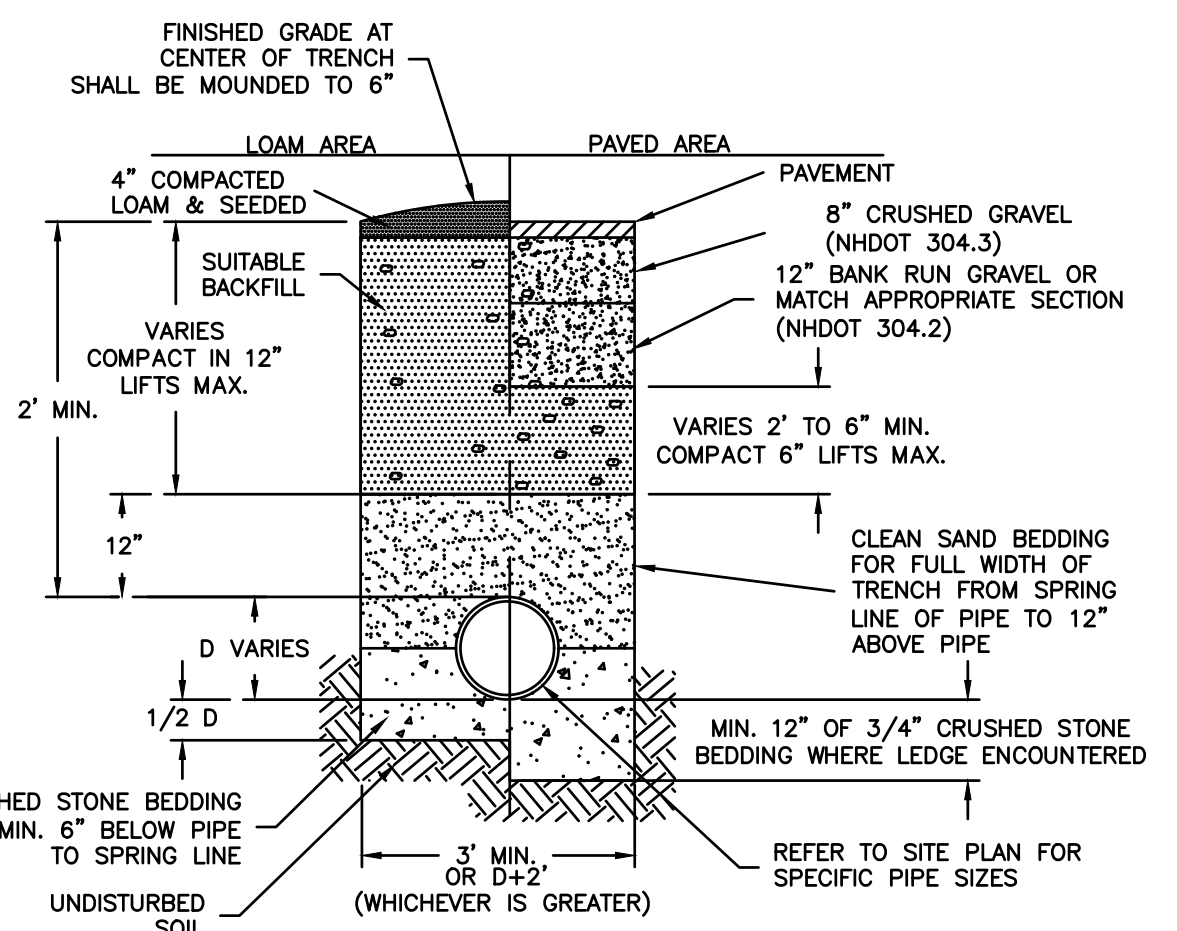
D50	% OF WEIGHT SMALLER THAN THE GIVEN SIZE		SIZE OF STONE (INCHES)	
	100	85	9	TO 12
			7.8	TO 10.8
			6	TO 9
			1.8	TO 3

D50	% OF WEIGHT SMALLER THAN THE GIVEN SIZE		SIZE OF STONE (INCHES)	
	100	85	12	TO 16
			10.4 <td>TO 14.4</td>	TO 14.4
			8 <td>TO 12</td>	TO 12
			2.4 <td>TO 4</td>	TO 4

RIP RAP APRON DIMENSION TABLE

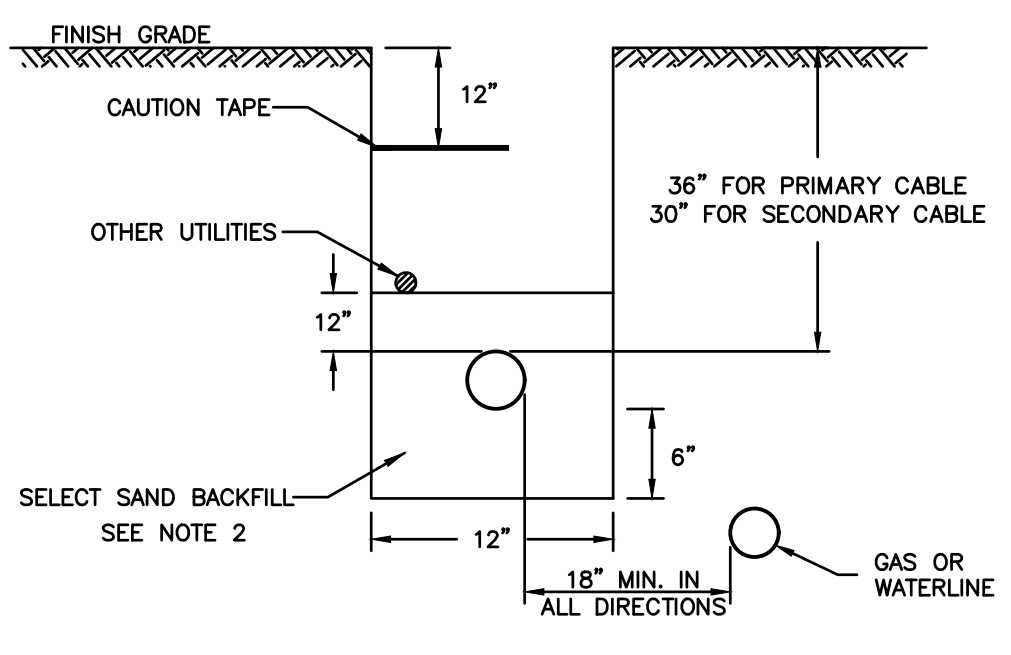
LOCATION	W ₀	W	L _a	T	Ø50
RIPRAP #1 - GRAVEL WETLAND EMERGENCY SPILLWAY	2.5	16	13	18"	24"
RIPRAP #2 - 12" CFP OUTLET @ STA. 15+57	3.75	4.7	16	18"	6"
RIPRAP #3 - 18" CFP OUTLET @ STA. 15+66	VARIES SEE PLAN			24"	8"
RIPRAP #4 - GRAVEL WETLAND MID SPILLWAY	3.75	8.1	18	24"	8"
RIPRAP #5 - 18" CFP OUTLET @ STA. 17+80	1.25	9	8	18"	6"
RIPRAP #6 - 6" CFP GRAVEL WETLAND OUTLET					

PIPE OUTLET PROTECTION DETAIL
NTS



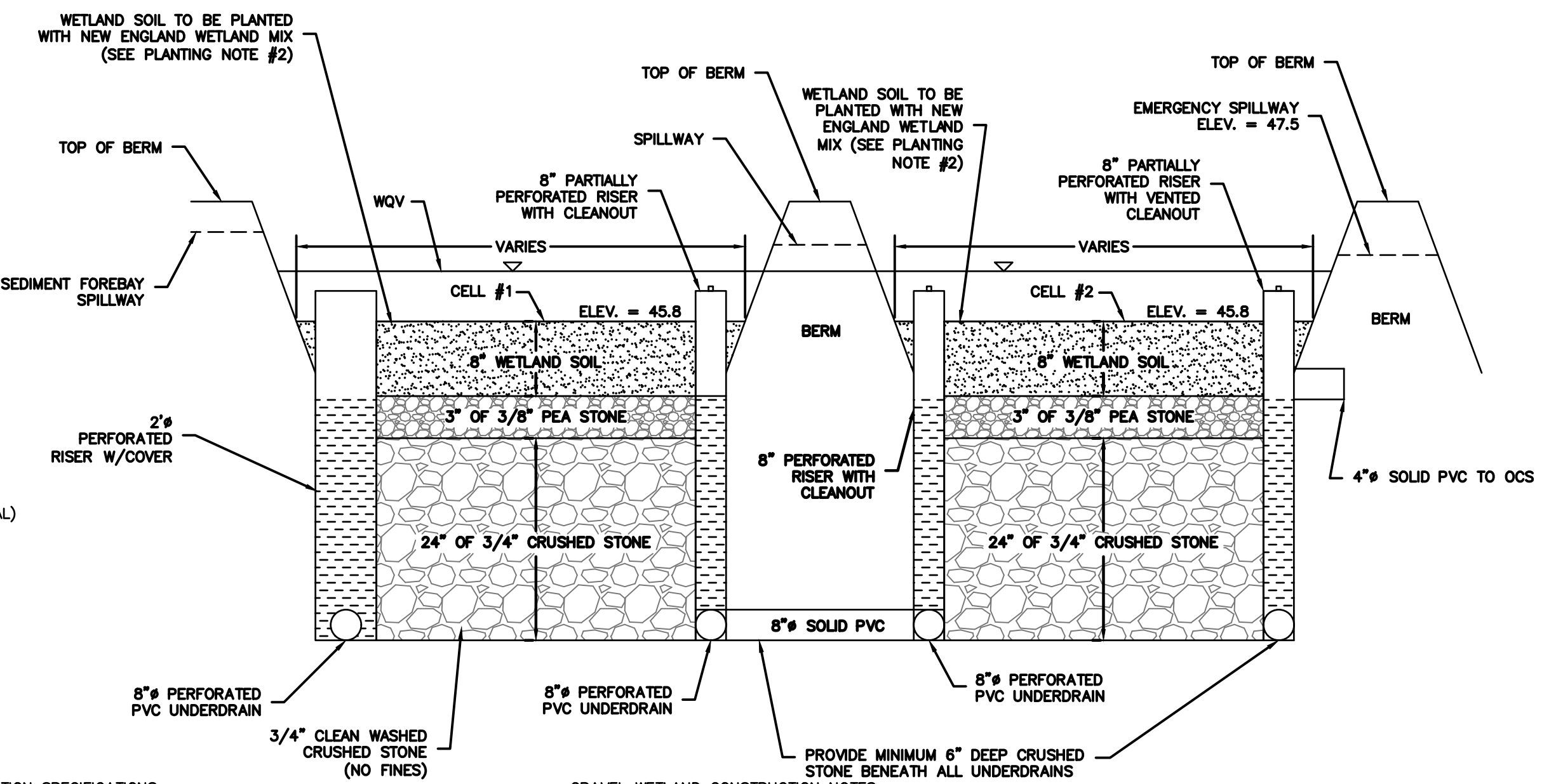
STANDARD DRAINAGE PIPE TRENCH
NTS

- DRAINAGE STRUCTURE NOTES:**
- DRAINAGE STRUCTURE MATERIALS SHALL COMPLY WITH NHDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, LATEST EDITION, DIVISION 600, SECTION 604.
 - SITE CONTRACTOR SHALL BACKFILL AROUND DRAINAGE STRUCTURES IN 6 TO 8 INCH LIFTS, ATTAINING 95% MAXIMUM PROCTOR DENSITY FOR EACH LIFT.
 - PIPE OPENINGS SHALL BE FULLY MORTARED ON OUTSIDE PRIOR TO BACK FILLING. INSIDE OF PIPE OPENINGS SHALL BE MORTARED AND ALLOWED TO CURE PER MANUFACTURERS REQUIREMENTS PRIOR TO RECEIVING RUNOFF.
 - JOINTS BETWEEN ADJACENT RISERS SHALL BE FULLY SEALED WITH ELASTOMERIC SEALANT PER MANUFACTURERS REQUIREMENTS.
 - WHEN FRAME/GRATE ARE LOCATED IN A PAVED AREA, THEY SHALL BE BROUGHT TO FINISH GRADE AFTER BINDER COURSE PAVEMENT IS PLACED. THE EXCAVATION REQUIRED AROUND THE GRATE AND FRAME SHALL BE BACKFILLED FLUSH WITH THE TOP OF BINDER COURSE WITH NHDOT CLASS B CONCRETE.
 - FRAME AND GRATE: CATCH BASIN: NEEHAH UFMATE OR PAMREX



TELEPHONE & ELECTRICAL TRENCH
NTS

- NOTES:**
- CONSTRUCTION TO BE IN ACCORDANCE WITH PSNH CONSTRUCTION STANDARDS FOR NEW ELECTRICAL SERVICE WORK BY CONTRACTORS, MOST RECENT EDITION.
 - SELECT SAND BACKFILL SHALL CONSIST OF A FINE GRANULAR MATERIAL OF WHICH 100% SHALL PASS THROUGH A 1/4" SIEVE. EXCEPT NATURALLY OCCURRING SMOOTH ROUND PEBBLES NO GREATER THAN 3/8" IN DIAMETER ARE PERMITTED AS LONG AS THEIR TOTAL VOLUME PER CUBIC FOOT OF SAND DOES NOT EXCEED 1%. THE SAND SHALL BE COMPLETELY FREE OF FROZEN LUMPS, ROCKS, STONES, DEBRIS AND RUBBISH. BACKFILL SHALL BE THOROUGHLY COMPACTED IN 6" LIFTS.
 - CONDUIT SIZES TO BE 5" 3-PHASE PRIMARY AND 4" 3-PHASE SECONDARY. ALL CONDUIT SIZES TO BE VERIFIED BY PSNH.
 - ALL CONDUIT INSTALLATIONS MUST CONFORM TO THE CURRENT EDITION OF THE NATIONAL ELECTRIC SAFETY CODE, STATE AND LOCAL CODES AND ORDINANCES, AND WHERE APPLICABLE THE NATIONAL ELECTRIC CODE.



GRAVEL WETLAND CONSTRUCTION NOTES:

- DO NOT PLACE GRAVEL WETLANDS INTO SERVICE UNTIL EACH BMP HAS BEEN PLANTED AND ITS CONTRIBUTING AREAS HAVE BEEN FULLY STABILIZED.
- DO NOT DISCHARGE SEDIMENT-LADEN WATERS FROM CONSTRUCTION ACTIVITIES (RUNOFF, WATER FROM EXCAVATIONS) TO THE GRAVEL WETLAND OR DURING ANY STAGE OF CONSTRUCTION.
- CLEAR AND GRUB THE AREA WHERE THE GRAVEL WETLAND IS TO BE LOCATED. STOCKPILE LOAM FOR REUSE LATER.
- THE FOUNDATION AREA SHALL BE SCARIFIED PRIOR TO PLACING FILL. ALL UNSUITABLE MATERIAL UNDER THE BERM SHALL BE REMOVED AND REPLACED WITH SUITABLE FOUNDATION MATERIAL.
- THE BERM SHALL BE CONSTRUCTED BEGINNING FROM THE LOWEST POINT UNIFORMLY ALONG ITS ENTIRE LENGTH. PLACE MATERIALS IN MAXIMUM 12" LOOSE LIFTS COMPACTED TO 95% MAXIMUM MODIFIED PROCTOR DENSITY. EMBANKMENT SOIL SHALL HAVE NO ORGANIC MATTER OR FROZEN MATERIAL AND NO STONES LARGER THAN 2/3 OF THE MAXIMUM LOOSE LIFT THICKNESS. STONES AROUND ANY STRUCTURES AND/OR CONDUITS SHALL NOT EXCEED 3 INCHES. EMBANKMENT FILL MATERIAL SHALL HAVE THE FOLLOWING GRADATION:

SIEVE SIZE:	% PASSING:
#4	80-90
#10	50-60
#30	30-45
#60	15-30

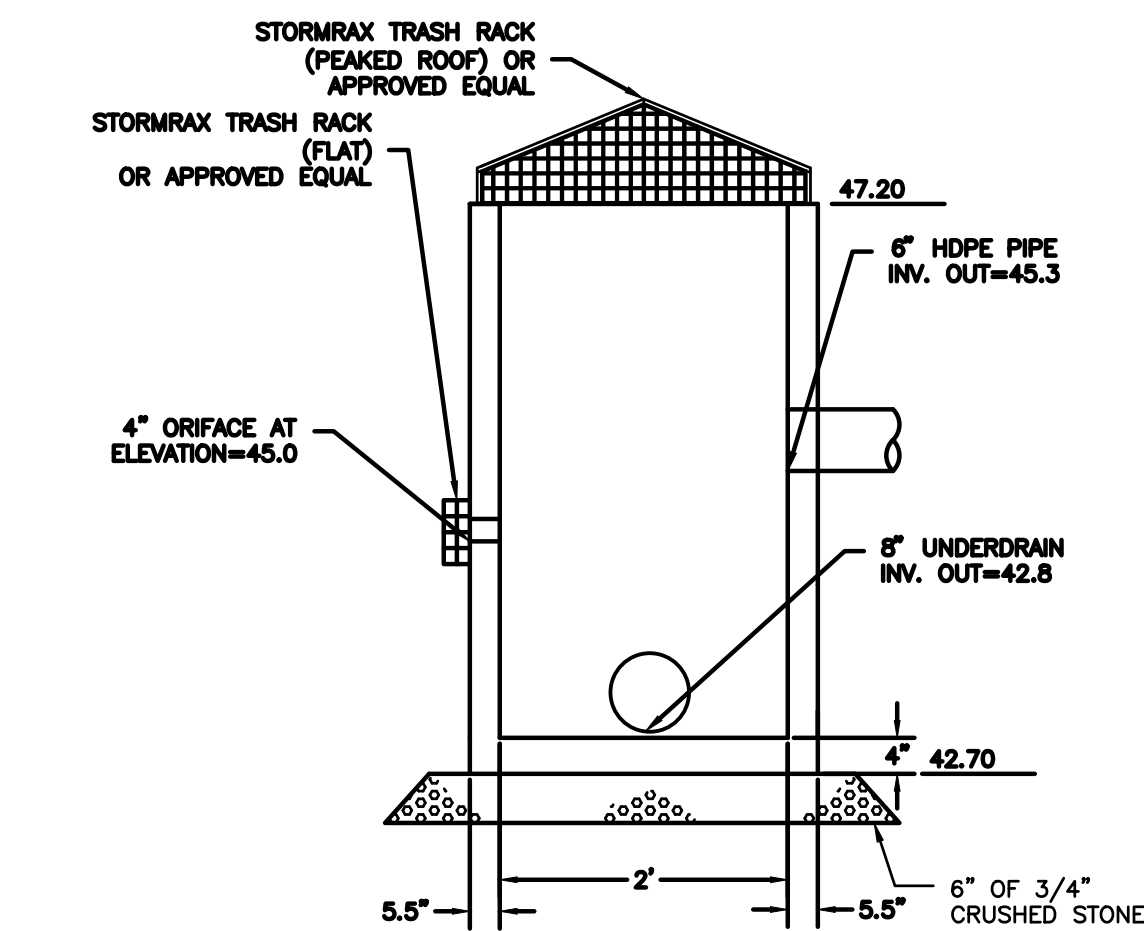
- ALL PIPE TO PIPE CONNECTIONS SHALL BE WATER-TIGHT.
- ALL DISTURBED AREAS NOT OTHERWISE PLANTED SHALL RECEIVE FOUR INCHES OF LOAM AND SEEDED PER THE CONSTRUCTION SEQUENCING AND EROSION CONTROL NOTES ON SHEET D101.

GRAVEL WETLAND MAINTENANCE:

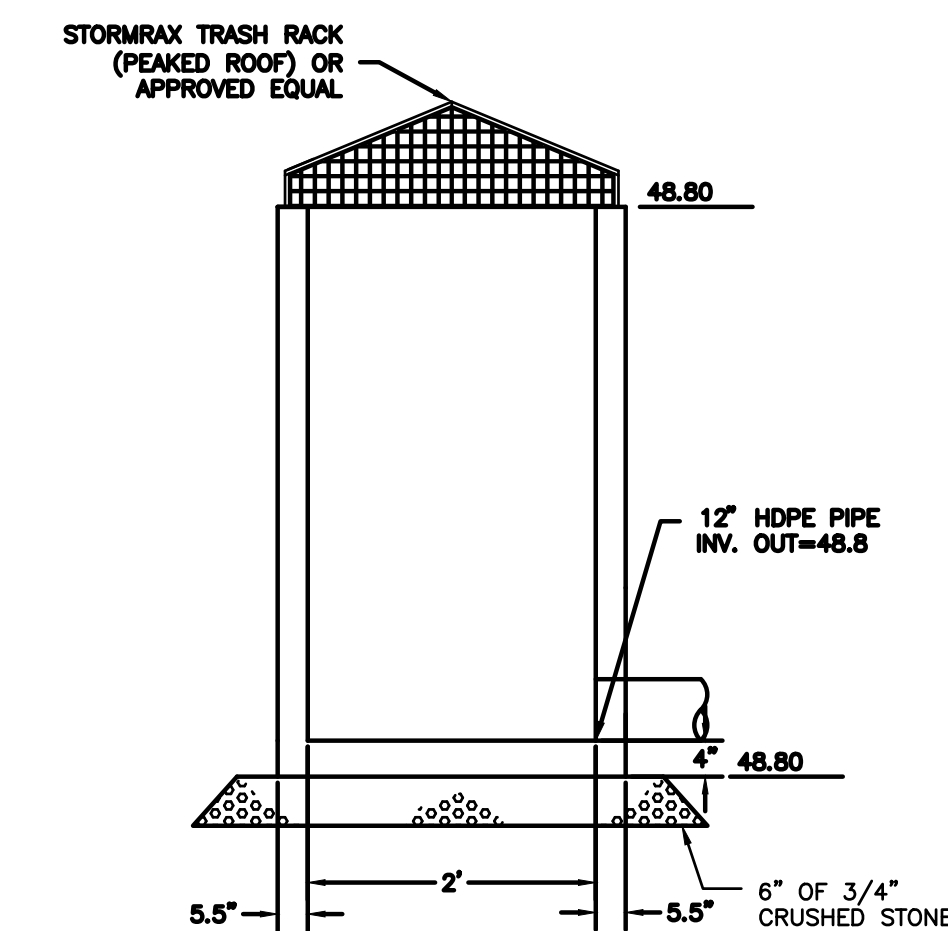
- SYSTEMS SHOULD BE INSPECTED AT LEAST TWICE ANNUALLY, AND FOLLOWING ANY RAINFALL EVENT EXCEEDING 2.5 INCHES IN A 24 HOUR PERIOD, WITH MAINTENANCE OR REHABILITATION CONDUCTED AS WARRANTED BY SUCH INSPECTION.
- TRASH AND DEBRIS SHOULD BE REMOVED AT EACH INSPECTION.
- AT LEAST ONCE ANNUALLY SYSTEM SHOULD BE INSPECTED FOR DRAINAGE TIME. IF GRAVEL WETLAND DOES NOT DRAIN WITHIN 72-HOURS FOLLOWING A RAINFALL EVENT, THEN A QUALIFIED PROFESSIONAL SHOULD ASSESS THE CONDITION OF THE FACILITY TO DETERMINE MEASURES REQUIRED TO RESTORE FILTRATION FUNCTION INCLUDING BUT NOT LIMITED TO REMOVAL AND REPLACEMENT OF WETLAND SOIL AND REPLANTING.
- VEGETATION SHOULD BE INSPECTED AT LEAST ANNUALLY, AND MAINTAINED IN HEALTHY CONDITION, INCLUDING PRUNING, REMOVAL AND REPLACEMENT OF DEAD OR DISEASED VEGETATION, AND REMOVAL OF INVASIVE SPECIES.

PLANTING NOTES:

- WETLAND SOIL MIX FOR GRAVEL WETLAND SHALL BE A SILT LOAM WITH A MINIMUM OF 15-20% ORGANIC CONTENT BY MASS. THE CLAY CONTENT SHALL NOT EXCEED 15% BY VOLUME. THE ORGANIC MATTER SHALL CONSIST OF DECIDUOUS LEAF COMPOST PROPERLY MATURED AND AT LEAST ONE YEAR OLD. THERE SHALL BE NO LEAF MULD, COMPOSTED MIXED YARD DEBRIS, OR WOOD CHIPS.
- GRAVEL WETLAND BOTTOM TO BE PLANTED WITH NEW ENGLAND WETLAND MIX AVAILABLE FROM: PIERSON NURSERIES INC. 24 BUZZELL ROAD BIDDEFORD, ME 04005 (207)-498-4992
- GRAVEL WETLAND SLOPES AND BERM TO BE PLANTED WITH SEED MIX 'C' LISTED ON SHEET D101.

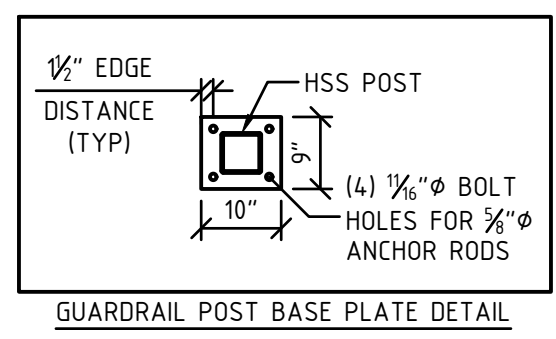


MODIFIED OUTLET CONTROL STRUCTURE FOR GRAVEL WETLAND
NTS

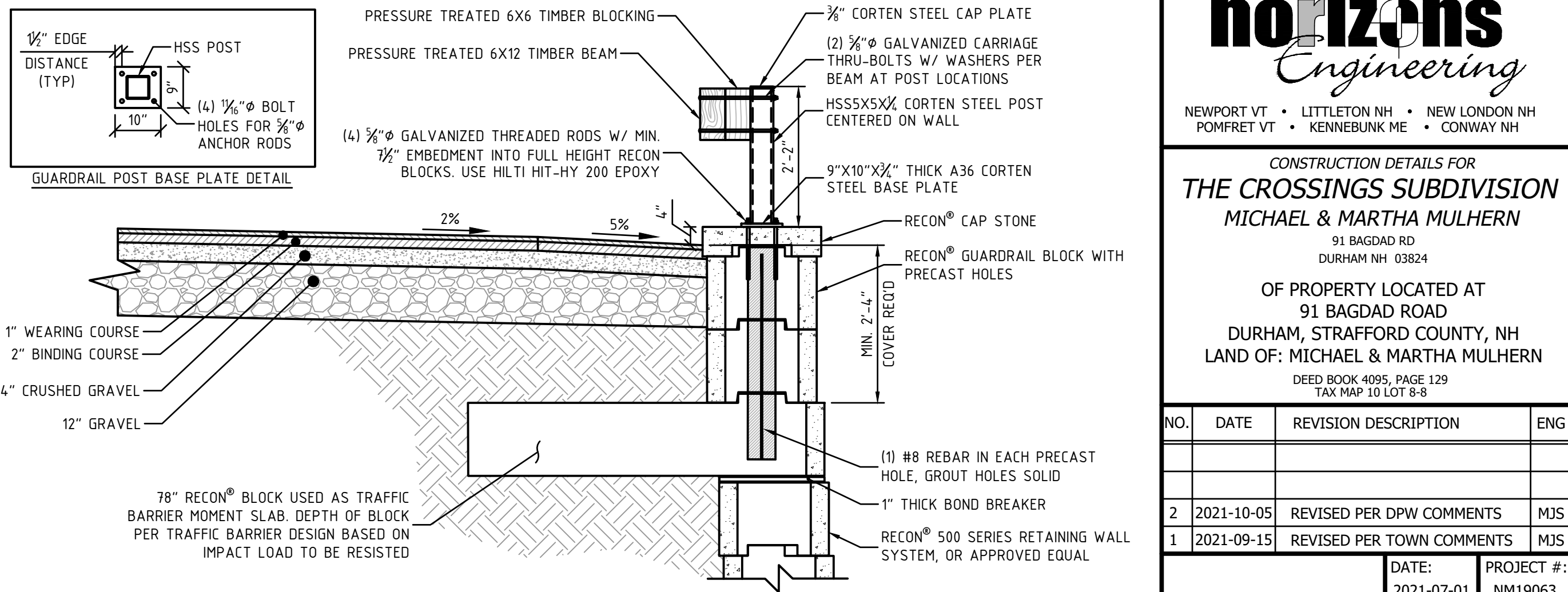


MODIFIED OUTLET CONTROL STRUCTURE FOR SEDIMENT FOREBAY
NTS

FINAL APPROVAL BY DURHAM PLANNING BOARD.
CERTIFIED BY MICHAEL BEHRENDT, TOWN PLANNER
DATE _____



GUARDRAIL POST BASE PLATE DETAIL



- NOTES:**
- DELETERIOUS MATERIALS ENCOUNTERED BELOW ROAD SHALL BE COMPLETELY REMOVED.
 - COMPACT SUBGRADE TO 95% OF STANDARD PROCTOR.

RETAINING WALL AND GUARDRAIL DETAIL
NTS

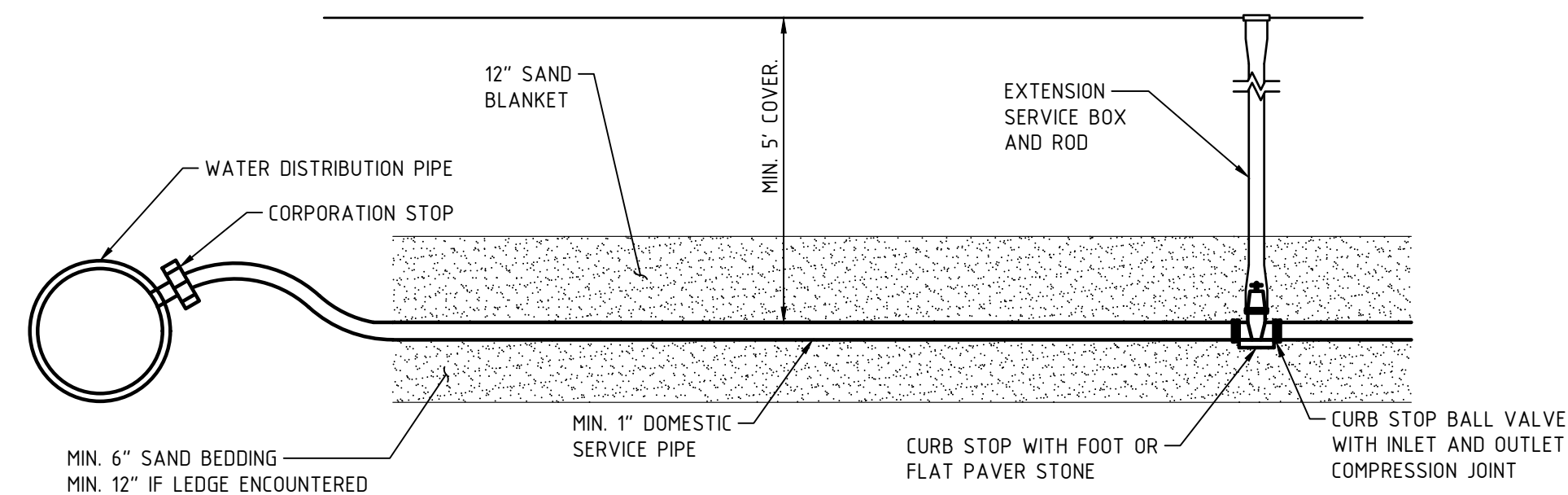


CONSTRUCTION DETAILS FOR
THE CROSSINGS SUBDIVISION
MICHAEL & MARTHA MULHERN
91 BAGDAD RD
DURHAM NH 03824
OF PROPERTY LOCATED AT
91 BAGDAD ROAD
DURHAM, STRAFFORD COUNTY, NH
LAND OF: MICHAEL & MARTHA MULHERN
DEED BOOK 4095, PAGE 129
TAX MAP 10 LOT 8-8

NO.	DATE	REVISION DESCRIPTION	ENG
2	2021-10-05	REVISED PER DPW COMMENTS	MJS
1	2021-09-15	REVISED PER TOWN COMMENTS	MJS

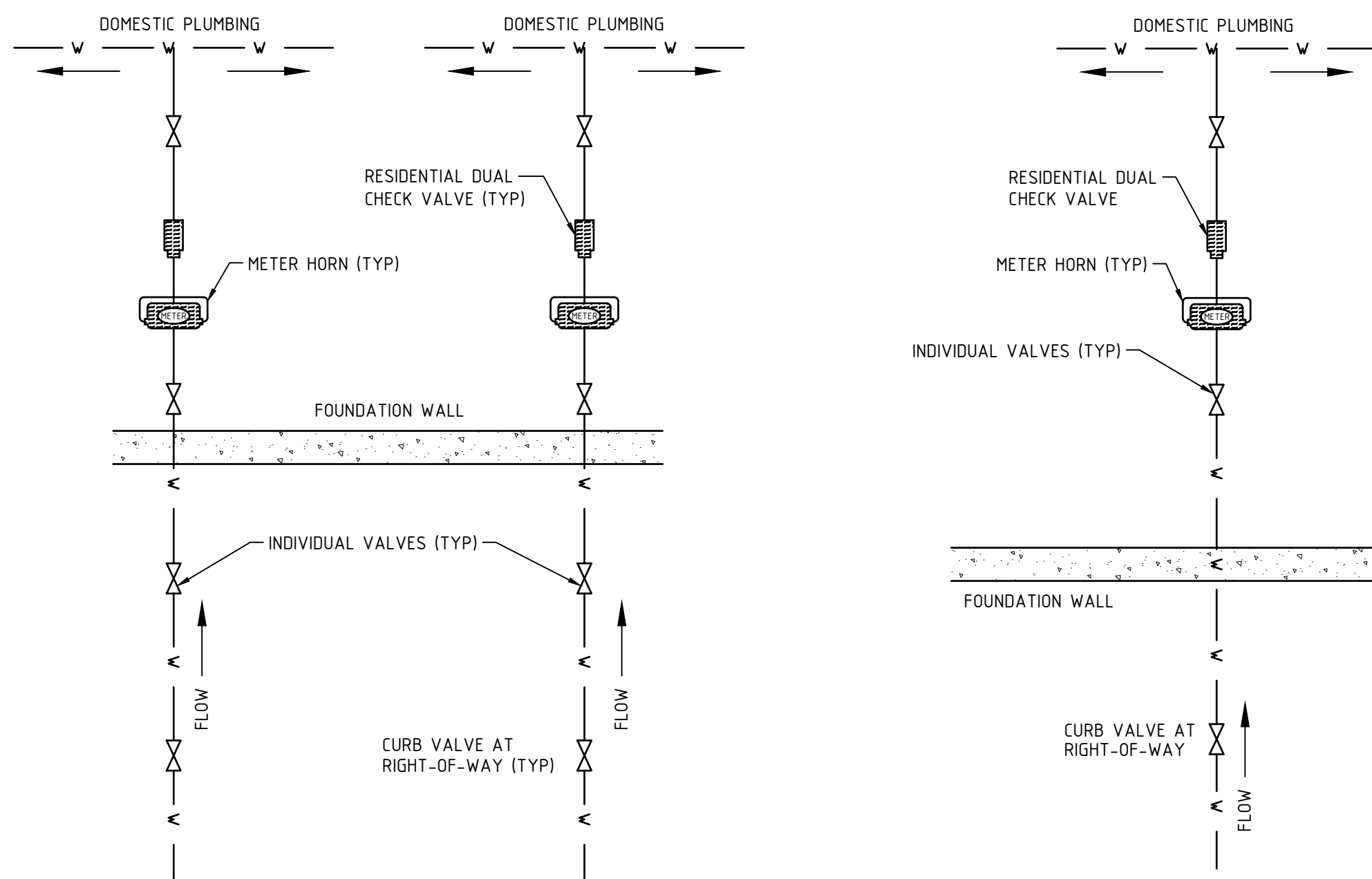
DATE:	PROJECT #:
2021-07-01	NM19063
ENGINE'D BY:	DRAWN BY:
MJS	MJS
CHECK'D BY:	ARCHIVE #:
MJS	H-

C505



TYPICAL WATER SERVICE CONNECTION
N.T.S.

- NOTES**
- COORDINATE ALL WORK WITH TOWN OF NEWMARKET.
 - ALL WORK TO BE IN ACCORDANCE WITH TOWN OF NEWMARKET SPECIFICATIONS.
 - ALL TAPS SHALL BE MADE AT 2 AND 10 O'CLOCK (APPROX.).
 - NO COUPLINGS SHALL BE ALLOWED IN ROADWAY WITHOUT PRIOR APPROVAL BY ENGINEER.

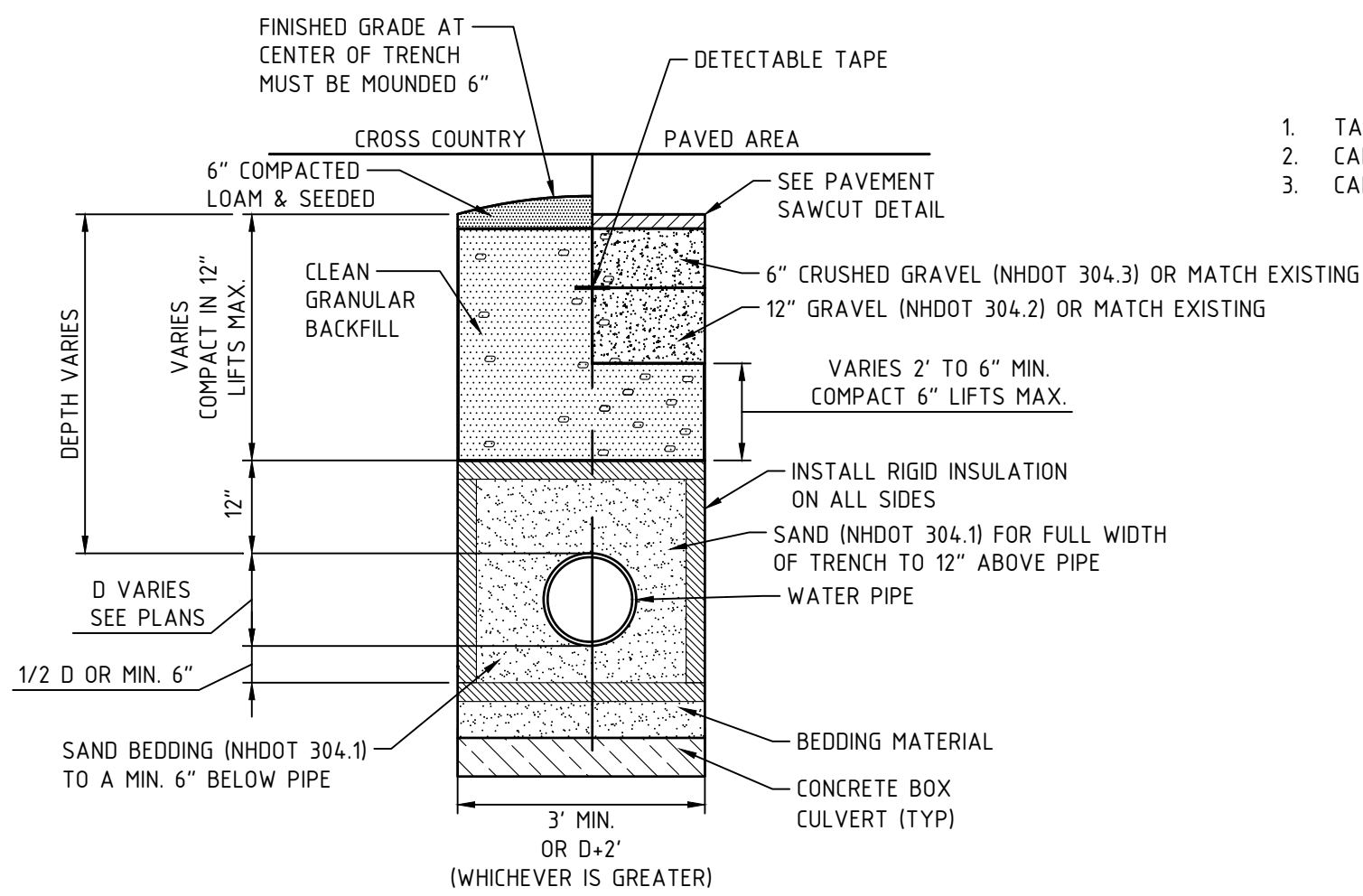


DUAL RESIDENTIAL WATER METER INSTALLATION
N.T.S.

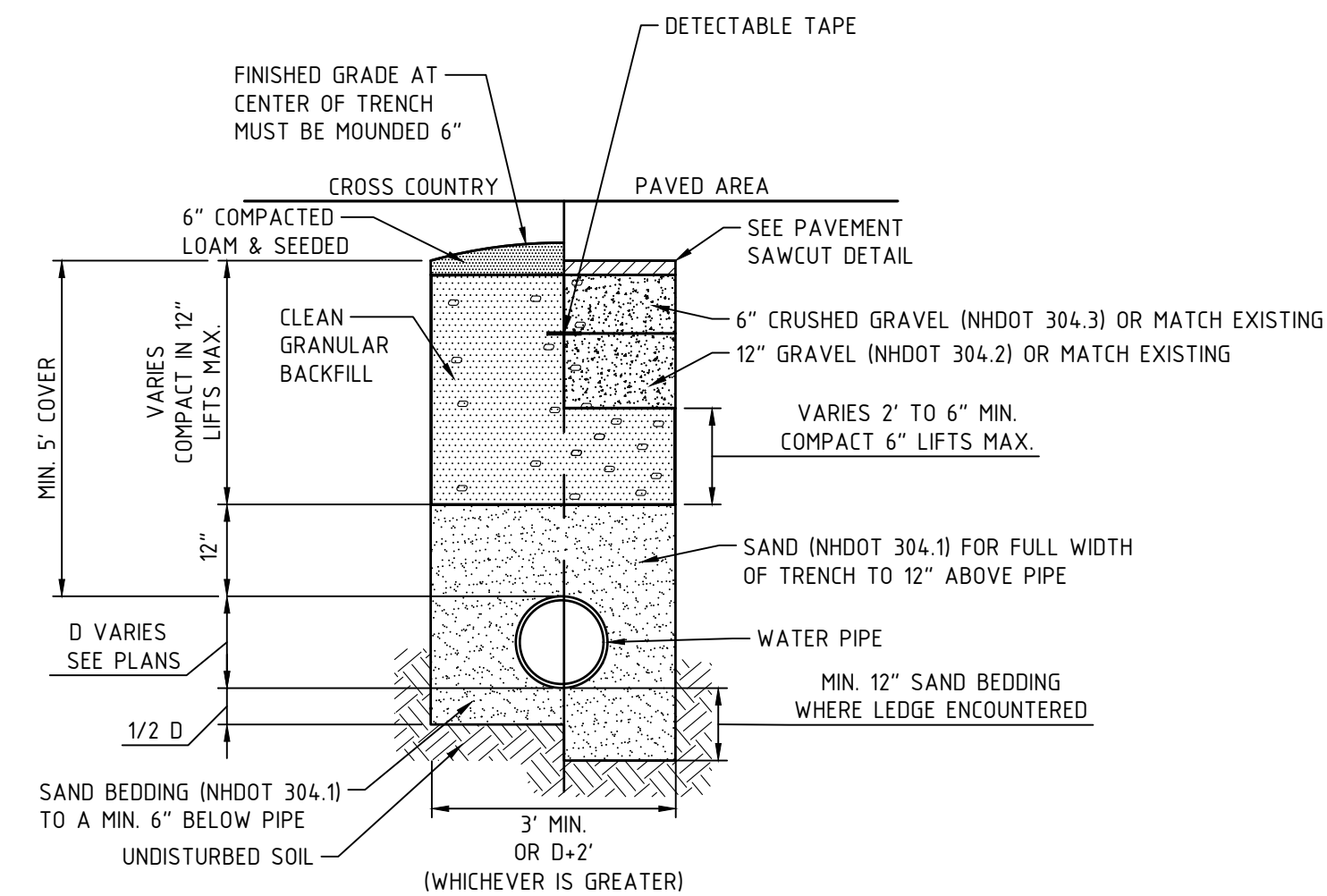
SINGLE FAMILY WATER METER INSTALLATION
N.T.S.

NOTE: ALL METERS SUPPLIED BY TOWN OF DURHAM GENERAL SERVICES DEPARTMENT

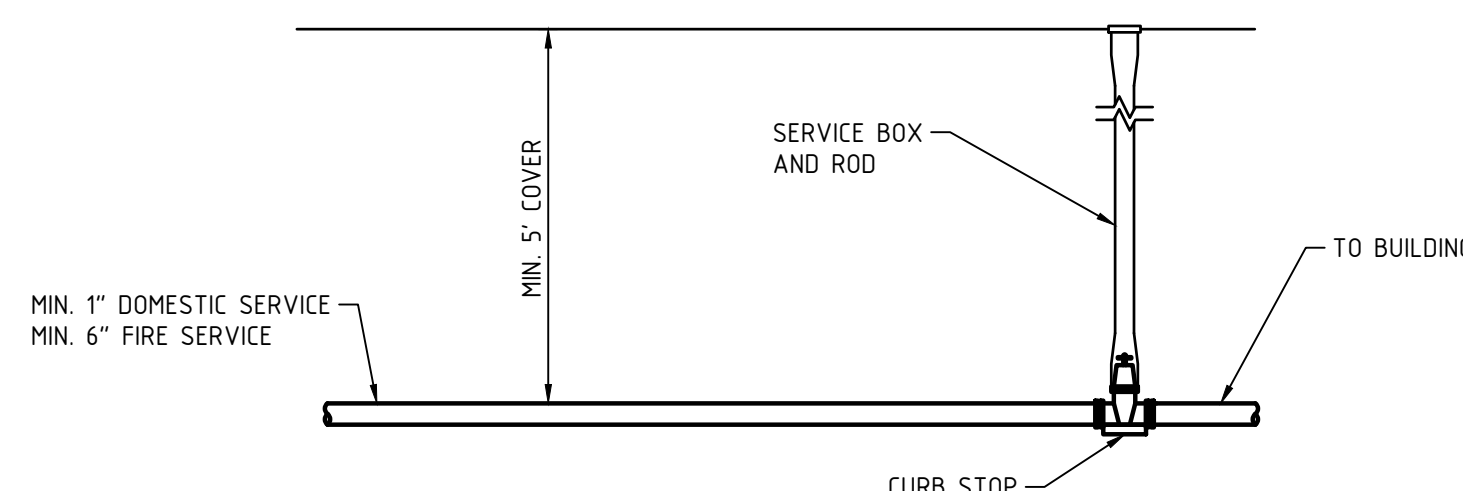
NOTE: ALL METERS SUPPLIED BY TOWN OF DURHAM GENERAL SERVICES DEPARTMENT



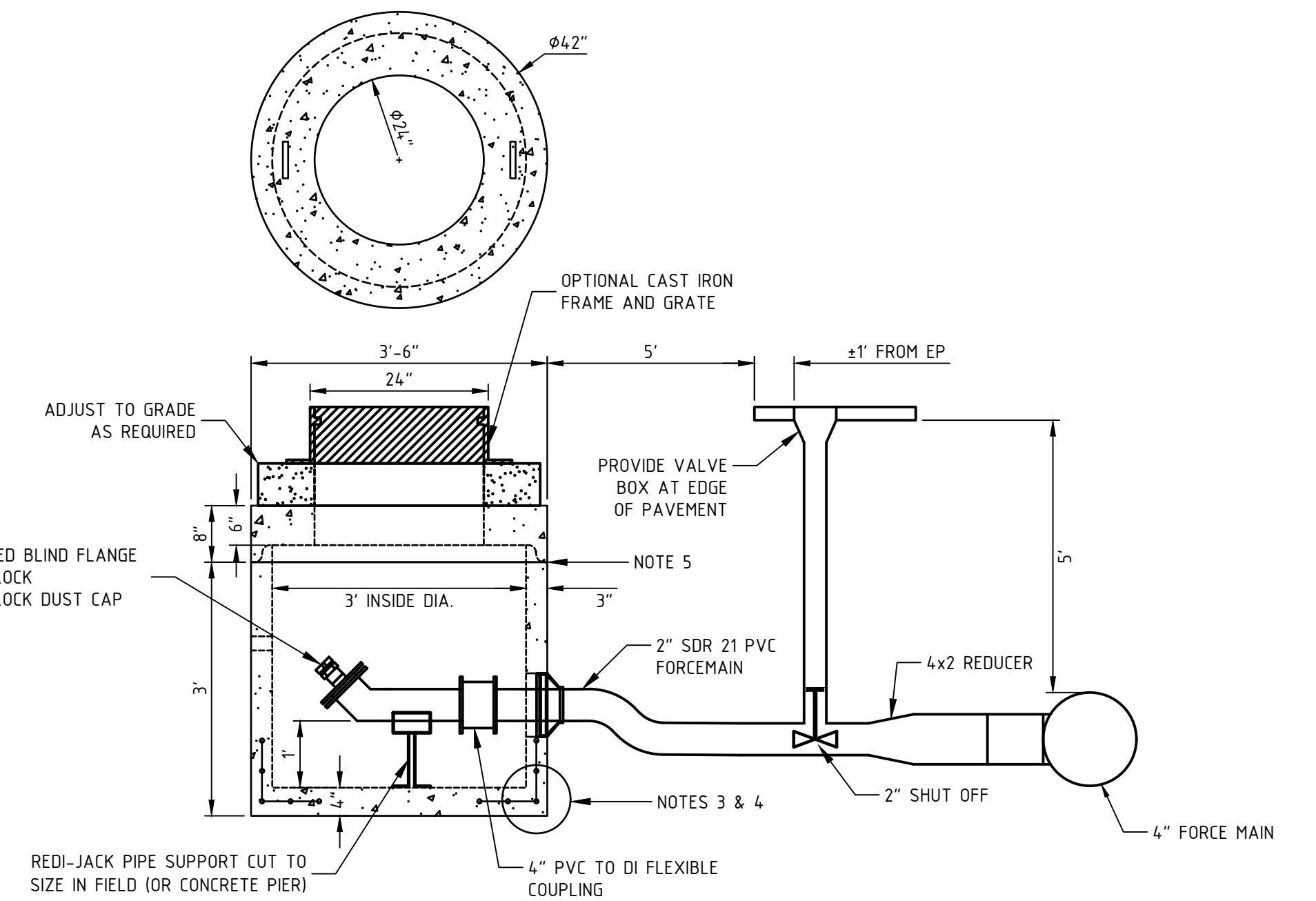
WATER SUPPLY TRENCH AT CULVERT CROSSING
N.T.S.



STANDARD WATER SUPPLY TRENCH
N.T.S.



TYPICAL WATER SHUTOFF CONNECTION
N.T.S.

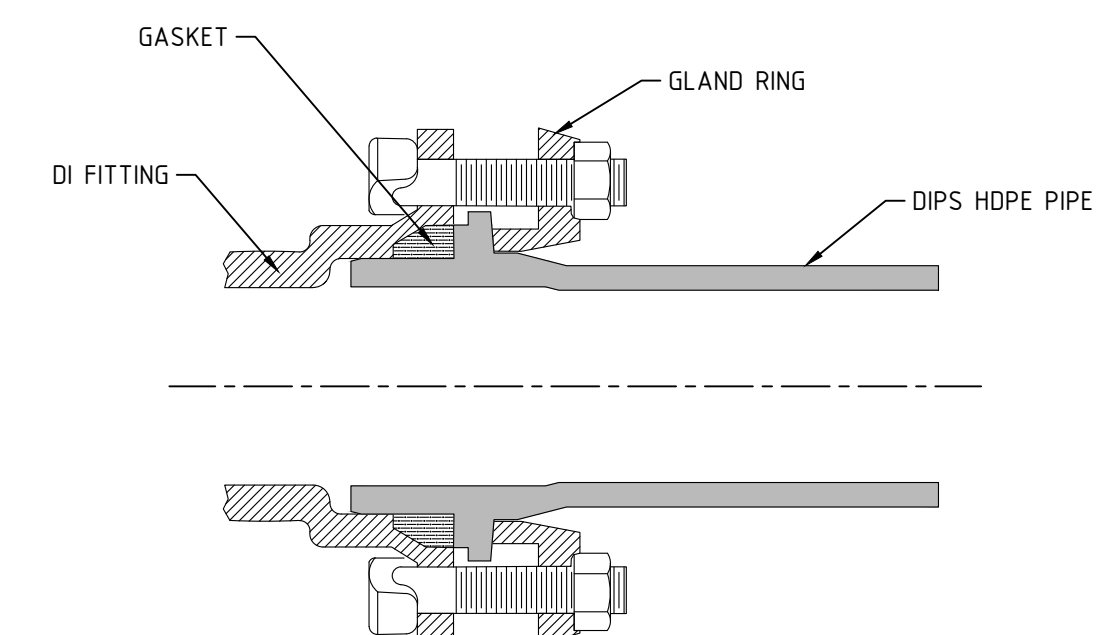


TYPICAL 4' Ø FORCEMAIN CLEANOUT MANHOLE
N.T.S.

GENERAL NOTES

- CONCRETE: FC = 4,000 PSI @ 28 DAYS MINIMUM, TYPE III CEMENT
- HS-20 DESIGN LOADING CONFORMS TO LATEST SPECIFICATIONS
ASTM C478, AASHTO M199 PRECAST REINFORCED CONCRETE MANHOLE SECTIONS
- ONE POUR MONOLITHIC BASE SECTION
- STEEL REINFORCEMENT CONFORMS TO LATEST ASTM SPECIFICATION:
ASTM A-615, GRADE 60 BLACK DEFORMED BARS
ASTM A-185 WELDED WIRE FABRIC
- 0.12 SQ. IN./LINEAL FT. AND 0.12 SQ. IN.(BOTH WAYS) BASE BOTTOM
- BUTYL RUBBER JOINT SEALANT PROVIDED CONFORMS TO ASTM C-990 AND FEDERAL SPEC SS-S-210A
- 94 GALLONS/VF
- HOLES & ELEVATIONS TBD
- SECTIONS AVAILABLE IN INCREMENTS OF 6"
- BOOTED PIPE CONNECTIONS (IF USED) CONFORM TO ASTM C-923.
- PLASTIC MANHOLE STEPS (IF REQUIRED) ARE STEEL REINFORCED CONFORMING TO ASTM C-478
- ASPHALTIC EXTERIOR COATING AVAILABLE.
- ALL INTERIOR PIPING AND VALVES TO BE CONFIRMED WITH DESIGN ENGINEER PRIOR TO START OF PROJECT.
- MANHOLES TO BE SET ON MINIMUM 6" COMPACTED CRUSHED STONE (3/4")
- FOR SALES CONTACT:

PHOENIX PRECAST PRODUCTS
77 REGIONAL DRIVE
CONCORD, NH 03301
1-800-639-2199



NOTES

- FITTINGS MUST COMPLY WITH AWWA C153/A215.3.
- HDPE DISTRIBUTION PIPES MUST BE DIPS.
- INSTALL FITTING FOLLOWING MANUFACTURERS INSTRUCTIONS.
- HDPE PIPE STIFFENERS MUST BE MADE OF 316 STAINLESS STEEL.

PE PIPE TO MECHANICAL JOINT CONNECTION
N.T.S.



NEWPORT VT • LITTLETON NH • NEW LONDON NH
POMFRET VT • KENNEBUNK ME • CONWAY NH

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C506