

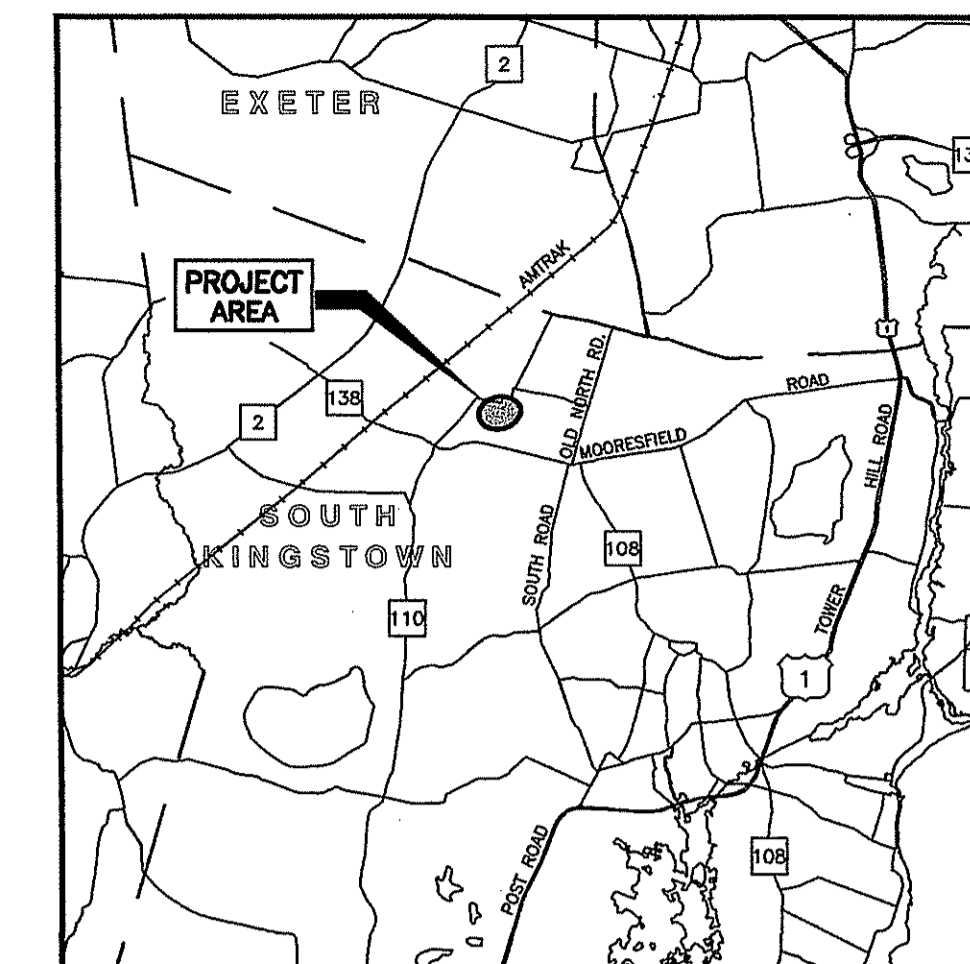
INDEX

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UNIVERSITY OF RHODE ISLAND

Office of Capital Projects

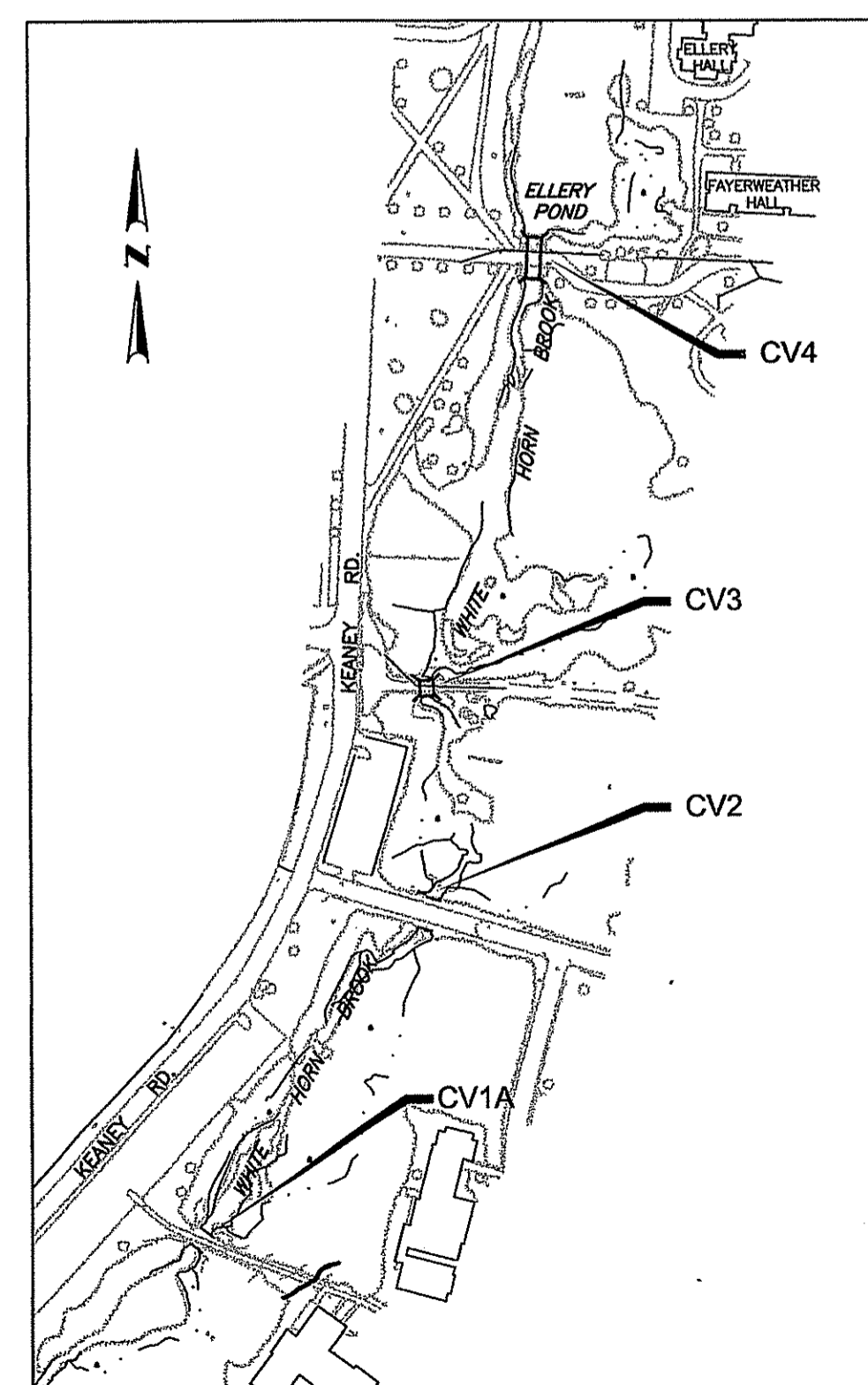
**PLANS AND DETAILS OF PROPOSED
CULVERT REPLACEMENT
OF
CULVERTS CV1A, CV2, CV3 and CV4
WHITE HORN BROOK
KINGSTON, RHODE ISLAND**



LOCATION MAP
SCALE: 1" = 2 Miles



**UNIVERSITY OF
Rhode Island**



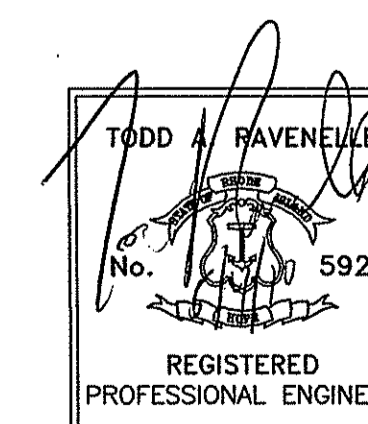
LAYOUT PLAN
SCALE: 1" = 200'

Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

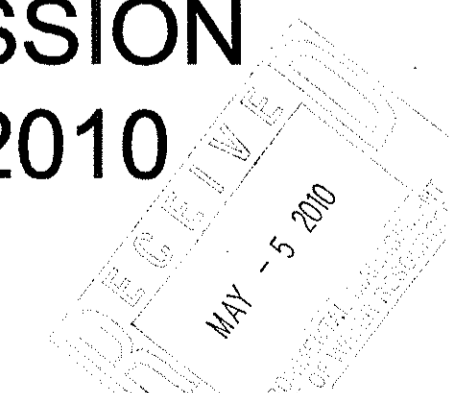
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUN - 3 2010 FILE # 10-2040
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Carey

**WETLAND PERMIT
SUBMISSION
MAY 2010**



Number of Sheet 1
Total Sheets 12



LEGEND

- 2.3.0 PRECAST CONCRETE FLARED END SECTION, R.I. STD. 2.3.0
- 4.2.0 PRECAST 4'-0" ROUND MANHOLE, R.I. STD. 4.2.0
- 6.2.1 HEAVY DUTY ROUND FRAME AND COVER, R.I. STD. 6.2.1
- 7.5.1 BITUMINOUS BERM, R.I. STD. 7.5.1
- 8.3.0 RIP-RAP DITCH, R.I. STD. 8.3.0
- 8.4.0 PAVED WATERWAY, R.I. STD. 8.4.0
- 9.1.0 BALED HAY EROSION CHECK, R.I. STD. 9.1.0
- 9.3.0 BALED HAY DITCH EROSION CHECK AND SILT FENCE COMBINED, R.I. STD. 9.3.0
- 9.7.0 DEWATERING BASIN, R.I. STD. 9.7.0
- DH REMOVE AND DISPOSE HEADWALL
- DP REMOVE AND DISPOSE PIPE
- LS 4" LOAM AND SEED
- LOD LIMIT OF DISTURBANCE
- NWVB FURNISH AND INSTALL NEW WATER GATE VALVE AND BOX
- RRP RIP RAP PAD (SEE DETAIL)
- RD REMOVE AND DISPOSE (ITEM)
- TEP TIE EXISTING PIPE INTO NEW STRUCTURE

GENERAL NOTES

1. REFERENCE IS MADE TO THE RIDOT 2004 EDITION "STANDARDS AND SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION" INCLUDING ALL APPROVED COMPILATION OF SPECIFICATIONS; AND RIDOT 1998 "STANDARD DETAILS" INCLUDING ALL REVISIONS. ALL PROJECT SITE IMPROVEMENTS SHALL CONFORM TO THESE REGULATIONS AND THE SUB-REFERENCES INCORPORATED THEREIN.
2. EXISTING UTILITIES HAVE BEEN PLOTTED FROM BEST AVAILABLE DATA AND ARE APPROXIMATE ONLY. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF ALL EXISTING DRAINAGE AND UTILITIES BOTH UNDERGROUND AND OVERHEAD BEFORE EXCAVATION BEGINS IN ACCORDANCE WITH THE "DIG SAFE LAW" ENACTED BY R.I. LEGISLATURE BILL NO. 79S-291, WHICH BECAME EFFECTIVE JULY 1, 1979 AND BY CONTACTING THE INDIVIDUAL UTILITY COMPANIES. EXCAVATION SHALL BE IN ACCORDANCE WITH ALL STATUTES, ORDINANCES, RULES AND REGULATIONS OF ANY APPLICABLE CITY, TOWN, STATE OR FEDERAL AGENCY. THE CONTRACTOR SHOULD UNDERSTAND THAT NOT ALL UTILITIES SUBSCRIBE TO THE DIG SAFE PROGRAM. IT IS THE CONTRACTOR'S RESPONSIBILITY TO NOTIFY ALL UTILITY COMPANIES AND ENSURE THAT ALL UTILITIES HAVE BEEN MARKED PRIOR TO COMMENCING THEIR WORK. ANY DAMAGE TO EXISTING UTILITIES MARKED IN THE FIELD, OR AS A RESULT OF FAILING TO CONTACT THE APPROPRIATE UTILITY COMPANY, SHALL BE REPAIRED OR REPLACED AT NO COST TO THE OWNER.
3. THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATION IN A DRY CONDITION. NO SEPARATE PAYMENT OR ALLOWANCE SHALL BE MADE FOR DEWATERING.
4. FILL NEEDED FOR THE ROADWAY EMBANKMENT SHALL MEET SECTION M.01.01 COMMON BORROW OF THE RIDOT STANDARDS AND SPECIFICATIONS, 2004 EDITION UNLESS OTHERWISE NOTED.
5. ALL GRASSED AREAS DISTURBED BY THE CONTRACTOR SHALL BE LOAMED AND SEEDDED OR SODDED IF SO DIRECTED BY THE ENGINEER AND RETURNED TO THEIR ORIGINAL CONDITION. ALL OTHER VEGETATED OR WOODED AREAS DISTURBED SHALL BE LOAMED AND SEEDDED.
6. ALL EXISTING CURBING, SIDEWALK AND OTHER PAVEMENT DISTURBED BY THE CONTRACTOR SHALL BE REPLACED AND RESTORED, IN KIND AT NO ADDITIONAL COST TO THE OWNER.
7. ALL EXISTING PIPE, SUBSURFACE STRUCTURES, PAVEMENTS, EXCESS EXCAVATED MATERIALS AND MISCELLANEOUS MATERIALS REMOVED DURING THE COURSE OF WORK OF INSTALLING DRAINAGE, WATER AND SEWER PIPING SHALL BE LEGALLY DISPOSED OF OFF THE PROJECT SITE BY THE CONTRACTOR.
8. CONTINUOUS DUST CONTROL, USING CALCIUM CHLORIDE OR OTHER APPROVED METHODS, SHALL BE PROVIDED BY THE CONTRACTOR FOR ALL EARTH STOCKPILES, EARTH PILED ALONG EXCAVATIONS AND SURFACES OF BACK FILLED TRENCHES, AS DIRECTED AND SPECIFIED BY THE ENGINEER.
9. WETLAND BOUNDARIES WERE DELINEATED BY APPLIED BIO-SYSTEMS OF KINGSTON, RHODE ISLAND.
10. THE CONTRACTOR SHALL GIVE NOTICES AND COMPLY WITH ALL PERMITS, LAWS, ORDINANCES, RULES AND REGULATIONS BEARING ON THE CONDUCT OF THE WORK AS DRAWN AND SPECIFIED.
11. ALL SOIL EROSION CONTROL MEASURES TO BE USED ON THE PROJECT ARE INDICATED ON THE PLANS. EROSION CONTROL MEASURES SHALL BE IN CONFORMANCE WITH THE PROVISIONS OF THE RHODE ISLAND SOIL EROSION & SEDIMENT CONTROL HANDBOOK.
12. PRIOR TO COMMENCEMENT OF CONSTRUCTION ACTIVITIES, A CONTINUOUS UNINTERRUPTED LINE OF STAKED HAY BALES OR SILT FENCING SHALL BE INSTALLED IN LOCATIONS SHOWN ON THE PLANS AND MAINTAINED IN EFFECTIVE CONDITION UNTIL DISTURBED AREAS HAVE BEEN STABILIZED WITH VEGETATION. FOLLOWING SUCCESSFUL STABILIZATION OF DISTURBED AREAS, ALL SILT FENCING AND HAY BALES SHALL BE REMOVED. PRIOR TO REMOVAL OF THE SILT FENCING AND HAY BALES, ALL ACCUMULATED TRAPPED SEDIMENTS MUST BE REMOVED TO A SUITABLE UPLAND SITE.
13. UNTIL VEGETATIVE COVER IS ESTABLISHED AND DISTURBED AREAS ARE STABILIZED, ACCUMULATED SEDIMENTS SHALL BE REMOVED AS SOON AS SEDIMENTS HAVE ACCUMULATED TO A DEPTH OF SIX (6) INCHES.
14. THE LIMITS OF ALL CLEARING, GRADING AND DISTURBANCE SHALL BE KEPT TO A MINIMUM WITHIN THE PROPOSED AREA OF CONSTRUCTION. ALL AREAS OUTSIDE THE LIMITS OF DISTURBANCE SHALL BE TOTALLY UNDISTURBED.
15. SOIL STOCKPILES AND DEPOSITION AREAS FOR CONSTRUCTION MATERIALS SHALL BE LOCATED OUTSIDE WETLAND AREAS AND ASSOCIATED BUFFERS AND SHALL BE SURROUNDED BY STAKED HAY BALES.
16. TEMPORARY VEGETATION AND/OR HAY MULCHING SHALL BE USED TO PROTECT BARE AREAS AND STOCKPILES FROM EROSION DURING CONSTRUCTION. BARE EARTH SLOPES AND SOIL STOCKPILES SHALL BE KEPT TO A MINIMUM AT ALL TIMES. TEMPORARY SEEDING OR MULCHING SHALL BE INSTALLED ON ALL BARE EARTH PRIOR TO ENDING CONSTRUCTION FOR WINTER AND AS OTHERWISE NECESSARY. AS SOON AS WEATHER PERMITS AFTER THE COMPLETION OF FINE GRADING, ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED WITH PLACEMENT OF LOAM AND THE SPECIFIED GRASS SEED MIXTURE, AND COVERED WITH A MAT OF LOOSE HAY PRIOR TO THE COMPLETION OF THE PROJECT. APPROVED SOD SHALL BE USED IN LIEU OF SEEDING AS DIRECTED BY THE ENGINEER. AREAS WHERE WORK IS TO CEASE FOR 14 DAYS AND NOT SET TO RESUME WITHIN 21 DAYS SHALL RECEIVE TEMPORARY VEGETATIVE COVER AND BE COMPLETELY COVERED WITH LOOSE HAY MULCH.
17. PLANTING OF GRASS SHALL BE ACCOMPLISHED BY THE CONTRACTOR AS EARLY AS POSSIBLE UPON COMPLETION OF GRADING AND CONSTRUCTION.
18. ALL DISTURBED AREAS NOT TO BE COVERED WITH PAVEMENT WITHIN THE PROJECT WILL RECEIVE PERMANENT VEGETATION. DISTURBED AREAS WILL BE FINE GRADED AND RECEIVE 4 INCHES OF TOP SOIL.

EROSION AND SEDIMENT CONTROL NOTES

1. DENUDED SLOPES SHALL NOT BE UNATTENDED OR EXPOSED IN AREAS WHERE WORK IS TO CEASE FOR 14 DAYS AND NOT SET TO RESUME WITHIN 21 DAYS OR THE INACTIVE WINTER SEASON.
2. ALL DISTURBED SLOPES EITHER NEWLY CREATED OR EXPOSED PRIOR TO OCTOBER 15, SHALL BE SEEDDED OR PROTECTED BY THAT DATE FOR ANY WORK COMPLETED DURING EACH CONSTRUCTION YEAR.
3. THE TOPSOIL SHALL HAVE A SANDY LOAM TEXTURE RELATIVELY FREE OF SUBSOIL MATERIAL, STONES, ROOTS, LUMPS OF SOIL, TREE LIMBS, TRASH OR CONSTRUCTION DEBRIS AND SHALL CONFORM WITH R.I. STANDARD SPECIFICATION M.18.01
4. THE SEED MIX SHALL BE INOCULATED WITHIN 24 HOURS, BEFORE MIXING AND PLANTING, WITH APPROPRIATE INOCULUM FOR EACH VARIETY.
5. THE DESIGN MIX SHALL BE COMPRISED OF THE FOLLOWING:
PERMANENT SEEDING MIXTURES:
A. - UPLAND AREA:
MIXTURE % BY WT. SEEDING DATES
RED FESCUE 70 APRIL 1 - JUNE 13
KENTUCKY BLUEGRASS 15 AUG. 15 - OCT. 15
COLONIAL BENTGRASS 5
PERENNIAL RYEGRASS 10
TOTAL 100 LBS./ ACRE
B. - WETLAND AREA:
MIXTURE POUNDS PER ACRE SEEDING DATES
REED CANARY GRASS 20 MAY 1 - JUNE 15
LADING WHITE CLOVER 1 AUG. 15 - SEPT. 30
TOTAL 21 LBS./ ACRE
6. TEMPORARY TREATMENTS SHALL CONSIST OF A HAY, STRAW, OR FIBER MULCH OR PROTECTIVE COVERS SUCH AS A MAT OR FIBER LINING (BURLAP, JUTE, FIBERGLASS NETTING, EXCELSIOR BLANKETS) THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS ORDERED BY THE ENGINEER.
7. HAY OR STRAW APPLICATIONS SHOULD BE IN THE AMOUNT OF 3,000 - 4,000 LBS/ACRE.
8. ALL HAY BALES, SILT FENCES OR TEMPORARY PROTECTION SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED AND THE PROJECT RECEIVES A FAVORABLE APPROVAL FOR FINAL ACCEPTANCE FROM THE ENGINEER. IF NEEDED TEMPORARY SEEDING CAN HELP TO MINIMIZE EROSION. A TEMPORARY SEEDING GUIDE MUST BE INCLUDED AS A REFERENCE. THE FOLLOWING SPECIES ARE RECOMMENDED:
SPECIES LBS./AC. LBS./1,000 SQ.FT. SEEDING DATE
ANNUAL RYEGRASS 40-60 1.0-1.5 3/1 - 6/1
PERENNIAL RYEGRASS 40-60 1.0-1.5 3/1 - 6/1
SUDAN GRASS 30-40 0.7-1.0 5/15 - 8/15
MILLET 30-40 0.7-1.0 5/15 - 8/15
WINTER RYE 120 3.0 4/15 - 6/15
OATS 86-120 0.5-5.0 3/1 - 6/15
WEEPING COVERGRASS 5-20 0.5-5.0 5/1 - 7/1
9. THE CONTRACTOR MUST REPAIR AND OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE YEAR AND HE SHALL DO SO AT NO ADDITIONAL EXPENSE.
10. THE NORMAL ACCEPTABLE SEASONAL SEEDING DATES ARE APRIL 1ST - JUNE 1ST AND AUGUST 15TH TO OCTOBER 15TH.
11. STABILIZATION OF ONE FORM OR ANOTHER AS DESCRIBED ABOVE SHALL BE ACHIEVED WITHIN 15 DAYS OF FINAL GRADING.
12. STOCKPILES OF TOPSOILS SHALL NOT BE LOCATED NEAR WATERWAYS. THEY SHALL HAVE SIDE SLOPES NO GREATER THAN 30% AND STOCKPILES SHALL ALSO BE SEEDDED AND OR STABILIZED.
13. SLOPES SURFACES 3:1 OR STEEPER WHICH ARE DISTURBED DURING CONSTRUCTION SHALL BE COVERED WITH JUTE MESH OR EXCELSIOR MATTING TO AID IN STABILIZING THE SLOPES AND PREVENTING EROSION.
14. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
15. EROSION CONTROL DEVICES SHOULD INSPECTED WEEKLY AND AFTER RAINFALL EVENTS OF $\geq 1/2"$ IN A 24-HOUR PERIOD. MAINTENANCE AND REPAIRS SHALL BE COMPLETED WITHIN 24 HOURS OF THE INSPECTION WHEN NECESSARY.
16. IMMEDIATELY UPON COMPLETION OF THE CLEARING AND GRUBBING OPERATION AND PRIOR TO ANY ROUGH GRADING, TEMPORARY HAYBALES OR SILT FENCES SHALL BE PLACED AS INDICATED ON THE PLANS.
17. ALL EROSION AND SEDIMENTATION CONTROL STRUCTURES SHALL BE PERIODICALLY MAINTAINED AS PER THE RESPECTIVE PROGRAMS DURING THE CONSTRUCTION.

SEQUENCE OF CONSTRUCTION NOTES:

- CULVERT CV1A**
1. WORK WITHIN THE WATERWAY SHALL TAKE PLACE ONLY DURING THE LOW FLOW PERIOD BETWEEN JUNE 30 AND OCTOBER 30.
 2. PRIOR TO THE START OF WORK THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROLS AT THE LOCATIONS INDICATED ON THE PLANS.
 3. VERIFY THE LOCATION OF THE EXISTING SEWER MAIN WITHIN THE WORK CORRIDOR TO BE RELOCATED.
 4. RELOCATE SEWER MAIN AS INDICATED ON THE PLANS.
 5. EXCAVATE AS NECESSARY TO INSTALL TRESTLE PILES.
 6. UTILIZE SAND BAGS AND DIRECT BROOK FLOW INTO ONE OF THE EXISTING 24-INCH CULVERTS. THE CULVERT WILL BE UTILIZED FOR TEMPORARY BY-PASS.
 7. REMOVE AND DISPOSE TWO OF THE EXISTING 24-INCH CULVERTS. EXCAVATE AREA TO THE PROPOSED GRADES INDICATED ON THE PLANS
 8. THE REMAINING CULVERT SHALL BE UTILIZED AS A TEMPORARY BYPASS. GRADE AND STABILIZE SURFACE AREA WITH RIPRAP WITHIN AREA OF CULVERT REMOVAL AS INDICATED ON THE PLANS.
 9. EXCAVATE AREAS UNDER TRESTLE TO PROPOSED GRADE. MAINTAIN A DRY CONSTRUCTION ACCESS ROAD FOR INSTALLATION OF TRESTLE SUPERSTRUCTURE. DO NOT DISTURB NEW PILING DURING EXCAVATIONS.
 10. INSTALL TRESTLE SUPERSTRUCTURE.
 11. EXCAVATE AND REMOVE REMAINING FILL EMBANKMENT WITHIN WORK AREA AND REMOVE 24-INCH RCP TEMPORARY BYPASS. STABILIZE SURFACE WITH RIP-RAP AND LOAM AND SEED AS INDICATED ON THE PLANS.
 12. REMOVE EROSION AND SEDIMENT CONTROL DEVICES WHEN AREA HAS FULLY STABILIZED.

CULVERT CV2

1. WORK WITHIN THE WATERWAY SHALL TAKE PLACE ONLY DURING THE LOW FLOW PERIOD BETWEEN JUNE 30 AND OCTOBER 30.
2. PRIOR TO THE START OF WORK THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROLS AT THE LOCATIONS INDICATED ON THE PLANS.
3. VERIFY THE LOCATION OF THE EXISTING SEWER MAIN AND GAS MAIN WITHIN THE WORK CORRIDOR TO BE RELOCATED.
4. RELOCATE GAS MAIN AS REQUIRED.
5. UTILIZE SAND BAGS AND DIRECT BROOK FLOW INTO EITHER THE WESTERLY OR EASTERLY 24-INCH CULVERT. THE CULVERT WILL BE UTILIZED FOR TEMPORARY BY-PASS.
6. REMOVE AND DISPOSE THE TWO REMAINING CULVERTS AND INSTALL NEW BOX CULVERT.
7. UTILIZE SAND BAGS REDIRECT BROOK FLOW INTO NEW BOX CULVERT AND REMOVE THE REMAINING 24-INCH CULVERT.
8. EXCAVATE AND INSTALL THE SECOND BOX CULVERT
9. COMPLETE CONSTRUCTION OF BOX CULVERTS AND WALLS
10. EXCAVATE AND RE-GRADE AS INDICATED ON THE PLANS.
11. STABILIZE SURFACE WITH RIP-RAP, AND LOAM AND SEED AS INDICATED ON THE PLANS.
12. REMOVE EROSION AND SEDIMENT CONTROL DEVICES WHEN AREA HAS FULLY STABILIZED.

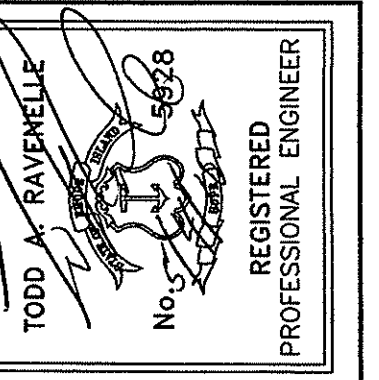
CULVERT CV3

1. WORK WITHIN THE WATERWAY SHALL TAKE PLACE ONLY DURING THE LOW FLOW PERIOD BETWEEN JUNE 30 AND OCTOBER 30.
2. PRIOR TO THE START OF WORK THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROLS AT THE LOCATIONS INDICATED ON THE PLANS.
3. VERIFY THE LOCATION OF THE EXISTING WATER MAIN WITHIN THE WORK CORRIDOR TO BE RELOCATED.
4. RELOCATE WATER MAIN AS INDICATED ON THE PLANS.
5. INSTALL TEMPORARY BYPASS PIPE TO REDIRECT BROOK FLOW AROUND EXISTING CULVERTS AS INDICATED ON THE PLANS. REDIRECT FLOW UTILIZING SAND BAGS.
6. EXCAVATE AND REMOVE EXISTING CULVERTS, EXCAVATE AND INSTALL THE NEW BOX CULVERT, COMPLETE CONSTRUCTION OF BOX CULVERTS AND WALLS
7. EXCAVATE AND RE-GRADE AS INDICATED ON THE PLANS.
8. STABILIZE SURFACE WITH RIP-RAP, AND LOAM AND SEED AS INDICATED ON THE PLANS.
9. REMOVE EROSION AND SEDIMENT CONTROL DEVICES WHEN AREA HAS FULLY STABILIZED.

CULVERT CV4

1. WORK WITHIN THE WATERWAY SHALL TAKE PLACE ONLY DURING THE LOW FLOW PERIOD BETWEEN JUNE 30 AND OCTOBER 30.
2. PRIOR TO THE START OF WORK THE CONTRACTOR SHALL INSTALL ALL EROSION CONTROLS AT THE LOCATIONS INDICATED ON THE PLANS.
3. VERIFY THE LOCATION OF THE EXISTING SEWER MAIN AND GAS MAIN WITHIN THE WORK CORRIDOR.
4. UTILIZE SAND BAGS AND DIRECT BROOK FLOW INTO EITHER THE WESTERLY OR EASTERLY 30-INCH CULVERT. THE CULVERT WILL BE UTILIZED FOR TEMPORARY BY-PASS.
5. REMOVE AND DISPOSE THE THREE REMAINING CULVERTS AND INSTALL NEW BOX CULVERT.
6. UTILIZE SAND BAGS REDIRECT BROOK FLOW INTO NEW BOX CULVERT AND REMOVE THE REMAINING 30-INCH CULVERT.
7. EXCAVATE AND INSTALL THE SECOND BOX CULVERT
8. COMPLETE CONSTRUCTION OF BOX CULVERTS AND WALLS
9. EXCAVATE AND RE-GRADE AS INDICATED ON THE PLANS.
10. STABILIZE SURFACE WITH RIP-RAP, AND LOAM AND SEED AS INDICATED ON THE PLANS.
11. REMOVE EROSION AND SEDIMENT CONTROL DEVICES WHEN AREA HAS FULLY STABILIZED.

PROJECT
CULVERT REPLACEMENT OF CV1A, CV2, CV3 and CV4 WHITE HORN BROOK KINGSTON, RHODE ISLAND



CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

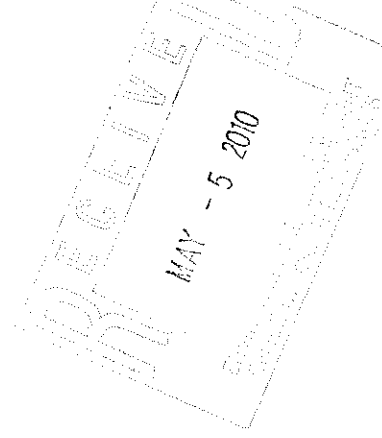
DRAWING TITLE
GENERAL NOTES & LEGEND

| NO. | DATE | REVISIONS |
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Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUN - 3 2010 FILE # 18-0040
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Carey



PROJECT NO.: 1254

DATE: APRIL 2010

SCALE: NONE

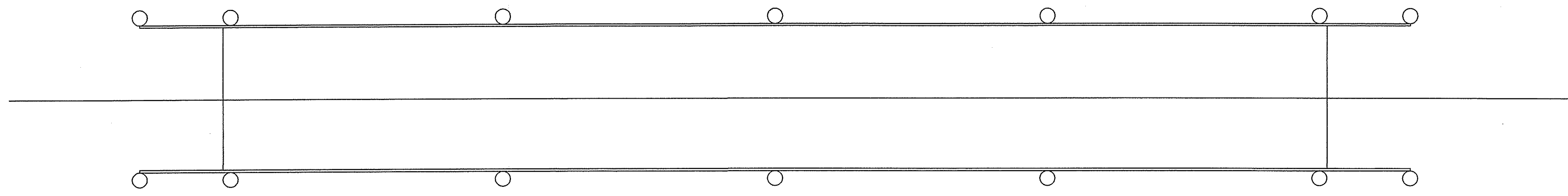
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CHECKED BY: T.A.R.

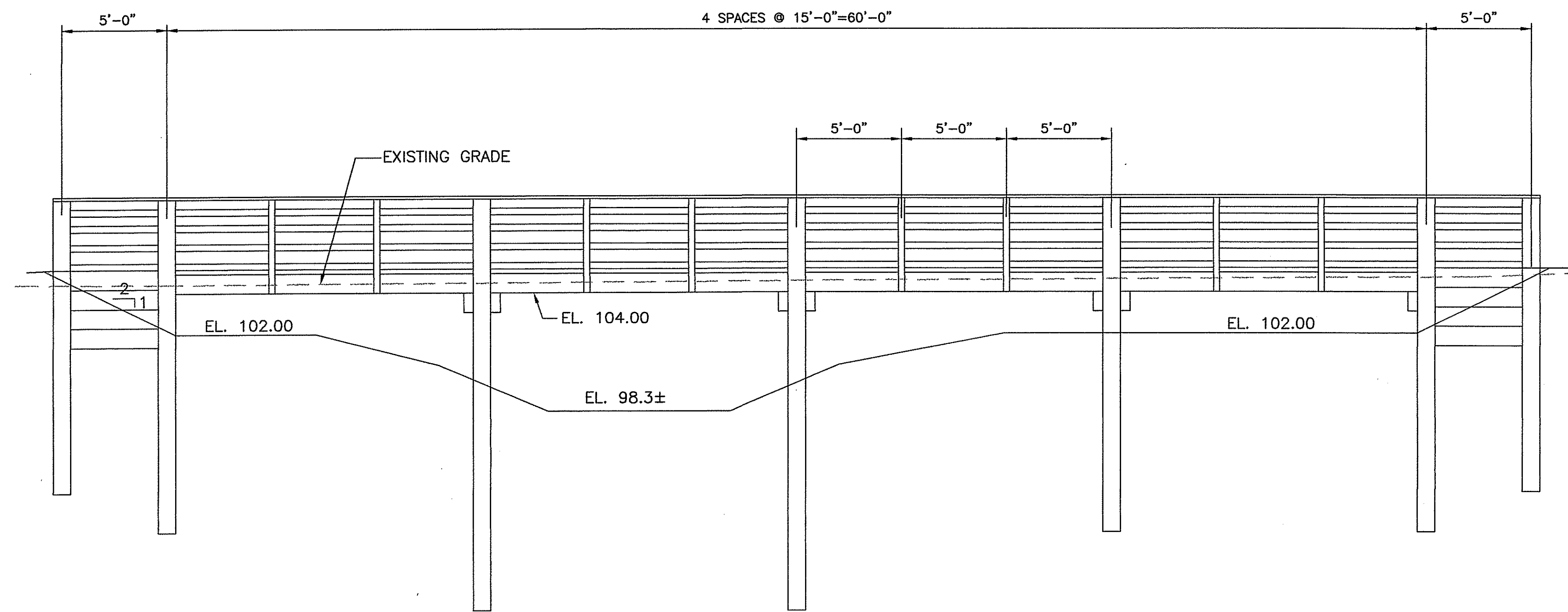
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SHEET 2 OF 12

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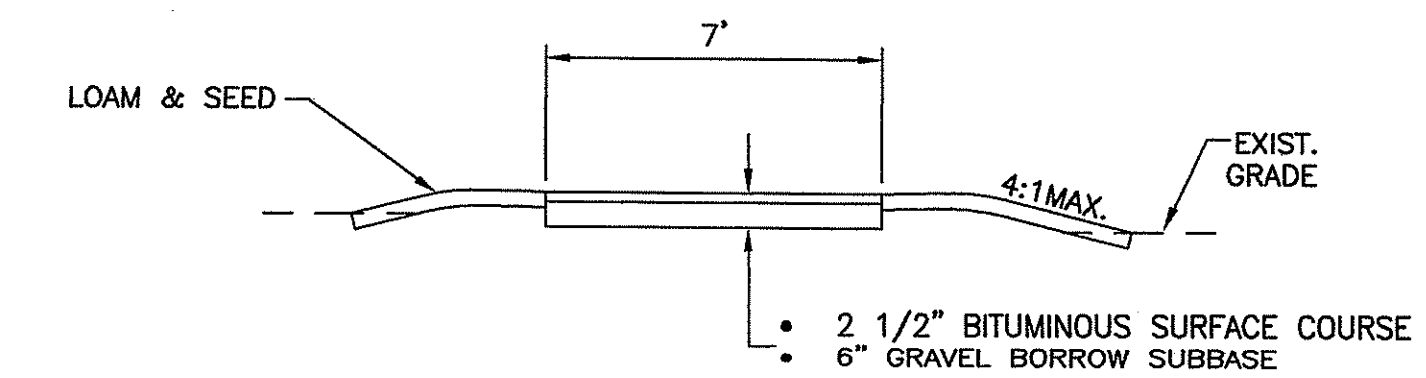
PLAN



ELEVATION

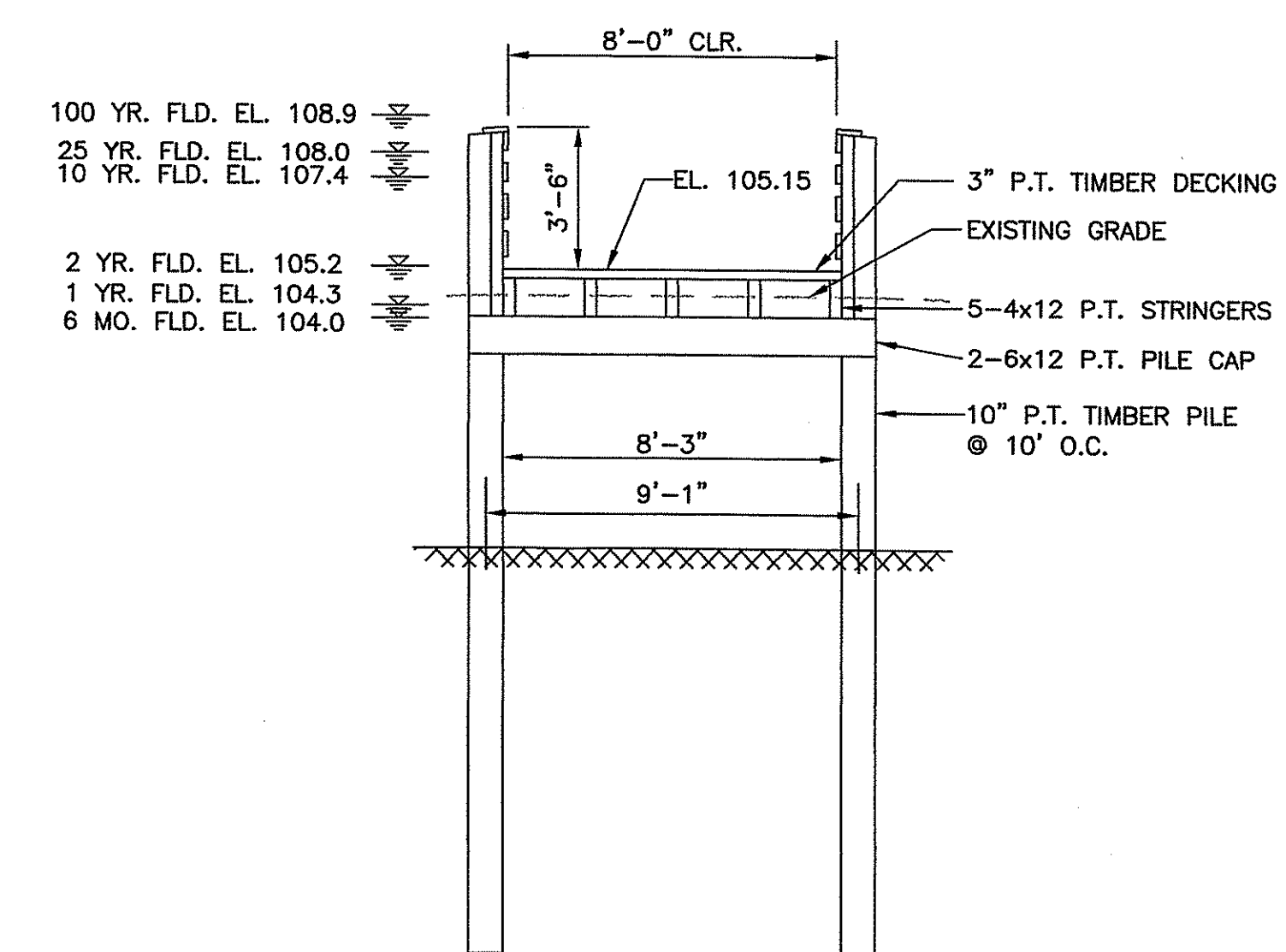
TIMBER TRESTLE WITH STRINGERS

SCALE: 1/4"=1'-0"



TYPICAL ROADWAY SECTION

SCALE: 1/4"=1'-0"



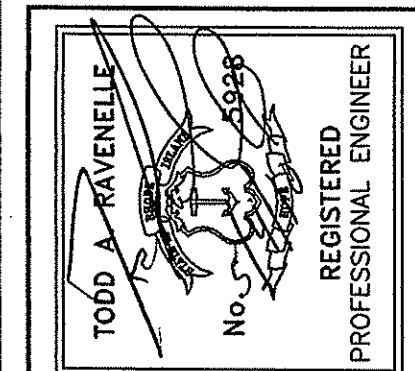
SECTION THRU BRIDGE

Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF WATER RESOURCES
 FRESHWATER WETLANDS PROGRAM
 APPROVED WITH CONDITIONS
 AS SPECIFIED IN THE LETTER OF APPROVAL
 DATED JUN - 3 2010 FILE # 10-2046
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Conroy
 MAY - 5 2010

PROJECT
**CULVERT REPLACEMENT OF
 CV1A, CV2, CV3 and CV4
 WHITE HORN BROOK
 KINGSTON, RHODE ISLAND**



CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
 Civil and Environmental Engineers
 Pawtucket, Rhode Island

DRAWING TITLE
CV1A PLAN AND PROFILE

| NO. | DATE | REVISIONS | BY |
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PROJECT NO.: 1254

DATE: APRIL 2010

SCALE: AS NOTED

DRAWN BY: J.L.H.

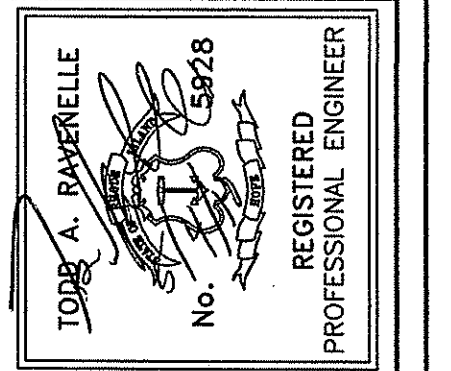
CHECKED BY: T.A.R.

DRAWING NUMBER

4

SHEET 4 OF 12

PROJECT
**CULVERT REPLACEMENT OF
 CV1A, CV2, CV3 and CV4
 WHITE HORN BROOK
 KINGSTON, RHODE ISLAND**



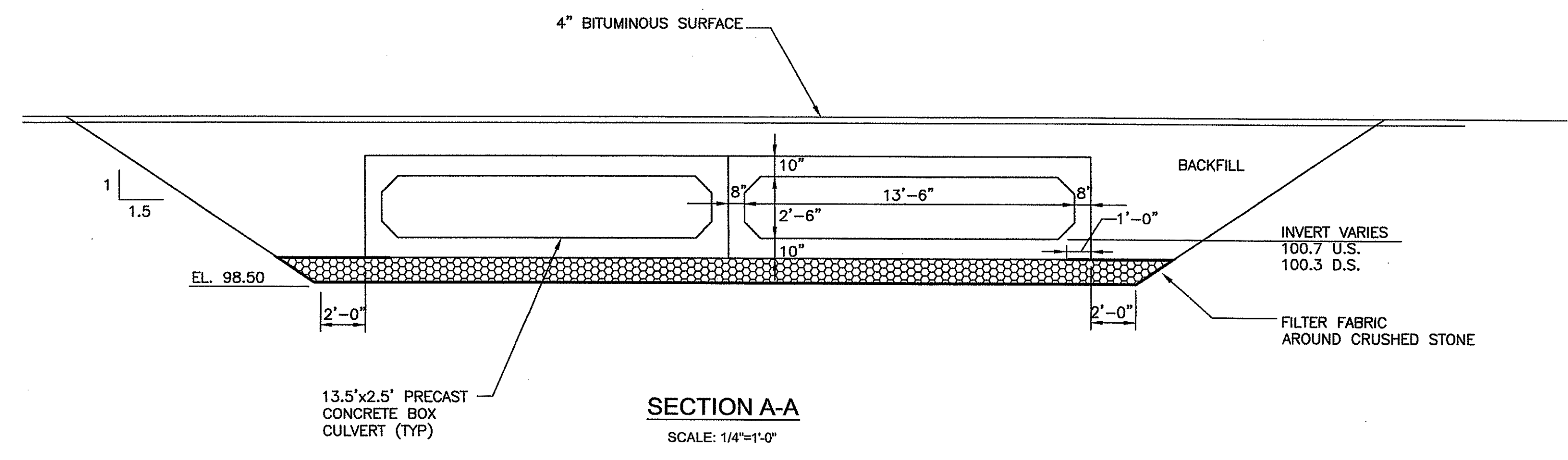
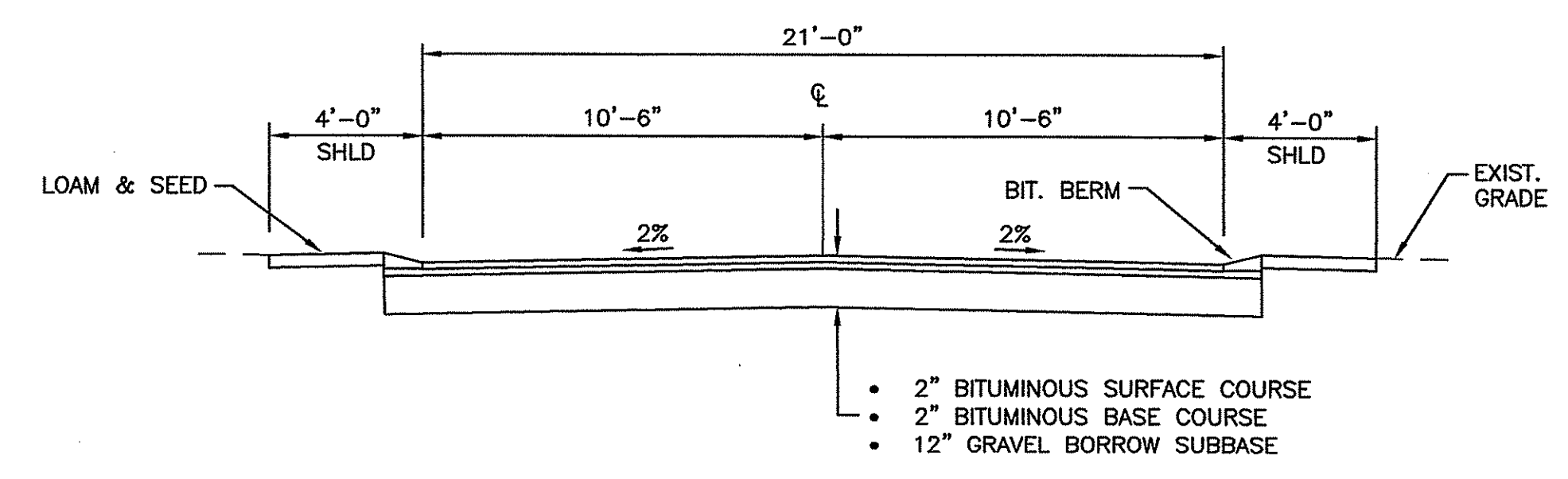
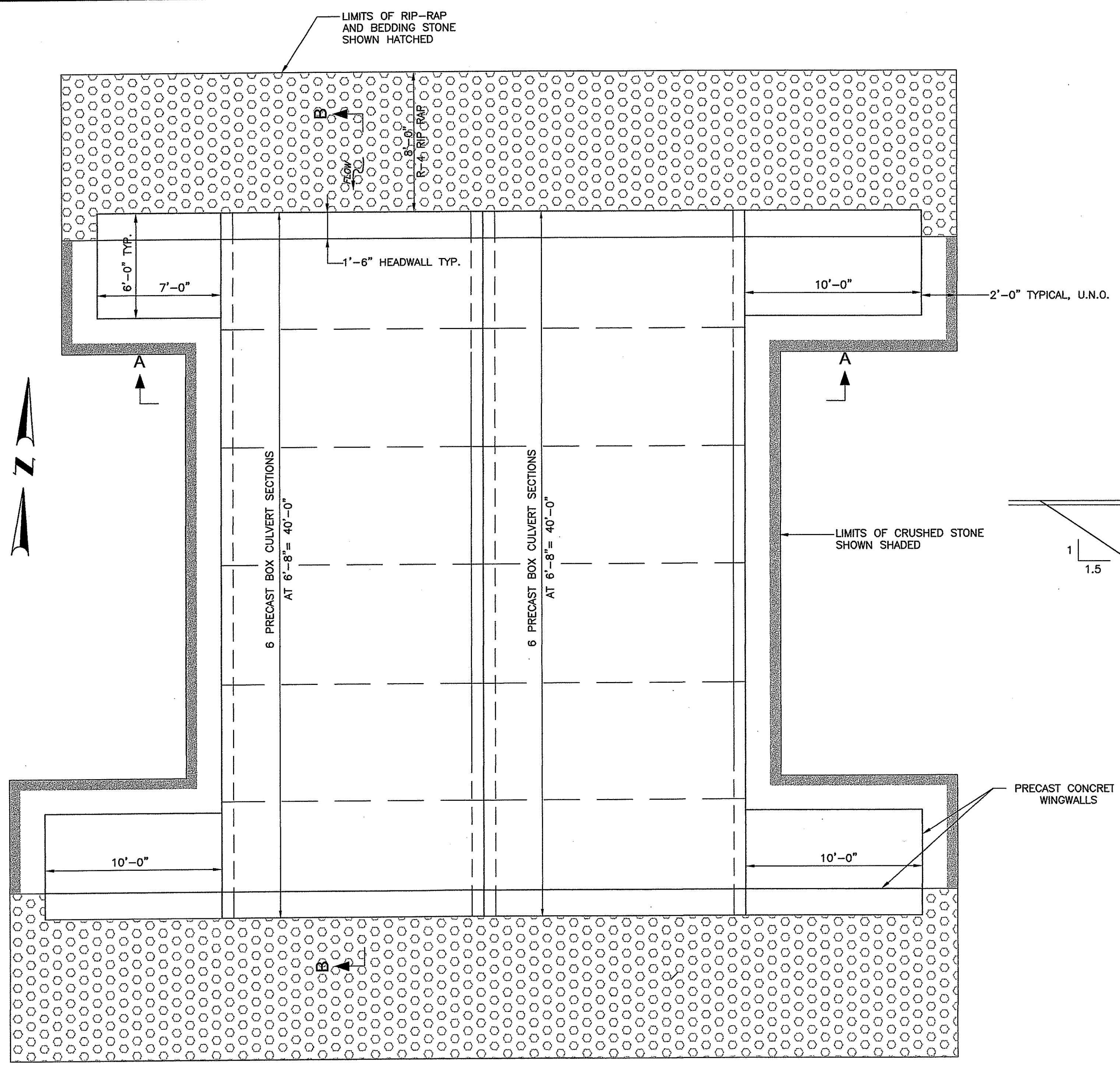
CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
 Civil and Environmental Engineers
 Pawtucket, Rhode Island

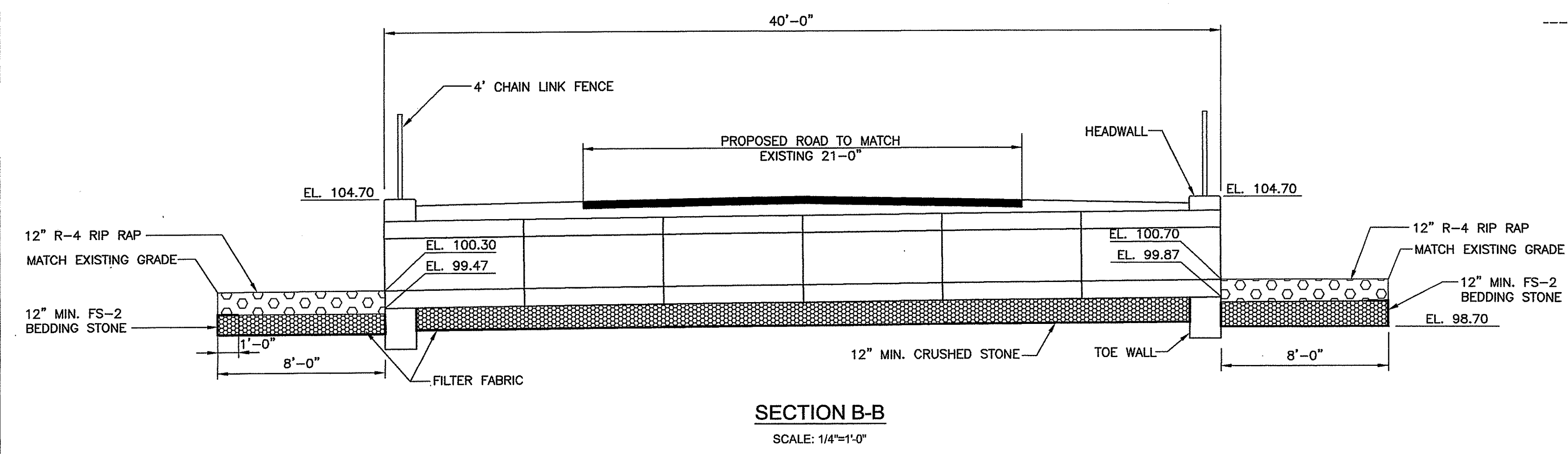
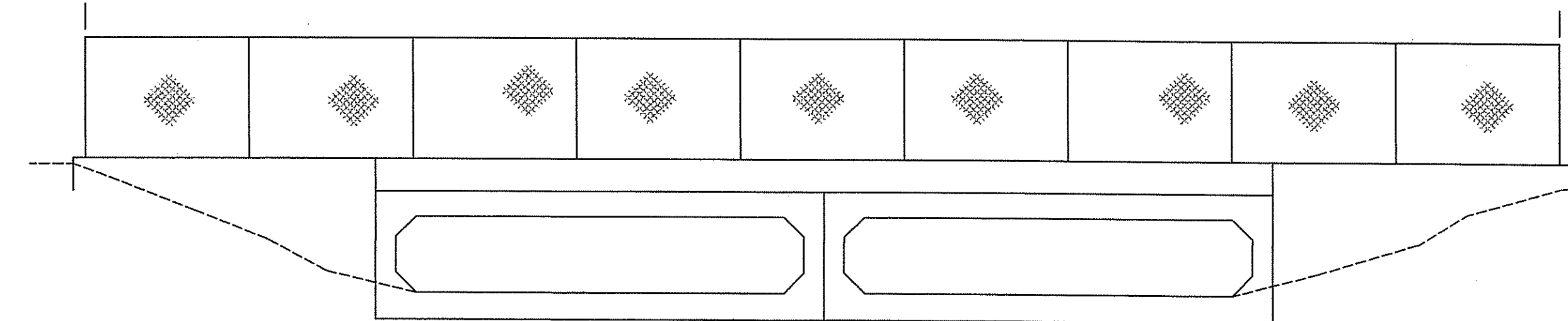
DRAWING TITLE
CV2 DETAILS

| NO. | DATE | REVISIONS | BY |
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PROJECT NO.: 1254
 DATE: APRIL 2010
 SCALE: AS NOTED
 DRAWN BY: J.L.H.
 CHECKED BY: T.A.R.
 DRAWING NUMBER
6
 SHEET 6 OF 12



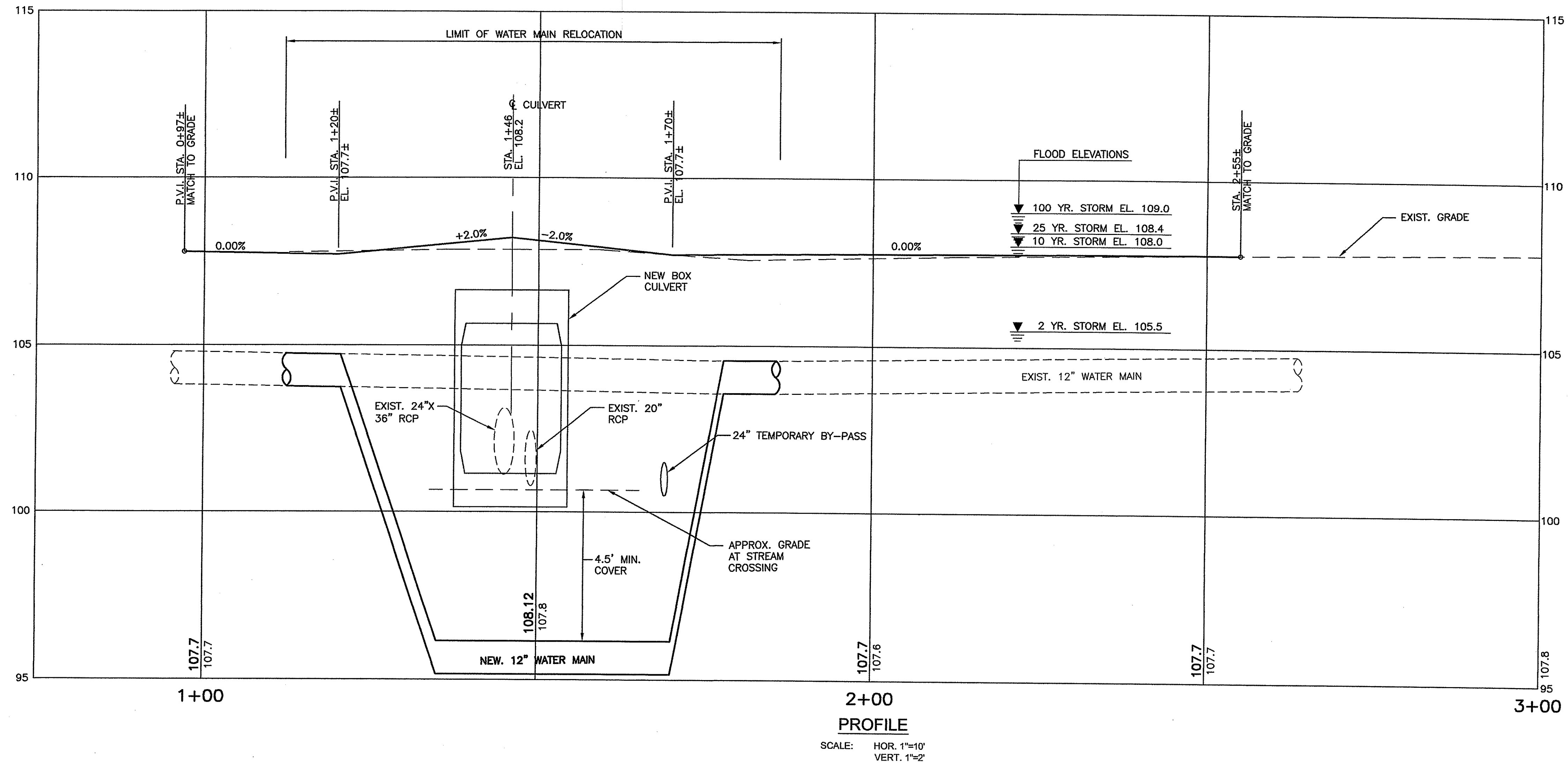
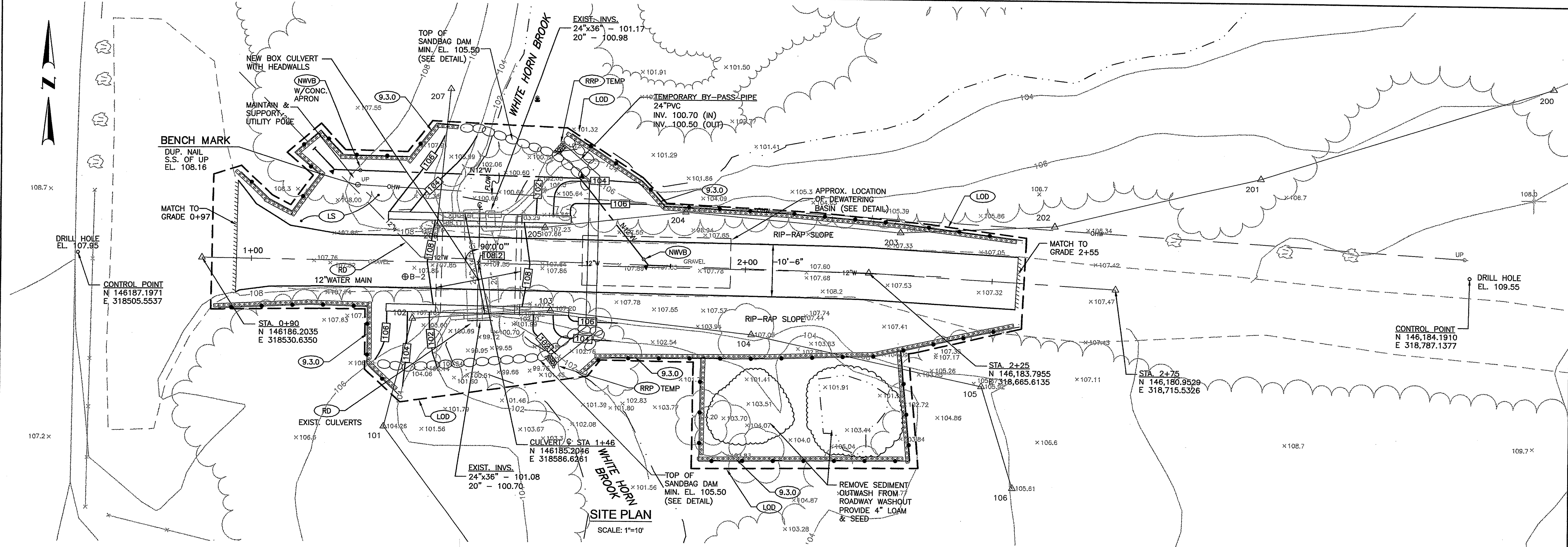
Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF WATER RESOURCES
 FRESHWATER WETLANDS PROGRAM
 APPROVED WITH CONDITIONS
 AS SPECIFIED IN THE LETTER OF APPROVAL
 DATED JUN - 3 2010 FILE # 12-0014
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Conroy

P:\FILES\CV2\WETLAND PLANS\CV2_BOX_CULVERT\2010 10-06-10 10:46:56 AM USER:G.D\NEW STANDARD SIZE BRPT\AS 11



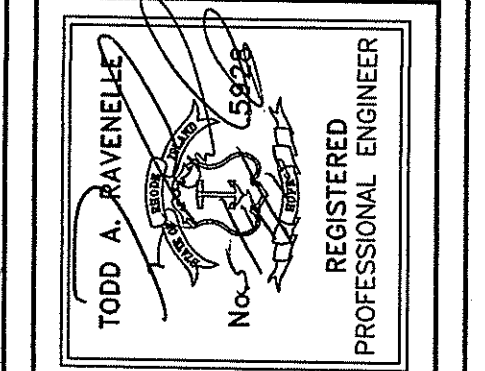
- NOTES:**
1. THE CONTRACTOR SHALL VERIFY LOCATION OF EXISTING WATER MAIN AND PRIOR TO THE START OF CONSTRUCTION.
 2. THE ENTIRE PROJECT LIES WITHIN THE 50' WETLAND PERIMETER AND THE 100 YEAR FLOOD PLAN.
 3. RELOCATION OF THE WATER MAIN SHALL BE PERFORMED TO MINIMIZE THE SHUT-DOWN OF THE WATER SERVICE. SHUT DOWN OF THE WATER SERVICE SHALL ONLY BE PERMITTED BETWEEN 11:00 PM AND 4:00AM.

Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF WATER RESOURCES
 FRESHWATER WETLANDS PROGRAM
 APPROVED WITH CONDITIONS
 AS SPECIFIED IN THE LETTER OF APPROVAL
 DATED JUN - 3 2010 FILE # 10-0040
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Carey
 MAY - 5 2010

PROJECT
**CULVERT REPLACEMENT OF
 CV1A, CV2, CV3 and CV4
 WHITE HORN BROOK
 KINGSTON, RHODE ISLAND**



CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
 Civil and Environmental Engineers
 Pawtucket, Rhode Island

DRAWING TITLE
CV3 PLAN AND PROFILE

| NO. | DATE | REVISIONS | BY |
|-----|------|-----------|----|
| | | | |
| | | | |
| | | | |

PROJECT NO.: 1254

DATE: APRIL 2010

SCALE: AS NOTED

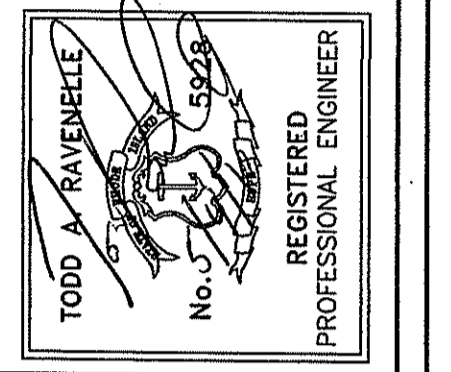
DRAWN BY: J.L.H.

CHECKED BY: T.A.R.

DRAWING NUMBER
7

SHEET 7 OF 12

PROJECT
**CULVERT REPLACEMENT OF
 CV1A, CV2, CV3 and CV4
 WHITE HORN BROOK
 KINGSTON, RHODE ISLAND**



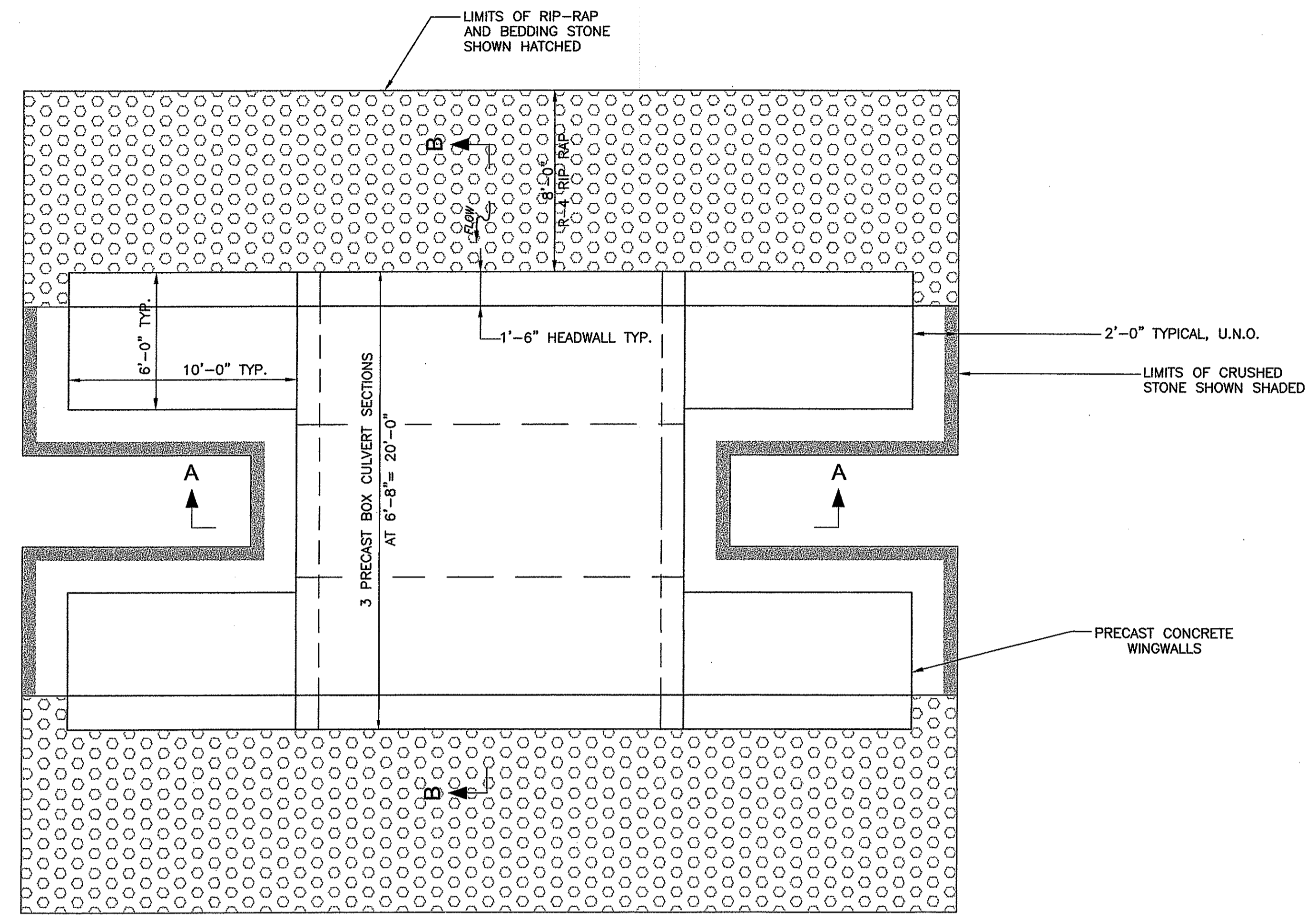
CLIENT
UNIVERSITY OF RHODE ISLAND

Gordon R. Archibald, Inc.
 Civil and Environmental Engineers
 Pawtucket, Rhode Island

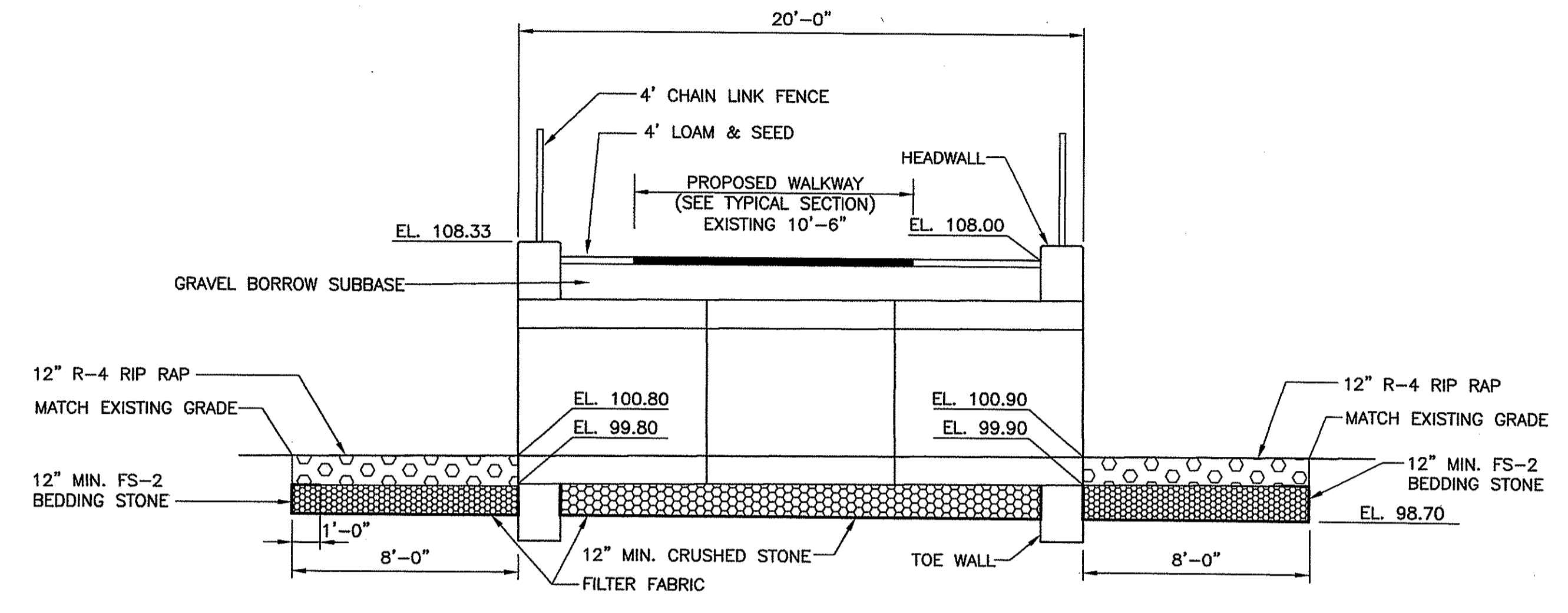
DRAWING TITLE
CV3 DETAILS

| NO. | DATE | REVISIONS | BY |
|-----|------|-----------|----|
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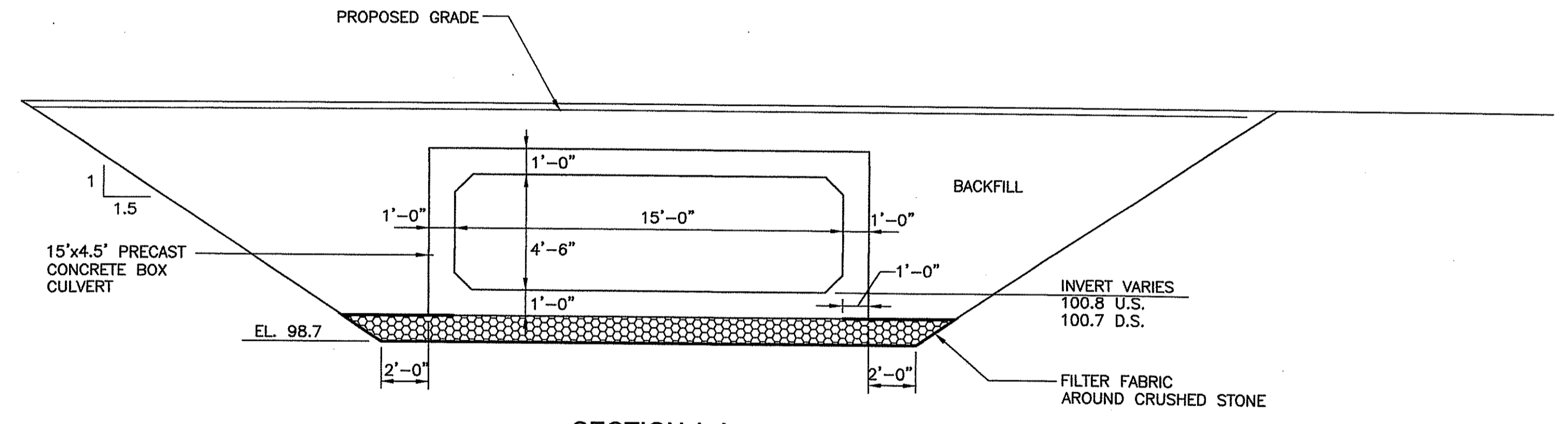
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|----------------|------------|
| PROJECT NO.: | 1254 |
| DATE: | APRIL 2010 |
| SCALE: | NONE |
| DRAWN BY: | J.L.H. |
| CHECKED BY: | T.A.R. |
| DRAWING NUMBER | 8 |
| SHEET | 8 OF 12 |



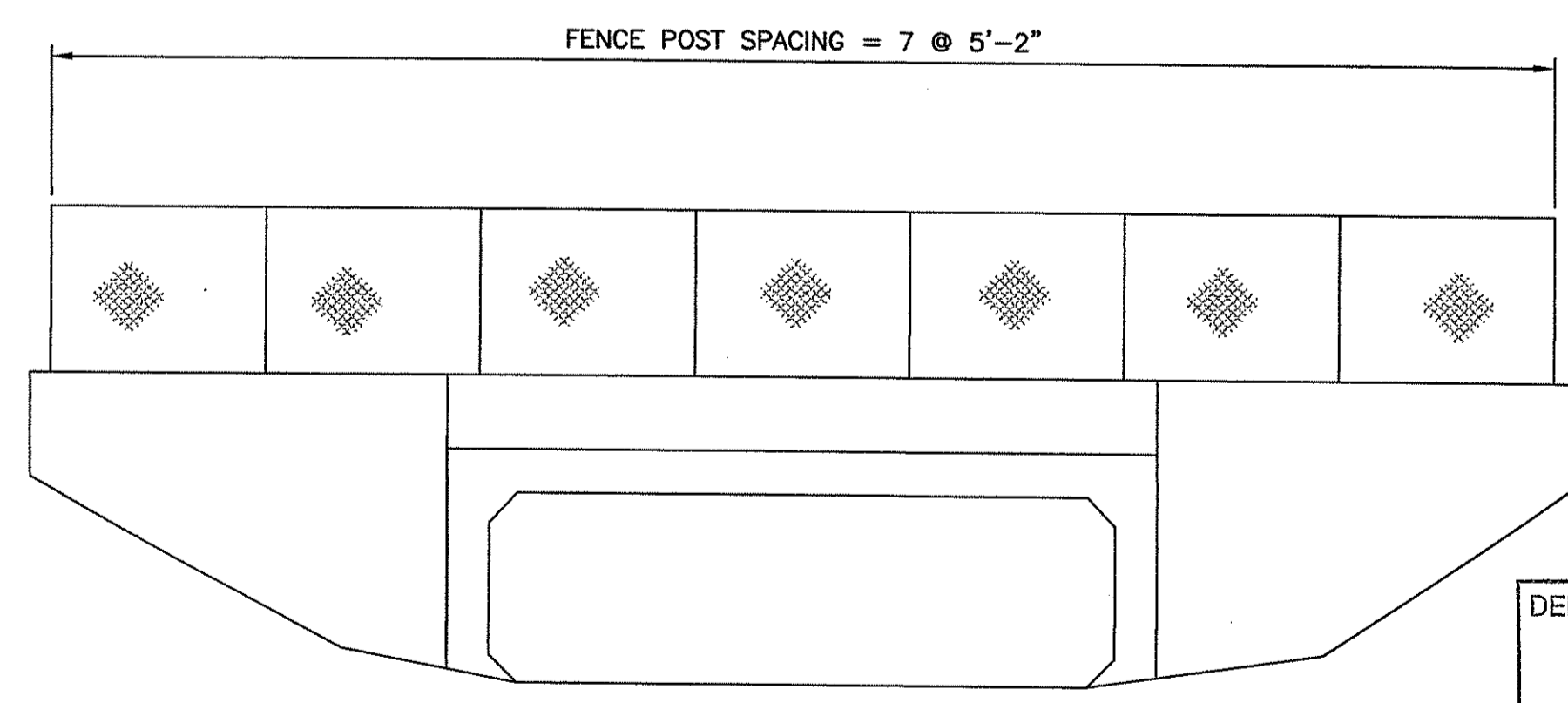
PLAN
 SCALE: 1/4"=1'-0"



SECTION B-B
 SCALE: 1/4"=1'-0"



SECTION A-A
 SCALE: 1/4"=1'-0"

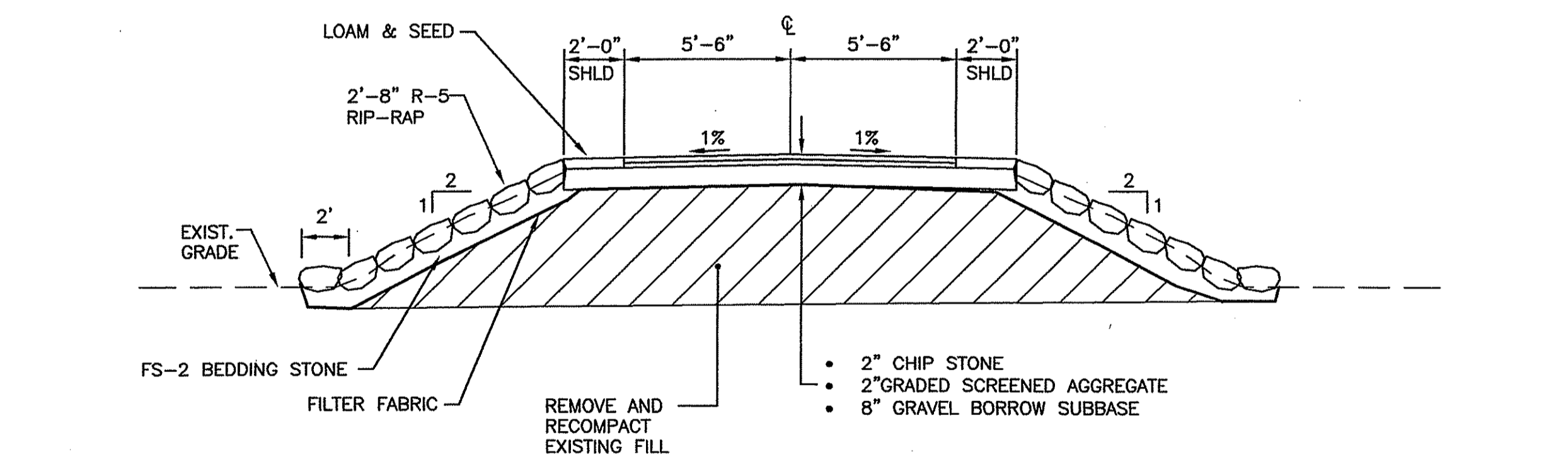


ELEVATION LOOKING NORTH
 SCALE: 1/4"=1'-0"

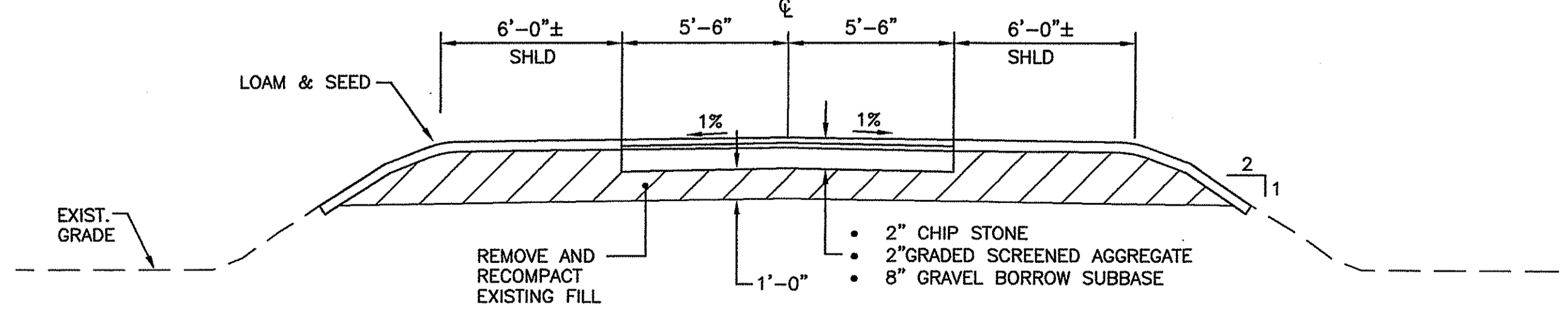
Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
 OFFICE OF WATER RESOURCES
 FRESHWATER WETLANDS PROGRAM
 APPROVED WITH CONDITIONS
 AS SPECIFIED IN THE LETTER OF APPROVAL
 DATED JUN - 3 2010 FILE # 10-0040
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Casey
 MAY - 5 2010

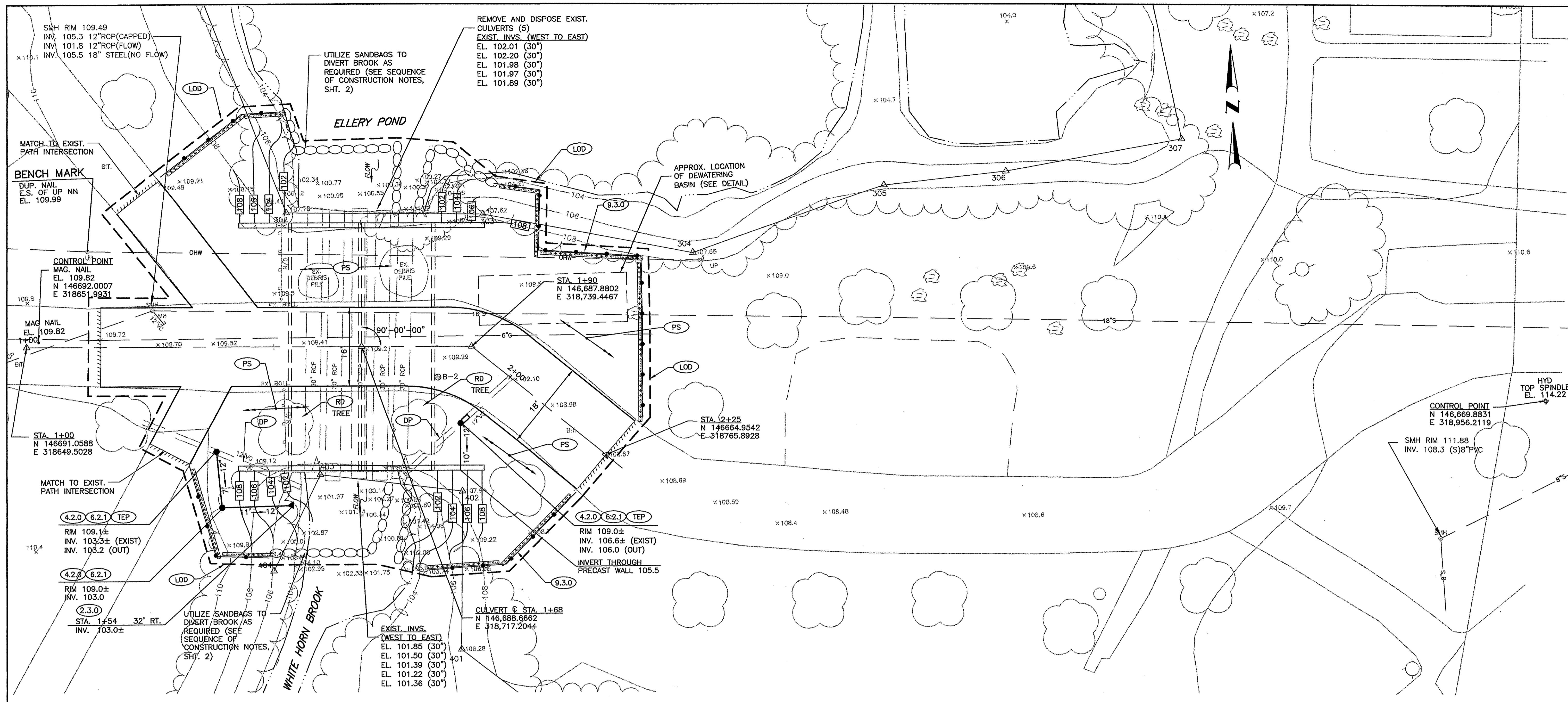


**TYPICAL ROADWAY SECTION
 STA. 1+65 TO 2+55**
 SCALE: 1/4"=1'-0"



**TYPICAL ROADWAY SECTION
 STA. 0+97 TO 1+65**
 SCALE: 1/4"=1'-0"

FILE: C:\GIS\WETLAND\PLANS\CV3_BOX_CULVERTS.dwg, 5/20/10 10:41:15 AM, USER: JLD, NEW STANDARD SIZE, DWGTYPE: 11



PROJECT
CULVERT REPLACEMENT OF
CV1A, CV2, CV3 and CV4
WHITE HORN BROOK
KINGSTON, RHODE ISLAND

REGISTERED PROFESSIONAL ENGINEER
TODD A. RAVENHILL
No. 5225

CLIENT
UNIVERSITY OF RHODE ISLAND

UNIVERSITY OF RHODE ISLAND
Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
CV4 PLAN AND PROFILE

| NO. | DATE | REVISIONS | BY |
|-----|------|-----------|----|
| | | | |
| | | | |
| | | | |

- NOTES:**
1. THE CONTRACTOR SHALL MAINTAIN AND SUPPORT EXIST. 12" AND 8" GAS MAINS.
 2. THE CONTRACTOR SHALL VERIFY LOCATION OF EXISTING SEWER MAIN AND EXISTING GAS MAIN PRIOR TO THE START OF CONSTRUCTION.
 3. THE ENTIRE PROJECT LIES WITHIN THE 200' WETLAND PERIMETER AND THE 100 YEAR FLOOD PLAIN.

Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUN - 3 2010 FILE # 10-044
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

W. Joseph Carney

RECEIVED
MAY - 5 2010

PROJECT NO.: 1254

DATE: APRIL 2010

SCALE: AS NOTED

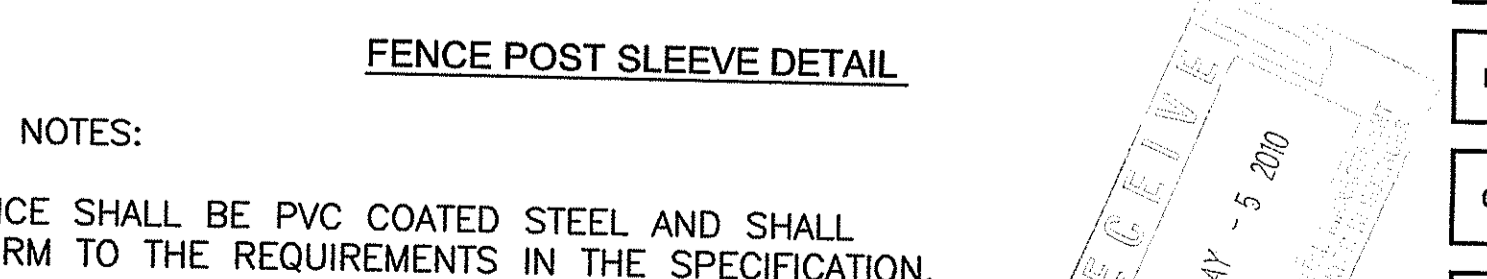
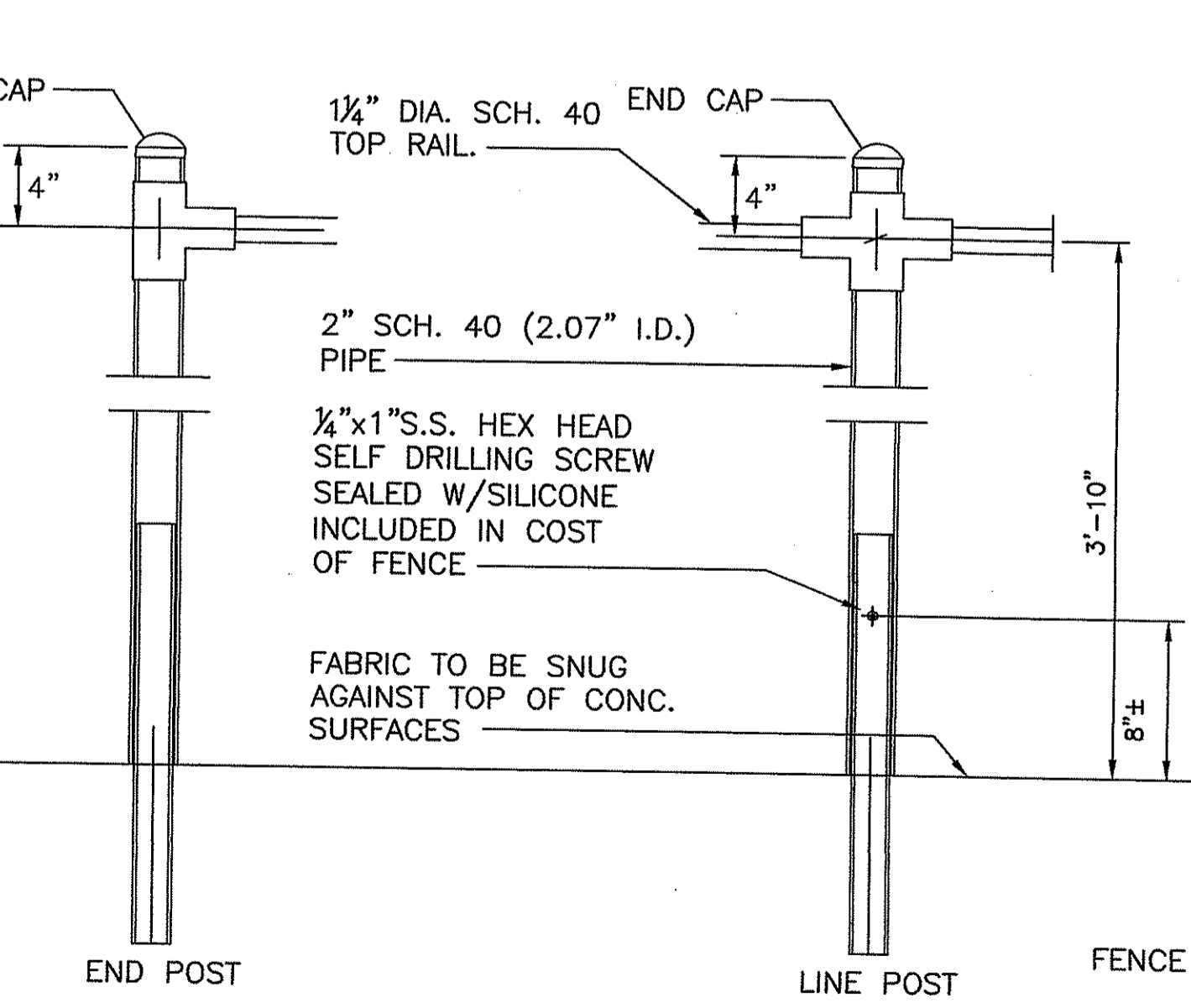
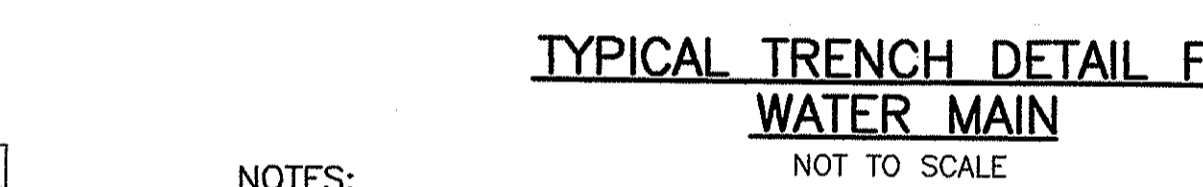
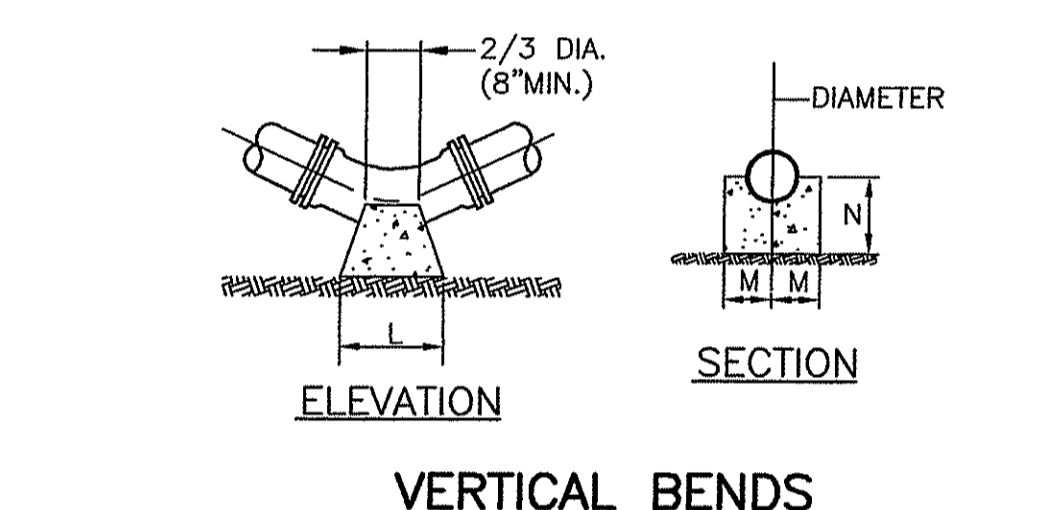
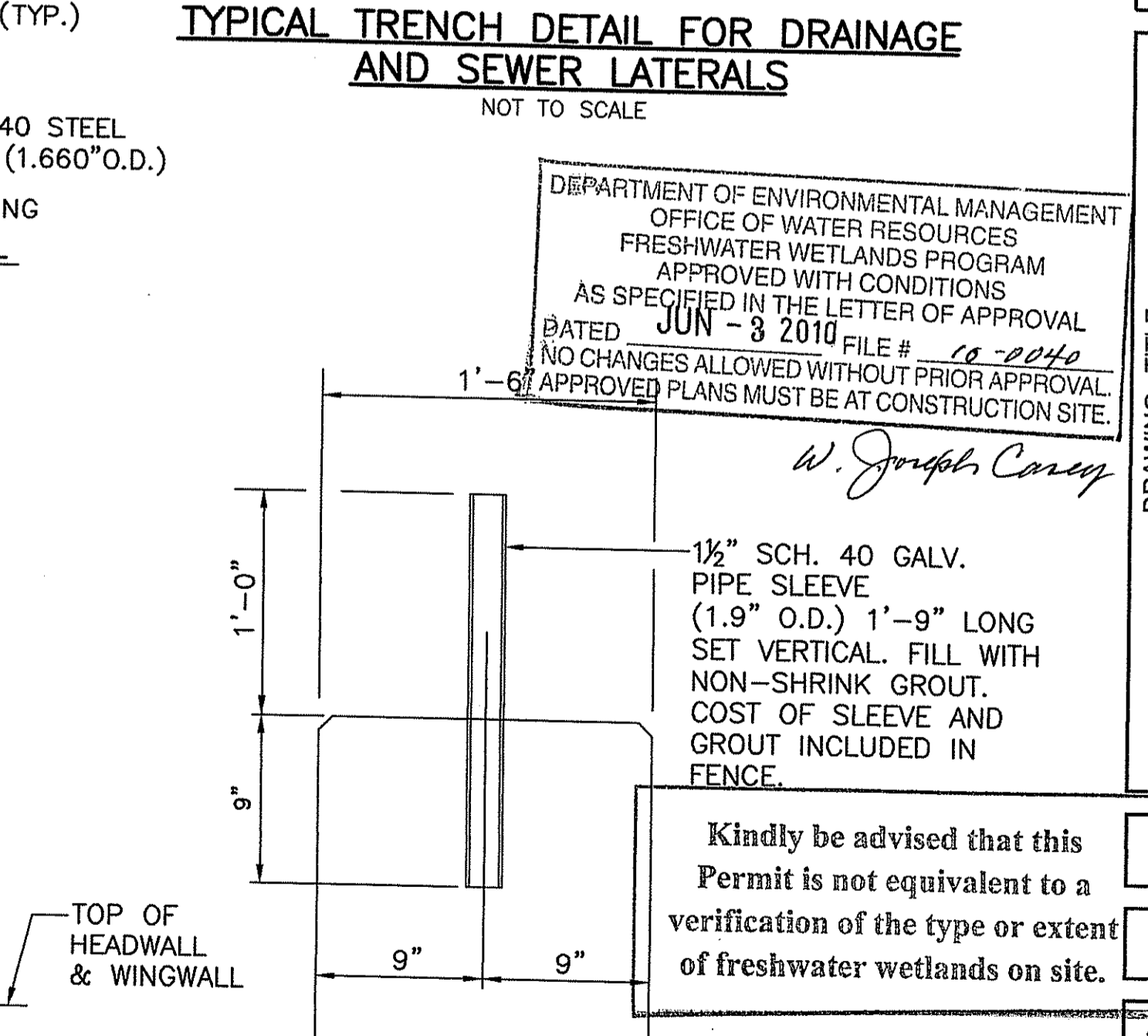
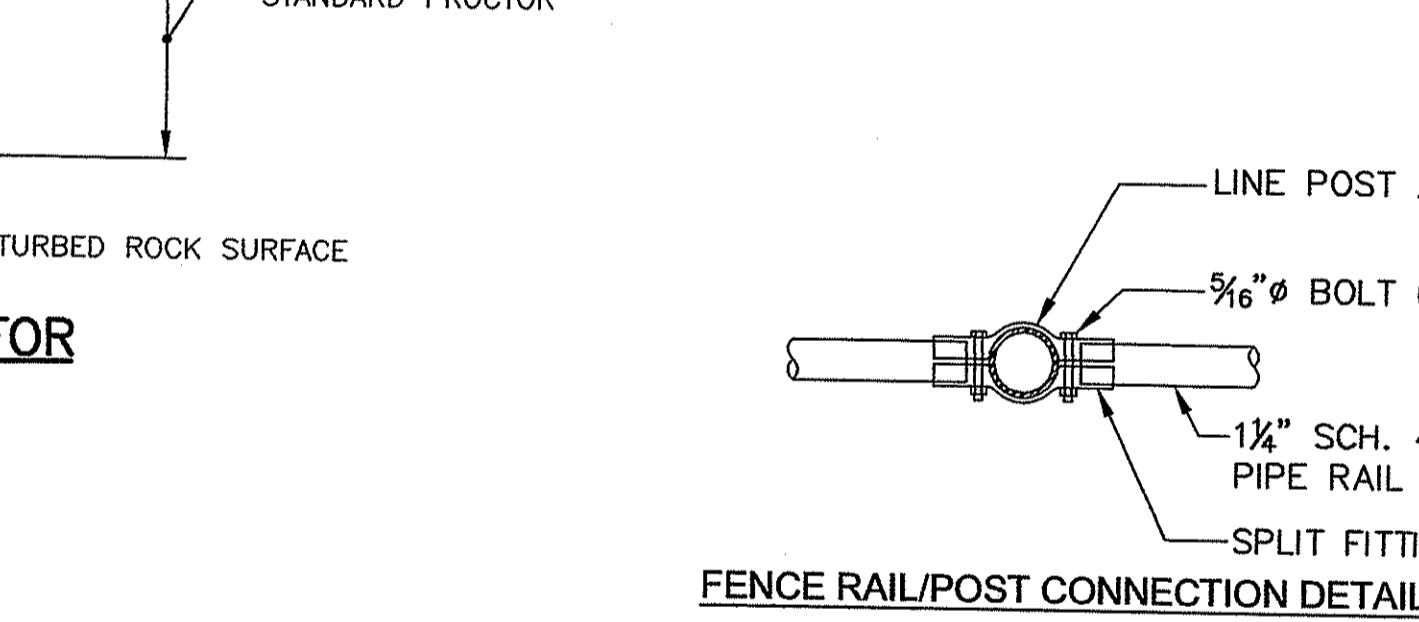
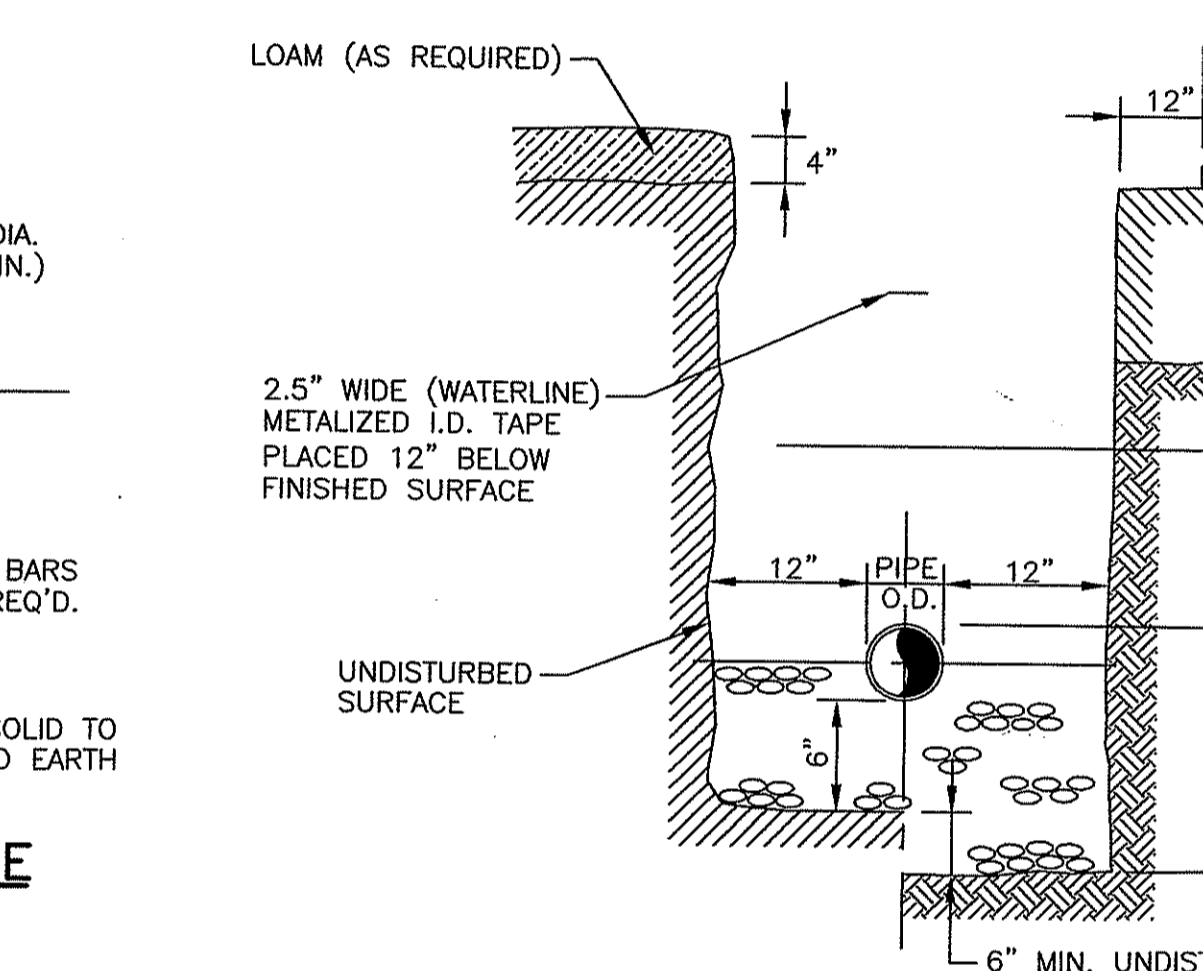
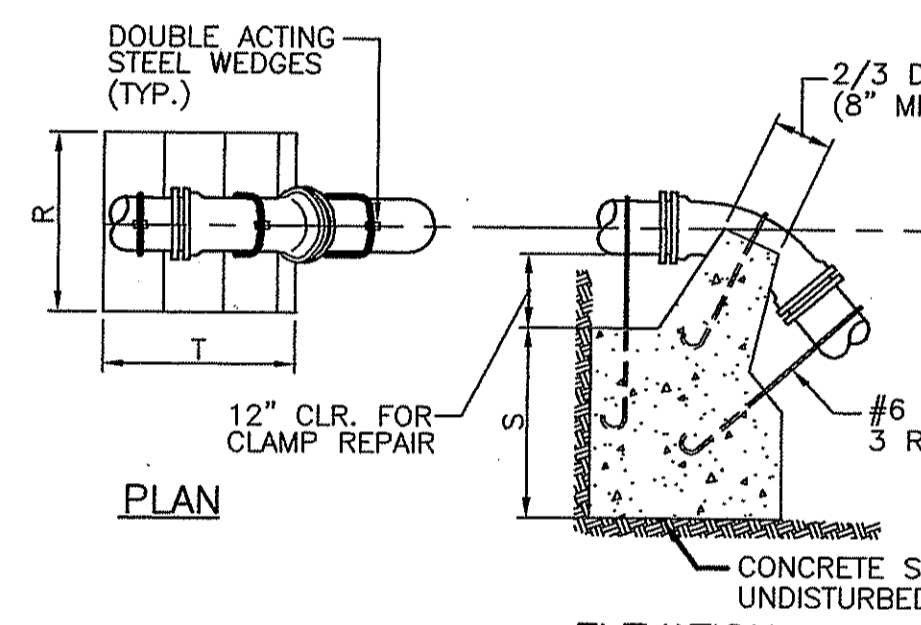
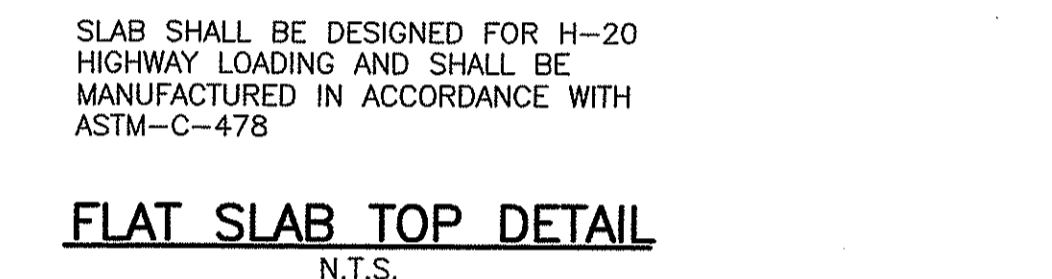
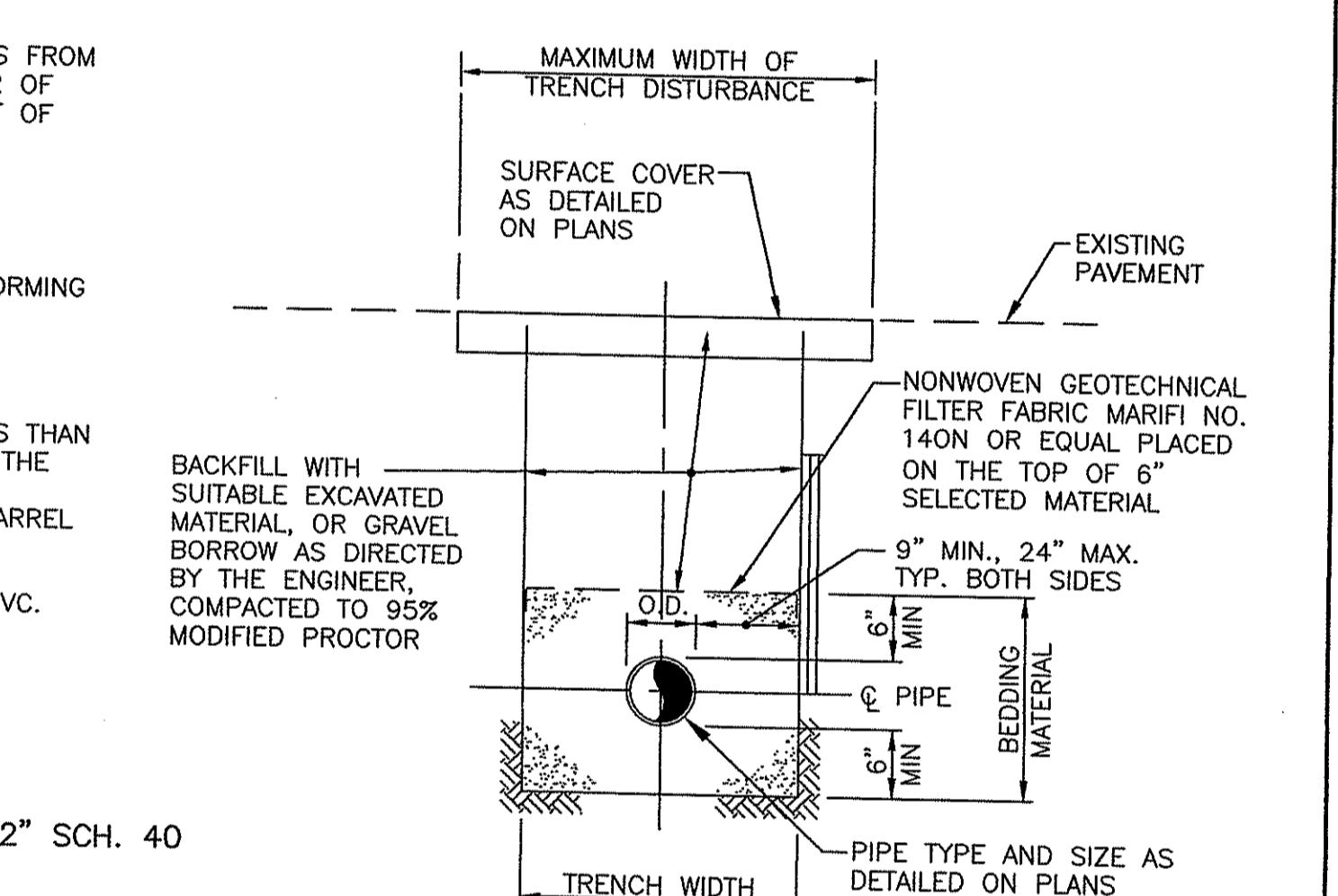
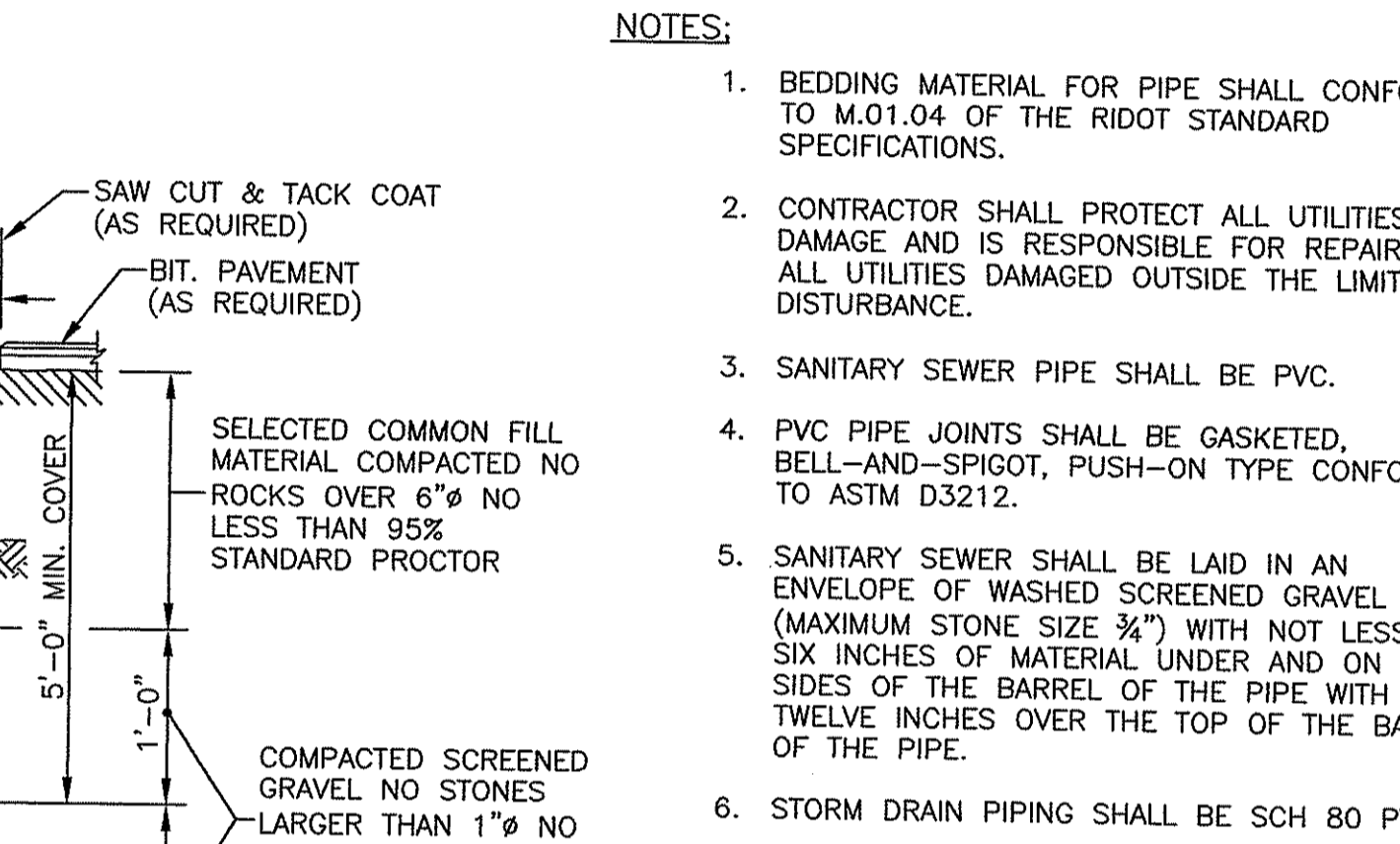
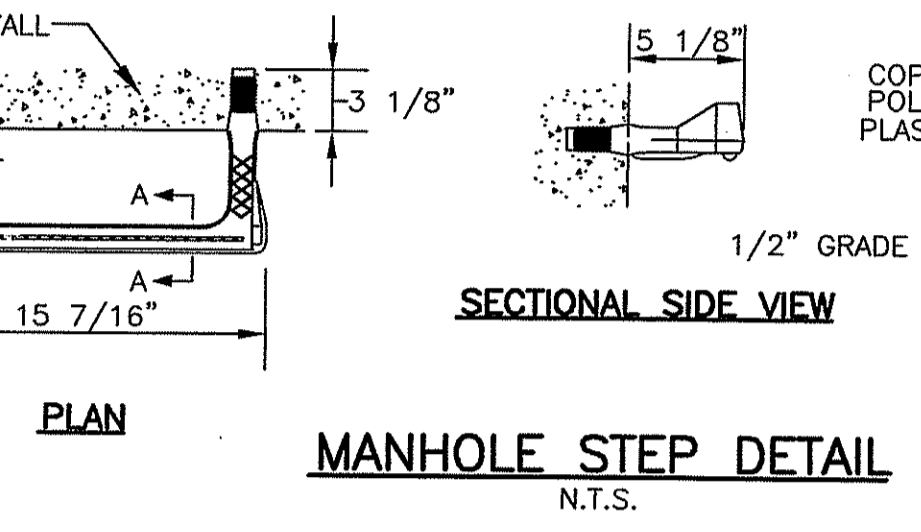
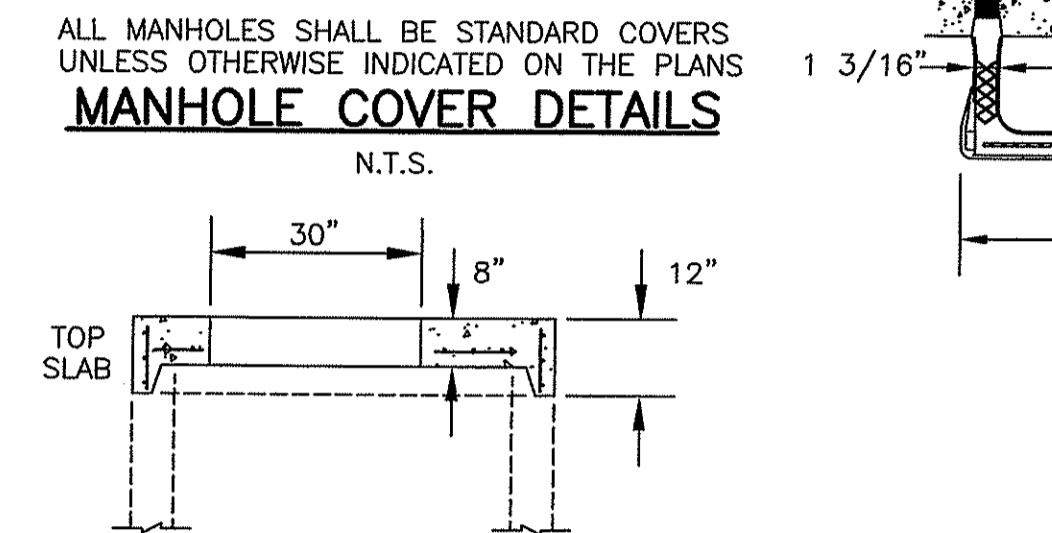
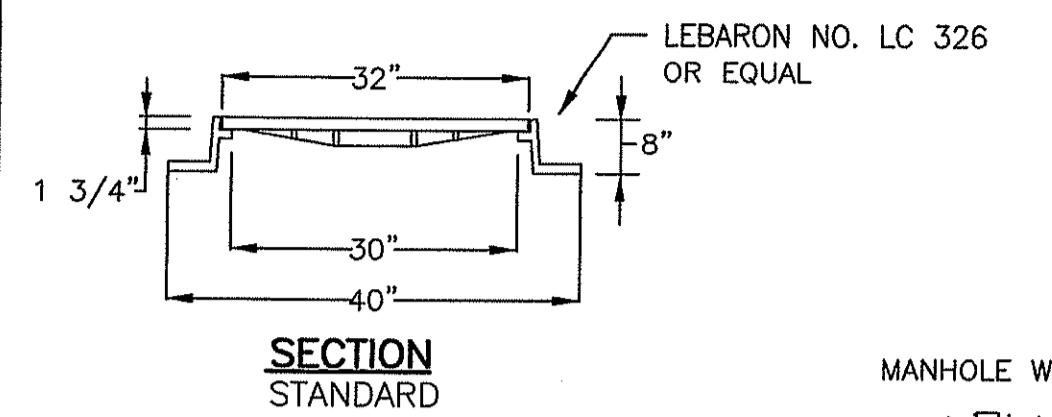
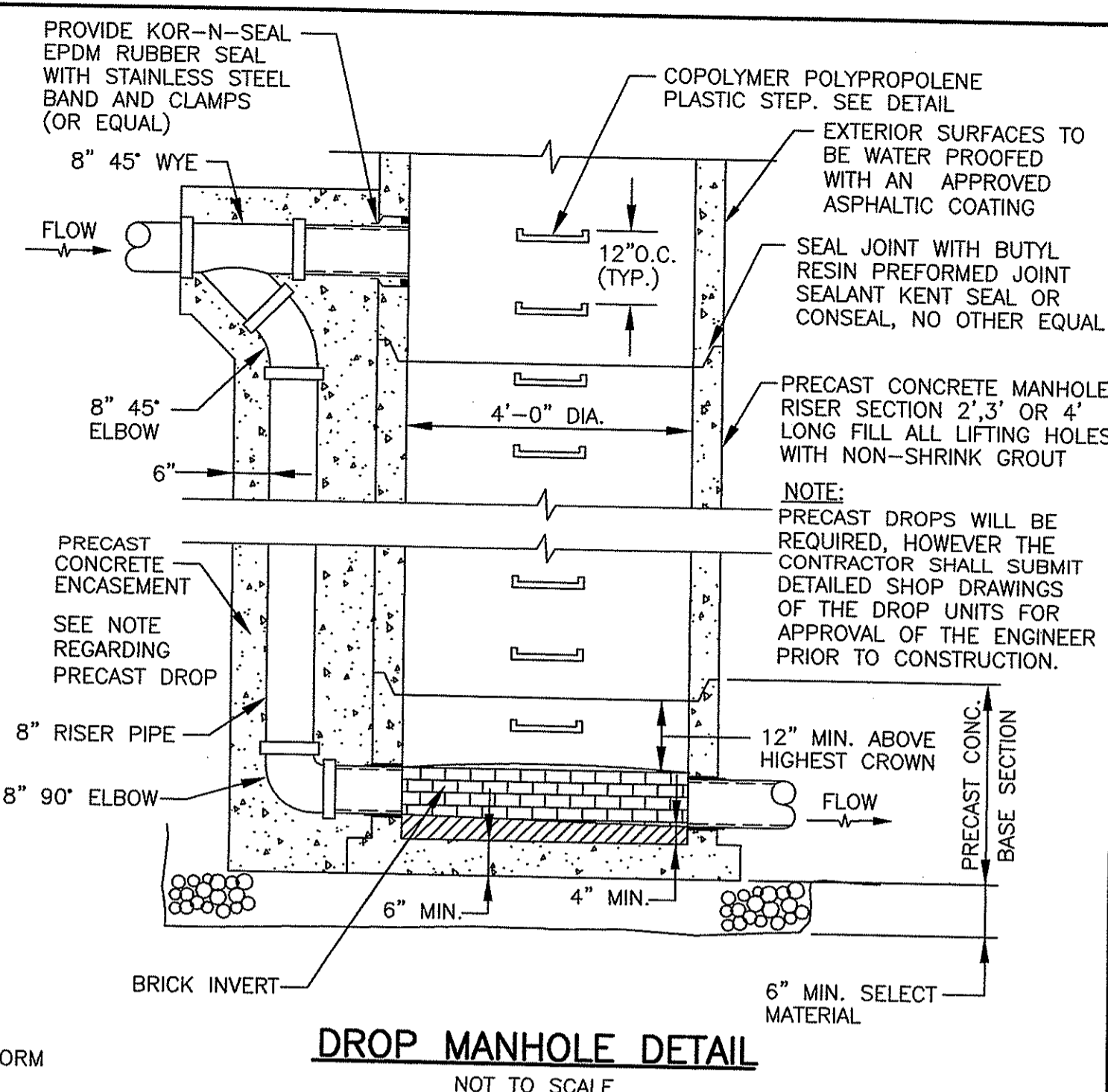
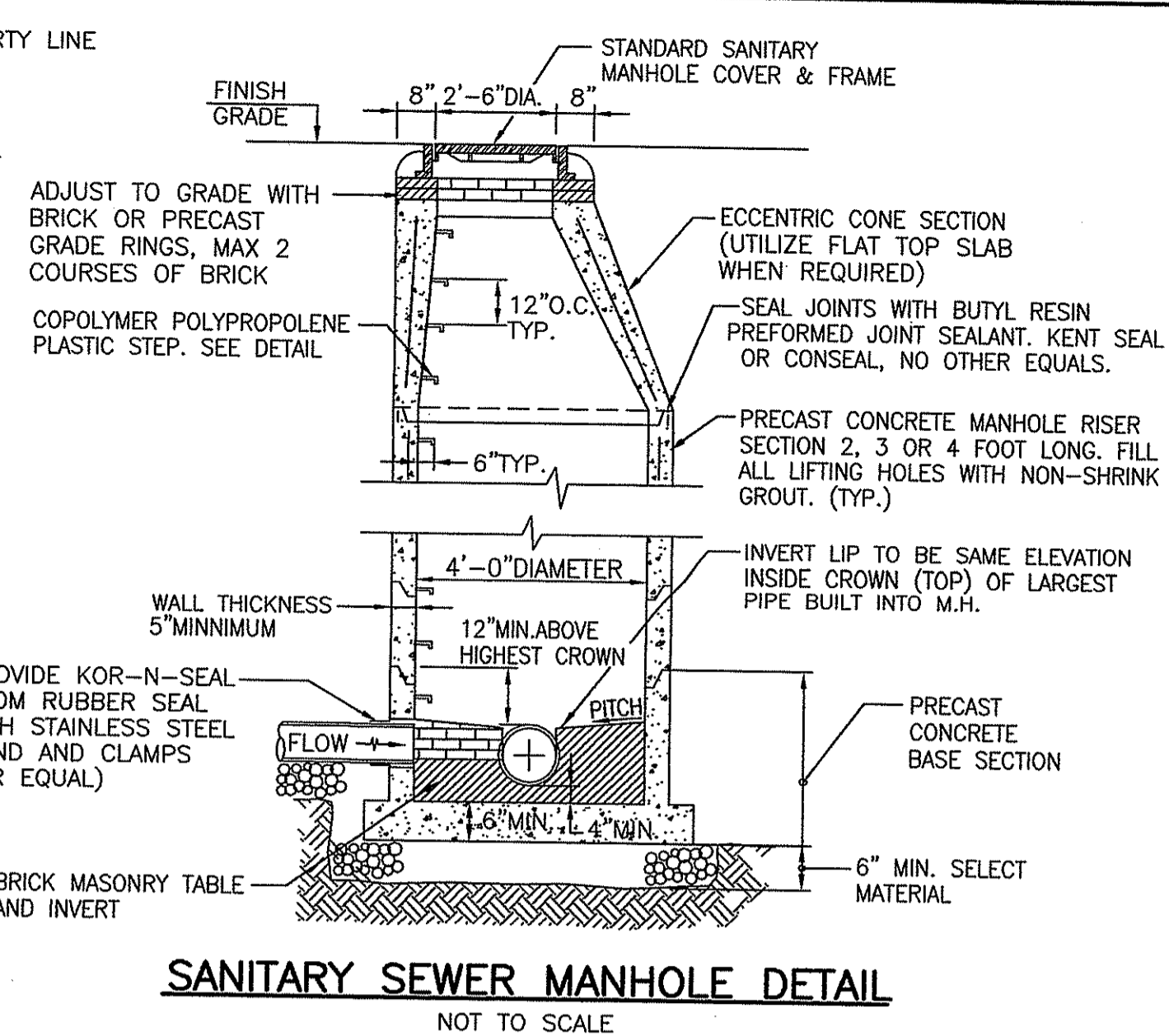
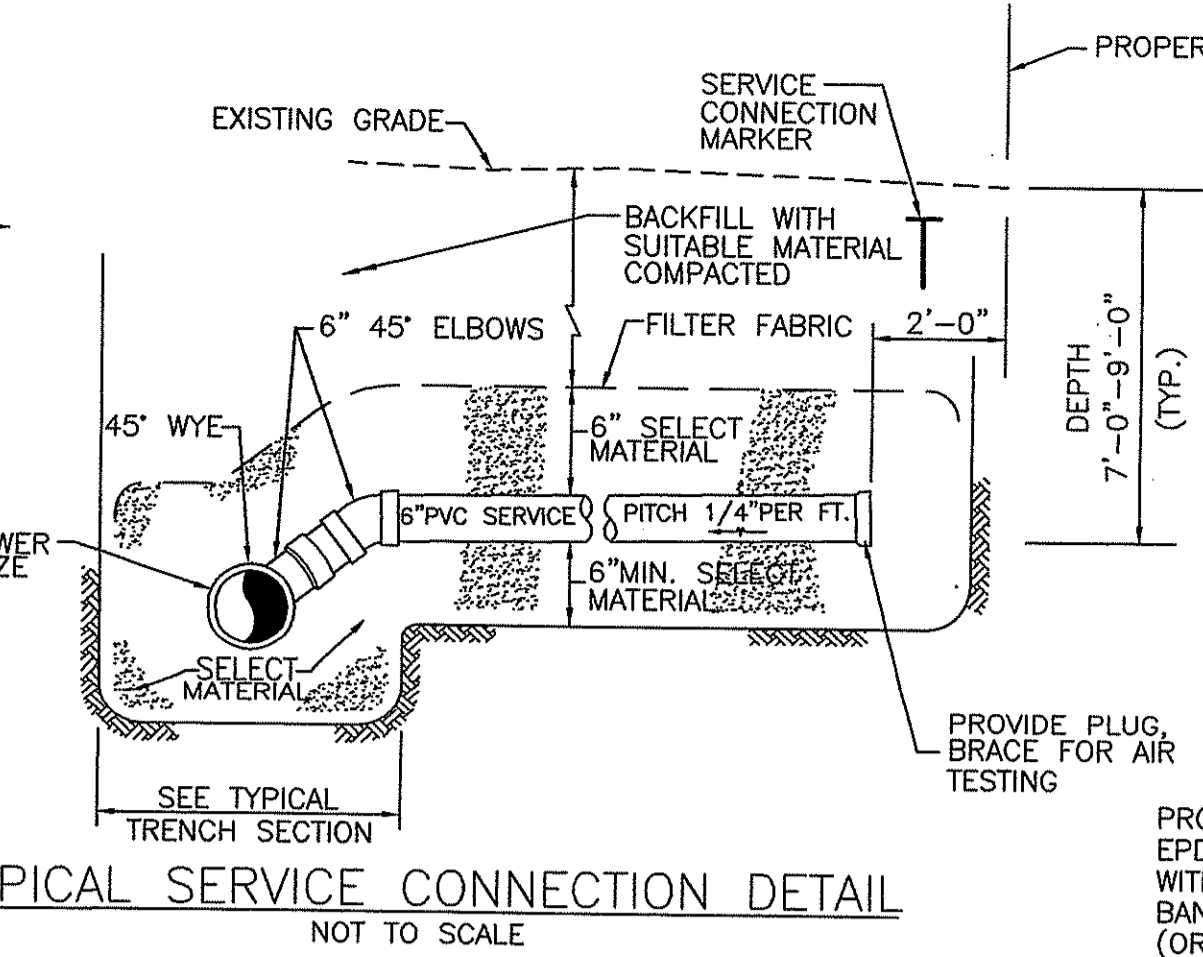
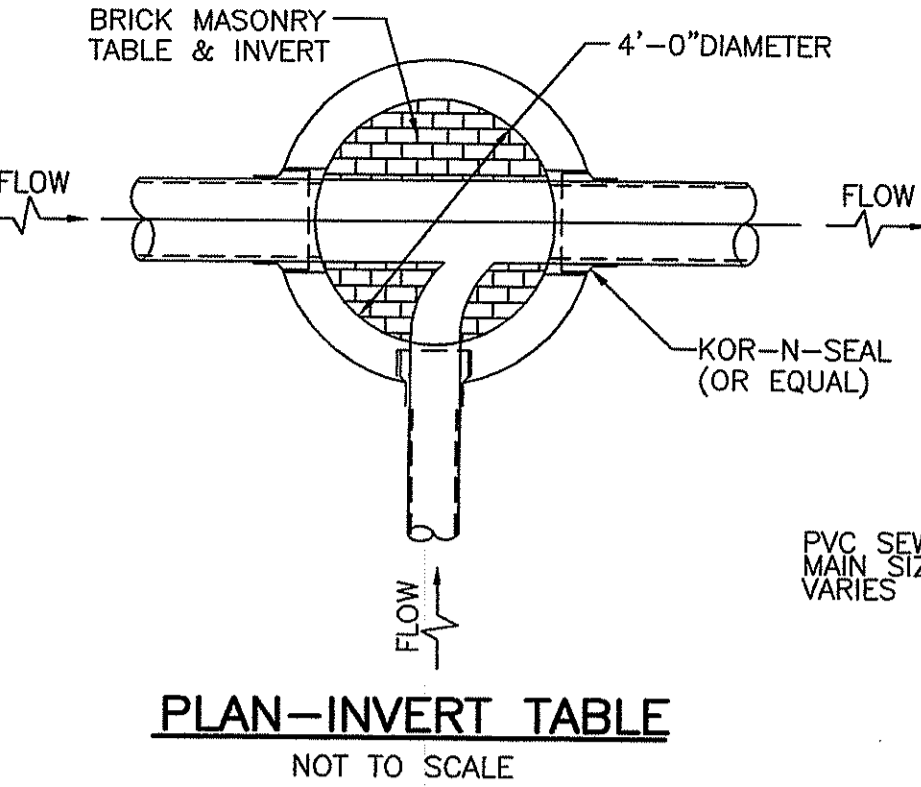
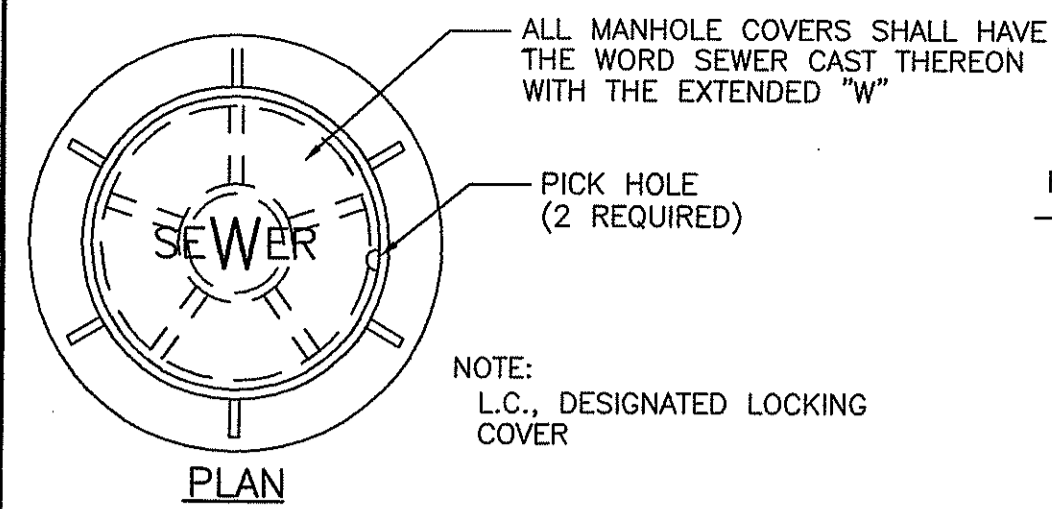
DRAWN BY: J.L.H.

CHECKED BY: T.A.R.

DRAWING NUMBER
9

SHEET 9 OF 12

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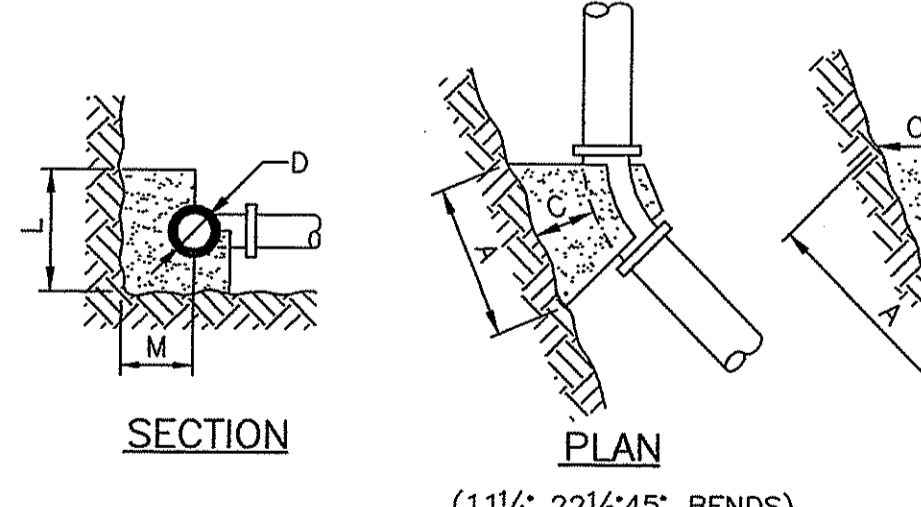
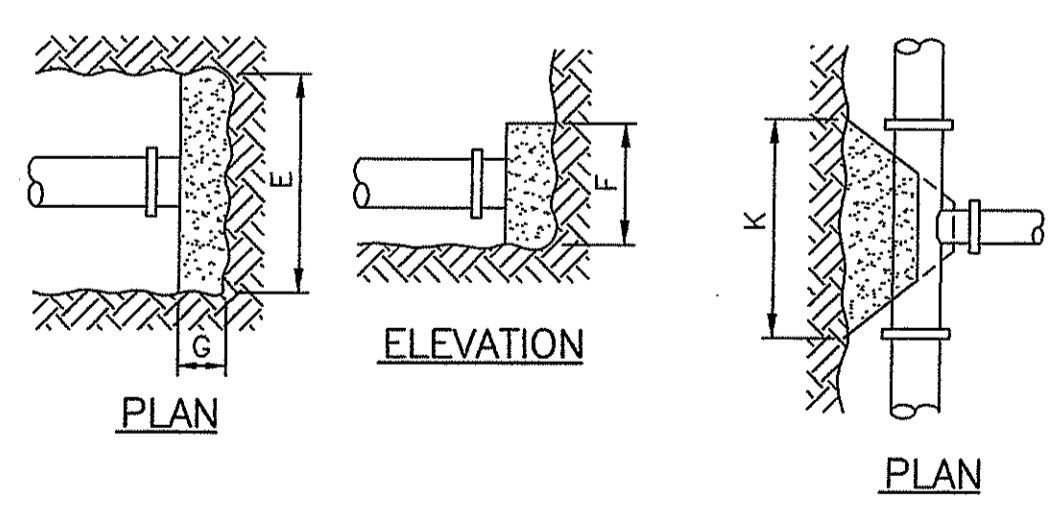


- NOTES:
1. ALL CONCRETE SHALL BE 3000 PSI @ 28 DAYS.
 2. CONCRETE THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH.
 3. ALL FORCE MAIN BENDS, TEES, MAIN TAPS, AND END CAPS SHALL REQUIRE A CONCRETE THRUST BLOCK.

| VERTICAL BENDS | |
|----------------|--------------------|
| BEND | PIPE SIZE-D (DIA.) |
| 1/8 | L 2'-6" |
| | M 1'-11" |
| | N 1'-9" |
| 1/16 | L 1'-9" |
| | M 1'-10" |
| | N 1'-8" |
| 1/32 | L 1'-0" |
| | M 1'-10" |
| | N 1'-8" |

| ANCHORAGES | |
|------------|--------------------|
| BEND | PIPE SIZE-D (DIA.) |
| 1/8 | R 4'-6" |
| | S 3'-6" |
| | T 4'-9" |
| 1/16 | R 2'-6" |
| | S 2'-6" |
| | T 4'-0" |
| 1/32 | R 3'-0" |
| | S 2'-0" |
| | T 3'-0" |

- NOTES:
1. THE MINIMUM BURY DEPTH FOR DOMESTIC WATER PIPE SHALL BE 5'-0" TO THE PIPE CROWN. FIRE MAIN SHALL BE 5'-6" TO THE PIPE CROWN.
 2. CONTRACTOR SHALL PROTECT ALL UTILITIES FROM DAMAGE AND IS RESPONSIBLE FOR REPAIR OF ALL UTILITIES DAMAGED OUTSIDE THE LIMIT OF DISTURBANCE.



| PIPE DIAMETER (in.) | BLOCK DIMENSIONS (in.) | | | BEARING AREA (SF.) |
|---------------------|------------------------|----|----|--------------------|
| | E | F | G | |
| 12 | 48 | 48 | 18 | 16.0 |

| PIPE DIAMETER (in.) | BLOCK DIMENSIONS (in.) | | | BEARING AREA (SF.) |
|---------------------|------------------------|----|----|--------------------|
| | K | L | M | |
| 12 | 48 | 48 | 36 | 16.0 |

| PIPE DIAMETER (in.) | BEND | BLOCK DIMENSIONS (in.) | | | BEARING AREA (SF.) |
|---------------------|---------|------------------------|----|----|--------------------|
| | | A | B | C | |
| 12 | 90° | 60 | 48 | 36 | 21.0 |
| | 45° | 42 | 42 | 36 | 11.7 |
| | 22 1/2° | 36 | 24 | 24 | 6.0 |
| | 11 1/4° | 30 | 19 | 24 | 3.0 |

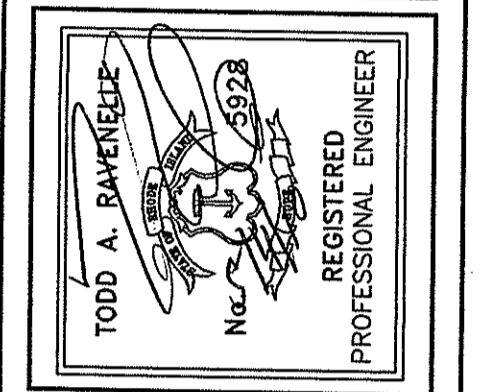
- NOTES:
1. ALL CONCRETE SHALL BE 4000 PSI @ 28 DAYS.
 2. CONCRETE THRUST BLOCKS SHALL BEAR AGAINST UNDISTURBED EARTH OR COMPACTED COMMON BORROW OR GRAVEL BORROW. ALL COMPACTION SHALL BE TO 95% MODIFIED PROCTOR.

THRUST BLOCK DETAILS
N.T.S.

FENCE DETAILS
SCALE: 1/2"=1'-0"

- FENCE NOTES:
1. FENCE SHALL BE PVC COATED STEEL AND SHALL CONFORM TO THE REQUIREMENTS IN THE SPECIFICATION.

PROJECT
CULVERT REPLACEMENT OF CV1A, CV2, CV3 and CV4 WHITE HORN BROOK KINGSTON, RHODE ISLAND



CLIENT
UNIVERSITY OF RHODE ISLAND
Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
DETAILS - 1

| NO. | DATE | REVISIONS |
|-----|------|-----------|
| | | |

PROJECT NO.: 1254

DATE: APRIL 2010

SCALE: NONE

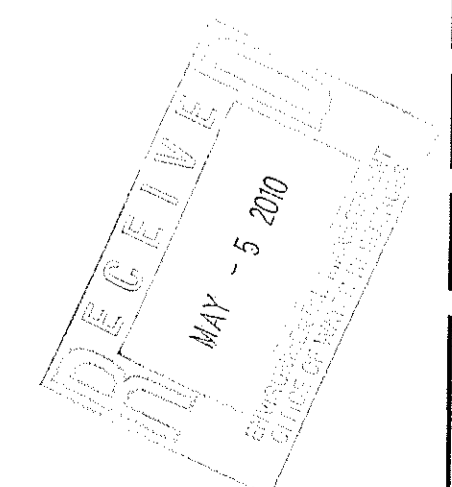
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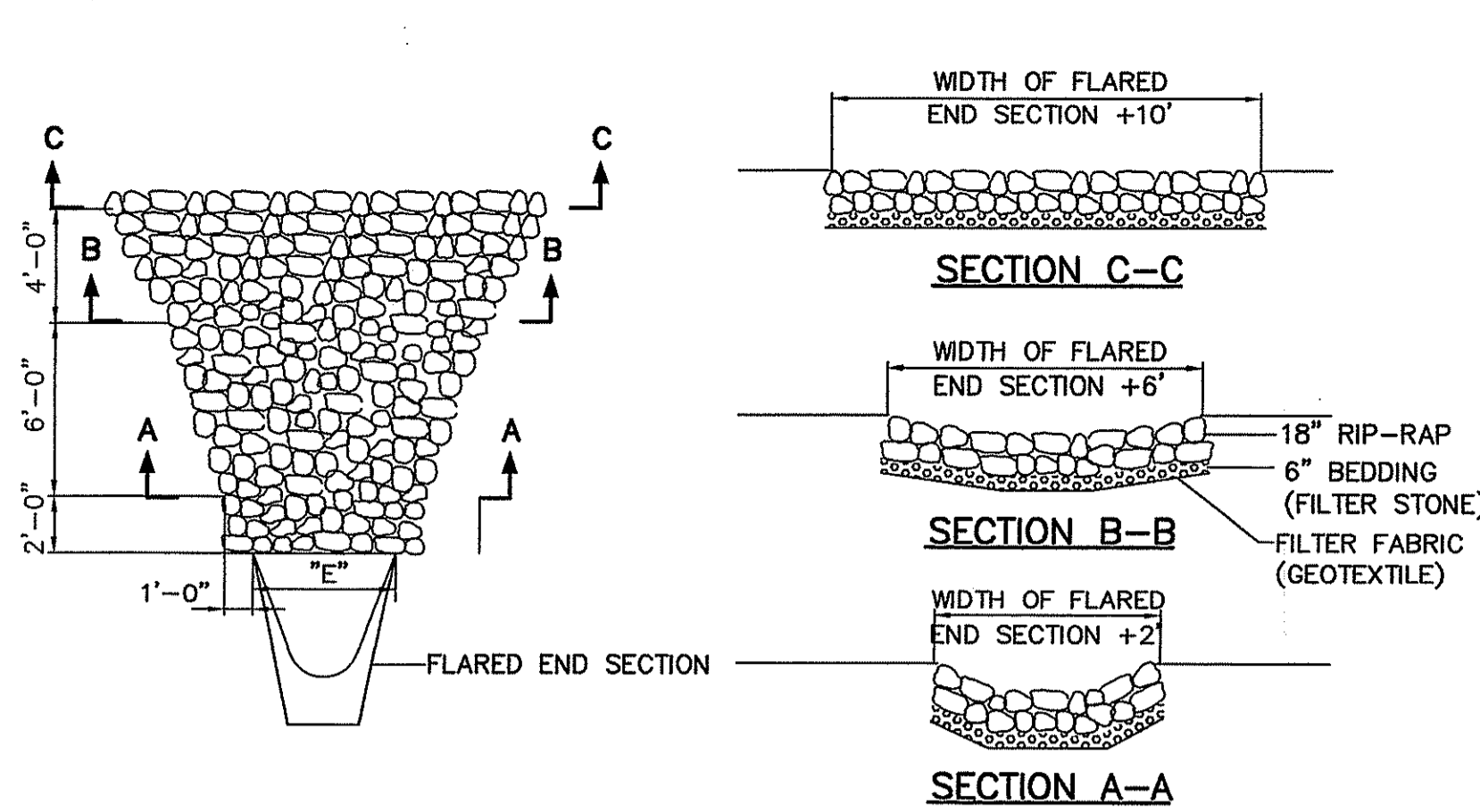
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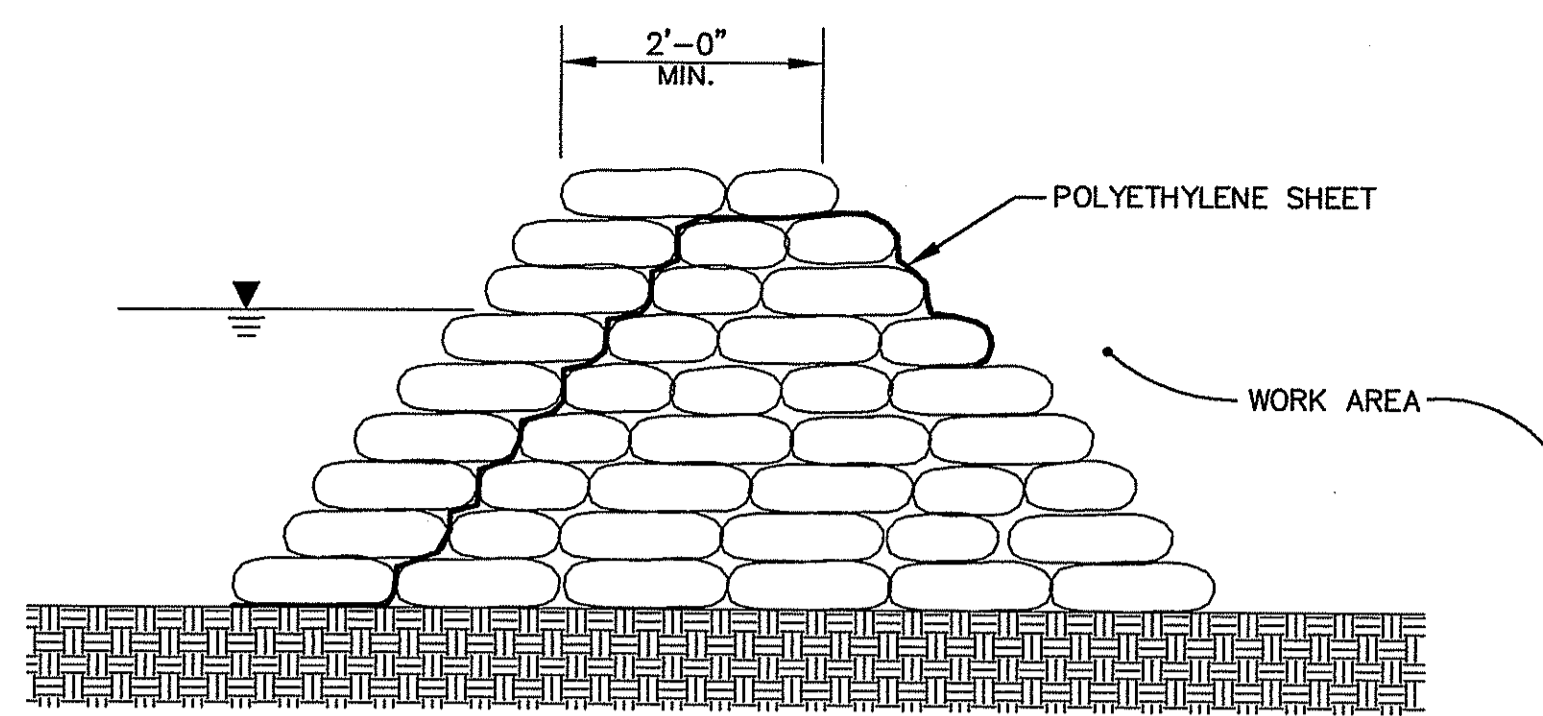
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SHEET 11 OF 12



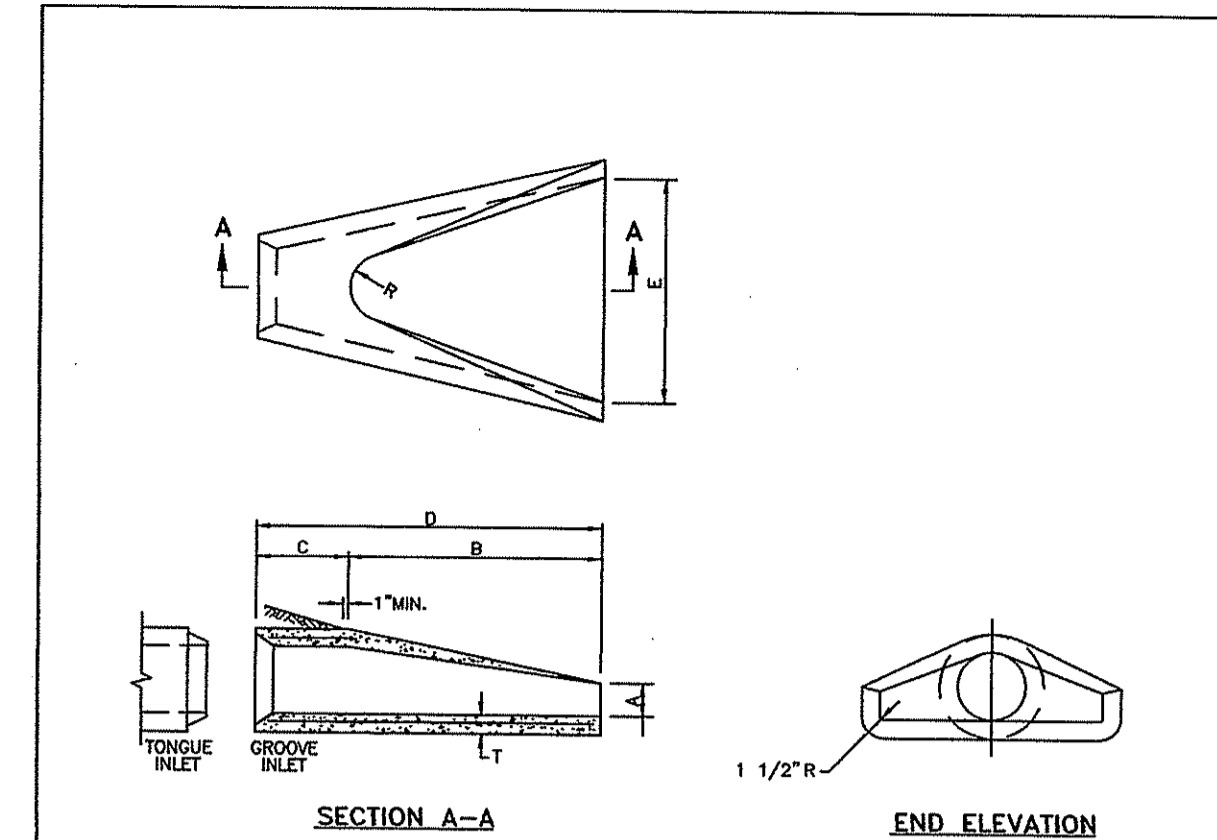


RIP-RAP PAD DETAIL (RRP)
N.T.S.



- NOTES:**
- ACTUAL SANDBAG DAM TO BE DETERMINED BY THE CONTRACTOR BASED ON SITE CONDITIONS.
 - SANDBAGS SHALL BE IN ACCORDANCE WITH SECTION 207 OF THE STANDARD SPECIFICATIONS.

SCHEMATIC SANDBAG DAM DETAIL
NOT TO SCALE



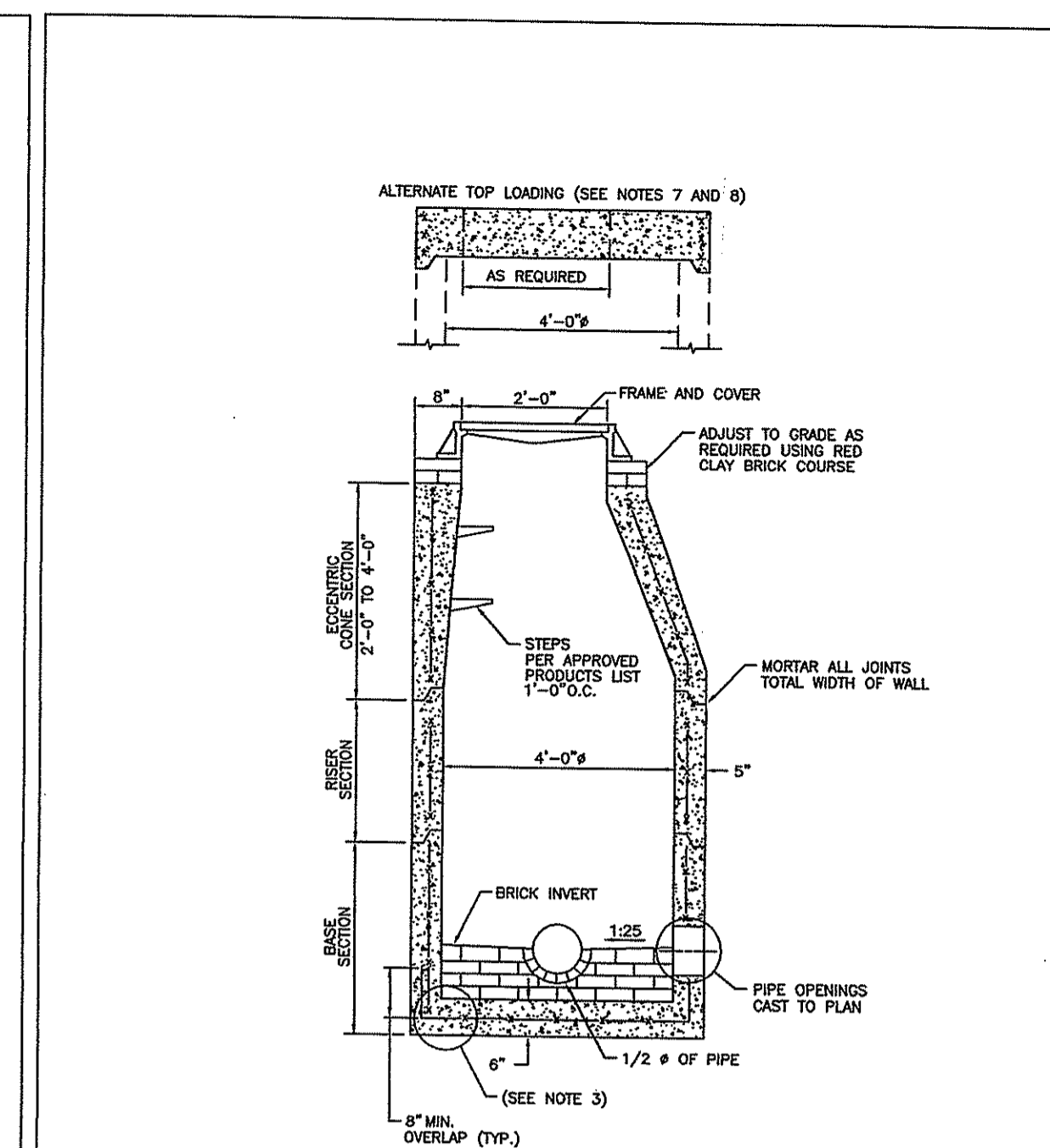
| NO. | DIMENSIONS | | | | | | | REINFORCEMENT ONE LAYER REINFORCEMENT MIN. AREA OF EACH WAY (SQ. IN./FT.) | |
|--------|------------|-----------|------------|-----------|-------|--------|--------|--|-------|
| | A | B | C | D | E | R | T | | |
| 1-1/4" | 4" | 2'-0" | 4'-0" | 7/8" | 8'-0" | 7/8" | 2'-0" | 9" | 0.048 |
| 1-3/4" | 6" | 2'-3" | 3'-10" | 6'-1" | 2'-8" | 11" | 2 1/4" | 2" | 0.054 |
| 1'-0" | 9" | 2'-3" | 3'-10" | 6'-1" | 3'-0" | 12" | 2 1/2" | 2" | 0.050 |
| 2'-0" | 9 1/2" | 3'-7 1/2" | 2'-6" | 8'-1 1/2" | 4'-0" | 1'-2" | 3" | 3" | 0.072 |
| 2'-0" | 1'-0" | 4'-0" | 1'-7 3/4" | 8'-1 3/4" | 5'-0" | 1'-3" | 3 1/2" | 3" | 0.084 |
| 3'-0" | 1'-3" | 5'-3" | 2'-10 3/4" | 8'-1 3/4" | 6'-0" | 1'-8" | 4" | 4" | 0.096 |
| 3'-6" | 1'-9" | 5'-9" | 2'-11" | 8'-2" | 6'-6" | 1'-10" | 4 1/2" | 4" | 0.108 |
| 4'-0" | 2'-0" | 6'-0" | 2'-2" | 8'-2" | 7'-0" | 1'-10" | 5" | 5" | 0.120 |
| 4'-6" | 2'-3" | 6'-3" | 2'-11" | 8'-4" | 7'-6" | 2'-0" | 5 1/2" | 5" | 0.132 |
| 5'-0" | 2'-6" | 6'-6" | 3'-3" | 8'-3" | 8'-0" | 2'-0" | 6" | 6" | 0.144 |

NOTE: SHALL BE IN ACCORDANCE WITH SECTION 701 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE FLARED END SECTION

JUNE 15, 1998
R.I. STANDARD 2.3.0

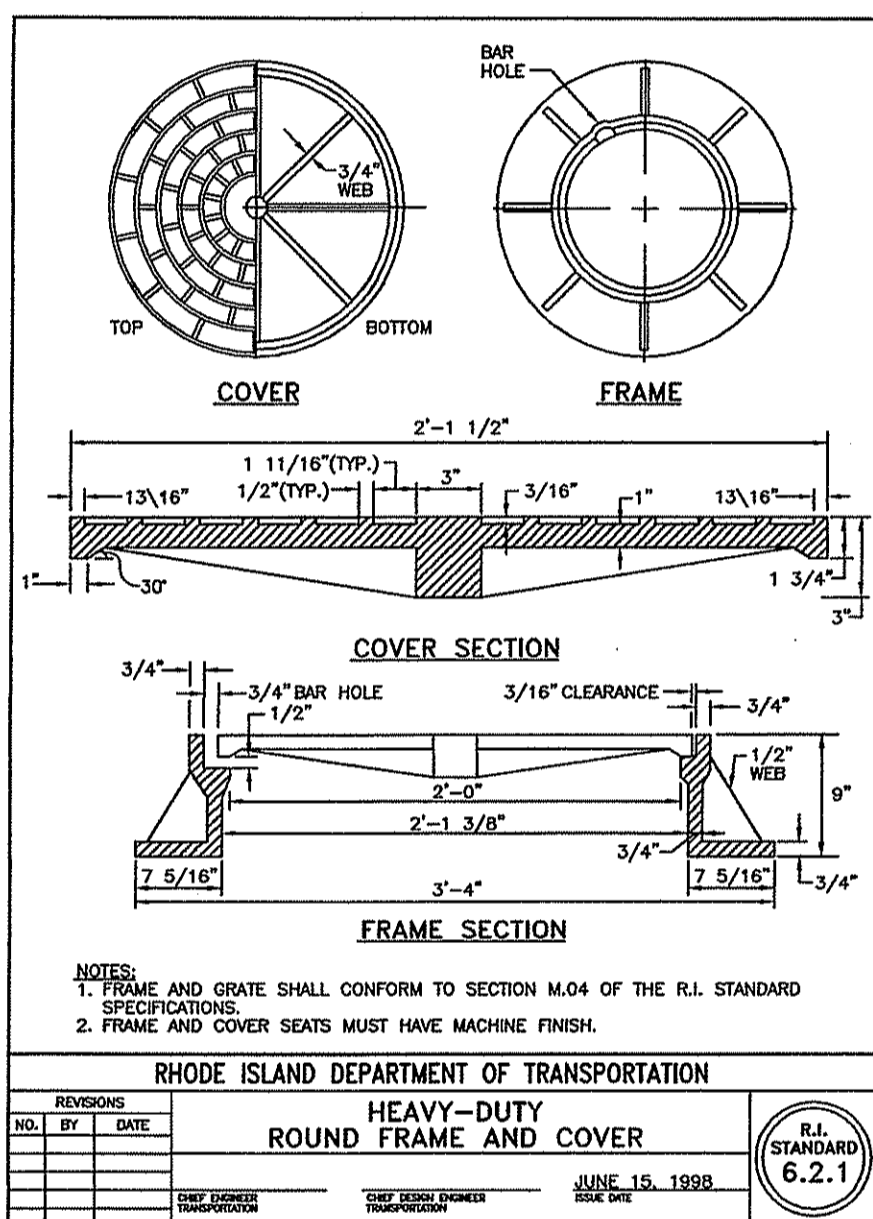


- NOTES:**
- SHALL BE IN ACCORDANCE WITH SECTION 702 OF THE R.I. STANDARD SPECIFICATIONS.
 - CIRCUMFERENTIAL STEEL REINFORCEMENT REQUIRED = 0.12 SQ. IN. / LIN. FT. MINIMUM.
 - STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MINIMUM OF 0.12 SQ. IN./LIN. FT. (BOTH WAYS).
 - ONE FOUR MONOLITHIC BASE SECTION.
 - ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW-CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS AND CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.
 - STEPS SHALL CONFORM TO STD. 9.3.0 AND SHALL BE INSTALLED AT THE CASTING PLANT.
 - ALTERNATE TOP SLAB IS STEEL REINFORCED TO MEET OR EXCEED H-20 LOADING (SEE STD. 4.7.2).
 - ALTERNATE TOP SLAB IS ONLY FOR USE WHEN REDUCING SECTION DOES NOT FIT BECAUSE OF STRUCTURE DEPTH.
 - REFER TO STD. 5.2.0 FOR MAXIMUM PIPE SIZES.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST 4'-0" ROUND MANHOLE

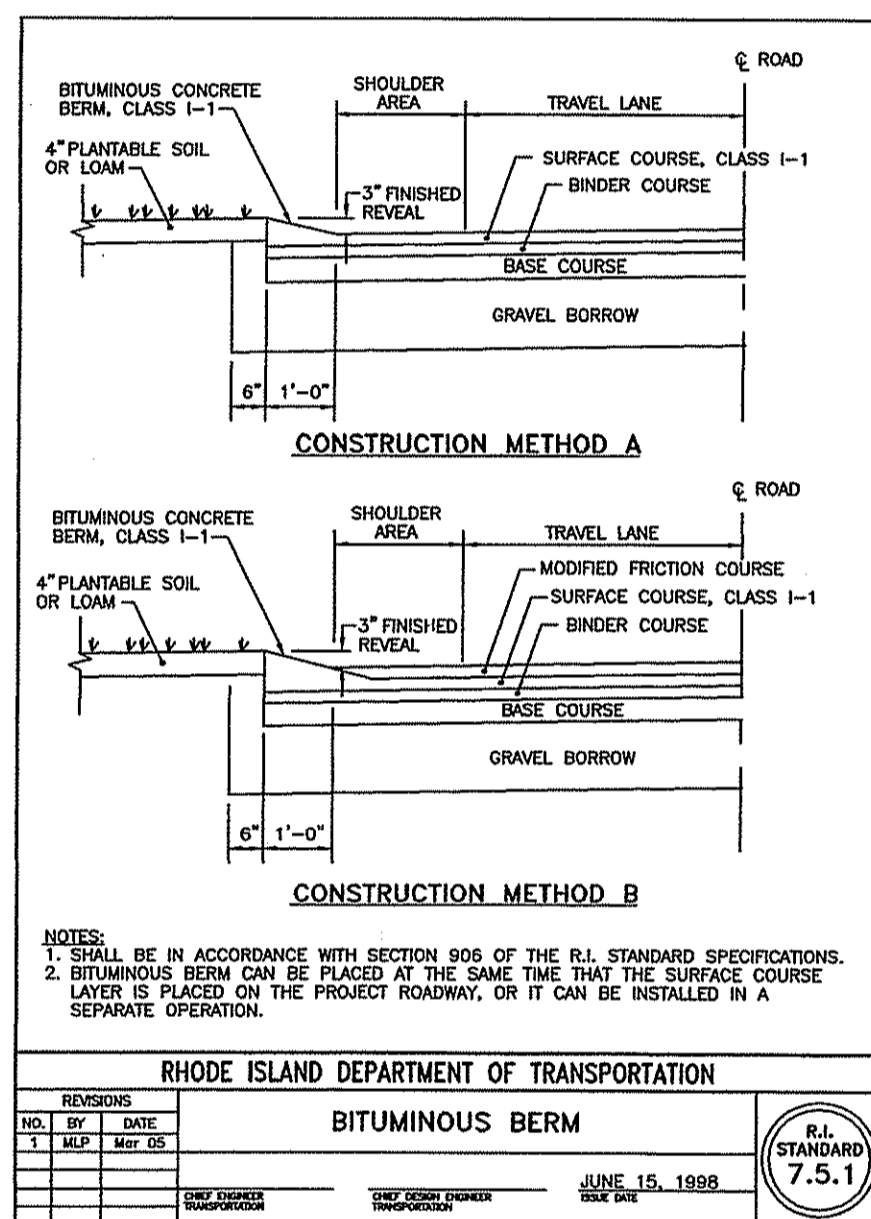
JUNE 15, 1998
R.I. STANDARD 4.2.0



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

HEAVY-DUTY ROUND FRAME AND COVER

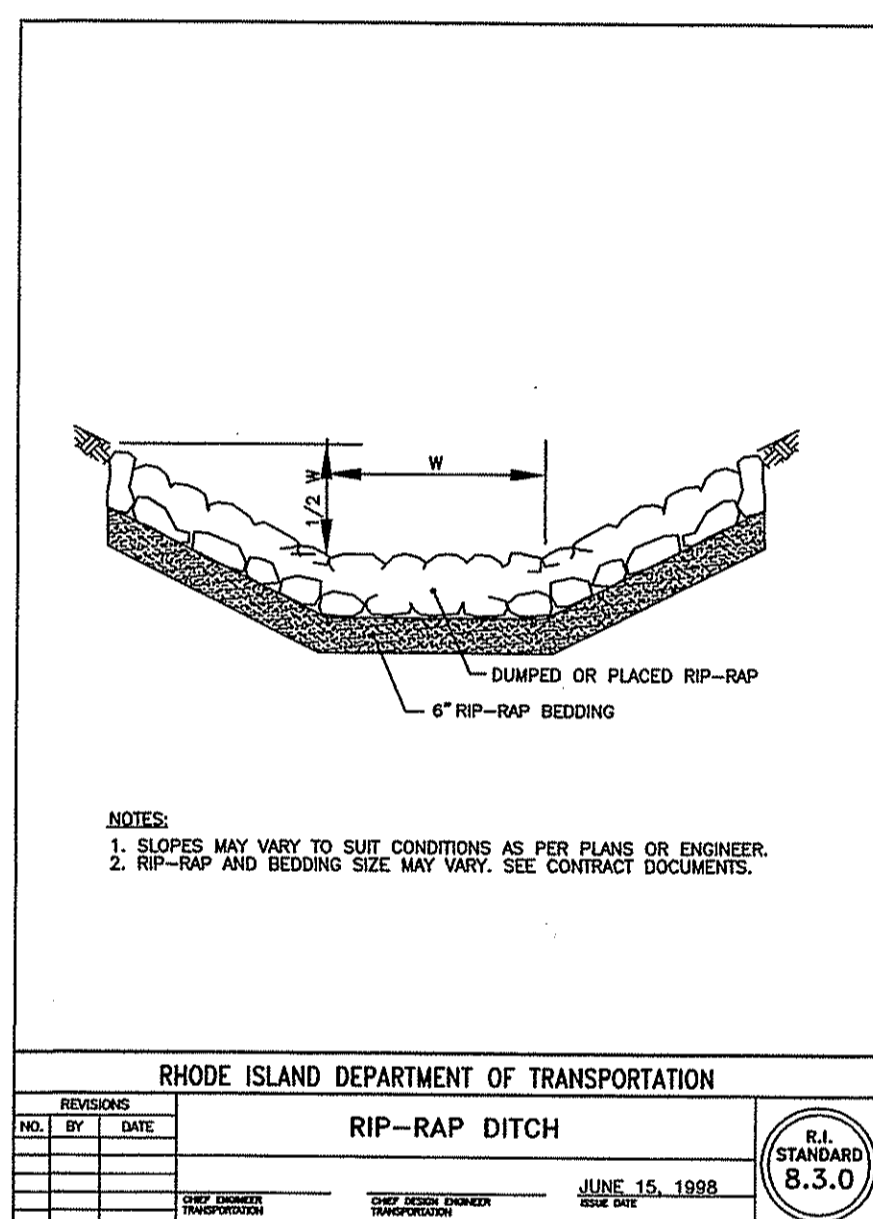
JUNE 15, 1998
R.I. STANDARD 6.2.1



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BITUMINOUS BERM

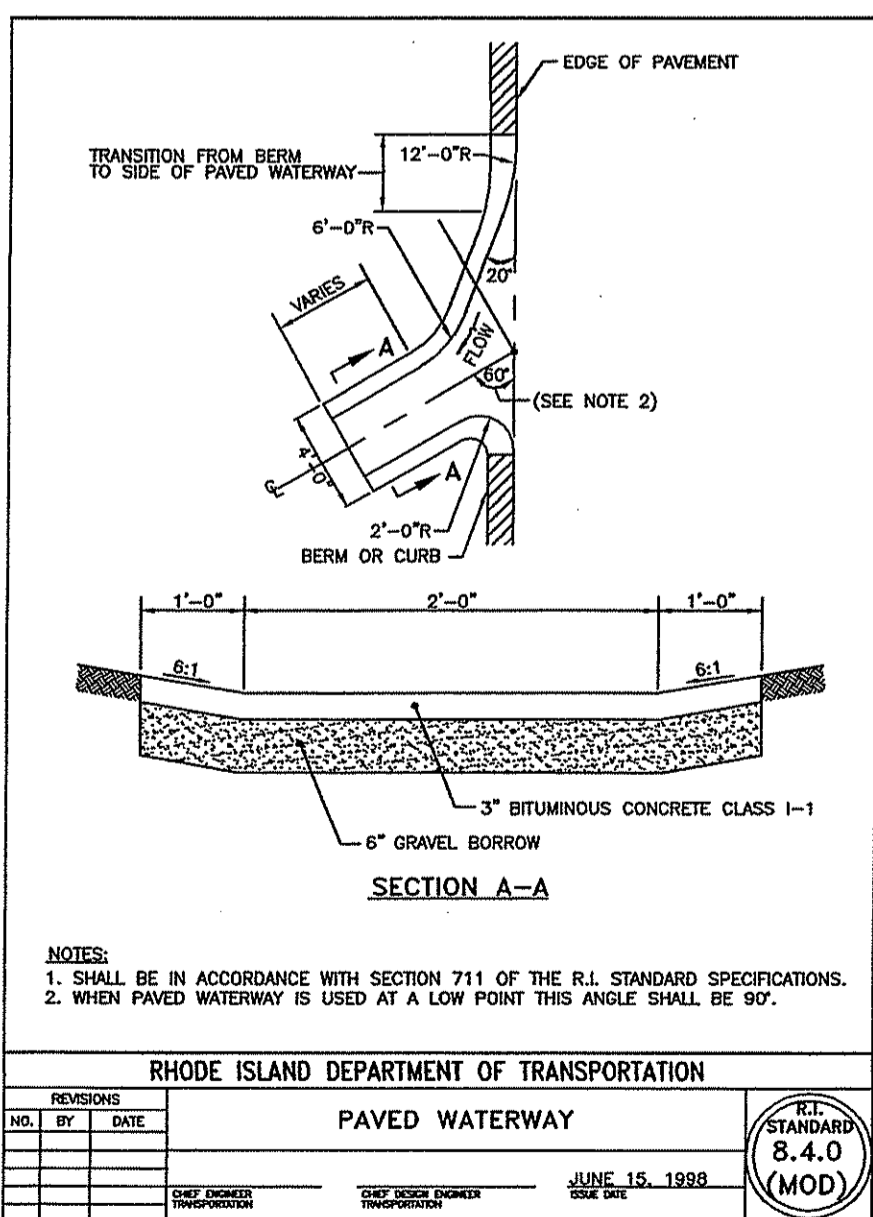
JUNE 15, 1998
R.I. STANDARD 7.5.1



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RIP-RAP DITCH

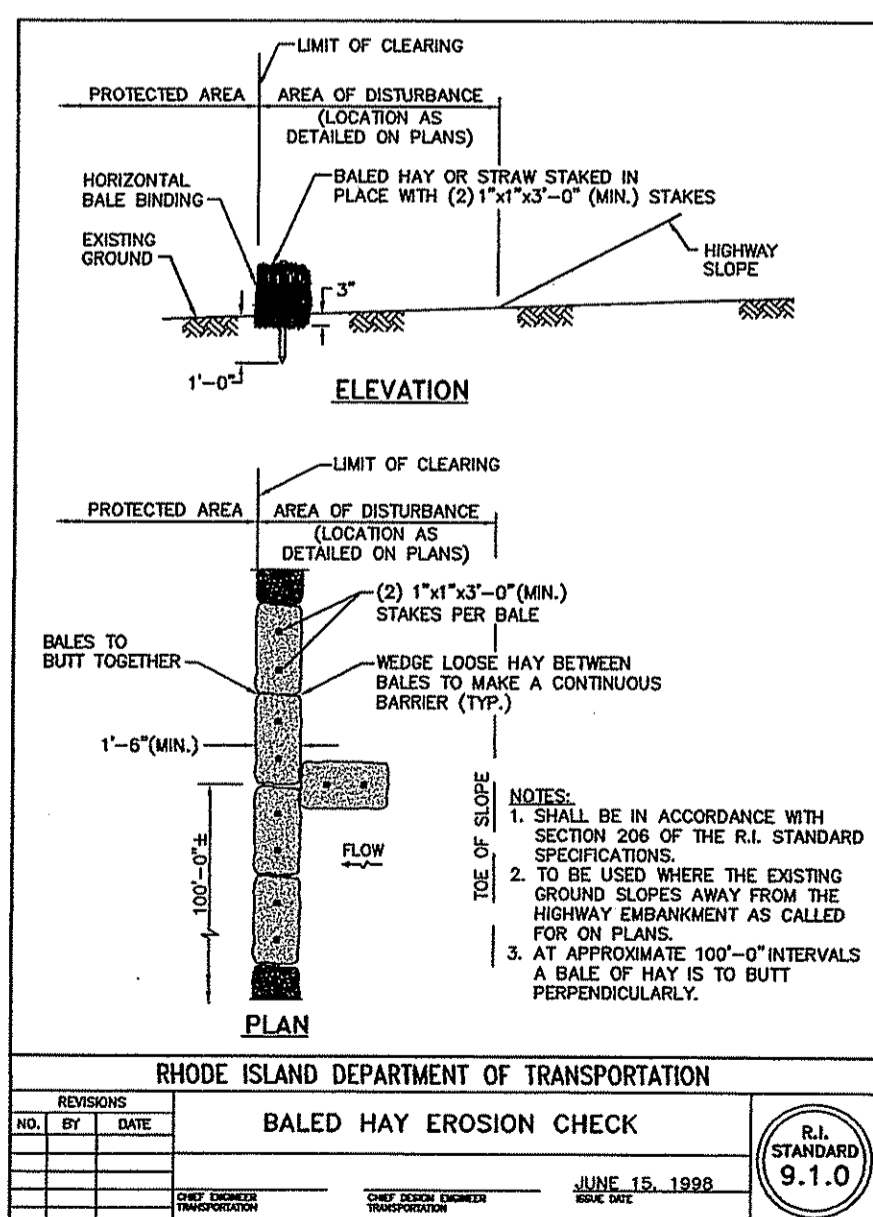
JUNE 15, 1998
R.I. STANDARD 8.3.0



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PAVED WATERWAY

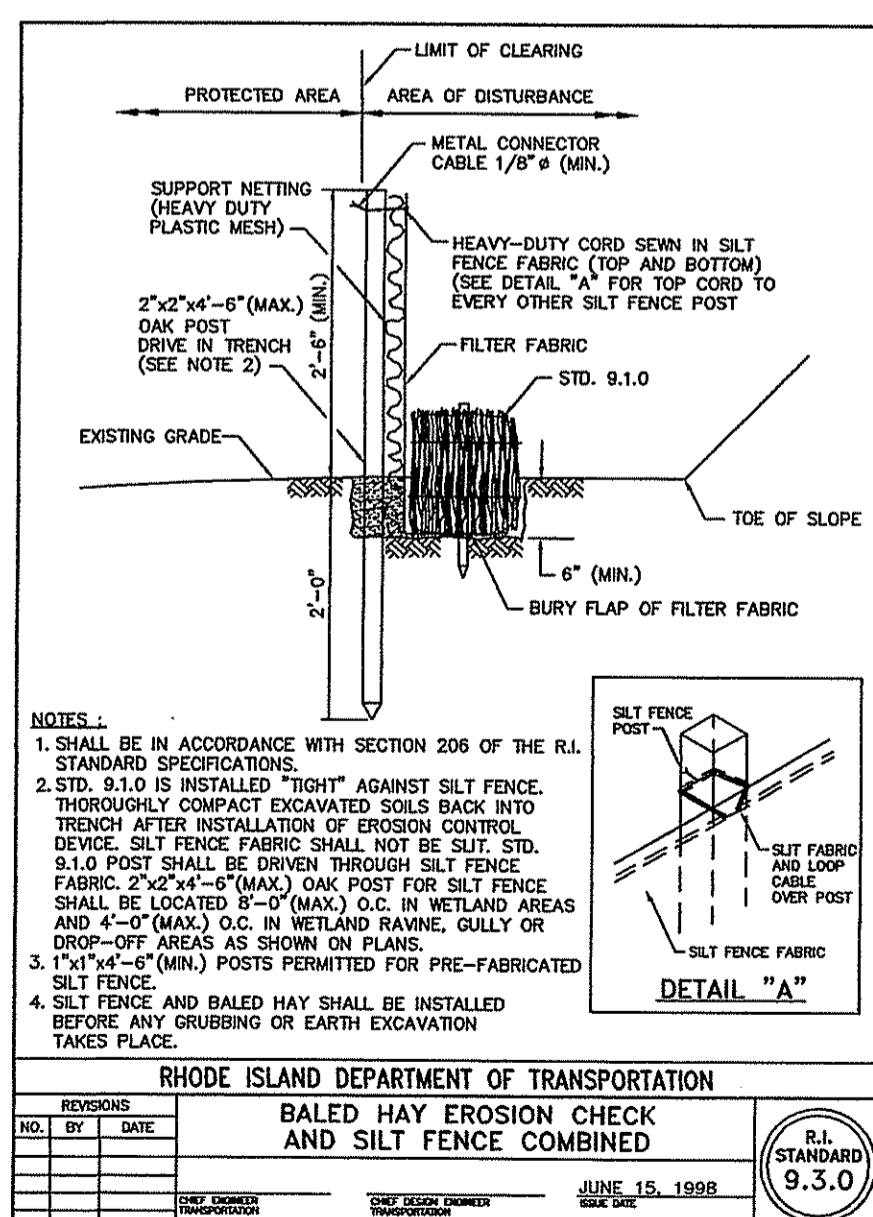
JUNE 15, 1998
R.I. STANDARD 8.4.0 (MOD)



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY EROSION CHECK

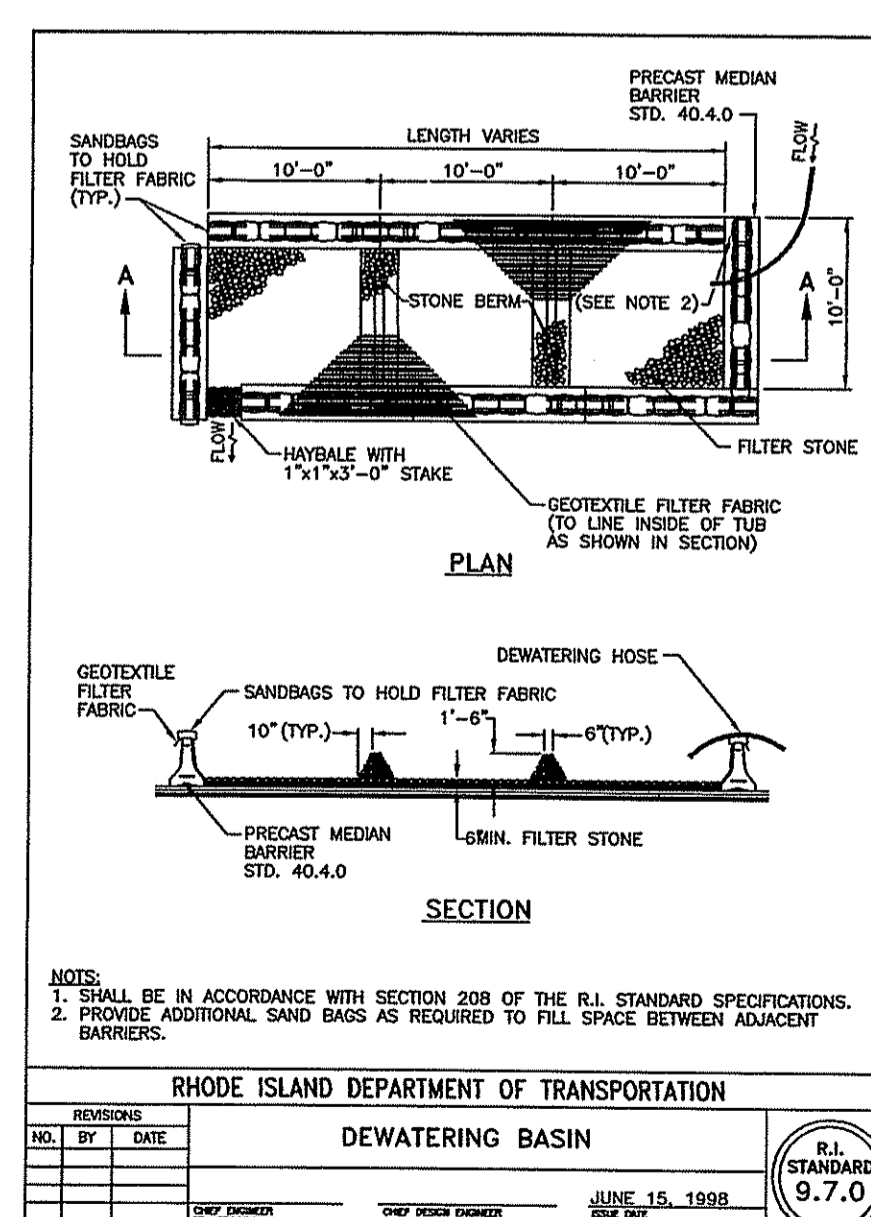
JUNE 15, 1998
R.I. STANDARD 9.1.0



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY EROSION CHECK AND SILT FENCE COMBINED

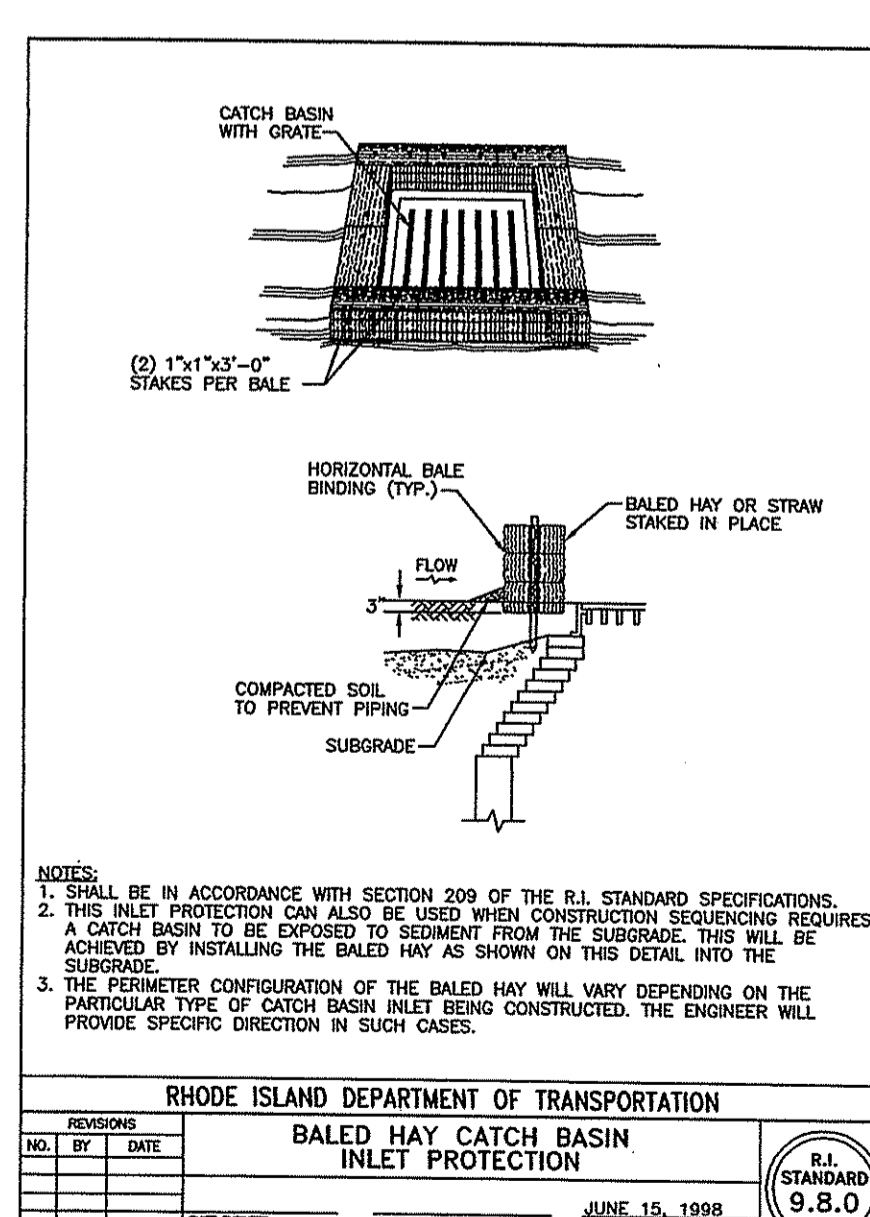
JUNE 15, 1998
R.I. STANDARD 9.3.0



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

DEWATERING BASIN

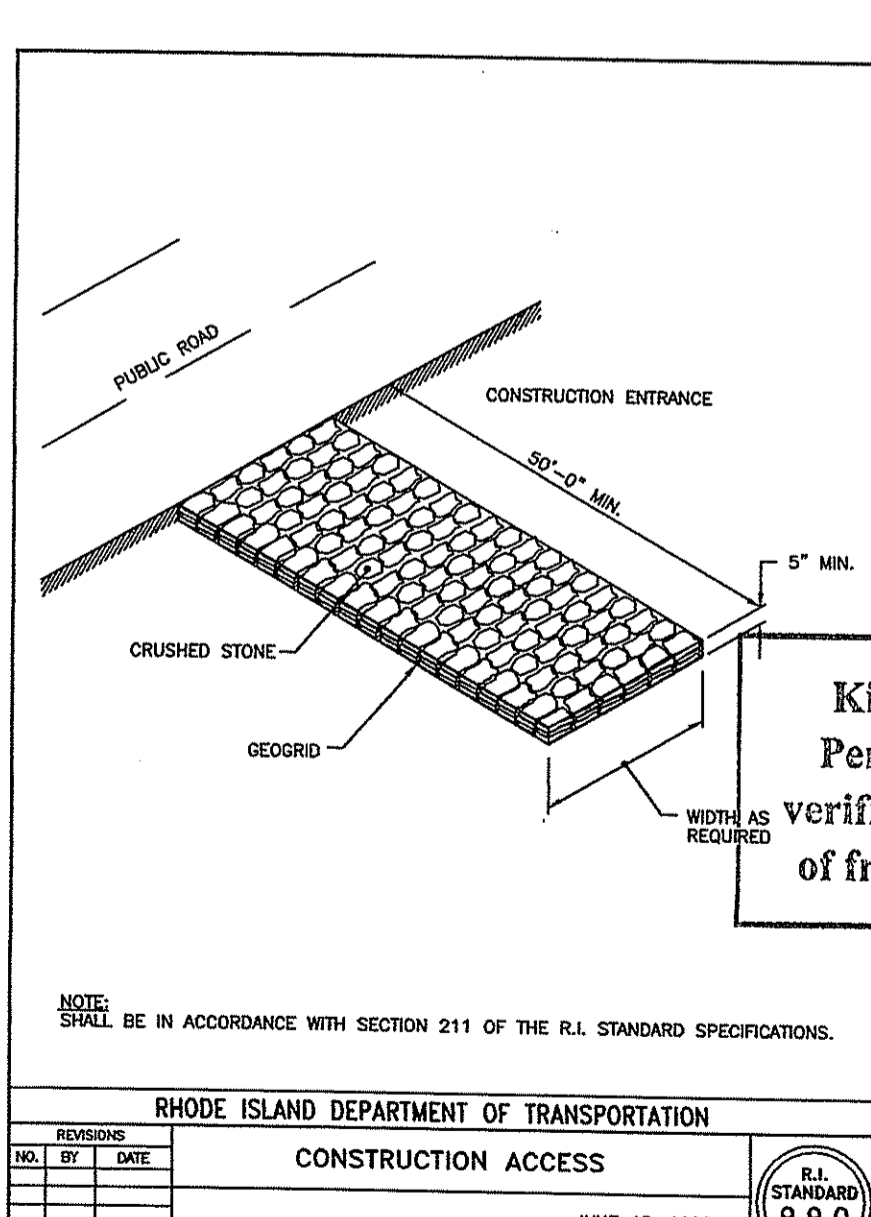
JUNE 15, 1998
R.I. STANDARD 9.7.0



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY CATCH BASIN INLET PROTECTION

JUNE 15, 1998
R.I. STANDARD 9.8.0



RHODE ISLAND DEPARTMENT OF TRANSPORTATION

CONSTRUCTION ACCESS

JUNE 15, 1998
R.I. STANDARD 9.9.0

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES
FRESHWATER WETLANDS PROGRAM
APPROVED WITH CONDITIONS
AS SPECIFIED IN THE LETTER OF APPROVAL
DATED JUN - 3 2010 FILE # 10-2010
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

RECEIVED
MAY - 5 2010
ENVIRONMENTAL MANAGEMENT
OFFICE OF WATER RESOURCES

PROJECT
CULVERT REPLACEMENT OF CV1A, CV2, CV3 and CV4 WHITE HORN BROOK KINGSTON, RHODE ISLAND

TODD A. BAYNE
No. 6628
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND
Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
DETAILS - 2

PROJECT NO.: 1254

DATE: APRIL 2010

SCALE: NONE

DRAWN BY: J.L.H.

CHECKED BY: T.A.R.

DRAWING NUMBER

12

SHEET 12 OF 12

W. Joseph Casey