

# Preliminary Submission

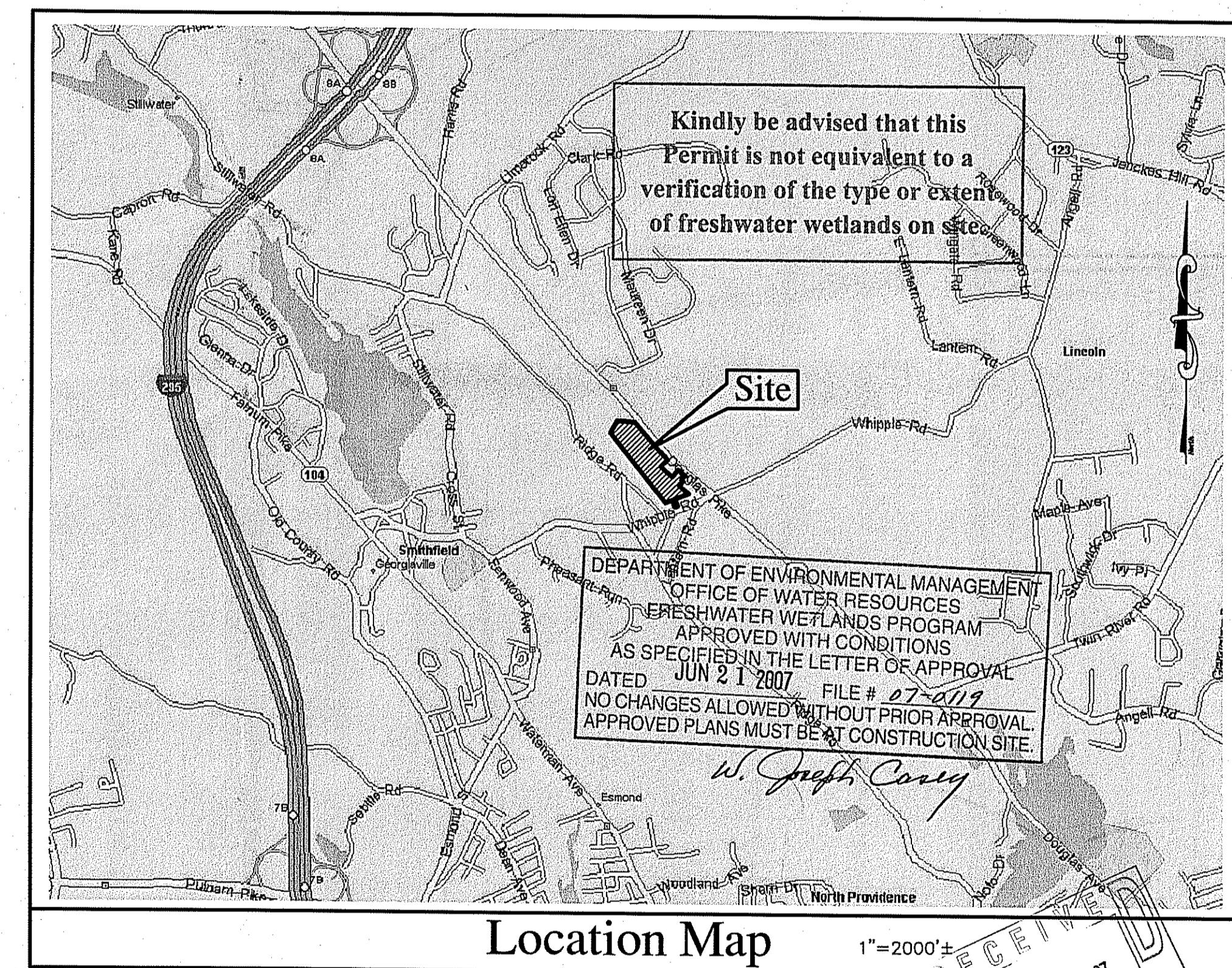
# Cardinal Hill

Located on Douglas Pike & Whipple Road  
Smithfield, Rhode Island

Assessor's Plat 42 Lots 113, 161, 164, & 165

## Sheet Index

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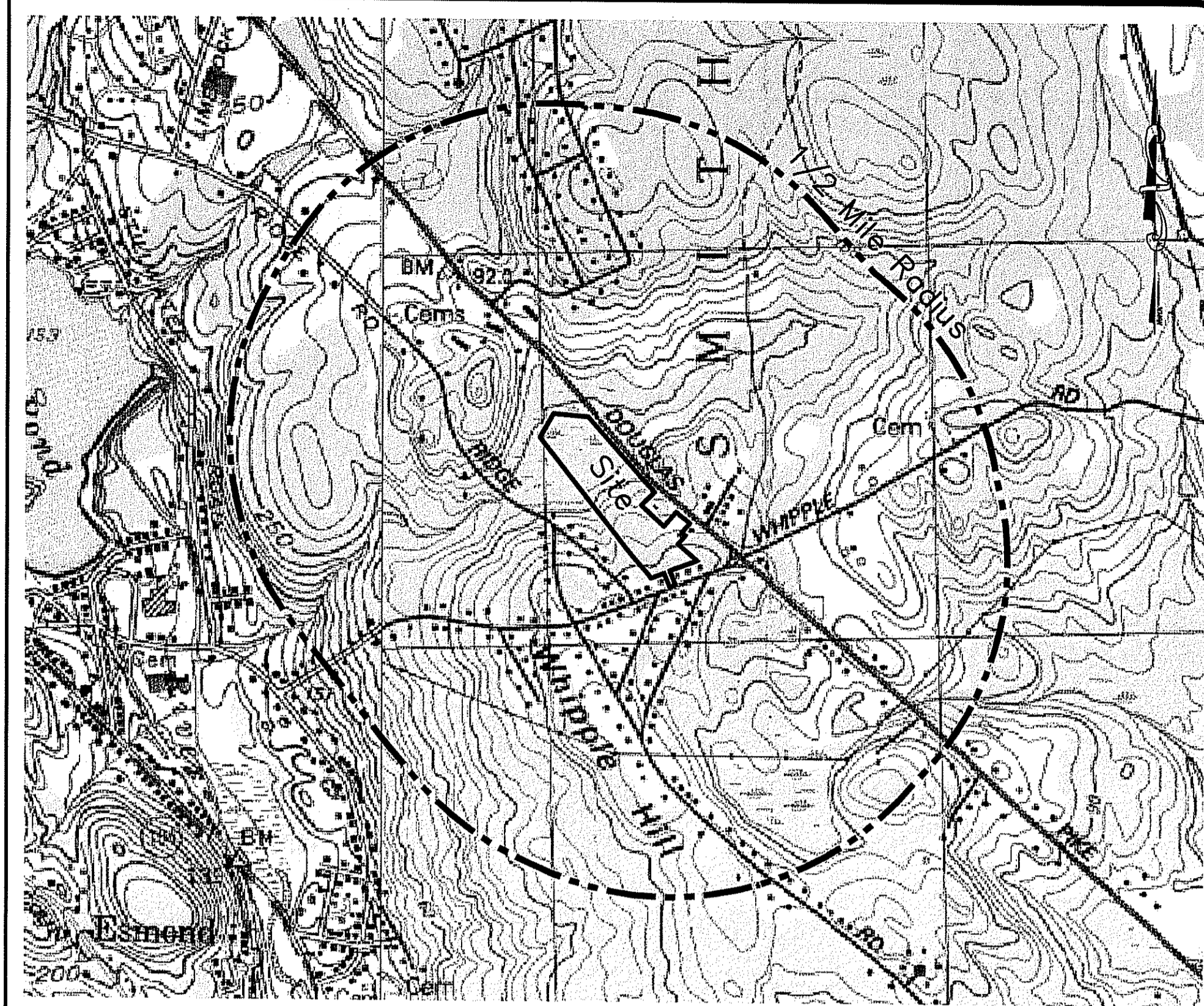


Location Map 1"=2000'±

Preliminary Submission

				<p align="center"><b>COVER SHEET</b></p> <p align="center"><b>Cardinal Hill</b></p> <p align="center">ASSESSOR'S PLAT 42 LOTS 113, 161, 164 &amp; 165 SMITHFIELD, RHODE ISLAND</p> <p align="center"><b>DiPrete Engineering Associates, Inc.</b></p> <p align="center">ENGINEERING, SURVEYING AND PLANNING CONSULTANTS TWO STAFFORD COURT CRANSTON, R.I. 02920 (401) 943-1000 FAX: (401) 464-6006</p> <p align="center">PREPARED FOR <b>Crown Properties, LLC</b></p> <p align="center">34 OAKDALE AVENUE JOHNSTON, RI 02920 (401) 272-1100</p> <p align="center">FEBRUARY, 2007 DWN. BY: J.M.D.</p>	
No.	DATE	DESCRIPTION	BY		
2	5-16-07	Wetland Comments	J.M.D.		
3	4-18-07	Utility Submission	J.M.D.		
0	2-26-07	RIDE1 Wetlands / RIDOT PAPA	J.M.D.		

M:\Engineers\Projects\0731-005 Whipple Road\dwg\0731-005 Preliminary Co-Ex Sheets (1-4).dwg, 5/16/2007 4:02:12 PM, Jaaron, DWG ePlot.pc3



USGS Topographic Map 1"=1000'+/-

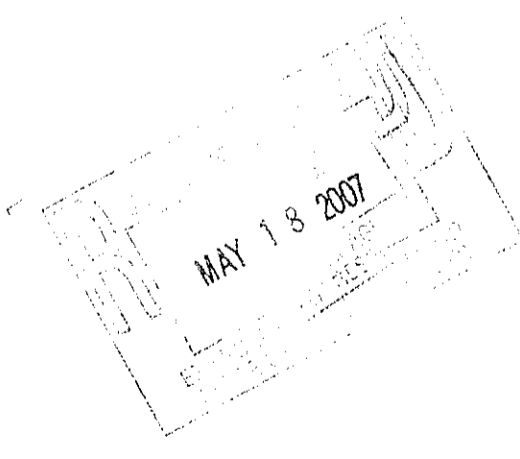
-  APPROXIMATE WETLANDS AREA
-  STATE DESIGNATED SCENIC AREA

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 21 2007 FILE # 07-019  
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

*W. Joseph Casey*

**Preliminary Submission**



CHRISTOPHER A. DUHAMEL  
 No. 5013  
 REGISTERED PROFESSIONAL ENGINEER

**1/2 MILE AERIAL PHOTOGRAPH**

**Cardinal Hill**

ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
 SMITHFIELD, RHODE ISLAND

**DiPrete Engineering Associates, Inc.**  
 ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
 TWO STAFFORD COURT  
 CRANSTON, R.I. 02920  
 (401) 943-1000 FAX: (401) 464-6006

PREPARED FOR  
**Crown Properties, LLC**  
 34 OAKDALE AVENUE  
 JOHNSTON, RI 02920  
 (401) 272-1100

FEBRUARY, 2007  
 DWN. BY: J.M.D.

PHOTO OBTAINED FROM THE RIGIS/RIDOT 2003/2004 ORTHOPHOTO INDEX (MRSID IMAGES) AND THE MASSACHUSETTS INSTITUTE OF TECHNOLOGY (MIT).  
 SCALE: 1"=300'  
 0 150' 300' 600'

NO.	DATE	DESCRIPTION	BY
2	5-16-07	Wetland Comments	J.M.D.
1	4-13-07	Utility Scrambling	J.M.D.
0	2-26-07	DiPrete Wetlands / RIDOT PAPA	J.M.D.

**LEGEND**

- EXISTING TREELINE
- ABUTTING PROPERTY LINE
- SOIL DIVISION LINE
- EXISTING EDGE OF PAVEMENT
- PROPERTY LINE
- EXISTING BUILDING
- 50' FOOT PERIMETER WETLAND LINE
- FLAGGED WETLAND LINE
- TWO FOOT CONTOUR
- TEN FOOT CONTOUR
- STREAM EDGE
- EXISTING FENCE
- EXISTING STONEWALL
- APPROXIMATE LIMIT OF FLOOD ZONE 'A'
- UTILITY POLES
- IRON ROD/PIN
- BOUND
- ASSESSOR'S PLAT
- NOW OR FORMERLY
- SEASONAL HIGH WATER TABLE LESS THAN 3.5 FEET
- FLOOD ZONE AREA
- 25 PERCENT SLOPES OR GREATER
- 15 PERCENT SLOPES OR GREATER
- SOIL DESCRIPTION
- TEST HOLE LOCATION

**GENERAL NOTES**

1. PROPERTY FOUND ON TOWN OF SMITHFIELD ASSESSOR'S PLAT 42 LOTS 113, 161, 164, AND 165. AREA OF THE PARCEL IS 16.04 ACRES ±. SITE IS ZONED R-20M.
2. OWNER OF THE PARCEL IS VITO & GABRIELLA L. CAPOBIANCO. REFERENCE DEED BOOK 22 PG 282
3. APPLICANT IS CROWN PROPERTIES, LLC, 34 OAKDALE AVENUE, JOHNSTON, RI 02919.
4. EDGE OF WETLANDS DELINEATED BY NATURAL RESOURCE SERVICES, INC., SURVEYED BY DIPRETE ENGINEERING ASSOCIATES, INC., AND VERIFIED BY RIDEM OFFICE OF WATER RESOURCES UNDER APPLICATION NO. 03-0570.
5. THE SITE IS NOT LOCATED WITHIN A WATERSHED PROTECTION DISTRICT, OR ZONE OF CONTRIBUTION OF A POND OR PUBLIC WATER SUPPLY WELL.
6. THERE IS A 100 YEAR FLOOD ZONE ON SITE. REFERENCE F.E.M.A. FLOOD INSURANCE RATE MAP NO. 440025 0008 B, DATED MARCH 4, 1991. NO BASE FLOOD ELEVATION DETERMINED.
7. COORDINATES, IN U.S. SURVEY FEET, ARE REFERENCED IN THE RHODE ISLAND STATE PLANE COORDINATE SYSTEM, REFERENCED TO THE NORTH AMERICAN DATUM OF 1983 (NAD 83), AS DETERMINED BY DIPRETE ENGINEERING ASSOCIATES, INC. SURVEY BY REAL TIME KINEMATIC G.P.S. OBSERVATIONS.
8. ELEVATIONS, IN U.S. SURVEY FEET, ARE REFERENCED TO THE (NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD 88), AS DETERMINED BY DIPRETE ENGINEERING ASSOCIATES, INC. SURVEY BY REAL TIME KINEMATIC G.P.S. OBSERVATIONS.
9. PLANIMETRIC FEATURES, CONTOUR LINES, AND SPOT ELEVATIONS WERE STEREO COMPILED AT A SCALE OF 1"=40' BY TECHMAP INC., SMITHFIELD RHODE ISLAND. SUB CONSULTANTS TO THE OWNER/DEVELOPER, FROM BLACK AND WHITE PHOTOGRAPHY AND WAS FIT TO GROUND CONTROL POINTS SURVEYED BY DIPRETE ENGINEERING ASSOCIATES, INC.
10. THE PERIMETER OF THE SUBJECT PROPERTY IS TO A CLASS I SURVEY STANDARD AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS. THE GEOMETRY AND AREAS OF THE INTERIOR LOTS DEPICTED HEREON ARE PRELIMINARY ONLY AND SUBJECT TO REVIEW AND CHANGE BY THE PLANNING BOARD. THIS PRELIMINARY PLAN MAY NOT BE USED FOR CONVEYANCE PURPOSES. ONLY THE FINAL PLAN APPROVED BY THE PLANNING BOARD AND SUBSEQUENTLY RECORDED MAY BE USED FOR CONVEYANCE PURPOSES.
11. AREA OF WETLANDS AND BUFFERS ARE APPROXIMATELY 7.06 ACRES.
12. AREA OF SLOPES GREATER THEN 25% IS APPROXIMATELY 0.37 ACRES.
13. ZONING OF THE SITE IS R-20M. A RESTRICTION OF 14 SINGLE FAMILY CONDOMINIUMS AND THE EXISTING DUPLEX TO BE DEDICATED FOR AFFORDABLE HOUSING.
14. SUBSURFACE UTILITY LINES AND FEATURES, AS SHOWN HEREIN, WERE COMPILED FROM FIELD EVIDENCE AND/OR AVAILABLE RECORD INFORMATION, AND THEIR LOCATIONS ARE ONLY APPROXIMATE. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD PRIOR TO CONSTRUCTION. BEFORE CONSTRUCTION, ALL UTILITIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED (SEE RI GENERAL LAWS SECTION 39-1.2). CALL "DIG SAFE" AT 1-888-DIG-SAFE (1-888-344-7233) PRIOR TO ANY WORK COMMENCEMENT.

**SOIL DESCRIPTIONS**

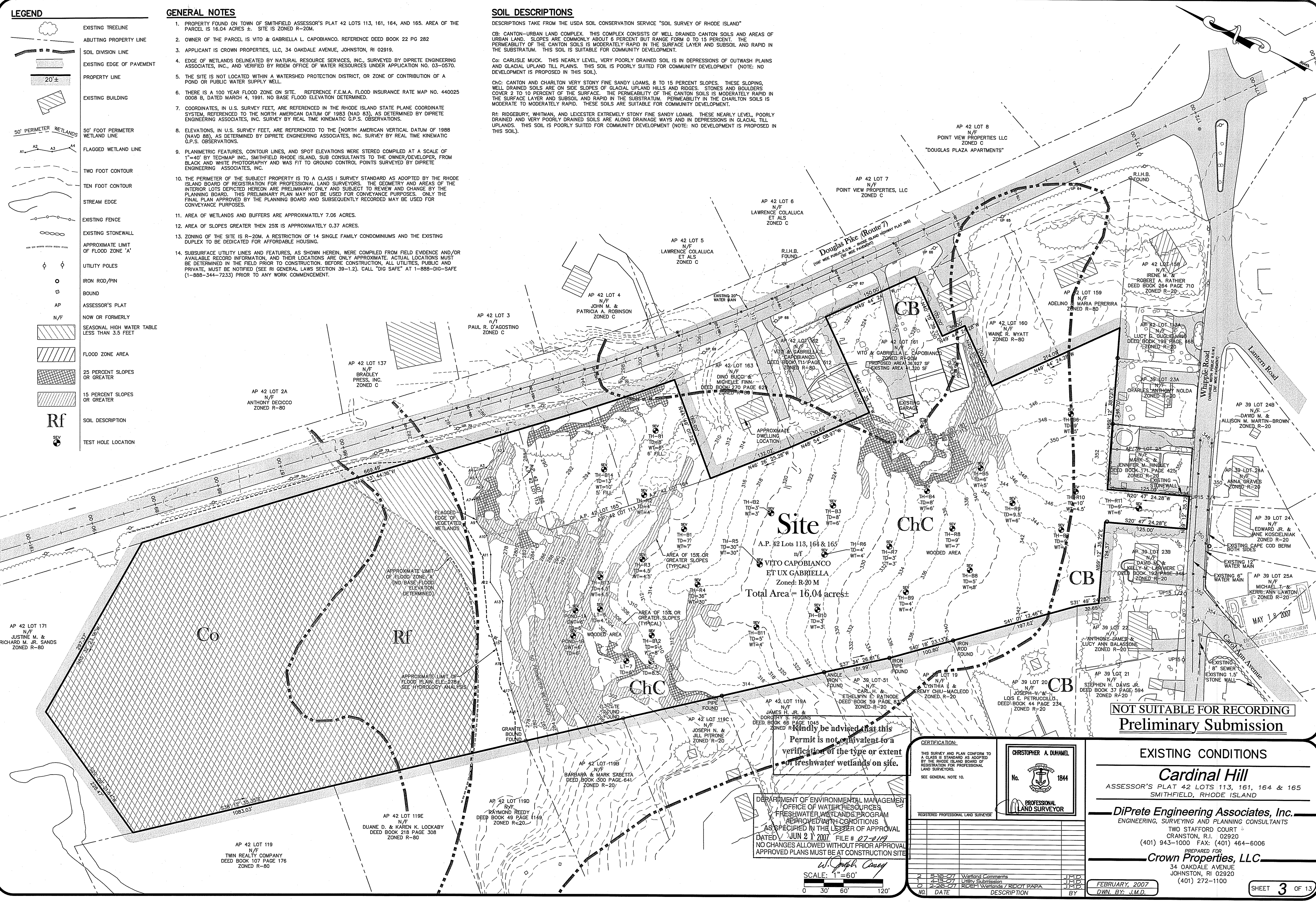
DESCRIPTIONS TAKE FROM THE USDA SOIL CONSERVATION SERVICE "SOIL SURVEY OF RHODE ISLAND"

**CB:** CANTON-URBAN LAND COMPLEX. THIS COMPLEX CONSISTS OF WELL DRAINED CANTON SOILS AND AREAS OF URBAN LAND. SLOPES ARE COMMONLY ABOUT 5 PERCENT BUT RANGE FROM 0 TO 15 PERCENT. THE PERMEABILITY OF THE CANTON SOILS IS MODERATELY RAPID IN THE SURFACE LAYER AND SUBSOIL AND RAPID IN THE SUBSTRATUM. THIS SOIL IS SUITABLE FOR COMMUNITY DEVELOPMENT.

**Co:** CARLISLE MUCK. THIS NEARLY LEVEL, VERY POORLY DRAINED SOIL IS IN DEPRESSIONS OF OUTWASH PLAINS AND GLACIAL UPLAND TILL PLAINS. THIS SOIL IS POORLY SUITED FOR COMMUNITY DEVELOPMENT (NOTE: NO DEVELOPMENT IS PROPOSED IN THIS SOIL).

**ChC:** CANTON AND CHARLTON VERY STONY FINE SANDY LOAMS, 8 TO 15 PERCENT SLOPES. THESE SLOPING, WELL DRAINED SOILS ARE ON SIDE SLOPES OF GLACIAL UPLAND HILLS AND RIDGES. STONES AND BOULDERS COVER 2 TO 10 PERCENT OF THE SURFACE. THE PERMEABILITY OF THE CANTON SOILS IS MODERATELY RAPID IN THE SURFACE LAYER AND SUBSOIL AND RAPID IN THE SUBSTRATUM. PERMEABILITY IN THE CHARLTON SOILS IS MODERATE TO MODERATELY RAPID. THESE SOILS ARE SUITABLE FOR COMMUNITY DEVELOPMENT.

**Rf:** RIDGEBURY WHITMAN, AND LEICESTER EXTREMELY STONY FINE SANDY LOAMS. THESE NEARLY LEVEL, POORLY DRAINED AND VERY POORLY DRAINED SOILS ARE ALONG DRAINAGE WAYS AND IN DEPRESSIONS IN GLACIAL TILL UPLANDS. THIS SOIL IS POORLY SUITED FOR COMMUNITY DEVELOPMENT (NOTE: NO DEVELOPMENT IS PROPOSED IN THIS SOIL).



**Site**  
 A.P. 42 Lots 113, 164 & 165  
 VITO CAPOBIANCO  
 ET UX GABRIELLA  
 Zoned: R-20 M  
 Total Area = 16.04 acres±

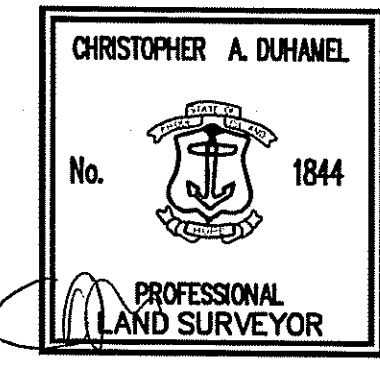
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DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 FRESHWATER WETLANDS PROGRAM  
 APPROVED WITH CONDITIONS  
 AS SPECIFIED IN THE LETTER OF APPROVAL  
 DATED JUN 21 2007 FILE # 07-0119  
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE

W. Joseph Casey  
 SCALE: 1"=60'  
 0 30' 60' 120'

**NOT SUITABLE FOR RECORDING**  
**Preliminary Submission**

**CERTIFICATION:**  
 THIS SURVEY AND PLAN CONFORM TO A CLASS II STANDARD AS ADOPTED BY THE RHODE ISLAND BOARD OF REGISTRATION FOR PROFESSIONAL LAND SURVEYORS.  
 SEE GENERAL NOTE 10.



NO.	DATE	DESCRIPTION	BY
2	5-16-07	Wetland Comments	J.M.D.
1	4-18-07	Utility Easements	J.M.D.
0	2-26-07	RIDEM Wetlands / RIDOT DATA	J.M.D.

**EXISTING CONDITIONS**  
**Cardinal Hill**  
 ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
 SMITHFIELD, RHODE ISLAND

**Diprete Engineering Associates, Inc.**  
 ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
 TWO STAFFORD COURT  
 CRANSTON, R.I. 02920  
 (401) 943-1000 FAX: (401) 464-6006

PREPARED FOR  
**Crown Properties, LLC**  
 34 OAKDALE AVENUE  
 JOHNSTON, RI 02920  
 (401) 272-1100

FEBRUARY, 2007  
 DWN. BY: J.M.D. SHEET 3 OF 13

**GENERAL NOTES**

1. THE SITE IS TO BE SERVICED BY PUBLIC WATER AND PUBLIC SEWER. THE WATER MAIN WILL BE CONNECTED TO THE 20" WATER MAIN LOCATED IN DOUGLAS PIKE, AND SERVICED BY THE SMITHFIELD WATER SUPPLY BOARD. THE SEWER WILL BE A FORCE MAIN TO THE EXISTING GRAVITY MANHOLE LOCATED AT THE INTERSECTION OF WHIPPLE ROAD AND CAROLANN AVENUE AND WILL BE SERVICED BY SMITHFIELD SEWER AUTHORITY.
2. THE DRAINAGE SYSTEM IS DESIGNED TO MEET THE TOWN OF SMITHFIELD SUBDIVISION REGULATIONS WITH THE USE OF CATCH BASINS, CULVERTS, AND A DRAINAGE DETENTION BASIN. THE BASIN IS SIZED TO CONTROL THE DISCHARGE OF STORMWATER TO LEVELS WHICH PRESENTLY EXIST FOR THE 2-100 YEAR STORMS. THE STORMWATER MANAGEMENT MEETS THE BEST MANAGEMENT PRACTICES OF THE RIDEM.
3. UNDERGROUND ELECTRIC, TELEPHONE & CABLE TV PROPOSED WITHIN PRIVATE ROW.
4. THE PROPOSED CONSERVATION EASEMENT MAY CONTAIN EXISTING PLANTINGS OR PROPOSED PLANTINGS TO PROVIDE A SEMI-OPAQUE SCREEN, LIMITING VIEWS INTO THE DEVELOPMENT.
5. THE PROPOSED PAVEMENT WILL BE 24' WIDE PRIVATE DRIVE WITH 1' WIDE CAPE COD BERMS (11' TRAVEL LANES).
6. THE SITE IS PROPOSED TO BE BUILT IN 1 PHASE.
7. SUBSURFACE UTILITY LINES AND FEATURES, AS SHOWN HEREIN, WERE COMPILED FROM FIELD EVIDENCE AND/OR AVAILABLE RECORD INFORMATION, AND THEIR LOCATIONS ARE ONLY APPROXIMATE. ACTUAL LOCATIONS MUST BE DETERMINED IN THE FIELD PRIOR TO CONSTRUCTION. BEFORE CONSTRUCTION, ALL UTILITIES, PUBLIC AND PRIVATE, MUST BE NOTIFIED (SEE RI GENERAL LAWS SECTION 39-1.2). CALL "DIG SAFE" AT 1-888-DIG-SAFE (1-888-344-7233) PRIOR TO ANY WORK COMMENCEMENT.

**DIMENSIONAL REGULATIONS**  
ZONING: R20M

MINIMUM LOT AREA	20,000 SQ.FT.
MINIMUM FRONTAGE	125 L.F.
MINIMUM FRONT YARD SETBACK	30 FT.
MINIMUM SIDE YARD SETBACK	15 FT.
MINIMUM REAR YARD SETBACK	30 FT.
MINIMUM ACCESSORY BUILDING SETBACK	15 FT.

**DEVELOPMENT DATA**

TOTAL SITE AREA	16.04 ACRES
SINGLE FAMILY UNITS	14 UNITS
AFFORDABLE DUPLEX UNITS (EXISTING)	2 UNITS
TOTAL UNITS PROPOSED	16 UNITS
AREA OF PROPOSED DRIVEWAY	0.41 ACRES
LENGTH OF PRIVATE DRIVE	1,180 L.F.-L

**DENSITY CALCULATIONS**

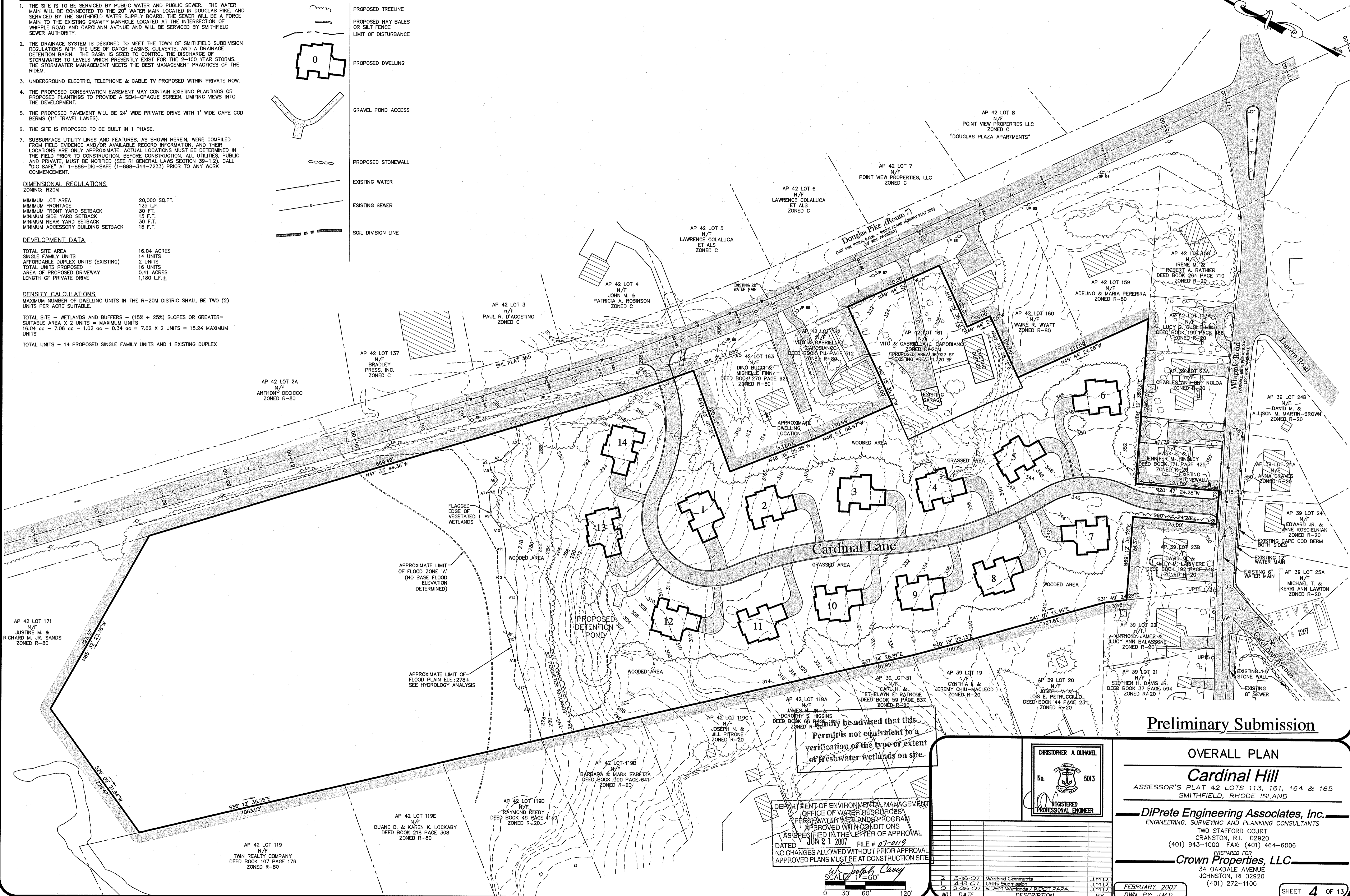
MAXIMUM NUMBER OF DWELLING UNITS IN THE R-20M DISTRICT SHALL BE TWO (2) UNITS PER ACRE SUITABLE.

TOTAL SITE - WETLANDS AND BUFFERS - (15% + 25%) SLOPES OR GREATER = SUITABLE AREA X 2 UNITS = MAXIMUM UNITS  
16.04 ac - 7.06 ac - 1.02 ac - 0.34 ac = 7.62 X 2 UNITS = 15.24 MAXIMUM UNITS

TOTAL UNITS - 14 PROPOSED SINGLE FAMILY UNITS AND 1 EXISTING DUPLEX

**LEGEND**

- PROPOSED TREELINE
- PROPOSED HAY BALES OR SILT FENCE
- LIMIT OF DISTURBANCE
- PROPOSED DWELLING
- GRAVEL POND ACCESS
- PROPOSED STONEWALL
- EXISTING WATER
- EXISTING SEWER
- SOIL DIVISION LINE



**PLEASE BE ADVISED THAT THIS PERMIT IS NOT EQUIVALENT TO A VERIFICATION OF THE TYPE OR EXTENT OF FRESHWATER WETLANDS ON SITE.**

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W. Joseph Carney  
SCALE: 1"=60'

**CHRISTOPHER A. DUHAMEL**  
No. 5013  
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY
2	5-16-07	Wetland Comments	J.M.D.
1	5-16-07	Utility Submission	J.M.D.
0	2-26-07	Wetland Wetlands / RIDOT PAPA	J.M.D.

**Preliminary Submission**

**OVERALL PLAN**  
**Cardinal Hill**  
ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
SMITHFIELD, RHODE ISLAND

**DiPrete Engineering Associates, Inc.**  
ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
TWO STAFFORD COURT  
CRANSTON, R.I. 02920  
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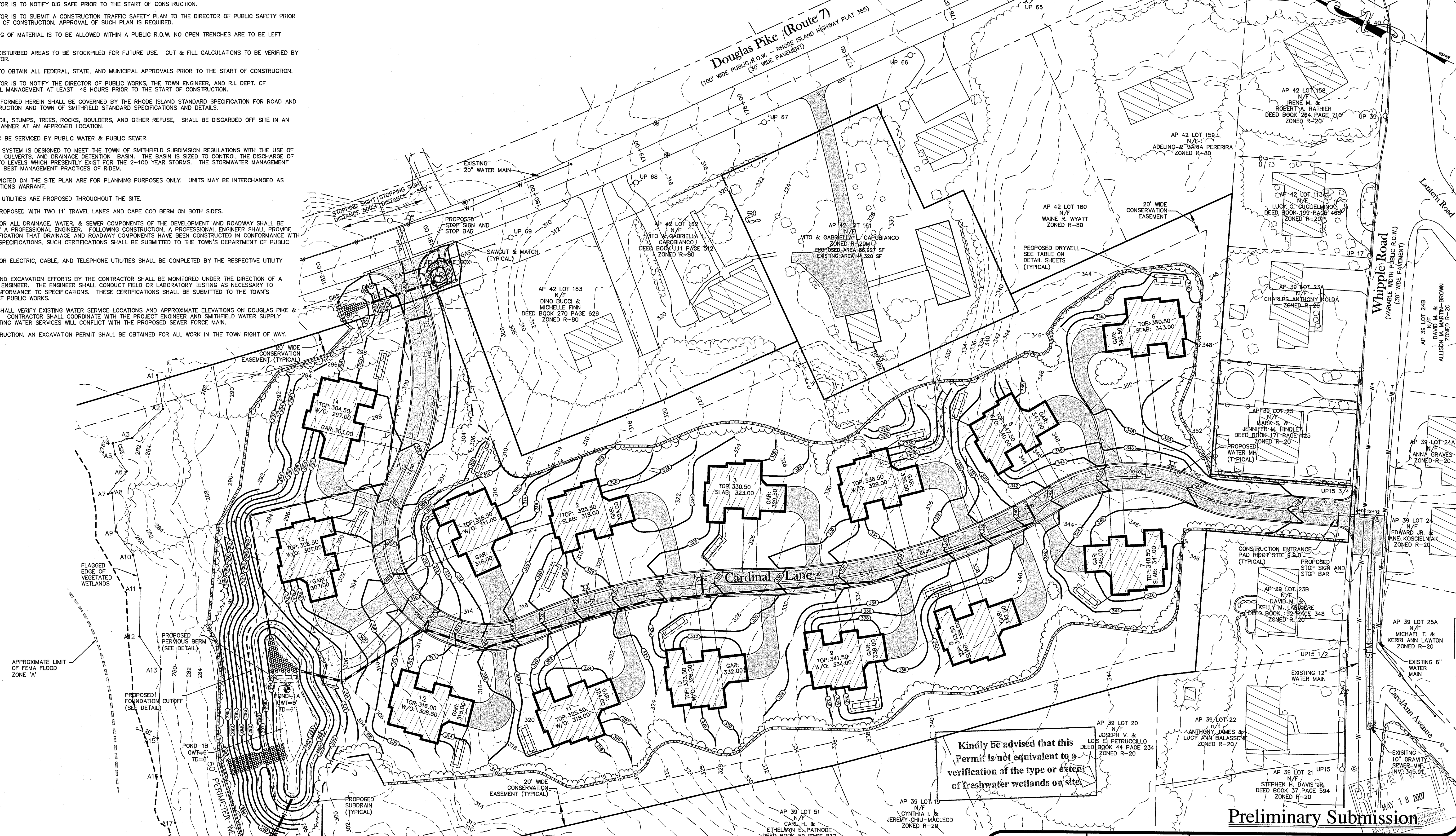
PREPARED FOR  
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34 OAKDALE AVENUE  
JOHNSTON, RI 02920  
(401) 272-1100

FEBRUARY, 2007  
DWN. BY: J.M.D.

SHEET 4 OF 13

# General Construction Notes

1. THE CONTRACTOR IS TO NOTIFY DIG SAFE PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR IS TO SUBMIT A CONSTRUCTION TRAFFIC SAFETY PLAN TO THE DIRECTOR OF PUBLIC SAFETY PRIOR TO THE START OF CONSTRUCTION. APPROVAL OF SUCH PLAN IS REQUIRED.
3. NO STOCKPILING OF MATERIAL IS TO BE ALLOWED WITHIN A PUBLIC R.O.W. NO OPEN TRENCHES ARE TO BE LEFT OVERNIGHT.
4. ALL LOAM IN DISTURBED AREAS TO BE STOCKPILED FOR FUTURE USE. CUT & FILL CALCULATIONS TO BE VERIFIED BY THE CONTRACTOR.
5. CONTRACTOR TO OBTAIN ALL FEDERAL, STATE, AND MUNICIPAL APPROVALS PRIOR TO THE START OF CONSTRUCTION.
6. THE CONTRACTOR IS TO NOTIFY THE DIRECTOR OF PUBLIC WORKS, THE TOWN ENGINEER, AND R.I. DEPT. OF ENVIRONMENTAL MANAGEMENT AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
7. ALL WORK PERFORMED HEREIN SHALL BE GOVERNED BY THE RHODE ISLAND STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION AND TOWN OF SMITHFIELD STANDARD SPECIFICATIONS AND DETAILS.
8. ALL EXCESS SOIL, STUMPS, TREES, ROCKS, BOULDERS, AND OTHER REFUSE, SHALL BE DISCARDED OFF SITE IN AN ACCEPTABLE MANNER AT AN APPROVED LOCATION.
9. THE SITE IS TO BE SERVICED BY PUBLIC WATER & PUBLIC SEWER.
10. THE DRAINAGE SYSTEM IS DESIGNED TO MEET THE TOWN OF SMITHFIELD SUBDIVISION REGULATIONS WITH THE USE OF CATCH BASINS, CULVERTS, AND DRAINAGE DETENTION BASIN. THE BASIN IS SIZED TO CONTROL THE DISCHARGE OF STORMWATER TO LEVELS WHICH PRESENTLY EXIST FOR THE 2-100 YEAR STORMS. THE STORMWATER MANAGEMENT WILL MEET THE BEST MANAGEMENT PRACTICES OF RIDEM.
11. THE UNITS DEPICTED ON THE SITE PLAN ARE FOR PLANNING PURPOSES ONLY. UNITS MAY BE INTERCHANGED AS MARKET CONDITIONS WARRANT.
12. UNDERGROUND UTILITIES ARE PROPOSED THROUGHOUT THE SITE.
13. ROADWAY IS PROPOSED WITH TWO 11' TRAVEL LANES AND CAPE COD BERM ON BOTH SIDES.
14. INSPECTIONS FOR ALL DRAINAGE, WATER, & SEWER COMPONENTS OF THE DEVELOPMENT AND ROADWAY SHALL BE CONDUCTED BY A PROFESSIONAL ENGINEER. FOLLOWING CONSTRUCTION, A PROFESSIONAL ENGINEER SHALL PROVIDE WRITTEN CERTIFICATION THAT DRAINAGE AND ROADWAY COMPONENTS HAVE BEEN CONSTRUCTED IN CONFORMANCE WITH THE PROJECT SPECIFICATIONS. SUCH CERTIFICATIONS SHALL BE SUBMITTED TO THE TOWN'S DEPARTMENT OF PUBLIC WORKS.
15. INSPECTIONS FOR ELECTRIC, CABLE, AND TELEPHONE UTILITIES SHALL BE COMPLETED BY THE RESPECTIVE UTILITY COMPANIES.
16. COMPACTION AND EXCAVATION EFFORTS BY THE CONTRACTOR SHALL BE MONITORED UNDER THE DIRECTION OF A PROFESSIONAL ENGINEER. THE ENGINEER SHALL CONDUCT FIELD OR LABORATORY TESTING AS NECESSARY TO DETERMINE CONFORMANCE TO SPECIFICATIONS. THESE CERTIFICATIONS SHALL BE SUBMITTED TO THE TOWN'S DEPARTMENT OF PUBLIC WORKS.
17. CONTRACTOR SHALL VERIFY EXISTING WATER SERVICE LOCATIONS AND APPROXIMATE ELEVATIONS ON DOUGLAS PIKE & WHIPPLE ROAD. CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER AND SMITHFIELD WATER SUPPLY BOARD IF EXISTING WATER SERVICES WILL CONFLICT WITH THE PROPOSED SEWER FORCE MAIN.
18. BEFORE CONSTRUCTION, AN EXCAVATION PERMIT SHALL BE OBTAINED FOR ALL WORK IN THE TOWN RIGHT OF WAY.



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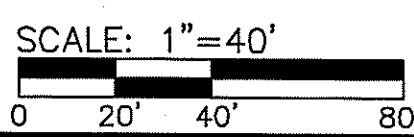
*W. Joseph Conroy*

CHRISTOPHER A. DURANEL  
No. 5013  
REGISTERED PROFESSIONAL ENGINEER

GRADING PLAN  
**Cardinal Hill**  
ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
SMITHFIELD, RHODE ISLAND

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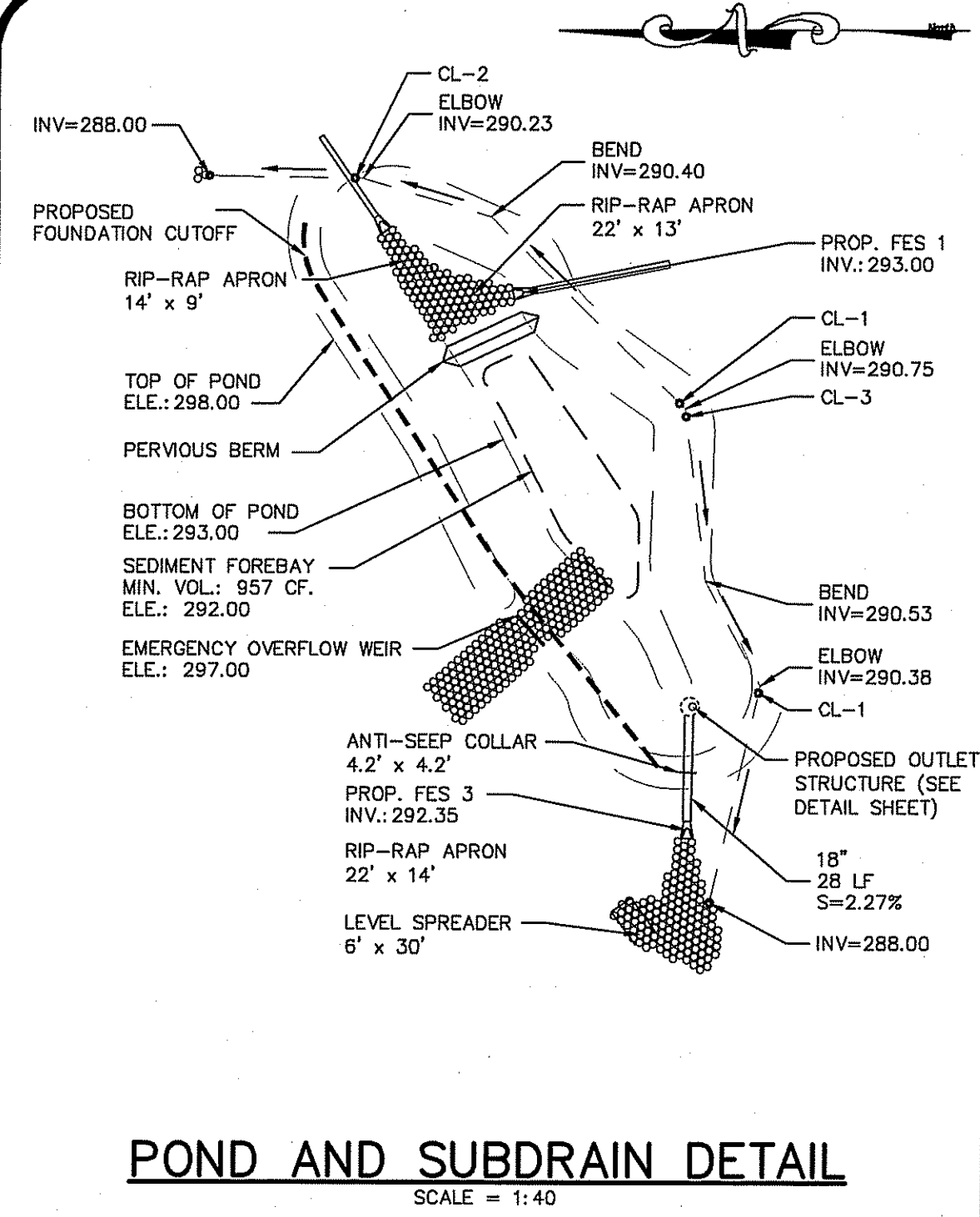


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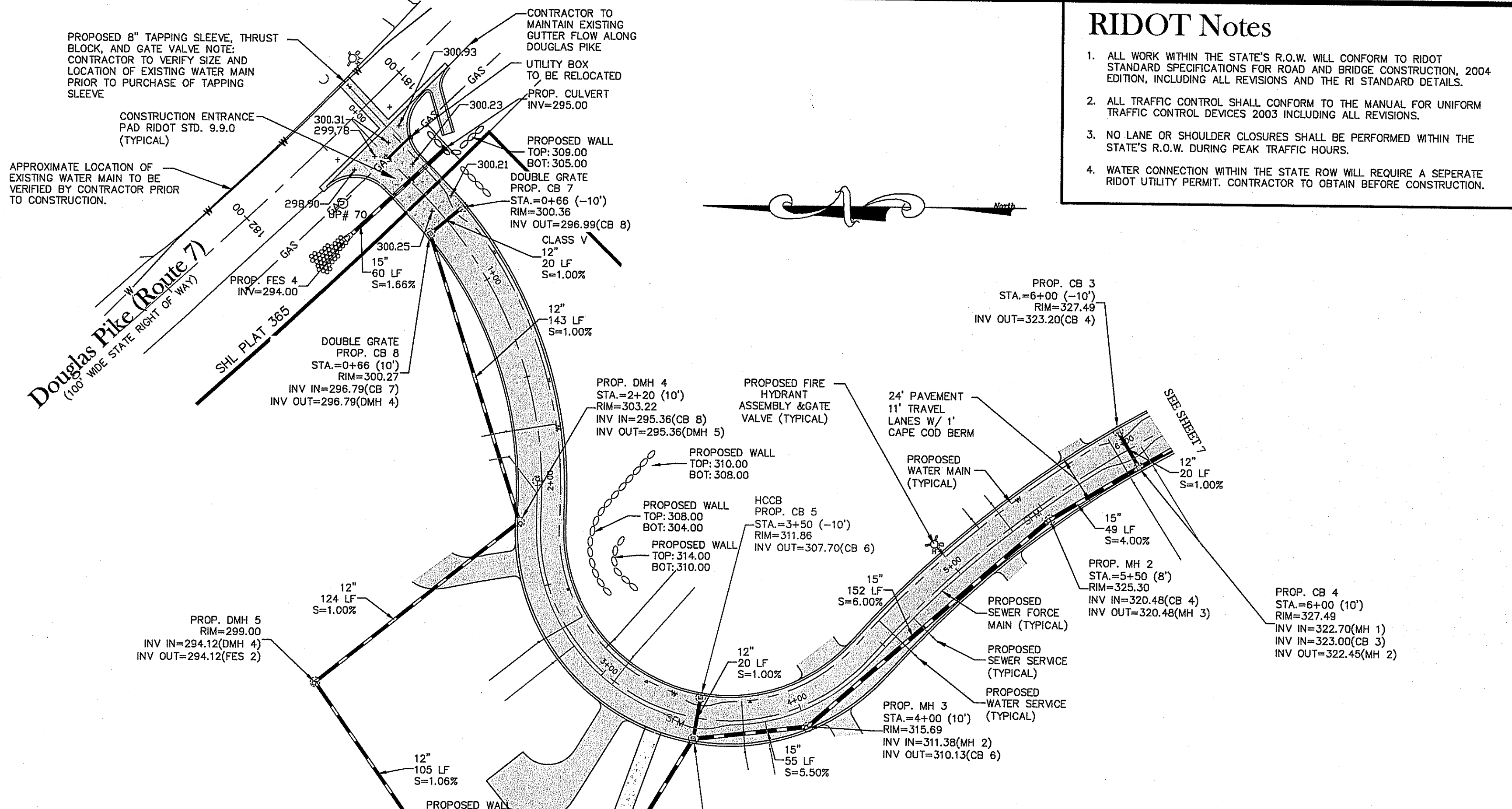
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SHEET 5 OF 13

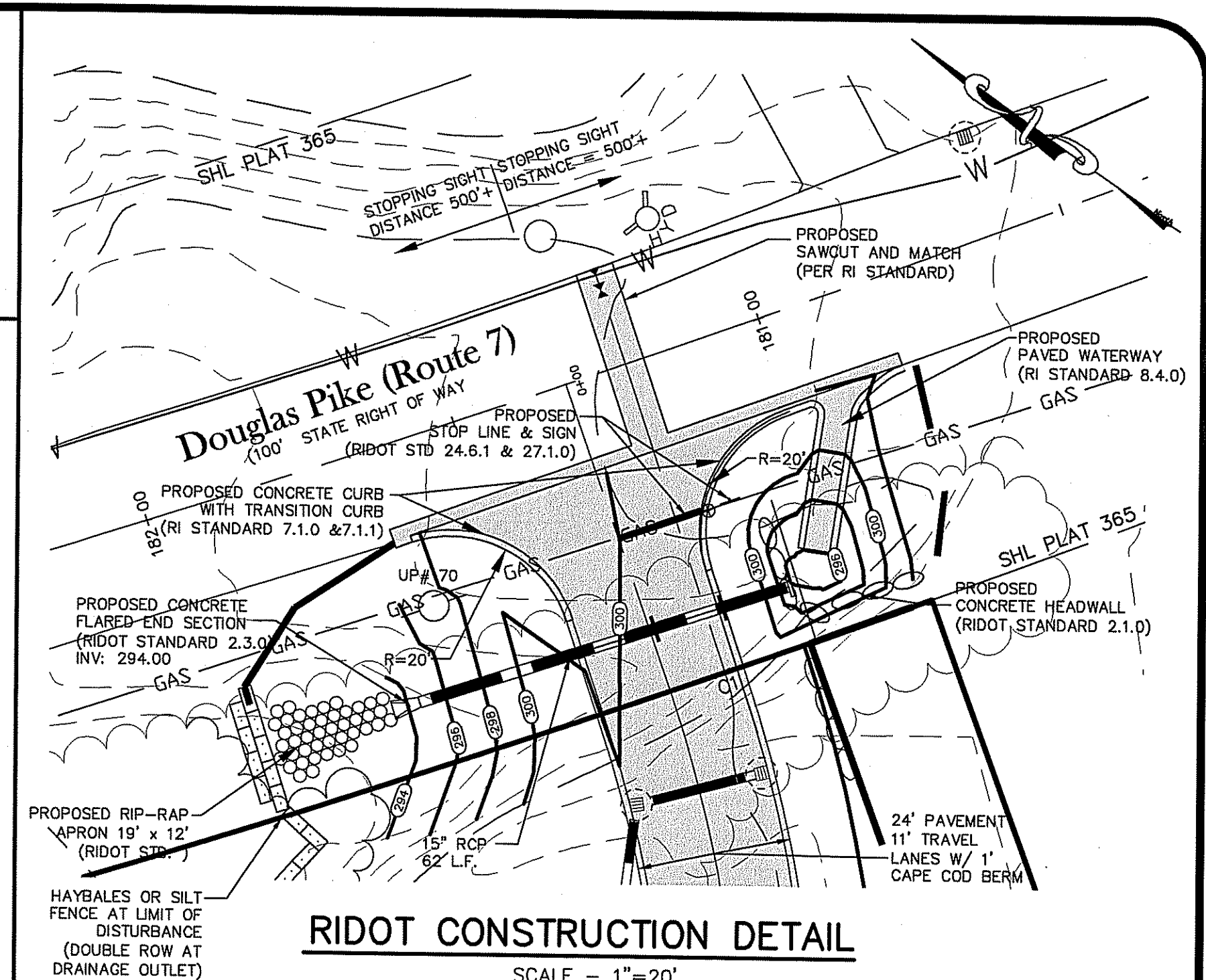
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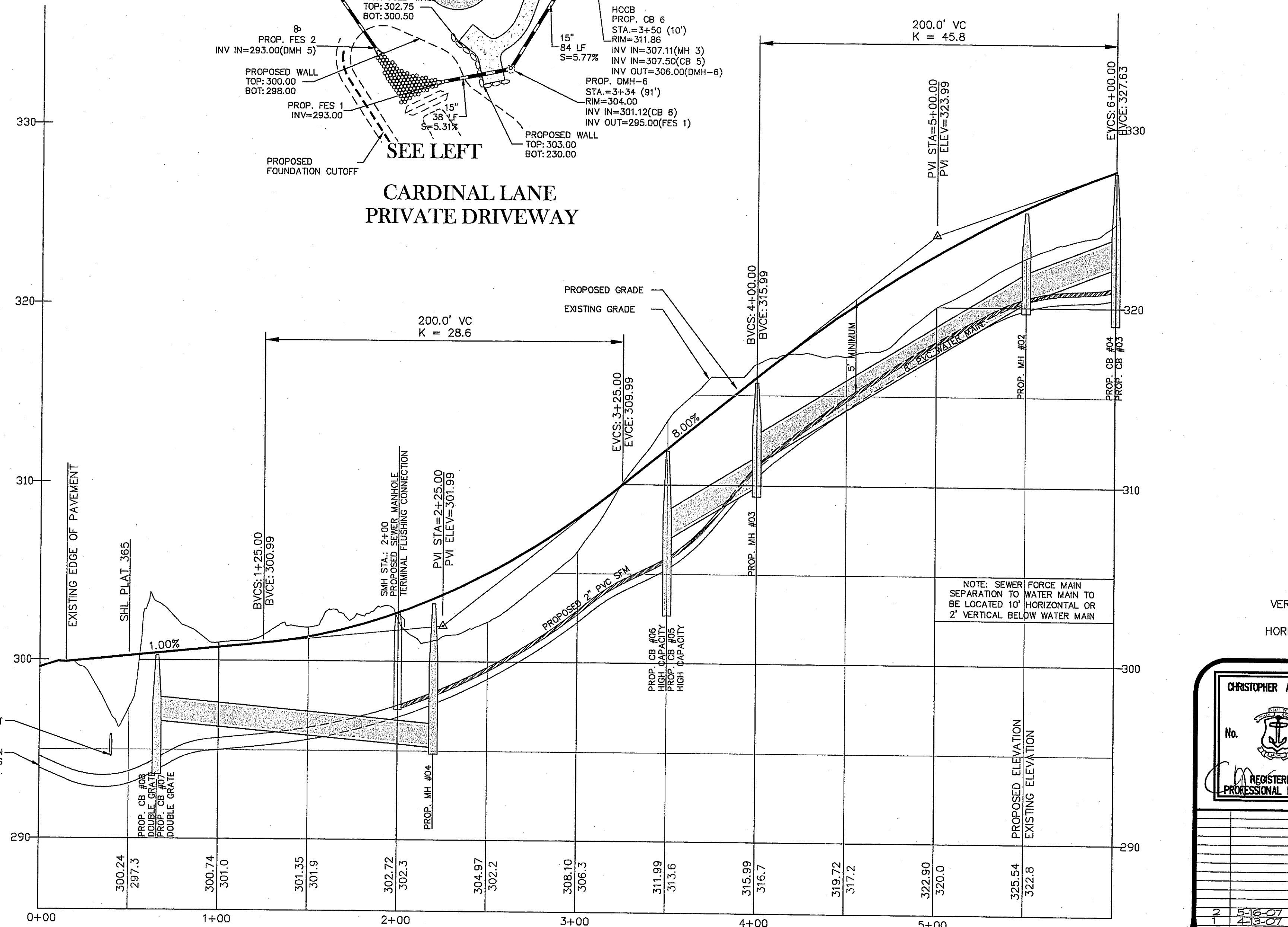
**POND AND SUBDRAIN DETAIL**  
SCALE = 1:40



- RIDOT Notes**
1. ALL WORK WITHIN THE STATE'S R.O.W. WILL CONFORM TO RIDOT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, 2004 EDITION, INCLUDING ALL REVISIONS AND THE RI STANDARD DETAILS.
  2. ALL TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE MANUAL FOR UNIFORM TRAFFIC CONTROL DEVICES 2003 INCLUDING ALL REVISIONS.
  3. NO LANE OR SHOULDER CLOSURES SHALL BE PERFORMED WITHIN THE STATE'S R.O.W. DURING PEAK TRAFFIC HOURS.
  4. WATER CONNECTION WITHIN THE STATE ROW WILL REQUIRE A SEPARATE RIDOT UTILITY PERMIT. CONTRACTOR TO OBTAIN BEFORE CONSTRUCTION.

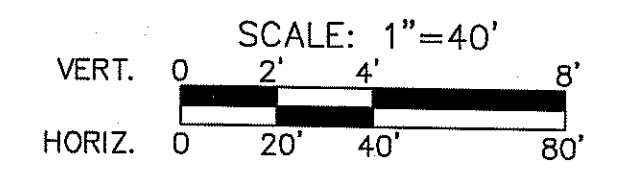


**RIDOT CONSTRUCTION DETAIL**  
SCALE = 1\"/>



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**Preliminary Submission**

CHRISTOPHER A. DUHAMEL  
No. 5013  
REGISTERED PROFESSIONAL ENGINEER

**PLAN & PROFILE**  
**Cardinal Hill**  
ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
SMITHFIELD, RHODE ISLAND

**DiPrete Engineering Associates, Inc.**  
ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
TWO STAFFORD COURT  
CRANSTON, R.I. 02920  
(401) 943-1000 FAX: (401) 464-6006

PREPARED FOR  
**Crown Properties, LLC**  
34 OAKDALE AVENUE  
JOHNSTON, RI 02920  
(401) 727-1100

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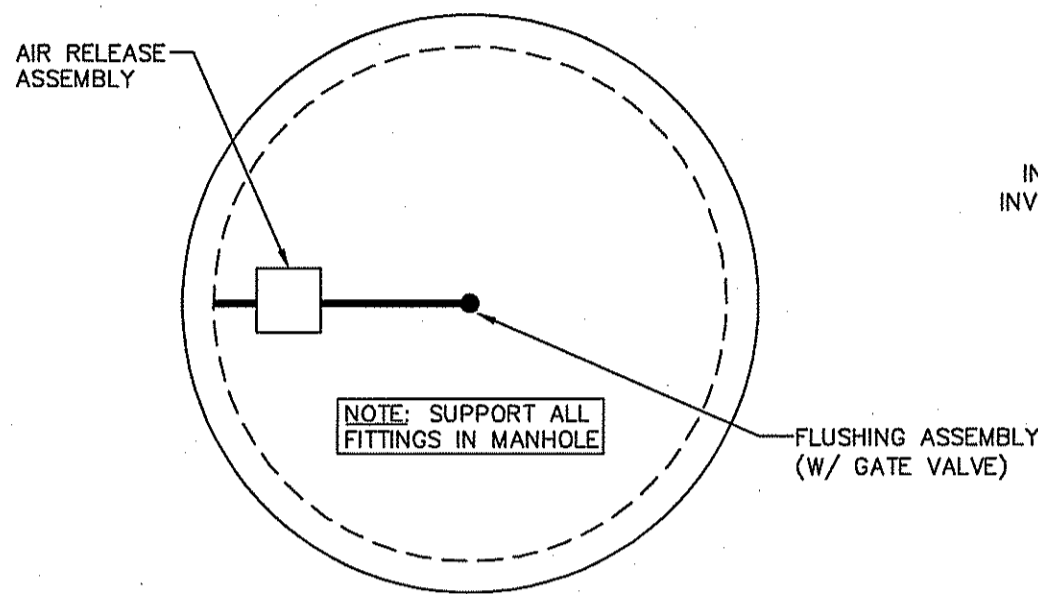
NO.	DATE	DESCRIPTION	BY
2	5-16-07	Wetland Comments	J.M.D.
1	4-25-07	Utility Submission	J.M.D.
0	2-23-07	RIPOT Wetlands / RIDOT PAPA	J.M.D.

JANUARY, 2007  
DWN. BY: J.M.D.

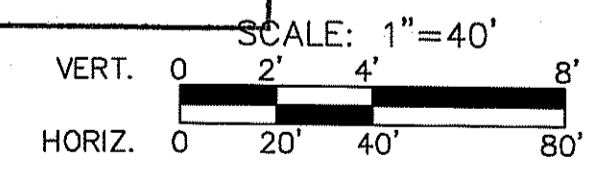
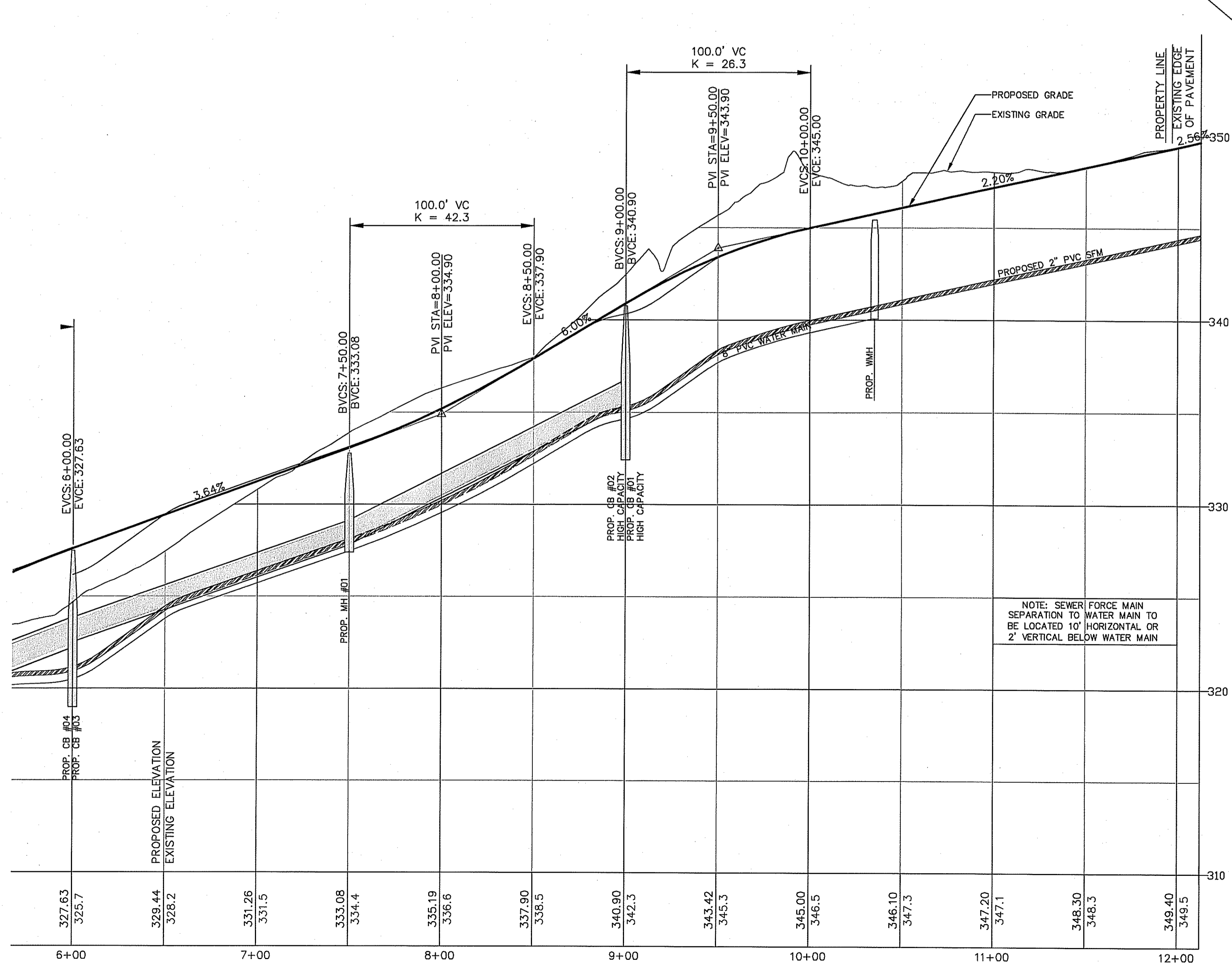
SHEET **6** OF 13

M:\Engineers\Projects\0731-005 Whipple Road\Drawings\0731-005 Preliminary Design Sheets (5-7).dwg, 5/11/2007 5:30:43 PM, Jason, DWG ePlot.pc3

**WATER MANHOLE @ Sta. 10+35**



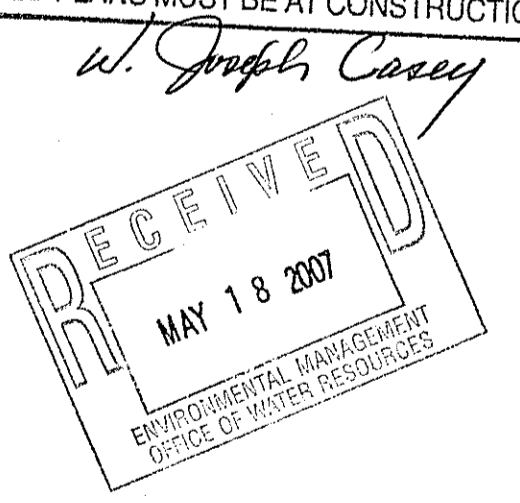
**CARDINAL LANE PRIVATE DRIVEWAY**



**General Construction Notes**

1. THE CONTRACTOR IS TO NOTIFY DIG SAFE PRIOR TO THE START OF CONSTRUCTION.
2. THE CONTRACTOR IS TO SUBMIT A CONSTRUCTION TRAFFIC SAFETY PLAN TO THE DIRECTOR OF PUBLIC SAFETY PRIOR TO THE START OF CONSTRUCTION. APPROVAL OF SUCH PLAN IS REQUIRED.
3. NO STOCKPILING OF MATERIAL IS TO BE ALLOWED WITHIN A PUBLIC R.O.W. NO OPEN TRENCHES ARE TO BE LEFT OVERNIGHT.
4. CONTRACTOR TO OBTAIN ALL FEDERAL, STATE, AND MUNICIPAL APPROVALS PRIOR TO THE START OF CONSTRUCTION.
5. THE CONTRACTOR IS TO NOTIFY THE DIRECTOR OF PUBLIC WORKS, THE TOWN ENGINEER, AND R.I. DEPT. OF ENVIRONMENTAL MANAGEMENT AT LEAST 48 HOURS PRIOR TO THE START OF CONSTRUCTION.
6. ALL WORK PERFORMED HEREIN SHALL BE GOVERNED BY THE RHODE ISLAND STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION AND TOWN OF SMITHFIELD STANDARD SPECIFICATIONS AND DETAILS.
7. CONTRACTOR SHALL VERIFY EXISTING WATER SERVICE LOCATIONS AND APPROXIMATE ELEVATIONS ON DOUGLAS PIKE & WHIPPLE ROAD. CONTRACTOR SHALL COORDINATE WITH THE PROJECT ENGINEER SMITHFIELD WATER SUPPLY BOARD AND GREENVILLE WATER DISTRICT, IF EXISTING WATER SERVICES WILL CONFLICT WITH THE PROPOSED SEWER FORCE MAIN.
8. BEFORE CONSTRUCTION, AN EXCAVATION PERMIT SHALL BE OBTAINED FOR ALL WORK IN THE TOWN RIGHT OF WAY.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS  
AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED JUN 21 2007 FILE # 07-019  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
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**Preliminary Submission**

CHRISTOPHER A. DUHAMEL  
No. 5013  
REGISTERED PROFESSIONAL ENGINEER

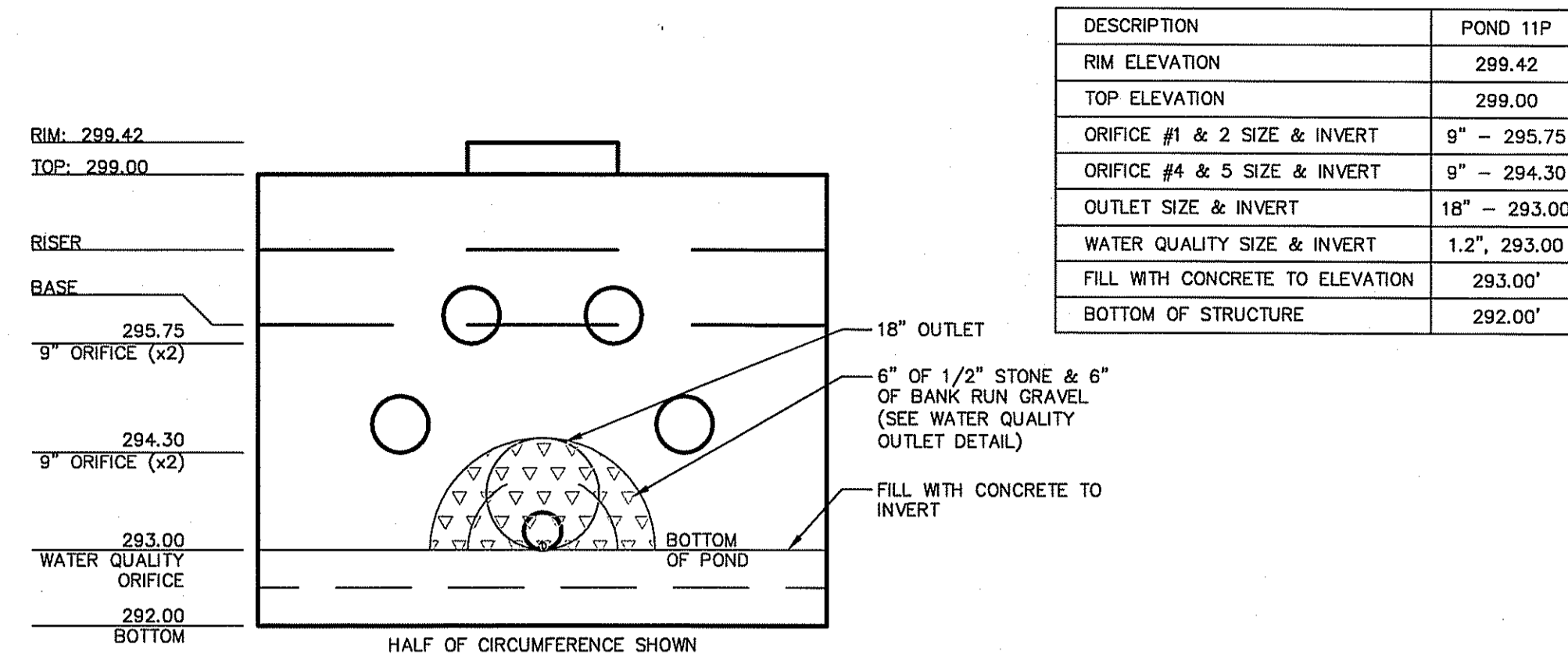
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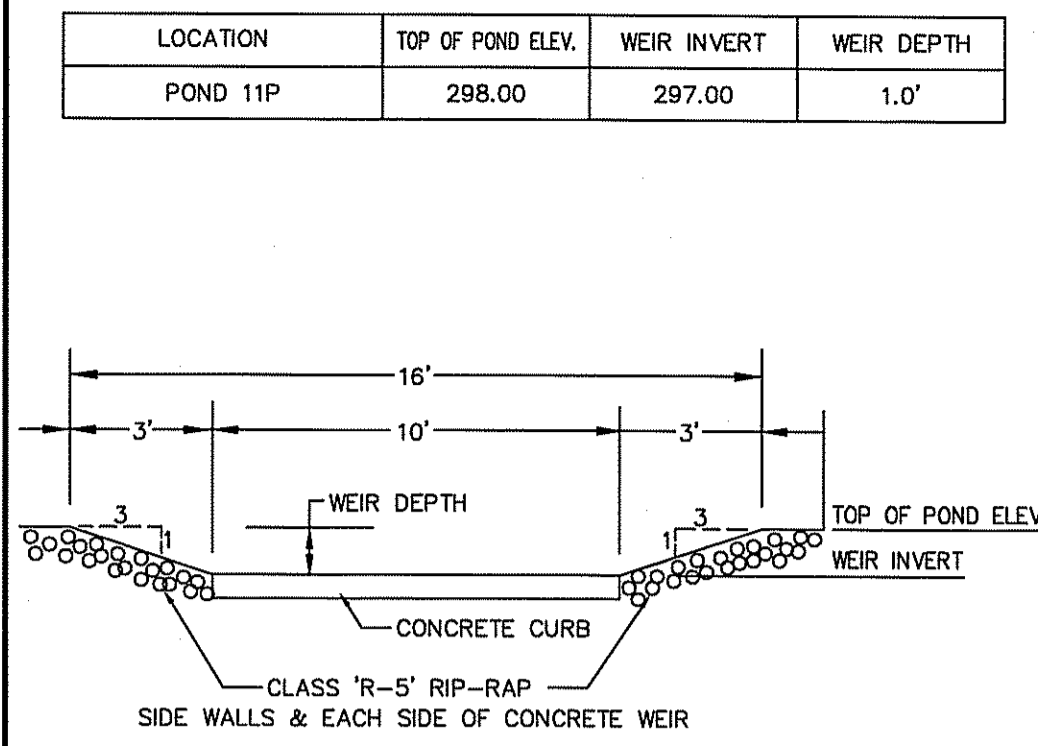
PREPARED FOR  
**Crown Properties, LLC**  
34 OAKDALE AVENUE  
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(401) 727-1100

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4	2-28-07	RIDEWetlands / RIDOT PAPA	J.M.D.

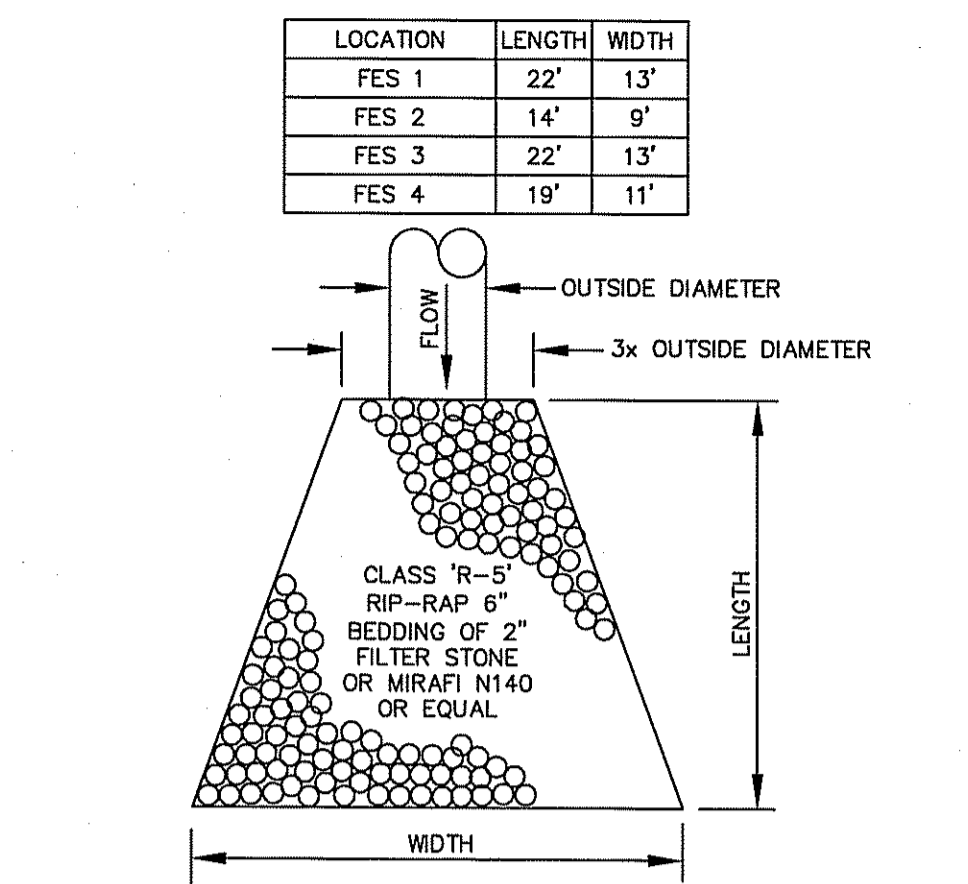
JANUARY, 2007  
DWN. BY: J.M.D.



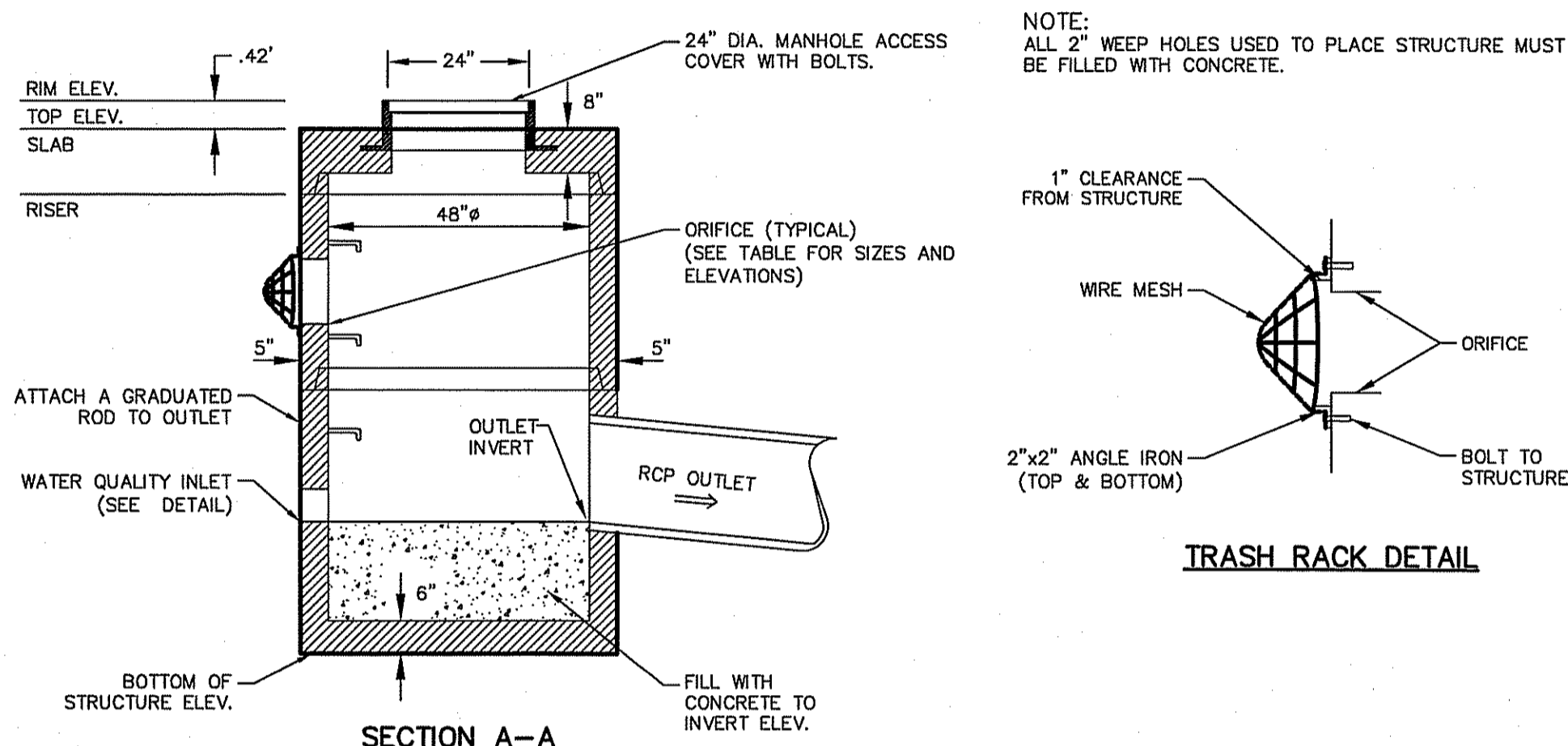
**POND OUTLET STRUCTURE**  
SCALE 1"=2'



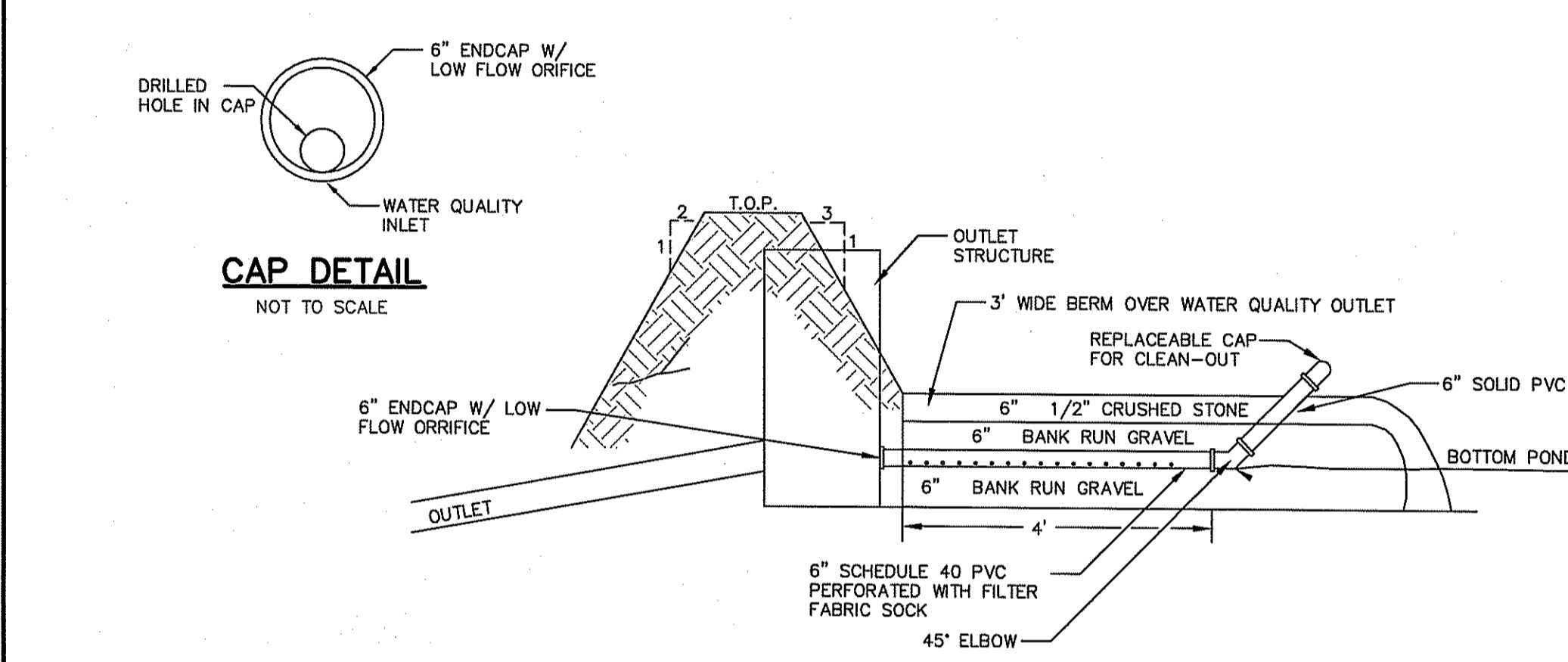
**EMERGENCY SPILLWAY DETAIL**  
NOT TO SCALE



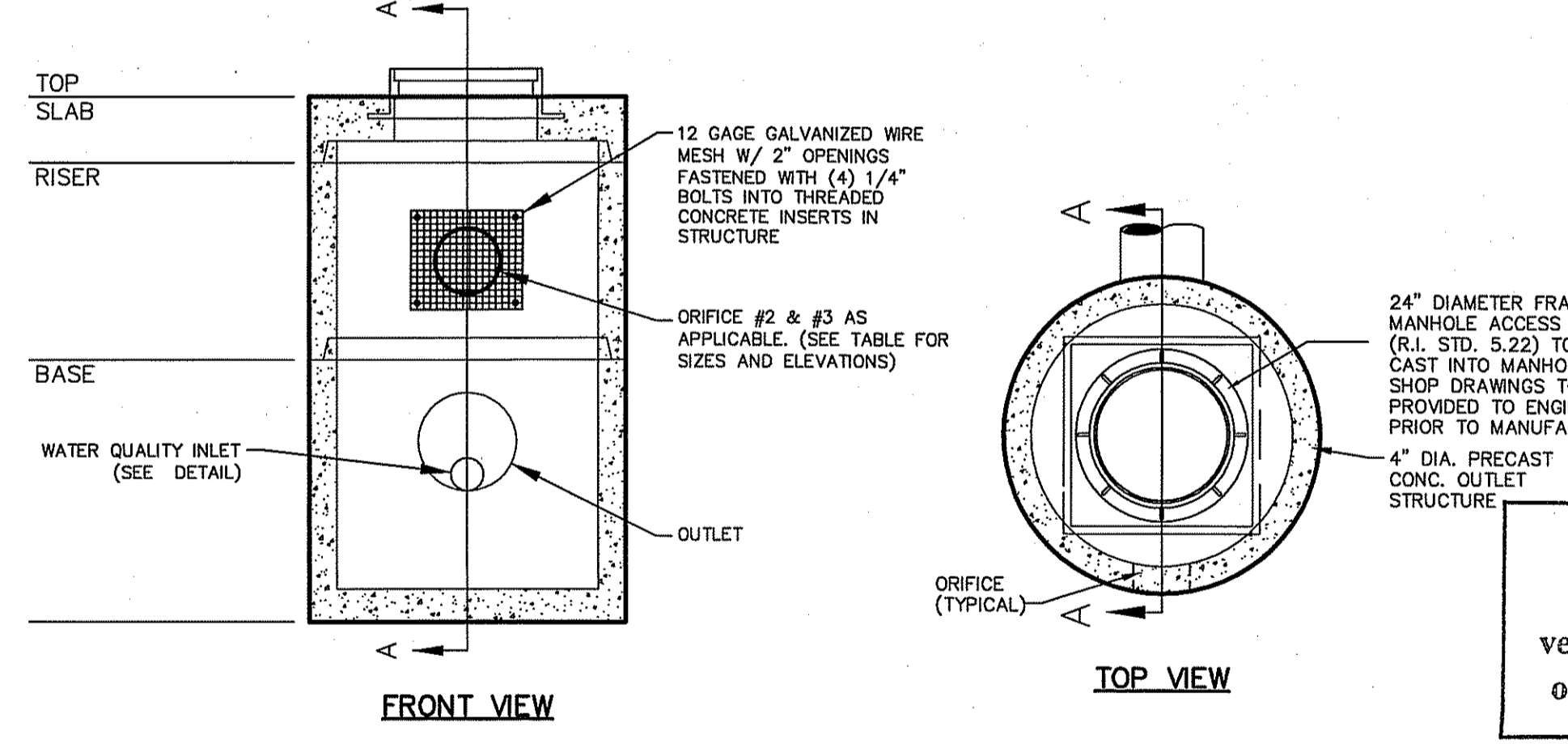
**RIP-RAP APRON DETAIL**  
NOT TO SCALE



**TRASH RACK DETAIL**



**WATER QUALITY OUTLET POND**  
NOT TO SCALE

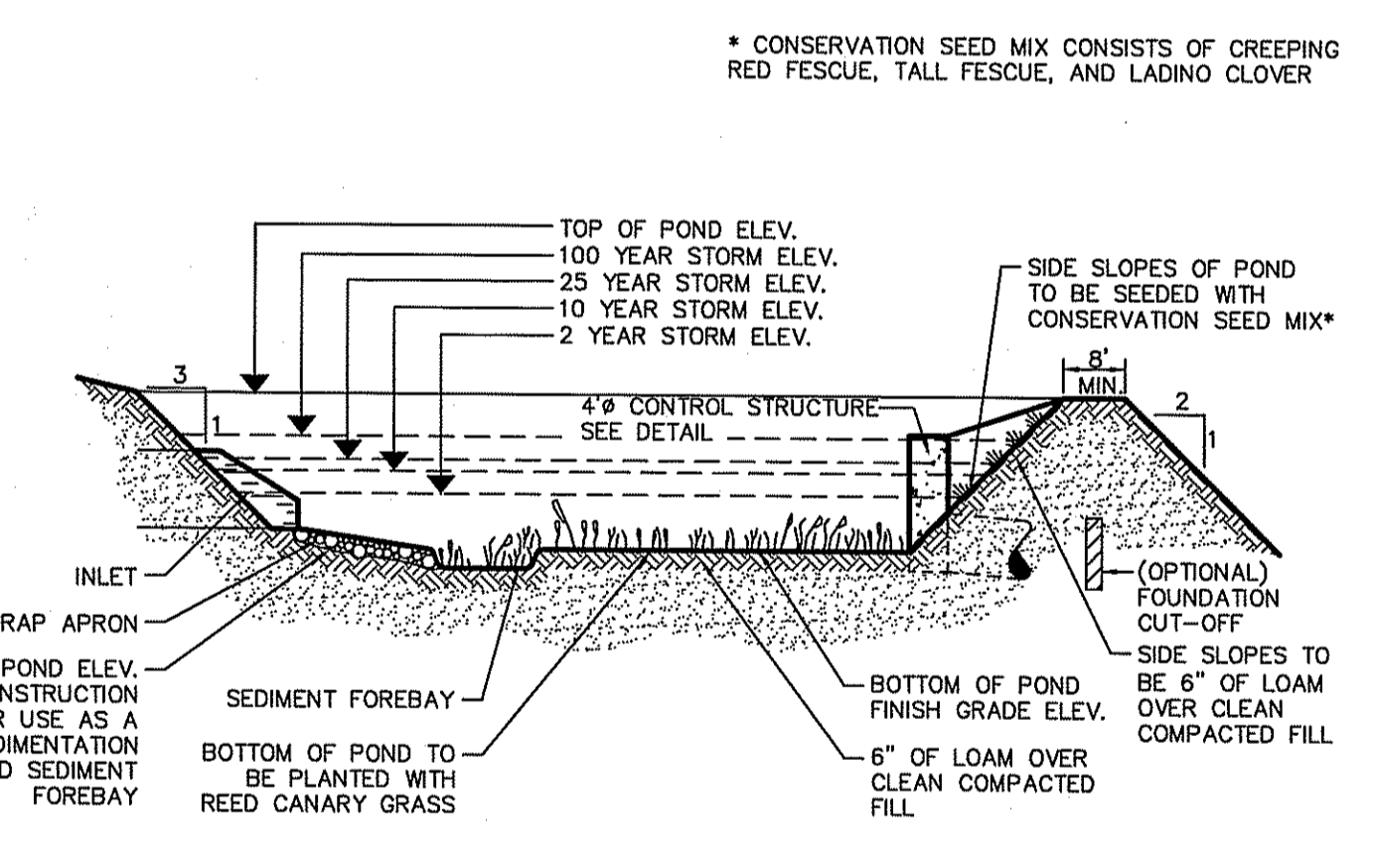


**4' DIA. OUTLET STRUCTURE**  
NOT TO SCALE

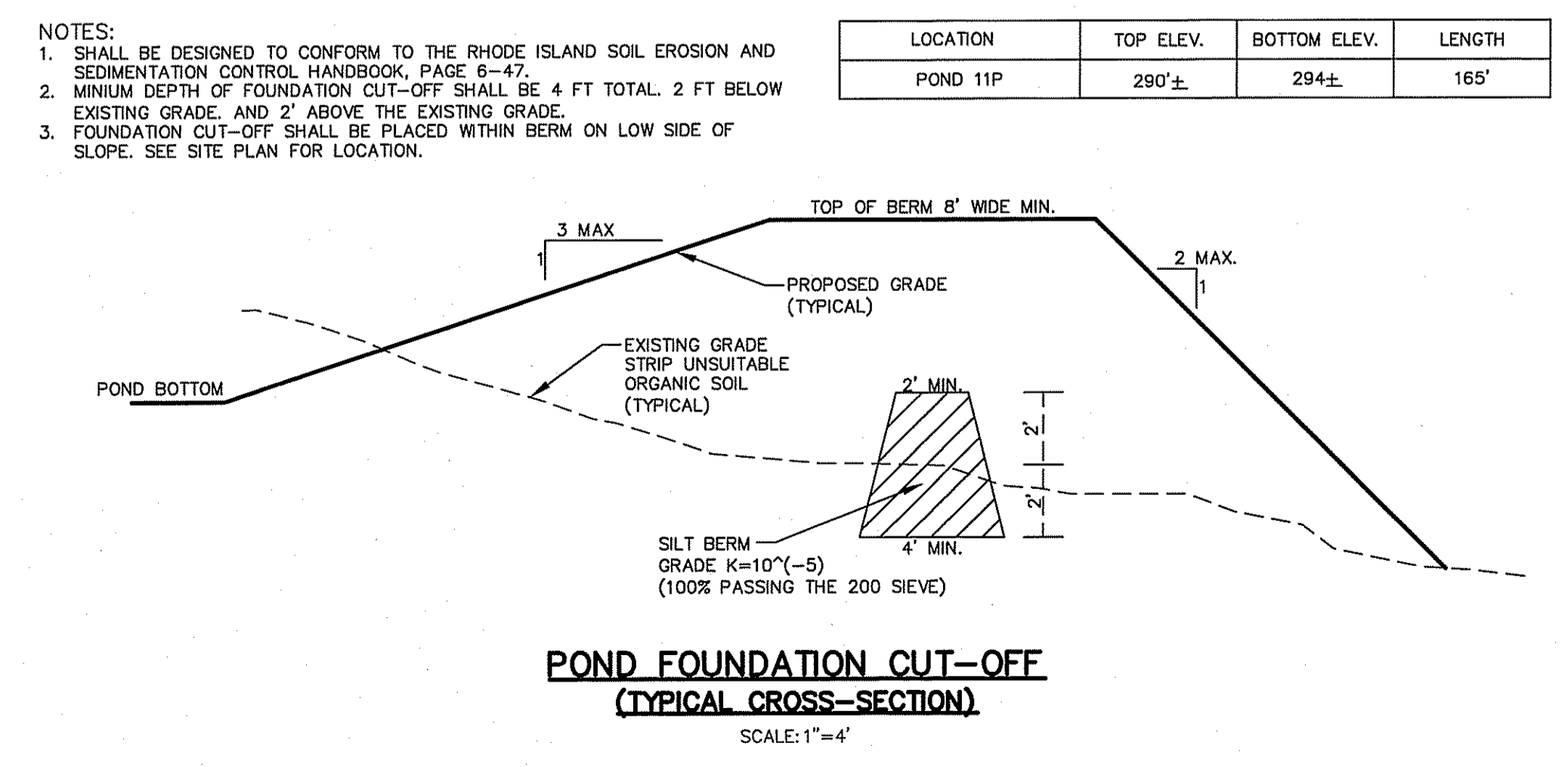
DESCRIPTION	POND #1
TOP OF POND ELEVATION	298.00
BOTTOM OF POND ELEVATION FOR SEDIMENT FOREBAY	292.00
BOTTOM OF POND	293.00
100 YEAR STORM ELEVATION	296.93
25 YEAR STORM ELEVATION	296.16
10 YEAR STORM ELEVATION	295.60
2 YEAR STORM ELEVATION	294.67
SEASONAL HIGH GWL ELEVATION	291.00*

\* DETERMINED FROM SUBIRAN CALCULATIONS.

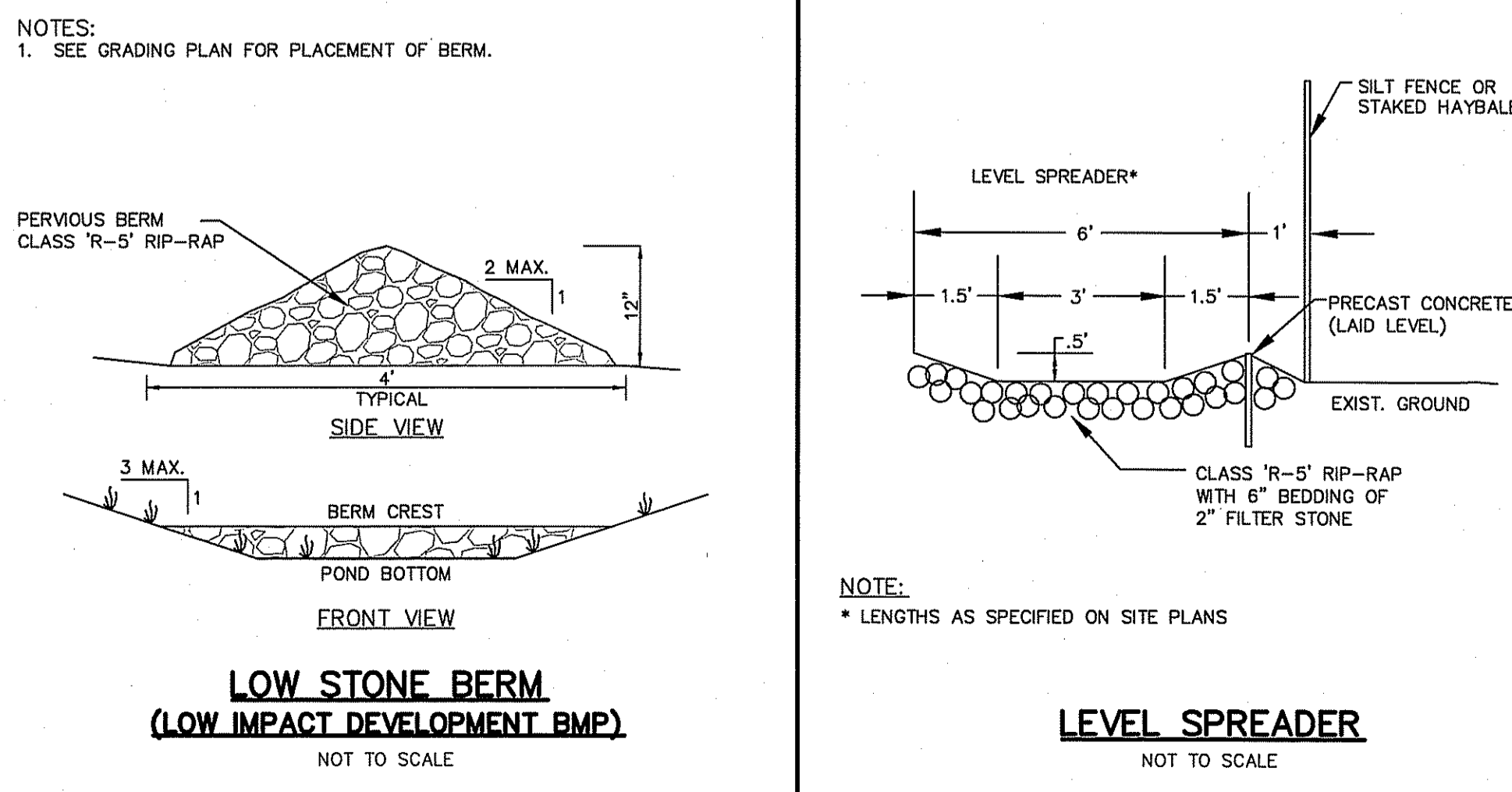
Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.



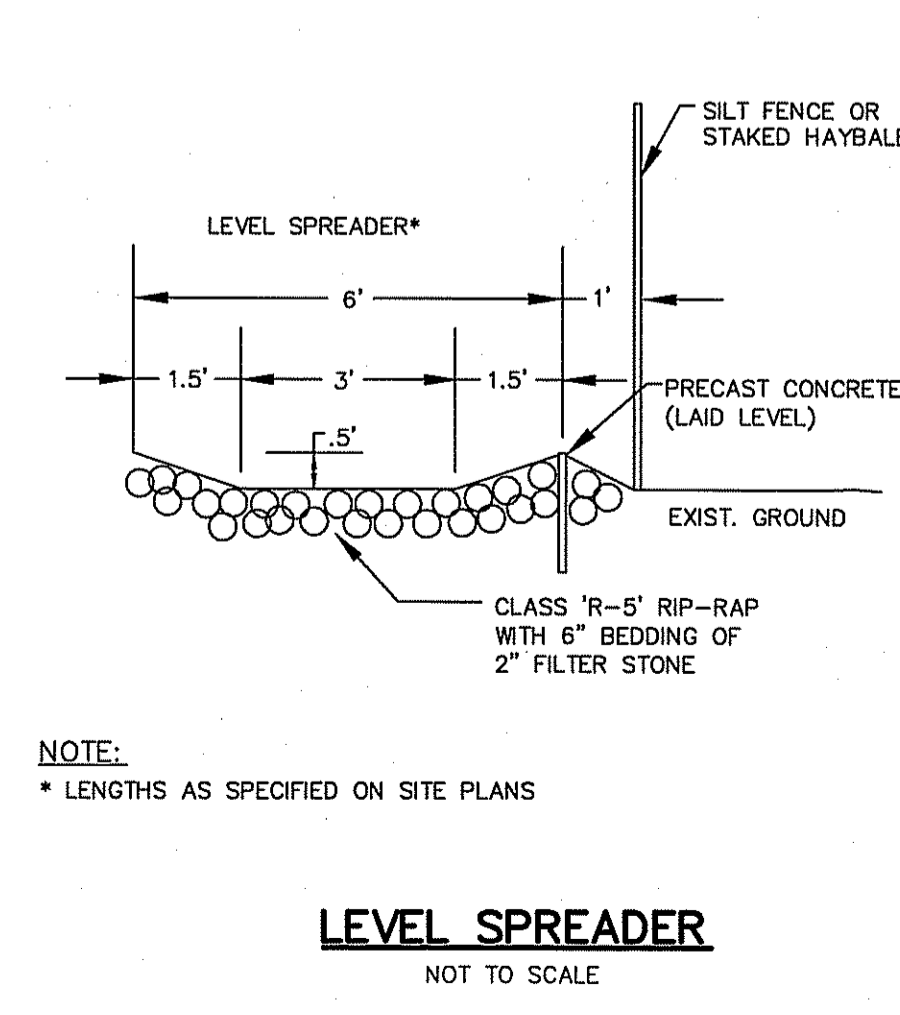
**DETENTION POND - TYPICAL CROSS SECTION**  
NOT TO SCALE



**POND FOUNDATION CUT-OFF (TYPICAL CROSS-SECTION)**  
SCALE: 1"=4'



**LOW STONE BERM (LOW IMPACT DEVELOPMENT BMP)**  
NOT TO SCALE



**LEVEL SPREADER**  
NOT TO SCALE

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OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
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DATED JUN 21 2007 FILE # 07-0118  
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*W. Joseph Carey*

CHRISTOPHER A. DUHAMEL  
No. 5013  
REGISTERED PROFESSIONAL ENGINEER

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0	2-28-07	RIP-RAP Wetlands / RBDP PAPA	J.M.D.

**Preliminary Submission**

RECEIVED  
MAY 18 2007  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES

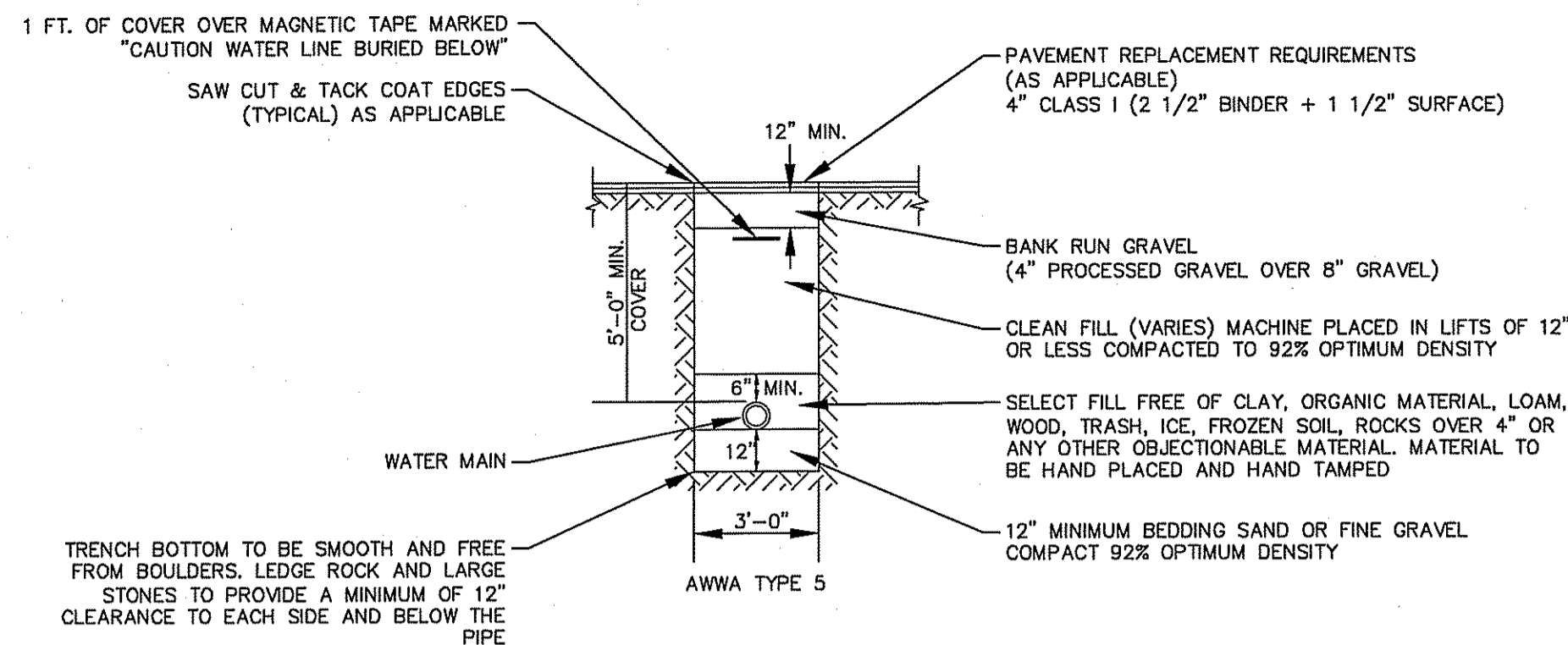
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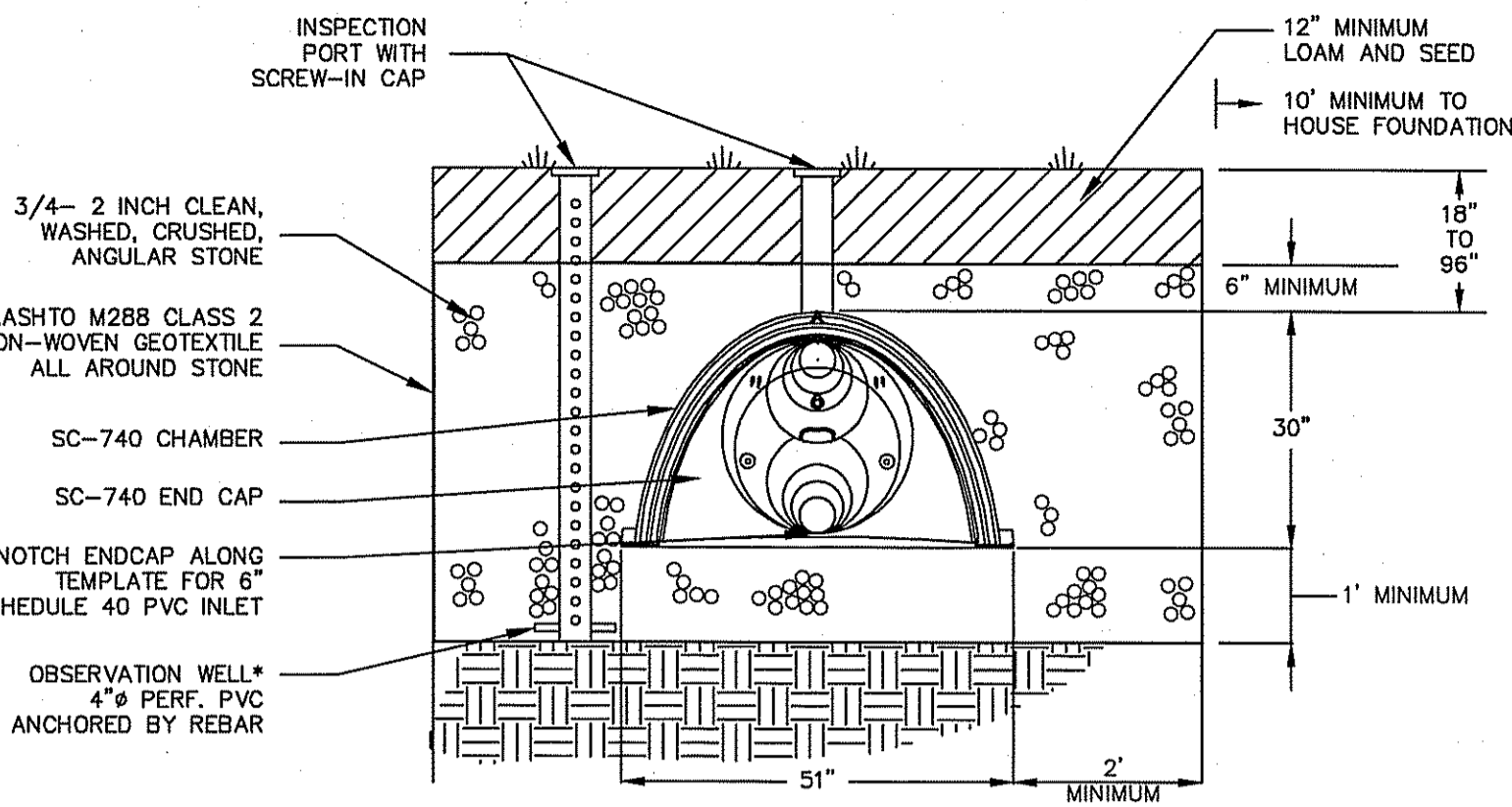
PREPARED FOR:  
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34 OAKDALE AVENUE  
JOHNSTON, RI 02920  
(401) 727-1100

DATE: FEBRUARY, 2007  
BY: DWN. BY. J.M.D.

SHEET 8 OF 13



**WATER TRENCH DETAIL**  
 NOT TO SCALE



**STORMTECH SC-740 DRYWELL DETAIL (PROFILE)**  
 SCALE: 1" = 2"

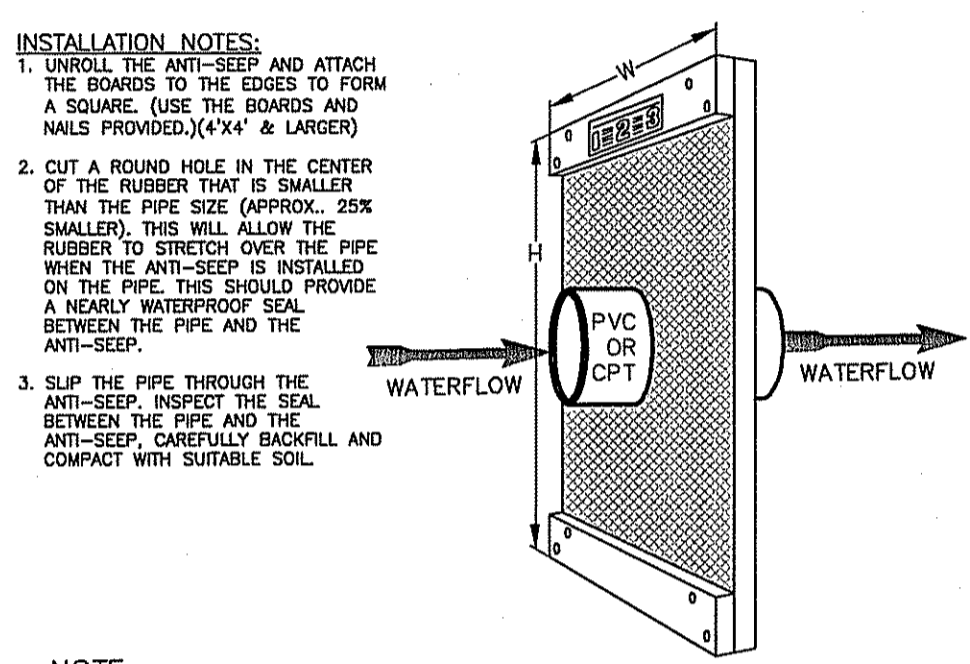
UNIT	EXISTING GROUND	GWT (FT)	SEASONAL HIGH GWT	PROPOSED GROUND	TOP OF DRYWELL	BOTTOM OF DRYWELL	SEPARATION DISTANCE (FT)
1	308.0	6.0'	302.0	309.0	308.0	304.0	2.0'
2	316.0	3.0	313.0	321.0	320.0	316.0	3.0'
3	324.0	6.0'	318.0	328.0	327.0	323.0	5.0'
4	328.0	6.0'	322.0	329.0	328.0	324.0	2.0'
5	334.0	5.0'	329.0	336.0	335.0	331.0	2.0'
6	334.5	5.0'	339.5	346.5	345.5	341.5	2.0'
7	334.2	4.0'	338.0	345.0	344.0	340.0	2.0'
8	337.0	6.0'	331.0	338.0	337.0	333.0	2.0'
9	337.0	4.0'	333.0	340.0	339.0	335.0	2.0'
10	324.0	3.0'	321.0	328.0	327.0	323.0	2.0'
11	318.0	6.0'	312.0	319.0	318.0	314.0	2.0'
12	312.0	8.0'	304.0	312.0	311.0	307.0	3.0'
13	300.0	4.0'	296.0	305.0	304.0	300.0	4.0'
14	298.0	6.0'	292.0	300.0	299.0	295.0	3.0'

**DRYWELL TABLE**  
 NOT TO SCALE

**WATER NOTES**

1. ALL WORK AND MATERIAL OF WATER LINE SHALL CONFORM TO SMITHFIELD WATER AUTHORITY (SWA) DISTRICT STANDARD CONSTRUCTION SPECIFICATIONS.
2. WATER MAIN INSTALLATION SHALL BE INSPECTED BY (SWA) OR THEIR AGENT PRIOR TO BACK FILLING THE TRENCH.
3. CONTRACTOR SHALL CONTACT DIRECTOR FOR PRE-CONSTRUCTION MEETING, INSPECTION FEE CHARGES AND SCHEDULING TEN (10) DAYS PRIOR TO START OF WORK.
4. THE (SWA) OR THEIR AGENT WILL BE PRESENT DURING PRESSURE TESTING AND STERILIZATION OF ALL NEW WATER MAINS.
5. THE CONTRACTOR SHALL NOTIFY THE (SWA) AT LEAST TWO WORKING DAYS IN ADVANCE FOR FINAL INSPECTION.
6. WHENEVER, IN THESE SPECIFICATIONS, REFERENCE IS MADE TO THE REQUIREMENTS OF AWWA, ANSI, ASTM OR ANY OTHER STANDARD SPECIFICATION, THE REFERENCE IS MADE TO THE LATEST REVISIONS OR MODIFICATIONS OF SUCH REQUIREMENTS AND SPECIFICATIONS.
7. ALL PIPE, FITTINGS, AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA AND ANSI STANDARDS AND THE MANUFACTURER'S SUGGESTED RECOMMENDATIONS FOR INSTALLATIONS.
8. PIPELINES SHALL BE CONSTRUCTED IN DRY TRENCHES AND LAID TO THE LINE GRADE. WHENEVER PIPE IS TO BE INSTALLED IN SATURATED SOIL CONDITIONS A BEDDING OF PROCESSED GRANULAR FILTER MATERIAL SHALL BE PROVIDED.
9. MECHANICAL JOINTS SHALL BE GRIPPER RING OR MEGA-LUG TYPE RESTRAINTS IN PLACE OF THRUST BLOCKS. THRUST BLOCKS ARE AT THE DISCRETION OF THE CONTRACTOR.
10. JOINTING OF MECHANICAL AND PUSH ON TYPE JOINTS SHALL BE PERFORMED IN STRICT ACCORDANCE WITH AWWA STANDARD C-600 AND THE GREENVILLE WATER AUTHORITY SPECIFICATIONS. RUBBER GASKETS AND RINGS SHALL BE SUITABLE FOR USE WITH POTABLE WATER AND THOROUGHLY CLEANED TO REMOVE OIL, GRIT, AND OTHER FOREIGN MATTER PRIOR TO ASSEMBLY. THE GASKETS SHALL BE INSPECTED BY THE (SWA) OR HIS AGENT TO INSURE THAT THEY ARE ACCEPTABLE.
11. ALL FITTINGS USED FOR SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH AWWA C-800 AND THE (SWA) SPECIFICATIONS.
12. ALL WATER SERVICES SHALL BE SADDLED. NO DIRECT TAPS ARE PERMITTED. CURB STOPS SHALL BE NON-DRAIN TYPE.
13. VALVES USED SHALL BE IN ACCORDANCE WITH AWWA C-500 SERIES AND THE (SWA) SPECIFICATIONS.
14. BLOW-OFF ASSEMBLIES SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-800 SERIES AND (SWA) SPECIFICATIONS.
15. FIRE HYDRANTS SHALL BE INSTALLED IN ACCORDANCE WITH AWWA C-502 "WET BARREL FIRE HYDRANTS" AND (SWA) SPECIFICATIONS.
16. HYDROSTATIC AND LEAKAGE TESTS SHALL BE PERFORMED ON ALL COMPLETED SECTIONS OF NEWLY INSTALLED PIPELINE IN ACCORDANCE WITH AWWA C-600 AND THE (SWA) SPECIFICATIONS.
17. ALL PIPE SHALL BE DISINFECTED PRIOR TO BEING ACTIVATED IN ACCORDANCE WITH AWWA B-300, AWWA C-601 AND THE (SWA) SPECIFICATIONS.
18. PIPE SHALL BE 8" PVC 1120 PRESSURE PIPE. POLYVINYL CHLORIDE WATER PIPE SHALL BE CLASS-150, CONFORMING TO THE REQUIREMENTS AWWA C-900-75 STANDARD SPECIFICATIONS FOR POLYVINYL CHLORIDE PRESSURE PIPE FOR PVC 1120 PIPE MADE FROM CLASS 12454-A OR CLASS 12454-B MATERIAL AS DEFINED IN ASTM D1784. THE PIPE SHALL CONFORM WITH THE OUTSIDE DIAMETER DIMENSIONS OF STEEL PIPE OR CAST IRON PIPE AND WITH THE WALL THICKNESS OF DR SERIES 18 FOR CLASS-150 PIPE. THE PIPE SHALL BE OF THE GASKETED BELL OR GASKETED COUPLING TYPE. SOLVENT CEMENT CONNECTIONS WILL NOT BE ALLOWED. RUBBER RING GASKETS CONSIST OF A SOLID CROSS-SECTION ELASTOMERIC RING WHICH MEETS THE REQUIREMENTS OF ASTM 1869. ALL RING GASKETS SHALL BE SHIPPED SECURELY FITTED IN THE BELL GROOVE OR A COUPLING GROOVE. LOOSE RING GASKETS WHICH MAY CAUSE "FISH MOUTHING" WILL NOT BE ALLOWED.
19. ALL FITTINGS USED FOR THE SERVICE CONNECTIONS SHALL BE IN ACCORDANCE WITH AWWA C-80 AND (SWA) SPECIFICATIONS. TYPE K COPPER PIPE OR POLYETHYLENE ASTM D-2239 PIPE WITH STAINLESS STEEL INSERTS AT THE FITTINGS IS TO BE USED BETWEEN THE CORPORATION AND METER.
20. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL FEDERAL, STATE, AND TOWN PERMITS PRIOR TO CONSTRUCTION.
21. THE CONTRACTOR IS RESPONSIBLE FOR INITIATING, MAINTAINING AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS RELATED TO INSTALLATION OF THE WATER MAIN.
22. EXCAVATIONS THAT EXTEND INTO PUBLIC RIGHT-OF-WAY SHALL BE BACK FILLED AND COMPACTED IN 12" LIFTS. A TEMPORARY BINDER COURSE IS TO BE APPLIED. FINAL BINDER AND FINISH COURSE TO BE PLACED AFTER REMOVAL OF TEMPORARY PAVEMENT AND COMPACTION OF GRAVEL BASE. CONTRACTOR SHALL MAKE ROAD PASSABLE FOR ONE LANE OF TRAFFIC AT ALL TIMES. EXCAVATIONS THAT EXTEND INTO PUBLIC RIGHT-OF-WAY SHALL BE BACK FILLED WITH A "FLOW ABLE FILL" TYPE OF MATERIAL.
23. CONTRACTOR SHALL NOTIFY DIG SAFE PRIOR TO DIGGING ANY TRENCHES.
24. WHEN WORK IS NOT IN PROGRESS AND AT THE END OF EACH DAY, ALL OPEN ENDS OF THE PIPE AND FITTINGS SHALL BE SECURELY CLOSED.
25. THE PROPOSED WATER SYSTEM HAS BEEN ANALYZED, MODELED, AND TO BE SIZED BY THE CONSULTING ENGINEERING AND THE SMITHFIELD WATER AUTHORITY. DIPRETE ENGINEERING ASSOCIATES, INC. HAS NOT PERFORMED ANY WATER MODELING OR ANALYSIS AND DOES NOT CERTIFY AS TO THE AVAILABLE WATER PRESSURE WITHIN THE PROPOSED WATER MAIN EXTENSION.

LOCATION	WIDTH	HEIGHT	QUANTITY
POND	4.2'	4.2'	1



**ANTI-SEEP COLLAR**  
 NOT TO SCALE

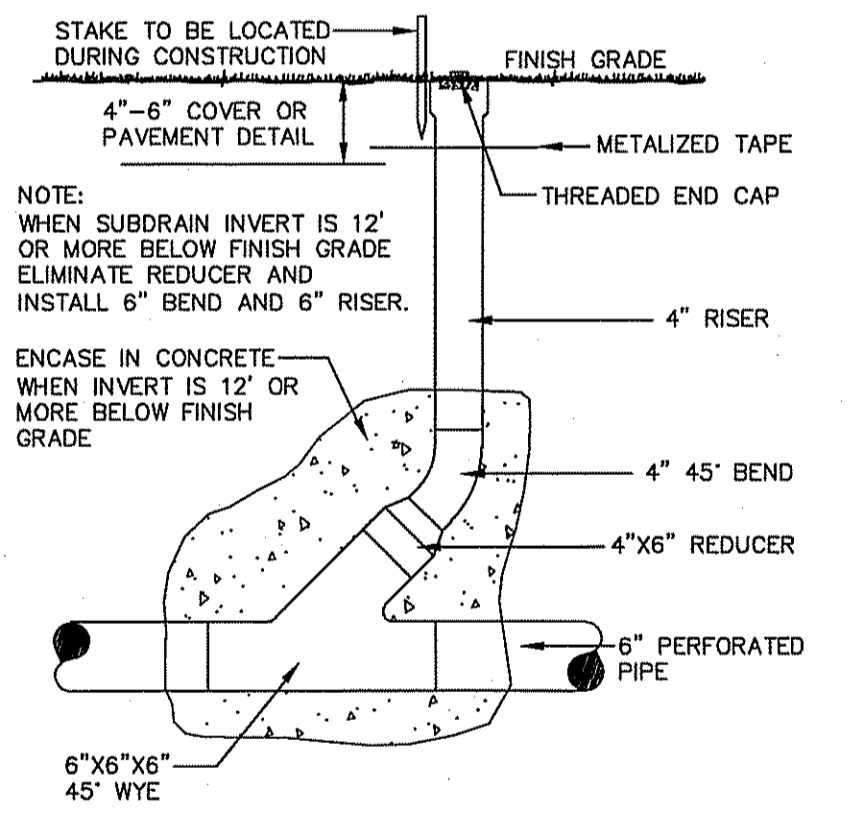
**CONSTRUCTION, MAINTENANCE, & INSPECTION NOTES:**

1. UNDERGROUND DRAINAGE AREA TO BE STAKED, MARKED, AND REMAIN UNDISTURBED PRIOR TO CONSTRUCTION. THERE IS TO BE NO CONSTRUCTION TRAFFIC ON DESIGNATED AREA PRIOR TO CONSTRUCTION.
2. STAKE CORNERS OF INFILTRATION BASINS.
3. PLACE FILTER FABRIC ALONG THE BOTTOM AND SIDES OF TRENCH AND FILL WITH SPECIFIED DIAMETER FILTER STONE. THE DEPTH OF STONE BELOW
4. SET STRUCTURES AT THE INVERT ELEVATION ALONG WITH INSPECTION/ MAINTENANCE PORTS AS INDICATED ON THE PLANS. BACK FILL SIDES AND TOP OF STRUCTURE WITH FILTER STONE. THERE SHALL BE A MINIMUM OF 12" OF FILTER STONE ALL SIDES OF THE STRUCTURE.
5. OVERLAP FILTER FABRIC ON THE TOP OF THE FILTER GRADE. BACK FILL WITH CLEAN FILL TO FINISH GRADE.
6. (\*) MONITORING WATER LEVELS WITHIN THE CLEAN-OUTS AT VARIOUS TIME INTERVALS AFTER A RAINFALL EVENT WILL INDICATE THE EFFECTIVENESS OF THE SYSTEM. IF WATER IS STANDING IN INFILTRATION SYSTEM 72 HOURS AFTER A STORM EVENT, SYSTEM FAILURE HAS OCCURRED AND WILL REQUIRE FLUSHING MAINTENANCE, REPAIR OR REPLACEMENT OF THE SYSTEM. THE OWNER WILL MAINTAIN THE DRAINAGE COMPONENTS.

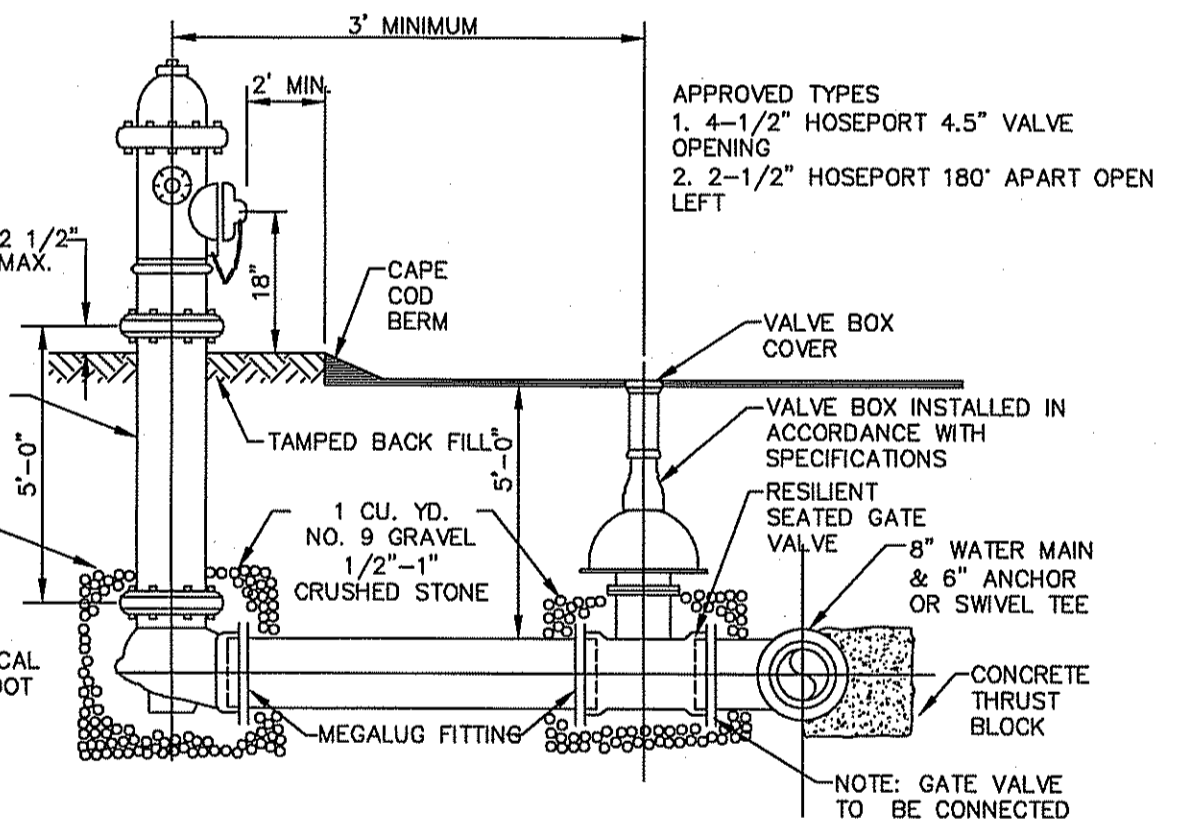
**INSTALLATION NOTES:**

1. CHAMBERS SHALL BE STORMTECH SC-740 OR APPROVED EQUAL.
2. INSPECTION PORT TO BE ATTACHED THROUGH KNOCK-OUT LOCATED AT CENTER OF CHAMBER.
3. ALL DESIGN SPECIFICATIONS FOR CHAMBERS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S LATEST DESIGN MANUAL.
4. THE INSTALLATION OF CHAMBERS SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S LATEST INSTALLATION INSTRUCTIONS.
5. CONTACT STORMTECH LLC ("STORMTECH") WITH ANY QUESTIONS ON THE STORMTECH CHAMBER SYSTEM REQUIREMENTS BEFORE BEGINNING THE SYSTEM'S CONSTRUCTION. CALL 1-888-892-2694 TO SPEAK TO A TECHNICAL SERVICE REPRESENTATIVE OR VISIT WWW.STORMTECH.COM TO RECEIVE A COPY OF THE INSTALLATION INSTRUCTIONS.

**STORMTECH SC-740 DRYWELL DETAIL (PROFILE)**  
 SCALE: 1" = 2"



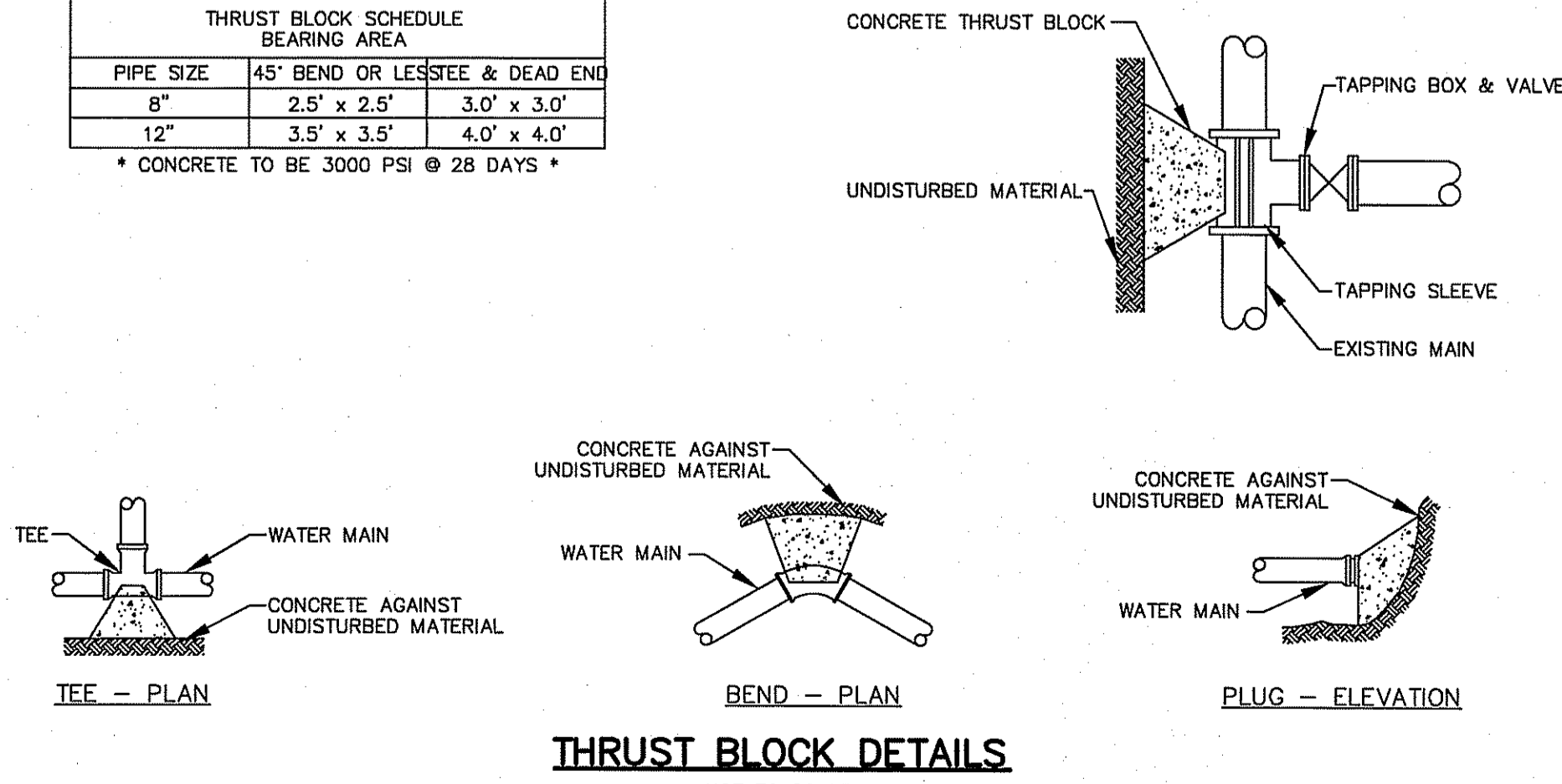
**SUBDRAIN CLEANOUT (TYPICAL)**  
 NOT TO SCALE



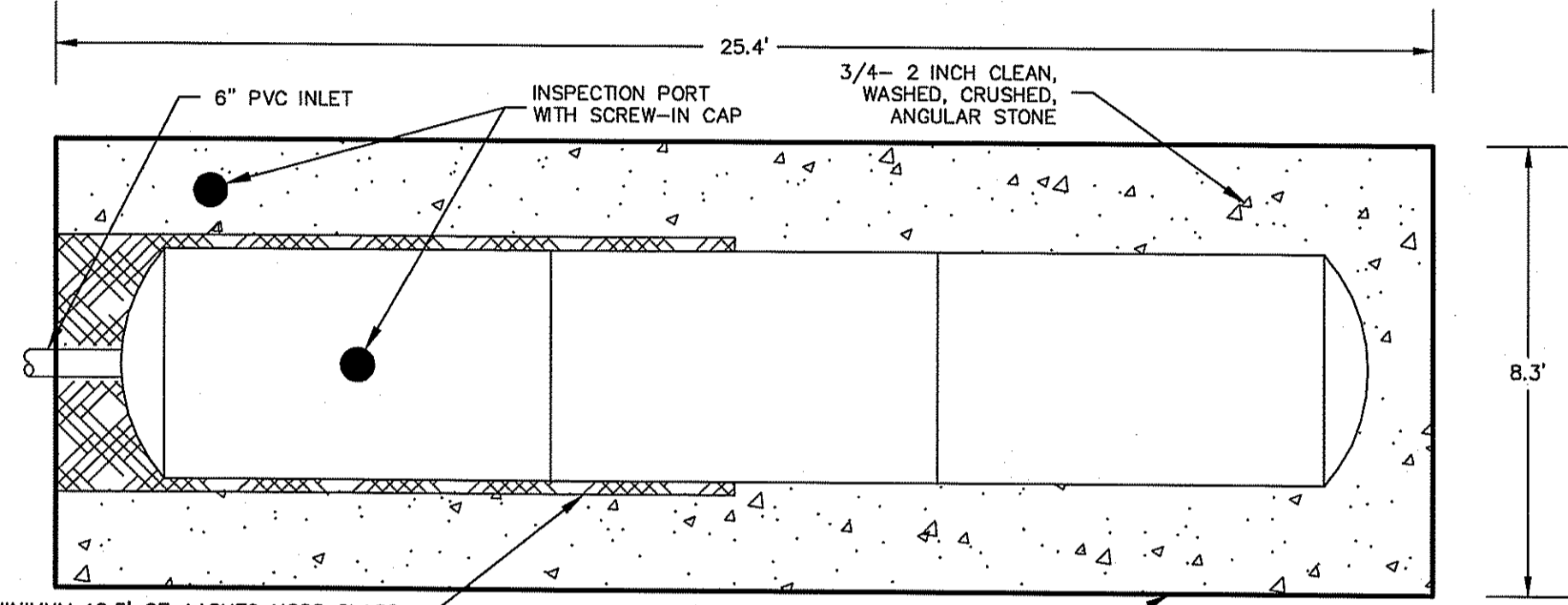
**AWWA C502 DRY BARREL FIRE HYDRANT**  
 NOT TO SCALE

PIPE SIZE	45° BEND OR LESSSEE & DEAD END	3.0' x 3.0'
8"	2.5' x 2.5'	3.0' x 3.0'
12"	3.5' x 3.5'	4.0' x 4.0'

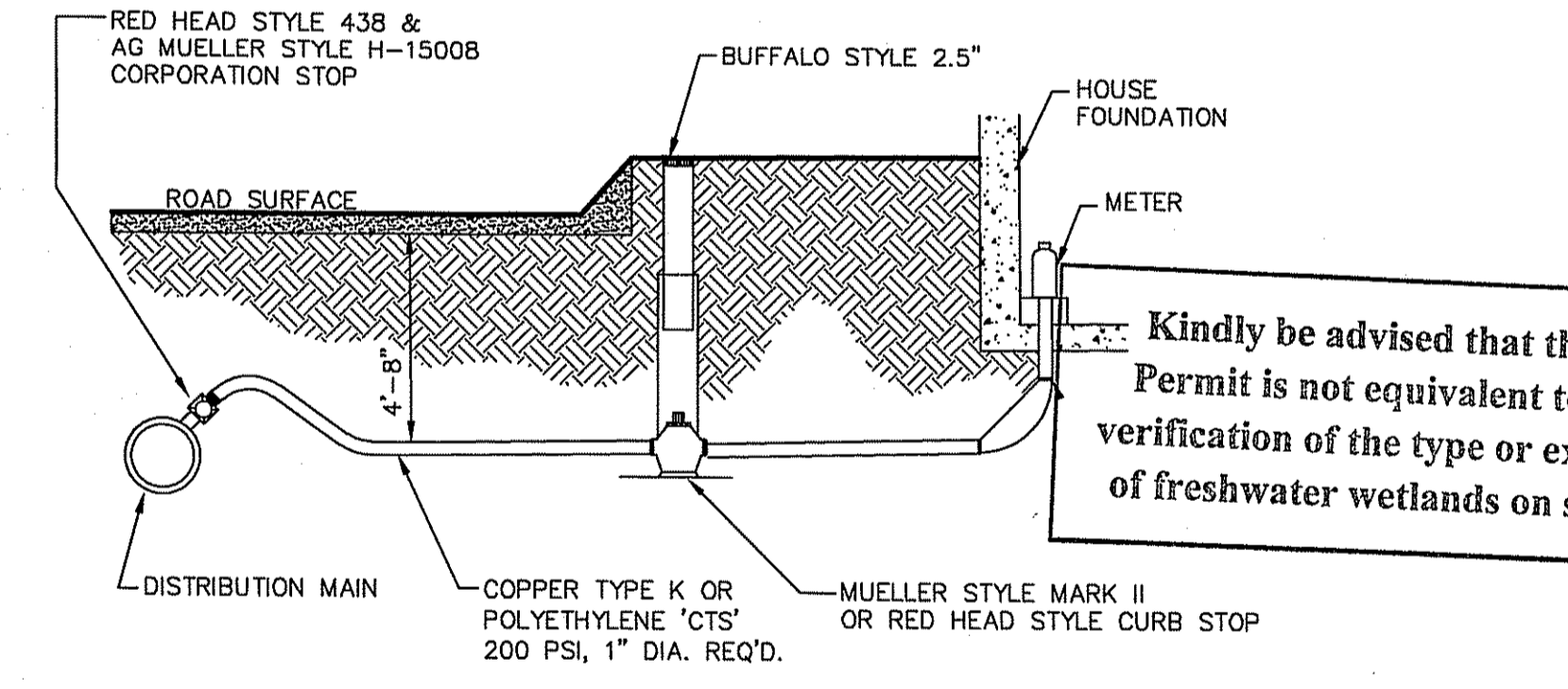
\* CONCRETE TO BE 3000 PSI @ 28 DAYS \*



**THRUST BLOCK DETAILS**  
 NOT TO SCALE



**STORMTECH SC-740 DRYWELL DETAIL (PLAN)**  
 SCALE: 1" = 10"



**WATER SERVICE INSTALLATION (TYPICAL)**  
 NOT TO SCALE

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*W. Douglas Casey*



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CHRISTOPHER A. DUHAMEL  
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**DETAIL SHEET**

**Cardinal Hill**

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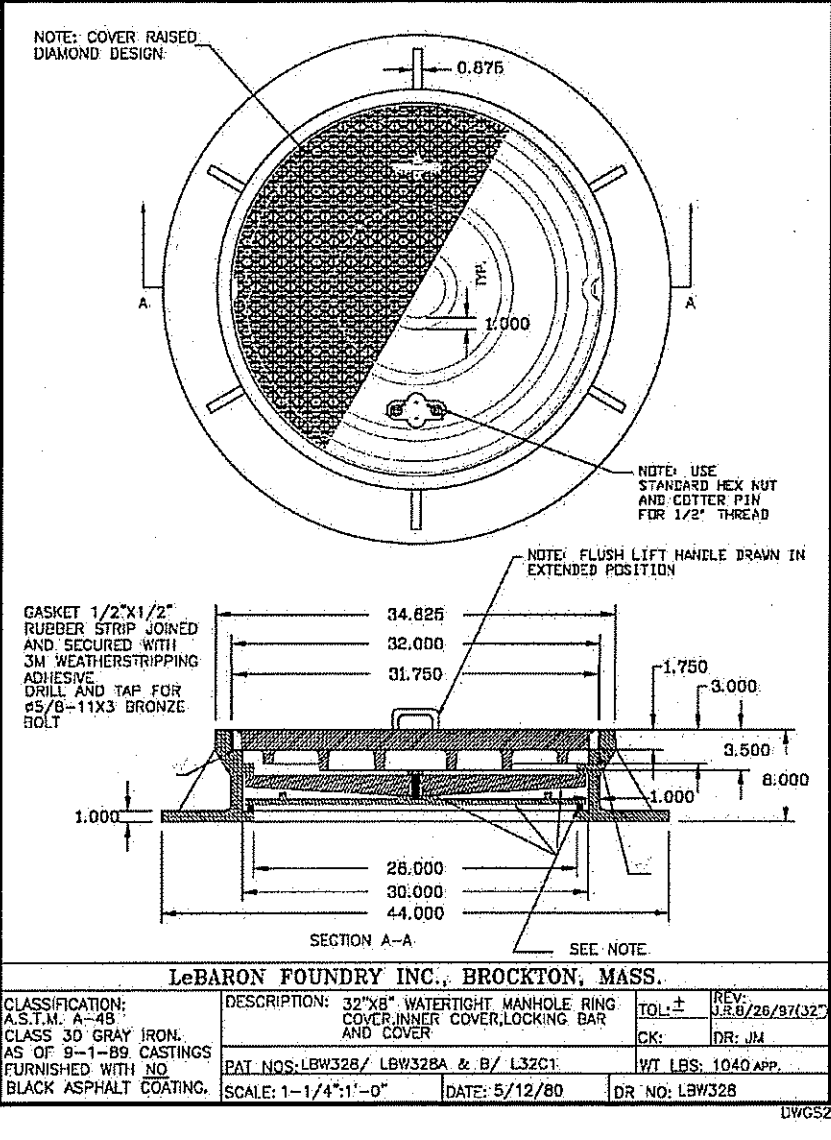
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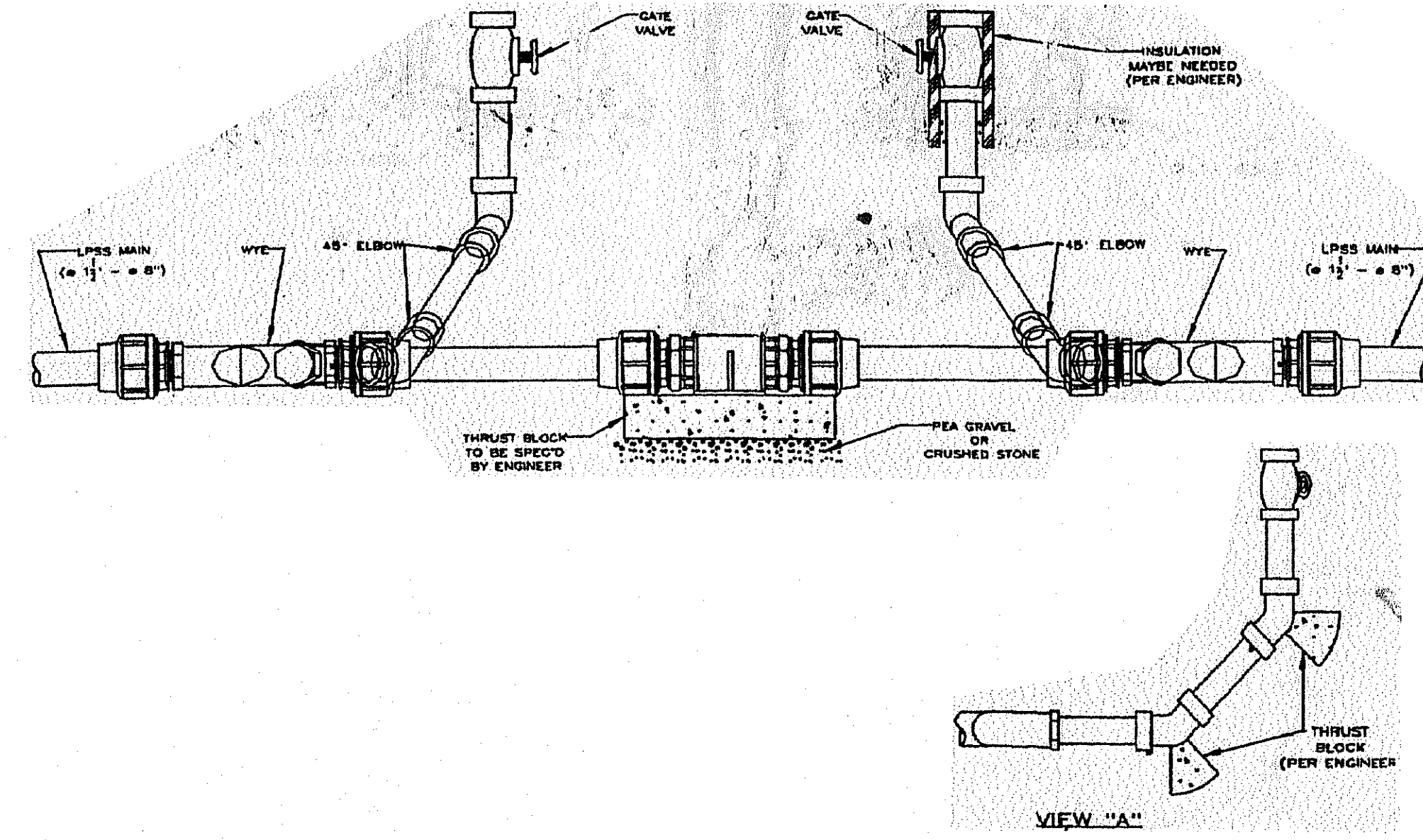
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SHEET 9 OF 13

M:\Engineers\Projects\0731-005 Whipple Road Dwg\0731-005 Preliminary Detail Sheets (0-13).dwg, 5/16/2007 5:21:25 PM, JasonD, DWGfile.pc3



**SEWER WATER TIGHT MANHOLE FRAMES & COVERS**  
NOT TO SCALE



**TYPICAL FLUSHING CONNECTION ON LPSS MAIN (LOCATED IN SEWER MANHOLE)**  
NOT TO SCALE

**SEWER LINE / WATER MAIN SEPARATION POLICY FOR DESIGN OF SANITARY SEWERS**

- A. LATERAL PLACEMENT OF SEWERS AND WATER MAINS**
- SEWERS SHALL BE LAID AT LEAST 10 FEET HORIZONTALLY FROM ANY EXISTING OR PROPOSED WATERMAIN. THE DISTANCE SHALL BE MEASURED EDGE-TO-EDGE. THERE IS NO MINIMUM VERTICAL SEPARATION REQUIRED PROVIDED THE 10 FOOT HORIZONTAL SEPARATION IS MAINTAINED.
- IN CASES WHERE IT IS NOT POSSIBLE TO MAINTAIN A 10 FOOT HORIZONTAL SEPARATION, THE DIVISION MAY ALLOW DEVIATION ON A CASE BY CASE BASIS, IF SUPPORTED BY DATA FROM THE DESIGN ENGINEER. SUCH DEVIATION MAY ALLOW INSTALLATION OF THE SEWER CLOSER TO A WATERMAIN, PROVIDED THAT:
1. THE SEWER AND WATER MAIN ARE LAID IN SEPARATE TRENCHES, OR
  2. THE SEWER AND WATER MAIN MAY BE INSTALLED IN THE SAME TRENCH WITH THE WATERMAIN PLACED ON A BENCH OF UNDISTURBED EARTH, AND
  3. IN EITHER CASE, THE CROWN OF THE SEWER SHALL BE AT LEAST 18 INCHES BELOW THE INVERT OF THE WATERMAIN.
- IN SITUATIONS WHERE IT IS IMPOSSIBLE TO OBTAIN PROPER HORIZONTAL AND VERTICAL SEPARATION AS STIPULATED ABOVE, THE FOLLOWING PROTECTION SHALL BE PROVIDED:
4. ENCASEMENT OF THE SEWER PIPE IN CONCRETE (MIN. 6 INCH THICKNESS) OR A CARRIER PIPE FOR AT LEAST 10 FEET EITHER SIDE OF THE AREA NOT COMPLYING WITH THE MINIMUM HORIZONTAL AND VERTICAL SEPARATION, OR
  5. DESIGN AND CONSTRUCTION OF THE SEWER EQUAL TO WATER MAIN PIPE (CEMENT-LINED DUCTILE IRON OR OTHER AWWA-APPROVED MATERIAL FOR POTABLE WATER CONVEYANCE), AND PRESSURE TESTED IN ACCORDANCE WITH AWWA SPECIFICATIONS.
- B. SEWERS CROSSING WATER MAINS**
- SEWERS CROSSING OVER WATER MAINS SHOULD BE AVOIDED, BUT IF CONDITIONS WARRANT THIS SITUATION, THEN ADEQUATE STRUCTURAL SUPPORT SHALL BE PROVIDED FOR THE SEWER TO MAINTAIN LINE AND GRADE. SEWERS CROSSING UNDER WATER MAINS SHALL BE LAID TO PROVIDE A MINIMUM VERTICAL SEPARATION OF 18 INCHES BETWEEN THE INVERT OF THE WATER MAIN AND THE CROWN OF THE SEWER. THE CROSSING SHALL BE ARRANGED SO THAT SEWER JOINTS WILL BE EQUIDISTANT AND AS FAR AS POSSIBLE FROM THE WATER MAIN JOINTS.
- WHERE CONDITIONS PREVENT AN 18 INCH VERTICAL SEPARATION FROM BEING MAINTAINED, THE FOLLOWING METHODS SHALL BE SPECIFIED:
- A. THE SEWER SHALL BE DESIGNED AND CONSTRUCTED EQUAL TO WATER MAIN PIPE (CEMENT-LINED DUCTILE IRON PIPE, PVC OR OTHER AWWA APPROVED MATERIAL FOR POTABLE WATER CONVEYANCE) FOR A DISTANCE OF 12 FEET ON EACH SIDE OF THE CROSSING, MEASURED PERPENDICULAR TO THE WATER MAIN AND PRESSURE TESTED IN ACCORDANCE WITH AWWA SPECIFICATIONS, OR
  - B. EITHER THE WATER MAIN OR THE SEWER MAY BE ENCASED IN CONCRETE (MIN. 6 INCH THICKNESS) OR A CARRIER PIPE FOR A DISTANCE OF 12 FEET ON EACH SIDE OF THE CROSSING, MEASURED PERPENDICULAR TO THE WATERMAIN. THE CARRIER PIPE SHALL BE DESIGNED AND CONSTRUCTED OF MATERIALS WHICH ARE SATISFACTORY TO THE DIVISION, OR
  - C. ANY OTHER METHODS, IF SUPPORTED BY DATA FROM THE DESIGN ENGINEER, WHICH ENSURE ADEQUATE WATER TIGHTNESS AND ARE SATISFACTORY TO THE DIVISION.

**LEAKAGE AND PRESSURE TESTING FOR SEWER FORCE MAINS AND WATERMAINS**

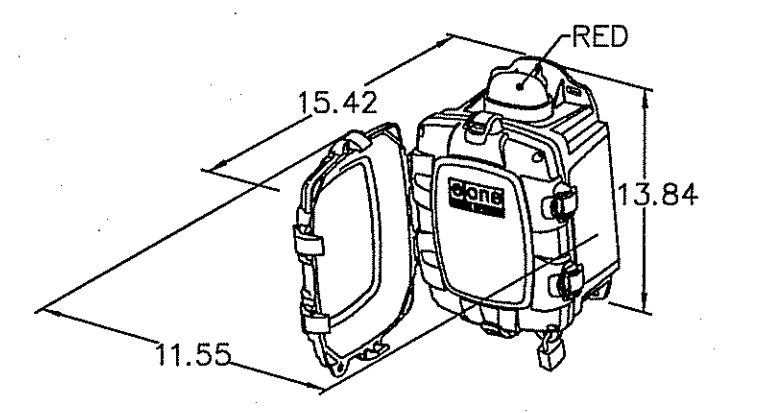
1. **GENERAL**  
HYDROSTATIC AND LEAKAGE TESTS SHALL BE PERFORMED ON ALL COMPLETED SECTIONS OF NEWLY INSTALLED SEWER FORCE MAIN AND WATERMAIN PIPELINE IN ACCORDANCE WITH AWWA C600, UNITED WATER, THE TOWN OF SMITHFIELD, AND AS SPECIFIED BELOW.  
THE CONTRACTOR IS RESPONSIBLE FOR FURNISHING ALL LABOR, TOOLS AND EQUIPMENT NECESSARY FOR TESTING.
2. **TESTING PROCEDURES**  
ALL AIR SHALL BE EXPELLED AT THE HIGH POINTS AND THE PIPELINE SLOWLY FILLED WITH POTABLE WATER.  
THE INTERNAL PRESSURE SHALL BE BUILT UP TO 150 PSI OR 1.25 OPERATING PRESSURE AND MAINTAINED FOR A PERIOD OF NOT LESS THAN TWO (2) HOURS.  
ALL LEAKS IN THE PIPELINE SHALL BE STOPPED; CRACKED OR DEFECTIVE PIPE, FITTINGS OR ACCESSORIES SHALL BE REMOVED AND REPLACED WITH NEW BY THE CONTRACTOR.  
THE PIPELINE SHALL BE RETESTED AS MAY BE REQUIRED AND NECESSARY UNTIL THE LEAKAGE FALLS WITHIN THE ALLOWABLE DETERMINED FOR THE PIPE NETWORK, AT WHICH TIME THE PIPELINE MAY BE CONSIDERED READY FOR:  
a. WATERMAINS - DISINFECTION STEP  
b. SEWER FORCE MAIN - READY FOR USE  
ALL PIPES SHALL BE DISINFECTED PRIOR TO BEING ACTIVATED IN ACCORDANCE WITH AWWA 9-300, AWWA C-601, AND TOWN SPECIFICATIONS. CHLORINATION ACCORDING TO AWWA REQUIREMENTS FOR SERVICE AND MAIN INSTALLATION.

**GENERAL SEWER NOTES**

1. INSTALLATION OF THE SEWERAGE FACILITIES SHALL BE IN ACCORDANCE WITH THE TOWN OF SMITHFIELD'S "STANDARD SPECIFICATIONS AND DETAILS FOR THE INSTALLATION OF SEWERS AND APPURTENANCES BY PRIVATE DEVELOPERS" IN EFFECT ON THE DATE PART I OF THE SEWER PERMIT AGREEMENT IS EXECUTED.
  2. PRIOR TO RECEIVING AUTHORIZATION TO CONSTRUCT, ALL MATERIALS SHALL MEET THE STANDARDS AND RECEIVE THE WRITTEN APPROVAL, BASED ON MANUFACTURER'S DRAWINGS AND OTHER DATA, OF THE SEWER AUTHORITY OR ITS REPRESENTATIVE.
  3. ALL SEWERAGE FACILITIES SHALL BE MEET TESTING AND CLEANING REQUIREMENTS PRIOR TO ACCEPTANCE.
  4. AS-BUILT DRAWING SHALL BE FURNISHED AS A CONDITION FOR ACCEPTANCE OF THE NEW SEWERAGE FACILITIES.
  5. NO FLOW WILL BE ACCEPTED UNTIL ALL ABOVE STEPS ARE COMPLETED AND COMPLETION CERTIFICATE IS ISSUED.
  6. AFTER THE DEVELOPERS HAS "STAKED OUT" THE FACILITIES TO BE CONSTRUCTED AND HAS THE APPROVE MATERIALS ON THE JOB, THE SEWER AUTHORITY SHALL BE NOTIFIED AT LEAST TWO WORKING DAYS IN ADVANCE OF CONSTRUCTION IN ORDER FOR IT TO ARRANGE FOR ITS INSPECTOR.
  7. ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE APPROVE PLANS AND MATERIALS, STANDARD AND SPECIAL DETAILS, AND STANDARD SPECIFICATION. ANY WORK NOT MEETING THE APPROVED STANDARDS SHALL BE IMMEDIATELY REMOVED AND REPLACED AT THE FULL RESPONSIBILITY AND COST/EXPENSE TO THE DEVELOPER.
  8. THE CONTRACTOR SHALL BE CONFINE HIS OPERATIONS AND ACTIVATES FOR CONSTRUCTION PURPOSES WITHIN THE STREET LINES, EASEMENTS AND/OR RIGHT-OF-WAY AS SHOWN ON THE DRAWINGS.
  9. ALL AREAS DISTURBED BY THE CONTRACTOR SHALL BE RESTORED TO THEIR ORIGINAL CONDITION AT NO EXTRA COST TO THE OWNER. ALL GRASSED AREAS DISTURBED BY THE CONTRACTOR'S OPERATIONS SHALL BE LOAMED AND SEEDED.
  10. LOCATION AND DEPTHS OF EXISTING UTILITIES ARE APPROXIMATE AND HAVE BEEN PLOTTED FROM THE BEST AVAILABLE INFORMATION. THE CONTRACTOR SHALL VERIFY LOCATIONS OF ALL EXISTING UTILITIES AND NOTIFY THE APPROPRIATE UTILITY AUTHORITIES INCLUDING "DIG SAFE" PRIOR TO STAKING WORK. ANY DAMAGE TO UTILITIES CAUSED BY THE CONTRACTOR'S OPERATIONS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND COST OF REPAIRS SHALL BE BORNE BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.
  11. ALL ELEVATIONS ARE BASED ON THE NORTH AMERICAN VERTICAL DATUM NAVD 88.
  12. VERTICAL SEPARATION OF SEWER AND WATER MAINS SHALL BE 1.5 CLER OR AS OTHERWISE APPROVED IN WRITING BY LOCAL WATER DEPARTMENT HAVING JURISDICTION.
  13. APPROVAL OF THE ROAD OPENING SHALL BE OBTAINED BY CONTRACTOR PRIOR TO CONSTRUCTION FROM THE TOWN OF SMITHFIELD DIRECTOR OF PUBLIC WORKS.
- DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS  
AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED JUN 21 2007 FILE # 07-013  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.
- W. Joseph Casey*

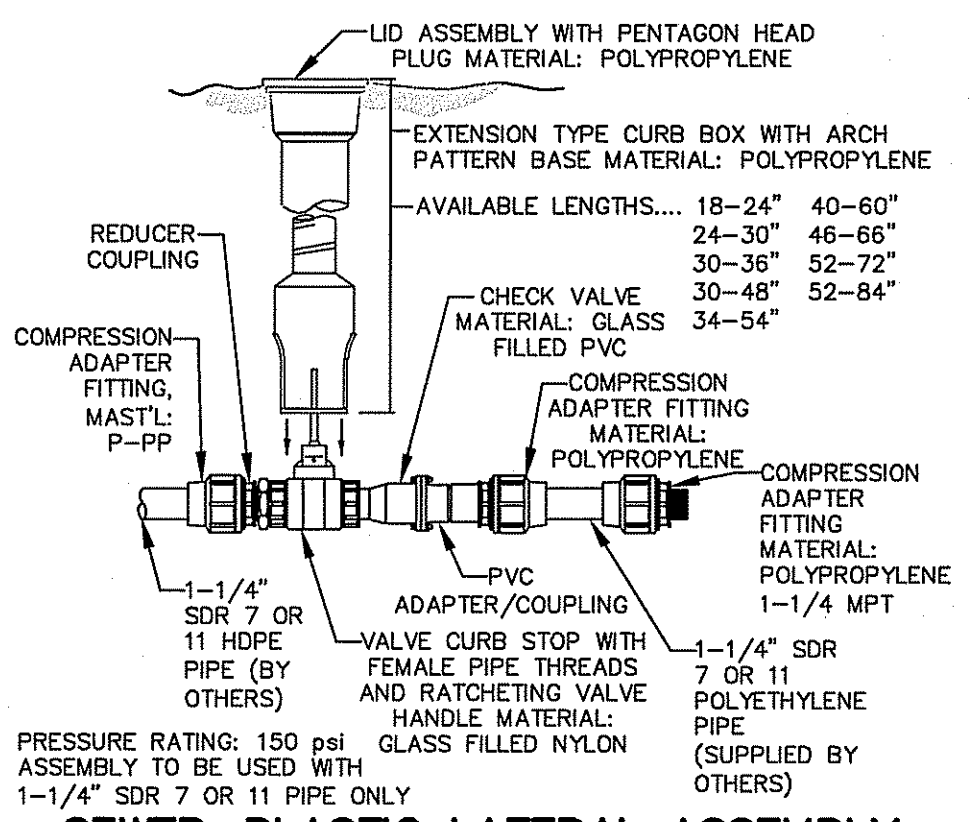
NOTE:  
1. OR APPROVED EQUAL.

**SIMPLEX SENTRY**  
REUNDANT RUN (HIGH LEVEL)  
EXTERNAL VISUAL & AUDIBLE ALARM  
EXTERNAL LATCHING MANUAL SILENCE  
MANUAL RUN  
PUMP RUN INDICATOR  
CONFORMAL COATED CIRCUIT BOARD  
PADLOCK  
NEMA 4X ENCLOSURE ASSEMBLY  
CORROSION PROOF THERMOPLASTIC  
POLYESTER APPROVED BY UL FOR  
ELECTRICAL CONTROL ENCLOSURE



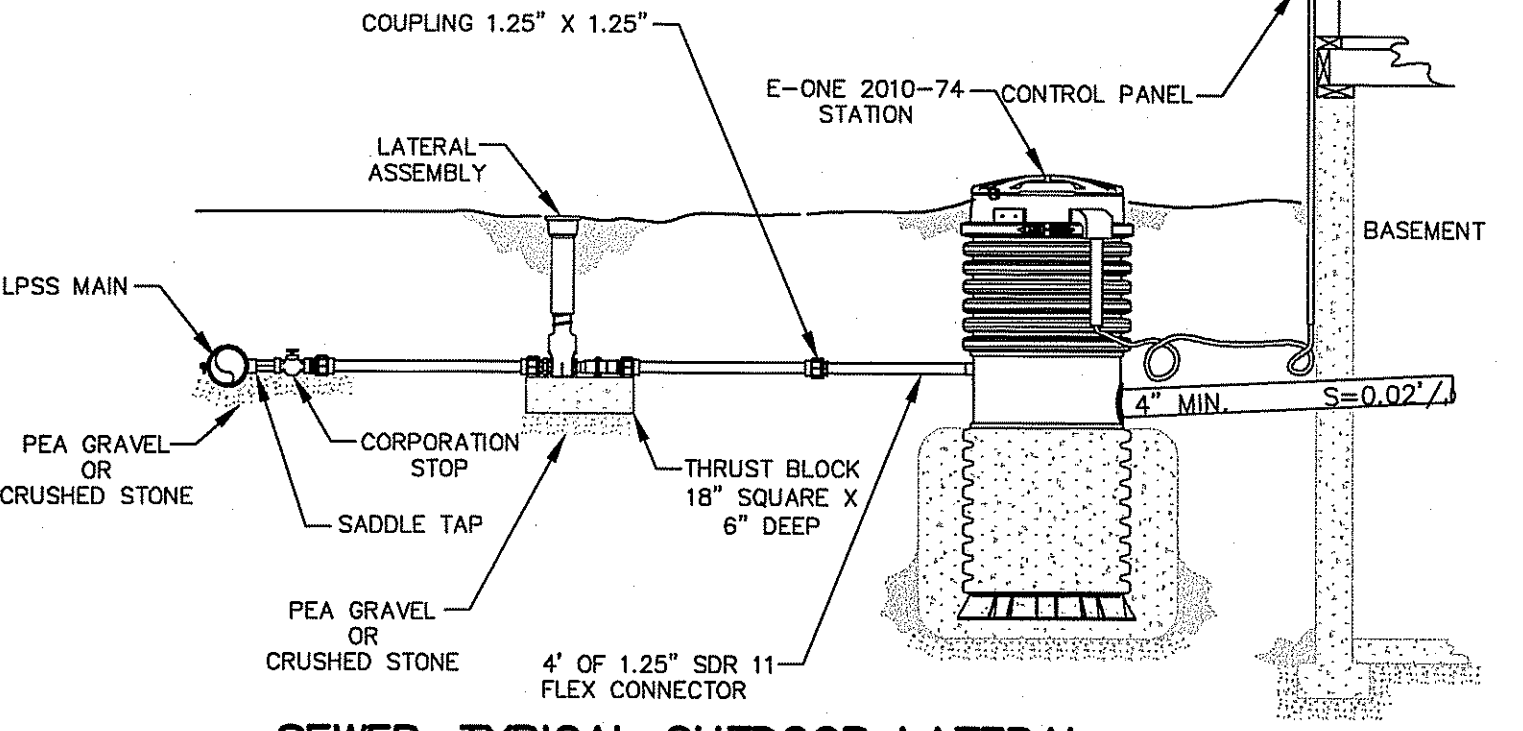
**SEWER FORCE MAIN ALARM BOX**  
NOT TO SCALE

NOTE:  
1. 1-1/4" SDR-7 OR 11 HDPE ARCH PATTERN.

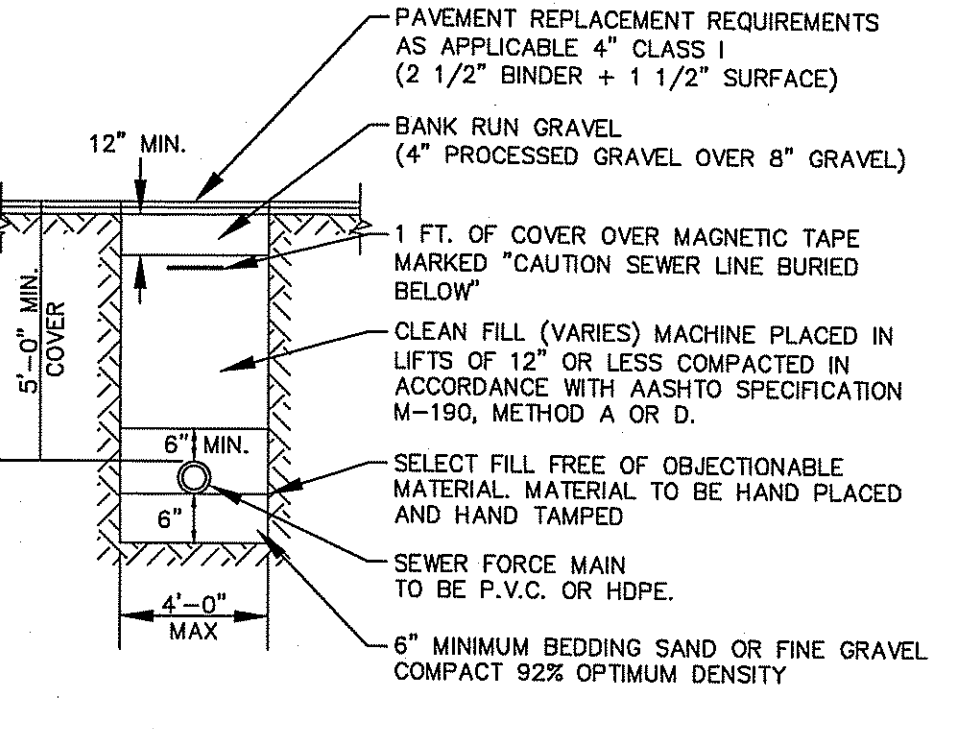


**SEWER-PLASTIC LATERAL ASSEMBLY**  
NOT TO SCALE

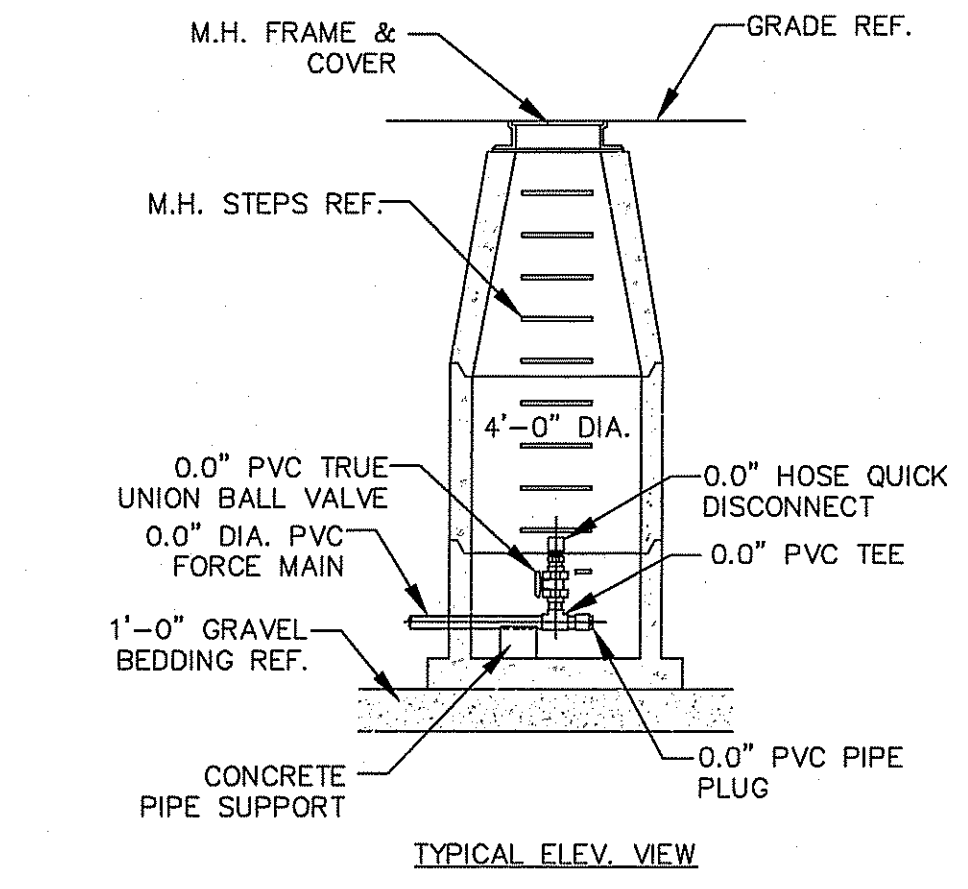
NOTE:  
1. A CONCRETE BLOCK IS REQUIRED TO PREVENT TANK FROM FLOATING. SEE INSTALLATION INSTRUCTIONS OR SPECIFIC SHEET SHEET FOR SIZE AND WEIGHT OF ANCHOR.



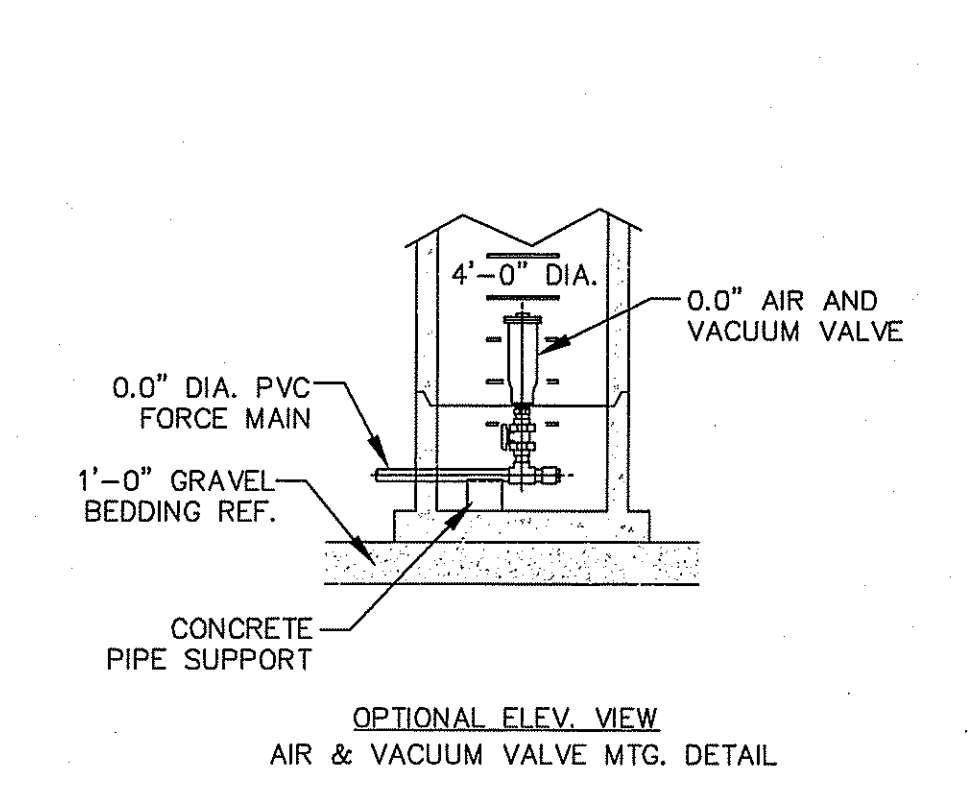
**SEWER-TYPICAL OUTDOOR LATERAL INSTALLATION DETAIL**  
NOT TO SCALE



**SEWER TRENCH DETAIL**  
NOT TO SCALE

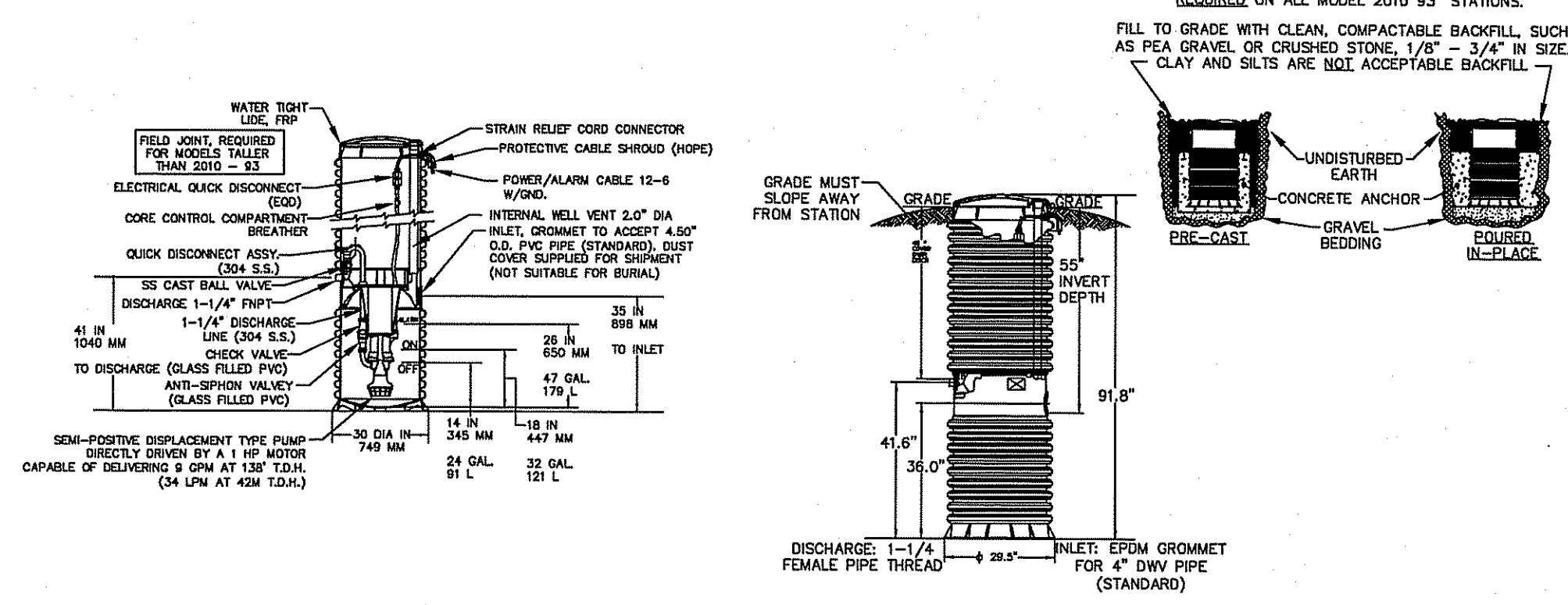


**SEWER-TERMINAL FLUSHING MANHOLE WITH OPTIONAL AIR RELEASE VALVE (PVC)**  
NOT TO SCALE



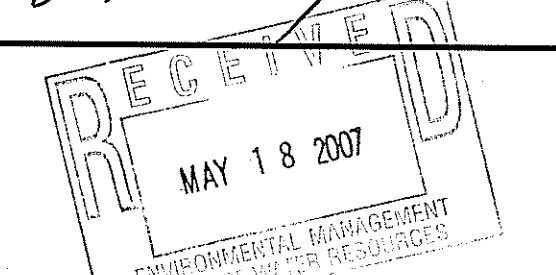
**OPTIONAL ELEV. VIEW AIR & VACUUM VALVE MOUNT. DETAIL**

NOTE:  
1. A CONCRETE BLOCK IS REQUIRED TO PREVENT TANK FROM FLOATING. SEE INSTALLATION INSTRUCTIONS OR SPECIFIC SHEET SHEET FOR SIZE AND WEIGHT OF ANCHOR.

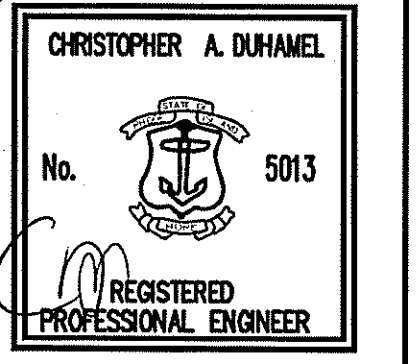


**SEWER-E-ONE DETAIL**  
NOT TO SCALE

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



**Preliminary Submission**



NO.	DATE	DESCRIPTION	BY
1	5-16-07	Wetland Comments	J.M.D.
2	4-18-07	Utility Submission	J.M.D.
3	2-28-07	RIPET Wetlands / RI/PT PAPA	J.M.D.

**DETAIL SHEET**  
**Cardinal Hill**  
ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
SMITHFIELD, RHODE ISLAND

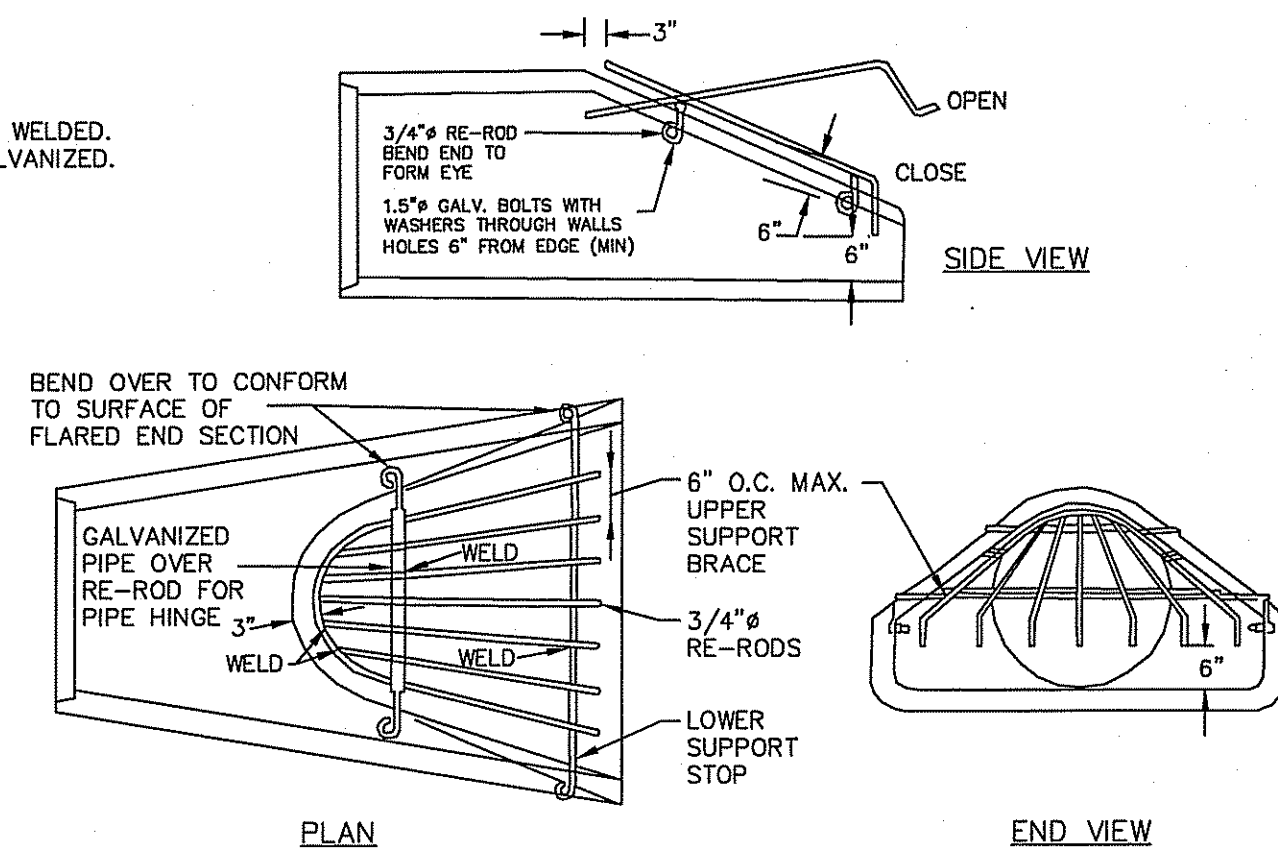
**DiPrete Engineering Associates, Inc.**  
ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
TWO STAFFORD COURT  
CRANSTON, R.I. 02920  
(401) 943-1000 FAX: (401) 464-6006

PREPARED FOR  
**Crown Properties, LLC**  
34 OAKDALE AVENUE  
JOHNSTON, RI 02920  
(401) 727-1100

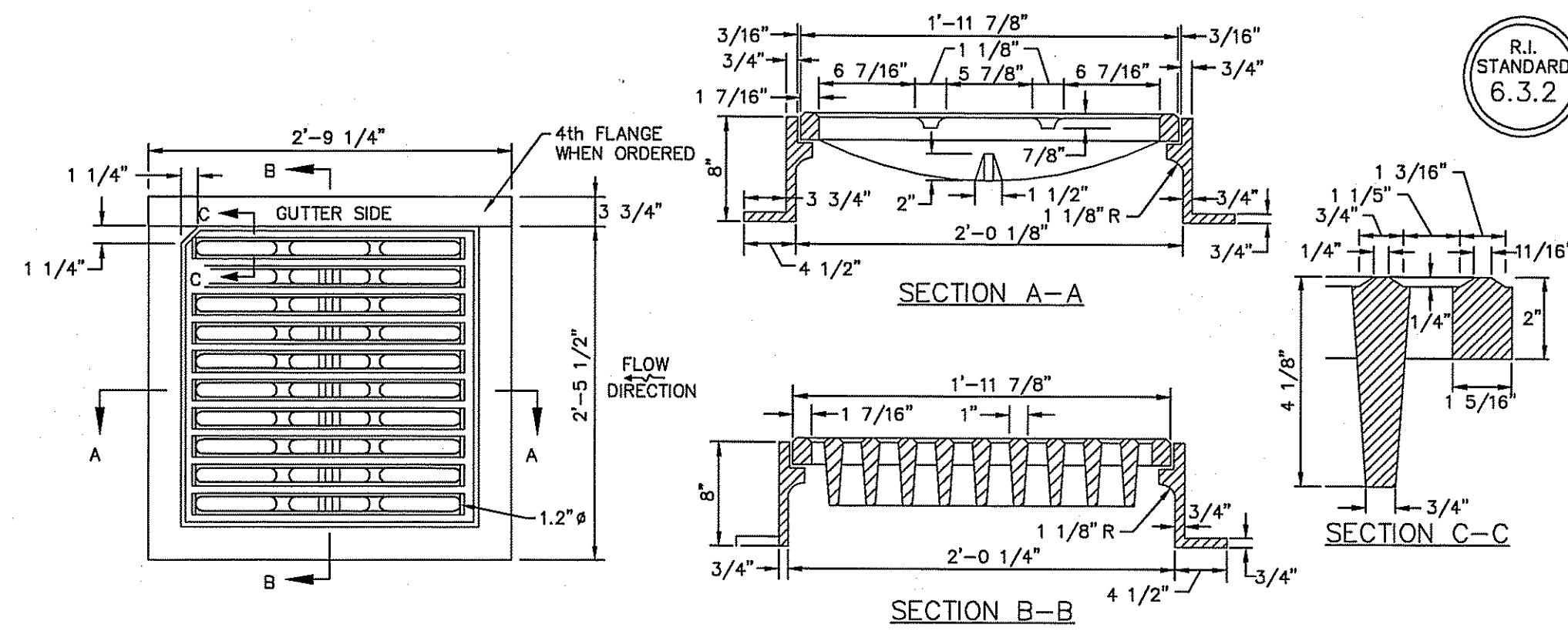
FEBRUARY, 2007  
DWN. BY: J.M.D.

SHEET 10 OF 13

- NOTES:  
 1. ALL RE-RODS ARE TO BE WELDED.  
 2. ALL RODS ARE TO BE GALVANIZED.



**GRATING FOR FLARED END**  
 NOT TO SCALE



**SQUARE FRAME AND GRATE (BICYCLE SAFE)**  
 NOT TO SCALE

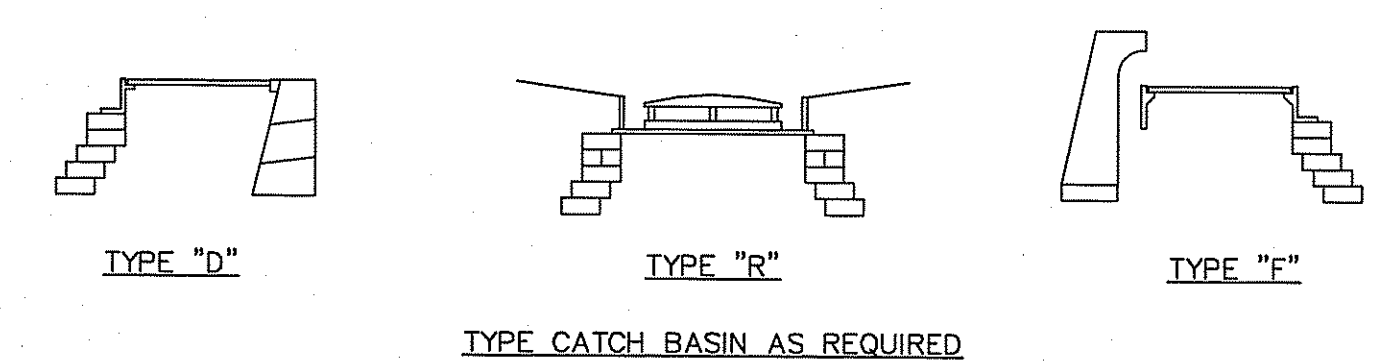
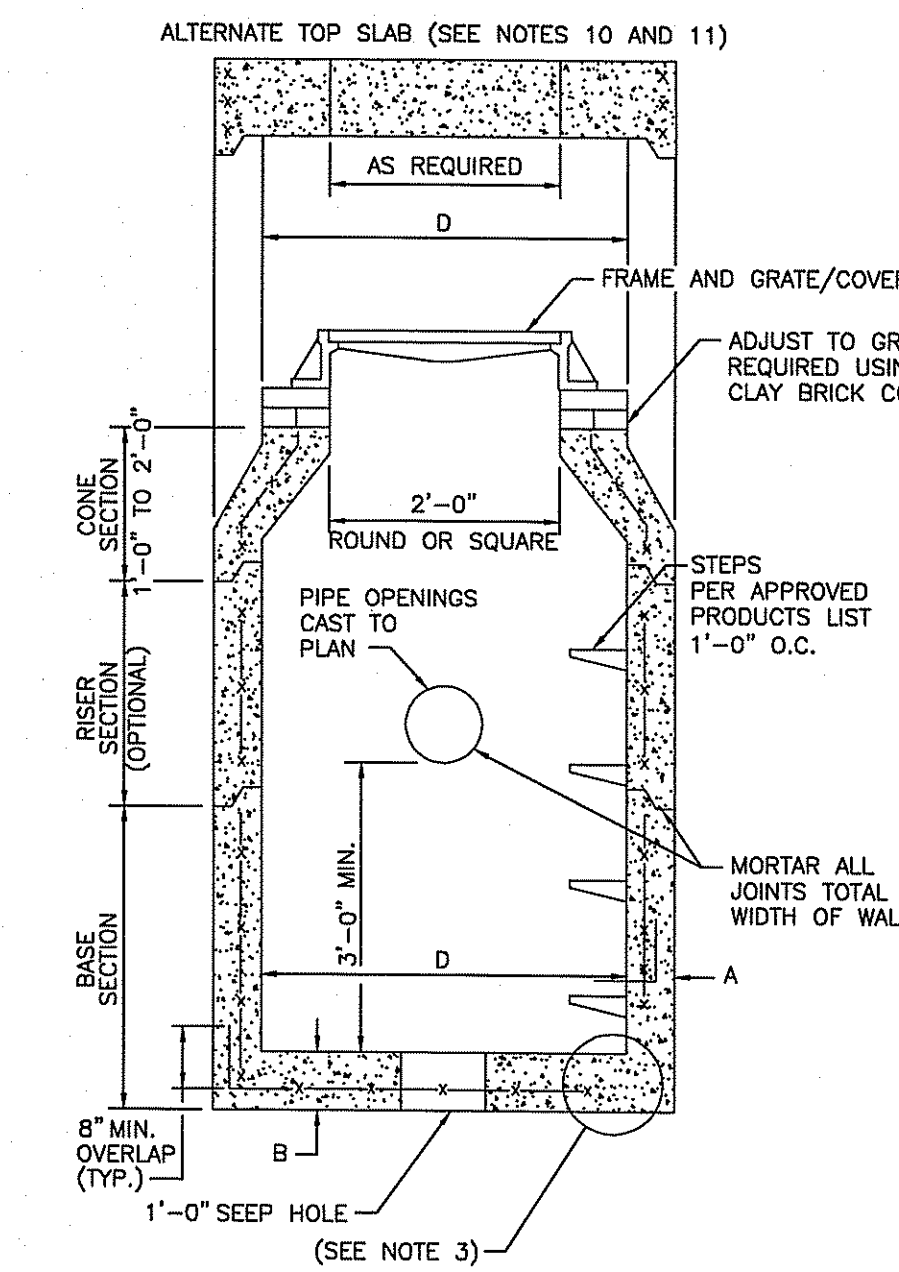


TABLE 1  
 CIRCUMFERENTIAL STEEL REINFORCEMENT REQUIRED\*

CATCH BASIN DIAMETER (D)	A	B	CIRCUMFERENTIAL STEEL REINFORCEMENT REQUIRED*
4'-0"	5"	6"	0.12 SQ. IN./LIN. FT.
5'-0"	6"	7"	0.15 SQ. IN./LIN. FT.
6'-0"	7"	8"	0.18 SQ. IN./LIN. FT.

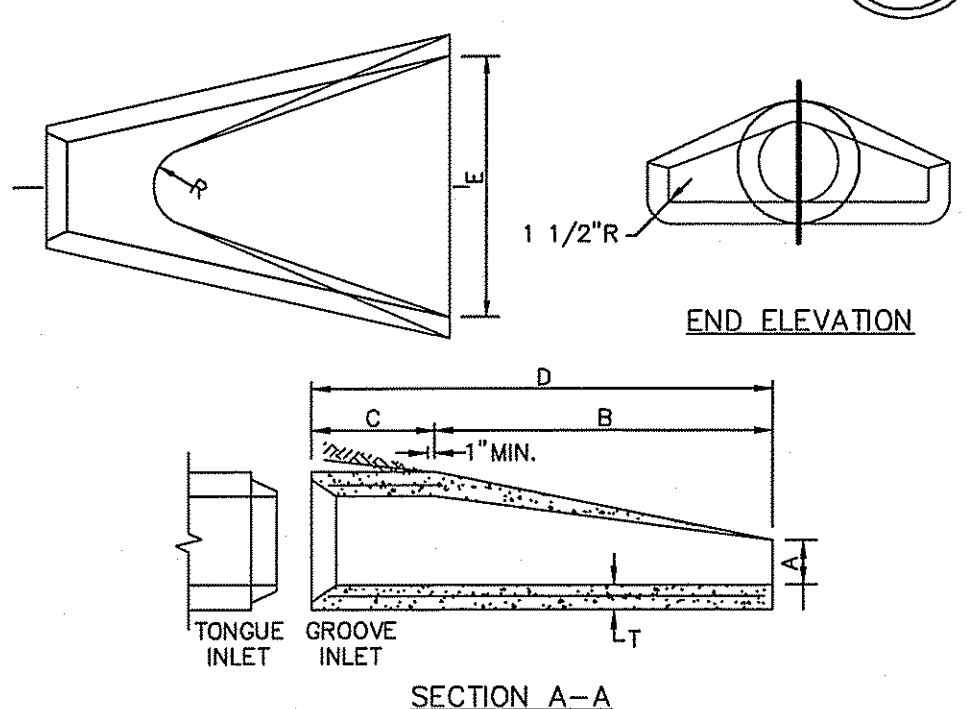
\* FOR LONGITUDINAL (VERTICAL STANDING) REINFORCEMENT REFER TO ASTM C478, ITEM 8.1.2



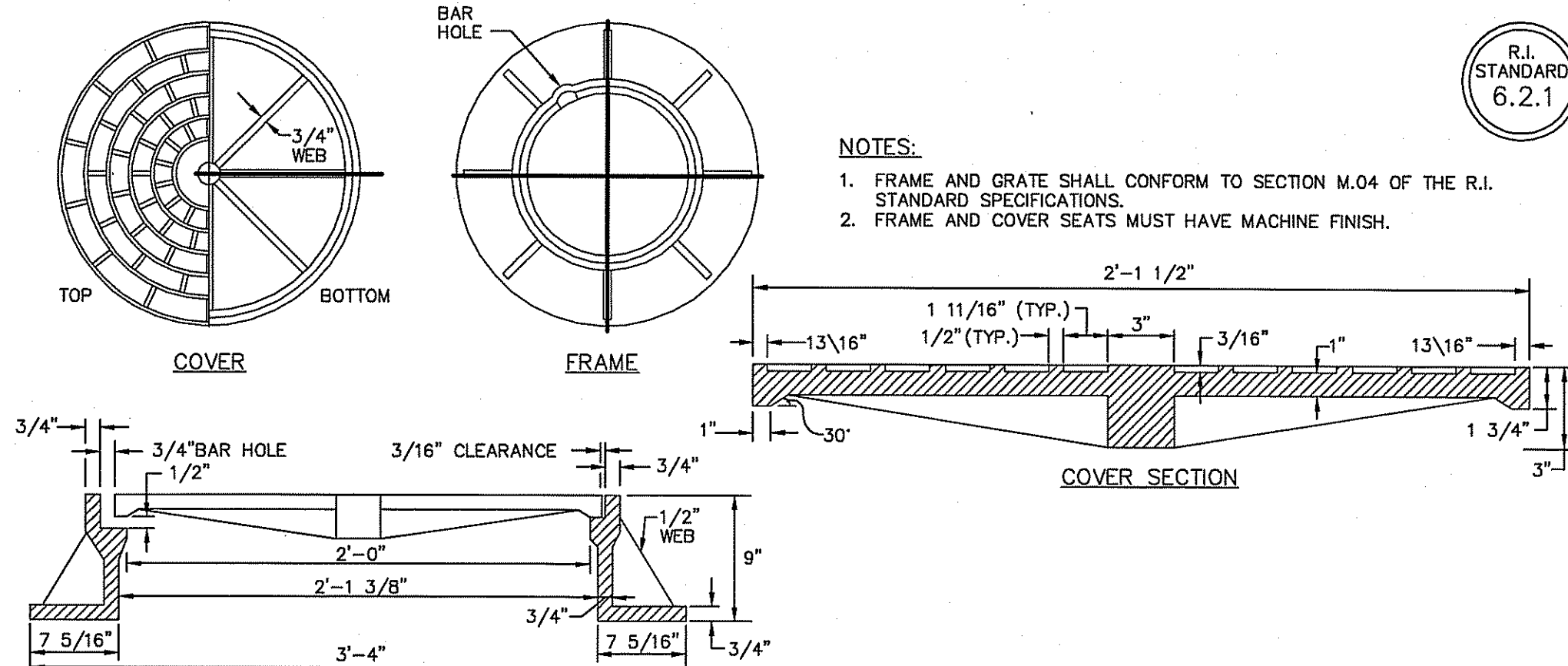
- NOTES:  
 1. SHALL BE IN ACCORDANCE WITH SECTION 702 OF THE R.I. STANDARD SPECIFICATIONS.  
 2. SEE TABLE 1 FOR STEEL REINFORCEMENT REQUIREMENTS.  
 3. STEEL REINFORCEMENT FOR BASE SECTION BOTTOM SHALL BE A MINIMUM OF 0.12 SQ. IN./LIN. FT. (BOTH WAYS).  
 4. STEPS SHALL CONFORM TO STD. 5.3.0 AND SHALL BE INSTALLED AT THE CASTING PLANT.  
 5. ONE POUR MONOLITHIC BASE SECTION.  
 6. 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.  
 7. CORREL MADE OF RED CLAY BRICK WILL BE PERMITTED FOR THE "CONE SECTION" OF THE 4'-0" CATCH BASIN ONLY.  
 8. FOR CATCH BASIN TYPES "D" AND "F" STEPS MUST BE INSTALLED ON THE CURB SIDE OF THE STRUCTURE.  
 9. THE CENTERLINE OF THE OPENING MUST BE WITHIN 2'-0" FROM THE STEPS.  
 10. ALTERNATE TOP SLAB IS STEEL REINFORCED TO MEET OR EXCEED H-25 LOADING (SEE STD. 4.7.2).  
 11. ALTERNATE TOP SLAB IS ONLY FOR USE WHEN REDUCING SECTION DOES NOT FIT BECAUSE OF STRUCTURE DEPTH.  
 12. REFER TO STD. 5.2.0 FOR MAXIMUM PIPE SIZES.

**PRECAST ROUND CATCH BASIN**  
 NOT TO SCALE

DIMENSIONS								REINFORCEMENT
DIA.	A	B	C	D	E	R	T	ONE LAYER REINFORCEMENT IN CENTER OF WALL MIN. AREA OF EACH WAY (SQ. IN./FT.)
1'-0"	4"	2'-0"	4'-0 7/8"	6'-0 7/8"	2'-0"	9"	2"	0.048
1'-3"	6"	2'-3"	3'-10"	6'-11"	2'-3"	11"	2 1/2"	0.054
1'-6"	9"	2'-6"	3'-10"	6'-11"	3'-0"	12"	2 1/2"	0.060
2'-0"	1 1/2"	3'-7 1/2"	2'-6"	6'-1 1/2"	4'-0"	1'-2"	3"	0.072
2'-6"	1'-0"	4'-6"	4'-6"	1'-7 3/4"	6'-1 3/4"	5'-0"	1'-3 1/2"	0.084
3'-0"	1'-3"	5'-3"	2'-10 3/4"	8'-1 3/4"	6'-0"	1'-8"	4"	0.096
3'-6"	1'-9"	5'-9"	2'-11"	8'-2"	6'-5"	1'-10"	4 1/2"	0.108
4'-0"	2'-0"	6'-0"	2'-2"	8'-2"	7'-0"	1'-10"	5"	0.120
4'-6"	2'-3"	6'-5"	2'-11"	8'-4"	7'-6"	2'-0"	5 1/2"	0.132
5'-0"	2'-6"	7'-0"	3'-3"	8'-3"	8'-0"	2'-0"	6"	0.144

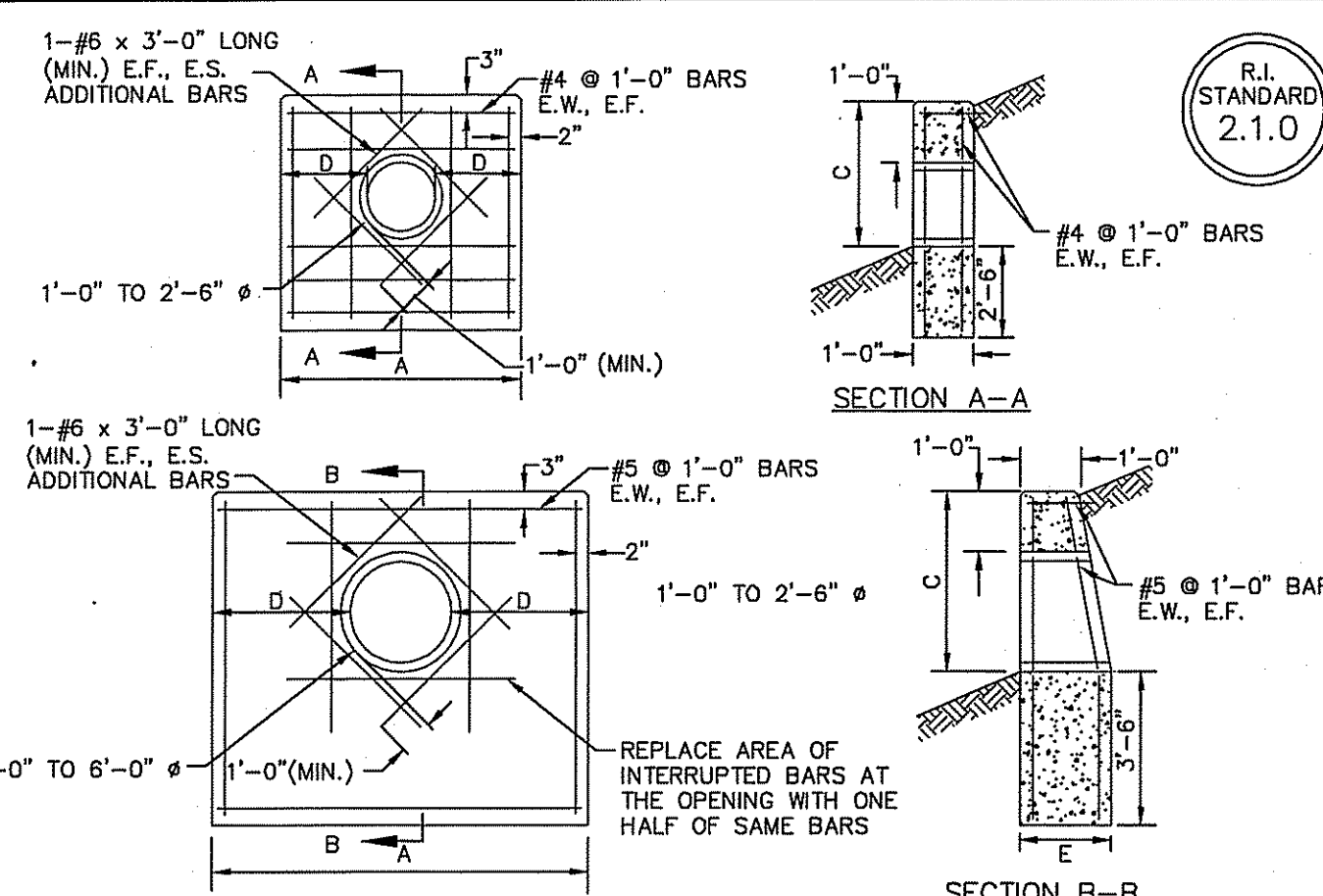


**PRECAST CONCRETE FLARED END SECTION**  
 NOT TO SCALE

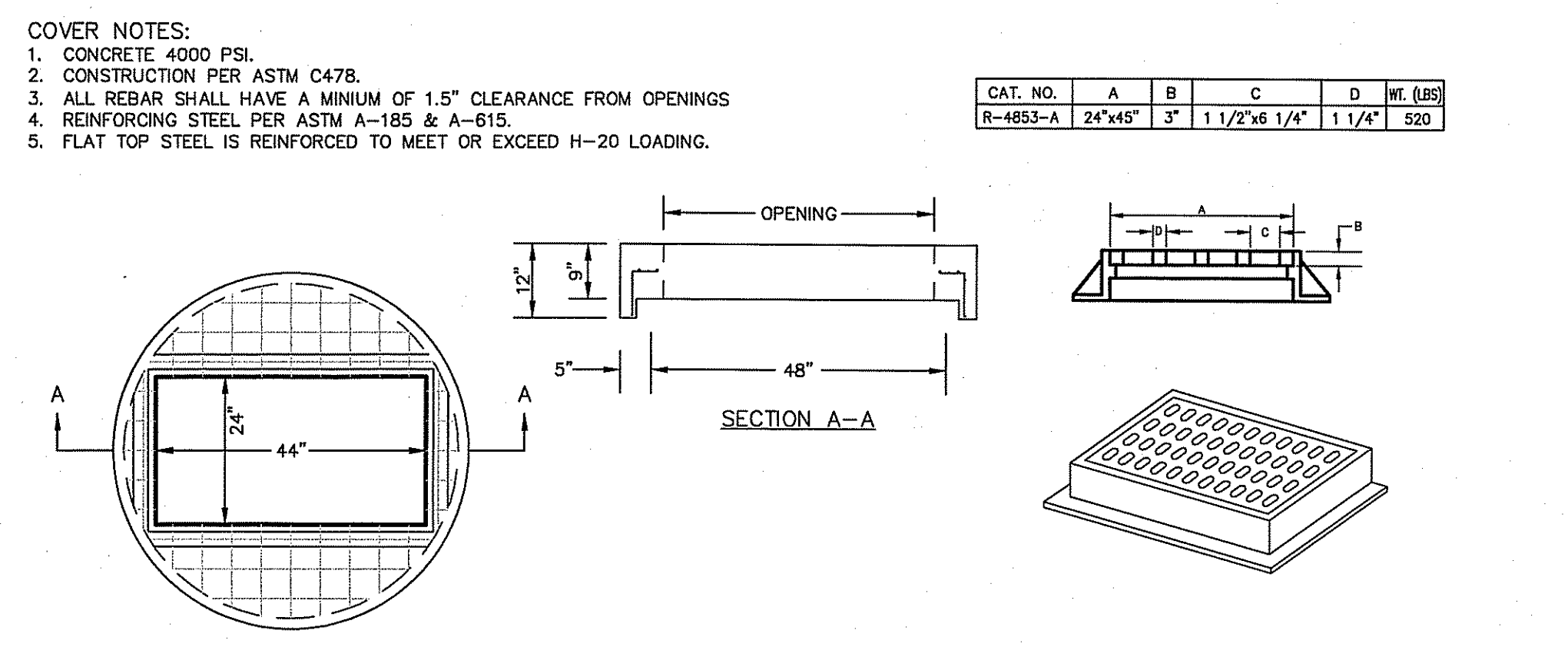


**HEAVY-DUTY ROUND FRAME AND COVER**  
 NOT TO SCALE

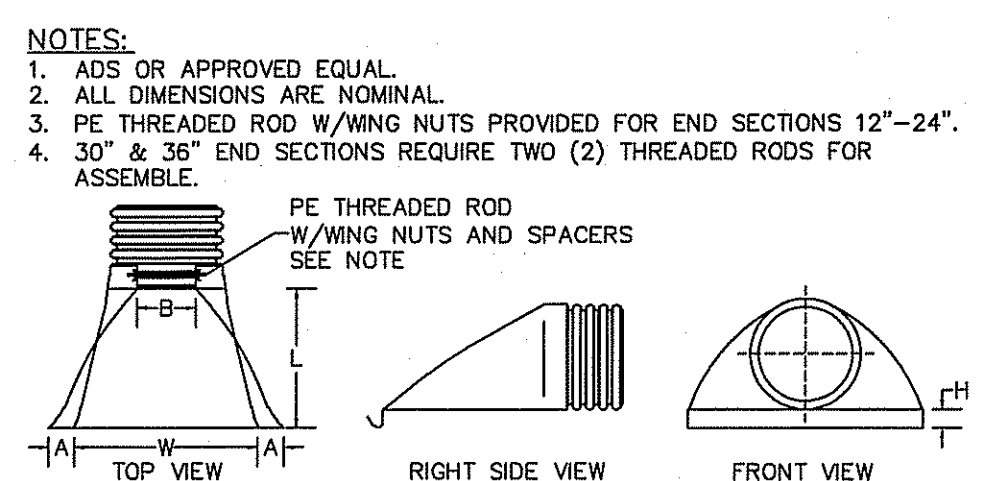
DIAMETER OF PIPE	A	C	D	E	CU. FT. CONCRETE
1'-0"	3'-0"	2'-2"	1'-0"	-	13.2
1'-3"	3'-9"	2'-5"	1'-3"	-	17.2
1'-6"	4'-6"	2'-8"	1'-6"	-	21.5
1'-9"	5'-3"	2'-11"	1'-9"	-	26.0
2'-0"	6'-0"	3'-2"	2'-0"	-	30.9
2'-3"	6'-9"	3'-6"	2'-3"	-	36.5
2'-6"	7'-6"	3'-9"	2'-6"	-	42.0
3'-0"	9'-6"	4'-0"	3'-3"	1'-5"	84.1
3'-6"	11'-0"	4'-6"	3'-9"	1'-7"	111.8
4'-0"	12'-8"	5'-0"	4'-4"	1'-9"	146.5
4'-6"	14'-4"	5'-6"	4'-11"	1'-11"	186.3
5'-0"	16'-0"	6'-0"	5'-8"	2'-1"	232.6
5'-6"	17'-8"	6'-6"	6'-1"	2'-3"	284.9
6'-0"	19'-4"	7'-0"	6'-8"	2'-5"	343.6



**CONCRETE HEADWALLS FOR PIPE CULVERTS**  
 NOT TO SCALE

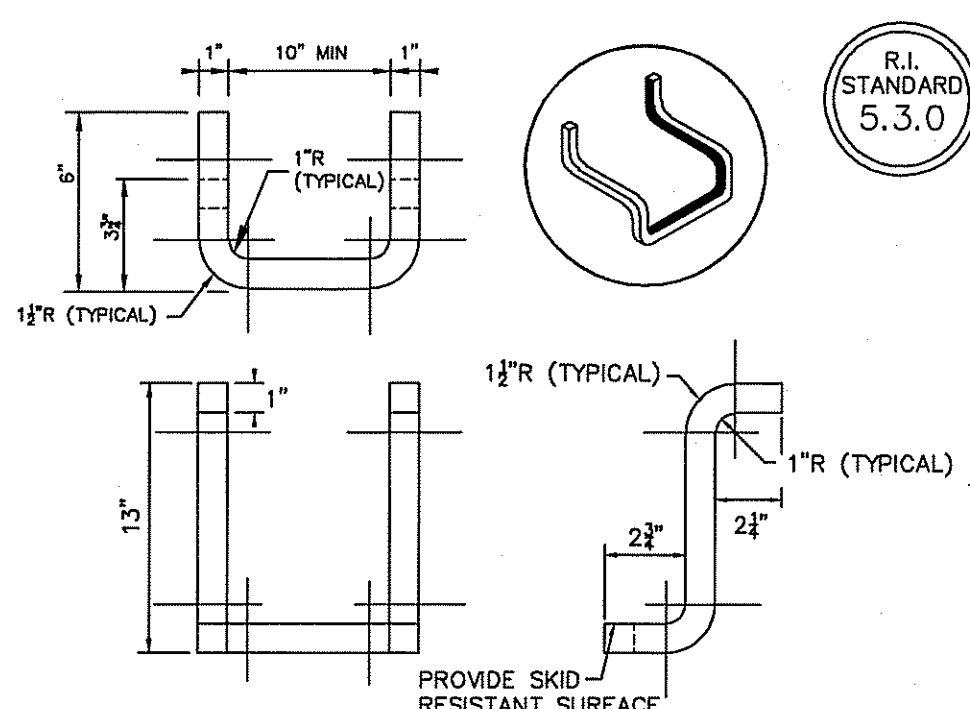


**4' DIA. DOUBLE OPENING SLAB COVER WITH DOUBLE FRAME & GRATE (BICYCLE SAFE)**  
**HANSON PIPE COVER & NEENAH FOUNDRY CORP. FRAME & GRATE (OR EQUAL)**  
 NOT TO SCALE

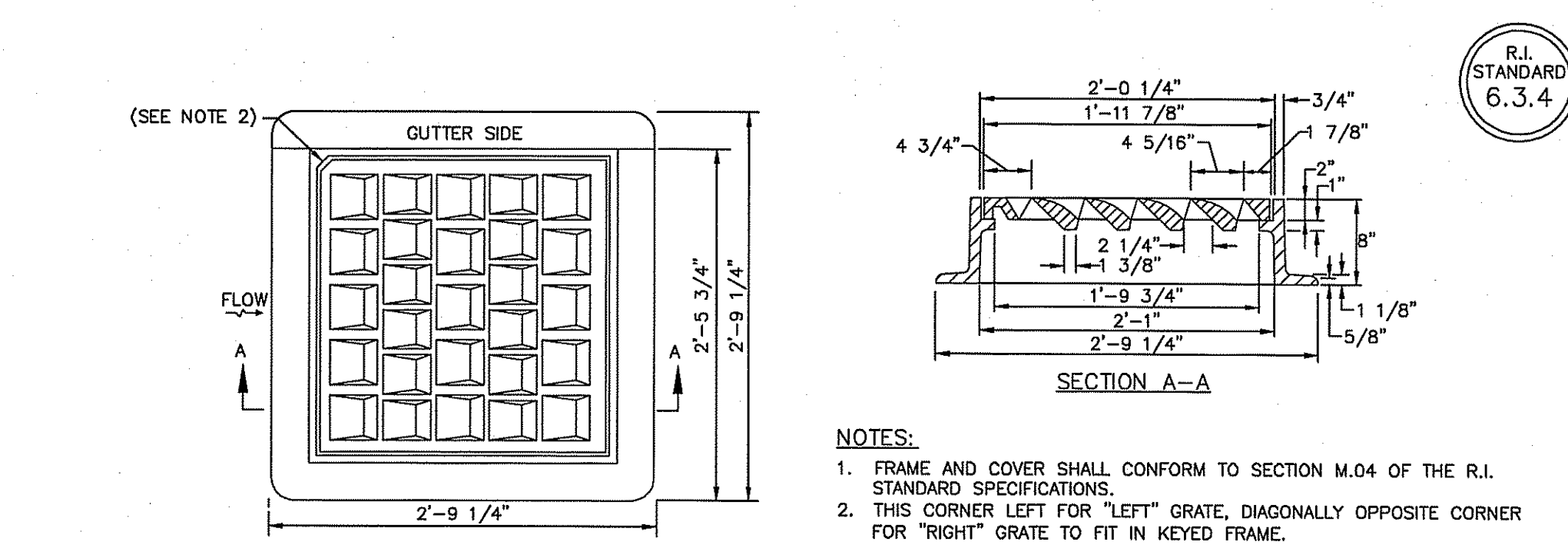


PART #	PIPE SIZE	A	B (H/W)	H	L	W
1210NP	12 in (300 mm)	6.50 in (165 mm)	10.50 in (267 mm)	6.50 in (165 mm)	25.00 in (635 mm)	29.00 in (737 mm)
1510NP	15 in (375 mm)	6.50 in (165 mm)	10.00 in (254 mm)	6.50 in (165 mm)	25.00 in (635 mm)	29.00 in (737 mm)
1810NP	18 in (450 mm)	7.50 in (191 mm)	16.00 in (406 mm)	6.50 in (165 mm)	32.00 in (813 mm)	35.00 in (889 mm)
2410NP	24 in (600 mm)	7.50 in (191 mm)	18.00 in (457 mm)	6.50 in (165 mm)	36.00 in (914 mm)	45.00 in (1143 mm)
3016NP	30 in (750 mm)	7.50 in (191 mm)	12.00 in (305 mm)	6.50 in (165 mm)	58.00 in (1473 mm)	65.00 in (1651 mm)
3616NP	36 in (900 mm)	7.50 in (191 mm)	25.00 in (635 mm)	6.50 in (165 mm)	58.00 in (1473 mm)	63.00 in (1600 mm)

**HDPE FLARED END SECTION**  
 NOT TO SCALE

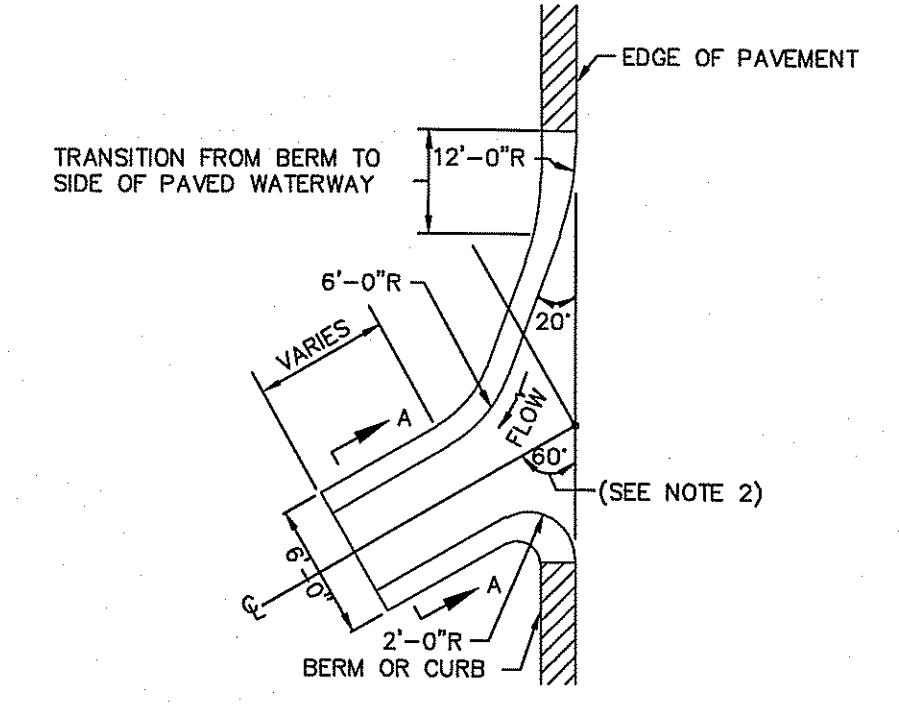


**CATCH BASIN AND MANHOLE STEP**  
 NOT TO SCALE



**HIGH CAPACITY FRAME AND GRATE (BICYCLE SAFE)**  
 NOT TO SCALE

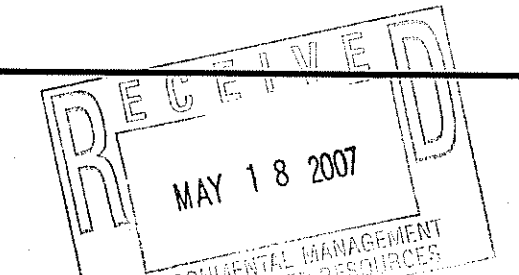
Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.



- NOTES:  
 1. SHALL BE IN ACCORDANCE WITH SECTION 711 OF THE R.I. STANDARD SPECIFICATIONS.  
 2. WHEN PAVED WATERWAY IS USED AT A LOW POINT THIS ANGLE SHALL BE 90°.

**PAVED WATERWAY**  
 NOT TO SCALE

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
 OFFICE OF WATER RESOURCES  
 FRESHWATER WETLANDS PROGRAM  
 APPROVED WITH CONDITIONS  
 AS SPECIFIED IN THE LETTER OF APPROVAL  
 DATED JUN 21 2007 FILE # 07-0119  
 NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
 APPROVED PLANS MUST BE AT CONSTRUCTION SITE.



**Preliminary Submission**

CHRISTOPHER A. DUHAMEL  
 No. 5013  
 REGISTERED PROFESSIONAL ENGINEER

**DETAIL SHEET**  
**Cardinal Hill**  
 ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
 SMITHFIELD, RHODE ISLAND

**DiPrete Engineering Associates, Inc.**  
 ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
 TWO STAFFORD COURT  
 CRANSTON, R.I. 02920  
 (401) 943-1000 FAX: (401) 464-6006  
 PREPARED FOR  
**Crown Properties, LLC**  
 34 OAKDALE AVENUE  
 JOHNSTON, RI 02920  
 (401) 727-1100

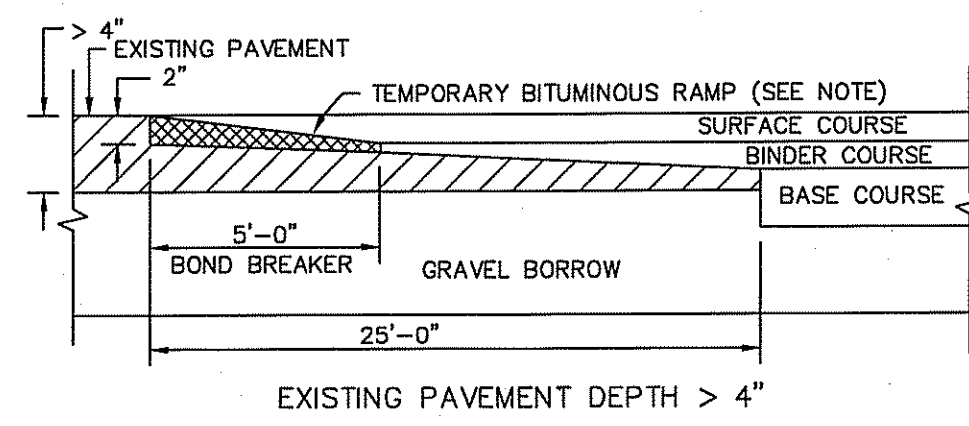
NO.	DATE	DESCRIPTION	BY
2	5-16-07	Wetland Comments	J.M.P.
1	4-13-07	Utility Submission	J.M.P.
0	2-26-07	REPEAT Wetland / RIDPT PAPA	J.M.P.

FEBRUARY, 2007  
 DWN. BY: J.M.D.

SHEET 11 OF 13

**NOTES:**

A BOND BREAKER (TAPERED OR EQUIVALENT) WILL BE PLACED FROM THE JOINT AND COVERED WITH THE BINDER COURSE AS THE TEMPORARY RAMP. PRIOR TO PLACING THE SURFACE COURSE, THE BINDER COURSE AND BOND BREAKER WILL BE REMOVED.



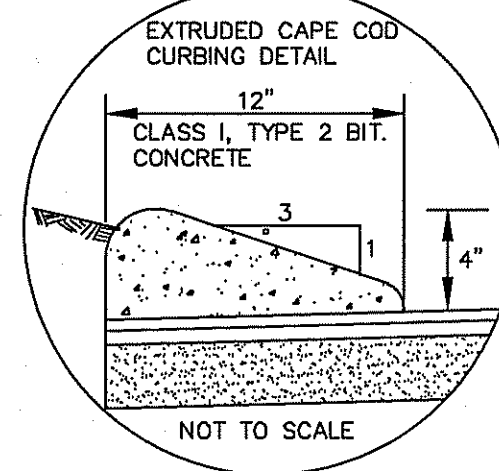
**TRANSVERSE PAVEMENT SAWCUT & MATCH**

NOT TO SCALE

R.I. STANDARD 4.7.1.1

**GENERAL NOTES:**

- ROADWAY CROSS SECTION AND MATERIALS SHALL CONFORM TO TOWN OF SMITHFIELD STANDARDS FOR ROAD CONSTRUCTION AND UTILITY LOCATIONS.
- CAPE COD CURBING HALL MANUFACTURING CO. MOLD JEX OR D.P.W. APPROVED EQUAL SLOPE FACED PRECAST CONCRETE CURBING REQUIRED AT ALL INTERSECTION FILLET CURVES. SEE R.I. DOT STD. 7.2.0.
- WATER MAIN LOCATION SUBJECT TO APPROVAL OF THE DIRECTOR OF PUBLIC WORKS.
- STORM DRAIN MATERIALS AND METHODS SHALL CONFORM TO APPLICABLE TOWN OF SMITHFIELD AND R.I.D.O.T. STANDARDS.
- FIRE ALARMS ARE REQUIRED AND SHALL BE INSTALLED ACCORDING TO TOWN FIRE DEPARTMENT REQUIREMENTS.
- UNDERGROUND UTILITY TRENCH CONSTRUCTION TO CONFORM TO THE NATIONAL GRID 'DEVELOPER' / CONTRACTOR/CUSTOMER RESPONSIBILITIES & CONSTRUCTION SPECIFICATIONS FOR UNDERGROUND RESIDENTIAL DEVELOPMENTS'
- SEWER FORCE MAIN SEPARATION TO WATER MAIN TO BE LOCATED 10' HORIZONTAL OR 2' VERTICAL BELOW WATER MAIN.



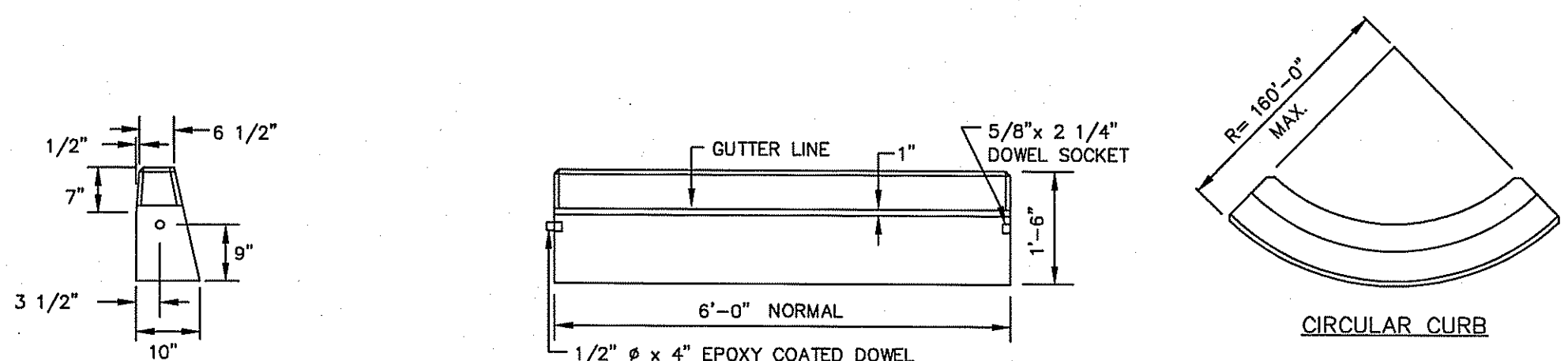
NOT TO SCALE

**CONSTRUCTION NOTES:**

- CLEARING & GRUBBING: ALL ROOT SYSTEMS, TREES, STUMPS, BUSHES, AND OTHER OBJECTIONABLE MATERIALS SHALL BE REMOVED AND DISPOSED OF AS INDICATED BY THE MUNICIPAL ENGINEER. HEALTHY TREES WITHIN THE RIGHTS-OF-WAY WIDTH AND OUTSIDE THE PAVEMENT WIDTH MAY BE LEFT STANDING, PROVIDED SAID TREES ARE NOT MORE THAN 5' (FIVE FEET) FROM THE RIGHT-OF-WAY LINE, EXCEPT WHERE SIDEWALKS ARE REQUIRED.
- EARTH EXCAVATIONS SHALL INCLUDE, BUT NOT BE LIMITED TO, THE REMOVAL OF CLAY, SAND, GRAVEL, LOAM, SOFT OR DISINTEGRATED ROCK WHICH CAN BE REMOVED WITHOUT BLASTING; BOULDERS OF LESS THAN ONE-HALF CUBIC YARD IN VOLUME; AND, OTHER UNACCEPTABLE MATERIALS WITHIN THE LIMITS OF ROADWAY, DRAINAGE, OR OTHER EXCAVATION.
- ROCK AND LEDGE EXCAVATION SHALL INCLUDE REMOVAL AND DISPOSAL OF ALL BOULDERS OF ONE-HALF CUBIC YARD OR MORE IN VOLUME AND ALL HARD LEDGE ROCK WHICH CAN BE REMOVED ONLY BY DRILLING AND SPLITTING MECHANICALLY BY HAND OR BLASTING.
- WHERE GROUND WATER IS ENCOUNTERED WITHIN 5' (FIVE FEET) OF FINISHED GRADE AS DETERMINED BY RI DEPARTMENT OF ENVIRONMENTAL MANAGEMENT, "GROUND WATER PROCEDURES", DURING THE WET SEASON, ADEQUATE SURFACE DRAINAGE SHALL BE CONSTRUCTED TO LOWER THE GROUND WATER LEVEL TO A DEPTH OF AT LEAST 5' (FIVE FEET) BELOW FINISHED GRADE.
- PAVEMENT SHALL BE CONSTRUCTED SO AS TO PROVIDE A MINIMUM CROSS-SECTION AFTER COMPACTION OF 8" (EIGHT INCHES) GRAVEL BORROW BASE COURSE SUB-BASE IN FILL AND 10" (TEN INCHES) GRAVEL BORROW BASE COURSE IN CUTS WITH 2" (TWO INCHES) OF CRUSHED BANK RUN GRAVEL (MEETING TOWN SPECIFICATIONS) AND HOT-MIX ASPHALTIC AND BITUMINOUS CONCRETE MATERIALS CONFORMING TO R.I. STANDARD SPECIFICATIONS.

**NOTES:**

- SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
- MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'-0".
- EXPOSED SURFACES TO HAVE A SPONGE FLOAT FINISH.
- CIRCULAR CURB IS REQUIRED ON CURVES WITH RADI OF 160'-0" OR LESS. STRAIGHT CURB TO BE USED ON CURVES OF MORE THAN 160'-0" RADIUS.
- EXPOSED EDGES TO HAVE A 3/4 CHAMFER.



**PRECAST CONCRETE CURB**

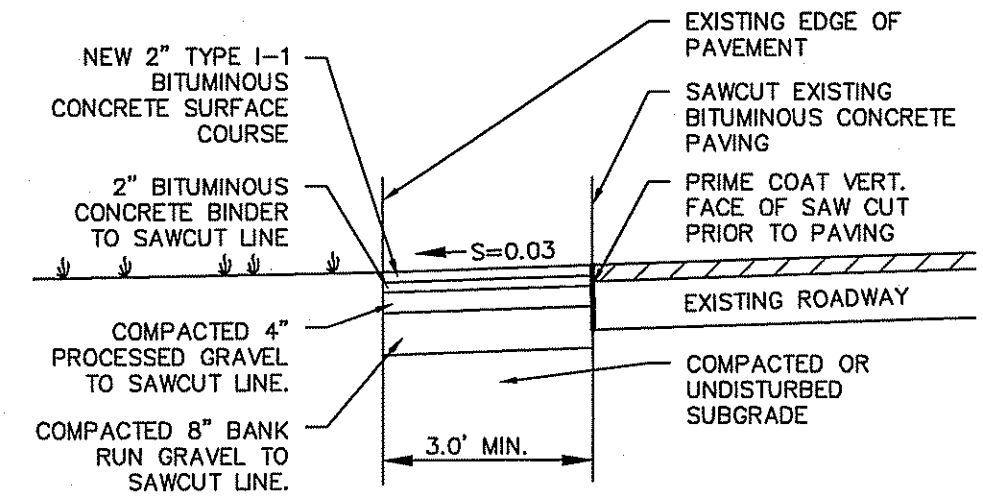
NOT TO SCALE

R.I. STANDARD 7.1.0

**NOTES:**

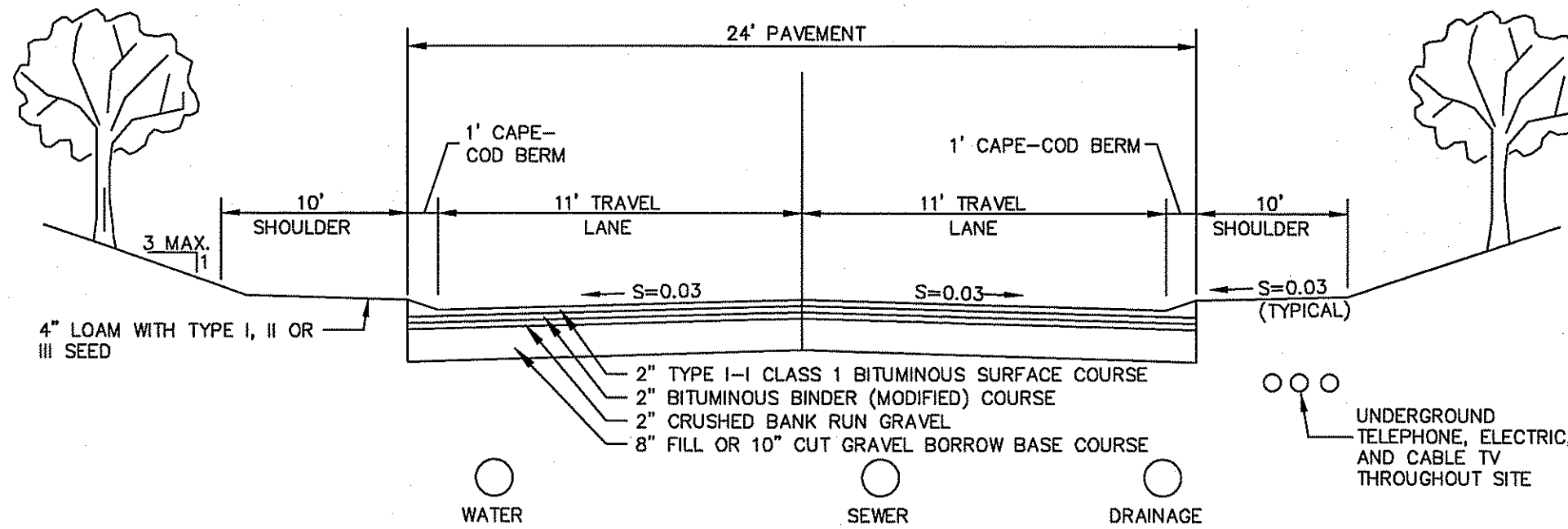
MINIMUM COMPACTION FOR GRAVEL SUB-BASE OR SUBGRADE: 95% MODD PROCTOR.

R.I.D.O.T. APPROVED



**SAWCUT & MATCH**

NOT TO SCALE

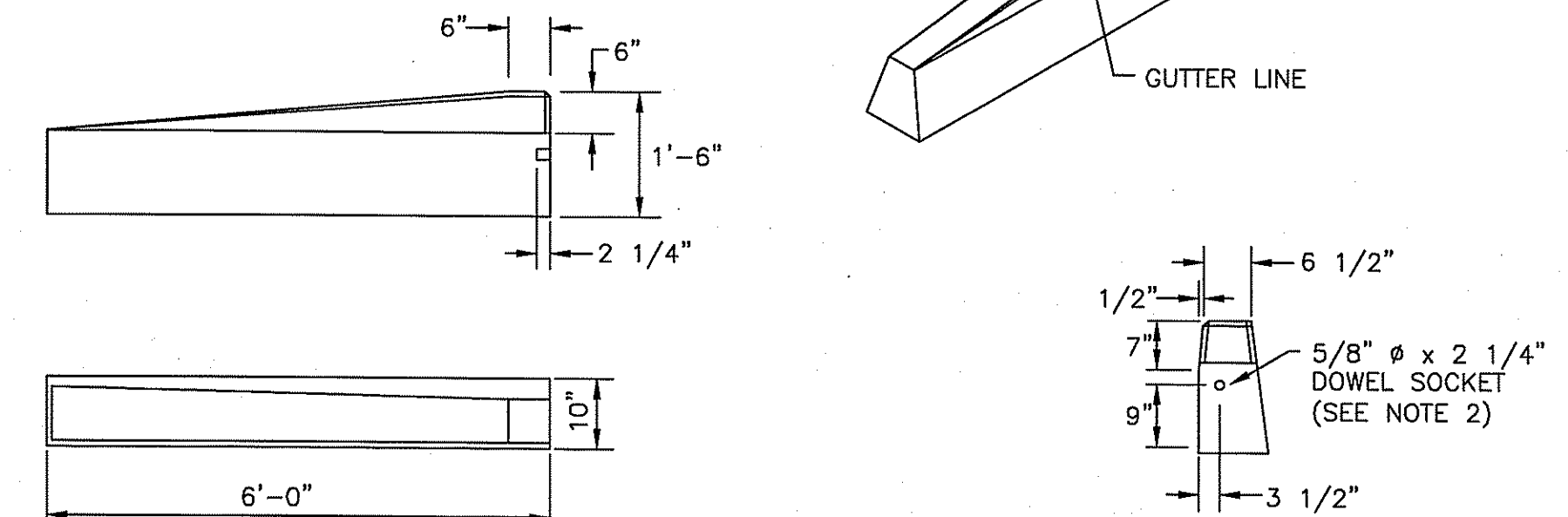


**TYPICAL ROAD CONSTRUCTION (PRIVATE DRIVE)**

NOT TO SCALE

**NOTES:**

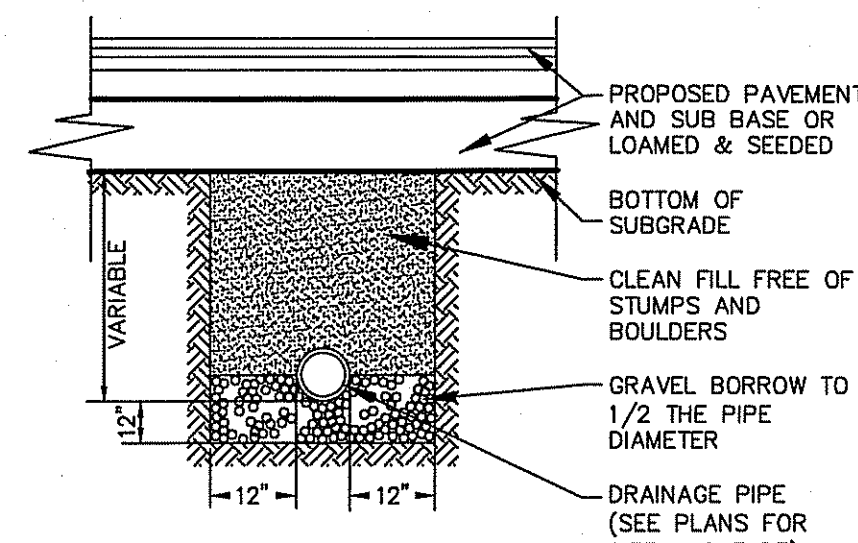
- SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
- DRAWING SHOWS TRANSITION CURB FOR ONE DIRECTION. FOR OTHER DIRECTION USE OPPOSITE HAND AND INCLUDE A 1/2" x 4" EPOXY COATED DOWEL.
- EXPOSED SURFACES TO HAVE A SPONGE FLOAT FINISH.
- EXPOSED EDGES TO HAVE A 3/4" CHAMFER.



**6'-0" PRECAST CONCRETE TRANSITION CURB**

NOT TO SCALE

R.I. STANDARD 7.1.2



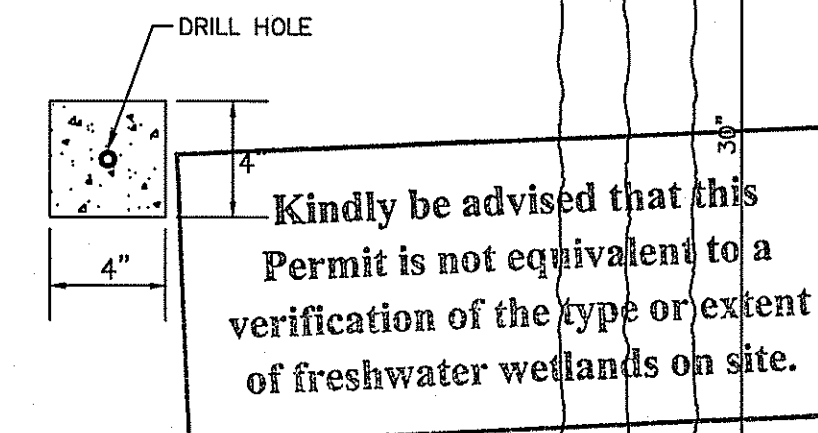
**DRAINAGE TRENCH DETAIL**

NOT TO SCALE

NOTE: ALL PIPE TO BE HDPE OR RCP CLASS III UNLESS NOTED OTHERWISE

**NOTES:**

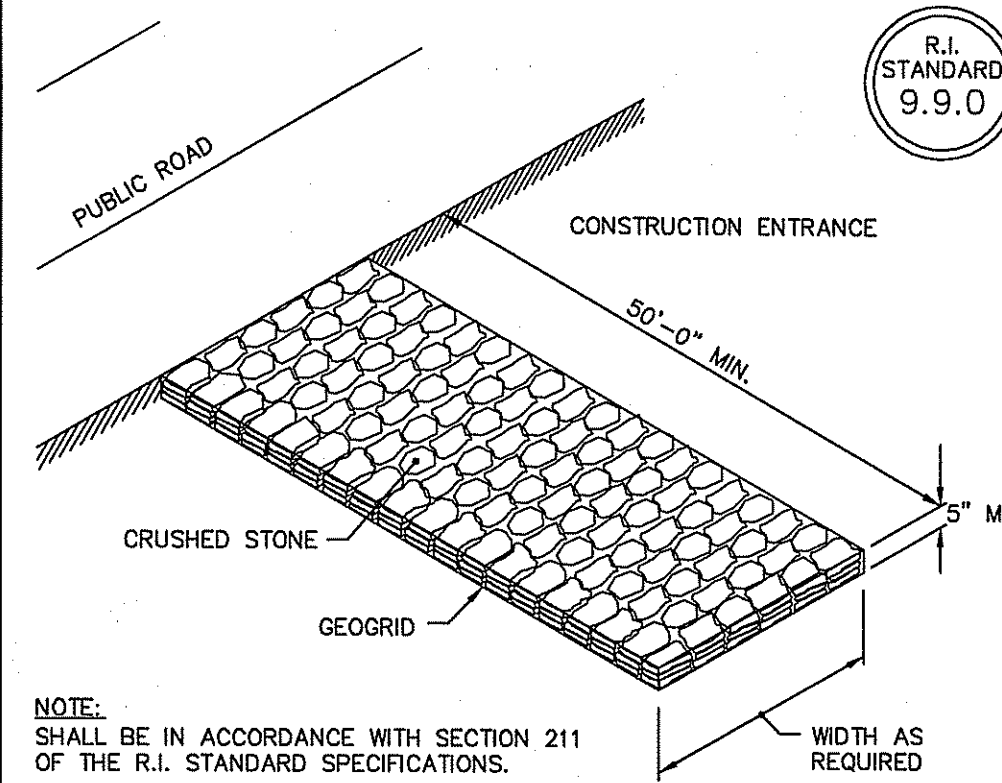
- BOUNDS TO BE MADE FROM QUARRY CUT GRANITE.
- BOUNDS ARE TO BE PLACED WHERE INDICATED ON PLANS.
- ALL BOUNDS ARE TO BE INSTALLED WITH THE TOP SURFACE LEVEL WITH THE GROUND.
- HOLES TO BE 1/2" DIA., 3/4" DEEP.
- ALL DIMENSIONS SHOWN ARE MINIMUM.



**GRANITE BOUND**

NOT TO SCALE

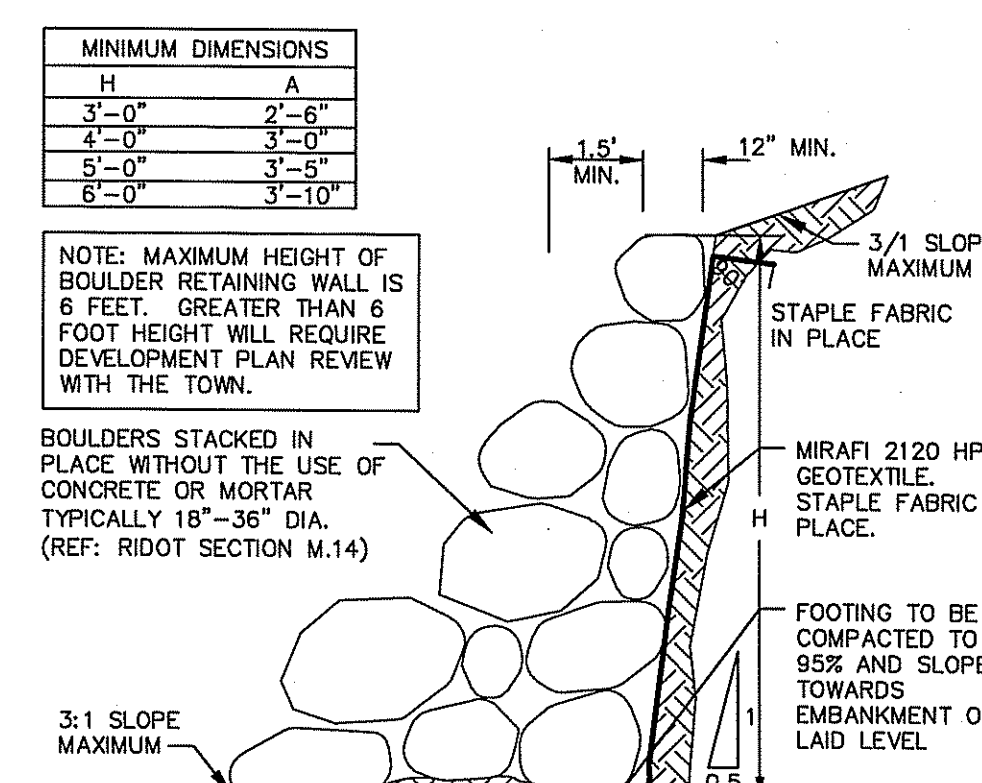
Kindly be advised that this Permit is not equivalent to a verification of the type or extent of freshwater wetlands on site.



**CONSTRUCTION ACCESS**

NOT TO SCALE

NOTE: SHALL BE IN ACCORDANCE WITH SECTION 211 OF THE R.I. STANDARD SPECIFICATIONS.



**BOULDER RETAINING WALL**

NOT TO SCALE

NOTE: MAXIMUM HEIGHT OF BOULDER RETAINING WALL IS 6 FEET. GREATER THAN 6 FOOT HEIGHT WILL REQUIRE DEVELOPMENT PLAN REVIEW WITH THE TOWN. BOULDERS STACKED IN PLACE WITHOUT THE USE OF CONCRETE OR MORTAR. TYPICALLY 18"-36" DIA. (REF: RIDOT SECTION M.14). FOOTING TO BE COMPACTED TO 95% AND SLOPED TOWARDS EMBANKMENT OR LAID LEVEL.

R.I. STANDARD 9.9.0

MINIMUM DIMENSIONS	
H	A
3'-0"	2'-6"
4'-0"	3'-0"
5'-0"	3'-5"
6'-0"	3'-10"

SIGN NUMBER		R1-1	
LEGEND			
COLOR	BACKGROUND	RED	WHITE
COPY			
SIGN DIMENSION	WIDTH	24"	30"
	HEIGHT	36"	48"

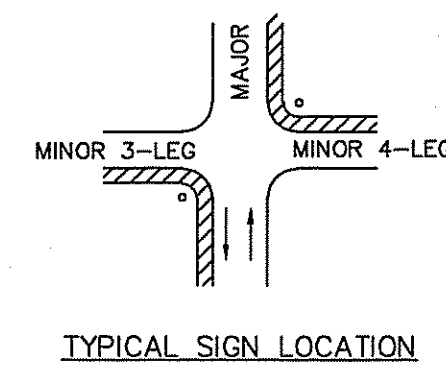
**REGULATORY SIGNS**

NOT TO SCALE

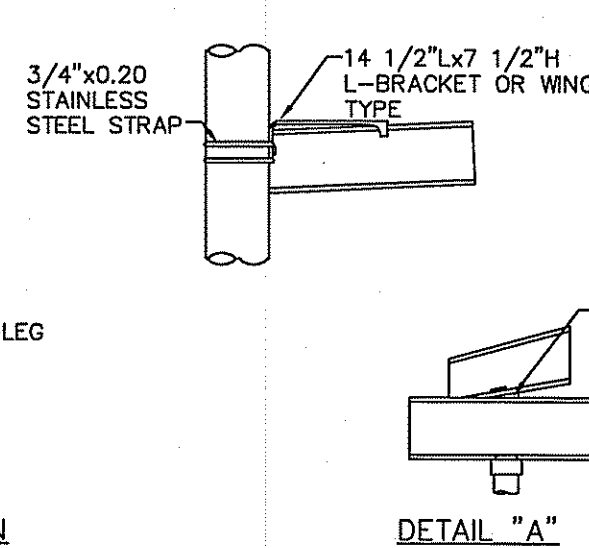
STANDARD 27.1.0

**NOTES:**

- SHALL BE IN ACCORDANCE WITH SECTION T.15 OF THE R.I. STANDARD SPECIFICATIONS.
- EACH SIGN SHALL HAVE LEGEND ON BOTH SIDES.
- POSTS SHALL BE INSTALLED AS CLOSE AS POSSIBLE TO THE BACK OF SIDEWALK, UNLESS SPACE DOES NOT PERMIT.
- IF SIGNS ARE ON THEIR OWN SUPPORT POST, THE POST SHALL BE LOCATED NEARER TO THE MAJOR STREET AND WITHIN 5'-0" OF THE P.T. OF THE CURVE.



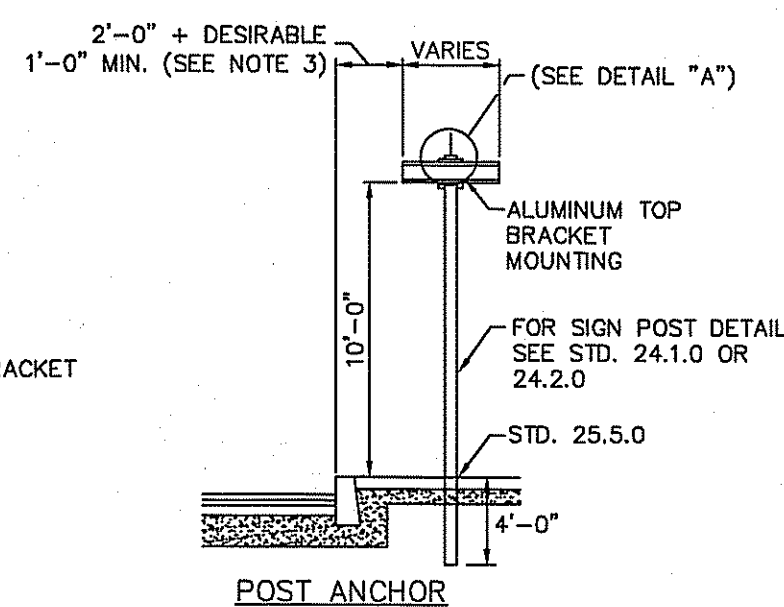
TYPICAL SIGN LOCATION



**STREET SIGN MOUNTING DETAIL**

NOT TO SCALE

R.I. STANDARD 24.6.1



DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS  
AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED JUN 21 2007 FILE # 07-0119  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL.  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.

CHRISTOPHER A. DURHAM  
No. 5013  
REGISTERED PROFESSIONAL ENGINEER

NO.	DATE	DESCRIPTION	BY
2	5-16-07	Wetland Comments	J.M.D.
0	2-26-07	Wetland Submission	J.M.D.
0	2-26-07	Wetland / RIDOT PAPA	J.M.D.

**Preliminary Submission**

**DETAIL SHEET**

**Cardinal Hill**

ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
SMITHFIELD, RHODE ISLAND

**DiPrete Engineering Associates, Inc.**

ENGINEERING, SURVEYING AND PLANNING CONSULTANTS  
TWO STAFFORD COURT  
CRANSTON, R.I. 02920  
(401) 943-1000 FAX: (401) 464-6006

**Crown Properties, LLC**

34 OAKDALE AVENUE  
JOHNSTON, RI 02920  
(401) 727-1100

FEBRUARY, 2007  
DWN. BY: J.M.D.

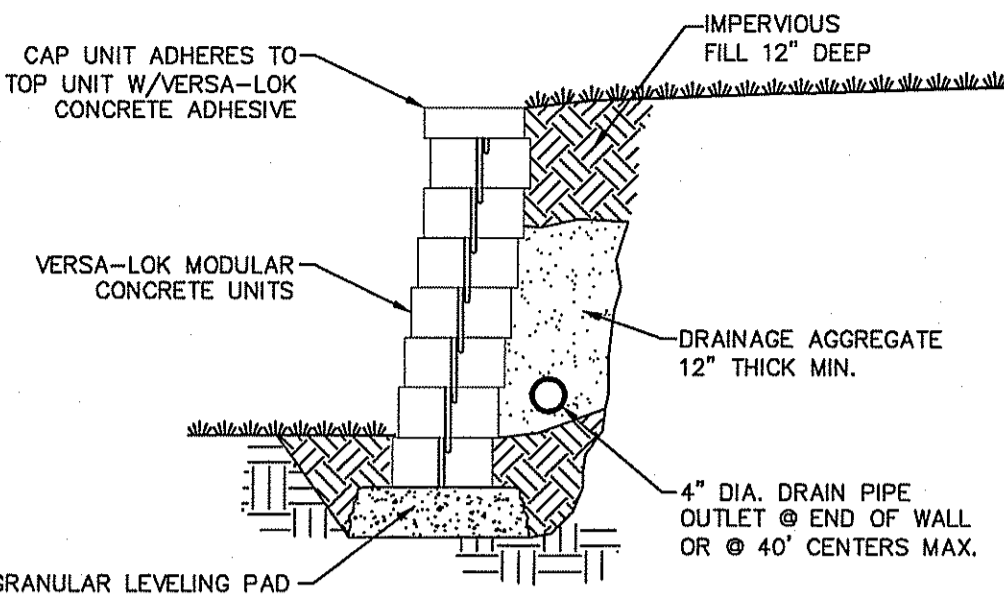
SHEET 12 OF 13

**RETAINING WALL INSTALLATION NOTES:**

- STRIP VEGETATION AND ORGANIC SOIL FROM WALL AND GEOSYNTHETIC ALIGNMENT
- BENCH CUT ALL EXCAVATED SLOPES.
- DO NOT EXCAVATE BEYOND EXCAVATION LINES SHOWN ON PLAN UNLESS DIRECTED BY SITE SOILS ENGINEER TO REMOVE UNSUITABLE SOIL.
- CONTRACTOR SHALL ENSURE TEMPORARY EXCAVATIONS ARE STABLE AND PROVIDE EXCAVATION SUPPORT IF NEEDED.
- SITE SOILS ENGINEER SHALL VERIFY FOUNDATION SOILS AS BEING COMPETENT PER THE DESIGN PARAMETERS.
- LEVELING PAD SHALL CONSIST OF WELL GRADED ROAD BASE AGGREGATE, 3/4" CRUSHED, ANGULAR GRAVEL WITH SOME FINES
- CONTRACTOR MAY OPT FOR A LEAN CONCRETE LEVELING PAD. PAD SHALL BE UNREINFORCED LEAN CONCRETE, 200-300 PSI, 3" THICK MAXIMUM.
- DRAINAGE AGGREGATE SHALL CONSIST OF CLEAN ANGULAR GRAVEL, 3/4" DIAMETER WITH LESS THAN 5% FINES.
- DRAINAGE PIPE SHALL BE PERFORATED OR SLOTTED PVC OR CORRUGATED HDPE PIPE.
- REINFORCED BACKFILL SHALL BE FREE OF DEBRIS, ORGANIC SOIL, AND EXPANSIVE SOILS.
- FOR UNITS TO BE EMBEDDED, COMPACT FILL IN FRONT OF UNITS AT THE SAME TIME FILL BEHIND UNITS IS COMPLETED.
- COMPACTION SHALL BE TO 95% OF MAXIMUM STANDARD PROCTOR DENSITY (ASTM D-698)
- COMPACTION TESTS SHALL BE TAKEN AS THE WALL IS INSTALLED. THE MINIMUM NUMBER OF TESTS SHALL BE DETERMINED BY THE SITE SOILS ENGINEER.
- COMPACTION WITHIN 3FT. OF WALL SHALL BE LIMITED TO HAND OPERATED EQUIPMENT.
- CONTRACTOR SHALL SLOPE SITE GRADES TO DIRECT SURFACE RUNOFF AWAY FROM WALL AT END OF EACH DAY TO AVOID WATER DAMAGING THE WALL WHILE UNDER CONSTRUCTION.
- ANY SURFACE DRAINAGE FEATURES, FINISH GRADING, PAVEMENT, OR TURF SHALL BE INSTALLED IMMEDIATELY AFTER WALL IS COMPLETED.
- FOLLOW APPLICABLE PROVISIONS OF THE WALL UNIT AND GEOSYNTHETIC MANUFACTURER'S INSTALLATION INSTRUCTIONS AND WRITTEN SPECIFICATIONS.
- IF SITE AND SOIL CONDITIONS, WALL GEOMETRY, OR WALL LOADINGS ARE DIFFERENT THAN IN THE DRAWINGS AND THE DESIGN PARAMETERS, THE CONTRACTOR MUST CONTACT DESIGN ENGINEER PRIOR TO PROCEEDING WITH THE CONSTRUCTION OF THE WALL.
- UNREINFORCED HEIGHT TO 4' ONLY.
- CONSTRUCTION TO PROVIDE SHOP DRAWING TO ENGINEERING FOR APPROVAL PRIOR TO CONSTRUCTION.

**NOTES:**

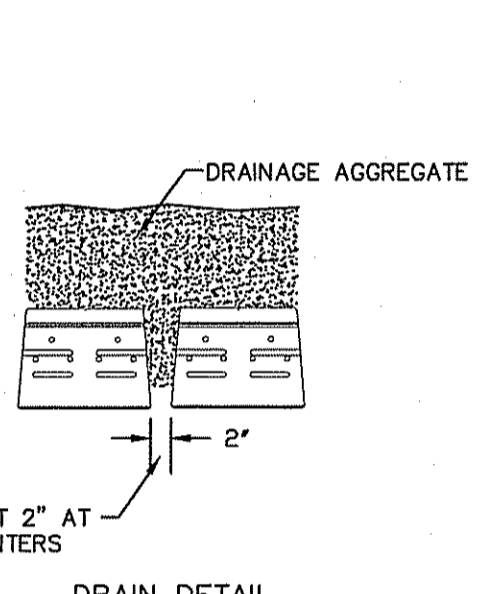
\*\*FINAL SHOP DRAWINGS TO BE PROVIDED TO ENGINEER FOR APPROVAL\*\*  
THERE ARE NO WALLS GREATER THAN 4' TALL PROPOSED. WALLS OVER 4' REQUIRE ADDITIONAL DESIGN BY OTHERS.



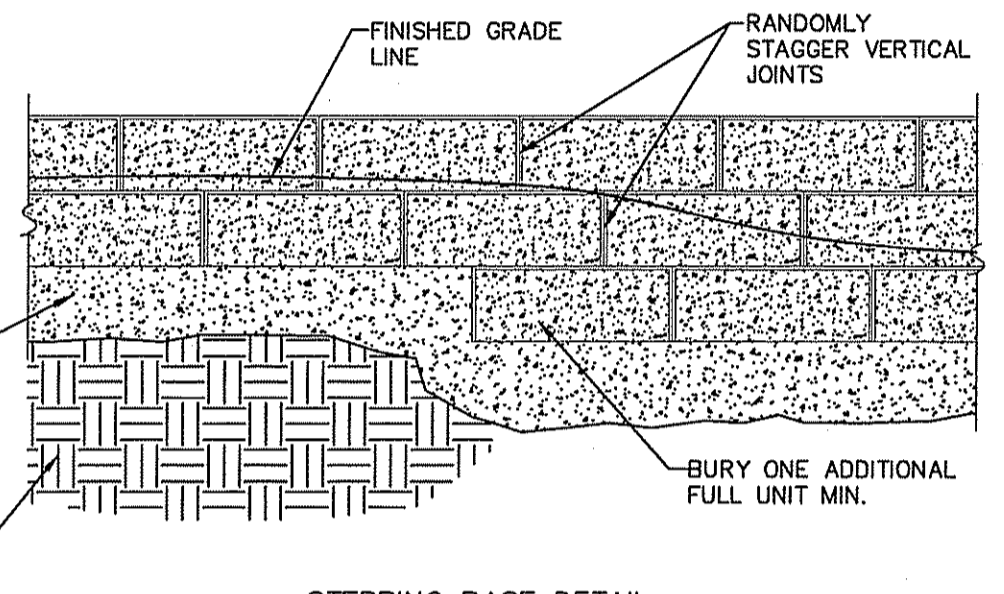
**TYPICAL SECTION-UNREINFORCED RETAINING WALL**

**STEPPING NOTES:**

- LIMIT CHANGES IN BASE ELEVATION TO 6" PER STEP TO AVOID DIFFERENTIAL SETTLEMENT.
- STEP OFFEN ENOUGH TO MAINTAIN MINIMUM REQUIRED EMBEDMENT



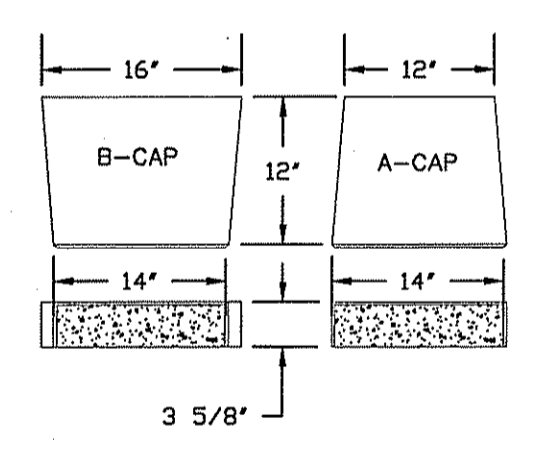
**DRAIN DETAIL**



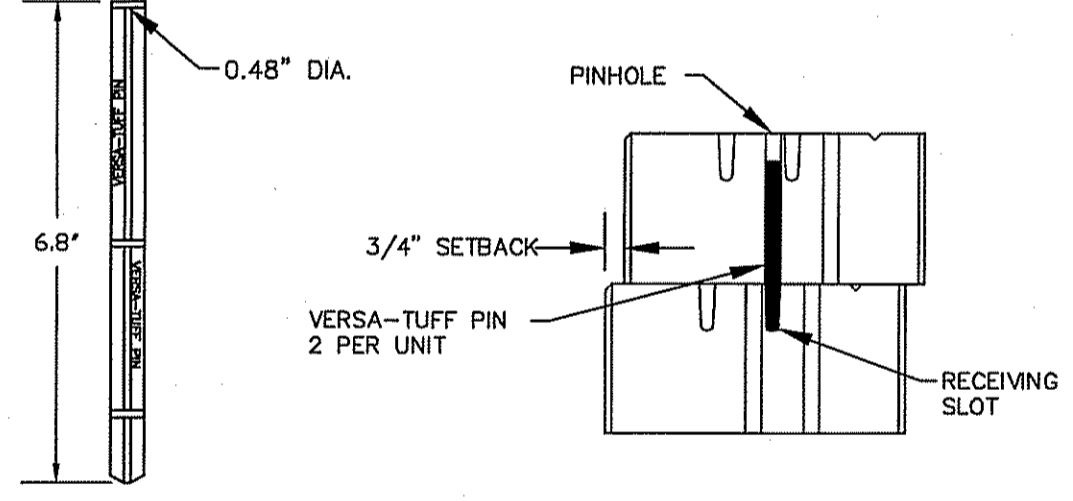
**STEPPING BASE DETAIL**

**UNREINFORCED RETAINING WALL UP TO 4'**  
**VERSA-LOK (OR ENGINEER APPROVED EQUAL)**

NOT TO SCALE

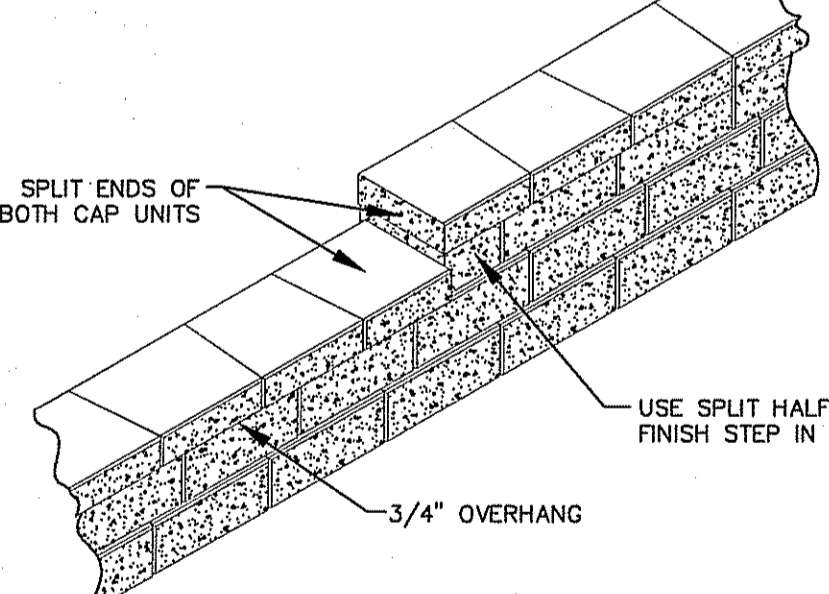


**CAP DIMENSION**



**VERSA-TUFF PIN**

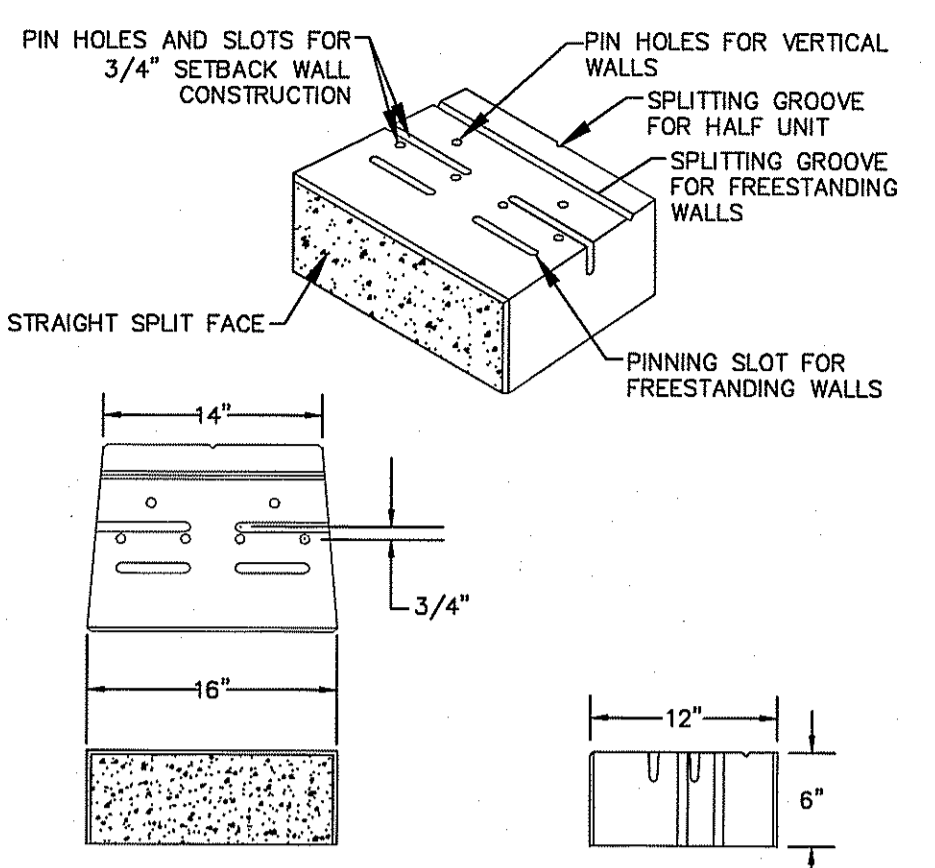
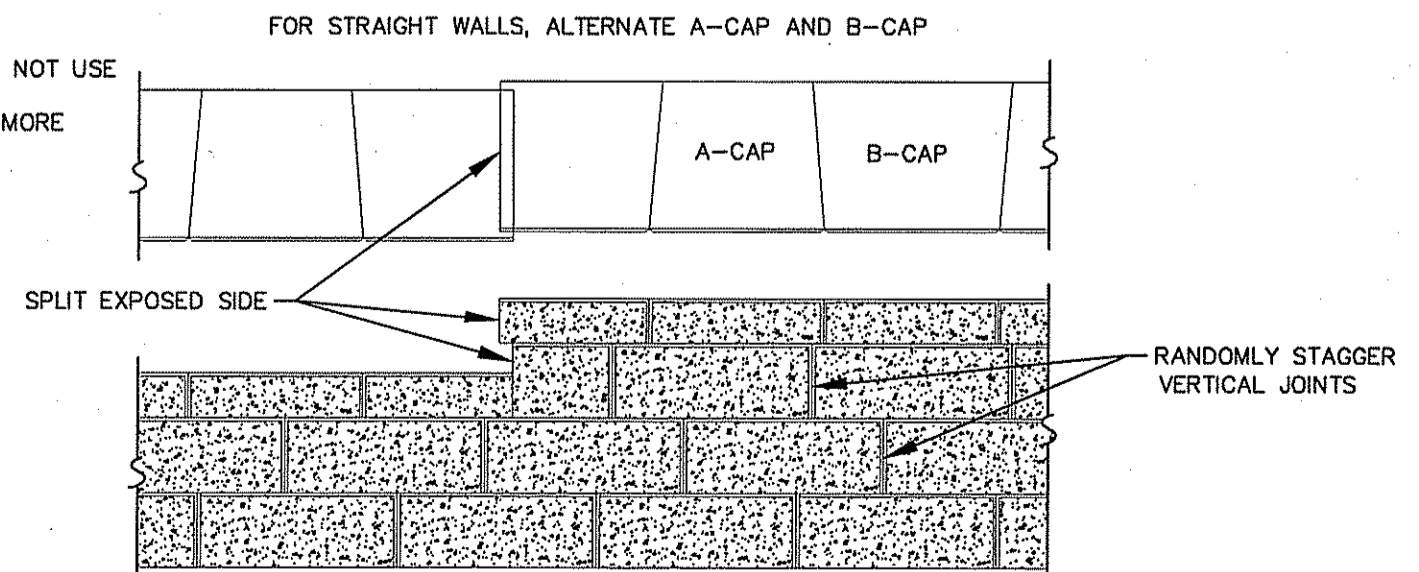
**PROFILE**



**VERSA-LOK CAPPING & PINNING DETAIL**  
**(OR ENGINEER APPROVED EQUAL)**

NOT TO SCALE

- GENERAL NOTES FOR CAPPING:**
- CAPS SHALL BE ADHERED TO WALL USING VERSA-LOK CONCRETE ADHESIVE.
  - CAPS MAY BE PLACED WITH A 1/2" TO 3/4" OVERHANG OF TOP COURSE.
  - WHEN SPLITTING CAP UNIT FOR WALL END DO NOT USE A CAP SECTION LESS THAN 8" WIDE.
  - DO NOT OVERHANG CAP AT END OF COURSE MORE THAN 1"



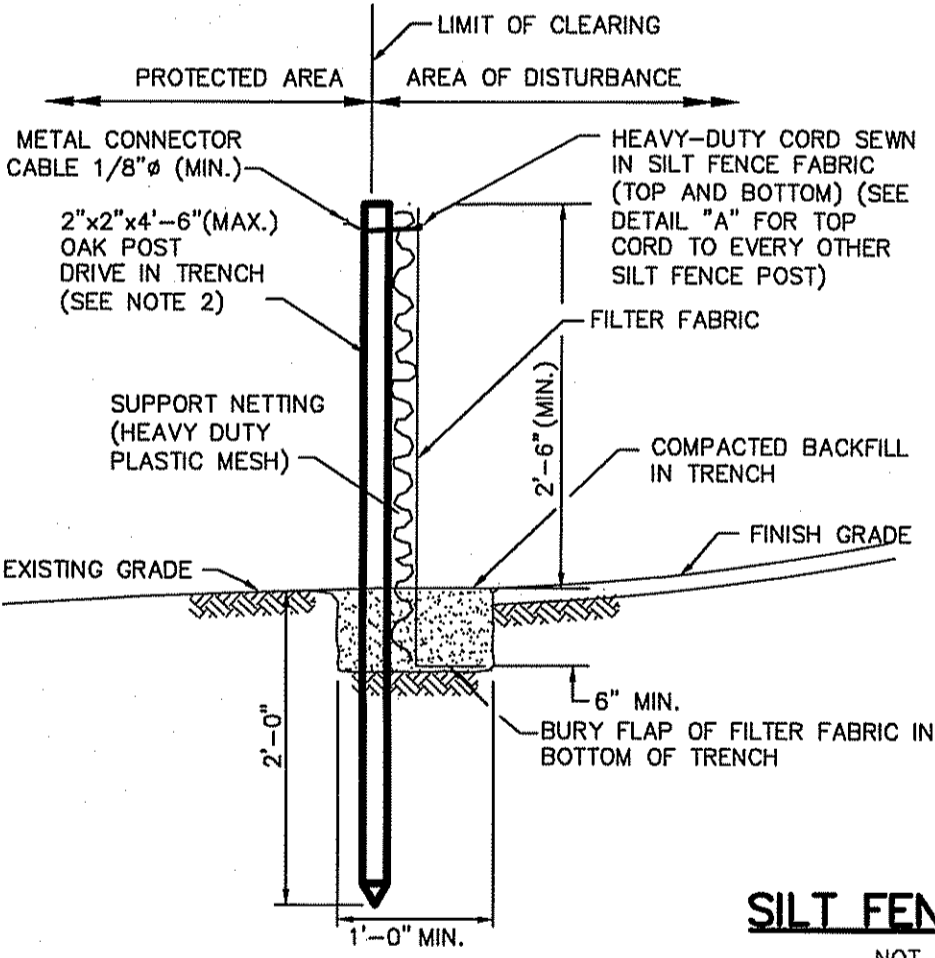
**VERSA-LOK BLOCK DETAIL**  
**(OR ENGINEER APPROVED EQUAL)**

NOT TO SCALE

**ESTABLISHMENT OF VEGETATIVE COVER**

- 1.1 SLOPES SHALL NOT BE LEFT UNATTENDED OR EXPOSED FOR EXCESSIVE PERIODS OF TIME SUCH AS THE INACTIVE WINTER SEASON.
- 1.2 ALL DISTURBED SLOPES EITHER NEWLY CREATED OR CURRENTLY EXPOSED SHALL BE SEED OR PROTECTED.
- 1.3 THE TOPSOIL SHALL HAVE A SANDY LOAM TEXTURE RELATIVELY FREE OF SUBSOIL MATERIAL, STONES, ROOTS, LIMBS OF SOIL, TREE LIMBS, TRASH OR CONSTRUCTION DEBRIS AND SHALL CONFORM TO RHODE ISLAND'S STANDARD SPECIFICATION, M.20.
- 1.4 THE SEEDING DESIGN MIX FOR RE-GRADING AREAS SHALL BE COMPRISED OF THE FOLLOWING:
 

TYPE	LBS/AC
CREeping RED FESCUE	75
KENTUCKY BLUE GRASS	15
COLONIAL BENT GRASS	5
PERENNIAL RYE GRASS	5
- 1.5 EARLY SPRING OR LATE SUMMER SEEDING IS RECOMMENDED. LIME AND FERTILIZATION, AS REQUIRED BY SOIL TESTING TO COMPLEMENT OR UPGRADE EXISTING CONDITIONS, WILL BE USED. THE SEED MIX SHALL BE INOCULATED WITHIN 24 HOURS AND BEFORE MIXING AND PLANTING.
- 1.6 TEMPORARY TREATMENTS SHALL CONSIST OF HAY STRAW OR FIBER MULCH OR PROTECTIVE COVERS SUCH AS MAT OR FIBER LINING. SIDE SLOPES OF PONDS SHALL BE TREATED WITH NORTH AMERICAN GREEN S150 EROSION CONTROL BLANKETS OR APPROVED EQUAL. THEY SHALL BE INCORPORATED INTO THE WORK AS WARRANTED OR AS ORDERED BY THE ENGINEER. HAY OR STRAW APPLICATIONS SHALL BE IN THE AMOUNT OF 2 TONS/ACRE.
- 1.7 ALL HAY BALES OR TEMPORARY PROTECTION SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED.
- 1.8 ALL FILL SHALL BE THOROUGHLY COMPACTED UPON PLACEMENT IN STRICT CONFORMANCE WITH THE RHODE ISLAND STANDARD SPECIFICATION FOR ROAD AND BRIDGE CONSTRUCTION, SECTION 202.
- 1.9 STOCKPILES OF TOPSOIL SHALL NOT BE LOCATED NEAR WATERWAYS. THEY SHALL HAVE SIDE SLOPES NO GREATER THAN 2:1 AND SHALL BE TEMPORARILY SEED OR STABILIZED.
- 1.10 THE CONSTRUCTION SUPERINTENDENT SHALL HAVE OVERALL RESPONSIBILITY FOR PLAN IMPLEMENTATION AND FOR SEEING THAT THE APPROPRIATE WORKERS ARE AWARE OF THE PROVISIONS OF THE PLAN. THE CONTRACTOR MUST REPAIR AND/OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE YEAR AND SHALL DO SO AT NO ADDITIONAL EXPENSE.
- 1.11 ALL AREAS DISTURBED BY POND CONSTRUCTION SHALL BE STABILIZED WITH PERMANENT SEEDING IMMEDIATELY FOLLOWING FINISH GRADING. PERMANENTLY SEED OR AREAS SHALL BE PROTECTED DURING ESTABLISHMENT WITH MULCH. ALL SEED OR AREAS WILL BE CHECKED REGULARLY TO SEE THAT A GOOD STAND IS MAINTAINED. AREAS SHALL BE FERTILIZED AND RESEED AS NECESSARY.
- 1.12 REFERENCE THE "RHODE ISLAND SOIL EROSION AND SEDIMENTATION CONTROL HANDBOOK" PREPARED BY THE USDA SOIL CONSERVATION SERVICE 1989 AS A GUIDE.
- 1.13 TEMPORARY HAY MULCH TO BE TACKED IN PLACE WITH NYLON MESH NETTING.
- 1.14 MAXIMUM GRADED SLOPE WITHIN THE DEVELOPMENT IS TO BE 3:1. UNLESS OTHERWISE NOTED.

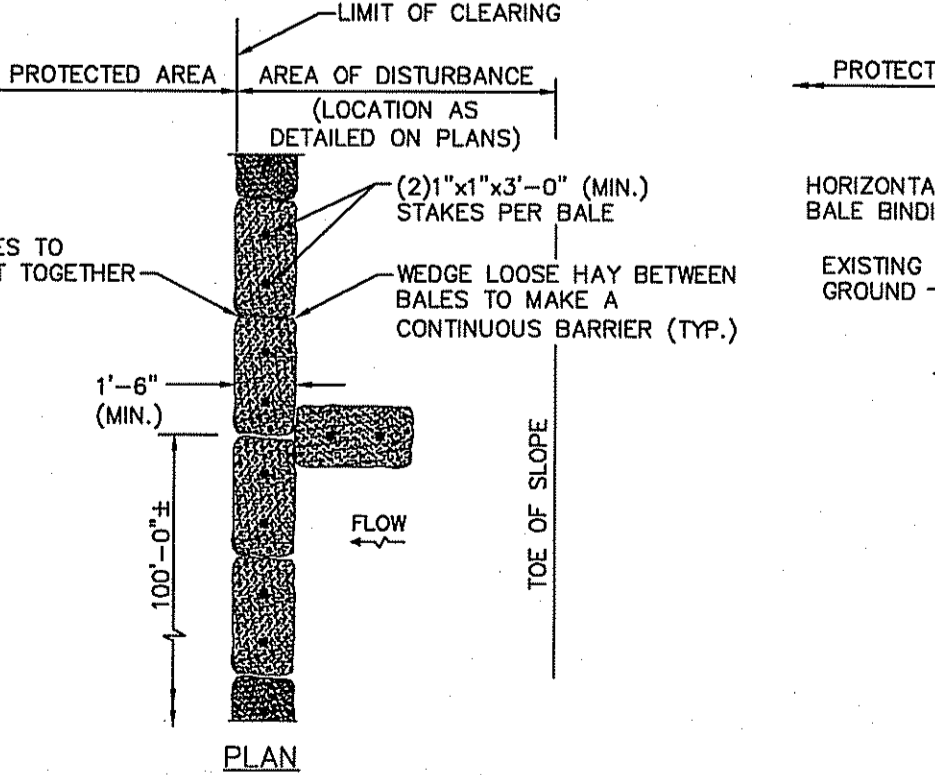


**SILT FENCE DETAIL**

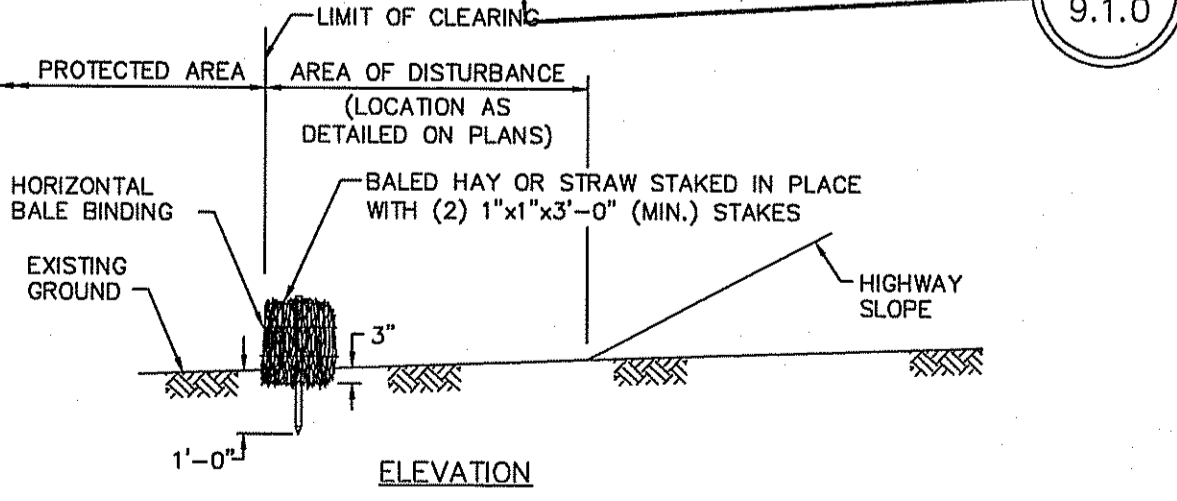
NOT TO SCALE

- SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
- 2"x2"x4"-6"(MAX.) OAK POSTS FOR SILT FENCE SHALL BE LOCATED 8'-0" (MAX.) O.C. IN WETLAND AREAS AN 4'-0"D (MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP-OFF AREAS AS SHOWN ON PLANS.
- 1"x1"x4"-6"(MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
- SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

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



**PLAN**



**ELEVATION**

- NOTES:**
- SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
  - TO BE USED WHERE THE EXISTING GROUND SLOPES AWAY FROM THE HIGHWAY EMBANKMENT AS CALLED FOR ON PLANS.
  - AT APPROXIMATE 100'-0" INTERVALS A BALE OF HAY IS TO BUTT PERPENDICULARLY.

**BALED HAY EROSION CHECK**

NOT TO SCALE

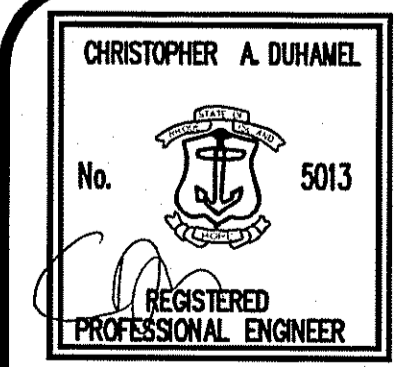
**STRUCTURAL MEASURES**

- 6.3.1 RUNOFF WATER QUALITY IS IMPROVED UTILIZING THE EXTENDED DETENTION BASIN. THE DETENTION BASIN IS DESIGNED TO PROMOTE SEDIMENT REMOVAL PRIOR TO FINAL DISCHARGE. DISCHARGE OUTLETS ARE PROTECTED WITH RIP-RAP APRONS OR LEVEL SPREADERS.
- 6.3.2 A PERMANENT VEGETATIVE COVER SHALL BE ESTABLISHED IN THE BASIN IMMEDIATELY AFTER GRADING. THE SEEDING EXTENT TO AT LEAST THE DESIGN TOP WIDTH AND INCLUDE ANY OTHER AREAS DISTURBED BY CONSTRUCTION ACTIVITIES. ACTIVITIES SHALL BE CONFINED TO WITHIN THE LIMIT OF DISTURBANCE AS SHOWN ON THE PLANS.
- 6.3.3 VIGOROUS VEGETATION SHALL BE MAINTAINED BY APPLYING LIME AND FERTILIZER. BARE OR ERODED AREAS SHALL BE IMMEDIATELY REPAIRED AND RESEED BY THE CONTRACTOR.
- 6.3.4 THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND INSPECTION OF THE DETENTION AREA UP TO ACCEPTANCE OF CONSTRUCTION BY THE TOWN OF SMITHFIELD (TOWN). THE CONDOMINIUM ASSOCIATION (CA) IS RESPONSIBLE THEREAFTER. ANY UNDEVELOPED VEGETATIVE COVER IN THE BASIN WITHIN A YEAR OF THE PROJECT COMPLETION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL RESEED ANY UNSTABILIZED AREAS AFTER A FULL GROWING SEASON AT NO ADDITIONAL EXPENSE TO THE OWNER.
- 6.3.5 THE GRASS IN THE BASINS SHALL BE ALLOWED TO GROW BETWEEN 2' - 10".
- 6.3.6 THE PERMANENT DETENTION BASIN SHALL BE INSTALLED. COVER WITH TOPSOIL AT THE END OF CONSTRUCTION.
- 6.3.7 THE DETENTION POND SHALL BE BUILT TO CONTROL RUNOFF FOR 2 THROUGH 100-YEAR STORM FREQUENCIES.
- 6.3.8 THE SIDE SLOPES OF THE BASINS SHALL BE 3:1 MAXIMUM OR AS CALLED FOR ON THE PROJECT PLANS.
- 6.3.9 ALL EMBANKMENTS OF THE BASINS SHALL BE THOROUGHLY COMPACTED UPON PLACEMENT IN STRICT CONFORMANCE WITH RI STANDARD SPECIFICATION SECTION 202.
- 6.3.10 THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SEDIMENTATION BASINS DURING CONSTRUCTION AND THE DETENTION AREAS UP TO THE ACCEPTANCE BY THE TOWN. THE (CA) SHALL BE RESPONSIBLE THEREAFTER FOR MAINTAINING THE BASINS. THE (CA) SHALL INSPECT THE BASIN SEMIANNUALLY AND AFTER MAJOR STORMS.
- 6.3.11 A GRADUATED GAUGE IS TO BE SET WITHIN THE POND TO MONITOR ACCUMULATED SEDIMENTS.
- 6.3.12 RIP-RAP APRONS SHALL BE INSTALLED AT THE INLETS AND OUTLETS OF ALL CULVERTS. EMERGENCY SPILLWAY SHALL BE PROTECTED BY RIP-RAP UPSTREAM AND DOWNSTREAM.
- 6.3.13 RIP-RAP PADS SHALL BE INSPECTED SEMIANNUALLY AND AFTER MAJOR STORMS. IF REPAIRS ARE NEEDED, THEY SHALL BE ACCOMPLISHED IMMEDIATELY.
- 6.3.14 THE CONSTRUCTION SUPERINTENDENT SHALL HAVE THE OVERALL RESPONSIBILITY FOR STRUCTURAL MEASURE IMPLEMENTATION AND FOR SEEING THAT APPROPRIATE WORKERS ARE AWARE OF THE PROVISIONS OF THE PLAN.
- 6.3.15 REFERENCE THE "RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" PREPARED BY USDA SOIL CONSERVATION SERVICE 1989, AS A GUIDE.

**SEQUENCE AND STAGING OF LAND DISTURBING ACTIVITIES**

- 8.1 SURVEY AND STAKE CENTERLINE OF THE PROPOSED ROAD, THE DRAINAGE STRUCTURES AND PIPES, THE DETENTION POND, AND THE LIMIT OF SEDIMENTATION BARRIERS.
- 8.2 PLACE SEDIMENTATION BARRIERS (HAY BALES OR SILT FENCE) AS SHOWN ON THE PLANS AND STAKED OUT IN THE FIELD. IN NO CASE IS THE LIMIT OF WORK TO EXTEND BEYOND THE SEDIMENTATION BARRIERS.
- 8.3 BEGIN ROUGH GRADING, ROAD AND DRAINAGE WORK (CLEARING AND GRUBBING, EXCAVATING AND GRADING, ETC.). TOPSOIL TO BE STRIPPED AND STOCKPILED IN APPROVED AREAS. THE STOCKPILES ARE TO BE PROTECTED BY A ROW OF SEDIMENTATION BARRIERS AND COVERED OR TEMPORARILY SEED OR. DIVERT ALL THE RUNOFF FROM DISTURBED AREAS TO THE PROPOSED BASINS.
- 8.4 INSTALL UTILITIES AND DRAINAGE PIPES. IMMEDIATELY PLACE THE EROSION CONTROLS AT THE DISCHARGE POINTS AND SEED THE BASIN AND DISTURBED AREAS.
- 8.5 BEGIN ROAD PAVING.
- 8.6 BEGIN LAYOUT OF HOUSES AND CONTINUE GRADING ALONG WITH 8.7.
- 8.7 BEGIN LANDSCAPING WHILE HOMES ARE UNDER CONSTRUCTION.
- 8.8 FINISH HOMES AND ROAD CONSTRUCTION.
- 8.9 FINISH LANDSCAPING AND PERMANENT STABILIZATION.
- 8.10 REPAIR DRAINAGE OUTLETS AND PONDS AS REQUIRED. THE TREE LIMBS, LEAVES, BouldERS, ETC. SHALL BE REMOVED FROM THE BOTTOM OF THE BASIN BEFORE THE APPLICATION OF TOPSOIL.
- 8.11 REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES FOLLOWING VEGETATIVE ESTABLISHMENT OF ALL DISTURBED AREAS.
- 8.12 CONSTRUCTION TO COMMENCE 2007 OR UPON RECEIPT OF ALL NECESSARY APPROVALS.
- 8.13 PRIOR TO COMMENCING INDIVIDUAL LOT CONSTRUCTION, THE PROPOSED LIMITS OF CLEARING SHALL BE SURVEYED AND FLAGGED TO LIMIT TREE CLEARING.

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
OFFICE OF WATER RESOURCES  
FRESHWATER WETLANDS PROGRAM  
APPROVED WITH CONDITIONS  
AS SPECIFIED IN THE LETTER OF APPROVAL  
DATED JUN 21 2007 FILE # 07-019  
NO CHANGES ALLOWED WITHOUT PRIOR APPROVAL  
APPROVED PLANS MUST BE AT CONSTRUCTION SITE.



**MAINTENANCE: SHORT TERM / LONG TERM**

- 6.4.1 ALL DISTURBED SLOPES AND NEWLY CREATED OR CURRENTLY EXPOSED SHALL BE SEED OR, PROTECTED, AND MAINTAINED BY THE CONTRACTOR FOLLOWING FINISH GRADING AND CONSTRUCTION. THE CONTRACTOR SHALL CHECK REGULARLY ALL SEED OR AREAS TO SEE THAT A GOOD STAND IS MAINTAINED.
- 6.4.2 THE CONTRACTOR MUST REPAIR OR RESEED ANY AREAS THAT DO NOT DEVELOP WITHIN THE PERIOD OF ONE YEAR AND SHALL DO SO AT NO ADDITIONAL EXPENSE.
- 6.4.3 ALL HAY BALES, TEMPORARY TREATMENTS (HAY, STRAW, ETC.), AND TEMPORARY PROTECTION SHALL BE MAINTAINED BY THE CONTRACTOR THROUGHOUT CONSTRUCTION AND SHALL REMAIN IN PLACE UNTIL AN ACCEPTABLE STAND OF GRASS OR APPROVED GROUND COVER IS ESTABLISHED.
- 6.4.4 THE CONTRACTOR SHALL MAINTAIN ALL TOPSOIL STOCKPILES AND SEDIMENT BARRIERS THROUGHOUT CONSTRUCTION. EXTREME CARE SHALL BE TAKEN TO ENSURE THAT SEDIMENTS DO NOT SPILL OVER THE SEDIMENT BARRIER.
- 6.4.5 THE CONTRACTOR SHALL CHECK THE HAY BALES OR SILT FENCE ON A WEEKLY BASIS AND AFTER EACH STORM FOR UNDERMINING OR DETERIORATION. THE CONTRACTOR SHALL REPAIR OR REPLACE THE HAY BALES AS NECESSARY. THE CONTRACTOR SHALL CLEAN THE ACCUMULATED SEDIMENT IF HALF OF THE ORIGINAL HEIGHT OF THE BALES BECOMES FILLED IN WITH SEDIMENTS.
- 6.4.6 THE CONTRACTOR SHALL MAINTAIN THE STONE STABILIZATION PADS AT THE SITE ENTRANCES TO THE MAINTENANCE SHALL INCLUDE TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND OR AS DIRECTED BY THE ENGINEER. ALL SEDIMENTS SPILLED, DROPPED, WASHED, OR TRACKED ON THE PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
- 6.4.7 THE CONTRACTOR IS RESPONSIBLE FOR MAINTENANCE AND INSPECTION OF THE POND DURING AND UP TO A YEAR AFTER COMPLETION OF CONSTRUCTION. MAINTENANCE SHALL INCLUDE RESEEDING ANY UNDEVELOPED AREAS AFTER A FULL GROWING SEASON AT NO ADDITIONAL EXPENSE, REMOVING ACCUMULATED SILT WHEN SEDIMENTS IN THE BASIN EXCEED 3", AND MAINTAINING THE GRASS TO A GROWING HEIGHT BETWEEN 2"-10".
- 6.4.8 THE CONTRACTOR SHALL INSPECT RIP RAP PADS AFTER EACH STORM AND REPAIR AS NECESSARY.
- 6.4.9 THE CONTRACTOR SHALL MAINTAIN THE DRAINAGE SYSTEM THROUGHOUT CONSTRUCTION. THE ACCUMULATED SEDIMENTS IN THE POND SHALL BE REMOVED AND DRAINAGE PIPES FLUSHED BY THE CONTRACTOR AT THE END OF CONSTRUCTION.
- 6.4.10 THE (CA) IS RESPONSIBLE FOR THE LONG-TERM MAINTENANCE OF THE DETENTION AREA. THE DRAINAGE SYSTEM SHALL BE CHECKED SEMI-ANNUALLY AND ACCUMULATED SEDIMENTS SHALL BE REMOVED WHEN THEY EXCEED 3" DEPTH OR EVERY 10 YEARS, WHICHEVER COMES FIRST. CATCH BASIN SUMPS SHALL BE CHECKED ANNUALLY AND SEDIMENTS SHALL BE REMOVED IF THEY EXCEED 0.5' OR EVERY 10 YEARS, WHICHEVER COMES FIRST.
- 6.4.11 THE (CA) SHALL CHECK THE RIP-RAP PADS AND EMERGENCY OUTLETS AFTER MAJOR STORMS AND ON AN ANNUAL BASIS. REPAIRS SHALL BE PERFORMED IMMEDIATELY AS CONDITIONS WARRANT.
- 6.4.12 THE (CA) SHALL MAINTAIN THE POND'S AFTER THE FIRST YEAR. THE (CA) SHALL MAINTAIN A GOOD VEGETATIVE COVER (GRASS BETWEEN 2"-10" OR VEGETATION AS SPECIFIED). BOTTOM OF POND SHALL BE INSPECTED ON A SEMIANNUAL BASIS AND ACCUMULATED SEDIMENTS SHALL BE REMOVED WHEN THEY EXCEED 3" DEPTH OR EVERY 10 YEARS, WHICHEVER COMES FIRST.
- 6.4.13 THE CONSTRUCTION SUPERINTENDENT SHALL HAVE OVERALL RESPONSIBILITY FOR THE MAINTENANCE PROGRAM DURING THE CONSTRUCTION PHASE. THE SUPERINTENDENT SHALL SEE THAT THE APPROPRIATE WORKERS ARE AWARE OF THE PROVISIONS OF THE PLAN.
- 6.4.13 AFTER ACCEPTANCE BY THE TOWN, THE (CA) SHALL HAVE OVERALL RESPONSIBILITY FOR IMPLEMENTING THE MAINTENANCE PROGRAM.
- 6.4.14 CONSTRUCTION OF DRAINAGE POND SHALL BE SUPERVISED BY A PROFESSIONAL ENGINEER. A REPORT PLAN OF AS-BUILT SHALL BE MADE AVAILABLE TO THE TOWN ENGINEER.

**NON-STRUCTURAL MEASURES**

- 6.2.1 CONSTRUCTION TRAFFIC SHALL BE LIMITED TO ACCESS ROADS, DRAINAGE EASEMENTS AND AREAS TO BE GRADED.
- 6.2.2 STONE STABILIZATION PADS ARE LOCATED AT THE SITE ENTRANCES TO REDUCE THE TRACKING OR FLOWING OF SEDIMENT ONTO THE PUBLIC RIGHT OF WAY.
- 6.2.3 THE CONTRACTOR SHALL MAINTAIN THE ENTRANCES. THE MAINTENANCE SHALL INCLUDE TOP DRESSING WITH ADDITIONAL STONE OR ADDITIONAL LENGTH AS CONDITIONS DEMAND OR AS DIRECTED BY THE ENGINEER. ALL SEDIMENTS SPILLED, DROPPED, WASHED, OR TRACKED ONTO THE PUBLIC RIGHT OF WAY MUST BE REMOVED IMMEDIATELY BY THE CONTRACTOR.
- 6.2.4 TOPSOIL SHALL BE STRIPPED FROM AREAS TO BE GRADED AND STOCKPILED FOR LATER USE. STOCKPILE LOCATION SHALL BE SUBJECT TO APPROVAL BY THE PROJECT ENGINEER. A SEDIMENT BARRIER SHOULD SURROUND ALL TOPSOIL STOCKPILES.
- 6.2.5 HAY BALES OR SILT FENCE SHALL BE INSTALLED DOWNSTREAM OUTSIDE THE LIMITS OF ANY PROPOSED CONSTRUCTION AS SHOWN ON THE SITE PLANS AND PRIOR TO THE COMMENCEMENT OF THE PROPOSED ALTERATION.
- 6.2.6 HAY BALES SHALL BE MAINTAINED BY THE CONTRACTOR. INSPECTION SHALL BE MADE AFTER EACH STORM EVENT AND REPAIRED OR REPLACED AS WARRANTED. THE CONTRACTOR SHALL CLEAN THE ACCUMULATED SEDIMENT IF HALF OF THE ORIGINAL HEIGHTS OF THE BALES BECOME FILLED IN WITH SEDIMENT.
- 6.2.7 THE HAY BALES OR SILT FENCE SHALL BE CHECKED WEEKLY BY THE CONTRACTOR FOR UNDERMINING OR DETERIORATION.
- 6.2.8 THE CONSTRUCTION SUPERINTENDENT SHALL HAVE OVERALL RESPONSIBILITY FOR PLAN IMPLEMENTATION OF NON-STRUCTURAL MEASURES AND FOR SEEING THAT APPROPRIATE WORKERS ARE AWARE OF THE PROVISIONS OF THE PLAN.
- 6.2.9 REFERENCE THE "RHODE ISLAND SOIL EROSION AND SEDIMENT CONTROL HANDBOOK" PREPARED BY THE USDA SOIL CONSERVATION SERVICE 1989, AS A GUIDE.

**Preliminary Submission**

**DETAIL SHEET**

**Cardinal Hill**

ASSESSOR'S PLAT 42 LOTS 113, 161, 164 & 165  
SMITHFIELD, RHODE ISLAND

**DiPrete Engineering Associates, Inc.**  
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FEBRUARY, 2007  
DWN. BY: J.M.D.

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