STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Administration
DIVISION OF PURCHASES
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June 26, 2012

ADDENDUM NUMBER ONE

RFQ # 7457801

TITLE: FLAGG ROAD EXTENSION, URI

Closing Date and Time: 7/13/12 at 1:45 PM

Per the issuance of this <u>ADDENDUM # 1</u>
(292 pages, including this cover sheet)

[X] **Specification Change /Addition / Clarification**

Construction Bid Pre bid meeting
Wed June 13

MIKE DUFFY KEOUGH CONST. MANAGEMENT
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508-336-3069

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NOTICE OF ADDENDUM NO. 1

TO

State of Rhode Island
Board of Governors for Higher Education
University of Rhode Island
Project No. KC.T.PVNG.2010.001
Flagg Road Parking Lot
Kingston, Rhode Island

DATE OF ADDENDUM: June 21, 2012

The contract documents are hereby modified to include the following documents as if fully attached thereto.

Contract Plans

1. Add the following attached plan drawings to the Contract. The project has been modified to add the construction of the Flagg Road Parking Lot.

Dwg. No.	Drawing Title	Date
1	Cover Sheet Volume I and Volume II	June 2012
Flagg Road Parking Lot (Add Alternate No. 2)		
1	Cover Sheet	June 2012
2	General Notes & Legends	June 2012
3	Existing Conditions Plan	June 2012
4	General Plan	June 2012
5	Drainage & Grading Plan	June 2012
6	Location Plan	June 2012
7-11	Details 1-5	June 2012
12	Landscape Plan	June 2012
13	Landscape Details	June 2012
14	Electrical Plan	June 2012
15	Electrical Details	June 2012

Contract Specifications

2. Deleted the following Specification Sections in their entirety.

- 00010 Table of Contents
- 00015 List of Drawings
- 00410 Bid Form
- 00710 Supplemental General Conditions
- 01100 Summary
- 01200 Price and Payment Procedures

- 01201 Attachment A - Price and Payment Procedures
- 01331 Attachment A – Submittal Procedures
- 02110 Site Preparation
- 02130 Erosion Controls
- 02140 Bus Shelter Relocation
- 02210 Excavation and Embankment
- 02220 Trench and Miscellaneous Excavation
- 02230 Excavation and Removal of Unsuitable Materials
- 02310 Drainage Pipe
- 02320 Drainage Structures
- 02330 Paved Waterways
- 02340 Riprap Pads
- 02350 Riprap Ditch Check Dams
- 02360 Stone Baffles
- 02370 Cleaning and Flushing Pipe and Drainage Structures
- 02410 Cast-in-Place Concrete
- 02510 Borrow and Aggregates
- 02520 Bituminous Concrete Pavements
- 02530 Curbing
- 02610 Directional, Regulatory and Warning Signs
- 02620 Pavement Markings
- 02810 Loam and Seed
- Appendix C - Bus Shelter Relocation

3. Add the following attached Specification Sections.

- 00010 Table of Contents
- 00015 List of Drawings
- 00410 Bid Form
- 00710 Supplemental General Conditions
- 01100 Summary
- 01200 Price and Payment Procedures
- 01201 Attachment A - Price and Payment Procedures
- 01331 Attachment A – Submittal Procedures
- 02110 Site Preparation
- 02130 Erosion Controls
- 02210 Excavation and Embankment
- 02220 Trench and Miscellaneous Excavation
- 02230 Excavation and Removal of Specification Unsuitable
- 02310 Drainage Pipe
- 02320 Drainage Structures
- 02330 Paved Waterways
- 02340 Riprap Pads
- 02350 Riprap Ditch Check Dams
- 02360 Stone Baffles
- 02370 Cleaning and Flushing Pipe and Drainage Structures
- 02410 Cast-in-Place Concrete
- 02510 Borrow and Aggregates
- 02520 Bituminous Concrete Pavements

- 02525 Porous Asphalt Pavements
- 02530 Curbing
- 02540 Cold Plane and Removal of Existing Pavement
- 02610 Directional, Regulatory and Warning Signs
- 02620 Pavement Markings
- 02900 Topsoil
- 02920 Turf and Grasses
- 02905 Plants
- 16050 Electrical Materials and Methods
- 16119 Underground Ducts and Utility Structures
- 16120 Conductors and Cables
- 16130 Raceways and Boxes
- 16140 Wiring Devices
- 16170 Grounding and Bonding for Electrical Systems
- 16410 Enclosed Switches and Circuit Breakers
- 16442 Panelboards
- 16461 Dry-Type Transformers
- 16491 Fuses

4. Add the following Appendix data to the following Sections

- Amend Soil Data for Flagg Road Parking Lot to Appendix A.
- Amend Permit Data for Flagg Road Parking Lot to Appendix B.

Attached: (288 Sheets)

********** **END OF ADDENDUM NUMBER 1** **********

f:\files\wordpro\1255\flagg road extension addendum 1\addendum 1.docx

DOCUMENT 00010 - TABLE OF CONTENTS

INTRODUCTORY INFORMATION

00001 Cover
00005 Title Page
00010 Table of Contents
00015 List of Drawings

BIDDING AND CONTRACT REQUIREMENTS

00100 Invitation to Bid
00200 Instructions to Bidders
00210 Supplemental Instructions to Bidders
00410 Bid Form
00430 Bid Security Form
00450 Bidder's Qualification Form
00520 Agreement Form
00610 Performance Bond; Payment Bond
00614 Waiver of Lien Form
00700 General Conditions
00710 Supplemental General Conditions
00720 URI Sexual Harassment Policy
00730 Manual for Construction Project Safety Procedures
00740 Hot Work Procedure
00750 Managing Fire Protection System Impairment
00760 URI Water System Regulations/Policies
00850 Prevailing Wage Rates
00900 Addenda and Modifications

SPECIFICATIONS

DIVISION 1 - GENERAL REQUIREMENTS

01100 Summary
01101 Attachment A – Site Utilization
01102 Attachment B – Fire Protection Impairment Form
01200 Price and Payment Procedures
01201 Attachment A - Price and Payment Procedures
01300 Administrative Requirements
01301 Attachment A – Administrative Requirements
01330 Submittal Procedures
01331 Attachment A – Submittal Procedures
01400 Quality Requirements
01500 Temporary Facilities and Controls
01501 Attachment A – Temporary Facilities and Controls
01600 Product Requirements
01700 Execution Requirements
01732 Waste Management

01780 Closeout Requirements

DIVISION 2 – CONSTRUCTION
02110 Site Preparation
02130 Erosion Controls
02210 Excavation and Embankment
02220 Trench and Miscellaneous Excavation
02230 Excavation and Removal of Unsuitable Materials
02310 Drainage Pipe
02320 Drainage Structures
02330 Paved Waterways
02340 Riprap Pads
02350 Riprap Ditch Check Dams
02360 Stone Baffles
02370 Cleaning and Flushing Pipe and Drainage Structures
02410 Cast-in-Place Concrete
02510 Borrow and Aggregates
02520 Bituminous Concrete Pavements
02525 Porous Asphalt Pavements
02530 Curbing
02540 Cold Plane and Removal of Existing Pavement
02610 Directional, Regulatory and Warning Signs
02620 Pavement Markings
02820 High Organic Soil and Wetland Seed
02900 Topsoil
02920 Turf and Grasses
02905 Plants

DIVISION 16 – ELECTRICAL POWER
16050 Electrical Materials and Methods
16119 Underground Ducts and Utility Structures
16120 Conductors and Cables
16130 Raceways and Boxes
16140 Wiring Devices
16170 Grounding and Bonding for Electrical Systems
16410 Enclosed Switches and Circuit Breakers
16442 Panelboards
16461 Dry-Type Transformers
16491 Fuses

APPENDIX

Appendix A Soil Data
Appendix B Permits

END OF DOCUMENT

DOCUMENT 00015 - LIST OF DRAWINGS

Dwg. No.	Drawing Title	Date
1	Cover Sheet Volume I and Volume II	June 2012

Flagg Road Extension

1	Cover Sheet	March 2012
2	General Notes & Legends	March 2012
3	Typical Sections	March 2012
4	General and Location Plan - 1	March 2012
5	General and Location Plan - 2	March 2012
6	Location Data	March 2012
7	Grading and Drainage Plan - 1	March 2012
8	Grading and Drainage Plan - 2	March 2012
9	Grading and Drainage Plan - 3	March 2012
10	Signing and Striping Plan - 1	March 2012
11	Signing and Striping Plan - 2	March 2012
12	Maintenance and Protection of Traffic	March 2012
13	Miscellaneous Details - 1	March 2012
14	Miscellaneous Details - 2	March 2012
15	Miscellaneous Details - 2	March 2012

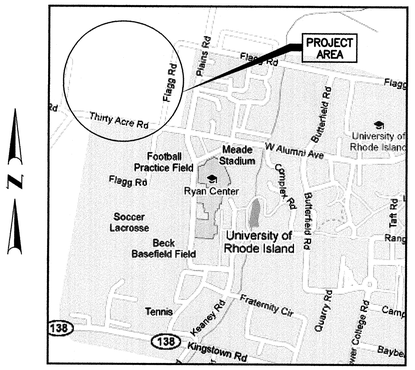
Flagg Road Parking Lot (Alternate No. 2)

1	Cover Sheet	June 2012
2	General Notes & Legends	June 2012
3	Existing Conditions Plan	June 2012
4	General Plan	June 2012
5	Drainage & Grading Plan	June 2012
6	Location Plan	June 2012
7-11	Details 1-5	June 2012
12	Landscape Plan	June 2012
13	Landscape Details	June 2012
14	Electrical Plan	June 2012
15	Electrical Details	June 2012

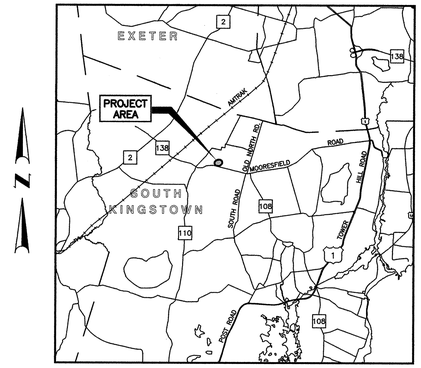
END OF DOCUMENT

UNIVERSITY OF RHODE ISLAND
Office of Capital Projects

PLANS AND DETAILS OF PROPOSED
FLAGG ROAD EXTENSION AND PARKING LOT
KINGSTON, RHODE ISLAND



LOCATION MAP
NOT TO SCALE



LOCATION MAP
SCALE: 1" = 2 Miles

INDEX

VOLUME I

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	LEGEND AND NOTES
3	TYPICAL SECTIONS
4 & 5	GENERAL & LOCATION PLANS 1 & 2
6	LOCATION DATA
7 - 9	GRADING & DRAINAGE PLANS 1 - 3
10 & 11	SIGNING & STRIPING PLANS 1 & 2
12	MAINTENANCE & PROTECTION OF TRAFFIC PLAN
13 - 15	DETAIL SHEETS 1 - 3

VOLUME II

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES & LEGEND
3	EXISTING CONDITIONS PLAN
4	GENERAL PLAN
5	DRAINAGE & GRADING PLAN
6	LOCATION PLAN
7 - 11	DETAILS 1 - 5
12	LANDSCAPE PLAN
13 - 15	ELECTRICAL PLANS

UNIVERSITY OF
Rhode Island

JUNE 2012
ADDENDUM NO. 1

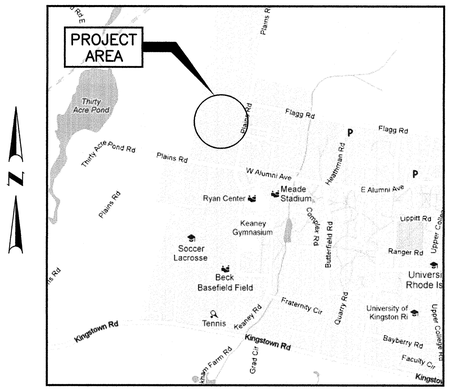
TODD A. RAVENELLE
REGISTERED
PROFESSIONAL ENGINEER

Gordon R. Archibald, Inc.
Civil and Environmental Engineers

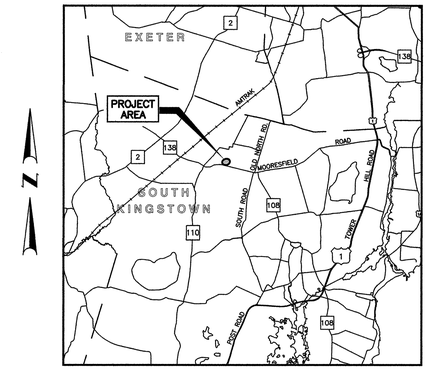
Number of Sheet 1
Total Sheets 31

UNIVERSITY OF RHODE ISLAND
Office of Capital Projects

PLANS AND DETAILS OF PROPOSED
FLAGG ROAD PARKING LOT
KINGSTON, RHODE ISLAND



LOCATION MAP
NOT TO SCALE



LOCATION MAP
SCALE: 1" = 2 Miles

INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES & LEGEND
3	EXISTING CONDITIONS PLAN
4	GENERAL PLAN
5	DRAINAGE & GRADING PLAN
6	LOCATION PLAN
7 - 11	DETAILS 1 - 5
12	LANDSCAPE PLAN
13 - 15	ELECTRICAL PLANS

UNIVERSITY OF
Rhode Island

JUNE 2012
ADDENDUM NO. 1

TODD A. RAVENELLE
No. 5928
REGISTERED
PROFESSIONAL ENGINEER

Gordon R. Archibald, Inc.
Civil and Environmental Engineers

Number of Sheet 1
Total Sheets 15

LEGEND

2.3.0 (DIA.)	PRECAST CONCRETE FLARED END SECTION
4.4.0 (DIA.)	PRECAST 4'–0", 5'–0", OR 6'–0" ROUND CATCH BASIN
4.7.2	ALTERNATE TOP COVER FOR ROUND PRECAST MANHOLES AND CATCH BASINS
5.3.0	CATCH BASIN AND MANHOLE STEP
6.2.1	HEAVY–DUTY ROUND FRAME AND COVER
6.3.2	SQUARE FRAME AND GRATE (BICYCLE SAFE)
7.1.0	PRECAST CONCRETE CURB
7.1.2	6'–0" PRECAST CONCRETE TRANSITION CURB
8.1.0	SEED DITCH
8.3.0	RIP–RAP DITCH
8.4.0	PAVED WATERWAY
9.1.0	BALED HAY EROSION CHECK
9.2.0	SILT FENCE DETAIL
9.3.0	BALED HAY DITCH EROSION CHECK AND SILT FENCE COMBINED
9.4.0	BALED HAY DITCH AND SWALE EROSION CHECK
9.8.0	BALED HAY CATCH BASIN INLET PROTECTION
9.9.0	CONSTRUCTION ACCESS
20.1.0	PAVEMENT MARKINGS – ARROWS AND ONLY
24.2.0	SIGN POST SELECTION AND INSTALLATION DETAILS U–CHANNEL POST
26.1.0	FLUORESCENT TRAFFIC CONE
26.2.0	POLYETHYLENE DRUM WITH MARKINGS
26.3.0	PVC PLASTIC PIPE TYPE III BARRICADE
27.1.1	TRAFFIC FINES IN WORK ZONE REGULATORY SIGN
29.1.0	CONSTRUCTION SIGNS
43.3.0	WHEELCHAIR RAMP
47.1.1	TRANSVERSE PAVEMENT CUT AND MATCH
48.1.0	DETECTABLE WARNING SYSTEM
50.1.0	LARGE TREE STAKING AND PLANTING DETAIL (2" CALIPER AND GREATER)
50.1.1	TREE PLANTING ON SLOPE
50.2.0	EVERGREEN TREE PLANTING DETAIL (4'–0" HIGH AND GREATER)
50.3.0	BALL AND BURLAP SHRUB PLANTING DETAIL
50.3.1	CONTAINER GROWN SHRUB PLANTING DETAIL
CG	CLEARING AND GRUBBING
LOD	LIMIT OF DISTURBANCE
LS	4" LOAM AND SEED
PWW	PAVED WATERWAY
RDC	REMOVE AND DISPOSE CURB
RDF	REMOVE AND DISPOSE FENCE
RDL	REMOVE AND DISPOSE LITE POLE
RDP	REMOVE AND DISPOSE PAVEMENT
RDS	REMOVE AND DISPOSE SHRUBS
RDT	REMOVE AND DISPOSE TREE
4DY	4" EPOXY RESIN PAVEMENT MARKINGS – DOUBLE YELLOW
6W	6" EPOXY RESIN PAVEMENT MARKINGS – WHITE
12W	12" EPOXY RESIN PAVEMENT MARKINGS – WHITE
A	BEEHIVE GRATE AND BASIN
C	RI. STD. 4.4.0, 5.3.0, & 6.3.2 WITH 4' SUMP

SIGN LOCATION NUMBER
SIGN NUMBER (SIZE)
SIGN MOUNTING (R.I. STD. NO.)
STREET SIGN LOCATION NUMBER
(#) STREET SIGN LOCATION NUMBER

TYPICAL SIGN DESIGNATION SYMBOL

	EDGE OF PROPOSED PAVEMENT
	PROPOSED CURB
	PROPOSED FENCE
	SAWCUT AND MATCH EXISTING PAVEMENT
ELEV.	PROPOSED CONTOUR LINE
ELEV.	PROPOSED FINISHED GRADE ELEVATION
ELEV. TC	PROPOSED TOP OF CURB ELEVATION
ELEV. TB	PROPOSED TOP OF BERM ELEVATION
ELEV.	EXISTING CONTOUR LINE
ELEV.	EXISTING SPOT GRADE
TP–1	EXISTING TEST PIT

GENERAL NOTES

1. REFERENCE IS MADE TO THE RIDOT 2004 EDITION "STANDARD 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. 795–291, 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 CONTRACTORS 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. CONTRACTOR SHALL RECOGNIZE THAT WORK UNDER EXISTING OVERHEAD UTILITIES IS REQUIRED AND THAT MINIMUM CLEARANCE SHALL CONFORM TO UTILITY COMPANY REQUIREMENTS AND SHALL BE MAINTAINED AT ALL TIMES. THIS MAY REQUIRE SPECIAL CONSTRUCTION TECHNIQUES. SHOULD THE CONTRACTOR ELECT TO RELOCATE THE EXISTING OVERHEAD UTILITIES, THEN THE CONTRACTOR SHALL COORDINATE AND BEAR ALL ASSOCIATED COSTS.
4. THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATION IN A DRY CONDITION. NO SEPARATE PAYMENT OR ALLOWANCE SHALL BE MADE FOR DEWATERING.
5. 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.
6. ALL GRASSED AREAS DISTURBED BY THE CONTRACTOR SHALL BE LOAMED AND SEEDED 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 SEEDED.
7. 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.
8. 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.
9. 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.
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 SEDIMENT 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 AREA FOR CONSTRUCTION MATERIALS SHALL BE LOCATED WITHIN THE LIMIT OF WORK 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 SOC 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 BE COVERED WITH PAVEMENT WITHIN THE PROJECT WILL RECEIVE PERMANENT VEGETATION. DISTURBED AREAS WILL BE FINE GRADED AND RECEIVE 4 INCHES OF TOP SOIL.
19. AT LEAST TWO TEST PITS SHALL BE DUG AT EACH UNDERGROUND UTILITY TO DETERMINE LOCATION AND MATERIAL.

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 SEEDED 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 SEEDED 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:

MIXTURE	BY WT.	SEEDING DATE
RED FESCUE	70	APRIL 1 – JUNE 13
KENTUCKY BLUEGRASS	15	AUG. 15 – OCT. 15
COLONIAL BENTGRASS	5	
PERENNIAL RYEGRASS	10	
TOTAL 100 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	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. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
13. EROSION CONTROL DEVICES SHOULD INSPECTED WEEKLY AND AFTER RAINFALL EVENTS OF > 1/2" IN A 24–HOUR PERIOD. MAINTENANCE AND REPAIRS SHALL BE COMPLETED WITH 24 HOURS OF THE INSPECTION WHEN NECESSARY.
14. IMMEDIATELY UPON COMPLETION OF THE CLEARING AND GRUBBING OPERATION AND PRIOR TO ANY ROUGH GRADING, TEMPORARY HAY BALES OR SILT FENCES SHALL BE PLACED AS INDICATED ON THE PLANS.
15. ALL EROSION AND SEDIMENTATION CONTROL STRUCTURES SHALL BE PERIODICALLY MAINTAINED AS PER THE RESPECTIVE PROGRAMS DURING THE CONSTRUCTION.

DRAINAGE SYSTEM NOTES

1. PERMEABLE PAVEMENT SHALL BE PRE–BLENDED PERFORMANCE GRADE 76–22 MODIFIED WITH STYRENE BUTADIENE STYRENE (SBS) AND 5 POUNDS OF FIBERS PER TON OF ASPHALT MIX. THE SBS WILL BE SUPPLIED BY AN APPROVED PGAB SUPPLIER HOLDING A QUALITY CONTROL PLAN APPROVED BY THE RIDOT. A BILL OF LADING (BOL) WILL BE DELIVERED WITH EACH TRANSPORT OF PG 76–22 SBS. A COPY OF THE BOL WILL BE FURNISHED TO THE QUALITY ASSURANCE INSPECTOR AT THE PLANT.
2. GRAVEL BORROW AND CRUSHED STONE SHALL MEET THE REQUIREMENT OF THE RIDOT STANDARD SPECIFICATIONS, SECTION M.01.09, TABLE I, COLUMN I AND II.
3. CHOKER STONE SHALL MEET THE REQUIREMENTS OF AASHTO NO. 57.
4. SAND SHALL MEET THE REQUIREMENTS OF AASHTO M–6, AND SHALL BE POORLY GRADED.

STORMWATER MAINTENANCE NOTES

1. ALL MAINTENANCE (INCLUDING CLEANING) REQUIRED DURING CONSTRUCTION PHASE OF THE PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL INCLUDE:

   MEASURES NEEDED TO ENSURE THE PROPER OPERATION OF THE STORM WATER RUNOFF (DRAINAGE) AND WATER QUALITY CONTROL SYSTEMS TO INCLUDE INSPECTION, CLEANING AND REPAIRS TO THE INFILTRATION BASIN SYSTEM INCLUDING ALL PIPES, SWALES, INTAKE AND DISCHARGE STRUCTURES, CATCH BASIN SUMPS, AND MANHOLES.

   INSPECTION OF ALL SLOPES, BERMS, AND OTHER CONTROL STRUCTURES FOR STRUCTURAL INTEGRITY/STABILITY AND EVIDENCE OF SOIL EROSION PROCESSES, AND MAINTENANCE OF THESE STRUCTURES IF NECESSARY. INSPECTIONS SHALL BE PERFORMED FOLLOWING ALL RAIN EVENTS OF ½ INCH RAINFALL OR MORE IN A 24–HOUR PERIOD, OR BI–MONTHLY IF NO RAINFALL EVENT OCCURS.
2. UPON COMPLETION OF PROJECT CONSTRUCTION, AND PRIOR TO VACATING THE SITE, THE CONTRACTOR SHALL CONDUCT A FINAL INSPECTION AND CLEANING OF THE DRAINAGE SYSTEM AND ALL ASSOCIATED STRUCTURES.
3. AFTER THE COMPLETION OF THE ENTIRE PROJECT TO THE SATISFACTION OF THE ENGINEER, ALL MAINTENANCE OF THE DRAINAGE SYSTEM SHALL THEN BE THE RESPONSIBILITY OF THE UNIVERSITY OF RHODE ISLAND OR THEIR APPOINTED AGENTS.
4. ELEMENTS ASSOCIATED WITH THE FLAGG ROAD INFILTRATION BASIN SHALL BE INSPECTED, CLEANED AND MAINTAINED (ROUTINE MAINTENANCE) A MINIMUM OF TWO (2) TIMES IN A GIVEN CALENDAR YEAR TO ENSURE THAT ALL SYSTEM ELEMENTS ARE FUNCTIONING PROPERLY AND THAT DESIGN INFILTRATION RATES ARE BEING MET (SYSTEMS COMPLETELY DRAINING BETWEEN STORM EVENTS). THIS INFILTRATION SYSTEM SHALL BE INSPECTED AFTER ALL STORM EVENTS EQUAL TO OR GREATER THAN THE 1–YEAR, 24–HOUR, TYPE III STORM EVENT. FOR WASHINGTON COUNTY, THIS CORRESPONDS TO 2.8 INCHES OF RAIN WITHIN A 24–HOUR PERIOD.
5. CLEANING AND ROUTINE MAINTENANCE OF CATCH BASINS, OUTLETS, FOREBAYS, AND OTHER ELEMENTS ASSOCIATED WITH THE FLAGG ROAD INFILTRATION BASIN SHALL INCLUDE THE REMOVAL OF ALL ACCUMULATED SEDIMENTS (EITHER MANUALLY OR BY VACUUM TRUCK) AND DEBRIS, MAINTENANCE OF OIL–WATER–DEBRIS SEPARATORS, AND OTHER ACTIVITIES AS REQUIRED TO ENSURE THE CONTINUED OPERATIONAL PERFORMANCE OF THE SYSTEM. ANY BARE SPOTS OR ERODED AREAS WITHIN SWALES, FOREBAYS, OR THE BASIN MUST BE REPLANTED AND/OR STABILIZED IMMEDIATELY FOLLOWING OBSERVATIONS TO PREVENT SUBSEQUENT EROSION OR CLOGGING. SHOULD THE INSPECTION OF THE SYSTEM REVEAL ANY EVIDENCE OF SEDIMENT ACCUMULATION WITHIN THE BASIN ITSELF, SEDIMENTS SHALL BE REMOVED AND THE SURFACE LAYER RESTORED TO ITS ORIGINAL DEPTH AND CONDITION.
6. BY ITS NATURE, THE INFILTRATION BASIN HAS AN OPERATIONAL LIFE CYCLE THAT WILL REQUIRE THE DEEP TILLING AND RESEEDING OF THE BASIN FLOOR TO RESTORE THE DESIGN INFILTRATION RATE THROUGH THE SURFACE LAYER (WHICH BECOMES REDUCED OVER TIME DUE TO CLOGGING, BLINDING, AND/OR OTHER FACTORS). THIS TILLING SHOULD BE PERFORMED APPROXIMATELY ONCE EVERY 5–10 YEARS, WHEN INFILTRATION CAPACITY IS DIMINISHED TO THE POINT WHERE STANDING WATER REMAINS IN THE BASIN MORE THAN 72 HOURS FOLLOWING A RAINFALL EVENT. THE TILLING/RESEEDING OPERATION SHALL BE CONDUCTED DURING THE SPRING OR FALL GROWING PERIOD, WITH TILLING ACCOMPLISHED USING A ROTARY TILLER OR DISC HARROW AND THE BASIN FLOOR RESEEDED IMMEDIATELY FOLLOWING TILLING TO PREVENT EROSION.
7. THE ENTIRETY OF POROUS ASPHALT SURFACE OF FLAGG ROAD PARKING LOT PROPER SHALL BE INSPECTED AND CLEANED (SWEPT BY VACUUM TRUCK) ONCE PER CALENDAR QUARTER, AND AT A MINIMUM FOUR (4) TIMES PER CALENDAR YEAR. INSPECTIONS SHALL OCCUR NO EARLIER THAN 24 HOURS FOLLOWING A RAINFALL EVENT AND SHALL INCLUDE TAKING READINGS AT MULTIPLE CLEANOUT MANHOLES AND MEDIAN CATCH BASINS TO ASCERTAIN THAT NO WATER REMAINS IN THE RESERVOIR COURSE (AND THAT THE SYSTEM IS EXFILTRATING PROPERLY. THE POROUS ASPHALT SURFACE SHALL ALSO BE VISUALLY INSPECTED DURING RAINFALL EVENTS (ON AN APPROXIMATELY MONTHLY BASIS) TO ENSURE THAT STORMWATER IS PERCOLATING THROUGH THE SURFACE AND THAT RUNOFF TO GRASSED MEDIANS / OVERFLOW BASINS IS NEGLIGIBLE.
8. THE INTEGRITY OF THE POROUS ASPHALT SURFACE SHALL BE INSPECTED ANNUALLY FOR EVIDENCE OF ANY CRACKING, SPALLING, OR DETERIORATION. SMALL AREAS (LESS THAN 50 SQUARE FEET) REQUIRING PATCHING MAY BE REPAIRED USING CONVENTIONAL BITUMINOUS ASPHALT. ANY LARGER OR MORE SIGNIFICANT REPAIRS TO THE LOT SURFACE OR PERMEABLE PAVEMENT MUST BE APPROVED BY THE DIRECTOR OF THE OFFICE OF CAPITAL PROJECTS PRIOR TO IMPLEMENTATION.
9. THE OWNER SHALL ERECT AND MAINTAIN APPROPRIATE SIGNAGE INDICATING THAT THE PERMEABLE PAVEMENT OF THE FLAGG ROAD PARKING LOT IS NOT TO BE TREATED WITH SAND, SALT OR OTHER DEICING AGENTS TYPICALLY USED FOR WINTER MAINTENANCE OPERATIONS.
10. ALL GRASSED AREAS (SWALES AND INFILTRATION BASIN, MEDIAN ISLANDS, LANDSCAPED PERIMETER AREAS OF THE PARKING LOT) SHALL BE MOWED AT LEAST ONCE PER GROWING SYSTEM, WITH GRASS VEGETATION CUT TO A HEIGHT NO SHORTER THAN FOUR (4) INCHES.
11. THE URI OFFICE OF CAPITAL PROJECTS SHALL BE RESPONSIBLE FOR ALL REPAIRS, REPLACEMENTS, AND OTHER WORK NECESSARY TO MAINTAIN THE PROPER FUNCTIONING OF INFILTRATION SYSTEMS. ANY REQUIRED REPAIR AND/OR REPLACEMENT OF DRAINAGE STRUCTURES OR FACILITIES SHALL BE PERFORMED PROMPTLY TO ENSURE PROPER FUNCTIONING OF THE SYSTEM. IN THE EVENT OF A SIGNIFICANT LOSS IN INFILTRATION CAPACITY (BELOW THE ORIGINAL DESIGN CAPACITY) OF EITHER OR BOTH SYSTEMS (DUE TO CLOGGING, BLINDING, AND/OR OTHER ISSUES), THE PERTINENT SYSTEMS ELEMENTS SHALL BE REPAIRED OR REPLACED SO AS TO RE–ESTABLISH ORIGINAL DESIGN INFILTRATION RATES.
12. ANY INCIDENT OF INADVERTENT OR DELIBERATE DISCHARGE OF WASTE OIL OR OTHER CONTAMINANT TO EITHER INFILTRATION SYSTEM SHALL BE IMMEDIATELY REPORTED TO THE RIDEM OFFICE OF WATER RESOURCES AT (401) 222–3961. THE RIDEM AFTER–HOURS EMERGENCY TELEPHONE NUMBER IS (401) 222–3070. ANY INCIDENT OF GROUNDWATER CONTAMINATION RESULTING FROM THE IMPROPER DISCHARGE OF CONTAMINANTS TO THE INFILTRATION SYSTEM SHALL BE THE RESPONSIBILITY OF THE OWNER (UNIVERSITY OF RHODE ISLAND).
13. OPERATION AND MAINTENANCE OF THE INFILTRATION SYSTEMS SHALL BE CONDUCTED IN ACCORDANCE WITH THE TERMS AND CONDITIONS SET FORTH IN THE RIDEM UIC PROGRAM PERMIT ISSUED FOR THE CONSTRUCTION OF THE FLAGG ROAD PARKING LOT PROJECT. WRITTEN NOTIFICATION OF ANY CHANGES TO (A) THE PHYSICAL INFRASTRUCTURE OF EITHER SYSTEM OR (B) THIS O&M PLAN SHALL BE PROVIDED TO THE RIDEM UIC PROGRAM.

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5968
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
LEGEND & NOTES

REVISIONS

NO.	DATE		BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

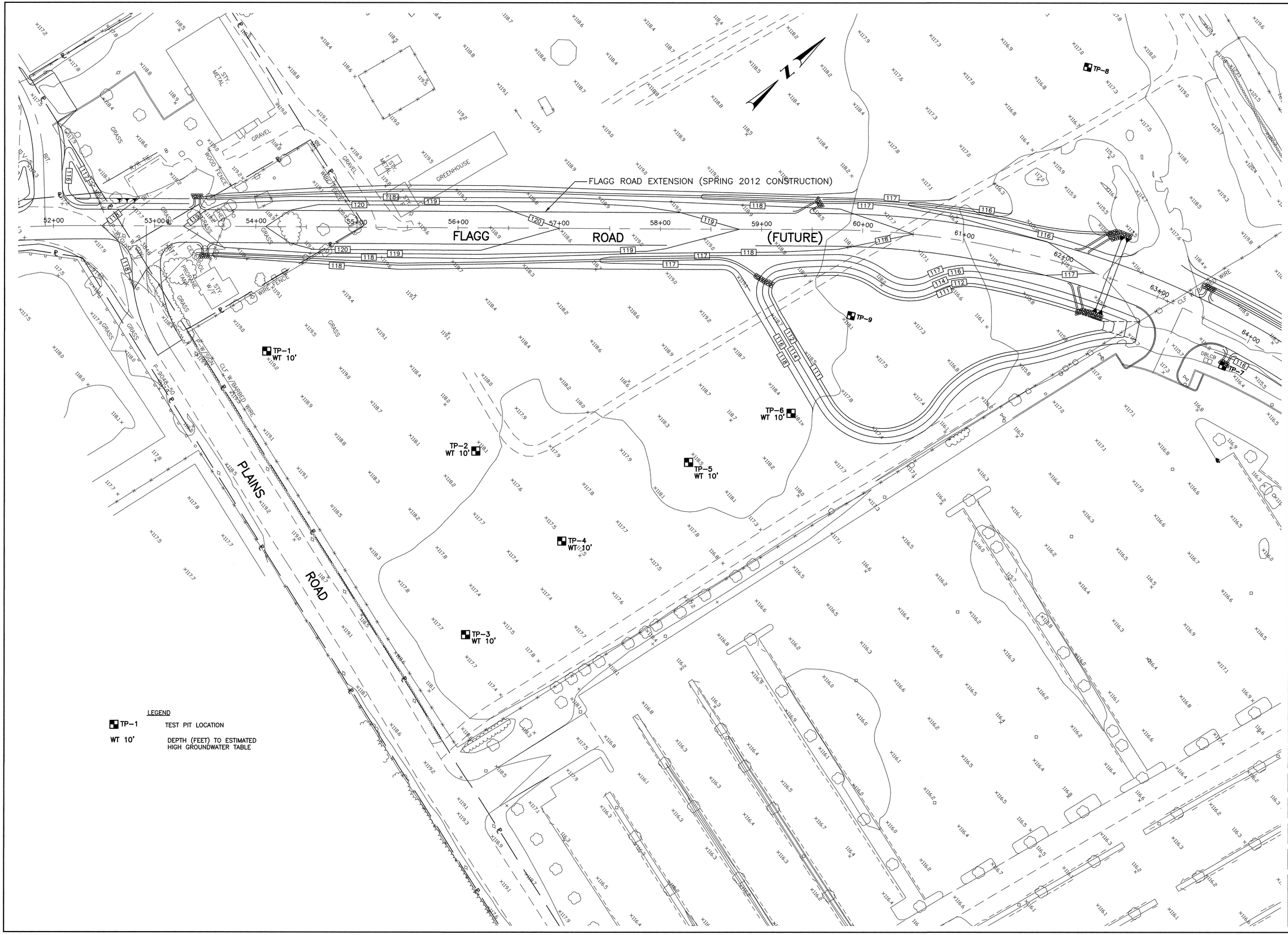
SCALE: NONE

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
2

SHEET 2 OF 15



LEGEND

TP-1 — TEST PIT LOCATION

WT 10' — DEPTH (FEET) TO ESTIMATED HIGH GROUNDWATER TABLE

PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE — 5994 — REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

EXISTING CONDITIONS PLAN

REVISIONS

NO.	DATE		BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: 1" = 40'

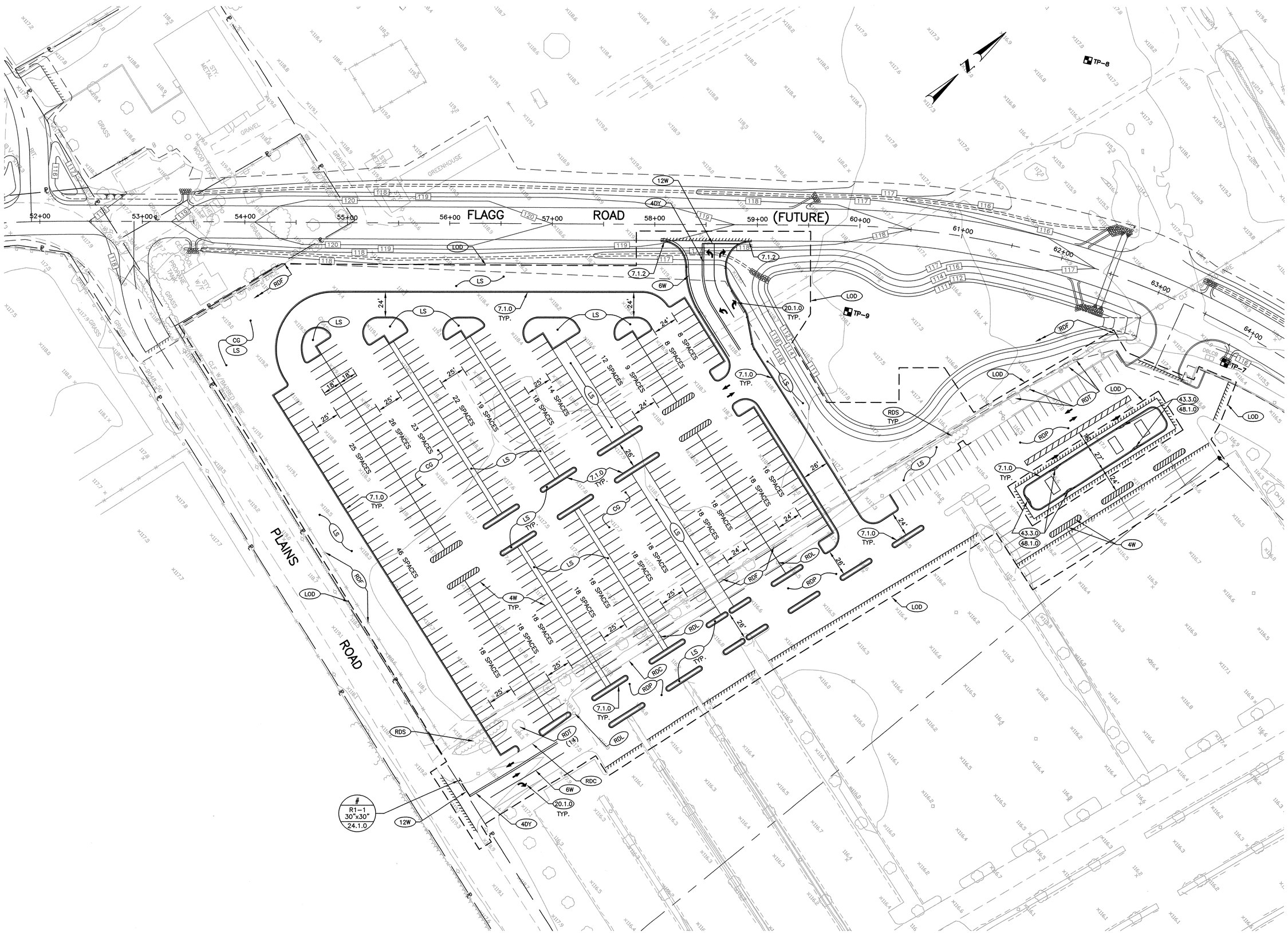
DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER

3

SHEET 3 OF 15



PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5628
REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

GENERAL PLAN

REVISIONS

NO.	DATE		BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: 1" = 40'

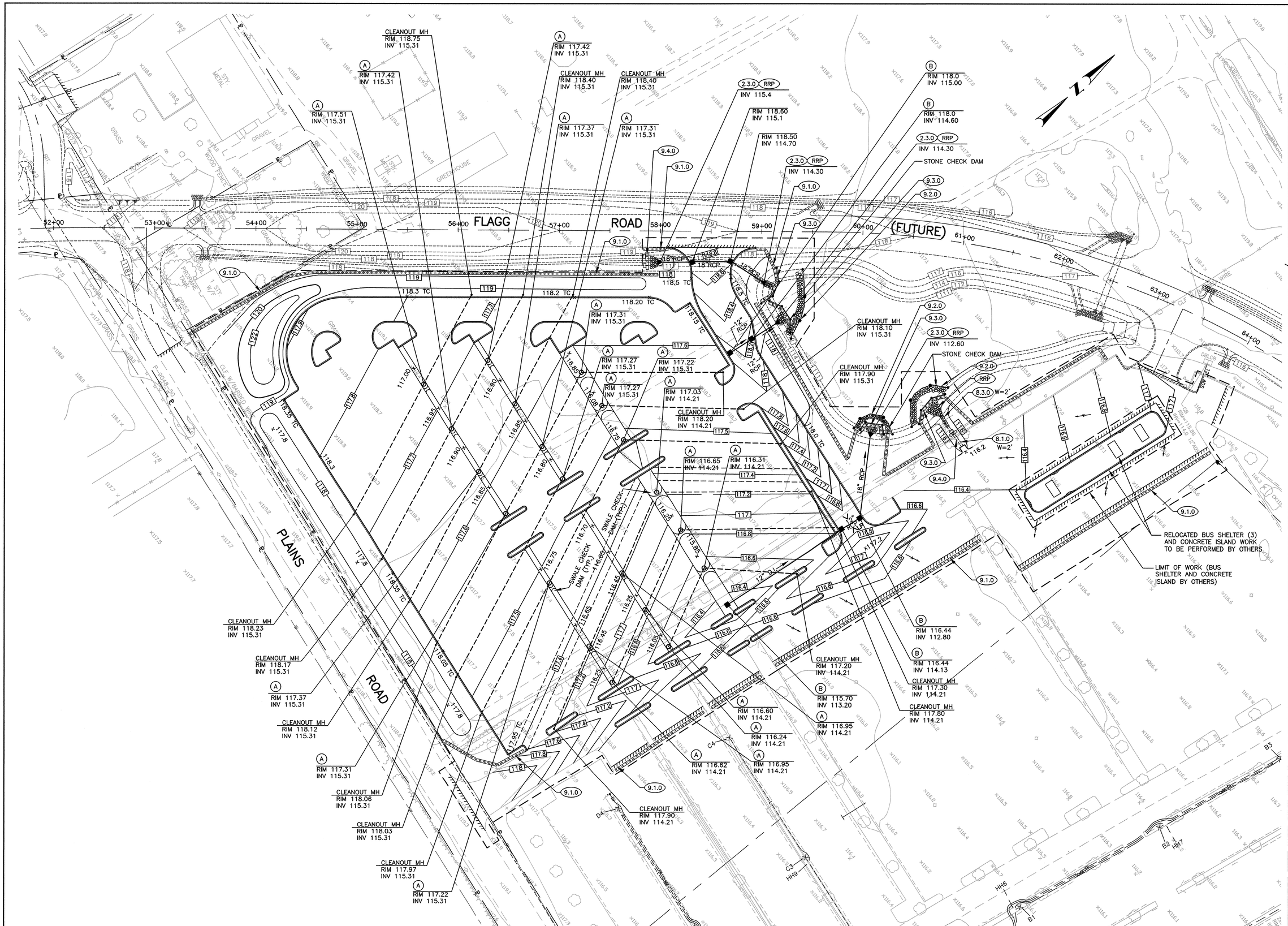
DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER

4

SHEET 4 OF 15



PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

DRAINAGE & GRADING PLAN

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: 1" = 40'

DRAWN BY: LBD

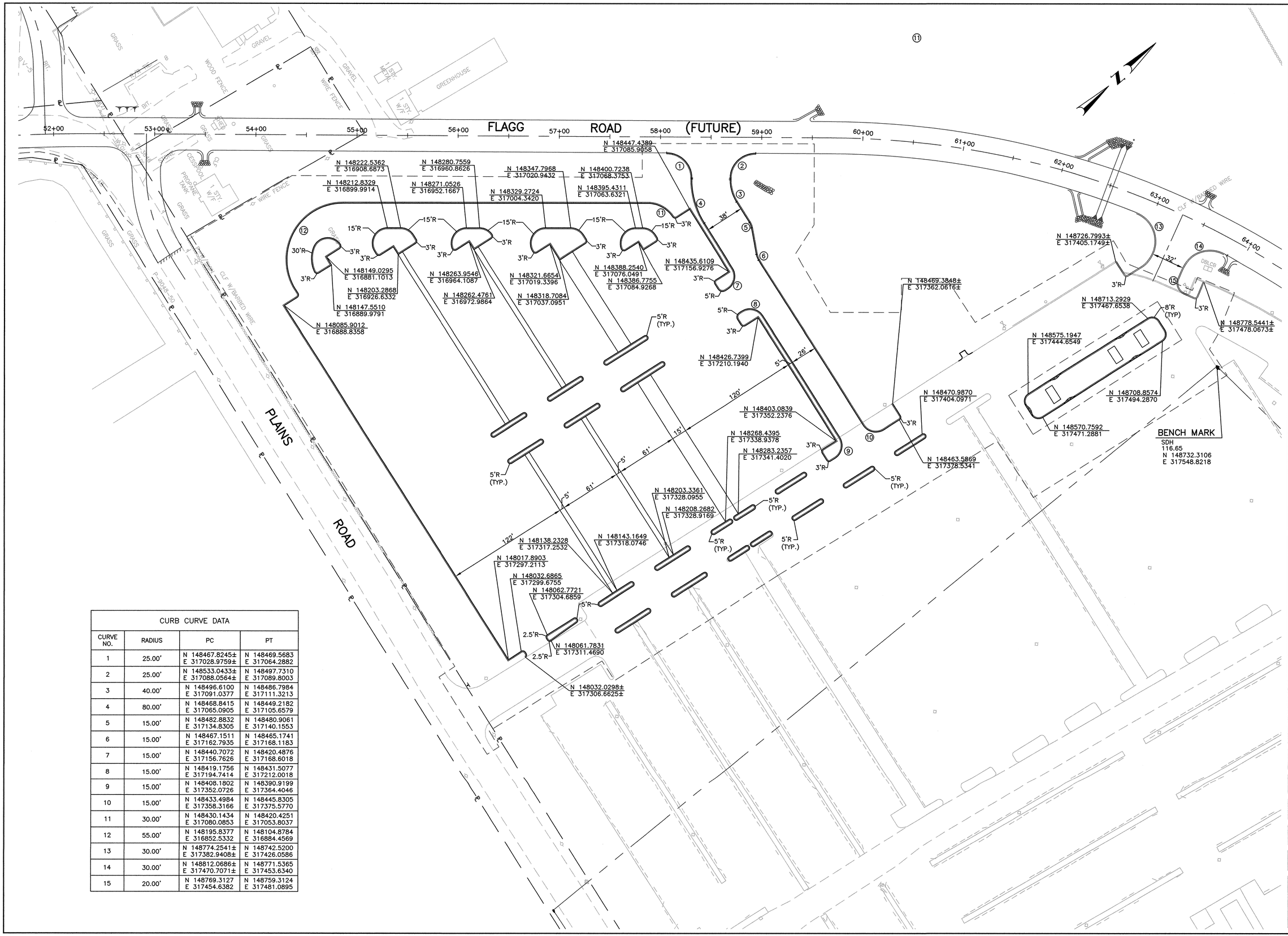
CHECKED BY: TAR

DRAWING NUMBER

5

SHEET 5 OF 15

F:\FILES\CAD\1377\HIGHWAY PLANS\1377_XXX_DRAINAGE.dwg Layout1 6/20/2012 8:23:42 AM, USERNT, Canon\WPD-BLK/WHT.pc3, 1:1



CURB CURVE DATA			
CURVE NO.	RADIUS	PC	PT
1	25.00'	N 148467.8245± E 317028.9759±	N 148469.5683 E 317064.2882
2	25.00'	N 148533.0433± E 317088.0564±	N 148497.7310 E 317089.8003
3	40.00'	N 148496.6100 E 317091.0377	N 148486.7984 E 317111.3213
4	80.00'	N 148468.8415 E 317065.0905	N 148449.2182 E 317105.6579
5	15.00'	N 148482.8832 E 317134.8305	N 148480.9061 E 317140.1553
6	15.00'	N 148467.1511 E 317162.7935	N 148465.1741 E 317168.1183
7	15.00'	N 148440.7072 E 317156.7626	N 148420.4876 E 317168.6018
8	15.00'	N 148419.1756 E 317194.7414	N 148431.5077 E 317212.0018
9	15.00'	N 148408.1802 E 317352.0726	N 148390.9199 E 317364.4046
10	15.00'	N 148433.4984 E 317358.3166	N 148445.8305 E 317375.5770
11	30.00'	N 148430.1434 E 317080.0853	N 148420.4251 E 317053.8037
12	55.00'	N 148195.8377 E 316852.5332	N 148104.8784 E 316884.4569
13	30.00'	N 148774.2541± E 317382.9408±	N 148742.5200 E 317426.0586
14	30.00'	N 148812.0686± E 317470.7071±	N 148771.5365 E 317453.6340
15	20.00'	N 148769.3127 E 317454.6382	N 148759.3124 E 317481.0895

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5028
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
LOCATION PLAN

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

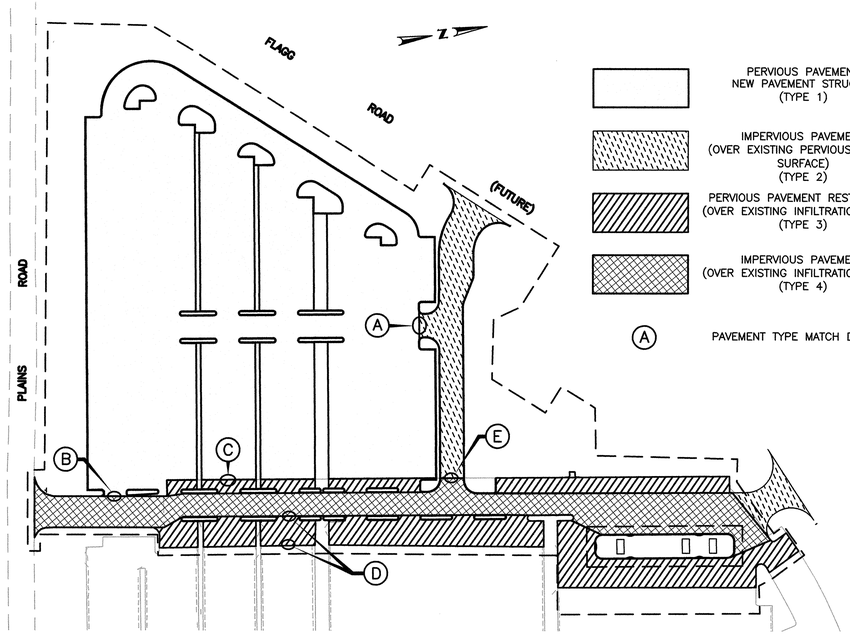
SCALE: 1" = 40'

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
6

SHEET 6 OF 15



PERVIOUS PAVEMENT NEW PAVEMENT STRUCTURE (TYPE 1)

IMPERVIOUS PAVEMENT (OVER EXISTING PERVIOUS/GRASSED SURFACE) (TYPE 2)

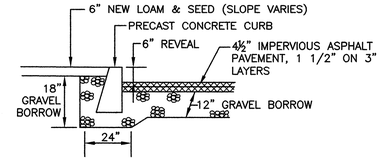
PERVIOUS PAVEMENT RESTORATION (OVER EXISTING INFILTRATION SYSTEM) (TYPE 3)

IMPERVIOUS PAVEMENT (OVER EXISTING INFILTRATION SYSTEM) (TYPE 4)

(A) PAVEMENT TYPE MATCH DETAIL

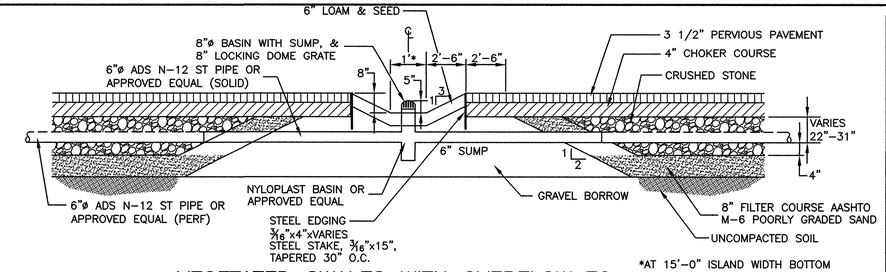
PAVEMENT TYPE LAYOUT

NOT TO SCALE



IMPERVIOUS PAVING (TYPE 2) CURB TREATMENT

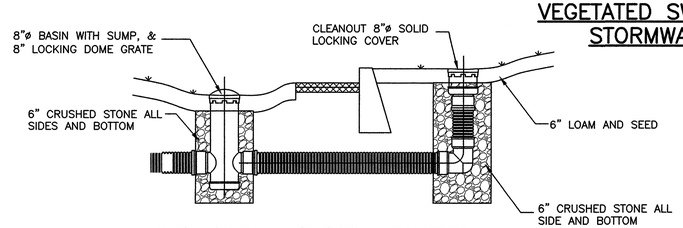
NOT TO SCALE



*AT 15'-0" ISLAND WIDTH BOTTOM CHANNEL SHALL BE 11'-0"

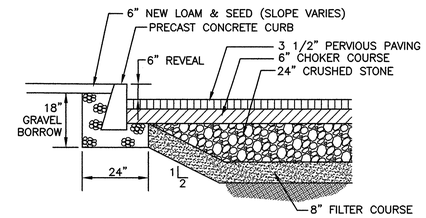
VEGETATED SWALES WITH OVERFLOW TO STORMWATER RECHARGE BEDS

NOT TO SCALE



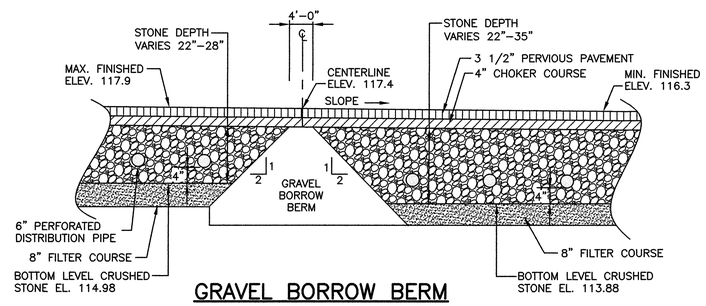
COLLECTION SYSTEM SECTION

NOT TO SCALE



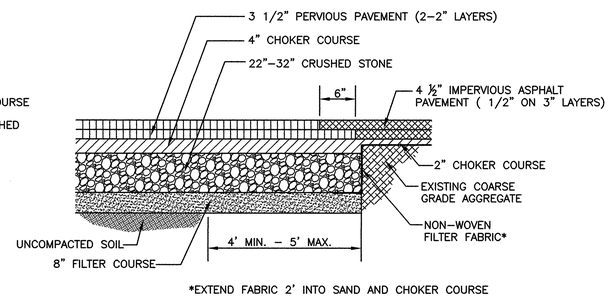
PERVIOUS PAVING (TYPE 1) CURB TREATMENT

NOT TO SCALE



GRAVEL BORROW BERM

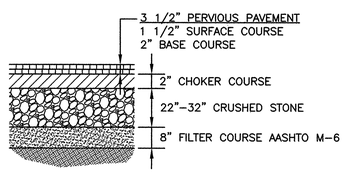
NOT TO SCALE



*EXTEND FABRIC 2' INTO SAND AND CHOKER COURSE

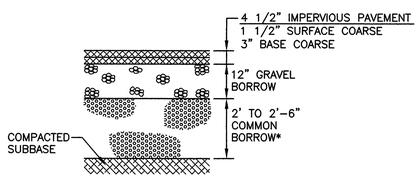
(B) PAVEMENT MATCH DETAIL (TYPE 1 TO TYPE 4)

NOT TO SCALE



PAVEMENT TYPE 1

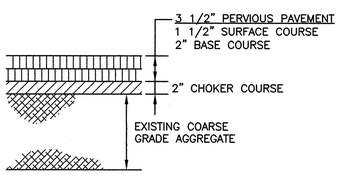
NOT TO SCALE



NOTE:
*CONTRACTOR SHALL REMOVE EXISTING UNSUITABLE MATERIAL TO GRAVELLY/SAND LAYER

PAVEMENT TYPE 2

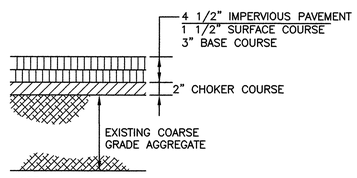
NOT TO SCALE



NOTE:
CONTRACTOR SHALL REMOVE EXISTING BITUMINOUS PAVEMENT (2"-3" DEPTH), REMOVE EXISTING CHOKER COURSE AND COARSE GRADE AGGREGATE AND INSTALL PROPOSED PAVEMENT STRUCTURE

PAVEMENT TYPE 3

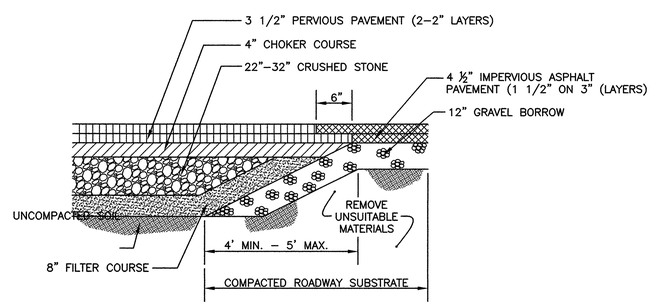
NOT TO SCALE



NOTE:
CONTRACTOR SHALL REMOVE EXISTING BITUMINOUS PAVEMENT (2"-3" DEPTH), REMOVE EXISTING CHOKER COURSE AND COARSE GRADE AGGREGATE AND INSTALL PROPOSED PAVEMENT STRUCTURE

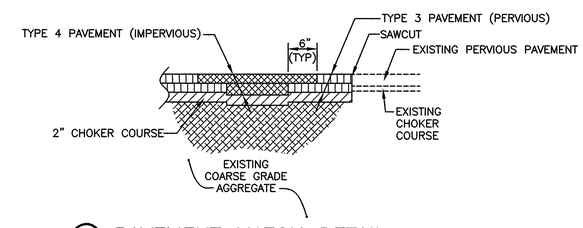
PAVEMENT TYPE 4

NOT TO SCALE



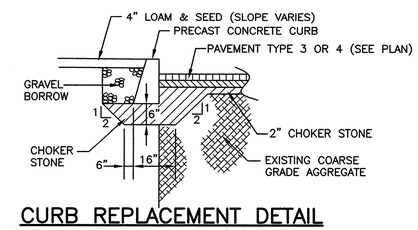
(A) PAVEMENT MATCH DETAIL (TYPE 1 TO TYPE 2)

NOT TO SCALE



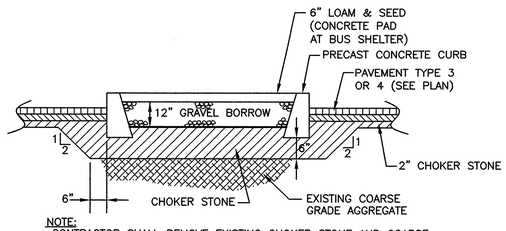
(D) PAVEMENT MATCH DETAIL (TYPE 3 TO TYPE 4) TO EXISTING PAVEMENT

NOT TO SCALE



CURB REPLACEMENT DETAIL WITHIN EXISTING PARKING LOT

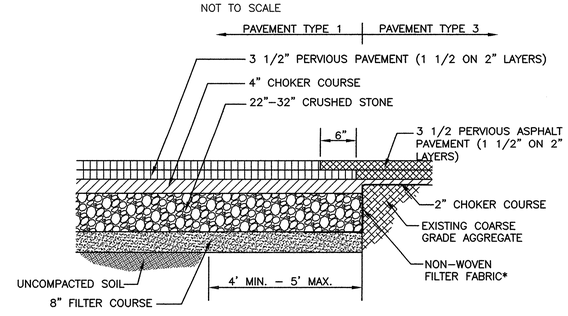
NOT TO SCALE



NOTE:
CONTRACTOR SHALL REMOVE EXISTING CHOKER STONE AND COARSE AGGREGATE AS REQUIRED TO ACHIEVE PROPOSED GRADE AND DESIGN.

CURB AND ISLAND DETAIL WITHIN EXISTING PARKING LOT

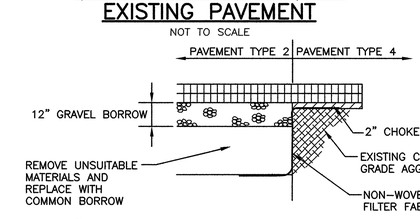
NOT TO SCALE



*EXTEND FABRIC 2' INTO SAND AND CHOKER COURSE

(C) PAVEMENT MATCH DETAIL (TYPE 1 TO TYPE 4)

NOT TO SCALE



*EXTEND FABRIC 2' INTO COMMON BORROW AND CHOKER STONE

(E) PAVEMENT MATCH DETAIL (TYPE 2 TO TYPE 4)

NOT TO SCALE

PROJECT
FLAGG ROAD PARKING LOT

TODD A. DAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
DETAIL - 1

REVISIONS

NO.	DATE		BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

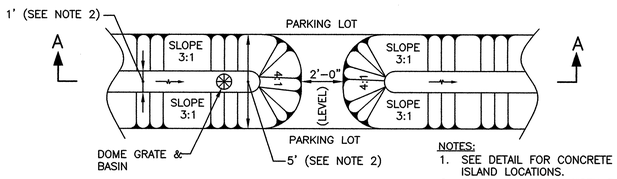
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

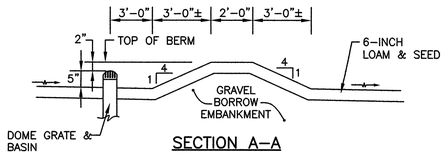
DRAWING NUMBER
7

SHEET 7 OF 15



PLAN

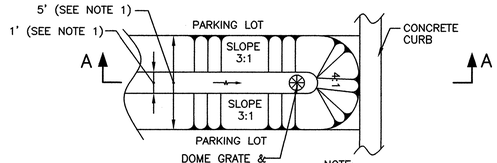
NOTES:
1. SEE DETAIL FOR CONCRETE ISLAND LOCATIONS.
2. AT 15'-0" ISLAND WIDTH BOTTOM CHANNEL SHALL BE 11'-0"



SECTION A-A

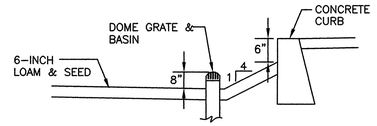
GRASS SWALE CHECK DAM

NOT TO SCALE



PLAN

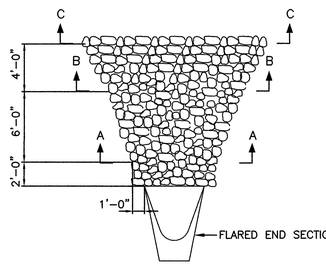
NOTE:
1. AT 15'-0" ISLAND WIDTH BOTTOM CHANNEL SHALL BE 11'-0"

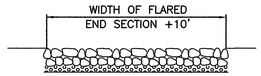


SECTION A-A

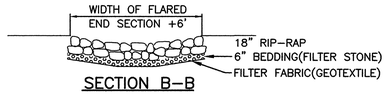
CHECK DAM AT CURB ISLAND

NOT TO SCALE

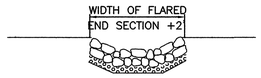




SECTION C-C



SECTION B-B



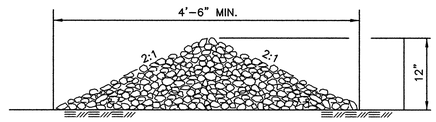
SECTION A-A

RIP-RAP PAD DETAIL (RRP)

N.T.S.

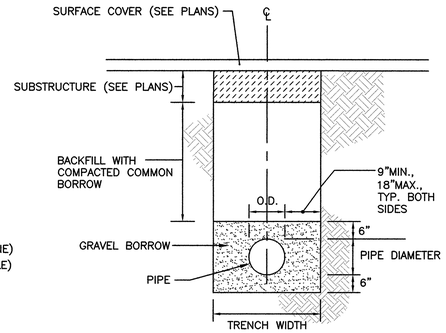
NOTES:

1. RIP-RAP AND BEDDING SHALL BE IN ACCORDANCE WITH SECTION M.10 OF THE RI STD. SPECIFICATIONS FOR BRIDGE AND HIGHWAY. RIP-RAP SHALL BE MODIFIED NSA NO. R-4, BEDDING SHALL BE MODIFIED NSA NO. FS-2.
2. DIMENSIONS MAY BE MODIFIED BY ENGINEER TO MEET FIELD CONDITIONS.
3. UNLESS OTHERWISE SPECIFIED, DUMPED RIP-RAP SHALL BE USED.



SIDE VIEW FOR AT GRADE STONE BAFFLE

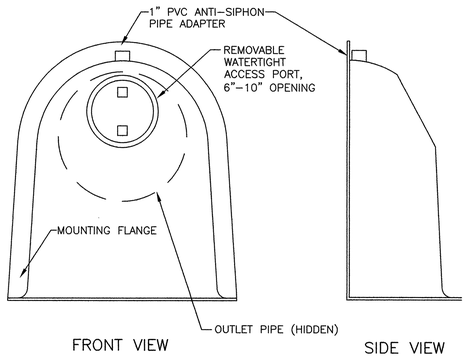
STONE BAFFLE (SB)



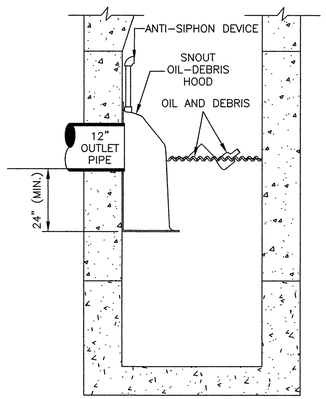
NOTE:
SUITABLE MATERIAL EXCAVATED FROM THE TRENCH MAY BE USED FOR PIPE BEDDING.

TYPICAL STORM PIPE TRENCH DETAIL

NOT TO SCALE

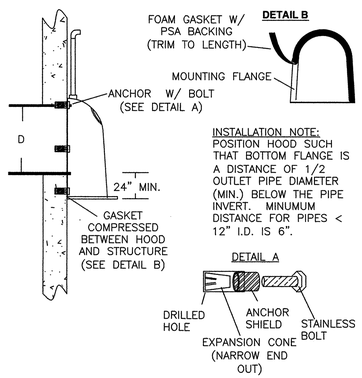


SNOUT OIL-WATER-DEBRIS SEPARATOR



NOTES:

1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY:
   BEST MANAGEMENT PRODUCTS, INC.
   53 MT. ARCHER RD.
   LYME, CT 06371
   (860) 434-0277, (860) 434-3195 FAX
   TOLL FREE: (800) 504-8008 OR (888) 354-7585
   WEB SITE: www.bestmp.com
   OR PRE-APPROVED EQUAL
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE EQUAL TO 24" BELOW OUTLET INVERT.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8' STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL)
9. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT. INSTALLATION KIT SHALL INCLUDE:
   A. INSTALLATION INSTRUCTIONS
   B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
   C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
   D. 3/8" STAINLESS STEEL BOLTS
   E. ANCHOR SHIELDS

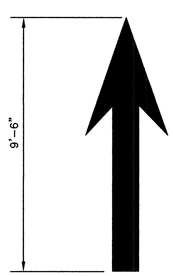


INSTALLATION NOTE:
POSITION HOOD SUCH THAT BOTTOM FLANGE IS A DISTANCE OF 1/2 OUTLET PIPE DIAMETER (MIN.) BELOW THE PIPE INVERT. MINUMUM DISTANCE FOR PIPES < 12" I.D. IS 6".

INSTALLATION DETAIL

CATCH BASIN OIL/WATER SEPARATION

NOT TO SCALE

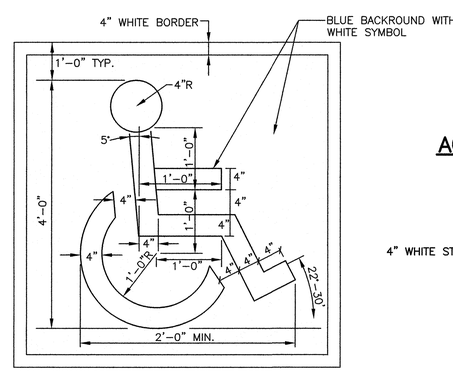


NOTES:

1. THE SPACING OF THE PAVEMENT MARKINGS WILL BE AS SHOWN ON THE PLAN
2. SYMBOLS SHALL MEET THE REQUIREMENTS OF THE FHWA STANDARD ALPHABET AND SYMBOLS FOR HIGHWAY PAVEMENT MARKINGS.

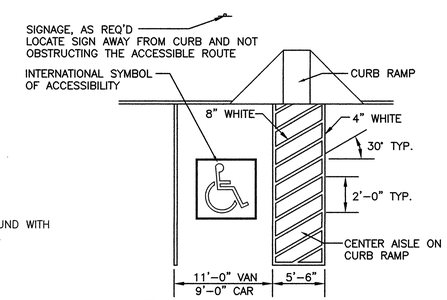
PAVEMENT MARKING ARROWS

N.T.S.



PAINTED HANDICAP SYMBOL

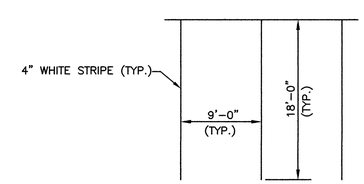
N.T.S.



NOTE:
ALL STRIPING SHALL BE WHITE

ACCESSIBLE PARKING SPACE AND AISLE

N.T.S.



NOTE:
ALL PARKING AREA STRIPING SHALL BE 4" WIDE WHITE UNLESS LABLED OTHERWISE.

TYPICAL PARKING SPACE DETAIL

N.T.S.

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE 5926 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
DETAIL - 2

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

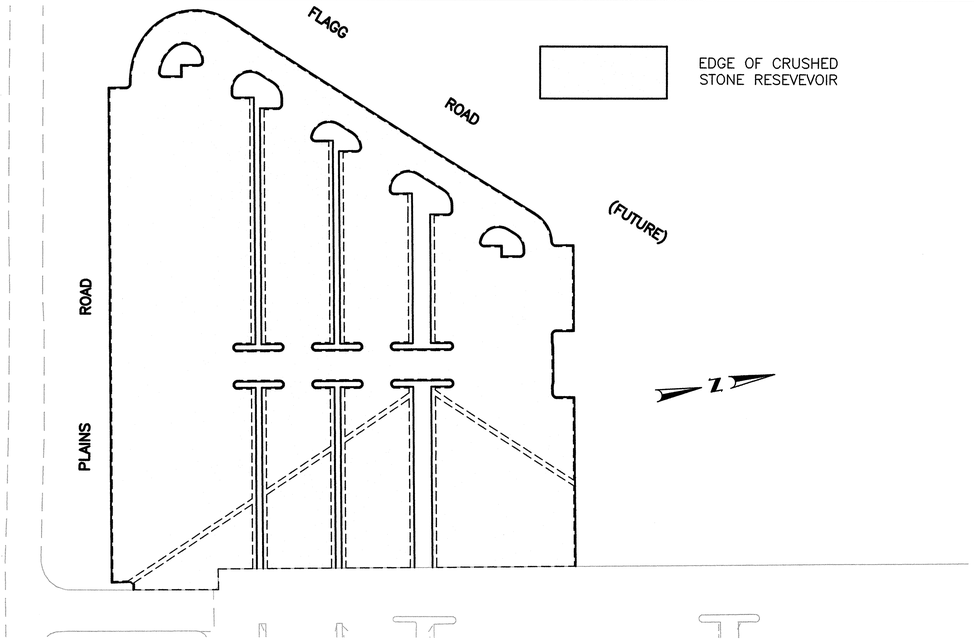
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

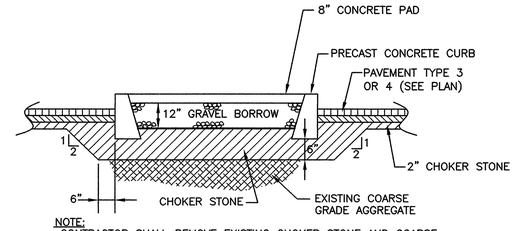
DRAWING NUMBER
8

SHEET 8 OF 15



SUBSURFACE RESERVIOR LIMITS

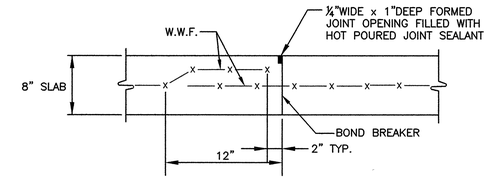
NOT TO SCALE



NOTE:
CONTRACTOR SHALL REMOVE EXISTING CHOKER STONE AND COARSE AGGREGATE AS REQUIRED TO ACHIEVE PROPOSED GRADE AND DESIGN.

CONCRETE SLAB AT BUS SHELTER

NOT TO SCALE



TYPICAL CONCRETE PAD & CONSTRUCTION JOINT DETAIL

NOT TO SCALE

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5998
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
DETAIL - 3

REVISIONS

NO.	DATE		BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

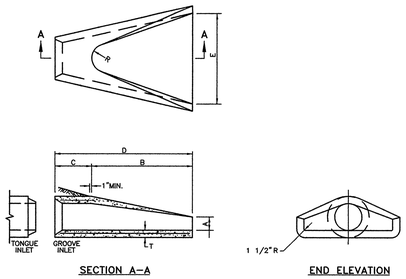
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
9

SHEET 9 OF 15



SECTION A–A

END ELEVATION

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'–1"	2'–6"	11"	2 1/4"	0.054
1'–6"	9"	2'–3"	3'–10"	6'–1"	3'–0"	12"	2 1/2"	0.060
2'–0"	9 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"	1'–7 3/4"	6'–1 3/4"	5'–0"	1'–3"	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'–3"	2'–11"	8'–2"	6'–6"	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"	5'–5"	2'–11"	8'–4"	7'–6"	2'–0"	5 1/2"	0.132
5'–0"	2'–6"	5'–0"	3'–3"	8'–3"	8'–0"	2'–0"	6"	0.144

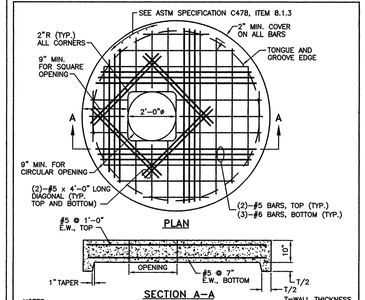
NOTE:
SHALL BE IN ACCORDANCE WITH SECTION 701 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE FLARED END SECTION

R.I. STANDARD 2.3.0

JUNE 15, 1998



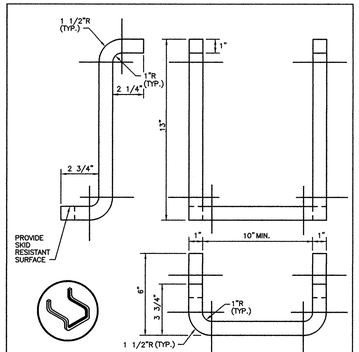
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 702 OF THE R.I. STANDARD SPECIFICATIONS.
2. ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW–CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS AND CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.
3. THE CENTER LINE OF THE OPENING MUST BE WITHIN 2" FROM THE STEPS.
4. ALTERNATE TOP COVER IS STEEL REINFORCED TO MEET OR EXCEED H–25 OR HS–25 LOADINGS WITH EARTH PRESSURES INCLUDED. THIS IMPLIES THAT THE TOP SLAB IS DESIGNED FOR AXLE LOADS OF NO MORE THAN 20 TONS.
5. ALL REBAR SHALL HAVE A MINIMUM OF 2" CLEARANCE FROM OPENING.
6. ALL REBARS IN THE BOTTOM MAT ARE #5 @ 2", BOTH WAYS, WITH 2" MINIMUM COVER, EXCEPT FOR REBARS ADJACENT TO THE OPENING. THESE BARS SHALL BE (3)–#6 SHOWN WITH A HEAVIER LINE FOR CLARITY). REBARS IN THE TOP MAT ARE #5 @ 1'–0", BOTH WAYS, WITH 2" MINIMUM COVER, EXCEPT FOR REBARS ADJACENT TO THE OPENING. THESE BARS SHALL BE (2)–#5 BARS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

ALTERNATE TOP COVER FOR ROUND PRECAST MANHOLES AND CATCH BASINS

R.I. STANDARD 4.7.2

JUNE 15, 1998



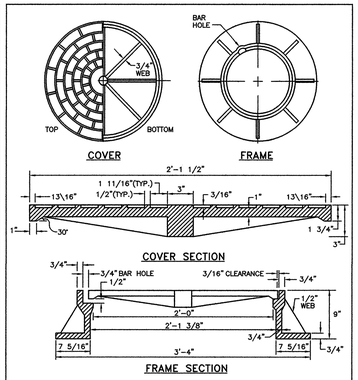
NOTES:
1. STEPS SHALL CONFORM TO SECTION M.04 OF THE R.I. STANDARD SPECIFICATIONS.
2. CROSS SECTION AREA MAY BE REDUCED UPON SUBMISSION OF CERTIFIED LOAD TESTS. STEPS MUST SUPPORT 300 LBS.
3. STOCK SHOWN IS 1" SQUARE WHICH MAY BE REPLACED BY 1" DIAMETER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

CATCH BASIN AND MANHOLE STEP

R.I. STANDARD 5.3.0

JUNE 15, 1998



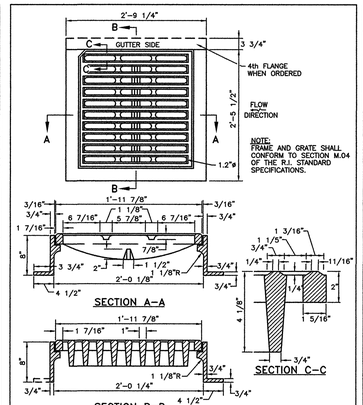
NOTES:
1. FRAME AND GRATE SHALL CONFORM TO SECTION M.04 OF THE R.I. STANDARD SPECIFICATIONS.
2. FRAME AND COVER SEATS MUST HAVE MACHINE FINISH.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

HEAVY–DUTY ROUND FRAME AND COVER

R.I. STANDARD 6.2.1

JUNE 15, 1998



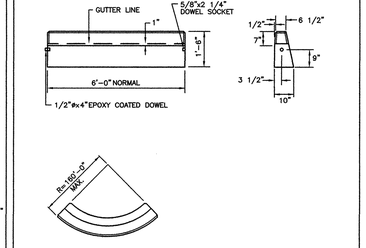
NOTE:
FRAME AND GRATE SHALL CONFORM TO SECTION M.04 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

SQUARE FRAME AND GRATE (BICYCLE SAFE)

R.I. STANDARD 6.3.2

JUNE 15, 1998



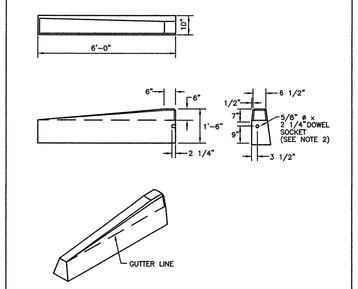
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'–0".
3. EXPOSED SURFACES TO HAVE A SPONGE FLOAT FINISH.
4. CIRCULAR CURB IS REQUIRED ON CURVES WITH RADII OF 160'–0" OR LESS. STRAIGHT CURB TO BE USED ON CURVES OF MORE THAN 160'–0" RADIUS.
5. EXPOSED EDGES TO HAVE A 3/4" CHAMFER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE CURB

R.I. STANDARD 7.1.0

JUNE 15, 1998



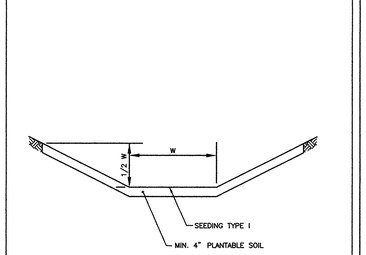
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. DRAWING SHOWS TRANSITION CURB FOR ONE DIRECTION. FOR OTHER DIRECTION USE OPPOSITE HAND AND INCLUDE A 1/2" ø x 4" EPOXY COATED DOWEL.
3. EXPOSED SURFACES TO HAVE A SPONGE FLOAT FINISH.
4. EXPOSED EDGES TO HAVE A 3/4" CHAMFER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

6'–0" PRECAST CONCRETE TRANSITION CURB

R.I. STANDARD 7.1.2

JUNE 15, 1998



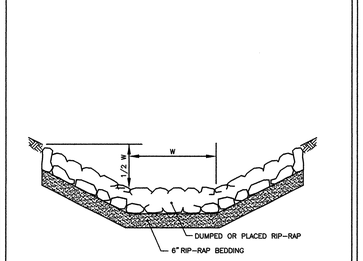
NOTE:
SLOPES MAY VARY TO SUIT CONDITIONS AS PER PLANS OR ENGINEER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

SEEDED DITCH

R.I. STANDARD 8.1.0

JUNE 15, 1998



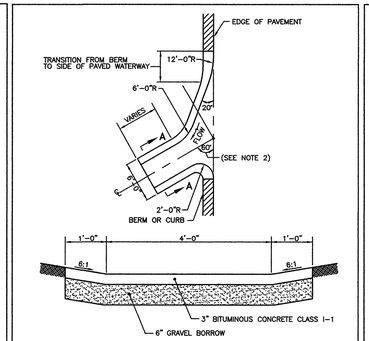
NOTES:
1. SLOPES MAY VARY TO SUIT CONDITIONS AS PER PLANS OR ENGINEER.
2. RIP–RAP AND BEDDING SIZE MAY VARY. SEE CONTRACT DOCUMENTS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RIP–RAP DITCH

R.I. STANDARD 8.3.0

JUNE 15, 1998



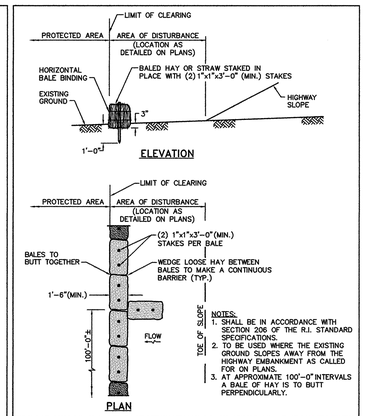
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 711 OF THE R.I. STANDARD SPECIFICATIONS.
2. WHEN PAVED WATERWAY IS USED AT A LOW POINT THIS ANGLE SHALL BE 90°.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PAVED WATERWAY

R.I. STANDARD 8.4.0

JUNE 15, 1998



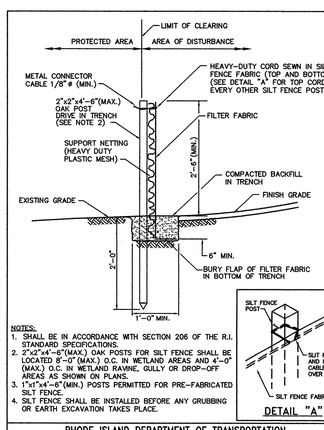
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
2. TO BE USED WHERE THE EXISTING GROUND SLOPES AWAY FROM THE HIGHWAY EMBANKMENT AS CALLED FOR ON PLANS.
3. AT APPROXIMATE 100'–0" INTERVALS A BALE OF HAY IS TO BUTT PERPENDICULARLY.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY EROSION CHECK

R.I. STANDARD 9.1.0

JUNE 15, 1998



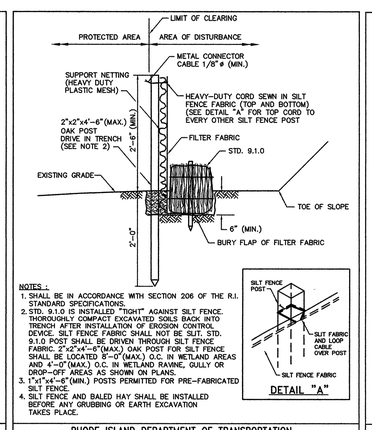
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
2. 2"x2"x4'–6"(MAX.) OAK POSTS FOR SILT FENCE SHALL BE LOCATED 8'–0" (MAX.) O.C. IN WETLAND AREAS AND 4'–0" (MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP–OFF AREAS AS SHOWN ON PLANS.
3. 1"x1"x4'–6"(MIN.) POSTS PERMITTED FOR PRE–FABRICATED SILT FENCE.
4. SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

SILT FENCE DETAIL

R.I. STANDARD 9.2.0

JUNE 15, 1998



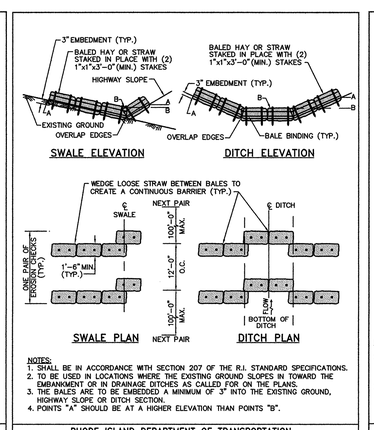
NOTES :
1. SHALL BE IN ACCORDANCE WITH SECTION 206 OF THE R.I. STANDARD SPECIFICATIONS.
2. STD. 9.1.0 IS INSTALLED "TIGHT" AGAINST SILT FENCE. THOROUGHLY COMPACT EXCAVATED SOILS BACK INTO TRENCH AFTER INSTALLATION OF EROSION CONTROL DEVICE. SILT FENCE FABRIC SHALL NOT BE SLIT. STD. 9.1.0 POST SHALL BE DRIVEN THROUGH SILT FENCE FABRIC. 2"x2"x4'–6"(MAX.) OAK POST FOR SILT FENCE SHALL BE LOCATED 8'–0"(MAX.) O.C. IN WETLAND AREAS AND 4'–0"(MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP–OFF AREAS AS SHOWN ON PLANS.
3. 1"x1"x4'–6"(MIN.) POSTS PERMITTED FOR PRE–FABRICATED SILT FENCE.
4. SILT FENCE AND BALED HAY SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY EROSION CHECK AND SILT FENCE COMBINED

R.I. STANDARD 9.3.0

JUNE 15, 1998



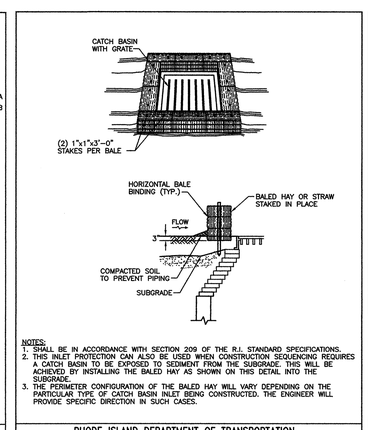
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 207 OF THE R.I. STANDARD SPECIFICATIONS.
2. TO BE USED IN LOCATIONS WHERE THE EXISTING GROUND SLOPES IN TOWARD THE EMBANKMENT OR IN DRAINAGE DITCHES AS CALLED FOR ON THE PLANS.
3. THE BALES ARE TO BE EMBEDDED A MINIMUM OF 3" INTO THE EXISTING GROUND, HIGHWAY SLOPE OR DITCH SECTION.
4. POINTS "A" SHOULD BE AT A HIGHER ELEVATION THAN POINTS "B".

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY DITCH AND SWALE EROSION CHECK

R.I. STANDARD 9.4.0

JUNE 15, 1998



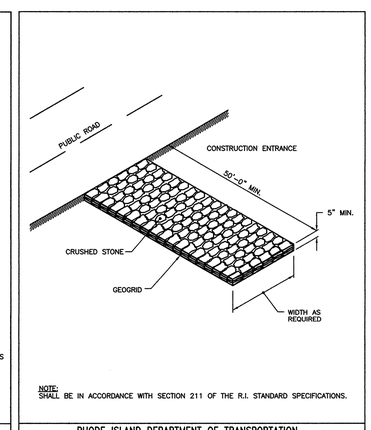
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 209 OF THE R.I. STANDARD SPECIFICATIONS.
2. THIS INLET PROTECTION CAN ALSO BE USED WHEN CONSTRUCTION SEQUENCING REQUIRES A CATCH BASIN TO BE EXPOSED TO SEDIMENT FROM THE SUBGRADE. THIS WILL BE ACHIEVED BY INSTALLING THE BALED HAY AS SHOWN ON THIS DETAIL INTO THE SUBGRADE.
3. THE PERIMETER CONFIGURATION OF THE BALED HAY WILL VARY DEPENDING ON THE PARTICULAR TYPE OF CATCH BASIN INLET BEING CONSTRUCTED. THE ENGINEER WILL PROVIDE SPECIFIC DIRECTION IN SUCH CASES.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY CATCH BASIN INLET PROTECTION

R.I. STANDARD 9.8.0

JUNE 15, 1998



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

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

CONSTRUCTION ACCESS

R.I. STANDARD 9.9.0

JUNE 15, 1998

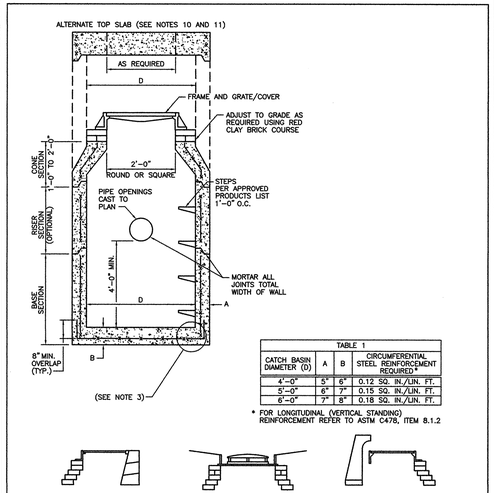
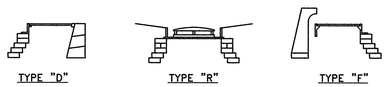


TABLE 1			
CATCH BASIN DIAMETER (D)	A	B	CIRCUMFERENTIAL STEEL REINFORCEMENT REQUIRED*
4'–0"	5"	6"	0.12 SQ. IN./LIN. FT.
5'–0"	6"	7"	0.15 SQ. IN./LIN. FT.
6'–0"	7"	8"	0.18 SQ. IN./LIN. FT.

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



TYPE "D" TYPE "R" TYPE "F"

TYPE CATCH BASIN AS REQUIRED

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. CORBEL 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.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST 4'–0", 5'–0", OR 6'–0" ROUND CATCH BASIN

R.I. STANDARD 4.4.0

JUNE 15, 1998

(MOD.)

PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

DETAIL - 4

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: AS NOTED

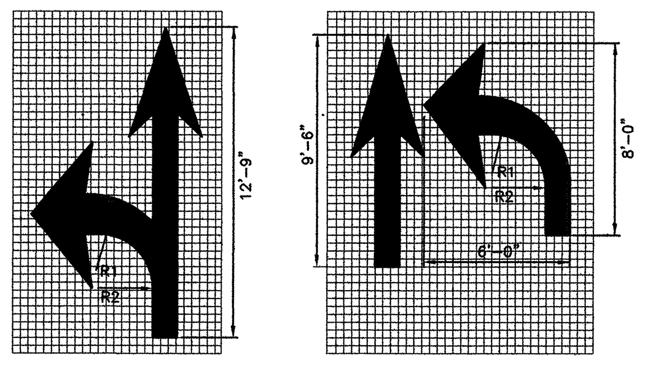
DRAWN BY: LBD

CHECKED BY: TAR

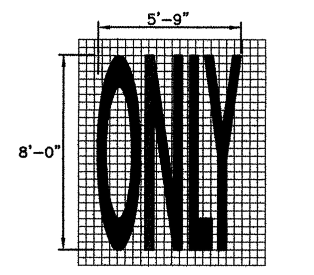
DRAWING NUMBER

10

SHEET 10 OF 15



R1 = 3'-2"
R2 = 2'-2"



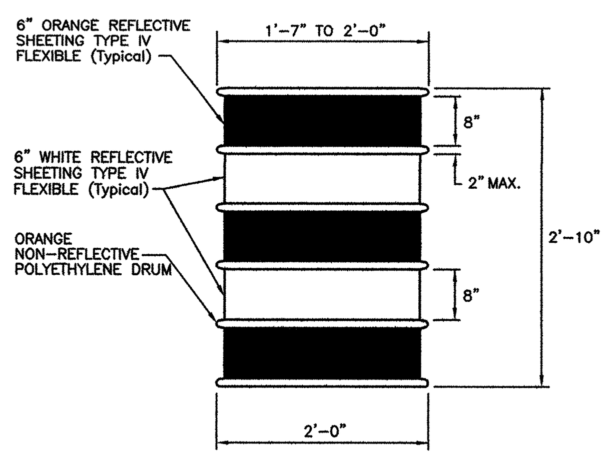
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION T.20 OF THE R.I. STANDARD SPECIFICATIONS.
2. THE LONGITUDINAL SPACE BETWEEN WORD OR SYMBOL MESSAGES, INCLUDING ARROWS, SHOULD BE AT LEAST FOUR TIMES THE HEIGHT OF THE CHARACTER FOR LOW SPEED ROADS BUT NOT MORE THAN TEN TIMES THE HEIGHT OF THE CHARACTER UNDER ANY CONDITIONS.
3. THE SPACING OF THE PAVEMENT MARKINGS WILL BE AS SHOWN ON THE PLAN AND AS PER THE MUTCD.
4. SYMBOLS AND WORDS SHALL MEET THE REQUIREMENTS OF THE FHWA "STANDARD ALPHABET AND SYMBOLS FOR HIGHWAY PAVEMENT MARKINGS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

PAVEMENT MARKINGS ARROWS AND ONLY

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 20.1.0



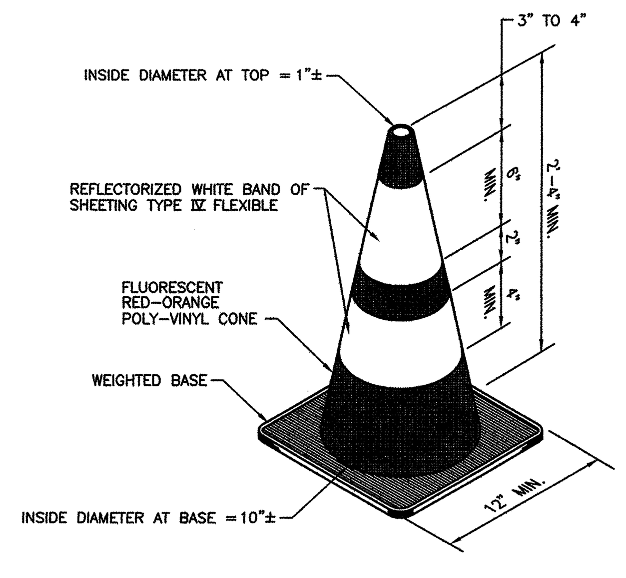
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 923 OF THE R.I. STANDARD SPECIFICATIONS.
2. BASE TO BE ADAPTED FOR SANDBAG BALLAST.
3. DRUM CAN BE CYLINDRICAL OR PARTLY CYLINDRICAL WITH A FLAT SIDE.
4. DRUM SHALL BE MANUFACTURED FROM TOUGH, REBOUNDABLE PLASTIC, MADE OF HIGH DENSITY (HARD) POLYETHYLENE.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE — 1 | MLP | Mar 05

POLYETHYLENE DRUM WITH MARKINGS

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 26.2.0



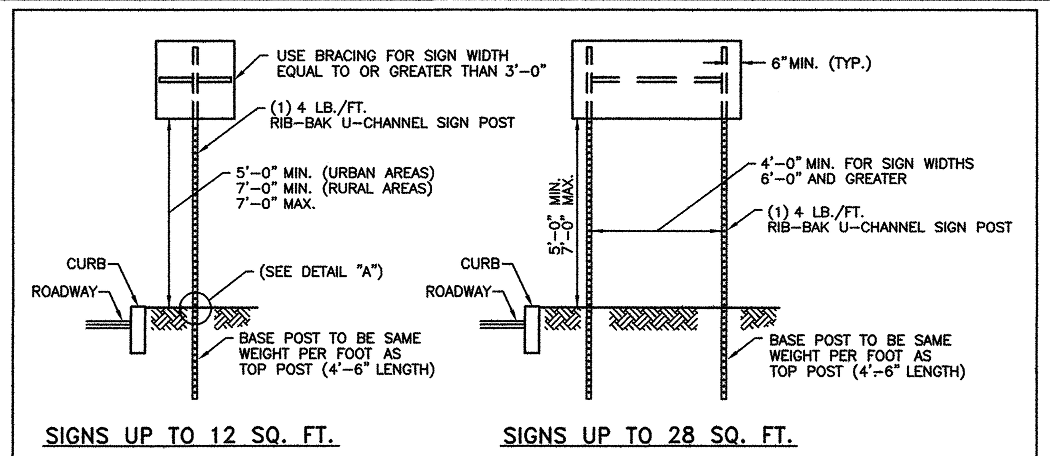
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 923 OF THE R.I. STANDARD SPECIFICATIONS.
2. DIMENSIONS MAY VARY WITH MANUFACTURER'S RECOMMENDATIONS.
3. IN AREAS WHERE POSTED SPEED IS 45 MPH AND OVER ADD A 7 LB. WEIGHTED RING TO EACH CONE.

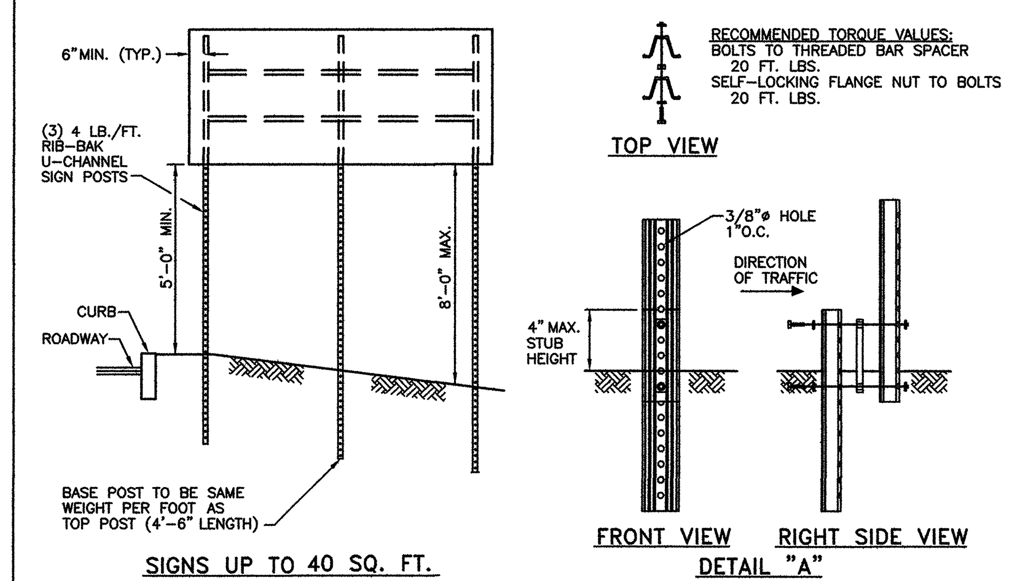
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE — 1 | MLP | Mar 05

FLUORESCENT TRAFFIC CONE

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 26.1.0





INSTALLATION PROCEDURE:
1. REMOVE A SPADE FULL OF SOIL (APPROXIMATELY 2" DEEP) FROM WHERE THE BASE POST WILL BE LOCATED.
2. DRIVE THE BASE POST IN THE CENTER OF THE HOLE JUST CREATED, TO WITHIN 4" OF GRADE LEVEL.
3. PLACE ONE BOLT AND FLAT WASHER IN THE TOP HOLE OF THE BASE POST. (IF THE TOP HOLE ON THE BASE POST, OR THE BOTTOM HOLE ON THE TOP POST IS LESS THAN 3/4" FROM END OF THE POST USE THE SECOND AND SIXTH HOLES.) WITH THE THREADED BAR SPACER ALIGNED WITH TOP HOLE ON THE BACK SIDE OF THE BASE POST, SECURELY TIGHTEN THE BOLT TO 20 FT. LBS. OF TORQUE. REPEAT THIS PROCESS FOR THE LOWER BOLT.
4. NEST THE TOP POST OVER THE PROTRUDING BOLTS ON THE BASE POST. PLACE A SELF-LOCKING FLANGE NUT ON EACH BOLT AND TIGHTEN SECURELY TO 20 FT. LBS. OF TORQUE.
5. REPLACE SOIL REMOVED IN STEP 1.
6. IN TRIPLE POST INSTALLATIONS USING 4 LB./FT. POSTS IN WEAK SOIL, A 1'-0"W x 6"H SOIL PLATE IS REQUIRED.

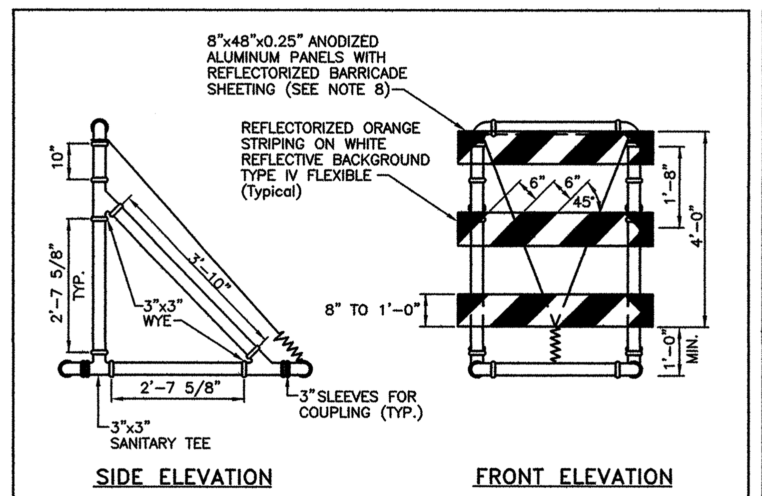
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION T.15 OF THE R.I. STANDARD SPECIFICATIONS.
2. THE SIVER ANODIZED BAR SPACER IS FOR USE WITH 2, 2.5 AND 2.75 LB./FT. RIB-BAK POST GRADE SP-80 ONLY.
3. THE GOLD ANODIZED BAR SPACER IS FOR USE WITH 3 AND 4 LB./FT. RIB-BAK POST GRADE SP-80 ONLY.
4. INSTALLATION PROCEDURES SHALL BE IN ACCORDANCE WITH THE MANUFACTURE'S RECOMMENDATIONS.
5. FOR SIGNS GREATER THAN 40 SQ. FT., REFER TO STD. 30.1.0, 30.1.1, 30.2.0, 30.2.1, 30.3.0, 30.3.1, 30.4.0, 30.4.1, 30.4.2 AND 30.4.3

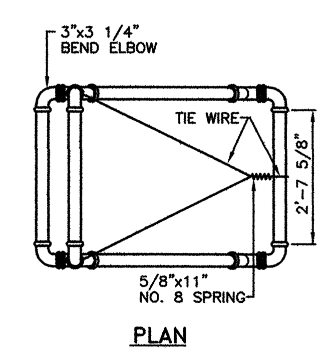
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

SIGN POST SELECTION AND INSTALLATION DETAILS U-CHANNEL POST (SIGNS UP TO 8'-0"Wx4'-0"H)

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 24.2.0





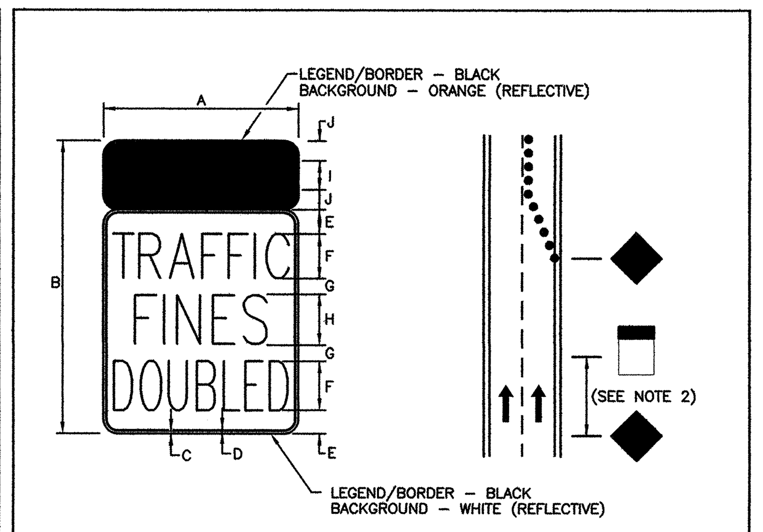
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 923 OF THE R.I. STANDARD SPECIFICATIONS.
2. ALL PIPE SHALL BE POLYVINYL CHLORIDE (PVC) PRESSURE RATED CLASS SDR 21 OR SDR 26 CONFORMING TO ASTM D2241 OR ASTM D2729.
3. JOINT FILLINGS MAY BE PVC-ASTM D 2665 OR ACRYLONITILE BUTADIENE STYRENE (ABS) ASTM D 2661 (DRAINAGE WASTE AND VENT).
4. ALL PIPES SHALL BE WHITE. WHITE FITTINGS ARE PREFERRED, BLACK MAY BE USED.
5. ALL JOINTS SHALL BE FREE TO SEPARATE UPON VEHICLE IMPACT.
6. A FIXED FRANGIBLE PAVEMENT CONNECTION PREFERRED. SAND BAGS MAY BE SUBSTITUTED.
7. STRIPES SHALL BE SLOPED DOWNWARD IN DIRECTION OF TRAFFIC TO PASS.
8. PVC PIPE SHALL BE ULTRAVIOLET LIGHT STABILIZED.
9. ATTACH PANELS WITH 1" NO. 14 PAN HEAD METAL SCREWS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE — 1 | MLP | 3/1/2005

PVC PLASTIC PIPE TYPE III BARRICADE

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 26.3.0



SIGN	DIMENSIONS (INCHES)									
	A	B	C	D	E	F	G	H	I	J
STANDARD	24	36	3/8	5/8	3 1/2	6B	2 1/2	6C	4C	2
RURAL	36	54	5/8	7/8	5	8B	4	8C	6C	3
EXPRESSWAY	48	72	3/4	1 1/4	7	10B	5	10C	8C	5

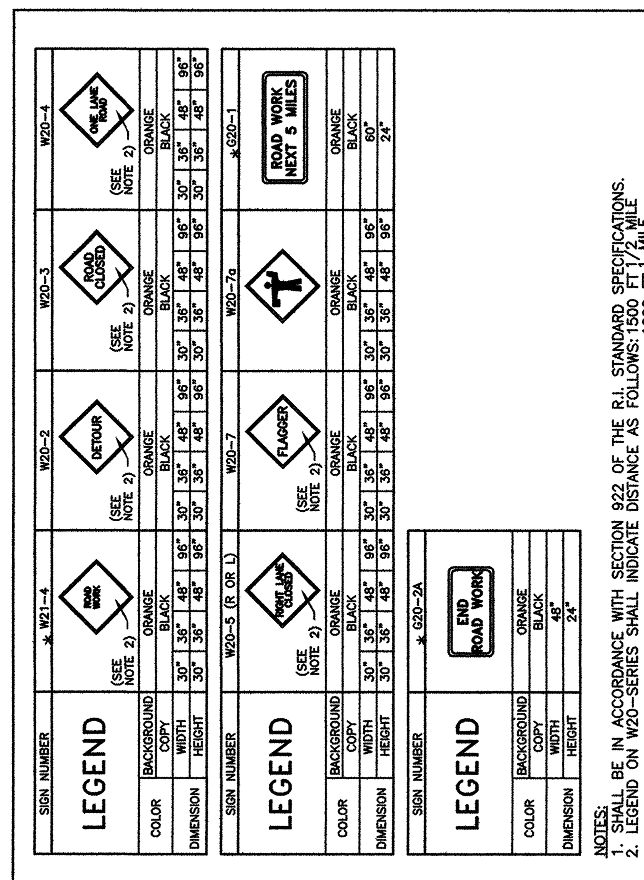
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION T.15 OF THE R.I. STANDARD SPECIFICATIONS.
2. STANDARD: > 50'-0" < 200'-0"
RURAL: > 200'-0" < 400'-0"
EXPRESSWAY: > 400'-0" <800'-0"
3. WHEN INSTALLING ON JERSEY BARRIERS LESS THAN 48" WIDE, A 36"x54" SIGN DIMENSION MAY BE USED.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

TRAFFIC FINES IN WORK ZONE REGULATORY SIGN

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 27.1.1



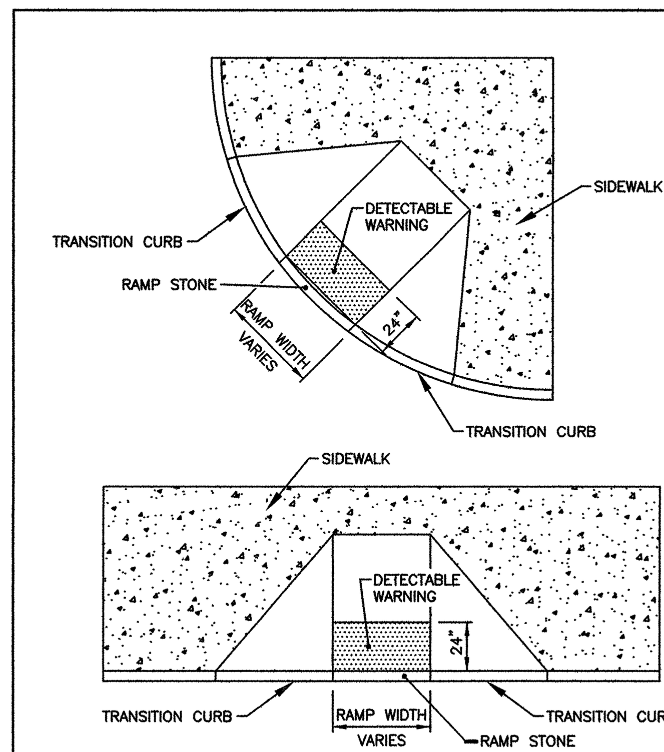
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 922 OF THE R.I. STANDARD SPECIFICATIONS.
2. LEGEND ON W20-SERIES SHALL INDICATE DISTANCE AS FOLLOWS: 1500 FT 1/2 MILE, 1000 FT 1 MILE, 500 FT AHEAD
EXAMPLE: W20-2a = DETOUR 1500 FT
3. ★ DENOTES TYPE V GRADE SHEETING.
4. CONSTRUCTION SIGNS SHALL BE MOUNTED IN ACCORDANCE WITH STD. 24.1.0, 24.2.0 OR 24.3.0.
5. FOR ADDITIONAL SIGNS SEE THE MUTCD.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

CONSTRUCTION SIGNS

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 29.1.0



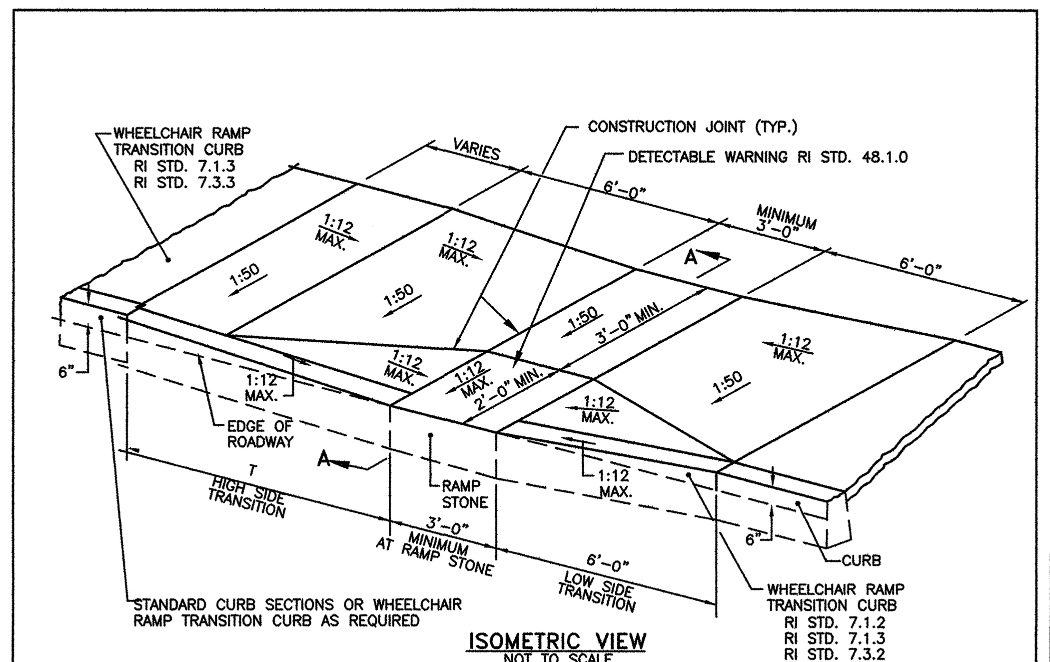
NOTES
1. DETECTABLE WARNING SYSTEM SHALL BE IN ACCORDANCE WITH SECTION 942 OF THE RI STANDARDS SPECIFICATIONS

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

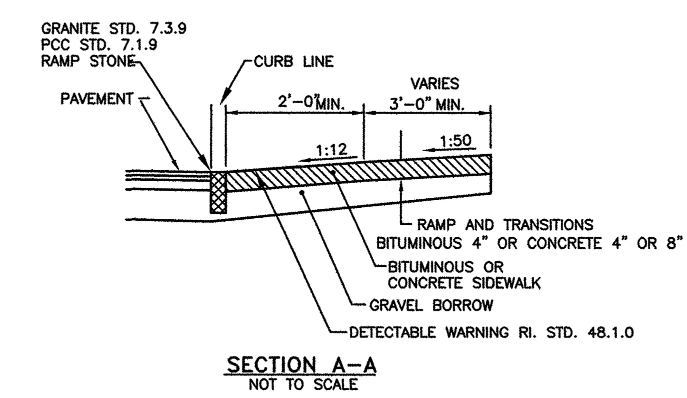
REVISIONS: NO. | BY | DATE — 1 | MLP | March 05

DETECTABLE WARNING SYSTEM

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 48.1.0



ROADWAY PROFILE GRADE	T (FT.)
0.00	6.0
0.01	7.0
0.02	8.0
0.03	9.5
0.04	11.5
0.05	15.0



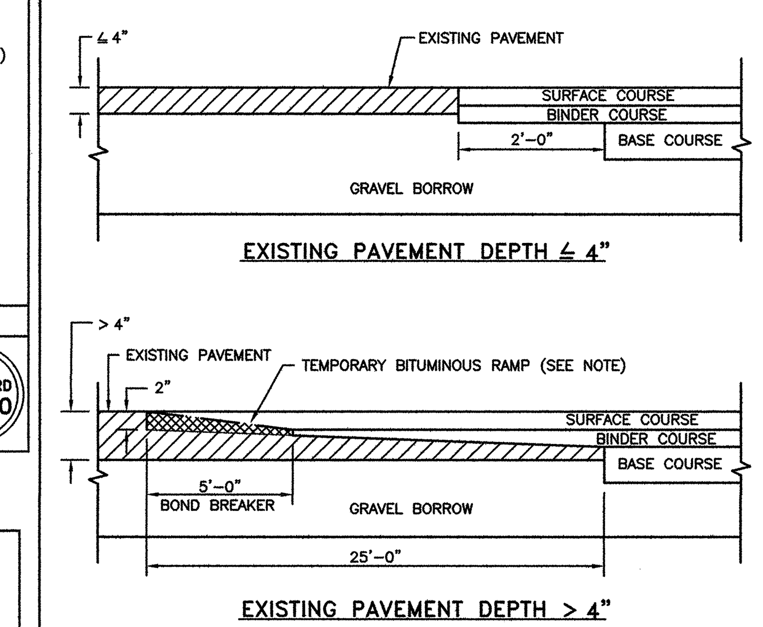
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 905 OF THE R.I. STANDARD SPECIFICATIONS.
2. WHEN ANY OBSTRUCTION LOCATED IN THE SIDEWALK FALLS WITHIN A CROSSWALK AREA, THE WHEELCHAIR RAMP WILL BE PLACED SUCH THAT THE OBSTRUCTION FALLS OUTSIDE OF THE RAMP.
3. AT NO TIME IS ANY PART OF THE WHEELCHAIR RAMP TO BE LOCATED OUTSIDE OF THE CROSSWALK, AND IT IS TO BE CENTERED WHENEVER POSSIBLE.
4. DRAINAGE FACILITIES ARE TO BE LOCATED UP-GRADE OF ALL WHEELCHAIR RAMPS.
5. LOCATION OF WHEELCHAIR RAMPS IS AS SHOWN ON CONTRACT DRAWINGS.
6. IN NO INSTANCE SHALL THE SIDEWALK CROSS SLOPE EXCEED 1:50 EXCEPT WITHIN THE RAMP AREA.
7. AN UNOBSTRUCTED PATH OF TRAVEL WITH A MINIMUM WIDTH OF 3'-0" SHALL BE MAINTAINED.
8. THE WHEELCHAIR RAMP SLOPE AND SIDE SLOPES (TRANSITIONS), MUST NOT EXCEED 1:12. HOWEVER, THESE SLOPES MAY BE FLATTER THAN 1:12 WHEN WARRANTED BY SURROUNDING CONDITIONS.
9. WHERE THE ROAD PROFILE EXCEEDS 5% THE HIGH SIDE TRANSITION LENGTH (T) SHALL BE EIGHTEEN FEET (18'-0").
10. IN NO CASE, WHERE A STOP LINE IS WARRANTED, SHALL A RAMP BE PLACED BEHIND THE STOP LINE.
11. THE ENTRANCE OF THE WHEELCHAIR RAMP SHALL BE FLUSH WITH THE ROADWAY.
12. THE WHEELCHAIR RAMP SHALL BE CENTERED RADIALLY, OPPOSITE THE RADIUS POINT WHEN POSSIBLE.
13. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'-0" (GREATER LENGTHS PREFERRED).
14. ALL REQUIRED CUTTING OF CURB PIECES TO BE PAID FOR UNDER COST OF CURB.
15. DETECTABLE WARNINGS TO BE PAID FOR UNDER SECTION 942 OF THE RI STANDARD SPECIFICATIONS
16. 8" CONCRETE DEPTH FOR RADIUS WHEELCHAIR RAMPS ONLY. USE 4" DEPTH FOR TANGENT (MID BLOCK) LOCATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE — 1 | MLP | Oct 05 — 2 | MLP | 6/27/08

WHEELCHAIR RAMP

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 43.3.0



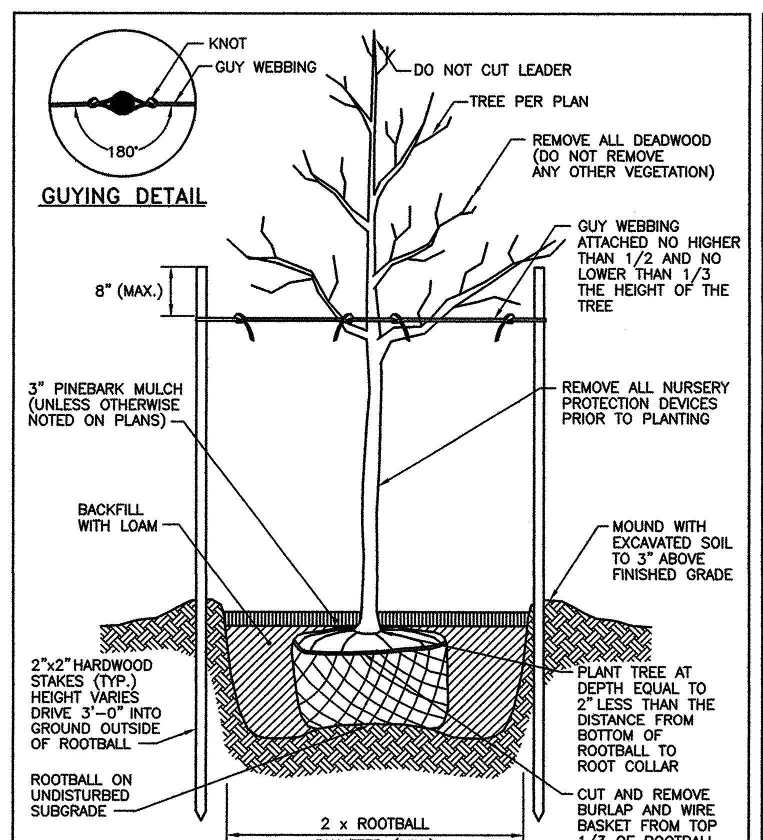
NOTE:
A BOND BREAKER (TAPERED OR EQUIVALENT) WILL BE PLACED 5'-0" FROM THE JOINT AND COVERED WITH THE BINDER COURSE AS THE TEMPORARY RAMP. PRIOR TO PLACING THE SURFACE COURSE, THE BINDER COURSE AND BOND BREAKER WILL BE REMOVED.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

TRANSVERSE PAVEMENT CUT AND MATCH

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 47.1.1



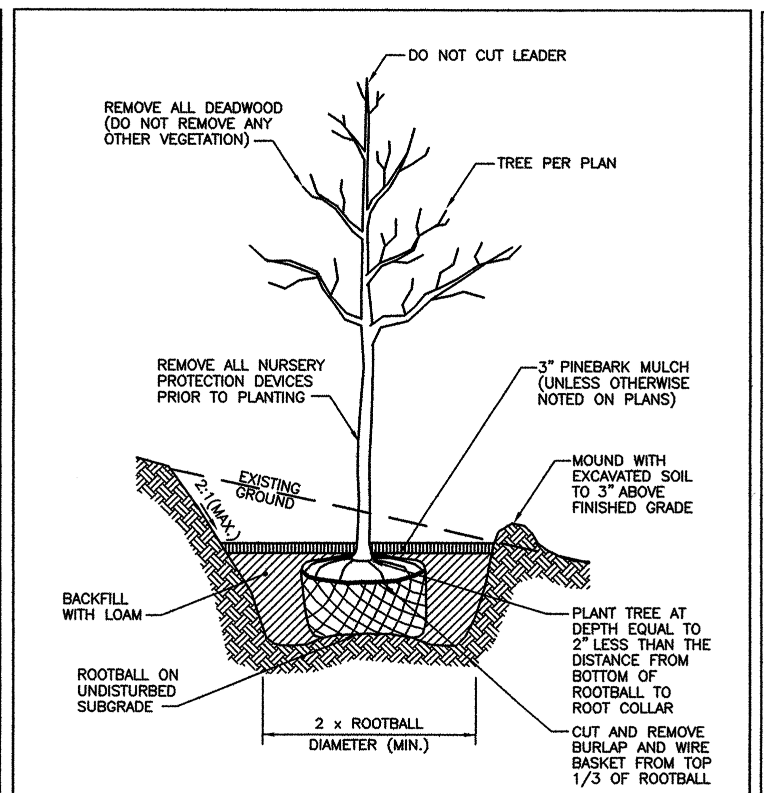
NOTE:
SHALL BE IN ACCORDANCE WITH SECTION L.06 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

LARGE TREE STAKING AND PLANTING DETAIL (2" CALIPER AND GREATER)

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 50.1.0



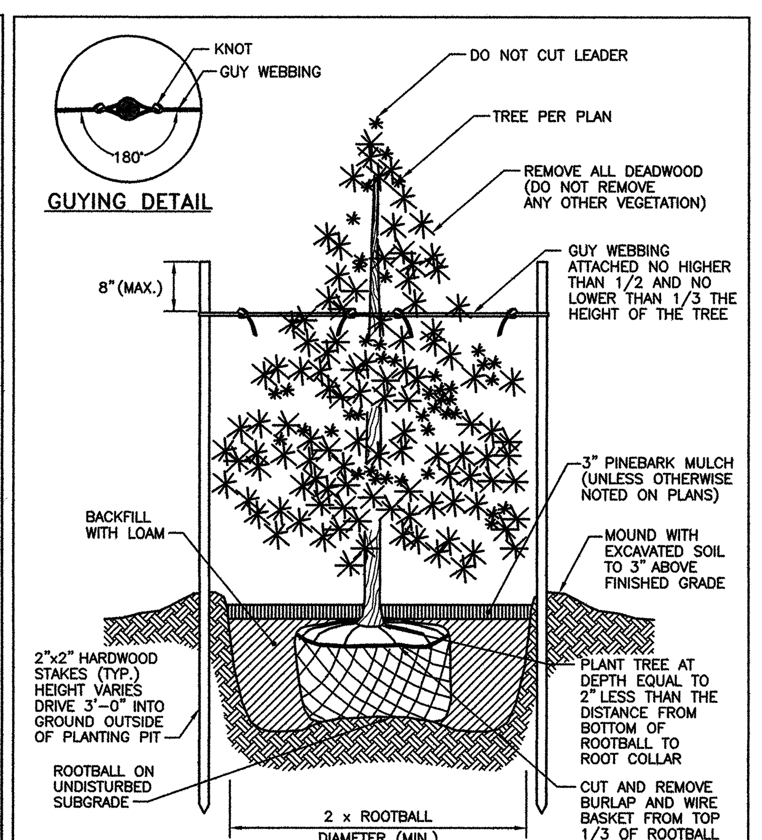
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION L.06 OF THE R.I. STANDARD SPECIFICATIONS.
2. FOR STAKING DETAIL SEE STD. 50.1.0

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

TREE PLANTING ON SLOPE

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 50.1.1



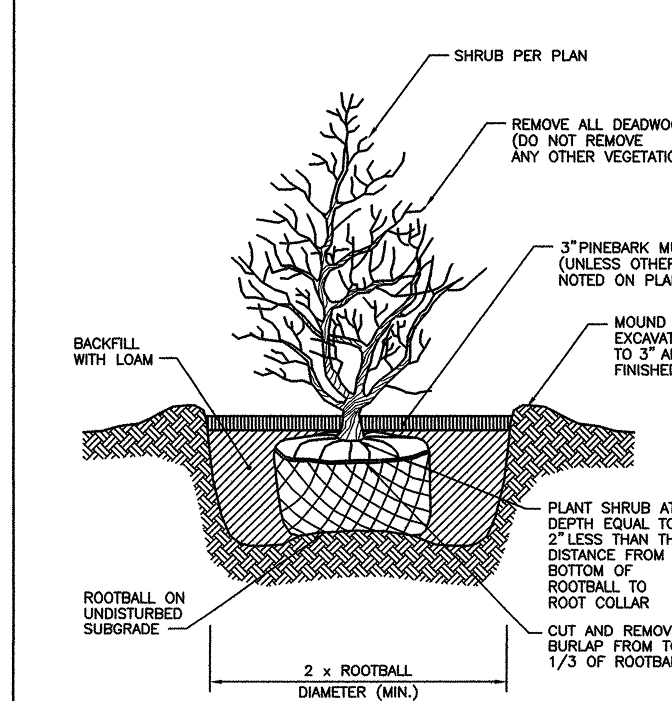
NOTE:
SHALL BE IN ACCORDANCE WITH SECTION L.06 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

EVERGREEN TREE PLANTING DETAIL (4'-0" HIGH AND GREATER)

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 50.2.0



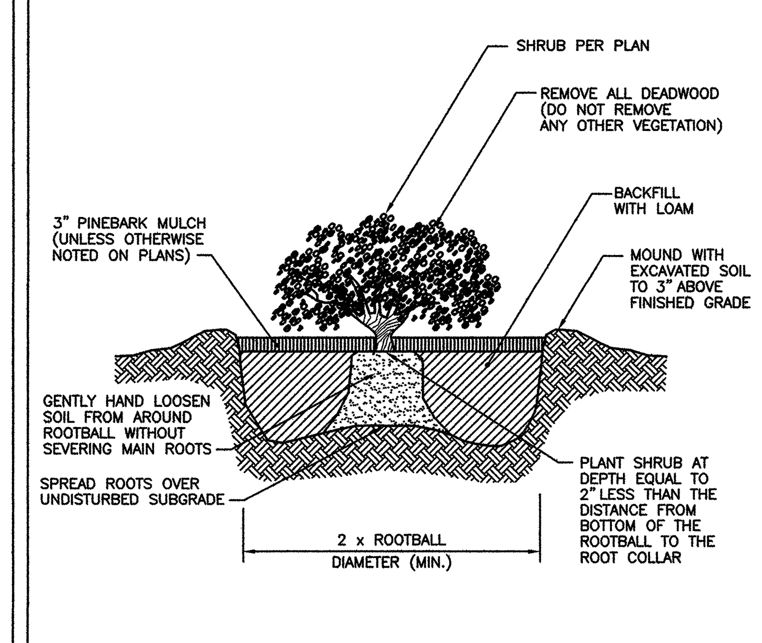
NOTE:
SHALL BE IN ACCORDANCE WITH SECTION L.06 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

BALL AND BURLAP SHRUB PLANTING DETAIL

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 50.3.0



NOTE:
SHALL BE IN ACCORDANCE WITH SECTION L.06 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

REVISIONS: NO. | BY | DATE

CONTAINER GROWN SHRUB PLANTING DETAIL

CHIEF ENGINEER TRANSPORTATION — CHIEF DESIGN ENGINEER TRANSPORTATION — JUNE 15, 1998 ISSUE DATE — R.I. STANDARD 50.3.1

PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER 6/21/12

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

DETAIL - 5

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: AS NOTED

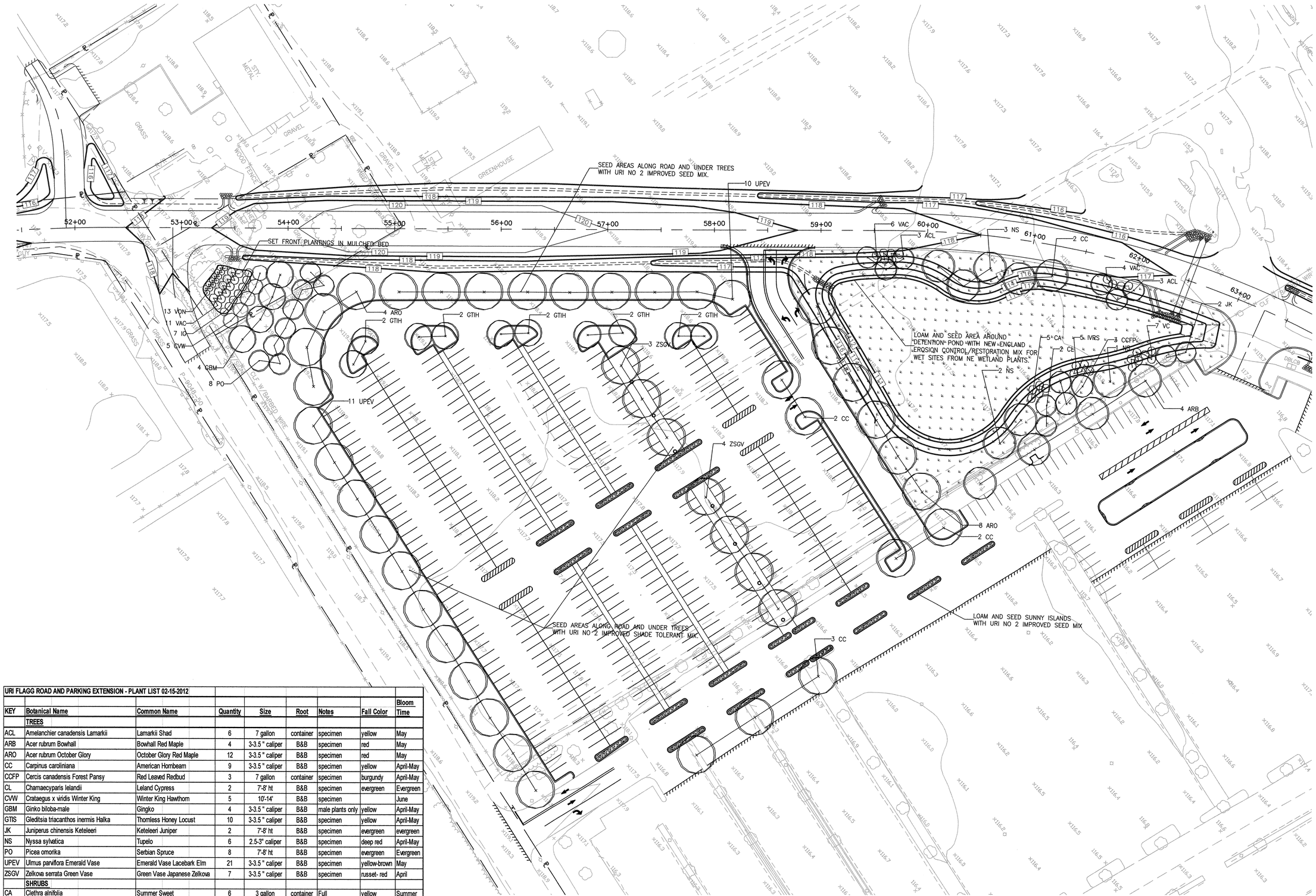
DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER

11

SHEET 11 OF 15



URI FLAGG ROAD AND PARKING EXTENSION - PLANT LIST 02-15-2012								
KEY	Botanical Name	Common Name	Quantity	Size	Root	Notes	Fall Color	Bloom Time
	TREES							
ACL	Amelanchier canadensis Lamarkii	Lamarkii Shad	6	7 gallon	container	specimen	yellow	May
ARB	Acer rubrum Bowhall	Bowhall Red Maple	4	3-3.5 " caliper	B&B	specimen	red	May
ARO	Acer rubrum October Glory	October Glory Red Maple	12	3-3.5 " caliper	B&B	specimen	red	May
CC	Carpinus caroliniana	American Hornbeam	9	3-3.5 " caliper	B&B	specimen	yellow	April-May
CCFP	Cercis canadensis Forest Pansy	Red Leaved Redbud	3	7 gallon	container	specimen	burgundy	April-May
CL	Chamaecyparis lelandii	Leland Cypress	2	7'-8' ht	B&B	specimen	evergreen	Evergreen
CVW	Crataegus x viridis Winter King	Winter King Hawthorn	5	10'-14'	B&B	specimen		June
GBM	Ginko biloba-male	Gingko	4	3-3.5 " caliper	B&B	male plants only	yellow	April-May
GTIS	Gleditsia triacanthos inermis Halka	Thornless Honey Locust	10	3-3.5 " caliper	B&B	specimen	yellow	April-May
JK	Juniperus chinensis Keteleeri	Keteleeri Juniper	2	7'-8' ht	B&B	specimen	evergreen	evergreen
NS	Nyssa sylvatica	Tupelo	6	2.5-3" caliper	B&B	specimen	deep red	April-May
PO	Picea omorika	Serbian Spruce	8	7'-8' ht	B&B	specimen	evergreen	Evergreen
UPEV	Ulmus parvifora Emerald Vase	Emerald Vase Lacebark Elm	21	3-3.5 " caliper	B&B	specimen	yellow-brown	May
ZSGV	Zelkova serrata Green Vase	Green Vase Japanese Zelkova	7	3-3.5 " caliper	B&B	specimen	russet- red	April
	SHRUBS							
CA	Clethra alnifolia	Summer Sweet	6	3 gallon	container	Full	yellow	Summer
IG	Ilex glabra	Inkberry	7	3'-4' ht	B&B	Full	evergreen	Evergreen
IVRS	Ilex verticillata Red Sprite	Red Sprite Dwarf Winterberry	5	3 gallon	container	Full	reddish	Berries
VAC	Viburnum acerfolium	Mapleleaf viburnum	21	3'-4' ht	B&B	Full	reddish	June
VC	Vaccinium corymbosum	High bush Blueberry	7	3'-4' ht	B&B	Full	reddish	June
VON	Viburnum opulus Nanum	European Cranberrybush	13	2'-3' ht	B&B	Full	yellow-red	June

Landscape Architecture
Landscape Ecology
Cultural Landscape Preservation

Landscape Elements, LLC
P.O. Box 1328, Pawcatuck, CT 06379
200 Centerville Road, Warwick, RI 02886
tel: 860-535-9299
fax: 866-203-7686
www.landscapeelementsllc.com

PROJECT
FLAGG ROAD PARKING LOT

TODD RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
LANDSCAPE PLANTING PLAN

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: 1" = 40'

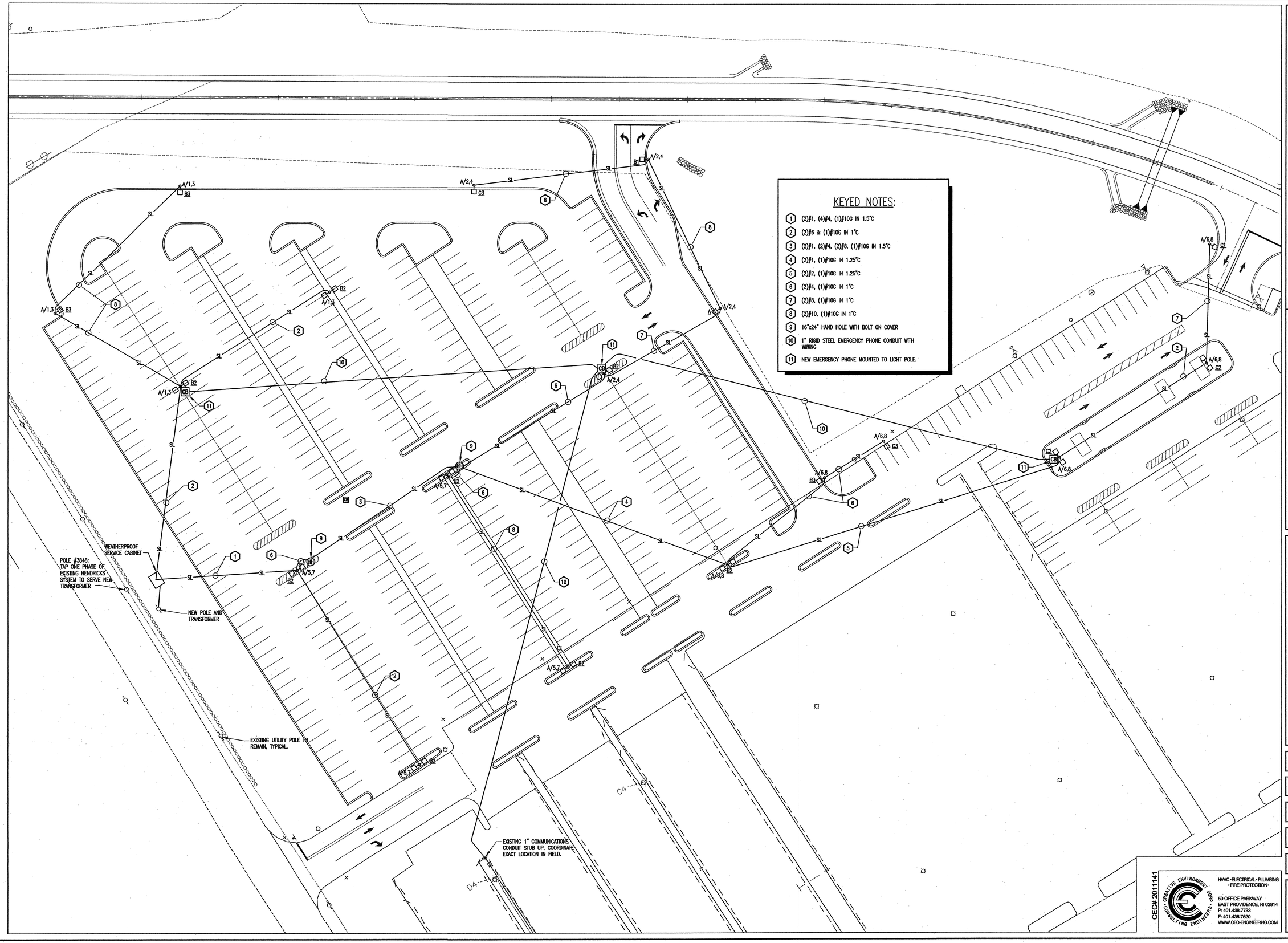
DRAWN BY: EMP

CHECKED BY: EMP

DRAWING NUMBER
12

SHEET 12 OF 15

F:\FILES\CAD\1377\HIGHWAY PLANS\1377 LANDSCAPE - CORRECTED 2-28-12.dwg, Layout1, 6/18/2012 1:59:09 PM, USER07, CanonWIPS-BLK-KMT.pc3, 1:1



KEYED NOTES:

1. (2)#1, (4)#4, (1)#10G IN 1.5"C
2. (2)#6 & (1)#10G IN 1"C
3. (2)#1, (2)#4, (2)#8, (1)#10G IN 1.5"C
4. (2)#1, (1)#10G IN 1.25"C
5. (2)#2, (1)#10G IN 1.25"C
6. (2)#4, (1)#10G IN 1"C
7. (2)#8, (1)#10G IN 1"C
8. (2)#10, (1)#10G IN 1"C
9. 16"x24" HAND HOLE WITH BOLT ON COVER
10. 1" RIGID STEEL EMERGENCY PHONE CONDUIT WITH WIRING
11. NEW EMERGENCY PHONE MOUNTED TO LIGHT POLE.

PROJECT

FLAGG ROAD PARKING LOT

PETER D. DISPIGNO
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL
7230
3/9/12

CLIENT

UNIVERSITY OF RHODE ISLAND

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

ELECTRICAL SITE LIGHTING PLAN

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 8, 2012

SCALE: AS NOTED

DRAWN BY: JR

CHECKED BY: PDS

DRAWING NUMBER

E-1

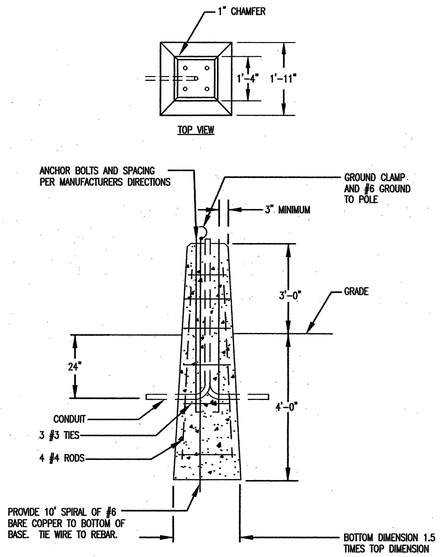
SHEET 1 OF 3

CEC# 2011141

CREATIVE ENVIRONMENT CORP. CONSULTING ENGINEERS

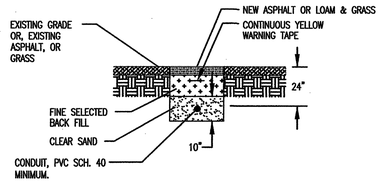
HVAC-ELECTRICAL-PLUMBING
-FIRE PROTECTION-

50 OFFICE PARKWAY
EAST PROVIDENCE, RI 02914
P: 401.438.7733
F: 401.438.7620
WWW.CEC-ENGINEERING.COM



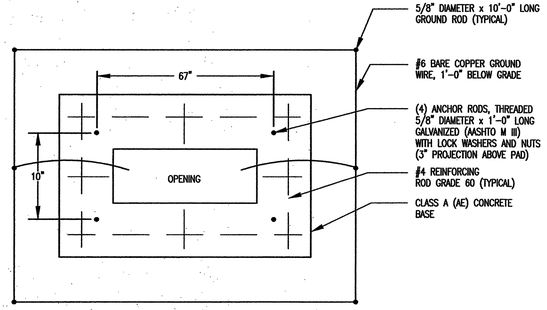
POLE BASE DETAIL

NTS

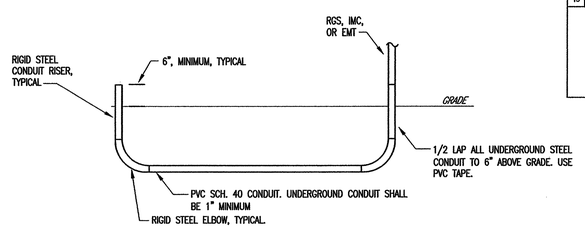


TRENCH DETAIL

NTS



FOUNDATION PLAN

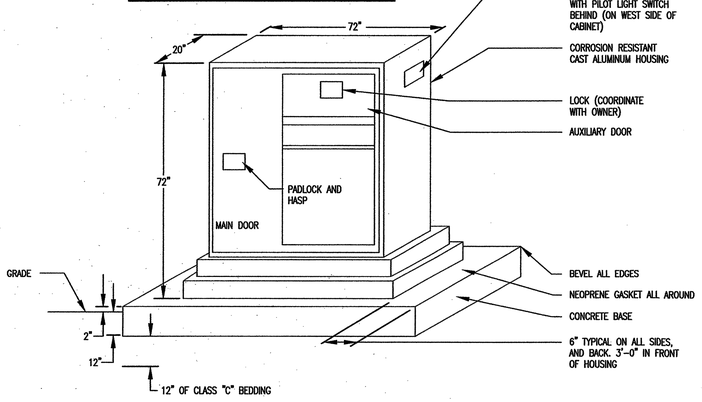


UNDERGROUND CONDUIT DETAIL, TYPICAL

NTS

PEDESTAL NOTE:

HOUSING TO CONTAIN POWER COMPANY METERING, PANELBOARD, 3/4" THICK MARINE GRADE PLYWOOD MOUNTING BACKBOARD, METER TROUGH, AND ALL OTHER EQUIPMENT INDICATED ON PLANS. TAP BASE TO ACCEPT ALL CONDUITS. (CABINET DIMENSIONS SHOWN ARE MINIMUM.)



ELEVATION

SERVICE PEDESTAL DETAIL

NTS

ELECTRICAL SYMBOL LEGEND

LIGHTING & POWER

- POLE MOUNTED LIGHTING
- SL — SITE LIGHTING WIRING, 24" BELOW GRADE
- HH — HAND HOLE
- CB — EMERGENCY CALL PHONE
- TELEPHONE POLE
- QUADRUPLEX RECEPTACLE MTD 18" A.F.F. TO CENTER.

ABBREVIATIONS

A	AMPS
C	CONDUIT
G	GROUND
kW	KILOWATT
MTD	MOUNTED
N	NEUTRAL
NTS	NOT TO SCALE
P	POLE
PH	PHASE
TEL	TELEPHONE
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
V	VOLT
W	WATT
W/	WITH

NOTES

1. DISCONNECT, REMOVE, AND MAKE SAFE ALL CONDUIT AND WIRING NOT IN SERVICE.
2. VERIFY ALL EQUIPMENT NAMEPLATE LOADS AND INSURE PROPER SIZING OF CONDUCTORS AND OVERCURRENT PROTECTION. NOTIFY ENGINEER OF DISCREPANCIES.
3. USE #10 CONDUCTORS FOR ALL HOMERUNS OVER 100 FEET IN LENGTH.
4. BALANCE THE PHASES IN EACH ELECTRICAL PANEL.

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	MOUNTING	LAMPS WATTS	LAMPS TYPE	REMARKS
A	KIM LIGHTING 1A/AR2/400PMH208/CTM/HS	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
B1	KIM LIGHTING 1A/AR2/400PMH208/CTM	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
B2	KIM LIGHTING 2B/AR3/400PMH208/CTM/HS	POLE	(2) 400W	MH	DOUBLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
B3	KIM LIGHTING 1A/AR3/400PMH208/CTM/HS	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
C1	KIM LIGHTING 1A/AR4/400PMH208/CTM	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
C2	KIM LIGHTING 2B/AR4/400PMH208/CTM	POLE	(1) 400W	MH	DOUBLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
C3	KIM LIGHTING 1A/AR4/400PMH208/CTM/HS	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT

LIGHTING FIXTURE SCHEDULE NOTES:

1. PROVIDE ALL LAMPS FOR ALL LIGHTING FIXTURES. LAMP COLOR SHALL BE 3000K.
2. PROVIDE VALMONT LIGHT POLE, MODEL #: 2500-6060S4 FOR EACH LIGHT FIXTURE. COLOR TO MATCH EXISTING LIGHT POLES IN ADJOINING LOT.

PANEL: A — 150 A 240/120 V 3PH 4W 60HZ

22,000 AIC
CIRCUITS: 16
BUS RATING: 150A

MAIN LUG ONLY
MAIN CIRCUIT BREAKER X
SURFACE MOUNTED X
FLUSH MOUNTED
FLOOR MOUNTED

NOTE	DESCRIPTION
A	AFCI
G	GFCI - 5mA TRIP
P	GFPE - 30 mA TRIP
S	SHUNT TRIP
L	LOCK ON
IG	ISOLATED GROUND
C	VIA LIGHTING CONTROL PANEL

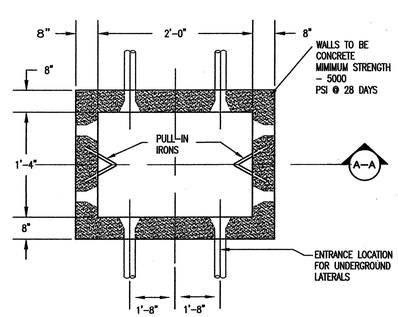
SHUNT TRIP MAIN
200% RATED NEUTRAL
ISOLATED GROUND
FEED THRU LUGS
100% RATED MAIN BREAKER
GROUND FAULT MAIN C.B.

CKT No.	Load Type	LOAD DESCRIPTION	Note	WIRE SIZE	LOAD kVA	CIRCUIT BREAKER 20/1	CIRCUIT BREAKER 30/2	CKT No.	Load Type	LOAD DESCRIPTION	Note	WIRE SIZE	LOAD kVA	CIRCUIT BREAKER 20/1	CIRCUIT BREAKER 30/2
1	L	SITE LIGHTING		6	3.1	1		2	L	SITE LIGHTING		4	2.6	1	
3								4							
5	L	SITE LIGHTING		4	4.2	1		6	L	SITE LIGHTING		1	4.7	1	
7								8							
9	R	RECEPTACLE				1		10		SPACE					
11	N	TIMECLOCK		12	0.2	1		12							
13		SPACE						14		SPACE					
15								16							

			Connected Load	14.6	KVA
R	Receptacle Load	0.0 KVA	Noncontinuous	0.0	KVA
L	Lighting Load	14.6 KVA	Continuous	18.3	KVA
M	Mechanical and Power Load	0.0 KVA	Noncontinuous	0.0	KVA
			TOTAL LOAD	18.3	KVA

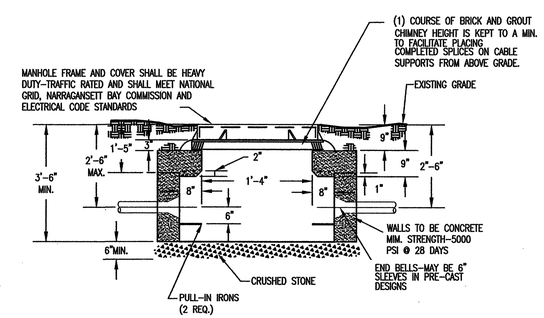
CIRCUIT BREAKER SIZE	20/1	30/2						
CIRCUIT BREAKER COUNT	2	4	0	0	0	0	0	0

AMPERAGE: 76 AMP



HAND HOLE - DETAIL

NTS



HAND HOLE - DETAIL A-A

NTS

PROJECT
FLAGG ROAD PARKING LOT

PETER D. DIGIANO
No. 7230
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL

CLIENT
UNIVERSITY OF RHODE ISLAND

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

ELECTRICAL SYMBOL LEGEND, SCHEDULES & DETAILS

NO.	DATE	REVISIONS	BY
1	6/25/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 8, 2012

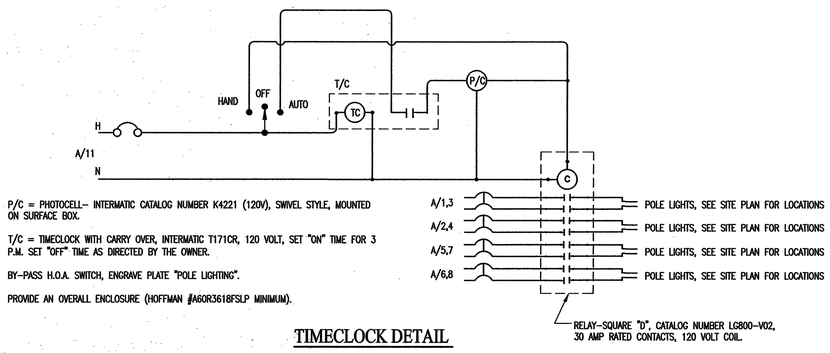
SCALE: AS NOTED

DRAWN BY: JR

CHECKED BY: PDS

DRAWING NUMBER
E-2
SHEET 2 OF 3

CEC# 2011141
CREATIVE ENVIRONMENT CORP. CONSULTING ENGINEERS
HVAC-ELECTRICAL-PLUMBING
-FIRE PROTECTION-
50 OFFICE PARKWAY
EAST PROVIDENCE, RI 02914
P: 401.438.7733
F: 401.438.7620
WWW.CEC-ENGINEERING.COM



P/C = PHOTOCELL- INTERMATIC CATALOG NUMBER K4221 (120V), SWIVEL STYLE, MOUNTED ON SURFACE BOX.

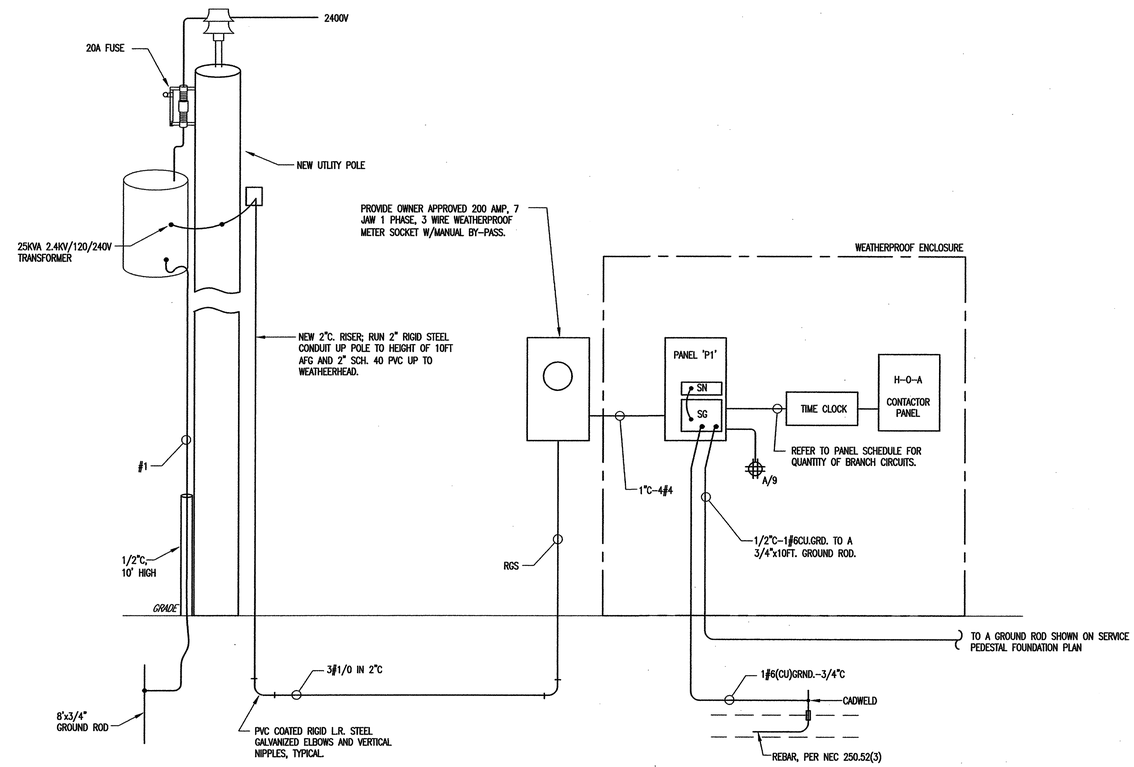
T/C = TIMECLOCK WITH CARRY OVER, INTERMATIC T171CR, 120 VOLT, SET "ON" TIME FOR 3 P.M. SET "OFF" TIME AS DIRECTED BY THE OWNER.

BY-PASS H.O.A. SWITCH, ENGRAVE PLATE "POLE LIGHTING".

PROVIDE AN OVERALL ENCLOSURE (HOFFMAN #A60R3618FSLP MINIMUM).

TIMECLOCK DETAIL

NTS



ELECTRICAL SERVICE/DISTRIBUTION SCHEMATIC

NTS

PROJECT

FLAGG ROAD PARKING LOT

PETER D. DISPONZIO
No. 7230
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL

CLIENT

UNIVERSITY OF RHODE ISLAND

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

ELECTRICAL DETAILS

NO.	DATE	REVISIONS	BY
1	6/21/12	NEW SHEET	TAR

PROJECT NO.: 1377

DATE: MARCH 8, 2012

SCALE: AS NOTED

DRAWN BY: JR

CHECKED BY: PDS

DRAWING NUMBER

E-3

SHEET 3 OF 3

CEC# 2011141
CREATIVE ENVIRONMENT CORP. CONSULTING ENGINEERS
HVAC-ELECTRICAL-PLUMBING
-FIRE PROTECTION-
50 OFFICE PARKWAY
EAST PROVIDENCE, RI 02914
P: 401.438.7733
F: 401.438.7620
WWW.CEC-ENGINEERING.COM

DOCUMENT 00410 - BID FORM

Date: _____

To: Rhode Island Department of Administration, Division of Purchases
One Capitol Hill, Providence, RI 02908

Project: Flagg Road Extension
University of Rhode Island, Kingston Campus

Submitted by: _____
(include address,
tel. & FAX nos., _____
and license no.
if applicable) _____

1. BID (CONSTRUCTION OF FLAGG ROAD EXTENSION - Base Bid)
Having examined the Place of The Work and all matters referred to in the Bid Documents and in the Contract Documents prepared by Gordon R. Archibald, Inc., Civil and Environmental Engineers for the above mentioned project, we, the undersigned, hereby offer to enter into a Contract to perform the Work for the Sum of:

_____($ _____.)
(written, and numerically)

- We have included the specified Allowances from Section 01200 in Division 1 of the Specifications in the above Bid sum as follows:

Allowance (Electrical and Overhead Utility Relocations)	$100,000.00
Allowance (Soil Testing)	$10,000.00
Allowance (Irrigation System Relocation)	$10,000.00
Total Allowances	$120,000.00

- We have included the required Bid security in the above Bid Sum. We have included 100% Payment and Performance Bonds in the above Bid Sum.

- We have included the original Bid and required additional **"public copy"** if required by Document 00210 – Supplemental Instructions to Bidders.

2. ALTERNATES

We propose to modify the above Base Bid Sum by the following amount(s) as identified by the numbered Alternative specified in Section 01200 of the Specifications:

Add Alternate No. 1: Demolition of the Greenhouse Structure and Foundations, Complete

Add:_____($_____)
(written, and numerically

We propose to modify the above Base Bid Sum by the following amount(s) as identified by the numbered Alternative specified in Section 01200:

Add Alternate No. 2: Construction of Flagg Road Parking Lot, Complete

Add:_____($_____)
(written, and numerically

3. UNIT PRICES

Deleted.

4. ACCEPTANCE

This offer shall be open to acceptance and is irrevocable for sixty days from the bid closing date.

If this bid is accepted by the Owner within the time period stated above, we will:

- Proceed under the Agreement, subject to compliance with required State regulatory agency approvals as described in the Bid Documents.
- Furnish the required bonds in compliance with amended provisions of the Instructions to Bidders.
- Commence work within seven days after receipt of a Purchase Order from URI Purchasing.

If this bid is accepted within the time stated, and we fail to commence the Work, or we fail to provide the required Bonds, the security deposit shall be forfeited to the Owner by reason of our failure, limited in amount to the lesser of the face value of the security deposit or the difference between this bid and the bid upon which a Contract is signed.

In the event our bid is not accepted within the time stated above, the required security deposit shall be returned to the undersigned, in accordance with the provisions of the Instructions to Bidders; unless a mutually satisfactory arrangement is made for its retention and validity for an extended period of time.

5. CONTRACT TIME

If this Bid is accepted, we will achieve Substantial Completion of the Work with 335 calendar days and in accordance with Section 00710, Article 2 - Time of Completion. We have included all premium time or additional staffing required to accommodate this schedule.

6. LIQUIDATED DAMAGES

Time is of the Essence: If we fail to achieve certification of Substantial Completion at the expiration of the agreed upon Contract Time indicated above, we acknowledge that we will be assessed Liquidated Damages for each calendar day the project continues to be in default of Substantial Completion, as follows:

$ 1,000 per calendar day

7. REQUIREMENT FOR LICENSE NUMBER

In compliance with the requirements of Rhode Island General Law, Section 5-65-23, my Rhode Island license number for the work to be performed by this firm as prime contractor is:

LICENSE NUMBER: _____ .

8. ADDENDA

The following Addenda have been received. The modifications to the Bid Documents noted below have been considered and all costs are included in the Bid Sum.

Addendum No. 1 dated: June 21, 2012

9. BID FORM SIGNATURE(S)

_____

(Bidder's name)

By: _____

Title: _____

Corporate Seal:

END OF DOCUMENT

DOCUMENT 00710 – SUPPLEMENTAL GENERAL CONDITIONS

TABLE OF ARTICLES

1. DEFINITION OF ENTITIES
2. TIME OF COMPLETION
3. LIQUIDATED DAMAGES
4. MBE REQUIREMENTS
5. LABOR LAWS
6. WAGE RATES
7. ADDITIONAL CONTRACT DOCUMENTS
8. BONDING REQUIREMENTS
9. PROJECT MANAGER FORM
10. OTHER REQUIREMENTS

ARTICLE 1 – DEFINITION OF ENTITIES

1.1 OWNER: The Rhode Island Board of Governors for Higher Education,
University of Rhode Island, and the State of Rhode Island
Office of Capital Projects, URI
Sherman Building, 523 Plains Road, Kingston RI 02881
Attn. Mr. Paul DePace, 401.874.2725

1.2 PURCHASER: Rhode Island Department of Administration, Division of Purchases
One Capitol Hill, Providence, RI 02908

1.3 DESIGN AGENT: Office of Capital Projects, University of Rhode Island

1.4 CONSULTANTS: Gordon R. Archibald, Inc. Civil and Environmental Engineers

1.5 PROJECT: Flagg Road Extension

ARTICLE 2 – TIME OF COMPLETION

2.1 The length of time available for construction shall be 335 Calendar days from the date of the URI Purchase Order until Substantial Completion. The Contractor shall also meet the following completion date.

Flagg Road shall be operational within 180 days from the date of the URI Purchase Order. The first course of pavement with interim markings shall be in place and the roadway opened for traffic.

These are the dates to which liquidated damages apply and may only be adjusted as provided for in the Contract Documents. Contractor shall be responsible for completing the submittals required for issue of a Purchase Order in a timely manner. No extension will be granted for Purchasing delays.

ARTICLE 3 – LIQUIDATED DAMAGES

3.1 The amount payable by the Contractor to the Owner in liquidated damages shall be:

$1,000 per calendar day

ARTICLE 4 – MBE REQUIREMENTS

4.1 This project is subject to terms, conditions and provisions of the Rhode Island General Laws Chapter 37-14.1 et. Seq, and regulations promulgated there under, which require that ten percent (10%) of the dollar value of work performed on the project be performed by minority business enterprises.

ARTICLE 5 – LABOR LAWS

5.1 Attention is called to a new requirement within RIGL 37 for apprenticeship training. RIGL 37-13-3.1 State public works contract apprenticeship requirements states:

> "(a) Notwithstanding any laws to the contrary, all general contractors and subcontractors who perform work on any public works contract awarded by the state after passage of this act and valued at one million dollars ($1,000,000) or more shall employ apprentices required for the performance of the awarded contract. The number of apprentices shall comply with the apprentice to journeyman ratio for each trade approved by the Apprenticeship Council of the Department of Labor and Training."

ARTICLE 6 – WAGE RATES

6.1 Prevailing wage rates to be paid under the Contract for this project must be in accordance with those prevailing wages on file in the Rhode Island Department of Labor, Office of the Director. Labor rates that are revised by the Dept. of Labor during the course of this project must be utilized for succeeding work on this project.

ARTICLE 7 – ADDITIONAL CONTRACT DOCUMENTS

7.1 Deleted.

7.2 The following documents, bound herein following Document 00711, will apply to all of the work of this project and are hereby incorporated:

URI Sexual Harassment Policy
Manual for Construction Project Safety Procedures
Hot Work Procedure
Managing Fire Protection System Impairment
URI Water System Regulations/Policies

7.3 The Purchase Order from URI for this work is also a Contract Document, including its Terms and Conditions and other documents referenced therein, such as the Bid Form from the Contractor.

ARTICLE 8 – BONDING REQUIRMENTS

8.1 100% Payment and Performance Bonds will be required for this Project. The Contractor shall furnish bonds covering the faithful performance of the Contract and Payment of all obligations arising

thereunder. Bonds may be secured through a federally-listed surety company licensed to do business in the State of Rhode Island.

8.2 The Bidder shall deliver the required bonds to the Owner prior to the date of execution of the Contract.

8.3 Unless otherwise provided, the bonds should be written on the Owner's version of Performance Bond and Payment Bond, a copy of which is bound herein in Document 00610 – Performance Bond; Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

8.4 The bonds shall be dated before the date of the Contract.

8.5 The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

ARTICLE 10 – PROJECT MANAGER FORM

9.1 This project will use project management forms as described in the General Conditions.

ARTICLE 11 – OTHER REQUIREMENTS

10.1 Permit Applications in Appendix B

END OF DOCUMENT

SECTION 01100 - SUMMARY

PART 1 - GENERAL

1.01 PROJECT

A. See Supplemental General Conditions for official Project Information.

B. The Project consists of the following types of work:
   1. Site mobilization and demolition
   2. Erosion controls
   3. Earth excavation
   4. Pipe installation
   5. Construction of drainage catch basins and manholes
   6. Stormwater detention systems
   7. Parking lot pavement construction
   8. Trimming and fine grading of subgrade
   9. Gravel borrow subbase course
   10. Bituminous concrete base and surface courses including permeable pavement
   11. Pavement markings
   12. Loam and seeding
   13. Landscaping
   14. Police Protection by the Town of South Kingstown
   15. Lighting, Security Equipment & Cameras

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00520 - Agreement.

1.03 DESCRIPTION OF WORK

A. Scope of alterations work is shown on drawings and/or as specified herein.

1.04 OWNER OCCUPANCY/SCHEDULE

A. Owner intends to partially occupy the parking facility. Work areas will be made available as mutually agreed to during project scheduling. The work area shall be divided into minimum of 2 zones.

B. Work to begin within 7 days of receipt of Purchase Order.

D. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings. Coordinate with Attachment A following this section. Include all costs of this coordination, including all premium time wages that may be required to meet these requirements, in the Base bid.

B. Arrange use of site and premises to allow:

1. Adjacent projects to progress as planned for the Owner.
2. Use of street and adjacent properties by the Public.
3. Continued operation of the facility in accordance with Attachment A.

C. Provide access to and from site as required by law and by Owner:
1. Maintain appropriate egress for workforce and users of the facility.
2. Do not obstruct roadways, sidewalks, or other public ways without permit. Provide necessary signage and barriers to direct pedestrians around work areas.

D. Time Restrictions:
1. Night and weekend work is not allowed.

E. Utility Outages and Shutdown:
1. Do not disrupt or shut down life safety systems, including but not limited to fire sprinklers and fire alarm system, without 7 days notice to Owner and authorities having jurisdiction.
2. Prevent accidental disruption of utility services to other facilities.
3. Contractor to provide written notification on Fire Sprinkler and Alarm System Impairment Notification Form following this section as Attachment B.

1.06 ITEMS TO BE SALVAGED

A. Deleted.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION – NOT USED

END OF SECTION

SECTION 01200 - PRICE AND PAYMENT PROCEDURES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Cash allowances.

B. Contingency allowances.

C. Testing and inspection allowances.

D. Schedule of values.

E. Applications for payment.

F. Warranty inspection retainage.

G. Sales tax exemption.

H. Change procedures.

I. Defect assessment.

J. Unit prices.

K. Alternates.

1.02 CASH ALLOWANCES

A. See General Conditions Article 3.8 for Cash Allowance provisions.

B. Design Agent Responsibility:
1. Consult with Contractor for consideration and selection of products, suppliers, and Installers.
2. Select products in consultation with Owner and transmit decision to Contractor.
3. Prepare Change Order to adjust final cost.

C. Contractor Responsibility:
1. Assist Design Agent or its Consultants in selection of products, suppliers and installers.
2. Obtain proposals from suppliers and installers, and offer recommendations.
3. On notification on selection by Design Agent, execute purchase agreement with designated supplier and installer.
4. Arrange for and process shop drawings, product data, and samples. Arrange for delivery.
5. Promptly inspect products upon delivery for completeness, damage, and defects. Submit claims for transportation damage.

D. Schedule of Cash Allowances: See Attachment A.

1.03 CONTINGENCY ALLOWANCES

A. See General Conditions Article 3.8 for Contingency Allowance provisions.

B. Schedule of Contingency Allowances: See Attachment A.

1.04 TESTING AND INSPECTION ALLOWANCE

A. All costs of testing are included in the Base Bid. There is no testing allowance.

1.05 SCHEDULE OF VALUES

A. Submit Schedule of Values in duplicate, one copyrighted original and one copy.

B. Format: Utilize the Table of Contents of this Project Manual. Identify each line item with number and title of the major specification Section. Identify site mobilization, bonds, insurance and closeout.

C. Include in each line item, the amount of Allowances specified in this Section. For unit cost Allowances, identify quantities taken from Contract Documents multiplied by the unit cost to achieve the total for the item.

D. Include separately for each line item, a direct proportional amount of Contractor's overhead and profit.

E. Revise schedule to list approved Change Orders, with each Application for Payment.

1.06 APPLICATIONS FOR PAYMENT

A. Submit each application on an original AIA Form G702 - Application and Certificate for Payment and AIA G703 - Continuation Sheet, accompanied by three copies.
   1. Prepare a draft version “pencil copy” of each application and distribute via email 5 days prior to due date for review by Design Agent and Owner’s representative.
   2. After making agreed revisions, individually sign and notarize and emboss with notary's official seal, the original and each of the three copies. Deliver to Owner’s representative for further processing and distribution.
   3. Applications not including original copyrighted AIA G702, and G703 Forms, will be rejected, and returned for re-submittal.
   4. Applications not properly signed and notarized will be rejected, and returned for re-submittal.
   5. Applications submitted without the following items described in this section will be returned for resubmittal.

B. Content and Format: Utilize Schedule of Values for listing items in Application for Payment.

C. Provide one hard copy and one copy in disc form of the updated construction schedule with each Application for Payment submission, prepared per Section 01330.
   1. Provide a statement signed by the Contractor's firm principal certifying that there are no unidentified outstanding claims for delay.

D. Include with each monthly Application for Payment, following the first application, Certified Monthly Payroll Records with proper compliance cover sheet for the previous month's pay period. See Attachment A this section for current State and Federal requirements.

E. Submit with transmittal letter as specified for Submittals in Section 01330.

F. Beginning with the second Application for Payment, Contractor's right to payment must be substantiated by documenting, on a copy of the URI Waiver of Lien Form included in Document 00614 - Waiver of Lien Form in this Project Manual, that payment monies due, less retainage not exceeding ten percent, have been paid in full to subcontractor and suppliers for work, materials, or rental of equipment billed for under specific line item numbers in the immediately preceding application.

G. Substantiating Data: When the Owner or Design Agent requires additional substantiating information from the review of the “pencil copy”, submit data justifying dollar amounts in question.

H. In addition to the items above, include the following with the Application for Payment :
   1. Record Documents as specified in Section 01780, for review by the Owner which will be returned to the Contractor.
   2. Affidavits attesting to off-site stored products with insurance certificates as requested.
   3. Digital Photographs as specified in Section 01330. Include on same disc with construction schedule.

I. Payment Period: Submit at monthly intervals unless stipulated otherwise in the Supplemental General Conditions.

1.07 WARRANTY INSPECTION RETAINAGE

A. A percentage of job cost as defined in Attachment A will be retained from Final Payment for a duration of ten months. If, after ten months, all systems including mechanical and electrical, are determined by the Owner to be properly functioning, the Warranty Inspection Retainage will be released.

B. If, after ten months, there are found to be modifications, adjustments, or corrections necessary to be made to address any system or product malfunction, in order to fulfill specified performance or requirements of such systems or products, release of the warranty inspection retainage will be delayed until such malfunctions are rectified.

C. If, after twelve months from the date of Final Completion, all systems have not been fully addressed, the Owner may utilize the Warranty Inspection Retainage to hire others to execute necessary modifications, adjustments, or corrections.

1.08 SALES TAX EXEMPTION

A. Owner is exempt from sales tax on products permanently incorporated in Work of the Project.
   1. Obtain sales tax exemption certificate number from Owner.
   2. Place exemption certificate number on invoice for materials incorporated in the Work of the Project.
   3. Furnish copies of invoices to Owner.
   4. Upon completion of Work, file a notarized statement with Owner that all purchases made under exemption certificate were entitled to be exempt.
   5. Pay legally assessed penalties for improper use of exemption certificate number.

1.09 CHANGE PROCEDURES

A. Submittals: Submit name of the individual authorized to receive change documents, and be responsible for informing others in Contractor's employ or Subcontractors of changes to the Work.

B. The Design Agent will advise of minor changes in the Work not involving an adjustment to Contract Sum or Contract Time by issuing supplemental instructions on AIA Form G710.

C. The Design Agent may issue a Proposal Request which includes a detailed description of a proposed change with supplementary or revised Drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required, and the period of time during which the requested price will be considered valid. Contractor will prepare and submit an estimate within 15 days.

D. The Contractor may propose changes by submitting a request for change to the Design Agent, describing the proposed change and its full effect on the Work. Include a statement describing the reason for the change, and the effect on the Contract Sum and Contract Time with full documentation, and a statement describing the effect on Work by separate or other Contractors. Document any requested substitutions in accordance with Section 01600.

E. Stipulated Sum Change Order: Based on Proposal Request, and Contractor's fixed price quotation, or Contractor's request for a Change Order as approved by Design Agent.

F. Unit Price Change Order: For contract unit prices and quantities, the Change Order will be executed on a fixed unit price basis. For unit costs or quantities of units of work which are not pre-determined, execute the Work under a Construction Change Directive. Changes in the Contract Sum or Contract Time will be computed as specified for a Time and Material Change Order.

G. Construction Change Directive: Design Agent may issue a directive, on AIA Form G713 Construction Change Directive signed by the Owner, instructing the Contractor to proceed with a change in the Work, for subsequent inclusion in a Change Order. Document will describe changes in the Work, and designate method of determining any change in the Contract Sum or Contract Time. Promptly execute the change.

H. Time and Material Change Order: Submit an itemized account and supporting data after completion of the change, including timeslips signed by Owner's representative, within the time limits indicated in the Conditions of the Contract. The Design Agent will determine the change allowable in the Contract Sum and Contract Time as provided in the Contract Documents. Only Owner-representative-signed timeslips will be considered.

I. Maintain detailed records of work done on a Time and Material basis. Submit timeslips daily for verification and sign-off by Owner's representative on-site. Provide full information required for an evaluation of the proposed changes, and to substantiate costs for the changes in the Work.

J. Document each quotation for a change in cost or time with sufficient data to allow an evaluation of the quotation. Provide detailed breakdown of costs and estimates for labor and materials including a detailed breakdown for subcontractor's or vendor's Work. Include copies of written quotations from subcontractors or vendors.

K. Change Order Forms: AIA G701 Change Order.

L. Execution of Change Orders: The Design Agent will issue Change Orders for signatures of the parties as provided in the Conditions of the Contract.

M. Correlation Of Contractor Submittals:
   1. Promptly revise the Schedule of Values and the Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum. Promptly revise progress schedules to reflect any change in the Contract Time, revise sub-schedules to adjust times for any other items of work affected by the change, and resubmit.
   2. Promptly enter changes in the Project Record Documents.

1.10 DEFECT ASSESSMENT

A. Replace the Work, or portions of the Work, not conforming to specified requirements.

B. If, in the opinion of the Design Agent, it is not practical to remove and replace the Work, the Design Agent will direct an appropriate remedy or adjust payment.

C. The defective Work may remain, but the unit sum will be adjusted to a new sum at the discretion of the Design Agent.

D. The defective Work will be partially repaired to the instructions of the Design Agent, and the unit sum will be adjusted to a new sum at the discretion of the Design Agent.

E. The individual Specification Sections may modify these options or may identify a specific formula or percentage sum reduction.

F. The authority of the Design Agent to assess the defect and identify a payment adjustment, is final.

G. Non-Payment For Rejected Products: Payment will not be made for rejected products for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected products.

1.11 UNIT PRICES

A. See Attachment A.

1.12 ALTERNATES

A. Alternates quoted on Bid Forms will be reviewed and accepted or rejected by the Owner in numerical order. Alternate 2 will not be considered for acceptance by the Owner unless Alternate 1 has been accepted. Accepted Alternates will be identified in the Purchase Order.

B. Coordinate related work and modify surrounding work as required.

C. Schedule of Alternates: See Attachment A.

PART 2 - PRODUCTS

Not Used.

PART 3 - EXECUTION

Not Used.

END OF SECTION

Attachment A – 01201

A. Allowance

Summary

Include an allowance of $120,000.00 in the Base Bid for use for the following items of work:

Allowance (Electrical and Overhead Utility Relocations)	$100,000.00
Allowance (Soil Testing)	$10,000.00
Allowance (Temporary Irrigation System Relocation)	$10,000.00
Total Allowances	$120,000.00

Allowance for Electrical and Overhead Utility Relocation

An allowance of $100,000.00 is listed in Section 00410 - Bid Form. This allowance allows the Contractor with the approval of the Owner to retain the services of National Grid, other services providers (Verizon and Communications), and an electrical utility Contractor for the purpose of relocating certain utility poles and overhead lines owned by the University and by private parties.

The Contractor shall commence negotiations with National Grid, the University, and other utility providers within one (1) week of the notice to proceed to facilitate the relocation.

Allowance Soil Testing

An allowance of $10,000.00 is listed in Section 00410 - Bid Form. This allowance allows the Contractor with the approval of the Owner, to retain the services of a qualified Materials Testing Company to conduct various soil testing including, but not limited to, sieve analysis and field density testing.

The scope of the soil testing program will be developed by the Engineer. The Contractor will transmit the scope of the testing program to the Materials Testing Company together with a request for a firm quotation for the work. When the Contractor receives the quotation from the Materials Testing Company and he finds it fair and reasonable, he shall provide to the Owner. The Owner will review the Contractor's submission and if satisfaction, the Contractor shall notify the Materials Testing Company to proceed forthwith.

Allowance for Irrigation System

An allowance of $10,000.00 is listed in Section 00410 - Bid Form. This allowance allows the Contractor with the approval of the Owner to retain and/or to perform work to relocate any irrigation line which may be still be active during the roadway construction.

B. Cash Allowances

1. None.

C. Unit Prices

1. None

D. Alternates

1. Alternate No. 1 is to remove and legally dispose of the existing greenhouse facility and foundations as indicated on the plans.

2. Alternate No. 2 is to complete all work indicated on the Plans labeled Volume II - Flagg Road Parking Lot and as indicated in the Specifications

E. Payroll Reporting

1. Forms for the submission of Certified Payroll Records may be found from the Rhode Island Prevailing Wage Website in either PDF or Excel formats. These forms must be used on monthly submittals.

2. Identify Apprenticeship hours required under RIGL 37-13-3.1 for all contracts over $1 million in value.

3. Identify MBE/DBE subcontractors and hours worked in a format acceptable to URI.

F. Warranty Inspection Retainage

1. One-half of one percent of the cost of the Work will be retained from Final Payment for this purpose.

E. Revision to 01200 Texts

1. In paragraph 1.01, delete the "Cash" from line A. Delete line B entirely.
2. At paragraph 1.02, delete the word "Cash" in the heading, and again in lines A and D.
3. Delete paragraph 1.03 in its entirety.

END OF ATTACHMENT

Attachment A – 01331

A. Required Submittals

1. Bituminous Pavements
2. Fill and Embankment Materials, Gravel Borrow, Crushed Stone, high organic soil, loam, common borrow, etc.
3. Storm Drainage structures, frames, covers, etc.
4. Pipe (all types)
5. Electrical and Lighting

END OF ATTACHMENT

DIVISION 2 CONSTRUCTION

SECTION 02110

SITE PREPARATION AND DEMOLTION

PART 1 – GENERAL

1.1 Description

1.1.1 In general this work consists of the performance of actions that are required to clear and prepare the site for subsequent construction operations. These actions all have a common characteristic; they involve the removal and legal disposal of both designated vegetative materials and man-made objects and facilities. These actions include, but are not limited to, the following: clearing and grubbing; cutting and removing isolated trees and stumps; partial or complete removal of isolated tree stumps; trimming tree roots; removal and disposal of culverts, masonry; drainage and utility structures; **Greenhouse Structure**[(1)]; pipe; rigid and flexible pavement; granite, concrete and bituminous curbing; fences and railings; guardrail of all types; underground and above-ground structures, miscellaneous items such as signs; and other obstructions or undesirable materials within the limits of disturbance. All such materials, objects and facilities shall be removed and legally disposed of.

(1) See Section 00410; Bid Form, for Alternate No. 1 Payment for Demolition of Greenhouse Structure.

PART 2 - PRODUCT

2.1 Materials. Not applicable

PART 3 – EXECUTION

3.1 Construction Methods

3.1.1 Refer to the applicable subsections of Section 201.03 of the R.I. Standard Specifications for guidance on removal and disposal of the various site preparation actions.

3.1.2 The demolition of the Greenhouse shall include removal of all foundations to a minimum of 3 feet below existing grade.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment.

5.1.1 Site Preparation and Demolition for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for the Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price that

represents payment for the work of this Section 02110 (except for the Greenhouse Structure which shall be paid under Bid Alternate No. 1) constitutes full and complete compensation for all labor, materials and equipment for removing and legally disposing of all debris generated by site preparation and demolition actions, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Site Preparation and Demolition for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed as Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this Section 02110 constitutes full and complete compensation for all labor, materials and equipment for removing and legally disposing of all debris generated by site preparation and demolition actions, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

EROSION CONTROLS

PART 1 – GENERAL

1.1 Description. This work includes the provision of temporary perimeter erosion controls; ditch and swale erosion controls and storm drainage protection erosion controls. Also included is the maintenance and cleaning and subsequent removal of all erosion controls. These controls shall be placed in reasonably close conformity with the layout and details indicated on the Plans, and as directed by the Engineer, all in accordance with these Specifications.

1.1.1 Perimeter Controls

.1 Baled Hay Erosion Checks consist of baled hay placed in line, each bale of which is embedded in the ground with a wood stake.

.2 Baled Hay Erosion Check and Silt Fence Combined consists of baled as described above with the addition of a silt fence. The silt fence consists of oak fence posts to which is fastened heavy duty plastic mesh.

1.1.2 Ditch and Swale Erosion Checks consists of baled hay staked across a ditch or drainage swale.

1.1.3 Baled Hay Catch Basin Inlet Protection consists of placing baled hay around the inlets of catch basins.

PART 2 – PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Baled Hay Erosion Checks: Subsection 206.02.1. Silt Fence; and Baled Hay Erosion Check and Silt Fence Combined: Subsections 206.02.1 and 206.02.2.

2.1.2 Baled Hay Ditch and Swale Erosion Checks: Subsection 207.02.1.

2.1.3 Baled Hay Catch Basin Inlet Protection: Subsection 209.02.3.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply:

3.1.1 Baled Erosion Checks; Subsection 206.03.1 and R.I. Standard 9.1.0., Silt Fence; Baled Hay Erosion Checks and Silt Fence Combined: Subsections 206.03.1 and 206.03.2, and R.I. Standard 9.2.0 and 9.3.0.

3.1.2 Baled Hay Ditch and Swale Erosion Checks; Subsection 207.03.1, and R.I. Standard 9.4.0.

3.1.3 Baled Hay Catch Basin Inlet Protection; Subsection 209.03.3, and R.I. Standard 9.8.0.

3.2 Cleaning and Maintaining Erosion Controls. The following, references to the R.I. Standard Specifications apply:

3.2.1 Baled Hay Erosion Checks, Silt Fence, and Baled Hay Erosion Checks and Silt Fence Combined: Subsection 212.03.1a

3.2.2 Baled Hay Ditch and Swale Erosion Checks: Subsection 212.01.2, and 212.03.1b (1)

3.2.3 Baled Hay Catch Basin Inlet Protection: Subsection 212.01.2, and 212.03.1d (3)

PART 4 – MEASUREMENT. Not applicable

PART 5 – PAYMENT

5.1 Basis of Payment.

5.1.1 Erosion Controls for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price represents payment for the work of this Section 02130 constitutes full and complete compensation for all labor, materials and equipment for providing the various erosion controls, and for maintaining and cleaning the erosion controls, and for the subsequent removal of erosion controls; and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Erosion Controls for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in as Alternate No. 2 - Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price represents payment for the work of this Section 02130 constitutes full and complete compensation for all labor, materials and equipment for providing the various erosion controls, and for maintaining and cleaning the erosion controls, and for the subsequent removal of erosion controls; and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

EXCAVATION AND EMBANKMENT

PART 1 - GENERAL

1.1 Description. This work consists of excavation and the satisfactory placement and compaction of all materials encountered within the limits of the work and which are necessary for the construction of roadways, parking lot, and drainage basins. Such excavation shall be in reasonably close conformity with the dimensions and sections indicated on the Plans or as directed by the Engineer.

1.1.1 Earth Excavation. Earth excavation shall include the removal of suitable and unsuitable soils and the removal of boulders and rock fragments less than 1 cubic yard in volume , from the following areas:

1.1.2 Excavation of Unsuitable Soils. Unsuitable soils shall include and are hereby defined as those soils, other than muck, which due to their consolidation properties, degree of saturation, graduation, or other deleterious characteristics will not provide a stable subgrade or side slopes; cannot be used as, or support embankment, or cannot be placed and compacted as backfill, or do not otherwise conform to the requirements of these Specifications.

1.1.3 Embankment Construction. Embankment construction shall consist of constructing roadway embankments, including preparation of the areas upon which they are to be placed; the benching of embankments; the construction of side slopes and toe drainage ditches; the construction of dikes within or outside the right-of-way; the placing and compacting of approved material within roadway areas where unsuitable material has been removed; and the placing and compacting of embankment material in holes, pits and other depressions within the roadway area. Only approved materials shall be used in the construction of embankments and backfills.

PART 2 – PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Common Borrow; Subsection M.01.01

2.1.2 Gravel Borrow; Subsection M.01.02

2.1.3 Crushed Stone; Subsection M.01.09, Table I, Column II. Crushed stone shall be clean, washed, coarse aggregate consisting of 100% crushed bedrock, produced by crushing bedrock extracted from a single-source quarry location. Crushed quarry rock aggregate shall be processed separately from overburden soil deposits, and shall not contain crushed or uncrushed gravel, and shall be free of deleterious material, or soft, friable particles.

2.1.4 Choker Stone shall conform to the requirements of AASHTO No. 57 with a maximum wash loss of 0.5%, minimum durability index of 35, maximum abrasion loss of 10% for 100 revolutions, and a maximum of 50% for 500 revolutions. The material shall be free of deleterious material, or soft, friable particles. The gradation shall be as follows:

U.S. Standard Sieve Size	Percentage by Weight Passing
1 1/2”	100%
1”	95-100%
1/2”	25-60%
No. 4”	0-10%
No. 8”	0-5%

2.1.5 Sand shall be free of any organic material, naturally weathered, sub-angular/rounded not acquired from a crushed rock source. The sand shall conform to AASHTO M-6, and shall be poorly graded.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply:

3.1.1 Excavation –General: Subsection 202.03.1. First three paragraphs.

3.1.2 Excavation of Unsuitable Materials: Subsection 202.03.1 (b).

3.1.3 Embankment Construction – General: Subsection 202.03.2.

3.1.4 Compaction – General: Subsection 202.03.3.

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Excavation and Embankment for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price for the Base Bid that represents payment for the work of this Section 02210 constitutes full and complete compensation for all labor, materials and equipment for making excavations and placing and compaction of embankments, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Excavation and Embankment for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price for Alternate No. 2 represents payment for the work of this Section 02210 constitutes full and complete compensation for all labor, materials and equipment for making excavations and placing and compaction of embankments, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

TRENCH AND MISCELLANEOUS EXCAVATION

PART 1 - GENERAL

1.1 Description. This work consists of excavation, dewatering, trench protection, and backfill, of all materials required for the construction of storm drainage pipes, catch basins, manholes, ditches, swales, and any other miscellaneous constructions in reasonably close conformity with the dimension and details indicated on the Plans or as directed by the Engineer, all in accordance with these Specifications.

PART 2 – PRODUCT

2.1 Materials. Not applicable

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply.

3.1.1 Excavation of Trench: Subsection 205.03.1

3.1.2 Trench Protection: Subsection 205.03.2

3.1.3 Dewatering: Subsection 205.03.4

3.1.4 Backfill and Compaction: Subsection 205.03.5

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Trench and Miscellaneous Excavation for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price represents payment for the work of this Section 02220 constitutes full and complete compensation for all labor, materials and equipment for making all trench and miscellaneous excavations, backfill and compaction thereof, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Trench and Miscellaneous Excavation for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price represents payment for the work of this Section 02220 constitutes full and complete compensation for all labor, materials and equipment for making all trench and miscellaneous excavations, backfill and compaction thereof, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

EXCAVATION AND REMOVAL OF UNSUITABLE MATERIALS

PART 1 - GENERAL

1.1 Description. This work consists of the excavation of unsuitable soils and their subsequent removal to an approval off-site location, all as directed and approved by the Engineer.

1.1.1 Unsuitable soils shall include and are hereby defined as those soils, other than muck, which due to their consolidation properties, degree of saturation, gradation, or other deleterious characteristics will not provide a stable subgrade or side slopes; cannot be used as, or support embankment, or cannot be placed and compacted as backfill, or do not otherwise conform to the requirements of these Specifications.

PART 2 - PRODUCT

2.1 Not Applicable

PART 3 - EXECUTION

3.1 Where unsuitable soils are encountered within an excavated section, such excavation shall be suspended to allow to the removal of said unsuitable material. Removal shall proceed until a stable base is reached or as otherwise directed by the Engineer.

PART 4 – MEASUREMENT

4.1 Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.1 Excavation and Removal of Unsuitable Materials for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, complete. **Caveat** That part of the lump sum price represents payment for the work of this Section 02230 constitutes full and complete compensation for all labor, materials and equipment for removal of such material and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Excavation and Removal of Unsuitable Materials for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Extension, complete. **Caveat** That part of the lump sum price represents payment for the work of this Section 02230 constitutes full and complete compensation for all labor, materials and equipment for removal of such material and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

DRAINAGE PIPE

PART 1 - GENERAL

1.1 Description. This work consists of the construction of storm drainage pipe in reasonably close conformity with the dimensions and details indicated as the Plans or as directed by the Engineer, all in accordance with these Specifications.

Part 2 - PRODUCT

2.1 Materials.

2.1.1 Reinforced Concrete Pipe, Subsection M.04.01.2.

2.1.2 Flared End Sections, Subsection 701.02.3.

2.1.3 Bedding Material, Subsection 701.02.5, Class B (gravel borrow).

2.1.4 Filter Fabric, Non-woven material conforming to MIFARI 140N, or approved equal.

2.1.5 Ductile Iron Pipe shall conform to the requirements of M.04.02.1, and shall be Class 52.

2.1.6 HDPE perforated and non-perforated pipe shall be N-12, soil tight, manufactured by ADS or approved equal. Pipe shall conform to AASHTO M 252, AASHTO M 294, ASTM F 405, and ASTM F 606.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply;

3.1.1 Layout: Subsection 701.03.1

3.1.2 Trench Excavation: Section 02220

3.1.3 Bedding: Subsection 701.03.3, Class B

3.1.4 Laying Pipe: Subsection 701.03.04

3.1.5 Laying Underdrains: Subsection 703.03.2 (d)

3.1.6 Joining Pipe: Subsection 701.03.5

3.1.7 Trench Protection System: Subsection 701.03.6. Subparagraph (d)

3.1.8 The geotextile filter fabric shall be protected at all times during construction against contamination with mud or dirt, from damage and ultraviolet light (sunlight). The fabric shall not

be exposed to sunlight for more than three days prior to placement. Filter fabric shall be place on top of pipe bedding material and also around the 8-inch PVC perforated bleed pipe.

PART 4 - MEASUREMENT. Not applicable

PART 5 – PAYMENT

5.1 Basis of Payment.

5.1.1 Drainage Pipe will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this Section 02310 constitutes full and complete compensation for all labor, materials and equipment for providing drainage pipe of all types and sizes, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Drainage Pipe will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this Section 02310 constitutes full and complete compensation for all labor, materials and equipment for providing drainage pipe of all types and sizes, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 Description. This work consists of providing drainage catch basins, manholes, and discharge structure, complete with frames, grates, covers and all appurtenant hardware and accessories at those locations and according to the details indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

PART 2 – PRODUCT

2.1 Materials.

2.1.1 Precast Concrete Catch Basins Manholes and Discharge Structure shall be designed and manufactured in accordance with ASTM C478 and the mix design shall be Class XX as set forth Subsection 601.03.1, Table 2 of the R.I. Standard Specifications.

2.1.2 Metal Frames, Grates, Covers and Ladder Ramps shall be grey iron castings that conform to the requirement of AASHTO M105.

2.1.3 Brick Inverts for Manholes shall be Grade SA hard burnt clay brick of especially dense texture.

2.1.4 Drainage swale basins and cleanouts shall be ADS, Nyloplast, with 8-inch locking dome cover or 8-inch solid locking covers respectively or approved equal.

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Testing and Inspection. Precast concrete catch basins, manholes, and discharge structure shall be inspected both at the point of manufacture and at the project site. Any such unit exhibiting defects or damage that cannot be corrected to the complete satisfaction of the Engineer shall be removed and replaced by the Contractor at no additional cost to the State.

3.1.2 Catch Basins, manholes, and discharge structures shall conform to the details provided on the plans.

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Drainage Structures will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this

Section 02320 constitutes full and complete compensation for all labor, materials and equipment for providing all required drainage structures, complete with all frames, grates, covers, brick inverts and appurtenant hardware and accessories, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Drainage Structures will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this Section 02320 constitutes full and complete compensation for all labor, materials and equipment for providing all required drainage structures, complete with all frames, grates, covers, brick inverts and appurtenant hardware and accessories, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

PAVED WATERWAYS

PART 1 – GENERAL

1.1 DESCRIPTION. This work consists of the construction of paved waterways with gravel borrow base courses and bituminous concrete surfaces with riprap outfalls at the ends of the waterways. Paved waterways shall be located at those locations indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

PART 2 – PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Bituminous Concrete: Subsection M.03.01 for Class I-2 mix

2.1.2 Gravel Borrow: Subsection M.01.02.1

2.1.3 Bedding for Riprap: Subsection M.10.03.1; FS-2

2.1.4 Graded Riprap: Subsection M.10.03.2; R-4

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Bituminous Mixture Paving: A layer of gravel borrow shall be placed upon a prepared subgrade. This course shall be 6 inches thick such that it conforms to the proper grade and cross section after compaction.

The bituminous mixture shall be spread on the gravel borrow base prepared as herein specified and compacted by tamping or rolling to a finished depth of 3 inches, or such other depth as may be indicated on the Plans. The finished surface shall reasonably conform to the proposed lines, grades and cross sections. Refer to the details of Paved Waterways on the Plans.

3.1.2 Riprap Outfalls: The bedding material of 6-inch riprap shall be placed on prepared slopes at the end of the paved waterways. Placement of stone bedding must proceed from the bottom up to the edge of the paved waterway.

Dumped Riprap: R-4 riprap shall be placed on prepared bedding surfaces that will produce an evenly graded mass of stone. The entire mass of stone shall be placed so as to conform with the lines grades, and thicknesses shown on the Plans. Riprap shall be placed to its full course thickness in one operation and in such a manner as to avoid displacing the underlying material.

PART 4 - MEASUREMENT. Not applicable

PART 5 – PAYMENT

5.1 Basis of Payment.

5.1.1 Paved Waterways for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extensions, Complete. **Caveat:** The part of the lump sum price represents payment for the work of this Section 02330 constitutes full and complete compensation for all labor, materials and equipment for providing all of the paved waterways indicated as the Plans, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Paved Waterways for Flagg Road Parking will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat:** The part of the lump sum price represents payment for the work of this Section 02330 constitutes full and complete compensation for all labor, materials and equipment for providing all of the paved waterways indicated as the Plans, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

RIPRAP PADS

PART 1 - GENERAL

1.1 Description. This work consists of providing riprap pads at the outfalls of flared end sections at the locations and accordance to the details indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

Part 2 - PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Bedding for Riprap: Subsection M.10.03.1; FS-2.

2.1.2 Graded Riprap: Subsection M.10.03.2; R-4.

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Riprap Pads shall be constructed in accordance with the detail indicated on the Plans.

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Riprap Pads will not be paid for separately but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat.** That part of the lump sum price represents payment for the work of this Section 02340 constitutes full and complete compensation for all labor, materials and equipment for providing all of the riprap pads indicated on the Plans, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.1 Riprap Pads will not be paid for separately but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat.** That part of the lump sum price represents payment for the work of this Section 02340 constitutes full and complete compensation for all labor, materials and equipment for providing all of the riprap pads indicated on the Plans, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

RIPRAP DITCH CHECK DAMS

PART 1 - GENERAL

1.1 Description. This work consists of providing riprap ditch check dams at the locations and according to the details indicated on the Plans. These check dams are located just upstream of the point where ditches enter drainage basins. The work shall be as directed by the Engineer and according to these Specifications.

Part 2 - PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply;

2.1.1 Bedding for Riprap: Subsection M.10.03.1; FS-2.

2.1.2 Placed Riprap: Subsection M.10.03.2: R-4.

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Riprap Ditch Check Dams shall be constructed in accordance with the detail indicated on the Plans.

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Riprap Ditch Check Dams for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02350 constitutes full and complete compensation for all labor, materials and equipment for providing the riprap check dams including the fine grading upstream of the dams, and all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.1 Riprap Ditch Check Dams for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02350 constitutes full and complete compensation for all labor, materials and equipment for providing the riprap check dams including the fine grading upstream of the dams, and all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

STONE BAFFLES

PART 1 - GENERAL

1.1 Description. This work consists of constructing stone baffles within the Storm Water Basins in accordance with the details indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

Part 2 - PRODUCT

2.1 Materials.

2.1.1 Stone shall be Class R-4 Riprap.

PART 3 – EXECUTION

3.1 Construction Methods

3.1.1 Stone for Baffles shall be hand or mechanically placed in accordance with the detail indicated on the Plans.

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Stone Baffles will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02360 constitutes full and complete compensation for all labor, materials and equipment for providing the baffles indicated on the Plans, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Stone Baffles will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of the Flagg Road Parking Lot, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02360 constitutes full and complete compensation for all labor, materials and equipment for providing the baffles indicated on the Plans, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

CLEANING AND FLUSHING PIPE AND DRAINAGE STRUCTURES

PART 1 - GENERAL

1.1 Description. This work consists of cleaning storm drains and drainage structures of all types and sizes as designated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

Part 2 - PRODUCT

2.1 Materials.

2.1.1 Equipment. Equipment for cleaning pipe lines includes hoses, rodding machines, balls, hydraulic cleaners, root cutters, small clam shell buckets, steel porcupines, pumps, or other suitable and approved means.

2.1.2 Water. Water used for cleaning and flushing drainage pipes shall be fresh and free of oil, acid, salt, alkali, organic matter, or any other deleterious substances. The Contractor shall provide all water required for the cleaning operation.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply:

3.1.1 Operation of Drainage System during Construction: Subsection 708.03.1

3.1.2 Cleaning Methods: Subsection 708.03.2

3.1.3 Disposal of Debris Collected: Subsection 708.03.3a

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Cleaning and Flushing Pipe and Drainage Structures will not be paid for separately but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat.** That part of the lump sum price that represents payment for the work of this Section 02370 constitutes full and complete compensation for all labor, materials and equipment for cleaning and flushing and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Cleaning and Flushing Pipe and Drainage Structures will not be paid for separately but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat.** That part of the lump sum price that represents payment for the work of this Section 02370 constitutes full and complete compensation for all

labor, materials and equipment for cleaning and flushing and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

CAST-IN-PLACE REINFORCED CONCRETE

PART 1 - GENERAL

1.1 Description. This work consists of the provision of cast-in-place reinforced concrete for miscellaneous structures at the locations and details indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

PART 2 – PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Reinforcing Steel: Subsection M.05.01, Grade 60 and shall be epoxy coated

2.1.2 Concrete Subsection 601.01.1, Class XX.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply:

3.1.1 Reinforcing Steel; Applicable requirements of: Subsection 810.03.01 (Schedules) 810.03.3 (Fabrication), 810.03.4 (Placing), and 810.03.5 (Drill and Grout Reinforcing Dowels).

3.1.2 Proportioning Concrete: Subsection 601.03.1 Table 2 for Class XX and HP.

3.1.3 Portland Cement Concrete: Applicable requirements of Subsection 808.03.2 (Footings), 808.03.4 (Forms), 808.03.5 (Placing Concrete) and 808.03.9 (curling).

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Cast-in-Place Reinforced Concrete for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02410 constitutes full and complete compensation for all labor, materials and equipment for providing the reinforced concrete, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Cast-in-Place Reinforced Concrete for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02410 constitutes full and complete

compensation for all labor, materials and equipment for providing the reinforced concrete, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

BORROW AND AGGREGATES

PART 1 - GENERAL

1.1 Description. This work consists of providing borrows and aggregates for the various use in the construction of the Flagg Road Extension and Parking Lot all according to the grades and details indicated on the Plans, and as directed by the Engineer, all according to these Specifications.

PART 2 – PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Common Borrow; Subsection M.01.01

2.1.2 Gravel Borrow shall conform to the requirements of Subsection M.01.02 and M.01.09, Col. 1 of the R.I. Standard Specifications.

2.1.3 Crushed Stone; Subsection M.01.09, Table I, Column II. Crushed stone shall be clean, washed, coarse aggregate consisting of 100% crushed bedrock, produced by crushing bedrock extracted from a single-source quarry location. Crushed quarry rock aggregate shall be processed separately from overburden soil deposits, and shall not contain crushed or uncrushed gravel, and shall be free of deleterious material, or soft, friable particles.

2.1.4 Choker Stone shall have the AASHTO No. 57 gradations, with a maximum wash loss of 0.5%, minimum durability index of 35, maximum abrasion loss of 10% for 100 revolutions, and a maximum of 50% for 500 revolutions. The material shall be free of deleterious material, or soft, friable particles. The gradation shall be as follows:

U.S. Standard Sieve Size	Percentage by Weight Passing
1 1/2”	100%
1”	95-100%
1/2”	25-60%
No. 4”	0-10%
No. 8”	0-5%

2.1.5 Sand shall be free of any organic material, naturally weathered, sub-angular/rounded not acquired from a crushed rock source. The sand shall conform to AASHTO M-6, and shall be poorly graded.

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Gravel Borrow Subbase Course shall conform to the requirements of Subsection 302.03 of the R.I. Standard Specifications.

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Borrow and Aggregates for Subbase Courses for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02510 constitutes full and complete compensation for all labor, materials and equipment for providing the subbase materials, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Borrow and Aggregates for Subbase Courses for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking lot, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02510 constitutes full and complete compensation for all labor, materials and equipment for providing the subbase materials, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

BITUMINOUS CONCRETE PAVEMENTS

PART 1 - GENERAL

1.1 Description. This work consists of providing bituminous concrete base and surface courses on a prepared gravel subbase along the alignment of the Flagg Road Extension and Parking Lot all in accordance with the grades and details indicated on the Plans, and as directed by the Engineer, all according to these Specifications.

PART 2 – PRODUCT

2.1 Materials. The following references to the R.I. Standard Specifications apply:

2.1.1 Bituminous Concrete Surface Course: Subsection M.03.01; Col. “Class I-1”

2.1.2 Bituminous Concrete Base Course: Subsection M.03.01, Col. “Base Course”.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply:

3.1.1 Bituminous Concrete Pavements: Subsection 401.03.1

3.1.2 Trimming and Fine Grading: Subsections 204.01 and 204.03

PART 4 - MEASUREMENT.

4.1 Method of Measurement. Not Applicable.

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Bituminous Concrete Pavements for all will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this Section 02520 constitutes full and complete compensation for all labor, materials and equipment for making all excavation, trimming and fine grading, backfill and compaction thereof, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Bituminous Concrete Pavements for all will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price that represents payment for the work of this Section 02520 constitutes full and complete compensation for all labor, materials and equipment for making all excavation, trimming and fine grading, backfill and compaction thereof, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

POROUS ASPHALT PAVEMENTS

PART 1 - GENERAL

1.1 Description. This work consists of furnishing and installing pervious asphalt pavement base and surface courses for the Flagg Road Parking Lot (Alternate No. 2) permeable pavement system. The work includes subgrade preparation, installation of the underlying porous media beds and the design and production of the porous asphalt mix, all in accordance with these specification and as directed by the Engineer.

1.1.1 Definition. Porous media beds refer to the material layers underlying the porous asphalt pavement. Porous asphalt pavement refers to the compacted mix of modified asphalt, aggregate, and additives.

1.2 Related Work

1.2.1 Section 02310 – Drainage Pipe

1.2.2 Section 02510 – Borrow and Aggregate

1.3 Submittals. The Contractor shall submit the following pursuant to the requirements of this section:

1.3.1 A list of materials proposed for work under this Section including the name and address of the materials producers and the locations from which the materials are to be obtained;

1.3.2 Certificates, signed by the materials producers and the relevant subcontractors, stating that materials meet or exceed the specified requirements, for review and approval by the Engineer;

1.3.3 Samples of materials for review and approval by the Engineer. For mix materials, samples may be submitted only to the QA Inspector with the Engineer's approval.

1.4 Quality Control / Quality Assurance (QC/QA).

1.4.1 Use adequate numbers of skilled workers who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work in this section.

1.4.2 Codes and Standards. All materials, methods of construction and workmanship shall conform to applicable requirements of AASHTO Standards, ASTM Standards, RIDOT Standard Specifications for Road and Bridge Construction, latest edition (including supplements and updates), and other standards as specified.

1.4.3 QC/QA requirements for production of mix are provided in Part 2.1 Materials of this Section. QC/QA requirements for construction of the porous media beds and paving are provided in Part 3 Execution of this Section.

1.4.4 Submittal Requirements. The following table summarizes the submittal requirements for work performed under this section.

Material or Pavement Course *	**Properties to be reported on Certificate ****
choker course, reservoir course	gradation, max. wash loss, min. durability index, max. abrasion loss, air voids (reservoir course)
filter course	gradation, permeability/ sat. hydraulic conductivity
filter blanket	gradation
geotextile filter fabric	manufacturer's certification, AOS/EOS, tensile strength
striping paint	certificate
binder	PGAB certification
fine aggregate	gradation
silicone	manufacturer's certification
fibers	manufacturer's certification
mineral filler (optional)	manufacturer's certification
fatty amines (optional anti-strip)	manufacturer's certification
hydrated lime (optional anti-strip)	manufacturer's certification

* Samples of each material shall be submitted to the Engineer (or QA Inspector for mix). These samples must be in sufficient volume to perform the standardized tests for each material.
** At a minimum, more material properties may be required (refer to Par 2.1 Materials).

1.5 Project Conditions.

1.5.2 Protect adjacent work from the unintended dispersal/splashing of pavement materials. Remove all stains from exposed surfaces of pavement, structures, and grounds. Remove all waste and spillage. If necessary, limit access to adjacent work/structures with appropriate signage and/or barriers.

1.5.3 Restore damaged areas, including existing pavement on or adjacent to the site that has been damaged as a result of construction work, to their original condition or repair as directed to the satisfaction of the Engineer at no additional cost.

1.5.4 Weather Limitations. Porous asphalt shall not be placed between November 15 and March 15, or when the ambient air temperature at the pavement site in the shade away from artificial heat is below 16° C (60° F) or when the actual ground temperature is below 10° C (50° F). Only the Engineer may adjust the air temperature requirement or extend the dates of the pavement

season. The Contractor shall not pave on days when rain is forecast for the day, unless a change in the weather results in favorable conditions as determined by the Engineer.

1.6 References.

1.6.1 *General Porous Asphalt Bituminous Paving and Groundwater Infiltration Beds,* specification by UNH Stormwater Center, February, 2005.

1.6.2 Porous Asphalt for Stormwater Management, Design, Construction, and Maintenance Guide, Information Series 131, National Asphalt Pavement Association (NAPA), 2003.

1.6.3 Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115, NAPA, 2002.

1.6.4 Annual Book of ASTM Standards, American Society for Testing and Materials, Philadelphia, PA, 1997 or latest edition.

1.6.5 Standards of the American Association of State Highway and Transportation Officials (AASHTO), 1998 or latest edition.

PART 2 – PRODUCT

2.1 Materials.

2.1.1 Porous Media Beds. The material layers underlying the porous asphalt pavement – including choker course, crushed stone (reservoir course) and filter course – shall conform to the requirements set forth in **Section 02510** of these Specifications.

2.1.2 Porous Asphalt Mix. Mix materials consist of polymer and/or fiber modified performance grade asphalt binder (PGAB) and coarse/fine aggregates. Materials shall meet the requirements of the NAPA *Design, Construction, and Maintenance of Open-Graded Friction Courses, Information Series 115* (2002), except where noted otherwise below or approved in writing by the Engineer.

2.1.2.1 Polymer Modified PGAB and Mix Designs. The asphalt binder shall be a polymer and fiber modified Performance Graded asphalt binder (PGAB) used in the production of Superpave Hot Mix Asphalt (HMA) mixtures and shall meet the requirements of AASHTO M320. The mix design shall be a **Pre-Blended PG 76-22 modified with styrene butadiene styrene (SBS) and 5 pounds of fibers per ton of asphalt mix**. The SBS shall be supplied by an approved PGAB supplier holding a Quality Control Plan approved by the RIDOT. A Bill of Lading (BOL) shall be delivered with each transport of PG 76-22 SBS and a copy of the BOL shall be furnished to the QA Inspector at the Plant. Mix designs shall meet or exceed criteria listed in Paragraph 2.1.2.5 below.

2.1.2.2 Anti-Stripping Mix Additives. The mix shall be tested for moisture susceptibility and asphalt stripping from the aggregate by AASHTO T283. If the retained tensile strength (TSR) < 80% upon testing, a heat stable additive shall be furnished to improve the anti-stripping

properties of the asphalt binder. Test with one freeze-thaw cycle (rather than five recommended in NAPA IS 115). The amount and type of additive (e.g. fatty amines or hydrated lime) to be used shall be based on the manufacturer's recommendations, the mix design test results, and shall be approved by the Engineer. Silicone shall be added to the binder at the rate of 1.5 mL/m^3 (1 oz per 5000 gal). Fibers may be added per manufacturer and NAPA IS 115 recommendation if the draindown requirement cannot be met (<0.3% via ASTM D6390) provided that the air void content requirement is met (>18%, or >16% as tested with CoreLok device). Additives should be added per the relevant DOT specification and NAPA IS 115.

2.1.2.3 Coarse Aggregate. Coarse aggregate shall be that part of the aggregate retained on the No. 8 sieve; it shall consist of clean, tough, durable fragments of crushed stone, or crushed gravel of uniform quality throughout. Coarse aggregate shall be crushed stone or crushed gravel and shall have a percentage of wear as determined by AASHTO T96 of not more than 40 percent. In the mixture, at least 75 percent, by mass (weight), of the material coarser than the 4.75 mm (No. 4) sieve shall have at least two fractured faces, and 90 percent shall have one or more fractured faces (ASTM D5821). Coarse aggregate shall be free from clay balls, organic matter, deleterious substances, and a not more than 8.0% of flat or elongated pieces (>3:1) as specified in ASTM D4791.

2.1.2.4 Fine Aggregate. The fine aggregate shall be that part of the aggregate mixture passing the No. 8 sieve and shall consist of sand, screenings, or combination thereof with uniform quality throughout. Fine aggregate shall consist of durable particles, free from injurious foreign matter. Screenings shall be of the same or similar materials as specified for coarse aggregate. The plasticity index of that part of the fine aggregate passing the No. 40 sieve shall be not more than 6 when tested in accordance with AASHTO T90. Fine aggregate from the total mixture shall meet plasticity requirements.

2.1.2.5 Porous Asphalt Mix Design Criteria. The Contractor shall submit a mix design at least 10 working days prior to the beginning of production. The Contractor shall make available samples of coarse aggregate, fine aggregate, mineral filler, fibers and a sample of the PGAB that will be used in the design of the mixture. A certificate of analysis (COA) of the PGAB shall be submitted with the mix design. The COA shall be certified by a laboratory meeting the requirements of AASHTO R18. The Laboratory shall be certified by the RIDOT, regional equivalent (e.g. NETTCP), and/or qualified under ASTM D3666. Technicians shall be certified by the regional certification agency (e.g. NETTCP) in the discipline of HMA Plant Technician. Bulk specific gravity (SG) used in air void content calculations shall not be determined and results will not be accepted using AASHTO T166 (saturated surface dry), since it is not intended for open graded specimens (>10% AV). Bulk SG shall be calculated using AASHTO T275 (paraffin wax) or ASTM D6752 (automatic vacuum sealing, e.g. CoreLok). Air void content shall be calculated from the bulk SG and maximum theoretical SG (AASHTO T209) using ASTM D3203. The materials shall be combined and graded to meet the composition limits by mass (weight) as shown in the following table.

Sieve Size (inch/mm)	Percent Passing (%)
0.75/19	100
0.50/12.5	85-100
0.375/9.5	55-75
No.4/4.75	10-25
No.8/2.36	5-10
No.200/0.075 (#200)	2-4
Binder Content (AASHTO T164)	6-6.5%
Fiber Content by Total Mixture Mass	0.3% cellulose or 0.4% mineral
Air Void Content (ASTM D6752/AASHTO T275)	16.0-22.0%
Draindown (ASTM D6390) *	≤ 0.3%
Retained Tensile Strength (AASHTO 283) **	≧ 80%
Cantabro abrasion test on unaged samples (ASTM D7064-04)	≤ 20%
Cantabro abrasion test on 7 day aged samples	≤ 30%

* Cellulose or mineral fibers may be used to reduce draindown.
** If the TSR (retained tensile strength) values fall below 80% when tested per NAPA IS 131 (with a single freeze thaw cycle rather than 5), then in Step 4, the contractor shall employ an antistrip additive, such as hydrated lime (ASTM C977) or a fatty amine, to raise the TSR value above 80%.

2.1.3 Porous Asphalt Mix Production.

2.1.3.1 Mixing Plants. The mixing plant shall be an approved asphalt plant on the current RIDOT list of Approved Asphalt, Ready Mix Concrete and Precast Concrete Plants.

2.1.3.2 Preparation of Asphalt Binder. The asphalt material shall be heated to the temperature specified in the RIDOT Standard Specifications Part 400 in a manner that will avoid local overheating. A continuous supply of asphalt material shall be furnished to the mixer at a uniform temperature.

2.1.3.3 Preparation of Aggregates. The aggregate for the mixture shall be dried and heated at the mixing plant before being placed in the mixer. Flames used for drying and heating shall be properly adjusted to avoid damaging the aggregate and depositing soot or unburned fuel on the aggregate.

2.1.3.4 Mineral filler. Mineral filler if required to meet the grading requirements, shall be added in a manner approved by the Engineer after the aggregates have passed through the dryer.

2.1.3.5 Mixing. The above preparation of aggregates does not apply for drum-mix plants. The dried aggregate shall be combined in the mixer in the amount of each fraction of aggregate required to meet the job-mix formula and thoroughly mixed prior to adding the asphalt material. The dried aggregates shall be combined with the asphalt material in such a manner as to produce a mixture that when discharged from the pugmill is at a target temperature in the range that corresponds to an asphalt binder viscosity of 700 to 900 centistokes and within a tolerance of ±11° C (±20° F). The asphalt material shall be measured or gauged and introduced into the mixer in the quantity determined by the Engineer for the particular material being used and at the temperature specified in the relevant specification. After the required quantity of aggregate and asphalt material has been introduced into the mixer, the materials shall be mixed until a complete and uniform coating of the particles and a thorough distribution of the asphalt material throughout the aggregate is secured. The mixing time will be regulated by the Engineer. All plants shall have a positive means of eliminating oversized and foreign material from being incorporated into the mixer.

2.1.3.6 QC/QA During Production. The Contractor shall provide at Contractors' expense and the Engineer's approval a third-party QA Inspector to oversee and document mix production. All mix testing results during production should be submitted to the QA Inspector.

2.1.3.7 The QC plan may be altered at the discretion of the Engineer and based on feasible testing as suggested by the asphalt producer. Certain QC testing requirements during production may not be feasible for small projects in which limited asphalt is generated. Some testing methods cannot be completed during the time needed during small batch production. The feasibility should be assessed with the Engineer and producer.

2.1.3.8 The mixing plant shall employ a Quality Control Technician (QCT). The QCT will perform QC/QA testing and will be certified in the discipline of HMA Plant Technician by the relevant certifying agency (NETTCP in New England). The Contractor shall sample, test and evaluate the mix in accordance with the methods and minimum frequencies in the following table.

Test	**Minimum Frequency**	**Test Method**
Temperature in Truck at Plant	6 times per day	
Gradation	greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T30
Binder Content	greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	AASHTO T164
Air Void Content	greater of either (a) 1 per 500 tons, (b) 2 per day, or (c) 3 per job	ASTM D6752
Binder Draindown	greater of either (a) 1 per 500 tons, (b) 1 per day, or (c) 1 per job	ASTM D6390

2.1.3.9 If an analyzed sample is outside the testing tolerances immediate corrective action will be taken. After the corrective action has been taken the resulting mix will be sampled and tested. If the re-sampled mix test values are outside the tolerances the Engineer will be immediately informed. The Engineer may determine that it is in the best interest of project that production is ceased. The Contractor will be responsible for all mix produced for the project.

2.1.3.10 Testing Tolerances During Production. Testing of the air void content, binder draindown, and TSR shall be within the limits set in Paragraph 2.1.3.8 above. The paving mixture produced should not vary from the design criteria for aggregate gradation and binder content by more than the tolerances listed in the following table.

Sieve Size (inch/mm)	Percent Passing
0.75 / 19	-
0.50 / 12.5	±6.0
0.375 / 9.5	±6.0
No.4 / 4.75	±5.0
No.8 / 2.36	±4.0
No.200 / 0.075 (#200)	±2.0
%PGAB	+0.4, -0.2

2.1.3.11 Samples of the mixture, when tested in accordance with AASHTO T164 and T30, shall not vary from the grading proportions of the aggregate and binder content by more than the respective tolerances specified in Paragraph 2.1.3.10 above and shall be within the limits specified for the design gradation. Should the paving mixture produced vary from the designated grading and asphalt content by more than the tolerances listed, appropriate production modifications shall be made until the porous asphalt mix is within these tolerances.

2.1.3.12 Plant Shutdown and Rejection of Mix. Should the porous asphalt mix not meet the tolerances specified in this section upon repeat testing, the Engineer may reject further loads of mix. Mix that is loaded into trucks during the time that the plant is changing operations to comply with a failed test shall not be accepted.

2.1.4 Striping Paint. Striping paint shall be latex, water-base emulsion, ready-mixed, and complying with pavement marking specifications PS TT-P-1952.

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Porous Media Beds. Protection of native materials from over compaction is important. Proper compaction of select subbase materials is essential. Improper compaction of subbase materials will result in either low pavement durability from insufficient compaction, or poor

infiltration due to over-compaction of subbase. Care must be taken to assure proper compaction as detailed below.

3.1.1.1 Grade Control.

(a) Establish and maintain required lines and elevations. The Engineer shall be notified for review and approval of final stake lines for the work before construction work is to begin. Finished surfaces shall be true to grade and even, free of roller marks and free of puddle-forming low spots. All areas must drain freely. Excavation elevations should be within ± 0.1 foot.

(b) If, in the opinion of the Engineer, based upon reports of the testing service and inspection, the quality of the work is below the standards which have been specified, additional work and testing will be required until satisfactory results are obtained.

(c) The Engineer shall be notified at least 24 hours prior to all porous media bed and porous pavement work.

3.1.1.2 Subgrade Preparation.

(a) Native subgrade refers to materials beyond the limit of the excavation. The existing native subgrade material under all bed areas shall NOT be compacted or subject to excessive construction equipment traffic prior to placement of system courses.

(b) Where erosion of the native material subgrade has caused accumulation of fine materials and/or surface ponding, this material shall be removed with light equipment and the underlying soils scarified to a minimum depth of 6 inches with a York rake or equivalent and light tractor.

(c) Bring subgrade to line, grade, and elevations indicated. Fill and lightly regrade any areas damaged by erosion, ponding, or traffic compaction before the placing of the subbase (sand filter) course.

(d) All bed bottoms are as level as feasible to promote uniform infiltration.

3.1.1.3 Porous Media Bed Installation

(a) Subbase refers to materials below pavement surface and above native subgrade (i.e., sand filter course). Upon completion of subgrade work, the Engineer shall be notified and shall inspect at his/her discretion before proceeding with the porous media bed installation.

(b) For sideslopes and pavement matching, geotextile (filter fabric) and subbase shall be placed immediately after approval of subgrade preparation. Any accumulation of debris or sediment which has taken place after approval of subgrade shall be removed prior to installation of geotextile at no extra cost to the Owner.

(c) Place geotextile filter fabric in accordance with manufacturer's standards and recommendations. Adjacent strips of geotextile shall overlap a minimum of sixteen (16) inches. Secure geotextile at least four (4) feet outside of the bed excavation and take any steps necessary to prevent any runoff or sediment from entering the storage bed.

(d) Install filter course aggregate in 8-inch maximum lifts to a MAXIMUM of 95% standard proctor compaction (ASTM D698 / AASHTO T99) to the grades indicated on the drawings.

(e) Install crushed stone (reservoir) and choker course aggregate to a MAXIMUM of 95% compaction standard proctor (ASTM D698 / AASHTO T99). Choker should be placed evenly over surface of crushed stone course bed, sufficient to allow for even placement of the porous asphalt.

(f) The density of subbase courses shall be determined by AASHTO T 191 (Sand-Cone Method), AASHTO T 204 (Drive Cylinder Method), or AASHTO T 238 (Nuclear Methods), or other approved methods at the discretion of the Engineer.

(g) The field infiltration rate of the compacted sand filter course subbase shall be determined by ASTM D3385, or approved alternate at the discretion of the Engineer. The field-measured infiltration rate shall be no less than 5 feet/day (2.5 inches/hour) and no greater than 30 feet/day (15 inches/hour).

(h) Compaction of subbase course material shall be done with a method and adequate water to meet the requirements. Rolling and shaping shall continue until the required density is attained. Water shall be uniformly applied over the subbase course materials during compaction in the amount necessary for proper consolidation.

(i.) Rolling and shaping patterns shall begin on the lower side and progress to the higher side of the subbase course while lapping the roller passes parallel to the centerline. Rolling and shaping shall continue until each layer conforms to the required grade and cross-section and the surface is smooth and uniform.

3.1.1.4 QC/QA requirements for Porous Media Bed Construction. QC/QA activities are summarized in the following table.

Activity	**Schedule**
Contractor to notify Engineer for approval	24 hours in advance of start of work
Contractor to employ soil inspector acceptable to Engineer	N/A
Contractor to employ staking and layout control inspector acceptable to Engineer	N/A
Contractor to employ site grading inspector acceptable to Engineer	N/A
Contractor to employ pavement work inspector acceptable to Engineer	N/A
Contractor to notify Engineer for approval	after subgrade preparation, before construction of porous media bed
Contractor to notify Engineer for approval	after choker course placed, before placement of pavement

3.1.2 Porous Asphalt Pavement Installation

3.1.2.1 Mixing Plant. The mixing plant, hauling and placing equipment, and construction methods shall be in conformance with NAPA IS 131 and applicable sections of the RIDOT Standard Specifications for asphalt mixes. The use of surge bins shall not be permitted.

3.1.2.2 Hauling Equipment. The open graded mix shall be transported in clean vehicles with tight, smooth dump beds that have been sprayed with a non-petroleum release agent or soap solution to prevent the mixture from adhering to the dump bodies. Mineral filler, fine aggregate, slag dust, etc. shall not be used to dust truck beds. The open graded mix shall be covered during transportation with a suitable material of such size sufficient to protect the mix from the weather and also minimize mix cooling and the prevention of lumps. When necessary, to ensure the delivery of material at the specified temperature, truck bodies shall be insulated, and covers shall be securely fastened. Long hauls, particularly those in excess of 25 miles (40 km), may result in separation of the mix and its rejection.

3.1.2.3 Placing Equipment. The paver shall be a self-propelled unit with an activated screed or strike-off assembly, capable of being heated if necessary, and capable of spreading and finishing the mixture without segregation for the widths and thicknesses required. In general, track pavers have proved superior for Porous Asphalt placement. The screed shall be adjustable to provide the desired cross-sectional shape. The finished surface shall be of uniform texture and evenness and shall not show any indication of tearing, shoving, or pulling of the mixture. The machine shall, at all times, be in good mechanical condition and shall be operated by competent personnel.

(a) Pavers shall be equipped with the necessary attachments, designed to operate electronically, for controlling the grade of the finished surface. The adjustments and

attachments of the paver will be checked and approved by the Engineer before placement of asphalt material.

(b) Pavers shall be equipped with a sloped plate to produce a tapered edge at longitudinal joints. The sloped plate shall be attached to the paver screed extension. The sloped plate shall produce a tapered edge having a face slope of 1:3 (vertical:horizontal). The plate shall be so constructed as to accommodate compacted mat thickness from 35 to 100 mm (1¼ to 4 inches). The bottom of the sloped plate shall be mounted 10 to 15 mm (3/8 to ½ inch) above the existing pavement. The plate shall be interchangeable on either side of the screed.

(c) Pavers shall also be equipped with a joint heater capable of heating the longitudinal edge of the previously placed mat to a surface temperature of 95° C (200 °F), or higher if necessary, to achieve bonding of the newly placed mat with the previously placed mat. This shall be done without undue breaking or fracturing of aggregate at the interface. The surface temperature shall be measured immediately behind the joint heater. The joint heater shall be equipped with automated controls that shut off the burners when the pavement machine stops and reignite them with the forward movement of the paver. The joint heater shall heat the entire area of the previously placed wedge to the required temperature. Heating shall immediately precede placement of the asphalt material.

3.1.2.4 Rollers. Rollers shall be in good mechanical condition, operated by competent personnel, capable of reversing without backlash, and operated at speeds slow enough to avoid displacement of the asphalt mixture. The mass (weight) of the rollers shall be sufficient to compact the mixture to the required density without crushing of the aggregate. Rollers shall be equipped with tanks and sprinkling bars for wetting the rolls. Rollers shall be two-axle tandem rollers with a gross mass (weight) of not less than 7 metric tons (8 tons) and not more than 10 metric tons (12 tons) and shall be capable of providing a minimum compactive effort of 44 kN/m (250 pounds per inch) of width of the drive roll. All rolls shall be at least 1 m (42 inches) in diameter. A rubber tired roller is not required on the open graded asphalt friction course surface.

3.1.2.5 Conditioning of Existing Surface. Contact surfaces such as curbing, gutters, and manholes shall be painted with a thin, uniform coat of Type RS-1 emulsified asphalt immediately before the asphalt mixture is placed against them.

3.1.2.6 Temperature Requirements. The temperature of the asphalt mixture, at the time of discharge from the haul vehicle and at the paver, shall be between 135-163° C (275-325° F), within 6° C (10° F) of the compaction temperature for the approved mix design.

3.1.2.7 Spreading and Finishing. The Porous Asphalt shall be placed in two lifts, with great care taken to ensure that the porous asphalt layers join completely. This requires keeping the time between layer placements minimal, keeping the first layer clear from dust and moisture, and minimizing traffic on the first layer.

(a) The Contractor shall protect all exposed surfaces that are not to be treated from damage during all phases of the pavement operation.

(b) The asphalt mixture shall be spread and finished with the specified equipment. The mixture shall be struck off in a uniform layer to the full width required and of such depth that each course, when compacted, has the required thickness and conforms to the grade and elevation specified. Pavers shall be used to distribute the mixture over the entire width or over such partial width as practical. On areas where irregularities or unavoidable obstacles make the use of mechanical spreading and finishing equipment impractical, the mixture shall be spread and raked by hand tools.

(c) No material shall be produced so late in the day as to prohibit the completion of spreading and compaction of the mixture during daylight hours, unless night paving has been approved for the project.

(d) No traffic will be permitted on material placed until the material has been thoroughly compacted and has been permitted to cool to below 38° C (100° F). The use of water to cool the pavement is not permitted. The Engineer reserves the right to require that all work adjacent to the pavement, such as guardrail, cleanup, and turf establishment, is completed prior to placing the wearing course when this work could cause damage to the pavement.

3.1.2.8 Compaction.

(a) Immediately after the asphalt mixture has been spread, struck off, and surface irregularities adjusted, it shall be thoroughly and uniformly compacted by rolling. The compaction objective is 16% - 19% in place void content (Corelock).

(b) Breakdown rolling shall occur when the mix temperature is between 135-163° C (275-325° F).

(c) Intermediate rolling shall occur when the mix temperature is between 93-135° C (200-275° F).

(d) Finish rolling shall occur when the mix temperature is between 66-93° C (150-200° F).

(e) The cessation temperature occurs at approximately 79°C (175°F), at which point the mix becomes resistant to compaction. If compaction has not been done at temperatures greater than the cessation temperature, the pavement will not achieve adequate durability.

(f) The surface shall be rolled when the mixture is in the proper condition and when the rolling does not cause undue displacement, cracking, or shoving.

(g) Rollers or oscillating vibratory rollers, ranging from 8-12 tons, shall be used for compaction. The number, mass (weight), and type of rollers furnished shall be sufficient to obtain the required compaction while the mixture is in a workable condition. Generally, one breakdown roller will be needed for each paver used in the spreading operation.

(h) To prevent adhesion of the mixture to the rolls, rolls shall be kept moist with water or water mixed with very small quantities of detergent or other approved material. Excess liquid will not be permitted.

(i) Along forms, curbs, headers, walls, and other places not accessible to the rollers, the mixture shall be thoroughly compacted with hot or lightly oiled hand tampers, smoothing irons or with mechanical tampers. On depressed areas, either a trench roller or cleated compression strips may be used under the roller to transmit compression to the depressed area.

(j) Other combinations of rollers and/or methods of compacting may be used if approved in writing by the Engineer, provided the compaction requirements are met.

(k) Unless otherwise specified, the longitudinal joints shall be rolled first. Next, the Contractor shall begin rolling at the low side of the pavement and shall proceed towards the center or high side with lapped rollings parallel to the centerline. The speed of the roller shall be slow and uniform to avoid displacement of the mixture, and the roller should be kept in as continuous operation as practical. Rolling shall continue until all roller marks and ridges have been eliminated.

(l) Rollers shall not be stopped or parked on the freshly placed mat.

(m) It shall be the responsibility of the Contractor to conduct whatever process control the Contractor deems necessary. Acceptance testing will be conducted by the Engineer using cores provided by the Contractor.

(n) Any mixture that becomes loose and broken, mixed with dirt, or is in any way defective shall be removed and replaced with fresh hot mixture. The mixture shall be compacted to conform to the surrounding area. Any area showing an excess or deficiency of binder shall be removed and replaced. These replacements shall be at the Contractor's expense.

(o) If the Engineer determines that unsatisfactory compaction or surface distortion is being obtained or damage to highway components and/or adjacent property is occurring using vibratory compaction equipment, the Contractor shall immediately cease using this equipment and proceed with the work using non-vibratory methods set forth herein.

(p) The Contractor assumes full responsibility for the cost of repairing all damages that may occur to roadway or parking lot components and adjacent property if vibratory compaction equipment is used. After final rolling, no vehicular traffic of any kind shall be permitted on the surface until cooling and hardening has taken place, and in no case within the first 48 hours. Curing time is preferably one week, or until the entire surface temperature cools below 100º F (38º C). The Contractor shall provide barriers as necessary (and at no extra cost to the Owner) to prevent vehicular use of newly paved surfaces; these barriers shall be removed at the discretion of the Engineer.

3.1.2.9 Joints. Joints between old and new pavements or between successive day's work shall be made to ensure a thorough and continuous bond between the old and new mixtures. Whenever the spreading process is interrupted long enough for the mixture to attain its initial stability, the paver shall be removed from the mat and a joint constructed.

(a) Butt joints shall be formed by cutting the pavement in a vertical plane at right angles to the centerline, at locations approved by the Engineer. The Engineer will determine locations by using a straightedge at least 16 feet long. The butt joint shall be thoroughly coated with Type RS-1 emulsified asphalt just prior to depositing the pavement mixture when paving resumes.

(b) Tapered joints shall be formed by tapering the last 450 to 600 mm (18 to 24 inches) of the course being laid to match the lower surface. Care shall be taken in raking out and discarding the coarser aggregate at the low end of the taper, and in rolling the taper. The taper area shall be thoroughly coated with Type RS- 1 emulsified asphalt just prior to resuming pavement. As the paver places new mixture on the taper area, an evenly graduated deposit of mixture shall complement the previously made taper. Shovels may be used to add additional mixture if necessary. The joint shall be smoothed with a rake, coarse material discarded, and properly rolled.

(c) Longitudinal joints that have become cold shall be coated with Type RS-1 emulsified asphalt before the adjacent mat is placed. If directed by the Engineer, joints shall be cut back to a clean vertical edge prior to applying the emulsion.

3.1.2.10 Surface Tolerances.

(a) The surface will be tested by the Engineer using a straightedge at least 16 feet in length at selected locations parallel with the centerline. Any variations exceeding 1/8 inch between any two contact points shall be satisfactorily eliminated. The straightedge shall be provided by the Contractor.

(b) Work shall be done expertly throughout, without staining or injury to other work. Transition to adjacent impervious asphalt pavement shall be merged neatly with flush, clean line. Finished pavement shall be even, without pockets, and graded to elevations shown on drawing.

(c) Porous pavement beds shall not be used for equipment or materials storage during construction, and under no circumstances shall vehicles be allowed to deposit soil on paved porous surfaces.

3.1.2.11 Repair of Damaged Pavement. Any existing pavement on or adjacent to the site that has been damaged as a result of construction work shall be repaired to the satisfaction of the Engineer without additional cost to the Owner.

3.1.2.12 Striping Paint

(a) Vacuum and clean surface to eliminate loose material and dust.

(b) Paint 4-inch wide parking striping and traffic lane striping in accordance with layouts of plan. Apply paint with mechanical equipment to produce uniform straight edges. Apply in two coats at manufacturer's recommended rates. Provide clear, sharp lines using white traffic paint.

(c) Color for Handicapped Markings: Blue.

3.1.3 QC/QA for Paving Operations

3.1.3.1 The full permeability of the pavement surface shall be tested by application of clean water at the rate of at least 5 gallons per minute over the surface, using a hose or other distribution device. Water used for the test shall be clean, free of suspended solids and deleterious liquids and will be provided at no extra cost to the Owner. All applied water shall infiltrate directly without large puddle formation or surface runoff, and shall be observed by the Engineer.

3.1.3.2 Testing and Inspection: The contractor shall employ at his/her expense an inspection firm acceptable to the Engineer to perform soil inspection services, staking and layout control, and testing and inspection of site grading and pavement work. Inspection and list of tests shall be reviewed and approved in writing by the Engineer prior to starting construction. All test reports must be signed by a licensed Professional Engineer.

3.1.3.3 Test in-place base and surface course for compliance with requirements for thickness and surface smoothness. Repair or remove and replace unacceptable work as directed by the Engineer.

3.1.3.4 Surface Smoothness: Test finished surface for smoothness using a 10-foot straightedge applied parallel with and at right angles to the centerline of the paved area. Surface will not be accepted if gaps or ridges exceed 3/16 of an inch.

3.1.3.5 QC/QA requirements during paving are summarized in the following table.

Activity	**Schedule/ Frequency**	**Tolerance**
Inspect truck beds for pooling (draindown)	Every Truck	N/A
Take surface temp. behind joint heater	Each pull	6° C (10° F) of compaction temp.
Consult with Engineer to determine locations of butt joints	As needed	N/A
Test surface smoothness & positive drainage with a 10-foot straightedge	After compaction	4.5 mm (3/16”)
Consult with Engineer to mark core locations for QA testing	After compaction	N/A
Hose test with water (at least 5 gallons per minute)	After compaction	immediate infiltration, no puddling

PART 4 – MEASUREMENT

4.1 Method of Measurement. Not Applicable.

PART 5 – PAYMENT

5.1 Basis of Payment.

5.1.1 Porous Asphalt Pavements for the Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat**; That part of the lump sum price for Construction of Flagg Road Parking Lot represents payment for the work of this Section 02525 constitutes full and complete compensation for all labor, materials and equipment, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

CURBING

PART 1 - GENERAL

1.1 Description. This work consists of providing concrete and granite curbs of the various types, and removing and resetting existing curb at the locations indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

PART 2 – PRODUCT

2.1 Materials.

2.1.1 Granite and Concrete curb shall conform to the requirements of Section 906 Curbing for Roadways and Section M.09 Curbing of the R.I. Standard Specifications.

PART 3 – EXECUTION

3.1 Construction Methods. Conform to Section 906.03 of the R.I. Standard Specifications apply:

PART 4 - MEASUREMENT. Not Applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Concrete and Granite Curb and Removing and Resetting Existing Curb will not be paid for separately, but payment will included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02530 constitutes full and complete compensation for all labor, materials and equipment for providing curbing work, and all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Concrete and Granite Curb and Removing and Resetting Existing Curb will not be paid for separately, but payment will included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02530 constitutes full and complete compensation for all labor, materials and equipment for providing curbing work, and all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

DIRECTIONAL, REGULATORY AND WARNING SIGNS

PART 1 - GENERAL

1.1 Description. This work consists of furnishing and installing directional, regulatory, and warning signs on wood posts, square tubular steel posts, tubular steel posts, and reflective sheeting, at the locations indicated on the Plans and as directed by the Engineer, all in accordance with these Specifications.

PART 2 – PRODUCT

2.1 Materials. Aluminum sheets, sign posts, reflective sheeting, and hardware shall conform to the applicable requirements of Section M.16; Signs and Sign Supports, of the R.I. Standard Specifications.

PART 3 – EXECUTION

3.1 Construction Methods. The following references to the R.I. Standard Specifications apply:

3.1.1 Preparation of Aluminum Sheets: Subsection T.15.03.1

3.1.2 Sign Face: Subsection T.15.03.2

3.1.3 Application of Reflective Sheeting: Subsection T.15.03

PART 4 - MEASUREMENT. Not applicable

PART 5 - PAYMENT

5.1 Basis of Payment.

5.1.1 Directional, Regulatory and Warning Signs for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02610 constitutes full and complete compensation for all labor, materials and equipment for providing these signs, placing, moving, removing, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.2 Directional, Regulatory and Warning Signs for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02610 constitutes full and complete compensation for all labor, materials and equipment for providing these signs, placing, moving, removing, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

PAVEMENT MARKINGS

PART 1 - GENERAL

1.1 Description. This work consists of furnishing and applying the following items of pavement markings at the widths, and locations indicated on the Plans, and as directed by the Engineer, all in accordance with these Specifications.

1.1.1 Waterborne Pavement Markings shall be utilized for temporary pavement markings.

1.1.2 Epoxy Resin Pavement Markings shall be utilized for permanent pavement markings.

PART 2 – PRODUCT

2.1 Materials.

2.1.1 Temporary Waterborne Pavement Markings; Refer to Subsection M.17.02 of the R.I. Standard Specifications.

2.1.2 Epoxy Resin Pavement Markings: Refer to Subsection M.17.04 of the R.I. Standard Specifications.

PART 3 – EXECUTION

3.1 Construction Methods.

3.1.1 Temporary Waterborne Pavement Markings: Refer to Subsection T.20.03.3 of the R.I. Standard Specifications.

3.1.2 Epoxy Resin Pavement Markings: Refer to Subsection T.20.03.6 of the R.I. Standard Specifications.

PART 4 - MEASUREMENT. Not applicable

PART 5 – PAYMENT.

5.1 Basis of Payment.

5.1.1 Pavement Markings will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02620 constitutes full and complete compensation for all labor, materials and equipment for providing pavement markings, including the removal of the temporary markings and all other incidentals required to finish this work, complete and accepted by the Engineer.

5.1.1 Pavement Markings will not be paid for separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Parking Lot, Complete. **Caveat;** That part of the lump sum price that represents payment for the work of this Section 02620 constitutes full and complete compensation for all labor, materials and equipment for providing pavement markings, including the removal of the temporary markings and all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

TOPSOIL

PART I - GENERAL

1.1 DESCRIPTION

A. This work consists of providing topsoil at the locations indicated on the Plans and/or as directed by the Engineer. The following activities are covered by this section:

1. Testing, amending, placing and finish grading all stockpiled and borrow (new) topsoil.
2. Provide all borrow (new) topsoil necessary to properly complete all lawn and seeding operations.

B. Related Sections.

1. Section 02110 “Site Clearing” for topsoil stripping.
2. Section 02200 “Earthwork” for site earthwork.
3. Section 02920 “Turf and Grasses” for all lawn and meadow development.

1.2 QUALITY ASSURANCE

A. Topsoil:

1. Source: The sources and use of the topsoil prior to stripping shall be known and documented. Pesticide use on the site shall be documented and provided to the Owner. Soils with a known use of residual (preemergence) herbicide within two years of stripping are not acceptable.
2. Testing: Representative samples of borrow topsoil and stockpiled topsoil shall be completely analyzed/tested to determine:

    a. Nutrient analysis – to be performed by either a state extension laboratory or a soils laboratory with experience in agricultural nutrient analyses and resultant fertilizer and liming recommendations. Minimum analytic list to include nutrient analysis using the Modified Morgan extractant for soil for available phosphorus (P), potassium (K), calcium (Ca), manganese (Mg), iron, zinc, copper and boron and for total nitrogen and soluble nitrate.
    b. Soil pH.
    c. Organic content – determined by loss of weight on ignition.
    d. Particle size analysis – sand, silt, and clay – analysis shall be determined using the hydrometer method of particle size analysis with size fractions based upon size limits established by USDA.

3. Before delivery of any borrow topsoil, furnish the Engineer with a 5-gallon sample of material.

4. Topsoil testing costs shall be borne by the Contractor. At least 3 tests shall be taken from each source.
5. Testing laboratory shall be approved by the Owner and Engineer.

1.3 SUBMITTALS

A. Submit topsoil test results to the Engineer for review. The Engineer will be the sole judge of acceptability.

1.4 PRODUCT HANDLING

A. Coordinate delivery of borrow topsoil such that it is placed and stockpiled where designated by the Owner.

PART 2 – PRODUCTS

2.1 TOPSOIL (GENERAL)

A. Topsoil, separated from excavation material and stored as specified in Section 02200 shall be approved by the Engineer/Engineer before reuse. If not acceptable and/or if sufficient quantities are not available on-site, then topsoil from outside sources shall be furnished.

B. Topsoil, to be furnished from on-site excavation and/or sources outside of the project limits, shall consist of loose, friable, sandy loam, or loam topsoil, free of admixture of subsoil, refuse, stumps, rocks, brush, weeds, roots and other materials which will prevent the formation of a suitable seed bed. No stones in excess of one and one-quarter inch (1-1/4”) in diameter will be tolerated. The Contractor shall notify the Engineer/Engineer of the location of the source of supply for the topsoil at least ten (10) days prior to delivery of the topsoil to the project site.

   In addition, topsoil furnished from off-site sources shall meet the following requirements:

   1. The ph of the material shall be between 5.5 and 7.6.
   2. The organic content shall be not less than three percent (3%) not more than twenty percent (20%).
   3. It shall be well graded with twenty percent (20%) to eight-five percent (85%) by weight passing a No. 200 sieve.

Any imported materials which do not meet the above requirements shall be rejected and removed from the site.

2.2 BORROW TOPSOIL FOR GENERAL PLANTING AND LOAM AND SEED AREAS

A. Texture

1. Shall be a sandy loam as per USDA Soil Classification as determined by laboratory particle size analysis, with the following additional particle size limits:

   Sand (0.05 to 2 mm diam.) – minimum 60 % by weight
   Silt (0.002 to 0.05 mm diam.) – between 10 and 30 % by weight
   Clay (less than 0.002 mm diam) – between 5 and 15 % by weight

2. Topsoil shall not contain materials harmful to plant life, to be clean, fertile, friable, and well draining. All topsoil to be free of any subsoil earth clods, sods, stones over ¾" in any dimension, sticks, roots, weeds, litter and other deleterious material.

3. Coarse Fragments: Topsoil must pass through a 3/8-inch mesh and be free of stones and other foreign materials that are retained by the screen. Gravel between 2 mm and 9.5 mm (3/8") shall not exceed 5 percent by weight.

4. Topsoil Source: Obtain topsoil displaced from naturally well-drained sites where topsoil occurs at least 4 inches deep; do not obtain from bogs or marshes.

5. Nutrient levels shall be achieved by the Contractor's addition of amendments to the topsoil to meet the optimum nutrient levels specified in the testing laboratory report.

B. Permeability:

1. The finished topsoil product must possess a permeability of between 0.5 and 3 inches per hour when compacted to 80% of maximum as determined by a standard Proctor test.

C. Organic Matter

1. Topsoil shall be uniform in quality and texture and contain organic matter and mineral elements necessary for sustaining healthy plant growth.

2. Topsoil shall have the following optimum ranges unless otherwise approved by the Engineer.

   Organic Matter Content 6-8%

D. Soil Reaction: pH 6 -7

E. Organic Amendment

1. Acceptable organic materials to achieve the organic matter range include sphagnum moss or commercially prepared compost with the following characteristics.
   a. Sphagnum moss
   b. Minimum organic matter content: 85%
   c. Minimum fiber as retained by a 150 mm sieve: 60%
   d. Maximum mineral content: 15%

e. Commercial Compost
f. Minimum organic matter content: 50%
g. Carbon-nitrogen ration: 20 to 30
h. Particle size: <3/8”
i. Metals: Not to exceed state standards for biosolids

F. Metals: Metals shall not exceed state standards for agricultural soils.

G. Sand Amendments

1. Sand required to achieve the specified permeability for topsoil should meet ASTM Standard C33, Concrete Sand, and possess a Coefficient of Uniformity less than 4 and a Fineness Modulus between 2.7 and 3.2

PART 3 – EXECUTION

3.1 SHAPING AND GRADING OF SUBSOIL AT ALL LAWN AREAS

A. After rough grading has been completed, shape and grade lawn subgrade areas to lines and levels as noted on the drawings and as required based on total amounts of approved topsoil to allow placement of uniform depth of topsoil. Adjustments may be necessary due to field conditions. Provide all shaping adjustments at no additional cost to the Owner.

B. Harrow or otherwise loosen the subgrade soil to 12” depth if required to correct for over compaction.

C. After shaping of lawn subgrades remove all sticks, stones, or foreign material two (2) inches or greater in dimension. Remove debris and stone off-site.

3.2 TOPSOIL SPREADING

A. Do not apply topsoil to the scarified subgrade without approval by the Engineer. Once approved, no vehicular traffic will be allowed on finish subgrade. Topsoil will not be permitted to be spread until topsoil test reports have been submitted and approved. Topsoil shall not be delivered or worked in a frozen or muddy condition.

B. Uniformly distribute and spread topsoil over all graded lawn areas to conform smoothly to the lines, grades, and elevations shown or otherwise required. All lawn areas to have a minimum of six (6) inches of topsoil after compaction. All approved stockpiled topsoil is to be spread unless otherwise directed by the Engineer. Maintain consistent depths of material throughout the project area.

Manually supply topsoil around all trees to remain. Avoid damage to root systems.

C. Topsoil shall be spread in (2) equal lifts. Bottom lift shall be thoroughly mixed with the loosened subgrade by disking, harrowing, or other approved means to create a transition layer.

D. Place topsoil only when it can be immediately followed within 6 hours by lawn development operations.

E. Re-supply and place topsoil to eroded, settled or damaged areas until all lawn areas are stabilized. Care shall be taken not to damage grass or pavement areas in the replacement to topsoil.

3.3 PROTECTION

A. Remove weeds prior to lawn development operations. No weeds shall be allowed to go to seed.

B. Keep heavy equipment, trucks, etc. off topsoil areas at all times.

C. If compaction occurs, scarify to the full depth of the topsoil and regrade topsoil.

3.4 EXCESS TOPSOIL

A. Material approved for reuse but not required to be installed remains the property of the Owner and shall be deposited at a location designated by the Owner.

B. Material not approved for reuse remains the property of the Contractor and is to be removed from the site.

PART 4 - MEASUREMENT

4.1 METHOD OF MEASUREMENT – Not applicable

PART 5 - PAYMENT

5.1 BASIS OF PAYMENT

A. Topsoil for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02900 constitutes full and complete compensation for all labor, materials and equipment, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

B. Topsoil for Flagg Road Parking Lot will not be paid for separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02900 constitutes full and complete compensation for all labor, materials and equipment, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

PLANTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Plants.
2. Planting soils.
3. Landscape edgings.

B. Related Sections:
1. Section 02110 "Site Preparation and Demolition" for protection of existing trees and plantings, topsoil stripping and stockpiling, and site clearing.
2. Section 02200 "Earthwork" for excavation, filling, and rough grading and for subsurface aggregate drainage and drainage backfill materials.
3. Section 02920 "Turf and Grasses" for lawn and meadow planting, hydroseeding, and erosion-control materials.

1.3 DEFINITIONS

A. Backfill: The earth used to replace or the act of replacing earth in an excavation.

B. Balled and Burlapped Stock: Plants dug with firm, natural balls of earth in which they were grown, with ball size not less than diameter and depth recommended by ANSI Z60.1 for type and size of plant required; wrapped with burlap, tied, rigidly supported, and drum laced with twine with the root flare visible at the surface of the ball as recommended by ANSI Z60.1.

C. Balled and Potted Stock: Plants dug with firm, natural balls of earth in which they are grown and placed, unbroken, in a container. Ball size is not less than sizes indicated on plant list.

D. Bare-Root Stock: Plants with a well-branched, fibrous-root system developed by transplanting or root pruning, with soil or growing medium removed, and with not less than minimum root spread according to ANSI Z60.1 for type and size of plant required.

E. Container-Grown Stock: Healthy, vigorous, well-rooted plants grown in a container, with a well-established root system reaching sides of container and maintaining a firm ball when removed from container. Container shall be rigid enough to hold ball shape and

protect root mass during shipping and be sized according to ANSI Z60.1 for type and size of plant required.

F. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

G. Fabric Bag-Grown Stock: Healthy, vigorous, well-rooted plants established and grown in-ground in a porous fabric bag with well-established root system reaching sides of fabric bag. Fabric bag size is not less than diameter, depth, and volume required by ANSI Z60.1 for type and size of plant.

H. Finish Grade: Elevation of finished surface of planting soil.

I. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

J. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

K. Pests: Living organisms that occur where they are not desired, or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

L. Planting Area: Areas to be planted.

M. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

N. Plant; Plants; Plant Material: These terms refer to vegetation in general, including trees, shrubs, vines, ground covers, ornamental grasses, bulbs, corms, tubers, or herbaceous vegetation.

O. Root Flare: Also called "trunk flare." The area at the base of the plant's stem or trunk where the stem or trunk broadens to form roots; the area of transition between the root system and the stem or trunk.

P. Stem Girdling Roots: Roots that encircle the stems (trunks) of trees below the soil surface.

Q. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or the top surface of a fill or backfill before planting soil is placed.

R. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

S. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil; but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated, including soils.

1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to the Project.

B. Samples for Verification: For each of the following:

1. Trees and Shrubs: Engineer will select trees and shrubs at the nursery prior to delivery to the site, unless otherwise noted.
2. Organic Compost or Mulch: 1-pint volume of each organic mulch required; in sealed plastic bags labeled with composition of materials by percentage of weight and source of mulch. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
3. Weed Control Barrier: 12 by 12 inches
4. Edging Materials and Accessories: Manufacturer's standard size, to verify color selected.
5. Root Barrier: Width of panel by 12 inches

1.5 INFORMATIONAL SUBMITTALS

A. Qualification Data: For qualified Landscape Installer. Include list of similar projects completed by Installer demonstrating Installer's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of owners' contact persons.

B. Product Certificates: For each type of manufactured product, from manufacturer, and complying with the following:

1. Manufacturer's certified analysis of standard products.
2. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.

C. Material Test Reports: For imported native topsoil, existing native surface topsoil and existing in-place surface soil. Manufactured soil is not allowed.

D. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods.

E. Warranty: Sample of special warranty.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified Landscape Installer whose work has resulted in successful establishment of plants.

1. Professional Membership: Installer shall be a member in good standing of either the Rhode Island Nursery and Landscape Association (RINLA) or the American Nursery and Landscape Association.
2. Experience: Five years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from the Engineer. A minimum of two representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for plant growth.

   a. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
   b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1.

1. Selection of plants purchased under allowances will be made by Engineer, who will tag plants at their place of growth before they are prepared for transplanting.

E. Measurements: Measure according to ANSI Z60.1. Do not prune to obtain required sizes.

1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

F. Plant Material Observation: Engineer may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Engineer retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from Project site.

1. Notify Engineer of sources of planting materials **seven** days in advance of delivery to site.

G. Preinstallation Meeting: Engineer to review and approve placement of all plants prior to digging and installation.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, and soil amendments with appropriate certificates.

C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy

their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F until planting.

G. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

1.8 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:

1. Notify Engineer no fewer than three days in advance of proposed interruption of each service or utility.
2. Do not proceed with interruption of services or utilities without Engineer written permission.

C. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

1. Balled and Burlapped and Container Material – Deciduous
   a. Spring: March 1 to June 30
   b. Fall: September 1 to December 15

2. Balled and Burlapped and Container Materials – Evergreen (broadleaf and needle)

a. Spring: April 1 to May 15
b. Fall: August 15 to October 15

D. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

E. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.9 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.

1. Failures include, but are not limited to, the following:

a. Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
b. Structural failures including plantings falling or blowing over.
c. Faulty performance of tree stabilization and edgings
d. Deterioration of metals, metal finishes, and other materials beyond normal weathering.

2. Warranty Periods from Date of Planting Completion

a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
c. Annuals: Three months.

3. Include the following remedial actions as a minimum:

a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
b. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Architect, with a proportionate increase in size of roots or balls.

C. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.

E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Annuals and Biennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery and that are in bud but not yet in bloom.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural liming material containing a minimum of 80 percent calcium carbonate equivalent and as follows:

1. Class: T, with a minimum of 99 percent passing through No. 8 sieve and a minimum of 75 percent passing through No. 60 sieve.
2. Class: O, with a minimum of 95 percent passing through No. 8 sieve and a minimum of 55 percent passing through No. 60 sieve.
3. Provide lime in form of ground dolomitic limestone or calcitic limestone

B. Sulfur: Granular, biodegradable, and containing a minimum of 90 percent sulfur, with a minimum of 99 percent passing through No. 6 sieve and a maximum of 10 percent passing through No. 40 sieve. Synthetically derived sulfur is not allowed.

C. Iron Sulfate: Granulated ferrous sulfate containing a minimum of 20 percent iron and 10 percent sulfur.

D. Aluminum Sulfate: Commercial grade, unadulterated.

E. Perlite: Horticultural perlite, soil amendment grade.

F. Agricultural Gypsum: Minimum 90 percent calcium sulfate, finely ground with 90 percent passing through No. 50 sieve.

G. Sand: Clean, washed, natural or manufactured, and free of toxic materials.

H. Diatomaceous Earth: Calcined, 90 percent silica, with approximately 140 percent water absorption capacity by weight.

I. Zeolites: Mineral clinoptilolite with at least 60 percent water absorption by weight.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.
2. Feedstock: Agricultural, food, or industrial residuals; biosolids; yard trimmings; or source-separated or compostable mixed solid waste.

B. Sphagnum Peat: Partially decomposed sphagnum peat moss, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Muck Peat: Partially decomposed moss peat, native peat, or reed-sedge peat, finely divided or of granular texture, with a pH range of 6 to 7.5, and having a water-absorbing capacity of 1100 to 2000 percent.

D. Wood Derivatives: Decomposed, nitrogen-treated sawdust, ground bark, or wood waste; of uniform texture and free of chips, stones, sticks, soil, or toxic materials.

E. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, debris, and material harmful to plant growth.

2.4 FERTILIZERS

A. Bonemeal: Commercial, raw or steamed, finely ground; a minimum of 4 percent nitrogen and 20 percent phosphoric acid.

B. Commercial Fertilizer: Pro-Gro 5-3-4 from North Country Organics, Bradford, VT (802-222-4277), or approved equal.

2.5 PLANTING SOILS

A. Planting Soil: ASTM D 5268 topsoil, with pH range of 5.5 to 7.5, a minimum of 5 % percent and a maximum of 20% organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Mix ASTM D 5268 topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Topsoil by Volume:1:3
2. Weight of Lime per 1000 Sq. Ft. as per testing laboratory report
3. Weight of Organic Commercial Fertilizer per 1000 Sq. Ft. as per testing laboratory report

B. Planting Soil - Native: Existing, native surface topsoil formed under natural conditions with the duff layer retained during excavation process and stockpiled on-site. Verify suitability of native surface topsoil to produce viable planting soil. Clean soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth.

1. Supplement with other planting soil when quantities are insufficient.
2. Mix existing, native surface topsoil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

    a. Ratio of Loose Compost to Topsoil by Volume: 1:3
    b. Weight of Lime per 1000 Sq. Ft. as per testing laboratory report.
    c. Volume of Sand Plus 10 Percent Diatomaceous Earth per 1000 Sq. Ft.
    d. Weight of Organic Commercial Fertilizer per 1000 Sq. Ft. as per testing laboratory report.

C. Planting Soil – Salvaged from Site: Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth. Mix surface soil with the following soil amendments and fertilizers in the following quantities to produce planting soil:

1. Ratio of Loose Compost to Surface Soil by Volume: 1:3
2. Weight of Lime per 1000 Sq. Ft. as per testing laboratory report
3. Volume of Sand Plus 10 Percent **Diatomaceous Earth** per 1000 Sq. Ft.
4. Weight of Commercial Fertilizer per 1000 Sq. Ft. as per testing laboratory report.

2.6 MULCHES

A. Organic Mulch: Free from deleterious materials and suitable as a top dressing of trees and shrubs, consisting of one of the following:

1. Type: Ground or shredded bark or Pine needles
2. Size Range: 3 inches maximum, 1/2 inch minimum
3. Color: Natural. No dyed mulch is allowed.

2.7 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally-encountered chemicals, alkalis, and acids.

B. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd.

2.8 PESTICIDES

A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.

2.9 LANDSCAPE EDGINGS - none

2.10 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.

B. Burlap: Non-synthetic, biodegradable.

C. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.

1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Architect and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.

1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

F. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 18 inches Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.

   a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
   b. Mix lime with dry soil before mixing fertilizer.

2. Spread planting soil to a depth required to meet finish grades after natural settlement and application of mulch. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.

   a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

B. Finish Grading: Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

C. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

D. Application of Mycorrhizal Fungi: At time directed by Engineer, broadcast dry product uniformly over prepared soil at application rate to be determined by testing.

3.4 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on

undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.

1. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock.
2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
3. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
4. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
5. Maintain supervision of excavations during working hours.
6. Keep excavations covered or otherwise protected at all times when unattended, or overnight until excavation is filled.
7. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. Topsoil removed from excavations may be used as planting soil. Subsoil may not be used.

C. Obstructions: Notify Engineer if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

1. Hardpan Layer: Do not plant in hardpan layer or over bedrock Notify Engineer regarding relocation of plant.

D. Drainage: Notify Engineer if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

E. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.5 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. Use planting soil for backfill.

2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Set container-grown stock plumb and in center of planting pit or trench with root flare 2 inches above adjacent finish grades.

1. Use planting soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. Set and support bare-root stock in center of planting pit or trench with root flare 2 inches above adjacent finish grade.

1. Use planting soil for backfill.
2. Spread roots without tangling or turning toward surface, and carefully work backfill around roots by hand. Puddle with water until backfill layers are completely saturated. Plumb before backfilling, and maintain plumb while working backfill around roots and placing layers above roots.
3. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside soil-covered roots about 1 inch from root tips; do not place tablets in bottom of the hole or touching the roots.
4. Continue backfilling process. Water again after placing and tamping final layer of soil.

F. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

3.6 TREE STABILIZATION – REFER TO PLANS FOR LOCATIONS WHERE USED

A. Install trunk stabilization as follows only in windy sites and on unstable slope conditions:

1. Upright Staking and Tying: Stake trees of 2 - through 5-inch caliper. Stake trees of less than 2-inch caliper only as required to prevent wind tip out. Use a minimum of two stakes of length required to penetrate at least 18 inches below bottom of backfilled excavation and to extend one-third of trunk height above grade. Set vertical stakes and space to avoid penetrating root balls or root masses.
2. Use two stakes for trees up to 12 feet high and 2-1/2 inches or less in caliper; three stakes for trees less than 14 feet high and up to 4 inches in caliper. Space stakes equally around trees.
3. Support trees with bands of flexible ties at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.
4. Support trees with two strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk. Allow enough slack to avoid rigid restraint of tree.

B. Staking and Guying: Stake and guy trees more than 14 feet in height and more than 3 inches in caliper unless otherwise indicated. Securely attach no fewer than three guys to stakes 30 inches long, driven to grade.

1. Site-Fabricated Staking-and-Guying Method:

   a. For trees more than 6 inches in caliper, anchor guys to wood deadmen buried at least 36 inches below grade. Provide turnbuckle for each guy wire and tighten securely.
   b. Support trees with bands of flexible ties at contact points with tree trunk and reaching to turnbuckle**.** Allow enough slack to avoid rigid restraint of tree.
   c. Support trees with strands of cable or multiple strands of tie wire, connected to the brass grommets of tree-tie webbing at contact points with tree trunk and reaching to turnbuckle. Allow enough slack to avoid rigid restraint of tree.
   d. Attach flags to each guy wire, 30 inches above finish grade.
   e. Paint turnbuckles with luminescent white paint.

2. Proprietary Staking and Guying Device: Install staking and guying system sized and positioned as recommended by manufacturer unless otherwise indicated and according to manufacturer's written instructions.

3.7 GROUND COVER AND PERENNIAL PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated on the plant list or on the drawings in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.8 PLANTING AREA MULCHING

A. Install weed-control fabric before mulching according to manufacturer's written instructions. Completely cover area to be mulched, overlapping edges a minimum of 6 inches and secure seams with galvanized pins.

B. Mulch backfilled surfaces of planting areas and other areas indicated.

1. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 3-inch average thickness, with 24-inch radius around trunks or stems. Do not place mulch within 3 inches of trunks or stems.
2. Organic Mulch in Planting Areas: Apply 3-inch average thickness of organic mulch extending 12 inches beyond edge of individual planting pit or trench and over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.

3.9 EDGING INSTALLATION

A. Steel Edging: Install steel edging where indicated according to manufacturer's written instructions. Anchor with steel stakes spaced approximately 30 inches apart, driven below top elevation of edging.

B. Shovel-Cut Edging: Separate mulched areas from turf areas with a 45-degree, 4- to 6-inch-deep, shovel-cut edge as shown on Drawings.

3.10 PLANT MAINTENANCE

A. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.

B. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.

C. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

3.11 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective) Organic Only: Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective) - Organic Only: Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.12 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

C. After installation and before Punch List, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

3.13 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

PART 4 - MEASUREMENT

4.1 METHOD OF MEASUREMENT – Not applicable

PART 5 - PAYMENT

5.1 BASIS OF PAYMENT

A. Plants for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02905 constitutes full and complete compensation for all labor, materials and equipment,, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

TURF AND GRASSES

GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section Includes:

1. Seeding.
2. Hydroseeding.
3. Wetland Seed Mix and Park Seed Mix.
4. Sod.
5. Erosion-control material(s).

B. Alternatives in this section

1. One-year maintenance period.
2. Sod in place of seed.

C. Related Sections:

1. Section 02110 "Site Preparation & Demolition" for topsoil stripping and stockpiling.
2. Section 02200 "Earthwork" for excavation, filling and backfilling, and rough grading.
3. Section 02905 "Plants" for plantings.

1.3 DEFINITIONS

A. Duff Layer: The surface layer of native topsoil that is composed of mostly decayed leaves, twigs, and detritus.

B. Finish Grade: Elevation of finished surface of planting soil.

C. Manufactured Topsoil: Soil produced off-site by homogeneously blending mineral soils or sand with stabilized organic soil amendments to produce topsoil or planting soil.

D. Pesticide: A substance or mixture intended for preventing, destroying, repelling, or mitigating a pest. This includes insecticides, miticides, herbicides, fungicides, rodenticides, and molluscicides. It also includes substances or mixtures intended for use as a plant regulator, defoliant, or desiccant.

E. Pests: Living organisms that occur where they are not desired or that cause damage to plants, animals, or people. These include insects, mites, grubs, mollusks (snails and slugs), rodents (gophers, moles, and mice), unwanted plants (weeds), fungi, bacteria, and viruses.

F. Planting Soil: Standardized topsoil; existing, native surface topsoil; existing, in-place surface soil; imported topsoil; or manufactured topsoil that is modified with soil amendments and perhaps fertilizers to produce a soil mixture best for plant growth.

G. Subgrade: Surface or elevation of subsoil remaining after excavation is complete, or top surface of a fill or backfill before planting soil is placed.

H. Subsoil: All soil beneath the topsoil layer of the soil profile, and typified by the lack of organic matter and soil organisms.

I. Surface Soil: Soil that is present at the top layer of the existing soil profile at the Project site. In undisturbed areas, the surface soil is typically topsoil, but in disturbed areas such as urban environments, the surface soil can be subsoil.

1.4 ACTION SUBMITTALS

A. Product Data: For each type of product indicated.

1. Pesticides and Herbicides: Include product label and manufacturer's application instructions specific to this Project.

1.5 INFORMATIONAL SUBMITTALS

A. Certification of Grass Seed: From seed vendor for each grass-seed monostand or mixture stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.

1. Certification of each seed mixture for turfgrass. Include identification of source and name and telephone number of supplier.

B. Qualification Data: For qualified landscape Installer.

C. Product Certificates: For soil amendments and fertilizers, from manufacturer.

D. Material Test Reports: For standardized ASTM D 5268 topsoil, existing native surface topsoil and existing in-place surface soil

E. Maintenance Instructions: Recommended procedures to be established by Owner for maintenance of turf and meadow**s** during a calendar year. Submit before expiration of required initial maintenance periods.

1.6 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful turf and meadow establishment.

1. Professional Membership: Installer shall be a member in good standing of either the Rhode Island Nurserymen's and Landscape Association (RINLA) or the American Nursery and Landscape Association.
2. Experience: Five years' experience in turf installation in addition to requirements in Division 01 Section "Quality Requirements."
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
4. Pesticide Applicator: State licensed, commercial.

B. Soil-Testing Laboratory Qualifications: An independent laboratory or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; deleterious material; pH; and mineral and plant-nutrient content of the soil.

1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil-testing laboratory shall oversee soil sampling, with depth, location, and number of samples to be taken per instructions from Engineer. A minimum of two representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for turf growth.

    a. Based on the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
    b. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Seed and Other Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws, as applicable.

B. Bulk Materials:

1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime and soil amendments with appropriate certificates.

1.8 PROJECT CONDITIONS

A. Seeding Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.

1. For Turf areas to be seeded with Park Seed Mix
   a. Spring Seeding: April 1 to May 31
   b. Fall Seeding: August 5 to October 15

2. For areas to be seeded with Wetland Seed Mix:
   a. Spring Seeding: April 1 to May 31
   b. Fall Seeding: September 1 to O

NOTE: Fall seeding is preferred for Turf areas and spring seeding is preferred for Wetland Seed areas.

B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

1.9 MAINTENANCE SERVICE

A. Initial Turf Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:

1. Seeded Turf: 60 days from date of planting completion

a. When initial maintenance period has not elapsed before end of planting season, or if turf is not fully established, continue maintenance during next planting season.

B. Initial Meadow Maintenance Service: Provide full maintenance by skilled employees of landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable meadow is established, but for not less than 40 days from date of planting completion.

C. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard maintenance agreement, for one year, starting on date initial meadow maintenance service is concluded for all turf and meadow grasses. State services, obligations, conditions, and terms for agreement period and for future renewal options. Payment for Continuing Maintenance shall be lump sum and be bid as an add alternate to the base contract bid.

PART 2 - PRODUCTS

2.1 SEED

A. Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Journal of Seed Technology; Rules for Testing Seeds" for purity and germination tolerances.

B. Turf Grass Seed Mix: Proprietary seed mix as follows:

1. Products: Subject to compliance with requirements, provide the following:

a. URI No 2 Improved Seed Mix for Partial Shade and Full Sun Areas

Variety	Percent by Weight
Creeping Red Fescue (Improved varieties)	40
Kentucky Blue Grass (Improved varieties)	20
Perennial Ryegrass (Improved varieties)	20
Perennial Ryegrass (98/85)	20

Seeding Rate:
Overseeding: 75 lbs per acre (5 lbs per M/sq)
New Seeding: 150 lbs. per acre (7 lbs per M/sq)

b. URI No 2 Seed Mix for Sun Areas

Variety	Percent by Weight
Creeping Red Fescue (Improved varieties)	70
Kentucky Blue Grass (Improved varieties)	15
Perennial Ryegrass (Improved varieties)	15

Seeding Rate:
Overseeding: 75 lbs per acre
New Seeding: 150 lbs. per acre

C. Wetland Seed Mix: Fresh, clean, and dry new seed, of mixed species as follows:

1. For wet sites and detention basins

Botanical Name	**Common Name**	**Ind.**
Alisma plantago-aquatica	Mud Plantain	OBL
Asclepias incarnata	Swamp Milkweed	OBL
Aster novi-belgii	New York Aster	FACW+
Bidens cernua	Nodding Bur Marigold	OBL
Carex comosa	Bristly/Cosmos Sedge	OBL
Carex crinita	Fringed Sedge (Nodding)	OBL
Carex lupulina	Hop Sedge	OBL
Carex lurida	Lurid Sedge (Shallow)	OBL
Carex scoparia	Blunt Broom Sedge	FACW
Carex vulpinoidea	Fox Sedge	OBL
Eupatorium maculatum	Spotted Joe Pye Weed	FACW
Eupatorium perfoliatum	Boneset	FACW
Glyceria canadensis	Rattlesnake Grass	OBL
Glyceria striata	Fowl Mannagrass	OBL
Juncus effusus	Soft Rush	FACW+
Mimulus ringens	Square Stemmed Monkey Flower	OBL
Onoclea sensibilis	Sensitive Fern	FACW
Scirpus atrovirens	Green Bulrush	OBL
Scirpus cyperinus	Wool Grass	FACW
Scirpus validus	Soft Stem Bulrush	OBL
Verbena hastata	Blue Vervain	FACW

Seeding Rate: 18 lbs. per acre

D. Seed Carrier: Inert material, sharp clean sand or perlite, mixed with seed at a ratio of not less than two parts seed carrier to one part seed.

2.2 INORGANIC SOIL AMENDMENTS

A. Lime: ASTM C 602, agricultural limestone containing a minimum 80 percent calcium carbonate equivalent and as follows:

1. Class: Class T, with a minimum 99 percent passing through No. 8 sieve and a minimum 75 percent passing through No. 60 sieve.
2. Provide lime in form of ground limestone.

B. Perlite: Horticultural perlite, soil amendment grade.

C. Agricultural Gypsum: Finely ground, containing a minimum of 90 percent calcium sulfate.

D. Sand: Clean, washed, natural or manufactured, free of toxic materials.

2.3 ORGANIC SOIL AMENDMENTS

A. Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 7.4; moisture content 35 to 55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings; and as follows:

1. Organic Matter Content: 50 to 60 percent of dry weight.

B. Peat: Sphagnum peat moss, partially decomposed, finely divided or granular texture, with a pH range of 3.4 to 4.8.

C. Manure: Well-rotted, unleached, stable or cattle manure containing not more than 25 percent by volume of straw, sawdust, or other bedding materials; free of toxic substances, stones, sticks, soil, weed seed, and material harmful to plant growth.

2.4 PLANTING ACCESSORIES

A. Selective Herbicides and Fungicides: EPA registered and approved, of type recommended by manufacturer for application.
   1. Fungicides:
      a. CIVITAS plant defense activator (866 335-3369).
      2. Pre-emergent broadleaf weed control for Spring seeding: Allowed Herbicides include:
         a. SureGuard Herbicide (EPA approved) as manufactured by Valent. Contact Jim Santoro (508) 207-2094.

2.5 FERTILIZER

A. Organic Fertilize:
   1. Nature's Turf 8-1-9 as supplied by North Country Organics, Bradford, VT (802-222-4277)
   2. Apply as per manufacturer's written instructions and in amounts of N-P-K as recommended in soil reports from a qualified soil-testing agency.

2.6 MULCHES

A. Mulch: "Flexterra" FGM (Flexible Growth Medium as manufactured by Profile Erosion Control Solutions (PECS), registered trademark of Profile Products LLC.
website: http://www.profileproducts.com/corporate/index.htm

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to be planted for compliance with requirements and other conditions affecting performance.

   1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
   2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
   3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
   4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting operations.

1. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray.
2. Protect grade stakes set by others until directed to remove them.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

3.3 TURF AREA PREPARATION

A. Limit lawn subgrade preparation to areas to be seeded and/or sodded.

B. Pitch lawn and meadow areas as noted on drawings to shed excess water away from building and walk/drive surfaces.

C. During construction, prevent excessive compaction. Never handle soil when wet. Use only tracked equipment with a low weight bearing to spread the soil. Use lightweight equipment with flotation tires for finish grading.

D. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 6 inches. Remove stones larger than ¾-inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

1. Mix soil amendments and fertilizers with topsoil at rates recommended from soil testing results.
2. Thoroughly blend planting soil mix off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.

    a. Delay mixing fertilizer with topsoil if seeding will not proceed within a few days.
    b. Mix lime with dry soil before mixing fertilizer.

3. Spread topsoil mix to a depth required to meet thickness, elevations and finish grades shown after light rolling and natural settlement. Do not spread if topsoil or subgrade is frozen, muddy, or excessively wet.

E. Unchanged Subgrades: If lawns are to be planted in areas unaltered or undisturbed by excavating, grading, or surface soil stripping operations, prepare surface soil as follows:

1. Remove existing grass, vegetation, and turf. Do not mix into surface soil.
2. Loosen surface soil to a depth of at least of 6 inches**.** Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Trim high areas and fill depressions. Till soil to a homogeneous mixture of fine texture.
3. Remove stones larger than ¾ inch in any dimension and sticks, roots, trash, and other extraneous matter.

4. Legally dispose of waste material, including grass, vegetation, and turf, off Owner's property.

F. Finish Grading: Grade lawn and meadow areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.

G. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

H. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 PREPARATION FOR EROSION-CONTROL MATERIALS

A. Prepare area as specified in "Turf Area Preparation" Article.

B. Moisten prepared area before planting if surface is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

3.5 HYDROSEEDING

A. Hydroseeding: Mix specified seed, fertilizer, fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application.

1. Mix slurry with fiber-mulch manufacturer's recommended tackifier.
2. Apply slurry uniformly to all areas to be seeded in a one-step process.

3.6 SODDING

A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.

B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

1. Lay sod across angle of slopes exceeding 1:3.
2. Anchor sod on slopes exceeding 1:6 with wood pegs/steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.

C. Saturate sod with fine water spray within two hours of planting. During first week after planting, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches below sod.

3.7 TURF (LAWN) MAINTENANCE

A. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

   1. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence.
   2. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement.
   3. Apply treatments as required to keep turf and soil free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards.

B. Watering: Install and maintain temporary piping, hoses, and turf-watering equipment to convey water from sources and to keep turf uniformly moist to a depth of 4 inches.

   1. Schedule watering to prevent wilting, puddling, erosion, and displacement of seed or mulch. Lay out temporary watering system to avoid walking over muddy or newly planted areas.
   2. Water turf with fine spray at a minimum rate of 1 inch per week unless rainfall precipitation is adequate.

C. Mow turf for proposed lawn areas as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than 1/3 of grass height. Remove no more than 1/3 of grass-leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted. Do not mow when grass is wet. Schedule initial and subsequent mowings to maintain the following grass height:
   1. Mow Turf grass in lawn areas to a height of 2 inches- 2-1/2 inches.
   2. Mow Meadow areas between the 75-foot and 50-foot wetland buffer zones and roadside meadow areas as follows:
      a. If planted in spring, mow
         1) Once in the <u>second</u> autumn after planting (late August to September)
      b. If planted in autumn, mow
         1) Once in early spring (late March to early April)
   3. DO NOT MOW Meadow areas beyond 50-foot wetland buffer zone.

D. Turf Post fertilization: Apply fertilizer after initial mowing and when grass is dry.

1. Use organic fertilizer that will provide actual nitrogen of at least 1 lb/1000 sq. ft. to turf area.

3.8 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by Engineer:

1. Satisfactory Seeded Turf: At end of maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.

B. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory.

3.9 PESTICIDE APPLICATION

A. Apply organic pesticides and other chemical products and biological control agents in accordance with requirements of authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Post-Emergent Organic Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

3.10 CLEANUP AND PROTECTION

A. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

B. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

PART 4 - MEASUREMENT

4.1 METHOD OF MEASUREMENT – Not applicable

PART 5 - PAYMENT

5.1 BASIS OF PAYMENT

A. Turf and Grasses for Flagg Road Extension will not be paid for separately, but payment will be included in the Lump Sum price listed in the Base Bid Proposal Form for Bid Item

No. 1- Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02920 constitutes full and complete compensation for all labor, materials and equipment, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

B. Turf and Grasses for Flagg Road Parking Lot will not be paid for separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Extension, Complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 02920 constitutes full and complete compensation for all labor, materials and equipment, areas, and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

DIVISION 16 ELECTRICAL POWER

BASIC ELECTRICAL MATERIALS AND METHODS

PART 1 – GENERAL

1.1 Summary

1.1.1 Work that applies to all sections of DIVISION 16

1.1.2 Supporting devices for electrical components

1.2 Related Documents

1.2.1 The General Conditions and, Supplementary Conditions of Division Nos. 0 and 1, and applicable portions of Division 2 of this specification are part of this Section.

1.3 Related Work Specified under other Sections: Read these Section carefully. For purposes of bidding, assume that all work of the Section referenced is to be performed under that DIVISION unless specifically indicated therein to be performed under Division 16; Electrical Powers.

1.3.1 Cutting and patching –see Article 3, Section 3.14 of the General Provisions

1.3.2 Excavation and backfilling –see Section 02210 of Division 2

1.4 Definitions

1.4.1 Provide : Furnish and install.

1.4.2 Wiring: Wire, raceways, boxes and fittings.

1.5 Submittals

1.5.1 Product Data: For each product indicated.

1.5.2 Shop Drawings: Wiring and connection diagrams.

1.5.3 Manufacturers: Where the drawings or specifications list specific brands or catalog numbers, only these products may be used unless the words: “or approved equal” or “but are not limited to” are included.

1.5.4 Limitations of approval: The Contractor shall not be relieved of responsibility for deviations from requirements of the Contract Documents by the Engineer’s approval of Shop Drawings, Product Data, Samples or similar submittals unless the Contractor has specifically informed the Engineer in writing of such deviation, in a separate cover letter on Contractor’s

letterhead, at the time of submittal and the Engineer has given written approval to the specific deviations. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples or similar submittals by the Engineer's approval thereof.

1.5.5 Contractor's responsibility: It is the responsibility of the Contractor to check all dimensions and details on shop drawings, before submission to the Engineer, reject same if necessary and only forward to the Engineer shop drawings which he is reasonably certain fulfill the requirements of the contract documents and the work. The approval of shop drawings by the Engineer shall be general only in character and not mean dimensions on drawings have been checked, and will in no way relieve the Contractor of the responsibility for proper fitting and construction of the work, nor from the necessity of furnishing materials or doing the work required by the drawings and/or specifications, which may not be indicated on the shop drawings when approved. All shop drawings shall be checked by the Contractor, and must bear the Contractor's stamp of approval; drawings submitted without this stamp of approval will not be considered

1.5.6 Samples: Provide all samples requested by the Engineer.

1.5.7 Tests: Test the complete installation to prove it free from shorts, grounds, opens and faulty connections. Make any corrections necessary before acceptance.

.1 Test each function of each system including each device.

1.5.8 Certification: Upon request, provide "Certification" (by a recognized testing agency or a Professional Engineer registered in the state where the project is located) that submitted items of equipment are suitable for their intended use.

1.5.9 Record of Addenda and Change Orders: To avoid overlooking addenda and change order modifications, mark all changes on all copies of drawings and specifications, in a manor acceptable to the Engineer. One method of accomplishing this is to make copies and tape them on the back of the preceding page (tape all edges). Also, circle the changed area and note: see addenda #1, etc. If whole pages or sheets change, either remove the superseded document or put a bold **"X"** through it.

1.5.10 Record Drawings: Owner's record drawings shall be updated as the project progresses. Maintain documents in a safe, dry location. Indicate clearly and accurately any changes necessitated by field conditions and dimension all raceways built into or under concrete slabs or buried under ground. Contractor to prepare as-built drawings in CAD format at contractor's expense. Contract drawings in CAD format to be furnished to contractor at no cost to contractor. Contractor to provide two compact discs and two hard copies of final as-built drawings.

1.5.11 Operating Instructions and Manuals: Provide the Owner or his representative with complete operating instructions by qualified personnel of all electrical systems. Provide three (3) bound sets (indexed and bound in three sturdy three-ring binders) of operating and maintenance instructions of all electrical systems employed and all shop drawings.

1.5.12 Manuals: Provide one (1) extra bound set of all shop drawings. Bind in a sturdy 3-ring binder.

1.5.13 Letter of Confirmation: Include in the above manuals a letter confirming that the following items have been completed. Provide written receipt signed by the Owner or his representative indicating that the first 3 items listed below have been received.

- **.1** Keys have been provided for all locked electrical equipment.
- **.2** The provisions of the "Operating Instructions and Manuals" paragraph of these specifications have been met.
- **.3** Spare fuses have been provided.
- **.4** Identification is complete and in accordance with these specifications.
- **.5** As-built electrical drawings have been completed and submitted.
- **.6** All tests are complete and in accordance with these specifications.
- **.7** All required shop drawings have been submitted and approved.
- **.8** The entire installation has been accepted by all authorities.

1.6 Quality Assurance

1.6.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.6.2 Do all wiring and provide all equipment in accordance with the prevailing issue of the National Electrical Code, State Building Code, State Fire Code, OSHA and any additional local rules or requirements.

1.6.3 Obtain and pay for all necessary permits, certificates, etc. Present satisfactory proof of final inspection and approval by all inspection authorities.

1.6.4 Consider the following Industry Standards as minimum requirements for all materials, equipment and systems where such standards are established for materials in question:

- **.1** National Board of Fire Underwriters
- **.2** National Electrical Manufacturers Association
- **.3** National Fire Protection Association
- **.4** Institute of Electrical and Electronic Engineers
- **.5** Local Electric Utility Company
- **.6** Local Telephone Company
- **.7** A nationally recognized testing laboratory (UL, ETL, etc.)
- **.8** Factory Mutual
- **.9** Americans with Disabilities Act

1.6.5 Where applicable, this installation shall comply with the following NECA (National Electrical Contractors Associations) “National Electrical Installation Standards.” Except, if there is a conflict between this specification and these standards, the requirements of this specification shall prevail.

.1	NECA 1-200	Standard Practices for Good Workmanship in Electrical Contracting.
.2	NECA 101-2001	Standard for Installing Steel Conduit (Rigid, EMT)

1.7 Coordination

1.7.1 Coordinate chases, slots, inserts, sleeves, and openings for electrical supports, raceways, and cable with general construction work.

1.7.2 Sequence, coordinate, and integrate installing electrical materials and equipment for efficient flow of the Work. Coordinate installing large equipment that requires positioning before closing in the building.

1.7.3 Coordinate electrical service connections to components furnished by utility companies.

1.8 Scheduling and Shutdowns

1.8.1 All work must be scheduled to allow the least interference with the normal operation of the existing facility. Schedule must be arranged to meet the approval of the Owner. All shutdowns of services (power, fire alarm, telephone, etc.) must be approved in writing by the Owner.

1.8.2 All "shutdowns" must be done at other than normal working hours without additional compensation.

1.9 Change Orders

1.9.1 Reference Article 7 of the General Provisions “Changes in the Work”.

1.10 Packed Prices

1.10.1 It is in the facility owner's interest, that all bidders receive the best possible quotes on all materials during bidding so that any savings can result in a lower bid price. It is the policy of this Engineer not to specify brands that will result in "packaged" prices. Therefore, manufacturers' representatives are hereby notified that "packaged prices" are prohibited on this project. Upon request, suppliers are to provide bidders with complete material breakdown including each lighting fixture, system, component of system, each piece of equipment, etc. In keeping with this policy, Contractors are hereby cautioned not to anticipate deep discounts after the contract is awarded.

1.11 Inspections/Site Observations

1.1.1 The authority having jurisdiction (the State Electrical Inspector) shall be notified at periodic intervals that an inspection is requested.

1.1.2 Do not cover the work before the Engineer has had a chance to observe it in completed form. The electrical foreman shall request a meeting with the Engineer within 10 days after the start of electrical construction to assure that there is agreement on the scope of work and to answer questions.

1.1.3 The electrical foreman shall provide assistance to the Engineer during site observations:

- **.1** Describe the progress of the electrical work in detail.
- **.2** Accompany the Engineer on his tour of the site, upon request.
- **.3** Provide use of a suitable ladder, scaffolding or bucket truck to observe the work, upon request.
- **.4** Remove ceiling tiles, panel trims, junction box covers, etc. for observation of the work, upon request.
- **.5** Provide use of project drawings, specifications and shop drawings.

1.12 Guarantees/Warranties:

1.12.1 Reference Article 3 of the General Provisions, “Warranty”. However, minimum shall be one year from date of acceptance by the Engineer.

1.12.2 Reference Article 2 of the General Provisions, “Owner”

1.13 Miscellaneous

1.13.1 Provide all systems complete. Drawings and Specifications form complementary requirements; provide work specified and not shown, and work shown and not specified as though explicitly required by both.

1.13.2 Although work is not specifically shown or specified, provide supplementary or miscellaneous items, appurtenances, devices and materials obviously necessary for a sound, secure and complete installation.

1.13.3 All wiring and connections to be done with associated circuit de-energized.

PART 2 - PRODUCTS

2.1 Materials.

2.1.1 All materials and equipment to be new unless specifically stated otherwise.

2.1.2 Materials and equipment shall be suitable for their intended use and for the environment in which they are installed. For example, equipment located outside shall be weatherproof and constructed of materials that will not rust. This includes brackets, screws, etc.

2.1.3 Coordinate all dimensions to make sure that boxes, raceways, equipment, fixtures, etc., fit properly in the finished construction. If special provisions, such as shallow boxes, are required, they shall be provided at no increase in contract price, regardless of catalog numbers listed in contract documents or on shop drawings.

2.1.4 As it is not practical to enumerate in these specifications (or show on the drawings) all details of fittings and accessory equipment required for proper operation of the various electrical systems herein described, it is understood that they will be supplied without extra compensation. Provide all fittings, terminations, relays, components of panels and equipment, etc., needed for the best performance possible at the present state-of-the-art.

2.2 Supporting Devices

2.2.1 Material: Cold-formed steel, with corrosion-resistant coating.

2.2.2 Metal Items for Use Outdoors or in Damp Locations: Hot-dip galvanized steel.

2.2.3 Slotted-Steel Channel: Flange edges turned toward web, and 9/16-inch- (14-mm-) diameter slotted holes at a maximum of 2 inches (50 mm) o.c., in webs. Strength rating to suit structural loading.

2.2.4 Slotted Channel Fittings and Accessories: Recommended by the manufacturer for use with the type and size of channel with which used.

.1 Materials: Same as channels and angles, except metal items may be stainless steel.

2.2.5 Raceway and Cable Supports: Manufactured clevis hangers, riser clamps, straps, threaded C-clamps with retainers, ceiling trapeze hangers, wall brackets, and spring-steel clamps or click-type hangers.

2.2.6 Pipe Sleeves: ASTM A 53, Type E, Grade A, Schedule 40, galvanized steel, plain ends.

2.2.7 Cable Supports for Vertical Conduit: Factory-fabricated assembly consisting of threaded body and insulating wedging plug for nonarmored electrical cables in riser conduits. Plugs have number and size of conductor gripping holes as required to suit individual risers. Body constructed of malleable-iron casting with hot-dip galvanized finish.

2.2.8 Expansion Anchors: Carbon-steel wedge or sleeve type.

2.2.9 Toggle Bolts: All-steel springhead type.

2.3 Electrical Identification

2.3.1 Identification Device Colors: Use those prescribed by ANSI A13.1, NFPA 70, and these Specifications.

2.3.2 Colored Adhesive Marking Tape for Wires and Cables: Self-adhesive vinyl tape, not less than 1 inch wide by 3 mils thick (25 mm wide by 0.08 mm thick).

2.3.3 Tape Markers for Conductors: Vinyl or vinyl-cloth, self-adhesive, wraparound type with preprinted numbers and letters.

2.3.4 Underground Warning Tape: Permanent, bright-colored, continuous-printed, vinyl tape compounded for permanent direct-burial service, and with the following features:

- **.1** Not less than 6 inches wide by 4 mils thick (150 mm wide by 0.102 mm thick).
- **.2** Embedded continuous metallic strip or core.
- **.3** Printed legend that indicates type of underground line.

2.3.5 Engraved-Plastic Labels, Signs, and Instruction Plates: Engraving stock, melamine plastic laminate punched or drilled for mechanical fasteners 1/16-inch (1.6-mm) minimum thickness for signs up to 20 sq. in. (129 sq. cm) and 1/8-inch (3.2-mm) minimum thickness for larger sizes. Engraved legend in black letters on white background, unless otherwise indicated.

2.3.6 Fasteners for Nameplates and Signs: Self-tapping, stainless-steel screws or No. 10/32 stainless-steel machine screws with nuts and flat and lock washers.

PART 3 – EXECUTION

3.1 Electrical Equipment Installation

3.1.1 Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom.

3.1.2 Materials and Components: Install level, plumb, and parallel and perpendicular to other building systems and components, unless otherwise indicated.

3.1.3 Equipment: Install to facilitate service, maintenance, and repair or replacement of components. Connect for ease of disconnecting, with minimum interference with other installations.

3.1.4 Right of Way: Give to raceways and piping systems installed at a required slope.

3.2 Layouts

3.2.1 The electrical system layouts indicated are generally diagrammatic and locations of outlets and equipment are approximate only; govern exact routing of wiring and locations of outlets and equipment by structural conditions and obstructions. This is not to be construed to permit redesigning systems. Interconnect as shown.

3.2.2 Locate all equipment requiring maintenance and operation so that it will be readily accessible. The right is reserved to make any reasonable change in location of outlets and equipment prior to roughing-in without involving additional expense. This may involve slightly longer wiring runs, longer stems, additional mounting provisions, etc. Allow for this in your bid because additional compensation will not be provided. Items not specifically located on the plans shall (for the purposes of bidding) be assumed to be in the farthest, most difficult location. Exact location to be as directed in the field.

3.3 Electrical Supporting Device Application

3.3.1 Damp Locations and Outdoors: Hot-dip galvanized materials, slotted channel system components.

3.3.2 Dry Locations: Steel materials.

3.3.3 Strength of Supports: Adequate to carry present and future loads, times a safety factor of at least four with, 200-lb (90-kg) minimum design load for each support element.

3.4 Support Installation

3.4.1 Support parallel runs of horizontal raceways together on trapeze- or bracket-type hangers.

3.4.2 Size supports for multiple raceway or cable runs so capacity can be increased by a 25 percent minimum in the future.

3.4.3 Support individual horizontal single raceways with separate, malleable-iron pipe hangers or clamps except use spring-steel fasteners for 1-1/2-inch (38-mm) and smaller single raceways above suspended ceilings and for fastening raceways to slotted channel and angle supports.

3.4.4 Install sleeves for cable and raceway penetrations of concrete slabs and walls unless core-drilled holes are used. Install sleeves for cable and raceway penetrations of masonry and fire-rated gypsum walls and of all other fire-rated floor and wall assemblies. Install sleeves during erection of concrete and masonry walls.

3.4.5 Secure electrical items and their supports to building structure, using the following methods unless other fastening methods are indicated:

- **.1** Wood: Wood screws or screw-type nails.
- **.2** Gypsum Board: Toggle bolts. Seal around sleeves with joint compound, both sides of wall.
- **.3** Masonry: Toggle bolts on hollow block and expansion bolts on solid block. Seal around sleeves with mortar, both sides of wall.
- **.4** New Concrete: Concrete inserts with machine screws and bolts.
- **.5** Existing Concrete: Expansion bolts.
- **.6** Structural Steel: Welded threaded studs or Spring-tension clamps.
  - **a.** Comply with AWS D1.1 for field welding.
- **.7** Fasteners for Damp, Wet, or Weather-Exposed Locations: Stainless steel.

.8 Light Steel: Sheet-metal screws.
.9 Fasteners: Select so load applied to each fastener does not exceed 25 percent of its proof-test load.
.10 Light Steel Framing: sheet metal screws.

3.5 Identification Materials and Devices

3.5.1 Provide typewritten directories, not smaller than 5" x 7", mounted under clear plastic affixed to the inside surface of all door-in-trim panels. Information shall include circuit numbers, type of load served and location of load served. For example: #1 Receptacles in rooms 5 & 6.

3.5.2 Label the exterior of switchgear, distribution panels, power and lighting panels, cabinets, each switch of fuse switch panels, each disconnect switch (including those furnished under other sections) with engraved-plastic labels. Provide name of equipment (and use where appropriate). Also, identify each circuit, if a directory is not included. For example: Panel A "Lighting and Power." Provide nameplates called for elsewhere similar to above, unless otherwise noted. Provide a nameplate at each new pilot light. Identification shall include existing panels and equipment modified under this contract and additional existing items, as indicated.

3.5.3 At each pull box, junction box and outlet box, each circuit contained therein shall be identified by panel designation and circuit number. This shall be accomplished by attaching hand written cardboard labels with string to each set of wires or by other agreed upon methods. In addition, where boxes are concealed, covers shall be marked with the same information using magic marker or other agreed upon means.

3.5.4 Install at locations for most convenient viewing without interference with operation and maintenance of equipment.

3.5.5 Coordinate names, abbreviations, colors, and other designations used for electrical identification with corresponding designations indicated in the Contract Documents or required by codes and standards. Use consistent designations throughout Project.

3.5.6 Tag and label circuits designated to be extended in the future. Identify source and circuit numbers in each cabinet, pull and junction box, and outlet box.

3.5.7 Install continuous underground plastic marker tape with foil back during trench backfilling, for exterior underground power, control, signal, and communication lines located directly above power and communication lines. Locate 12 inches above the underground installation. If width of multiple lines installed in a common trench or concrete envelope does not exceed 16 inches (400 mm), overall, use a single line marker.

3.6 Color Code

3.6.1 Secondary service, feeder, and branch circuit conductors shall be color-coded as follows:

Phase	208/120 Volts
A	Black
B	Red
C	Blue
Neutral	White
Ground	Green
Isolated Ground	Green w/trace ID

3.6.2 Permanently post at each panel.

3.7 Sequence and Balance

3.7.1 Maintain correct phase sequence of all feeders and circuits by establishing phase identification and maintaining correct relationship throughout the system. Provide line balance within 10% of normal loads.

3.8 Firestopping

3.8.1 Apply firestopping to cable and raceway sleeves and other penetrations of fire-rated floor and wall assemblies to restore original undisturbed fire-resistance ratings of assemblies.

3.8.2 Penetrations through exterior surfaces shall be made watertight.

3.8.3 Floor boxes, fed from floor below, shall be fire-rated, poke-through type with UL labeled fire rating to match floor rating.

3.9 Concrete Bases

3.9.1 Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger, in both directions, than supported unit. Follow supported equipment manufacturer's anchorage recommendations and setting templates for anchor-bolt and tie locations, unless otherwise indicated.

3.10 Core Drilling

3.10.1 All holes through masonry surfaces must be "core drilled". This trade (specification section) is responsible for its respective core drilling, if any.

3.10.2 Do not endanger any work by drilling or altering work or any part of it.

3.10.3 Do not drill or alter work of another Contractor without written consent of the Engineer.

3.10.4 Prior to drilling which affects structural safety of project, or work of another Contractor, submit written notice to the Engineer, requesting consent to proceed with cutting.

3.10.5 Perform all work of core drilling to perfectly match the quality as specified throughout these specifications.

3.11 Cleaning Painting and Refinishing

3.11.1 Thoroughly clean all new electrical equipment, devices and enclosures upon completion of all work.

3.11.2 Refinish any new electrical equipment whose finish is damaged or rusted, as determined by the Engineer.

PART 4 – MEASUREMENT; Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.1 Electrical Materials and Methods for Flagg Road Parking Lot (Alternate No. 2) will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16050 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

UNDERGROUND DUCTS & UTILITY STRUCTURES

PART 1 - GENERAL

1.1 Description. This Section includes underground conduits and ducts, duct banks, pull boxes and handholes, and other underground utility structures. Products furnished but not installed under this Section include pulling eyes, cable stanchions, cable arms, and insulators.

1.2 Related Specifications

1.2.1 Drawing and general provisions of the Contract, including general and Supplementary Conditions and Division 1, 2, and 3 apply to this Section.

1.3 Definitions

1.3.1 Duct: Electrical conduit and other raceway, either metallic or nonmetallic, used underground, embedded in earth or concrete.

1.3.2 Duct Bank: 2 or more conduits or other raceway installed underground in the same trench or concrete envelope.

1.3.3 Handhole: An underground junction box in a duct or duct bank.

1.4 Applicable Standards

1.4.1 NFPA 70 - "National Electric Code"

1.4.2 UL 1990 - "Underground Conduit, Non Metallic"

1.4.3 ASTM C 858 - "Underground Precast Concrete Utility Structures"

1.4.4 ASTM C1037 - "Inspection of Underground Precast Concrete Utility"

1.4.5 ASTM C857- "Minimum Structural Design, Loading for Underground Precast Concrete Utility structures"

1.4.6 Conduit Standards listing in Section 2.2

1.5 Submittals

1.5.1 Submit the following according to Conditions of the Contract and Division 1 Specification Sections.

1.5.2 Product data for metal accessories for conduit and duct, duct bank materials, and miscellaneous components.

1.5.3 Shop drawings showing details and design calculations for precast handholes, including reinforcing steel. Stamp drawings with seal of registered professional structural engineer.

1.5.4 Certificate for concrete and steel used in underground precast concrete utility structures, according to ASTM C 858.

1.5.5 Inspection report for factory inspections, according to ASTM C 1037.

1.5.6 Coordination drawings showing duct profiles and coordination with other utilities and underground structures. Include plans and sections drawn to accurate scale.

1.5.7 Qualification data for firms and persons specified in "Quality Assurance" Article to demonstrate their capabilities and experience. Include list of completed projects with project names, addresses, names of Architect and Owner, and other information specified.

1.5.8 Field test reports indicating and interpreting test results relative to compliance with performance requirements of "Field Quality Control" Article in Part 3 of this Section.

1.5.9 Record Documents: Show dimensioned locations of underground ducts and handholes.

1.6 Quality Assurance

1.6.1 Manufacturer Qualifications: Firm experienced in manufacturing underground precast concrete utility structures of types and sizes required and similar to those indicated for this project. Firm must have a record of successful in-service performance.

1.6.2 Comply with NFPA 70 "National Electrical Code" and ANSI C2 "National Electrical Safety Code" for components and installation.

1.6.3 Listing and Labeling: Provide products specified in this Section that are listed and labeled.

1.6.4 The Terms "Listed "and "Labeled": As defined in the "National Electrical Code," Article 100.
Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

1.6.5 Coordinate layout and installation of ducts and handholes with final arrangement of other utilities ads determined in the field.

1.6.6 Coordinate elevations of duct and duct bank entrances into handholes with final profiles of conduits as determined by coordination with other utilities and underground

obstructions. Revise locations and elevations from those indicated as required to suit field conditions and ensure duct runs drain to handholes, and as approved by the Architect.

1.7 Delivery, Storage and Handling

1.7.1 Deliver ducts to site with ends capped. Store nonmetallic ducts with supports to prevent bending, warping, and deforming.

1.7.2 Store precast concrete units at site as recommended by manufacturer to prevent physical damage. Arrange so identification markings are visible.

1.7.3 Lift and support precast concrete units only at designated lifting or supporting points.

1.8 Extra Materials

1.8.1 Furnish extra materials matching products installed, packaged with protective covering for storage and with identification labels clearly describing contents.

1.8.2 Furnish cable stanchions, support arms, insulators, and associated fasteners each in quantities equal to 5 percent of quantities installed.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 Subject to compliance with requirements, manufacturers offering the specified products that may be incorporated in the Work include, but are not limited to the following:

.1 Underground Precast Concrete Utility Structures:
.2 Precast Division; Carder Concrete Products.
.3 Christy Concrete Products, Inc.
.4 Elmhurst-Chicago Stone Co.
.5 Riverton Concrete Products.
.6 Rotondo & Sons, Inc.
.7 Rotondo/Penn-Cast, Inc.
.8 Smith-Midland Corp.
.9 Utility Vault Co.
.10 Wausau Concrete Co.

2.1.2 Frames and Covers:

.1 Campbell Foundry Co.
.2 East Jordan Iron Works, Inc.

.3 McKinley Iron Works, Inc.
.4 Neenah Foundry Co.

2.1.3 Nonmetallic Ducts
.1 Arnco Corp.
.2 Breeze-Illinois, Inc.
.3 CANTEX, Inc.
.4 Carlon; Lamson & Sessions Company
.5 Pipe & Plastic Group; Certainteed Products Corp.
.6 Cole-Flex Corp.
.7 Electri-Flex Co.
.8 Spiraduct, Inc.

2.1.4 Conduit and Duct

.1 Rigid Steel Conduit: ANSI C80.1, galvanized.
.2 Plastic-Coated Rigid Steel Conduit and Fittings: NEMA RN 1.
.3 Rigid Plastic Conduit: NEMA TC 2, Schedule 40 PVC, rated for use with 90 deg.
.4 C conductors under all installation conditions.
.5 PVC Conduit and Tubing Fittings: NEMA TC 3.
.6 Rigid Plastic Underground Conduit: UL 651A, Type A PVC.
.7 Rigid Plastic Underground Conduit: UL 651A, Type EB PVC.
.8 Rigid Plastic Underground Conduit: High-density polyethylene, Schedule 40.
.9 Rigid Plastic Underground Conduit: Fiberglass-reinforced epoxy.
.10 Plastic Utilities Duct: NEMA TC 6.
.11 Plastic Utilities Duct Fittings: NEMA TC 9; match to duct type and material.
.12 Plastic Communication Duct and Fittings: NEMA TC 10.
.13 Manufactured Bends: Not less than 36-ich (900 mm) radius.
.14 Coilable Plastic Duct: NEMA TC 12.

2.1.5 Pull Boxes and Handholes

.1 Cast Metal Boxes: Cast aluminum, sized as indicated, with outside flanges and recessed, gasketed cover for flush mounting. Nonskid finish on cover.
.2 Fiberglass Handholes: Molded fiberglass, sized as indicated, with 6-inch square (150 mm) cable entrance at each side, weatherproof cover with nonskid finish.
.3 Cover Legend: ELECTRIC.

2.1.6 Accessories

.1 Furnish removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, for installation under another Contract. For each handhole furnish 1 stanchion for each 30 linear inches (750 mm) of interior floor perimeter. In addition, furnish 1 arm for each stanchion, 3 insulators for each arm, and a total of 3 pulling eyes. Furnish materials complete with associated fasteners, packaged with protective covering for storage and with identification labels clearly describing contents.

.2 Duct Supports: Rigid PVC spacers selected to provide minimum duct spacings and concrete cover depths indicated, while supporting ducts during concreting.

.3 Frames and Covers: Cast iron with cast-in legend ELECTRIC or SIGNAL as appropriate. Machine cover-to-frame bearing surfaces.

.4 Sump Frame and Grate: Comply with FS RR-F-621, Type VII for frame and Type I for cover.

.5 Pulling Eyes in Walls: Eyebolt with reinforcing bar fastening insert. 2-inch (50 mm) diameter eye, 1-inch (25 mm) by 4-inch (100 mm) bolt. Working load embedded in 6-inch (150 mm), 4000 psi (27.6 Mpa) concrete: 13,000 pounds minimum tension.

.6 Pulling and Lifting Irons in Floor: 7/8-inch-diameter (21 mm), hot-dipped galvanized, bent steel rod, stress relieved after forming, and fastened to reinforced rod. Exposed triangular opening. Ultimate yield strength: 40,000 pounds shear and 60,000 pounds tension.

.7 Bolting Inserts for Cable Stanchions: Flared, threaded inserts of noncorrosive, chemical resistant, nonconductive thermoplastic material; ½-inch (12 mm) internal diameter by 2-3/4 inches (68 mm) deep, flared to 1-1/4 inch (30 mm) minimum at base. Tested ultimate pull-out strength: 12,000 pound minimum.

.8 Expansion Anchors for Installation After Concrete is Cast: Zinc-plated carbon steel wedge type with stainless-steel expander clip ½-inch (12 mm) bolt size, 5300-pound rated pull-out strength, and 6800 -pound rated shear strength minimum.

.9 Cable Stanchions: Hot-rolled, hot-dipped galvanized "T" section steel, 2-1/4-iinch (56 mm) size, punched with 14 holes on 1-1/2-inch (35 mm) centers for cable arm attachment.

.10 Cable Arms: 3/16-inch (5 mm) thick hot-rolled, hot-dipped galvanized sheet steel pressed to channel shape, approximately two 12 inches (300 mm) wide by 14 inches (350 mm) long and arranged for secure mounting in horizontal position at any position on cable stanchions.

.11 Cable Support Insulators: High glaze, wet-process porcelain arranged for mounting on cable arms.

.12 Ground Roads: Solid copper clad steel, ¾-inch (18 mm) diameter by 10-feet (3 m) length.

.13 Ground Wire: Stranded bare copper, No.6 AWG minimum.

.14 Duct Sealing Compound: Non-hardening, safe for human skin contact, not deleterious to cable insulation, workable at temperatures as low s 35 deg. F (1 deg C), withstands temperature of 300 deg F (149 deg C) without slump, and adheres to clean surfaces of plastic ducts, metallic conduits, conduit coatings, concrete, masonry, lead, cable sheaths, cable jackets, insulation materials, and the common metals.

2.1.7 Construction Materials

.1 Dampproofing: Conform to Division 7 Section "Bituminous Dampproofing".

.2 Waterproofing: Conform to 07111 "Sheet Membrane Waterproofing."

.3 Brick: Conform to ASTM C 55, concrete brick Type I, Grade N.

.4 Mortar: Conform to ASTM C 270, Type M, except for quantities less than 2.0 cr. Ft. (60 L), where packaged mix complying with ASTM C 387, Type M may be used.

.5 Concrete: Conform to Division 3 Section "Cast-In-Place Concrete" for concrete and reinforcing. Strength: 3000 psi (20.7 Mpa) minimum 28-day compressive strength.

.6 Aggregate For Duct Encasement: 3/8-inch (10 mm) maximum size.

PART 3 - EXECUTION

3.1 Application

3.1.1 Underground Ducts For Electrical Feeders: Plastic conduit encased in "Red" concrete.

3.1.2 Underground Ducts For Telephone Utility Service: Plastic utilities duct encased in concrete.

3.1.3 Underground Ducts For Communication Circuits: Plastic underground conduit encased in concrete.

3.1.4 Handholes; Underground precast concrete utility structures.

3.2 Examination. Examine site to receive ducts, handholes and manholes for compliance with installation tolerances and other conditions affecting performance of the underground ducts and manholes. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.3 Earthwork. Excavation and Backfill: Conform to Division 2 Section "Earthwork," but do not use heavy-duty, hydraulic-operated compaction equipment. Restore surface features at areas disturbed by excavation, and reestablish original grades except as otherwise indicated. Replace removed sod as soon as possible after backfilling is complete. Restore all areas disturbed by trenching, storing of dirt, cable laying, and other work. Restore vegetation and include necessary topsoiling, fertilizing, liming, seeding, sodding, sprigging, or mulching. Restore disturbed paving. Refer to "Cutting and Patching" in Division 1.

3.4 Conduit and Duct Installation

3.4.1 Install nonmetallic conduit and duct as indicated according to manufacturer's written instructions.

3.4.2 Slope: Pitch ducts minimum of 4 inches per 100 feet (1:300) to drain toward manholes and handholes and away from buildings and equipment. Slope ducts fro a high point in runs between 2 manholes to drain in both directions.

3.4.3 Curves and Bends: Use manufactured elbows for stub-ups at equipment and at building entrances. Use manufactured long sweep bends with a minimum radius of 25 feet (7.5 m) both horizontally an vertically at other locations.

3.4.4 Make joints in ducts and fittings watertight according to manufacturer's instructions. Stagger couplings so those of adjacent ducts do not lie in the same plane.

3.4.5 Duct Entrances to Handholes: Space end bells approximately 10 inches (250 mm) on center for 5-high (125 mm) ducts and varied proportionately for other duct sizes. Change from regular spacing to end-bell spacing 10 feet (3 m) from the end bell without reducing duct line slope and without forming a trap in the line. Grout end bells into manhole walls from both sides to provide watertight entrances.

3.4.6 Building Entrances: Transition for underground duct to conduit 10 feet (3 m) minimum outside the building wall. Use fittings manufactured for the purpose. Follow appropriate installation instructions below.

3.4.7 Concrete-Encased Ducts: Install reinforcing in duct banks passing through disturbed earth near buildings and other excavations. Coordinate duct bank with

structural design to support duct bank at wall without reducing structural or watertight integrity of building wall.

3.4.8 Direct-Buried, Nonencased Duct Entering Nonwaterproofed Walls: Install a Schedule 40 galvanized-steel pipe sleeve for each duct. Caulk space between conduit and sleeve wit duct-sealing compound on both sides for moisture-tight seal.

3.4.9 Waterproofed Wall and Floor Entrances: Install a watertight entrance-sealing device with the sealing gland assembly on the inside. Anchor device into masonry construction with 1 or more integral flanges. Secure membrane waterproofing to the device to make permanently watertight.

3.4.10 Separation Between Direct-Buried, Nonencased Ducts: 3 inches (75 mm) minimum for like services, and 12 inches (300 mm) minimum between power and signal ducts.

3.4.11 Concrete-Encased Nonmetallic Ducts: Support on plastic separators coordinated with duct size and required duct spacing.

3.4.12 Separator Installation: Space separators close enough to prevent sagging and deforming of ducts, and secure separators to the earth and to ducts to prevent floating during concreting. Do not use tie wires or reinforcing steel that may form conductive or magnetic loops around ducts or duct groups.

3.4.13 Concreting: Spade concrete carefully during pours to prevent voids under and between conduits and at exterior surface of envelope. So not use power-driven agitating equipment unless specifically designed for duct bank application. Pour each run of envelope between manholes or other terminations in 1 continuous operation. When more than one pour is necessary, terminate each pour in a vertical plane and install ¾-inch (18 mm) reinforcing rod dowels extending 18 inches (450 mm) into the concrete on both sides of joint near the corners of the envelope.

3.4.14 Reinforcing: Reinforce duct banks where they cross disturbed earth and where indicated.

3.4.15 Forms: All ductbanks shall be formed. Use the walls of the trench to form the side walls of the duct bank is unacceptable.

3.4.16 Minimum Clearances Between Ducts: 3 inches (75 mm) between ducts and exterior envelope wall and for like services, and 10 inches (250 mm) between power and signal ducts.

3.4.17 Depth: Except as otherwise indicated, install top of duct bank at least 24 inches (600 mm) below finished grade in nontraffic areas and at least 30 inches (750 mm) below finished grade in vehicular traffic areas.

3.4.18 Stub-Ups: Use rigid steel conduit or stub-ups to equipment. For equipment mounted on outdoor concrete pads, extend steel conduit a minimum of 5 feet (1.5 m) from edge of pad. Install insulated grounding bushings on the terminations. Couple steel conduits to the ducts with adapters designed for the purpose and then encase coupling with 3 inches (75 mm) of concrete.

3.4.19 Sealing: Provide temporary closure at terminations of ducts that are wired under this Project. Seal spare ducts at terminations. Use sealing compound and plugs to withstand at least 15 psi (1.03 Mpa) hydrostatic pressure.

3.4.20 Pulling Cord: Install 100-pound-test nylon cord in ducts, including spares.

3.5 Underground Utility Structure Installation

3.5.1 Elevation: Install handholes with depth as indicated. Where indicated, cast handhole cover frame directly into roof of handhole and set roof surface 1 inch (25 mm) above grade.

3.5.2 Drainage: Install drains in bottom of units where indicated. Arrange to coordinate with drainage provisions indicated or specified.

3.5.3 Access: Install cast-iron frame and cover. Use 30-inch (750 mm) cover for handholes, except use 24-inch (600 mm) covers for 24-inch (600 mm) by 24-incb (600 mm) handholes. Install brick chimney to support frame and cover and to connect cover with roof opening. Provide moisture-tight masonry joints and waterproof grouting for cast-iron frame to chimney. Set frames in paved areas and traffic ways flush with finished grade. Set other frames 1 inch (25 mm) above finished grade.

3.5.4 Waterproofing: Apply waterproofing to exterior surfaces of units after concrete has cured at least 3 day. Apply according to Division 7 Section "Sheet Membrane Waterproofing". After ducts have been connected and grouted, and prior to backfilling, waterproof joints and connections and touch up abrasions and scars. Waterproof exterior of manhole/handhole chimneys after brick mortar has cured at least 3 days.

3.5.5 Dampproofing: Apply dampproofing to exterior surfaces of units after concrete has cured at least 3 days. Apply according to Division 7 Section "Bituminous Dampproofing". After ducts have been connected and grouted, and prior to backfilling, dampproof joints and connections and touch up abrasions and scars. Dampproof exterior of manhole/handhole chimneys after brick mortar has cured at least 3 days.

3.5.6 Hardware: Install removable hardware, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cable and conductors and as indicated.

3.5.7 Field-Installed Bolting Anchors: Do not drill deeper than 3-7/8 inches (96 mm) for anchor bolts installed in the field. Use a minimum of 2 anchors for each cable stanchion.

3.5.8 Grounding: Install ground rod though floor in each structure with top protruding 4 inches (100 mm) above floor. Seal the floor opening against water penetration wit waterproof non-shrink grout. Ground exposed metal components and hardware with bare copper ground conductor. Train conductors neatly around corners. Install on walls and roof using cable clamps secured with expansion anchors.

3.5.9 Cast-In-Place Underground Structure installation: Conform to applicable requirements of Division 3 Section "Cast-In-Place Concrete."

3.5.10 Finish interior surfaces with a smooth troweled finish.

3.5.11 Windows for Future Duct Connections: Form and pour concrete knock-out panels 1-1/2 to 2 inches (37 to 50 mm) thick, arranged as indicated.

3.5.12 Precast Concrete Underground Structure Installation: Install as indicated, according to manufacturer's written instructions and ASTM C 891.

3.5.13 Install units plumb and level and with orientation and depth coordinated with arrangement of connecting ducts to minimize bends and deflections required for proper entrances.

3.5.14 Support units on a level bed of crushed stone or gravel, graded from the 1-inch (25 mm) sieve to the No. 4 sieve and compacted to same density as adjacent undisturbed earth.

3.6 Field Quality Control

3.6.1 Testing: Demonstrate capability and compliance with requirements upon completion of installation of underground duct and utility structures.

3.6.2 Grounding: Test manhole grounding to ensure electrical continuity of bonding and grounding connections. Measure ground resistance at each ground rod and report results. Use an instrument specifically designed for ground-resistance measurements.

3.6.3 Duct Integrity: Rod ducts with a mandrel ¼ inch (6 mm) smaller in diameter than internal diameter of ducts. Where rodding indicated obstructions in ducts, remove the obstructions and retest.

3.6.4 Water Tightness: Make internal inspection of manholes 3 months after completion of construction for indications of water ingress. Where leakage is noted, remove water and seal leak sources. Re-inspect after 2 months and reseal remaining leak sources. Repeat process at 2 month intervals until leaks are corrected.

Correct installation where possible, and retest to demonstrate compliance. Otherwise, remove and replace defective products and retest.

3.7 Cleaning

3.7.1 Pull brush through full length of ducts. Use round bristle brush with a diameter ½ inch (12 mm) greater than internal diameter of duct.

PART 4 – MEASUREMENT Not applicable

PART 5 – PAYMENT

5.1 Basis of Payment

5.1.2 Underground Ducts & Utility Structures for Flagg Road Parking Lot (Alternate No. 1) will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16119 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION 16119

CONDUCTORS AND CABLES

PART 1 – GENERAL

1.1 Summary

1.1.1 This Section includes building wires and cables and associated connectors, splices, and terminations for wiring systems rated 600 V and less.

1.2 Related Documents

1.2.1 The General Conditions and, Supplementary Conditions of Division Nos. 0 and 1, and applicable portions of Division 2 of this specification are part of this Section.

1.2.2 The Applicable portions of Section 16050, Basic Electrical Materials and Methods are hereby make a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

1.3 Quality Assurance

1.3.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.3.2 Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 In other Part 2 articles where subparagraph titles below introduce lists, the following requirements apply for product selections.

.1 Available Manufacturers: Subject to compliance with manufacturers offering products that may be incorporated into the Work include, but are not limited to, the manufacturers specified.

2.2 Conductors and Cables

2.2.1 Conductor Material: Copper complying with NEMA WC 5 solid conductor for No. 10 AWG and smaller, stranded for No. 8 AWG and larger.

2.2.2 Conductor Insulation Types: Type THHN-THWN or XHHW complying with NEMA WC 5.

2.2.3 Multiconductor Cable: Metal-clad, Type MC.

2.3 Connectors and Splices

2.3.1 Description: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.

PART 3 – EXECUTION

3.1 Conductor and Insulation Applications

3.1.1 Exposed Feeders: Type THHN-THWN, single conductors in raceway.

3.1.2 Feeder Concealed in Ceilings, Walls, and Partitions: Type THHN-THWN, single conductors in raceway.

3.1.3 Feeders Concealed in Concrete, below Slabs-on Grade, and in Crawlspaces: Type THHN-THWN, single conductors in raceway.

3.1.4 Branch Circuits Concealed in Ceilings, Walls, and Partitions: Type THHN-WHWN, single conductors in raceway.

3.1.5 Branch Circuits Concealed in Concrete and below Slabs-on-Grade: Type THHN-THWN, single conductors in raceway.

3.2 Installation

3.2.1 Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.

3.2.2 Use manufacturer-approved puling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tensions and sidewall pressure values.

3.2.3 Use pulling means, including fish tape, cable rope, and basket-weave wire/cable grips, that will not damage cables or raceway.

3.2.4 Install cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.

3.2.5 Support cables according to Section 16050, "Basic Electrical Materials and Methods."

3.2.6 Seal around cables penetrating fire-rated elements.

3.2.7 Identify and color-code conductors and cables according to Section 16050, Electrical Materials and Methods.

3.2.8 Wiring at Outlets: Install conductor at each outlet, with a least 12 inches of slack.

3.2.9 Where the number of current-carrying conductors in a raceway or cable exceeds three, the allowable ampacity shall be reduced per NEC table based on no diversity. Consider neutrals to be current carrying conductors.

3.2.10 When branch circuits are combined using a common neutral, oversize the neutral to accommodate possible harmonic currents. On 20 amp (#12) branch circuits, use a #10 neutral.

3.3 Connections

3.3.1 Make all final connections required for a complete and fully operational facility.

3.3.2 Wiring connections to equipment shall include connections to all accessories. For example, if a fan has an associated damper, the wiring must be extended from the fan to the damper at no additional charge. Another example is interconnection of equipment. Some items of equipment consist of several pieces, which must be interconnected before connecting to the circuit. No additional compensation will be paid for interconnections.

3.3.3 Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.3.4 Avoid splices and taps, where feasible. Make splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unspliced conductors.

3.3.5 Locations of junction boxes, stub-ups and disconnects are diagrammatic. At the time of design, the exact brand of equipment is usually not known. Therefore, the exact locations of connections are not known. For the purposes of bidding assume the worst farthest locations. During construction, coordinate connections with final approved shop drawings and coordinate with other trades. Conform to manufacturers written installation instructions. Provide working space in compliance with code.

3.4 Field Quality Control

3.4.1 All cables installed under this contract are to be protected from damage prior to installation, during installation and after installation. Store cable in a dry area protected from physical damage. Before installing cable, raceway to be clear, dry and free from burs or sharp edges. When cables pass through metal partitions provide permanently installed insulating bushings. This applies to all cables installed under this contract (systems, communications, etc.) Insulated bushings are to be installed prior to pulling in of cable. Cables to be installed back from edge of studs as required by Code.

PART 4 – MEASUREMENT Not applicable

PART 5 – PAYMENT

5.1 Basis of Payment

5.1.1 Conductors and Cables for the Flagg Road Parking Lot (Alternate No. 2) will not be paid separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16120 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

RACEWAY AND BOXES

PART 1 – GENERAL

1.1 Summary

1.1.1 This Section includes raceways, fittings boxes, enclosures, and cabinets for electrical wiring.

1.1.2 Provide for firestopping materials and installation at penetrations through walls, ceilings, and other fire-rated elements.

1.1.3 See Section 16050; “Basic Electrical Materials and Methods” for supports, anchors, and identification products.

1.1.4 See Section 16140, “Wiring Devices” for devices installed in boxes and for floor-box service fittings.

1.2 Related Documents

1.2.1 The General Conditions and Supplementary Conditions of Division Nos.0 and 1, and applicable portions of Division 2 of this specification are part of this Section.

1.2.2 The applicable portions of Section 16050; Basic Electrical Materials and Methods are hereby make a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

1.3 Submittals

1.3.1 Shop Drawings: Show fabrication and installation details of custom enclosures and cabinets.

1.4 Quality Assurance

1.4.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4.2 Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 Metal Conduit and Tubing

2.1.1 Rigid Steel Conduit: ANSI C80.1.

2.1.2 EMT and Fittings: ANSI C80.3.

.1 Fittings: Set-screw or compression, steel. (Die-casts are not acceptable).

2.1.3 FMC: Zinc-coated steel.

2.1.4 LFMC: Flexible steel conduit with PVC jacket.

2.1.5 Fittings: NEMA FB 1; compatible with conduit and tubing materials.

2.2 Boxes, Enclosures, and Cabinets

2.2.1 Sheet Metal Outlet and Device Boxes: NEMA OS 1.

2.2.2 Cast-Metal Outlet and Device Boxes: NEMA FB 1, Type FD, with gasketed cover.

2.2.3 Small Sheet Metal Pull and Junction Boxes: NEMA OS 1.

2.2.4 Cast-Metal Pull and Junction Boxes: NEMA FB 1, cast aluminum with gasketed cover.

2.2.5 Hinged-Cover Enclosures: NEMA 250, Type 1, with continuous hinge cover and flush latch.

.1 Metal Enclosures: Steel, finished inside and out with manufacturer's standard enamel.

2.3 Factory Finishes

2.3.1 Finish: For raceway, enclosure, or cabinet components, provide manufacturer's standard prime-coat finish ready for field painting.

PART 3 – EXECUTION

3.1 Raceway Application

3.1.1 Outdoors:

.1 Exposed: Rigid steel. (Note: All raceways to be concealed unless otherwise indicated.)
.2 Concealed: Rigid steel.
.3 Underground, Single Run: RNC.
.4 Underground, Grouped: RNC.
.5 Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
.6 Boxes and Enclosures: NEMA 250.

3.1.2 Indoors:

- **.1** Exposed: EMT.
- **.2** Concealed: EMT
- **.3** Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC; except use LFMC in damp or wet locations.
- **.4** Damp or Wet Locations: Rigid steel conduit.
- **.5** Boxes and Enclosures: NEMA 250, Type 1, except as follows:
  - **a.** Damp or Wet Locations: NEMA 250, Type 4.

3.1.3 Minimum Raceway Size: 3/4-inch trade size.

3.1.4 Raceway Fittings: Compatible with raceways and suitable for use and location.

3.2 Installation

3.2.1 Keep raceways at least 6 inches (150 mm) away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.

3.2.2 Complete raceway installation before starting conductor installation.

3.2.3 Support raceways as specified in Section 16050 “Basic Electrical Materials and Methods.”

3.2.4 Install temporary closures to prevent foreign matter from entering raceways.

3.2.5 Protect stub-ups from damage where conduits rise through floor slabs. Arrange so curved portions of bends are not visible above finished slab.

3.2.6 Make bends and offsets so ID is not reduced. Keep legs of bends in same plane and keep straight legs of offsets parallel, unless otherwise indicated.

3.2.7 Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.

- **.1** Install concealed raceways with a minimum of bends in shortest practical distance, considering type of building construction and obstructions, unless otherwise indicated.

3.2.8 Raceways Embedded in Slabs: Install in middle 1/3 of slab thickness where practical and leave at least 2 inches (50 mm) of concrete cover.

- **.1** Secure raceways to reinforcing rods to prevent sagging or shifting during concrete placement.
- **.2** Space raceways laterally to prevent voids in concrete.

.3 Run conduit larger than 1-inch trade size (DN 27) parallel or at right angles to main reinforcement. Where at right angles to reinforcement, place conduit close to slab support.
.4 Change from nonmetallic tubing to rigid steel conduit before rising above floor.
.5 Do not run raceways in “topping” of precast concrete.

3.2.9 Install exposed raceways parallel or at right angles to nearby surfaces or structural members and follow contours as much as possible.

.1 Run parallel or banked raceways together on common supports.
.2 Make parallel bends in parallel or banked runs. Use factory elbows only where elbows can be installed parallel; otherwise, provide field bends for parallel raceways.

3.2.10 Join raceways with fittings designed and approved for that purpose and make joints tight.

.1 Use insulating bushings to protect conductors.

3.2.11 Tighten set screws of threadless fittings with suitable tools.

3.2.12 Terminations:

.1 Where raceways are terminated with locknuts and bushings, align raceways to enter squarely and install locknuts with dished part against box. Use two locknuts, one inside and one outside box.
.2 Where raceways are terminated with threaded hubs, screw raceways or fittings tightly into hub so end bears against wire protection shoulder. Where chase nipples are used, align raceways so coupling is square to box; tighten chase nipple so no threads are exposed.

3.2.13 Install pull wires in empty raceways. Use polypropylene or monofilament plastic line with not less than 200-lb (90-kg) tensile strength. Leave at least 12 inches (300 mm) of slack at each end of pull wire.

3.2.14 Install raceway scaling fittings at suitable, approved, and accessible locations and fill them with UL-listed sealing compound. For concealed raceways, install each fitting in a flush steel box with a blank cover plate having a finish similar to that of adjacent plates or surfaces. Install raceways sealing fittings at the following points:

.1 Where conduits pass from warm to cold locations, such as boundaries of refrigerated spaces.
.2 Where otherwise required by NFPA 70.

3.2.15 Stub-up Connections: Extend conduits through concrete floor for connection to freestanding equipment. Install with an adjustable top or coupling threaded inside for plugs set flush with finished floor. Extend conductors to equipment with rigid steel conduit; FMC may be

used 6 inches (150 mm) above the floor. Install screwdriver-operated, threaded plugs flush with floor for future equipment connections.

3.2.16 Flexible Connections: Use maximum of 72 inches (1830 mm) of flexible conduit for recessed and semirecessed lighting fixtures; for equipment subject to vibration, noise transmission, or movement; and for all motors. Use LFMC in a damp or wet locations. Install separate ground conductor in flexible conduit and in LFMC.

3.2.17 Surface Raceways: Install a separate, green, ground conductor in raceways from junction box supplying raceways t receptacle or fixture ground terminals.

3.2.18 Install hinged-cover enclosures and cabinets plumb. Support at each corner.

3.2.19 Provide a minimum of 2-inch spacing between raceways underground or in concrete.

3.2.20 Provide a minimum of 2-inches of concrete encasement on PVC underground.

3.2.21 Provide colored electrical marker warning tape above all buried raceways and cables including those that are concrete encased. For non-metallic raceways or direct burial cables, use marker tape with foil back. Locate a minimum of 12 inches above raceways, cable or concrete.

3.2.22 Expansion fittings shall be provided in all raceways, if and where required.

3.3 Protection

3.3.1 Provide final protection and maintain conditions that ensure coatings, finishes, and cabinets are without damage or deterioration at time of Substantial Completion.

- **.1** Repair damage to galvanized finishes with zinc-rich paint recommended by manufacturer.
- **.2** Repair damage to PVC or paint finishes with matching touchup coating recommended by manufacturer.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.1 Raceways and Boxes for Flagg Road Parking Lot (Alternate No. 2) will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price for Bid Item No. 1 that represents payment for the work of this Section 16130 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

WIRING DEVICES

PART 1 – GENERAL

1.1 Summary

1.1.1 This Section includes the following:

- **.1** Single and duplex receptacles, ground-fault circuit interrupters, and integral surge suppression units.
- **.2** Snap switches and dimmer switches.
- **.3** Device wall plates.

1.2 Related Documents

1.2.1 The General Conditions and Supplementary Conditions of Division Nos. 0 and 1, and applicable portions of Division 2 of this specification are part of this Section.

1.2.2 The Applicable portions of Section 16050; Basic Electrical Materials and Methods are hereby made a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

1.3 Submittals

1.3.1 Product Data: For each type of product indicated.

1.3.2 Samples: Upon request.

1.4 Quality Assurance

1.4.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4.2 Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

.1 Wiring Devices:

a. General Electric Company: Wiring Device Division

b. Bryant Electric, Inc./Hubbell Subsidiary
c. Hubbell Incorporated; Wiring Device-Kellems
d. Leviton Mfg. Company Inc.
e. Pass & Seymour/Legrand; Wiring Devices Div.

2.2 Receptables

2.2.1 Provide 20 amp., commercial specification grade, grounded, ivory duplex receptacles. Provide additional receptacles to suit the particular equipment served. Catalog numbers are for General Electric Company.

20A/125V	Duplex Receptacle	GE #GCR-20
20A/125V	Single Receptacle	GE #4102
30A/125V/250V	4 Wire Receptacle	GE #1439-3
50A/125V/250V	4 Wire Receptacle	GE #4181-3
20A/125V	Duplex Receptacle	GE #5362-IG(Isolated Ground)
20A/125V	Single Receptacle	GE #4102-IG(Isolated Ground)
20A/125V	GFI Dup. Rec.	GE #GFR 5342

.1 Receptacle mounted outdoors or in other wet or damp locations shall be GFI type and installed in weatherproof enclosures with key lock cover, the integrity of which is not affected when the receptacle is in use (attachment plug cap inserted).

2.3 Switches

2.3.1 Provide 20 amp., toggle type, “Federal Specification Grade” ivory lighting switches. Catalog numbers are for General Electric Company.

Single pole	GE #5951	Three-way	GE #5953
Double pole	GE #5952	Four-way	GE #5954

2.4 Wall Plates

2.4.1 Single and combination types to match corresponding wiring devices.

.1 Plate-Securing Screws: Metal with head color to match plate finish.
.2 Provide smooth (unribbed), high-impact thermoplastic (nylon, PVC, Lexan or polycarbonate) switch and receptacle cover plates, color by Architect.
.3 Receptacles mounted outdoors or in other wet or damp locations shall be installed in weatherproof enclosures with key lock cover, the integrity of which is not affected when the receptacle is in use (attachment plug cap inserted).

PART 3 – EXECUTION

3.1 Installation

3.1.1 Install devices and assembles level, plumb, and square with building lines.

3.1.2 Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical. Group adjacent switches under single, multigang wall plates.

3.1.3 Remove wall plates and protect devices and assemblies during painting.

3.2 Identification

3.2.1 Comply with Section 16050, "Basic Electrical Materials and Methods."

- **.1** Receptacle: Engrave each receptacle plate with panel designation and circuit number. (Brother P-Touch Labeling System is acceptable, in lieu of engraving.)
- **.2** Outlet boxes: Provide cardboard tags, tied to each wire inside <u>all</u> outlet boxes (receptacles, switches, motors, etc). Include panel designation and circuit number.

3.3 Connections

3.3.1 Connect wiring according to Division 16 Section "Conductors and Cables."

3.4 Field Quality Control

3.4.1 Perform the following field tests and inspections:

- **.1** After installing wiring devices and after electrical circuitry has been energized, test for proper, ground continuity, and compliance with requirements.
- **.2** Test GFCI operation with both local and remote fault simulations according to manufacturer's written instructions.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.2 Wiring Devices for Flagg Road Parking Lot (Alternate No. 2) will not be paid separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16140 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

PART 1 - GENERAL

1.1 Summary. This section includes methods and materials for grounding systems and equipment.

1.2 Submittals. Product data: for each type of product indicated and field quality-control test reports.

1.3 Quality assurance. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use. Comply with UL 467 for grounding and bonding materials and equipment.

PART 2 - PRODUCTS

2.1 Conductors

2.1.1 Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.

2.1.2 Bare Copper Conductors

.1 Solid Conductors: ASTM B 3.
.2 Stranded Conductors: ASTM B 8.
.3 Tinned Conductors: ASTM B 33.
.4 Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch (6 mm) in diameter.
.5 Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
.6 Bonding Jumper: Copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.
.7 Tinned Bonding Jumper: Tinned-copper tape, braided conductors, terminated with copper ferrules; 1-5/8 inches (41 mm) wide and 1/16 inch (1.6 mm) thick.

2.1.3 Connectors

.1 Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.

.2 Bolted Connectors for Conductors and Pipes: Copper or copper alloy, bolted pressure-type, with at least two bolts. Pipe Connectors: Clamp type, sized for pipe.

.3 Welded Connectors: Exothermic-welding kits of types recommended by kit manufacturer for materials being joined and installation conditions.

2.1.4 Grounding electrodes rods: Copper-clad; [3/4 inch by10 feet (19 mm by 3 m) in diameter.

PART 3 - EXECUTION

3.1 Applications

3.1.1 Conductors: Install solid conductor for No. 8 AWG and smaller, and stranded conductors for No. 6 AWG and larger, unless otherwise indicated.

3.1.2 Underground Grounding Conductors: Install bare copper conductor, No. 2/0 AWG minimum. Bury at least 24 inches (600 mm) below grade.

3.1.3 Isolated Grounding Conductors: Green-colored insulation with continuous yellow stripe. On feeders with isolated ground, identify grounding conductor where visible to normal inspection, with alternating bands of green and yellow tape, with at least three bands of green and two bands of yellow.

3.1.4 Conductor Terminations and Connections: Pipe and Equipment Grounding Conductor Terminations: Bolted connectors. Underground Connections: Welded connectors, except at test wells and as otherwise indicated. Connections to Ground Rods at Test Wells: Bolted connectors. Connections to Structural Steel: Welded connectors.

3.2 Equipment Grounding

3.2.1 Install insulated equipment grounding conductors with the following items, in addition to those required by NFPA 70: Feeders and branch circuits, Lighting circuits, and Receptacle circuits.

3.2.2 Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

3.2.3 Signal and Communication Equipment: For telephone, alarm, voice and data, and other communication equipment, provide No. 4 AWG minimum insulated grounding conductor in raceway from grounding electrode system to each service location, terminal cabinet, wiring closet, and central equipment location.

3.3 Installation

3.3.1 Grounding Conductors: Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.

3.3.1 Ground Rods: Drive rods until tops are 2 inches (50 mm) below finished floor or final grade, unless otherwise indicated.

3.3.1 Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating, if any.

3.3.1 For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least the same distance from other grounding electrodes, and connect to the service grounding electrode conductor.

3.3.1 Test Wells: Ground rod driven through drilled hole in bottom of handhole. Handholes are specified in Division 26 Section "Underground Ducts and Raceways for Electrical Systems," and shall be at least 12 inches (300 mm) deep, with cover. Test Wells: Install at least one test well for each service, unless otherwise indicated. Install at the ground rod electrically closest to service entrance. Set top of test well flush with finished grade or floor.

3.3.1 Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance, except where routed through short lengths of conduit.
Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.

3.3.1 Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install so vibration is not transmitted to rigidly mounted equipment.

3.3.1 Use exothermic-welded connectors for outdoor locations, but if a disconnect-type connection is required, use a bolted clamp.

3.4 Grounding and Bonding for Piping

3.4.1 Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes, using a bolted clamp connector or by bolting a lug-type connector to a pipe flange, using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor conduit or sleeve to conductor at each end.

3.4.2 Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
Bond each aboveground portion of gas piping system downstream from equipment shutoff valve.

3.4.3 Bonding Interior Metal Ducts: Bond metal air ducts to equipment grounding conductors of associated fans, blowers, electric heaters, and air cleaners. Install bonding jumper to bond across flexible duct connections to achieve continuity.

3.5 FIELD QUALITY CONTROL

3.5.1 After installing grounding system but before permanent electrical circuits have been energized, test for compliance with requirements.

3.5.2 Test completed grounding system at each location where a maximum ground-resistance level is specified, at service disconnect enclosure grounding terminal, and at ground test wells. Measure ground resistance not less than two full days after last trace of precipitation and without soil being moistened by any means other than natural drainage or seepage and without chemical treatment or other artificial means of reducing natural ground resistance. Perform tests by fall-of-potential method according to IEEE 81.

3.5.3 Report measured ground resistances that exceed the following values: Power Distribution Units or Panelboards Serving Electronic Equipment: 1 ohm.

3.5.4 Excessive Ground Resistance: If resistance to ground exceeds specified values, notify Architect promptly and include recommendations to reduce ground resistance.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.1 Underground Ducts and Utility Structures for Flagg Road Parking Lot will not be paid separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16710 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

ENCLOSED SWITCHES AND CIRCUIT BREAKERS

PART 1 – GENERAL

1.1 Summary

1.1.1 This Section includes the following individually mounted, enclosed switches and circuit breakers:

- **.1** Fusible switches
- **.2** Molded-case circuit breakers
- **.3** Solid state circuit breakers
- **.4** Enclosures

1.2 Related Documents

1.2.1 The General Conditions and Supplementary Conditions of Division Nos.0 and 1, and applicable portions of Division 2 of this specification are part of this Section.

1.2.2 The applicable portions of Section 16050; Basic Electrical Materials and Methods are hereby make a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

1.3 Submittals

1.3.1 Product Data: For each type of enclosed switch, circuit breaker, accessory, and component indicated.

1.4 Quality Assurance

1.4.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4.2 Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

- **.1** Manufacturers: Subject to compliance with requirements, provide products by one for the manufacturers specified.

2.2 Fusible Switches

2.2.1 Manufacturers:

.1 Square D/Group Schneider
.2 General Electric Co., Electrical Distribution & Control Division
.3 Siemens Energy & Automation, Inc.
.4 Eaton Corporation; Cutler-Hammer Products

2.2.2 All fusible switches: shall be rated for the application voltage specified and have a UL listed short circuit rating to match the fuse installed. Provide heavy duty switches. General duty switches are unacceptable.

2.2.3 Fusible Switch, 600 A and Smaller: NEMA KS 1, Type HD, with clips or bolt pads to accommodate specified fuses, lockable handle with capability to accept two padlocks, and interlocked with cover in closed position.

2.2.4 Fusible switches, 800 amps and above: NEMA bolted pressure contact switches made by firmly bolting the switchblades to the stationary contact terminals and to the hinge terminals and meet UL 977.

2.2.5 Accessories:

.1 Equipment Ground Kit: Internally mounted and labeled for copper and aluminum ground conductors.
.2 Neutral Kit: Internally mounted; insulated, capable of being grounded, and bonded; and labeled for copper and aluminum neutral conductors. (Provide when neutral is available at switch).

2.3 Molded Case Circuit Breakers

2.3.1 Manufacturers:

.1 Square D/Group Schneider Eaton Corporation; Cutler-Hammer Products.
.2 General Electric Co., Electrical Distribution & Control Division
.3 Siemens Energy & Automation, Inc.

2.3.2 Interrupting Capacity: Unless otherwise indicated, a “series-combination” system of interrupting capacity rating shall <u>not</u> be used.

2.3.3 Switching Duty: All single pole circuit breakers to be rated SWD.

2.3.4 Molded-Case Circuit Breaker: NEMA AB 1, with interrupting capacity to meet available fault currents. All main breakers to be 100% rated.

2.3.5 Molded-Case Circuit-Breaker Features and Accessories:

- **.1** Standard frame sizes, trip ratings, and number of poles.
- **.2** Lugs: Mechanical style suitable for number, size, trip ratings, and conductor material.
- **.3** Application Listing: Type SWD for switching fluorescent lighting loads; Type HACR for heating, air-conditioning, and refrigerating equipment.
- **.4** Ground-Fault Protection: With adjustable pickup and time-delay settings, push-to-test feature, and ground-fault indicator. Provide ground-fault protection when indicated or where required by code.
- **.5** Shunt Trip: 120-V trip coil energized from separate circuit, set to trip at 75 percent of rated voltage. Provide shunt trip when indicated.

2.3.6 Electronic trip-unit circuit breakers: where indicated or required, 100% rated, with RMS sensing, field-replaceable rating plug, trip indication (showing which adjustment caused trip) and the following field-adjustable settings, with interrupting capacity to meet available fault current.

- **.1** Instantaneous trip
- **.2** Long-time pickup
- **.3** Short-time pickup
- **.4** Long-time delay
- **.5** Short-time delay
- **.6** Ground fault (if required)

2.4 Enclosures

2.4.1 NEMA AB 1 and NEMA KS 1 to meet environmental conditions for installed location.

- **.1** Outdoor Locations: NEMA 250, Type 3R.

PART 3 – EXECUTION

3.1 Installation

3.1.1 Comply with applicable portions of NECA 1, PB 1.1, and NEMA PB 2.1 for installation of enclosed switches and circuit breakers.

3.1.2 Mount individual wall-mounting switches and circuit breakers with tops at uniform height, unless otherwise indicated. Anchor floor-mounting switches to concrete base.

3.1.3 Comply with mounting and anchoring requirements specified in Division 16 Section “Seismic Controls for Electrical Work”.

3.1.4 Temporary Lifting Provisions: Remove temporary lifting eyes, channels, and brackets and temporary blocking of moving parts from enclosures and components.

3.1.5 Most manufactures of bolted pressure switches make for line entering top and load exiting bottom. Verify shop drawings before running conduits.

3.1.6 Do not mount switches or circuit breakers upside down or side ways.

3.1.7 Identify field-installed conductors, interconnecting wiring, and components; provide labels and warning signs as specified in Division 16 Section "Basic Electrical Materials and Methods."

3.2 Circuit Breaker Adjustments

3.2.1 Thermal-magnetic circuit breakers:

- **.1** Test circuit and correct deficiencies
- **.2** Set magnetic trip at minimum.
- **.3** Turn associated loads “on”.
- **.4** Turn breaker on/off a minimum of six (6) times.
- **.5** If nuisance tripping occurs, set “up” one notch and repeat test.
- **.6** Repeat steps 4 and 5 until nuisance tripping no longer occurs.

3.2.2 Electronic trip-unit circuit breakers:

- **.1** Test circuit and correct deficiencies.
- **.2** Set “long time pickup” at 1.0 (Do not change)
- **.3** Set other adjustments at minimum.
- **.4** Turn associated loads “on”.
- **.5** Turn breaker on/off a minimum of six (6) times.
- **.6** If nuisance tripping occurs, adjust setting that caused trip “up” one notch and repeat test.
- **.7** Repeat steps 5 and 6 until nuisance tripping no longer occurs.

3.3 Field Quality Control

3.3.1 Prepare for acceptance testing as follows:

- **.1** Inspect mechanical and electrical connections.
- **.2** Verify switch and relay type and labeling verification.
- **.3** Verify rating of installed fuses.

3.3.2 Perform the following field tests and inspections.

- **1.** Perform visual and mechanical inspection stated in NETA ATS, Section 7.5 for switches and Section 7.6 for molded-case circuit breakers.
- **.2** Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

PART 4 – MEASUREMENT; Not applicable

PART 5 – PAYMENT

5.1 Basis of Payment

5.1.1 Enclosed Switches and Circuit Breakers for Flagg Road Parking Lot will not be paid for separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price for Bid Item No. 2 that represents payment for the work of this Section 16410 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

PANELBOARDS

PART 1 - GENERAL

1.1 Summary

1.1.1 This Section includes distribution panelboards and lighting and appliance branch-circuit panelboards.

1.2 Related Documents

1.2.1 The General Conditions and, Supplementary Conditions, of Division Nos. 0 and 1, and applicable portions of Division 2 of the specification are part of this Section.

1.2.2 The applicable portions of Section 16050; Basic Electrical Materials and Methods are hereby make a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

1.3 Submittals

1.3.1 Product Data: For each type of panelboard, overcurrent protective device, accessory, and component indicated. Include dimensions and manufacturers' technical data on features, performance, electrical characteristics, ratings, and finishes.

1.3.2 Shop Drawings: For each panelboard and related equipment.

.1 Dimensioned plans, elevations, sections, and details. Show tabulations of installed devices, equipment features, and ratings. Include the following:

a. Enclosure types and details for types other than NEMA 250, Type 1.
b. Bus configuration, current, and voltage ratings.
c. Short-circuit current rating of panelboards and overcurrent protective devices.
d. Features, characteristics, ratings, and factory settings of individual overcurrent protective devices and auxiliary components.

.2 Wiring Diagrams: Power, signal, and control wiring.
.3 Field quality-control test reports.
.4 Operation and maintenance data.

1.4 Quality Assurance

1.4.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4.2 Comply with NEMA PB 1.

1.4.3 Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

.1 Panelboards, Overcurrent Protective Devices, Controllers, Contactors, and Accessories:

a. Square D.
b. Eaton Corporation; Cutler-Hammer Products.
c. General Electric Co.; Electrical Distribution & Protection Div.
d. Siemens Energy & Automation, Inc.

2.2 Manufactured Units

2.2.1 Enclosures: NEMA PB 1, Type 1.

.1 Rated for environmental conditions at installed location.

a. Outdoor Locations: NEMA 250, Type 3.
b. Other Wet or Damp Indoor Locations: NEMA 250, Type 4.

.2 Door-In-Trim: Provide with piano hinge on left side of trim, so that trim (and door) can be swung open for easy access to wiring terminals (rather than removed).

.3 Equip door with spring latch and tumbler-lock with all locks keyed alike.

2.2.2 Phase and Ground Buses: Copper.

2.2.3 Conductor Connectors: Suitable for use with conductor material.

2.2.4 Service Equipment Label: UL labeled for use as service equipment for panelboards with main service disconnect breakers.

2.2.5 Future Devices: Mounting brackets, bus connections, and necessary appurtenances required for future installation of devices.

2.2.6 Panelboard Short-Circuit Rating:

.1 Fully rated to interrupt symmetrical short-circuit current available at terminals.

.2 Unless otherwise indicated, a “series-combination system” of interrupting capacity rating shall <u>not</u> be used.

2.2.7 Service Entrance Equipment: When used as service entrance equipment, so rate.

2.2.8 Provide typed circuit directory card mounted in frame with clear plastic covering.

2.3 Overcurrent Protective Devices

2.3.1 Provide circuit breakers, per Section 16410, “Enclosed Switches and Circuit Breakers”.

PART 3 – EXECUTION

3.1 Installation

3.1.1 Install panelboards and accessories according to NEMA PB 1.1.

3.1.2 Comply with mounting and anchoring requirements.

3.1.3 Mount top of trim 74 inches (1880 mm) above finished floor, unless otherwise indicated.

3.1.4 Mount plumb and rigid without distortion of box. Mount recessed panelboards with fronts uniformly flush with wall finish.

.1 Set field-adjustable and circuit-breaker trip ranges.

3.1.5 Install filler plates in unused spaces.

3.1.6 Stub four 1-inch empty conduits from panelboard into accessible ceiling space or space designated to be ceiling space in the future. Stub four 1-inch empty conduits into raised floor space or below slab not on grade.

3.1.7 Identify field-installed conductors, interconnecting wiring, and components; provide warning signs as specified in Section 16050; "Basic Electrical Materials and Methods”.

3.1.8 Panelboard Nameplates: Label each panelboard with engraved laminated-plastic nameplate mounted with corrosion-resistant screws.

3.1.9 Ground equipment.

3.1.10 Connect wiring according to Section 16120; "Conductors and Cables."

3.1.11 Re-Torque: Once in final location, carefully re-torque all connections with a torque wrench, to match manufacturers recommendations. If equipment is dismantled, it must be re-inspected and re-certified by a nationally recognized testing laboratory, acceptable to the Engineer and the Authority Having Jurisdiction.

3.2 Circuit Breaker Adjustments

3.2.1 Adjust as described in Section 16410; “Enclosed Switches and Circuit Breakers”.

3.3 Field Quality Control

3.3.1 Prepare for acceptance tests as follows:

.1 Test insulation resistance for each panelboard bus, component, connecting supply, feeder, and control circuit.
.2 Test continuity of each circuit.

3.3.2 Perform the following inspections:

.1 Perform each visual and mechanical inspection stated in NETA ATS, section 7.6.

3.3.3 Perform the following field tests and inspections and prepare test reports:

.1 Perform each electrical test and visual and mechanical inspection stated in NETA ATS, Section 7.6 for molded-case circuit breakers. Certify compliance with test parameters.
.2 Correct malfunctioning units on-site, where possible, and retest to demonstrate compliance; otherwise, replace with new units and retest.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.2 Payment for Panel Boards for Flagg Road Parking Lot will not be paid separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16442 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

DRY-TYPE TRANSFORMERS

PART 1 - GENERAL

1.1 Summary

1.1.1 This Section includes dry-type transformers rated 600 V and less.

1.2 Related Documents

1.2.1 The General Conditions and, Supplementary Conditions of Division Nos. 0 and 1, and applicable portions of Division 2 of this specification are part of this Section.

1.2.2 The applicable portions of Section 16050; Basic Electrical Materials and Methods are hereby make a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

3.1 Submittals

1.3.1 Product Data: For each product indicated.

1.3.2 Shop Drawings: Wiring and connection diagrams.

1.4 Quality Assurance

1.4.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4.2 Comply with IEEE C 57.12.91.

1.4.3 Energy-Efficient Transformers Rated 15 kVA and Larger: Certified as meeting NEMA TP 1, Class 1 efficiency levels when tested according to NEMA TP 2.

1.5 Delivery, Storage, and Handling

1.5.1 Temporary Heating: Apply temporary heat according to manufacturer's written instructions within the enclosure of each ventilated-type unit, throughout periods during which equipment is not energized and when transformer is not in a space that is continuously under normal control of temperature and humidity.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 Manufacturers: Subject to compliance with requirements, provide products by one of the following:

.1 Square D/Group Schneider NA.

.2 Acme Electric Corporation; Power Distribution Products Division.
.3 Cutler-Hammer.
.4 Federal Pacific Transformer Company; Division of Electro-Mechanical Corp.
.5 GE Electrical Distribution & Control.
.6 Jefferson Electric, Inc.
.7 Siemens Energy & Automation, Inc.
.8 Sola/Hevi-Duty Electric.

2.2 Materials

2.2.1 Description: Factory-assembled and -tested, air-cooled units for 60-Hz service.

2.2.2 Cores: Grain-oriented, non-aging silicon steel.

2.2.3 Coils: Continuous windings without splices, except for taps.

.1 Internal Coil Connections: Brazed or pressure type.

2.2.4 Autotransformers: Not acceptable, unless specifically otherwise indicated.

2.3 Distribution Transformers

2.3.1 Comply with NEMA ST 20, and list and label as complying with UL 1561.

2.3.2 Cores: One leg per phase.

2.3.3 Enclosure: To suite environment, minimum to be: Ventilated, NEMA 250, Type 2.

2.3.4 Insulation Class: 220 deg C, UL-component-recognized insulation system with a maximum of 150 deg C rise above 40 deg C ambient temperature.

2.3.5 Taps for Transformers Smaller Than 3 kVA: None.

2.3.6 Taps for Transformers 7.5 to 24 kVA: Two 5 percent taps below rated voltage.

2.3.7 Taps for Transformers 25 kVA and Larger: Two 2.5 percent taps above and four 2.5 percent taps below normal full capacity.

2.3.8 K-Factor Rating: Transformers indicated to be K-factor rated shall comply with UL 1561 requirements for non-sinusoidal load current-handling capability to the degree defined by designated K-factor.

.1 Unit shall not overheat when carrying full-load current with harmonic distortion corresponding to designated K-factor.
.2 Indicate value of K-factor on transformer nameplate.

2.3.9 Step-up Transformers: Transformers described above are designed to step-down from a higher voltage to a lower voltage; usually 480 volt delta to 120/208 volts, wye. When a

transformer is used to “step-up’, provide a specially wound unit that will avoid excessive inrush currents.

2.4 Source Quality Control

2.4.1 Test and inspect transformers according to IEEE C57.12.91.

PART 3 - EXECUTION

3.1 Installation

3.1.1 Install transformers level and plumb.

3.1.2 Vibration Isolation: When Division 16 Section “Seismic Controls” for electrical work is <u>not</u> included, provide vibration isolation as follows: Transformers hung from overhead to have four (4) Mason Industries, Inc. (or approved equal) type 30N vibration isolators (one in each rod). Floor mounted transformers to have four (4) Mason Industries, Inc. (or approved equal) type RBA vibration isolators (one at each corner). Note: This is in addition to vibration isolators built into transformer. (Available from W.T. Morgan, Inc., P.O. Box 9065, Warwick, RI 02889 (401) 739-6650.)

3.2 Connections

3.2.1 Connect wiring according to Section 16120 "Conductors and Cables."

3.3 Adjusting

3.3.1 Adjust transformer taps to provide optimum voltage conditions at secondary terminals. Optimum is defined as not exceeding nameplate voltage plus 10 percent and not being lower than nameplate voltage minus 5 percent.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

5.1 Basis of Payment

5.1.2 Dry Type Transformers for Flagg Road Parking Lot will not be paid separately, but payment will be included in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16461 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

FUSES

PART 1 - GENERAL

1.1 Summary

1.1.1 This Section includes the following:

.1 Cartridge fuses rated 600 V and less.

1.2 Related Documents

1.2.1 The General Conditions and, Supplementary Conditions of Division Nos. 0 and 1, and applicable portions of Division 2 of the specification are part of this section.

1.2.2 The applicable portions of Section 16050 Basic Electrical Materials and Methods are hereby make a part of this Section. It is important that you read that section carefully because it expands upon the requirements herein.

1.3 Submittals

1.3.1 Product Data: For each fuse type indicated.

1.4 Quality Assurance

1.4.1 Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

1.4.2 Comply with NEMA FU 1.

1.4.3 Comply with NFPA 70.

PART 2 - PRODUCTS

2.1 Manufacturers

2.1.1 Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

.1 Cooper Bussman, Inc.
.2 Tracor, Inc.; Littelfuse, Inc. Subsidiary.
.3 Gould

2.2 Cartridge Fuses

2.2.1 Characteristics: NEMA FU 1, nonrenewable cartridge fuse; class and current rating indicated; voltage rating consistent with circuit voltage.

PART 3 - EXECUTION

3.1 Fuse Applications

3.1.1 Provide all main, switchboard, and distribution panel fuses Class L, Class J, or Class RK1 current limiting time delay type. At other locations, provide Class J or Class RK1 dual-element, time-delay type fuses. "One-time", "renewable" and RK5 type fuses are not acceptable.

3.1.2 Provide one spare set (3) of each size and type used. Where fuse sizes are not indicated, size per N.E.C.

FUSE CLASS	LITTLEFUSE	BUSSMANN	GOULD
L	KLPC	KRPC	A4BQ
J	JTD	LPJ	AJT
RK-1	LLSRK/LLNRK	LPSRK/LPNRK	A6D/A2D

3.2 Installation

3.2.1 Install fuses in fusible devices. Arrange fuses so rating information is readable without removing fuse.

3.3 Identification

3.3.1 Install labels indicating fuse replacement information on inside door of each fused switch.

PART 4 – MEASUREMENT Not applicable

Part 5 – PAYMENT

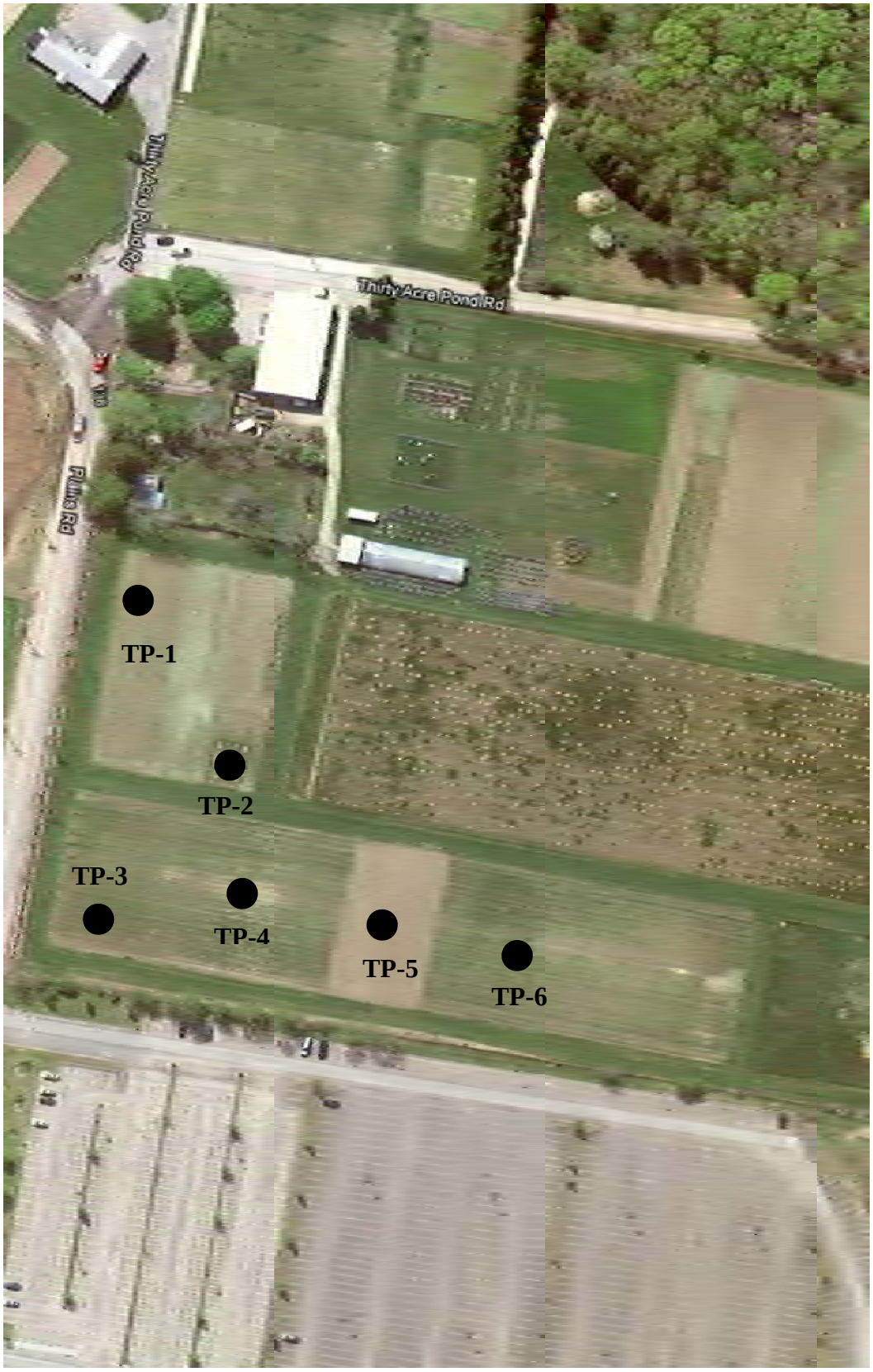
5.1 Basis of Payment

5.1.1 Fuses for Flagg Road Parking Lot will not be paid for separately, but payment will be included in the Lump Sum price listed in Alternate No. 2 for Construction of Flagg Road Parking Lot, complete. **Caveat;** That part of the lump sum price represents payment for the work of this Section 16491 constitutes full and complete compensation for all labor, materials and equipment and for all other incidentals required to finish this work, complete and accepted by the Engineer.

END OF SECTION

Soil Data
Flagg Road Parking Lot

University of Rhode Island - Test Pits - Plains Road



STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources

Site Evaluation Form
Part A - Soil Profile Description

Application Number _____

Property Owner: URI

Property Location: Proposed Parking Lot - Plains Road

Date of Test Hole: 11-22-11

Soil Evaluator: Steven Cadorette License Number: PE 8536

Weather: Cloudy 50's Shaded: Yes ☐ No ☒ Time: Morning

TH TP-1 Horizon	Depth	Horizon Boundaries Dist	Horizon Boundaries Topo	Soil Colors Matrix	Soil Colors Re-Dox Features	Re-Dox Description Ab.	Re-Dox Description S.	Re-Dox Description Con.	Texture	Structure	Consistence	Soil Category
Ap	12"			10YR4/4					sil	0fm	l	5
Bw	32"	c	w	10YR6/2	10YR6/8	f	1	f	sil	1fsbk	fr	5
C1	91"	c	w	2.5Y6/2					s	0Msg	l	1
C2	98"	c	w	10YR6/2					s	0Msg	l	1
C3	120"	c	W	2.5Y6/2					gs	0Msg	1	1

TH TP-2 Horizon	Depth	Horizon Boundaries Dist	Horizon Boundaries Topo	Soil Colors Matrix	Soil Colors Re-Dox Features	Re-Dox Description Ab.	Re-Dox Description S.	Re-Dox Description Con.	Texture	Structure	Consistence	Soil Category
Ap	16"			10YR4/4					sil	ofm	l	5
Bw	30"	c	w	10YR6/2	10YR6/8	f	1	f	sil	lfsbk	fr	5
C1	78"	c	w	2.5Y6/2					s	0Mg	l	1
C2	90"	c	w	10YR6/2					s	0Mg	l	1
C3	120"	c	w	2.5Y6/2					gs	0Mg	l	1

Soil Class: Eolian Deposit Total Depth of eachTest Hole: 120"

Depth to Groundwater Seepage: None Depth to Impervious or Limiting Layer: Not encountered

Estimated Seasonal High Water Table: 10' Comments:

Potential perched water table at approximately 30" below grade

Part B

Site Evaluation - to be completed by Class II or III Designer or Soil Evaluator

Please use the area below to locate:

1. Test holes
2. Approximate direction of due north
3. Offsets from test holes to fixed points such as street, utility pole, or other permanent, marked object

Key:

- Approximate location of test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

See attached diagram

1. Relief and Slope: Plain landform with <5% slope
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
3. Presence of existing or proposed private drinking water wells within 200 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
4. Public drinking water wells within 500 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
5. Is site within the watershed of a public drinking water reservoir or other critical area defined in SD 19.00? YES☐ NO☒
6. Has soil been excavated from or fill deposited on site? YES☐ NO☒ If yes, locate on above sketch.
7. Site's potential for flooding or ponding: NONE☒ SLIGHT☐ MODERATE☐ SEVERE☐
8. Landscape position: Mid-plain
9. Vegetation: Agriculrural field
10. Indicate approximate location of property lines and roadways.
11. Additional comments, site constraints or additional information regarding site: _____

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature _____ License #

Part B prepared by: _____ Signature _____ License #

FOR OFFICE USE ONLY

Decision: Approved ☐ Disclaimed ☐

Comments: _____

_____ Signature Authorized Agent

_____ Date

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources

Site Evaluation Form
Part A - Soil Profile Description

Application Number _____

Property Owner: URI

Property Location: Proposed Parking Lot - Plains Road

Date of Test Hole: 11-22-11

Soil Evaluator: Steven Cadorette License Number: PE 8536

Weather: Cloudy 50's Shaded: Yes ☐ No ☒ Time: Morning

TH TP-3 Horizon	Depth	Horizon Boundaries Dist	Horizon Boundaries Topo	Soil Colors Matrix	Soil Colors Re-Dox Features	Re-Dox Description Ab. S. Con.	Texture	Structure	Consistence	Soil Category
Ap	12"			10YR4/4			sil	0fm	l	5
Bw	34"	c	w	10YR6/2			sil	1fsbk	fr	5
C1	102"	c	w	2.5Y6/2			s	0Msg	l	1
C2	120"	c	w	10YR6/2			s	0Msg	l	1

TH TP-4 Horizon	Depth	Horizon Boundaries Dist	Horizon Boundaries Topo	Soil Colors Matrix	Soil Colors Re-Dox Features	Re-Dox Description Ab. S. Con.	Texture	Structure	Consistence	Soil Category
Ap	16"			10YR4/4			sil	ofm	l	5
Bw1	22"	c	w	10YR6/2			sil	lfsbk	fr	5
Bw2	40"	c	w	2.5Y6/2			sil	lfsbk	fr	5
C1	44"	c	w	7.5YR6/8			gs	0Mg	l	1
C2	110"	c	w	2.5Y6/2			gs	0Mg	l	1
C3	120"	c	w	2.5Y6/2			vgs	0Mg	l	1

Soil Class: Eolian Deposit

Total Depth of eachTest Hole: 120"

Depth to Groundwater Seepage: None

Depth to Impervious or Limiting Layer: Not encountered

Estimated Seasonal High Water Table: 10'

Comments: _____

Part B

Site Evaluation - to be completed by Class II or III Designer or Soil Evaluator

Please use the area below to locate:

1. Test holes
2. Approximate direction of due north
3. Offsets from test holes to fixed points such as street, utility pole, or other permanent, marked object

Key:

- Approximate location of test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

See attached diagram

1. Relief and Slope: Plain landform with <5% slope
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
3. Presence of existing or proposed private drinking water wells within 200 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
4. Public drinking water wells within 500 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
5. Is site within the watershed of a public drinking water reservoir or other critical area defined in SD 19.00? YES☐ NO☒
6. Has soil been excavated from or fill deposited on site? YES☐ NO☒ If yes, locate on above sketch.
7. Site's potential for flooding or ponding: NONE☒ SLIGHT☐ MODERATE☐ SEVERE☐
8. Landscape position: Mid-plain
9. Vegetation: Agriculrural field
10. Indicate approximate location of property lines and roadways.
11. Additional comments, site constraints or additional information regarding site: _____

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature _____ License #

Part B prepared by: _____ Signature _____ License #

FOR OFFICE USE ONLY

Decision: Approved ☐ Disclaimed ☐

Comments: _____

_____ Signature Authorized Agent

_____ Date

STATE OF RHODE ISLAND AND PROVIDENCE PLANTATIONS

Department of Environmental Management
Office of Water Resources

Site Evaluation Form
Part A - Soil Profile Description

Application Number _____

Property Owner: URI

Property Location: Proposed Parking Lot - Plains Road

Date of Test Hole: 11-22-11

Soil Evaluator: Steven Cadorette License Number: PE 8536

Weather: Cloudy 50's Shaded: Yes ☐ No ☒ Time: Morning

TH TP-5 Horizon	Depth	Horizon Boundaries Dist	Horizon Boundaries Topo	Soil Colors Matrix	Soil Colors Re-Dox Features	Re-Dox Description Ab. S. Con.	Texture	Structure	Consistence	Soil Category
Ap	14"			10YR4/4			sil	0fm	l	5
Bw	30"	c	w	10YR6/2			sil	1fsbk	fr	5
C1	75"	c	w	2.5Y6/2			s	0Msg	l	1
C2	93"	c	w	10YR6/2			s	0Msg	l	1
C3	120"	c	W	2.5Y6/2			gs	0Msg	1	1

TH TP-6 Horizon	Depth	Horizon Boundaries Dist	Horizon Boundaries Topo	Soil Colors Matrix	Soil Colors Re-Dox Features	Re-Dox Description Ab. S. Con.	Texture	Structure	Consistence	Soil Category
F	40"			10YR4/4			vstsil	ofm	l	5
C1	85"	c	w	2.5Y6/2			gs	0Mg	l	1
C2	120"	c	w	10YR6/2			vgs	0Mg	l	1

Soil Class: Eolian Deposit Total Depth of eachTest Hole: 120"

Depth to Groundwater Seepage: None Depth to Impervious or Limiting Layer: Not encountered

Estimated Seasonal High Water Table: 10' Comments:

TP-6 appears to be a former stonewall and farm dump area. Large rock encountered at 6-18" below grade and bottles, metal, and other debris from 18" to 40" below grade.

Part B

Site Evaluation - to be completed by Class II or III Designer or Soil Evaluator

Please use the area below to locate:

1. Test holes
2. Approximate direction of due north
3. Offsets from test holes to fixed points such as street, utility pole, or other permanent, marked object

Key:

- Approximate location of test holes
- x% Estimated gradient and direction of slope
- N Approximate direction of due north

See attached diagram

1. Relief and Slope: Plain landform with <5% slope
2. Presence of any watercourse, wetlands or surface water bodies, within 200 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
3. Presence of existing or proposed private drinking water wells within 200 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
4. Public drinking water wells within 500 feet of test holes: YES☐ NO☒ If yes, locate on above sketch.
5. Is site within the watershed of a public drinking water reservoir or other critical area defined in SD 19.00? YES☐ NO☒
6. Has soil been excavated from or fill deposited on site? YES☐ NO☒ If yes, locate on above sketch.
7. Site's potential for flooding or ponding: NONE☒ SLIGHT☐ MODERATE☐ SEVERE☐
8. Landscape position: Mid-plain
9. Vegetation: Agriculrural field
10. Indicate approximate location of property lines and roadways.
11. Additional comments, site constraints or additional information regarding site: _____

Certification

The undersigned hereby certifies that all information on this application and accompanying forms, submittals and sketches are true and accurate and that I have been authorized by the owner(s) to conduct these necessary field investigations and submit this request.

Part A prepared by: _____ Signature _____ License #

Part B prepared by: _____ Signature _____ License #

FOR OFFICE USE ONLY

Decision: Approved ☐ Disclaimed ☐

Comments: _____

_____ Signature Authorized Agent

_____ Date

Stormwater Pollution Prevention Plan

For:

Flagg Road Parking Lot

Plains Road

South Kingstown, Rhode Island 02881

Map 15-4, Lots 5 and 6

Owner:	University of Rhode Island Paul M. DePace, P.E., Director Office of Capital Projects 523 Plains Road, South Kingstown, RI 02881 (401) 874-4845
Operator: *TO BE DETERMINED UPON CONTRACT AWARD*	Company Name Name Address City, State, Zip Code Telephone Number
Estimated Project Dates:	Start Date: 2012 Completion Date: 2012
SWPPP Prepared By:	Gordon R. Archibald, Inc. Todd A. Ravenelle, P.E. 200 Main Street Pawtucket, RI 02860 (401) 726-4084
SWPPP Preparation Date:	January 31, 2012

OWNER CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the SWPPP as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

Owner Signature: Date

Owner Name: Paul M. DePace, P.E.

Owner Title: Director, Office of Capital Projects

Company Name: University of Rhode Island

OPERATOR CERTIFICATION

Upon contract award, the OPERATOR must sign this certification statement before construction may begin.

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete.

I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the SWPPP as appropriate in accordance with the requirements of the RIPDES Construction General Permit.

Operator Signature: Date

Contractor Representative: Name

Contractor Title: Title

Contractor Company Name: Company Name (if applicable)

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This Table of Contents is structured to be automatically populated by Microsoft Word. Upon final completion of this template, "right-click" anywhere in the Table of Contents, select "Update Field", and then "Update entire table". Page numbers will automatically be synced with the changed document.

INTRODUCTION

This Construction Site Stormwater Pollution Prevention Plan (SWPPP) has been prepared for the University of Rhode Island (URI) Office of Capital Projects for the Flagg Road Parking Lot . In accordance with the RIDEM Rhode Island Pollutant Discharge Elimination System (RIPDES) General Permit for Stormwater Discharge Associated with Construction Activity (RIPDES Construction General Permit), projects that disturb one (1) or more acres require the preparation of a SWPPP. This SWPPP provides guidance for complying with the terms and conditions of the RIPDES Construction General Permit, however, this document does not negate or eliminate the need to understand and adhere to all applicable RIPDES regulations.

The purpose of erosion and sedimentation best management practices (BMPs) is to prevent pollutants from leaving the construction site and entering waterways or environmentally sensitive areas during and after construction. This SWPPP has been prepared prior to the initiation of construction activities to address anticipated worksite conditions. The best management practices (BMPs) depicted on the site plan and described in this narrative should be considered the minimum measures required to control erosion, sedimentation, and stormwater runoff at the site. Since construction is a dynamic process with changing site conditions, it is the operator's responsibility to manage the site during each construction phase so as to prevent pollutants from leaving the site. This may require the operator to revise and amend the SWPPP during construction to address varying site and/or weather conditions, such as by adding or realigning erosion or sediment controls, to ensure the SWPPP remains compliant with the RIPDES Construction General Permit. Records of these changes must be added to the amendment log attached to the SWPPP, and to the site plans as "red-lined" drawings. *Please Note*: **Even if practices are correctly installed on a site according to the approved plan, the site is only in compliance when erosion and sedimentation are effectively controlled throughout the entire site.**

It is the responsibility of the site owner and the site operator to maintain the SWPPP, including all attachments, amendments and inspection records, at the site and to make all records available for inspection by RIDEM during and after construction. (RIPDES Construction General Permit – Section II.A.)

The site owner, the site operator, and the designated site inspector are required to review the SWPPP and sign the Party Certification pages (Section 8). The prime contractor (if different) and all subcontractors (if applicable) involved in earthwork or exterior construction activities are also required to review the SWPPP and sign the certification pages before construction begins.

Any questions regarding the SWPPP, BMPs, inspection requirements, or any other facet of this document may be addressed to the RIDEM Office of Water Resources RIPDES Permitting Program at 401-222-4700.

ADDITIONAL RESOURCES

Rhode Island Department of Environmental Management
Office of Water Resources
RIPDES Permitting Program
235 Promenade Street
Providence, RI 02908-5767
phone: 401-222-4700
email: waterresources@dem.ri.gov

RIDEM Office of Water Resources website
http://www.dem.state.ri.us/programs/benviron/water/index.htm

RIDEM RIPDES website
http://www.dem.state.ri.us/programs/benviron/water/permits/ripdes/index.htm

RIDEM Water Quality website (for 303(d) and TMDL listings)
http://www.dem.ri.gov/programs/benviron/water/quality/index.htm

RIDEM Rhode Island Natural Heritage Program
http://www.dem.ri.gov/programs/bpoladm/plandev/heritage/index.htm

RIDEM Geographic Data Viewer – Environmental Resource Map
http://www.dem.ri.gov/maps/index.htm

RIDEM *RI Stormwater Design and Installation Standards Manual* (as amended)
http://www.dem.state.ri.us/programs/benviron/water/permits/ripdes/stwater/t4guide/desman.htm

RIDEM, USDA Soil Conservation Service, and RI State Conservation Committee *Soil Erosion and Sediment Control Handbook* (as amended)
http://www.dot.ri.gov/documents/enviro/stormwater/Soil_Erosion_Sediment_Control_Handbook.pdf

Rhode Island Department of Transportation *Standard Specifications for Road and Bridge Design and Other Specifications* and *Standard Details*
http://www.dot.ri.gov/engineering/standards/index.asp

Natural Resources Conservation Service - Rhode Island Soil Survey Program
http://www.ri.nrcs.usda.gov/technical/soils.html

EPA NPDES SWPPP website
http://cfpub.epa.gov/npdes/stormwater/swppp.cfm#guide

EPA National Menu of Stormwater Best Management Practices
http://cfpub.epa.gov/npdes/stormwater/menuofbmps

SECTION 1: SITE DESCRIPTION

RIPDES Construction General Permit – Section IV.E.1

1.1 Project/Site Information

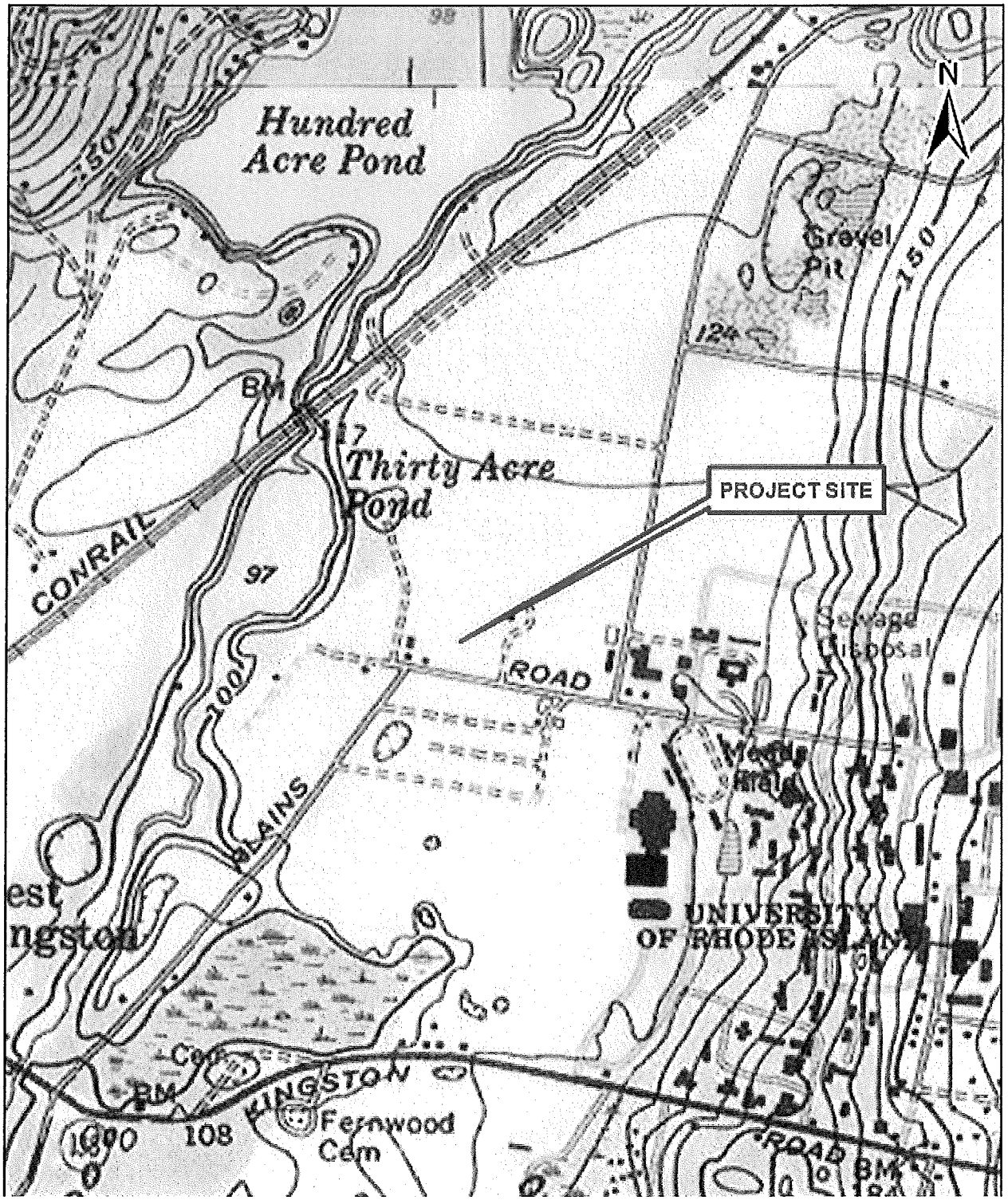
Project/Site Name:

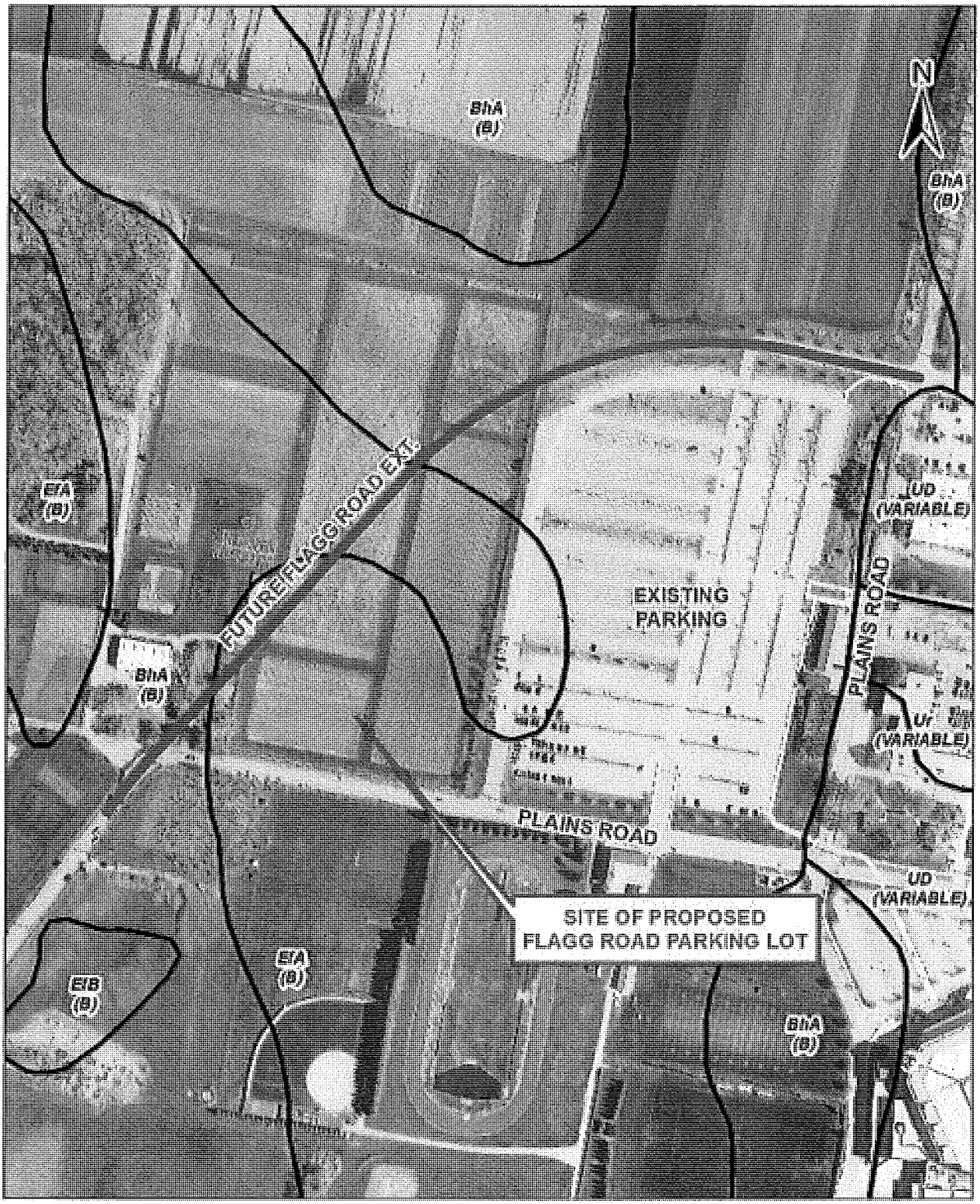
- Flagg Road Parking Lot
- The University of Rhode Island (URI) Office of Capital Projects is proposing to construct the Flagg Road Parking Lot, a new 426-space permeable pavement facility at the URI Kingston Campus in South Kingstown, Rhode Island. The development site is located in the northwest quadrant of the campus, near the intersection of Plains Road and Thirty Acre Pond Road and directly adjacent an existing campus parking lot (Plains Road Parking Lot) to the east.

  Consistent with the University's Campus Master Plan, the purpose of the proposed Flagg Road Parking Lot is to provide additional parking space for commuter students, faculty, staff, and visitors. This additional space is necessary to both (a) offset the loss of parking associated with the development of new campus buildings to the east along Flagg Road and (b) meet the current and future parking demands of the University.

Project Street/Location:

- The development site is located in a predominantly open, agricultural area in the northwest corner of the URI Kingston Campus, bounded southerly by Plains Road, easterly by the existing Plains Road Parking Lot, and northwesterly by the future Flagg Road Extension (Freshwater Wetlands Insignificant Alteration Permit No. 10-0243). See location maps below (not to scale).




N
BhA
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UD
(VARIABLE)
FUTURE FLAGG ROAD EXT.
EXISTING
PARKING
PLAINS ROAD
BhA
(B)
UD
(VARIABLE)
PLAINS ROAD
UD
(VARIABLE)
SITE OF PROPOSED
FLAGG ROAD PARKING LOT
EfA
(B)
EfB
(B)
BhA
(B)

1.2 Nature and Sequence of Construction Activity

Provide a narrative describing the nature and estimated timetable for the construction activities, including an anticipated sequence of major activities of the project, and the ultimate intended use of the project. (IV.E.1.b)

- The proposed parking facility is being developed in concert with the Flagg Road Extension, a project to link the tangent segments of Plains Road and Flagg Road to improve traffic circulation within the campus. This road project was approved by the Rhode Island Department of Environmental Management (RIDEM) Office of Water Resources as an Insignificant Alteration (Application No. 10-0243) and will be constructed prior to the construction of the proposed parking lot.

  Principal elements of the new 426-space parking facility consist of the following:

  Permeable Pavement Structure – Parking Lot – The proposed Flagg Road Parking Lot proper (parking area) has been designed with a permeable pavement structure in accordance with Section 5.4 and Appendix F.4 of the 2010 *Rhode Island Stormwater Design and Installation Standards Manual* (RIDEM and CRMC, 2010), as well as the National Asphalt Pavement Association (NAPA) Information Series 131 – *Porous Asphalt Pavements for Stormwater Management: Design Construction and Maintenance Guide* (2008).

  In accordance with the requirements of the 2010 Stormwater Manual, the proposed system has been designed to manage both water quality and peak flows, and functionally, the system has also been provided with overflow catch basins within the grassed median islands of the lot, which will divert to the reservoir course any high-intensity rainfall runoff exceeding the uptake capacity of the porous asphalt surface.

  Lot Access Roads (Impervious Pavement) – The proposed parking facility will be integrated with the adjoining Plains Road Parking Lot (to its east) and the Flagg Road Extension through the construction of new access ways north and east of the proposed parking lot proper. Since these access roads will be subjected to heavier vehicle traffic (i.e., busses), a conventional impervious asphalt pavement structure is proposed along these corridors to ensure long-term durability. This conventional pavement structure will be matched to the proposed Flagg Road Parking Lot permeable pavement structure and the existing Plains Road Parking Lot permeable pavement structure. Runoff these access roads will primarily drain (via closed systems) to the infiltration basin to be constructed under the Flagg Road Extension project, with portions also shedding over the porous pavements of the existing Plains Road Parking Lot and proposed Flagg Road Parking Lot. In accordance with Stormwater Manual requirements, pretreatment for discharges to the infiltration has been provided in the design (deep-sump catch basins and stone check dam forebays.

  The anticipated sequence of construction is as follows:

  - Mobilize and establish construction site.
  - Conduct survey and layout.
  - Install perimeter erosion controls (baled hay) up-gradient of Flagg Road Infiltration Basin and at locations along site perimeter.
  - Clear and excavate area of Flagg Road Parking Lot (permeable pavement system) and access road south of infiltration basin to subgrade. Cut and remove portions of existing Plains Road Parking Lot pavement as needed to accommodate permeable pavement system construction.
  - Install construction-phase erosion and sedimentation controls for inlets and outlets to Flagg Road Infiltration Basin (baled hay ditch and swale erosion check, baled hay/silt fence combined, silt fence) and permanent sedimentation controls (stone check dams).

- Construct/install new deep-sump catch basins, new drainage pipe, and outlets (including concrete flared ends and riprap pads).
- Install sand filter base course (parking lot) and gravel borrow base course (access road), and construct gravel borrow berm for crushed stone reservoir course.
- Install initial 4-inch lift of crushed stone reservoir course.
- Install overflow/collection system including all median swale basins, cleanouts, perforated pipe, and other appurtenant elements.
- Place crushed stone reservoir course of pervious pavement system in lifts to finish elevations.
- Remove and dispose existing pavements along west perimeter of Plains Road Parking Lot to accommodate north-south access road construction, pavement matching, an installation of concrete curbing.
- Place choker course stone (and gravel borrow where applicable), set concrete curbing, and trim/fine grade top surface of choker and gravel borrow base courses.
- Install baled hay inlet protection at catch basins.
- Place porous and conventional asphalt base courses.
- Place porous and conventional asphalt surface courses.
- Loam and seed designated areas.
- Install pavement markings, symbols and signage.
- Remove and dispose temporary erosion controls.
- Conduct final site cleanup, including vacuum sweeping of all pervious pavement surfaces.
- Demobilize and open facility for operation.

Estimated Project Start Date:	2nd or 3rd Quarter, 2012
Estimated Project Completion Date:	3rd or 4th Quarter, 2012
Estimated Number of Months:	2-3 (Estimated)

1.3 Existing and Proposed Soils, Slopes, Vegetation, and Drainage Patterns

Provide description of pre- and post-construction site conditions

Soil type(s):
Provide a description of the soils at the site and of each soils' erodibility hazard as listed in the Natural Resources Conservation Service Rhode Island Soil Survey Program. (IV.E.1.e)

- Natural Resources Conservation Service (NRCS) Soil Survey geographic data (available through the Rhode Island Geographic Information System – http://www.edc.uri.edu/rigis/data/) classifies the soils underlying the project area as Enfield Silt Loam, 0 To 3 % Slopes (EfA) and Bridgehampton Silt Loam (BhA), both of which are described as nearly level, well-drained soils typically found on terraces and outwash plains. Both soil types are identified in the NRCS data as Hydrologic Soil Group (HSG) B, with seasonal high groundwater tables greater than 6 feet below the ground surface, and permeability in the B and C horizons of 0.6 - 2.0 inches/hour and > 6.0 inches/hour respectively. These soils are described as suitable for farming and community development.

- Neither of the soils underlying the project site is listed as having a high or potentially high erosion rating the R.I. Soil Survey (http://www.ri.nrcs.usda.gov/technical/soillegend.html). The map unit descriptions of both the EfA and BhA soils types do however note that "Slopes of excavated areas are commonly unstable."

Slopes:

Provide a description of the slopes that will be impacted by construction activities (grading or filling)

- Existing: The existing topography of the site is relatively flat, with slopes predominantly 1% or less). As soils/subsoils are also well-drained, surface runoff is only generated only by more significant rainfall events.
- Proposed: The project will require a fair amount of excavation to install the permeable pavement system, drainage structures, and other elements associated with the Flagg Road Parking Lot. Modest (2:1) slopes will be created for the installation of the pervious pavement system base courses.

Vegetation/Impervious Area:

Provide a description of the vegetative and impervious areas that will be impacted by construction activities

- Existing: As depicted on the location maps provided, the project site consists primarily of cultivated open fields. The adjacent Plains Road Parking Lot is a pervious pavement surface, and there are essentially no impervious areas presently within the site limits.
- Proposed: Construction of the parking facility will involve disturbances to both the open farmland and a portion of the existing Plains Road Parking Lot. The bulk of surface cover modification consists of cultivated open space being replaced by the porous pavement, which will maintain the existing recharge characteristics of the site. Approximately 0.8 acres of impervious surface will be created (in the conventional asphalt pavement along access roadways), and runoff from these impervious areas will be managed by infiltration (via pervious pavement and the Flagg Road Infiltration Basin). Median islands and perimeter areas surrounding the lot will be finished graded/landscaped with loam and grass seed.

Drainage Patterns:

Provide a description of the drainage patterns that will be impacted by construction activities

- Existing: While the project is located within the watershed of Thirty Acre Pond to the west (see location maps), there are no surface water or wetland features on or near the site, and the existing drainage subarea (approximately 19.5 acres, virtually all grassed / agricultural open space) drains in an easterly direction to a small isolated depression area just north of the existing Plains Road Parking Lot. As virtually all of the existing area is pervious with relatively flat topography (slopes predominantly 1% or less), surface runoff to the depression is only generated by more significant rainfall events.
- Proposed: Stormwater runoff from the Flagg Road Parking Lot and accesses will be managed and discharged to ground via infiltration: depending on location, recharge will either occur through the permeable pavement system or the Flagg Road Infiltration Basin. A Stormwater Management Plan has be developed for the project/facility in accordance with the 2010 *Rhode Island Stormwater Design and Installation Standards Manual* (RIDEM and CRMC, 2010), and the proposed design meets the applicable standards for the stormwater quantity/quality management contained therein.

1.4 Construction Site Estimates

Provide construction site estimates of the total area of the site and the total area of the site that is expected to undergo soil disturbance (IV.E.1.c) and the calculated pre-construction and post-construction runoff coefficients for the site. (IV.E.1.d)

The following are estimates of the construction site:

Total Project Area	7.1 acres
Construction Site Area to be disturbed	7.1 acres
Percentage impervious area before construction	1-2% (approx.)
Runoff coefficient before construction	60 (NRCS CN)
Percentage impervious area after construction	13%
Runoff coefficient after construction	62 (NRCS CN)

1.5 Receiving Waters

List the waterbody(s) that will receive stormwater from the site, including streams, rivers, lakes, coastal waters, and wetlands. Note any stream crossings, if applicable. (III.A.7)

List/description of receiving waters:

- The project is located within the watershed of Thirty Acre Pond to the west (ID # RI0008039L-12), a waterbody designated as Class B according to the most recent water quality data available from the RIDEM Office of Water Resources. Class B waters are defined in the *Water Quality Regulations* (RIDEM, 2010)[1] as being "...designated for fish and wildlife habitat and primary and secondary contact recreational activities. They shall be suitable for compatible industrial processes and cooling, hydropower, aquacultural uses, navigation, and irrigation and other agricultural uses. These waters shall have good aesthetic value."
- While the project is located within the watershed of Thirty Acre Pond to the west (see location maps), there are no surface water or wetland features on or near the site, and the existing drainage subarea (approximately 19.5 acres, virtually all grassed / agricultural open space) drains in an easterly direction to a small isolated depression area just north of the existing Plains Road Parking Lot. As virtually all of the existing area is pervious with relatively flat topography (slopes predominantly 1% or less), surface runoff to the depression is only generated by more significant rainfall events. Stormwater infiltrating in this subarea is recharged to the groundwater table, which is characterized by a hydraulic gradient in a general westerly direction (towards Thirty Acre Pond).

List the separate storm sewer system or drainage system that stormwater from the site could discharge to and the waterbody(s) that receive discharges from the storm sewer or drainage system. (III.A.7)

List/description of separate storm sewer systems:

- Apart from the subdrains of the Plains Road Parking Lot permeable pavement system (which currently overflow to a grassed ditch north of the lot, and will in the future discharge to a drainage

[1] http://www.dem.ri.gov/programs/benviron/water/quality/index.htm

basin associated with the Flagg Road Extension project), there are no separate storm sewer systems in the project area to which stormwater from the site could potentially discharge.

If any of the water bodies above are impaired (303(d) listed) and/or subject to Total Maximum Daily Loads (TMDLs), list the pollutants causing the impairment and any specific requirements in the TMDL(s) that are applicable to construction sites. Visit http://www.dem.ri.gov/programs/benviron/water/quality/index.htm for more information and a list of Rhode Island impaired waters and TMDL Studies. See also the RIDEM Notice of Intent instructions (Section IV).

List/description of 303(d)/TMDL waters and applicable TMDL requirements:

- The Thirty Acre Pond is not on the State's 303(d) list and does not have a TMDL.

1.6 Allowable Non-Stormwater Discharges

Discharges not comprised of Stormwater are allowed under the RIPDES Construction General Permit but are limited to the following: discharges which result from the washdown of vehicles where no detergents are used; external building washdown where no detergents are used; the use of water to control dust; fire fighting activities; fire hydrant flushings; natural springs; uncontaminated groundwater; lawn watering; potable water sources including waterline flushings; irrigation drainage; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled materials have been removed) and where detergents are not used; and foundation or footing drains where flows are not contaminated with process materials such as solvents, or contaminated by contact with soils where spills or leaks of toxic or hazardous materials has occurred. If any of these discharges may reasonably be expected to be present and to be mixed with stormwater discharges, they must be specifically listed here. (IV.E.1.g)

Are there allowable non-Stormwater discharges on or near the project area?

X Yes ☐ No

If yes, list the sources of allowable non-Stormwater discharge (be sure to include all dewatering activity discharges). If applicable, control measures must be documented in Section 2.12 &/or Section 3.4.

List of allowable non-stormwater discharges:

- Water for dust control would constitute a non-stormwater discharge.

If any existing or proposed discharges consist of contaminated groundwater, such discharges are not authorized under the RIPDES Construction General Permit. These discharges must be permitted separately by seeking coverage to treat and discharge under a separate RIPDES individual permit or under the RIPDES Remediation General Permit. Contact the RIDEM Office of Water Resources RIPDES Permitting Program at 401-222-4700 for application requirements and additional information.

Are there any known or contaminated discharges, including dewatering operations, on or near the project area?

☐ Yes X No

If yes, list the discharges and the RIPDES individual permit number(s) or RIPDES Remediation General Permit Authorization number(s) associated with these discharges.

- RIPDES individual permit number : N/A
- RIPDES Remediation General Permit Authorization number: N/A

1.7 Existing Data of Known Discharges from Site

List and provide existing data (if available) on the quality of any known discharges from the site (IV.E.1.h).

Are there known discharges from the project area?

☐ Yes X No

Describe how this determination was made:

- The topography of the site is flat (slopes predominantly 1% or less) and existing surface cover / land use is open space / agricultural.

If yes, list discharges and locations:

- N/A

Is there existing data on the quality of the known discharges?

☐ Yes X No

If yes, provide data:

- N/A

1.8 Natural Heritage Area Information

Each project authorized under the RIPDES Construction General Permit must determine if the site is within or directly discharges to a Natural Heritage Area (NHA). DEM Natural Heritage Areas include known occurrences of state and federal rare, threatened and endangered species. Review RIDEM NHA maps to determine if there are natural heritage areas on or near the construction site. See the RIDEM Notice of Intent instructions (Section V).

Are there any Natural Heritage Areas being disturbed by the construction activity or will discharges be directed to the Natural Heritage Area as a result of the construction activity?

☐ Yes X No

If yes, describe or refer to documentation which determines the likelihood of an impact on this area and the steps that will be taken to address any impacts.

- N/A

1.9 Historic Preservation/Cultural Resources

The National Historic Preservation Act, and any state, local and tribal historic preservation laws apply to construction activities. As with endangered species, some permits may specifically require you to assess the potential impact of your stormwater discharges on historic properties. However, whether or not this is stated as a condition for permit coverage, the National Historic Preservation Act and any applicable state or tribal laws apply to you. Contact the Rhode Island Historic Preservation Officer (http://www.preservation.ri.gov/) or your Tribal Historic Preservation Officer (http://grants.cr.nps.gov/THPO_Review/index.cfm) for more information.

Are there any historic properties, historic cemeteries or cultural resources on or near the construction site?

☐ Yes ☐ No

Describe how this determination was made and summarize state or tribal review comments:

- A determination has not yet been made as to whether there are historic/cultural resources within the project area. A site investigation will be conducted and all proper documentation will be prepared prior to any construction.

If yes, describe or refer to documentation which determines the likelihood of an impact on this historic property, historic cemetery or cultural resource and the steps taken to address that impact including any conditions or mitigation measures that were approved by other parties.

- N/A. A site investigation will be conducted to determine if any resources of historical or cultural significance could be potentially impacted by the project.

1.10 Site Features and Sensitive Areas to be Protected

The first goal in the LID site planning and design process is to avoid disturbance of natural features. This includes identification and preservation of natural areas that can be used in the protection of water resources. It is important to understand that minimizing the hydrologic alteration of a site is just as important as stormwater treatment for resource protection. Therefore, describe all site features and sensitive resources that exist at the site such as floodplains, steep slopes (>15%), erodible soils, wetlands, hydric soils, surface waters, and their riparian buffers, specimen trees, natural vegetation, forest areas, stream crossings, historic properties, historic cemeteries or cultural resources that are to be preserved.

Sensitive areas and measures that must be implemented to protect them:

- There are no natural features of a sensitive nature within or in the immediate vicinity of the project limits. A qualifying pervious area (QPA) will be established south of the Flagg Road Parking Lot and will be protected from traffic and compaction during construction.

1.11 Potential Sources of Pollution

Provide a description of potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site (i.e. exposed, un-stabilized soil stockpiles, clearing and grubbing operations, vehicle tracking, concrete washouts, diesel fuel, etc.)(IV.E.1.f)

Check All Those That Apply	Operation/ Location	Stormwater Pollutants
X	Clearing, grading, excavating, and unstabilized areas	Sediment; Trash/Debris
X	Construction Entrance	Sediment
☐	Soil Stockpiles	Sediment
X	Paving operations	Sediment; Trash/Debris
☐	Concrete washout and waste	Heavy metals; pH; Trash/Debris
☐	Structure construction/ painting/ cleaning	Nutrients; pH; Trash/Debris; Toxic chemicals
☐	Demolition and debris disposal	Sediment; Trash/Debris
☐	Dewatering operations	Sediment; Nutrients
☐	Drilling and blasting operations	Sediment; pH; Trash/Debris
☐	Material delivery and storage	Sediment; Nutrients; Heavy metals; pH; Pesticides/Herbicides; Oil/Grease; Trash/Debris; Toxic chemicals
☐	Material use during building process	Nutrients; heavy metals; pH; pesticides/herbicides; oil/grease; trash/debris; toxic chemicals
☐	Solid waste/ trash/ debris	trash/debris; toxic chemicals
☐	Hazardous waste	heavy metals; pH; pesticides/herbicides; oil/grease; toxic chemicals
☐	Contaminated spills	Nutrients; heavy metals; pH; pesticides/herbicides; oil/grease; toxic chemicals
☐	Sanitary/septic waste	Nutrients; pH; Bacteria/Viruses; toxic chemicals
☐	Vehicle/equipment fueling and maintenance	Oil/Grease; Toxic chemicals
☐	Vehicle/equipment use and storage	Oil/Grease; Toxic chemicals
X	Landscaping operations	Sediment; Nutrients; Trash/Debris
☐	Other:	
☐	Other:	

1.12 SWPPP Site Maps

A series of construction phase site maps must be included as part of the SWPPP. Appendix A must contain a General Location Map. Appendix B should ideally contain several maps, the first of which should depict the undeveloped site and its current features. An additional Construction Site Map should be developed which identifies the erosion and sedimentation control BMPs and construction phase pollution prevention BMPs that will be implemented at the site and maintained throughout the active construction phase of the project. In some cases more than one Construction Site Map may be necessary depending on the length and complexity of the project. It is also recommended that a working draft copy of the Construction Site Map be made available as part of the SWPPP so that the operator may document any changes to the BMPs and keep a record of any changes with the SWPPP as required by the RIPDES Construction General Permit. Examples of the types of maps that should be included in the SWPPP are shown in Appendix A and Appendix B of this template.(IV.E.1.a)

At a minimum the SWPPP Site Maps must include all of the following elements:

**** 8½ x 11" reduced scale Regulatory Permit Application Submission plans (January 2012) meeting the applicable requirements listed below are provided herewith in Appendix B.***

The appended SWPPP Site Maps contain the following elements:

- ☐ SWPPP plan set scale should have no less detail than 1" = 100'
- ☐ A minimum contour interval of 2' must be utilized.
- ☐ Total area of development and area of soil disturbance
- ☐ Pre- and post-development drainage patterns
- ☐ Approximate slopes anticipated after the completion of major grading activities
- ☐ The location and name of the receiving waters or separate storm sewer system and the ultimate receiving waters, including wetlands
- ☐ Direction(s) of stormwater flow
- ☐ Location and field verified boundaries of resource protection areas such as freshwater and coastal wetlands, lakes, ponds, coastal shoreline features and required setbacks (e.g. buffers, water supply wells, septic systems)
- ☐ Location of environmentally sensitive features/areas that will not be disturbed (i.e. endangered species habitats, historic sites, natural heritage areas, Qualified Pervious Areas (QPAs))
- ☐ Boundaries of existing predominant vegetation
- ☐ Proposed limits of disturbance.
- ☐ Construction site property lines.
- ☐ Location of existing and proposed roads, buildings, and other structures.
- ☐ The location of all impervious structures
- ☐ Location of existing and proposed conveyance systems such as grass channels and swales
- ☐ Locations and timing of stabilization measures
- ☐ Locations of construction staging and material stockpiling areas
- ☐ The location of all erosion and sedimentation stormwater control structures and BMPs, including the location of any temporary or permanent retention or detention basins or other water quality control structures

- ☐ Locations of all non-structural BMPs which will address all potential sources of pollution that may reasonably be expected to affect the quality of stormwater discharges from the site (i.e. fueling areas, material storage areas, equipment storage areas, designated concrete washout areas, solid and hazardous waste collection areas, soil stockpiles, etc.)
- ☐ Locations of storm drain inlets and outfalls that need to be protected
- ☐ Locations of all graveled access entrance and exit drives and parking areas to reduce the tracking of sediment onto public and private roads.
- ☐ The location of any necessary spill prevention and response equipment

SECTION 2: EROSION & SEDIMENTATION CONTROLS

RIPDES Construction General Permit – Section IV.E.2.a

The purpose of erosion controls is to prevent sediment from moving onto, around, or off of the construction site. Properly installed and maintained erosion controls are the primary defense against sediment pollution.

Sedimentation controls are a second line of defense against moving sediment. The purpose is to prevent sediment from leaving the construction site and entering environmentally sensitive areas.

Runoff controls are used to slow the velocity of concentrated water flows. By intercepting and diverting stormwater runoff to a stabilized outlet or treatment BMP, erosion and sedimentation are reduced.

This section describes the set of measures that will be installed before and during the construction project to control pollutants in stormwater discharges that will occur at the site. Such measures may include: perimeter controls, stock pile covering, storm drain inlet protection, check dams, and temporary seeding.

Include any applicable references to design specifications and any applicable maintenance requirements.

Please note: The operator should initiate appropriate vegetative practices on all disturbed areas as soon as possible but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased, unless the activity is to resume within twenty one (21) days. Section IV.E.2.a.i of the RIPDES Construction General Permit.

2.1 Minimize Disturbed Area and Protect Natural Features and Soil

As far as is practicable, existing vegetation shall be protected and left in place, in accordance with the clearing limits shown on the approved Plans. Prior to any land disturbance activities commencing on the site, the Contractor shall physically mark limits of disturbance (LOD) on the site and any areas to be protected within the site, so that workers can clearly identify the areas to be protected.

Describe the areas that will be disturbed with each phase of construction and the BMPs (signs, fences, etc.) that will be used to protect those areas that should not be disturbed. Plans should highlight measures to prevent soil compaction in areas designated as Qualified Pervious Areas (QPAs) for better infiltration. Describe natural features identified earlier and how each will be protected during construction activity. Also describe how topsoil will be preserved.

- Virtually all areas within the established LOD will involve various types and degrees of ground disturbances, the most significantly being the excavation and installation of the Flagg Road Parking Lot pervious pavement system. In accordance with the guidance set forth in the latest edition of the *Rhode Island Soil Erosion and Sediment Control Handbook*, temporary and permanent physical controls (R.I. Standard baled hay/silt fence, catch basin protection, outlet protection, etc.) and construction best management practices will be implemented and maintained for the duration of the work. The qualifying pervious area (QPA) to be established south of the Flagg Road Parking Lot will be protected from traffic and compaction during construction.

2.2 Phase Construction Activity

Proper sequencing of construction activities is essential to maximize the effectiveness of erosion and sediment control measures. Construction sequencing and timing of construction activities will include:

1. Installation of all erosion and sediment controls that are required to be in place and functional before any earthwork begins. This shall be done in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended). Upon acceptable completion of site preparation and installation of erosion and sediment controls, site construction activities may commence. Routine inspection and maintenance and/or modification of erosion and sediment controls while earthwork is being done is required.
2. Upon commencement of site construction activities, the operator shall initiate appropriate stabilization practices on all disturbed areas as soon as possible but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased, unless the activity is to resume within twenty one (21) days.
3. Final stabilization of any disturbed areas after earthwork has been completed.

Describe the intended construction sequencing and timing of major activities, including grading activities, road and utility installation, and building phases. The first phase should include all erosion and sediment controls that are required to be in place before earthwork begins. Phase II through XX may include erosion and sediment controls required while earthwork is being done. The final phase should include final stabilization BMPs.

A general sequence of construction is outlined in Section 1.2 of this document and includes the implementation of appropriate erosion and sedimentation controls applicable to the various phases of the work. The contractor will be required to adhere to the Erosion and Sediment Control notes set forth on the Plans (see Appendix B) and the terms and conditions of the RIPDES General Permit for Construction Activity for the duration of the project.

- Phase I – BEFORE EARTHWORK
  - ☐ Describe phase
  - ☐ Duration of phase (start date, end date)
  - ☐ List BMPs associated with this phase
  - ☐ Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)
- Phase II – DURING EARTHWORK
  - ☐ Describe phase
  - ☐ Duration of phase (start date, end date)
  - ☐ List BMPs associated with this phase
  - ☐ Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)
- Phase III – FINAL STABILIZATION
  - ☐ Describe phase
  - ☐ Duration of phase (start date, end date)
  - ☐ List BMPs associated with this phase
  - ☐ Describe stabilization methods for this phase (describe any temporary stabilization methods that will be used before final stabilization)

- Add additional phases as required

2.3 Phased Clearing/Grubbing

Only areas that can be reasonably expected to have active construction work being performed within 21-days of disturbance will be cleared/grubbed at any one time. It is NOT acceptable to clear and grub the entire construction site if portions will not be active within the 21-day time-frame. Proper phasing of

clearing and grubbing activities shall include temporary stabilization techniques for areas cleared and grubbed that will not be active within the 21 day time frame.

No undisturbed areas shall be cleared of existing vegetation after October 15th of any calendar year or during any period of full or limited winter shutdown. All disturbed soils exposed prior to October 15 of any calendar year shall be seeded or protected by that date. Any such areas that do not have adequate vegetative stabilization, as determined by the site operator or designated inspector, by November 15 of any calendar year, must be stabilized through the use of erosion control matting or hay mulch, in accordance with specifications contained within the RI Soil Erosion and Sediment Control Handbook (as amended). If work continues within any of these areas during the period from October 15 through April 15, care must be taken to ensure that only the area required for that day's work is exposed, and all erodible soil must be restabilized within 5 working days.

Clearing/Grubbing shall not take place during a rain event if erosion is likely to occur; nor shall it occur if a rain event is forecasted and appropriate erosion controls can not be installed prior to the storm.

After clearing, and by the end of each day's grubbing operation, the site operator shall install erosion control measures that are indicated on the Plans or as directed by the Engineer. Such erosion control measures shall be installed in strict accordance with the RI Soil Erosion and Sediment Control Handbook (as amended).

2.4 Monitoring Weather Conditions

Care will be taken to avoid having unstabilized areas exposed during precipitation events. Weather forecasts will be routinely checked, and in the case of an expected precipitation event of over 0.25-inches over a 24-hour period, all BMPs will be inspected, and maintained as necessary, prior to the weather event.

In the case of an extreme weather forecast (greater than one-inch of rain over a 24-hour period), additional erosion/sediment controls will be installed where appropriate.

List the weather gauge station that will be utilized to monitor weather conditions on the construction site. See www.wunderground.com or www.weather.gov for available stations.

The weather gauge station and website that will be utilized to monitor weather conditions on the construction site is as follows:

- STATION RI-WS-5, Biscuit City Road, Kingston, Rhode Island

2.5 Initiating Stabilization Practices

As per RIPDES Construction General Permit Section IV.E.2.a: Upon completion and acceptance of site preparation and initial installation of erosion and sediment controls the operator shall initiate appropriate stabilization practices during all phases of construction on all disturbed areas as soon as possible but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased, unless the activity is to resume within twenty one (21) days.

2.6 Control Stormwater Flowing Onto and Through the Project

Structural BMPs are used to divert flows from exposed soils, retain or detain flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site.

BMPs shall be installed as depicted on the approved plan set and in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction.

Describe structural practices (i.e., diversions, berms, ditches, storage basins) including design specifications and details used to divert flows from exposed soils, retain or detain flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site.(IV.E.2.a)

- The nature of the project area (flat topography, well-drained soils) and work is such that only limited runoff is expected to flow to or through the project site. Overland flows from north of the work area will be routed from the depression north of the Flagg Road Extension (to be constructed prior to the Flagg Road Parking Lot project) and into the Flagg Road Infiltration Basin. Similarly, flows from the grassed swale along Flagg Road Extension (east of the parking lot) to the infiltration basin will be maintained through construction in the timed/sequenced installation of the new culvert and drainage system at the access road entrance at this location. As depicted and detailed on the plans, both temporary (baled hay, silt fence, inlet protection) and permanent (riprap inlet/outlet protection, deep-sump catch basins, stone check dam forebay) controls will be installed to maintain flows and minimize erosion and sedimentation processes.

2.7 Stabilize Soils

Any disturbed areas that will not have active construction activity occurring within twenty one (21) days must be stabilized using the BMPs depicted on the approved plan set and in accordance with applicable measures specified in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

Describe controls (i.e., temporary seeding with native vegetation, hydroseeding, etc.) including design specifications and details that will be implemented to stabilize exposed soils where construction activities have temporarily or permanently ceased. Also describe measures to control dust generation. Use of impervious surfaces for stabilization should be avoided whenever possible. (IV.E.2.a.i)

- While there are no anticipated elements of the work that will involve unstabilized/bare soils remaining exposed for greater than 21 days, the contractor is required to adhere to the Erosion and Sediment Control notes set forth on the Plans (see Appendix B), including those requiring exposed soils to be stabilized (by seeding, hay/straw, or matting applications).

2.8 Protect Slopes

Slopes that will have concentrated stormwater flow must be protected using the BMPs depicted on the approved plan set and in accordance with the specifications outlined in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

If the slope stabilization BMPs fail and erosion occurs, then alternative control measures may be used, upon approval of the site owner, which may include compost filter socks, fiber rolls, gravel bag berms, erosion control mats/blankets, and temporary vegetative cover.

Describe controls (i.e., erosion control blankets, tackifiers, etc.) including design specifications and details that will be implemented to protect all slopes.

- Beyond the temporary excavations required to install the permeable pavement system (which have limited potential to cause erosion or sedimentation), the project will not involve any creation or alteration of slopes requiring protection. Should any temporary slopes require stabilization, the

engineer will direct the contractor to employ matting or fiber lining to the applicable slopes (as stated in the Erosion and Sediment Control notes set forth on the Plans - see Appendix B)

2.9 Protect Storm Drain Inlets

Storm drain inlet protection measures prevent soil and debris from entering storm drain inlets. These measures are usually temporary and are implemented before a site is disturbed. ALL stormwater inlets &/or catchbasins that are operational during construction and may receive sediment-laden stormwater flow from the construction site must be protected using any of the BMPs outlined in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

Possible control measures that may be used include compost filter socks, fiber rolls, gravel bag berms, or catch basin inserts. (Please note: **Haybale/Silt Fence protection measures DO NOT work on paved roadways)**

Describe controls, including design specifications and details, which will be implemented to protect all inlets receiving stormwater from the project during the entire duration of the project.

- R.I. Standard 9.8.0 baled hay inlet protection will be installed and maintained all catch basins prior to final paving operations and systems actively accepting runoff. The drainage swale culvert inlet along Flagg Road Extension will be provided with R.I. Standard 9.4.0 baled hay erosion check and riprap pad inlet protection.

2.10 Protect Storm Drain Outfalls

Outfall protection is necessary to prevent scour or severe erosion at discharge points. Outfalls often have high velocity, high volume flows, and require strong materials that will withstand the forces of stormwater. The function of these BMPs is to protect the soil surface, reduce velocity, and promote infiltration. Storm drain outlet BMPs also offer a last line of protection against sediment entering environmentally sensitive areas.

All stormwater outfalls that may discharge sediment-laden stormwater flow from the construction site must be protected using the BMPs depicted on the approved plan set and in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

Possible temporary control measures that may be used include hay bale & silt fence protection, compost filter socks or fiber rolls.

Describe controls, including design specifications and details, which will be implemented to protect outlets discharging stormwater from the project during the entire duration of the project.

- As depicted on the Plans, both temporary (baled hay, silt fence) and permanent (riprap outlet protection, deep-sump catch basins, stone check dam forebays) controls will be employed to protect the outfalls discharging to the Flagg Road Infiltration Basin.

2.11 Establish Perimeter Controls and Sediment Barriers

Perimeter controls shall be installed, and maintained, as depicted on the approved plan set and in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

If the Baled Hay &/or Silt Fence erosion checks fail to contain the sediment on-site, then alternative control measures may be substituted with approval of the site owner. Such measures may include (but are not limited to) compost filter socks or straw wattles (fiber rolls).

Describe structural practices (i.e., silt fences or fiber rolls) including design specifications and details to filter and trap sediment before it leaves the construction site.(IV.E.2.a.ii)

- A perimeter of baled hay (R.I. Standard 9.1.0) will be installed and maintained at the applicable perimeter locations where sheet and shallow concentrated runoff has the potential to cause erosion or sedimentation. These locations include the top of slope around the Flagg Road Infiltration Basin, the match line to the Plains Road Parking Lot, the northwesterly limits of work (along the Flagg Road Extension grassed swale), and the area immediately down-gradient from the Plains Road entrance to the lot.

2.12 Retain Sediment On-Site and Control Dewatering Practices

Sediment traps, basins, and barriers are used to retain sediment on the site to protect streams, lakes, drainage systems, and adjacent property. These devices are used at the outlets of channels, diversions, and other runoff conveyance measures to allow sediment-filled water to pool and sediment to settle. These measures are often used as the last line of defense to stop sediment from leaving the site.

A sediment trap or basin shall be installed, and maintained, as depicted on the approved plan set and in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

The dewatering of non-contaminated non-stormwater (i.e. groundwater) or accumulated precipitation discharge of sediment-laden water into storm drains, streams, lakes or wetlands prior to sediment removal is prohibited. A sediment trap or basin shall be installed, and maintained, as depicted on the approved plan set and in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

The dewatering of contaminated non-stormwater cannot be discharged without obtaining a Rhode Island Department of Environmental Management RIPDES discharge permit to do so. If dewatering of contaminated water is anticipated at the site, appropriate permits must be obtained in advance.

Describe sediment control practices (i.e., sediment trap or sediment basin), including design specifications and details (volume, dimensions, outlet structure) that will be implemented at the construction site to retain sediments on-site. Describe dewatering practices that will be implemented if water must be removed from an area so that construction activity can continue. (IV.E.2.a.ii)

- Given the estimated depth of the seasonal high groundwater table in the area of excavations for the permeable pavement system (> 10 feet below ground level), no dewatering is anticipated for the project. The areas and systems discharging to the infiltration basin are provided with deep sump catch basins, oil-water-debris separators, and stone check dam sediment forebays, pretreatment practices which will protect the infiltration system proper from sedimentation.

2.13 Additional BMPs

Describe additional BMPs that may not fit into the above categories.

- N/A

2.14 Construction Site Erosion and Sediment Control BMPs

Complete the following table for each location where Erosion and Sediment Control BMPs will be utilized. This table is to be used as part of the SWPPP Inspection Report – please fill out accordingly.(IV.E.2.a)

It is expected that this table will be amended as needed throughout the construction project.

Location/Station	BMP Description/ Reference	Maintenance Requirement	Phase
Perimeter Controls	**[R.I. Std. 9.1.0] Straw/Hay Bales. Chapter Five, Section F – Perimeter Sediment Barriers (ST), RI Soil Erosion and Sediment Control Handbook.**	**Page 5-12** Inspection should be made after each storm event and repair or replacement should be made promptly as needed. **Page 5-12** Cleanout of accumulated sediment behind the bales is necessary if ½ of the original height of the bales becomes filled in with sediment.	All
Outlets to Infiltration Basin and Culvert Inlet	**[R.I. Stds. 9.2.0, 9.3.0, & 9.4.0] Check Dams and Silt Curtains. Chapter Five, Sections G & H – Check Dams (CD) & Silt Curtains (SI), RI Soil Erosion and Sediment Control Handbook.**	**Page 5-18** Sediment should be removed from behind the check dams when it has accumulated to ½ of the original height of the dam. Temporary check dams shall be maintained in proper working condition by the contractor as long as the structure is in place. Maintenance of permanent stone check dams and is the responsibility of the contractor until construction is completed or until maintenance responsibility is accepted by the owner.	All

Catch Basins (20 + 7)	**[R.I. Std. 9.1.0] Erosion Control Mats. Chapter Five, Section I – Storm Drain Protection (SD), RI Soil Erosion and Sediment Control Handbook.**	**Page 5-25** Sediment shall be removed and the trap restored to its original dimensions when sediment has accumulated to ½ the design depth of the trap. Removed sediment shall be deposited in a suitable area and in such an area that it will not erode.	All

SECTION 3: GOOD HOUSEKEEPING BMPS

RIPDES Construction General Permit – Section IV.E.2.c

The purpose of good housekeeping is to prevent daily construction activities from causing pollution.

This section describes the key good housekeeping and pollution prevention measures that will be implemented to control pollutants in stormwater. Example BMPs include the proper management of waste, material handling and storage, and equipment/vehicle fueling/washing/maintenance operations.

Where applicable, include RI Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended) specifications.

3.1 Off-site Tracking of Sediments

Each site shall have graveled access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads. IV.E.2.c.i

Any construction site access point must employ the BMPs depicted on the approved plan set and in accordance with the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended). Construction entrances shall be used in conjunction with the stabilization of construction roads to reduce the amount of mud picked up by construction vehicles. All construction access roads shall be constructed prior to any roadway accepting construction traffic.

If a Construction Entrance BMP is not designated on the plans, it is still the responsibility of the Operator to ensure that no sediment is tracked off of the construction site by any vehicles leaving the site. Additional control measures that may be used, upon approval of the site owner, include a vehicle washing station and/or daily street sweeping.

The Operator shall remain responsible for the clean-up of any mud or dirt that is tracked onto streets or paved areas, even with the installation of gravel construction entrances. Inspect access for excessive sediment build up. Remove sediment and rebuild the exit as necessary to retain effectiveness and prevent off-site tracking. Additional street cleaning may be required if unable to retain sediment on site.

Describe location(s) of vehicle entrance(s) and exit(s), procedures to remove accumulated sediment off-site (i.e., vehicle tracking), and stabilization practices (i.e., stone pads and/or wash racks) to minimize off-site vehicle tracking of sediments and discharges to stormwater.

- Constructions access to/from the site will be by way of Plains Road (via the Plains Road Parking Lot entrance) and by the Flagg Road Extension entrance (at the northerly end of the Flagg Road Infiltration Basin). R.I. Standard 9.9.) crushed stone construction accesses will be established at each access location to minimize the tracking of sediments to and from the site.

3.2 Waste Disposal

Building materials and other construction site wastes must be properly managed and disposed of to prevent the discharge of solid materials from wind and precipitation. All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations. IV.E.2.c.ii

- A waste collection area shall be designated on the site that does not receive a substantial amount of runoff from upland areas and does not drain directly to a waterbody or storm drain.

- All waste containers shall be covered to avoid contact with wind and precipitation.
- Waste collection shall be scheduled frequently enough to prevent containers from overfilling.
- All construction site wastes shall be collected, removed, and disposed of in accordance with applicable regulatory requirements and only at authorized disposal sites.
- Equipment and containers shall be checked for leaks, corrosion, support or foundation failure, or other signs of deterioration. Those that are found to be defective shall be immediately repaired or replaced.

Describe measures (i.e., trash disposal, sanitary wastes, recycling, and proper material handling) to prevent the discharge of solid materials. All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations.

- It shall be the responsibility of the contractor to remove and dispose all waste materials (e.g., excavated borrow) from the site in accordance with all applicable local, state, and federal regulations. No stockpiling of waste materials will be permitted on the construction site.

3.3 Spill Prevention and Control Plan

Spills and leaks shall be avoided through frequent inspection of equipment and material storage areas. Heavy equipment and other vehicles shall be routinely inspected for leaks and repaired as necessary. Material storage areas shall be routinely inspected for leaky containers, open containers, or improper storage techniques that may lead to spills or leaks. Appropriate cleanup procedures and supplies shall be available on-site and should be clearly marked so that all personnel can locate and access these supplies quickly. IV.E.2.c.iii

Spills shall be cleaned up immediately and following proper response procedures and in accordance with any applicable regulatory requirements. At no time shall spills be cleaned and flushed down storm drains or in to any environmentally sensitive area (i.e. stream, pond, wetland).

Equipment/vehicle fueling and repair/maintenance operations or hazardous material storage shall not take place within regulated wetlands or buffer zone areas. Designated areas shall be approved by the site owner.

Describe all areas where potential spills can occur, and their accompanying drainage points, and describe the spill prevention and control plan to reduce the chance of spills, stop the source of spills, contain and clean up spills, dispose of materials contaminated by spills, and train personnel responsible for spill prevention and control.

- For hazardous materials, any product shall be used or disposed in accordance with the manufacturer's recommendations.
- On site construction vehicles shall be inspected for oil and fuel leaks daily and provided regular preventive maintenance. Any discharge petroleum product shall be cleaned immediately. No petroleum products shall be discharged to any storm drains. Logs should be also provided for this activity.

3.4 Control of Allowable Non-Stormwater Discharges

For the allowable non-stormwater discharge(s) associated with construction activity identified in Section 1.6, describe controls and measures that will be implemented at those sites to minimize pollutant contamination. IV.E.2.c.iv

For contaminated non-stormwater discharge(s), the requirements and regulations of the associated RIPDES individual permit or RIPDES Remediation General Permit must be adhered to at all times.

- Water for dust control is the only anticipated/foreseen non-stormwater discharge associated with the construction project. This does not represent a significant contamination risk, and the erosion and sedimentation controls for stormwater (described in preceding subsections) will also suffice in containing any potential migration of sediments potentially associated with dust control operations.

3.5 Establish Proper Building Material Staging Areas

Stock pile management consists of procedures and practices designed to minimize or eliminate the discharge of stockpiled material (soil, topsoil, base material, rubble) from entering drainage systems or water courses.

Stockpiles of any material shall not be located within regulated wetlands or buffer zone areas. They shall have side slopes no greater than 30% and stockpiles of erodible material shall be seeded and ringed with berms, dikes, fiber rolls, compost socks, sandbag, gravel bags or any other equivalent perimeter control specified in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

If soil stockpiles are not stabilized with vegetation, then they must be securely covered at the end of each workday.

All chemicals and/or hazardous waste material must be stored properly and legally in covered areas, with containment systems constructed in or around the storage areas. Areas must be designated for materials delivery and storage. Designated areas shall be approved by the site owner.

Describe construction materials expected to be stored on-site and procedures for storage of materials to minimize exposure of the materials to stormwater. IV.E.2.c.v

- Construction equipment and maintenance materials will be stored at designated areas. The respective perimeters of these areas will be enclosed by those erosion control measures already included in the contract. Additionally, a watertight shipping container shall be used to store hand tools, small parts and other construction equipment. Storage areas will be inspected weekly and after storm events.

3.6 Designate Washout Areas

Concrete mixer trucks and chutes will be washed in a designated area or concrete wastes will be properly disposed of off-site. Washout areas for concrete, shall be designated on the Approved Plans, or approved of by the site owner. Any concrete washout area shall not be within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system.

Temporary concrete washout areas must be constructed and maintained to contain all water and concrete waste generated by washout operations. A sign should be placed at the washout site to inform concrete equipment operators of the facility location. Facilities must be cleaned or replaced when they reach 75% capacity.

At no time shall any material (concrete, paint, chemicals) be washed into storm drains, open ditches, streets, streams, wetlands, or any environmentally sensitive area. The site operator must ensure that construction waste is properly disposed of, to avoid exposure to precipitation, at the end of each working day.

Describe location(s) and controls to minimize the potential for stormwater pollution from washout areas for concrete mixers. IV.E.2.c.v

- No concrete, asphalt, paints, detergents, or other materials shall be discharged on site. If concrete trucks are to discharge surplus concrete or drum wash water on site, the Contractor shall be required to submit a plan to URI for approval (indicating the location of the wash-out areas, method of containment and disposal) and this plan shall be incorporated into the SWPPP as a modification. No release to nearby surface waters will be allowed.

3.7 Establish Proper Equipment/Vehicle Fueling and Maintenance Practices

Vehicle fueling shall not take place within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Designated areas shall be depicted on the Approved Plans, or shall be approved by the site owner.

Vehicle maintenance and washing shall occur off-site, or in designated areas depicted on the Approved Plans or approved of by the site owner. Maintenance or washing areas shall not be within regulated wetlands or buffer zone areas, or within 50-feet of the storm drain system. Maintenance areas shall be clearly designated, and berms, sandbags, or other barriers shall be used around the perimeter of the maintenance area to prevent stormwater contamination.

Construction vehicles shall be inspected frequently for leaks. Repairs shall take place immediately. Disposal of all used oil, antifreeze, solvents and other automotive-related chemicals shall be according to applicable regulations; at no time shall any material be washed down the storm drain or in to any environmentally sensitive area.

Describe equipment/vehicle fueling and maintenance practices that will be implemented to control pollutants to stormwater (e.g., secondary containment, drip pans, spill kits, etc.) IV.E.2.c.v

- Several types of vehicles and equipment will be used on-site throughout the project, including excavators, paving equipment, rollers, trucks and backhoes. All major equipment/vehicle maintenance shall be performed off-site. When vehicle fueling must occur on-site, the fueling activity shall occur in the storage equipment area. Only minor equipment maintenance shall occur on-site. All equipment fluids generated from maintenance activities will be disposed of into designated drums stored on spill pallets in accordance with Section 3, Part 3.1. Absorbent, spill-clean-up materials and spill kits shall be available at the combined equipment and materials storage area. Drip pans will be placed under all equipment receiving maintenance and vehicles and equipment parked overnight.

3.8 Dust Control

Dust control procedures and practices shall be used to suppress dust on a construction site during the construction process, as applicable. Precipitation, temperature, humidity, wind velocity and direction will determine amount and frequency of applications. However, the best method of controlling dust is to prevent dust production. This can best be accomplished by limiting the amount of bare soil exposed at one time. Dust Control measures outlined in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended) shall be followed.

Other techniques for controlling dust may be utilized upon approval by the site owner. Other Dust Control methods include surface roughening, wind barriers, walls, and covers.

Describe dust control practices that will be implemented to control pollutants to stormwater. IV.E.2.c.v

- INSERT TEXT

3.9 Sweeping

Sweeping of streets, roads, highways and parking lots that have accumulated significant amounts of pollutants (construction site sediment, trash, debris) shall be done as necessary, or as directed by the site owner. When construction exits are not keeping construction site sediment from the roadway, sweeping shall be done on a daily basis. Disposal of collected sweeping material shall be done in a manner consistent with State Law and/or regulations.

Describe sweeping practices and schedule that will be implemented to control pollutants to stormwater. IV.E.2.c.v

- When and if required, the procedures outlined in Section 907 (Dust Control) of the R.I. Department of Transportation *Standard Specifications for Road and Bridge Construction* will be fully implemented.
- When required, the procedures outlined in Section 931 (Cleaning and Sweeping Pavement) of the R.I. Department of Transportation *Standard Specifications for Road and Bridge Construction* will be implemented.

3.10 Additional BMPs

Describe any additional BMPs that don't fit into the above categories. Indicate the problem they are intended to address.

- The anticipated BMPs required for this project have been listed above. The need for additional BMPs is not anticipated.

3.11 Construction Site Good Housekeeping BMPs

Complete the following table for each location where Good Housekeeping BMPs will be utilized. This table is to be used as part of the SWPPP Inspection Report – please fill out accordingly.(IV.E.2.c.v)

It is expected that this table will be amended as needed throughout the construction project.

Location/Station	BMP Description/ Reference	Maintenance Requirement	Phase
Construction Site Entrance/Exit	**Stone Stabilization Pad. Chapter Five, Section D – Construction Entrances, RI Soil Erosion and Sediment Control Handbook.**	**Page 5-9** The entrance shall be maintained in a condition which will prevent tracking or flowing of sediment onto public right-of-ways. This will require periodic top dressing with additional stone or additional length as conditions demand and repair and/or cleanout of any measures used to trap sediment. All sediment spilled, dropped, washed or tracked onto public right-of-ways must be removed immediately.	All
Adjacent Roads	Public roads adjacent to a construction site shall be clean at the end of each day	Street Sweep if construction site sediment is visible	All
Site Wide	Pick up of construction trash and debris	All loose trash and debris must be disposed of properly at the end of each working day	All

SECTION 4: PROTECTION OF POST-CONSTRUCTION BMPs

This section details the measures that will be installed to protect permanent or long term BMPs as they are installed so that they will function properly when they are brought online at the end of the construction phase.

Include any applicable specifications from the Rhode Island Soil Erosion and Sediment Control Handbook (as amended), the RIDEM RI Stormwater Design and Installation Standards Manual (as amended), or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended) including any applicable BMP maintenance requirements.

4.1 Post-Construction BMPs

List and describe all post-construction stormwater management measures that will be installed during the construction process to control pollutants in stormwater discharges after construction operations have been completed.

After identifying all post-construction stormwater management measures, outline how these measures will be protected during the construction phase of the project to ensure that they will function appropriately once they are brought online.

- The project's post-construction stormwater management design employs infiltration (recharge to ground) as the means for treating and releasing runoff from the site. Stormwater will be infiltrated through the permeable pavement system and the Flagg Road Infiltration Basin constructed under the Flagg Road Extension project. As described in the preceding sections addressing sequence of construction and erosion/sedimentation controls, these facilities will be protected throughout the construction process to ensure their proper functioning upon completion of the project. The permeable pavement system has been designed in accordance with the 2010 R.I. Stormwater Design and Installation Standards Manual, and all impervious runoff diverted to the infiltration basin will receive adequate pre-treatment (deep-sump catch basins, sediment forebays). As required, a long-term operation and maintenance (O&M) plan has been prepared for the Flagg Road Parking Lot facility and has been submitted to the RIDEM UIC program.

SECTION 5: MAINTENANCE and INSPECTIONS

RIPDES Construction General Permit – Section IV.E.2.d

5.1 Maintenance

Maintenance procedures for erosion and sedimentation controls and stormwater management structures/facilities are described on the plans and in the Rhode Island Soil Erosion and Sediment Control Handbook.

Construction shall not commence or continue until all specified erosion and pollution controls are in place and properly installed.

Erosion and pollution controls shall be maintained by the site operator to the satisfaction of the site owner. Erosion and pollution controls must be able to prevent, under normal weather conditions, both the movement of soil materials and the intrusion of sediment-laden discharges into environmentally sensitive areas.

Erosion and pollution controls will be cleaned when directed by the site operator; after a rainstorm; and/or whenever maintenance is required for any BMP as specified in the Rhode Island Soil Erosion and Sediment Control Handbook (as amended) or the RI Department of Transportation Standard Specifications for Road and Bridge Construction (as amended).

Erosion control structures shall remain in place until all disturbed earth has been securely stabilized and accepted by the site owner. Before final removal, all accumulated sediment on the upstream side shall be removed and legally disposed of. After removal of structures, disturbed areas shall be regraded and stabilized as necessary.

Note: It is recommended that the site operator designates a full-time, on-site contact person responsible for working with the site owner to resolve SWPPP-related issues.

5.2 Inspections

RIPDES Construction General Permit – Section II.B & Section II.D

Minimum Monitoring and Reporting Requirements

All stormwater control measures, disturbed areas, areas used for the storage of materials that are exposed to precipitation (including unstabilized soil stockpiles), discharge locations, and locations where vehicles enter or exit the site must be inspected at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event which generates at least 0.25-inches of precipitation per twenty four (24) hour period and/or after a significant amount of runoff or snowmelt. An appropriate rain gauge is identified in Section 2.4 of this SWPPP.

General Notes

- A separate inspection report will be prepared for each inspection.
- The Inspection Reference Number shall be a combination of the RIPDES Construction General Permit No - consecutively numbered inspections.
  ex/ Inspection reference number for the **4**th inspection of a project would be:
  RIR100###-**4**

- Each report will be signed and dated by the Inspector and must be kept onsite as required by Part II.D of the RIPDES Construction General Permit.
- Each report will be signed and dated by the Site Operator and returned to the Inspector within 24 hours of receipt.
- It is the responsibility of the site operator to maintain a copy of the SWPPP, copies of all completed inspection reports, and amendments as part of the SWPPP documentation at the site during construction.

5.3 Corrective Actions

RIPDES Construction General Permit – Section II.C

If, in the opinion of the designated site inspector, corrective action is required, the inspector shall note it on the inspection report and shall inform the site operator that corrective action is necessary. The site operator must make all necessary repairs whenever maintenance of the erosion and pollution controls is required.

In accordance with the RIPDES Construction General Permit and the SWPPP, non-compliance issues shall be addressed no later than seven (7) calendar days from the date of inspection.

In accordance with the SWPPP the site operator shall commence with the requisite cleaning and maintenance measures no later than the next consecutive calendar day after receiving notification from the designated site inspector, and shall aggressively and expeditiously perform such cleaning and maintenance work until the original problem is remedied.

The corrective action log contained in each inspection report must be completed, signed, and dated by the site operator once all necessary repairs have been completed.

SECTION 6: Amendments

RIPDES Construction General Permit – Section IV.D

This SWPPP is intended to be a working document. It is expected that amendments will be required throughout the active construction phase of the project. **Even if practices are installed on a site according to the approved plan, the site is only in compliance when erosion and sedimentation are effectively controlled throughout the entire site for the entire duration of the project.**

The SWPPP shall be amended whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SWPPP proves to be ineffective in achieving its objectives (i.e. the selected BMPs are not effective in controlling erosion or sedimentation).

All revisions must be recorded in the Record of Amendments Log Sheet which is contained in Appendix G of this SWPPP, and dated red-line drawings and/or a detailed written description must be appended to the SWPPP. Inspection Forms must be revised to reflect all amendments. Update the Revision Date and the Version # in the footer of the Report to reflect amendments made.

All SWPPP Amendments, except minor non-technical revisions, must be approved by the site owner and operator.

Attach a copy of the Amendment log

- REFERENCE APPENDIX G

SECTION 7: Recordkeeping

RIPDES Construction General Permit – Section II.A & Section II.D

It is the site owner and site operator's responsibility to have the following documents available at the construction site and immediately available for RIDEM review upon request:

- A copy of the fully signed and dated SWPPP, which includes:
  - A copy of the General Location Map
    INCLUDED AS APPENDIX A
  - A copy of all SWPPP Site Maps
    INCLUDED AS APPENDIX B
  - A copy of the RIPDES Construction General Permit
    INCLUDED AS APPENDIX C
  - A copy of any regulatory permits (RIDEM Freshwater Wetlands Permit, CRMC, RIDEM Water Quality, etc)
    INCLUDED AS APPENDIX D
  - The signed and certified NOI form or permit application form
    INCLUDED AS APPENDIX E
  - Completed Inspection Reports w/Completed Corrective Action Logs
    INCLUDED AS APPENDIX F
  - SWPPP Amendment Log
    INCLUDED AS APPENDIX G

SECTION 8: Party Certifications

RIPDES Construction General Permit – Section V.G

All parties working at the project site are required to comply with the Stormwater Pollution Prevention Plan (SWPPP) for any work that is performed on-site. The site owner, site operator, contractors and sub-contractors are encouraged to advise all employees working on this project of the requirements of the SWPPP. A copy of the SWPPP is available for your review at the following location: _____, or may be obtained by contacting the site owner or site operator.

The site owner and site operator and each subcontractor engaged in activities at the construction site that could impact stormwater must be identified and sign the following certification statement.

I acknowledge that I have read and understand the terms and conditions of the SWPPP for the above designated project and agree to follow the BMPs and practices described in the SWPPP.

Site Owner:
Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

Site Operator:
Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

Designated Site Inspector:
Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

SubContractor SWPPP Contact:
Insert Company or Organization Name
Insert Name & Title
Insert Address
Insert City, State, Zip Code
Insert Telephone Number, Insert Fax/Email

_____
signature/date

Insert more contact/signature lines as necessary

APPENDICES

Appendix A - General Location Map

Appendix B - SWPPP Site Maps

Appendix C - Copy of RIPDES Construction General Permit

Appendix D - Copy of Regulatory Permits

Appendix E - Copy of RIPDES NOI

Appendix F - Inspection Reports and Corrective Action Log

Appendix G - Amendment Log

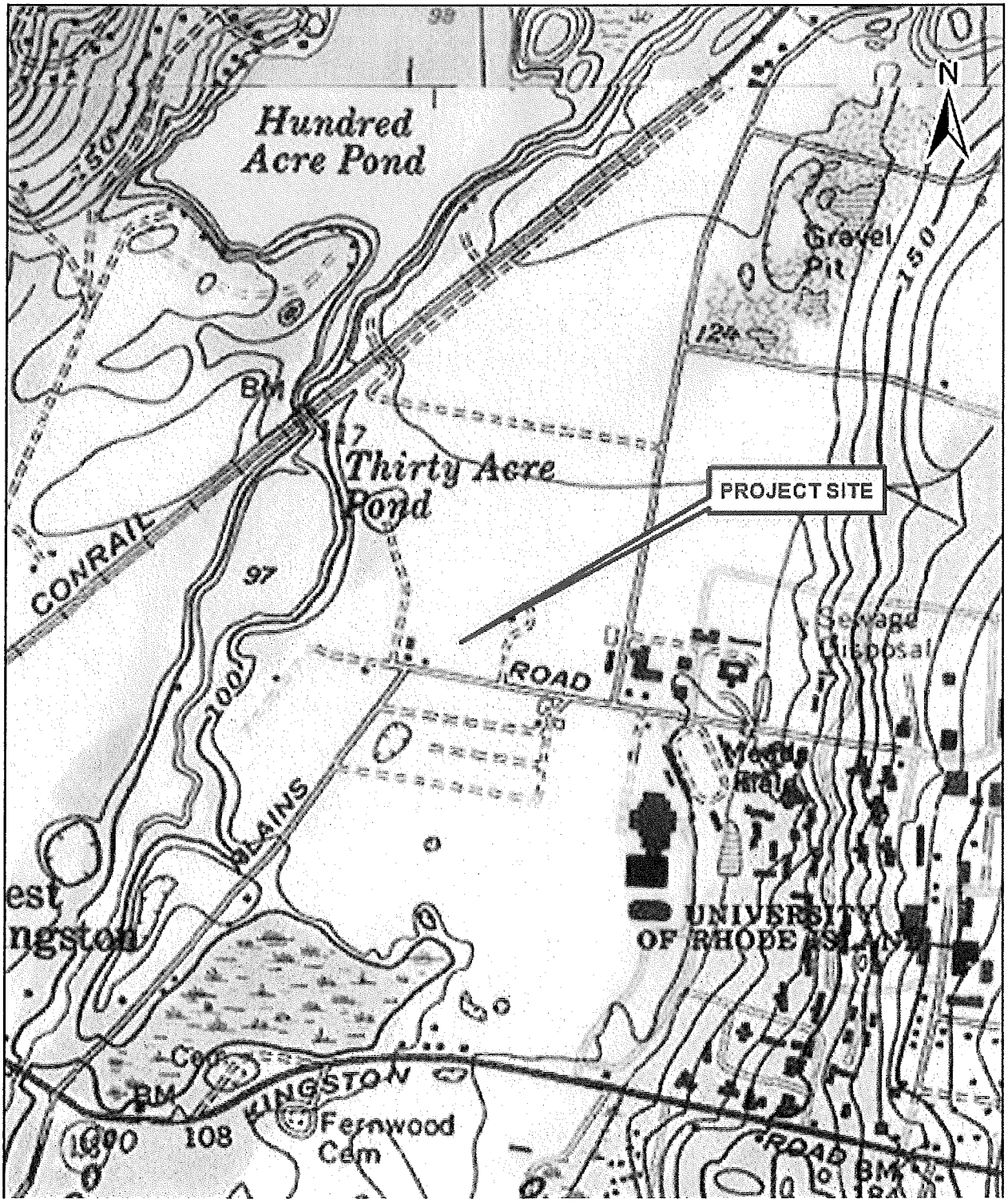
Appendix A

General Location Map

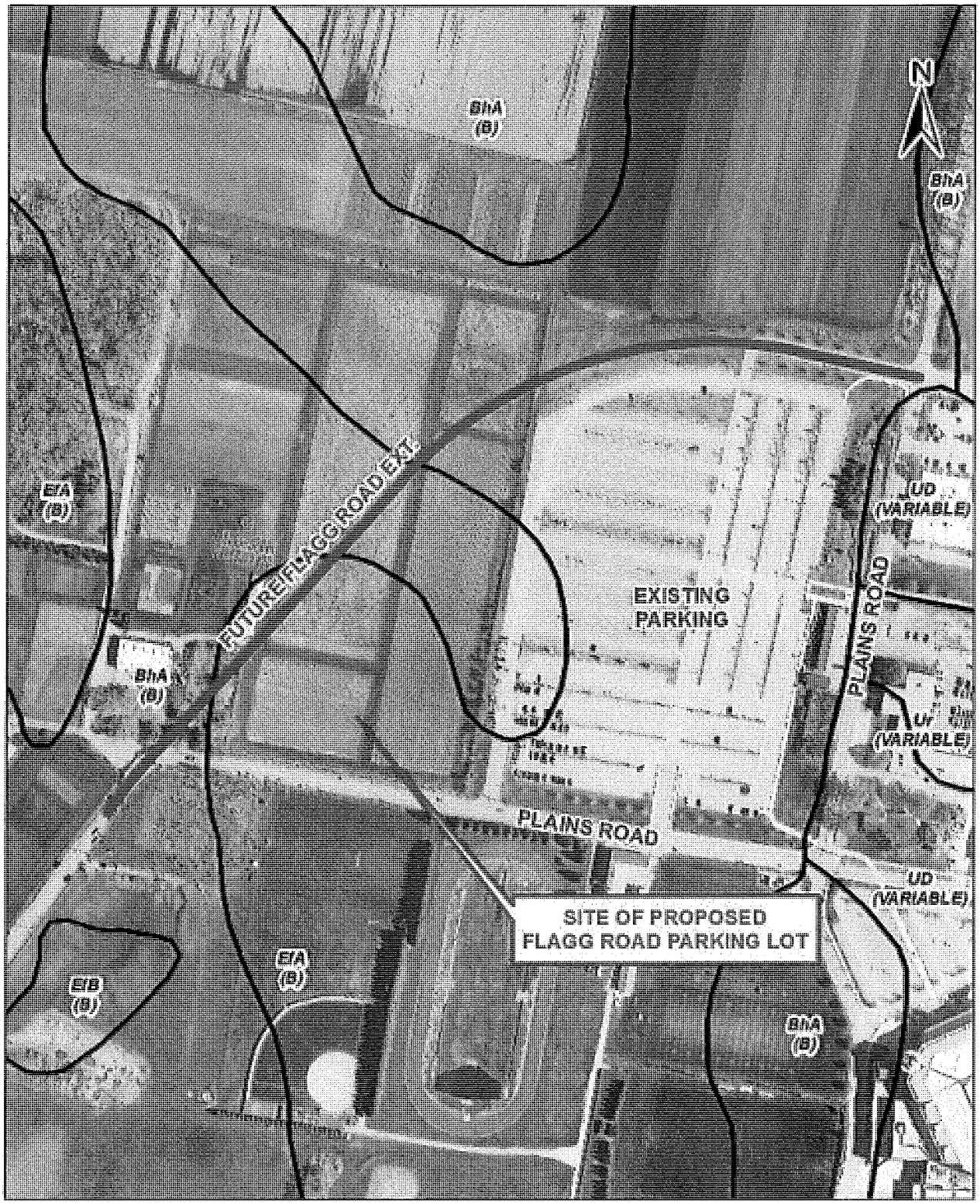
Construction Site Stormwater Pollution Prevention Plan
FLAGG ROAD PARKING LOT

Project Street/Location:

- The development site is located in a predominantly open, agricultural area in the northwest corner of the URI Kingston Campus, bounded southerly by Plains Road, easterly by the existing Plains Road Parking Lot, and northwesterly by the future Flagg Road Extension (Freshwater Wetlands Insignificant Alteration Permit No. 10-0243). See location maps below (not to scale).



Construction Site Stormwater Pollution Prevention Plan
FLAGG ROAD PARKING LOT

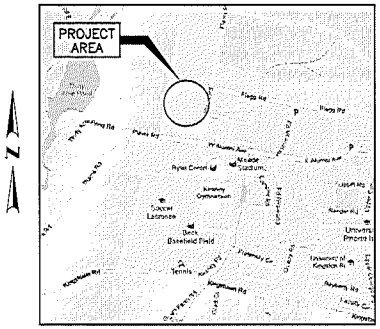


Appendix B

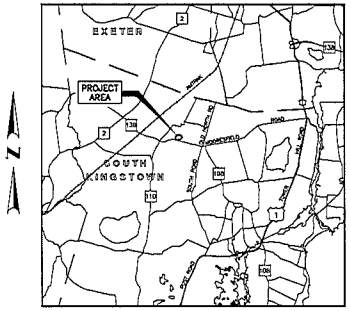
SWPPP Site Maps

UNIVERSITY OF RHODE ISLAND
Office of Capital Projects

PLANS AND DETAILS OF PROPOSED
FLAGG ROAD PARKING LOT
KINGSTON, RHODE ISLAND



LOCATION MAP
NOT TO SCALE



LOCATION MAP
SCALE: 1" = 2 Miles

UNIVERSITY OF
Rhode Island

INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES & LEGEND
3	EXISTING CONDITIONS PLAN
4	GENERAL PLAN
5	DRAINAGE & GRADING PLAN
6	LOCATION PLAN
7 - 11	DETAILS 1 - 5
12	LANDSCAPE PLAN
13 - 15	ELECTRICAL PLANS

MARCH 2012

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

Gordon R. Archibald, Inc.
Civil and Environmental Engineers

Number of Sheet 1
Total Sheets 15

LEGEND

- (2.3.0) (DIA.) PRECAST CONCRETE FLARED END SECTION
- (4.4.0) (DIA.) PRECAST 4'-0", 5'-0", OR 6'-0" ROUND CATCH BASIN
- (4.7.2) ALTERNATE TOP COVER FOR ROUND PRECAST MANHOLES AND CATCH BASINS
- (5.3.0) CATCH BASIN AND MANHOLE STEP
- (5.2.1) HEAVY-DUTY ROUND FRAME AND COVER
- (6.3.2) SQUARE FRAME AND GRATE (BICYCLE SAFE)
- (7.1.0) PRECAST CONCRETE CURB
- (7.1.2) 6'-0" PRECAST CONCRETE TRANSITION CURB
- (8.1.0) SEED DITCH
- (8.3.0) RIP-RAP DITCH
- (8.4.0) PAVED WATERWAY
- (9.1.0) BALED HAY EROSION CHECK
- (9.2.0) SILT FENCE DETAIL
- (9.3.0) BALED HAY DITCH EROSION CHECK AND SILT FENCE COMBINED
- (9.4.0) BALED HAY DITCH AND SWALE EROSION CHECK
- (9.8.0) BALED HAY CATCH BASIN INLET PROTECTION
- (9.9.0) CONSTRUCTION ACCESS
- (20.1.0) PAVEMENT MARKINGS - ARROWS AND ONLY
- (24.2.0) SIGN POST SELECTION AND INSTALLATION DETAILS U-CHANNEL POST
- (26.1.0) FLUORESCENT TRAFFIC CONE
- (26.2.0) POLYETHYLENE DRUM WITH MARKINGS
- (26.3.0) PVC PLASTIC PIPE TYPE III BARRICADE
- (27.1.1) TRAFFIC FINES IN WORK ZONE REGULATORY SIGN
- (29.1.0) CONSTRUCTION SIGNS
- (43.3.0) WHEELCHAIR RAMP
- (47.1.1) TRANSVERSE PAVEMENT CUT AND MATCH
- (48.1.0) DETECTABLE WARNING SYSTEM
- (50.1.0) LARGE TREE STAKING AND PLANTING DETAIL (2" CALIPER AND GREATER)
- (50.1.1) TREE PLANTING ON SLOPE
- (50.2.0) EVERGREEN TREE PLANTING DETAIL (4'-0" HIGH AND GREATER)
- (50.3.0) BALL AND BURLAP SHRUB PLANTING DETAIL
- (50.3.1) CONTAINER GROWN SHRUB PLANTING DETAIL
- (CC) CLEARING AND GRUBBING
- (LOD) LIMIT OF DISTURBANCE
- (LS) 4" LOAM AND SEED
- (PWW) PAVED WATERWAY
- (RDC) REMOVE AND DISPOSE CURB
- (RDF) REMOVE AND DISPOSE FENCE
- (RDL) REMOVE AND DISPOSE LITE POLE
- (RDP) REMOVE AND DISPOSE PAVEMENT
- (RDS) REMOVE AND DISPOSE SHRUBS
- (RDT) REMOVE AND DISPOSE TREE
- (4DY) 4" EPOXY RESIN PAVEMENT MARKINGS - DOUBLE YELLOW
- (6W) 6" EPOXY RESIN PAVEMENT MARKINGS - WHITE
- (12W) 12" EPOXY RESIN PAVEMENT MARKINGS - WHITE
- (A) BEEHIVE GRATE AND BASIN
- (C) RI. STD. 4.4.0, 5.3.0, & 6.3.2 WITH 4' SUMP

SIGN LOCATION NUMBER
SIGN NUMBER (SIZE)
SIGN MOUNTING (RI. STD. NO.)
(#) STREET SIGN LOCATION NUMBER

TYPICAL SIGN DESIGNATION SYMBOL

- EDGE OF PROPOSED PAVEMENT
- PROPOSED CURB
- PROPOSED FENCE
- SAWCUT AND MATCH EXISTING PAVEMENT
- ELEV. PROPOSED CONTOUR LINE
- ELEV. PROPOSED FINISHED GRADE ELEVATION
- ELEV. TC PROPOSED TOP OF CURB ELEVATION
- ELEV. TB PROPOSED TOP OF BERM ELEVATION
- ELEV. EXISTING CONTOUR LINE
- ELEV. EXISTING SPOT GRADE
- TP-1 EXISTING TEST PIT

GENERAL NOTES

1. REFERENCE IS MADE TO THE RIDOT 2004 EDITION "STANDARD 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. 795-291, 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 CONTRACTORS 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. CONTRACTOR SHALL RECOGNIZE THAT WORK UNDER EXISTING OVERHEAD UTILITIES IS REQUIRED AND THAT MINIMUM CLEARANCE SHALL CONFORM TO UTILITY COMPANY REQUIREMENTS AND SHALL BE MAINTAINED AT ALL TIMES. THIS MAY REQUIRE SPECIAL CONSTRUCTION TECHNIQUES. SHOULD THE CONTRACTOR ELECT TO RELOCATE THE EXISTING OVERHEAD UTILITIES, THEN THE CONTRACTOR SHALL COORDINATE AND BEAR ALL ASSOCIATED COSTS.
4. THE CONTRACTOR SHALL MAINTAIN ALL EXCAVATION IN A DRY CONDITION. NO SEPARATE PAYMENT OR ALLOWANCE SHALL BE MADE FOR DEWATERING.
5. 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.
6. ALL GRASSED AREAS DISTURBED BY THE CONTRACTOR SHALL BE LOAMED AND SEEDED 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 SEEDED.
7. 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.
8. 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.
9. 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.
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, THE SILT FENCING AND HAY BALES SHALL BE REMOVED. PRIOR TO REMOVAL OF THE SILT FENCING AND HAY BALES, ALL ACCUMULATED TRAPPED SEDIMENT 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 AREA FOR CONSTRUCTION MATERIALS SHALL BE LOCATED WITHIN THE LIMIT OF WORK 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 IN 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 BE COVERED WITH PAVEMENT WITHIN THE PROJECT WILL RECEIVE PERMANENT VEGETATION. DISTURBED AREAS WILL BE FINE GRADED AND RECEIVE 4 INCHES OF TOP SOIL.
19. AT LEAST TWO TEST PITS SHALL BE DUG AT EACH UNDERGROUND UTILITY TO DETERMINE LOCATION AND MATERIAL.

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 SEEDED 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 SEEDED 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:

MIXTURE	BY WT.	SEEDING DATE
RED FESCUE	70	APRIL 1 - JUNE 13
KENTUCKY BLUEGRASS	15	AUG. 15 - OCT. 15
COLONIAL BENTGRASS	5	
PERENNIAL RYEGRASS	10	
TOTAL 100 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	85-120	0.5-3.0	3/1-6/15
WEEPING	5-20	0.5-3.0	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. DURING CONSTRUCTION, THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING DRAINAGE AND RUNOFF FLOW DURING STORMS AND PERIODS OF RAINFALL.
13. EROSION CONTROL DEVICES SHOULD INSPECTED WEEKLY AND AFTER RAINFALL EVENTS OF > 1/2" IN A 24-HOUR PERIOD. MAINTENANCE AND REPAIRS SHALL BE COMPLETED WITH 24 HOURS OF THE INSPECTION WHEN NECESSARY.
14. IMMEDIATELY UPON COMPLETION OF THE CLEARING AND GRUBBING OPERATION AND PRIOR TO ANY ROUGH GRADING, TEMPORARY HAY BALES OR SILT FENCES SHALL BE PLACED AS INDICATED ON THE PLANS.
15. ALL EROSION AND SEDIMENTATION CONTROL STRUCTURES SHALL BE PERIODICALLY MAINTAINED AS PER THE RESPECTIVE PROGRAMS DURING THE CONSTRUCTION.

DRAINAGE SYSTEM NOTES

1. PERMEABLE PAVEMENT SHALL BE PRE-BLENDED PERFORMANCE GRADE 75-22 MODIFIED WITH STYRENE BUTADIENE STYRENE (SBS) AND 5 POUNDS OF FIBERS PER TON OF ASPHALT MIX. THE SBS WILL BE SUPPLIED BY AN APPROVED PGAB SUPPLIER HOLDING A QUALITY CONTROL PLAN APPROVED BY THE RIDOT. A BILL OF LADING (BOL) WILL BE DELIVERED WITH EACH TRANSPORT OF PG 75-22 SBS. A COPY OF THE BOL WILL BE FURNISHED TO THE QUALITY ASSURANCE INSPECTOR AT THE PLANT.
2. GRAVEL BORROW AND CRUSHED STONE SHALL MEET THE REQUIREMENT OF THE RIDOT STANDARD SPECIFICATIONS, SECTION M.01.09, TABLE 1, COLUMN I AND II.
3. CHOKER STONE SHALL MEET THE REQUIREMENTS OF AASHTO NO. 57.
4. SAND SHALL MEET THE REQUIREMENTS OF AASHTO M-6, AND SHALL BE POORLY GRADED.

STORMWATER MAINTENANCE NOTES

1. ALL MAINTENANCE (INCLUDING CLEANING) REQUIRED DURING CONSTRUCTION PHASE OF THE PROJECT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL INCLUDE:

   MEASURES NEEDED TO ENSURE THE PROPER OPERATION OF THE STORM WATER RUNOFF (DRAINAGE) AND WATER QUALITY CONTROL SYSTEMS TO INCLUDE INSPECTION, CLEANING AND REPAIRS TO THE INFILTRATION BASIN SYSTEM INCLUDING ALL PIPES, SWALES, INTAKE AND DISCHARGE STRUCTURES, CATCH BASIN SUMPS, AND MANHOLES.

   INSPECTION OF ALL SLOPES, BERMS, AND OTHER CONTROL STRUCTURES FOR STRUCTURAL INTEGRITY/STABILITY AND EVIDENCE OF SOIL EROSION PROCESSES, AND MAINTENANCE OF THESE STRUCTURES IF NECESSARY. INSPECTIONS SHALL BE PERFORMED FOLLOWING ALL RAIN EVENTS OF ½ INCH RAINFALL OR MORE IN A 24-HOUR PERIOD, OR BI-MONTHLY IF NO RAINFALL EVENT OCCURS.
2. UPON COMPLETION OF PROJECT CONSTRUCTION, AND PRIOR TO VACATING THE SITE, THE CONTRACTOR SHALL CONDUCT A FINAL INSPECTION AND CLEANING OF THE DRAINAGE SYSTEM AND ALL ASSOCIATED STRUCTURES.
3. AFTER THE COMPLETION OF THE ENTIRE PROJECT TO THE SATISFACTION OF THE ENGINEER, ALL MAINTENANCE OF THE DRAINAGE SYSTEM SHALL THEN BE THE RESPONSIBILITY OF THE UNIVERSITY OF RHODE ISLAND OR THEIR APPOINTED AGENTS.
4. ELEMENTS ASSOCIATED WITH THE FLAGG ROAD INFILTRATION BASIN SHALL BE INSPECTED, CLEANED AND MAINTAINED (ROUTINE MAINTENANCE) A MINIMUM OF TWO (2) TIMES IN A GIVEN CALENDAR YEAR TO ENSURE THAT ALL SYSTEM ELEMENTS ARE FUNCTIONING PROPERLY AND THAT DESIGN INFILTRATION RATES ARE BEING MET (SYSTEMS COMPLETELY DRAINING BETWEEN STORM EVENTS). THIS INFILTRATION SYSTEM SHALL BE INSPECTED AFTER ALL STORM EVENTS EQUAL TO OR GREATER THAN THE 1-YEAR, 24-HOUR, TYPE III STORM EVENT. FOR WASHINGTON COUNTY, THIS CORRESPONDS TO 2.8 INCHES OF RAIN WITHIN A 24-HOUR PERIOD.
5. CLEANING AND ROUTINE MAINTENANCE OF CATCH BASINS, OUTLETS, FOREBAYS, AND OTHER ELEMENTS ASSOCIATED WITH THE FLAGG ROAD INFILTRATION BASIN SHALL INCLUDE THE REMOVAL OF ALL ACCUMULATED SEDIMENTS (EITHER MANUALLY OR BY VACUUM TRUCK) AND DEBRIS, MAINTENANCE OF OIL-WATER-DEBRIS SEPARATORS, AND OTHER ACTIVITIES AS REQUIRED TO ENSURE THE CONTINUED OPERATIONAL PERFORMANCE OF THE SYSTEM. ANY BARE SPOTS OR ERODED AREAS WITHIN SWALES, FOREBAYS, OR THE BASIN MUST BE REPLANTED AND/OR STABILIZED IMMEDIATELY FOLLOWING OBSERVATIONS TO PREVENT SUBSEQUENT EROSION OR CLOGGING. SHOULD THE INSPECTION OF THE SYSTEM REVEAL ANY EVIDENCE OF SEDIMENT ACCUMULATION WITHIN THE BASIN ITSELF, SEDIMENTS SHALL BE REMOVED AND THE SURFACE LAYER RESTORED TO ITS ORIGINAL DEPTH AND CONDITION.
6. BY ITS NATURE, THE INFILTRATION BASIN HAS AN OPERATIONAL LIFE CYCLE THAT WILL REQUIRE THE DEEP TILLING AND RESEEDING OF THE BASIN FLOOR TO RESTORE THE DESIGN INFILTRATION RATE THROUGH THE SURFACE LAYER (WHICH BECOMES REDUCED OVER TIME DUE TO CLOGGING, BLINDING, AND/OR OTHER FACTORS). THIS TILLING SHOULD BE PERFORMED APPROXIMATELY ONCE EVERY 5-10 YEARS, WHEN INFILTRATION CAPACITY IS DIMINISHED TO THE POINT WHERE STANDING WATER REMAINS IN THE BASIN MORE THAN 72 HOURS FOLLOWING A RAINFALL EVENT. THE TILLING/RESEEDING OPERATION SHALL BE CONDUCTED DURING THE SPRING OR FALL GROWING PERIOD, WITH TILLING ACCOMPLISHED USING A ROTARY TILLER OR DISC HARROW AND THE BASIN FLOOR RESEEDED IMMEDIATELY FOLLOWING TILLING TO PREVENT EROSION.
7. THE ENTIRETY OF POROUS ASPHALT SURFACE OF FLAGG ROAD PARKING LOT PROPER SHALL BE INSPECTED AND CLEANED (SWEPT BY VACUUM TRUCK) ONCE PER CALENDAR QUARTER, AND AT A MINIMUM FOUR (4) TIMES PER CALENDAR YEAR. INSPECTIONS SHALL OCCUR NO EARLIER THAN 24 HOURS FOLLOWING A RAINFALL EVENT AND SHALL INCLUDE TAKING READINGS AT MULTIPLE CLEANOUT MANHOLES AND MEDIAN CATCH BASINS TO ASCERTAIN THAT NO WATER REMAINS IN THE RESERVOIR COURSE (AND THAT THE SYSTEM IS EXFILTRATING PROPERLY. THE POROUS ASPHALT SURFACE SHALL ALSO BE VISUALLY INSPECTED DURING RAINFALL EVENTS (ON AN APPROXIMATELY MONTHLY BASIS) TO ENSURE THAT STORMWATER IS PERCOLATING THROUGH THE SURFACE AND THAT RUNOFF TO GRASSED MEDIANS / OVERFLOW BASINS IS NEGLIGIBLE.
8. THE INTEGRITY OF THE POROUS ASPHALT SURFACE SHALL BE INSPECTED ANNUALLY FOR EVIDENCE OF ANY CRACKING, SPALLING, OR DETERIORATION. SMALL AREAS (LESS THAN 50 SQUARE FEET) REQUIRING PATCHING MAY BE REPAIRED USING CONVENTIONAL BITUMINOUS ASPHALT. ANY LARGER OR MORE SIGNIFICANT REPAIRS TO THE LOT SURFACE OR PERMEABLE PAVEMENT MUST BE APPROVED BY THE DIRECTOR OF THE OFFICE OF CAPITAL PROJECTS PRIOR TO IMPLEMENTATION.
9. THE OWNER SHALL ERECT AND MAINTAIN APPROPRIATE SIGNAGE INDICATING THAT THE PERMEABLE PAVEMENT OF THE FLAGG ROAD PARKING LOT IS NOT TO BE TREATED WITH SAND, SALT OR OTHER DEICING AGENTS TYPICALLY USED FOR WINTER MAINTENANCE OPERATIONS.
10. ALL GRASSED AREAS (SWALES AND INFILTRATION BASIN, MEDIAN ISLANDS, LANDSCAPED PERIMETER AREAS OF THE PARKING LOT) SHALL BE MOWED AT LEAST ONCE PER GROWING SYSTEM, WITH GRASS VEGETATION CUT TO A HEIGHT NO SHORTER THAN FOUR (4) INCHES.
11. THE URI OFFICE OF CAPITAL PROJECTS SHALL BE RESPONSIBLE FOR ALL REPAIRS, REPLACEMENTS, AND OTHER WORK NECESSARY TO MAINTAIN THE PROPER FUNCTIONING OF INFILTRATION SYSTEMS. ANY REQUIRED REPAIR AND/OR REPLACEMENT OF DRAINAGE STRUCTURES OR FACILITIES SHALL BE PERFORMED PROMPTLY TO ENSURE PROPER FUNCTIONING OF THE SYSTEM. IN THE EVENT OF A SIGNIFICANT LOSS IN INFILTRATION CAPACITY (BELOW THE ORIGINAL DESIGN CAPACITY) OF EITHER OR BOTH SYSTEMS (DUE TO CLOGGING, BLINDING, AND/OR OTHER ISSUES), THE PERTINENT SYSTEMS ELEMENTS SHALL BE REPAIRED OR REPLACED SO AS TO RE-ESTABLISH ORIGINAL DESIGN INFILTRATION RATES.
12. ANY INCIDENT OF INADVERTENT OR DELIBERATE DISCHARGE OF WASTE OIL OR OTHER CONTAMINANTS TO EITHER INFILTRATION SYSTEM SHALL BE IMMEDIATELY REPORTED TO THE RIDEM OFFICE OF WATER RESOURCES AT (401) 222-3961. THE RIDEM AFTER-HOURS EMERGENCY TELEPHONE NUMBER IS (401) 222-3070. ANY INCIDENT OF GROUNDWATER CONTAMINATION RESULTING FROM THE IMPROPER DISCHARGE OF CONTAMINANTS TO THE INFILTRATION SYSTEM SHALL BE THE RESPONSIBILITY OF THE OWNER (UNIVERSITY OF RHODE ISLAND).
13. OPERATION AND MAINTENANCE OF THE INFILTRATION SYSTEMS SHALL BE CONDUCTED IN ACCORDANCE WITH THE TERMS AND CONDITIONS SET FORTH IN THE RIDEM UIC PROGRAM PERMIT ISSUED FOR THE CONSTRUCTION OF THE FLAGG ROAD PARKING LOT PROJECT. WRITTEN NOTIFICATION OF ANY CHANGES TO (A) THE PHYSICAL INFRASTRUCTURE OF EITHER SYSTEM OR (B) THIS O&M PLAN SHALL BE PROVIDED TO THE RIDEM UIC PROGRAM.

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
LEGEND & NOTES

NO	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

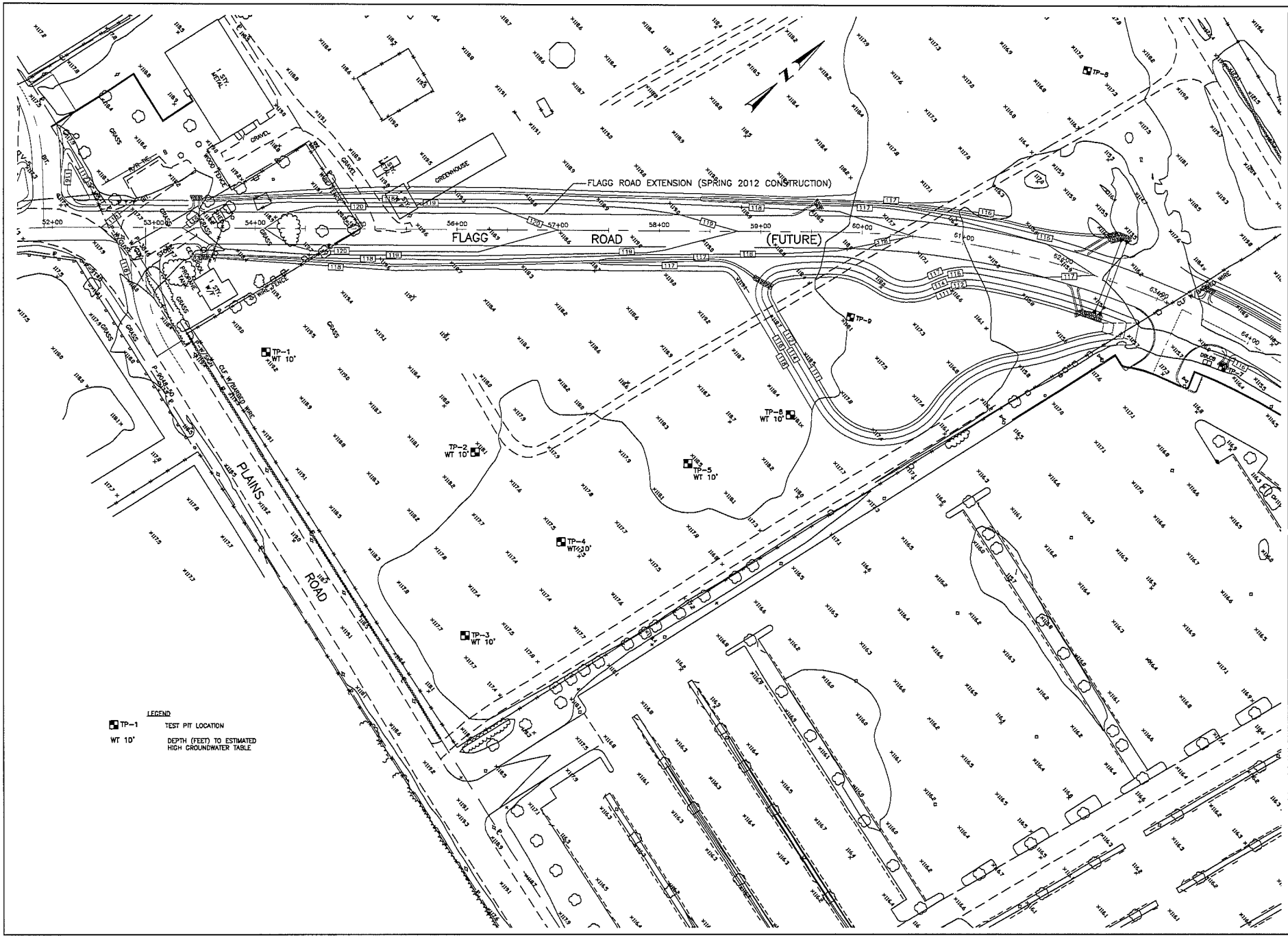
SCALE: NONE

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
2

SHEET 2 OF 15



PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5926
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
EXISTING CONDITIONS PLAN

NO	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

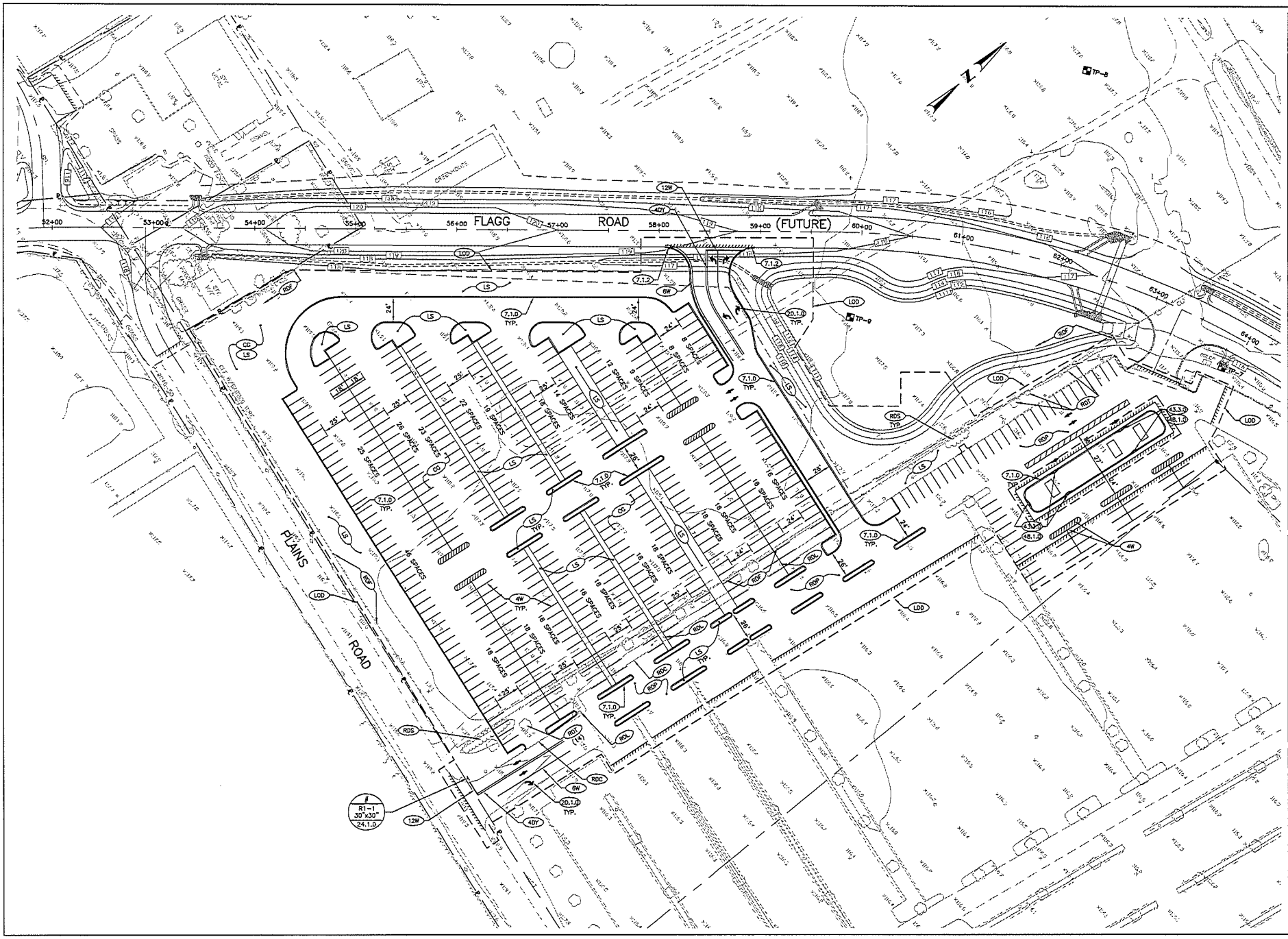
SCALE: 1" = 40'

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
3

SHEET 3 OF 15



PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

GENERAL PLAN

NO	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: 1" = 40'

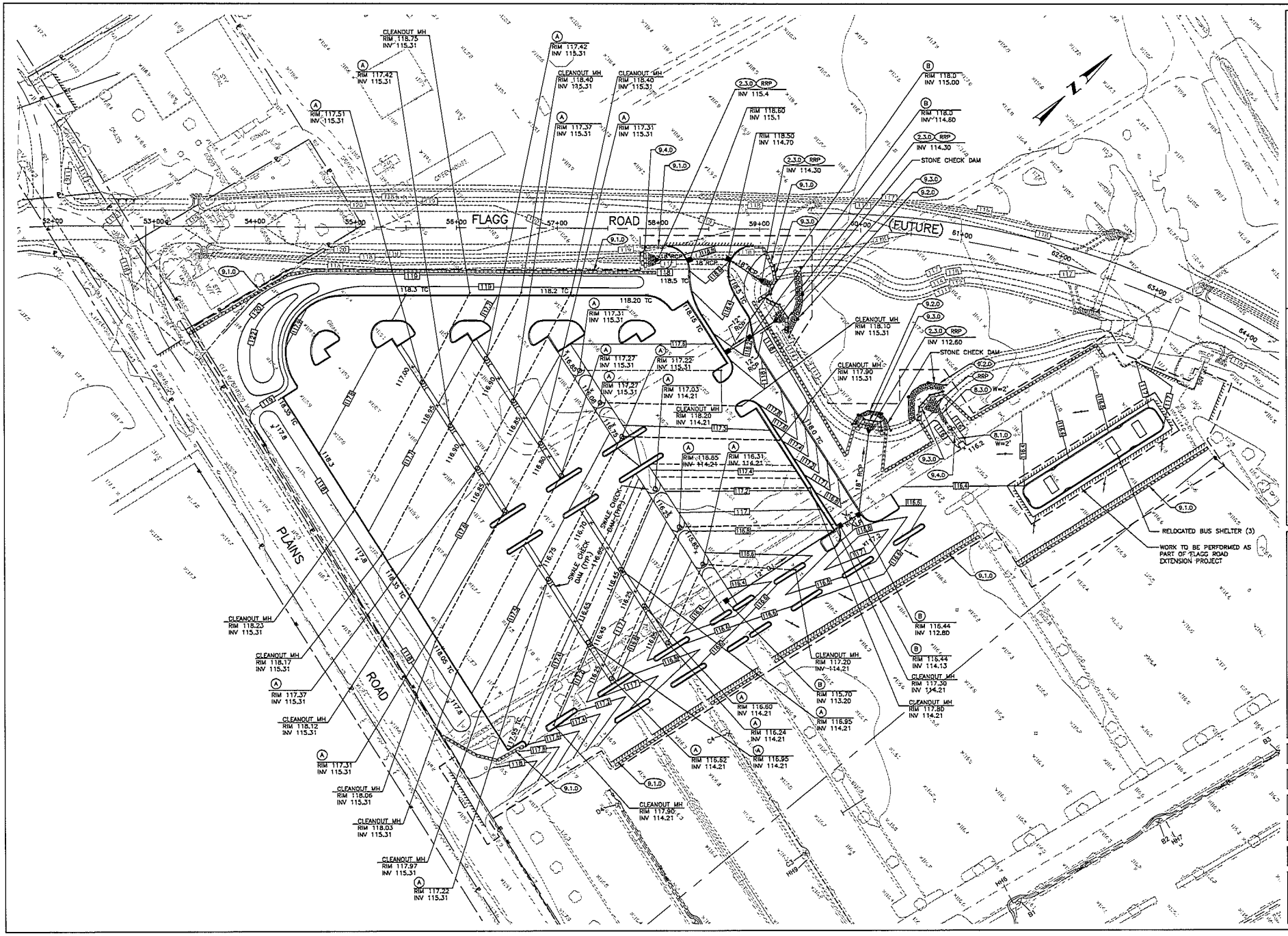
DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER

4

SHEET 4 OF 15



PROJECT

FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT

UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE

DRAINAGE & GRADING PLAN

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

SCALE: 1" = 40'

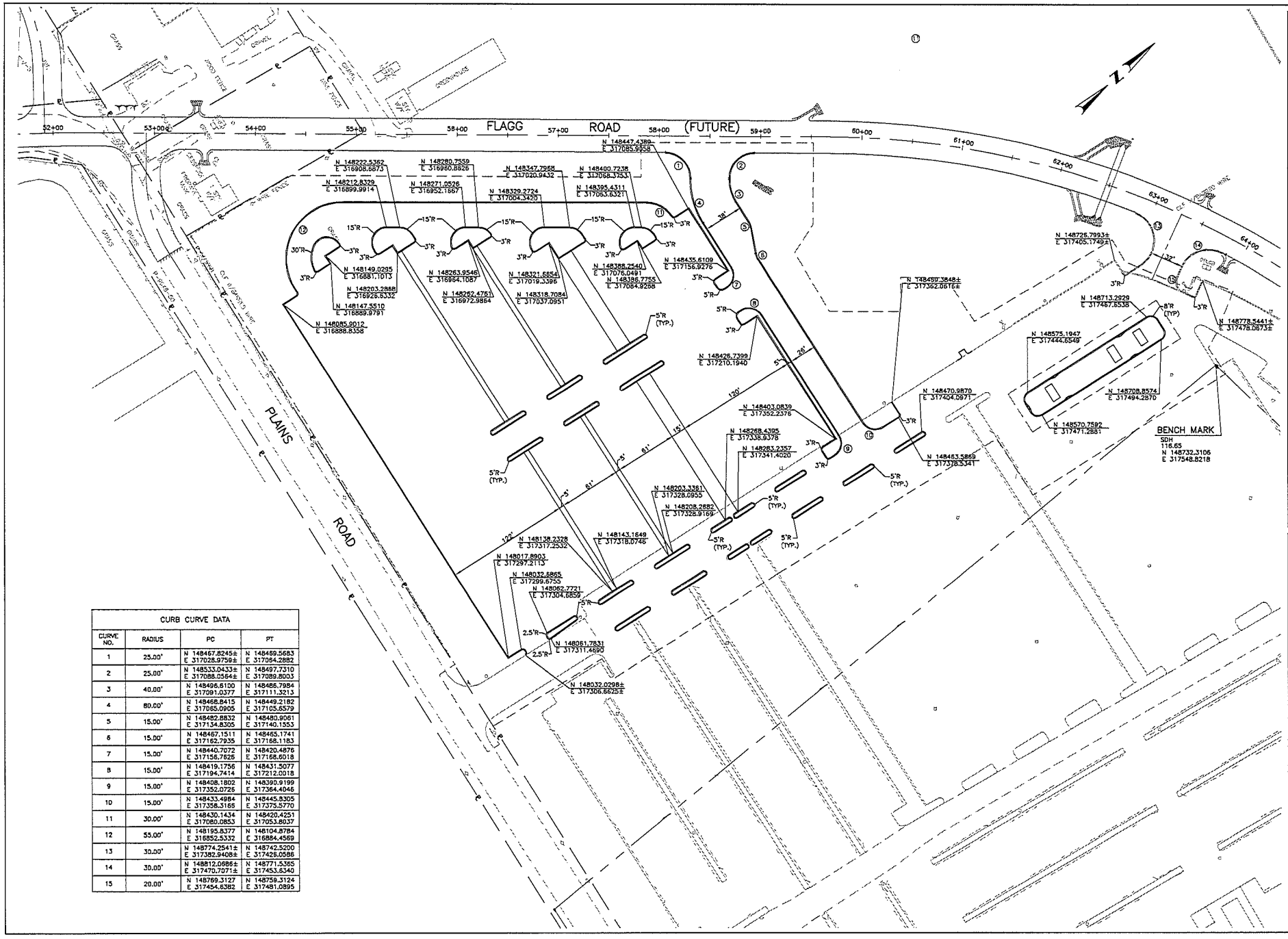
DRAWN BY: LSD

CHECKED BY: TAR

DRAWING NUMBER

5

SHEET 5 OF 15



CURB CURVE DATA			
CURVE NO.	RADIUS	PC	PT
1	25.00'	N 148467.8245± E 317028.9759±	N 148469.5683 E 317064.2882
2	25.00'	N 148533.0433± E 317088.0564±	N 148497.7310 E 317089.8003
3	40.00'	N 148495.6100 E 317091.0377	N 148486.7984 E 317111.3213
4	80.00'	N 148468.8415 E 317065.0905	N 148449.2182 E 317105.6579
5	15.00'	N 148482.8832 E 317134.8305	N 148480.9061 E 317140.1553
6	15.00'	N 148467.1511 E 317162.7935	N 148465.1741 E 317168.1183
7	15.00'	N 148440.7072 E 317156.7625	N 148420.4876 E 317168.6018
8	15.00'	N 148419.1756 E 317194.7414	N 148431.5077 E 317212.0018
9	15.00'	N 148408.1802 E 317352.0725	N 148390.9199 E 317364.4046
10	15.00'	N 148433.4984 E 317358.3165	N 148445.8305 E 317379.5770
11	30.00'	N 148430.1434 E 317080.0853	N 148420.4251 E 317053.8037
12	55.00'	N 148195.8377 E 316852.5332	N 148104.8784 E 316884.4569
13	30.00'	N 148774.2541± E 317382.9408±	N 148742.5200 E 317426.0598
14	30.00'	N 148812.0686± E 317470.7071±	N 148771.5365 E 317453.6340
15	20.00'	N 148759.3127 E 317454.8382	N 148759.3124 E 317481.0895

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
LOCATION PLAN

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

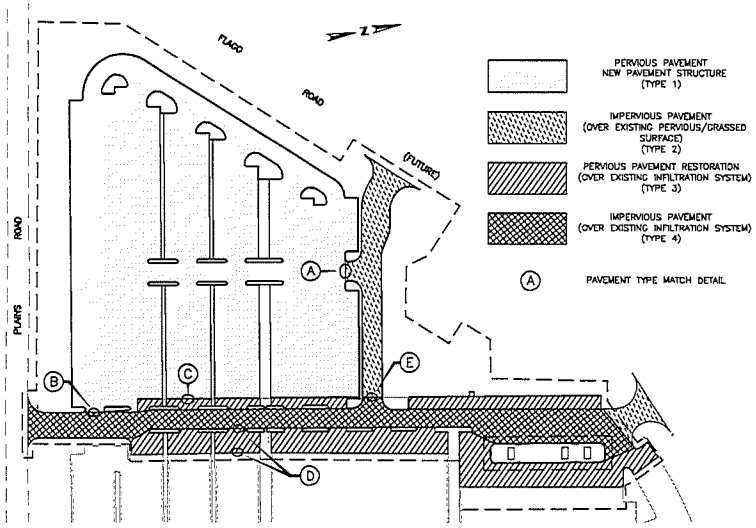
SCALE: 1" = 40'

DRAWN BY: LBD

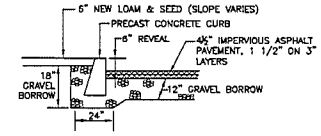
CHECKED BY: TAR

DRAWING NUMBER
6

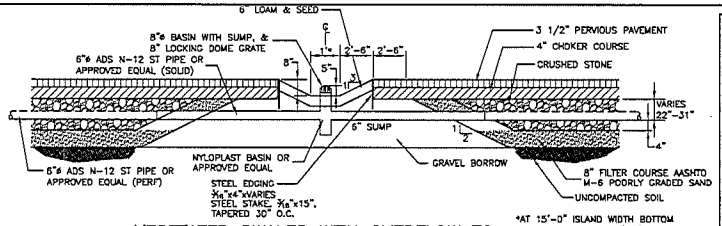
SHEET 6 OF 15



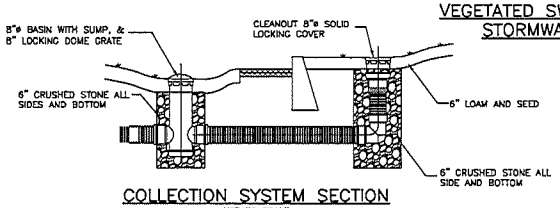
PAVEMENT TYPE LAYOUT
NOT TO SCALE



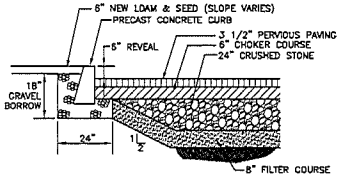
IMPERVIOUS PAVING (TYPE 2) CURB TREATMENT
NOT TO SCALE



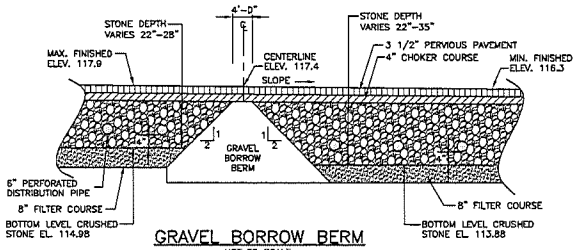
VEGETATED SWALES WITH OVERFLOW TO STORMWATER RECHARGE BEDS
NOT TO SCALE



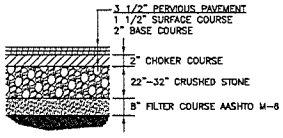
COLLECTION SYSTEM SECTION
NOT TO SCALE



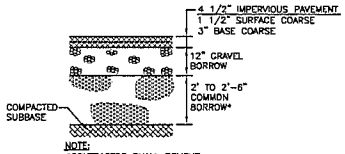
PERVIOUS PAVING (TYPE 1) CURB TREATMENT
NOT TO SCALE



GRAVEL BORROW BERM
NOT TO SCALE

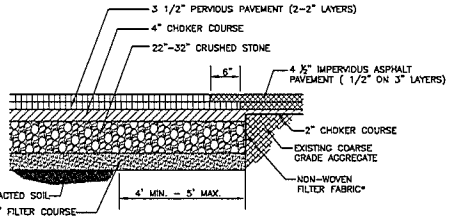


PAVEMENT TYPE 1
NOT TO SCALE

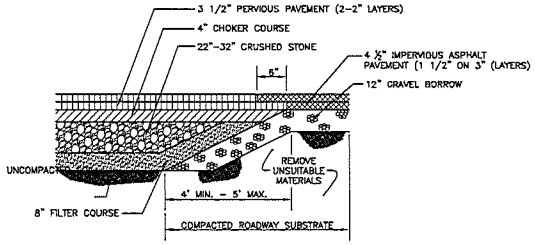


NOTE:
*CONTRACTOR SHALL REMOVE EXISTING UNSUITABLE MATERIAL TO GRAVELLY/SAND LAYER

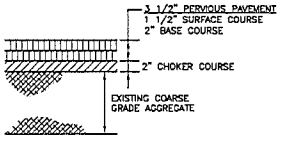
PAVEMENT TYPE 2
NOT TO SCALE



Ⓑ PAVEMENT MATCH DETAIL (TYPE 1 TO TYPE 4)
NOT TO SCALE

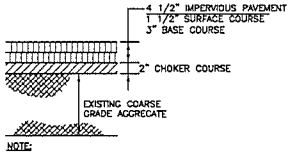


Ⓐ PAVEMENT MATCH DETAIL (TYPE 1 TO TYPE 2)
NOT TO SCALE



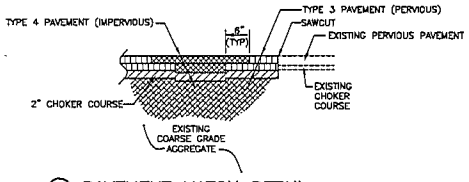
NOTE:
CONTRACTOR SHALL REMOVE EXISTING BITUMINOUS PAVEMENT (2"-3" DEPTH). REMOVE EXISTING CHOKER COURSE AND COARSE GRADE AGGREGATE AND INSTALL PROPOSED PAVEMENT STRUCTURE

PAVEMENT TYPE 3
NOT TO SCALE

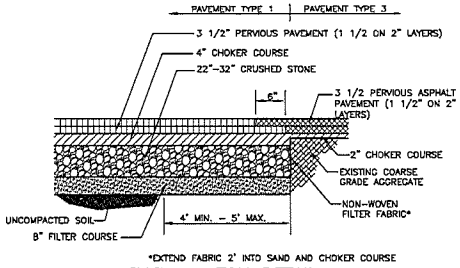


NOTE:
CONTRACTOR SHALL REMOVE EXISTING BITUMINOUS PAVEMENT (2"-3" DEPTH). REMOVE EXISTING CHOKER COURSE AND COARSE GRADE AGGREGATE AND INSTALL PROPOSED PAVEMENT STRUCTURE

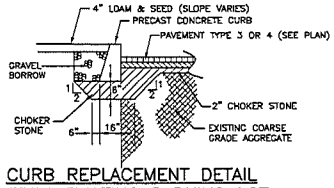
PAVEMENT TYPE 4
NOT TO SCALE



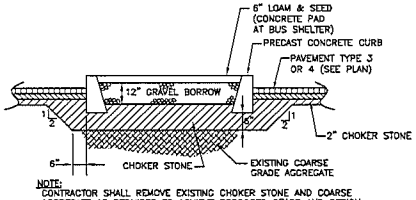
Ⓓ PAVEMENT MATCH DETAIL (TYPE 3 TO TYPE 4) TO EXISTING PAVEMENT
NOT TO SCALE



Ⓒ PAVEMENT MATCH DETAIL (TYPE 1 TO TYPE 4)
NOT TO SCALE

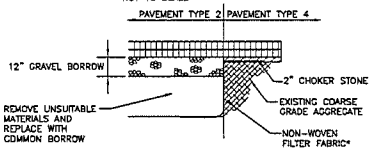


CURB REPLACEMENT DETAIL WITHIN EXISTING PARKING LOT
NOT TO SCALE



NOTE:
CONTRACTOR SHALL REMOVE EXISTING CHOKER STONE AND COARSE AGGREGATE AS REQUIRED TO ACHIEVE PROPOSED GRADE AND DESIGN.

CURB AND ISLAND DETAIL WITHIN EXISTING PARKING LOT
NOT TO SCALE



Ⓔ PAVEMENT MATCH DETAIL (TYPE 2 TO TYPE 4)
NOT TO SCALE

*EXTEND FABRIC 2' INTO COMMON BORROW AND CHOKER STONE

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

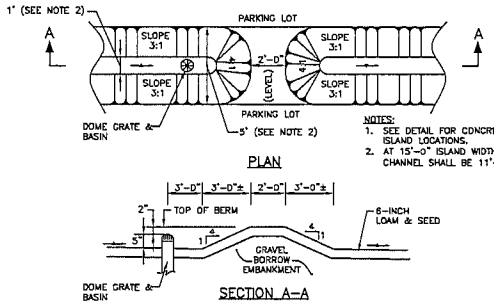
Gordon R. Archibald, Inc.
Civil and Environmental Engineers
Pawtucket, Rhode Island

DRAWING TITLE
DETAIL - 1

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377
DATE: MARCH 2012
SCALE: AS NOTED
DRAWN BY: LBD
CHECKED BY: TAR

DRAWING NUMBER
7
SHEET 7 OF 15



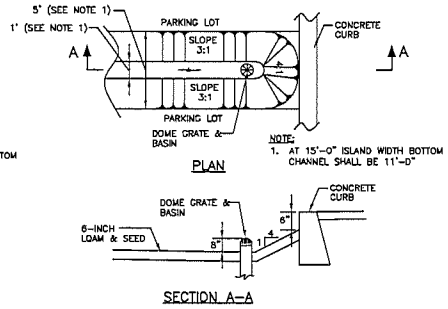
NOTES:
1. SEE DETAIL FOR CONCRETE ISLAND LOCATIONS.
2. AT 15'-0" ISLAND WIDTH BOTTOM CHANNEL SHALL BE 11'-0"

PLAN

SECTION A-A

GRASS SWALE CHECK DAM

NOT TO SCALE



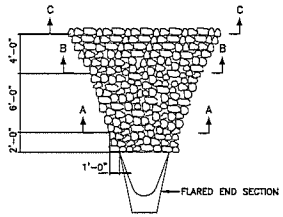
NOTE:
1. AT 15'-0" ISLAND WIDTH BOTTOM CHANNEL SHALL BE 11'-0"

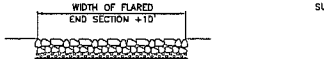
PLAN

SECTION A-A

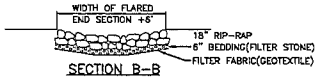
CHECK DAM AT CURB ISLAND

NOT TO SCALE

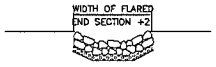




SECTION C-C



SECTION B-B

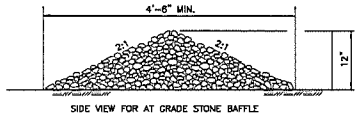


SECTION A-A

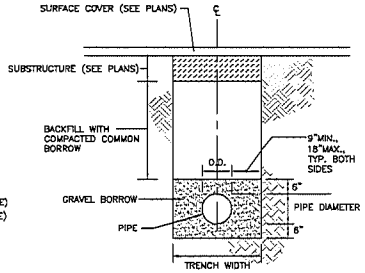
RIP-RAP PAD DETAIL (RRP)

N.T.S.

NOTES:
1. RIP-RAP AND BEDDING SHALL BE IN ACCORDANCE WITH SECTION M.10 OF THE RI STD. SPECIFICATIONS FOR BRIDGE AND HIGHWAY. RIP-RAP SHALL BE MODIFIED NSA NO. R-4, BEDDING SHALL BE MODIFIED NSA NO. FS-2.
2. DIMENSIONS MAY BE MODIFIED BY ENGINEER TO MEET FIELD CONDITIONS.
3. UNLESS OTHERWISE SPECIFIED, DUMPED RIP-RAP SHALL BE USED.



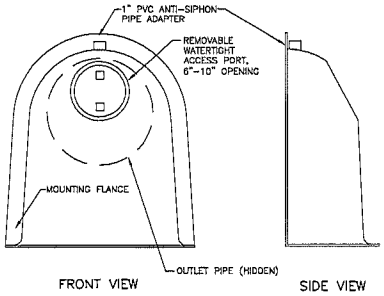
STONE BAFFLE (SB)



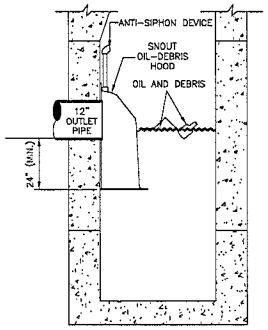
NOTE:
SUITABLE MATERIAL EXCAVATED FROM THE TRENCH MAY BE USED FOR PIPE BEDDING.

TYPICAL STORM PIPE TRENCH DETAIL

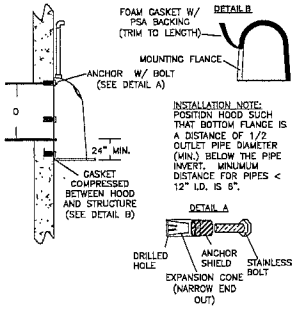
NOT TO SCALE



SNOUT OIL-WATER-DEBRIS SEPARATOR



NOTES:
1. ALL HOODS AND TRAPS FOR CATCH BASINS AND WATER QUALITY STRUCTURES SHALL BE AS MANUFACTURED BY:
   BEST MANAGEMENT PRODUCTS, INC.
   53 MT. ARCHER RD.
   LYME, CT 06371
   (860) 434-0277, (860) 434-3195 FAX
   TOLL FREE: (800) 504-8008 OR (888) 354-7585
   WEB SITE: www.bestmp.com
   OR PRE-APPROVED EQUAL
2. ALL HOODS SHALL BE CONSTRUCTED OF A GLASS REINFORCED RESIN COMPOSITE WITH ISO GEL COAT EXTERIOR FINISH WITH A MINIMUM 0.125" LAMINATE THICKNESS.
3. ALL HOODS SHALL BE EQUIPPED WITH A WATERTIGHT ACCESS PORT, A MOUNTING FLANGE, AND AN ANTI-SIPHON VENT AS DRAWN. (SEE CONFIGURATION DETAIL)
4. THE SIZE AND POSITION OF THE HOOD SHALL BE DETERMINED BY OUTLET PIPE SIZE AS PER MANUFACTURER'S RECOMMENDATION.
5. THE BOTTOM OF THE HOOD SHALL EXTEND DOWNWARD A DISTANCE EQUAL TO 24" BELOW OUTLET INVERT.
6. THE ANTI-SIPHON VENT SHALL EXTEND ABOVE HOOD BY MINIMUM OF 3" AND A MAXIMUM OF 24" ACCORDING TO STRUCTURE CONFIGURATION.
7. THE SURFACE OF THE STRUCTURE WHERE THE HOOD IS MOUNTED SHALL BE FINISHED SMOOTH AND FREE OF LOOSE MATERIAL.
8. THE HOOD SHALL BE SECURELY ATTACHED TO STRUCTURE WALL WITH 3/8" STAINLESS STEEL BOLTS AND OIL-RESISTANT GASKET AS SUPPLIED BY MANUFACTURER. (SEE INSTALLATION DETAIL)
9. INSTALLATION INSTRUCTIONS SHALL BE FURNISHED WITH MANUFACTURER SUPPLIED INSTALLATION KIT. INSTALLATION KIT SHALL INCLUDE:
   A. INSTALLATION INSTRUCTIONS
   B. PVC ANTI-SIPHON VENT PIPE AND ADAPTER
   C. OIL-RESISTANT CRUSHED CELL FOAM GASKET WITH PSA BACKING
   D. 3/8" STAINLESS STEEL BOLTS
   E. ANCHOR SHIELDS

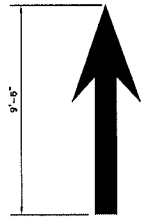


INSTALLATION NOTE:
POSITION HOOD SUCH THAT BOTTOM FLANGE IS A DISTANCE OF 1/2 OUTLET PIPE DIAMETER (MIN.) BELOW THE PIPE INVERT. MINIMUM DISTANCE FOR PIPES < 12" I.D. IS 6".

INSTALLATION DETAIL

CATCH BASIN OIL/WATER SEPARATION

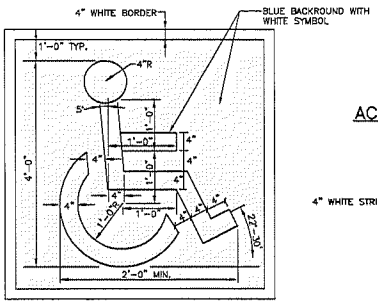
NOT TO SCALE



NOTES:
1. THE SPACING OF THE PAVEMENT MARKINGS WILL BE AS SHOWN ON THE PLAN
2. SYMBOLS SHALL MEET THE REQUIREMENTS OF THE FHWA STANDARD ALPHABET AND SYMBOLS FOR HIGHWAY PAVEMENT MARKINGS.

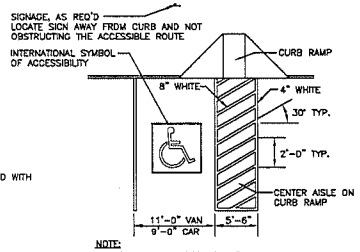
PAVEMENT MARKING ARROWS

N.T.S.



PAINTED HANDICAP SYMBOL

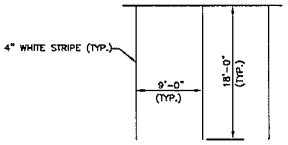
N.T.S.



NOTE:
ALL STRIPING SHALL BE WHITE

ACCESSIBLE PARKING SPACE AND AISLE

N.T.S.



NOTE:
ALL PARKING AREA STRIPING SHALL BE 4" WIDE WHITE UNLESS LABLED OTHERWISE.

TYPICAL PARKING SPACE DETAIL

N.T.S.

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
DETAIL - 2

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

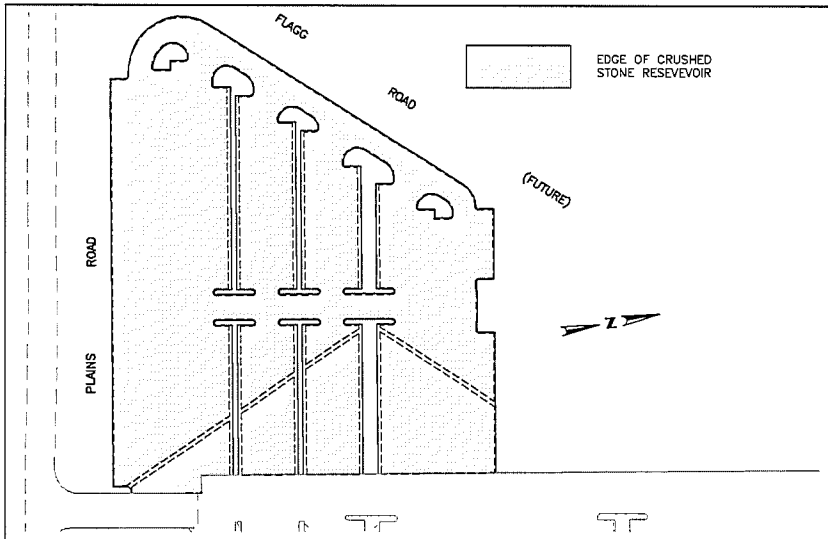
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

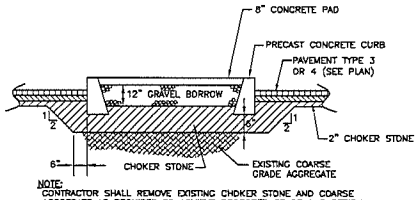
DRAWING NUMBER
8

SHEET 8 OF 15



SUBSURFACE RESERVIOR LIMITS

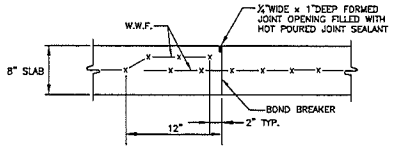
NOT TO SCALE



NOTE:
CONTRACTOR SHALL REMOVE EXISTING CHOKER STONE AND COARSE AGGREGATE AS REQUIRED TO ACHIEVE PROPOSED GRADE AND DESIGN.

CONCRETE SLAB AT BUS SHELTER

NOT TO SCALE



TYPICAL CONCRETE PAD & CONSTRUCTION JOINT DETAIL

NOT TO SCALE

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE No. 5928 REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
DETAIL - 3

NO	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

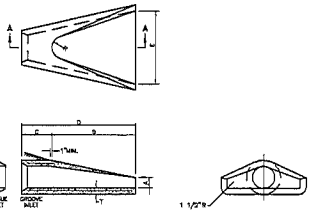
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
9

SHEET 9 OF 15



DIMENSIONS								REINFORCEMENT
DIA.	A	B	C	D	E	R	T	MIN. AREA OF EACH WAY (SQ. IN./FT.)
1'-0"	4"	2'-0"	1'-0 7/8"	8'-0 7/8"	2'-0"	9"	2"	0.048
1'-3"	6"	2'-3"	1'-10"	8'-1"	2'-0"	11"	2 1/4"	0.054
1'-6"	8"	2'-3"	1'-10"	8'-1"	2'-0"	13"	2 1/2"	0.060
2'-0"	9 1/2"	2'-7 1/2"	2'-4"	9'-1 1/2"	2'-0"	1'-1"	3"	0.072
2'-6"	1'-0"	4'-0"	3'-0"	9'-1 3/4"	2'-0"	1'-3"	3 1/2"	0.084
3'-0"	1'-3"	5'-3"	3'-8"	9'-1 3/4"	2'-0"	1'-6"	4"	0.096
3'-6"	1'-6"	6'-3"	4'-4"	9'-1 3/4"	2'-0"	1'-9"	4 1/2"	0.108
4'-0"	1'-9"	7'-3"	5'-0"	9'-1 3/4"	2'-0"	2'-0"	5"	0.120
4'-6"	2'-0"	8'-0"	5'-11"	9'-4"	2'-0"	2'-0"	5 1/2"	0.132
5'-0"	2'-6"	9'-0"	6'-7"	9'-3"	2'-0"	2'-0"	6"	0.144

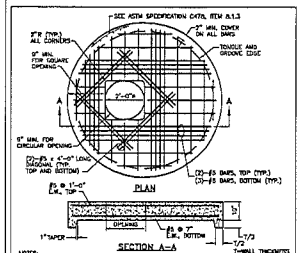
NOTE: SHALL BE IN ACCORDANCE WITH SECTION 701 OF THE R.I. STANDARD SPECIFICATIONS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE FLARED END SECTION

R.I. STANDARD 2.3.0

JUNE 15, 1998



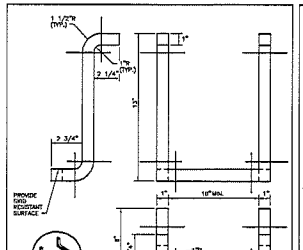
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 700 OF THE R.I. STANDARD SPECIFICATIONS.
2. ANY NECESSARY ADJUSTMENTS DURING CONSTRUCTION WILL BE DONE BY SAW-CUTTING AND/OR CORING ONLY. NO JACKHAMMERS, HAMMERS AND CHISELS OR PNEUMATIC TOOLS WILL BE ALLOWED.
3. THE CENTER LINE OF THE OPENING MUST BE WITHIN 3" FROM THE STEPS.
4. ALTERNATE TOP COVER IS STEEL REINFORCED TO MEET OR EXCEED H-25 OR HS-25 LOADING WITH EARTH PROTECTED, INCLUDED THIS IMPLIES THAT THE TOP SLAB IS DESIGNED FOR AXLE LOADS OF NO MORE THAN 20 TONS.
5. ALL REBARS SHALL BE SPACED AT 6" CENTERS AROUND THE OPENING.
6. ALL REBARS SHALL BE SET IN MINIMUM OF 2" OF CONCRETE COVER, WITH 2" MINIMUM COVER, EXCEPT FOR REBARS ADJACENT TO THE OPENING. THESE BARS SHALL BE (2)-#8 SHOWN WITH A HEAVIER LINE FOR CLARITY. REBARS IN THE TOP MAT ARE @ 6" x 1'-0", BOTH WAYS, WITH 2" MINIMUM COVER, EXCEPT FOR REBARS ADJACENT TO THE OPENING. THESE BARS SHALL BE (2)-#8 BARS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

ALTERNATE TOP COVER FOR ROUND PRECAST MANHOLES AND CATCH BASINS

R.I. STANDARD 4.7.2

JUNE 15, 1998



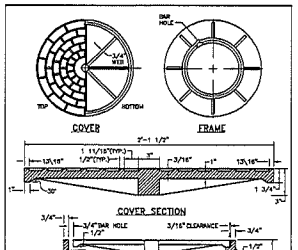
NOTES:
1. STEPS SHALL CONFORM TO SECTION M.04 OF THE R.I. STANDARD SPECIFICATIONS.
2. CAST IRON SECTION AREA MAY BE REDUCED UPON SUBMISSION OF CERTIFIED LOAD TESTS. STEPS MUST SUPPORT 300 LBS.
3. STOCK SHOWN IS 1" SQUARE WHICH MAY BE REPLACED BY 1" DIAMETER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

CATCH BASIN AND MANHOLE STEP

R.I. STANDARD 5.3.0

JUNE 15, 1998



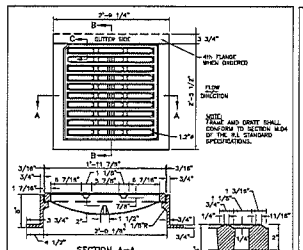
NOTES:
1. FRAME AND GRATE SHALL CONFORM TO SECTION M.04 OF THE R.I. STANDARD SPECIFICATIONS.
2. FRAME AND COVER SEATS MUST HAVE MACHINE FINISH.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

HEAVY-DUTY ROUND FRAME AND COVER

R.I. STANDARD 5.2.1

JUNE 15, 1998

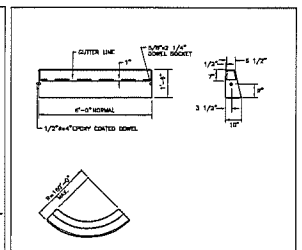


RHODE ISLAND DEPARTMENT OF TRANSPORTATION

SQUARE FRAME AND GRATE (BICYCLE SAFE)

R.I. STANDARD 5.3.2

JUNE 15, 1998



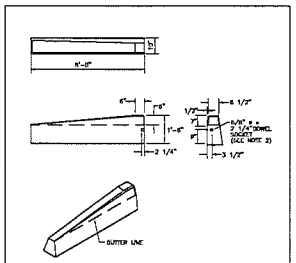
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. MINIMUM LENGTH OF STRAIGHT OR CIRCULAR FILLER PIECES TO BE 3'-0".
3. EXPOSED SURFACES TO HAVE A MEDIUM FLOAT FINISH.
4. CIRCULAR CURB IS REQUIRED ON CURVES WITH RADII OF 150'-0" OR LESS. STRAIGHT CURB TO BE USED ON CURVES OF MORE THAN 150'-0" RADIUS.
5. EXPOSED EDGES TO HAVE A 3/4" CHAMFER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST CONCRETE CURB

R.I. STANDARD 7.1.0

JUNE 15, 1998



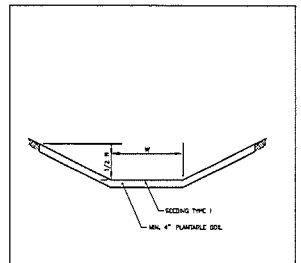
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. DRAWING SHOWS TRANSITION CURB FOR ONE DIRECTION. FOR OTHER DIRECTION USE OPPOSITE HAND AND INCLUDE A 1/2" x 4" EPOXY COATED DOWEL.
3. EXPOSED SURFACES TO HAVE A MEDIUM FLOAT FINISH.
4. EXPOSED EDGES TO HAVE A 3/4" CHAMFER.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

6'-0" PRECAST CONCRETE TRANSITION CURB

R.I. STANDARD 7.1.2

JUNE 15, 1998

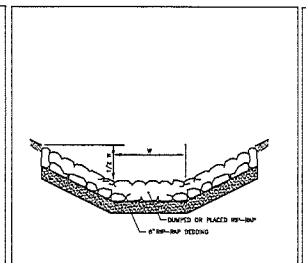


RHODE ISLAND DEPARTMENT OF TRANSPORTATION

SEEDED DITCH

R.I. STANDARD 8.1.0

JUNE 15, 1998



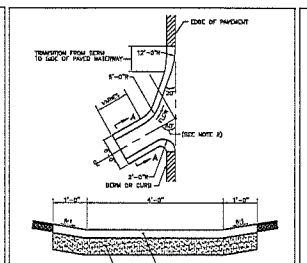
NOTES:
1. SLOPES MAY VARY TO SUIT CONDITIONS AS PER PLANS OR ENGINEER.
2. RIP-RAP AND BEDDING SIZE MAY VARY, SEE CONTRACT DOCUMENTS.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

RIP-RAP DITCH

R.I. STANDARD 8.3.0

JUNE 15, 1998



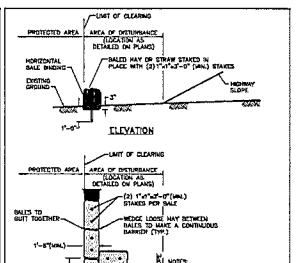
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 711 OF THE R.I. STANDARD SPECIFICATIONS.
2. WHEN PAVED WATERWAY IS USED AT A LOW POINT THIS ANGLE SHALL BE 90°.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PAVED WATERWAY

R.I. STANDARD 8.4.0

JUNE 15, 1998



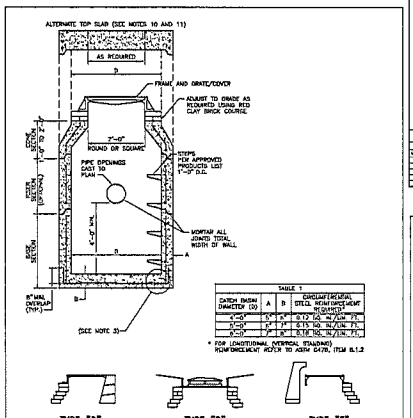
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 211 OF THE R.I. STANDARD SPECIFICATIONS.
2. DO NOT USE WHERE THE EXISTING GROUND SLOPES AWAY FROM THE HIGHWAY EMBANKMENT AS CALLED FOR ON PLANS.
3. AT APPROXIMATE 100'-0" INTERVALS A BALE OF HAY IS TO BUTT PERPENDICULARLY.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY EROSION CHECK

R.I. STANDARD 9.1.0

JUNE 15, 1998



TYPE CATCH BASIN AS REQUIRED

TABLE 1			
CATCH BASIN DIAMETER (D)	A	B	EMBEDMENT REQUIRED STEEL REINFORCEMENT REQUIRED
4'-0"	1'-6"	2'-6"	0.12 SQ. IN./LIN. FT.
5'-0"	1'-9"	2'-9"	0.15 SQ. IN./LIN. FT.
6'-0"	2'-0"	3'-0"	0.18 SQ. IN./LIN. FT.

* FOR LONGITUDINAL (VERTICAL STANDING) REINFORCEMENT REFER TO ASSM DATA, ITEM 8.1.2

NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 703 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. 9.3.0 AND SHALL BE INSTALLED AT THE CASTING PLANT.
5. USE FOAM 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. CORBEL MADE OF RED CLAY BRICK WILL BE PERMITTED FOR THE "CONE SECTION" OF THE 4'-0"DIAMETER DRAIN 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 REQUIRED SECTION DUCT MIT FE BECAUSE OF STRUCTURE DEPTH.
12. REFER TO STD. 9.3.0 FOR MINIMUM TYPE DETS.

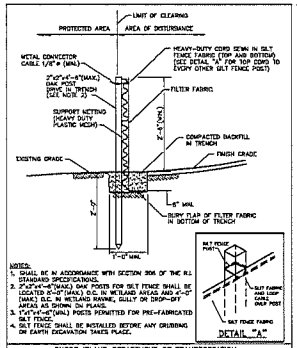
RHODE ISLAND DEPARTMENT OF TRANSPORTATION

PRECAST 4'-0", 5'-0", OR 6'-0" ROUND CATCH BASIN

R.I. STANDARD 4.4.0

JUNE 15, 1998

(MOD.)



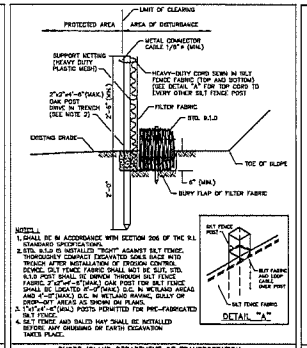
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. 2"x2"x4'-8"(MAX.) OAK POSTS FOR SILT FENCE SHALL BE LOCATED 6'-0"(MAX.) O.C. IN WETLAND AREAS AND 4'-0" (MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP-OFF AREAS AS SHOWN ON PLANS.
3. 1"x1"x4'-8"(MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
4. SILT FENCE SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

SILT FENCE DETAIL

R.I. STANDARD 9.2.0

JUNE 15, 1998



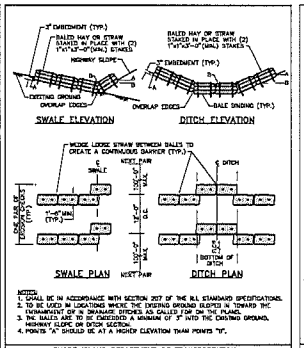
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 906 OF THE R.I. STANDARD SPECIFICATIONS.
2. STD. 9.1.0 IS INSTALLED "RIGHT" AGAINST SILT FENCE. THOROUGHLY COMPACT EXCAVATED SOILS BACK INTO TRENCH AFTER INSTALLATION OF PROVIDED CONTROL DEVICE. SILT FENCE FABRIC SHALL NOT BE CUT. STD. 9.1.0 POST SHALL NO DAMAGE THROUGH SILT FENCE FABRIC. 2"x2"x4'-8"(MAX.) OAK POST FOR SILT FENCE SHALL BE LOCATED 6'-0"(MAX.) O.C. IN WETLAND AREAS AND 4'-0"(MAX.) O.C. IN WETLAND RAVINE, GULLY OR DROP-OFF AREAS AS SHOWN ON PLANS.
3. 1"x1"x4'-8"(MIN.) POSTS PERMITTED FOR PRE-FABRICATED SILT FENCE.
4. SILT FENCE AND BALED HAY SHALL BE INSTALLED BEFORE ANY GRUBBING OR EARTH EXCAVATION TAKES PLACE.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY EROSION CHECK AND SILT FENCE COMBINED

R.I. STANDARD 9.3.0

JUNE 15, 1998



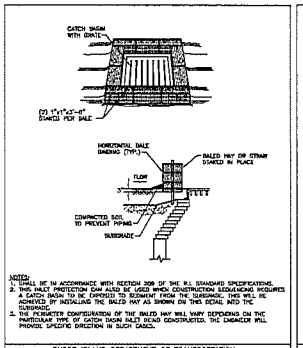
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 207 OF THE R.I. STANDARD SPECIFICATIONS.
2. TO BE USED IN LOCATIONS WHERE THE EXISTING GROUND SLOPES IN TOWARD THE ENTRAINMENT OR IN DRAINAGE DITCHES AS CALLED FOR ON THE PLANS.
3. THE BALES ARE TO BE EMBEDDED A MINIMUM OF 3" INTO THE EXISTING GROUND, HIGHWAY SLOPE OR DITCH SECTION.
4. POINTS "A" SHOULD BE AT A HIGHER ELEVATION THAN POINTS "B".

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY DITCH AND SWALE EROSION CHECK

R.I. STANDARD 9.4.0

JUNE 15, 1998



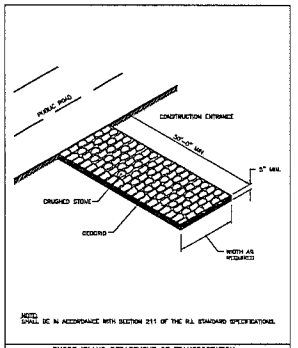
NOTES:
1. SHALL BE IN ACCORDANCE WITH SECTION 209 OF THE R.I. STANDARD SPECIFICATIONS.
2. THIS INLET PROTECTION CAN ALSO BE USED WHEN CONSTRUCTION SEDIMENTING MEASURES A CATCH BASIN TO BE EXPOSED TO SEDIMENT FROM THE TURBIDACE. THIS WILL BE ACHIEVED BY INSTALLING THE BALED HAY AS SHOWN ON THIS DETAIL INTO THE TURBIDACE.
3. THE PERIMETER CONFIGURATION OF THE BALED HAY WILL VARY DEPENDING ON THE PARTICULAR TYPE OF CATCH BASIN INLET BEAD CONSTRUCTED. THE ENGINEER WILL PROVIDE SPECIFIC DIRECTION IN SUCH CASES.

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

BALED HAY CATCH BASIN INLET PROTECTION

R.I. STANDARD 9.8.0

JUNE 15, 1998



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

RHODE ISLAND DEPARTMENT OF TRANSPORTATION

CONSTRUCTION ACCESS

R.I. STANDARD 9.9.0

JUNE 15, 1998

PROJECT: FLAGG ROAD PARKING LOT

1000 A. RAKEWELL — No. 5928 — REGISTERED PROFESSIONAL ENGINEER

CLIENT: UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE: DETAIL - 4

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

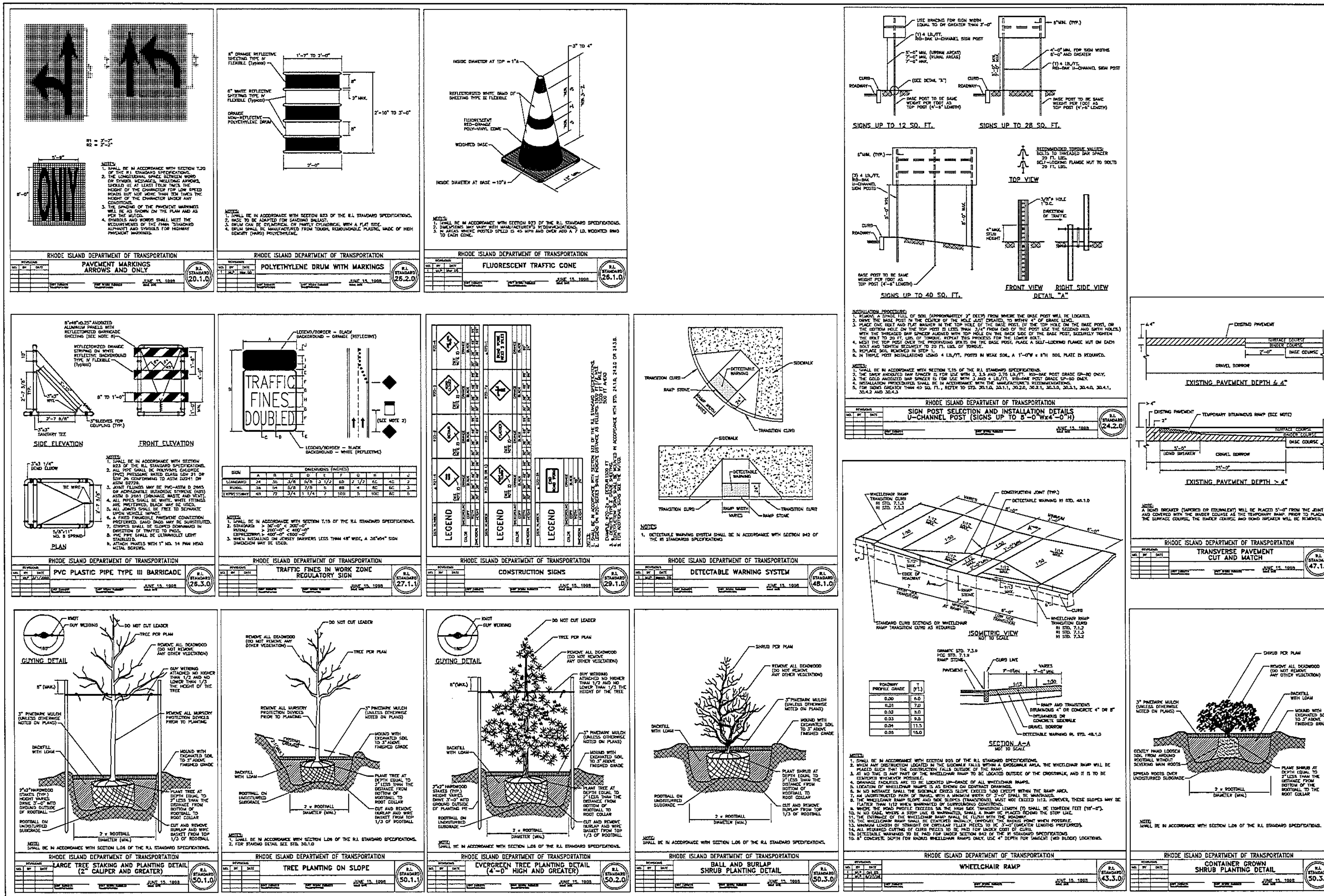
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER 10

SHEET 10 OF 15



PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
DETAIL - 5

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

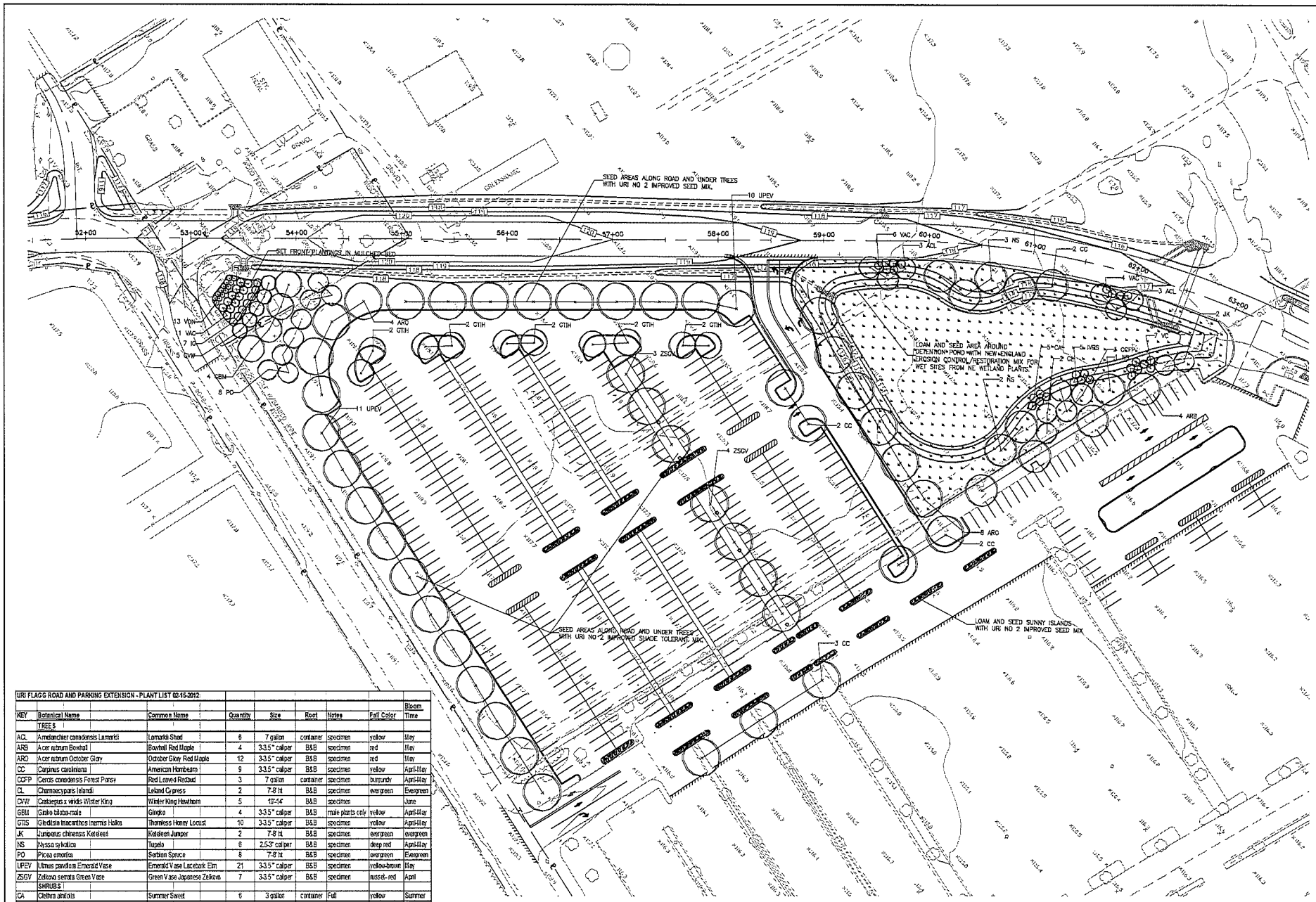
SCALE: AS NOTED

DRAWN BY: LBD

CHECKED BY: TAR

DRAWING NUMBER
11

SHEET 11 OF 15



URI FLAGG ROAD AND PARKING EXTENSION - PLANT LIST 02-15-2012								
KEY	Botanical Name	Common Name	Quantity	Size	Root	Notes	Fall Color	Bloom Time
	TREES							
ACL	Amelanchier canadensis Lamarkii	Lamarkii Shad	6	7 gallon	container	specimen	yellow	May
ARB	Acer rubrum Bowhall	Bowhall Red Maple	4	3-3.5" caliper	B&B	specimen	red	May
ARO	Acer rubrum October Glory	October Glory Red Maple	12	3-3.5" caliper	B&B	specimen	red	May
CC	Carpinus caroliniana	American Hornbeam	9	3-3.5" caliper	B&B	specimen	yellow	April-May
CCFP	Cercis canadensis Forest Pansy	Red Leaved Redbud	3	7 gallon	container	specimen	burgundy	April-May
CL	Chamaecyparis lelandii	Leland Cypress	2	7-8 ht	B&B	specimen	evergreen	Evergreen
CVW	Crataegus x viridis Winter King	Winter King Hawthorn	5	10'-14'	B&B	specimen		June
GBM	Ginko biloba-male	Gingko	4	3-3.5" caliper	B&B	male plants only	yellow	April-May
GTIS	Gleditsia triacanthos inermis Halka	Thornless Honey Locust	10	3-3.5" caliper	B&B	specimen	yellow	April-May
JK	Juniperus chinensis Keteleeii	Keteleen Juniper	2	7-8 ht	B&B	specimen	evergreen	evergreen
NS	Nyssa sylvatica	Tupelo	8	2.5-3" caliper	B&B	specimen	deep red	April-May
PO	Picea omorika	Serbian Spruce	8	7-8 ht	B&B	specimen	evergreen	Evergreen
UPEV	Ulmus pavidiana Emerald Vase	Emerald Vase Lacebark Elm	21	3-3.5" caliper	B&B	specimen	yellow-brown	May
ZSGV	Zelkova serrata Green Vase	Green Vase Japanese Zelkova	7	3-3.5" caliper	B&B	specimen	russet- red	April
	SHRUBS							
CA	Clethra alnifolia	Summer Sweet	6	3 gallon	container	Full	yellow	Summer
IG	Ilex glabra	Inkberry	7	3-4 ht	B&B	Full	evergreen	Evergreen
IVRS	Ilex verticillata Red Sprite	Red Sprite Dwarf Winterberry	5	3 gallon	container	Full	reddish	Berries
VAC	Viburnum acerifolium	Mapleleaf viburnum	21	3-4 ht	B&B	Full	reddish	June
VC	Vaccinium corymbosum	High bush Blueberry	7	3-4 ht	B&B	Full	reddish	June
VON	Viburnum opulus Nanum	European Cranberry bush	13	2-3 ht	B&B	Full	yellow-red	June

Landscape Architecture
Landscape Ecology
Cultural Landscape Preservation

Landscape Elements, LLC
P.O. Box 1326, Pawcatuck, CT 06379
200 Centerville Road, Warwick, RI 02886
tel: 860-535-5295
fax: 860-203-7088
www.landscapeelementsllc.com

PROJECT
FLAGG ROAD PARKING LOT

TODD A. RAVENELLE
No. 5928
REGISTERED PROFESSIONAL ENGINEER

CLIENT
UNIVERSITY OF RHODE ISLAND

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

DRAWING TITLE
LANDSCAPE PLANTING PLAN

NO	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 2012

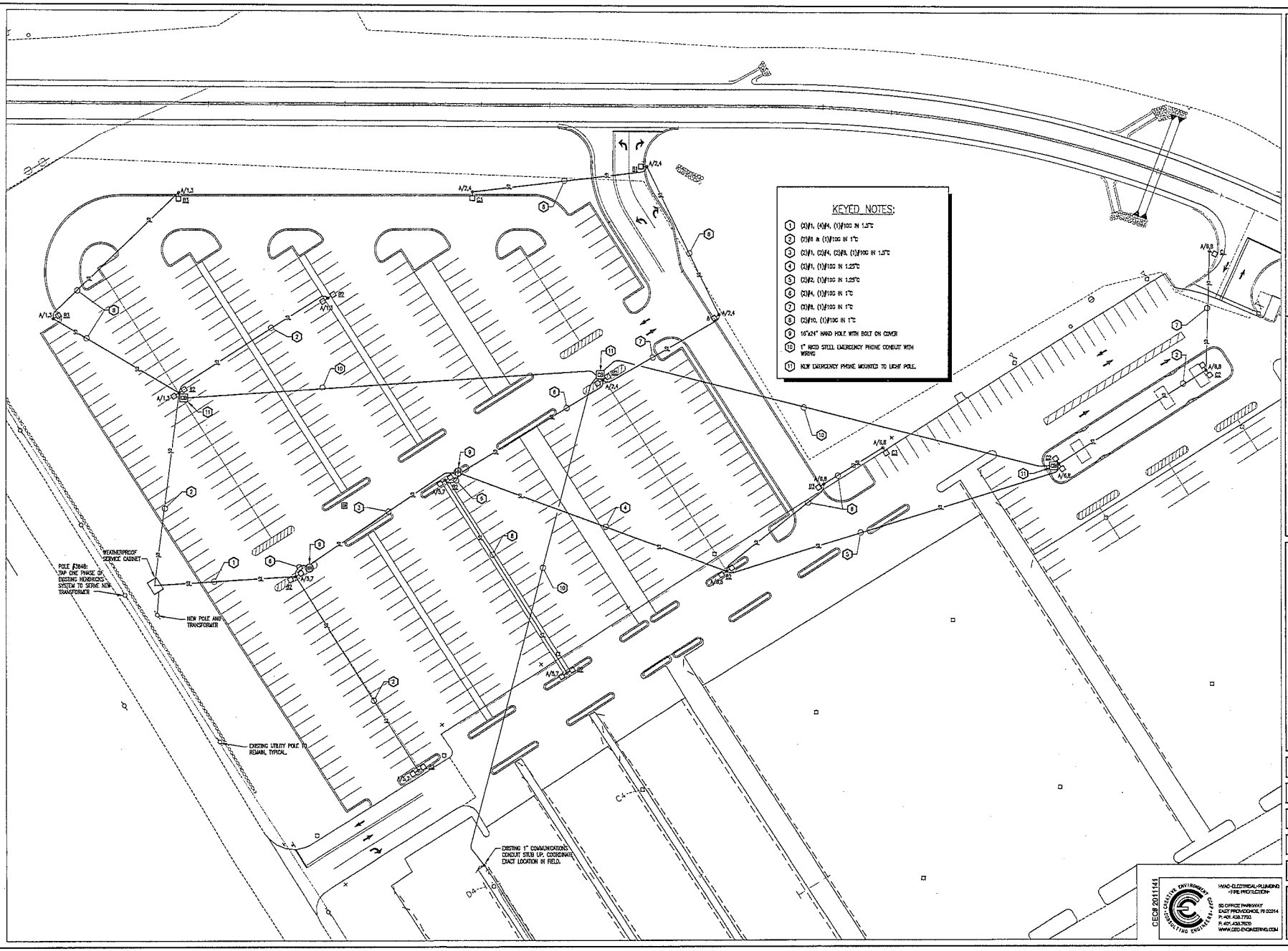
SCALE: 1" = 40'

DRAWN BY: EMP

CHECKED BY: EMP

DRAWING NU BER
12

SHEET 12 OF 15



PROJECT
FLAGG ROAD PARKING LOT

PETER D. DESIGNO
REGISTERED PROFESSIONAL ENGINEER ELECTRICAL

CLIENT
UNIVERSITY OF RHODE ISLAND

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

ELECTRICAL SITE LIGHTING PLAN

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 6, 2012

SCALE: AS NOTED

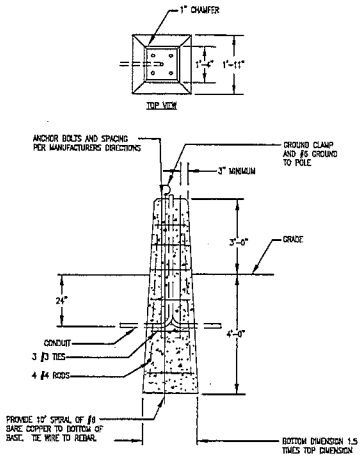
DRAWN BY: JR

CHECKED BY: PDS

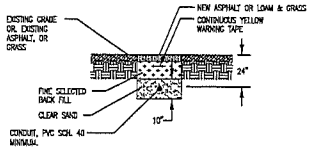
DRAWING NUMBER
E-1
SHEET 1 OF 3

CEC# 2011141

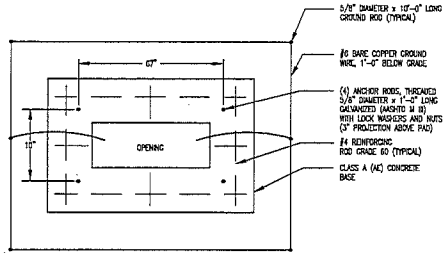
CREATIVE ENVIRONMENTS & ENGINEERING, LTD.
HVAC-ELECTRICAL-PLUMBING +FIRE PROTECTION
55 OFFICE PARKWAY
EAST PROVIDENCE, RI 02914
P: 401.438.7733
F: 401.438.7620
WWW.CEC-ENGINEERING.COM



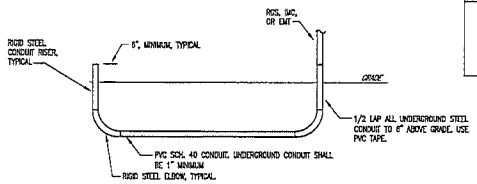
POLE BASE DETAIL
NTS



TRENCH DETAIL
NTS

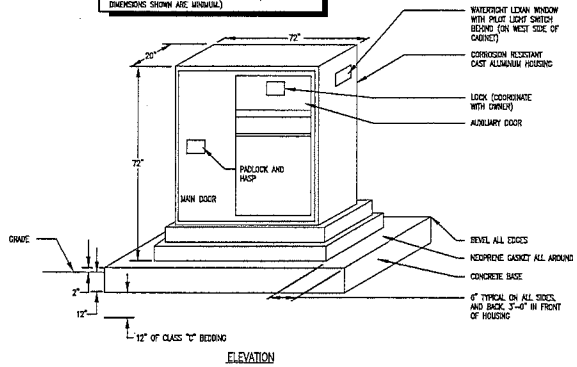


FOUNDATION PLAN



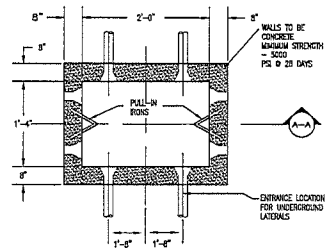
UNDERGROUND CONDUIT DETAIL, TYPICAL
NTS

PEDESTAL NOTE:
HOUSING TO CONTAIN POWER COMPANY METERING, PANELBOARD, 3/4" THICK MARINE GRADE PLYWOOD MOUNTING BACKBOARD, METER TRUNCH, AND ALL OTHER EQUIPMENT INDICATED ON PLANS. TAP BASE TO ACCEPT ALL CONDUITS. (CABINET DIMENSIONS SHOWN ARE MINIMUM.)

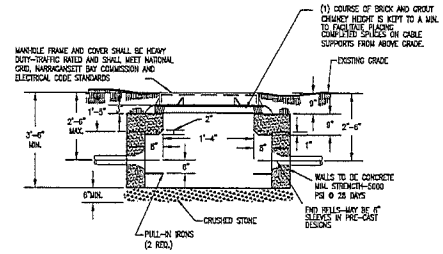


ELEVATION

SERVICE PEDESTAL DETAIL
NTS



HAND HOLE - DETAIL
NTS



HAND HOLE - DETAIL A-A
NTS

ELECTRICAL SYMBOL LEGEND

LIGHTING & POWER

- POLE MOUNTED LIGHTING
- SITE LIGHTING WIRING, 24" BELOW GRADE
- HAND HOLE
- EMERGENCY CALL PHONE
- TELEPHONE POLE
- QUADRUPLEX RECEPTACLE MTD 18" A.F.F. TO CENTER.

ABBREVIATIONS

A	AMPS
C	CONDUIT
G	GROUND
KW	KILOWATT
MTD	MOUNTED
N	NEUTRAL
NTS	NOT TO SCALE
P	POLE
PH	PHASE
TEL	TELEPHONE
TTB	TELEPHONE TERMINAL BOARD
TYP	TYPICAL
V	VOLT
W	WATT
W/	WITH

NOTES

1. DISCONNECT, REMOVE, AND MAKE SAFE ALL CONDUIT AND WIRING NOT IN SERVICE.
2. VERIFY ALL EQUIPMENT NAMEPLATE LOADS AND INSURE PROPER SIZING OF CONDUCTORS AND OVERCURRENT PROTECTION. NOTIFY ENGINEER OF DISCREPANCIES.
3. USE #10 CONDUCTORS FOR ALL HOMERUNS OVER 100 FEET IN LENGTH.
4. BALANCE THE PHASES IN EACH ELECTRICAL PANEL.

LIGHTING FIXTURE SCHEDULE

TYPE	MANUFACTURER	MOUNTING	LAMPS WATTS	LAMPS TYPE	REMARKS
A	KIM LIGHTING 1A/AR2/400PMH208/CTM/HS	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
B1	KIM LIGHTING 1A/AR2/400PMH208/CTM	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
B2	KIM LIGHTING 2B/AR3/400PMH208/CTM/HS	POLE	(2) 400W	MH	DOUBLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
B3	KIM LIGHTING 1A/AR3/400PMH208/CTM/HS	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
C1	KIM LIGHTING 1A/AR4/400PMH208/CTM	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
C2	KIM LIGHTING 2B/AR4/400PMH208/CTM	POLE	(1) 400W	MH	DOUBLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT
C3	KIM LIGHTING 1A/AR4/400PMH208/CTM/HS	POLE	(1) 400W	MH	SINGLE METAL HALIDE LUMINAIRE CTM: COLOR TO MATCH EXISTING LIGHTS IN ADJOINING LOT

LIGHTING FIXTURE SCHEDULE NOTES:

1. PROVIDE ALL LAMPS FOR ALL LIGHTING FIXTURES. LAMP COLOR SHALL BE 3000K.
2. PROVIDE VALMONT LIGHT POLE, MODEL #: 2500-6060554 FOR EACH LIGHT FIXTURE. COLOR TO MATCH EXISTING LIGHT POLES IN ADJOINING LOT.

PANEL: A — 150 A 240/120 V 3PH 4W 60HZ

25,000 AIC
CIRCUITS: 18
BUS RATING: 150A

MAIN LUG ONLY
MAIN CIRCUIT BREAKER
SURFACE MOUNTED X
FLUSH MOUNTED
FLOOR MOUNTED

WIRE	DESCRIPTION
A	AFCI
G	GFCI - 5mA TRIP
P	GFPE - 30 mA TRIP
S	SHUNT TRIP
L	LOCK OFF
10	ISOLATED GROUND
C	VIA LIGHTING CONTROL PANEL

SHUNT TRIP MAIN
200% RATED NEUTRAL
ISOLATED GROUND
FEED THRU LUGS
100% RATED MAIN BREAKER
GROUND FAULT MAIN C.B.

CKT No.	Load Type	LOAD DESCRIPTION	Note	WIRE SIZE	LOAD KVA	CIRCUIT BREAKER								CKT No.	Load Type	LOAD DESCRIPTION	Note	WIRE SIZE	LOAD KVA	CIRCUIT BREAKER						
1	L	SITE LIGHTING		6	3.1	1								2	L	SITE LIGHTING		4	2.8	1						
3														4												
5	L	SITE LIGHTING		4	4.2	1								6	L	SITE LIGHTING		1	4.7	1						
7														8												
9	R	RECEPTACLE				1								10		SPACE										
11	N	TIMECLOCK		13	0.2	1								12												
13		SPACE												14		SPACE										
15														16												

			Connected Load	14.6	KVA
R	Receptacle Load	0.0 KVA	Noncontinuous	0.0	KVA
L	Lighting Load	14.6 KVA	Continuous	18.3	KVA
M	Mechanical and Power Load	0.0 KVA	Noncontinuous	0.0	KVA
			TOTAL LOAD	18.3	KVA

CIRCUIT BREAKER SIZE	20A	30A					
CIRCUIT BREAKER COUNT	3	4	0	0	0	0	0

AMPERAGE: 76 AMP

PROJECT
FLAGG ROAD PARKING LOT

PETER D. DESROCHES
No. 7230
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL

CLIENT
UNIVERSITY OF RHODE ISLAND

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

ELECTRICAL SYMBOL LEGEND, SCHEDULES & DETAILS

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 9, 2012

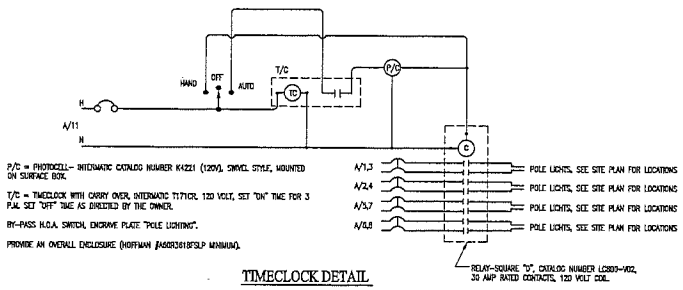
SCALE: AS NOTED

DRAWN BY: JR

CHECKED BY: PDB

DRAWING NUMBER
E-2
SHEET 2 OF 3

CEC# 2011141
CREATIVE ENVIRONMENTS CONSULTING ENGINEERS, CORP.
HVAC • ELECTRICAL • PLUMBING • FIRE PROTECTION •
50 CITRICE PARKWAY
EAST PROVIDENCE, RI 02914
P: 401.438.7720
P: 401.438.7520
WWW.CEC-ENGINEERING.COM



P/C = PHOTOCELL- INTERMATIC CATALOG NUMBER K4221 (120V), SWIVEL STYLE, MOUNTED ON SURFACE BOX.

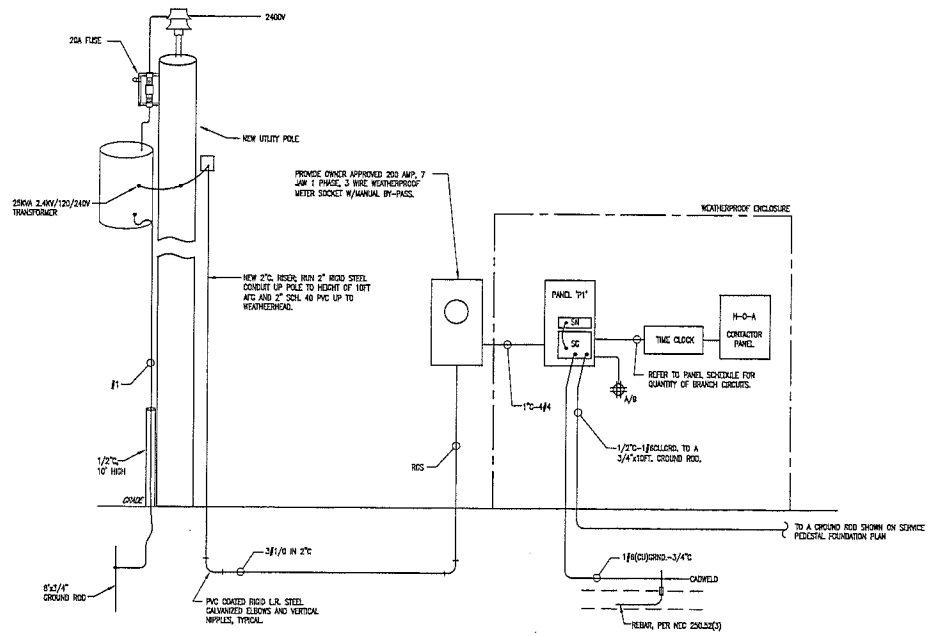
T/C = TIMECLOCK WITH CARRY OVER, INTERMATIC T171CR, 120 VOLT, SET "ON" TIME FOR 3 P.M. SET "OFF" TIME AS DIRECTED BY THE OWNER.

BY-PASS H.O.A. SWITCH, ENGRAVE PLATE "POLE LIGHTING".

PROVIDE AN OVERALL ENCLOSURE (HOFFMAN #A60R3618FSLP MINIMUM).

TIMECLOCK DETAIL

NTS



ELECTRICAL SERVICE/DISTRIBUTION SCHEMATIC

NTS

PROJECT
FLAGG ROAD PARKING LOT

PETER D. DISPANO
No. 7230
REGISTERED PROFESSIONAL ENGINEER
ELECTRICAL

CLIENT
UNIVERSITY OF RHODE ISLAND

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

ELECTRICAL DETAILS

NO.	DATE	REVISIONS	BY

PROJECT NO.: 1377

DATE: MARCH 8, 2012

SCALE: AS NOTED

DRAWN BY: JR

CHECKED BY: PDS

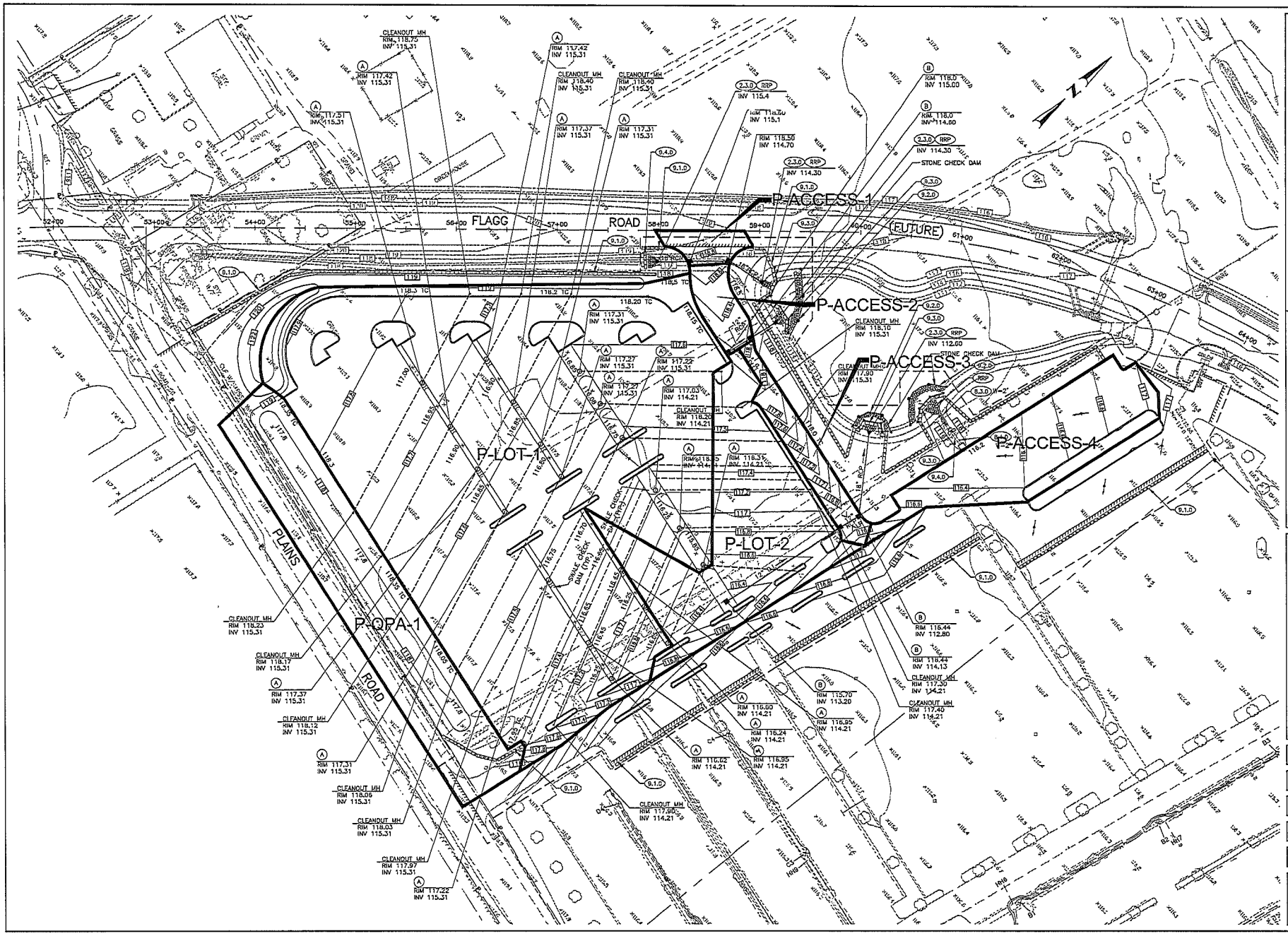
DRAWING NUMBER
E-3
SHEET 3 OF 3

CEC# 2011141

CONSULTING ENGINEERS DESIGN ENVIRONMENT

HVAC-ELECTRICAL-PLUMBING
-FIRE PROTECTION-

50 OFFICE PARKWAY
EAST PROVIDENCE, RI 02914
P: 401.438.7722
F: 401.438.7520
WWW.CEC-ENGINEERING.COM


FLAGG ROAD
(FUTURE)
PLAINS ROAD
P-ACCESS-1
P-ACCESS-2
P-ACCESS-3
P-ACCESS-4
P-LOT-1
P-LOT-2
P-QPA-1
STONE CHECK DAM
CLEANOUT MH
RIM 118.75
INV 115.31
RIM 117.42
INV 115.31
RIM 117.37
INV 115.31
RIM 117.31
INV 115.31
RIM 118.40
INV 115.31
RIM 118.56
INV 114.70
RIM 118.0
INV 115.00
RIM 118.0
INV 114.00
INV 114.30
INV 112.60
RIM 118.10
INV 115.31
RIM 117.27
INV 115.31
RIM 117.22
INV 115.31
RIM 117.03
INV 114.21
RIM 118.20
INV 114.21
RIM 118.23
INV 115.31
RIM 118.17
INV 115.31
RIM 118.12
INV 115.31
RIM 118.06
INV 115.31
RIM 118.03
INV 115.31
RIM 117.97
INV 115.31
RIM 117.90
INV 114.21
RIM 118.44
INV 112.80
RIM 118.44
INV 114.13
RIM 117.30
INV 114.21
RIM 117.40
INV 114.21
RIM 115.70
INV 113.20
RIM 116.95
INV 114.21
RIM 116.00
INV 114.21
RIM 116.24
INV 114.21
RIM 116.02
INV 114.21
RIM 116.95
INV 114.21
118.20 TC
118.15 TC
118.3 TC
118.2 TC
118.35 TC
118.95 TC
118.65 TC
118.60 TC
118.55 TC
118.50 TC
118.45 TC
118.40 TC
118.35 TC
118.30 TC
118.25 TC
118.20 TC
118.15 TC
118.10 TC
118.05 TC
118.00 TC
117.95 TC
117.90 TC
117.85 TC
117.80 TC
117.75 TC
117.70 TC

Attachment C

Copy of RIPDES Construction General Permit

General Permit
Rhode Island Pollutant Discharge Elimination System
Storm Water Discharge Associated
with Construction Activity

September 26, 2008

Valid ONLY in accordance with Part I.C.

Expiration Date: September 25, 2013

Rhode Island Department of Environmental Management
Office of Water Resources
Permitting Section

RIPDES Program

GENERAL PERMIT
RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM
STORM WATER DISCHARGE ASSOCIATED WITH CONSTRUCTION ACTIVITY

PLEASE READ THIS PERMIT CAREFULLY!

Construction activities which disturb one (1) or more acres of land and where storm water runoff is directed, via a point source (see RIPDES Rule 3 for the definition of point source), into a separate storm sewer system or into the waters of the State, are required to seek coverage under a RIPDES storm water permit. The RIPDES Program of the Office of Water Resources realizes that effective regulatory mechanisms to control erosion and sedimentation are currently required by the RIDEM, Freshwater Wetlands and Water Quality Certification Programs; the Coastal Resources Management Council (CRMC); and in those towns/cities which have a Qualifying Local Program that has been formally approved by the Department (see RIPDES Rule 15.01(i) for the definition of Qualifying State, or Local Programs). In order to reduce duplication of effort, construction activities that require a CRMC permit, RIDEM Water Quality Certification approval and/or QLP approval will be automatically granted authorization from RIPDES upon departmental receipt of the CRMC permit or the QLP approval and the RIDEM Water Quality Certification (if applicable) and a complete and certified NOI for activities that disturb five (5) or greater acres. For activities that disturb equal to or greater than one (1) acre and less than five (5) acres, approval will be automatically granted authorization from RIPDES upon applicant receipt of the CRMC permit or the QLP approval and the RIDEM Water Quality Certification (if applicable). For all construction activities equal to or greater that one (1) acre and require a RIDEM Freshwater Wetlands permit, authorization from RIPDES will be automatically granted upon applicants receipt of the Freshwater Wetlands permit. For all other construction activities that disturb five (5) or greater acres, authorization will only be granted upon notification from the Director after RIPDES review of the NOI and Storm Water Pollution Prevention Plan. For all other construction activities that disturb equal to or greater than one (1) acre and less than five (5) acres, authorization will be granted automatically upon departmental receipt of a complete and certified NOI if the project does not propose a storm water or allowable storm water discharge to or discharge related activities within a Natural Heritage Area that may affect, a listed or proposed to be listed endangered or threatened species or its critical habitat. If the project does propose a storm water or non-storm water discharge to or discharge related activities within a Natural Heritage Area, authorization will be automatically granted within thirty (30) days after departmental receipt of NOI unless notified to the contrary by the Director, or automatically granted with a prior approval from the DEM Natural Heritage Program finding no adverse impact. Regardless of the means of obtaining approval, the permittee is still responsible for complying with all terms and conditions of this permit and any other applicable State, local and/or federal regulations. The Department will be held harmless for any failure of the permittee to comply with this permit.

I. GENERAL COVERAGE UNDER THIS PERMIT

A. Permit Area. This permit applies to all areas of the State of Rhode Island.

B. Eligibility

1. Allowable Storm Water Discharges. Subject to compliance with the terms and conditions of this permit, you are authorized to discharge pollutants in:

   a. All new and existing storm water discharges associated with construction activity, including, but not limited to, clearing, grading, excavation, and filling, where total land disturbance is equal to or greater than one (1) acres including construction activities involving soil disturbances of less than one (1) acre of disturbance if that construction activity is part of a larger common plan of development or sale that would disturb one (1) or more acre, and the discharge is composed entirely of storm water. A discharge

shall be considered composed entirely of storm water if there is adequate access to sample the storm water discharge covered under this permit prior to mixing with a discharge which is authorized and in compliance with an existing RIPDES permit or the discharge is listed in Part I.B.2. below. If a construction site is within the jurisdiction of a Qualifying Local Program (QLP), and the operator of the construction activity is not required to obtain a RIDEM Freshwater Wetlands Permit, Coastal Resources Management Council (CRMC) permit, or a RIDEM Water Quality Certification, the operator must apply for QLP approval unless the operator is a Federal or State agency that has obtained RIPDES permit authorization from the Department. For sites requiring QLP approval, all conditions of this permit apply, with the exception of Parts V.L. and V.T. This permit does not pre-empt or supersede or expand the authority of local agencies to prohibit, restrict, or control discharges of storm water to storm drains or other water courses within their jurisdiction;

b. Storm Water Discharges from support activities (e.g., concrete or asphalt batch plants, equipment staging areas yards, material storage areas, excavated material disposal areas, borrow areas) provided:

   i. The support activity is directly related to the construction site required to have a RIPDES permit coverage for discharges of storm water associated with construction activity;

   ii. The support activity is not a commercial operation serving multiple unrelated construction projects by different operators, and does not operate beyond the completion of the construction activity at the last construction project it supports; and

   iii. Appropriate controls and measures are identified in a Storm Water Pollution Prevention Plan (SWPPP) covering the discharges from the support activity areas; and

c. Discharges composed of allowable discharges listed in Part I.B.1 of this permit commingled with a discharge authorized by a different RIPDES permit and/or discharge that does not require a RIPDES permit authorization.

2. Allowable non-storm water discharges. Other discharges not comprised of storm water are allowed under this permit but are limited to the following: discharges which result from the washdown of vehicles where no detergents are used; external building washdown where no detergents are used; the use of water to control dust; fire fighting activities; fire hydrant flushings; natural springs; uncontaminated groundwater; lawn watering; potable water sources including waterline flushings; irrigation drainage; pavement washwaters where spills or leaks of toxic or hazardous materials have not occurred (unless all spilled materials have been removed) and where detergents are not used; and foundation or footing drains where flows are not contaminated with process materials such as solvents, or contaminated by contact with soils where spills or leaks of toxic or hazardous materials has occurred. If any of these discharges may reasonably be expected to be present and to be mixed with storm water discharges, they must be specifically

identified in the site's Storm Water Pollution Prevention Plan as described in Part IV. of this permit.

3. Limitations of Coverage. The following discharges associated with construction activity are not authorized by this permit.

   a. Storm water discharges associated with construction activity that the Director of the Department of Environmental Management has found to be or may reasonably be expected to be contributing to a violation of water quality standards, or to be a significant contributor of pollutants;

   b. Storm water discharges associated with construction activity, allowable non-storm water discharges and discharge related activities that adversely effect a listed, or a proposed to be listed, endangered or threatened species or its critical habitat;

   c. Storm water associated with construction activity discharging into any water for which a Total Maximum Daily Load (TMDL) has been either established or approved by the EPA or other water quality determination unless the SWPPP incorporates measures or controls that are consistent with the assumptions and requirement of the TMDL.

      i. If the TMDL or other water quality determination establishes specific requirements that would apply to the discharges from the site, the requirements must be incorporated into the SWPPP and the necessary steps to be consistent with the TMDL must be implemented.

      ii. If the TMDL or other water quality determination establishes general requirements applicable to construction storm water discharges, but does not establish specific requirements for the discharges from the site, the owner/operator must consult with the Department TMDL authority to confirm that adherence to a SWPPP that meets the requirements of the Construction General Permit will be consistent with the TMDL.

      iii. If an EPA approved or established TMDL or other water quality determination has not specified requirements applicable to construction storm water discharges, but has not specifically excluded these discharges, adherence to a SWPPP that meets the requirements of the Construction General Permit, will generally be assumed to be consistent with the approved TMDL.

      iv. If the EPA approved or established TMDL or other water quality determination specifically precludes the discharges, the discharges are not eligible for coverage under this permit; and

   d. Post-construction discharges that originate from the site after construction activities have been completed and the site has achieved final stabilization, including any temporary support activity. Post-construction storm water from industrial sites may need to be covered by a separate RIPDES permit.

C. Authorization. To be covered under this general permit, owners or operators of storm water discharges associated with construction activities that disturb one (1) or more acres or less than one (1) acre if that construction activity is part of a larger common plan of development or sale that would disturb one (1) or more acre, must comply with the applicable sections below.

1. *Deadlines for Requesting Authorization*

a. For storm water discharges associated with construction activity of five (5) acres or more, which was authorized under the 2003 General Permit and is expected to continue beyond the effective date of this permit, an NOI must be submitted within thirty (30) days of the effective date of this permit to maintain permit coverage in accordance with Part I.C.2 of this permit.

b. For storm water discharges associated with construction activities which commence after the effective date of this permit, and are required to submit an NOI in accordance with Part I.C.2 of this permit, an NOI must be submitted at least thirty (30) days prior to the commencement of the land disturbing activities.

2. *Granting of Authorization.*

CRMC / QLP a. For all construction activities that are required to obtain a CRMC permit, or QLP approval, and a RIDEM Water Quality Certification (if applicable):

CRMC or QLP > 5 acres

i. Construction activities that disturb an area equal to or greater than five (5) acres, authorization to discharge under this permit will be automatically granted upon departmental receipt of the CRMC permit or QLP approval, RIDEM Water Quality Certification (if applicable), and a complete and certified NOI (in accordance with Part III.A.9), unless notified to the contrary by the Director. The issuance of the CRMC permit or the QLP approval and RIDEM Water Quality Certification (if applicable) will serve as authorization of RIPDES approval.

CRMC or QLP 1-5 acres

ii. Construction activities that disturb an area equal to or greater than one (1) acre and less than five (5) acres, authorization to discharge under this permit will be automatically granted upon applicant receipt of the CRMC permit or QLP approval and RIDEM Water Quality Certification (if applicable). The issuance of the CRMC permit or the QLP approval and RIDEM Water Quality Certification (if applicable) will serve as authorization of RIPDES approval.

Note: All construction activities regulated by RIPDES which are also under CRMC review are required to file an application for a Water Quality Certification.

Wetlands >1 acre

b. For all construction activities that disturb an area equal to or greater than one (1) acre and are required to obtain a RIDEM Freshwater Wetlands permit, authorization to discharge under this permit will be automatically

granted upon applicants receipt of the Freshwater Wetlands permit. The issuance of RIDEM Freshwater Wetlands permit will serve as authorization of RIPDES approval.

All Other > 5 acres

c. For all other construction activities that disturb an area equal to or greater than five (5) acres, authorization to discharge will only be granted upon notification from the Director after review of the NOI and Storm Water Pollution Prevention Plan.

All Other 1-5 acres

d. For all other construction activities that disturb an area equal to or greater than one (1) acre and less than five (5) acres, authorization to discharge will be granted as follows, unless notified to the contrary by the Director:

(i) If the construction activity is located completely outside of and does not discharge directly to a Natural Heritage Area found on RIDEM's web site under Maps, DEM Heritage Program Data, authorization will be granted automatically upon receipt of a complete certified NOI (in accordance with Part III.A.9 & 10).

(ii) If the construction activity is located within or discharges directly to a Natural Heritage Area found on RIDEM's web site under Maps, DEM Heritage Program Data, authorization will be automatically granted upon departmental receipt of a complete certified NOI (in accordance with Part III.A.9) and an approval from the DEM Fish and Wildlife finding no adverse impact, or

(iii) If the construction activity is within or discharges directly to a Natural Heritage Area found on RIDEM's web site under Maps, DEM Heritage Program Data, authorization will be automatically granted within thirty (30) days after departmental receipt of a complete certified NOI (in accordance with Part III.A.9).

D. Termination of Coverage. Owners and/or operators of storm water discharges associated with construction activity must notify the Director in writing upon completion of land disturbing activities. At that point, coverage under this permit is terminated. At a minimum, the following information is required to terminate coverage under this permit:

1. The owner's name, mailing address, and telephone number,
2. The operator's name, mailing address, and telephone number,
3. The name and location of the facility,
4. The RIPDES Storm Water permit number, and
5. Certification that the storm water discharge associated with construction activity no longer takes place at the site.

E. Failure to Notify. Owners or operators who fail to notify the Director of their intent to be covered under a general permit, and discharge pollutants to the waters of the State or to a separate storm sewer system without a RIPDES permit, are in violation of Chapter 46-12 of Rhode Island General Laws and the Clean Water Act (CWA).

II. PERMIT CONDITIONS

A. Development of a Storm Water Pollution Prevention Plan (SWPPP), as described in Part IV of this permit, is required prior to submitting an NOI. The SWPPP developed under the previous (2003) general permit may satisfy this requirement, provided it adequately addresses all requirements of this permit. Compliance with the SWPPP is required upon the date of authorization to discharge under this permit. A copy of the SWPPP must be kept on site at all times during the extent of coverage under this permit.

B. All storm water control measures, disturbed areas, areas used for the storage of materials that are exposed to precipitation (including unstabilized soil stockpiles), discharge locations, and locations where vehicles enter or exit the site, as outlined in Part IV of this permit, must be inspected by or under the supervision of the permittee at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event which generates at least 0.25 inches of rainfall per twenty four (24) hour period and/or after a significant amount of runoff. Such areas shall be inspected for evidence of, or the potential for, pollutants entering the waters of the State or a separate storm sewer system. All BMPs shall be maintained to prevent uncontrolled releases of measurable amounts of sediment or sediment laden water from traveling beyond the limits of disturbance. If an inspection reveals a discharge of sediments to the waters of the State or a separate storm sewer system, the permittee must notify this office of the nature of the discharge, the measures taken to clean up the discharge, and the measures taken to prevent future releases.

C. Based on the results of the inspections (as required in paragraph B. above), the site description identified in the SWPPP in accordance with Part IV.E.1. of this permit and pollution prevention measures identified in the SWPPP in accordance with Part IV.E.2. of this permit must be revised as appropriate, but in no case later than seven (7) calendar days following the inspection. Such modifications must provide for implementation of any changes to the SWPPP within seven (7) calendar days following the inspection.

D. A report summarizing the scope of the inspection, name(s), and titles of personnel making the inspection, the date(s) of the inspection, major observations relating to the implementation of the SWPPP, and actions taken in accordance with paragraph B. and C. above must be made and retained as part of the SWPPP for at least five (5) years from the date that the site has undergone final stabilization. Such reports must identify any incidents of noncompliance. Where a report does not identify any incidents of noncompliance, the report must contain a certification that the site is in compliance with the SWPPP and this permit. The report must be signed in accordance with Part V.G. of this permit.

E. Failure to make inspections under this part constitutes a violation of this permit and enforcement actions under 46-12 of R.I. General Laws may result.

III. NOTICE OF INTENT REQUIREMENTS

A. <u>Contents of the Notice of Intent:</u>

1. The owner's name, mailing address, telephone number, ownership status, contact person, billing address, and status as a Federal, State, private, public, or other entity.

2. The operator's name, mailing address, telephone number, and contact person.

3. Construction site information, including the street address, latitude and longitude, nearest utility pole number, and Assessors plat and lot.

4. Information for construction sites that are part of a larger common plan of development or sale, including all the names of development and total disturbed area of the larger common plan.

5. The projected or actual construction commencement date and the projected construction completion date.

6. The total area of the site, the total area of impervious surface for both the pre-construction and post-construction conditions, and the runoff coefficient for both the pre-construction and post construction site conditions.

7. The name of the receiving water(s), or if the discharge is through a separate storm sewer system, the name of the operator of the separate storm sewer system and the ultimate receiving water(s).

8. Location and impact of the construction site relative to Natural Heritage Areas.

9. The type of construction at the site (i.e. the ultimate intended use of the project), the types of any materials handled and/or stored at the site, and the types of any storm water management controls proposed to be used at the site.

10. Applicants with construction activity disturbing greater than five (5) acres who are not required to obtain a permit addressing erosion and sediment controls from CRMC, a QLP, RIDEM Freshwater Wetlands Program or a RIDEM Water Quality Certification, are required to submit a copy of the SWPPP as part of the NOI for review. Applicants previously authorized to discharge under the 2003 general permit are only required to submit the SWPPP to obtain authorization in accordance with Part IV.D of this permit.

11. For all construction activities that disturb an area equal to or greater than five (5) acres and are required to obtain a CRMC permit and/or QLP approval, or disturb an area equal to or greater than one (1) acres and less than five (5) acres and do not require a permit or approval from the CRMC, the RIDEM Freshwater Wetlands Program, or a QLP, submission of a complete NOI is required and must contain a signed certification by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect, that the SWPPP has been developed in accordance to the requirements of this permit as well as all applicable guidelines of the Soil Erosion and Sediment Control Handbook and the Storm Water Design and Installation Standards Manual (see Part IV.A. for references). If the SWPPP requires the practice of engineering, the NOI must be signed by a Registered Professional Engineer.

12. For all construction projects that are required to submit an NOI to the Department in accordance with Part I.C.2.c & d of this permit, the NOI must contain a signed certification by a Registered Professional Engineer, a Certified Professional in

Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect certifying that the construction activity is located completely outside of and does not discharge directly to a Natural Heritage Area found on RIDEM's web site under Maps, Environmental Resource Map. For projects that propose a storm water or allowable non-storm water discharge to a Natural Heritage Area, or has discharge related activities that potentially affect, a listed or proposed to be listed endangered or threatened species or its critical habitat, must submit a map showing the location of the construction site, including the street, nearest utility pole number, and Assessors plat and lot, total area of the site, and the limits of disturbance.

13. After review of the NOI, additional information may be required by this office to determine whether or not to authorize the discharge under this permit.

14. Where a new operator is selected after the submittal of an NOI, a new NOI must be submitted by the new operator in accordance with the requirements of this part.

B. Where to Submit. A completed and signed NOI must be submitted to:

R.I. Department of Environmental Management
Office of Water Resources
RIPDES Program
Permitting Section
235 Promenade Street
Providence, RI 02908

C. Additional Notification. Construction sites discharging storm water which are operating under an approved local Soil Erosion and Sediment Control Ordinance must, in addition to the requirements in paragraph B. above, submit a copy of the NOI to the Town or City Department which approves such plans.

D. Deficient NOI. If any portion of the NOI does not meet one or more of the minimum requirements of this part, then the applicant will be notified as such by a deficiency letter at any point during the review period. It is the responsibility of the applicant to make all required changes in the plan and resubmit the application. The review period will recommence upon the departmental receipt of the revised application.

IV. STORM WATER POLLUTION PREVENTION PLAN REQUIREMENTS

A. A Storm Water Pollution Prevention Plan (SWPPP) shall be developed for each construction site covered by this permit. The SWPPP shall be designed to address two components of storm water pollution: (1) pollution caused by soil erosion and sedimentation during and after construction; and (2) storm water pollution caused by use of the site after construction is completed, including, but not limited to, parking lots, roadways, impervious surfaces, and the maintenance of grassed areas. The SWPPP shall be stamped and signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect certifying that the SWPPP meets all requirements of this permit, and be developed as part of the NOI application process. However, SWPPPs which require the practice of engineering must be stamped and signed by a Registered Professional Engineer. The SWPPP shall identify potential sources of

pollutants which may reasonably be expected to affect the quality of storm water discharges associated with the construction activity. The SWPPP shall identify potential sources of pollutants associated with post construction activity and comply with all local or QLP post construction requirements. In addition, the SWPPP shall describe and ensure the implementation of Best Management Practices (BMPs) which are to be used to reduce or eliminate the pollutants in the storm water discharge(s) at the site and assure compliance with the terms and conditions of this permit. BMP selection shall include an evaluation of the effectiveness of available practices and be made with proper references. Available guidance documents include, but are not limited to, the following:

1. RIDEM, USDA Soil Conservation Service, and Rhode Island State Conservation Committee. **Soil Erosion and Sediment Control Handbook.** 1989.

2. RIDEM. **Storm Water Design and Installation Standards Manual.** (as amended)

3. RIDEM - Office of Environmental Coordination. **Artificial Wetland for Storm Water Treatment: Processes and Design.** 1989.

4. EPA - Office of Water. **Storm Water Management for Construction Activities.** September, 1992.

B. If the SWPPP is not required to be submitted along with the NOI (see Part III.A.8. of this permit), then the owner, operator, or other designated person under the supervision of the owner or operator shall make it available to the Department upon request.

C. If the SWPPP is requested and reviewed by the Director, he or she may notify the permittee at any time that it does not meet one or more of the minimum requirements of this part. After such notification from the Director, the permittee shall amend the SWPPP and shall submit to the Director, within seven (7) days of the notification, a written certification that the required changes have been made.

D. The permittee shall amend the SWPPP whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SWPPP proves to be ineffective in achieving its objectives. In addition, the SWPPP shall be amended to identify any new operator that will implement a component of the SWPPP. All amendments made to the SWPPP must be submitted to the applicable agency which conducted the initial review. Amendments to the SWPPP that will be reviewed by the Department will be reviewed in the same manner as described in paragraph C. above.

E. The SWPPP shall, at a minimum, include the following:

1. <u>Site Description</u>

a. A site plan (map) which includes the following:

i. total area of development;
ii. total area of soil disturbance;
iii. pre- and post-development drainage patterns;
iv. approximate slopes anticipated after the completion of major

grading activities;

v. the location of all erosion and sedimentation storm water control structures, including the location of any temporary or permanent retention or detention basins or other water quality control structures;

vi. the location of all impervious structures; and

vii. the location and name of the receiving waters or separate storm sewer system and the ultimate receiving waters.

b. A narrative describing the nature and estimated timetable for the construction activities, including a sequence of major activities of the project, and the ultimate intended use of the project (e.g. shopping mall, residential subdivision, etc.).

c. Estimates of the total area of the site and the total area of the site that is expected to undergo soil disturbance.

d. The calculated pre-construction and post-construction runoff coefficients for the site.

e. A description of the soils at the site and of each soils' erodibility hazard as listed in the Soil Survey of Rhode Island.

f. A description of potential sources of pollution that may reasonably be expected to effect the quality of storm water discharges from the site, such as exposed, unstabilized soil stockpiles.

g. A list of sources of allowable non-storm water discharges, as described in Part I.B.2. of this permit (except flows from fire fighting activities)

h. Existing data on the quality of any known discharges from the site, if available.

2. Controls. The SWPPP shall include a description of controls, including construction details appropriate for the site, and implement such controls. The description of controls shall address the following minimum components:

a. *Erosion and Sedimentation Controls (E&S)*

i. Vegetative Practices. A description of the vegetative BMPs designed to preserve existing vegetation where attainable and revegetate open areas as soon as practicable after grading or construction. Such practices may include: temporary and permanent seeding, mulching, sod stabilization, vegetative buffer strips and tree protection. The operator should initiate appropriate vegetative practices on all disturbed areas as soon as possible but not more than fourteen (14) days after the construction activity in that area has temporarily or permanently ceased, unless the activity is to resume within twenty one (21) days.

ii. Structural Practices. A description of structural BMPs to divert flows

from exposed soils, filter runoff, store flows, or otherwise limit runoff from coming into contact with exposed, unvegetated areas of the site and to prevent sediments and/or other pollutants from leaving the site. Such practices may include: staked hay bales, silt fence, earthen dikes, drainage swales, check dams, subsurface drains, pipe slope drains, level spreaders, storm drain inlet protection, rip-rap outlet protection, sediment traps and sediment basins.

b. *Post Construction Storm Water Management.* A description of measures that will be installed during the construction project to control pollutants in storm water discharges that will occur at the site after the construction operations have been completed. Such measures may include: infiltration of runoff on-site, flow attenuation by use of open vegetated swales and natural depressions, vegetated buffer strips, and the use of detention/ retention structures. Where controls are needed to prevent or minimize erosion, velocity dissipation devices shall be placed at all outfall locations and along the length of any outfall channel as necessary to provide a non-erosive velocity flow from the structure to the receiving waters. Justification shall be provided by the permittee for each practice selected based on site conditions. In addition, the SWPPP shall include a description of maintenance activities in accordance with paragraph d. below.

c. *Other Controls.*

i. Off-site Vehicle Tracking of Sediments. Each site shall have graveled access entrance and exit drives and parking areas to reduce the tracking of sediment onto public or private roads.

ii. Waste Disposal. All types of waste generated at the site shall be disposed of in a manner consistent with State Law and/or regulations.

iii. Spill Prevention and Response Procedure. Areas where potential spills can occur, and their accompanying drainage points, shall be identified clearly in the SWPPP. The potential for spills to enter the storm water drainage system shall be eliminated wherever feasible. Where appropriate, specific material handling procedures, storage requirements, and procedures for cleaning up spills shall be identified in the SWPPP and made available to the appropriate personnel. The necessary equipment to implement a clean up must also be made available to personnel.

iv. Control of Allowable Non-Storm Water Discharges. If allowable non-storm water discharges are occurring at the site, then such discharges shall be visually observed and recorded in accordance with Part II of this permit.

v. Good Housekeeping. Each site shall provide for the minimization of exposure of construction debris (including, but not limited to, insulation, wiring, paints and paint cans, solvents, wall board, etc.) to precipitation. The SWPPP shall ensure that such construction

waste is properly disposed of, to avoid exposure to precipitation, at the end of each working day.

d. *Maintenance.* A description of procedures to maintain, in good and effective operating condition, vegetation, storm water control measures, and other protective measures, identified in the site plan, must be included as part of the SWPPP. Procedures in the SWPPP shall provide that all erosion controls on the site are inspected at least once every seven (7) calendar days and within twenty four (24) hours after an event which generates 0.25 inches of rain in a twenty four (24) hour period.

e. No condition of this permit shall release the permittee from any responsibility or requirements under other environmental statutes or regulations.

V. GENERAL REQUIREMENTS

A. Duty to Comply. The permittee must comply with all conditions of this permit and any other applicable State, local and/or federal regulations. Any permit noncompliance constitutes a violation of Chapter 46-12 of the Rhode Island General Laws and the CWA and is grounds for enforcement action which may include, permit termination, revocation and reissuance, modification, or for the denial of a permit renewal application and the imposition of penalties.

1. The permittee shall comply with effluent standards or prohibitions established under Section 307(a) of the CWA for toxic pollutants within the time provided in the regulations that establish these standards or prohibitions, even if the permit has not yet been modified to incorporate this requirement.

2. Section 309 of the CWA provides significant penalties for any person who violates a permit condition implementing Sections 301, 302, 306, 307, 308, 318, or 405 of the CWA or any permit condition or limitation implementing any such sections in a permit issued under Section 402 of the CWA. Any person who violates any condition of this permit is subject to a civil penalty of up to $25,000 per day of such violation, as well as any other appropriate sanctions provided by Section 309 of the CWA. Section 309(c)(4) of the CWA provides that any person who knowingly makes any false material statement, representation, or certification in any record or other document submitted or required to maintained under this permit, including reports of compliance or noncompliance shall, upon conviction, be punished by a fine of up to $10,000 or by imprisonment of not more than two (2) years, or by both.

3. Chapter 46-12 of the R.I. General Laws provides that any person who violates a permit condition is subject to a civil penalty of not more than $25,000 per day of such violation. Any person who willfully or negligently violates a permit condition is subject to a criminal penalty of not more than $25,000 per day of such violation and imprisonment for not more than five (5) years, or both. Any person who knowingly makes any false statement in connection with the permit is subject to a criminal penalty of not more than $5,000 for each instance of violation or by imprisonment for not more than thirty (30) days, or both.

B. Continuation of the Expired General Permit. Provided the permittee has reapplied in accordance with paragraph C. below, an expired general permit continues in force and effect until a new general permit is issued. Only those construction sites previously authorized to discharge under the expired permit are covered by the continued permit.

C. Duty to Reapply. If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain coverage under a new permit. The permittee shall submit a complete Notice of Intent at least one hundred eighty (180) days before the expiration date of the existing permit, unless permission for a later date has been granted by the Director.

D. Need to Halt or Reduce Activity Not a Defense. It shall not be a defense for the permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.

E. Duty to Mitigate. The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit, which has a reasonable likelihood of adversely affecting human health or the environment.

F. Duty to Provide Information. The permittee shall furnish to the Department, within a reasonable time, any information which the Director may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall furnish to the Director any documents that are required to be kept as part of this permit.

G. Signatory Requirements. All Notices of Intent, Storm Water Pollution Prevention Plans, reports, certifications, or other information submitted to the Director, or that this permit requires be maintained by the permittee shall be signed and certified in accordance with Rule 12 of the RIPDES regulations. R.I. General Laws, Chapter 46-12 provides that any person who knowingly makes any false statements, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or noncompliance shall, upon conviction, be punished by a fine of not more than $5,000 per violation, or by imprisonment for not more than thirty (30) days per violation, or by both.

H. Oil and Hazardous Substance Liability. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties to which the permittee is or may be subject under Section 311 of the CWA.

I. Release in Excess of Reportable Quantities. If a release in excess of a reportable quantity occurs, this office must be notified immediately. This permit does not relieve the permittee of the reporting requirements of 40 CFR 117 and 40 CFR 302. The discharge of hazardous substances in the storm water discharge(s) from a facility shall be minimized in accordance with the applicable storm water pollution prevention plan for the facility, and in no case, during any twenty four (24) hour period, shall the discharge(s) contain a hazardous substance equal to or in excess of reportable quantities.

J. Property Rights. The issuance of this permit does not convey any property rights of any sort, nor any exclusive privileges, nor does it authorize any injury to private property nor any invasion of personal rights, nor any infringement of Federal, State, or local laws or

regulations.

K. Severability. The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances and the remainder of this permit shall not be affected thereby.

L. Transfers. This permit is not transferable to any person except after notice to the Director. The Director may require the operator to apply for and obtain an individual RIPDES permit as stated in Part V.T. of this permit.

M. State Laws. Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, or penalties established pursuant to any applicable State law.

N. Proper Operations and Maintenance. The permit shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the requirements of the storm water pollution prevention plans.

O. Monitoring and Records.

1. Samples and measurements taken for the purpose of monitoring shall be representative of the volume and nature of the discharge over the sampling and reporting period.

2. The permittee shall retain records of all monitoring including all calibration and maintenance records and all original strip chart recordings from continuous monitoring instrumentation, copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five (5) years from the date of the sample, measurement, report or application. This period may be extended by request of the Director at any time.

3. Records of monitoring information shall include:

   a. The date, exact place, and time of sampling or measurements;
   b. The individual(s) who performed the sampling or measurements;
   c. The date(s) analyses were performed;
   d. The individual(s) who performed the analyses;
   e. The analytical techniques or methods used; and
   f. The results of such analyses.

4. Monitoring must be conducted according to test procedures approved under 40 CFR 136 and applicable Rhode Island regulations, unless other test procedures have been specified in this permit.

5. The CWA provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall upon conviction, be punished by a fine of up to $10,000 per violation or by imprisonment for not more than six (6) months per violation, or by both. Chapter 46-12 of the Rhode Island General Laws also provides that such

acts are subject to a fine of up to $5,000 per violation, or by imprisonment for not more than thirty (30) days per violation, or by both.

6. Monitoring results must be reported on a Discharge Monitoring Report (DMR).

7. If the permittee monitors any pollutants more frequently than required by this permit, using test procedures approved under 40 CFR 136, applicable State regulations, or as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted in the DMR.

P. Bypass of Storm Water Control

1. *Anticipated Bypass.* If the permittee knows in advance of the need for a bypass, he or she shall notify this Department in writing at least ten (10) days prior to the date of the bypass. Such notice shall include the anticipated quantity and the anticipated effect of the bypass.

2. *Unanticipated Bypass.* The permittee shall submit notice of an unanticipated bypass. Any information regarding the unanticipated bypass shall be provided orally within twenty four (24) hours from the time the permittee became aware of the circumstances. A written submission shall also be provided within five (5) days of the time the permittee became aware of the bypass. The written submission shall contain a description of the bypass and its cause; the period of the bypass; including exact dates and times, and if the bypass has not been corrected, the anticipated time it is expected to continue; and steps taken or planned to reduce, eliminate and prevent reoccurrence of the bypass.

3. *Prohibition of Bypass.*

   a. Bypass is prohibited and enforcement action against the permittee may be taken for the bypass unless:

      i. The bypass was unavoidable to prevent loss of life, personal injury or severe property damage;

      ii. The permittee submitted notices as required in paragraphs P.1. and P.2. above.

   b. The Director may approve an unanticipated bypass after considering its adverse effects, if the Director determines that it will meet the two conditions in paragraph P.3.a. above.

Q. Upset Conditions

1. An upset constitutes an affirmative defense to an action brought for non-compliance with technology based permit limitations if the requirements of paragraph 2. below are met. No determination made during administrative review of claims that noncompliance was caused by upset, and before an action for noncompliance, is final administrative action subject to judicial review.

2. A permittee who wishes to establish an affirmative defense of an upset shall

demonstrate, through properly signed, contemporaneous operating logs, or other relevant evidence, that:

a. An upset occurred and the permittee can identify the specific causes(s) of the upset;
b. The permittee facility was at the time being properly operated;
c. The permittee submitted notice of the upset as required in Rule 14.08 of the RIPDES Regulations; and
d. The permittee complied with any remedial measures required under Rule 14.05 of the RIPDES Regulations.

3. In any enforcement proceeding the permittee seeking to establish the occurrence of an upset has the burden of proof.

R. Inspection and Entry. The permittee shall allow the Director, upon the presentation of credentials and other documents as may be required by law, to:

1. Enter upon the permittee's premises where a regulated activity is conducted, or where records must be kept under the conditions of this permit;
2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
3. Inspect at reasonable times any equipment, practices, or operations regulated or required under this permit; and
4. Sample or monitor any substances or parameters at any location, at reasonable times, for the purposes of assuring permit compliance or as otherwise authorized by the CWA or R.I. law.

S. Permit Actions. This permit may be modified, revoked and reissued, or terminated for cause, including but not limited to: violation of any terms or conditions of this permit; obtaining this permit by misrepresentation or failure to disclose all relevant facts; or a change in any condition that requires either a temporary or permanent reduction or elimination of the authorized discharge. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated noncompliance does not stay any permit condition.

T. Requiring an Individual Permit or an Alternative General Permit

1. The Director of the Department of Environmental Management (DEM) may require any owner or operator authorized to discharge storm water under this permit to apply for and obtain either an individual or an alternative RIPDES general permit. Any interested person may petition the Director to take action under this paragraph. The Director may determine at his or her own discretion that an individual or an alternative general permit is required (see RIPDES Rule 32 for reasons why an alternative permit may be required).

2. Any owner or operator authorized to discharge storm water by this permit may request to be excluded from coverage of this permit by applying for coverage under an individual permit or an alternative general permit. The request shall be granted by the issuance of an individual permit only if the reasons cited by the owner or operator are adequate to support the request. The Director shall notify the permittee within a timely fashion as to whether or not the request has been

granted.

3. If a facility requests or is required to obtain coverage under an individual or an alternative general permit, then authorization to discharge storm water under this permit shall automatically be terminated on the date of issuance of the individual or the alternative general permit. Until such time as an alternative permit is issued, the existing general permit remains fully in force.

U. Reopener Clause

1. If there is evidence indicating potential or realized impacts on water quality due to any storm water discharge associated with a construction activity covered by this permit, the owner or operator of such discharge may be required to obtain an individual permit or alternative general permit in accordance with Part V.T. of this permit or the permit may be modified to include different limitations and/or requirements.

2. Permit modification or revocation will be conducted in accordance with 40 CFR 122.62, 122.63, 122.64 and 124.5.

V. Availability of Reports. Except for data determined to be confidential under Part W.1. below, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the DEM at 235 Promenade Street, Providence, Rhode Island. As required by the CWA, effluent data shall not be considered confidential. Knowingly making any false statement on any such report may result in the imposition of criminal penalties as provided for in Section 309 of the CWA and under Chapter 46-12-14 of the Rhode Island General Laws.

W. Confidentiality of Information

1. Any information submitted to DEM pursuant to these regulations may be claimed as confidential by the submitter, consistent with Rhode Island General Law 38-2-2. Any such claim must be asserted at the time of the submission in the manner prescribed on the application form or instructions or, in the case of other submissions, by stamping the words "confidential business information" on each page containing such information. If no claim is made at the time of submission, DEM may make the information available to the public without further notice.

2. Claims of confidentiality for the following information will be denied:

   a. The name and address of any permit application or permittee;
   b. Permit applications, permits and any attachments thereto; and
   c. RIPDES effluent data.

X. Right to Appeal. Within thirty (30) days of receipt of notice of final authorization, the permittee or any interested person may submit a request to the Director for an adjudicatory hearing to reconsider or contest that decision. The request for a hearing must conform to the requirements of Rule 49 of the RIPDES Regulations.

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

Dear Applicant:

Section 46-12-15(b) of the Rhode Island General laws of 1956, Title 46, Chapter 12 entitled Water Pollution, as amended, prohibits the discharge of pollutants into waters of the State. The only exceptions are discharges in compliance with the terms and conditions of a Rhode Island Pollutant Discharge Elimination System (RIPDES) Permit issued in accordance with State Regulations.

Rule 31 of the RIPDES Regulation, requires permit coverage for construction sites disturbing equal to and greater than one acre, as well as sites less than one acre of total land area that are part of a larger common plan of development or sale if the larger common plan will ultimately disturb equal to or greater than one acre.

To request authorization under the General Permit for Storm Water Discharge Associated with Construction Activity, which was reissued and became effective on September 26, 2008, applicants must follow the submission requirements under Part I.C of the permit. For additional information, you may obtain the fact sheet titled "Frequently Asked Questions (FAQ's) on RIPDES Permit Requirements for Storm Water Discharges Associated with Construction Activity" by visiting the website at: http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/t4guide/consfact.htm. Enclosed with this letter is a copy of the Construction General Permit NOI Application Form. Provided all the required information is submitted and it is determined that a general permit is appropriate for a site, authorization will be granted in accordance with Part 1.C. of this permit. The 2008 Construction General Permit expires at midnight September 25, 2013.

A non-refundable application fee is due at the time the NOI is submitted to this office in the form of a check or money order, payable to the General Treasurer of the State of Rhode Island (**note: no fee if only an NOI is required to be submitted, $400 fee if a NOI and a SWPPP is required to be submitted**). The review for completeness of the application will not be made until the fee is paid. The check of money order and the attached Application(s) Fee Form must be submitted to:

Department of Environmental Management
Office of Management Services
235 Promenade Street
Providence, RI 02908

Return the completed NOI form to:

Department of Environmental Management
Office of Water Resources
RIPDES Program
235 Promenade Street
Providence, RI 02908

Any questions about the General Permit or the NOI Form should be directed to the RIPDES Program Staff, Permitting Section at (401) 222-4700.

Sincerely,

Eric A. Beck, P.E.
Supervising Sanitary Engineer

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES)
NOTICE OF INTENT (NOI)
STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY
(Revised 8/08)

DEM USE ONLY

Date NOI Received _____

Date Fee Received _____

RIPDES# RIR_____

MARK ONLY ONE ITEM	☐ Re-Application ☐ Amendment Previous RIPDES Authorization No. RIR_____	☐ New Authorization	

I. OWNER

Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ( )
Contact Person:	Title:		
Billing Address (if different than above):			
City:	State:	Zip:	

Ownership (please circle one):
PRI - Private PUB - Public BPP - Public/Private STA - State FED - Federal
Other (please specify):

II. OPERATOR (if different from Owner)

Name:			
Local Mailing Address:			
City:	State:	Zip:	Phone: ( )
Contact Person:	Title:		

III. CONSTRUCTION SITE INFORMATION

Site's Official or Legal Name:			
Street Address:			
City:	State:	Zip:	Phone:
Latitude (to nearest 15 sec.) _____Deg. _____Min. _____Sec.	Longitude (to nearest 15 sec.) _____Deg. _____Min. _____Sec.		
Nearest Utility Pole Number:	Assessors Plat:	Lot:	

Is the construction site part of a larger common plan of development or sale? ☐ YES ☐ NO

If YES, you must include the following information:

All Names of Development:_____

Projected **Total Disturbed Area of larger common plan:**_____ **Acres**

If the construction project is part of a larger common plan and the total disturbed area of the larger common plan is 5 acres or more then submission of the Storm Water Pollution Prevention Plan and Full Set of Plans is required.

Projected or Actual Construction Commencement _____ MO/DY/YR Projected Construction Completion _____ MO/DY/YR		
Area of Site: Total _____ Acres Disturbed _____ Acres	Total area of Impervious Surface: Pre-Construction _____ Acres Post-Construction _____ Acres	Runoff Coefficient or Curve Number: Pre-Construction _____ Post-Construction _____

IV. RECEIVING WATER INFORMATION (For an NOI to be considered complete the name of the receiving surface water must be included)

NOTE: If Storm Water from the site discharges to a Combined Sewer Overflow a RIPDES authorization for the construction activity is not necessary, please confirm with the appropriate sewer authority.

☐ Separate Storm Sewer System (MS4) Name:_____

☐ Receiving Surface Water Name:_____ Water Body ID#:_____

☐ Unnamed stream or wetlands connected to named surface water. Name:_____

☐ Unnamed stream or wetlands not connected to named surface water.

Is the Receiving Surface Water an Impaired Water Body? ☐ YES ☐ NO

Watershed Code: Name of Watershed:

V. NATURAL HERITAGE AREA (NHA) INFORMATION

Is the site within or directly discharging to a Natural Heritage Area (NHA)?
☐ YES ☐ NO

If the site is within or directly discharging to a NHA, do you have previous approval from DEM Fish and Wildlife?
☐ YES ☐ NO If yes, include a copy of the approval letter

Projects that propose a storm water or allowable non-storm water discharge to a NHA, or has discharge related activities that potentially affect a listed or proposed to be listed endangered or threatened species or its critical habitat, must submit a map showing the location of the construction sites, including the street, nearest utility pole number, and Assessor's plat and lot, total area of the site, and the limits of disturbance.

VI. CONSTRUCTION TYPE (check all that apply)

Type of Construction:

☐ New Development ☐ Redevelopment
☐ Residential ☐ Commercial ☐ Industrial ☐ Restoration (i.e. wetlands)
☐ MS4 Capital Improvements, specify (municipal, State, private institutional):_____
☐ Utility ☐ Other (please list):_____

Types of Materials Handled and/or Stored Outdoors:

☐ Solvents ☐ Paints ☐ Petroleum Products ☐ Metal
☐ Plated Products ☐ Asphal t/Concrete ☐ Hazardous Substances ☐ Wood Treated Products
☐ Other (please list):_____

Types of Storm Water Management Controls:

☐ Oil/Water Separator ☐ Erosion Controls ☐ Sedimentation Controls ☐ Overhead Coverage
☐ Detention/Desiltation Pond ☐ Chemical Treatment ☐ Other (please specify):_____

VII. REGULATORY INFORMATION (if applicable, please attach plan or approval documentation)

Is the site subject to Coastal Resources Management Council (CRMC) review and approval?
☐ YES ☐ NO Application Number: _____
Water Quality Certification Application Number: _____

If Yes, for construction activities that disturb an area of five (5) or more acres, authorization to discharge under this permit will be automatically granted upon departmental receipt of the CRMC approval, RIDEM Water Quality Certification (if applicable), and a complete and certified NOI.

Note: all construction activities regulated by the RIPDES Program, which are also under CRMC review, are required to file an application for a Water Quality Certification.

Is the site subject to Qualifying Local Program (QLP) review and approval?
☐ YES ☐ NO Name: _____
Water Quality Certification Application Number (if applicable): _____

If Yes, for construction activities that disturb an area of five (5) or more acres, authorization to discharge under this permit will be automatically granted upon departmental receipt of the QLP approval, RIDEM Water Quality Certification (if applicable), and a complete and certified NOI.

VIII. OWNER/OPERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that if review of the Storm Water Pollution Prevention Plan is performed by the Permitting Program, Wetlands Section, Coastal Resources Management Council, or by a city/town which has adopted a DEM approved Soil Erosion and Sediment Control Ordinance, then a Storm Water Permit from this office is contingent upon approval from the reviewing agency. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the SWPPP as appropriate in accordance with the requirements of the General Permit.

Print Owner Name _____

Print Owner Title _____

Signature _____ Date _____

Print Operator Name* _____

Print Operator Title _____

Signature _____ Date _____

*This part needs to be filled out by the entity or the individuals that will have an ongoing role in the management and operation of the system during construction.

IX. PROFESSIONAL CERTIFICATION - NATURAL HERITAGE AREAS

I certify under penalty of law that the Natural Heritage Area Information under Section V of this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete at the time this application is made. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name of Professional _____

Print Professionals Title* _____

Registration or License Number _____

Signature _____ Date _____

*Must be signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect.

X. PROFESSIONAL CERTIFICATION - SWPPP DEVELOPMENT

Note: This section needs to be filled out for construction activities that are not required to submit a SWPPP to the RIPDES Program (refer to Part III.A.9 of the General Permit). The purpose of this certification is to document that a site specific SWPPP was prepared consistent with the requirements of the General Permit prior to filing the NOI. This certification by a professional does not alleviate or in any way limit the liability and sole responsibility of the Owner/Operator to properly implement the SWPPP and to amend the SWPPP as site conditions may require, so as to effectively control storm water discharges leaving the site during the construction period.

I certify under penalty of law that a site specific SWPPP was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for developing the SWPPP, the SWPPP is, to the best of my knowledge and belief, true, accurate, and complete at the time this certification is made and has been developed in accordance to the requirements of the Permit as well as all applicable guidelines of the Soil Erosion and Sediment Control Handbook and the Storm Water Design and Installation Standards Manual. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name of Professional _____

Print Professionals Title* _____

Registration or License Number _____

Signature _____ Date _____

*Must be signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect. If the SWPPP requires the practice of engineering, this must be signed by a Registered Professional Engineer.

Note: Upon completion of the permitted project, the DEM must be notified via a Notice of Termination (NOT) form. In accordance with Construction Activity General Permit Part V.L., this permit is not transferable to any person or group except after due notice to the Director. If no such notice is given, the named owner will be held liable for all fees and expenses levied to this permit.

RHODE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources

APPLICATION FEE FORM

Please complete the information below and **submit this completed form and your check (payable to "R.I. General Treasurer") for the appropriate fee directly to**:

R.I. Department of Environmental Management
Office of Management Services
235 Promenade Street
Providence, RI 02908

***** FEES ARE NOT REFUNDABLE *****

APPLICANT'S NAME: _____

OWNER'S NAME: _____

SITE LOCATION: _____

APPLICATION TYPE (Permit, Order of Approval): **RIPDES General Permit**

NOTE: The application and all accompanying documents should be submitted to the appropriate section of the Office of Water Resources, 235 Promenade Street, Providence, RI 02908-5767. Application review will be initiated only upon receipt of the complete application fee.

FOR OFFICE USE ONLY

OMS Receipt Date: _____

Fee Amount Received: _____

Processor Initials: _____

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

Office of Water Resources

INSTRUCTIONS FOR THE RI POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES)
NOTICE OF INTENT (NOI) - STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY

Who Must File A Notice of Intent (NOI) Form

Discharges of storm water associated with construction activity to a water body of the State of Rhode Island are prohibited without a Rhode Island Pollutant Discharge Elimination System (RIPDES) permit. The operator of a construction activity that has such a storm water discharge must submit a Notice of Intent (NOI) to obtain coverage under the RIPDES Storm Water General Permit. If you have questions about whether you need a permit under the RIPDES Storm Water program contact the Rhode Island Department of Environmental Management (RIDEM), Office of Water Resources, Permitting Section at (401) 222-4700.

The original NOI form must be sent to:

RIDEM
Office of Water Resources
RIPDES Program
Permitting Section
235 Promenade Street
Providence, RI 02908

Please be sure to keep a copy for your files.

Completing the Form

You must type or print in the appropriate areas only. Abbreviate if necessary to save space.

Section I - Owner Information

Give the legal name of the person, firm, public (municipal) organization, or any other entity that owns the site described in this application (RIPDES Rules 3 & 12). The name of the owner may or may not be the same as the name of the site. Do not use a colloquial name. Enter the complete address and telephone number of the owner. Provide the name of person to be contacted to answer questions on the construction project. Circle the appropriate choice to indicate the legal status of the owner of the site.

Section II - Operator Information

If the operator is the same as the owner do not complete this section. Give the legal name of the person, firm, public (municipal) organization, or any other entity that has legal responsibility for the day-to-day operations of the site described in this application (RIPDES Rules 3 & 12). Enter the complete name address and telephone number of the operator.

Section III - Construction Site Information

Enter the site's official or legal name and complete street address and telephone number, if available. Enter the latitude and longitude of the site. Enter the number of the utility pole closest to the site and the assessor's plat and lot numbers of the site. Indicate if the site is part of a larger development by checking yes or no. If yes, please enter the name of the development and total area of disturbance of the larger common plan. Indicate the actual or projected construction commencement and the projected construction completion date using the 2-digit code format for month/day/year (e.g. 01/31/09 for January 31, 2009). Enter the total area of the site (acres), the area of disturbed land (acres), and the total area of the impervious surface for both pre-construction and post-construction (acres). You must also supply the runoff coefficient or curve number for both pre-construction and post-construction.

Section IV - Receiving Water Information

If the storm water discharges to a separate storm sewer system check the box and enter the name of the operator of the storm sewer system and enter the name of the ultimate surface water. If the site discharges storm water directly to a surface water body check the box and enter the name of the receiving water. If the receiving water is an unnamed stream or wetlands that is either connected to a named surface water check the box and enter the name of surface water; or if the receiving water is an unnamed stream or wetlands not connected to named surface water check the box. Determine the water body ID number and if the receiving water body is impaired:

- Step 1: Go to: http://www.dem.ri.gov/maps/index.htm
- Step 2: Select Environmental Resource Map.
- Step 3: Open the "DEM Water Quality and Impairments" Folder listed under the LAYERS heading.
- Step 4: Select "Integrated Assessment FW Stream", "Integrated Assessment FW Pond" or "Integrated Assessment FW Estuarine" as applicable for your discharge, by checking the square box and clicking on the "Refresh Map" button.
- Step 5: Activate the appropriate layer by selecting the circle next to the applicable "Integrated assessment" water body type (stream, pond, estuarine).

- Step 6: Click on left hand legend the "Togle between Legend and Layers List" icon (top left icon), legend with water quality categories pops-up on the right. Water classes 5 and 4A, indicate impaired water bodies scheduled for a TMDL and impaired water bodies with EPA approved TMDLs respectively.

- Step 7: Select the Zoom from icons listed on the left hand legend and zoom in to the area in the vicinity of your construction project and receiving water body.

- Step 8: Open the "Transportation" folder listed under the LAYERS heading and select "Primary Roads" or "All Roads" then click on refresh button.

- Step 8: Select the information feature (**i** icon in red circle) on the left hand legend, and click on the receiving water body on the vicinity of the ultimate discharging point. Information regarding the receiving water body will be shown on the bottom of the screen, such as the name of the water body, water body ID number, and Integrated Report Category (IRCat), water classes 5 and 4A, indicate impaired water bodies scheduled for a TMDL and impaired water bodies with EPA approved TMDLs respectively.

Enter the name and code of the watershed that receives the storm water runoff. Available at: http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater/graphics/watersh.jpg (RI Watersheds)).

Section V – Natural Heritage Area (NHA) Information
Determine if your site is within or directly discharging to a NHA:

- Step 1: Go to http://www.dem.ri.gov/maps/index.htm

- Step 2: Open the "Regulatory Overlays" Group / Folder listed under the LAYERS heading.

- Step 3: Select Natural Heritage Area – Rare Species as a visible layer from menu and press the "Refresh Map" button (*Note: Menu may not list all layers if scale factor is too large. If this is the case, then use the "zoom in" feature until all layers are listed in menu).

- Step 4: Select any other layer that may be useful in determining the location of the construction activity relative to the Natural Heritage Area (such as roads).

Upon careful review of the above maps, check the appropriate box to indicate whether or not your site is within or directly discharging to an NHA. If Yes and you have pre-approval to discharge please include documentation of such. If No, please provide a map showing location of site, street, nearest utility pole number, assessor's plat and lot, and include the total area of the site and limits of disturbance.

Section VI - Construction Type
Check the appropriate box(es) to indicate the Type of Construction, Types of Materials Handled and/or Stored Outdoors, and the Types of Storm Water Management Controls at the site. List additional information for each section in the appropriate spaces provided. If necessary, attach additional sheets.

Section VII - Regulatory Information
Indicate Coastal Resources Management Council (CRMC) or Qualified Local Program (QLP) regulatory approvals obtained for the site by checking Yes or No and list the application number as applicable. All construction activities regulated by RIPDES which are also under CRMC review are required to file an application for a Water Quality Certification. For additional guidance on submission requirements and authorization, visit the RIPDES Storm Water Home Page at: http://www.dem.ri.gov/programs/benviron/water/permits/ripdes/stwater and click on the Guidance tab.

Certification
State and federal statutes provide for severe penalties for submitting false information on this application form. State and federal regulations require this application to be signed as follows (RIPDES Rule 12);

Section VIII - Owner/Operator Certification
Owner:
For a corporation: by a responsible corporate officer, which means: (i) president, secretary, treasurer, or vice-president of the corporation in charge of a principal business function, or any other person who performs similar policy or decision making functions, or (ii) the manager of one or more manufacturing, production, or operating facilities employing more than 250 persons or having gross annual sales or expenditures exceeding $25 million (in second quarter 1980 dollars), if authority to sign documents has been assigned or delegated to the manager in accordance with corporate procedures;

For a partnership or sole proprietorship: by a general partner or the proprietor;

For a Municipality, State, Federal or other public site: by either a principal executive officer or ranking elected official.

Operator:
This part needs to be filled out by the entity or the individuals that will have an ongoing role in the management and operation of the system during construction.

Section IX – Professional Certification - Natural Heritage Program
This section must be signed/certified by a Registered Professional Engineer, a Certified Professional in Soil Erosion and Sediment Control (CPESC), or a Certified

Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect.

Section X – Professional Certification - SWPPP Development

This section must be signed/certified by a Registered Professional Engineer, a Certified Professional in Soil Erosion and Sediment Control (CPESC), or a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect. This section needs to be filled out for construction activities that are not required to submit a SWPPP to the RIPDES Program (refer to Part III.A.9 of the General Permit). The purpose of this certification is to document that a site specific SWPPP was prepared consistent with the requirements of the General Permit prior to filing the NOI. This certification by a professional does not alleviate or in any way limit the liability and sole responsibility of the Owner/Operator to properly implement the SWPPP and to amend the SWPPP as site conditions may require, so as to effectively control storm water discharges leaving the site during the construction period.

Paperwork Reduction Act Notice

Public burden for this application is estimated to average 0.5 hours per application, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. EPA determined this time estimate for the Federal NOI form and although the Rhode Island form requires additional information, it is considered minor and therefore this time estimate is believed to be valid for the State NOI form. Send comments regarding the burden estimate any other aspect of the collection of information, or suggestions for improving this form, including any suggestions which may increase or reduce this burden to: Chief, Information Policy Branch, PM-223, U.S. Environmental Protection Agency, 401 M Street SW, Washington, DC 20460, or Director, Office of Information and Regulatory Affairs, Office of Management and Budget, Washington, DC 20503.

RHODE ISLAND DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources

NOTICE OF TERMINATION (NOT)

STORM WATER GENERAL PERMIT
FOR CONSTRUCTION ACTIVITY
(Revised – 7/03)

RIPDES Permit Authorization to be terminated: No. RIR_____

I. OWNER

Name:			
Mailing Address:			
City:	State:	Zip:	Phone: ( )
Contact Person:	Title:		

II. OPERATOR (if different from Owner)

Name:			
Local Mailing Address:			
City:	State:	Zip:	Phone: ( )
Contact Person:	Title:		

III. CONSTRUCTION SITE INFORMATION

Street Address:			
City:	State:	Zip:	Phone:
Nearest Utility Pole Number:	Assessors Plat:	Lot:	

IV. OWNER CERTIFICATION

I certify under penalty of law that all disturbed soils at the construction site have been finally stabilized and temporary erosion and sediment control measures have been removed or will be removed at an appropriate time, or all storm water discharges associated with construction activity from the construction site that are authorized by the General Permit have otherwise been eliminated. The burden of operating in compliance with applicable RIPDES Regulations is my responsibility. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Owner Name _____

Print Owner Title _____

Signature _____ Date _____

Appendix D

Copy of Regulatory Permits

(TO BE INSERTED UPON RECEIPT)

4-4-12 D

RHODE ISLAND
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
235 Promenade Street, Providence, RI 02908-5767 TDD 401-222-4462

March 30, 2012

RE: Groundwater Quality Certification (File # GWC-12-01)

University of Rhode Island – Flagg Road Parking Lot
Plains Road & Thirty Acre Pond Road: URI Campus
South Kingstown, RI 02881

Dear Applicant:

Your project application including drawings (Sheets 1-11 of 11), Stormwater Management Plan, Stormwater Pollution Prevention Plan and Long-Term Operation and Maintenance Plan prepared by Gordon R. Archibald, Inc. received February 9, 2012 has been reviewed for compliance with the RIDEM Groundwater Quality Certification (GWC) Program requirements. This correspondence serves as official notification that the proposed project as designed appears to be in compliance with the Program's requirements for subsurface disposal.

Please note the following conditions:

1) Any alterations or modifications to the stormwater collection and infiltration system from that approved herein, including permanent closure, must be reviewed and approved by this office prior to being effected.
2) Any inadvertent or deliberate discharge of waste oil or any other pollutant to this system requires the immediate notification of the DEM Office of Water Resources, Groundwater Discharge Program.
3) The property owner / applicant shall periodically inspect, clean and maintain the subsurface stormwater collection and disposal system to ensure proper performance of all components.
4) The Office of Water Resources, Groundwater Discharge Program must be notified in writing within thirty (30) days upon any future transfer of the property.

Should you have any questions regarding the contents of this letter, please contact me at (401) 222-4700; ext. 7422.

Sincerely,

Ray Larson
Principle Civil Engineer
Office of Water Resources

XC: Gordon R. Archibald, Inc.

30% post-consumer fiber

Appendix E

Copy of RIPDES NOI

RHODE ISLAND POLLUTANT DISCHARGE ELIMINATION SYSTEM (RIPDES)
NOTICE OF INTENT (NOI)
STORM WATER GENERAL PERMIT FOR CONSTRUCTION ACTIVITY
(Revised 8/08)

DEM USE ONLY

Date NOI Received _____

Date Fee Received _____

RIPDES# RIR _____

MARK ONLY ONE ITEM	☐ Re-Application ☐ Amendment Previous RIPDES Authorization No. RIR_____	☒ New Authorization	

I. OWNER

Name: **State of Rhode Island – Board of Governors for Higher Education (University of RI)**			
Mailing Address: **University of Rhode Island, Office of Capital Projects – 523 Plains Road**			
City: **South Kingstown**	State: **RI**	Zip: **02881**	Phone: **(401)874-4845**
Contact Person: **Paul DePace, P.E.**	Title: **Director, Office of Capital Projects**		
Billing Address (if different than above):			
City:	State:	Zip:	

Ownership (please circle one):
PRI - Private PUB - Public BPP - Public/Private STA - State FED - Federal
Other (please specify):

II. OPERATOR (if different from Owner)

Name:			
Local Mailing Address:			
City:	State:	Zip:	Phone: ( )
Contact Person:	Title:		

III. CONSTRUCTION SITE INFORMATION

Site's Official or Legal Name: **Flagg Road Parking Lot**			
Street Address: **Plains Road**			
City: **South Kingstown**	State: **RI**	Zip: **02881**	Phone: **401 874-4845**
Latitude (to nearest 15 sec.) **41** Deg. **29** Min. **30** Sec.	Longitude (to nearest 15 sec.) **71** Deg. **32** Min. **30** Sec.		
Nearest Utility Pole Number:	Assessors Plat: **15-4**	Lot: **5, 6**	

Is the construction site part of a larger common plan of development or sale? ☒ YES ☐ NO

If YES, you must include the following information:

All Names of Development: **Flagg Road Extension Project – RIDEM Wetlands File No. 10-0243**

Projected **Total Disturbed Area of larger common plan:** **17.8** **Acres**

If the construction project is part of a larger common plan and the total disturbed area of the larger common plan is 5 acres or more then submission of the Storm Water Pollution Prevention Plan and Full Set of Plans is required.

Projected or Actual Construction Commencement **2012** MO/DY/YR Projected Construction Completion **2012** MO/DY/YR		
Area of Site: Total **7.1** Acres Disturbed **7.1** Acres	Total area of Impervious Surface: Pre-Construction **0.1 *** Acres Post-Construction **0.9 *** Acres	Runoff Coefficient or Curve Number: Pre-Construction **60** Post-Construction **62**

*** 1.7 Ac Permeable Pavement (Pre-Const.); 4.5 Ac Permeable Pavement (Post-Const.)**

IV. RECEIVING WATER INFORMATION (For an NOI to be considered complete the name of the receiving surface water must be included)

NOTE: If Storm Water from the site discharges to a Combined Sewer Overflow a RIPDES authorization for the construction activity is not necessary, please confirm with the appropriate sewer authority.

☐ Separate Storm Sewer System (MS4) Name:_____

☒ Receiving Surface Water Name: **Thirty Acre Pond *** Water Body ID#: **RI0008039L-12**

☐ Unnamed stream or wetlands connected to named surface water. Name: *** Site is within Thirty Acre Pond catchment; however all runoff is discharged to ground by infiltration**

☐ Unnamed stream or wetlands not connected to named surface water.

Is the Receiving Surface Water an Impaired Water Body? ☐ YES ☒ NO

Watershed Code: **010900050201** Name of Watershed: **Chipuxet River – Pawcatuck River**

V. NATURAL HERITAGE AREA (NHA) INFORMATION

Is the site within or directly discharging to a Natural Heritage Area (NHA)?

☐ YES ☒ NO

If the site is within or directly discharging to a NHA, do you have previous approval from DEM Fish and Wildlife?

☐ YES ☐ NO If yes, include a copy of the approval letter

Projects that propose a storm water or allowable non-storm water discharge to a NHA, or has discharge related activities that potentially affect a listed or proposed to be listed endangered or threatened species or its critical habitat, must submit a map showing the location of the construction sites, including the street, nearest utility pole number, and Assessor's plat and lot, total area of the site, and the limits of disturbance.

VI. CONSTRUCTION TYPE (check all that apply)

Type of Construction:

☐ New Development ☒ Redevelopment
☐ Residential ☐ Commercial ☐ Industrial ☐ Restoration (i.e. wetlands)
☐ MS4 Capital Improvements, specify (municipal, State, private institutional):_____
☐ Utility ☒ Other (please list): **Parking Lot Reconstruction (Permeable Pavement)**

Types of Materials Handled and/or Stored Outdoors:

☐ Solvents ☐ Paints ☐ Petroleum Products ☐ Metal
☐ Plated Products ☒ Asphal t/Concrete ☐ Hazardous Substances ☐ Wood Treated Products
☒ Other (please list): **Stone, gravel, common borrow, and landscaping materials**

Types of Storm Water Management Controls:

☒ Oil/Water Separator ☒ Erosion Controls ☒ Sedimentation Controls ☐ Overhead Coverage
☐ Detention/Desiltation Pond ☐ Chemical Treatment ☒ Other (please specify): **Permeable Pavement Sys.**

VII. REGULATORY INFORMATION (if applicable, please attach plan or approval documentation)

Is the site subject to Coastal Resources Management Council (CRMC) review and approval?
☐ YES ☒ NO Application Number: _____
Water Quality Certification Application Number: _____

If Yes, for construction activities that disturb an area of five (5) or more acres, authorization to discharge under this permit will be automatically granted upon departmental receipt of the CRMC approval, RIDEM Water Quality Certification (if applicable), and a complete and certified NOI.

Note: all construction activities regulated by the RIPDES Program, which are also under CRMC review, are required to file an application for a Water Quality Certification.

Is the site subject to Qualifying Local Program (QLP) review and approval?
☐ YES ☒ NO Name: _____
Water Quality Certification Application Number (if applicable): _____

If Yes, for construction activities that disturb an area of five (5) or more acres, authorization to discharge under this permit will be automatically granted upon departmental receipt of the QLP approval, RIDEM Water Quality Certification (if applicable), and a complete and certified NOI.

VIII. OWNER/OPERATOR CERTIFICATION

I certify under penalty of law that this document and all attachments were prepared under the direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that if review of the Storm Water Pollution Prevention Plan is performed by the Permitting Program, Wetlands Section, Coastal Resources Management Council, or by a city/town which has adopted a DEM approved Soil Erosion and Sediment Control Ordinance, then a Storm Water Permit from this office is contingent upon approval from the reviewing agency. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations. I am aware that it is the responsibility of the owner/operator to implement and amend the SWPPP as appropriate in accordance with the requirements of the General Permit.

Print Owner Name **Paul DePace, P.E.**

Print Owner Title **Director, Office of Capital Projects**

Signature _____ Date _____

Print Operator Name* **Paul DePace, P.E.**

Print Operator Title **Director, Office of Capital Projects**

Signature _____ Date _____

*This part needs to be filled out by the entity or the individuals that will have an ongoing role in the management and operation of the system during construction.

IX. PROFESSIONAL CERTIFICATION - NATURAL HERITAGE AREAS

I certify under penalty of law that the Natural Heritage Area Information under Section V of this document was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete at the time this application is made. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name of Professional **Todd A. Ravenelle, P.E.**

Print Professionals Title* **Senior Vice President, Gordon R. Archibald, Inc.**

Registration or License Number **R.I. No. 5928**

Signature _____ Date _____

*Must be signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect.

X. PROFESSIONAL CERTIFICATION - SWPPP DEVELOPMENT

Note: This section needs to be filled out for construction activities that are not required to submit a SWPPP to the RIPDES Program (refer to Part III.A.9 of the General Permit). The purpose of this certification is to document that a site specific SWPPP was prepared consistent with the requirements of the General Permit prior to filing the NOI. This certification by a professional does not alleviate or in any way limit the liability and sole responsibility of the Owner/Operator to properly implement the SWPPP and to amend the SWPPP as site conditions may require, so as to effectively control storm water discharges leaving the site during the construction period.

I certify under penalty of law that a site specific SWPPP was prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for developing the SWPPP, the SWPPP is, to the best of my knowledge and belief, true, accurate, and complete at the time this certification is made and has been developed in accordance to the requirements of the Permit as well as all applicable guidelines of the Soil Erosion and Sediment Control Handbook and the Storm Water Design and Installation Standards Manual. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Print Name of Professional **Todd A. Ravenelle, P.E.**

Print Professionals Title* **Senior Vice President, Gordon R. Archibald, Inc.**

Registration or License Number **R.I. No. 5928**

Signature _____ Date _____

*Must be signed by a Registered Professional Engineer, a Certified Professional in Erosion and Sediment Control (CPESC), a Certified Professional in Storm Water Quality (CPSWQ), or a Registered Landscape Architect. If the SWPPP requires the practice of engineering, this must be signed by a Registered Professional Engineer.

Note: Upon completion of the permitted project, the DEM must be notified via a Notice of Termination (NOT) form. In accordance with Construction Activity General Permit Part V.L., this permit is not transferable to any person or group except after due notice to the Director. If no such notice is given, the named owner will be held liable for all fees and expenses levied to this permit.

RHODE DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
Office of Water Resources

APPLICATION FEE FORM

Please complete the information below and **submit this completed form and your check (payable to "R.I. General Treasurer") for the appropriate fee directly to**:

R.I. Department of Environmental Management
Office of Management Services
235 Promenade Street
Providence, RI 02908

*** FEES ARE NOT REFUNDABLE ***

APPLICANT'S NAME: **State of Rhode Island – Board of Governors for Higher Education**

OWNER'S NAME: **State of Rhode Island – Board of Governors for Higher Education**

SITE LOCATION: **523 Plains Road, University of Rhode Island, Kingston Campus**

APPLICATION TYPE (Permit, Order of Approval): **RIPDES General Permit**

NOTE: The application and all accompanying documents should be submitted to the appropriate section of the Office of Water Resources, 235 Promenade Street, Providence, RI 02908-5767. Application review will be initiated only upon receipt of the complete application fee.

FOR OFFICE USE ONLY

OMS Receipt Date: _____

Fee Amount Received: _____

Processor Initials: _____

Appendix F

Inspection Reports and Corrective Action Log

SWPPP Inspection Report Instructions

For all projects with at least one (1) acre of soil disturbance, the site owner and operator are required to develop and comply with a site specific Storm Water Pollution Prevention Plan (SWPPP) in order to remain in compliance with the RIPDES General Permit for Stormwater Discharges Associated with Construction Activities (RIPDES Construction General Permit).

This inspection report template has been provided by RIDEM for the use by the site operator and the designated inspector to document the erosion and sediment control conditions at the construction site. It should be customized to meet the requirements in the RIPDES Construction General Permit and the site specific SWPPP.

Using the Inspection Report

This inspection report is designed to be customized according to the BMPs and conditions at the site. On a copy of the site plan, number all stormwater BMPs and areas of the site that will be inspected. Include both structural (basins, outlet protection, swales, etc) and non-structural (construction entrances, perimeter barriers, trash areas, etc) BMPs and areas that will be inspected. Also identify all point source outfalls, areas of highly erosive soils, and the priority natural resource areas (i.e. streams, wetlands, mature trees, etc). List each BMP or area to be inspected separately in the site-specific BMP section of the inspection report.

Complete any items that will remain constant, such as the project information and BMP locations and descriptions. Then print out multiple copies of this customized inspection report to use during the inspections.

When conducting the inspection, walk the site by following the site map and numbered BMPs locations for inspection. Also note whether the overall site issues have been addressed (customize this list according to the conditions at the site).

Minimum Monitoring and Reporting Requirements

All storm water control measures, disturbed areas, areas used for the storage of materials that are exposed to precipitation (including unstabilized soil stockpiles), discharge locations, and locations where vehicles enter or exit the site must be inspected at least once every seven (7) calendar days and within twenty-four (24) hours after any storm event which generates at least 0.25-inches of precipitation per twenty four (24) hour period and/or after a significant amount of runoff or snowmelt. An appropriate rain gauge (as may be found on www.wunderground.com or www.nws.noaa.gov (or similar sites)) must be identified and utilized for the determination of the storm events.

General Notes

- A separate inspection report will be prepared for each inspection.
- The Inspection Reference Number shall be a combination of the RIPDES Permit Authorization No - consecutively numbered inspections.
  ex/ Inspection reference number for the **4**th inspection of a project would be:
  RIR100**###-4**
- Each report will be signed and dated by the inspector and forwarded to the site operator within 24 hours of the inspection.
- Each report will be signed and dated by the site operator and returned to the Inspector within 24 hours of receipt.
- It is the responsibility of the site operator to maintain a copy of the SWPPP, copies of all completed inspection reports, and amendments as part of the SWPPP documentation at the site during construction.

Corrective Actions

If the SWPPP Inspection determines that corrective actions are necessary to install or repair BMP controls, the resultant actions taken must be documented by the site operator. The actions must be recorded in the Corrective Action Log attached to each SWPPP inspection form. If the site operator disagrees with the corrective action recommendations, it must be documented, with justifiable reasons, in the corrective action log as well.

Amendments

All SWPPP Amendments, except minor non-technical revisions, must be approved by the site owner and site operator. The revision must be recorded in the Record of Amendments Log Sheet within the SWPPP, and dated red-line drawings and/or a detailed written description must be appended to the SWPPP. Inspection Forms must be revised to reflect all amendments. Update the *Revision Date* and the *Version #* in the footer of the Report to reflect amendments made.

The SWPPP shall be amended whenever there is a change in design, construction, operation, maintenance or other procedure which has a significant effect on the potential for the discharge of pollutants, or if the SWPPP proves to be ineffective in achieving its objectives.

******Remember that the regulations are performance-oriented. Even if best management practices are installed on a site according to the approved plan, the site is only in compliance when erosion, sedimentation, and pollution are effectively controlled.******

SWPPP Inspection Report

Project Information			
Name			
Location			
DEM Permit No.			
Site Owner	Name	Phone	Email
Site Operator	Name	Phone	Email
Inspection Information			
Inspector Name	Name	Phone	Email
Inspection Date		Start/End Time	
Inspection Type ❑ Weekly ❑ Pre-storm event ❑ During storm event ❑ Post-storm event ❑ Other			
Weather Information			
Last Rain Event Date: Duration (hrs): Approximate Rainfall (in):			
Rain Gauge Location & Source:			
Weather at time of this inspection:			

Check statement that applies then sign and date below:

☐ I, as the designated Inspector, certify that this site has been inspected and is in compliance with the site SWPPP and the RIPDES Construction General Permit.

☐ I, as the designated Inspector, certify that this site has been inspected and I have made the determination that the site requires corrective actions before it will be compliant with the site SWPPP and the RIPDES Construction General Permit. The required corrective actions are noted within this inspection report.

	Print Name	Signature	Date
Inspector:			

The Site Operator (identified in the permit application) acknowledges the receipt of this SWPPP inspection report, and understands the requirements set forth in the RIPDES Construction General Permit regarding the implementation and maintenance of erosion and sedimentation controls and pollution prevention measures.

	Print Name	Signature	Date
Operator:			

Site-specific BMPs

Number the structural and non-structural BMPs identified in the SWPPP on the site map and list them below (add as necessary). Bring a copy of this inspection form and numbered site map with you during your inspections. This list will help ensure that you are inspecting all required BMPs at your site.

FILL THIS TABLE USING THE SWPPP TABLES 2.14 & 3.11.

	Location/Station	BMP Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action Needed (Yes or No; if 'Yes', please detail action required)
1			❑Yes ❑No		
2			❑Yes ❑No		
3			❑Yes ❑No		
4			❑Yes ❑No		
5			❑Yes ❑No		
6			❑Yes ❑No		
7			❑Yes ❑No		
8			❑Yes ❑No		
9			❑Yes ❑No		
10			❑Yes ❑No		
11			❑Yes ❑No		
12			❑Yes ❑No		
13			❑Yes ❑No		
14			❑Yes ❑No		
15			❑Yes ❑No		

	Location/Station	BMP Description	Installed & Operating Properly?	Assoc. Photo/ Figure #	Corrective Action Needed (Yes or No; if 'Yes', please detail action required)
16			❑Yes ❑No		
17			❑Yes ❑No		
18			❑Yes ❑No		
19			❑Yes ❑No		
20			❑Yes ❑No		
21			❑Yes ❑No		
22			❑Yes ❑No		
23			❑Yes ❑No		
24			❑Yes ❑No		
25			❑Yes ❑No		
26			❑Yes ❑No		
27			❑Yes ❑No		
28			❑Yes ❑No		
29			❑Yes ❑No		
30			❑Yes ❑No		

(add more as necessary)

Overall Site Issues

Below are some general site issues that should be assessed during inspections. Please customize this list as needed for conditions at the site. If item is not applicable, please note why.

	Location/Station		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
1	Have Limits of Disturbance been properly marked and maintained?	❑Yes ❑No ❑ N/A		
2	Have perimeter controls and sediment barriers been adequately installed and maintained?	❑Yes ❑No ❑ N/A		
3	Are storm drain inlets properly protected?	❑Yes ❑No ❑ N/A		
4	Are natural resource areas (e.g., streams, wetlands, trees, etc.) protected with barriers or similar BMPs?	❑Yes ❑No ❑ N/A		
5	Have graveled access entrance and exit drives and parking areas been installed and maintained?	❑Yes ❑No ❑ N/A		
6	Have sediment controls been installed on all steep side slopes and down slopes that are disturbed, especially those adjacent to property lines, drainage conveyances/inlets or water bodies?	❑Yes ❑No ❑ N/A		
7	Are all steep slopes and disturbed areas not actively being worked properly stabilized?	❑Yes ❑No ❑ N/A		
8	Have soils been stabilized where final grading is complete and land disturbance activities have permanently ceased?	❑Yes ❑No ❑ N/A		
9	Have soils been stabilized where land disturbance activities have been halted temporarily and are not planned to resume within the next fourteen (14) days?	❑Yes ❑No ❑ N/A		
10	Have soil/gravel stockpiles been stabilized or isolated?	❑Yes ❑No ❑ N/A		
11	Are building materials which possess an elevated pollution potential stored inside or under cover?	❑Yes ❑No ❑ N/A		
12	Are stockpiles of construction wastes properly covered or disposed of to reduce exposure?	❑Yes ❑No ❑ N/A		
13	Are washout facilities (e.g. paint, concrete) available, clearly marked, and maintained?	❑Yes ❑No ❑ N/A		

	Location/Station		Assoc. Photo/ Figure #	Corrective Action Needed (If 'Yes', please detail action required and include location/station)
14	Are vehicle and equipment fueling, cleaning, and maintenance areas free of spills, leaks, or any other deleterious material?	❑Yes ❑No ❑ N/A		
15	Are hazardous materials spill kits in place and are there enough materials as prescribed in the SWPPP to adequately prevent spills from entering any storm water drainage systems?	❑Yes ❑No ❑ N/A		
16	Have provisions been made for wind erosion and dust control?	❑Yes ❑No ❑ N/A		
17	Have areas of obvious erosion/channelization been repaired?	❑Yes ❑No ❑ N/A		
18	Are receiving conveyance systems and receiving waters at discharge points free of sediment deposition?	❑Yes ❑No ❑ N/A		
19	Is there evidence of sediment being tracked into the street or off-site?	❑Yes ❑No ❑ N/A		
20	Are non-stormwater discharges (e.g., wash water, dewatering) properly controlled?	❑Yes ❑No ❑ N/A		
21	Are post-construction BMPs protected from sedimentation prior to final stabilization and bringing them online?	❑Yes ❑No ❑ N/A		
22	Are infiltrating stormwater practices and qualifying pervious areas protected during construction activities to avoid compacting soil?	❑Yes ❑No ❑ N/A		
23	(Other)	❑Yes ❑No ❑ N/A		

(add more as necessary)

General Field Comments:

Photos:
(Associated photos – each photo should be dated and have a unique identification # and written description indicating where it is located within the project area. If a close up photo is required, it should be preceded with a photo including both the detail area and some type of visible fixed reference point. Photos should be annotated with Station numbers and other identifying information where needed.)

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

Photo #:	Station:
(insert Photo here)	Description:

(add more as necessary)

Corrective Action Log

TO BE FILLED OUT BY SITE OPERATOR

Describe repair, replacement, and maintenance of BMPs, actions taken, date completed, and note the person that completed the work.

	Location/Station	Corrective Action	Date Completed	Person Responsible
Operator Signature:			**Date:**	

Appendix G

Amendment Log

PROJECT: _____

Amendment Log

TO BE FILLED OUT BY SITE OPERATOR

Describe amendment to be made to SWPPP, the date, and the person/title making the amendment. ALL amendments must be approved by the Site Owner.

#	Date	Description of Amendment	Amended by: Person/Title	Site Owner Must Initial
1				
2				
3				
4				
5				
6				
7				
8				
9				
10				

Add more lines/pages as necessary