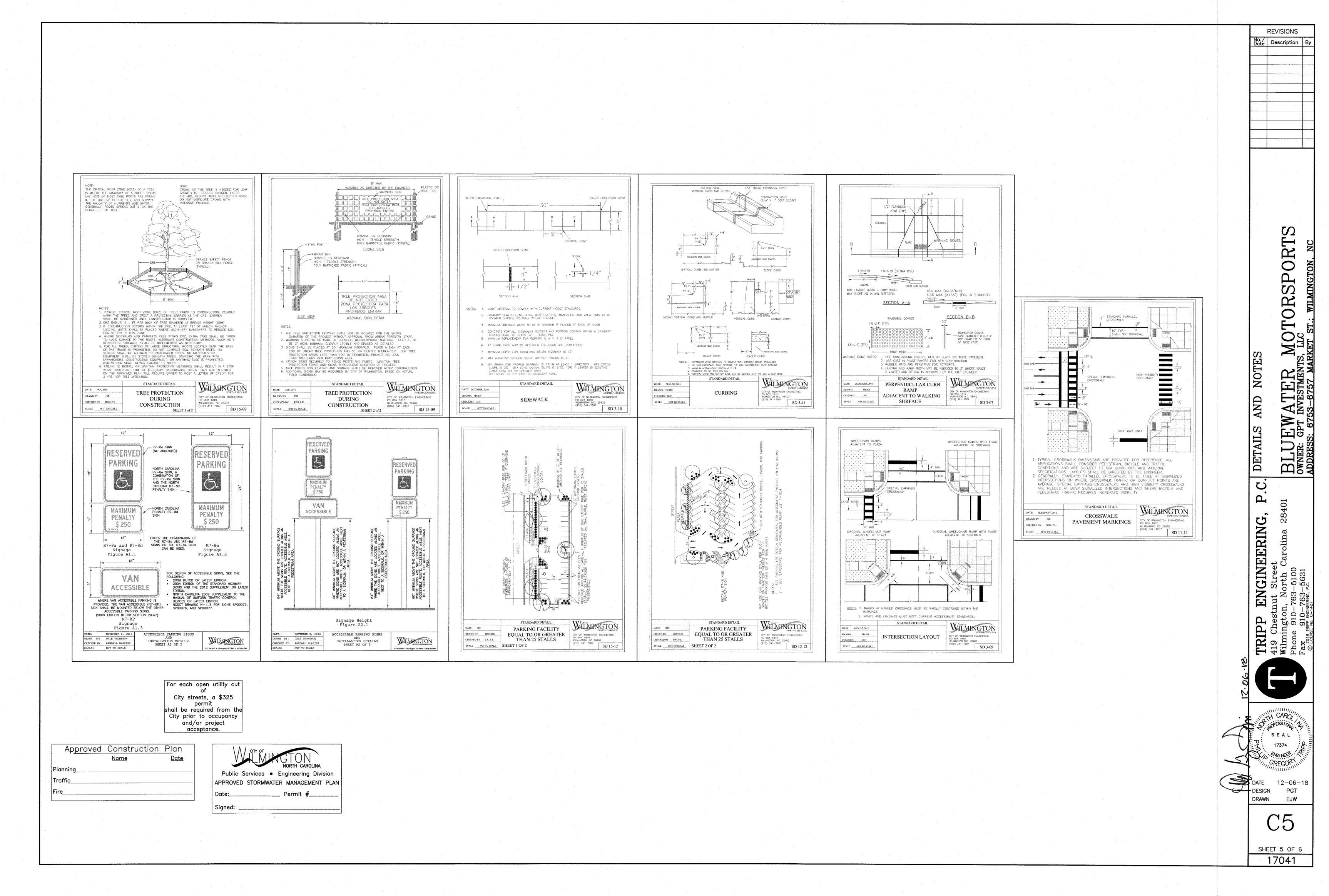
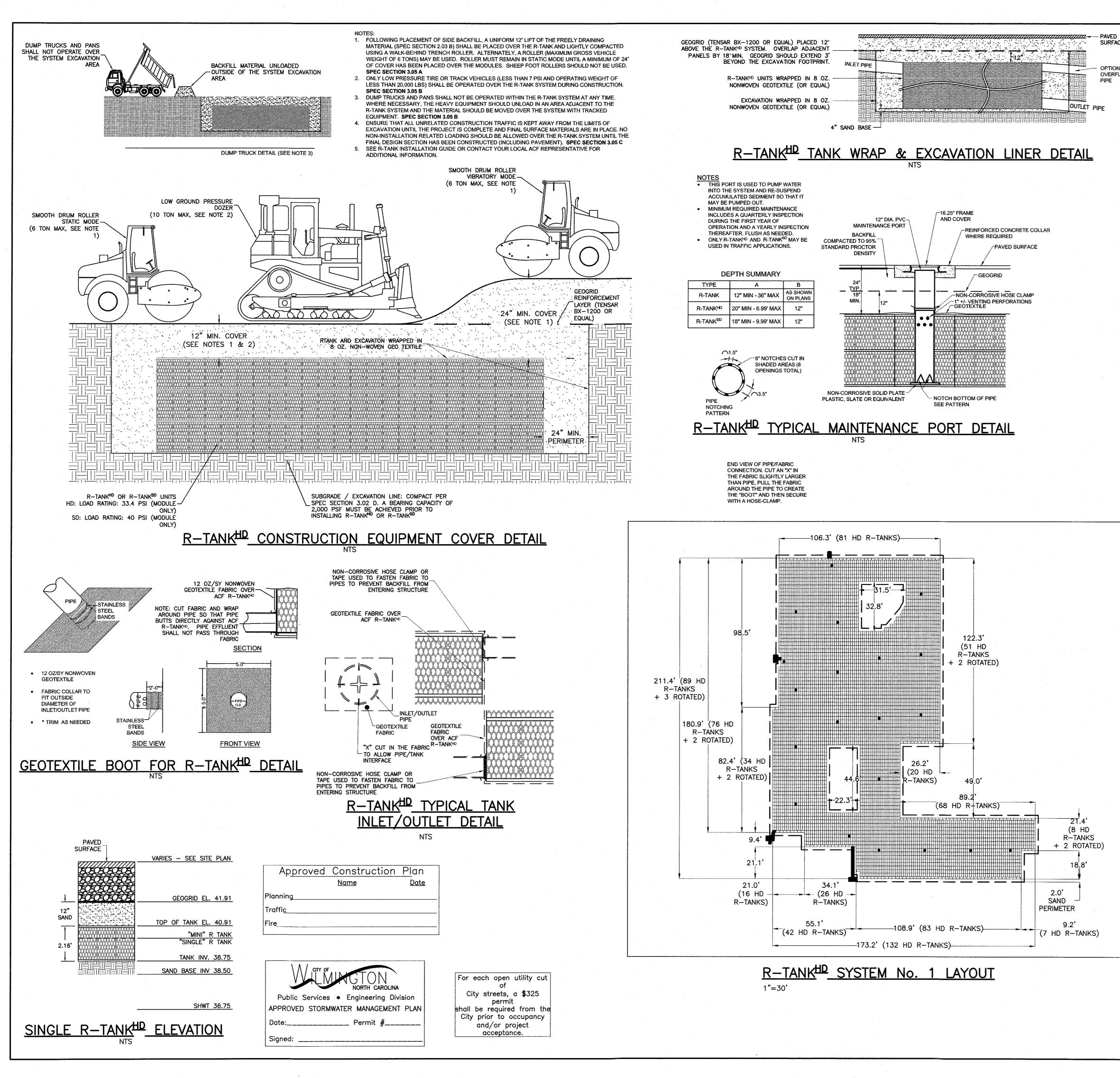


NPDES GR	OUND STABI	LIZATION CRITERIA	SITE WORK NOTES	[REVISIONS	
SITE AREA DESCRIPTION	STABILIZATION TIMEFRAME	STABILIZATION TIMEFRAME	2. CLEARING: CONTRACTOR SHALL VISIT THE STIE AND BECOME FAMILIARIZED WITH EXISTING CONDITIONS BOTH ON AND IMMEDIATELY ADJACENT TO THE SITE. 2. CLEARING: CONTRACTOR SHALL REMOVE ALL TREES AND VEGETATION WITHIN	No./ Date	Description	By
PERIMETER DIKES, SWALES, DITCHES	7 DAYS	EXCEPTIONS NONE	LIMITS OF CONSTRUCTION UNLESS OTHERWISE DESIGNATED TO REMAIN 3. GRUBBING AND STRIPPING: CONTRACTOR SHALL RAKE AND REMOVE ROOTS, STUMPS, VEGETATION, DEBRIS, EXISTING STRUCTURES ABOVE AND BELOW GRADE,		-	
AND SLOPES HIGH QUALITY	7 DAYS	NONE	ORGANIC MATERIAL OR ANY OTHER UNSUITABLE MATERIAL WITHIN LIMITS OF CONSTRUCTION. 4. MUCKING: CONTRACTOR SHALL COORDINATE WITH OWNER AND THEIR			
WATER (HQW) ZONES			GEOTECHNICAL REPRESENTATIVE TO COORDINATE REMOVAL OF ANY SOFT AREAS. 5. DISPOSAL: CLEARED, GRUBBED, STRIPPED OR OTHER WASTE MATERIAL SHALL			
SLOPES STEEPER	7 DAYS	IF SLOPES ARE 10' OR LESS IN LENGTH AND ARE NOT STEEPER THAN	BE REMOVED FROM SITE AND DISPOSED OF IN A PROPERLY PERMITTED FACILITY. 6. FILL AND COMPACTION SHOULD COMPLY WITH GEOTECHNICAL REPORT. 7. THE CONTRACTOR SHALL NOTE THAT THE GRADING PLAN MAY NOT			
THAN 3:1	14 DAYS	2:1, 14 DAYS ARE ALLOWED	REPRESENT A BALANCED EARTHWORK CONDITION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CUT AND FILL QUANTITIES AND COMPLETE INSTALLATION TO SPECIFIED GRADES.			
SLOPES 3:1 OR FLATTER	14 DATS	7 DAYS FOR SLOPES GREATER THAN 50 FEET IN LENGTH	8. THE CONTRACTOR SHALL FURNISH SUITABLE BORROW MATERIAL FROM AN OFF-SITE PROPERLY PERMITTED FACILITY AS REQUIRED. 9. THE CONTRACTOR IS RESPONSIBLE FOR THE LOCATION AND PROTECTION OF			
ALL OTHER AREAS WITH SLOPES		NONE (EXCEPT FOR PERIMETERS AND	ALL EXISTING UTILITIES DURING CONSTRUCTION. BEFORE COMMENCING ANY EXCAVATIONS IN OR ALONG ROADWAYS OR RIGHT-OF-WAYS, PUBLIC AREAS OR IN			
FLATTER THAN 4:1		HQW ZONES)	PRIVATE EASEMENTS, THE CONTRACTOR SHALL NOTIFY ALL APPROPRIATE PERSONNEL OF THEIR INTENT TO EXCAVATE, IN WRITING, NOT LESS THAN 10 DAYS PRIOR TO EXCAVATING.		· · · · · · · · · · · · · · · · · · ·	
	RARY SEEDING SEEDING MIXTURE	SPECIFICATION	10. THE CONTRACTOR SHALL BE RESPONSIBLE TO COORDINATE DISCONNECTION/ RECONNECTION AND/OR THE RELOCATION OF ALL EXISTING UTILITIES WITH APPROPRIATE PERSONNEL.			
	SPECIES Rye (grain) Annual lespedeza (Kobe ji	RATE (ib/acre)	11. EXISTING SURVEYING PERFORMED BY MARK A. STOCKS, PLS AND SUPPLIED BY THE OWNER. 12. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS AT THE SITE.			
LATE WINTER &	Piedmont and Coastal Pi Korean in Mountains) Omit annual lespedeza wh	lain, 50 nen	FURTHERMORE THE CONTRACTOR SHALL REPORT ALL DISCREPANCIES OR QUESTIONS TO THE ENGINEER PRIOR TO INSTALLATION.			
	duration of temporary cover is not to extend beyond June. German Millet 40 SUMMER In the Piedmont and mountains, a		 13. THE CONTRACTOR SHALL PROVIDE ANY AND ALL LAYOUT REQUIRED TO CONSTRUCT HIS WORK UNLESS OTHERWISE DIRECTED BY OWNER. 14. ALL PVC UTILITY MAINS SHALL BE INSTALLED WITH A MINIMUM OF 36" COVER 			
	small—stemmed sundangrass may be substituted at a rate of 50 lf/acre		AT FINAL GRADE. 15. ALL SERVICE CONNECTIONS SHALL BE INSTALLED TO MEET ALL LOCAL AND STATE CODES. METERS, TAPS, MATERIALS, WORKMANSHIP AND ALL FEES SHALL BE		70	
FALL	SEEDING DATES		THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL COMPLY WITH ALL REQUIREMENTS.			7
LATE WINTER & EARLY SPRING	Mountains — Above 2500 ff Below 2500 ff Piedmont — Jan. 1—May 1 Coastai Plain — Dec. 1—Ap	t: Feb. 1May 1	16. ALL PAVEMENT, BASE AND SUBGRADE SHALL CONFORM TO NCDOT STANDARDS INCLUDING WORKMANSHIP, MATERIALS AND EQUIPMENT. APPROPRIATE BARRICADES, SIGNS, LIGHTS OR OTHER TRAFFIC CONTROL DEVICES SHALL BE		Ř	NC
SUMMER	Mountains — May 15—Aug Piedmont — May 1—Aug 15 Coastal Plain — Apr. 15—Au	15 5 4g 15	PROVIDED IN ACCORDANCE WITH NCDOT TO MAINTAIN SAFETY AND TWO WAY TRAFFIC. 17. ALL AREAS SHALL BE GRADED FOR POSITIVE DRAINAGE. THE CONTRACTOR		Ö	ON.
FALL	Mountains — Aug 15—Dec Coastal Plain and Pleamont	15	SHALL REPORT ANY DISCREPANCIES TO THE ENGINEER PRIOR TO INSTALLATION. ALL AREAS SHALL BE SLOPED TO DRAIN AWAY FROM BUILDINGS AT ALL TIMES. 18. CONCRETE STORM DRAINAGE PIPE SHALL BE CLASS III WITH RUBBER			T D
		NS OF SOIL TESTS OR APPLY 2,000 ULTURAL LIMESTONE AND 750	GASKETED JOINTS AND INSTALLED IN ACCORDANCE WITH MANUFACTURER'S REQUIREMENTS. 19. USE WHITE LANE MARKING PAINT FOR ALL PAVEMENT MARKINGS. PAINT	1	S S	WILMINGTON
	LB/ACRE 10-10-10 FEF		SHALL BE A CHLORINATED RUBBER ALKYD, FS TT-P-115, TYPE III, FACTORY MIXED, QUICK DRYING, NON BLEEDING. REFLECTIVE MATERIAL MAY BE ADDED AT		Ц Ц	MIL
	APPLY 4,000 LB/ACRE S WITH ASPHALT, NETTING,	STRAW. ANCHOR STRAW BY TACKING OR A MULCH ANCHORING TOOL. A NEARLY STRAIGHT CAN BE USED AS 201.	OWNER'S OPTION FOR NIGHT REFLECTING. 20. DUCTILE IRON SHALL BE CLASS 50. 21. CONCRETE FOR WALKS, CURBS AND DRIVES SHALL HAVE A MINIMUM		ľ	ST.:
	MAINTENANCE	IS NOT FULLY ADEQUATE. RESEED,	COMPRESSIVE STRENGTH OF 3000 PSI © 28 DAYS - AIR ENTRAINED. 22. FIELD TESTING SHALL BE DONE BY AN INDEPENDENT TESTING LABORATORY PAID FOR BY THE OWNER. FURTHER TESTING REQUIRED DUE TO A FAILED TEST		Ō	LC LC
	REFERITLIZE AND MULCH OR OTHER DAMAGE.	IMMEDIATELY FOLLOWING EROSION	WILL BE PAID FOR BY THE CONTRACTOR. 23. SEE GEOTECHNICAL REPORT NO, DATED, BY	S		S, L RKE'
	SPRING- PERMANENT GI	SUMMER RASSING DETAIL	CONSTRUCTION SEQUENCE	OTE		NT'S MAR
SEEDI	NG MIXTURE	RATE (ib/gcre)	1. NO CUT SLOPE OR FILL SLOPE SHALL EXCEED A RISE OR FALL OF ONE FOOT FOR EVERY RUN OF 3 FEET (1 VERTICAL TO 3 HORIZONTAL). 2. NO SEDIMENT WILL BE ALLOWED TO EXIT THE SITE. ALL EROSION	NO	L L	MET 57 A
SERIC COM GERM	acola Bahiagrass Sea lespedeza Kon Bermuda grass An Millet Fescue	50 30 10 50	SHALL BE CONTROLLED INCLUDING SIDE SLOPES DURING AND AFTER CONSTRUCTION.		H L	EST 675
TALL FESCUE 50 SEEDING NOTES			3. INSTALL PRIMARY EROSION CONTROL MEASURES BEFORE BEGINNING CONSTRUCTION INCLUDING BUT NOT LIMITED TO GRAVELED CONSTRUCTION ENTRANCE, SILT FENCE, CHECK DAMS, ETC. INSTALL ALL SECONDARY	AND	'A'	1NV 53-
1. WHERE A NEAT APPEARANCE IS DESIRED, ONIT SERICEA. 2. USE COMMON BERMUDA GRASS ONLY ON ISOLATED SITES WHERE IT CANNOT BE COME A PEST. BERMUDA GRASS MAY BE REPLACED WITH 5 ID/ORTO CENTIPEDE GRASS.			EROSION CONTROL MEASURES AS SOON AS POSSIBLE AFTER BEGINNING CONSTRUCTION. 4. ALL EROSION CONTROL MEASURES TO BE INSPECTED AFTER EACH			л' 675
SEEDING DATES APRIL 1 - JULY 15			RAIN. SILT FENCE AND INLET PROTECTION ARE TO BE CLEANED WHEN 0.5 FEET OF SEDIMENT HAVE ACCUMULATED IN FRONT OF THE DEVICE OR WHEN THEY LEAK OR FAIL. SEDIMENT TRAPS ARE CLEANED OUT AS	ILS	E	5. SS:
SOIL AMENDMENTS APPLY LINE AND FERTILIZER ACCORDING TO SOIL TESTS, OR APPLY 3,000 lb/gcre GROUND AGRICULTURE LINESTONE AND 500 lb/gcre 10-10-10 FERTILIZER.			STATED OR WHEN HALF FULL. 5. IF APPLICABLE, CONSTRUCT PROPOSED RETENTION POND TO ACT AS A SEDIMENT BASIN DURING CONSTRUCTION. REMOVE ACCUMULATION OF	TA		NEK: DRES
			SILT AS REQUIRED TO ALLOW PROPER FUNCTIONING. RESTORE POND TO DESIGN LEVELS AT THE COMPLETION OF CONSTRUCTION. 6. IF	DE	m	₹A
MULCH Apply 4,000 ib/gets grain strawor equivalent cover of another suitable wulch, anchor by tacking with asphalt, roving, or netring or by crimping with a mulch anchoring tool, a disk with blades set nearly straight can be			APPLICABLE, INSTALL DROP INLETS WITH INLET PROTECTION TO ACT AS SILT TRAPS DURING CONSTRUCTION. REMOVE ACCUMULATED SILT AS NEEDED TO PREVENT SILT FROM ENTERING STORM DRAIN PIPING.			
Used as a mulch anchoring tool.			7. A 4" LAYER OF TOPSOIL SHALL BE APPLIED TO ALL NEW AREAS TO BE GRASSED. 8. MAINTAIN ALL EROSION CONTROL MEASURES UNTIL PROJECT IS		; ;	
MAINTENANCE REFERTILIZE THE FOLLOWING APRIL WITH 50 ID/gorg NITROGEN, REPEAT AS GROWTH REQUIRES, MAY BE MOWED ONLY ONCE A YEAR. WHERE A NEAT APPEARANCE IS DESIRED, OWIT SERVICE AND MOW AS OFTEN AS NEEDED,			COMPLETE. 9. MORE STRINGENT MEASURES MAY BE REQUIRED TO HALT EROSION IF THOSE ON THIS PLAN PROVE TO BE LESS EFFECTIVE.		401	
DESIRED	, UNIT SERVER AND MOW AS OFTE	ER AS NELLEU.	10. REMOVE ALL TEMPORARY EROSION CONTROL MEASURES UPON COMPLETION OF CONSTRUCTION. ALL PERMANENT MEASURES SHALL BE	5	582	
SITE POLLUTANTS NO	DEDICATED FOR MA		WELL ESTABLISHED PRIOR TO PROJECT COMPLETION. <u>MAINTENANCE PLAN</u> 1. ALL EROSION AND SEDIMENT CONTROL PRACTICES WILL BE CHECKED		olina	
WASTE, AND HAZARD	OUS OR TOXIC WAS	NSTRUCTION AND DOMESTIC STE. THIS LOCATION SHALL DRAIN INLETS AND SURFACE	FOR STABILITY AND OPERATION FOLLOWING EVERY RUNOFF-PRODUCING RAINFALL, BUT IN NO CASE, LESS THAN ONCE EVERY WEEK AND WITHIN 24 HOURS OF EVERY HALF INCH RAINFALL.	ER	L,	
WATERS UNLESS IT ARE REASONABLY AV	ATERS UNLESS IT CAN BE SHOWN THAT NO OTHER ALTERNATIVES RE REASONABLY AVAILABLE. DUMPING OF PAINT OR OTHER LIQUID BUILDING MATERIAL		2. ALL POINTS OF EGRESS WILL HAVE CONSTRUCTION ENTRANCES THAT WILL BE PERIODICALLY TOP-DRESSED WITH AN ADDITIONAL 2 INCHES OF	IE I	ca Ca	
WASTES IN STORM DRAINS IS PROHIBITED. 3. LITTER AND SANITARY WASTE-THE PERMITTEE SHALL CONTROL			#4 STONE TO MAINTAIN PROPER DEPTH. THEY WILL BE MAINTAINED IN A CONDITION TO PREVENT MUD OR SEDIMENT FROM LEAVING THE SITE. IMMEDIATELY REMOVE OBJECTIONABLE MATERIAL SPILLED, WASHED OR		10 10 10	3
THE MANAGEMENT AND DISPOSAL OF LITTER AND SANITARY WASTE FROM THE SITE. 4. LOCATE EARTHEN-MATERIAL STOCK PILE AREAS AT LEAST 50'			TRACKED ONTO THE CONSTRUCTION ENTRANCE OR ROADWAYS. 3. SEDIMENT WILL BE REMOVED FROM HARDWARE CLOTH AND GRAVEL INLET PROTECTION, BLOCK AND GRAVEL INLET, ROCK DOUGHNUT INLET	N	t (No 33-	က စ္ ျ
AWAY FROM STORM DRAIN INLETS AND SURFACE WATERS UNLESS IT CAN BE SHOWN THAT NO OTHER ALTERNATIVES ARE REASONABLY AVAILABLE.			PROTECTION AND ROCK PIPE INLET PROTECTION WHEN THE DESIGNED STORAGE CAPACITY HAS BEEN HALF FILLED WITH SEDIMENT. ROCK WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER	E	- 1, 1, -)-76 IGINEERIN -1427
5. CONCRETE MAT MUST BE CONTROLLI	ERIALS ONSITE, INCL ED AND MANAGED T	LUDING EXCESS CONCRETE, O AVOID CONTACT WITH ERS. NO CONCRETE OR	DRAINS AS DESIGNED. DEBRIS WILL BE REMOVED FROM THE ROCK AND HARDWARE CLOTH TO ALLOW PROPER DRAINAGE. SILT SACKS WILL BE	Ŭ	91 gf 19	ဝှင်ပြင်
CEMENT SLURRY SHALL BE DISCHARGED FROM THE SITE. 6. ANY HARDENED CONCRETE RESIDUE WILL BE DISPOSED OF, OR RECYCLED ON SITE, IN ACCORDANCE WITH LOCAL AND STATE			EMPTIED ONCE A WEEK AND AFTER EVERY RAIN EVENT. SEDIMENT WILL BE REMOVED FROM AROUND BEAVER DAMS, DANDY SACKS AND SOCKS ONCE A WEEK AND AFTER EVERY RAIN EVENT. 4. DIVERSION DITCHES WILL BE) Cl min	CENSE
SOLID WASTE REGUL 7. SOIL STABILIZAT	ATIONS. FION SHALL BE ACH	EIVED ON ANY AREA OF A	CLEANED OUT IMMEDIATELY TO REMOVE SEDIMENT OR OBSTRUCTIONS FROM THE FLOW AREA. THE DIVERSION RIDGES WILL ALSO BE REPAIRED. SWALES MUST BE TEMPORARILY STABILIZED WITHIN 21 CALENDAR DAYS OF		419 Wilr Pho	ି ପ 🎯
PERMANENTLY CEASE i. ALL PERIMETER	D ACCORDING TO T DIKES, SWALES, DI	ES HAVE TEMPORARILY OR THE FOLLOWING SCHEDULE: ITCHES, PERIMETER SLOPES	CEASE OF ANY PHASE OF ACTIVITY ASSOCIATED WITH A SWALE. 5. SEDIMENT WILL BE REMOVED FROM BEHIND THE SEDIMENT FENCE WHEN IT BECOMES HALF FILLED. THE SEDIMENT FENCE WILL BE REPAIRED			
(3:1) SHALL BE PRO	GROUND COVER AS	SOON AS PRACTICABLE	AS NECESSARY TO MAINTAIN A BARRIER. STAKES MUST BE STEEL. STAKE SPACING WILL BE 6 FEET MAX. WITH THE USE OF EXTRA STRENGTH FABRIC, WITHOUT WIRE BACKING. STAKE SPACING WILL BE 8 FEET MAX.			
BUT IN ANY EVENT	WITHIN 7 CALENDAR	DAYS FROM THE LAST	WHEN STANDARD STRENGTH FABRIC AND WIRE BACKING ARE USED. IF ROCK FILTERS ARE DESIGNED AT LOW POINTS IN THE IN THE SEDIMENT FENCE THE ROCK WILL BE REPAIRED OR REPLACED IF IT BECOMES HALF			
TEMPORARY OR PER AS SOON AS PRACT	MANENT STABILIZATIO	ON WITH GROUND COVER	FULL OF SEDIMENT, NO LONGER DRAINS AS DESIGNED OR IS DAMAGED. 6. SEDIMENT WILL BE REMOVED FROM SEDIMENT TRAPS WHEN THE		CARO	
8. CONDITIONS-IN ABOVE, THE FOLLOW	MEETING THE STAB	REQUIREMENTS REQUIREMENTS	DESIGNED STORAGE CAPACITY HAS BEEN HALF FILLED WITH SEDIMENT. THE ROCK WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS OR WHEN THE ROCK IS DISLODGED. BAFFLES WILL		TH CARO	11,11,11,1
AUTHORITY BASED O CONDITIONS THAT MA	N WEATHER OR OTH AKE COMPLIANCE IM	IPRACTICABLE.	BE REPAIRED OR REPLACED IF THEY COLLAPSE. TEAR, DECOMPOSE OR BECOME INEFFECTIVE. THEY WILL BE REPLACED PROMPTLY. SEDIMENT WILL BE REMOVED WHEN DEPOSITS REACH HALF THE HEIGHT OF THE 1ST		SEAL	
ii. ALL SLOPES 50' IN LENGTH OR GREATER SHALL APPLY TO GROUND COVER WITHIN 7 DAYS EXCEPT WHEN THE SLOPE IS FLATTER THAN 4:1. SLOPES LESS THAN 50' SHALL APPLY			BAFFLE. FLOATING SKIMMERS WILL BE INSPECTED WEEKLY AND WILL BE KEPT CLEAN. 7. SEDIMENT WILL BE REMOVED FROM THE SEDIMENT BASIN WHEN THE	震	17374	
GROUND COVER WITHIN 14 DAYS EXCEPT WHEN SLOPES ARE STEEPER THAN 3:1, THE 7-DAY REQUIREMENT APPLIES.			DESIGN STORAGE CAPACITY HAS BEEN HALF FILLED WITH SEDIMENT. ROCK WILL BE CLEANED OR REPLACED WHEN THE SEDIMENT POOL NO LONGER DRAINS OR IF THE ROCK IS DISLODGED. BAFFLES WILL BE REPAIRED OR		CREGOR	IIIII
iii. ANY SLOPED AREA FLATTER THAN 4:1 SHALL BE EXEMPT FROM THE 7-DAY GROUND COVER REQUIREMENT. iv. SLOPES 10' OR LESS IN LENGTH SHALL BE EXEMPT FROM			REPLACED IF THEY TEAR, DECOMPOSE OR BECOME INEFFECTIVE. THEY WILL BE REPLACED PROMPTLY. SEDIMENT WILL BE REMOVED FROM	DATE	12-06-	
THE 7-DAY GROUND SLOPE IS STEEPER) COVER REQUIREME THAN 2:1.	ENT EXCEPT WHEN THE	BAFFLES WHEN DEPOSITS REACH HALF THE HEIGHT OF THE 1ST BAFFLE. FLOATING SKIMMERS WILL BE INSPECTED WEEKLY AND WILL BE KEPT CLEAN.	DESIG	SN PGT	
COVER, OTHER METH BE ALLOWED ON A	IODS, SUCH AS CHE CASE-BY-CASE BAS	EMICAL STABILIZATION, MAY	8. ALL SEEDED AREAS WILL BE FERTILIZED, RESEEDED AS NECESSARY, AND MULCHED ACCORDING TO SPECIFICATIONS IN THE VEGETATIVE PLAN TO MAINTAIN A VIGOROUS, DENSE VEGETATIVE COVER. ALL SLOPES WILL BE	DRAW	'N EJW	
COMMISSION-DEFINE 04A. 0105), STABILIZ	D "HIGH QUALITY WA ZATION WITH GROUN	ATER ZONE" (15A NCAC ID COVER SHALL BE	STABILIZED WITHIN 21 CALENDAR DAYS. ALL OTHER AREAS WILL BE STABILIZED WITHIN 15 WORKING DAYS.		$C\Delta$	i
ACHIEVED AS SOON	AS PRACTICABLE BU WITHIN 7 CALENDAR	UT IN ANY EVENT ON ALL R DAYS FROM THE LAST	9. FLOCCULATES WILL BE USED TO ADDRESS TURBIDITY ISSUES. THE PUMPS, TANKS, HOSES AND INJECTION SYSTEMS WILL BE CHECKED FOR PROBLEMS OR TURBID DISCHARGES DAILY.			
				SH	IEET 4 OF	6
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REVISIONS PART 1 - GENERAL SURFACE Date | Description | By 1.01 Related Documents A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section CITY SW -10-18 COMMENTS 1.02 Description of Work Included A. Provide excavation and base preparation per geotechnical engineer's recommendations and/or as shown on the design drawings, to provide adequate support OPTIONAL for project design loads and safety from excavation sidewall collapse. Excavations shall be in accordance with the owner's and OSHA requirements. B. Provide and install R-Tank, R-TankHD, or R-TankSD system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, OVERFLOW inlet and outlet pipe with connections per the manufacturer's installation guidelines provided in this section. C. Provide and construct the cover of the R-Tank system including; stone backfill, structural fill cover, and pavement section as specified. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area 1.03 Quality Control All materials shall be manufactured in ISO certified facilities. Installation Contractor shall demonstrate the following experience A minimum of three R-Tank or equivalent projects completed within 2 years; and, A minimum of 25,000 cubic feet of storage volume completed within 2 years. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction Installation Personnel: Performed only by skilled workers with satisfactory record of performance on bulk earthworks, pipe, chamber, or pond/landfill construction projects of comparable size and quality. Contractor must have manufacturer's representative available for site review if requested by Owner 1.04 Submittals A. Submit proposed R-Tank layout drawings. Drawings shall include typical section details as well as the required base elevation of stone and tanks, minimum cover requirements and tank configuration. B. Submit manufacturer's product data, including compressive strength and unit weight. Submit manufacturer's installation instructions. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor. Submit material certificates for geotextile, geogrid, base course and backfill materials Submit required experience and personnel requirements as specified in Section 1.03. Any proposed equal alternative product substitution to this specification must be submitted for review and approved prior to bid opening. Review package should include third party reviewed performance data that meets or exceeds criteria in Table 2.01 B. 1.05 Delivery, Storage, and Handling A. Protect R-Tank and other materials from damage during delivery, and store UV sensitive materials under tarp to protect from sunlight when time from delivery to stallation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc. Cold weather: Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle. Do not use frozen materials or materials mixed or coated with ice or frost. Do not build on frozen ground or wet, saturated or muddy subgrade. 1.06 Preinstallation Conference Prior to the start of the installation, a preinstallation conference shall occur with the representatives from the design team, the general contractor, the excavation contractor, the R-Tank installation contractor, and the manufacturer's representative. 1.07 Project Conditions A. Coordinate installation for the R-Tank system with other on-site activities to eliminate all non-installation related construction traffic over the completed R-Tank system. No loads heavier than the design loads shall be allowed over the system, and in no case shall loads higher than a standard AASHTO HS20 (or HS2 depending on design criteria) load be allowed on the system at any time. \mathcal{O} Protect adjacent work from damage during R-Tank system installation All pre-treatment systems to remove debris and heavy sediments must be in place and functional prior to operation of the R-Tank system. Additional ORT perfectment measures may be needed if unit is operational during construction due to increased sediment loads. O. Contractor is responsible for any damage to the system during construction. PART 2 - PRODUCTS 2.01 R-Tank Units A. R -Tank - Injection molded plastic tank plates assembled to form a 95% void modular structure of predesigned height (custom for each project). B. R-Tank units shall meet the following Physical & Chemical Characteristics: SР Z 民 \bigcirc OT 2.02 Geosynthetics \mathbf{Z}^{2} Geotextile. A geotextile envelope is required to prevent backfill material from entering the R-Tank modules. ATER N INVESTMENTS, 1 53-6757 MARKE Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (ACF N080 or equivalent). Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (ACF M200 or TE equivalent) shall be used. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (ACF BX12 or equivalent) to reinforce backfill above the \frown R-Tank system. Geogrid is often not required for non-traffic load applications. 2.03 Backfill & Cover Materials A. Bedding Materials: Stone (smaller than 1.5* in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System) shall be used below the R-Tank system (3* minimum). Material must be free from lumps, debris, and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation. For infiltration applications bedding material shall be free draining. B. Side and Top Backfill: Free draining stone (smaller than 1.5° in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System) 되 shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system. Material must be free from lumps, debris and any sharp objects that could cut the geotextile. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of installation. NOITA VION C. Additional Cover Materials: Structural Fill shall consist of granular materials meeting the gradational requirements of SM, SP, SW, GM, GP or GW as classified by the Unified Soil Classification System. Structural fill shall have a maximum of 25 percent passing the No. 200 sieve, shall have a maximum clay content of 10 percent and a maximum Plasticity Index of 4. Material shall be within 3 percent of the optimum moisture content as determined by ASTM D698 at the time of 2.04 Other Materials Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection. PART 3 - EXECUTION EL, TR 3.01 Assembly of R-Tank Units A. On-site assembly of tanks shall be performed in accordance with the R-Tank Installation Manual Section 2 3.02 Layout and Excavation Installer shall stake out, excavate, and prepare the subgrade area to the required plan grades and dimensions, ensuring that the excavation is at least 2 feet JER greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials ET. All excavations must be prepared with OSHA approved excavated sides and sufficient working space. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencin arricades, or other means until construction is complete. D. Base of the excavation shall be uniform, level, and free of lumps or debris and soft or yielding subgrade areas. A minimum 2,000 pounds per square foot earing capacity is required. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's engineer Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration C applications. Unsuitable Soils or Conditions: All questions about the base of the excavation shall be directed to the owner's engineer, who will approve the subgrade conditions prior to placement of stone. The owner's engineer shall determine the required bearing capacity of the R-Tank subgrade; however in no case shall a earing capacity of less than 2,000 pounds per square foot be provided. ቢ If unsuitable soils are encountered at the subgrade, or if the subgrade is pumping or appears excessively soft, repair the area in accordance with contract 0 cuments and/or as directed by the owner's engineer. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the owners α engineer ひ N 3.03 Preparation of Base A. Place a thin layer (3" unless otherwise specified) of bedding material (Section 2.03 A), over the subgrade to establish a level working platform for the R-Tank ENGINEERIN aut Street modules. Level to within 1/2" (+/- 1/4") or as shown on the plans. Native subgrade soils or other materials may be used if determined to meet the requirements of 2.03 A and are accepted by the owner's engineer. olin Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unvielding Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents. Outline the footprint of the R-Tank system on the excavation floor using spray paint or chalk line to ensure a 2' perimeter is available around the R-Tank system for proper installation and compaction of backf 3.04 Installation of the R-Tanks A. Where a geotextile wrap is specified on the stone base, cut strips to length and install in excavation, removing wrinkles so material lays flat. Overlap geotextile a ت <u>ہ</u> minimum 12" or as recommended by manufacturer. B. Where an impervious liner (for containment) is specified, install the liner per manufacturer's recommendations and the contract documents. The R-Tark units Ð tree th 5100 5631 shall be separated from impervious liner by a non-woven geotextile fabric installed accordance with Section 3.04A. C. Install R-Tank modules by placing side by side, in accordance with the design drawings. No lateral connections are required. It is advisable to use a string line 51 50 to form square corners and straight edges along the perimeter of the R-Tank system. The modules are to be oriented as per the design drawing (15.75" x 28.15") with required depth as shown on plans. The large side plate of the tank should be placed on the perimeter of the system. This will typically require that the two ends of the 0 tank area will have a row of tanks placed perpendicular to all other tanks. If this is not shown in the construction drawings, it is a simple field adjustment that will have minimal effect on the overall system footprint. Refer to R-Tank Installation Guide for more details. 763-763-D. Wrap the R-Tank top and sides in specified geotextile. Cut strips of geotextile so that it will cover the sides and top, encapsulating the entire system to prevent soil entry into the system. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious stnu on, liner) during placement. Identify locations of inlet, outlet and any other penetrations of the geotextile (and optional liner). These connections should be installed flush (butted up to the R-Tank) and the geotextile fabric shall be cut to enable hydraulic continuity between the connections and the R-Tank units. These connections shall be secured using 0 0 0TRIPP 419 Ches Wilmingto Phone 910 Fax 910 pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile, imperviou iner (if specified) or pipe. Connecting pipes at 90 degree angles facilitates construction, unless otherwise specified. Ensure end of pipe is installed snug against R-Tank system. -. Install Inspection and Maintenance Ports in locations noted on plans. At a minimum one maintenance port shall be installed within 10' of each inlet & outlet connection, and with a maximum spacing of one maintenance port for every 2,500 square feet. Install all ports as noted in the R-Tank Installation Guide. If required, install ventilation pipes and vents as specified on drawings to provide ventilation for proper hydraulic performance. The number of pipes and vents will depend on the size of the system. Vents are often installed using a 90 degree elbow with PVC pipe into a landscaped area with 'U" bend or venting bollard to inhibit the ingress of debris. A ground level concrete or steel cover can be used. 3.05 Backfilling of the R-Tank Units A. Backfill and fill with recommended materials as follows Place freely draining backfill materials (Section 2.03 B) around the perimeter in lifts with a maximum thickness of 12°. Each lift shall be placed around the entire perimeter such that each lift is no more than 24" higher than the side backfill along any other location on the perimeter of the R-Tank system. No fill shall be placed over top of tanks until the side backfill has been completed. Each lift shall be compacted at the specified moisture content to a minimum of 95% of the Standard Proctor Density until no further densification is observed (for self-compacting stone materials). The side lifts must be compacted with walk behind compaction equipment. Even when "self-compacting" backfill materials are selected, a walk behind vibratory compactor must be used.

Take care to ensure that the compaction process does not allow the machinery to come into contact with the modules due to the potential for damage to the geotextile and R-Tank units.
 No compaction equipment is permissible to operate directly on the R-Tank modules.
 Following placement of side backfill, a uniform 12" lift of the freely draining material (Section 2.03 B) shall be placed over the R-Tank and lightly compacted using a walk-behind trench roller. Alternately, a roller (maximum gross vehicle weight of 6 tons) may be used. Roller must remain in static mode until a minimum of 24" of cover has been placed over the modules. Sheep foot rollers should not be used.
 Install a geogrid (required for traffic applications) over the initial 12" lift of backfill. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
 Following placement and compaction of the initial cover, subsequent lifts of structural fill (Section 2.03 C) shall be placed at the specified moisture content and compacted to a minimum of 9% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement. Do not exceed maximum cover

depths listed in Table 2.01 B.
8. Place additional layers of geotextile and/or geogrid at elevations as specified in the design details. Each layer of geosynthetic reinforcement placed above the R-Tank system shall extend a minimum of 3 feet beyond the limits of the excavation wall.
B. Only low pressure tire or track vehicles shall be operated over the R-Tank system during construction. No machinery should drive on top of the tank until a minimum of 16° of backfill and compaction is achieved. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Where necessary the heavy equipment should unload in an area adjacent to the R-Tank system and the material should be moved over the system with tracked equipment.
C. Ensure that all unrelated construction traffic is kept away from the limits of excavation until the project is complete and final surface materials are in place. No non-installation related loading should be allowed over the R-Tank system until the final design section has been constructed (including pavement).
D. Place surfacing materials, such as groundcovers (no large trees), or paving materials over the structure with care to avoid displacement of cover fill and damage to surfacing materials.
E. Backfill depth over R-Tank system must be within the limitations shown in the table in Section 2.01 B. If the total backfill depth does not comply with this table,

E. Backfill depth over R-Tank system must be within the limitations shown in the table in Section 2.01 B. If the total backfill depth does not comply with this table, contact engineer or manufacturer's representative for assistance. PART 4 - USING THE SYSTEM

4.01 Maintenance Requirements

A. A routine maintenance effort is required to ensure proper performance of the R-Tank system. The Maintenance program should be focused on pretreatment systems. Ensuring these structures are clean and functioning properly will reduce the risk of contamination of the R-Tank system and stormwater released from the site. Pre-treatment systems shall be inspected yearly, or as directed by the regulatory agency and by the manufacturer (for proprietary systems). Maintain as needed using acceptable practices or following manufacturer's guidelines (for proprietary systems).
B. Inspection and/or Maintenance Ports in the R-Tank system will need to be inspected for accumulation of sediments at least quarterly through the first year of operation and at least yearly thereafter. This is done by removing the cap of the port and using a measuring device long enough to reach the bottom of the R-Tank system and stiff enough to push through the loose sediments, allowing a depth measurement.
C. If sediment has accumulated to the level noted in the R-Tank Maintenance Guide or beyond a level acceptable to the Owner's engineer, the R-Tank system should be flushed.
D. A flushing event consists of pumping water into the Maintenance Port and/or adjacent structure, allowing the turbulent flows through the R-Tank system to re-suspend the fine sediments. If multiple Maintenance Ports have been installed, water should be pumped into each port to maximize flushing efficiency.

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