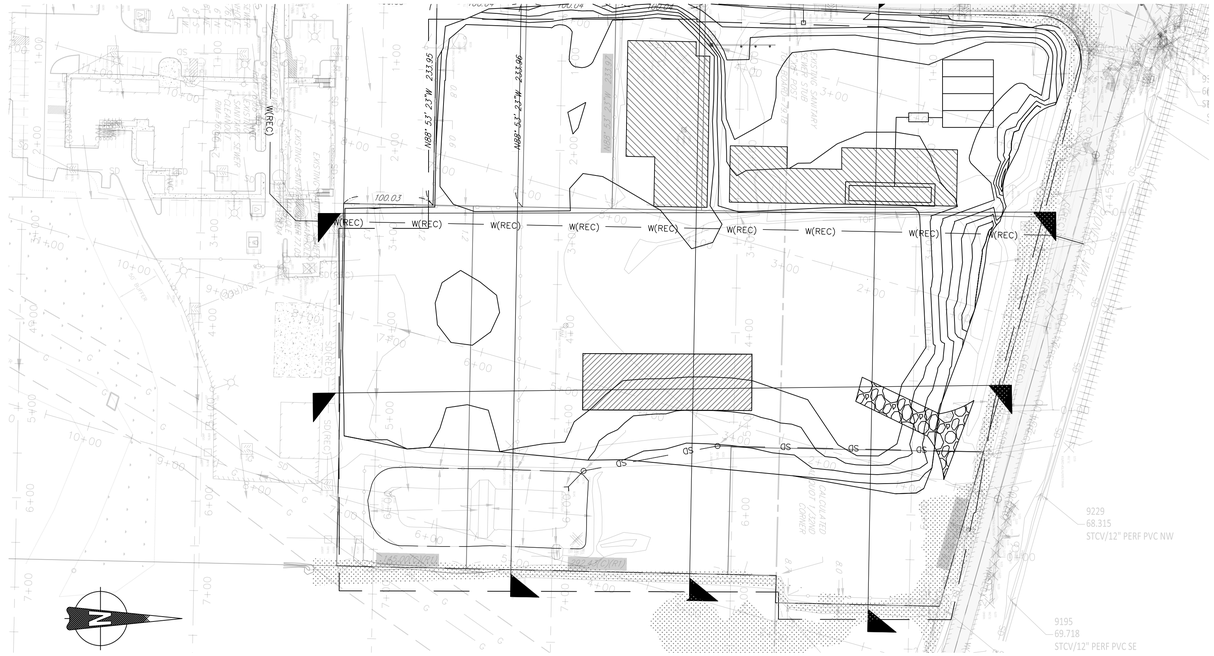
EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

SHEET INDEX

SHEET NUMBER	SHEET NAME	DESCRIPTION
1	C-1	COVER SHEET
2	C-2	TESC PLAN
3-6	C3-C6	GRADING I- IV
7-10	C7-C10	DETAILS
11-16	C11-C16	RTANK 1 DETAILS
17-22	C17-C22	RTANK 2 DETAILS
23-28	C23-C28	RTANK 3 DETAILS



SURVEYOR

ABBEY ROAD GROUP
CONTACT: LARRY WALKER
P.O. BOX 1224
PUYALLUP, WA 98371
OFFICE: 253-435-3699

ARCHITECT

SYNTHESIS 9, LLC
CONTACT: BRETT LINDSAY
523 N. D. ST
TACOMA, WA 98403
OFFICE: 253-468-4117

CIVIL ENGINEER

MCINNIS ENGINEERING
202 E 34TH ST.
TACOMA, WA 98404
CONTACT: WILL MCINNIS
OFFICE: 253-414-1992

SITE INFORMATION

PARCEL: 0420264021, 0420264054, 0420264053, 0420351066, 0420351030, 0420351029, 0420351026
ADDRESS: 2902 E PIONEER
PUYALLUP, WA 98372
ZONING: RM-20

SURVEYOR'S NOTES

1. **HORIZONTAL DATUM:** BASIS OF BEARING AND SURVEY DATA PER WASHINGTON STATE PLANE COORDINATE SYSTEM, SOUTH ZONE.

2. **BASIS OF BEARING:** HELD S 01° 21' 28" W OBSERVED ALONG THE EAST LINE OF THE NORTHEAST QUARTER OF SEC. 35, T. 20 N. R. 4 E. BETWEEN THE NORTHEAST CORNER OF THE NORTHEAST QUARTER MONUMENT AND THE SOUTHEAST CORNER OF THE NORTHEAST QUARTER MONUMENT OF THE SAID SECTION AS SHOWN HEREON.

3. **VERTICAL DATUM:** NAVD88
AS DEFINED BY THE NATIONAL GEODETIC SURVEY (NGS)
PROJECT BENCHMARK:
DESIGNATION: 21 010
PID: DL2774

PUBLISHED ELEVATION: 75.70 FEET (NAVD 88)
DESCRIPTION: ENCASED STEEL ROD LOCATED IN EASTERLY GRAVEL SHOULDER AT THE INTERSECTION OF PIONEER WAY AND 134TH AVE. E.

4. ALL UTILITY LOCATES HAVE BEEN DETERMINED BY SURFACE LOCATION ONLY EITHER BY PHYSICAL STRUCTURES OR PAINT MARKINGS
AS DETERMINED BY UNDERGROUND + UTILITY LOCATE, INC. AND/OR UTILITY COMPANY. GAS PIPE LOCATION WITH IN THE PROPERTY
DETERMINED BY MAP PROVIDE BY PUGET SOUND ENERGY, INC. ACTUAL UNDERGROUND LOCATION MAY VARY. EXISTING UTILITIES AS
SHOWN MAY NOT BE THE SAME AFTER THIS DATE AS MAJOR CONSTRUCTION IS IN PROGRESS.

5. REFERENCE SURVEYS:
   1. 200303315001
   2. SP 9303315001
   3. ROS 8210040207

6. METHOD OF SURVEYING WAS:
   1. CONVENTIONAL TRAVERSE USING A TOPCON 800A TOTAL STATION.
   2. MONUMENTS FOUND MARCH 2008

GENERAL NOTES

At any time during construction it is determined by the City that mud and debris are being tracked onto public
streets with insufficient cleanup, all work shall cease on the project until this condition is corrected. The contractor
and/or the owner shall immediately take all steps necessary to prevent future tracking of mud and debris into the
public ROW, which may include the installation of a wheel wash facility on-site

Contractor shall designate a Washington Department of Ecology certified erosion and sediment control leadperson,
and shall comply with the Stormwater Pollution Prevention Plan (SWPPP) prepared for this project.

Sediment-laden runoff shall not be allowed to discharge beyond the construction limits in accordance with the
Project's NPDES General Stormwater Permit.

Any permanent infiltration system shall not be utilized for TESC runoff. Connect infiltration system to the upstream
stormwater conveyance only after construction is complete and site is stabilized and paved.

TOPOGRAPHIC NOTE

THE EXISTING CULTURAL AND TOPOGRAPHICAL DATA SHOWN ON THESE DRAWINGS HAS BEEN PREPARED, IN PART, BASED UPON INFORMATION FURNISHED BY OTHERS. WHILE THIS INFORMATION IS BELIEVED TO BE RELIABLE, MCINNIS ENGINEERING CANNOT ENSURE ACCURACY AND THUS IS NOT RESPONSIBLE FOR THE ACCURACY OF THAT INFORMATION OR FOR ANY ERRORS OR OMISSIONS WHICH MAY HAVE BEEN INCORPORATED INTO THESE DRAWINGS AS A RESULT.

FILL SPECIFICATIONS

FILL MATERIAL SHALL NOT CONTAIN PETROLEUM PRODUCTS, OR SUBSTANCES WHICH ARE HAZARDOUS, DANGEROUS, TOXIC, OR WHICH OTHERWISE VIOLATE ANY STATE, FEDERAL, OR LOCAL LAW, ORDINANCE, CODE, REGULATION, RULE, ORDER, OR STANDARD.

TRENCH NOTES

IF WORKERS ENTER ANY TRENCH OR OTHER EXCAVATION FOUR OR MORE FEET IN DEPTH THAT DOES NOT MEET THE OPEN PIT REQUIREMENTS OF WSDOT SECTION 2-09 .3(3)8, IT SHALL BE SHORED AND CRIBBED. THE CONTRACTOR IS ALONE RESPONSIBLE FOR WORKER SAFETY. ALL TRENCH SAFETY SYSTEMS SHALL MEET THE REQUIREMENTS OF THE WASHINGTON INDUSTRIAL SAFETY AND HEALTH ACT, CHAPTER 49.17 RCW.

VERIFICATION NOTE

ALL EXISTING UTILITIES IN THE CONSTRUCTION AREA SHALL BE IDENTIFIED AND VERIFIED FOR DEPTH AND LOCATION PRIOR TO ANY CONSTRUCTION ACTIVITIES SO TO IDENTIFY ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

PRIOR TO ANY CONSTRUCTION ACTIVITIES, VERIFY EXISTING TOPOGRAPHY IS CONSISTENT WITH WHAT IS SHOWN ON PLANS AND IF THERE ARE ANY POTENTIAL CONFLICTS WITH PROPOSED CONSTRUCTION ACTIVITIES. CONTACT PROJECT ENGINEER IMMEDIATELY IF ANY CONFLICTS ARE IDENTIFIED.

CONSTRUCTION SEQUENCE

1. OBTAIN REQUIRED PERMITS AND HOLD A PRE-CONSTRUCTION MEETING WITH THE CITY
2. FLAG CLEARING LIMITS
3. INSTALL OR REPLACE SILT FENCE
4. INSTALL CONSTRUCTION ENTRANCE
5. POTHOLE ANY EXISTING UTILITIES FOR VERIFICATION OF DEPTH AND LOCATION. SEE VERIFICATION NOTE
6. SCHEDULE EROSION CONTROL INSPECTION W/ CITY
7. GRADE SITE
8. MAINTAIN EROSION CONTROL MEASURE AND RELOCATE SURFACEWATER CONTROLS AS NEEDED IN ACCORDANCE WITH CITY OF PUYALLUP REQUIREMENTS AND NPDES CONSTRUCTION STORMWATER GENERAL PERMIT
9. COVER ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN FIVE DAYS DURING THE DRY SEASON OR TWO DAYS DURING THE WET SEASON
10. STABILIZE ALL AREAS WITHIN SEVEN DAYS OF REACHING FINAL GRADE
11. INSTALL RTANKS
12. STABILIZE ALL DISTURBED AREAS AND REMOVES BMP'S AND EROSION CONTROL MEASURES AS APPROPRIATE
13. ARRANGE FINAL INSPECTION WITH THE CITY

CUT AND FILL ESTIMATES

CUT: 441 CY
FILL: 32936 CY
NET IMPORT: 32495 CY

LEGAL DESCRIPTION

TAX PARCEL NO. 0420264021: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249900-T35 DATED JANUARY 22, 2021 AT 8:00 A.M.

BEGINNING AT THE INTERSECTION OF THE SOUTH LINE OF SECTION 26, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M., IN PIERCE COUNTY, WASHINGTON, WITH THE EAST 1/16TH LINE OF SAID SECTION;
THENCE SOUTH ALONG THE 1/16TH LINE OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST, W.M., A DISTANCE OF 95.4 FEET;
THENCE EAST 258.26 FEET;
THENCE NORTH TO THE SOUTHERLY LINE OF THE COUNTY ROAD;
THENCE NORTHWESTERLY ALONG SAID SOUTHERLY LINE OF COUNTY ROAD TO THE EAST 1/16TH LINE OF SECTION 26;
THENCE SOUTH ALONG SAID 1/16TH LINE TO THE POINT OF BEGINNING;

EXCEPT THE WEST 30 FEET THEREOF CONVEYED TO PIERCE COUNTY BY DEED RECORDED UNDER RECORDING NO. 1618885 FOR SHAW COUNTY ROAD;

ALSO EXCEPT THEREFROM THAT PORTION CONVEYED TO THE CITY PUYALLUP BY INSTRUMENT RECORDED UNDER AUDITOR'S FILE NO. 9408230215, BEING A RE-RECORD OF INSTRUMENT RECORDED UNDER AUDITOR'S FILE NO. 9308310480;

AND ALSO EXCEPT ANY PORTION THEREOF LYING SOUTHERLY AND WESTERLY OF A LINE DESCRIBED AS BEGINNING AT THE NORTHWEST
CORNER OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 35, HEREINAFTER CALLED "POINT A";
THENCE SOUTH ALONG THE 1/16TH LINE 95.4 FEET TO THE TRUE POINT OF BEGINNING OF THE LINE TO BE DESCRIBED;
THENCE EAST 258.35 FEET;
THENCE SOUTH TO A POINT 495.4 FEET SOUTH OF AND 258.35 FEET EAST OF "POINT A";
THENCE EAST TO THE EAST LINE OF SAID PREMISES AND THE TERMINUS OF SAID LINE, SAID POINT ALSO BEING DESCRIBED AS THE SOUTHWEST CORNER OF LOT 3 OF BOUNDARY LINE ADJUSTMENT RECORDED UNDER AUDITOR'S FILE NO. 200303315001;

SITUATE IN THE CITY PUYALLUP, COUNTY OF PIERCE STATE OF WASHINGTON.

TAX PARCEL NO. 0420264053: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249901-T35 DATED JANUARY 22, 2021 AT 8:00 A.M.

THAT PORTION OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 35, AND THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 26, TOWNSHIP 20 NORTH, RANGE 4 EAST, WM.M., IN PIERCE COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

COMMENCING AT THE NORTHEAST CORNER OF THE WEST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 35 WHICH POINT BEARS NORTH 88°32'51" WEST, 640.11 FEET FROM A BRASS IN CONCRETE MONUMENT MARKING THE NORTHEAST
CORNER OF SAID SECTION 35;
THENCE ALONG THE EAST LINE OF SAID WEST HALF, SOUTH 01°15'04" WEST, 54.00 FEET TO THE TRUE POINT OF BEGINNING;
THENCE ALONG THE EAST LINE OF SAID WEST HALF, SOUTH 01°15'04" WEST, 437.43 FEET TO POINT LYING
SOUTH 88°53'30" EAST, 405.26 FEET OF THE EASTERLY EXTENSION OF THE NORTH LINE OF LOT 2 OF PIERCE COUNTY SHORT PLAT NO. 9303010321;
THENCE ALONG THE NORTHERLY EXTENSION OF THE EAST LINE OF SAID LOT 2, NORTH 01°06'30" EAST, 789.89 FEET TO THE SOUTHERLY MARGIN OF PIONEER WAY;
THENCE ALONG SAID SOUTHERLY MARGIN, SOUTH 74°08'09" EAST, 272.98 FEET TO A LINE LYING 263.84 FEET EAST OF AND PARALLEL WITH
THE NORTHERLY EXTENSION OF THE EAST LINE OF SAID LOT 2;
THENCE ALONG SAID PARALLEL LINE, SOUTH 01°06'30" WEST, 282.06 FEET TO A LINE 54.00 FEET SOUTH OF AND PARALLEL WITH THE NORTH
LINE OF SECTION 35:
THENCE ALONG SAID PARALLEL LINE, SOUTH 88°32'51" EAST, 142.38 FEET TO THE TRUE POINT OF BEGINNING;

EXCEPT THE SOUTH 145.00 FEET THEREOF;
(ALSO KNOWN AS LOT 3 OF RECORD OF SURVEY FOR BOUNDARY LINE ADJUSTMENT RECORDED MARCH 31, 2003 UNDER RECORDING NO. 200303315001).

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.

TAX PARCEL NO. 0420264054: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249902-T35 DATED JANUARY 22, 2021 AT 8:00 A.M.

THAT PORTION OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 35, AND THE SOUTHEAST QUARTER OF THE SOUTHEAST QUARTER OF SECTION 26, TOWNSHIP 20 NORTH, RANGE 4 EAST, WM.M., IN PIERCE COUNTY, WASHINGTON, DESCRIBED AS FOLLOWS:

BEGINNING AT THE NORTHEAST CORNER OF THE WEST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SECTION 35 WHICH POINT BEARS NORTH 88°32'51" WEST, 640.11 FEET FROM A BRASS IN CONCRETE MONUMENT MARKING THE NORTHEAST CORNER OF SAID SECTION 35;
THENCE ALONG THE EAST LINE OF SAID WEST HALF, SOUTH 01°15'04" WEST, 54.00 FEET;
THENCE ALONG A LINE PARALLEL WITH THE NORTH LINE OF SAID SECTION 35, NORTH 88°32'51" WEST, 142.38 FEET;
THENCE NORTH 01°06'30" EAST, 282.08 FEET TO THE SOUTHERLY MARGIN OF PIONEER WAY;
THENCE ALONG SAID SOUTHERLY MARGIN, SOUTH 74°08'09" EAST, 179.36 FEET TO A LINE LYING 30.48 FEET EAST OF AND PARALLEL WITH EAST LINE OF THE WEST HALF OF THE NORTH EAST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 35;
THENCE ALONG SAID PARALLEL LINE, SOUTH 01°15'04" WEST, 183.43 FEET TO THE NORTH LINE OF SAID SECTION 35;
THENCE ALONG SAID NORTH LINE, NORTH 88°32'51" WEST, 30.48 FEET TO THE POINT OF BEGINNING;

(ALSO KNOWN AS LOT 5 OF RECORD OF SURVEY FOR BOUNDARY LINE ADJUSTMENT RECORDED MARCH 31, 2003 UNDER RECORDING NO. 200303315001).

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.

TAX PARCEL NO. 0420351066: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249903-T35 DATED JANUARY 22, 2021 AT 8:00 A.M.

COMMENCING AT THE NORTHEAST CORNER OF THE WEST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 35 WHICH POINT BEARS NORTH 88°32'51" WEST, 640.11 FEET FROM A BRASS IN CONCRETE MONUMENT MARKING THE NORTHEAST CORNER OF SAID SECTION 35;
THENCE ALONG THE EAST LINE OF SAID WEST HALF, SOUTH 01°15'04" WEST, 491.43 FEET TO A POINT LYING
SOUTH 88°53'30" EAST, 405.26 FEET TO THE EASTERLY EXTENSION OF THE NORTH LINE OF LOT 2 OF THE PIERCE COUNTY SHORT PLAT NO. 9303010321 AND THE TRUE POINT OF BEGINNING;
THENCE ALONG SAID NORTH LINE, NORTH 88°53'30" WEST, 405.26 TO THE NORTHEAST CORNER OF SAID LOT 2;
THENCE ALONG THE NORTHERLY EXTENSION OF THE EAST LINE OF SAID LOT 2, NORTH 01°06'30" EAST, 145.00 FEET;
THENCE SOUTH 88°53'30" EAST 405.62 FEET TO THE EAST LINE OF THE WEST HALF OF THE NORTHEAST QUARTER OF THE NORTHEAST QUARTER OF SAID SECTION 35;
THENCE ALONG SAID EAST LINE SOUTH 01°15'04" WEST, 145.00 FEET TO THE TRUE POINT OF BEGINNING

(ALSO KNOWN AS LOT 3 OF RECORD OF SURVEY FOR BOUNDARY LINE ADJUSTMENT RECORDED MARCH 31, 2003 UNDER RECORDING NO. 200303315001).

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.

TAX PARCEL NO. 0420351030: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249904-T35 DATED JANUARY 22, 2021 AT 8:00 A.M.

BEGINNING AT THE SIXTEENTH SECTION CORNER OF SECTION 35, TOWNSHIP 20 NORTH, RANGE 4 EAST OF THE WILLAMETTE MERIDIAN, 1321.48 FEET WEST OF THE CORNER COMMON TO SECTIONS 25, 26, 35 AND 36;
THENCE SOUTH ALONG THE SIXTEENTH SECTION 95.4 FEET TO THE TRUE POINT OF BEGINNING;
THENCE EAST 258.26 FEET;
THENCE SOUTH 100 FEET;
THENCE WEST 258.26 FEET;
THENCE NORTH 100 FEET TO THE TRUE POINT OF BEGINNING, IN PIERCE COUNTY, WASHINGTON.

EXCEPT SHAW COUNTY ROAD.

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.

TAX PARCEL NO. 0420351029: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249905-1-E DATED JANUARY 22, 2021 AT 8:00 A.M.

BEGINNING AT THE 1/16 SECTION CORNER, 1321.48 FEET WEST OF CORNER MONUMENT
COMMON TO SECTIONS 25, 26, 35 AND 36 IN TOWNSHIP 20 NORTH, RANGE 4 EAST,
WILLAMETTE MERIDIAN, IN PIERCE COUNTY, WASHINGTON;
THENCE SOUTH ALONG THE 1/16 SECTION LINE 195.4 FEET TO THE TRUE POINT OF BEGINNING;
THENCE EAST 258.26 FEET;
THENCE SOUTH 100 FEET;
THENCE WEST 258.26 FEET;
THENCE NORTH 100 FEET TO TRUE POINT OF BEGINNING.

EXCEPT THE WEST 30 FEET THEREOF FOR ROAD.

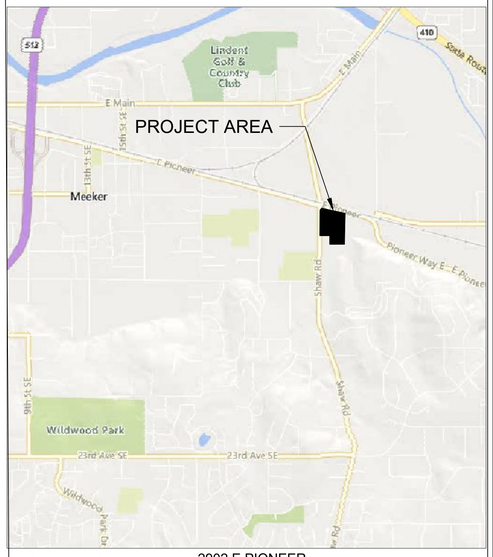
SITUATE IN THE COUNTY OF PIERCE, STATE OF WASHINGTON.

TAX PARCEL NO. 0420351026: PER CW TITLE TITLE RESOURCES GUARANTY COMPANY SUBDIVISION GUARANTEE ORDER NO. 40249906-T35
DATED JANUARY 22, 2021 AT 8:00 A.M.

BEGINNING AT THE 1/16 CORNER 1321.48 FEET WEST OF THE CORNER MONUMENT COMMON TO SECTIONS 25, 26, 35 AND 36 IN TOWNSHIP 20
NORTH, RANGE 4 EAST, WILLAMETTE MERIDIAN, IN PIERCE COUNTY, WASHINGTON;
THENCE SOUTH ALONG THE 1/16 SECTION LINE 294.5 FEET TO THE TRUE POINT OF BEGINNING;
THENCE EAST 258.35 FEET;
THENCE SOUTH 100 FEET;
THENCE WEST 258.35 FEET;
THENCE NORTH 100 FEET TO THE TRUE POINT OF BEGINNING, IN PIERCE COUNTY, WASHINGTON.

EXCEPT SHAW COUNTY ROAD.

SITUATE IN THE CITY OF PUYALLUP, COUNTY OF PIERCE, STATE OF WASHINGTON.



SCALE: NTS

2902 E PIONEER
PUYALLUP, WA 98372

C-1

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

City of Puyallup
Development & Permitting Services
ISSUED PERMIT

Building	Planning
Engineering	Public Works
Fire	Traffic

McInnis ENGINEERING
mcinnisengineering.com
253.414.1992
202 East 34th Street
Tacoma, Washington 98404

EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

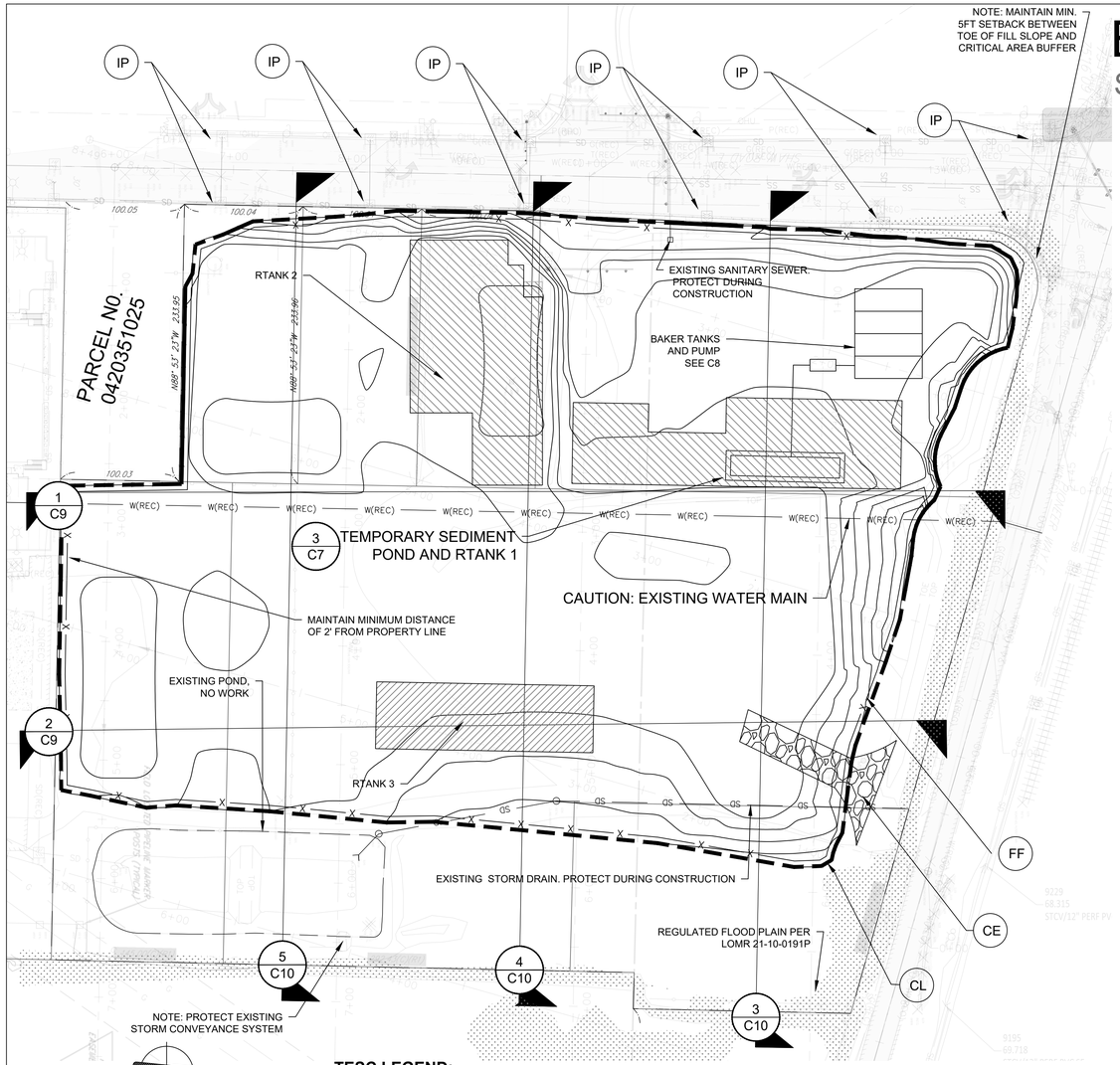
NUM	DATE	DESCRIPTION

DESIGNED	SCALE
J. MCINNIS	1:80
DRAWN	CHECKED
W. MCINNIS	CHCK
DATE	APPROVED
10/2/23	APRD

COVER SHEET

SHEET
1 OF 28

C-1



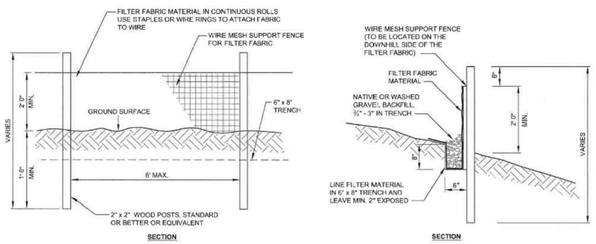
TESC LEGEND:

CL — CLEARING/ GRADING/ DISTURBED LIMITS

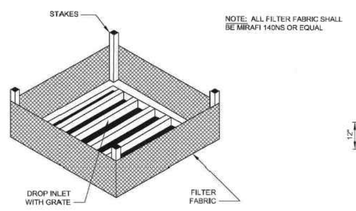
FF — FILTER FABRIC FENCE SEE DETAIL 2/C2

CE — CONSTRUCTION ENTRANCE 1/C2

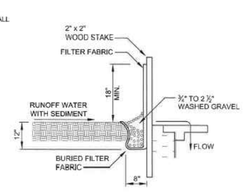
IP — INLET PROTECTION 3/C2

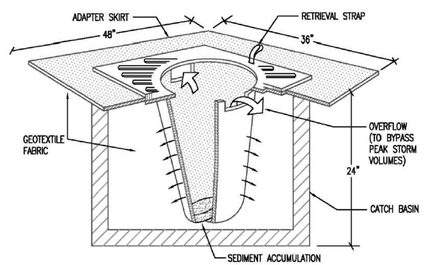


2 FILTER FABRIC FENCE
SCALE:NTS



3 INLET PROTECTION
SCALE:NTS





EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

TESC INSPECTION NOTES:

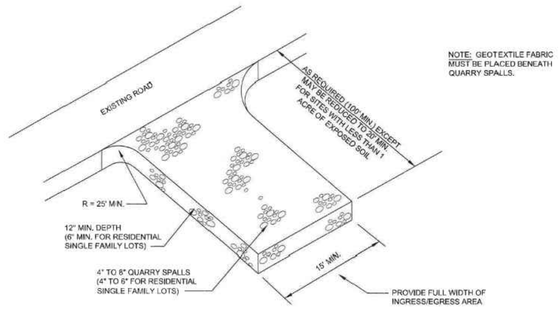
1. INSPECT ALL INLET PROTECTION ON CATCH BASINS. CLEAN OR REPLACE IF FULL OF SEDIMENT /DEBRIS AND REPAIR/REPLACE AS NEEDED IF DAMAGED TO MAINTAIN PROTECTION.
2. INSPECT ALL PERMANENT AND TEMPORARY STABILIZED SLOPES. REPAIR ANY DAMAGED SECTIONS AND RE-VEGETATE AS NEEDED TO ENSURE THE ESTABLISHMENT OF VEGETATION AND THAT NO EROSION OF THE SLOPES OCCUR.
3. INSPECT ALL FILTER FABRIC FENCING FOR SIGNS OF EROSION, DAMAGE OR FAILURES. REPAIR AND/OR REPLACE AS NEEDED. SEE FILTER FABRIC NOTES. SEDIMENT BUILD-UP ALONG FENCE SHALL BE REMOVED WHEN REACHES 1/3 THE FENCE HEIGHT. IF EROSION IS OCCURRING, CONTRACTOR SHALL INSTALL ADDITIONAL EROSION CONTROL MEASURES AS NEEDED TO PREVENT EROSION.
4. ANY FILL/CUT SLOPES SHALL BE INSPECTED FOR EROSION. IF SIGNS OF EROSION ARE PRESENT, INSTALL APPROPRIATE BMPS AS NEEDED TO STOP EROSION AND STABILIZE SLOPES.
5. TESC LEAD RESPONSIBLE FOR NOTIFYING ENGINEER IF ADDITIONAL MEASURES ARE WARRANTED.

PERMANENT STABILIZATION NOTES:

1. ALL EXPOSED SOILS AND SLOPES SHALL BE SEEDED OR OTHERWISE STABILIZED IMMEDIATELY AFTER CONSTRUCTION AND GRADING ACTIVITIES HAVE BEEN COMPLETED.
2. SILT FENCE, IF DEEMED APPROPRIATE, SHALL REMAIN FOR A MINIMUM OF 30 DAYS AFTER THE FINAL STABILIZATION OF THE SLOPES HAS OCCURRED.
3. ALL TEMPORARY EROSION CONTROL BMP'S SHALL BE REMOVED 30 DAYS AFTER FINAL STABILIZATION HAS OCCURRED AS DIRECTED BY CITY OR COUNTY INSPECTOR.
4. CONTRACTOR SHALL REFER TO THE CONSTRUCTION SWPP FOR APPLICABLE BMPS.

CONSTRUCTION ENTRANCE NOTES:

1. MATERIAL SHALL BE 4" TO 8" QUARRY SPALLS (4 TO 6 INCH FOR RESIDENTIAL SINGLE FAMILY LOTS) AND MAY BE TOP-DRESSED WITH 1 TO 3 INCH ROCK.
2. THE ROCK PAD SHALL BE AT LEAST 12" THICK AND 100' LONG (REDUCED TO 20 FEET FOR SITES LESS THAN 1 ACRE OF DISTURBED SOIL) WIDTH SHALL BE FULL WIDTH OF INGRESS AND EGRESS AREA. SMALLER PADS MAY BE APPROVED FOR SINGLE-FAMILY RESIDENTIAL AND COMMERCIAL SITES
3. ADDITIONAL ROCK SHALL BE ADDED PERIODICALLY TO MAINTAIN FUNCTION OF THE PAD.
4. IF THE PAD DOES NOT ADEQUATELY REMOVE MUD FROM THE VEHICLE WHEELS, THE WHEELS SHALL BE HOSED OFF BEFORE THE VEHICLE ENTERS A PAVED STREET.THE WASHING SHALL BE DONE ON AN AREA COVERED WITH CRUSHED ROCK AND WASH WATER SHALL DRAIN TO A SEDIMENT RETENTION FACILITY OR THROUGH A SILT FENCE.



1 CONSTRUCTION ENTRANCE
SCALE:NTS

FILTER FABRIC FENCE NOTES:

1. SUPPORT POST, WITH A MINIMUM 6-INCH OVERLAP. AND SECURELY FASTENED AT BOTH ENDS TO POSTS.
2. POSTS SHALL BE SPACED A MAXIMUM OF 6 FEET APART AND DRIVEN SECURELY INTO THE GROUND (MINIMUM OF 30 INCHES).
3. A TRENCH SHALL BE EXCAVATED APPROXIMATELY 8 INCHES WIDE AND 12 INCHES DEEP ALONG THE LINE OF POSTS
4. AND UPSLOPE FROM THE BARRIER. THIS TRENCH SHALL BE BACKFILLED WITH WASHED GRAVEL.
5. WHEN STANDARD STRENGTH FILTER FABRIC IS USED, A WIRE MESH SUPPORT FENCE SHALL BE FASTENED SECURELY TO THE UPSLOPE SIDE OF THE POSTS USING HEAVY-DUTY WIRE STAPLES AT LEAST 1 INCH LONG, TIE WIRES OR HOG RINGS. THE WIRE SHALL EXTEND INTO THE TRENCH A MINIMUM OF 4 INCHES AND SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE.
6. THE STANDARD STRENGTH FILTER FABRIC SHALL BE STAPLED OR WIRED TO THE FENCE, AND 20 INCHES OF THE FABRIC SHALL BE EXTENDED INTO THE TRENCH. THE FABRIC SHALL NOT EXTEND MORE THAN 24 INCHES ABOVE THE ORIGINAL GROUND SURFACE. FILTER FABRIC SHALL NOT BE STAPLED TO EXISTING TREES.
7. WHEN EXTRA-STRENGTH FILTER FABRIC AND CLOSER POST SPACING IS USED, THE WIRE MESH SUPPORT FENCE MAY BE ELIMINATED. IN SUCH A CASE, THE FILTER FABRIC IS STAPLED OR WIRED DIRECTLY TO THE POSTS WITH ALL OTHER PROVISIONS OF ABOVE NOTES APPLYING.
8. FILTER FABRIC FENCES SHALL NOT BE REMOVED BEFORE THE UPSLOPE AREA HAS BEEN PERMANENTLY STABILIZED.
9. FILTER FABRIC FENCES SHALL BE INSPECTED IMMEDIATELY AFTER EACH RAINFALL AND AT LEAST DAILY DURING PROLONGED RAINFALL. ANY REQUIRED REPAIRS SHALL BE MADE IMMEDIATELY.
10. SILT FENCES WILL BE INSTALLED PARALLEL TO ANY SLOPE CONTOURS.
11. CONTRIBUTING LENGTH TO FENCE WILL NOT BE GREATER THAN 100 FEET.
12. DO NOT INSTALL BELOW AN OUTLET PIPE OR WEIR.
13. INSTALL DOWNSLOPE OF EXPOSED AREAS.
14. DO NOT DRIVE OVER OR FILL OVER SILT FENCES.

AMENDED SOILS NOTES:

- SOIL AMENDMENTS ARE REQUIRED FOR ALL DISTURBED AREAS IN ACCORDANCE WITH BMP L613: POST-CONSTRUCTION SOIL QUALITY AND DEPTH OF THE 2021 SURFACE WATER MANAGEMENT MANUAL
- AMENDED SOILS SHALL BE A MINIMUM OF 8" (NON-COMPACTED) WITH SUBSOILS SCARIFIED AT LEAST 4" WITH INCORPORATION OF THE UPPER MATERIAL TO AVOID STRATIFIED LAYERS, WHERE FEASIBLE.
- QUALITY OF COMPOST AND OTHER MATERIALS USED TO MEET THE ORGANIC CONTENT REQUIREMENTS ARE AS FOLLOWS:

a. THE ORGANIC CONTENT FOR "PRE-APPROVED" AMENDMENT RATES CAN BE MET ONLY USING COMPOST THAT MEETS THE DEFINITION OF "COMPOSTED MATERIALS" IN WAC 173-350-220. THE WAC IS AVAILABLE ONLINE AT: HTTP://WWW.ECY.WA.GOV/PROGRAMS/SWFA/FACILITIES/350.HTML THE COMPOST MUST ALSO HAVE AN ORGANIC MATTER CONTENT OF 35% TO 65%, AND A CARBON TO NITROGEN RATIO BELOW 25:1. THE CARBON TO NITROGEN RATIO MAY BE AS HIGH AS 35: 1 FOR PLANTINGS COMPOSED ENTIRELY OF PLANTS NATIVE TO THE PUGET SOUND LOWLANDS REGION.
b. CALCULATED AMENDMENT RATES MAY BE MET THROUGH USE OF COMPOSTED MATERIALS AS DEFINED ABOVE; OR OTHER ORGANIC MATERIALS AMENDED TO MEET THE CARBON TO NITROGEN RATIO REQUIREMENTS, AND MEETING THE CONTAMINANT STANDARDS OF GRADE A COMPOST.

- USE ONE OF THE FOLLOWING OPTIONS TO MEET THE POST CONSTRUCTION SOIL QUALITY AND DEPTH REQUIREMENTS. USE THE MOST RECENT VERSION OF "GUIDELINES FOR RESOURCES FOR IMPLEMENTING SOIL QUALITY AND DEPTH BMP T5.13" TO MEET THE REQUIREMENTS OF THIS BMP. THIS GUIDANCE CAN BE FOUND ONLINE AT:WWW.SOILSFORSALMON.ORG

a. LEAVE NATIVE VEGETATION AND SOIL UNDISTURBED, AND PROTECT FROM COMPACTION DURING CONSTRUCTION
b. AMEND EXISTING SITE TOPSOIL OR SUBSOIL EITHER AT DEFAULT "PRE-APPROVED" RATES, OR AT CUSTOM CALCULATED RA TES BASED ON SPECIFIC TESTS OF THE SOIL AND AMENDMENT
c. STOCKPILE EXISTING TOPSOIL DURING GRADING, AND REPLACE IT PRIOR TO PLANTING. STOCKPILED TOPSOIL MUST ALSO BE AMENDED IF NEEDED TO MEET THE ORGANIC MATTER OR DEPTH REQUIREMENTS, EITHER AT A DEFAULT "PRE-APPROVED" RATE OR AT A CUSTOM CALCULATED RATE.
d. IMPORT TOPSOIL MIX OF SUFFICIENT ORGANIC CONTENT AND DEPTH TO MEET THE REQUIREMENTS. MORE THAN ONE METHOD MAY BE USED ON DIFFERENT PORTIONS OF THE SAME SITE. SOIL THAT ALREADY MEETS THE DEPTH AND ORGANIC MATTER QUALITY STANDARDS, AND IS NOT COMPACTED, DOES NOT NEED TO BE AMENDED.

- AMENDED SOILS SHALL BE MAINTAINED AS FOLLOWS:

a. SOIL QUALITY AND DEPTH SHOULD BE ESTABLISHED TOWARD THE END OF CONSTRUCTION AND ONCE ESTABLISHED, SHOULD BE PROTECTED FROM COMPACTION, SUCH AS FROM LARGE MACHINERY USE, AND FROM EROSION.
b. SOIL SHOULD BE PLANTED AND MULCHED AFTER INSTALLATION.
c. PLANT DEBRIS OR ITS EQUIVALENT SHOULD BE LEFT ON THE SOIL SURFACE TO REPLENISH ORGANIC MA TIER.
d. IT SHOULD BE POSSIBLE TO REDUCE USE OF IRRIGATION, FERTILIZERS, HERBICIDES AND PESTICIDES. THESE ACTIVITIES SHOULD BE ADJUSTED WHERE POSSIBLE,RATHER THAN CONTINUING TO IMPLEMENT FORMERLY ESTABLISHED PRACTICES.

- SEE PROJECT CONSTRUCTION SWPPP FOR ADDITIONAL INFORMATION OR SECTION 2.2.1.4 OF CHAPTER 2 OF VOLUME 6 OF THE 2021 SURFACE WATER MANAGEMENT MANUAL

MULCHING NOTES:

1. MULCH MATERIALS USED SHALL BE STRAW OR HAY, AND SHALL BE APPLIED AT THE RATE OF 75-100 POUNDS PER 1000 SQ. FT. (APPX 2" THICK).
2. MULCH SHALL BE APPLIED IN ALL AREAS WITH EXPOSED SLOPES GREATER THAN 2: 1.
3. MULCHING SHALL BE USED IMMEDIATELY AFTER SEEDING OR IN AREAS WHICH CANNOT BE SEEDED BECAUSE OF THE SEASON.
4. ALL AREAS NEEDING MULCH SHALL BE COVERED BY NOVEMBER 1.

CONTRACTOR NOTES:

1. INLET PROTECTION SHALL BE INSTALLED IN ALL NEWLY CONSTRUCTED CATCH BASINS AND ALONG ALL IMPACTED FRONTAGE AND OFFSITE AREAS PER THE REQUIREMENTS OF THE COUNTY INSPECTOR PER DETAIL 5 ON THIS SHEET 5.
2. CONSTRUCTION FENCE CAN BE UTILIZED IN PLACE OF FILTER FABRIC FENCE ONLY IN AREAS WHERE THE GRADES DO NOT ALLOW THE POTENTIAL FOR ANY STORMWATER TO LEAVE THE SITE.
3. ALL DEMOLISHED MATERIALS SHALL BE REMOVED FROM THE SITE AND DISPOSED OF AT A CITY APPROVED LOCATION AND IN A MANNER CONSISTENT WITH CURRENT REGULATIONS AND REQUIREMENTS.
4. ALL AREAS THAT WILL BE UNWORKED FOR MORE THAN SEVEN (7) DAYS DURING THE DRY SEASON OR TWO (2) DAYS DURING THE WET SEASON, SHALL BE COVERED WITH STRAW, WOOD FIBER MULCH, COMPOST, PLASTIC SHEETING, OR OTHER EQUIVALENT PER CURRENT CITY OR COUNTY STANDARDS. SEE SEEDING NOTES AND MULCHING NOTES ON THIS SHEET.
5. CONTRACTOR SHALL DESIGNATE A WASHINGTON DEPT OF ECOLOGY CERTIFIED EROSION CONTROL LEAD PERSON, AND SHALL COMPLY WITH THE CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN (SWPPP) PREPARED FOR THE PROJECT.
6. AT ANY TIME DURING CONSTRUCTION IT IS DETERMINED BY THE CITY OR COUNTY THAT MUD AND DEBRIS ARE BEING TRACKED ONTO PUBLIC STREETS WITH INSUFFICIENT CLEANUP, ALL WORK SHALL CEASE ON THE PROJECT UNTIL THIS CONDITION IS CORRECTED. THE CONTRACTOR AND/OR THE OWNER SHALL IMMEDIATELY TAKE ALL STEPS NECESSARY TO PREVENT FUTURE TRACKING OF MUD AND DEBRIS INTO THE PUBLIC ROW, WHICH MAY INCLUDE THE INSTALLATION OF A WHEEL WASH FACILITY ON-SITE.
7. SEDIMENT LADEN RUNOFF SHALL NOT BE ALLOWED TO DISCHARGE BEYOND THE LIMITS OF THE IMPROVEMENTS. ADDITIONAL MEASURES SHALL BE INSTALLED AS NEEDED.
8. SAND BAGS SHALL BE SECURELY PLACED AROUND INSTALLED CATCH BASINS WITH INLET PROTECTION AS FIELD AND WEATHER CONDITIONS WARRANT SO TO PROTECT ALL DISPERSION AND INFILTRATION TRENCHES SEDIMENT LADEN RUNOFF.
9. TREES WITHIN WORKING LIMITS TO BE SAVED, SHALL BE MARKED AS SUCH ON SITE AND PROTECTION FENCE PLACED AROUND EACH TREE.

SEEDING NOTES:

1. THE FOLLOWING SEED MIXTURE SHALL BE AS BELOW AND SHALL BE APPLIED AT THE RATE RECOMMENDED BY THE SUPPLIER.

TABLE D.3.2.B TEMPORARY EROSION CONTROL SEED MIX

	% WEIGHT	% PURITY	% GERMINATION
CHEWINGS OR RED FESCUE FESTUCA *RUBRA VAR. COMMUTATA OR FESTUCA RUBRA*	40	98	90
ANNUAL OR PERENNIAL RYE *LOLIUM MULTIFLORUM OR LOLIUM PERENNE*	40	98	90
REDTOP OR COLONIAL BENTGRASS *AGROSTIS ALBA OR AGROSTIS TENUIS*	10	92	85
WHITE DUTCH CLOVER *TRIFOLIUM REPENS*	10	98	90

2. SEED BEDS PLANTED BETWEEN MAY 1 AND OCTOBER 31 WILL REQUIRE IRRIGATION AND OTHER MAINTENANCE AS NECESSARY TO FOSTER AND PROTECT THE ROOT STRUCTURE.
3. FOR SEED BEDS PLANTED BETWEEN OCTOBER 31 AND APRIL 30, ARMORING OF THE SEED BED WILL BE NECESSARY. (E.G., GEOTEXTILES, JUTE MAT, CLEAR PLASTIC COVERING),
4. BEFORE SEEDING, INSTALL NEEDED SURFACE RUNOFF CONTROL MEASURES SUCH AS GRADIENT TERRACES, INTERCEPTOR DIKES, SWALES, LEVEL SPREADERS AND SEDIMENT BASINS.
5. THE SEEDBED SHALL BE FIRM WITH A FAIRLY FINE SURFACE, FOLLOWING SURFACE ROUGHENING. PERFORM ALL OPERATIONS ACROSS OR AT RIGHT ANGLES TO THE SLOPE.
6. FERTILIZERS ARE TO BE USED ACCORDING TO SUPPLIER'S RECOMMENDATIONS. AMOUNTS USED SHOULD BE MINIMIZED, ESPECIALLY ADJACENT TO WATER BODIES AND WETLANDS.

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

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202 East 34th Street
Tacoma, Washington 98404

EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. MCINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED J. MCINNIS | SCALE 1"=60'
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

TESC PLAN

SHEET 2 OF 28

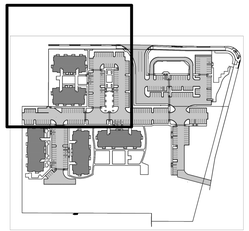
C-2

EAST TOWN CROSSING

GRADING PLAN I

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

KEY MAP



EXISTING CB CONNECT LEAD FROM CB IE=71.80 (6"SE) X RE-CONSTRUCT CURB X AS NECESSARY AFTER CONNECTION

4" LF 8" OPEN @ 2.8%

KEEP GRADING 2' MINIMUM FROM PROPERTY LINE (TYPICAL)

Type 1 CB W/ SOLID LID RIM=75.34 X IE=72.00 (6" NW & E)

IE = 75.00'

NOTE: R. TANK DETAILS SPECIFY ALLOWABLE LOADS DURING CONSTRUCTION. SEE SHEETS C18-C28

NOTE: FUTURE INTERCEPTOR TO BE CONSTRUCTED IN PHASE 1

INTERCEPTOR SWALE 640LF SLOPE @0.46%

GRADE TO DRAIN TO INTERCEPTOR SWALE AS NECESSARY

RTANK 2
EXCAVATE RTANK AND INSTALL
SEE SHEETS C17-C23

210LF 6" FRENCH DRAIN SEE DETAIL 3/C8

NOTE: EXISTING SIGNAL PROTECT DURING CONSTRUCTION

11LF of 8" SS

115LF of 8" SS

PROTECT EXISTING SANITARY SEWER DURING CONSTRUCTION

NOTE: EXISTING SSMH TO BE ABANDONED PHASE 1. RTANKS WILL BE ADDED IN EXISTING SEWER LOCATION IN PHASE 1

EX. SSMH Type 1
RIM:77.75
IE = 64.67 8" (PVC N)

BOTTOM ELEVATION = 67.88'

IE = 74.18'

GRADE TO DRAIN TO INTERCEPTOR SWALE AS NECESSARY.

IE = 74.03'

IE = 73.25'

NOTE: EXISTING WATER MAIN PROTECT DURING CONSTRUCTION

Type 1 CB W/ SOLID LID RIM=76.18 X IE=74.08 (6" S, W)

MATCH LINE SEE SHEET C4

MATCH LINE SEE SHEET C6

0 20 40 Feet

C-3

APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. MCINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

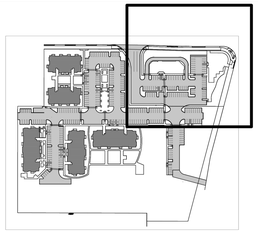
DESIGNED J. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 3 OF 28

C-3

EAST TOWN CROSSING
GRADING PLAN II
SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

KEY MAP



APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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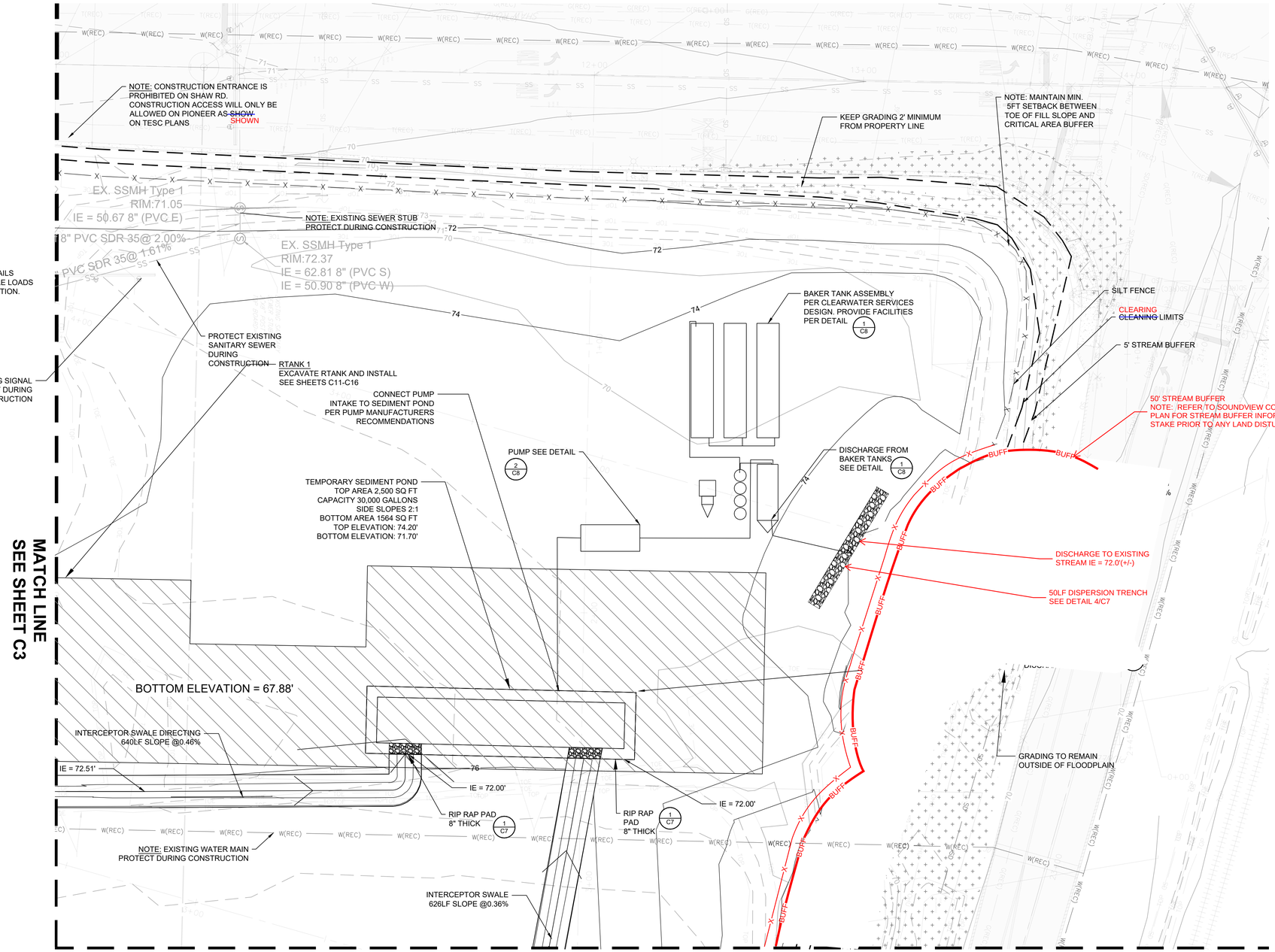

0 20 40 Feet

C-4

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. MCINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

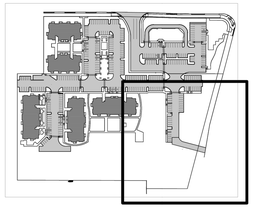
NUM	DATE	DESCRIPTION

DESIGNED J. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 4 OF 28

C-4

EAST TOWN CROSSING
GRADING PLAN III
SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



KEY MAP

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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MATCH LINE
SEE SHEET C4

NOTE: R. TANK DETAILS SPECIFY ALLOWABLE LOADS DURING CONSTRUCTION.

IE = 73.35'

IE = 72.47'

IE = 72.59'

WHERE NECESSARY, PROVIDE CULVERT FOR CONSTRUCTION EQUIPMENT CROSSING. PROVIDE ENGINEER SHOP DRAWING FOR CULVERT INCLUDING CALCULATIONS SUPPORTING COVER REQUIREMENTS

RTANK 3
EXCAVATE RTANK AND INSTALL
SEE SHEETS C23-C28

INTERCEPTOR SWALE
626LF SLOPE @0.36%

PROTECT EXISTING STORM OUTFALL DURING CONSTRUCTION

PROTECT EXISTING STORM DRAIN DURING CONSTRUCTION

CONSTRUCT ENTRANCE P... (1/C2)

MATCH LINE
SEE SHEET C6

0 15 30 Feet

C-5

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

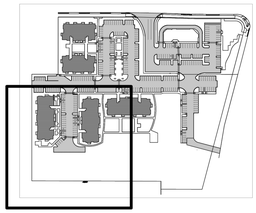
NUM	DATE	DESCRIPTION

DESIGNED J. MCINNIS	SCALE 1"=15'
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 5 OF 28

C-5

EAST TOWN CROSSING
GRADING PLAN IV
SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



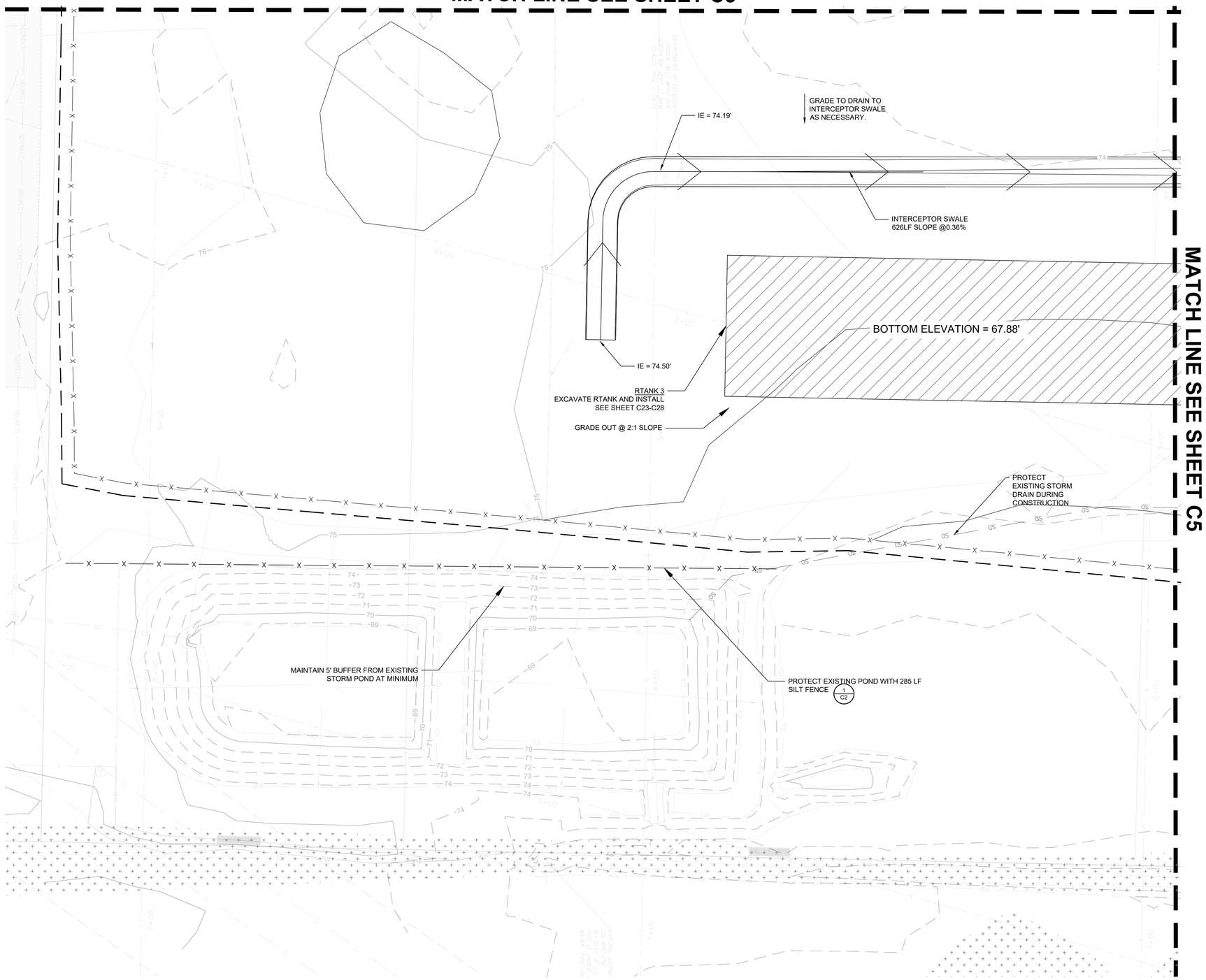
KEY MAP

NOTE: R. TANK DETAILS SPECIFY ALLOWABLE LOADS DURING CONSTRUCTION.

0 20 40 Feet

C-6

MATCH LINE SEE SHEET C3



APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

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EAST TOWN CROSSING
GRADE AND FILL PLANS

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PUYALLUP, WA 98372

JEFFREY W. MCINNIS
STATE OF WASHINGTON
37399
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PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED J. MCINNIS	SCALE 1"=20'
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

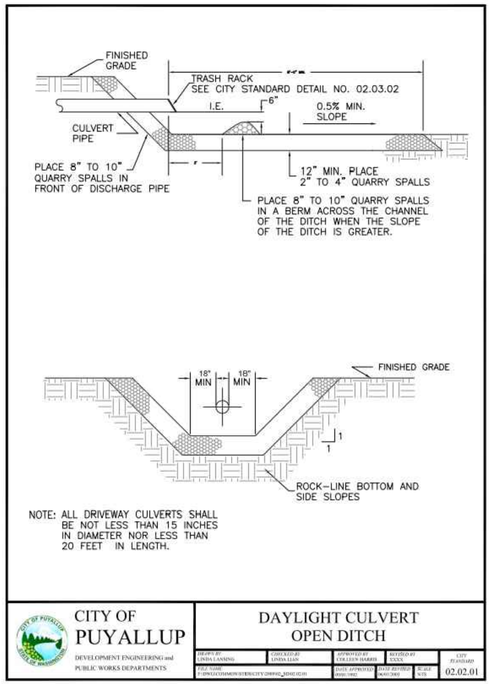
SHEET 6 OF 28

C-6

EAST TOWN CROSSING

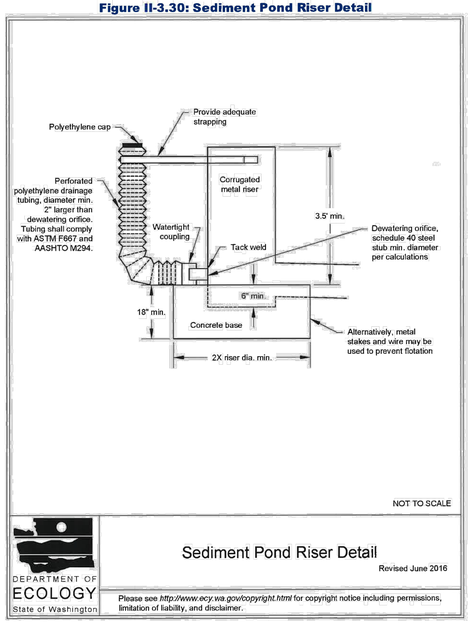
SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

GENERAL NOTES:
1. All work in City right-of-way requires a permit from the City of Puyallup. Prior to any work commencing, the general contractor shall arrange for a preconstruction meeting at the Development Services Center to be attended by all contractors that will perform work shown on the approved engineering plans, representatives from all applicable utility companies, the project owner and appropriate city staff. Contact Engineering Services at (253-841-5568) to schedule the meeting. The contractor is responsible to have their own set of approved plans at the meeting.
2. After completion of all items shown on these plans and before acceptance of the project the contractor shall obtain a "punch list" prepared by the City's inspector detailing remaining items of work to be completed. All items of work shown on these plans shall be completed to the satisfaction of the City prior to acceptance of the water system and provision of sanitary sewer service.
3. All materials and workmanship shall conform to the Standard Specifications for Road, Bridge, and Municipal Construction (hereinafter referred to as the "Standard Specifications"), Washington State Department of Transportation and American Public Works Association, Washington State Chapter, latest edition, unless superseded or amended by the City of Puyallup City Standards for Public Works Engineering and Construction (hereinafter referred to as the "City Standards").
4. A copy of these approved plans and applicable city developer specifications and details shall be on site during construction.
5. Any revisions made to these plans must be reviewed and approved by the developer's engineer and the City prior to any implementation in the field. The City shall not be responsible for any errors and/or omissions on these plans.
6. The contractor shall have all utilities verified on the ground prior to any construction. Call (811) at least two working days in advance. The owner and his/her engineer shall be contacted immediately if a conflict exists.
7. Any structure and/or obstruction that requires removal or relocation relating to this project shall be done so at the developer's expense.
8. Locations of existing utilities are approximate. It shall be the contractor's responsibility to determine the true elevations and locations of hidden utilities. All visible items shall be the engineer's responsibility.
9. The contractor shall install, replace, or relocate all signs, as shown on the plans or as affected by construction, per City Standards.
10. Power, street light, cable, and telephone lines shall be in a trench located within a 10-foot utility easement adjacent to public right-of-way. Right-of-way crossings shall have a minimum horizontal separation from other utilities (sewer, water, and storm) of 5 feet.
11. All construction surveying for extensions of public facilities shall be done under the direction of a Washington State licensed land surveyor or a Washington State licensed professional civil engineer.
City of Puyallup - City Standards Section 2 Revised 06/06/2012
2-5
12. During construction, all public streets adjacent to this project shall be kept clean of all material deposits resulting from on-site construction, and existing structures shall be protected as directed by the City.
13. Certified record drawings are required prior to project acceptance.
14. A NPDES Stormwater General Permit may be required by the Department of Ecology for this project. For information contact the Department of Ecology, Southwest Region Office at (360)407-6300.
15. Any disturbance or damage to Critical Areas and associated buffers, or significant trees designated for preservation and protection shall be mitigated in accordance with a Mitigation Plan reviewed and approved by the City's Planning Division. Preparation and implementation of the Mitigation Plan shall be at the developer's expense.



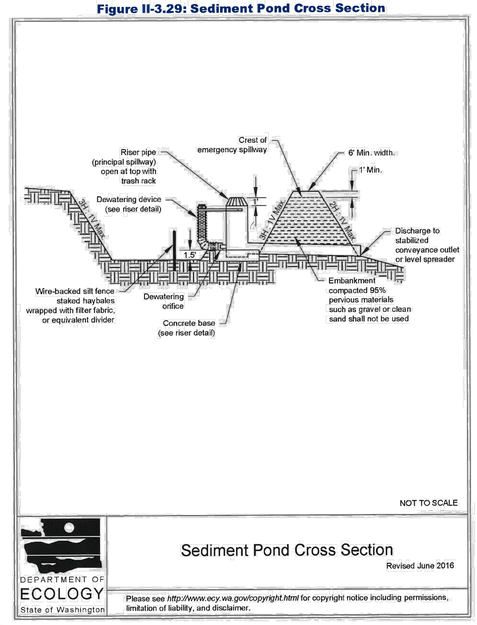
1 DAYLIGHT CULVERT OPEN DITCH
SCALE:NTS

Figure II-3.30: Sediment Pond Riser Detail



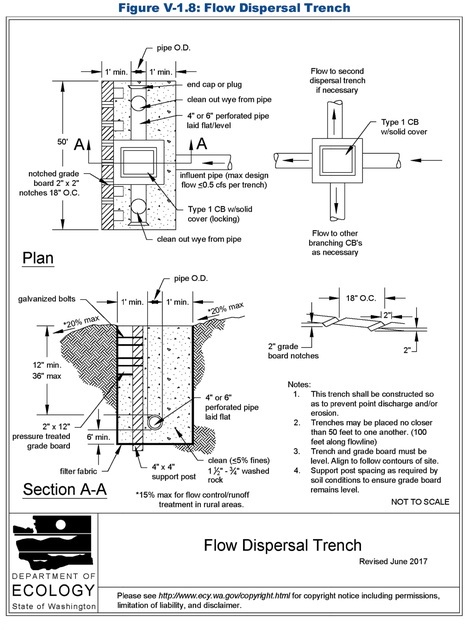
2 SEDIMENT POND RISER
SCALE:NTS

Figure II-3.29: Sediment Pond Cross Section



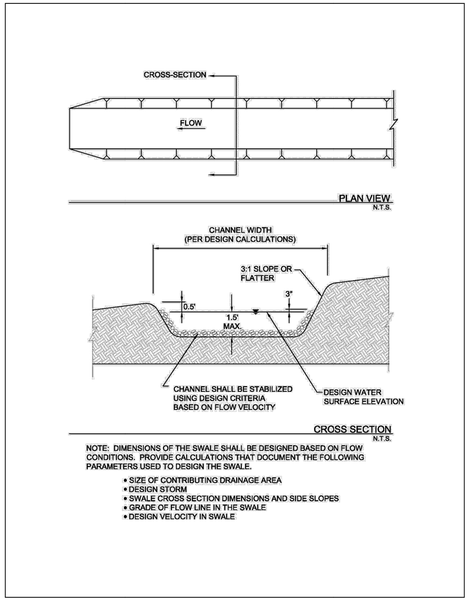
3 SEDIMENT POND CROSS SECTION
SCALE:NTS

Figure V-1.8: Flow Dispersal Trench



4 DISPERSION TRENCH
SCALE:NTS

NOTE: CHECK DAM TO BE SPACED 100 FT



5 Interceptor Ditch
SCALE:NTS

GRADING, EROSION AND SEDIMENTATION CONTROL NOTES:
1. All work in City right-of-way requires a permit from the City of Puyallup. Prior to any work commencing, the general contractor shall arrange for a preconstruction meeting at the Development Services Center to be attended by all contractors that will perform work shown on the engineering plans, representatives from all applicable Utility Companies, the project owner and appropriate City staff. Contact Engineering Services to schedule the meeting (253) 841-5566. The contractor is responsible to have their own approved set of plans at the meeting.
2. After completion of all items shown on these plans and before acceptance of the project, the contractor shall obtain a "punch list" prepared by the City's inspector detailing remaining items of work to be completed. All items of work shown on these plans shall be completed to the satisfaction of the City prior to acceptance of the water system and provision of sanitary sewer service.
3. All materials and workmanship shall conform to the Standard Specifications for Road, Bridge, and Municipal Construction (hereinafter referred to as the "Standard Specifications"), Washington State Department of Transportation and American Public Works Association, Washington State Chapter, latest edition, unless superseded or amended by the City of Puyallup City Standards for Public Works Engineering and Construction (herinafter referred to as the "City Standards").
4. A copy of these approved plans and applicable city developer specifications and details shall be on site during construction.
5. Any revisions made to these plans must be reviewed and approved by the developer's engineer and the city engineer prior to any implementation in the field. The City shall not be responsible for any errors and/or omissions on these plans.
6. The contractor shall have all utilities verified on the ground prior to any construction. Call (811) at least two working days hours in advance. The owner and his/her engineer shall be contacted immediately if a conflict exists.
7. All limits of clearing and areas of vegetation preservation as prescribed on the plans shall be clearly flagged in the field and observed during construction.
8. All required sedimentation and erosion control facilities must be constructed and in operation prior to any land clearing and/or other construction to ensure that sediment laden water does not enter the natural drainage system. The contractor shall schedule an inspection of the erosion control facilities PRIOR to any land clearing and/or other construction. All erosion and sediment facilities shall be maintained in a satisfactory condition as determined by the City, until such time that clearing and/or construction is completed and the potential for on-site erosion has passed. The implementation, maintenance, replacement, and additions to the erosion and sedimentation control systems shall be the responsibility of the permittee.
City of Puyallup - City Standards GESC Revised 06/06/12
500-6
9. The erosion and sedimentation control system facilities depicted on these plans are intended to be minimum requirements to meet anticipated site conditions. As construction progresses and unexpected or seasonal conditions dictate, facilities will be necessary to ensure complete siltation control on the site. During the course of construction, it shall be the obligation and responsibility of the permittee to address any new conditions that may be created by his activities and to provide additional facilities, over and above the minimum requirements, as may be needed to protect adjacent properties, sensitive areas, natural water courses, and/or storm drainage systems.
10. Approval of these plans is for grading, temporary drainage, erosion and sedimentation control only. It does not constitute an approval of permanent storm drainage design, size or location of pipes, restrictors, channels, or retention facilities.
11. Any disturbed area which has been stripped of vegetation and where no further work is anticipated for a period of 30 days or more, must be immediately stabilized with mulching, grass planting, or other approved erosion control treatment applicable to the time of year in question. Grass seeding alone will be acceptable only during the months of April through September inclusive. Seeding may proceed outside the specified time period whenever it is in the interest of the permittee but must be augmented with mulching, netting, or other treatment approved by the City.
12. In case erosion or sedimentation occurs to adjacent properties, all construction work within the development that will further aggravate the situation must cease, and the owner/contractor will immediately commence restoration methods. Restoration activity will continue until such time as the affected property owner is satisfied.
13. No temporary or permanent stockpiling of materials or equipment shall occur within critical

1. ALL LIMITS OF CLEARING AND AREAS OF VEGETATION PRESERVATION AS PRESCRIBED ON THE PLANS SHALL BE CLEARLY FLAGGED IN THE FIELD AND OBSERVED DURING CONSTRUCTION.

2. ALL REQUIRED SEDIMENTATION AND EROSION CONTROL FACILITIES MUST BE CONSTRUCTED AND IN OPERATION PRIOR TO ANY LAND CLEARING AND/OR OTHER CONSTRUCTION TO ENSURE THAT SEDIMENT LADEN WATER DOES NOT ENTER THE NATURAL DRAINAGE SYSTEM. THE CONTRACTOR SHALL SCHEDULE AN INSPECTION OF THE EROSION CONTROL FACILITIES PRIOR TO ANY LAND CLEARING AND/OR CONSTRUCTION. ALL EROSION AND SEDIMENT FACILITIES SHALL BE MAINTAINED IN A SATISFACTORY CONDITION AS DETERMINED BY THE CITY, UNTIL SUCH TIME THAT CLEARING AND/OR CONSTRUCTION IS COMPLETED AND THE POTENTIAL FOR ON-SITE EROSION HAS PASSED. THE IMPLEMENTATION, MAINTENANCE, REPLACEMENT, AND ADDITIONS TO THE EROSION AND SEDIMENTATION CONTROL SYSTEMS SHALL BE THE RESPONSIBILITY OF THE PERMITEE.

3. THE EROSION AND SEDIMENTATION CONTROL SYSTEM FACILITIES DEPICTED ON THESE PLANS ARE INTENDED TO BE MINIMUM REQUIREMENTS TO MEET ANTICIPATED SITE CONDITIONS. AS CONSTRUCTION PROGRESSES AND UNEXPECTED OR SEASONAL CONDITIONS DICTATE, FACILITIES WILL BE NECESSARY TO ENSURE COMPLETE SILTATION CONTROL ON THE SITE. DURING THE COURSE OF CONSTRUCTION, IT SHALL BE THE OBLIGATION AND RESPONSIBILITY OF THE PERMITEE TO ADDRESS ANY NEW CONDITIONS THAT MAY BE CREATED BY HIS ACTIVITIES AND TO PROVIDE ADDITIONAL FACILITIES, OVER AND ABOVE THE MINIMUM REQUIREMENTS, AS MAY BE NEEDED TO PROTECT ADJACENT PROPERTIES, SENSITIVE AREAS, NATURAL WATER COURSES, AND/OR STORM DRAINAGE SYSTEMS.

4. APPROVAL OF THESE PLANS IS FOR GRADING, TEMPORARY DRAINAGE, EROSION AND SEDIMENTATION CONTROL ONLY. IT DOES NOT CONSTITUTE AN APPROVAL OF PERMANENT STORM DRAINAGE DESIGN, SIZE OR LOCATION OF PIPES, RESTRICTORS, CHANNELS, OR RETENTION FACILITIES.

5. ANY DISTURBED AREA WHICH HAS BEEN STRIPPED OF VEGETATION AND WHERE NO FURTHER WORK IS ANTICIPATED FOR A PERIOD OF 30 DAYS OR MORE, MUST BE IMMEDIATELY STABILIZED WITH MULCHING, GRASS PLANTING, OR OTHER APPROVED EROSION CONTROL TREATMENT APPLICABLE TO THE TIME OF YEAR IN QUESTION. GRASS SEEDING ALONE WILL BE ACCEPTABLE ONLY DURING THE MONTHS OF APRIL THROUGH SEPTEMBER INCLUSVE. SEEDING MAY PROCEED OUTSIDE THE SPECIFIED TIME PERIOD WHENEVER IT IS IN THE INTEREST OF THE PERMITEE BUT MUST BE AUGMENTED WITH MULCHING, NETTING, OR OTHER TREATMENT APPROVED BY THE CITY.

6. IN CASE EROSION OR SEDIMENTATION OCCURS TO ADJACENT PROPERTIES, ALL CONSTRUCTION WORK WITHIN THE DEVELOPMENT THAT WILL FURTHER AGGRAVATE THE SITUATION MUST CEASE, AND THE OWNER/CONTRACTOR WILL IMMEDIATELY COMMENCE RESTORATION METHODS. RESTORATION ACTIVITY WILL CONTINUE UNTIL SUCH TIME AS THE AFFECTED PROPERTY OWNER IS SATISFIED.

7. NO TEMPORARY OR PERMANENT STOCKPILING OF MATERIALS OR EQUIPMENT SHALL OCCUR WITHIN CRITICAL AREAS OR ASSOCIATED BUFFERS, OR THE CRITICAL ROOT ZONE FOR VEGETATION PROPOSED FOR RETENTION.

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING and PUBLIC WORKS DEPARTMENTS

GRADING, EROSION, AND SEDIMENTATION CONTROL NOTES

DRAWN BY	CHECKED BY	APPROVED BY	REVISED BY	CITY STANDARD
DM DEWYN-SVOBODA	LINDA LUAN	COLLEEN HARRIS	LINDA LUAN	05.02.01
FILE NAME P:\PWCOMMON\STDS\CITY\2009\05_GRD\05.01\05.02.01		DATE APPROVED 07/01/2009	DATE REVISED 11/9/2014	SCALE 1/1

C-7

CALL BEFORE YOU DIG
1-800-424-5555 OR 811

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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Tacoma, Washington 98404

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2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
17399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

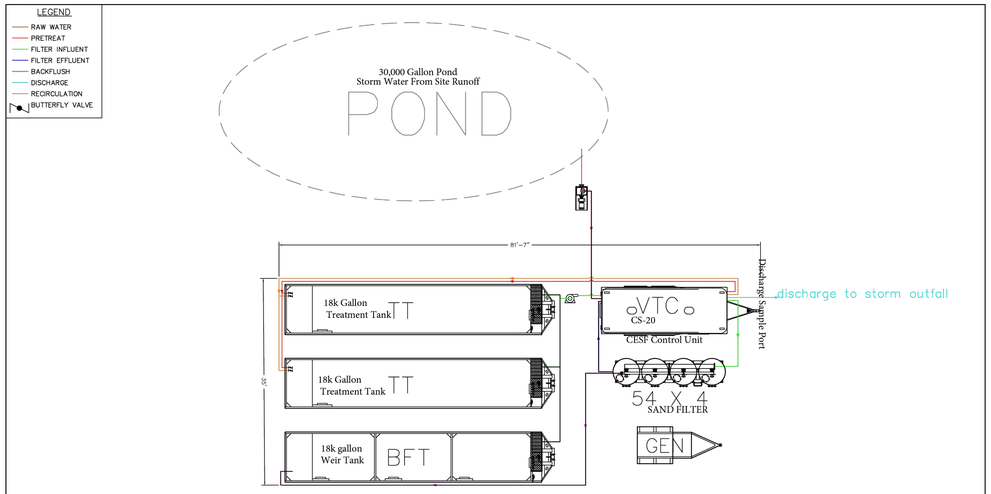
DESIGNED	SCALE
W. MCINNIS	NTS
DRAWN	CHECKED
W. MCINNIS	CHCK
DATE	APPROVED
10/2/23	APRD

SHEET 7 OF 28

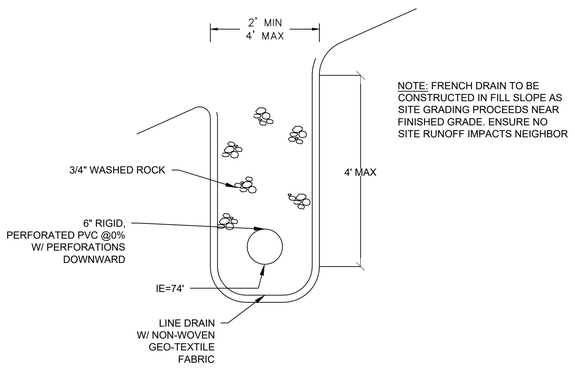
C-7

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



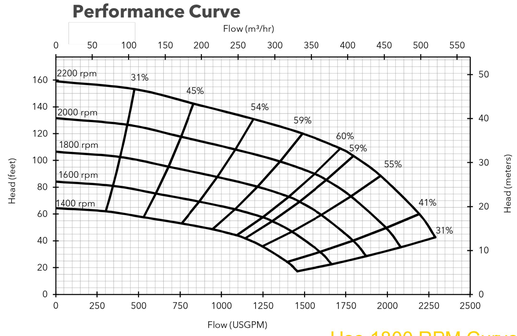
1 BAKER TANK DETAIL
SCALE:NTS



NOTE: FRENCH DRAIN TO BE CONSTRUCTED IN FILL SLOPE AS SITE GRADING PROCEEDS NEAR FINISHED GRADE. ENSURE NO SITE RUNOFF IMPACTS NEIGHBOR

3 FRENCH DRAIN
SCALE:NTS

Performance Curve



Use 1800 RPM Curve

Materials

Pump casing & suction cover	Cast iron BS EN 1561 - 1997
Wearplates	Cast iron BS EN 1561 - 1997
Pump Shaft	Carbon steel BS 970 - 1991 817M40T
Impeller	Cast Steel BS3100 A5 Hardness to 200 HB Brinell
Non-return valve body	Cast iron BS EN 1561 - 1997
Mechanical seal	Silicon carbide face; Viton elastomers; Stainless steel body

Engine option 1

JCB TCAE-55 (FT4), 74 HP @ 2200 rpm

Impeller diameter 11.0"

Pump speed 2200 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	30	46	62	81	121
	Output (USGPM)				
10	2179	2131	2083	1889	1356
15	2058	1937	1816	1574	1162
20	1453	1453	1453	1332	848
25	1259	1211	1114	969	484

Fuel capacity: 60 US Gal

Max fuel consumption @ 2200 rpm: 4.5 US Gal/hr

Max fuel consumption @ 1800 rpm: 2.4 US Gal/hr

Weight (Dry): 3,200 lbs

Weight (Wet): 3,630 lbs

Dim.: (L) 119" x (W) 66" x (H) 77"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.

Engine option 2

John Deere 4045TFC03 (FT4), 74 HP @ 2200 rpm

Impeller diameter 11.0"

Pump speed 2200 rpm

Suction Lift Table

Total Suction Head (feet)	Total Delivery Head (feet)				
	30	46	62	81	121
	Output (USGPM)				
10	2179	2131	2083	1889	1356
15	2058	1937	1816	1574	1162
20	1453	1453	1453	1332	848
25	1259	1211	1114	969	484

Fuel capacity: 60 US Gal

Max fuel consumption @ 2200 rpm: 5.2 US Gal/hr

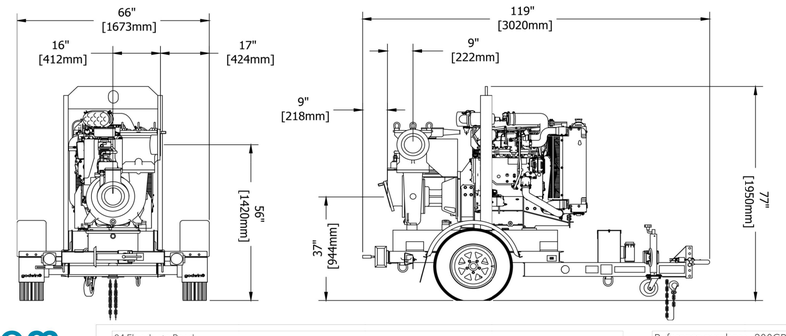
Max fuel consumption @ 1800 rpm: 2.6 US Gal/hr

Weight (Dry): 3,180 lbs

Weight (Wet): 3,610 lbs

Dim.: (L) 119" x (W) 66" x (H) 91"

Performance data provided in tables is based on water tests at sea level and 20°C ambient. All information is approximate and for general guidance only. Please contact the factory or office for further details.



xylem
Let's Solve Water

84 Floodgate Road
Bridgeport, NJ 08014 USA
(856) 467-3636 . Fax (856) 467-4841

Reference number : 200GPA00000980
Date of issue : November 2, 2015
Issue : -

2 PUMP DETAIL
SCALE:NTS

C-8

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CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
17399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET
8 OF 28

C-8

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

APPROVED

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

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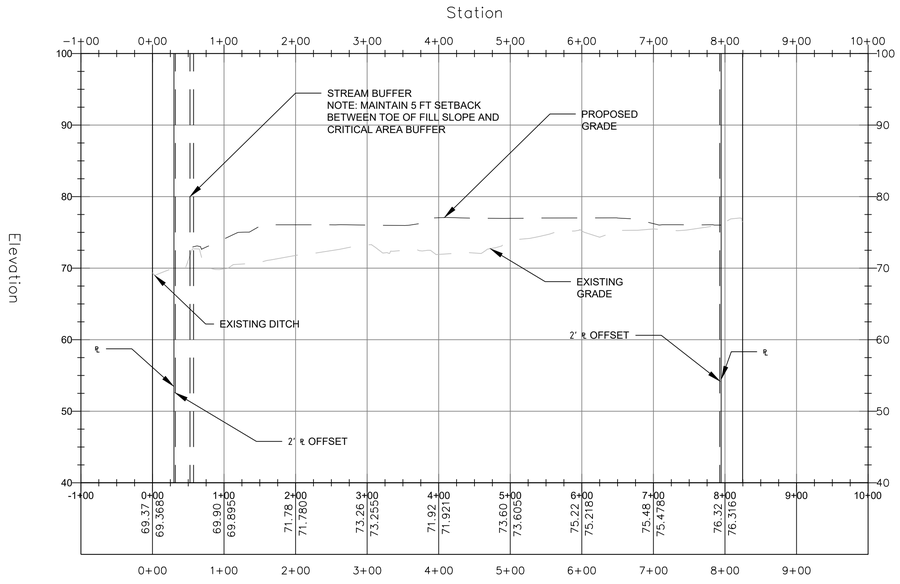
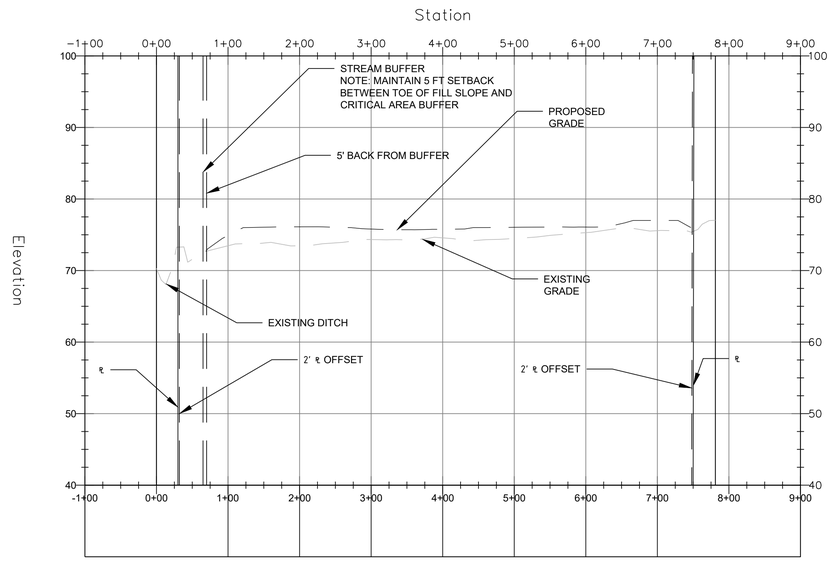
Alignment - Pioneer 1 PROFILE



1 PROFILE 1
SCALE:HORIZ: 1" = 40', VERT: 1" = 4"

Alignment - Pioneer 2 PROFILE



2 PROFILE 2
SCALE:HORIZ: 1" = 40', VERT: 1" = 4"

C-9

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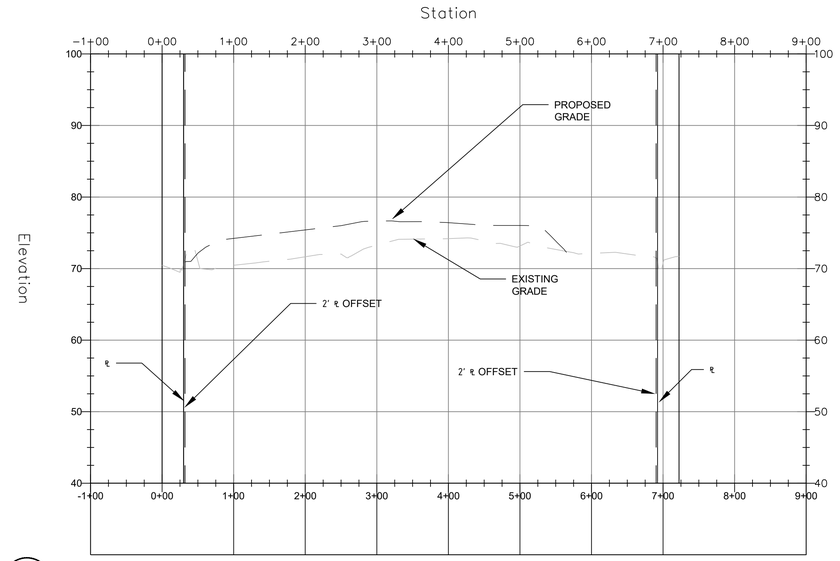
DATE 10/2/23	APPROVED APRD

SHEET
9 OF 28

C-9

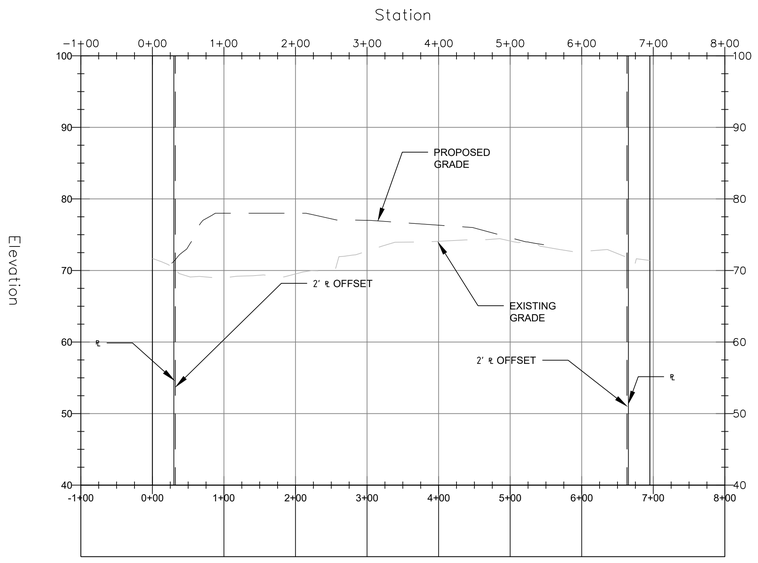
EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



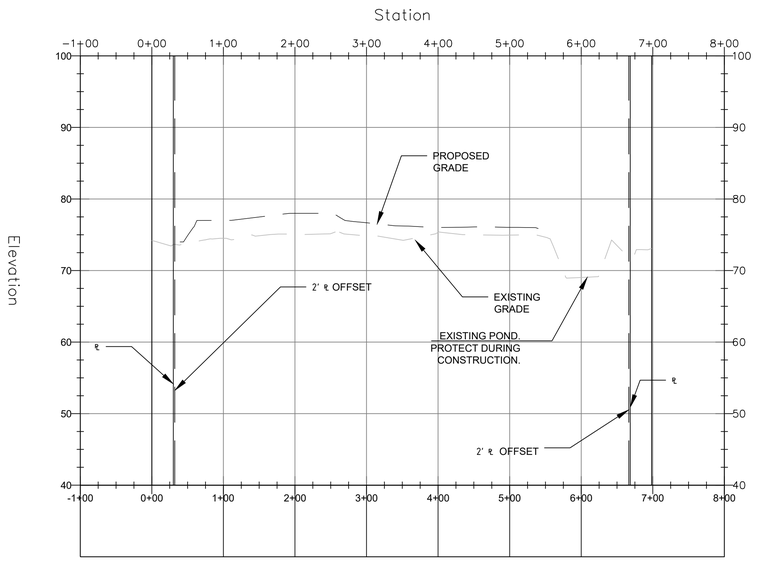
3 PROFILE 3

SCALE:HORIZ: 1" = 40', VERT: 1" = 4"



4 PROFILE 4

SCALE:HORIZ: 1" = 40', VERT: 1" = 4"



5 PROFILE 5

SCALE:HORIZ: 1" = 40', VERT: 1" = 4"

C-10

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BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

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JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET
10 OF 28

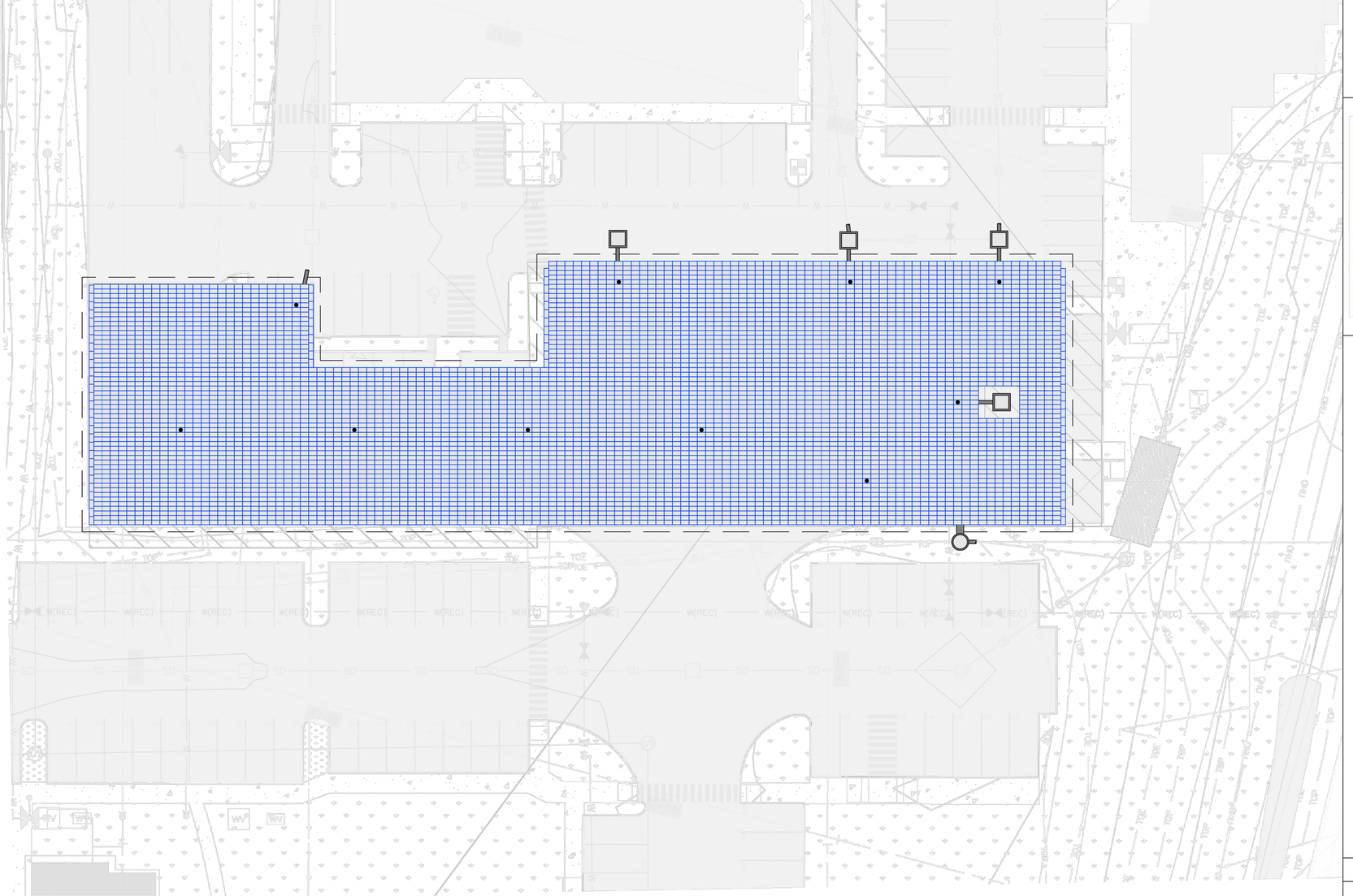
C-10

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

ACKNOWLEDGEMENT:
AN APPROVAL OF THE SUBMITTAL PLANS IS REQUIRED PRIOR TO MATERIAL ORDER. AS PART OF THE SUBMITTAL APPROVAL, THE ENGINEER OF RECORD HEREBY ACKNOWLEDGES THAT THE R-TANK SYSTEM IS NOT DESIGNED TO SUPPORT LOADS FROM BUILDINGS OR STRUCTURES. THEREFORE, THE ENGINEER OF RECORD HAS COORDINATED WITH THE PROPER DISCIPLINES TO ENSURE NO STRUCTURAL LOADS ARE IMPARTED UPON THE SYSTEM AND ANY INFILTRATION FROM THE SYSTEM HAS BEEN ACCOUNTED FOR IN THE FOUNDATION DESIGN.

NOTES:
- THE CONTRACTOR SHALL PARTICIPATE IN A PRECONSTRUCTION MEETING AND SIGN THE PRECONSTRUCTION CHECKLIST PRIOR TO MATERIAL INSTALLATION.
- DOCUMENTATION SHALL BE RECORDED BY THE CONTRACTOR OR ENGINEER OF RECORD SHOWING PROPER INSTALLATION OF THE SYSTEM AND ALL CONNECTIONS, IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
- IT IS HEREBY RECOMMENDED THAT THE R-TANK SYSTEM BE INSTALLED AFTER THE FOUNDATIONS HAVE BEEN INSTALLED TO ENSURE PROPER SEPARATION DISTANCES ARE MAINTAINED.



R-TANK^{SD} SYSTEM OVERLAY
SCALE: 1" = 30'

0 30' 60'
SCALE 1" = 30'

SD R-TANK

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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R-TANK^{SD} SYSTEM OVERLAY
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 1

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 1 of 6

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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EAST TOWN CROSSING
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JEFFREY W. McINNIS
STATE OF WASHINGTON
37390
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 11 OF 28

C-11

C-11

CALL BEFORE YOU DIG
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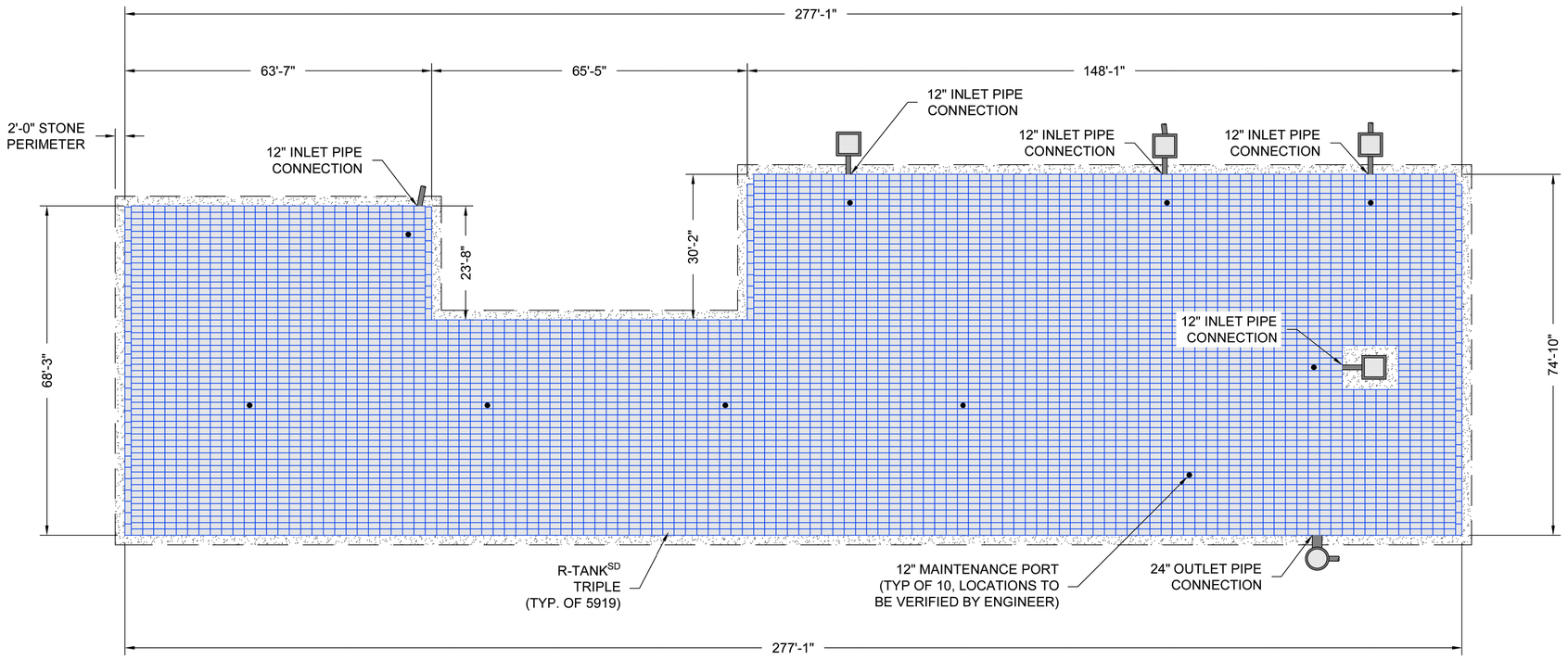
EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

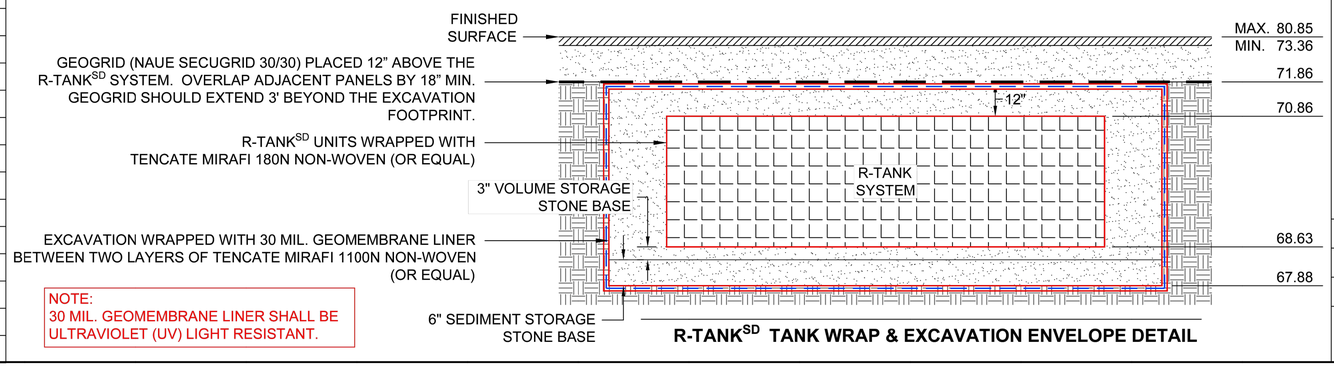
NOTE:
MINIMUM COVER FROM TOP OF TANK TO FINISH GRADE MUST BE AT LEAST 30" TO MEET A 45 KIP OUTRIGGER LOAD ON AN 18'X18" PAD.



NOTES:
1. DEAD STORAGE VOLUME FROM ELEVATION 67.88 TO 68.38 = 3,971 CF
2. LIVE STORAGE VOLUME FROM ELEVATION 68.38 TO 71.86 = 49,977 CF
3. ONLY 3" OF BASE STONE INCLUDED IN LIVE STORAGE VOLUME.

0 25' 50'
SCALE 1" = 25'

LAYOUT SCALE	1" = 25'
R-TANK^SD MODULE TYPE	TRIPLE
TRAFFIC LOAD	45 KIP OUTRIGGER (18"X18")
# OF TRIPLE R-TANKS	5,919
TOTAL SYSTEM STORAGE	49,977 CF
R-TANK STORAGE VOLUME	38,592 CF
STONE STORAGE VOLUME (40% VOID RATIO)	11,385 CF
TOP OF COVER STONE ELEV. (12")	71.86
NAUE SECUGRID 30/30 GEOGRID ELEV.	71.86
TOP OF R-TANK ELEV.	70.86
TANK INVERT	68.63
INVERT OF STONE BASE (9")	67.88
MIN. STONE PERIMETER WIDTH	2.0 FT
SEE SHEETS 3 - 6 FOR DETAILS AND ADDITIONAL INFORMATION	



NOTE:
30 MIL. GEOMEMBRANE LINER SHALL BE ULTRAVIOLET (UV) LIGHT RESISTANT.

R-TANK^SD TANK WRAP & EXCAVATION ENVELOPE DETAIL

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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R-TANK^SD

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF WEST, 1-800-423-4567, www.acfwest.com

R-TANK^SD SYSTEM LAYOUT
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 1

DRAWN BY EDQ
DATE 09/28/2023
ACF WEST PROJECT NUMBER 23-004WA
SHEET NO. 2 of 6

C-12

CALL BEFORE YOU DIG
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REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

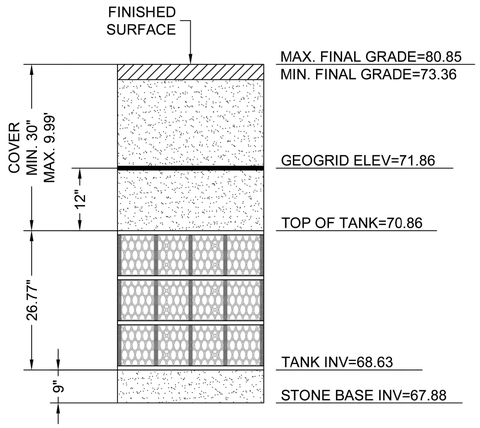
DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 12 OF 28

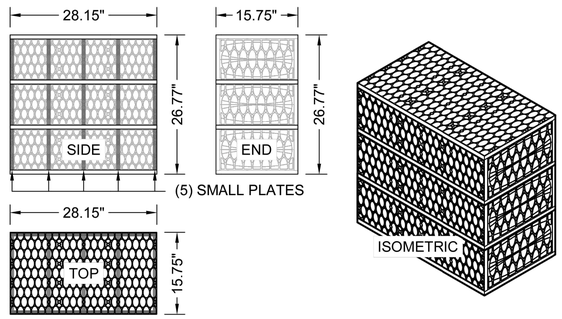
C-12

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



TRIPLE R-TANK^{SD} - ELEVATION



TRIPLE R-TANK^{SD} - MODULE DETAIL

MODULE DATA

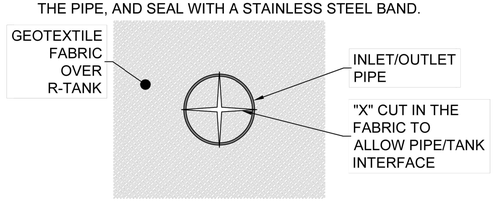
GEOMETRY:
LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 26.77 IN. (680 MM)
TANK VOLUME = 6.87 CF
STORAGE VOLUME = 6.52 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING:
42.9 PSI, (MODULE ONLY)
HS20/HS25 - SEE SPEC FOR COVER REQUIREMENTS

MATERIAL:
100% RECYCLED POLYPROPYLENE

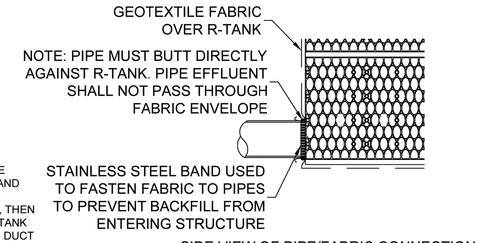
SMALL PLATES REQUIRED:
5/SEGMENT, 15/MODULE

CUT AN "X" IN THE FABRIC ENVELOPE THAT IS SLIGHTLY LARGER THAN THE PIPE. PULL THE FABRIC FLAPS AROUND THE PIPE, AND SEAL WITH A STAINLESS STEEL BAND.

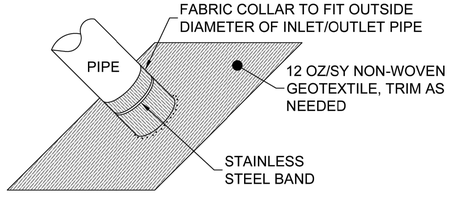


END VIEW OF PIPE/FABRIC CONNECTION

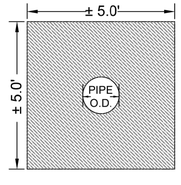
AFTER TANK WRAP IS SECURED TO PIPE, SLIDE BOOT AGAINST R-TANK AND SECURE WITH SECOND STAINLESS STEEL BAND, THEN ATTACH BOOT FLAP TO TANK ENVELOPE FABRIC WITH DUCT TAPE OR OTHER ADHESIVE.



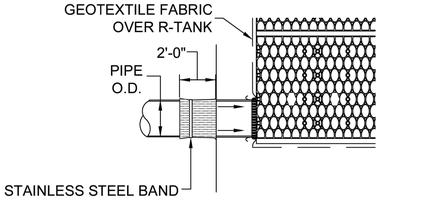
SIDE VIEW OF PIPE/FABRIC CONNECTION



GEOTEXTILE BOOT



FRONT VIEW OF GEOTEXTILE BOOT



SIDE VIEW OF GEOTEXTILE BOOT

R-TANK^{SD} TYPICAL TANK INLET/OUTLET W/ GEOTEXTILE PIPE BOOT DETAIL

R-TANK^{SD} QUANTITIES	
R-TANK^{SD} MODULE TYPE	TRIPLE
# OF TRIPLE R-TANKS	5,919
TOTAL SYSTEM STORAGE	49,977 CF
R-TANK STORAGE VOLUME	38,592 CF
STONE STORAGE VOLUME (40% VOID RATIO)	11,385 CF
STONE BED FOOTPRINT	19,856 SF
STONE QUANTITY	1,422 CY
TENCATE MIRAFI 180N NON-WOVEN TANK WRAP	43,950 SF (4,883 SY)
30 MIL. GEOMEMBRANE LINER EXCAVATION WRAP	49,184 SF (5,465 SY)
TENCATE MIRAFI 1100N NON-WOVEN LINER PROTECTION	98,368 SF (10,930 SY)
NAUE SECUGRID 30/30 GEOGRID	25,522 SF (2,836 SY)
12" MAINTENANCE PORTS	10
12" PIPE BOOTS	5
24" PIPE BOOTS	1
TRASHGUARD PLUS UNITS (RECOMMENDED)	5
NOTE: STONE QUANTITY INCLUDES 12" OF COVER AND 9" OF BASE.	
NOTE: GEOTEXTILE / LINER QUANTITIES INCLUDE A 15% WASTE FACTOR.	

NOTE:
30 MIL. GEOMEMBRANE LINER SHALL BE ULTRAVIOLET (UV) LIGHT RESISTANT.

NOTES:
1. DEAD STORAGE VOLUME FROM ELEVATION 67.88 TO 68.38 = 3,971 CF
2. LIVE STORAGE VOLUME FROM ELEVATION 68.38 TO 71.86 = 49,977 CF
3. ONLY 3" OF BASE STONE INCLUDED IN LIVE STORAGE VOLUME.

R-TANK^{SD} TANK

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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R-TANK^{SD} SYSTEM DETAILS
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 1

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 3 of 6

APPROVED
BY: CITY OF PUYALLUP DEVELOPMENT ENGINEERING
DATE: 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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202 East 34th Street
Tacoma, Washington 98404

EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS — STATE OF WASHINGTON — 37399 — REGISTERED PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED: W. MCINNIS | SCALE: NTS
DRAWN: W. MCINNIS | CHECKED: CHCK
DATE: 10/2/23 | APPROVED: APRD

SHEET 13 OF 28

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EAST TOWN CROSSING

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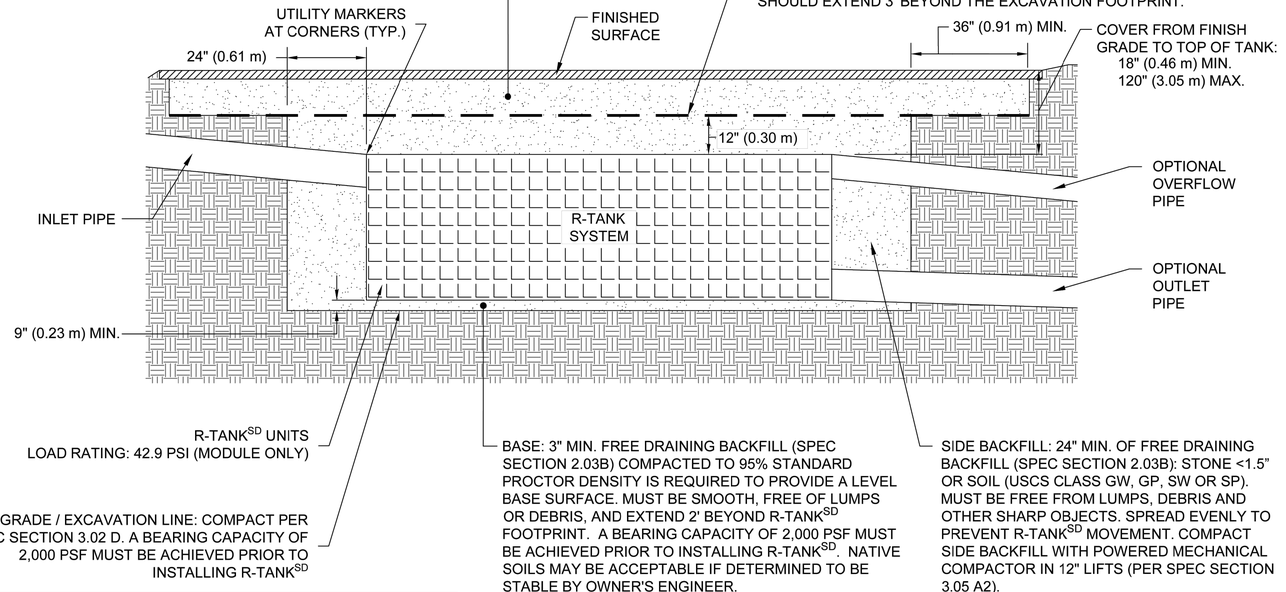
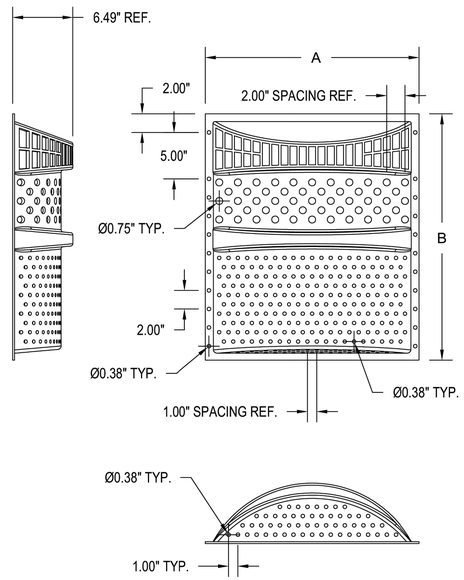
TOTAL COVER: 18" MINIMUM AND 120" MAXIMUM. FIRST 12" MUST BE FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). ADDITIONAL FILL MAY BE STRUCTURAL FILL (SPEC SECTION 2.03C): STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4 A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 10'. CONTACT ACF WEST IF MORE THAN 10' OR LESS THAN 18" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).

NOTES:
1. FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^{SD} MODULE SHEET .
2. INSTALLATIONS PER THIS DETAIL MEET GUIDELINES OF HL-93 LOADING PER THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, CUSTOMARY U.S. UNITS, 7TH EDITION, 2014 WITH 2015 AND 2016 INTERIM REVISIONS.
3. PRE-TREATMENT STRUCTURES NOT SHOWN.
4. FOR INFILTRATION APPLICATIONS, GEOTEXTILE ENVELOPING R-TANK SHALL BE TENCATE MIRAFI FW-402 WOVEN (PER SPEC SECTION 2.02A) AND BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03A) TO PROVIDE A LEVEL BASE. SURFACE MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{SD} FOOTPRINT.



NOTE:
MINIMUM COVER FROM TOP OF TANK TO FINISH GRADE MUST BE AT LEAST 30" TO MEET A 45 KIP OUTRIGGER LOAD ON AN 18'X18" PAD.

R-TANK^{SD} & HS-20 LOADS - SECTION VIEW



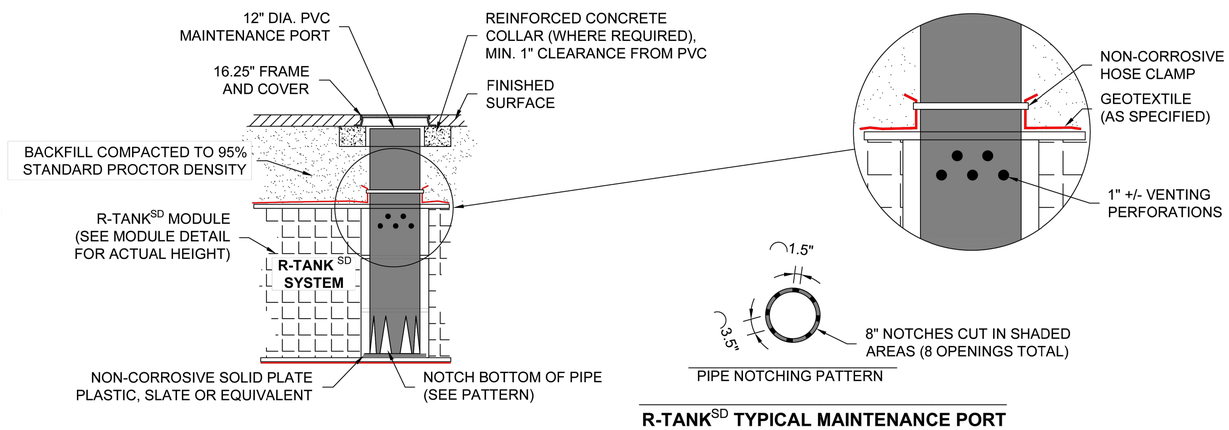
SIZE	A	B
23" x 24"	23"	26.51"
28" x 30"	28"	33.15"
34" x 36"	34"	38.69"

±0.25" TOLERANCE ON DIMENSIONS

NOTE:
TRASHGUARD PLUS UNITS ARE RECOMMENDED TO BE INSTALLED IN ALL CATCH BASINS DIRECTLY CONNECTED UPSTREAM OF THE R-TANK SYSTEM.

TRASHGUARD PLUS PRETREATMENT DETAIL

NOTES
1. THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.
2. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
3. R-TANK^{HD}, R-TANK^{SD}, R-TANK^{UD} AND R-TANK^{XD} MAY BE USED IN TRAFFIC APPLICATIONS.
4. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.
5. IF MAINTENANCE PORT IS LOCATED IN A NON-TRAFFIC AREA, A PLASTIC CAP CAN BE USED IN LIEU OF A FRAME AND COVER WITH CONCRETE COLLAR.



R-TANK^{SD} TYPICAL MAINTENANCE PORT

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R-TANK^{SD} SYSTEM DETAILS
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 1

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 4 of 6

APPROVED
BY
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
17399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 14 OF 28

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EAST TOWN CROSSING

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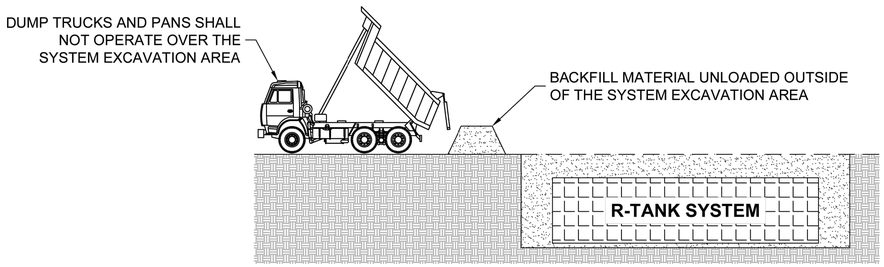
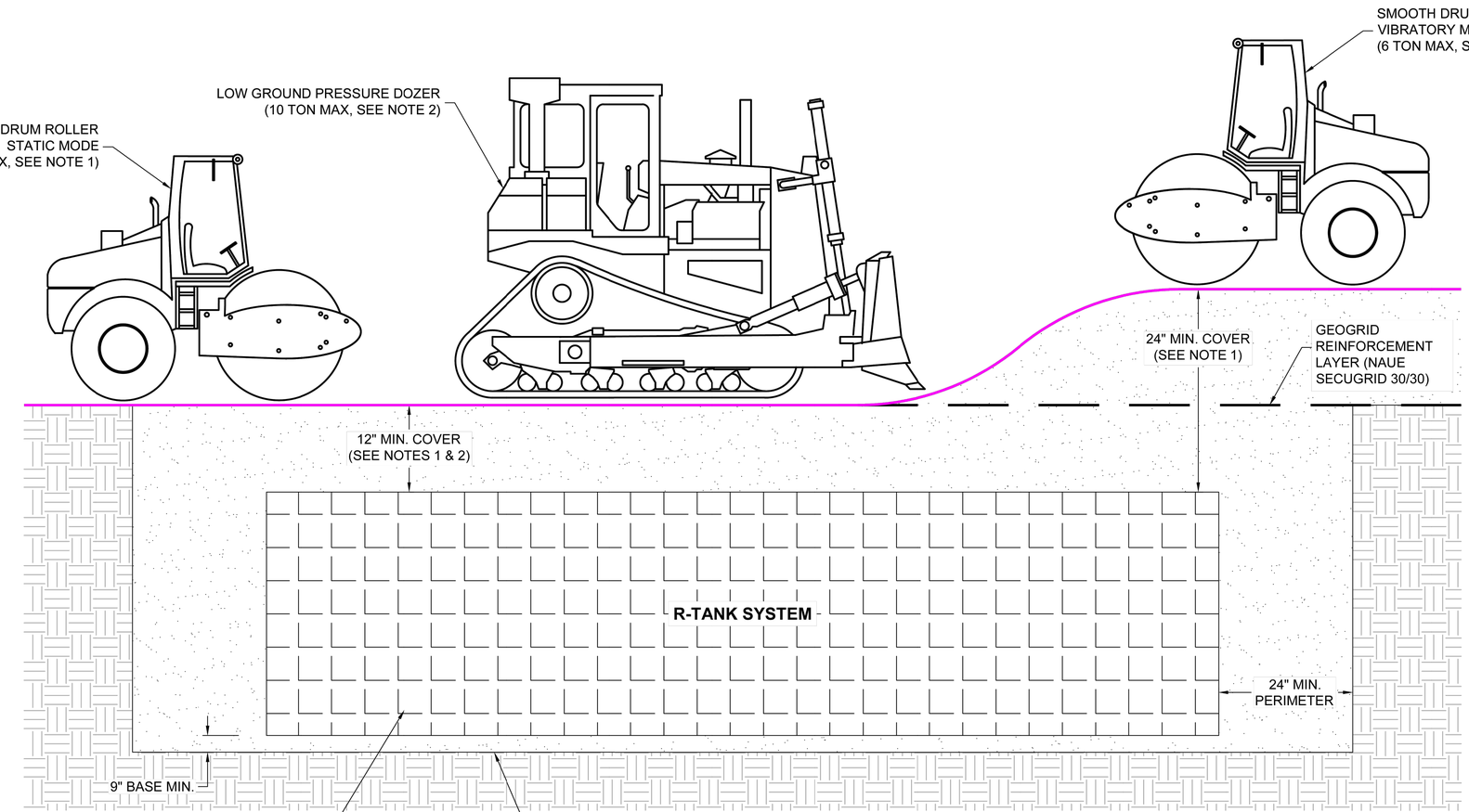


DUMP TRUCK DETAIL (SEE NOTE 3)

NOTES:

1. FOLLOWING PLACEMENT OF SIDE BACKFILL, A UNIFORM 12" LIFT OF THE FREELY DRAINING MATERIAL (SPEC SECTION 2.03 B2) 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. **SPEC SECTION 3.05 A5**
2. ONLY LOW PRESSURE TIRE OR TRACK VEHICLES (LESS THAN 7 PSI AND OPERATING WEIGHT OF LESS THAN 20,000 LBS) SHALL BE OPERATED OVER THE R-TANK SYSTEM DURING CONSTRUCTION. **SPEC SECTION 3.05 A5**
3. DUMP TRUCKS AND PANS SHALL NOT BE OPERATED WITHIN THE R-TANK SYSTEM 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. **SPEC SECTION 3.05 A5**
4. 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). **SPEC SECTION 3.05 B**
5. SEE R-TANK INSTALLATION GUIDE OR CONTACT YOUR LOCAL ACF WEST REPRESENTATIVE FOR ADDITIONAL INFORMATION.



CONSTRUCTION EQUIPMENT COVER DETAIL - VEHICULAR TRAFFIC

APPROVED
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DATE 10/10/2023
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R-TANK SD

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R-TANK^SD CONSTRUCTION EQUIPMENT COVER DETAIL
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 1

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 5 of 6

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2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS STATE OF WASHINGTON 17399 REGISTERED PROFESSIONAL ENGINEER 10/2/23

NUM	DATE	DESCRIPTION

DESIGNED	SCALE
W. MCINNIS	NTS
DRAWN	CHECKED
W. MCINNIS	CHCK
DATE	APPROVED
10/2/23	APRD

SHEET 15 OF 28

C-15

C-15

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EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

R-TANK SPECIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section.

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 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-TankLD/, R-TankHD/, R-TankSD/, or R-TankU/D/ system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, 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.

D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.

1.03 QUALITY CONTROL

A. All materials shall be manufactured in ISO certified facilities.

B. Installation Contractor shall demonstrate the following experience:

1. A minimum of three R-Tank or equivalent projects completed within 2 years; and,
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
3. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.

C. 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.

D. 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.

C. Submit manufacturer's installation instructions.

D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.

E. Submit material certificates for geotextile, geogrid, base course and backfill materials.

F. Submit required experience and personnel requirements as specified in Section 1.03.

G. 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 installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris.

B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.

C. Cold weather:

1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated or muddy subgrade.

1.06 PREINSTALLATION CONFERENCE.

A. 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 HS25, depending on design criteria) load be allowed on the system at any time.

B. Protect adjacent work from damage during R-Tank system installation.

C. 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 pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.

D. 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:

PROPERTY	DESCRIPTION	R-Tank^{LD} VALUE	R-Tank^{HD} VALUE	R-Tank^{SD} VALUE	R-Tank^{UD} VALUE
Void Area	Volume available for water storage	95%	95%	95%	95%
Surface Void Area	Percentage of exterior available for infiltration	90%	90%	90%	90%
Vertical Compressive Strength	ASTM D 2412 / ASTM F 2418	30.0 psi	33.4 psi	42.9 psi	134.2 psi
Lateral Compressive Strength	ASTM D 2412 / ASTM F 2418	20.0 psi	22.4 psi	28.9 psi	N/A
HS-20 Minimum Cover	Cover required to support HS-20 loads	N/A	20"	18"	12" (STONE BACKFILL)
HS-25 Minimum Cover	Cover required to support HS-25 loads	N/A	24"	19"	15" (STONE BACKFILL)
Maximum Cover	Maximum allowable cover depth	3 feet	< 7 feet	< 10 feet	5 feet
Unit Weight	Weight of plastic per cubic foot of tank	3.29 lbs / cf	3.62 lbs/cf	3.96 lbs / cf	4.33 lbs / cf
Rib Thickness	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	N/A
Service Temperature	Safe temperature range for use	-14 – 167° F	-14 – 167° F	-14 – 167° F	-14 – 167° F

C. Supplier: ACF West 15540 Woodinville-Redmond Rd., Woodinville, Washington 98072, (425) 415-6115, www.acfwest.com

2.02 GEOSYNTHETICS

A. Geotextile. A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.

1. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (TenCate Mirafi 180N or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (TenCate Mirafi FW402 or equivalent) shall be used.

B. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (Naue Secugrid 30/30 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-TankUD/ installations, and is often not required for non-traffic load applications.

2.03 BACKFILL & COVER MATERIALS

A. Bedding Materials: Stone (angular and 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: 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.

1. Traffic Applications - Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system.

a. For HD, and SD modules, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).

b. For UD modules with less than 14" of top cover, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter). The use of soil backfill on the sides and top of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of 14" or more. Top backfill material (from top of module to bottom of pavement base or 12" maximum) must be consistent with side backfill.

2. Non-Traffic / Green Space Applications - For all R-Tank modules installed in green spaces and not subjected to vehicular loads, backfill materials may either follow the guidelines for Traffic Applications above, or the top backfill layer (12" minimum) may consist of AASHTO #57 stone blended with 30-40% (by volume) topsoil to aid in establishing vegetation.

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 installation.

2.04 OTHER MATERIALS

A. Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

PART 3 - EXECUTION

3.01 ASSEMBLY OF R-TANK UNITS

A. Assembly of modules shall be performed in accordance with the R-Tank Installation Manual, Section 2.

3.02 LAYOUT AND EXCAVATION

A. 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 greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials.

B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.

C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, 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 bearing capacity is required.

1. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's engineer.
2. Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.

E. 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 bearing capacity of less than 2,000 pounds per square foot be provided.

1. 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 documents and/or as directed by the owner's engineer.
2. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations.
3. Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the owner's engineer.

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 modules. Level to within ½" (+/- ¼") 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.

1. Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unyielding.
2. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents.

B. 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 backfill.

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 minimum 12" or as recommended by manufacturer. Use tape, special adhesives, sandbags or other ballast to secure overlaps. As geotextiles can be damaged by extreme heat, smoking is not permissible on/near the geotextile, and tools using a flame to tack the overlaps, such as propane torches, are prohibited.

B. Where an impervious liner (for containment) is specified, install the liner per manufacturer's recommendations and the contract documents. The R-Tank units 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 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 with required depth as shown on plans.

1. For LD, HD, and SD installations, 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 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
2. For UD installations, there is no perpendicular end row required.

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 backfill entry into the system. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious liner) during placement.

E. 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 pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile, impervious liner (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.

F. 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.

G. 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:

1. 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.
2. 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.
3. 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.
4. No compaction equipment is permissible to operate directly on the R-Tank modules.
5. Top Backfill: Only low pressure track vehicles shall be operated over the R-Tank system during construction. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Heavy equipment should unload in an area adjacent to the R-Tank system and the material should be moved over the system using tracked equipment with an operating weight of less than 10 tons.
   a. Typical Applications: Install a 12" (or as shown on plans) lift of freely draining material (Section 2.03 B) over the R-Tank Units, maintaining 12" between equipment tracks and R-Tank System. 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.
   b. Shallow Applications (< 18" total cover): Install top backfill in accordance with plans.
6. If required, install a geogrid as shown on plans. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
7. 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 95% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement of fill above the system, unless otherwise specified, a uniform elevation of fill shall be maintained to within 12" across the footprint of the R-Tank system. 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. 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).

C. 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 surrounding areas.

D. 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.

3.06 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. All inlet pipes and 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.

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. All inspection and maintenance activities should be performed in accordance with the R-Tank Operation, Inspection & Maintenance Manual.

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF WEST, 1-800-423-4567, www.acfwest.com

R-TANK SPECIFICATION
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 1

DRAWN BY: EDQ

DATE: 09/28/2023

ACF WEST PROJECT NUMBER: 23-004WA

SHEET NO.: 6 of 6

C-16

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APPROVED

BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37390
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 16 OF 28

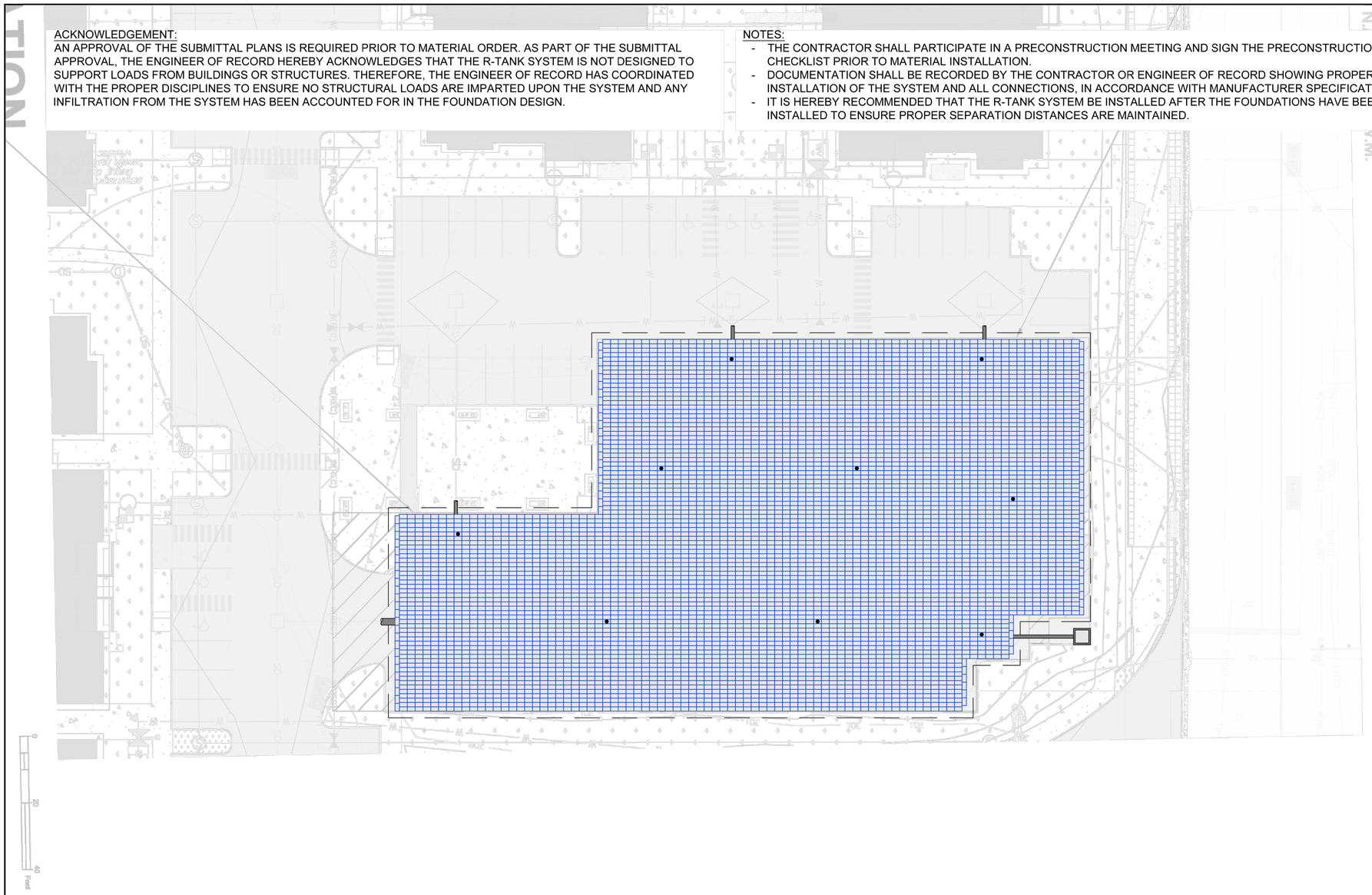
C-16

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

ACKNOWLEDGEMENT:
AN APPROVAL OF THE SUBMITTAL PLANS IS REQUIRED PRIOR TO MATERIAL ORDER. AS PART OF THE SUBMITTAL APPROVAL, THE ENGINEER OF RECORD HEREBY ACKNOWLEDGES THAT THE R-TANK SYSTEM IS NOT DESIGNED TO SUPPORT LOADS FROM BUILDINGS OR STRUCTURES. THEREFORE, THE ENGINEER OF RECORD HAS COORDINATED WITH THE PROPER DISCIPLINES TO ENSURE NO STRUCTURAL LOADS ARE IMPARTED UPON THE SYSTEM AND ANY INFILTRATION FROM THE SYSTEM HAS BEEN ACCOUNTED FOR IN THE FOUNDATION DESIGN.

NOTES:
- THE CONTRACTOR SHALL PARTICIPATE IN A PRECONSTRUCTION MEETING AND SIGN THE PRECONSTRUCTION CHECKLIST PRIOR TO MATERIAL INSTALLATION.
- DOCUMENTATION SHALL BE RECORDED BY THE CONTRACTOR OR ENGINEER OF RECORD SHOWING PROPER INSTALLATION OF THE SYSTEM AND ALL CONNECTIONS, IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
- IT IS HEREBY RECOMMENDED THAT THE R-TANK SYSTEM BE INSTALLED AFTER THE FOUNDATIONS HAVE BEEN INSTALLED TO ENSURE PROPER SEPARATION DISTANCES ARE MAINTAINED.



R-TANK^{SD} SYSTEM OVERLAY
SCALE: 1" = 30'

0 30' 60'
SCALE 1" = 30'

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF WEST, 1-800-423-4567, www.acfwest.com

R-TANK^{SD} SYSTEM OVERLAY
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 2

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 1 of 6

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 17 OF 28

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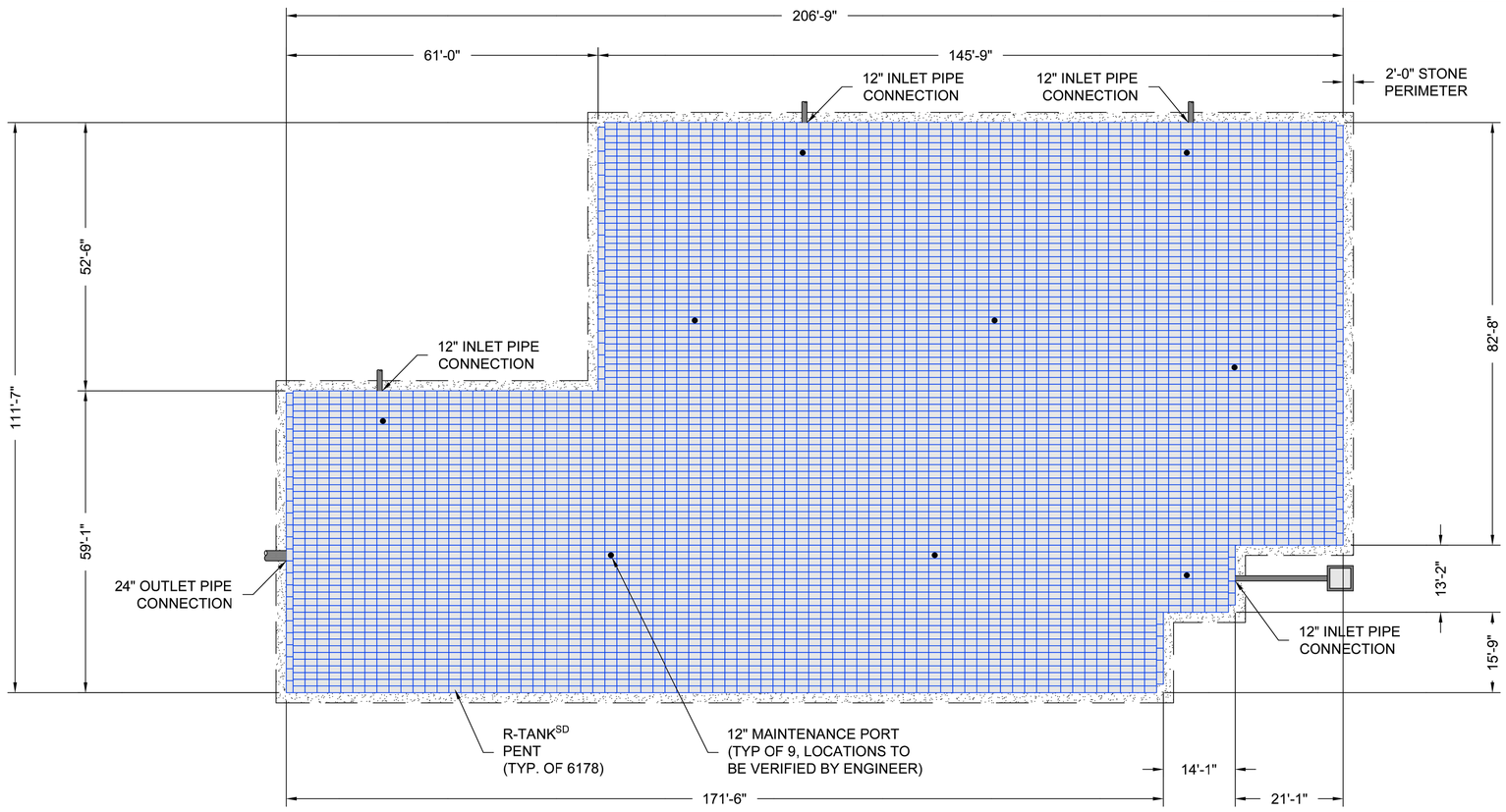
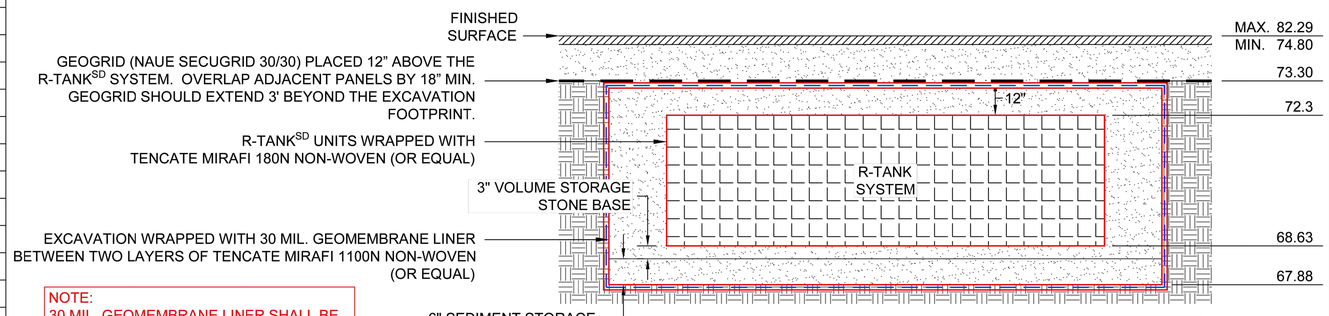
NOTE:
MINIMUM COVER FROM TOP OF TANK TO FINISH GRADE MUST BE AT LEAST 30" TO MEET A 45 KIP OUTRIGGER LOAD ON AN 18'X18" PAD.



NOTES:
1. DEAD STORAGE VOLUME FROM ELEVATION 67.88 TO 68.38 = 4,063 CF
2. LIVE STORAGE VOLUME FROM ELEVATION 68.38 TO 73.30 = 78,478 CF
3. ONLY 3" OF BASE STONE INCLUDED IN LIVE STORAGE VOLUME.

0 25' 50'
SCALE 1" = 25'

LAYOUT SCALE	1" = 25'
R-TANK^SD MODULE TYPE	PENT
TRAFFIC LOAD	45 KIP OUTRIGGER (18"X18")
# OF PENT R-TANKS	6,178
TOTAL SYSTEM STORAGE	78,478 CF
R-TANK STORAGE VOLUME	66,414 CF
STONE STORAGE VOLUME (40% VOID RATIO)	12,064 CF
TOP OF COVER STONE ELEV. (12")	73.30
NAUE SECUGRID 30/30 GEOGRID ELEV.	73.30
TOP OF R-TANK ELEV.	72.30
TANK INVERT	68.63
INVERT OF STONE BASE (9")	67.88
MIN. STONE PERIMETER WIDTH	2.0 FT
SEE SHEETS 3 - 6 FOR DETAILS AND ADDITIONAL INFORMATION	



NOTE:
30 MIL. GEOMEMBRANE LINER SHALL BE ULTRAVIOLET (UV) LIGHT RESISTANT.

R-TANK^SD TANK WRAP & EXCAVATION ENVELOPE DETAIL

R-TANK^SD SYSTEM LAYOUT
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 2

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 2 of 6

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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DATE 10/10/2023
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2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS — STATE OF WASHINGTON — 37399 — REGISTERED PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 18 OF 28

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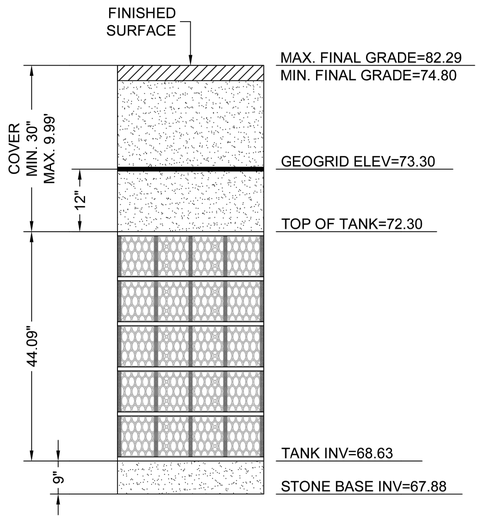
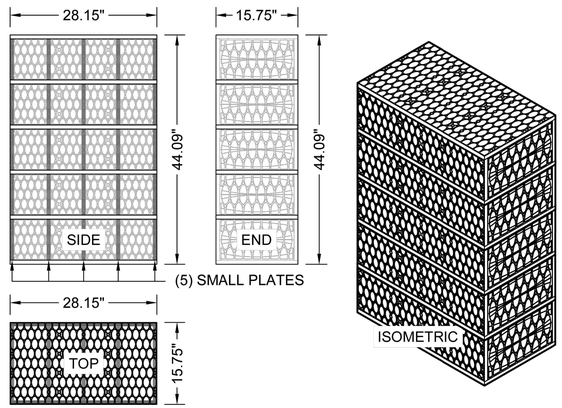
EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



PENT R-TANK^{SD} - ELEVATION



MODULE DATA

GEOMETRY:
LENGTH = 28.15 IN. (715 MM)
WIDTH = 15.75 IN. (400 MM)
HEIGHT = 44.09 IN. (1120 MM)
TANK VOLUME = 11.31 CF
STORAGE VOLUME = 10.75 CF
VOID INTERNAL VOLUME: 95%
VOID SURFACE AREA: 90%

LOAD RATING:
42.9 PSI, (MODULE ONLY)
HS20/HS25 - SEE SPEC FOR COVER REQUIREMENTS

MATERIAL:
100% RECYCLED POLYPROPYLENE

SMALL PLATES REQUIRED:
5/SEGMENT, 25/MODULE

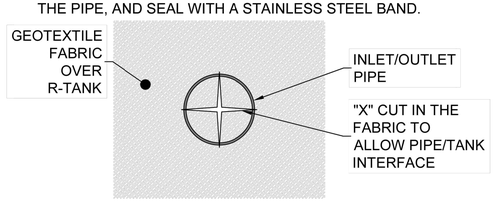
PENT R-TANK^{SD} - MODULE DETAIL

R-TANK^{SD} QUANTITIES	
R-TANK^{SD} MODULE TYPE	PENT
# OF PENT R-TANKS	6,178
TOTAL SYSTEM STORAGE	78,478 CF
R-TANK STORAGE VOLUME	66,414 CF
STONE STORAGE VOLUME (40% VOID RATIO)	12,064 CF
STONE BED FOOTPRINT	20,317 SF
STONE QUANTITY	1,493 CY
TENCATE MIRAFI 180N NON-WOVEN TANK WRAP	46,441 SF (5,160 SY)
30 MIL. GEOMEMBRANE LINER EXCAVATION WRAP	50,803 SF (5,645 SY)
TENCATE MIRAFI 1100N NON-WOVEN LINER PROTECTION	101,606 SF (11,290 SY)
NAUE SECUGRID 30/30 GEOGRID	25,657 SF (2,851 SY)
12" MAINTENANCE PORTS	9
12" PIPE BOOTS	4
24" PIPE BOOTS	1
TRASHGUARD PLUS UNITS (RECOMMENDED)	4
NOTE: STONE QUANTITY INCLUDES 12" OF COVER AND 9" OF BASE.	
NOTE: GEOTEXTILE / LINER QUANTITIES INCLUDE A 15% WASTE FACTOR.	

NOTE:
30 MIL. GEOMEMBRANE LINER SHALL BE ULTRAVIOLET (UV) LIGHT RESISTANT.

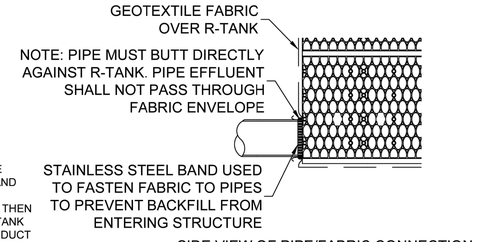
NOTES:
1. DEAD STORAGE VOLUME FROM ELEVATION 67.88 TO 68.38 = 4,063 CF
2. LIVE STORAGE VOLUME FROM ELEVATION 68.38 TO 73.30 = 78,478 CF
3. ONLY 3" OF BASE STONE INCLUDED IN LIVE STORAGE VOLUME.

CUT AN "X" IN THE FABRIC ENVELOPE THAT IS SLIGHTLY LARGER THAN THE PIPE. PULL THE FABRIC FLAPS AROUND THE PIPE, AND SEAL WITH A STAINLESS STEEL BAND.

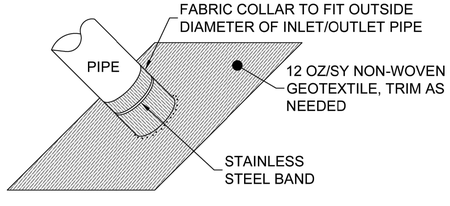


END VIEW OF PIPE/FABRIC CONNECTION

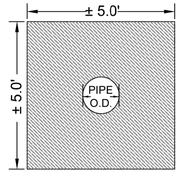
AFTER TANK WRAP IS SECURED TO PIPE, SLIDE BOOT AGAINST R-TANK AND SECURE WITH SECOND STAINLESS STEEL BAND, THEN ATTACH BOOT FLAP TO TANK ENVELOPE FABRIC WITH DUCT TAPE OR OTHER ADHESIVE.



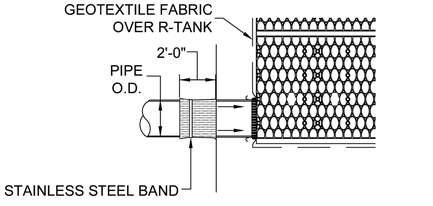
SIDE VIEW OF PIPE/FABRIC CONNECTION



GEOTEXTILE BOOT



FRONT VIEW OF GEOTEXTILE BOOT



SIDE VIEW OF GEOTEXTILE BOOT

R-TANK^{SD} TYPICAL TANK INLET/OUTLET W/ GEOTEXTILE PIPE BOOT DETAIL

R-TANK^{SD} SYSTEM DETAILS
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 2

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 3 of 6

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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DATE 10/10/2023

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS STATE OF WASHINGTON 37399 REGISTERED PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 19 OF 28

C-19

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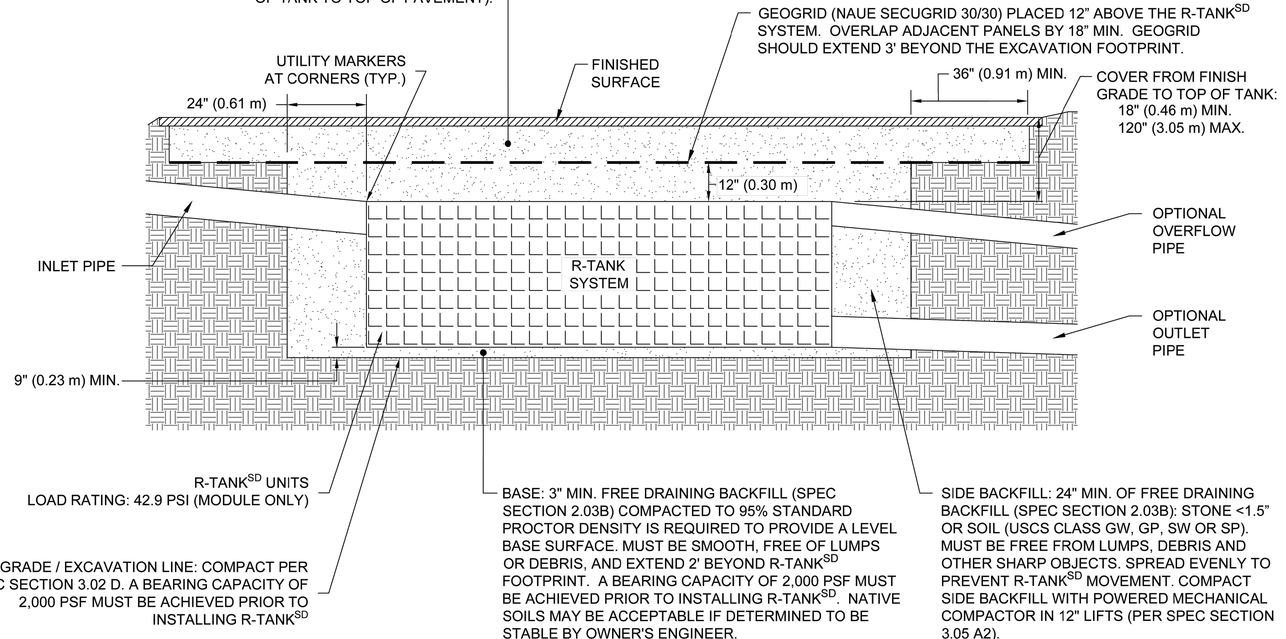
EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

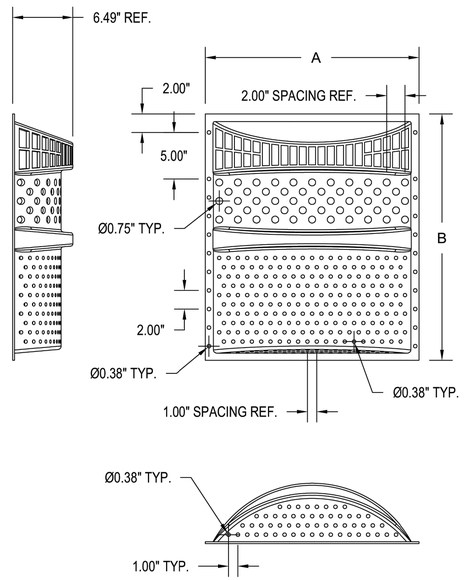
TOTAL COVER: 18" MINIMUM AND 120" MAXIMUM. FIRST 12" MUST BE FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). ADDITIONAL FILL MAY BE STRUCTURAL FILL (SPEC SECTION 2.03C): STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4 A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 10'. CONTACT ACF WEST IF MORE THAN 10' OR LESS THAN 18" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).

NOTES:
1. FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^{SD} MODULE SHEET .
2. INSTALLATIONS PER THIS DETAIL MEET GUIDELINES OF HL-93 LOADING PER THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, CUSTOMARY U.S. UNITS, 7TH EDITION, 2014 WITH 2015 AND 2016 INTERIM REVISIONS.
3. PRE-TREATMENT STRUCTURES NOT SHOWN.
4. FOR INFILTRATION APPLICATIONS, GEOTEXTILE ENVELOPING R-TANK SHALL BE TENCATE MIRAFI FW-402 WOVEN (PER SPEC SECTION 2.02A) AND BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03A) TO PROVIDE A LEVEL BASE. SURFACE MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{SD} FOOTPRINT.



NOTE:
MINIMUM COVER FROM TOP OF TANK TO FINISH GRADE MUST BE AT LEAST 30" TO MEET A 45 KIP OUTRIGGER LOAD ON AN 18'X18" PAD.

R-TANK^{SD} & HS-20 LOADS - SECTION VIEW



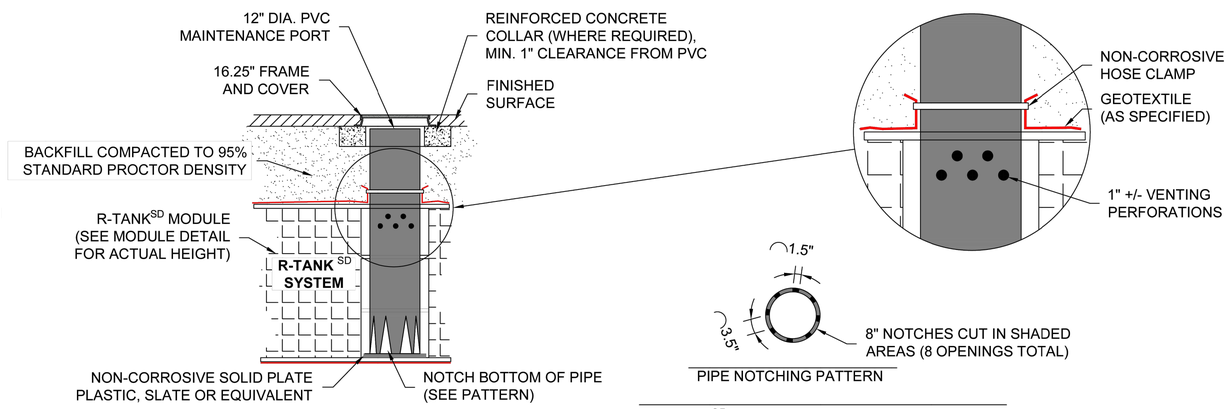
SIZE	A	B
23" x 24"	23"	26.51"
28" x 30"	28"	33.15"
34" x 36"	34"	38.69"

±0.25" TOLERANCE ON DIMENSIONS

NOTE:
TRASHGUARD PLUS UNITS ARE RECOMMENDED TO BE INSTALLED IN ALL CATCH BASINS DIRECTLY CONNECTED UPSTREAM OF THE R-TANK SYSTEM.

TRASHGUARD PLUS PRETREATMENT DETAIL

NOTES
1. THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.
2. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
3. R-TANK^{HD}, R-TANK^{SD}, R-TANK^{UD} AND R-TANK^{XD} MAY BE USED IN TRAFFIC APPLICATIONS.
4. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.
5. IF MAINTENANCE PORT IS LOCATED IN A NON-TRAFFIC AREA, A PLASTIC CAP CAN BE USED IN LIEU OF A FRAME AND COVER WITH CONCRETE COLLAR.



R-TANK^{SD} TYPICAL MAINTENANCE PORT

R-TANK^{SD} SYSTEM DETAILS
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 2

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 4 of 6

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOR ADDITIONAL INFORMATION PLEASE CONTACT: ACF WEST, 1-800-423-4567, www.acfwest.com

APPROVED
BY: CITY OF PUYALLUP DEVELOPMENT ENGINEERING
DATE 10/10/2023
NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

City of Puyallup
Development & Permitting Services
ISSUED PERMIT
Building | Planning | Engineering | Public Works | Fire | Traffic

McInnis ENGINEERING
mcinnisengineering.com
253.414.1992
202 East 34th Street
Tacoma, Washington 98404

EAST TOWN CROSSING
GRADE AND FILL PLANS
2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS — STATE OF WASHINGTON — 17399 — REGISTERED PROFESSIONAL ENGINEER — 10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 20 OF 28

C-20

C-20

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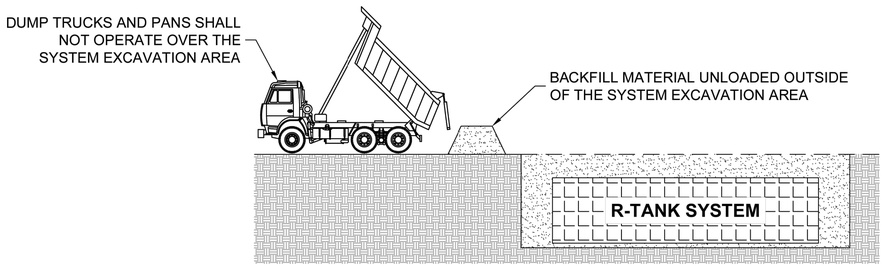
1-800-424-5555 OR 811

EAST TOWN CROSSING

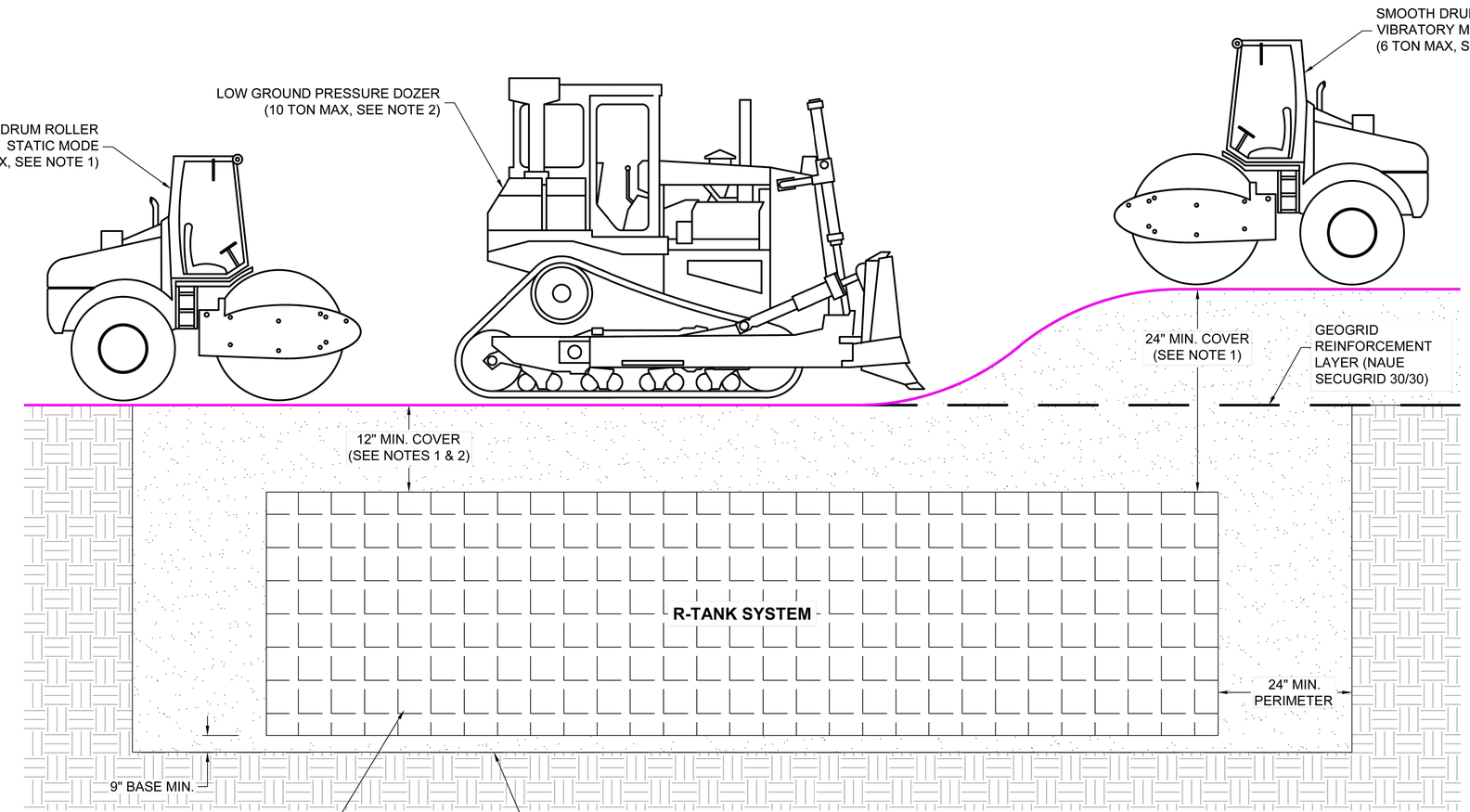
SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



DUMP TRUCK DETAIL (SEE NOTE 3)

NOTES:

1. FOLLOWING PLACEMENT OF SIDE BACKFILL, A UNIFORM 12" LIFT OF THE FREELY DRAINING MATERIAL (SPEC SECTION 2.03 B2) 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. **SPEC SECTION 3.05 A5**
2. ONLY LOW PRESSURE TIRE OR TRACK VEHICLES (LESS THAN 7 PSI AND OPERATING WEIGHT OF LESS THAN 20,000 LBS) SHALL BE OPERATED OVER THE R-TANK SYSTEM DURING CONSTRUCTION. **SPEC SECTION 3.05 A5**
3. DUMP TRUCKS AND PANS SHALL NOT BE OPERATED WITHIN THE R-TANK SYSTEM 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. **SPEC SECTION 3.05 A5**
4. 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). **SPEC SECTION 3.05 B**
5. SEE R-TANK INSTALLATION GUIDE OR CONTACT YOUR LOCAL ACF WEST REPRESENTATIVE FOR ADDITIONAL INFORMATION.



CONSTRUCTION EQUIPMENT COVER DETAIL - VEHICULAR TRAFFIC

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023
NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

City of Puyallup
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R-TANK^SD

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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FOR ADDITIONAL INFORMATION PLEASE CONTACT: ACF WEST, 1-800-423-4567, www.acfwest.com

R-TANK^SD CONSTRUCTION EQUIPMENT COVER DETAIL
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 2

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 5 of 6

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EAST TOWN CROSSING
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JEFFREY W. McINNIS — STATE OF WASHINGTON — 17399 — REGISTERED PROFESSIONAL ENGINEER — 10/2/23

NUM	DATE	DESCRIPTION

DESIGNED	SCALE
W. MCINNIS	NTS
DRAWN	CHECKED
W. MCINNIS	CHCK
DATE 10/2/23	APPROVED APRD

SHEET 21 OF 28

C-21

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EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

R-TANK SPECIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section.

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 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-TankLD/, R-TankHD/, R-TankSD/, or R-TankU/D/ system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, 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.

D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.

1.03 QUALITY CONTROL

A. All materials shall be manufactured in ISO certified facilities.

B. Installation Contractor shall demonstrate the following experience:

1. A minimum of three R-Tank or equivalent projects completed within 2 years; and,
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
3. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.

C. 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.

D. 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.

C. Submit manufacturer's installation instructions.

D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.

E. Submit material certificates for geotextile, geogrid, base course and backfill materials.

F. Submit required experience and personnel requirements as specified in Section 1.03.

G. 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 installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris.

B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.

C. Cold weather:

1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated or muddy subgrade.

1.06 PREINSTALLATION CONFERENCE.

A. 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 HS25, depending on design criteria) load be allowed on the system at any time.

B. Protect adjacent work from damage during R-Tank system installation.

C. 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 pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.

D. 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:

PROPERTY	DESCRIPTION	R-Tank^{LD} VALUE	R-Tank^{HD} VALUE	R-Tank^{SD} VALUE	R-Tank^{UD} VALUE
Void Area	Volume available for water storage	95%	95%	95%	95%
Surface Void Area	Percentage of exterior available for infiltration	90%	90%	90%	90%
Vertical Compressive Strength	ASTM D 2412 / ASTM F 2418	30.0 psi	33.4 psi	42.9 psi	134.2 psi
Lateral Compressive Strength	ASTM D 2412 / ASTM F 2418	20.0 psi	22.4 psi	28.9 psi	N/A
HS-20 Minimum Cover	Cover required to support HS-20 loads	N/A	20"	18"	12" (STONE BACKFILL)
HS-25 Minimum Cover	Cover required to support HS-25 loads	N/A	24"	19"	15" (STONE BACKFILL)
Maximum Cover	Maximum allowable cover depth	3 feet	< 7 feet	< 10 feet	5 feet
Unit Weight	Weight of plastic per cubic foot of tank	3.29 lbs / cf	3.62 lbs/cf	3.96 lbs / cf	4.33 lbs / cf
Rib Thickness	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	N/A
Service Temperature	Safe temperature range for use	-14 – 167° F	-14 – 167° F	-14 – 167° F	-14 – 167° F

C. Supplier: ACF West 15540 Woodinville-Redmond Rd., Woodinville, Washington 98072, (425) 415-6115, www.acfwest.com

2.02 GEOSYNTHETICS

A. Geotextile. A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.

1. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (TenCate Mirafi 180N or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (TenCate Mirafi FW402 or equivalent) shall be used.

B. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (Naue Secugrid 30/30 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-TankUD/ installations, and is often not required for non-traffic load applications.

2.03 BACKFILL & COVER MATERIALS

A. Bedding Materials: Stone (angular and 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: 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.

1. Traffic Applications - Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system.

a. For HD, and SD modules, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).

b. For UD modules with less than 14" of top cover, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter). The use of soil backfill on the sides and top of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of 14" or more. Top backfill material (from top of module to bottom of pavement base or 12" maximum) must be consistent with side backfill.

2. Non-Traffic / Green Space Applications - For all R-Tank modules installed in green spaces and not subjected to vehicular loads, backfill materials may either follow the guidelines for Traffic Applications above, or the top backfill layer (12" minimum) may consist of AASHTO #57 stone blended with 30-40% (by volume) topsoil to aid in establishing vegetation.

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 installation.

2.04 OTHER MATERIALS

A. Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

PART 3 - EXECUTION

3.01 ASSEMBLY OF R-TANK UNITS

A. Assembly of modules shall be performed in accordance with the R-Tank Installation Manual, Section 2.

3.02 LAYOUT AND EXCAVATION

A. 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 greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials.

B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.

C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, 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 bearing capacity is required.

1. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's engineer.
2. Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.

E. 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 bearing capacity of less than 2,000 pounds per square foot be provided.

1. 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 documents and/or as directed by the owner's engineer.
2. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations.
3. Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the owner's engineer.

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 modules. Level to within ½" (+/- ¼") 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.

1. Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unyielding.
2. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents.

B. 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 backfill.

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 minimum 12" or as recommended by manufacturer. Use tape, special adhesives, sandbags or other ballast to secure overlaps. As geotextiles can be damaged by extreme heat, smoking is not permissible on/near the geotextile, and tools using a flame to tack the overlaps, such as propane torches, are prohibited.

B. Where an impervious liner (for containment) is specified, install the liner per manufacturer's recommendations and the contract documents. The R-Tank units 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 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 with required depth as shown on plans.

1. For LD, HD, and SD installations, 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 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
2. For UD installations, there is no perpendicular end row required.

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 backfill entry into the system. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious liner) during placement.

E. 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 pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile, impervious liner (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.

F. 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.

G. 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:

1. 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.
2. 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.
3. 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.
4. No compaction equipment is permissible to operate directly on the R-Tank modules.
5. Top Backfill: Only low pressure track vehicles shall be operated over the R-Tank system during construction. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Heavy equipment should unload in an area adjacent to the R-Tank system and the material should be moved over the system using tracked equipment with an operating weight of less than 10 tons.
   a. Typical Applications: Install a 12" (or as shown on plans) lift of freely draining material (Section 2.03 B) over the R-Tank Units, maintaining 12" between equipment tracks and R-Tank System. 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.
   b. Shallow Applications (< 18" total cover): Install top backfill in accordance with plans.
6. If required, install a geogrid as shown on plans. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
7. 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 95% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement of fill above the system, unless otherwise specified, a uniform elevation of fill shall be maintained to within 12" across the footprint of the R-Tank system. 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. 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).

C. 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 surrounding areas.

D. 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.

3.06 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. All inlet pipes and 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.

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. All inspection and maintenance activities should be performed in accordance with the R-Tank Operation, Inspection & Maintenance Manual.

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
ACF WEST, 1-800-423-4567, www.acfwest.com

R-TANK SPECIFICATION
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 2

DRAWN BY: EDQ

DATE: 09/28/2023

ACF WEST PROJECT NUMBER: 23-004WA

SHEET NO.: 6 of 6

C-22

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FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

City of Puyallup
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mcinnisengineering.com
253.414.1992
202 East 34th Street
Tacoma, Washington 98404

EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 22 OF 28

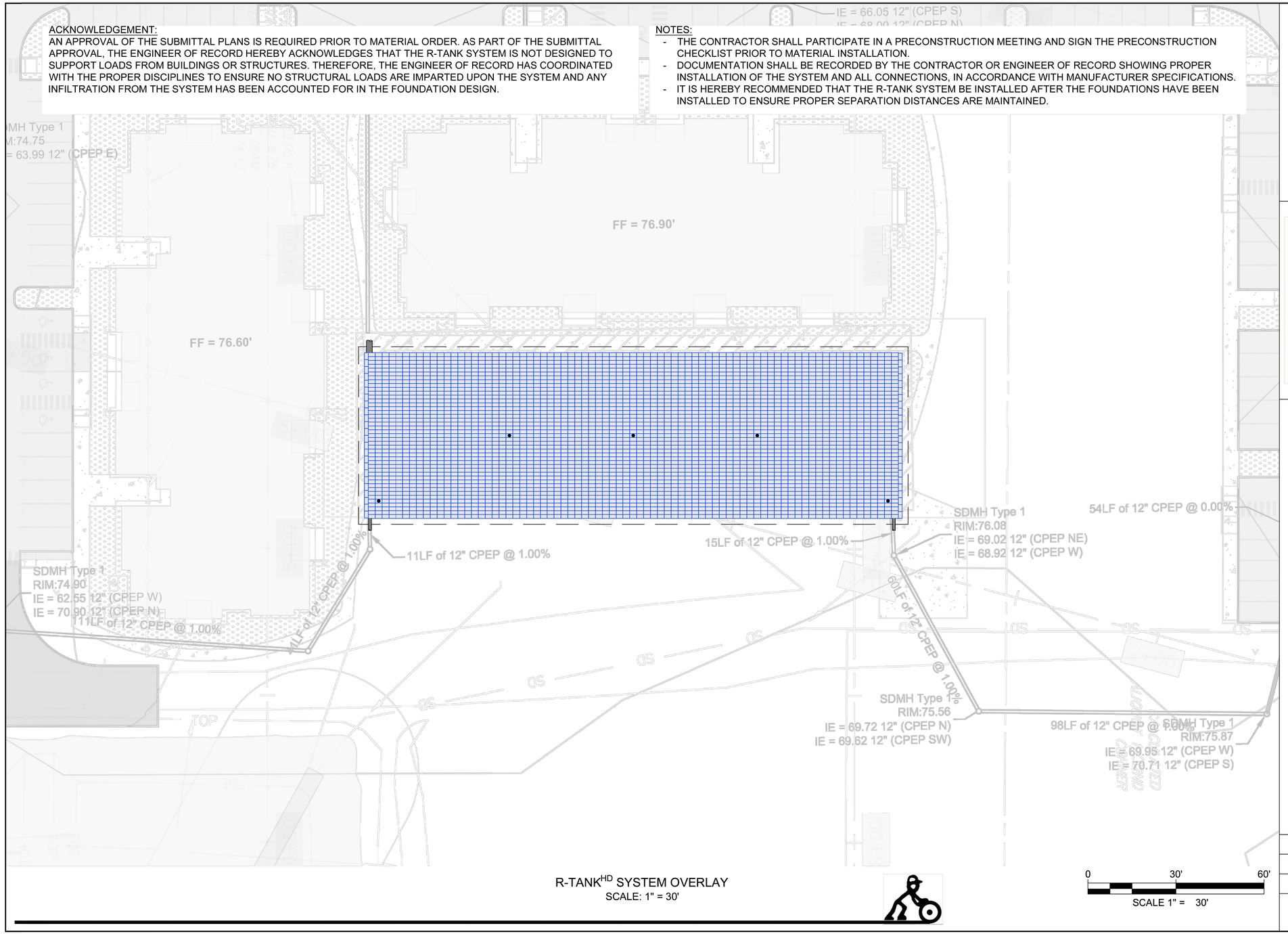
C-22

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

ACKNOWLEDGEMENT:
AN APPROVAL OF THE SUBMITTAL PLANS IS REQUIRED PRIOR TO MATERIAL ORDER. AS PART OF THE SUBMITTAL APPROVAL, THE ENGINEER OF RECORD HEREBY ACKNOWLEDGES THAT THE R-TANK SYSTEM IS NOT DESIGNED TO SUPPORT LOADS FROM BUILDINGS OR STRUCTURES. THEREFORE, THE ENGINEER OF RECORD HAS COORDINATED WITH THE PROPER DISCIPLINES TO ENSURE NO STRUCTURAL LOADS ARE IMPARTED UPON THE SYSTEM AND ANY INFILTRATION FROM THE SYSTEM HAS BEEN ACCOUNTED FOR IN THE FOUNDATION DESIGN.

NOTES:
- THE CONTRACTOR SHALL PARTICIPATE IN A PRECONSTRUCTION MEETING AND SIGN THE PRECONSTRUCTION CHECKLIST PRIOR TO MATERIAL INSTALLATION.
- DOCUMENTATION SHALL BE RECORDED BY THE CONTRACTOR OR ENGINEER OF RECORD SHOWING PROPER INSTALLATION OF THE SYSTEM AND ALL CONNECTIONS, IN ACCORDANCE WITH MANUFACTURER SPECIFICATIONS.
- IT IS HEREBY RECOMMENDED THAT THE R-TANK SYSTEM BE INSTALLED AFTER THE FOUNDATIONS HAVE BEEN INSTALLED TO ENSURE PROPER SEPARATION DISTANCES ARE MAINTAINED.



R-TANK^{HD} SYSTEM OVERLAY
SCALE: 1" = 30'

0 30' 60'
SCALE 1" = 30'

R-TANK^{HD} SYSTEM OVERLAY
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 3

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 1 of 6

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOR ADDITIONAL INFORMATION PLEASE CONTACT:
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APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
17799
REGISTERED PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 23 OF 28

C-23

C-23

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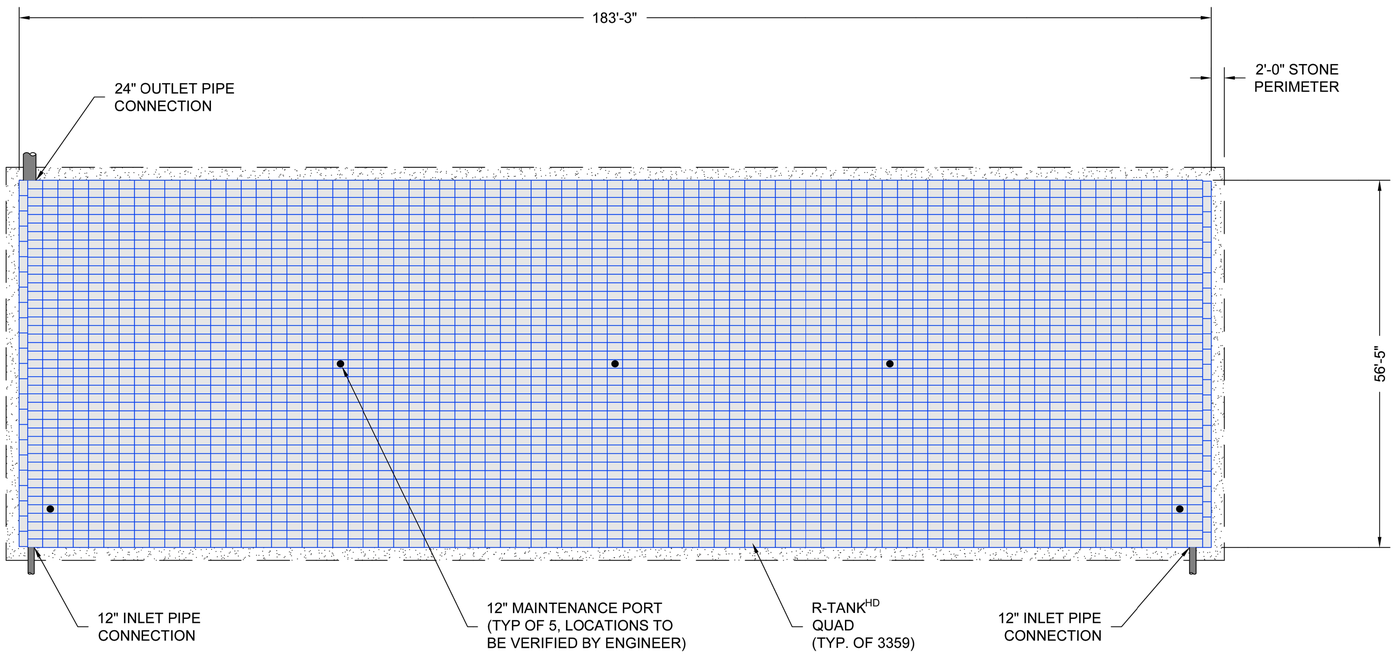
EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

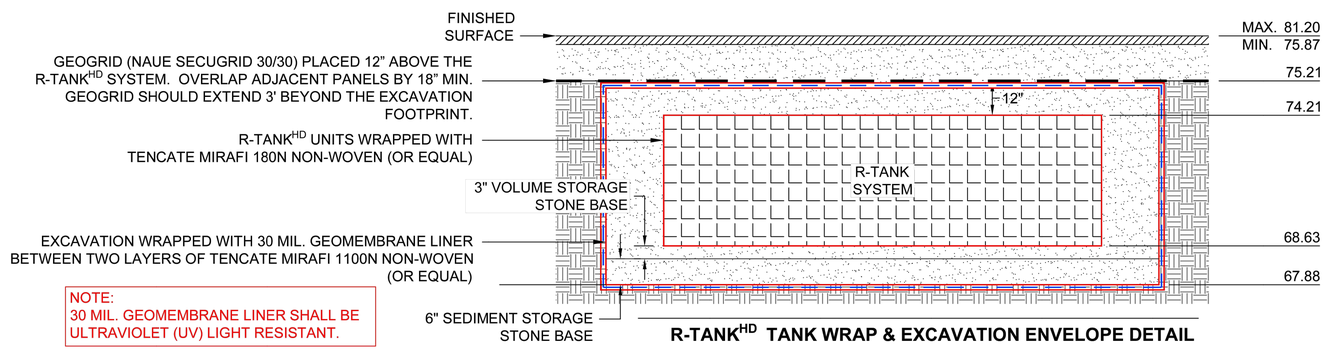


NOTES:
1. DEAD STORAGE VOLUME FROM ELEVATION 67.88 TO 68.38 = 2,263 CF
2. LIVE STORAGE VOLUME FROM ELEVATION 68.38 TO 75.21 = 62,623 CF
3. ONLY 3" OF BASE STONE INCLUDED IN LIVE STORAGE VOLUME.

0 20' 40'

SCALE 1" = 20'

LAYOUT SCALE	1" = 20'
R-TANK^{HD} MODULE TYPE	QUAD
TRAFFIC LOAD	HS-20
# OF QUAD R-TANKS	3,359
TOTAL SYSTEM STORAGE	62,623 CF
R-TANK STORAGE VOLUME	54,785 CF
STONE STORAGE VOLUME (40% VOID RATIO)	7,838 CF
NAUE SECUGRID 30/30 GEOGRID ELEV.	75.21
TOP OF COVER STONE ELEV. (12")	75.21
TOP OF R-TANK ELEV.	74.21
TANK INVERT	68.63
INVERT OF STONE BASE (9")	67.88
MIN. STONE PERIMETER WIDTH	2.0 FT
SEE SHEETS 3 - 6 FOR DETAILS AND ADDITIONAL INFORMATION	



NOTE:
30 MIL. GEOMEMBRANE LINER SHALL BE ULTRAVIOLET (UV) LIGHT RESISTANT.

R-TANK^{HD} TANK WRAP & EXCAVATION ENVELOPE DETAIL

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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Development & Permitting Services
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Fire	Traffic

R-TANK

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R-TANK^{HD} SYSTEM LAYOUT
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 3

DRAWN BY EDQ
DATE 09/28/2023
ACF WEST PROJECT NUMBER 23-004WA
SHEET NO. 2 of 6

C-24

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EAST TOWN CROSSING
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2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS
STATE OF WASHINGTON
37399
REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

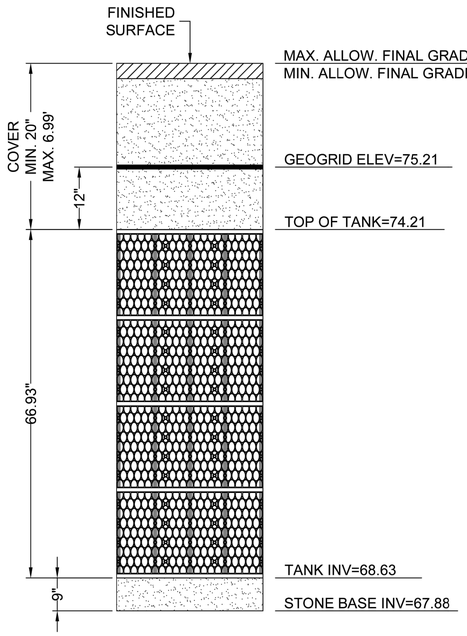
DESIGNED W. MCINNIS	SCALE NTS
DRAWN W. MCINNIS	CHECKED CHCK
DATE 10/2/23	APPROVED APRD

SHEET 24 OF 28

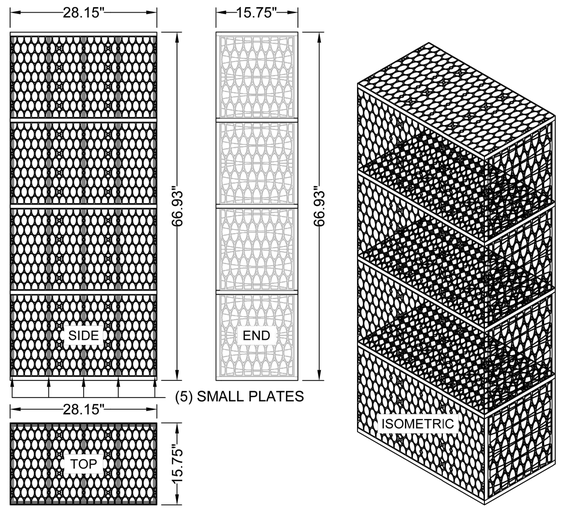
C-24

EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.



QUAD R-TANK^{HD} - ELEVATION

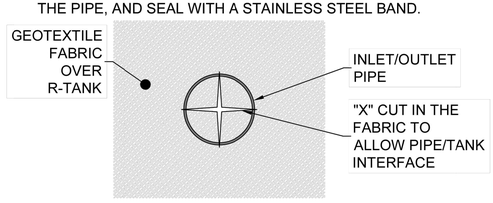


MODULE DATA

GEOMETRY:	**LOAD RATING:**
LENGTH = 28.15 IN. (715 MM)	33.4 PSI, (MODULE ONLY)
WIDTH = 15.75 IN. (400 MM)	HS20/HS25 - SEE SPEC FOR
HEIGHT = 66.93 IN. (1700 MM)	COVER REQUIREMENTS
TANK VOLUME = 17.17 CF	**MATERIAL:**
STORAGE VOLUME = 16.31 CF	100% RECYCLED POLYPROPYLENE
VOID INTERNAL VOLUME: 95%	**SMALL PLATES REQUIRED:**
VOID SURFACE AREA: 90%	5/SEGMENT, 20/MODULE

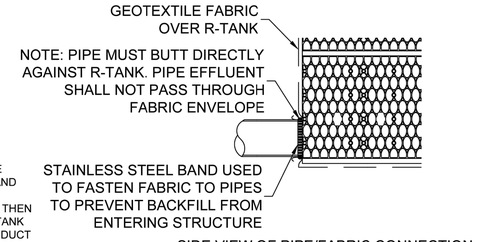
QUAD R-TANK^{HD} - MODULE DETAIL

CUT AN "X" IN THE FABRIC ENVELOPE THAT IS SLIGHTLY LARGER THAN THE PIPE. PULL THE FABRIC FLAPS AROUND THE PIPE, AND SEAL WITH A STAINLESS STEEL BAND.

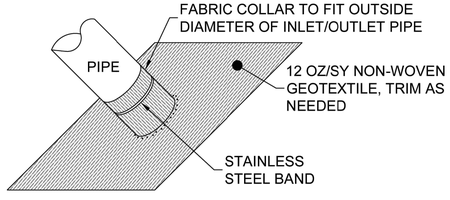


END VIEW OF PIPE/FABRIC CONNECTION

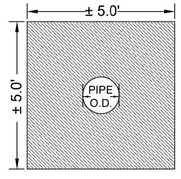
AFTER TANK WRAP IS SECURED TO PIPE, SLIDE BOOT AGAINST R-TANK AND SECURE WITH SECOND STAINLESS STEEL BAND, THEN ATTACH BOOT FLAP TO TANK ENVELOPE FABRIC WITH DUCT TAPE OR OTHER ADHESIVE.



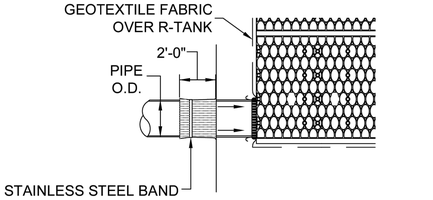
SIDE VIEW OF PIPE/FABRIC CONNECTION



GEOTEXTILE BOOT



FRONT VIEW OF GEOTEXTILE BOOT



SIDE VIEW OF GEOTEXTILE BOOT

R-TANK^{HD} TYPICAL TANK INLET/OUTLET W/ GEOTEXTILE PIPE BOOT DETAIL

R-TANK^{HD} QUANTITIES

R-TANK^{HD} MODULE TYPE	QUAD
# OF QUAD R-TANKS	3,359
TOTAL SYSTEM STORAGE	62,623 CF
R-TANK STORAGE VOLUME	54,785 CF
STONE STORAGE VOLUME (40% VOID RATIO)	7,838 CF
STONE BED FOOTPRINT	11,317 SF
STONE QUANTITY	935 CY
TENCATE MIRAFI 180N NON-WOVEN TANK WRAP	26,865 SF (2,985 SY)
30 MIL. GEOMEMBRANE LINER EXCAVATION WRAP	30,209 SF (3,357 SY)
TENCATE MIRAFI 1100N NON-WOVEN LINER PROTECTION	60,418 SF (6,713 SY)
NAUE SECUGRID 30/30 GEOGRID	14,765 SF (1,641 SY)
12" MAINTENANCE PORTS	5
12" PIPE BOOTS	2
24" PIPE BOOTS	1
TRASHGUARD PLUS UNITS (RECOMMENDED)	2
NOTE: STONE QUANTITY INCLUDES 12" OF COVER AND 9" OF BASE.	
NOTE: GEOTEXTILE / LINER QUANTITIES INCLUDE A 15% WASTE FACTOR.	

NOTE:
30 MIL. GEOMEMBRANE LINER SHALL BE ULTRAVIOLET (UV) LIGHT RESISTANT.

NOTES:
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2. LIVE STORAGE VOLUME FROM ELEVATION 68.38 TO 75.21 = 62,623 CF
3. ONLY 3" OF BASE STONE INCLUDED IN LIVE STORAGE VOLUME.

R-TANK^{HD}

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R-TANK^{HD} SYSTEM DETAILS
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 3

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 3 of 6

APPROVED
BY _____ CITY OF PUYALLUP DEVELOPMENT ENGINEERING
DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
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PUYALLUP, WA 98372

JEFFREY W. McINNIS STATE OF WASHINGTON 37399 REGISTERED PROFESSIONAL ENGINEER 10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 25 OF 28

C-25

C-25

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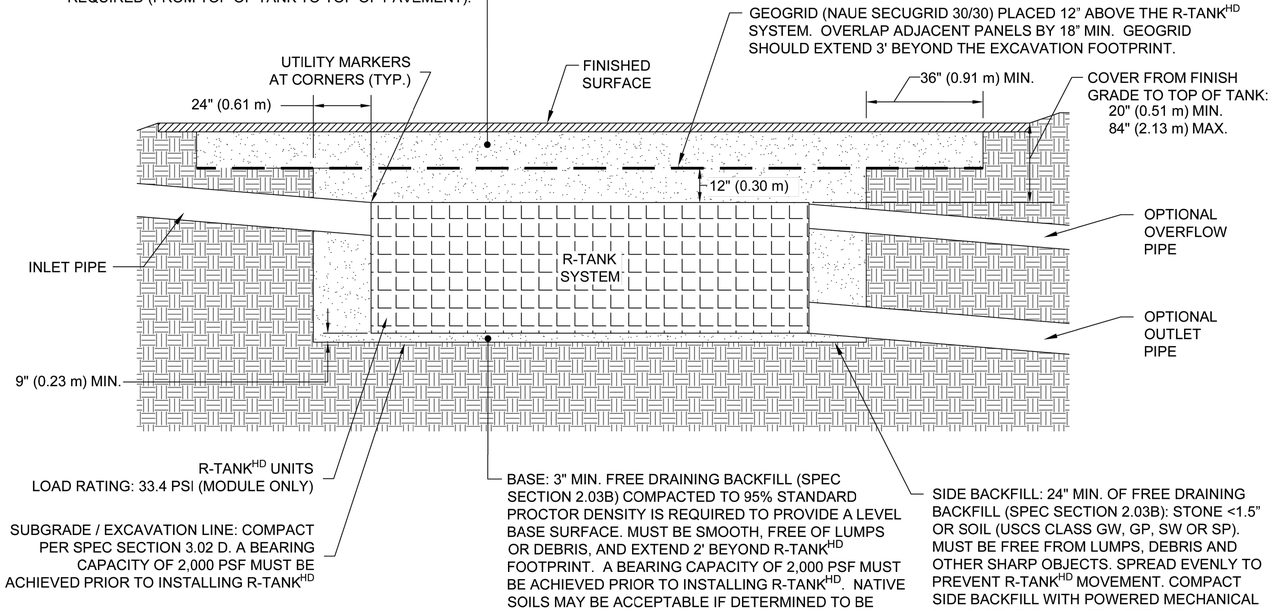
EAST TOWN CROSSING

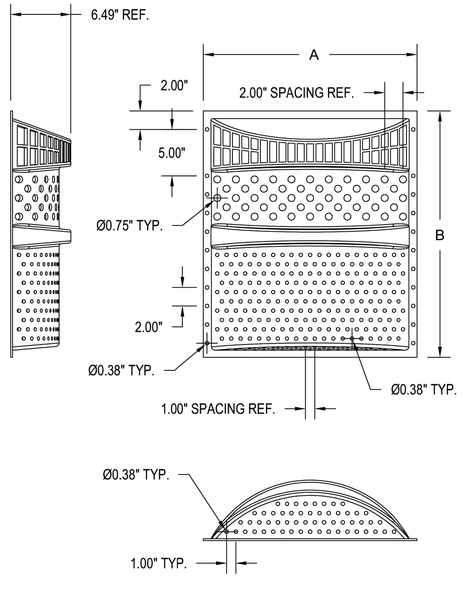
SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

TOTAL COVER: 20" MINIMUM AND 84" MAXIMUM. FIRST 12" MUST BE FREE DRAINING BACKFILL (SPEC SECTION 2.03B): STONE <1.5" OR SOIL (USCS CLASS GW, GP, SW OR SP). ADDITIONAL FILL MAY BE STRUCTURAL FILL (SPEC SECTION 2.03C): STONE OR SOIL (USCS CLASS SM, SP, SW, GM, GP OR GW) WITH MAX CLAY CONTENT<10%, MAX 25% PASSING NO. 200 SIEVE, AND MAX PLASTICITY INDEX OF 4. A MIN. 12" COVER MUST BE MAINTAINED BETWEEN BACKFILL EQUIPMENT AND THE TOP OF THE R-TANK™ SYSTEM AT ALL TIMES. TOTAL HEIGHT OF TOP BACKFILL SHOULD NOT EXCEED 7'. CONTACT ACF WEST IF MORE THAN 7' OR LESS THAN 20" OF TOP BACKFILL IS REQUIRED (FROM TOP OF TANK TO TOP OF PAVEMENT).

NOTES:
1. FOR COMPLETE MODULE DATA, SEE APPROPRIATE R-TANK^{HD} MODULE SHEET .
2. INSTALLATIONS PER THIS DETAIL MEET GUIDELINES OF HL-93 LOADING PER THE AASHTO LRFD BRIDGE DESIGN SPECIFICATIONS, CUSTOMARY U.S. UNITS, 7TH EDITION, 2014 WITH 2015 AND 2016 INTERIM REVISIONS.
3. PRE-TREATMENT STRUCTURES NOT SHOWN.
4. FOR INFILTRATION APPLICATIONS, GEOTEXTILE ENVELOPING R-TANK SHALL BE ACF M200 (PER SPEC SECTION 2.02A) AND BASE SHALL BE 4" MIN. UNCOMPACTED FREE DRAINING BACKFILL (SPEC SECTION 2.03A) TO PROVIDE A LEVEL BASE. SURFACE MUST BE SMOOTH, FREE OF LUMPS OR DEBRIS, AND EXTEND 2' BEYOND R-TANK^{HD} FOOTPRINT.



R-TANK^{HD} & HS-20 LOADS - SECTION VIEW



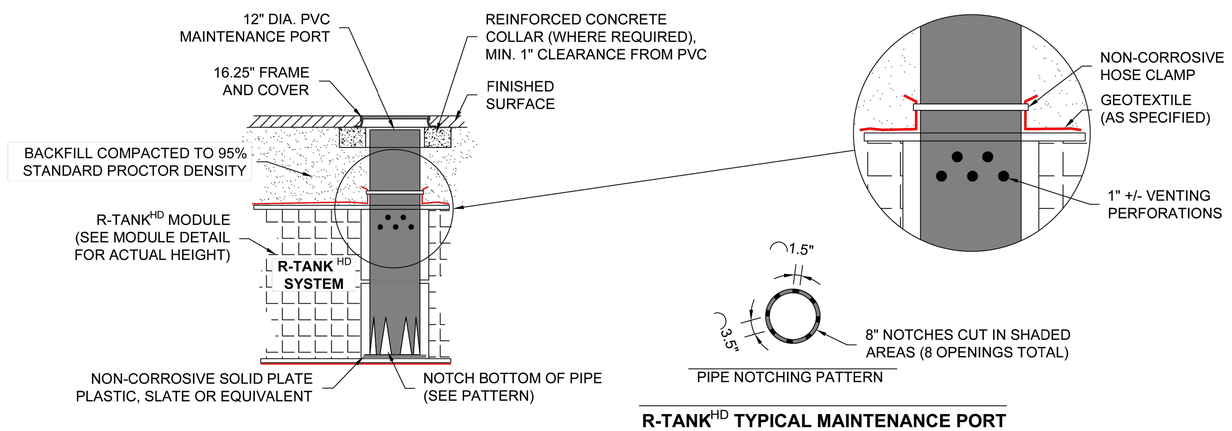
SIZE	A	B
23" x 24"	23"	26.51"
28" x 30"	28"	33.15"
34" x 36"	34"	38.69"

±0.25" TOLERANCE ON DIMENSIONS

NOTE:
TRASHGUARD PLUS UNITS ARE RECOMMENDED TO BE INSTALLED IN ALL CATCH BASINS DIRECTLY CONNECTED UPSTREAM OF THE R-TANK SYSTEM.

TRASHGUARD PLUS PRETREATMENT DETAIL

NOTES
1. THIS PORT IS USED TO PUMP WATER INTO THE SYSTEM AND RE-SUSPEND ACCUMULATED SEDIMENT SO THAT IT MAY BE PUMPED OUT.
2. MINIMUM REQUIRED MAINTENANCE INCLUDES A QUARTERLY INSPECTION DURING THE FIRST YEAR OF OPERATION AND A YEARLY INSPECTION THEREAFTER. FLUSH AS NEEDED.
3. R-TANK^{HD}, R-TANK^{SD}, R-TANK^{UD} AND R-TANK^{XD} MAY BE USED IN TRAFFIC APPLICATIONS.
4. SEE TRAFFIC LOADING DETAIL FOR MINIMUM & MAXIMUM COVER REQUIREMENTS.
5. IF MAINTENANCE PORT IS LOCATED IN A NON-TRAFFIC AREA, A PLASTIC CAP CAN BE USED IN LIEU OF A FRAME AND COVER WITH CONCRETE COLLAR.



R-TANK^{HD} TYPICAL MAINTENANCE PORT

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R-TANK^{HD} SYSTEM DETAILS
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 3

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 4 of 6

APPROVED
BY _____
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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PUYALLUP, WA 98372

JEFFREY W. McINNIS — STATE OF WASHINGTON — 37399 — REGISTERED PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 26 OF 28

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EAST TOWN CROSSING

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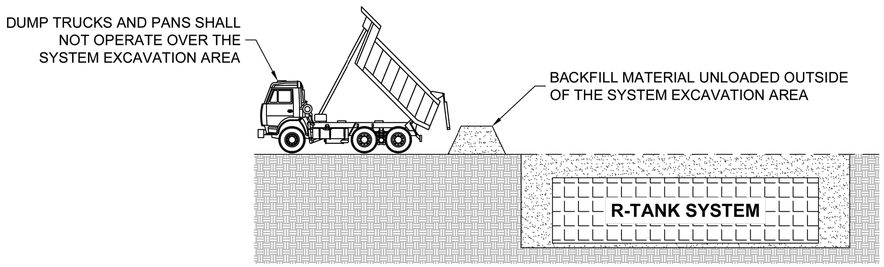
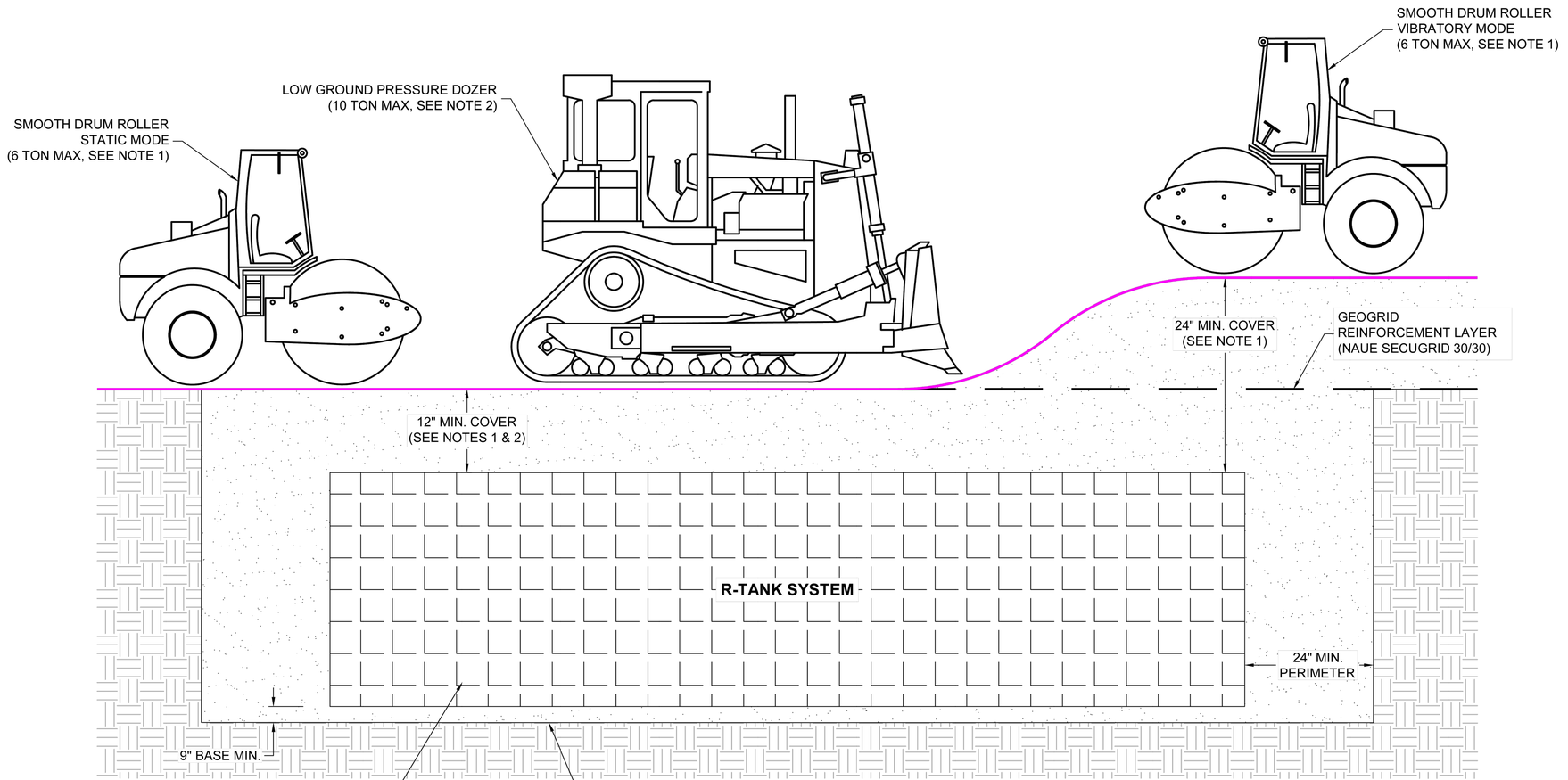


DUMP TRUCK DETAIL (SEE NOTE 3)

NOTES:

1. FOLLOWING PLACEMENT OF SIDE BACKFILL, A UNIFORM 12" LIFT OF THE FREELY DRAINING MATERIAL (SPEC SECTION 2.03 B2) 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. **SPEC SECTION 3.05 A5**
2. ONLY LOW PRESSURE TIRE OR TRACK VEHICLES (LESS THAN 7 PSI AND OPERATING WEIGHT OF LESS THAN 20,000 LBS) SHALL BE OPERATED OVER THE R-TANK SYSTEM DURING CONSTRUCTION. **SPEC SECTION 3.05 A5**
3. DUMP TRUCKS AND PANS SHALL NOT BE OPERATED WITHIN THE R-TANK SYSTEM 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. **SPEC SECTION 3.05 A5**
4. 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). **SPEC SECTION 3.05 B**
5. SEE R-TANK INSTALLATION GUIDE OR CONTACT YOUR LOCAL ACF WEST REPRESENTATIVE FOR ADDITIONAL INFORMATION.



CONSTRUCTION EQUIPMENT COVER DETAIL - VEHICULAR TRAFFIC

R-TANK^{HD} CONSTRUCTION EQUIPMENT COVER DETAIL
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 3

DRAWN BY: EDQ
DATE: 09/28/2023
ACF WEST PROJECT NUMBER: 23-004WA
SHEET NO.: 5 of 6

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

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APPROVED
CITY OF PUYALLUP
DEVELOPMENT ENGINEERING
DATE 10/10/2023

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EAST TOWN CROSSING
GRADE AND FILL PLANS

2902 E PIONEER
PUYALLUP, WA 98372

JEFFREY W. McINNIS STATE OF WASHINGTON 17399 REGISTERED PROFESSIONAL ENGINEER 10/2/23

NUM	DATE	DESCRIPTION

DESIGNED W. MCINNIS | SCALE NTS
DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 27 OF 28

C-27

C-27

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EAST TOWN CROSSING

SEC. 26,35/ TWP. 20 N./ RGE. 4 E., W.M.

R-TANK SPECIFICATION

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings, technical specification and general provisions of the Contract as modified herein apply to this section.

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 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-TankLD/, R-TankHD/, R-TankSD/, or R-TankU/D/ system (hereafter called R-Tank) and all related products including fill materials, geotextiles, geogrids, 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.

D. Protect R-Tank system from construction traffic after installation until completion of all construction activity in the installation area.

1.03 QUALITY CONTROL

A. All materials shall be manufactured in ISO certified facilities.

B. Installation Contractor shall demonstrate the following experience:

1. A minimum of three R-Tank or equivalent projects completed within 2 years; and,
2. A minimum of 25,000 cubic feet of storage volume completed within 2 years.
3. Contractor experience requirement may be waived if the manufacturer's representative provides on-site training and review during construction.

C. 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.

D. 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.

C. Submit manufacturer's installation instructions.

D. Submit R-Tank sample for review. Reviewed and accepted samples will be returned to the Contractor.

E. Submit material certificates for geotextile, geogrid, base course and backfill materials.

F. Submit required experience and personnel requirements as specified in Section 1.03.

G. 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 installation exceeds two weeks. Storage of materials should be on smooth surfaces, free from dirt, mud and debris.

B. Handling is to be performed with equipment appropriate to the materials and site conditions, and may include hand, handcart, forklifts, extension lifts, etc.

C. Cold weather:

1. Care must be taken when handling plastics when air temperature is 40 degrees or below as plastic becomes brittle.
2. Do not use frozen materials or materials mixed or coated with ice or frost.
3. Do not build on frozen ground or wet, saturated or muddy subgrade.

1.06 PREINSTALLATION CONFERENCE.

A. 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 HS25, depending on design criteria) load be allowed on the system at any time.

B. Protect adjacent work from damage during R-Tank system installation.

C. 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 pretreatment measures may be needed if unit is operational during construction due to increased sediment loads.

D. 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:

PROPERTY	DESCRIPTION	R-Tank^{LD} VALUE	R-Tank^{HD} VALUE	R-Tank^{SD} VALUE	R-Tank^{UD} VALUE
Void Area	Volume available for water storage	95%	95%	95%	95%
Surface Void Area	Percentage of exterior available for infiltration	90%	90%	90%	90%
Vertical Compressive Strength	ASTM D 2412 / ASTM F 2418	30.0 psi	33.4 psi	42.9 psi	134.2 psi
Lateral Compressive Strength	ASTM D 2412 / ASTM F 2418	20.0 psi	22.4 psi	28.9 psi	N/A
HS-20 Minimum Cover	Cover required to support HS-20 loads	N/A	20"	18"	12" (STONE BACKFILL)
HS-25 Minimum Cover	Cover required to support HS-25 loads	N/A	24"	19"	15" (STONE BACKFILL)
Maximum Cover	Maximum allowable cover depth	3 feet	< 7 feet	< 10 feet	5 feet
Unit Weight	Weight of plastic per cubic foot of tank	3.29 lbs / cf	3.62 lbs/cf	3.96 lbs / cf	4.33 lbs / cf
Rib Thickness	Thickness of load-bearing members	0.18 inches	0.18 inches	0.18 inches	N/A
Service Temperature	Safe temperature range for use	-14 – 167° F	-14 – 167° F	-14 – 167° F	-14 – 167° F

C. Supplier: ACF West 15540 Woodinville-Redmond Rd., Woodinville, Washington 98072, (425) 415-6115, www.acfwest.com

2.02 GEOSYNTHETICS

A. Geotextile. A geotextile envelope is required to prevent backfill material from entering the R-Tank modules.

1. Standard Application: The standard geotextile shall be an 8 oz per square yard nonwoven geotextile (TenCate Mirafi 180N or equivalent).
2. Infiltration Applications: When water must infiltrate/exfiltrate through the geotextile as a function of the system design, a woven monofilament (TenCate Mirafi FW402 or equivalent) shall be used.

B. Geogrid. For installations subject to traffic loads and/or when required by project plans, install geogrid (Naue Secugrid 30/30 or equivalent) to reinforce backfill above the R-Tank system. Geogrid is not always required for R-TankUD/ installations, and is often not required for non-traffic load applications.

2.03 BACKFILL & COVER MATERIALS

A. Bedding Materials: Stone (angular and 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: 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.

1. Traffic Applications - Free draining material shall be used adjacent to (24" minimum) and above (for the first 12") the R-Tank system.

a. For HD, and SD modules, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter) or soil (GW, GP, SW, or SP as classified by the Unified Soil Classification System).

b. For UD modules with less than 14" of top cover, backfill materials shall be free draining stone (angular and smaller than 1.5" in diameter). The use of soil backfill on the sides and top of the UD module is not permitted unless the modules are installed outside of traffic areas or with cover depths of 14" or more. Top backfill material (from top of module to bottom of pavement base or 12" maximum) must be consistent with side backfill.

2. Non-Traffic / Green Space Applications - For all R-Tank modules installed in green spaces and not subjected to vehicular loads, backfill materials may either follow the guidelines for Traffic Applications above, or the top backfill layer (12" minimum) may consist of AASHTO #57 stone blended with 30-40% (by volume) topsoil to aid in establishing vegetation.

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 installation.

2.04 OTHER MATERIALS

A. Utility Marker: Install metallic tape at corners of R-Tank system to mark the area for future utility detection.

PART 3 - EXECUTION

3.01 ASSEMBLY OF R-TANK UNITS

A. Assembly of modules shall be performed in accordance with the R-Tank Installation Manual, Section 2.

3.02 LAYOUT AND EXCAVATION

A. 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 greater than R-Tank dimensions in each direction allowing for installation of geotextile filter fabric, R-Tank modules, and free draining backfill materials.

B. All excavations must be prepared with OSHA approved excavated sides and sufficient working space.

C. Protect partially completed installation against damage from other construction traffic by establishing a perimeter with high visibility construction tape, fencing, barricades, 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 bearing capacity is required.

1. Standard Applications: Compact subgrade to a minimum of 95% of Standard Proctor (ASTM D698) density or as required by the Owner's engineer.
2. Infiltration Applications: Subgrade shall be prepared in accordance with the contract documents. Compaction of subgrade should not be performed in infiltration applications.

E. 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 bearing capacity of less than 2,000 pounds per square foot be provided.

1. 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 documents and/or as directed by the owner's engineer.
2. If indications of the water table are observed during excavation, the engineer shall be contacted to provide recommendations.
3. Do not start installation of the R-Tank system until unsatisfactory subgrade conditions are corrected and the subgrade conditions are accepted by the owner's engineer.

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 modules. Level to within ½" (+/- ¼") 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.

1. Standard Applications: Static roll or otherwise compact bedding materials until they are firm and unyielding.
2. Infiltration Applications: Bedding materials shall be prepared in accordance with the contract documents.

B. 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 backfill.

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 minimum 12" or as recommended by manufacturer. Use tape, special adhesives, sandbags or other ballast to secure overlaps. As geotextiles can be damaged by extreme heat, smoking is not permissible on/near the geotextile, and tools using a flame to tack the overlaps, such as propane torches, are prohibited.

B. Where an impervious liner (for containment) is specified, install the liner per manufacturer's recommendations and the contract documents. The R-Tank units 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 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 with required depth as shown on plans.

1. For LD, HD, and SD installations, 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 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
2. For UD installations, there is no perpendicular end row required.

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 backfill entry into the system. Overlap geotextile 12" or as recommended by manufacturer. Take great care to avoid damage to geotextile (and, if specified, impervious liner) during placement.

E. 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 pipe boots with stainless steel pipe clamps. Support pipe in trenches during backfill operations to prevent pipe from settling and damaging the geotextile, impervious liner (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.

F. 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.

G. 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:

1. 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.
2. 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.
3. 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.
4. No compaction equipment is permissible to operate directly on the R-Tank modules.
5. Top Backfill: Only low pressure track vehicles shall be operated over the R-Tank system during construction. Dump Trucks and Pans shall not be operated within the R-Tank system footprint at any time. Heavy equipment should unload in an area adjacent to the R-Tank system and the material should be moved over the system using tracked equipment with an operating weight of less than 10 tons.
   a. Typical Applications: Install a 12" (or as shown on plans) lift of freely draining material (Section 2.03 B) over the R-Tank Units, maintaining 12" between equipment tracks and R-Tank System. 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.
   b. Shallow Applications (< 18" total cover): Install top backfill in accordance with plans.
6. If required, install a geogrid as shown on plans. Geogrid shall extend a minimum of 3 feet beyond the limits of the excavation wall.
7. 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 95% of the Standard Proctor Density and shall cover the entire footprint of the R-Tank system. During placement of fill above the system, unless otherwise specified, a uniform elevation of fill shall be maintained to within 12" across the footprint of the R-Tank system. 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. 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).

C. 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 surrounding areas.

D. 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.

3.06 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. All inlet pipes and 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.

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. All inspection and maintenance activities should be performed in accordance with the R-Tank Operation, Inspection & Maintenance Manual.

ENGINEER OF RECORD TO REVIEW, APPROVE AND ENDORSE FINAL SITE SPECIFIC DESIGN.

FOR ADDITIONAL INFORMATION PLEASE CONTACT: ACF WEST, 1-800-423-4567, www.acfwest.com

R-TANK SPECIFICATION
EAST TOWN CROSSING
PUYALLUP, WA
SITE DESIGNATION: R-TANK 3

DRAWN BY: EDQ

DATE: 09/28/2023

ACF WEST PROJECT NUMBER: 23-004WA

SHEET NO.: 6 of 6

APPROVED

CITY OF PUYALLUP
DEVELOPMENT ENGINEERING

DATE 10/10/2023

NOTE: THIS APPROVAL IS VOID AFTER 180 DAYS FROM APPROVAL DATE.
THE CITY WILL NOT BE RESPONSIBLE FOR ERRORS AND/OR OMISSIONS ON THESE PLANS.
FIELD CONDITIONS MAY DICTATE CHANGES TO THESE PLANS AS DETERMINED BY THE DEVELOPMENT ENGINEERING MANAGER.

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REGISTERED
PROFESSIONAL ENGINEER
10/2/23

NUM	DATE	DESCRIPTION

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DRAWN W. MCINNIS | CHECKED CHCK
DATE 10/2/23 | APPROVED APRD

SHEET 28 OF 28

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