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**DEVIATION REQUEST
AND DECISION FORM**

Updated: 6/26/2019

PROJECT INFORMATION

Project Name :	CROSSROADS MIXED USE FILING NO. 1
Schedule No.(s) :	5408007005
Legal Description :	PLATTED UNDER RECEPTION NO. 222714975

APPLICANT INFORMATION

Company :	COLORADO SPRINGS EQUITIES LLC		
Name :	DANNY MIENTKA		
	X Owner	<input type="checkbox"/> Consultant	<input type="checkbox"/> Contractor
Mailing Address :	90 S. CASCADE AVENUE, SUITE 1500, COLORADO SPRINGS, CO 80903-1639		
Phone Number :	719-448-4034		
FAX Number :	N/A		
Email Address :	DANNY@THEEQUITYGROUP.NET		

ENGINEER INFORMATION

Company :	M&S CIVIL CONSULTANTS, INC.		
Name :	VIRGIL A. SANCHEZ	Colorado P.E. Number :	37160
Mailing Address :	PO BOX 1360, COLORADO SPRINGS, CO 80901		
Phone Number :	719-491-0818		
FAX Number :	N/A		
Email Address :	VIRGILS@MSCIVIL.COM		

OWNER, APPLICANT, AND ENGINEER DECLARATION

To the best of my knowledge, the information on this application and all additional or supplemental documentation is true, factual and complete. I am fully aware that any misrepresentation of any information on this application may be grounds for denial. I have familiarized myself with the rules, regulations and procedures with respect to preparing and filing this application. I also understand that an incorrect submittal will be cause to have the project removed from the agenda of the Planning Commission, Board of County Commissioners and/or Board of Adjustment or delay review until corrections are made, and that any approval of this application is based on the representations made in the application and may be revoked on any breach of representation or condition(s) of approval.

Kelly Nelson

Signature of owner (or authorized representative)

9-14-22

Date

Engineer's Seal, Signature
And Date of Signature



DEVIATION REQUEST (Attach diagrams, figures, and other documentation to clarify request)

A deviation from the standards of or in Section **1.7.2.B** of the Engineering Criteria Manual (ECM) is requested.

Identify the specific ECM standard which a deviation is requested:

DEVELOPMENT AND EVALUATION OF PERMANENT BMPs ARE CONTINUING PROCESSES. BETTER DESIGNS OF THE BMPs INCLUDED IN DCM2 AND DESIGNS OF NEW BMPs, INCLUDING MANUFACTURED (PROPRIETARY) BMPs, WILL BE DEVELOPED AND TESTED. TO ALLOW FO THIS PROGRESS, ADDITIONAL BMPs WILL BE CONSIDERED ON A CASE-BY-CASE BASIS BY COUNTY STORMWATER STAFF. DESIGN AND SIZING DETAILS AND RESULTS OF INDEPENDENT TESTING OF THE BMP IN CONDITIONS SIMILAR TO THOSE AT THE SITE WILL BE SUBMITTED DEMONSTRATING THAT THE BMP WILL MEET OR EXCEED THE PERFORMANCE OF APPROVED BMPs FOR THE SITE. TO PROMOTE IMPROVEMENT IN STORMWATER PROTECTION, COUNTY STORMWATER STAFF MAY APPROVE PROMISING BMPs ON AN EXPIERIMENTAL BASIS.

State the reason for the requested deviation:

THE DEVELOPER FOR THIS PROJECT WOULD LIKE TO USE THE DETENTION POND AREA TO CREATE A PARK SITE FOR RECREATIONAL PURPOSES. THE PARK SITE WILL VISUALLY ENHANCE THE DRIVING EXPERIENCE FROM US HWY 24 AS WELL AS INCREASE THE LIMITED NUMBER OF RECREATIONAL AMENITIES AVAILABLE TO THE ADJACENT AND SURROUNDING AREAS.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

THREE PROPOSED WATER QUALITY BMPs FOR THE PROJECT WILL CONSISTS OF A; XK BAYSEPARATOR, STORMTECH UNDERGROUND DETENTION CHAMBERS AND ISOLATOR ROW, AND A MODIFIED URBAN DRAINAGE OUTLET STRUCTURE.

A "XK BAYSEPARATORBAYSEPARATOR" WILL BE INSTALLED AHEAD OF THE UNDERGROUND DETENTION AND WATER QUALITY POND IN TWO LOCATIONS, ONE AT EACH DISCHARGE POINT INTO THE POND. THE XK BAYSEPARATOR REMOVES GREATER THAN 80% TSS BY RELYING ON DENSITY DIFFERENCES AND GRAVITY TO REMOVE SUSPENDED SOLIDS AND FLOATABLES FROM STORMWATER RUNOFF.

THE WATER QUALITY COMPONENT WITHIN THE STORMTECH UNDERGROUND DETENTION CHAMBERS CONSISTS OF "ISOLATOR ROWS". THEY ARE LOCATED FOLLOWING THE XK BAYSEPARATOR AT EACH INFLUENT POINT TO THE DETENTION AREA. THE ISOLATOR ROW IS DESIGNED TO CAPTURE THE FIRST FLUSH RUNOFF AND TREATING THE RUNOFF THROUGH FILTRATION.

THE 3RD WATER QUALITY CONTROL STRUCTURE WILL CONSIST OF A MODIFIED URBAN DRAINAGE OUTLET STRUCTURE.

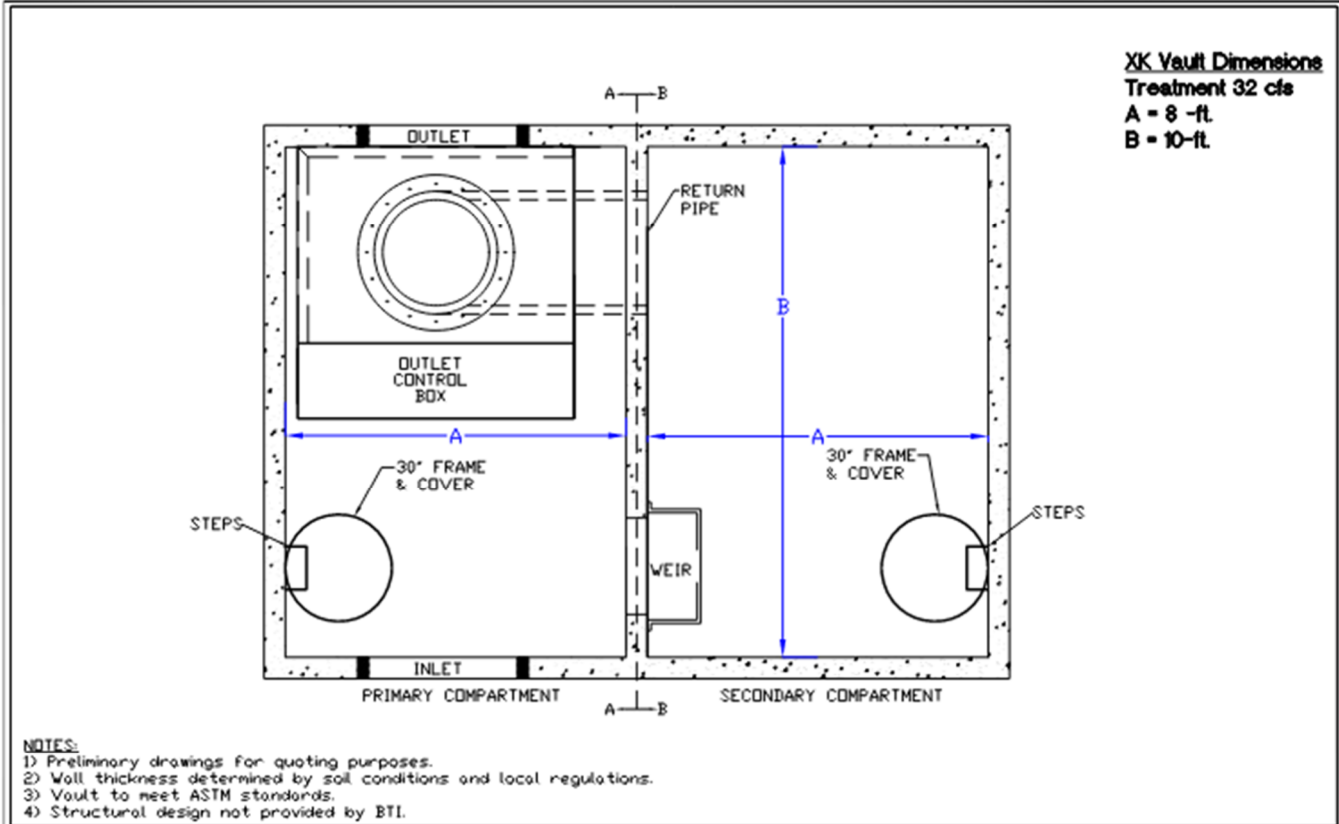
BOTH THE XK BAYSEPARATOR AND ISOLATOR ROWS PROVIDE WATER QUALITY BY CONTROLLING THE INFLUENT TO ALLOW THE POLLUTANTS TO SEPARATE. THE XK BAYSEPARATOR TREATS THE STORMWATER INFLUENT AND SEPARATES SEDIMENT AND FLOATABLES WITH THE INTERIOR CHAMBERS, WEIRS AND A PRIMARY AND SECONDARY STORAGE MANHOLE. LASTLY THE MODIFIED URBAN DRAINAGE OUTLET STRUCTURE WILL PROVIDE WATER QUALITY AND A CONTROL THE FINAL RELEASE FROM THE PROJECT.

BELOW IS MORE EXPLANATION AND DETAILS OF EACH WATER QUALITY STRUCTURE;

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

XK BAYSEPARATOR (PRE-TREATMENT)

THE XK BAYSEPARATOR SYSTEM REMOVES THE POLLUTION BY RELYING ON DENSITY DIFFERENCES AND GRAVITY TO REMOVE SUSPENDED SOLIDS AND FLOATABLES (HYDROCARBONS, FLOATING DEBRIS, ETC.) FROM STORM WATER RUNOFF. THE BAYSEPARATOR USES TWO CHAMBERS TO SEPARATE THE POLLUTANTS AND PROVIDES A CONTROLLED, VIA WEIR RELEASE DOWNSTREAM INTO THE STORMTECH ISOLATOR ROWS. THE LOW FLOWS ARE TREATED IN THE OFFLINE STORAGE CHAMBER (RIGHT SIDE OF DETAIL). THE PRIMARY CHAMBER (LEFT SIDE OF DETAIL) SEPARATES POLLUTENTS DURING LOW FLOW EVENTS AND HIGH FLOW EVENTS. THE BAYSEPARATOR HAS AN INTERNAL BYPASS TO ALLOW PEAK DESIGN FLOWS TO DIRECTLY FLOW OVER THE OUTLET CONTROL WEIR.



XK Vault Dimensions
Treatment 32 cfs
A = 8 -ft.
B = 10-ft.

- NOTES:**
- 1) Preliminary drawings for quoting purposes.
 - 2) Wall thickness determined by soil conditions and local regulations.
 - 3) Vault to meet ASTM standards.
 - 4) Structural design not provided by BTI.

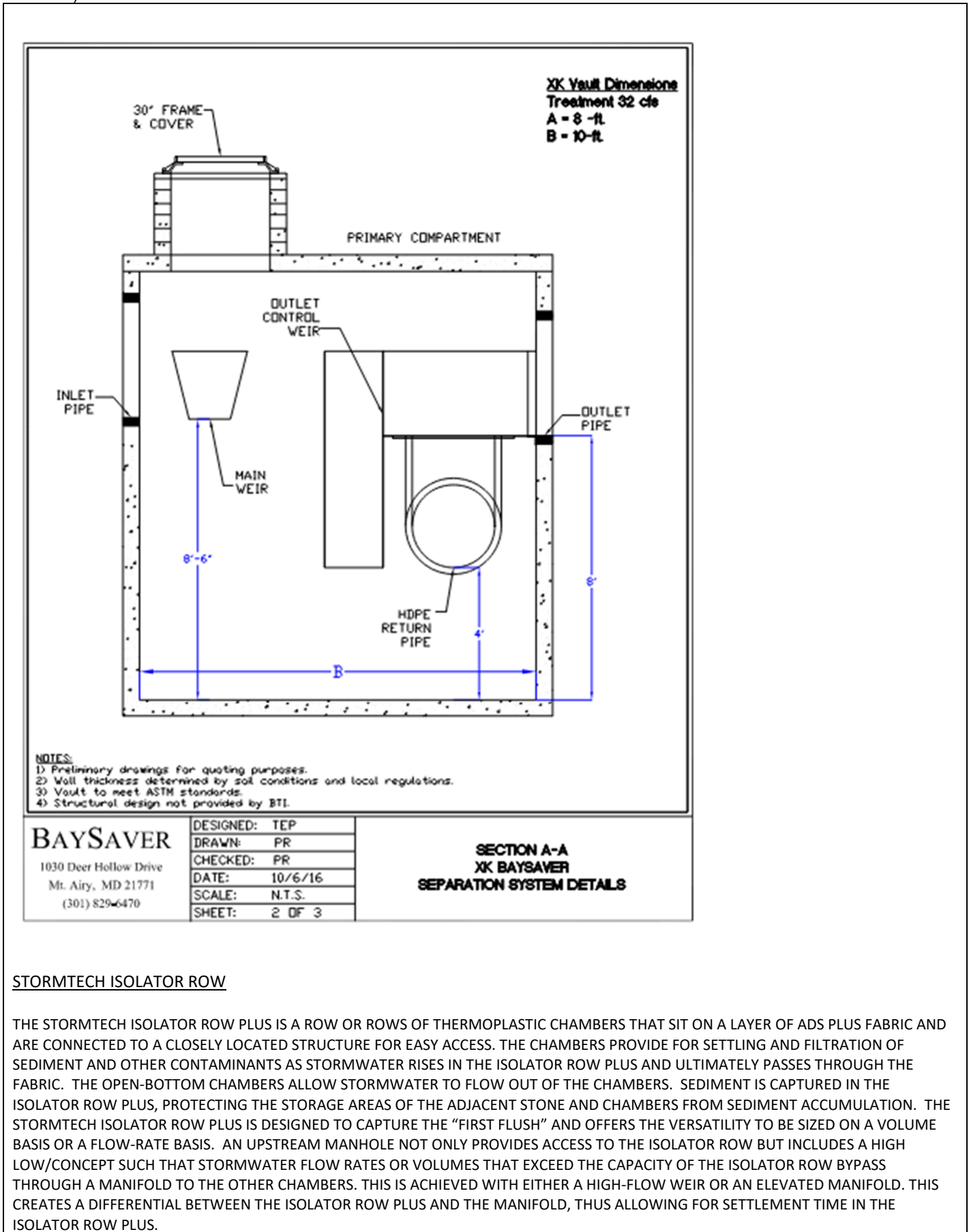
BAYSAVER

1030 Deer Hollow Drive
 Mt. Airy, MD 21771
 (301) 829-6470

DESIGNED:	TEP
DRAWN:	PR
CHECKED:	PR
DATE:	10/6/16
SCALE:	N.T.S.
SHEET:	1 OF 3

PLAN VIEW
XK BAYSAVER
SEPARATION SYSTEM DETAILS

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

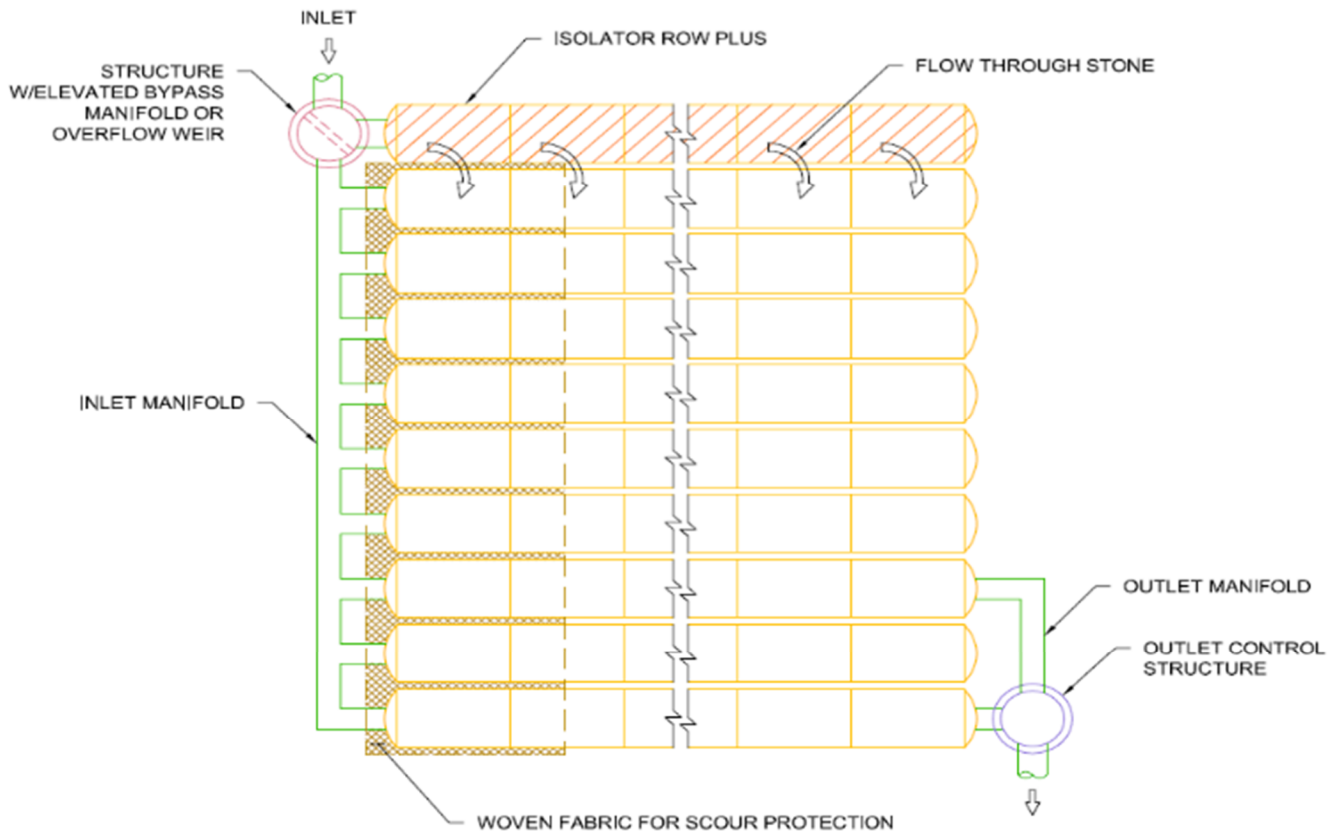


STORMTECH ISOLATOR ROW

THE STORMTECH ISOLATOR ROW PLUS IS A ROW OR ROWS OF THERMOPLASTIC CHAMBERS THAT SIT ON A LAYER OF ADS PLUS FABRIC AND ARE CONNECTED TO A CLOSELY LOCATED STRUCTURE FOR EASY ACCESS. THE CHAMBERS PROVIDE FOR SETTLING AND FILTRATION OF SEDIMENT AND OTHER CONTAMINANTS AS STORMWATER RISES IN THE ISOLATOR ROW PLUS AND ULTIMATELY PASSES THROUGH THE FABRIC. THE OPEN-BOTTOM CHAMBERS ALLOW STORMWATER TO FLOW OUT OF THE CHAMBERS. SEDIMENT IS CAPTURED IN THE ISOLATOR ROW PLUS, PROTECTING THE STORAGE AREAS OF THE ADJACENT STONE AND CHAMBERS FROM SEDIMENT ACCUMULATION. THE STORMTECH ISOLATOR ROW PLUS IS DESIGNED TO CAPTURE THE "FIRST FLUSH" AND OFFERS THE VERSATILITY TO BE SIZED ON A VOLUME BASIS OR A FLOW-RATE BASIS. AN UPSTREAM MANHOLE NOT ONLY PROVIDES ACCESS TO THE ISOLATOR ROW BUT INCLUDES A HIGH LOW/CONCEPT SUCH THAT STORMWATER FLOW RATES OR VOLUMES THAT EXCEED THE CAPACITY OF THE ISOLATOR ROW BYPASS THROUGH A MANIFOLD TO THE OTHER CHAMBERS. THIS IS ACHIEVED WITH EITHER A HIGH-FLOW WEIR OR AN ELEVATED MANIFOLD. THIS CREATES A DIFFERENTIAL BETWEEN THE ISOLATOR ROW PLUS AND THE MANIFOLD, THUS ALLOWING FOR SETTLEMENT TIME IN THE ISOLATOR ROW PLUS.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

CONTINUED;



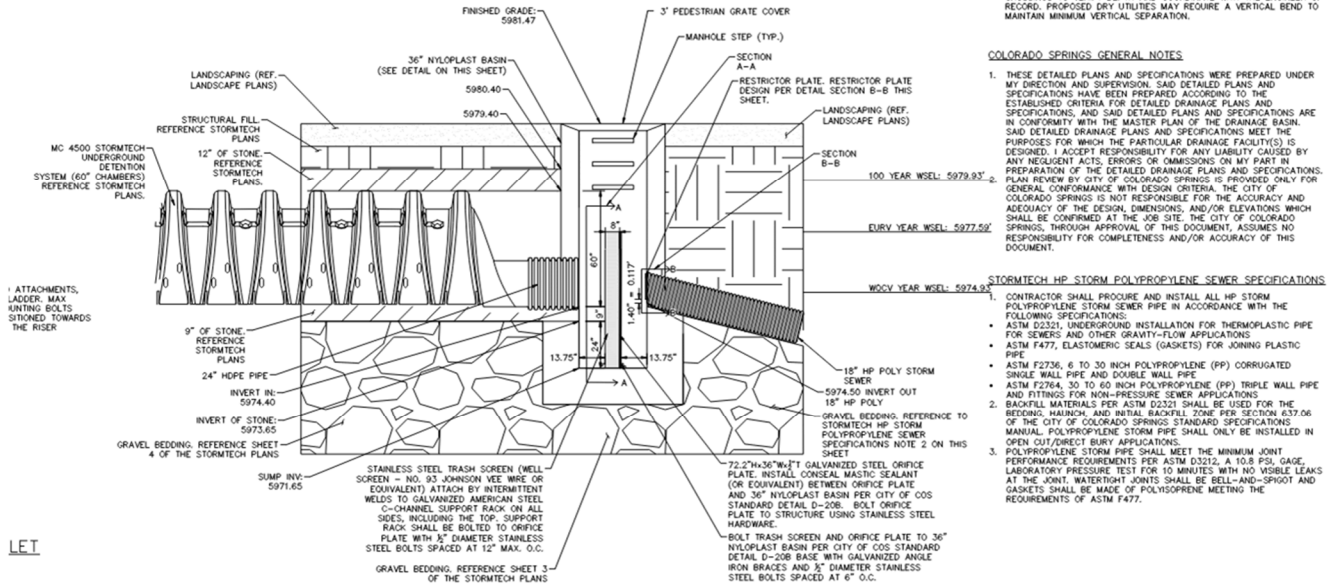
THE XK BAYSEPARATOR IS LOCATED SIMILAR TO THE "STRUCTURE W/ELEVATED BYPASS MANIFOLD OR OVERFLOW WEIR" SHOW IN THE DETAIL ABOVE AT THE INLET SIDE OF THE SYSTEM. THE ISOLATOR ROWS ARE ALSO ON THE INLET SIDE OF THE SYSTEM AFTER THE XK BAYSEPARATOR.

THE 3RD WATER QUALITY CONTROL STRUCTURE WILL CONSIST OF A MODIFIED URBAN DRAINAGE OUTLET STRUCTURE. THE LOCATION IS SIMILAR TO THE "OUTLET CONTROL STRUCTURE" SHOWN ABOVE AFTER THE "OUTLET MANIFOLD". THE OUTLET STRUCTURE WILL ACT LIKE AN NORMAL EL PASO COUNTY STANDARD STRUCTURE HAVING A TRASH SCREEN AND ORFICE PLATE. HOWEVER, A TRASH SCREEN MAY NOT BE NECESSARY THIS FAR DOWN IN THE SYSTEM.

SEE SCHEMATIC OUTLET CONTROL STRUCTURE DETAIL ON THE FOLOWING PAGE.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis);

CONTINUED;



CAUTION NOTE
 1. CONTRACTOR SHALL MAINTAIN 1' OF VERTICAL SEPARATION AT ALL DRY UTILITY CROSSINGS. CONTRACTOR SHALL POthOLE ALL EXISTING UTILITY CROSSINGS TO VERIFY DEPTH AND COORDINATE WITH THE ENGINEER OF RECORD. PROPOSED DRY UTILITIES MAY REQUIRE A VERTICAL BEND TO MAINTAIN MINIMUM VERTICAL SEPARATION.

COLORADO SPRINGS GENERAL NOTES
 1. THESE DETAILED PLANS AND SPECIFICATIONS WERE PREPARED UNDER MY DIRECTION AND SUPERVISION. SAID DETAILED PLANS AND SPECIFICATIONS HAVE BEEN PREPARED ACCORDING TO THE ESTABLISHED CRITERIA FOR DETAILED DRAINAGE PLANS AND SPECIFICATIONS, AND SAID DETAILED PLANS AND SPECIFICATIONS ARE IN CONFORMITY WITH THE MASTER PLAN OF THE DRAINAGE BASIN. SAID DETAILED DRAINAGE PLANS AND SPECIFICATIONS MEET THE PURPOSES FOR WHICH THE PARTICULAR DRAINAGE FACILITY(S) IS DESIGNED. I ACCEPT RESPONSIBILITY FOR ANY LIABILITY CAUSED BY ANY NEGLIGENT ACTS, ERRORS OR OMISSIONS ON MY PART IN PREPARATION OF THE DETAILED DRAINAGE PLANS AND SPECIFICATIONS. PLAN REVIEW BY CITY OF COLORADO SPRINGS IS PROVIDED ONLY FOR GENERAL CONFORMANCE WITH DESIGN CRITERIA. THE CITY OF COLORADO SPRINGS IS NOT RESPONSIBLE FOR THE ACCURACY AND ADEQUACY OF THE DESIGN, DIMENSIONS, AND/OR ELEVATIONS WHICH SHALL BE CONFIRMED AT THE JOB SITE. THE CITY OF COLORADO SPRINGS, THROUGH APPROVAL OF THIS DOCUMENT, ASSUMES NO RESPONSIBILITY FOR COMPLETENESS AND/OR ACCURACY OF THIS DOCUMENT.

STORMTECH HP STORM POLYPROPYLENE SEWER SPECIFICATIONS
 1. CONTRACTOR SHALL PROCURE AND INSTALL ALL HP STORM POLYPROPYLENE STORM SEWER PIPE IN ACCORDANCE WITH THE FOLLOWING SPECIFICATIONS:
 • ASTM D2231, UNDERGROUND INSTALLATION FOR THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS
 • ASTM F477, ELASTOMERIC SEALS (GASKETS) FOR JOINING PLASTIC PIPE
 • ASTM F2736, 6 TO 30 INCH POLYPROPYLENE (PP) CORRUGATED SINGLE WALL PIPE AND DOUBLE WALL PIPE
 • ASTM F2764, 30 TO 60 INCH POLYPROPYLENE (PP) TRIPLE WALL PIPE AND FITTINGS FOR NON-PRESSURE SEWER APPLICATIONS
 2. BACKFILL MATERIALS PER ASTM D2221 SHALL BE USED FOR THE BEDDING, HAIRNICH, AND INITIAL BACKFILL ZONE PER SECTION 637.06 OF THE CITY OF COLORADO SPRINGS STANDARD SPECIFICATIONS MANUAL. POLYPROPYLENE STORM PIPE SHALL ONLY BE INSTALLED IN OPEN CUT/DIRECT BURY APPLICATIONS.
 3. POLYPROPYLENE STORM PIPE SHALL MEET THE MINIMUM JOINT PERFORMANCE REQUIREMENTS PER ASTM D3212, A 10.8 PSI, GAGE, LABORATORY PRESSURE TEST FOR 10 MINUTES WITH NO VISIBLE LEAKS AT THE JOINT. WATER TIGHT JOINTS SHALL BE BELL-AND-SPOUT AND GASKETS SHALL BE MADE OF POLYISOPRENE MEETING THE REQUIREMENTS OF ASTM F477.

LET

SIMILAR TO AN ABOVE GROUND POND DESIGN, THE OVERALL DRAIN TIME AND RELEASE RATES WILL BE CONTROLLED WITHIN THE OUTLET STRUCTURE. A STAGE AREA SPREADSHEET WILL BE USED TO INCORPORATE THE DATA INTO THE MHFD DETENTION SPREADSHEET FOR OUTLET STRUCTURE SIZING.

EACH OF THE XK BAYSEPARATOR UNITS ARE DESIGNED TO REMOVE 80% TSS REMOVAL BY RELYING ON DENSITY DIFFERENCES AND GRAVITY TO REMOVE SUSPENDED SOLIDS AND FLOATABLES FROM STORMWATER RUNOFF. THE REMOVAL EFFICIENCY WAS CONFIRMED BASED ON THIRD PARTY TESTING. IN ADDITION, WASHINGTON DEPARTMENT OF ECOLOGY HAS ALSO PROVIDED THE GENERAL USE LEVEL DESIGNATION (GULD) FOR MEETING PRETREATMENT TSS REMOVAL PERFORMANCE GOALS. THE 30MG/L REMOVAL EFFICIENCY DOCUMENT (NEXT PAGE) IS BASED ON THE REMOVAL EFFICIENCIES BASED ON UNIVERSITY OF MINNESOTA'S SAINT ANTHONY FALLS LAB AND USING NJCAT PROCEDURE WHILE ASSUMING AN INFLUENT CONCENTRATION PER THE NATIONWIDE URBAN RUNOFF PROGRAM (NURP).

THEREFORE, BY WAY OF 3 WATER QUALITY STRUCTURES, AND CONTROLLED RELEASE OF THE STORMWATER, THE DESIGN OF THE SYSTEM EXCEEDS THE CRITERIA FOR WATER QUALITY. THE 3 SYSTEMS COMBINED EASILY REDUCE THE EFFLUENT TO LESS THAN 30 MG/L.

IN ADDITION TO THE REMOVAL EFFICIENCIES PROVIDED BY THE XK BAYSAVOR, AND THE ISOLATOR ROW PORTION OF THE STORMTECH SYSTEM WILL TOGETHER PROVIDE ADDITIONAL TSS REMOVAL. FOR THE ISOLATOR ROW, REFER TO THE NEXT PAGE WQ DOCUMENT SHOWING LESS THAN 80% TSS REMOVAL PER THIRD PARTY VERIFICATION AND TESTING, INCLUDING NJCAT VERIFICATION.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

Analysis of BaySeparator Removal Efficiencies

Project Name: Crossroads Mixed Use

Location: El Paso County, CO

Project Information:

Drainage Area: 14 Acres
 2-Year Flow: 24.39 cfs
 100-Year Flow: 65.50 cfs

Treatment System Information:

BaySeparator XK Unit
 Treatment Capacity: 25.0 cfs
 Peak Bypass Capacity: 96.2 cfs

The below table demonstrates the BaySeparator system has an average removal efficiency of 74% for incoming flows below, at, and above the listed treatment capacity of the specified system. These removal efficiencies were calculated based on data collected at the University of Minnesota’s Saint Anthony Falls Laboratory and using the procedure outlined in the NJCAT verification program.

Fraction of MTR	Flow Rate (cfs)	Removal Efficiency	NJCAT Weighting Factor
25%	6.3	86%	0.25
50%	12.5	68%	0.30
75%	18.8	74%	0.20
100%	25.0	68%	0.15
125%	31.3	73%	0.10
Average Removal Efficiency		74%	

The 101 mg/L TSS incoming concentration is the “Median Event Mean Concentration for Urban Land Uses” provided by the Nationwide Urban Runoff Program (NURP).

Incoming EMC (mg/l)	Removal Efficiency (%)	Discharge EMC (mg/l)
101	74%	26.3 mg/l

As shown above, the proposed BaySeparator system for the Crossroads Mixed Use project site has an expected reduction of Effluent Mean Concentration to less than 30mg/l, thus meeting the water quality treatment requirement.

FOUR STEP PROCESS FOR THIS PROJECT ONLY;

STEP 1 EMPLOY RUNOFF REDUCTION PRACTICES – APPROX. 2.54 ACRES OF THE PROPOSED DEVELOPMENT IS BEING USED FOR THE UNDERGROUND WATER QUALITY AND DETENTION POND. WHEREVER POSSIBLE UPSTREAM OF THE FACILITY, RUNOFF PRODUCED WITHIN DEVELOPABLE AREA CONTAINING IMPERVIOUS SURFACES WILL BE ROUTED THROUGH LANDSCAPED AREAS OR EARTHEN SWALES (GRASS-LINED WHERE SLOPE EXCEEDS 2%) TO MINIMIZE DIRECT CONNECTION OF IMPERVIOUS SURFACES.

STEP 2 STABILIZE DRAINAGEWAYS – THE DEVELOPMENT OF THIS SITE IS NOT ANTICIPATED TO HAVE NEGATIVE EFFECTS ON DOWNSTREAM DRAINAGE WAYS SINCE FLOWS RELEASED WILL BE BELOW HISTORIC RATES. THE FLOW IS DISCHARGED THROUGH AN RCP PIPE

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

AND OUTFALL ONTO A RIP RAP PAD IN THE CDOT R.O.W. FROM HERE IT CONTINUES WEST IN CDOT'S MAN-MADE ROADSIDE DITCH UNTIL IT REACHES PETERSON ROAD. IT IS THEN CONVEYED TO THE OTHER SIDE OF THE ROAD INTO A SIMILAR EARTHEN CHANNEL, VIA A 36" CMP CULVERT. THE DRAINAGE CONTINUES WEST IN THE RIGHT OF WAY UNTIL IT REACHES THE EAST FORK SAND CREEK CHANNEL. EXISTING RIP RAP BARRIERS ARE LINED THROUGHOUT THIS PORTION OF THE PATHWAY APPROXIMATELY EVERY 90-100 FEET WITHIN THE DITCH TO THE CHANNEL BANK.

STEP 3 PROVIDE WATER QUALITY CAPTURE VOLUME (WQCV)– THE SITE WILL USE 3 WATER QUALITY CONTROL STRUCTURES TO CONTROL THE DEVELOPED RUNOFF THAT IS DISCHARGING ONTO THE CDOT ROW, AND ULTIMATELY INTO SAND CREEK. THE UNDERGROUND DETENTION AND WATER QUALITY POND'S OUTLET STRUCTURE WILL BE DESIGNED TO DRAIN THE WATER QUALITY EVENT STORM IN 40 HOURS, WHILE REDUCING THE 100 YEAR PEAK DISCHARGE TO APPROXIMATELY 90% OF THE PREDEVELOPMENT CONDITIONS.

STEP 4 CONSIDER NEED FOR SELECTING INDUSTRIAL AND COMMERCIAL BMP'S – THE PROPOSED DEVELOPMENT WILL IMPLEMENT A STORMWATER MANAGEMENT PLAN INCLUDING PROPER HOUSEKEEPING PRACTICES, SPILL CONTAINMENT PROCEDURES, AND COVERAGE OF STORAGE/HANDLING AREAS.

ADDITIONAL BULLET POINTS;

- "PRE-TREATMENT" MANUFACTURED TREATMENT DEVICES WILL BE USED AT EACH POND INLET LOCATION (XK BAYSEPARATOR).
- SYSTEM MEETS OR EXCEEDS THE 30 MG/L EFFLUENT REMOVAL PER ECM I.7.1.C.2
- THE PRODUCT SUPPLIER WILL PROVIDE A CERTIFICATION THAT THE SYSTEM MEETS THE POLLUTANT REMOVAL STANDARD PER ECM I.7.1.C.2.
- POLLUTANTS ARE TRAPPED UNDERGROUND AND ARE LESS LIKELY TO BE DISCHARGED DOWNSTREAM.
- TRAPPED DEBRIS UNDERGROUND CANNOT BE DISTRIBUTED BY THE WIND.
- POLLUTANTS, DEBRIS AND SEDIMENT ARE NOT VISIBLE WHEN CAPTURED IN THE SYSTEM.
- THE POLLUTANTS, DEBRIS AND SEDIMENT ARE ISOLATED IN THE FIRST & SECOND STAGE OF THE WATER QUALITY AREA, AND ARE NOT DISTRIBUTED ACROSS THE ENTIRE AREA OF THE FACILITY.
- VISIBLE INSPECTION OF THE TRAPPED POLLUTANTS OR SEDIMENT CAN BE VIEWED VIA THE MANHOLE LID AND/OR THE INSPECTION PORT OF THE CHAMBERS AT ANY TIME.
- MAINTENANCE OF THE XK BAYSEPARATOR ARE SIMILAR TO REGULAR INLET OR MANHOLE MAINTENANCE.
- MAINTENANCE OF THE ISOLATOR ROW IS DESIGNED TO REDUCE PERIODIC MAINTENANCE.
- MAINTENANCE WILL FOLLOW A REGULAR SCHEDULE AS ADMINISTERED BY THE METRO DISTRICT.
- METRO DISTRICT WILL HIRE 3RD PARTY FOR MAINTENANCE AND REPORTING.
- FOR THIS DEVELOPMENT AREA, THE SOIL INFILTRATION RATE IS EXCELLENT.

TESTING CREDENTIALS FOR STORMTECH SYSTEM AND ISOLATOR ROW

OCTOBER 2006 – TENNESSEE TECH UNIVERSITY'S CIVIL AND ENVIRONMENTAL DEPARTMENT PREPARED THE "PERFORMANCE EVALUATION OF SEDIMENT REMOVAL EFFICIENCY – STORMTECH ISOLATOR ROW". TESTING ON A FULL-SCALE ISOLATOR ROW IN A LABORATORY WAS DONE TO DETERMINE THE SEDIMENT REMOVAL EFFICIENCY WITH TWO DIFFERENT SILICA-WATER SLURRIES IN ACCORDANCE WITH NJCAT PROTOCOLS. IN AUGUST OF 2007, THE TECHNOLOGY WAS VERIFIED BY NJCAT. RESULTS ARE SHOWN IN TABLE 1.

SEPTEMBER 2010 – THE UNIVERSITY OF NEW HAMPSHIRE STORMWATER CENTER RELEASED THE "FINAL REPORT ON FIELD VERIFICATION TESTING OF THE STORMTECH ISOLATOR ROW TREATMENT UNIT". TESTING CONSISTED OF DETERMINING THE WATER QUALITY PERFORMANCE FOR MULTIPLE STORMWATER POLLUTANTS IN ACCORDANCE WITH TARP TIER II PROTOCOL. TESTING WAS DONE FOR A SYSTEM ONLY CONSISTING OF THE STORMTECH ISOLATOR ROW. DATA WAS RECORDED FOR 23 STORM EVENTS. RESULTS ARE SHOWN IN TABLE 1.

JANUARY 2020 – BAYSEPARATOR TECHNOLOGIES PREPARED THE "NJCAT TECHNOLOGY VERIFICATION OF ISOLATOR ROW PLUS". TESTING ON A FULL-SCALE ISOLATOR ROW PLUS IN A LABORATORY WAS DONE TO DETERMINE THE SEDIMENT REMOVAL EFFICIENCY WITH A SILICA-WATER SLURRY IN ACCORDANCE WITH THE UPDATED NJCAT PROTOCOLS. IN JULY OF 2020, THE TECHNOLOGY WAS VERIFIED BY NJCAT. RESULTS ARE SHOWN IN TABLE 1.

JUNE 2020 – NORTH CAROLINA STATE UNIVERSITY DEPARTMENT OF BIOLOGICAL AND AGRICULTURAL ENGINEERING PREPARED THE TECHNICAL REPORT "AN EVALUATION OF THE STORMTECH ISOLATOR ROW AND SUBSURFACE STORMWATER MANAGEMENT SYSTEM AT CAPITAL OAKS RETIREMENT RESORT, RALEIGH, NORTH CAROLINA". 14 MONTHS OF MONITORING AND OVER 73 PRECIPITATION EVENTS WERE COMPLETED TO STUDY THE HYDROLOGIC AND WATER QUALITY PERFORMANCE OF A STORMTECH MC-4500 SYSTEM IN RALEIGH, NC. RESULTS ARE SHOWN IN TABLE 1.

Explain the proposed alternative and compare to the ECM standards (May provide applicable regional or national standards used as basis):

Table 1: StormTech Isolator Row 3rd Party Pollutant Removal Efficiency Data

Pollutant	University of New Hampshire (Isolator Row Only) Median	Raleigh, North Carolina (StormTech system with Isolator Row)	Tennessee Tech University (Isolator Row Only)	NJCAT Verification (Isolator Row PLUS only)
Total Suspended Solids	83%*	91%*	84%*	81%**
Total Phosphorus	33%	68%	Not Tested	Not Tested
Total Nitrogen	Not Tested	35%	Not Tested	Not Tested
Total Zinc	81%	Not Tested	Not Tested	Not Tested
Total Petroleum Hydrocarbons	91%	Not Tested	Not Tested	Not Tested

*Based on a flow rate of 2.5 gpm/sf (Isolator Row)

** Based on a flow rate of 4.1 gpm/sf (Isolator Row PLUS)

LIMITS OF CONSIDERATION

(At least one of the conditions listed below must be met for this deviation request to be considered.)

- The ECM standard is inapplicable to the particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

Provide justification:

THE PROPOSED UNDERGROUND DETENTION AND WATER QUALITY POND WILL INCORPORATE WATER QUALITY STRUCTURES THAT TOGETHER WILL MEET OR EXCEED THE POLLUTANT REMOVAL STANDARDS OF THE EL PASO COUNTY CODE. THE PROPOSED SYSTEM WILL ALSO MEET THE CONTROLLED RELEASE RATES AS A NORMAL ABOVE GROUND POND. THE PARTICULAR SITE CONTAINS EXCELLENT SOIL MATERIAL FOR INFILTRATION. THE PROPOSED SYSTEM MEETS GOOD ENGINEERING, HYDRAULIC AND POLLUTION CONTROL PRACTICES AS DEFINED IN SECTION I.7. THE PROJECT OWNER WILL PROVIDE AN O&M MANUAL AND MAINTENANCE AGREEMENT FOR THE STRUCTURES. THE ECM STANDARD IS INAPPLICABLE BECAUSE THE USE OF UNDERGROUND DETENTION IS CONSIDERED "EXPERIMENTAL" AND THEREFORE IS NOT TYPICALLY PERMITTED BY EPC.

THE PROPOSED UNDERGROUND DETENTION AND WATER QUALITY POND IS A SYSTEM IN SERIES (MHFD, T11, #2) THAT PROVIDES CAPTURE AND TREATMENT OF WQCV OVER 12 HOURS AND MEETS THE MEDIAN EFFLUENT CONCENTRATION REMOVAL OF TSS OF 30 MG/L. THE SERIES OF WATER QUALITY STRUCTURES IS AS FOLLOWS; RUNOFF REDUCTION PRACTICES (PRE-TREATMENT), XK BAYSEPARATOR (PRE-TREATMENT), ISOLATOR ROW FOR THE "FIRST FLUSH" TREATMENT, AND MODIFIED OUTLET STRUCTURE. THE TOTAL SYSTEM MEETS OR EXCEEDS THE EPC CRITERIA FOR WATER QUALITY AND CONTROLLED RELEASE RATES.

CRITERIA FOR APPROVAL

Per ECM section 5.8.7 the request for a deviation may be considered if the request is **not based exclusively on financial considerations**. The deviation must not be detrimental to public safety or surrounding property. The applicant must include supporting information demonstrating compliance with **all of the following criteria**:

The deviation will achieve the intended result with a comparable or superior design and quality of improvement.

THE PROPOSED DEVIATION WILL PROVIDE A SUPERIOR WATER QUALITY AND DETENTION TREATMENT SOLUTION WHILE PROVIDING SUPERIOR AESTHETIC APPEAL. THE FACT THAT THE FACILITY IS SUBTERRAINEOUS ALLOWS FOR SUPERIOR SAFETY TO THE PUBLIC AND LACKS THE NUISANCE OF PESTS SUCH AS FLY AND MOSQUITOS OFTEN PRESENT WITHIN ABOVE GROUND PONDS. THE USE OF "PRE-TREATMENT" MANUFACTURED TREATMENT DEVICES AND THE ISOLATOR ROWS PROVIDE FOR SUPERIOR WATER QUALITY TREATMENT THAT MEETS OR EXCEEDS THE ECM CRITERIA IN ECM I.7.1.C.2. (TREAT MINIMUM 80TH PERCENTILE STORM EVENT, REDUCES MEAN CONCENTRATION OF TOTAL SUSPENDED SOLIDS TO A MEDIAN VALUE OF 30 MG/L OR LESS). THE UNDERGROUND FACILITY MEETS THE DETENTION VOLUME EPC REQUIREMENT FOR CAPACITY, INFILTRATE 97% OF ALL OF THE RUNOFF FROM A RAIN EVENT THAT IS LESS THAN OR EQUAL TO A 5-YEAR STORM WITHIN 72 HOURS AFTER THE END OF THE EVENT. THE SITE ITSELF WILL PROVIDE EXCEPTIONAL INFILTRATION WHICH WILL LESSEN THE RISK OF FAILURE. THE MATERIALS USED FOR THE UNDERGROUND DETENTION AND WATER QUALITY POND ARE DURABLE, POSSESS A LONG DESIGN LIFE, AND ARE CONTAINED FROM EXPOSURE TO THE NATURAL ELEMENTS OF AN ABOVE POND. THE PROPOSED DESIGN CONTAINS LESS CONCRETE AND STEEL THAT OTHERWISE IS EXPOSED TO DEGRADATION.

THE PROPOSED SYSTEM IS SUPERIOR THAN A STANDARD FACILITY DUE TO THE CAPTURE OF SOLIDS, TRASH AND DEBRIS UNDERGROUND. THE SOLID POLLUTANTS WILL BE COLLECTED IN THE XK BAYSEPARATOR, OR ISOLATOR ROW OR THE TRASH RACK OF THE OUTLET STRUCTURE. THEY CAN NOT BE BLOWN BY WIND OR FLOATED DOWNSTREAM.

The deviation will not adversely affect safety or operations.

THE CONSTRUCTION OF AN UNDERGROUND DETENTION SYSTEM WILL NOT ADVERSELY AFFECT SAFETY FOR THE PUBLIC, BUT WILL ONLY ENHANCE THE AREA FOR RECREATION, AND DECREASE THE SAFETY CONCERN CAUSED BY FLOODING. THE UNDERGROUND SYSTEM WILL OPERATE UNSEEN AND THEREFORE NOT BE A NUISANCE OR EYE SORE TO THE PUBLIC. ACCESS TO THE SYSTEM IS NO MORE OF A CONCERN THAN THE PUBLIC OR AN EPC INSPECTOR LIFTING A TYPICAL MANHOLE COVER ANYWHERE ELSE.

The deviation will not adversely affect maintenance and its associated cost.

THE PROPOSED UNDERGROUND DETENTION FACILITY WILL BE PRIVATELY OWNED AND MAINTAINED BY THE CROSSROADS METROPOLITAN DISTRICT NO. 1. THE "DISTRICT" WILL ALSO PROVIDE AN AGREEMENT TO REPLACE THE SYSTEM IF IT DOES NOT FUNCTION TO THE REQUIRED LEVEL OF PERFORMANCE. (ECM I.7.2.B). A REGULAR MAINTENANCE SCHEDULE SHOULD BE THE SAME AS AN ABOVE GROUND FACILITY. THE DISTRICT SHOULD HIRE A CONTRACTOR THAT IS FAMILIAR WITH THE MAINTENANCE OF A SIMILAR SYSTEM. THEY SHOULD POSSES KNOWLEDGE AND EQUIPMENT TO PERFORM THEIR DUTIES AS REQUIRED FOR A REGULAR MAINTENANCE SCHEDULE. NO SPECIAL TRAINING OR CERTIFICATIONS IS REQUIRED. INSPECTION OF THE SYSTEM IS AS USUAL AS ANY OTHER STORM MANHOLE OR OUTLET STRUCTURE.

SEE FOLLOWING PAGES FOR EXAMPLES OF MAINTENANCE PROCEEDURES.

The deviation will not adversely affect maintenance and its associated cost.

CONTINUED;

EXAMPLE MAINTENANCE INSTRUCTIONS FOR BAYSEPARATOR;

NOTE: FOR EACH BAYSEPARATOR SYSTEM, THERE ARE 2 MANHOLES TO CLEAN: THE PRIMARY MANHOLE AND STORAGE MANHOLE.

1. REMOVE THE MANHOLE COVERS TO PROVIDE ACCESS TO THE POLLUTANT STORAGE.
2. STORAGE MANHOLE: USE A VACUUM TRUCK OR OTHER SIMILAR EQUIPMENT TO REMOVE ALL WATER, DEBRIS, OILS AND SEDIMENT.
3. STORAGE MANHOLE: USE A HIGH PRESSURE HOSE TO CLEAN THE MANHOLE OF ALL THE REMAINING SEDIMENT AND DEBRIS. THEN, USE THE VACUUM TRUCK TO REMOVE THE WATER.
4. PRIMARY MANHOLE: USE A SUBMERSIBLE PUMP TO PUMP THE BULK OF THE WATER FROM THE PRIMARY MANHOLE INTO THE CLEAN STORAGE MANHOLE:
 - a. KEEP THE PUMP INTAKE BELOW THE WATER SURFACE.
 - b. STOP PUMPING WHEN THE WATER SURFACE IS ONE (1) FOOT ABOVE THE ACCUMULATED SEDIMENTS.
5. PRIMARY MANHOLE: USE A VACUUM TRUCK OR OTHER SIMILAR EQUIPMENT TO REMOVE ALL WATER, DEBRIS, OILS AND SEDIMENT.
6. PRIMARY MANHOLE: USE A HIGH PRESSURE HOSE TO CLEAN THE MANHOLE OF ALL THE REMAINING SEDIMENT AND DEBRIS. THEN, USE THE VACUUM TRUCK TO REMOVE THE WATER.
7. PRIMARY MANHOLE: FILL THE CLEANED PRIMARY MANHOLE WITH WATER UNTIL YOU HAVE A DEPTH OF 8 FEET (OR 2.44 METERS).
8. STORAGE MANHOLE: TOP OFF THE STORAGE MANHOLE WITH WATER UNTIL YOU HAVE A DEPTH OF 8 FEET (OR 2.44 METERS).
9. REPLACE THE TWO MANHOLE COVERS.
10. DISPOSE OF THE POLLUTED WATER, OILS, SEDIMENT AND TRASH AT AN APPROVED FACILITY.
 - LOCAL REGULATIONS PROHIBIT THE DISCHARGE OF SOLID MATERIAL INTO THE SANITARY SYSTEM. CHECK WITH THE LOCAL SEWER AUTHORITY FOR AUTHORITY TO DISCHARGE THE LIQUID.
 - MANY PLACES TREAT THE POLLUTANTS AS LEACHATE. CHECK WITH LOCAL REGULATORS ABOUT DISPOSAL REQUIREMENTS.

EXAMPLE MAINTENANCE INSTRUCTIONS FOR ISOLATOR ROW

THE ISOLATOR ROW PLUS WAS DESIGNED TO REDUCE THE COST OF PERIODIC MAINTENANCE. BY "ISOLATING" SEDIMENTS TO JUST ONE ROW, COSTS ARE DRAMATICALLY REDUCED BY ELIMINATING THE NEED TO CLEAN OUT EACH ROW OF THE ENTIRE STORAGE BED. IF INSPECTION INDICATES THE POTENTIAL NEED FOR MAINTENANCE, ACCESS IS PROVIDED VIA A MANHOLE(S) LOCATED ON THE END(S) OF THE ROW FOR CLEANOUT. IF ENTRY INTO THE MANHOLE IS REQUIRED, PLEASE FOLLOW LOCAL AND OSHA RULES FOR A CONFINED SPACE ENTRIES.

MAINTENANCE IS ACCOMPLISHED WITH THE JETVAC PROCESS. THE JETVAC PROCESS UTILIZES A HIGH PRESSURE WATER NOZZLE TO PROPEL ITSELF DOWN THE ISOLATOR ROW PLUS WHILE SCOURING AND SUSPENDING SEDIMENTS. AS THE NOZZLE IS RETRIEVED, THE CAPTURED POLLUTANTS ARE FLUSHED BACK INTO THE MANHOLE FOR VACUUMING. MOST SEWER AND PIPE MAINTENANCE COMPANIES HAVE VACUUM/JETVAC COMBINATION VEHICLES. SELECTION OF AN APPROPRIATE JETVAC NOZZLE WILL IMPROVE MAINTENANCE EFFICIENCY. FIXED NOZZLES DESIGNED FOR CULVERTS OR LARGE DIAMETER PIPE CLEANING ARE PREFERABLE. REAR FACING JETS WITH AN EFFECTIVE SPREAD OF AT LEAST 45" ARE BEST. STORMTECH RECOMMENDS A MAXIMUM NOZZLE PRESSURE OF 2000 PSI BE UTILIZED DURING CLEANING. MOST JETVAC REELS HAVE 400 FEET OF HOSE ALLOWING MAINTENANCE OF AN ISOLATORROW PLUS UP TO 50 CHAMBERS LONG. THE JETVAC PROCESS SHALL ONLY BE PERFORMED ON STORMTECH ISOLATOR ROW PLUS THAT HAVE ADS PLUS FABRIC (AS SPECIFIED BY STORMTECH) OVER THEIR ANGULAR BASE STONE.

The deviation will not adversely affect maintenance and its associated cost.

STEP 1

INSPECT ISOLATOR ROW PLUS FOR SEDIMENT.

- A) INSPECTION PORTS (IF PRESENT)
 - i. REMOVE LID FROM FLOOR BOXFRAME
 - ii. REMOVE CAP FROM INSPECTION RISER
 - iii. USING A FLASHLIGHT AND STADIA ROD, MEASURE DEPTH OF SEDIMENT AND RECORD RESULTS ON MAINTENANCE LOG.
 - iv. IF SEDIMENT IS AT OR ABOVE 3 INCH DEPTH, PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.
- B) ALL ISOLATOR ROW PLUS
 - i. REMOVE COVER FROM MANHOLE AT UPSTREAM END OF ISOLATOR ROW PLUS
 - ii. USING A FLASHLIGHT, INSPECT DOWN ISOLATOR ROW PLUS THROUGH OUTLET PIPE
 - 1. MIRRORS ON POLES OR CAMERAS MAY BE USED TO AVOID A CONFINED SPACE ENTRY
 - 2. FOLLOW OSHA REGULATIONS FOR CONFINED SPACE ENTRY IF ENTERING MANHOLE
 - iii. IF SEDIMENT IS AT OR ABOVE THE LOWER ROW OF SIDEWALL HOLES (APPROXIMATELY 3 INCHES), PROCEED TO STEP 2. IF NOT, PROCEED TO STEP 3.

STEP 2

CLEAN OUT ISOLATOR ROW PLUS USING THE JETVAC PROCESS.

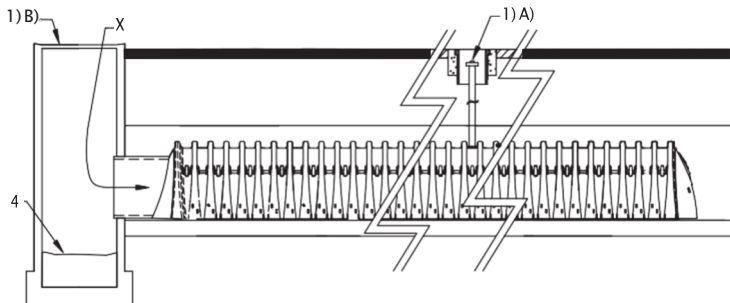
- A) A FIXED FLOOR CLEANING NOZZLE WITH REAR FACING NOZZLE SPREAD OF 45 INCHES OR MORE IS PREFERABLE
- B) APPLY MULTIPLE PASSES OF JETVAC UNTIL BACKFLUSH WATER IS CLEAN
- C) VACUUM MANHOLE SUMP AS REQUIRED

STEP 3

REPLACE ALL CAPS, LIDS AND COVERS, RECORD OBSERVATIONS AND ACTIONS.

STEP 4

INSPECT & CLEAN CATCH BASINS AND MANHOLES UPSTREAM OF THE STORMTECH SYSTEM.



The deviation will not adversely affect aesthetic appearance.

THE PROPOSED DEVIATION WILL ENHANCE THE AESTHETIC APPEARANCE WITH THE CONSTRUCTION OF A PARK SITE IN LIEU OF A STANDARD ABOVE GROUND EPC DETENTION POND.

The deviation meets the design intent and purpose of the ECM standards.

THE DEVIATION MEETS THE DESIGN INTENT FOR DETENTION, WATER QUALITY, MAINTENANCE AND OPERATION AS WELL AS, OR BETTER THAN, A STANDARD ABOVE GROUND EPC DETENTION POND. THE UNDERGROUND DETENTION FACILITY PROPOSED FOR USE IN THE COUNTY WILL MEET THE GOOD ENGINEERING, HYDROLOGIC AND POLLUTION CONTROL PRACTICES AS DEFINED IN THIS SECTION I.7. THE APPROVAL CRITERIA FOR THIS DEVIATION REQUEST PROVIDED IN CHAPTERS 1 AND 5 OF THE ECM, THE OWNER OR AUTHORIZED AGENT WILL PROVIDE A STRUCTURE-SPECIFIC OPERATION AND MAINTENANCE (O&M) MANUAL AND MAINTENANCE AGREEMENT FOR THE STRUCTURES. THE OPERATION AND MAINTENANCE MANUAL WILL INCLUDE SPECIFIC PROCEDURES AND EQUIPMENT THAT WILL BE USED BY THE OWNER OR AUTHORIZED REPRESENTATIVE TO OPERATE AND MAINTAIN THE STRUCTURES. A SPECIFICATION SHEET OR GENERIC O&M MANUAL PROVIDED BY THE VENDOR WILL NOT BE USED TO SATISFY THE O&M MANUAL REQUIREMENT.

The deviation meets the control measure requirements of Part I.E.3 and Part I.E.4 of the County's MS4 permit, as applicable.

THE DEVIATION MEETS THE CONTROL MEASURE REQUIREMENTS OF PART I.E.3 OF EPC'S MS4 PERMIT – CONSTRUCTION SITES. THE PERMITTEE WILL IMPLEMENT A PROGRAM TO REDUCE OR PREVENT THE DISCHARGE OF POLLUTANTS TO THE MS4 FROM APPLICABLE CONSTRUCTION ACTIVITIES.

THE DEVIATION MEETS THE CONTROL MEASURE REQUIREMENTS OF PART I.E.4 OF EPC'S MS4 PERMIT – POST-CONSTRUCTION STORMWATER MANAGEMENT IN NEW DEVELOPMENT AND REDEVELOPMENT. THE PERMITTEE WILL IMPLEMENT A PROGRAM TO REDUCE THE DISCHARGE OF POLLUTANTS TO THE MS4 FROM APPLICABLE DEVELOPMENT SITES.

1.1. PURPOSE

The purpose of this resource is to provide a form for documenting the findings and decision by the ECM Administrator concerning a deviation request. The form is used to document the review and decision concerning a requested deviation. The request and decision concerning each deviation from a specific section of the ECM shall be recorded on a separate form.

1.2. BACKGROUND

A deviation is a critical aspect of the review process and needs to be documented to ensure that the deviations granted are applied to a specific development application in conformance with the criteria for approval and that the action is documented as such requests can point to potential needed revisions to the ECM.

1.3. APPLICABLE STATUTES AND REGULATIONS

Section 5.8 of the ECM establishes a mechanism whereby an engineering design standard can be modified when if strictly adhered to, would cause unnecessary hardship or unsafe design because of topographical or other conditions particular to the site, and that a departure may be made without destroying the intent of such provision.

1.4. APPLICABILITY

All provisions of the ECM are subject to deviation by the ECM Administrator provided that one of the following conditions is met:

- The ECM standard is inapplicable to a particular situation.
- Topography, right-of-way, or other geographical conditions or impediments impose an undue hardship on the applicant, and an equivalent alternative that can accomplish the same design objective is available and does not compromise public safety or accessibility.
- A change to a standard is required to address a specific design or construction problem, and if not modified, the standard will impose an undue hardship on the applicant with little or no material benefit to the public.

1.5. TECHNICAL GUIDANCE

The review shall ensure all criteria for approval are adequately considered and that justification for the deviation is properly documented.

1.6. LIMITS OF APPROVAL

Whether a request for deviation is approved as proposed or with conditions, the approval is for project-specific use and shall not constitute a precedent or general deviation from these Standards.

1.7. REVIEW FEES

A Deviation Review Fee shall be paid in full at the time of submission of a request for deviation. The fee for Deviation Review shall be as determined by resolution of the BoCC.