

# Operation and Maintenance Manual

## St Charles Borromeo Parish Offices and Meeting Space Addition

Prepared for:

Prepared for:  
St Charles Borromeo  
7112 South 12<sup>th</sup> Street  
Tacoma, WA 98465

Contact: Father Michael McDermott  
Phone: (253) 564-5785

Prepared by:  
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Tacoma, Washington 98409

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March 2024

Job Number 20,126



City of Tacoma  
Reviewed for Code Compliance

# Operation and Maintenance Manual

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## 1 Project Information

The project proposes construction of a two story building to the existing St Charles Borromeo Site and accompanying site and utility improvements. Permits sought for the proposed project include a building permit and site development permit.

This report is prepared in accordance with the 2021 City of Tacoma Stormwater Management Manual (herein known as the Manual).

On Sunday October 24, 2021, St Charles Borromeo’s parish administration building caught fire, causing a total loss to the structural. This project proposes the replacement of the lost office space as well as additional meeting spaces in a two story building. Specific proposed improvements include the building, concrete and asphalt pavement, stormwater utilities, and relocation of power, water, and sewer utilities.

## 2 Maintenance Importance and Intent

The importance of maintenance for the proper functioning of stormwater control facilities cannot be over-emphasized. A substantial portion of failures (clogging of filters, resuspension of sediments, loss of storage capacity, etc.) are due to inadequate maintenance. Stormwater BMP maintenance is essential to ensure that BMPs function as intended throughout their full life cycle.

The fundamental goals of maintenance activities are to ensure the entire flow regime and treatment train designed for this site continue to fully function. For this site these include:

- Maintain ability to safely convey design stormwater flows
- Preserve soil and plant health, as well as stormwater flow contact with plant and soil systems
- Clearly identify systems so they can be protected
- Keep maintenance costs low
- Prevent large-scale or expensive stormwater system failures

The intent of this section and manual is to pass on to the responsible party(s) all the information critical to understand the design of the system, risks and considerations for proper use, suggestions for maintenance frequencies, and cost so that realistic budgets can be established.

## 3 Responsible Parties

The owner, St Charles Borromeo, is responsible for all maintenance of stormwater facilities.

## 4 Facilities Requiring Maintenance

The permitting process for the project requires the project to identify stormwater facilities requiring maintenance. The proposed facilities requiring maintenance include catch basins, underground conveyance pipes, a sump pump, and a Contech Stormfilter. See Appendix A for location of the stormwater facilities requiring maintenance.

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## 5 Maintenance Instructions

The parties responsible for maintenance must review and apply the maintenance requirements contained herein. These maintenance instructions outline conditions for determining if maintenance actions are required, as identified through inspection. However, they are not intended to be measures of the facility's required condition at all times between inspections. Exceedance of these conditions at any time between inspections or maintenance activity does not automatically constitute a violation of these standards. However, based upon inspection observations, the inspection and maintenance presented in the checklists shall be adjusted to minimize the length of time that a facility is in a condition that requires a maintenance action. A log of maintenance activities that indicates what actions were taken must be kept on site and be available for inspection by the City of Tacoma.

The 2021 City of Tacoma Stormwater Management Manual have template checklists for maintenance of stormwater facilities. The project specific applicable checklists are attached in this section. Using photocopies of these pages, check off the issues looked at each time an inspection has been done. Add comments on problems found and actions taken. Keep a record of these "checked" sheets for reference.

The proposed stormwater management systems are designed to collect, convey, and treat on-site stormwater runoff. The site contains catch basins and underground pipelines that collect and convey stormwater flows. The bioretention facility provides water quality treatment and infiltration, and the infiltration pond provides stormwater infiltration.

Any buildup of sediment, debris, vegetation, or trash that impedes the flow of stormwater may cause problems. As a result, care must be taken to keep pavement and catch basins clean. Deposits on paved surfaces should be swept or mechanically removed in order to prevent sediment, vegetation, or debris from clogging the catch basin or entering the drainage system. Removed sediments, vegetation, and debris shall be disposed of at an approved off-site location. Any questions about the existence of a drainage maintenance issue should be directed to a professional engineer.

## 6 Vegetation Maintenance

All proposed disturbed surfaces that are not covered by hard surfaces are to be restored and planted at the surface. See the landscape plan for information on the type and location of the plantings. Once established, the vegetation is to be trimmed regularly and irrigated during dry periods.

## 7 Annual Cost of Maintenance

The proposed stormwater system consists of approximately 4 catch basins, 435 linear feet of conveyance pipes, a Contech Stormfilter, and a pump station. There is an estimated annual cost of maintenance of \$250 for each catch basin, \$500 for the Contech Stormfilter and pump station, and \$1 per linear foot of pipe. This gives an estimated additional annual maintenance cost of \$2,435 on top of the existing stormwater system.

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**Cover Sheet for Inspection Forms**

**St Charles Borromeo  
7112 South 12<sup>th</sup> Street  
Tacoma, WA 98465**

Name of Inspector:	_____
Date of Inspection:	_____
Number of Sheets Attached:	_____
Inspector's Signature:	_____

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**#6 - Maintenance Standard for Catch Basins/Manholes**

Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Annually (preferably Sept.)	General	"Dump no pollutants" Stencil or stamp not visible	Stencil or stamp should be visible and easily read	Warning signs (e.g., "Dump No Waste-Drains to Stream") shall be painted or embossed on or adjacent to all storm drain inlets.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Trash and Debris	Trash or debris which is located immediately in front of the catch basin opening or is blocking inlet capacity of the basin by more than 10 percent.	No trash or debris located immediately in front of catch basin or on grate opening.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Trash and Debris	Trash or debris (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the debris surface to the invert of the lowest pipe.	No trash or debris in the catch basin.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Trash and Debris	Trash or debris in any inlet or outlet pipe blocking more than one-third of its height.	Inlet and outlet pipes free of trash or debris.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Trash and Debris	Dead animals or vegetation that could generate odors and cause complaints or dangerous gases (e.g., methane).	No dead animals or vegetation present within the catch basin.

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Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Sediment	Sediment (in the basin) that exceeds 60 percent of the sump depth as measured from the bottom of basin to invert of the lowest pipe into or out of the basin, but in no case less than a minimum of 6 inches clearance from the sediment surface to the invert of the lowest pipe.	No sediment in the catch basin.
Annually (preferably Sept.)	General	Structure Damage to Frame and/or Top Slab	Top slab has holes larger than 2 square inches or cracks wider than one-fourth inch (intent is to make sure no material is running into basin).	Top slab is free of holes and cracks.
Annually (preferably Sept.)	General	Structure Damage to Frame and/or Top Slab	Frame not sitting flush on top slab, i.e., separation of more than three-fourth inch of the frame from the top slab. Frame not securely attached.	Frame is sitting flush on the riser rings or top slab and firmly attached.
Annually (preferably Sept.)	General	Fractures or Cracks in Basin Walls/ Bottom	Maintenance person judges that structure is unsound.	Basin replaced or repaired to design standards.
Annually (preferably Sept.)	General	Fractures or Cracks in Basin Walls/ Bottom	Grout fillet has separated or cracked wider than one-half-inch and longer than 1 foot at the joint of any inlet/outlet pipe or any evidence of soil particles entering catch basin through cracks.	Pipe is regouted and secure at basin wall.
Annually (preferably Sept.)	General	Settlement/ Misalignment	If failure of basin has created a safety, function, or design problem.	Basin replaced or repaired to design standards.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Vegetation	Vegetation growing across and blocking more than 10 percent of the basin opening.	No vegetation blocking opening to basin.

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Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Vegetation	Vegetation growing in inlet/outlet pipe joints that is more than 6 inches tall and less than 6 inches apart.	No vegetation or root growth present.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Contamination and Pollution	Any evidence of oil, gasoline, contaminants or other pollutants.	No contaminants or pollutants present. (Coordinate removal/cleanup with Environmental Services at 253.502.2222 and/or DOE Spill Response 800.424.8802.)
Annually (preferably Sept.)	Catch Basin Cover	Cover Not in Place	Cover is missing or only partially in place.	Catch basin cover is in place.
Annually (preferably Sept.)	Catch Basin Cover	Locking Mechanism Not Working	Mechanism cannot be opened by one maintenance person with proper tools. Bolts into frame have less than one-half-inch of thread.	Mechanism opens with proper tools.
Annually (preferably Sept.)	Catch Basin Cover	Cover Difficult to Remove	One maintenance person cannot remove lid after applying normal lifting pressure. (Intent is keep cover from sealing off access to maintenance.)	Cover can be removed by one maintenance person.
Annually (preferably Sept.)	Ladder	Ladder Rungs Unsafe	Ladder is unsafe due to missing rungs, not securely attached to basin wall, misalignment, rust, cracks, or sharp edges.	Ladder meets design standards and allows maintenance person safe access.
Annually (preferably Sept.)	Grates	Grate opening Unsafe	Grate with opening wider than seven-eighths of an inch.	Grate opening meets design standards.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	Grates	Trash and Debris	Trash and debris that is blocking more than 20 percent of grate surface inletting capacity.	Grate free of trash and debris.

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Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Annually (preferably Sept.)	Grates	Damaged or Missing.	Grate missing or broken member(s) of the grate.	Grate is in place , meets design standards, and is installed and aligned with flowpath.
Annually (preferably Sept.)	General	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with adopted integrated pest management policies.

If you are unsure whether a problem exists, please contact Environmental Services at 253.591.5588.

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**#19 - Maintenance Standard for Fencing/Shrubbery Screen/Other Landscaping**

Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Monthly from Oct. – Apr.	General	Missing or broken parts/ dead shrubbery	Any defect in the fence or screen that permits easy entry to a facility.	Fence is mended or shrubs replaced to form a solid barrier to entry.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Erosion	Erosion has resulted in an opening under a fence that allows entry by people or pets.	Replace soil under fence so that no opening exceeds 4 inches in height.
Monthly from Oct. – Apr.	General	Unruly Vegetation	Shrubbery is growing out of control or is infested with weeds.	Shrubbery is trimmed and weeded to provide appealing aesthetics. Do not use chemicals to control weeds.
Annually (preferably Sept.)	Fences	Damaged Parts	Posts out of plumb more than 6 inches.	Posts are within 1.5 inches of plumb.
Annually (preferably Sept.)	Fences	Damaged Parts	Top rails bent more than 6 inches.	Top rail free of bends greater than 1 inch.
Annually (preferably Sept.)	Fences	Damaged Parts	Any part of fence (including posts, top rails, and fabric) more than 1 foot out of design alignment.	Fence is aligned and meets design standards.
Annually (preferably Sept.)	Fences	Damaged Parts	Missing or loose tension wire.	Tension wire in place and holding fabric.
Annually (preferably Sept.)	Fences	Damaged Parts	Missing or loose barbed wire that is sagging more than 2.5 inches between posts.	Barbed wire in place with less than three-fourth inch sag between posts.
Annually (preferably Sept.)	Fences	Damaged Parts	Extension arm missing, broken, or bent out of shape more than 1.5 inches.	Extension arm in place with no bends larger than three-fourth inch.
Annually (preferably Sept.)	Fences	Deteriorated Paint or Protective Coating	Part or parts that have a rusting or scaling condition that has affected structural adequacy.	Structurally adequate posts or parts with a uniform protective coating.
Annually (preferably Sept.)	General	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with adopted integrated pest management policies.

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**#21 - Maintenance Standard for Grounds (Landscaping)**

Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Monthly from Oct. – Apr.	General	Weeds (non-poisonous)	Weeds growing in more than 20 percent of the landscaped area (trees and shrubs only).	Weeds present in less than 5 percent of the landscaped area.
Biannually (Spring & Fall)	General	Poisonous Vegetation and Noxious Weeds	Any poisonous or nuisance vegetation which may constitute a hazard to maintenance personnel or the public. Any evidence of noxious weeds as defined in State and Local Regulations. (Apply requirements of adopted integrated vegetation management (IVM) policies for the use of herbicides.)	No danger of poisonous vegetation where maintenance personnel or the public might normally be. (Coordinate with the Pierce County Noxious Weed Control Board). Complete eradication of noxious weeds may not be possible, however compliance with state or local eradication policies are required.
Annually (preferably Sept.)	General	Insects	When insects such as wasps and hornets interfere with maintenance activities.	Insects destroyed or removed from site. Apply insecticides in compliance with adopted integrated pest management policies.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Trash and Debris	Any trash and debris which exceeds 1 cubic feet per 1,000 square feet. In general, there should be no visual evidence of dumping.	Trash and debris cleared from site.
Monthly from Oct. – Apr. and after any major storm event (1" in 24 hours)	General	Erosion of Ground Surface	Noticeable rills are seen in landscaped areas.	Causes of erosion are identified and steps taken to slow down/ spread out the water. Eroded areas are filled, contoured, and seeded.
Annually (preferably Sept.)	Trees and shrubs	Damage	Limbs or parts of trees or shrubs that are split or broken which affect more than 25 percent of the total foliage of the tree or shrub.	Trim trees/shrubs to restore shape. Replace severely damaged trees/shrubs.

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Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Monthly from Oct. – Apr.	Trees and shrubs	Damage	Trees or shrubs that have been blown down or knocked over.	Replant tree, inspecting for injury to stem or roots. Replace if severely damaged.
Annually (preferably Sept.)	Trees and shrubs	Damage	Trees or shrubs which are not adequately supported or are leaning over, causing exposure of the roots.	Place stakes and rubber-coated ties around young trees/ shrubs for support.

If you are unsure whether a problem exists, please contact Environmental Services at 253.591.5588.

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**#28 - Emerging Technologies**

At a minimum all stormwater devices must be inspected every six months and after every major storm event. Use the manufacturer’s recommendations as tailored to the use of the site and as outlined in the Operation and Maintenance Manual. Operations and Maintenance shall conform to any Ecology issued use level designation as applicable.

If you are unsure whether a problem exists, please contact Environmental Services at 253.591.5588.

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**#29 - General Maintenance Concerns for Stormwater Facilities**

Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Based on manufacturers instructions	Irrigation	Irrigation system (if any)	Irrigation system present.	Follow manufacturer's instructions for O&M.
Weekly (May – September)	Irrigation	Plant watering	Plant establishment period (1-3 years).	Water weekly during periods of no rain to ensure plant establishment.
As Needed	Irrigation	Plant watering	Longer term period (3+ years).	Water during drought conditions or more often if necessary to maintain plant cover.
Ongoing	Spill Prevention and Response	Spill prevention	Storage or use of potential contaminants in the vicinity of facility.	Exercise spill prevention measures whenever handling or storing potential contaminants.
As needed	Spill Prevention and Response	Spill response	Release of pollutants. Call to report any spill to City of Tacoma Source Control 253.502.2222.	Cleanup spills as soon as possible to prevent contamination of stormwater.
At startup	Training and Documentation	Training / written guidance	Training / written guidance is required for proper O&M.	Provide property owners and tenants with proper training and a copy of the O&M manual.
Annually (preferably Sept.)	Safety	Safety (slopes)	Erosion of sides causes slope to exceed 1:4 or otherwise becomes a hazard.	Restore to design slope.
Annually (preferably Sept.)	Safety	Safety (hydraulic structures)	Hydraulic structures (pipes, culverts, vaults, etc.) become a hazard to children playing in and around the facility.	Take actions to eliminate the hazard (such as covering and securing any openings).
Annually (preferably Sept.)	Safety	Line of sight	Vegetation causes some visibility (line of sight) or driver safety issues.	Prune or replace plants as necessary.
Annually (preferably Sept.)	Aesthetics	Aesthetics	Damage/vandalism/ debris accumulation.	Clean, repair, and restore facility to original aesthetic conditions.

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**#30 - Maintenance Standard for Trees**

Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Once a year for the first three years	Trees	Future failure	Weak branch attachments; co-dominant stems.	Structural Pruning <sup>a</sup> .
As needed	Trees	Threat to public safety	Low branches that may cause safety concerns if they remain.	Crown Raising <sup>a</sup> .
As needed, for safety	Trees	Threat to public safety	Dead, diseased and/or broken branches.	Pruning to remove dead, diseased and/or broken branches.
As needed	Trees	Threat to public safety	Dead, severely damaged or declining.	Replace per planting plan or acceptable substitute.

a. Trees shall be pruned according to industry standards, ANSI A300 Part 1 and the International Society of Arboriculture's Best Management Practices - Tree Pruning.

If you are unsure whether a problem exists, please contact Environmental Services at 253.591.5588.

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Recommended Inspection Frequency	Stormwater System Feature	Problem	Condition When Maintenance is Required	Maintenance Activities and Conditions that Should Exist
Annually (preferably Sept.)	Aesthetics	Grass/vegetation	Less than 75% of planted vegetation is healthy with a generally good appearance.	Take appropriate maintenance actions. (e.g., remove/replace plants, amend soil, etc.).
Annually (preferably Sept.)	Aesthetics	Edging	Grass is starting to encroach on facility.	Repair edging. Remove encroaching grass. Install additional measures to prevent encroachment.
Annually (preferably Sept.)	General	Poisonous Vegetation and noxious weeds	Any poisonous or nuisance vegetation may constitute a hazard to maintenance personnel or to the public. Any evidence of noxious weeds as defined by the State or local regulations. The Washington State Noxious Weed Control Board has a list of common noxious weeds at <a href="http://www.nwcb.wa.gov">www.nwcb.wa.gov</a> .	No danger of poisonous vegetation. Compliance with state or local eradication policies is required. Apply requirements of adopted integrated pest management plan as necessary.

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# OPERATION AND MAINTENANCE

## CatchBasin StormFilter™

*Important: These guidelines should be used as a part of your site stormwater plan.*

### Overview

The CatchBasin StormFilter™ (CBSF) consists of a multi-chamber steel, concrete, or plastic catch basin unit. The steel CBSF is offered both as a standard and as a deep unit for additional internal overflow and sediment capacity.

The CBSF is installed flush with the finished grade and is applicable for both constrained lot and retrofit applications. Steel and concrete units can accept surface and piped influent for roof leaders or similar applications.

The steel, concrete and plastic CBSF units have capacities of 4, 8 and 2 cartridges, respectively. Internal overflow capacity varies by system type from 0.5 cfs for the plastic, 1.3 cfs for the concrete and 1.0 or 1.8 cfs for the steel unit.

### Design Operation

The CBSF is installed as the primary receiver of runoff, similar to a standard, grated catch basin. The steel and concrete CBSF units have an H-20 rated, traffic bearing lid that allows the filter to be installed in parking lots, and for all practical purposes, takes up no land area. Plastic units can be used in landscaped areas or other non-traffic-bearing applications.

The steel CBSF consists of a sumped inlet chamber and cartridge chamber(s). Runoff enters the sumped inlet chamber either by sheet flow from a paved surface or from an inlet pipe discharging directly to the unit vault. The inlet chamber is equipped with an internal baffle, which traps debris and floating oil and grease, and an overflow weir. While in the inlet chamber, heavier solids are allowed to settle into the deep sump, while lighter solids and soluble pollutants are directed into the cartridge chamber through a port between the baffle and the overflow weir.

The concrete and plastic units operate similarly minus the presence of the inlet chamber or deep sump.

Once in the cartridge chamber, polluted water ponds and percolates horizontally through the media in the filter cartridges. Treated water collects in the cartridge's center tube from where it is directed to the outlet chamber and discharged to the outlet pipe on the downstream side of the overflow weir.

When influent flows exceed the water quality design value, excess water spills over the overflow weir, bypassing the cartridge bay, and discharges to the outlet pipe.

### Applications

The CBSF is particularly useful where small flows are being treated or for sites that have little available hydraulic head. The unit is ideal for applications in which standard catch basins are to be used. Both water quality and catchment issues can be resolved with the use of the CBSF.

### Retro-Fit

The retrofit market has many possible applications for the CBSF. The CBSF can be installed by replacing an existing catch basin without having to "chase the grade," thus reducing the high cost of re-piping the storm system.

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# OPERATION AND MAINTENANCE

## CatchBasin StormFilter™

### Maintenance Guidelines

Maintenance procedures for typical catch basins can be applied to the CatchBasin StormFilter (CBSF). The filter cartridges contained in the CBSF are easily removed and replaced during maintenance activities according to the following guidelines.

1. Establish a safe working area as per typical catch basin service activity.
2. Remove steel grate and diamond plate cover (weight 100 lbs. each) or plastic grating.
3. Turn cartridge(s) approximately ¼ turn counter-clockwise to disconnect from pipe manifold.
4. Remove cartridge(s) from catch basin by hand or with appropriate hoisting equipment.
5. Remove accumulated sediment via vactor truck from all interior chambers.
6. Rinse interior of both bays and vactor remaining water and sediment.
7. Install fresh cartridge(s), by rotating ¼ turn clockwise, taking care not to damage cartridge connectors.
8. Replace cover(s).
9. Dispose of accumulated debris and spent media in accordance with local regulations.
10. Return used, empty cartridges to Contech for refurbishing.

Media may be removed from the filter cartridges using the vactor truck before the cartridges are removed from the catch basin structure once the top cap and hood are removed. The vactor truck must be equipped with a hose capable of reaching areas of restricted clearance.

Empty cartridges can be easily removed from the catch basin structure by hand. Empty cartridges should be reassembled and returned to Contech as appropriate.

Refurbished cartridges are available from Contech on an exchange basis. Contact the maintenance department of Contech at 513-645-7770 for more information.

Onsite maintenance is estimated at 26 minutes once setup for a single cartridge unit. Add approximately 5 minutes for each additional cartridge.

### Mosquito Abatement

In certain areas of the United States, mosquito abatement is desirable to reduce the incidence of vectors.

In BMPs with standing water, which could provide mosquito breeding habitat, certain abatement measures can be taken.

1. Periodic observation of the standing water to determine if the facility is harboring mosquito larvae.
2. Regular catch basin maintenance.
3. Use of larvicides containing *Bacillus thuringiensis israelensis* (BTI). BTI is a bacterium toxic to mosquito and black fly larvae.

In some cases, the presence of petroleum hydrocarbons may interrupt the mosquito growth cycle.

### Using Larvicides in the CatchBasin StormFilter

Larvicides should be used according to manufacturer's recommendations.

Two widely available products are Mosquito Dunks and Summit B.t.i. Briquets. For more information, visit <https://www.amvac.com/products/summit-bti-briquets>.

The larvicide must be in contact with the permanent pool. The larvicide should also be fastened to the CatchBasin StormFilter to prevent displacement by high flows. A magnet can be used with a steel catch basin.

For more information on mosquito abatement in stormwater BMPs, refer to the following: <https://anrcatalog.ucanr.edu/pdf/8125.pdf>.

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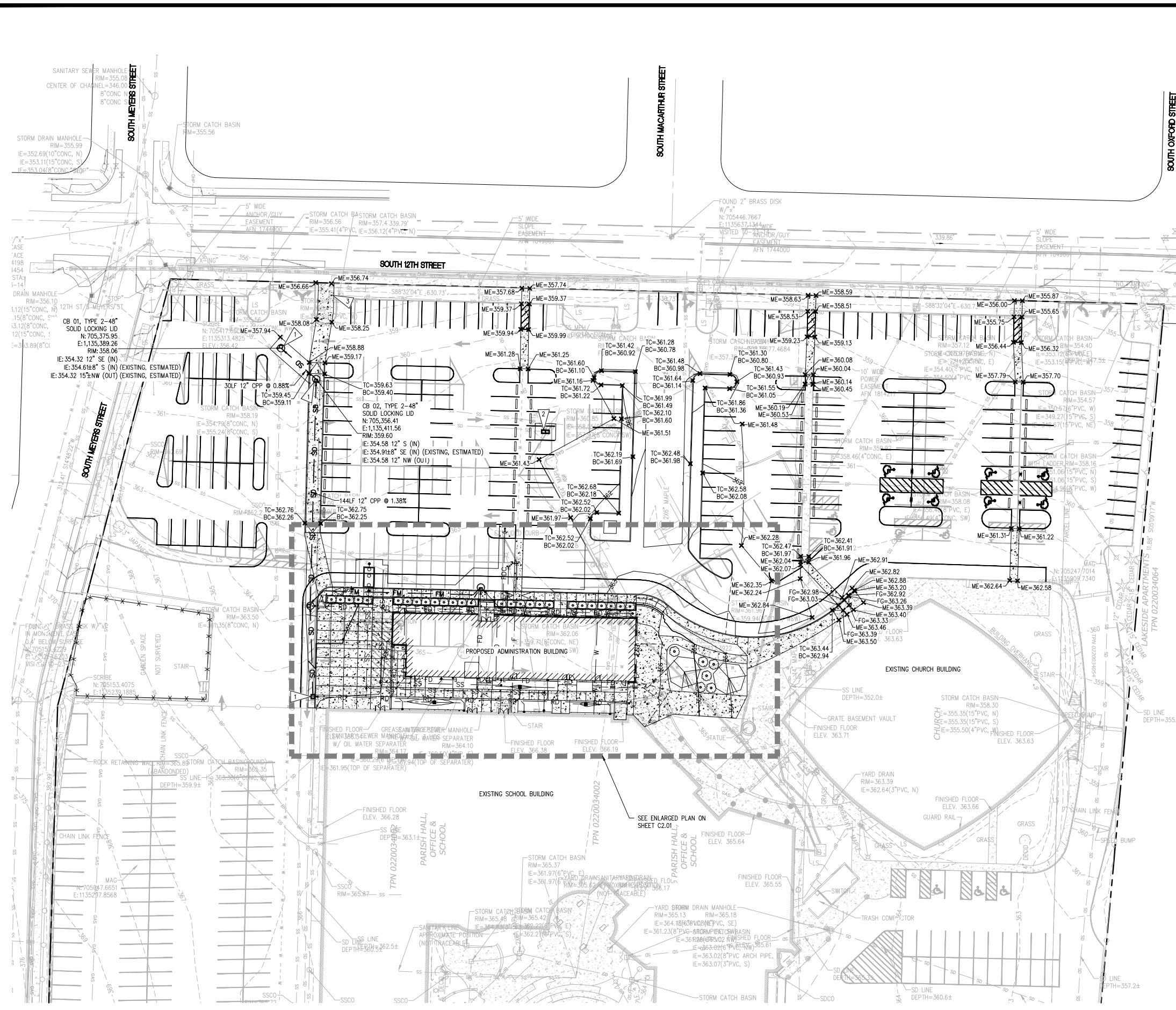
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**Appendix A      Grading and Drainage Plan**

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**LEGEND**

PROPOSED FEATURES	ABREVIATIONS
SD - STORM DRAIN PIPE	DS - DOWNSPOUT
RD - ROOF DRAIN PIPE	TC - TOP OF CURB
FD - FOUNDATION DRAIN PIPE	BC - BOTTOM OF CURB
FM - FORCEMAIN	FG - FINISHED GRADE
--- GRADE BREAK	ME - MATCH EXISTING
□ G - TYPE 1, TYPE 2 CATCH	
--- ROOF DRAIN CLEANOUT	
--- 500 - PROPOSED MAJOR CONTOUR	
--- 499 - PROPOSED MINOR CONTOUR	
--- SIDEWALK RAMP	

- GENERAL NOTES**
- THE BURIED UTILITIES ON THIS PROJECT ARE SHOWN IN THEIR APPROXIMATE LOCATION WHERE KNOWN BASED ON FIELD SURVEY PERFORMED BY SITTS & HILL ENGINEERS, INC. OTHER EXISTING BURIED UTILITIES MAY NOT BE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND HAVE THEIR LOCATION MARKED ON THE GROUND PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL PROTECT OR IMMEDIATELY REPAIR, ANY DAMAGED UTILITY "DISCOVERED" ON THIS PROJECT WITHOUT ADDITIONAL COSTS.
  - BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN ON THE SITE WAS PREPARED AND PROVIDED BY SITTS & HILL ENGINEERS, INC. SEE SHEET T1.00 FOR HORIZONTAL AND VERTICAL DATUM.
  - THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR MAINTAINING ALL STORM SYSTEMS (EXISTING AND PROPOSED) AND TESC FACILITIES THROUGH ALL PHASES OF CONSTRUCTION AND THROUGH PROJECT COMPLETION.
  - MAINTAIN 6" MINIMUM VERTICAL AND 3' MINIMUM HORIZONTAL CLEARANCE (OUTSIDE SURFACES) BETWEEN STORM DRAIN PIPES AND OTHER UTILITY PIPES AND CONDUITS, UNLESS OTHERWISE NOTED. SEE STORM PROFILE SHEET C2.03 FOR ADDITIONAL CROSSING INFORMATION.
  - TYPE 2 CATCH BASINS GREATER THAN 4' FROM RIM TO INVERT TO HAVE STANDARD LADDERS.
  - ALL CATCH BASIN GRATES SHALL BE BOLT DOWN GRATES AND INSTALLED WITH BOLTS. THE CONTRACTOR SHALL SET FRAMES AS NECESSARY TO MATCH CROSS SLOPE OF THE FINISH GRADE. UPON COMPLETION OF PAVING AND LANDSCAPING, CLEAN ALL CATCH BASINS AND PIPING WITH A VACTOR TRUCK. PROVIDE INVOICE TO ENGINEER UPON COMPLETION.
  - CONTRACTOR AND/OR SURVEYOR SHALL CALCULATE PIPE SLOPES BASED ON THE INVERT ELEVATIONS SHOWN ON THE PLANS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO FIELD STAKING AND CONSTRUCTION.
  - ALL STORM DRAIN (SD) LINES SHALL BE CPVC (CORRUGATED POLYPROPYLENE DUAL WALL), DOUBLE GASKET GRAY PIPE, PER WSDOT STANDARD SPECIFICATION 9-05, UNLESS OTHERWISE NOTED, AND INSTALLED PER DETAIL 01/C2.02.
  - ALL ROOF DRAIN (RD) LINES SHALL BE 6" SDR-35 PVC AT A MINIMUM SLOPE OF 1.5% (MINIMUM) IN ACCORDANCE WITH DETAIL 01/C2.02, UNLESS OTHERWISE NOTED. SEE DETAIL 04/C2.02 FOR DOWNSPOUT CONNECTIONS. COORDINATE LOCATION WITH ARCHITECTURAL PLANS.
  - ALL FOOTING DRAIN (FD) LINES SHALL BE 4" PERFORATED SDR-35 PVC AT EACH FOUNDATION LEVEL (GROUND FLOOR, BASEMENT, AND ELEVATOR PIT) IN ACCORDANCE WITH DETAIL 08/C2.02. SEE SHEET C2.04 FOR THE FOUNDATION DRAIN PLAN. EACH FOOTING DRAIN LEVEL SHALL BE TIGHTENED DIRECTLY TO THE PUMP STATION WITH 4" SOLID WALL SDR-35 PVC AT 1.0% SLOPE MINIMUM. DO NOT CONNECT FOOTING DRAINS TO ROOF DRAINS OR ANOTHER FOOTING DRAIN LEVEL.
  - SANDED MANHOLE ADAPTERS SHALL BE USED AT ALL CPP PIPE CONNECTIONS AT CATCH BASINS. GROUT INSIDE AND OUTSIDE OF STRUCTURE AT ADAPTER TO BE INSPECTED BY ENGINEER PRIOR TO BACKFILLING CATCH BASINS.
  - ALL CATCH BASIN INLETS IN OR ADJACENT TO PAVED AREAS SHALL BE MARKED WITH A "FISH STENOIL," SEE DETAIL 02/C3.03.

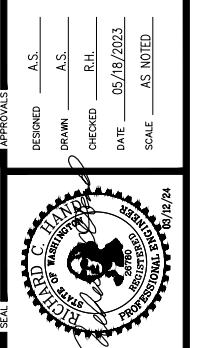
- KEY NOTES**
- SET CATCH BASIN ON EXISTING STORM DRAIN. CONTRACTOR TO POTHOLE AND REPORT INVERT ELEVATION BACK TO CIVIL ENGINEER.
  - REPLACE EXISTING CATCH BASIN WITH CONTECH STORMFILTER. SEE DETAIL 09/C2.02.
  - SET EXISTING UTILITY VAULT FLUSH WITH PROPOSED SIDEWALK.



**GRADING AND DRAINAGE PLAN**  
 SCALE: 1"=30'

APPROVALS

DESIGNED	A.S.
DRAWN	A.S.
CHECKED	R.H.
DATE	05/18/2023
SCALE	AS NOTED
ISSUE FOR PERMIT	05-12-2024



**sitts & hill**  
 CIVIL | STRUCTURAL | SURVEY  
 4818 CENTER STREET | TACOMA, WA 98409  
 PHONE: (253) 474-9449 | FAX: (253) 474-0183  
 http://www.sitts-hill.com/

PREPARED FOR  
**ST CHARLES BORROMEO PARISH**  
 7112 SOUTH 12TH STREET  
 TACOMA, WA 98465  
 MICHAEL MODERMOTT: 253-564-5785

PROJECT  
**ST CHARLES BORROMEO PARISH**  
 ADMINISTRATION BUILDING  
 TACOMA, WASHINGTON

SHEET TITLE  
**GRADING AND DRAINAGE PLAN**

SHEET NO.  
**C2.00**

PROJECT NO.  
**20126**



Approved 07/17/2024  
 Site Development  
 SDEV24-0120

Reviewed for Tacoma Code Compliance

**LEGEND**

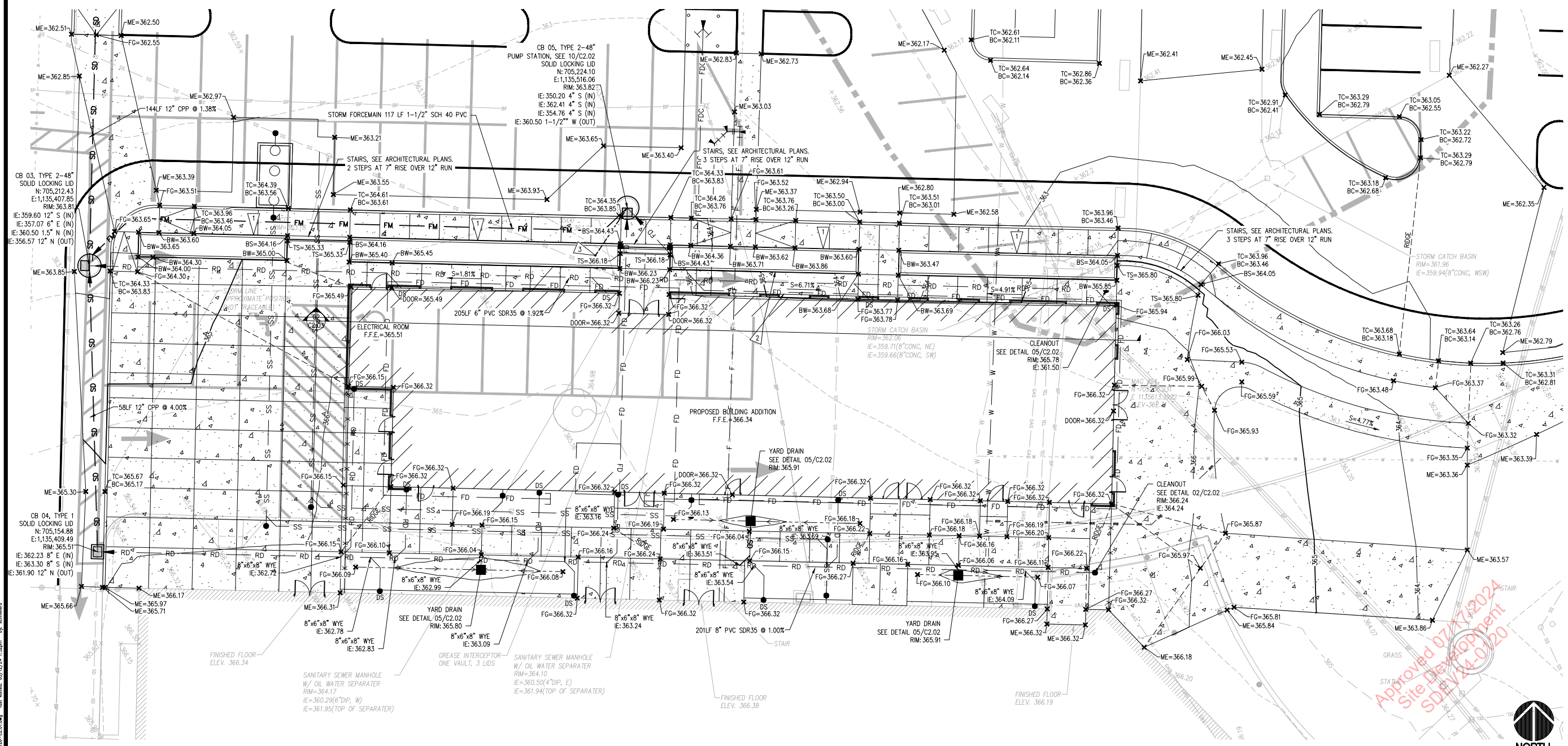
PROPOSED FEATURES		ABBREVIATIONS	
SD	STORM DRAIN PIPE	01	FINISHED FLOOR ELEVATION
RD	ROOF DRAIN PIPE	02	FG FINISHED GRADE
FD	FOUNDATION DRAIN PIPE	03	ME MATCH EXISTING GRADE
FM	FORCEMAIN	TC	TOP OF CURB
---	GRADE BREAK	BC	BOTTOM OF CURB
⊕	TYPE 1, TYPE 2 CATCH	TS	TOP OF STAIR
⊕	ROOF DRAIN CLEANOUT	BS	BOTTOM OF STAIR
500	PROPOSED MAJOR CONTOUR	FD	FOOTING DRAIN
499	PROPOSED MINOR CONTOUR	IE	INVERT ELEVATION
⊞	SIDEWALK RAMP	DS	DOWNSPOUT

**GENERAL NOTES**

- THE BURIED UTILITIES ON THIS PROJECT ARE SHOWN IN THEIR APPROXIMATE LOCATION WHERE KNOWN BASED ON FIELD SURVEY PERFORMED BY SITTS & HILL ENGINEERS, INC. OTHER EXISTING BURIED UTILITIES MAY NOT BE SHOWN ON THESE PLANS. THE CONTRACTOR SHALL CONTACT ALL UTILITY COMPANIES AND HAVE THEIR LOCATION MARKED ON THE GROUND PRIOR TO CONSTRUCTION. THE CONTRACTOR WILL PROTECT, OR IMMEDIATELY REPAIR, ANY DAMAGED UTILITY "DISCOVERED" ON THIS PROJECT WITHOUT ADDITIONAL COSTS.
- BOUNDARY AND TOPOGRAPHIC INFORMATION SHOWN ON THE SITE WAS PREPARED AND PROVIDED BY SITTS & HILL ENGINEERS, INC. SEE SHEET T1.00 FOR HORIZONTAL AND VERTICAL DATUM.
- THE CONTRACTOR SHALL BE FULLY RESPONSIBLE FOR MAINTAINING ALL STORM SYSTEMS (EXISTING AND PROPOSED) AND TESC FACILITIES THROUGH ALL PHASES OF CONSTRUCTION AND THROUGH PROJECT COMPLETION.
- MAINTAIN 6" MINIMUM VERTICAL AND 3' MINIMUM HORIZONTAL CLEARANCE (OUTSIDE SURFACES) BETWEEN STORM DRAIN PIPES AND OTHER UTILITY PIPES AND CONDUITS, UNLESS OTHERWISE NOTED. SEE STORM PROFILE SHEETS CXX FOR ADDITIONAL CROSSING INFORMATION.
- TYPE 2 CATCH BASINS GREATER THAN 4' FROM RIM TO INVERT TO HAVE STANDARD LADDERS.
- ALL CATCH BASIN GRATES SHALL BE BOLT DOWN GRATES AND INSTALLED WITH BOLTS. THE CONTRACTOR SHALL SET FRAMES AS NECESSARY TO MATCH CROSS SLOPE OF THE FINISH GRADE. THE PEDESTRIAN FRAME SHALL CONFORM TO WSDOT STANDARD PLAN B-30.15-00 GRATE ALTERNATE 3, LOCKING UPON COMPLETION OF PAVING AND LANDSCAPING. CLEAN ALL CATCH BASINS AND PIPING WITH A VACUUM TRUCK. PROVIDE INVOICE TO ENGINEER UPON COMPLETION.
- CONTRACTOR AND/OR SURVEYOR SHALL CALCULATE PIPE SLOPES BASED ON THE INVERT ELEVATIONS SHOWN ON THE PLANS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER OF ANY DISCREPANCIES PRIOR TO FIELD STAKING AND CONSTRUCTION.

**KEY NOTES**

- SEE ARCHITECTURAL PLANS FOR PLANTER HEIGHT AND FOOTING. PLANTER RETAINING WALL TO BE LESS THAN 4' TALL.
  - INSTALL HANDRAILS FOR RAMP GREATER THAN 12H:1V. SEE ARCHITECTURAL PLANS.
  - PUMP STATION VENT PIPE, SEE DETAIL 10/C2.02.
- ALL FOOTING DRAIN (FD) LINES SHALL BE 4" PERFORATED SDR-35 PVC AT EACH FOUNDATION LEVEL (GROUND FLOOR, BASEMENT, AND ELEVATOR PIT) IN ACCORDANCE WITH DETAIL 08/C2.02. SEE SHEET C2.04 FOR THE FOUNDATION DRAIN PLAN. EACH FOOTING DRAIN LEVEL SHALL BE TIGHTLINED DIRECTLY TO THE PUMP STATION WITH 4" SOLID WALL SDR-35 PVC AT 1.0% SLOPE MINIMUM. DO NOT CONNECT FOOTING DRAINS TO ROOF DRAINS OR ANOTHER FOOTING DRAIN LEVEL.
- ALL STORM DRAIN (SD) LINES SHALL BE CPP (CORRUGATED POLYPROPYLENE), DOUBLE GASKET GRAY PIPE, PER WSDOT STANDARD SPECIFICATION 9-05, UNLESS OTHERWISE NOTED, AND INSTALLED PER DETAIL 01/C2.02.
- ALL ROOF DRAIN (RD) LINES SHALL BE 6" SDR-35 PVC AT A MINIMUM SLOPE OF 1.0% (MINIMUM) IN ACCORDANCE WITH DETAIL 01/C2.02, UNLESS OTHERWISE NOTED. SEE DETAIL 04/C2.02 FOR DOWNSPOUT CONNECTIONS. COORDINATE LOCATION WITH ARCHITECTURAL PLANS.
- ALL STAIRS SHALL BE 6" SDR-35 PVC AT A MINIMUM SLOPE OF 1.0% (MINIMUM) IN ACCORDANCE WITH DETAIL 01/C2.02, UNLESS OTHERWISE NOTED. SEE DETAIL 04/C2.02 FOR DOWNSPOUT CONNECTIONS. COORDINATE LOCATION WITH ARCHITECTURAL PLANS.
10. SANDED MANHOLE ADAPTERS SHALL BE USED AT ALL CPP PIPE CONNECTIONS AT CATCH BASINS. GROUT INSIDE AND OUTSIDE OF STRUCTURE AT ADAPTER TO BE INSPECTED BY ENGINEER PRIOR TO BACKFILLING CATCH BASINS.
11. ALL CATCH BASIN INLETS IN OR ADJACENT TO PAVED AREAS SHALL BE MARKED WITH A 'FISH STENCIL,' SEE DETAIL 03/C3.03.



**ENLARGED GRADING AND DRAINAGE PLAN**  
SCALE: 1"=10'

HORIZONTAL SCALE: 1"=10'  
0 10 20



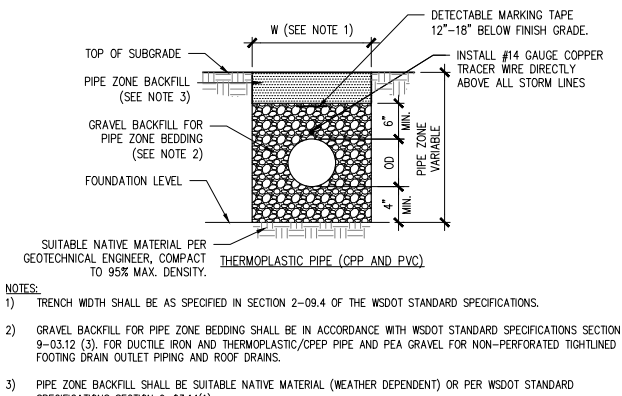
DESIGNED	A.S.	APPROVALS	REVISIONS
DRAWN	A.S.	SEAL	
CHECKED	R.H.		
DATE	05/18/2023		
SCALE	AS NOTED		
ISSUE FOR PERMIT	05-12-2024		

**sh sitts & hill**  
CIVIL | STRUCTURAL | SURVEY  
4815 CENTER STREET | TACOMA, WA 98409  
PHONE: (253) 474-9449 | FAX: (253) 474-0183  
http://www.sittshill.com/

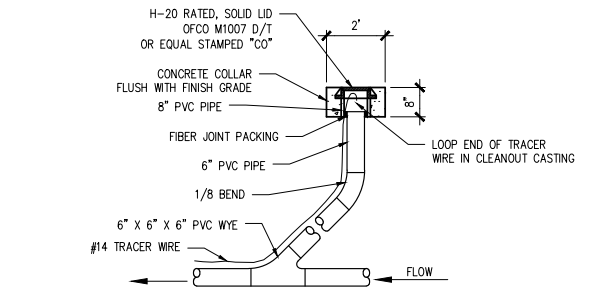
**ST CHARLES BORROMEO PARISH**  
ADMINISTRATION BUILDING  
TACOMA, WASHINGTON

**ENLARGED GRADING AND DRAINAGE PLAN**

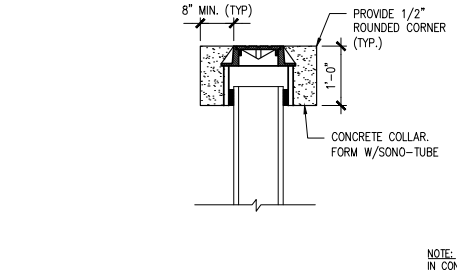
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SHEET NO. **20126**



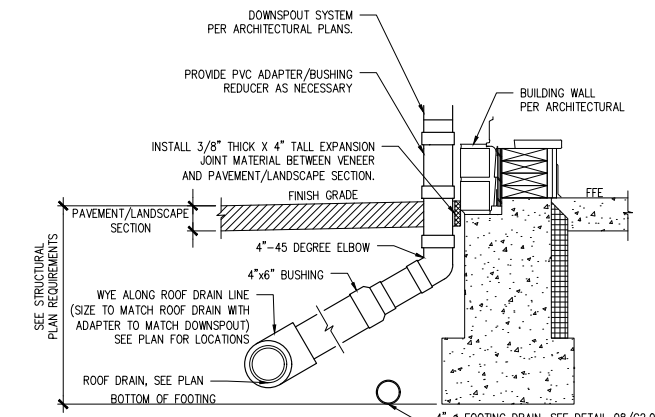
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SCALE: N.T.S.



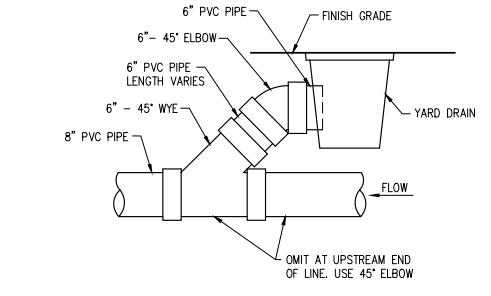
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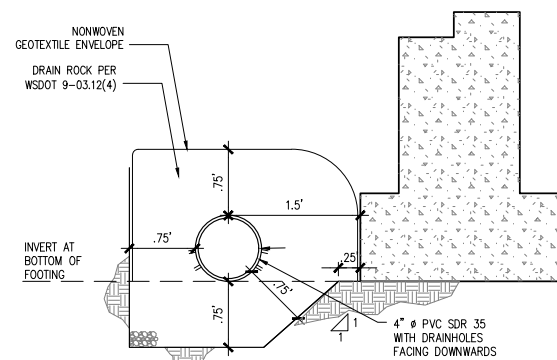
**03 CONCRETE COLLAR DETAIL**  
SCALE: N.T.S.



**04 DOWNSPOUT CONNECTION**  
SCALE: N.T.S.



**05 YARD DRAIN DETAIL**  
SCALE: N.T.S.



**08 FOOTING DRAIN DETAIL**  
SCALE: N.T.S.

**STORMFILTER DESIGN NOTES**

- CONCRETE CATCHBASIN STORMFILTER TREATMENT CAPACITY VARIES BY CARTRIDGE COUNT AND LOCAL APPROVALS
- PEAK CONVEYANCE CAPACITY IS 1.3 CFS
- CONCRETE CATCHBASIN STORMFILTER IS AVAILABLE WITH UP TO TWO (2), 18\"/>

CARTRIDGE SIZE (in. mm)	27 (686)	18 (457)
RECOMMENDED HYDRAULIC DROP (ft. mm)	3.05 (930)	2.3 (701)
SPECIFIC FLOW RATE (gpm/ft <sup>2</sup> (L/m <sup>2</sup> ))	2 (1.36)	1.67 (1.13)
CARTRIDGE FLOW RATE (gpm (L/m))	22.5 (1.4)	15.79 (1.19)
	11.25 (0.71)	15 (0.95)
		12.53 (0.79)
		7.5 (0.47)

**LINKING OPTIONS SHOWN BELOW. FLEXIBLE INLET PIPE, GRATED AND SOLID COVER PLACEMENT. CONTACT YOUR CONTECH REPRESENTATIVE FOR MORE INFORMATION.**

**GENERAL NOTES**

- CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
- DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
- ALTERNATE DIMENSIONS ARE MILLIMETERS (mm) UNLESS NOTED OTHERWISE.
- FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. [www.conteches.com](http://www.conteches.com)
- STORMFILTER WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
- FILTER CARTRIDGES SHALL BE MEDIA FILLED, PASSIVE, SIPHON ACTUATED, RADIAL FLOW, AND SELF-CLEANING. RADIAL MEDIA DEPTH SHALL BE 7 INCHES (178). FILTER MEDIA CONTACT TIME SHALL BE AT LEAST 38 SECONDS.
- SPECIFIC FLOW RATE IS THE MEASURE OF THE FLOW (GPM (L/S)) DIVIDED BY THE MEDIA SURFACE CONTACT AREA (SF (m<sup>2</sup>)).
- STRUCTURE SHALL MEET ASHTO H20-103 LOAD RATING, ASSUMING EARTH COVER OF 0\"/>

**INSTALLATION NOTES**

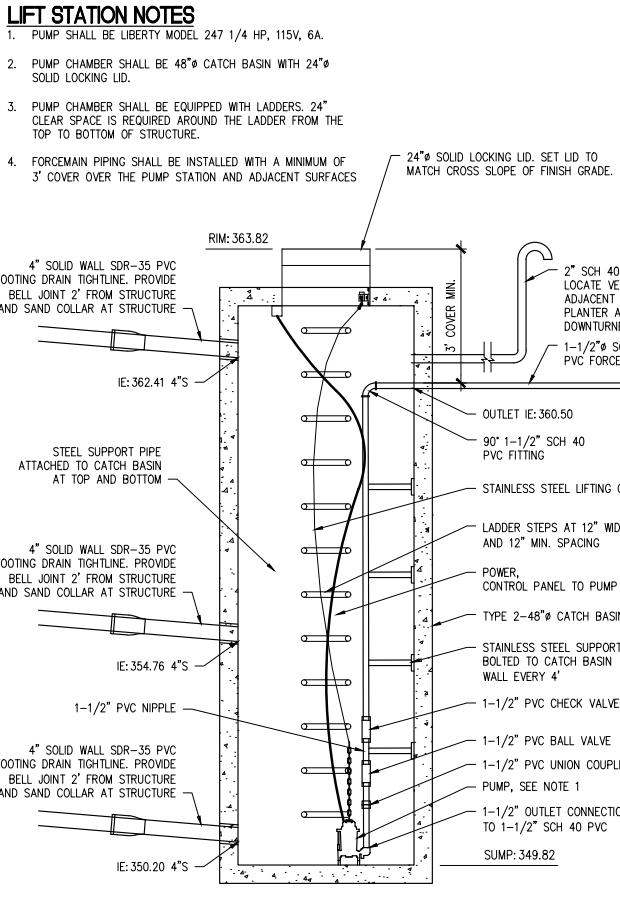
- ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
- CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE STORMFILTER STRUCTURE.
- CONTRACTOR TO PROVIDE AND INSTALL PIPES. MATCH PIPE INVERTS SHOWN ON PROJECT SPECIFIC DRAWINGS.
- CONTRACTOR TO TAKE APPROPRIATE MEASURES TO PROTECT CARTRIDGES FROM CONSTRUCTION-RELATED EROSION RUNOFF.

**SITE SPECIFIC DATA REQUIREMENTS**

PIPE DATA	INVERT	MATERIAL	DIAMETER
INLET PIPE 1			
INLET PIPE 2			
OUTLET PIPE	358.05	RCP	8"

**CONTECH ENGINEERED SOLUTIONS LLC**  
11815 NE Clinton Way, Portland, OR 97220  
503-548-4867 503-240-3393 800-561-1271 FAX

**09 CONTECH STORMFILTER CONCRETE CATCHBASIN**  
SCALE: N.T.S.



**10 STORM DRAINAGE LIFT STATION DETAIL**  
SCALE: 1\"/>

DESIGNED: A.S. DRAWN: A.S. CHECKED: R.H. DATE: 05/18/2023 SCALE: AS NOTED

ISSUE FOR PERMIT: 03-12-2024

APPROVALS: [Signature]

SEAL: [Professional Engineer Seal]

**sh sitts & hill**  
CIVIL | STRUCTURAL | SURVEY  
4816 CENTER STREET | TACOMA, WA 98409  
PHONE: (253) 474-9449 | FAX: (253) 474-0183  
<http://www.sittshill.com/>

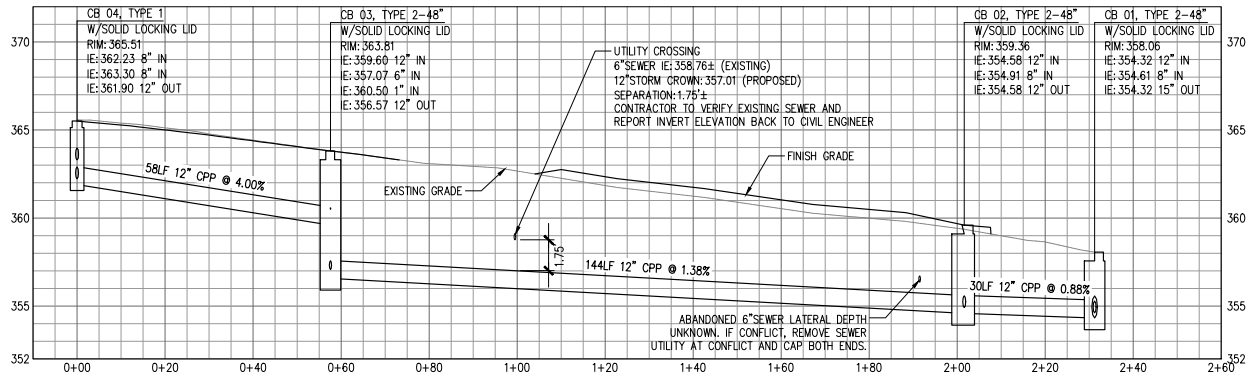
PROJECT: ST CHARLES BORROMEO PARISH ADMINISTRATION BUILDING TACOMA, WASHINGTON  
SHEET TITLE: GRADING AND DRAINAGE DETAILS  
SHEET NO.: C2.02  
PROJECT NO.: 20126

ST CHARLES BORROMEO PARISH  
7112 SOUTH 12TH STREET  
TACOMA, WA 98465  
MICHAEL MODERMOTT: 253-564-5785

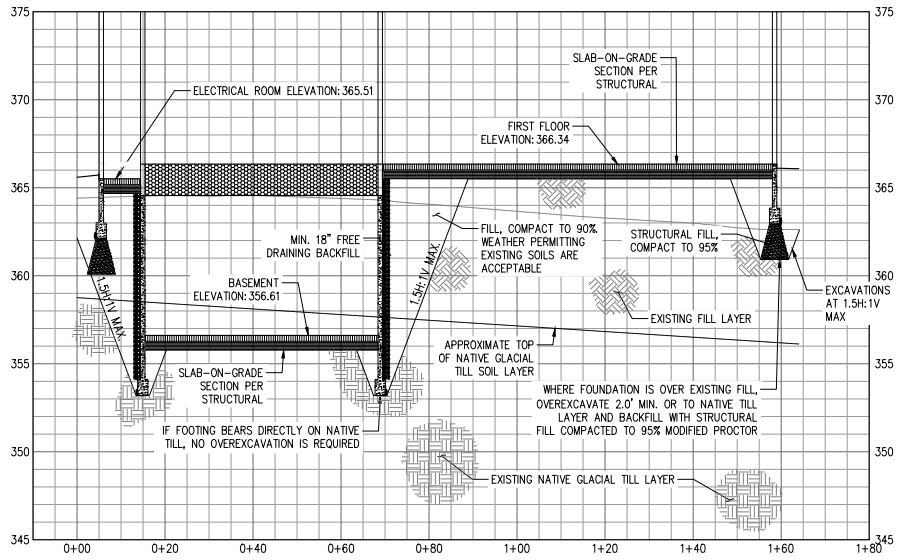
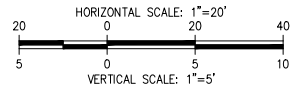
Approved 07/17/2024  
Site Development  
SDEV24-0120

811 Call 811  
two business days  
before you dig

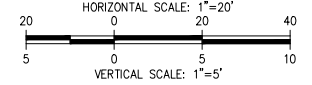




**01 CB 04 TO CB 01**  
SCALE: 1"=20' HORIZ ; 1"=5' VERT



**02 WEST TO EAST BUILDING EXCAVATION SECTION**  
SCALE: 1"=20' HORIZ ; 1"=5' VERT



DESIGNED	A.S.
DRAWN	A.S.
CHECKED	R.H.
DATE	05/18/2023
SCALE	AS NOTED
ISSUE FOR PERMIT	05-12-2024

APPROVALS	DESIGNED	A.S.
SEAL	DRAWN	A.S.
	CHECKED	R.H.
	DATE	05/18/2023
	SCALE	AS NOTED



**sh** **sitts & hill**  
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 PHONE: (253) 474-9449 | FAX: (253) 474-0183  
 http://www.sitts-hill.com/

ST CHARLES BORRAMEO  
 7112 SOUTH 12TH STREET  
 TACOMA, WA 98465  
 MICHAEL MCDERMOTT: 253-564-5785

PROJECT: ST CHARLES BORRAMEO PARISH ADMINISTRATION BUILDING TACOMA, WASHINGTON  
 SHEET TITLE: SECTIONS AND PROFILES  
 SHEET NO.: C2.03

PROJECT NO.: 20126



Approved 07/17/2024  
 Site Development  
 SDEV24-0120

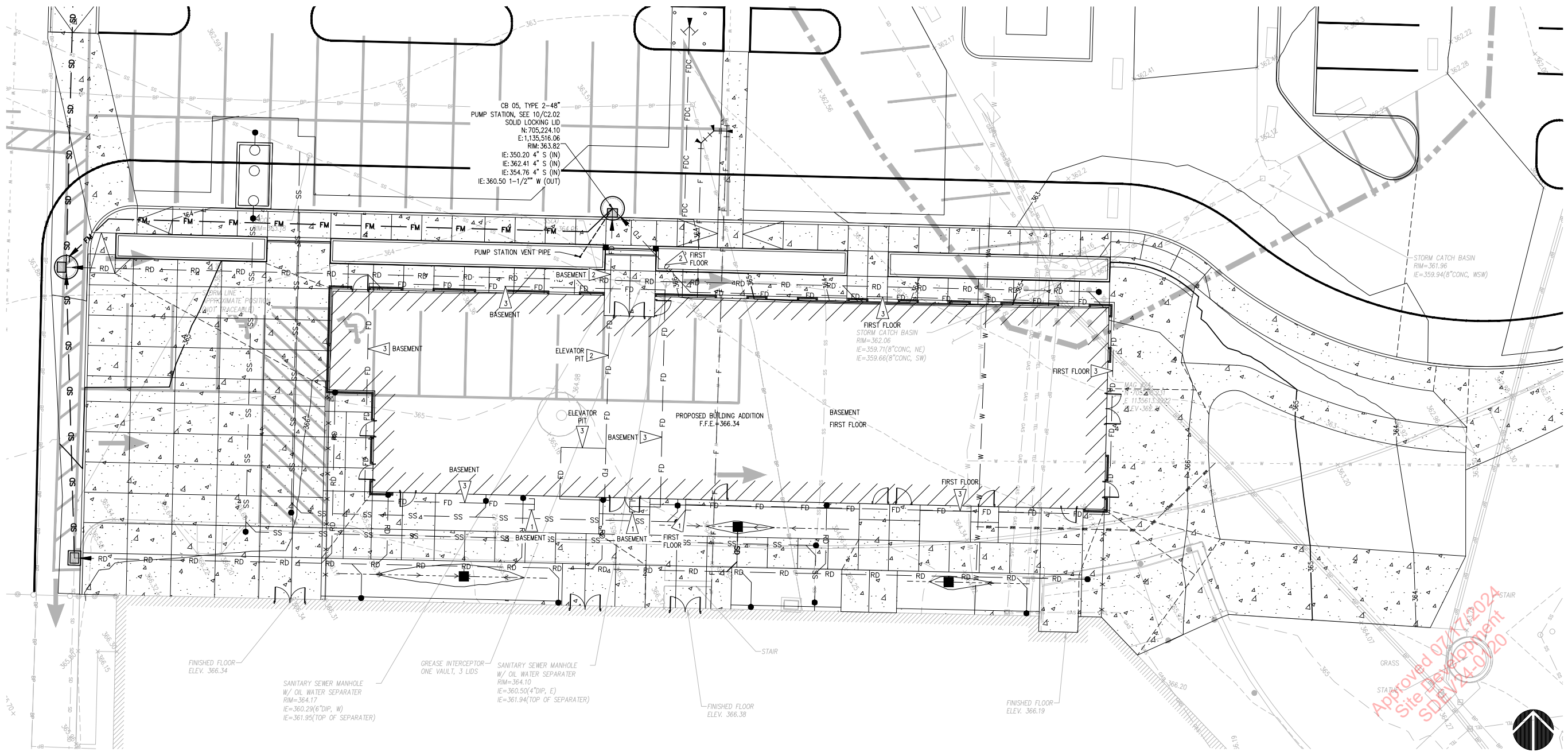
Reviewed for Tacoma Code Compliance

- LEGEND**
- PROPOSED FEATURES**
- SD STORM DRAIN PIPE (01, C2.02)
  - RD ROOF DRAIN PIPE (01, C2.02)
  - FD FOUNDATION DRAIN PIPE (08, C2.02)
  - FM FORCEMAIN
  - GRADE BREAK
  - TYPE 1, TYPE 2 CATCH (02, C2.02)
  - ⊥ ROOF DRAIN CLEANOUT
  - 500 PROPOSED MAJOR CONTOUR
  - 499 PROPOSED MINOR CONTOUR
  - ▭ SIDEWALK RAMP

**GENERAL NOTES**

1. ALL FOOTING DRAIN (FD) LINES TO BE 4" PERFORATED SDR-35 PVC AT EACH FOUNDATION LEVEL (GROUND FLOOR, BASEMENT, AND ELEVATOR PIT) IN ACCORDANCE WITH DETAIL 08/C2.02. EACH FOOTING DRAIN LEVEL SHALL BE TIGHTLINED DIRECTLY TO THE PUMP STATION WITH 4" SOLID WALL SDR-35 PVC AT 1.0% SLOPE MINIMUM. DO NOT CONNECT FOOTING DRAINS TO ROOF DRAINS OR ANOTHER FOOTING DRAIN LEVEL.

- KEY NOTES**
1. CAP END OF FOUNDATION DRAIN AT THE HIGHER LEVEL.
  2. TIGHTLINE FOUNDATION DRAIN TO PUMP STATION.
  3. FOUNDATION DRAIN AT BOTTOM OF FOOTING FOR THE LEVEL, SEE DETAIL 08/C2.02. SEE STRUCTURAL FOR BOTTOM OF FOUNDATION ELEVATION.



**ENLARGED FOUNDATION DRAIN PLAN**  
SCALE: 1"=10'

HORIZONTAL SCALE: 1"=10'  
0 10 20

**811 Call 811**  
two business days before you dig

**APPROVALS**

DESIGNED	A.S.
DRAWN	A.S.
CHECKED	R.H.
DATE	05/18/2023
SCALE	AS NOTED
ISSUE FOR PERMIT	05-12-2024

**ST CHARLES BORROMEO PARISH ADMINISTRATION BUILDING**  
TACOMA, WASHINGTON

**ENLARGED FOUNDATION DRAIN PLAN**

**C2.04**  
PROJECT NO. 20126

ST CHARLES BORROMEO  
7112 SOUTH 12TH STREET  
TACOMA, WA 98465  
MICHAEL McDERMOTT: 253-564-5785

Prepared by: **sh sitts & hill**  
CIVIL | STRUCTURAL | SURVEY  
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PHONE: (253) 474-9449 | FAX: (253) 474-0183  
http://www.sittshill.com/

Approved 07/17/2024  
Site Development  
SD/14-01-20

Reviewed for Tacoma Code Compliance