WESTLAKE CONSULTANTS

Planning | Engineering | Surveying

April 7th 2022

Lincoln City
Land Use Review

RE: Stormwater Management Calculations for 1500 SE Devils Lake Rd Lincoln City Outlets Redevelopment (Sherwin Williams)
Westlake Project No.: 2498-003

The applicant proposes to redevelop the southwest corner of the Lincoln City Outlet property (Tax Lots 4900) by sectioning off and demolishing an existing commercial wing and redeveloping inside the footprint with a new 4,022 sqft free standing retail building and a supporting parking lot. There is no net increase proposed to impervious areas inside the sub-basin due to this project. Furthermore, proposed storm drain conveyance will match existing routes which flow into the public system along 14th Street and flow to the west. This memorandum serves to demonstrate the preliminary conclusion that the project stormwater management can feasibly be developed in compliance with Chapter 3 of the Lincoln City Design Standards (henceforth Standards).

Basin Description:
Basin Size: 40,772 sqft
Existing Impervious Area: 33,017
Proposed Impervious Area: 29,057 sqft
Net Change to Impervious Area: 3,960 sqft reduction

Existing Pervious Area: 7,755 sqft
Proposed Pervious Area: 11,715 sqft
Net Change to Pervious Area: 3,960 sqft increase
Existing and proposed storm basin maps are shown in Attachments A and B to this memo.

Detention:
No new impervious area is being added to the site therefore we do not propose detention for flow control.

Water Quality:
Water quality facilities are required for all commercial subdivision projects per Chapter 3 of the Standards. Due to the horizontal site constraints as well as the shallow public storm system in the project vicinity, a cartridge based water quality vault system has been determined to be the best suited means of treatment. Peak run-off rate from the site was calculated to be 0.68 CFS for the full 2-year, 24-hour event (4.2 inches) using the Santa Barbara Urban Hydrograph method in HydroCAD. 50% of this peak flow, 0.34 CFS was utilized to select a cartridge quantity for a Perkfilter Vault (Oldcastle Infrastructure). Per the vendor, each cartridge has peak treatment capacity of 0.023 CFS, therefore 0.34 CFS/0.023 CFS = 15 cartridges minimum. An 8x12 15 cartridge system is therefore proposed. See

Attachment C for vendor preliminary specification and Attachment D for hydraulic calculations. Final detailing and vertical design of the system are to be provided in final engineering.

Conveyance:
All new piping and structures will be designed to convey the 25-year, 24 hour storm event with consideration given to safely pass beyond design basis storm events to prevent flooding of interior spaces and accessible pedestrian routes. Conveyance calculations will be prepared as part of final engineering.

This memorandum concludes that a stormwater management system is feasible for this project in full compliance with the established standards.

If you have any questions, please do not hesitate to contact us.

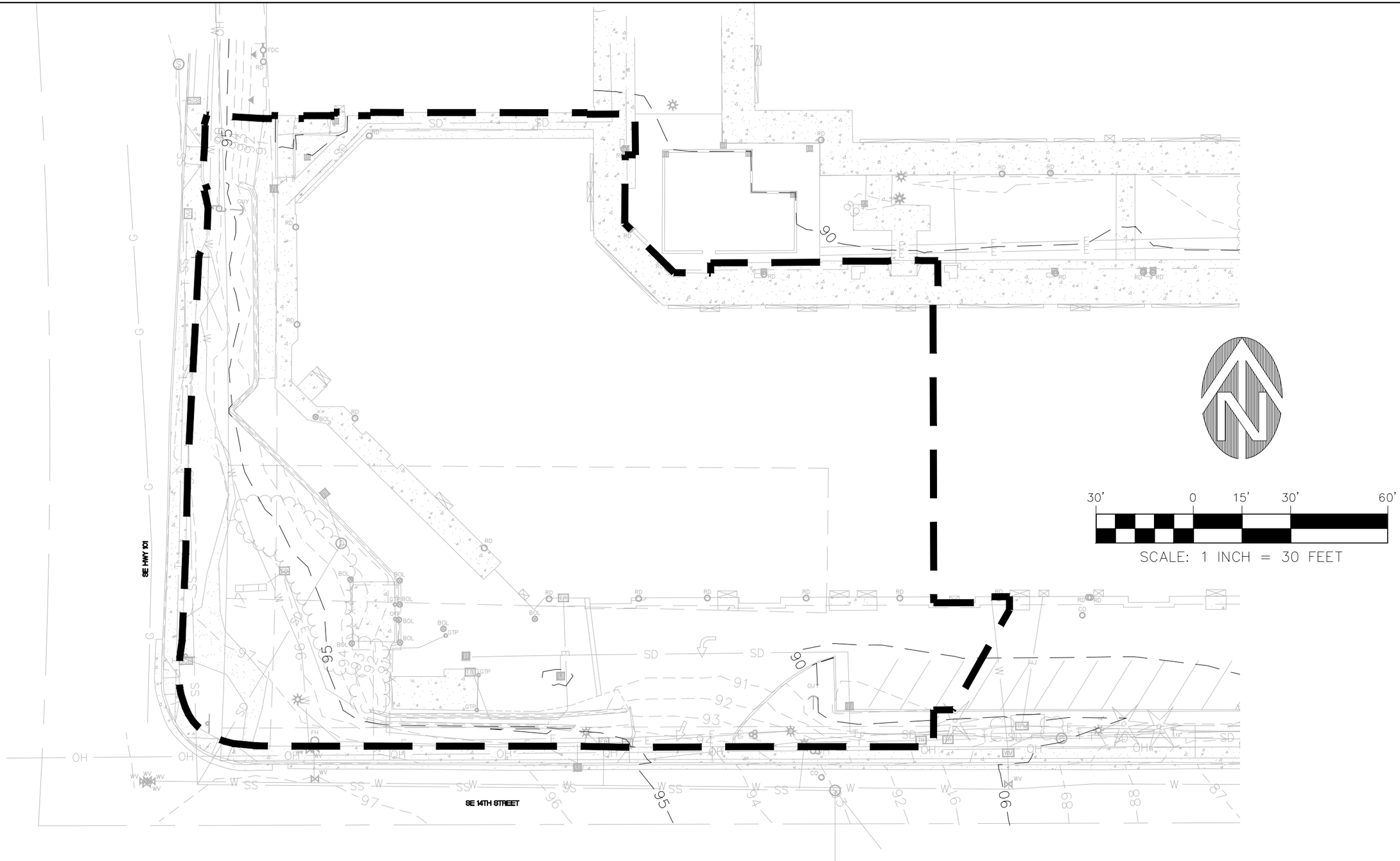
Sincerely,

Jeffrey M. Hinton, PE (96804)
Westlake Consultants, Inc.
Project Manager

ATTACHMENTS :
ATTACHMENT A – EXISTING BASIN MAP
ATTACHMENT B – PROPOSED BASIN MAP
ATTACHMENT C – OLDCASTLE PERKFILTER SPECIFICATIONS
ATTACHMENT D – HYDROCAD ANALYSIS REPORT

ATTACHMENT A

EXISTING BASIN MAP



SCALE: 1 INCH = 30 FEET

EXISTING

SITE AREA =	40,772 SF
IMPERVIOUS AREA =	33,017 SF
PERVIOUS AREA =	7,755 SF

DATE	2022-04-08
REVISION	0
DRAWN BY	SDS
CHECKED BY	
JOB NO.	2498-003

SHERWIN-WILLIAMS

LINCOLN CITY, OREGON

BASIN MAP
EXISTING

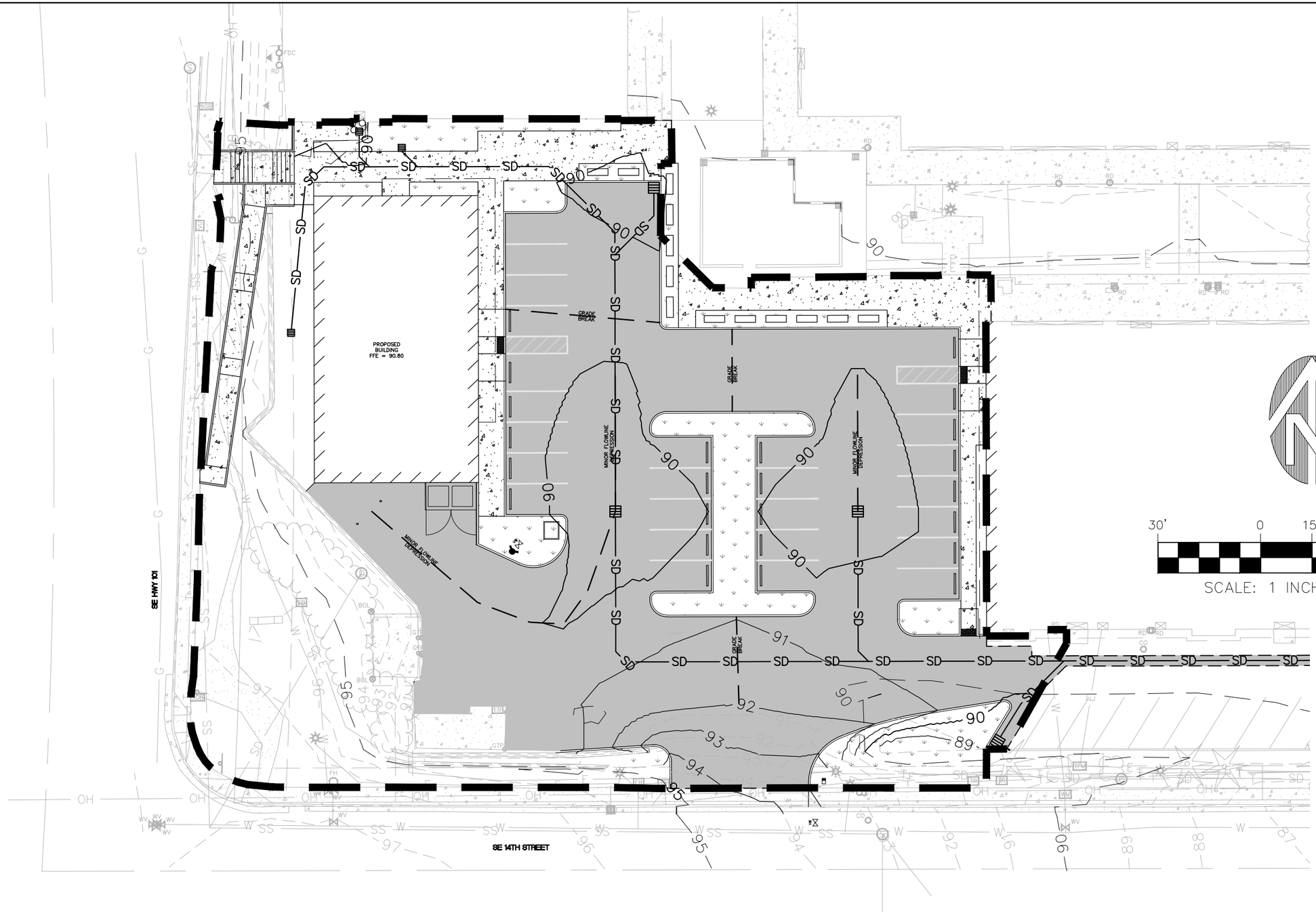
WESTLAKE CONSULTANTS

Planning | Engineering | Surveying

DRAWING NAME: J:\2498-003.22\6. ENGINEERING\4. REPORTS (CALCS)\BASIN MAPS.DWG 2022/04/08 - 03:05PM - CMH

ATTACHMENT B

PROPOSED BASIN MAP



30' 0 15' 30' 60'

SCALE: 1 INCH = 30 FEET

PROPOSED
SITE AREA = 40,772 SF
IMPERVIOUS AREA = 29,057 SF
PERVIOUS AREA = 11,715 SF

DATE	2022-04-08
REVISION	0
DRAWN BY	SDS
CHECKED BY	
JOB NO.	2498-003

SHERWIN-WILLIAMS

LINCOLN CITY, OREGON

BASIN MAP
PROPOSED

WESTLAKE CONSULTANTS

Planning | Engineering | Surveying

DRAWING NAME: J:\2498-003.22\6. ENGINEERING\4. REPORTS (CALCS)\BASIN MAPS.DWG 2022/04/08 - 03:04PM - CMH

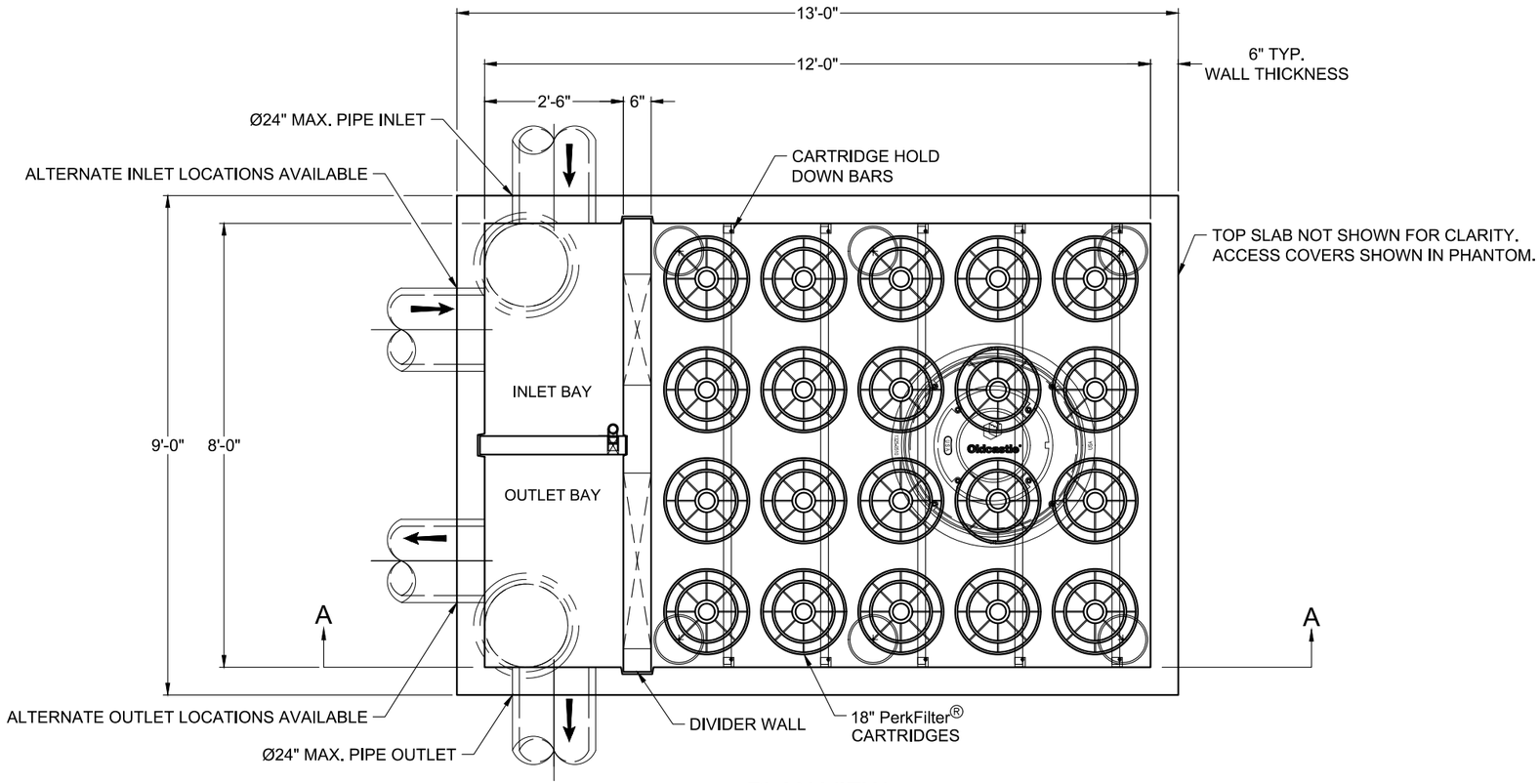
ATTACHMENT C

OLDCASTLE PERKFILTER SPECIFICATIONS

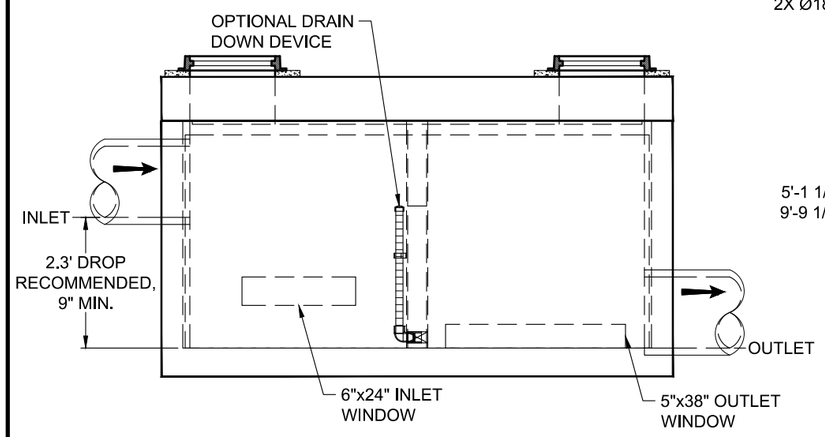
SITE SPECIFIC DATA				
Structure ID				-
Treatment Flow Rate (gpm/cfs)				-
Peak Flow Rate (cfs)				-
Rim Elevation				-
Pipe Data	**Pipe Location**	**Pipe Size**	**Pipe Type**	**Invert Elevation**
Inlet 1	-	-	-	-
Inlet 2	-	-	-	-
Outlet	-	-	-	-
Notes: -				

PERFORMANCE SPECIFICATIONS	
Peak Treatment Capacities:[1]	
Max. Cartridge Quantity	20
NJDEP 80% Removal, 75 micron	0.802 cfs
WA Ecology GULD - Basic & Phosphorus	0.455 cfs
Max. Bypass Capacity	12.0 cfs

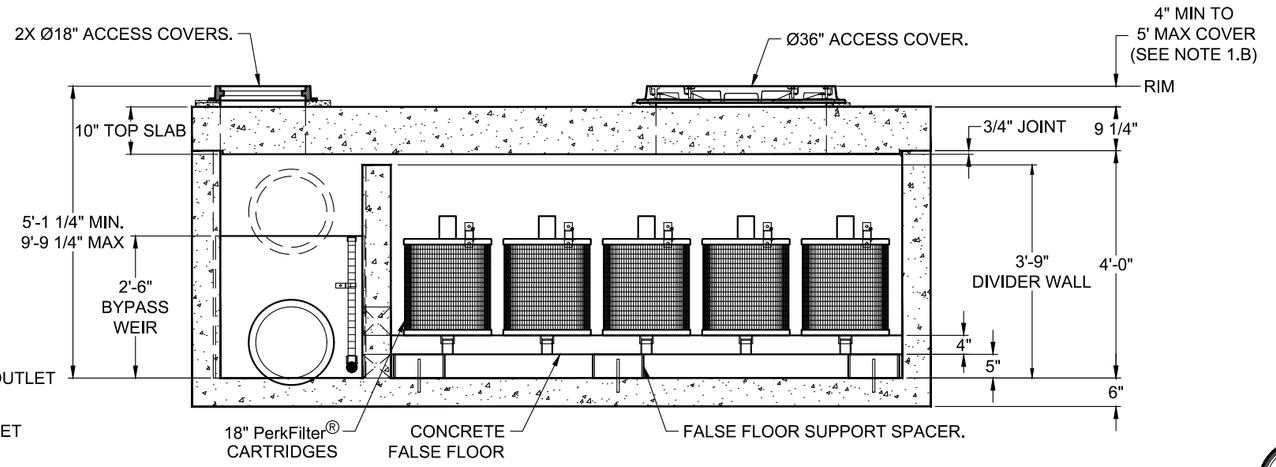
1. Contact Oldcastle for alternative treatment and peak flow capacities.



PLAN VIEW



LEFT END VIEW



SECTION A-A

NOTES:

1. DESIGN LOADINGS:
   A. AASHTO HS-20-44 (WITH IMPACT)
   B. DESIGN SOIL COVER: 5'-0" MAXIMUM
   C. ASSUMED WATER TABLE: BELOW BASE OF PRECAST (ENGINEER-OF-RECORD TO CONFIRM SITE WATER TABLE ELEVATION)
   D. LATERAL EARTH PRESSURE: 45 PCF (DRAINED)
   E. LATERAL LIVE LOAD SURCHARGE: 80 PSF (APPLIED TO 8'-0" BELOW GRADE)
   F. NO LATERAL SURCHARGE FROM ADJACENT BUILDINGS, WALLS, PIERS, OR FOUNDATIONS.
2. CONCRETE 28-DAY MINIMUM COMPRESSIVE STRENGTH: 5,000 PSI MINIMUM.
3. REINFORCING: REBAR, ASTM A615/A706, GRADE 60
4. CEMENT: ASTM C150
5. REQUIRED ALLOWABLE SOIL BEARING CAPACITY: 2,500 PSF
6. REFERENCE STANDARD:
   A. ASTM C890
   B. ASTM C913
   C. ACI 318-14
7. THIS STRUCTURE IS DESIGNED TO THE PARAMETERS NOTED HEREIN. ENGINEER-OF-RECORD SHALL VERIFY THAT NOTED PARAMETERS MEET OR EXCEED PROJECT REQUIREMENTS. IF DESIGN PARAMETERS ARE INCORRECT, REVIEWING ENGINEER/AUTHORITY SHALL NOTIFY OLDCASTLE INFRASTRUCTURE UPON REVIEW OF THIS SUBMITTAL.
8. OVERSIZED HOLES TO ACCOMMODATE SPECIFIC PIPE TYPE MUST BE CONCENTRIC TO PIPE ID. AFTER PIPES ARE INSTALLED, ALL ANNULAR SPACES SHALL BE FILLED WITH A MINIMUM OF 3,000 PSI CONCRETE FOR FULL THICKNESS OF PRECAST WALLS. PIPES ARE TO BE FLUSH WITH THE INSIDE SURFACE OF THE CONCRETE STRUCTURE.
9. CONTRACTOR RESPONSIBLE TO VERIFY ALL SIZES, LOCATIONS, AND ELEVATIONS OF OPENINGS.
10. CONTRACTOR RESPONSIBLE TO ENSURE ADEQUATE BEARING SURFACE IS PROVIDED (I.E. COMPACTED AND LEVEL PER PROJECT SPECIFICATIONS).
11. SECTION HEIGHTS, SLAB/WALL THICKNESSES, AND KEYWAYS ARE SUBJECT TO CHANGE AS REQUIRED FOR SITE REQUIREMENTS AND/OR DUE TO PRODUCT AVAILABILITY AND PRODUCTION FACILITY CONSTRAINTS.
12. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHTS, PLEASE CONTACT OLDCASTLE INFRASTRUCTURE.
13. MAXIMUM PICK WEIGHTS:
   A. TOP: XX,XXX LBS
   B. BASE: XX,XXX LBS* (* COMBINED WEIGHT OF BASE INCLUDES DIVIDER WALLS, FALSE FLOOR, AND PRODUCT INTERNALS.)
14. INTERNALS SHALL CONSIST OF CARTRIDGES, WEIR WALL, FALSE FLOOR, FALSE FLOOR SUPPORT SPACERS, AND DIVIDER WALL.

Media Filtration

Oldcastle Infrastructure™ A CRH COMPANY

Ph: 800.579.8819 | www.oldcastleinfrastructure.com/stormwater

PerkFilter® Vault (STANDARD)

8'x12' With 18" Cartridges

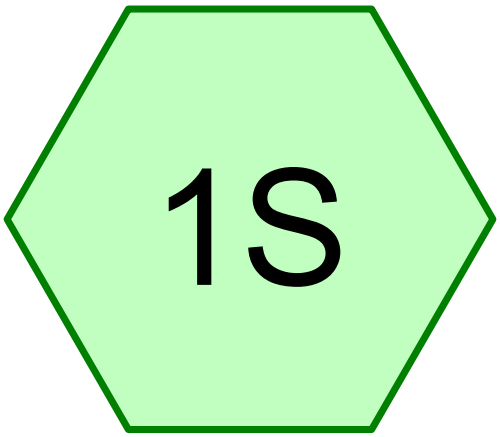
CUSTOMER: -

PROJECT NAME: -

SHEET NAME	REVISION	SHEET
Specifier Drawing PFV-812-18	-	1 OF 1
	REV DATE: -	

ATTACHMENT D

HYDROCAD ANALYSIS REPORT



PROPOSED BASIN

Subcat Reach Pond Link

Routing Diagram for Preliminary Storm Calcs
Prepared by {enter your company name here}, Printed 4/8/2022

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.667	98	(1S)
0.269	69	50-75% Grass cover, Fair, HSG B (1S)
0.936	**90**	**TOTAL AREA**

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	
0.269	HSG B	1S
0.000	HSG C	
0.000	HSG D	
0.667	Other	1S
0.936		**TOTAL AREA**

Ground Covers (all nodes)

HSG-A (acres)	HSG-B (acres)	HSG-C (acres)	HSG-D (acres)	Other (acres)	Total (acres)	Ground Cover	Subcatchment Numbers
0.000	0.000	0.000	0.000	0.667	0.667		1S
0.000	0.269	0.000	0.000	0.000	0.269	50-75% Grass cover, Fair	1S
0.000	**0.269**	**0.000**	**0.000**	**0.667**	**0.936**	**TOTAL AREA**	

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SBUH method, Split Pervious/Imperv.
Reach routing by Stor-Ind+Trans method - Pond routing by Stor-Ind method

Subcatchment1S: PROPOSED BASIN Runoff Area=40,772 sf 71.27% Impervious Runoff Depth=1.41"
Tc=5.0 min CN=69/98 Runoff=0.32 cfs 0.110 af

Total Runoff Area = 0.936 ac Runoff Volume = 0.110 af Average Runoff Depth = 1.41"
28.73% Pervious = 0.269 ac 71.27% Impervious = 0.667 ac

Summary for Subcatchment 1S: PROPOSED BASIN

[49] Hint: Tc<2dt may require smaller dt

Runoff = 0.32 cfs @ 7.90 hrs, Volume= 0.110 af, Depth= 1.41"

Runoff by SBUH method, Split Pervious/Imperv., Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
Type IA 24-hr 50% - 2-yr WQ Rainfall=2.10"

	Area (sf)	CN	Description
*	29,057	98	
	11,715	69	50-75% Grass cover, Fair, HSG B
	40,772	90	Weighted Average
	11,715	69	28.73% Pervious Area
	29,057	98	71.27% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
5.0					**Direct Entry,**

Subcatchment 1S: PROPOSED BASIN