

COLUMBIA HEIGHTS

Community Development Department
590 40th Ave. NE, Columbia Heights, MN 55421

SITE PLAN APPLICATION (UNDER 1 ACRE) ORDINANCE NO. 9.104 (N)

This application is subject to review and acceptance by the City. Applications will be processed only if all required items are submitted.

PROPERTY INFORMATION

Proposed name of development: Tsunami Express Car Wash
Project Address/Location: 999 50th Ave. NE, Columbia Heights, MN 55421
Legal Description of property involved: See Attached Word Document

Present use of property Office Building
Proposed use of property Car Wash

PROPERTY OWNER (As it appears on property title):

Name: Tsunami Car Wash Intermediate Holdco, LLC / Blake Ketner
Mailing Address: 4800 Meadows Road, Suite 300
City: Lake Oswego State: OR Zip: 97305
Daytime Phone: 920-744-9882 Cell Phone: _____
E-mail Address: blake.ketner@tsunamiexpress.com
Signature/Date: Blake Ketner 07/31/2024

APPLICANT:

Company Name (please print): Civil Site Group
Contact Person (please print): Dave Knaeble
Mailing Address: 5000 Glenwood Ave
City: Golden Valley State: MN Zip: 55422
Daytime Phone: 612-615-0060 Cell Phone: _____
Email Address: dknaeble@civilsitegroup.com
Signature/Date: Dave J Knaeble

Disclaimer: Information submitted, including contact information shall be made available to the public, unless otherwise noted.

COLUMBIA HEIGHTS

REASON FOR REQUEST (please attach a written narrative describing your proposal, the intended use of the property and justification for your request.)

FOR OFFICE USE ONLY

CASE NO: _____

APPLICATION REC'D BY: _____

\$500 APPLICATION FEE REC'D: _____

DATE APPLICATION REC'D: _____

RECEIPT NUMBER: _____

Legal Description of Property

That part of Lots 8 and 9, Auditor's Subdivision No. 153, in the Northwest 1/4 of Section 25, Township 30, Range 24, described as follows: Commencing at the Southwest corner of the Northwest 1/4 of said Section 25; thence Northerly along the West line of said Northwest 1/4 a distance of 710.00 feet; thence Easterly, deflecting 90 degrees 06 minutes, 32 seconds to the right, a distance of 140.06 feet; thence 90.16 feet along a tangential curve to the right having a radius of 766.35 feet, to the East line of the West 230.00 feet of said Northwest 1/4, being the actual point of beginning of the parcel of land to be described; thence continuing Easterly along said curve a distance of 223.58 feet to the East line of the West 445.00 feet of said Northwest 1/4; thence Northerly along the East line of the West 445.00 feet of the Northwest 1/4 a distance of 203.56 feet more or less to the intersection of said line with a line erected Easterly from a point in the West line of said Northwest 1/4 distant 850.00 feet Northerly of the Southwest corner thereof (said line erected Easterly at an angle of 90 degrees 06 minutes 32 seconds as measured from North to East); thence Westerly along said erected line a distance of 215.00 feet to the East line of the West 230.00 feet of said Northwest 1/4; thence Southwesterly along said East line of the West 230.00 feet of the Northwest 1/4 a distance of 145.30 feet to the point of beginning, Anoka County, Minnesota.



YOUR PREMIER DESIGN/BUILD PARTNER

31 July 2024

Community Development Department – City of Columbia Heights
590 40th Ave. NE
Columbia Heights, MN 55421

RE: Tsunami Express Carwash –

To Whom It May Concern,

Tsunami Express Carwash (“Tsunami”) is proudly presenting the proposed development plans for a state-of-the-art facility that will serve Columbia Heights (the “City”) and the surrounding communities.

Introduction

The proposed development is located directly South of the Aldi located on Central Ave NE, and the parcel number is 25-30-24-23-0002. The property is a 0.83 acre site currently occupied by an abandoned building. The site is currently zoned as GB “General Business.” The GB zoning district allows a car wash as a permitted use. The proposed facility is a single-story 4,300 SF building including the car wash bay, mechanical room, storage, office, and restroom. Accessory buildings include a 100 SF employee sales booth, 100 SF vacuum pump house, and dumpster enclosure.

Business Operations

Tsunami Express Carwash (“Tsunami”) is a high-quality express car wash that uses state-of-the-art equipment and provides customers with a wide variety of services. For washes, Tsunami offers several levels of memberships, or customers can pay for a single wash at every visit. The wash cycles are offered at varying price points to suit the needs of each customer.

The site will house 10 vacuums to serve 18 parking stalls. These stalls will be 13’-0” wide and 18’-0” deep. This is wider than the average parking stall to allow for more maneuverability around the vehicle. The vacuums will be available to customers for free regardless of whether they go through the wash. The free vacuums will only be available for use during regular business hours.

In addition to regular business operations, Tsunami also fosters community connections and is an advocate for supporting local organizations. They offer an opportunity to host fundraisers, giving a modern spin on the famous “community car wash” that was once a popular method of raising funds for various community organizations. Supporters of the organizations will receive a high-quality car wash, and the organization receives 50% of the proceeds from every wash donated back to them.

Regular business hours extend from 7:00 am to 8:00 pm daily. There will be attendants on duty for the full duration of the operating hours to assist customers and maintain the cleanliness of the site. Each shift will employ 2-3 employees with a total staff of approximately 8-10 employees. During these hours, Tsunami expects to service 200-400 customers per day.

Tsunami currently has five (5) facilities in the Milwaukee area including: Oak Creek, Greenfield, Waukesha, on Fond du Lac Avenue. They are excited to expand into and invest in the communities in Minnesota.

Entitlement Strategy & Timeline

Tsunami will comply with the local approval process by submitting a Site Plan Application for Plan Commission consideration. They anticipate receiving municipal approvals in Fall of 2024 with single-phase construction beginning in the Spring of 2025 thereafter. The facility is anticipated to be open and operational in early Fall of 2025.

Site Plan

The site is arranged such that the main car wash building is located on the north side of the site and is oriented to be parallel to 50th Ave NE. Tsunami strives to place themselves in areas that make access to their services convenient, allowing their customers to easily incorporate a car wash into their weekly errands.

- Layout: The plan shows (20) parking stalls with (2) being dedicated ADA spaces. The entrance to the wash includes (2) pay stations that allow space for the stacking of up to (8) vehicles – (4) per lane.
- Vacuum Design & Placement: The vacuums are aligned along both sides of the parking lot with one vacuum post serving two parking stalls. Each vacuum has (2) hoses that are attached to a central vacuum system that routes to either the main building or the detached pump house at the southeast corner of the site. Each vacuum station is also equipped with a trash bin, a mat clip for easy vacuuming, and a central blower system to help clean those hard-to-reach places.
- Landscaping/Screening: There is ample landscaping throughout the site that has been designed by a professional landscape architect. The dumpster is screened by an enclosure constructed of materials that match the main building, and the pump house is a fully-enclosed secondary building also constructed of similar materials. There is a retaining wall along the East property line, and the site sits 5 feet lower than the residential property to the east. There will be a fence installed at the top of the retaining wall to provide visual screening and safety.
- Access: There are two entrances to the site. The curb cut located on the east end of the site allows customers to access the pay stations to enter the wash tunnel. After exiting the wash tunnel, vehicles can continue on straight to exit the site or turn left to access the free vacuums. The curb cut on the west end of the site allows vehicles to exit the site and/or access the free vacuums without going through the wash tunnel.
- Signage: A full signage package complying with all code standards will be submitted for approval. There will be signage on the building as well as one monument sign on the west end of the site directly east of the site access lane.
- Lighting: The proposed lighting plan includes general pole lighting, wall packs, and canopy lighting that provide an average illumination of 2.0 footcandles.

Architecture

The design of the building consists of beige split-faced concrete block, gray masonry, clear anodized aluminum storefront windows, and a blue standing seam metal roof. The long façade

is broken up with brick accent piers. The windows located in the mechanical room will be spandrel glazing.

The main structure of the building consists of structural CMU walls, precast hollow core planks for the roof of the wash tunnel, steel joists and metal deck for the roof of the mechanical/support rooms and poured-in-place concrete foundation walls.

The tunnel contains dual overhead doors at both the entrance and the exit. The interior door will be insulated metal with vision lites to provide thermal protection and security during non-operational hours; the exterior overhead door will be vinyl roll-up doors that will correspond with Tsunami's blue and yellow branding. These vinyl doors are intended to provide protection from the elements in the winter months when the metal doors are open.

Conclusion

Tsunami Express Carwash is excited for the opportunity to submit their state-of-the-art facility to the Plan Commission to be considered for this site. They will prove to be a valuable addition to the Columbia Heights community.

Documents

Accompanying this narrative are all the documents required for the City to review and consider the project for approval. Also included are supplemental documents that provide additional information that may be of use to the Plan Commission while reviewing our submittal. These supplemental documents include:

- **Exhibit 1: Lighting Cut Sheets** Specific information on all proposed lighting fixtures to supplement the site photometric plan. *(Included in digital submittal only to conserve paper.)*
- **Exhibit 2: Reclaim System & Equipment** Information regarding the reclaim system and equipment.

Other documents are available upon request. These documents include a geotechnical survey and safety data sheets for all chemicals used for operations.

A sound study is planned be conducted for this site specifically to show the car wash's noise impact on the adjacent properties. The final report will be available and shared with the city as soon as it is received.

Please do not hesitate to contact us with any additional questions.

Sincerely,



Miranda R. Seals, AIA, NCARB
Architect
The Redmond Company

999 50th Avenue NE

Columbia Heights, Anoka County, Minnesota 55421

Tsunami Express Car Wash

4800 Meadows Road, #300, Lake Oswego, Oregon 97035

PROJECT

I HEREBY CERTIFY THAT THIS SURVEY, PLAN, OR REPORT WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY LICENSED LAND SURVEYOR UNDER THE LAWS OF THE STATE OF MINNESOTA.

RORY L. SYNSTELIEN
DATE 6-28-2024 LICENSE NO. 44565

QA/QC
FIELD CREW HS/BS
DRAWN BY DS
REVIEWED BY CJ
UPDATED BY



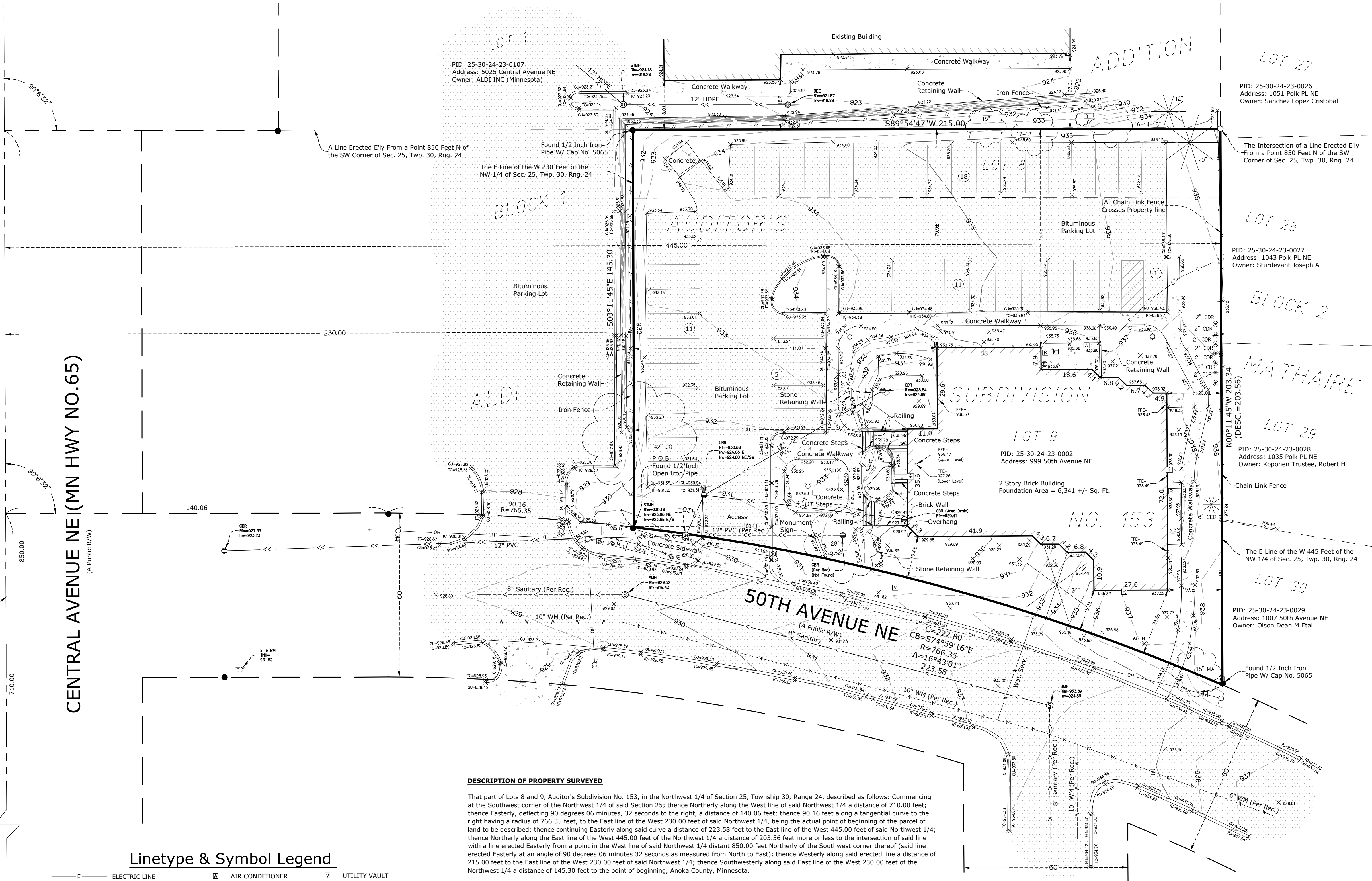
REVISION SUMMARY	
DATE	DESCRIPTION
PROJECT NO.: 24289.00	

PROJECT NO. 24289.00

ALTA/NSPS LAND
TITLE SURVEY

V1.0

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DESCRIPTION OF PROPERTY SURVEYED

That part of Lots 8 and 9, Auditor's Subdivision No. 153, in the Northwest 1/4 of Section 25, Township 30, Range 24, described as follows: Commencing at the Southwest corner of the Northwest 1/4 of said Section 25; thence Northerly along the West line of said Northwest 1/4 a distance of 710.00 feet; thence Easterly, deflecting 90 degrees 06 minutes, 32 seconds to the right, a distance of 140.06 feet; thence 90.16 feet along a tangential curve to the right having a radius of 766.35 feet, to the East line of the West 230.00 feet of said Northwest 1/4, being the actual point of beginning of the parcel of land to be described; thence continuing Easterly along said curve a distance of 223.58 feet to the East line of the West 445.00 feet of said Northwest 1/4; thence Northerly along the East line of the West 445.00 feet of the Northwest 1/4 a distance of 203.56 feet more or less to the intersection of said line with a line erected Easterly from a point in the West line of said Northwest 1/4 distant 850.00 feet Northerly of the Southwest corner thereof (said line erected Easterly at an angle of 90 degrees 06 minutes 32 seconds as measured from North to East); thence Westerly along said erected line a distance of 215.00 feet to the East line of the West 230.00 feet of said Northwest 1/4; thence Southwesterly along said East line of the West 230.00 feet of the Northwest 1/4 a distance of 145.30 feet to the point of beginning, Anoka County, Minnesota.

Abstract Property

GENERAL SURVEY NOTES

- Bearings are based on the NAD83 Datum. Site Benchmark is the top nut of the fire hydrant located on the south side of 50th Avenue NE, approximately 153 feet southwest of the southwest corner of the subject property, as shown hereon. Elevation = 931.52.
- Elevations are based on the NAVD 88 Datum. Site Benchmark is the top nut of the fire hydrant located on the south side of 50th Avenue NE, approximately 153 feet southwest of the southwest corner of the subject property, as shown hereon. Elevation = 931.52.
- We have shown the location of utilities to the best of our ability based on observed evidence together with evidence from the following sources: plans obtained from utility companies, plans provided by client, markings by utility companies and other appropriate sources. We have used this information to develop a view of the underground utilities for this site. However, lacking excavation, the exact location of underground features cannot be accurately, completely and reliably depicted. Where additional or more detailed information is required, the client is advised that excavation may be necessary. Also, please note that seasonal conditions may inhibit our ability to visibly observe all the utilities located on the subject property.

ALTA/NSPS LAND TITLE SURVEY NOTES

(numbered per Table A)

- Monuments placed and/or found at all major corners of the boundary of the surveyed property as shown hereon.
- Site Address: 999 50th Avenue NE, Columbia Heights, Minnesota 55421.
- This property is contained in Zone X (area determined to be outside the 0.2% annual chance floodplain) per Flood Insurance Rate Map, Community Panel No. 27003C0411E, effective date of December 16, 2015.
- The Gross land area is 36,268 +/- square feet or 0.833 +/- acres.
- (a) Exterior dimensions of buildings at ground level as shown hereon.
- Substantial features observed in the process of conducting the fieldwork as shown hereon. Please note that seasonal conditions may inhibit our ability to visibly observed all site features located on the subject property.
- The number of striped parking stalls on this site are as follows: 46 Regular + 0 Handicap = 46 Total Parking Stalls.
- The names of the adjoining owners of the platted lands, as shown hereon, are based on information obtained from the Anoka County Interactive Property Map.

SURVEY REPORT

- This map and report was prepared with the benefit of a Commitment for Title Insurance issued by Prestige Commercial Title as agent for Commonwealth Land Title Insurance Company, File No. 240543308, dated May 6, 2024.
We note the following with regards to Schedule B II Exceptions of the herein referenced Title Commitment:
 - Item no.'s 1-8 and 10 are not survey related.
 - All Easements, including those for utility and drainage purposes, if any, as shown on the recorded plat of Auditor's Subdivision No. 153. See plat drawing for dimension and location. **The plat does not dedicate any easements within the subject property.**
- Conflicts such as (but not limited to): encroachments, protrusions, access, occupation, and easements and/or servitudes:
 - Chain link fence crosses the east line of the subject property, as shown hereon.

ALTA CERTIFICATION

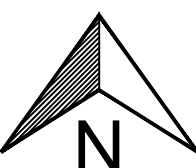
To: A & A Properties, LLP, a limited liability partnership; Tsunami Car Wash Intermediate Holdco, LLC; Prestige Commercial Title; and Commonwealth Land Title Insurance Company:
This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 7(a), 8, 9, and 13 of Table A thereof.
The fieldwork was completed on 6-24-2024.
Dated this 28th day of June, 2024.

Rory L. Synsteliem
rory@civilsitegroup.com
Minnesota License No. 44565

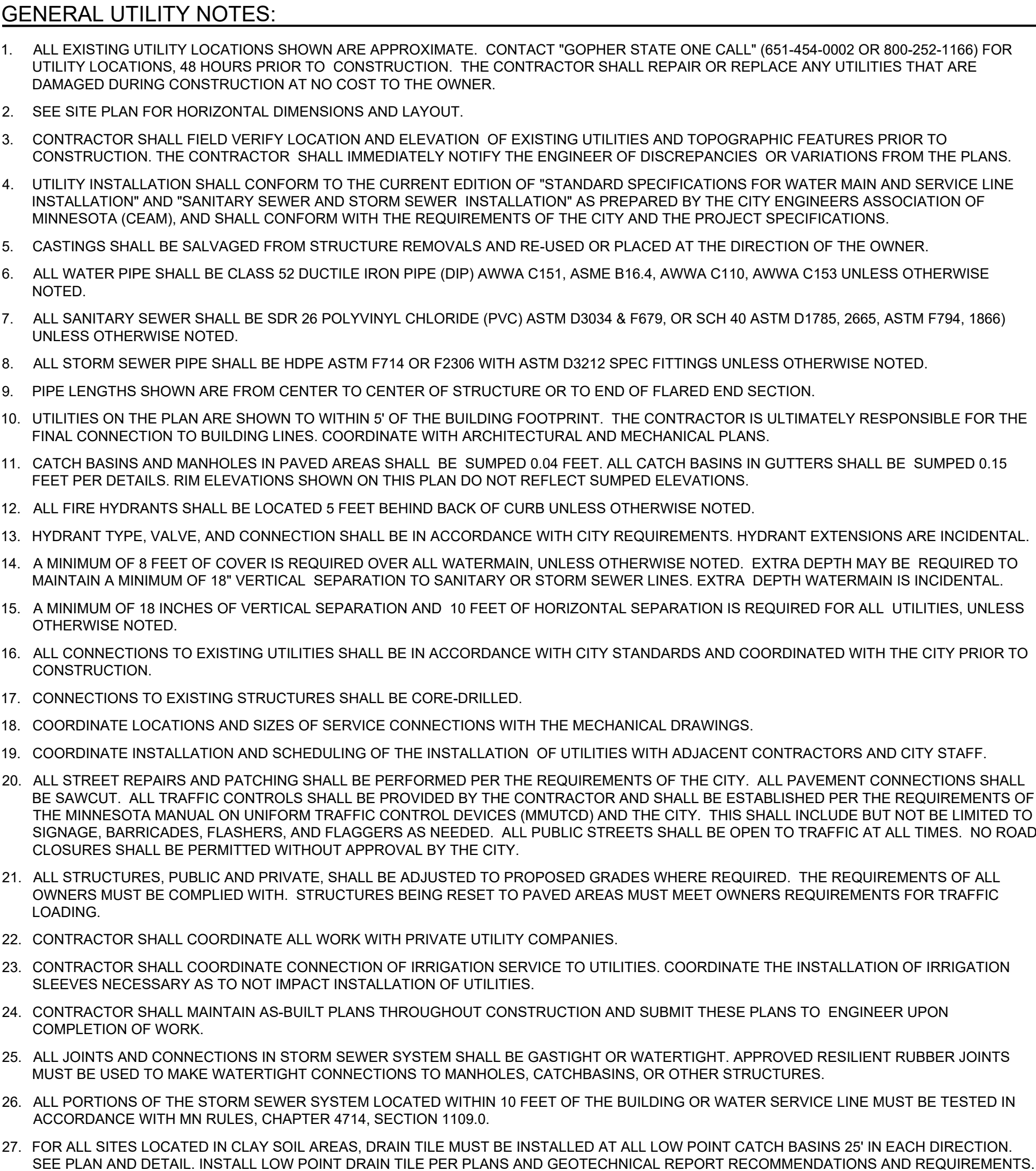
Linetype & Symbol Legend

—E—	ELECTRIC LINE	□	AIR CONDITIONER	□	UTILITY VAULT
---F---	ELECTRIC LINE (RECORD)	□	CABLE TV BOX	□	UTILITY MANHOLE
---F---	FIBER/COMM. LINE	□	ELECTRIC MANHOLE	□	ELECTRICAL OUTLET
---F---	FIBER/COMM. LINE (RECORD)	□	ELECTRIC TRANSFORMER	□	HAND HOLE
—G—	GASMAIN	□	ELECTRICAL METER	□	BOLLARD
---G---	GASMAIN (RECORD)	□	FIBER/COMM. MANHOLE	□	FLAG POLE
—OH—	OVERHEAD UTILITIES	□	POWER POLE	□	HANDICAP SYMBOL
—S—	SANITARY SEWER	□	GUY WIRE	□	LIGHT POLE
---S---	SANITARY SEWER (RECORD)	□	GAS METER	□	MAIL BOX
—>—	GAS VALVE	□	GAS MANHOLE	□	SIGN
--->---	STORM SEWER	□	GAS VALVE	□	CONIFEROUS TREE
--->---	STORM SEWER (RECORD)	□	ROOF DRAIN	□	DECIDUOUS TREE
—T—	TELEPHONE LINE	□	SEWER CLEAN OUT	□	
---T---	TELEPHONE LINE (RECORD)	□	SANITARY MANHOLE	□	
—W—	WATERMAIN	□	STORM MANHOLE	□	
---W---	WATERMAIN (RECORD)	□	CATCH BASIN	□	
—X—	CHAINLINK FENCE LINE	□	FLARED END SECTION	□	
—X—	WOODEN FENCE LINE	□	TELEPHONE BOX	□	
—X—	IRON FENCE LINE	□	TRAFFIC SIGNAL	□	
—X—	GUARDRAIL	□	TRAFFIC MANHOLE	□	
—X—	ACCESS RESTRICTION	□	FOIRE CONNECTION	□	
—X—	CONCRETE SURFACE	□	POST INDICATOR VALVE	□	
—X—	PAVER SURFACE	□	WATER MANHOLE	□	
—X—	BITUMINOUS SURFACE	□	WATER VALVE	□	
—X—	GRAVEL/LANDSCAPE SURFACE	□	WELL	□	

The SW Corner of the NW 1/4 of Sec. 25, Twp. 30, Rng. 24



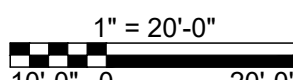
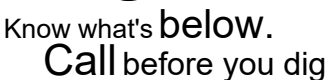
SCALE IN FEET
20 10 0 10 20 40



1. RESERVED FOR CITY SPECIFIC UTILITY NOTES.

- ## GENERAL UTILITY NOTES.
1. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
 2. SEE SITE PLAN FOR HORIZONTAL DIMENSIONS AND LAYOUT.
 3. CONTRACTOR SHALL FIELD VERIFY LOCATION AND ELEVATION OF EXISTING UTILITIES AND TOPOGRAPHIC FEATURES PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER OF DISCREPANCIES OR VARIATIONS FROM THE PLANS.
 4. UTILITY INSTALLATION SHALL CONFORM TO THE CURRENT EDITION OF "STANDARD SPECIFICATIONS FOR WATER MAIN AND SERVICE LINE INSTALLATION" AND "SANITARY SEWER AND STORM SEWER INSTALLATION" AS PREPARED BY THE CITY ENGINEERS ASSOCIATION OF MINNESOTA (CEAM), AND SHALL CONFORM WITH THE REQUIREMENTS OF THE CITY AND THE PROJECT SPECIFICATIONS.
 5. CASTINGS SHALL BE SALVAGED FROM STRUCTURE REMOVALS AND RE-USED OR PLACED AT THE DIRECTION OF THE OWNER.
 6. ALL WATER PIPE SHALL BE CLASS 52 DUCTILE IRON PIPE (DIP) AWWA C151, ASME B16.4, AWWA C110, AWWA C153 UNLESS OTHERWISE NOTED.
 7. ALL SANITARY SEWER SHALL BE SDR 26 POLYVINYL CHLORIDE (PVC) ASTM D3034 & F679, OR SCH 40 ASTM D1785, 2665, ASTM F794, 1866) UNLESS OTHERWISE NOTED.
 8. ALL STORM SEWER PIPE SHALL BE HDPE ASTM F714 OR F2306 WITH ASTM D3212 SPEC FITTINGS UNLESS OTHERWISE NOTED.
 9. PIPE LENGTHS SHOWN ARE FROM CENTER TO CENTER OF STRUCTURE OR TO END OF FLARED END SECTION.
 10. UTILITIES ON THE PLAN ARE SHOWN TO WITHIN 5' OF THE BUILDING FOOTPRINT. THE CONTRACTOR IS ULTIMATELY RESPONSIBLE FOR THE FINAL CONNECTION TO BUILDING LINES. COORDINATE WITH ARCHITECTURAL AND MECHANICAL PLANS.
 11. CATCH BASINS AND MANHOLES IN PAVED AREAS SHALL BE SUMPED 0.04 FEET. ALL CATCH BASINS IN GUTTERS SHALL BE SUMPED 0.15 FEET PER DETAILS. RIM ELEVATIONS SHOWN ON THIS PLAN DO NOT REFLECT SUMPED ELEVATIONS.
 12. ALL FIRE HYDRANTS SHALL BE LOCATED 5 FEET BEHIND BACK OF CURB UNLESS OTHERWISE NOTED.
 13. HYDRANT TYPE, VALVE, AND CONNECTION SHALL BE IN ACCORDANCE WITH CITY REQUIREMENTS. HYDRANT EXTENSIONS ARE INCIDENTAL.
 14. A MINIMUM OF 8 FEET OF COVER IS REQUIRED OVER ALL WATERMAIN, UNLESS OTHERWISE NOTED. EXTRA DEPTH MAY BE REQUIRED TO MAINTAIN A MINIMUM OF 18" VERTICAL SEPARATION TO SANITARY OR STORM SEWER LINES. EXTRA DEPTH WATERMAIN IS INCIDENTAL.
 15. A MINIMUM OF 18 INCHES OF VERTICAL SEPARATION AND 10 FEET OF HORIZONTAL SEPARATION IS REQUIRED FOR ALL UTILITIES, UNLESS OTHERWISE NOTED.
 16. ALL CONNECTIONS TO EXISTING UTILITIES SHALL BE IN ACCORDANCE WITH CITY STANDARDS AND COORDINATED WITH THE CITY PRIOR TO CONSTRUCTION.
 17. CONNECTIONS TO EXISTING STRUCTURES SHALL BE CORE-DRILLED.
 18. COORDINATE LOCATIONS AND SIZES OF SERVICE CONNECTIONS WITH THE MECHANICAL DRAWINGS.
 19. COORDINATE INSTALLATION AND SCHEDULING OF THE INSTALLATION OF UTILITIES WITH ADJACENT CONTRACTORS AND CITY STAFF.
 20. ALL STREET REPAIRS AND PATCHING SHALL BE PERFORMED PER THE REQUIREMENTS OF THE CITY. ALL PAVEMENT CONNECTIONS SHALL BE SAWCUT. ALL TRAFFIC CONTROLS SHALL BE PROVIDED BY THE CONTRACTOR AND SHALL BE ESTABLISHED PER THE REQUIREMENTS OF THE MINNESOTA MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD) AND THE CITY. THIS SHALL INCLUDE BUT NOT BE LIMITED TO SIGNAGE, BARRICADES, FLASHERS, AND FLAGGERS AS NEEDED. ALL PUBLIC STREETS SHALL BE OPEN TO TRAFFIC AT ALL TIMES. NO ROAD CLOSURES SHALL BE PERMITTED WITHOUT APPROVAL BY THE CITY.
 21. ALL STRUCTURES, PUBLIC AND PRIVATE, SHALL BE ADJUSTED TO PROPOSED GRADES WHERE REQUIRED. THE REQUIREMENTS OF ALL OWNERS MUST BE COMPLIED WITH. STRUCTURES BEING RESET TO PAVED AREAS MUST MEET OWNERS REQUIREMENTS FOR TRAFFIC LOADING.
 22. CONTRACTOR SHALL COORDINATE ALL WORK WITH PRIVATE UTILITY COMPANIES.
 23. CONTRACTOR SHALL COORDINATE CONNECTION OF IRRIGATION SERVICE TO UTILITIES. COORDINATE THE INSTALLATION OF IRRIGATION SLEEVES NECESSARY AS TO NOT IMPACT INSTALLATION OF UTILITIES.
 24. CONTRACTOR SHALL MAINTAIN AS-BUILT PLANS THROUGHOUT CONSTRUCTION AND SUBMIT THESE PLANS TO ENGINEER UPON COMPLETION OF WORK.
 25. ALL JOINTS AND CONNECTIONS IN STORM SEWER SYSTEM SHALL BE GASTIGHT OR WATERTIGHT. APPROVED RESILIENT RUBBER JOINTS MUST BE USED TO MAKE WATERTIGHT CONNECTIONS TO MANHOLES, CATCHBASINS, OR OTHER STRUCTURES.
 26. ALL PORTIONS OF THE STORM SEWER SYSTEM LOCATED WITHIN 10 FEET OF THE BUILDING OR WATER SERVICE LINE MUST BE TESTED IN ACCORDANCE WITH MN RULES, CHAPTER 4714, SECTION 1109.0.
 27. FOR ALL SITES LOCATED IN CLAY SOIL AREAS, DRAIN TILE MUST BE INSTALLED AT ALL LOW POINT CATCH BASINS 25' IN EACH DIRECTION. SEE PLAN AND DETAIL. INSTALL LOW POINT DRAIN TILE PER PLANS AND GEOTECHNICAL REPORT RECOMMENDATIONS AND REQUIREMENTS.

	CATCH BASIN
	MANHOLE
	GATE VALVE AND VALVE BOX
	PROPOSED FIRE HYDRANT
	DRAIN TILE
	WATER MAIN
	SANITARY SEWER
	STORM SEWER
	FES AND RIP RAP
	CONSTRUCTION LIMITS



**PRELIMINARY:
NOT FOR
CONSTRUCTION**

9999 50TH AVE. NE, COLUMBIA HEIGHTS, MN 55421

TSUNAMI EXPRESS CAR WASH, LLC.

I HEREBY CERTIFY THAT THIS PLAN,
SPECIFICATION, OR REPORT WAS
PREPARED BY ME OR UNDER MY DIRECT
SUPERVISION AND THAT I AM A DULY
LICENSED PROFESSIONAL ENGINEER
UNDER THE LAWS OF THE STATE OF
MINNESOTA.

David J. Knaeble

DATE 8/05/24 LICENSE NO. 48776

DATE	DESCRIPTION
8/05/24	CITY SUBMITTAL

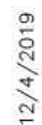
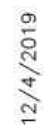
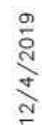
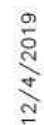
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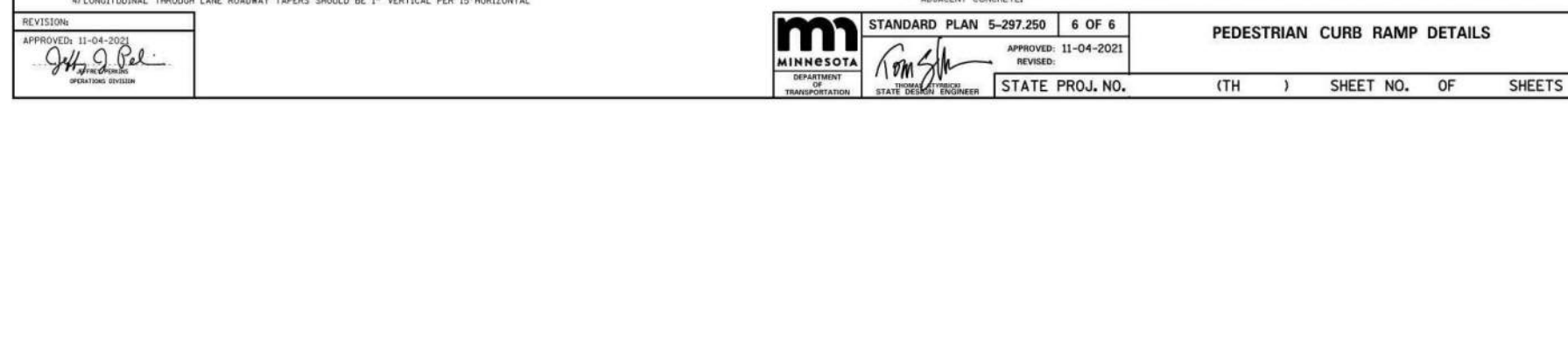
DATE	DESCRIPTION
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UTILITY PLAN

C4.0

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© COPYRIGHT 2023 CIVIL SITE GROUP INC.

CODE	COMMON / BOTANICAL NAME	QTY	CONT	NATIVE PLANTS	POLLINATOR FRIENDLY
2.5' OVERSTORY TREE					
GM	Sugar Maple / <i>Acer saccharum</i> 'Green Mountain'	2	2.5' CAL. B&B	NATIVE CULTIVAR	Y
SH	Skyline Thornless Honey Locust / <i>Gleditsia triacanthos inermis</i> 'Skycole' TM	1	2.5' Cal. B&B	NATIVE CULTIVAR	N
GC2.5	True North™ Kentucky Coffeetree / <i>Gymnocladus dioica</i> 'UMNSynergy'	2	2.5' CAL. B&B	NATIVE CULTIVAR	N
QM	Prairie Stature® Oak / <i>Quercus x bimundorum</i> 'Midwest'	2	2.5' CAL. B&B		
	SUBTOTAL:	7			

2* ORNAMENTAL TREE					
AL2	Spring Flurry Serviceberry / Amelanchier x laevis 'JFS-Arb'	2	2" CAL. B&B	NATIVE CULTIVAR	Y
CV2	Thornless Cockspur Hawthorn / Crataegus crus-galli inermis TM	2	2" CAL. B&B	NATIVE	Y
OV2	Ironwood / Ostrya virginiana	1	2" CAL. B&B	NATIVE	Y
	SUBTOTAL:	5			

6' HT. B&B

PD	Black Hills Spruce / Picea glauca 'Densata'	1	6' HT. B&B	NATIVE CULTIVAR	
	SUBTOTAL:	1			

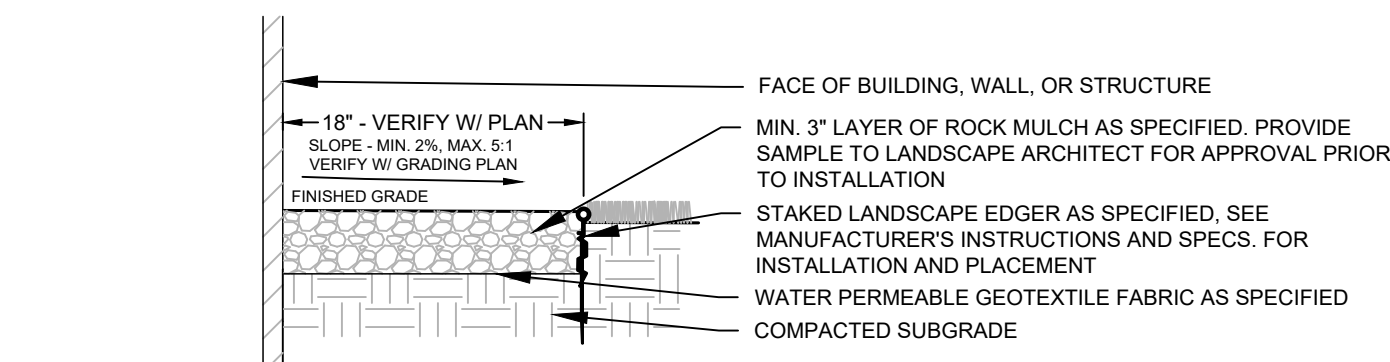
CODE	COMMON / BOTANICAL NAME	QTY	SIZE	NATIVE PLANTS	POLLINATOR FRIENDLY
------	-------------------------	-----	------	---------------	---------------------

SHRUBS

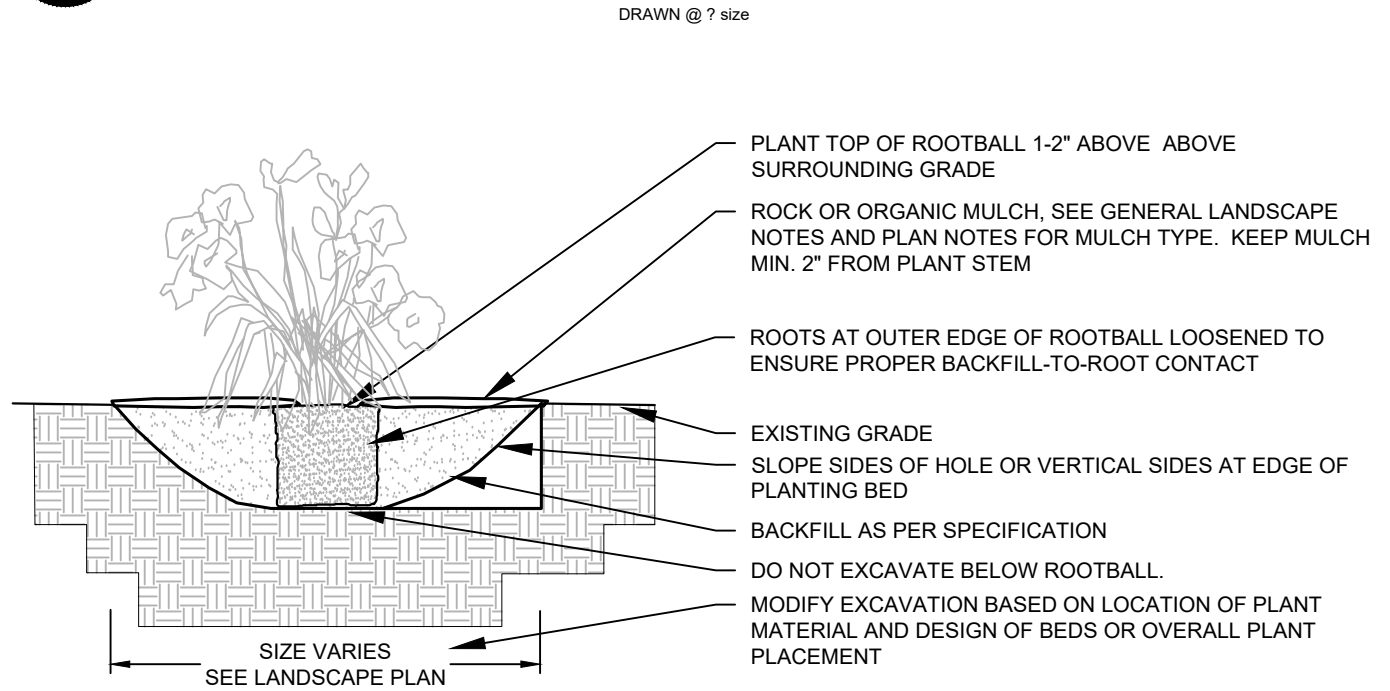
A#2	Low Scape Hedgehog Black Chokeberry / Aronia melanocarpa 'UCCONNAM166'	TM	15	#5 CONT	NATIVE CULTIVAR	Y
CM	Muskingham Gray Dogwood / Cornus racemosa 'Muskingham'		7	#5 CONT	NATIVE CULTIVAR	Y
LR	Kodiak® Orange Diervilla / Diervilla x 'G2X88544'		8	#5 CONT	NATIVE CULTIVAR	Y
HJ2	Kalm St. Johnswort / Hypericum kalmianum		6	#5 CONT	NATIVE	Y
HJ3	Cobalt and Gold Kalm St. Johnswort / Hypericum kalmianum 'PIIHYP-I'		3	#2 CONT	NATIVE CULTIVAR	Y
	SUBTOTAL:		39			

GRASSES

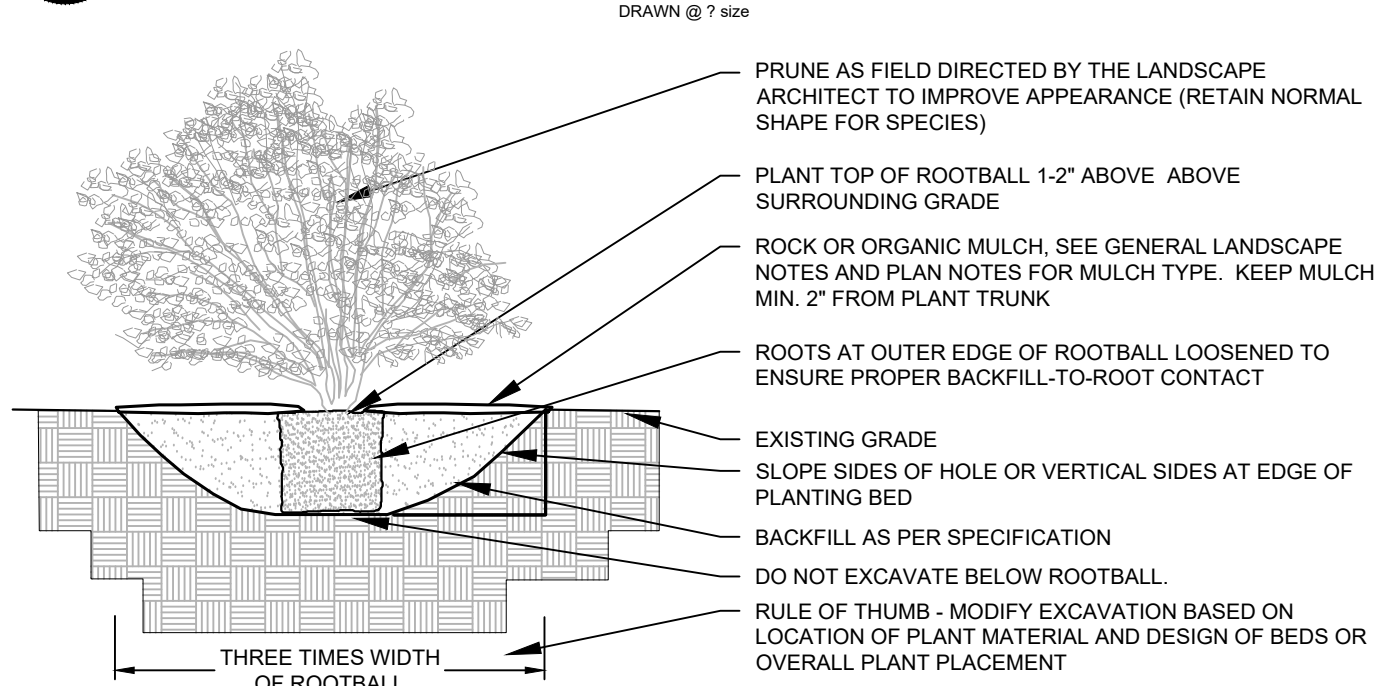
PN3	Northwind Switch Grass / <i>Panicum virgatum</i>	North Wind	5	#1 CONT	NATIVE CULTIVAR	Y
SH3	Prairie Dropseed / <i>Sporobolus heterolepis</i>		4	#1 CONT	NATIVE	Y
	SUBTOTAL:		9			



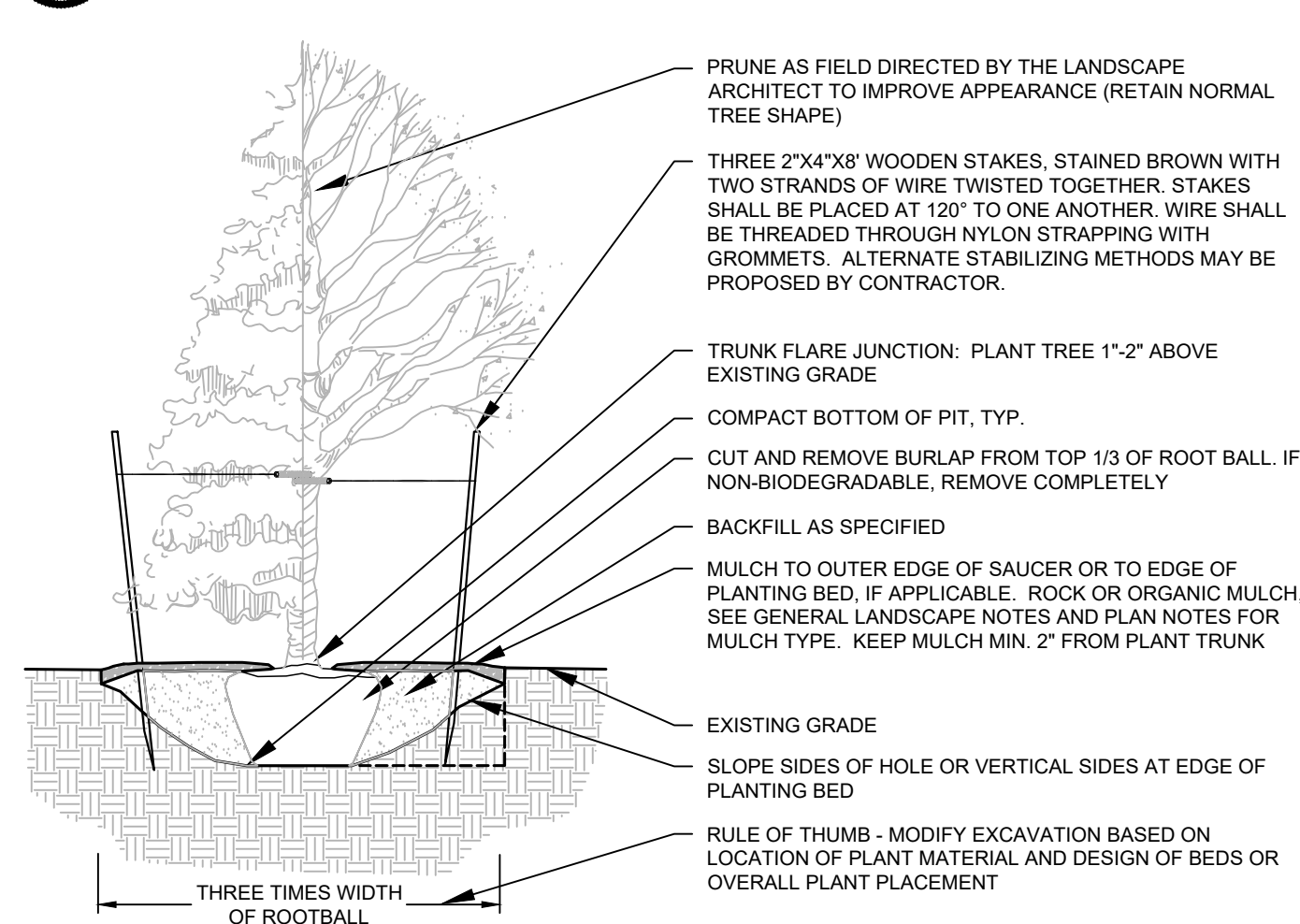
1 AGGREGATE MAINTENANCE STRIP



2 PERENNIAL BED PLANTING



3 DECIDUOUS & CONIFEROUS SHRUB PLANTING



4 DECIDUOUS & CONIFEROUS TREE PLANTING

1. ENTIRE SITE SHALL BE FULLY IRRIGATED. THE CONTRACTOR SHALL SUBMIT IRRIGATION SHOP DRAWINGS FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
2. PROVIDE SITE WIDE IRRIGATION SYSTEM DESIGN AND INSTALLATION. SYSTEM SHALL BE FULLY PROGRAMMABLE AND CAPABLE OF ALTERNATE DATE WATERING. THE SYSTEM SHALL PROVIDE HEAD TO HEAD OR DRIP COVERAGE AND BE CAPABLE OF DELIVERING ONE INCH OF PRECIPITATION PER WEEK. SYSTEM SHALL EXTEND INTO THE PUBLIC RIGHT-OF-WAY TO THE EDGE OF PAVEMENT/BACK OF CURB.
3. CONTRACTOR SHALL SECURE APPROVAL OF PROPOSED IRRIGATION SYSTEM INCLUDING PRICING FROM OWNER, PRIOR TO INSTALLATION.
4. SEE MECHANICAL AND ELECTRICAL PLANS AND SPECIFICATIONS FOR IRRIGATION WATER, METER, AND POWER CONNECTIONS.
5. CONTRACTOR TO VERIFY LOCATION OF ALL UNDERGROUND/ABOVE GROUND FACILITIES PRIOR TO ANY EXCAVATION/INSTALLATION. ANY DAMAGE TO UNDERGROUND/ABOVE GROUND FACILITIES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND COSTS ASSOCIATED WITH CORRECTING DAMAGES SHALL BE BORNE ENTIRELY BY THE CONTRACTOR.
6. SERVICE EQUIPMENT AND INSTALLATION SHALL BE PER LOCAL UTILITY COMPANY STANDARDS AND SHALL BE PER NATIONAL AND LOCAL CODES. EXACT LOCATION OF SERVICE EQUIPMENT SHALL BE COORDINATED WITH THE LANDSCAPE ARCHITECT OR EQUIVALENT AT THE JOB SITE.
7. CONTRACTOR SHALL COORDINATE WITH LOCAL UTILITY COMPANY FOR THE PROPOSED ELECTRICAL SERVICE AND METERING FACILITIES.
8. IRRIGATION WATER LINE CONNECTION SIZE IS 1-½" AT BUILDING. VERIFY WITH MECHANICAL PLANS.
9. ALL MAIN LINES SHALL BE 18" BELOW FINISHED GRADE.
10. ALL LATERAL LINES SHALL BE 12" BELOW FINISHED GRADE.
11. ALL EXPOSED PVC RISERS, IF ANY, SHALL BE GRAY IN COLOR.
12. CONTRACTOR SHALL LAY ALL SLEEVES AND CONDUIT AT 2'-0" BELOW THE FINISHED GRADE OF THE TOP OF PAVEMENT. EXTEND SLEEVES TO 2'-0" BEYOND PAVEMENT.
13. CONTRACTOR SHALL MARK THE LOCATION OF ALL SLEEVES AND CONDUIT WITH THE SLEEVING MATERIAL "ELLED" TO 2'-0" ABOVE FINISHED GRADE AND CAPPED.
14. FABRICATE ALL PIPE TO MANUFACTURER'S SPECIFICATIONS WITH CLEAN AND SQUARE CUT JOINTS. USE QUALITY GRADE PRIMER AND SOLVENT CEMENT FORMULATED FOR INTENDED TYPE OF CONNECTION.
15. BACKFILL ALL TRENCHES WITH SOIL FREE OF SHARP OBJECTS AND DEBRIS.
16. ALL VALVE BOXES AND COVERS SHALL BE BLACK IN COLOR.
17. GROUP VALVE BOXES TOGETHER FOR EASE WHEN SERVICE IS REQUIRED. LOCATE IN PLANT BED AREAS WHENEVER POSSIBLE.
18. IRRIGATION CONTROLLER LOCATION SHALL BE VERIFIED ON-SITE WITH OWNER'S REPRESENTATIVE.
19. CONTROL WIRES: 14 GAUGE DIRECT BURIAL, SOLID COPPER IRRIGATION WIRE. RUN UNDER MAIN LINE. USE MOISTURE-PROOF SPLICES AND SPLICE ONLY AT VALVES OR PULL BOXES. RUN SEPARATE HOT AND COMMON WIRE TO EACH VALVE AND ONE (1) SPARE WIRE AND GROUND TO FURTHEST VALVE FROM CONTROLLER. LABEL OR COLOR CODE ALL WIRES.
20. AVOID OVER SPRAY ON BUILDINGS, PAVEMENT, WALLS AND ROADWAYS BY INDIVIDUALLY ADJUSTING RADIUS OR ARC ON SPRINKLER HEADS AND FLOW CONTROL ON AUTOMATIC VALVE.
21. ADJUST PRESSURE REGULATING VALVES FOR OPTIMUM PRESSURE ON SITE.
22. USE SCREENS ON ALL HEADS.
23. A SET OF AS-BUILT DRAWINGS SHALL BE MAINTAINED ON-SITE AT ALL TIMES IN AN UPDATED CONDITION.
24. ALL PIPE 3" AND OVER SHALL HAVE THRUST BLOCKING AT EACH TURN.
25. ALL AUTOMATIC REMOTE CONTROL VALVES WILL HAVE 3" MINIMUM DEPTH OF ¾" WASHED GRAVEL UNDERNEATH VALVE AND VALVE BOX. GRAVEL SHALL EXTEND 3' BEYOND PERIMETER OF VALVE BOX.
26. THERE SHALL BE 3" MINIMUM SPACE BETWEEN BOTTOM OF VALVE BOX COVER AND TOP OF VALVE STRUCTURE.

1. SEE PLANTING SEASON SCHEDULE FOR PLANT INSTALLATION DATES. IF PLANT MATERIAL ARE INSTALLED OUTSIDE OF THOSE TIME PERIODS, CONTRACTOR MUST PROVIDE AND ADDITIONAL SPRING SEASON OF WARRANTY BEYOND THE STANDARD 1 YEAR MATERIAL & INSTALLATION WARRANTY SPECIFIED BY CONTRACT
2. PLANT MATERIAL SHALL COMPLY WITH THE CURRENT EDITION OF THE AMERICAN STANDARD FOR NURSERY STOCK, ANSI Z60.1. UNLESS NOTED OTHERWISE, DECIDUOUS SHRUBS SHALL HAVE AT LEAST 5 CANES AT THE SPECIFIED HEIGHT. ORNAMENTAL TREES SHALL HAVE NO "V" CROTCHES AND SHALL BEGIN BRANCHING NO LOWER THAN 3' FEET ABOVE THE ROOT BALL. STREET AND BOULEVARD TREES SHALL BEGIN BRANCHING NO LOWER THAN 6' ABOVE PAVED SURFACE.
3. STAKE PROPOSED PLANTING LOCATIONS PER PLAN FOR REVIEW AND APPROVAL BY LANDSCAPE ARCHITECT PRIOR TO INSTALL.
4. COORDINATE INSTALLATION OF PLANT MATERIAL WITH GENERAL CONTRACTOR.
5. SEE PLANTING DETAILS FOR INSTALLATION OF PLANT MATERIAL
6. SUBSTITUTION REQUESTS FOR PLANT MATERIAL TYPE & SIZE SHALL BE SUBMITTED TO THE LANDSCAPE ARCHITECT FOR CONSIDERATION PRIOR TO INSTALLATION.
7. MINOR, ON-SITE ADJUSTMENTS IN LOCATION OF PROPOSED PLANT MATERIALS MAY BE NEEDED IN FIELD. MORE SUBSTANTIAL ADJUSTMENTS MUST BE REVIEWED AND APPROVED BY LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
8. FERTILIZE PLANT MATERIAL UPON INSTALLATION WITH MNDOT 3881-B4 TYPE 4 FERTILIZER MIXED IN WITH THE PLANTING SOIL. (PER THE MANUFACTURER'S INSTRUCTIONS) OR TREAT FOR SUMMER AND FALL INSTALLATION WITH AN APPLICATION OF GRANULAR 10-0-5 OF 12 OZ. PER 2.5" CALIPER TREE AND 6 OZ. PER SHRUB WITH AN ADDITIONAL APPLICATION OF 10-0-10 THE FOLLOWING SPRING IN THE TREE SAUCER.
9. INSTALL 12" DEPTH OF PLANTING SOIL IN AREAS RECEIVING GROUND COVER, PERENNIALS, AND ANNUALS. PLANTING SOIL SHALL CONSIST OF MNDOT 3877-B MODIFIED TO CONTAIN A MAXIMUM OF 30% SAND, A PH OF 7.1 MAX., OR AS OTHERWISE SPECIFIED IN THE PROJECT SPECIFICATIONS MANUAL. AMEND THE TOPSOIL WITH 4 INCHES OF MNDOT 3890 - B GRADE 2 COMPOST.
10. PROVIDE TREE TRUNK DAMAGE PROTECTION FOR SMOOTH-BARKED DECIDUOUS TREES PLANTED IN THE FALL PRIOR TO DECEMBER 1. REMOVE WRAPPING AFTER MAY THE NEXT SPRING. WRAPPING MATERIAL SHALL BE TWO-WALLED PLASTIC SHEETING APPLIED FROM TRUNK FLARE TO FIRST BRANCH.
11. PRIOR TO PLANTING, APPLY PRE-EMERGENT HERBICIDE (PREEN OR APPROVED EQUAL) IN ANNUAL, PERENNIAL, AND SHRUB BEDS FOLLOWED BY MULCH AS SPECIFIED.
12. WHERE SHOWN, SHRUB & PERENNIAL BEDS SHALL BE MULCHED PER SCHEDULE(S)
13. ALL TREES SHALL BE MULCHED WITH MNDOT 3882 - E TYPE 6 MULCH TO OUTER EDGE OF SAUCER OR TO EDGE OF PLANTING BED, IF APPLICABLE. ALL MULCH SHALL BE KEPT WITHIN A MINIMUM OF 4" FROM TREE TRUNK. SEE MULCH SCHEDULE.
14. PLANT MATERIALS SHALL CONFORM WITH THE AMERICAN ASSOCIATION OF NURSERYMEN STANDARDS AND SHALL BE OF HARD STOCK, FREE FROM DISEASE, DAMAGE AND DISFIGURATION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING PLUMPNESS OF PLANT MATERIAL FOR DURATION OF ACCEPTANCE PERIOD.
15. UPON DISCOVERY OF A DISCREPANCY BETWEEN THE QUANTITY OF PLANTS SHOWN ON THE SCHEDULE AND THE QUANTITY SHOWN ON THE PLAN, THE PLAN SHALL GOVERN.
16. CONDITION OF VEGETATION SHALL BE MONITORED BY THE LANDSCAPE ARCHITECT THROUGHOUT THE DURATION OF THE CONTRACT. LANDSCAPE MATERIALS PART OF THE CONTRACT SHALL BE WARRANTED FOR ONE (1) FULL GROWING SEASONS FROM SUBSTANTIAL COMPLETION DATE.
17. ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITIES SHALL RECEIVE MIN. 6" LAYER MNDOT 3877-A COMMON TOPSOIL BORROW. IF NOT SPECIFIED ON PLAN, INCLUDE SOD OR SEED (TO MATCH SURROUNDING AND/OR ADJACENT GROUND COVERING).
18. COORDINATE LOCATION OF VEGETATION WITH UNDERGROUND AND OVERHEAD UTILITIES, LIGHTING FIXTURES, DOORS AND WINDOWS. CONTRACTOR SHALL STAKE IN THE FIELD FINAL LOCATION OF TREES AND SHRUBS FOR REVIEW AND APPROVAL BY THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
19. ALL PLANT MATERIALS SHALL BE WATERED AND MAINTAINED UNTIL ACCEPTANCE.
20. REPAIR AT NO COST TO OWNER ALL DAMAGE RESULTING FROM LANDSCAPE CONTRACTOR'S ACTIVITIES.
21. SWEEP AND MAINTAIN ALL PAVED SURFACES FREE OF DEBRIS GENERATED FROM LANDSCAPE CONTRACTOR'S ACTIVITIES.



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PRELIMINARY:
NOT FOR
CONSTRUCTION

TSUNAMI EXPRESS CAR WASH

9999 50TH AVE. NE, COLUMBIA HEIGHTS, MN 55421

TSUNAMI EXPRESS CAR WASH, LLC.

14800 MEADOWS ROAD, #300, LAKE OSWEGO, OREGON 97305

PROJECT

OWNER

I HEREBY CERTIFY THAT THIS PLAN,
SPECIFICATION, OR REPORT WAS
PREPARED BY ME OR UNDER MY DIRECT
SUPERVISION AND THAT I AM A DULY
LICENSED LANDSCAPE ARCHITECT UNDER
THE LAWS OF THE STATE OF MINNESOTA.


Robert L. Binder
DATE 8/05/24 LICENSE NO. 25821

ISSUE/SUBMITTAL SUMMARY

[illegible]

PROJECT MANAGER	DAVE KNAEBLE
CONTACT NUMBER	612-615-0060
DRAWN BY	DK, WMB
REVIEWED BY	DK
PROJECT NUMBER	24289

REVISION SUMMARY

[illegible]LANDSCAPE PLAN
NOTES & DETAILS

L1.1

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TSUNAMI EXPRESS CAR WASH, LLC.

14800 MEADOWS ROAD, #300, LAKE OSWEGO, OREGON 97305

PROJECT

23111

Daniel J Knaeble

ISSUE/SUBMITTAL SUMMARY

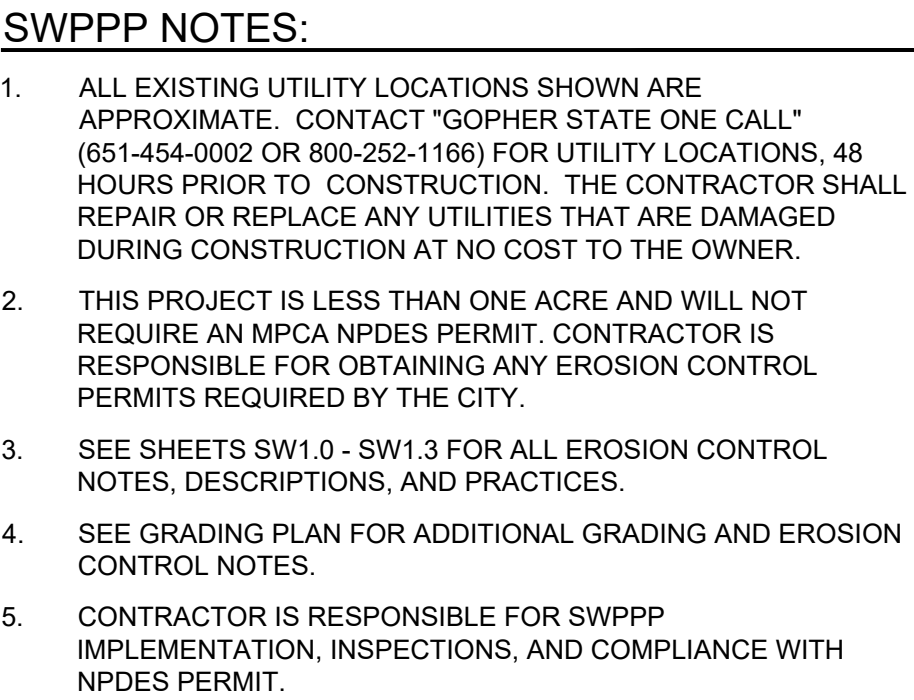
[illegible]

PROJECT MANAGER	DAVE KNAEBLE
CONTACT NUMBER	612-615-0060
DRAWN BY	DK, WMB
REVIEWED BY	DK
PROJECT NUMBER	24289

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SW1.0

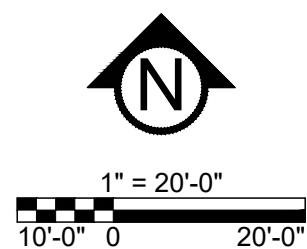
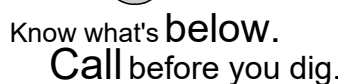
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ALL SPECIFIED EROSION AND SEDIMENT CONTROL PRACTICES, AND MEASURES CONTAINED IN THIS SWPPP ARE THE MINIMUM REQUIREMENTS. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.

SWPPP LEGEND:

	EX. 1' CONTOUR ELEVATION INTERVAL DRAINAGE ARROW
	SILT FENCE / BIOROLL - GRADING LIMIT
	INLET PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE



999 50TH AVE. NE, COLUMBIA HEIGHTS, MN 55421

TSUNAMI EXPRESS CAR WASH, LLC.

4800 MEADOWS ROAD, #300, LAKE OSWEGO, OREGON 97305

PROJECT

23110

Daniel J. Knaeble

DATE 8/05/24 LICENSE NO. 48776

ISSUE/SUBMITTAL SUMMARY

DATE	DESCRIPTION
8/05/24	CITY SUBMITTAL

[illegible]

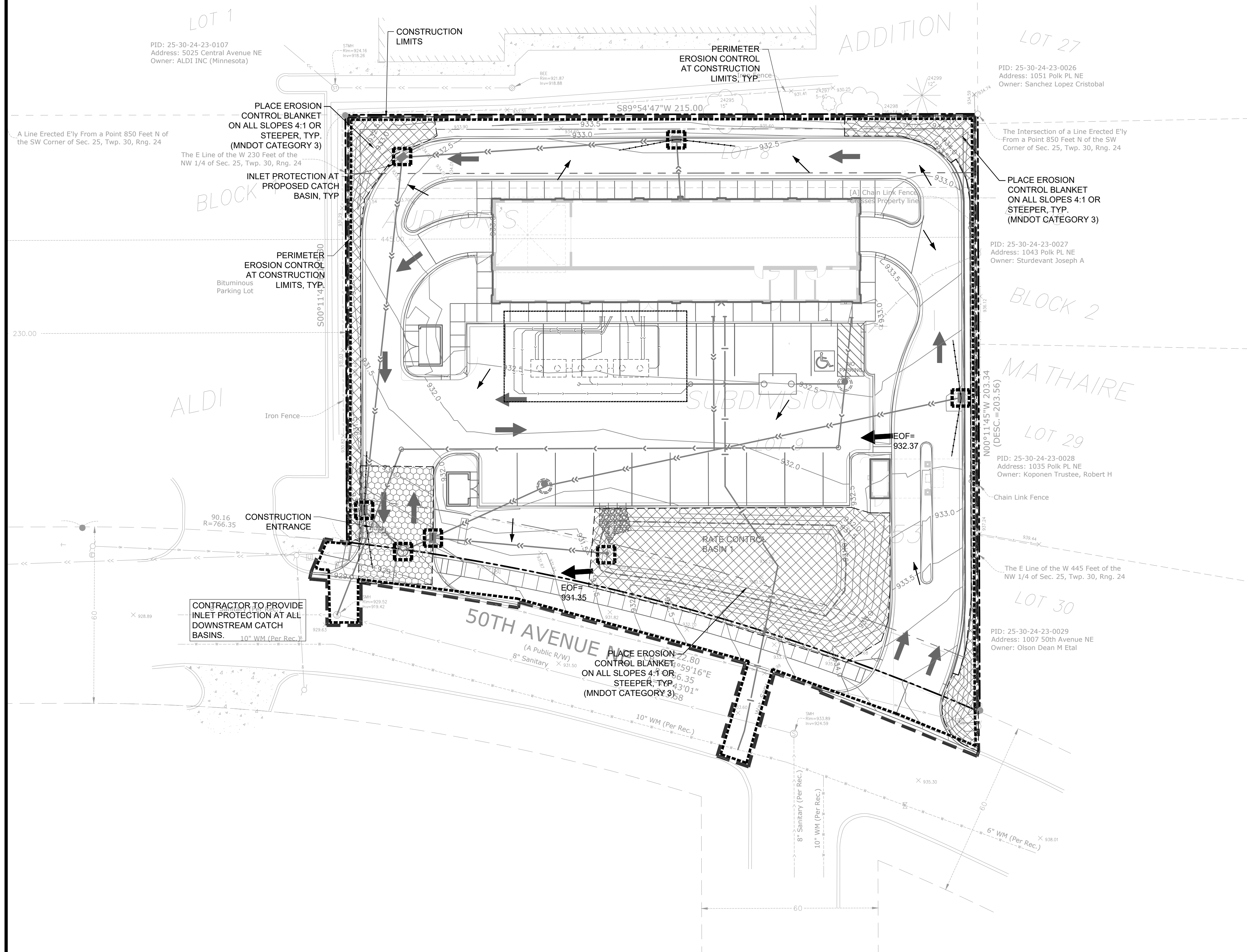
PROJECT MANAGER	DAVE KNAEBLE
CONTACT NUMBER	612-615-0060
DRAWN BY	DK, WMB
REVIEWED BY	DK
PROJECT NUMBER	24289

REVISION SUMMARY

[illegible]SWPPP - PROPOSED
CONDITIONS

SW1.1

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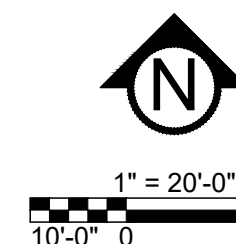


1. ALL EXISTING UTILITY LOCATIONS SHOWN ARE APPROXIMATE. CONTACT "GOPHER STATE ONE CALL" (651-454-0002 OR 800-252-1166) FOR UTILITY LOCATIONS, 48 HOURS PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL REPAIR OR REPLACE ANY UTILITIES THAT ARE DAMAGED DURING CONSTRUCTION AT NO COST TO THE OWNER.
2. THIS PROJECT IS LESS THAN ONE ACRE AND WILL NOT REQUIRE AN MPCA NPDES PERMIT. CONTRACTOR IS RESPONSIBLE FOR OBTAINING ANY EROSION CONTROL PERMITS REQUIRED BY THE CITY.
3. SEE SHEETS SW1.0 - SW1.3 FOR ALL EROSION CONTROL NOTES, DESCRIPTIONS, AND PRACTICES.
4. SEE GRADING PLAN FOR ADDITIONAL GRADING AND EROSION CONTROL NOTES.
5. CONTRACTOR IS RESPONSIBLE FOR SWPPP IMPLEMENTATION, INSPECTIONS, AND COMPLIANCE WITH NPDES PERMIT.

ALL SPECIFIED EROSION AND SEDIMENT CONTROL PRACTICES, AND MEASURES CONTAINED IN THIS SWPPP ARE THE MINIMUM REQUIREMENTS. ADDITIONAL PRACTICES MAY BE REQUIRED DURING THE COURSE OF CONSTRUCTION.

1. RESERVED FOR CITY SPECIFIC EROSION CONTROL NOTES.

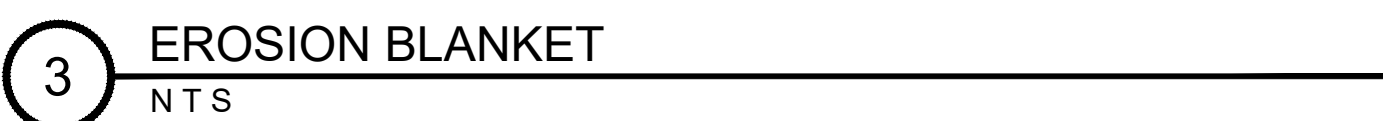
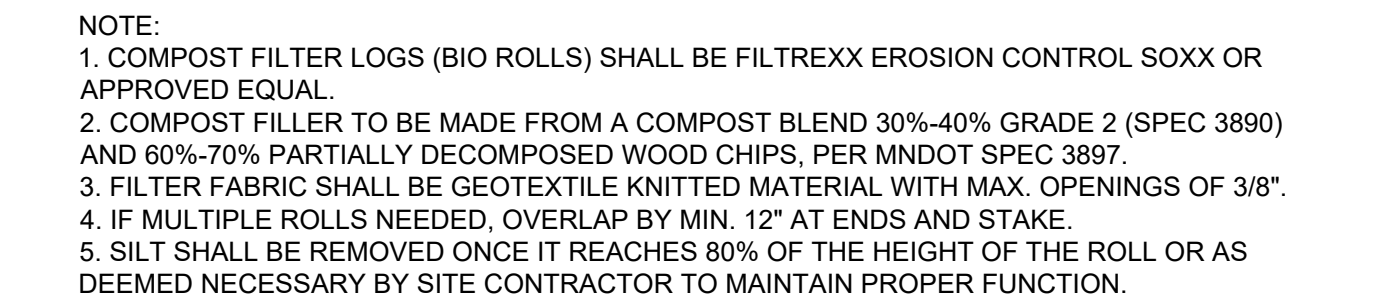
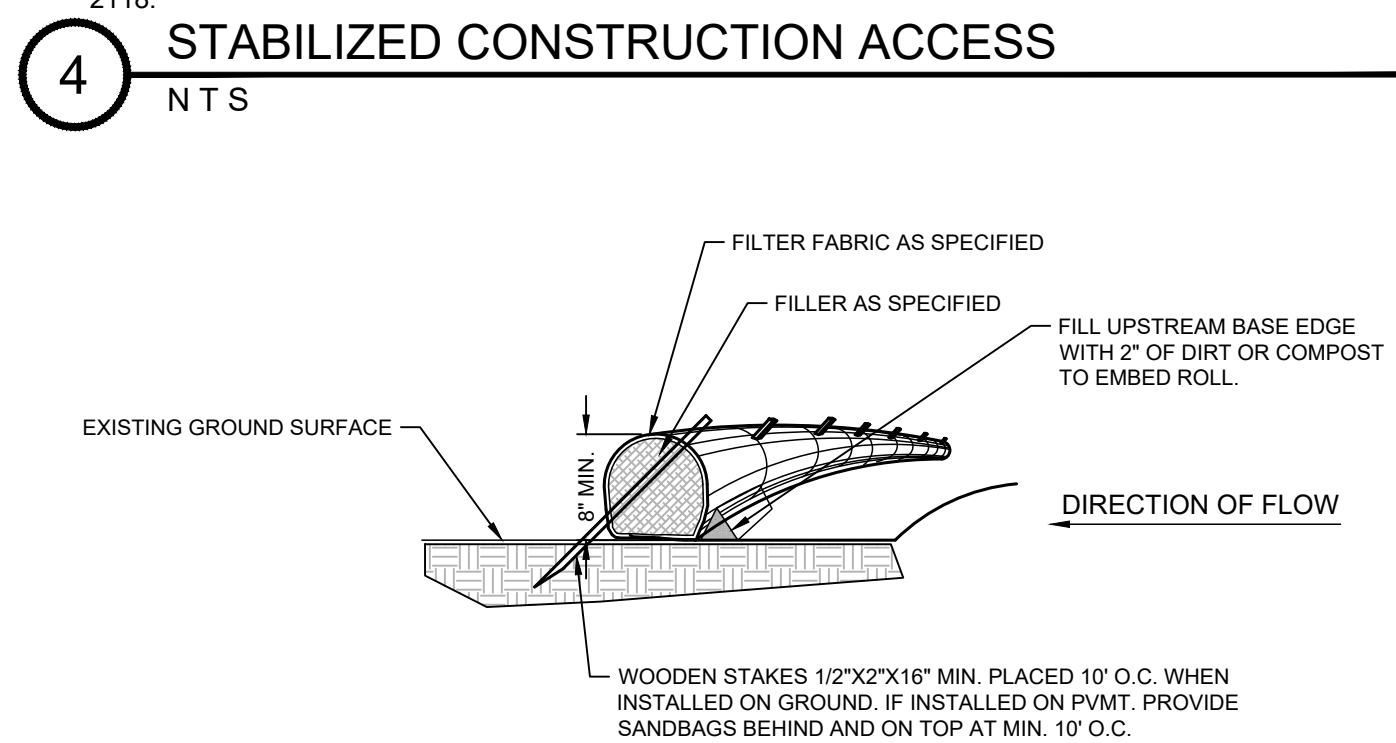
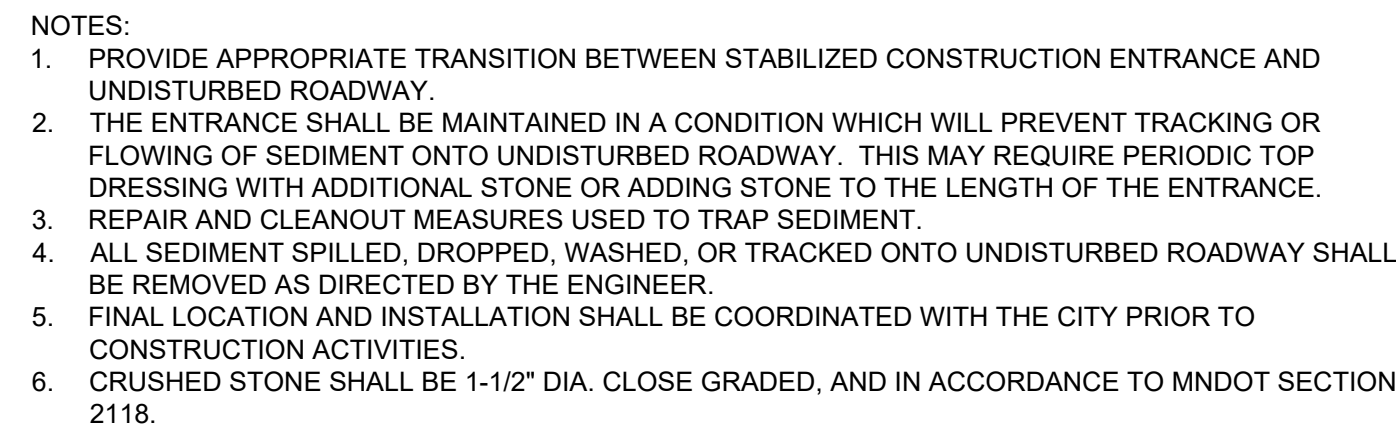
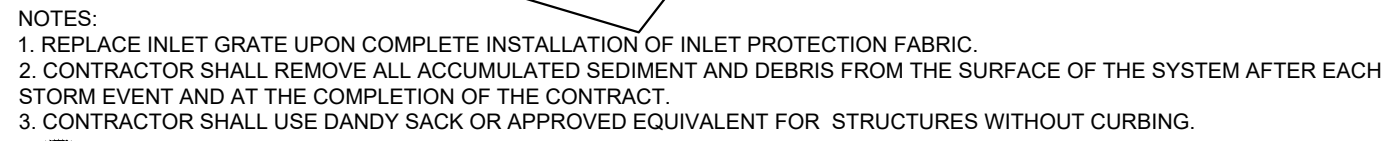
	EX. 1' CONTOUR ELEVATION INTERVAL 1.0' CONTOUR ELEVATION INTERVAL
	DRAINAGE ARROW
	SILT FENCE / BIOROLL - GRADING LIMIT
	INLET PROTECTION
	STABILIZED CONSTRUCTION ENTRANCE
	EROSION CONTROL BLANKET



1" = 20'-0"



10'-0" 0 20'-0"



PROJECT

TSUNAMI EXPRESS CAR WASH

999 50TH AVE. NE, COLUMBIA HEIGHTS, MN 55421

TSUNAMI EXPRESS CAR WASH, LLC.

OWNER

4830 MEADOWS ROAD, #930, LAKE OSWEGO, OREGON 97035

I HEREBY CERTIFY THAT THIS PLAN,
SPECIFICATION, OR REPORT WAS
PREPARED BY ME OR UNDER MY DIRECT
SUPERVISION AND THAT I AM A DULY
LICENSED PROFESSIONAL ENGINEER
UNDER THE LAWS OF THE STATE OF
MINNESOTA.

David J. Knaeble
David J. Knaeble
DATE 8/05/24 LICENSE NO. 48776

[illegible][illegible]

SWPPP - DETAILS

SW1.2

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THE CONTRACTOR AND ALL SUBCONTRACTORS INVOLVED WITH A CONSTRUCTION ACTIVITY THAT DISTURBS SITE SOIL OR WHO IMPOSE A POLLUTANT CONTROL MEASURE IDENTIFIED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) MUST COMPLY WITH THE REQUIREMENTS OF THE NATIONAL POLLUTION DISCHARGE ELIMINATION SYSTEM (NPDES) GENERAL PERMIT (DATED AUGUST 1, 2018 # MNR100001) AND ANY LOCAL GOVERNING AGENCY HAVING JURISDICTION CONCERNING EROSION AND SEDIMENTATION CONTROL.

STORMWATER DISCHARGE DESIGN REQUIREMENTS

SWPPP

THE NATURE OF THIS PROJECT WILL BE CONSISTENT WITH WHAT IS REPRESENTED IN THIS SET OF CONSTRUCTION PLANS AND SPECIFICATIONS. SEE THE SWPPP PLAN SHEETS AND SWPPP NARRATIVE (ATTACHMENT A CONSTRUCTION SWPPP TEMPLATE) FOR ADDITIONAL SITE SPECIFIC SWPPP INFORMATION. THE PLANS SHOW LOCATIONS AND TYPES OF ALL TEMPORARY AND PERMANENT EROSION PREVENTION AND SEDIMENT CONTROL BMP'S. STANDARD DETAILS ARE ATTACHED TO THIS SWPPP DOCUMENT.

THE INTENDED SEQUENCING OF MAJOR CONSTRUCTION ACTIVITIES IS AS FOLLOWS:

1. INSTALL STABILIZED ROCK CONSTRUCTION ENTRANCE
2. INSTALLATION OF SILT FENCE AROUND SITE
3. INSTALL ORANGE CONSTRUCTION FENCING AROUND INFILTRATION AREAS
4. INSTALL INLET PROTECTION AT ALL ADJACENT AND DOWNSTREAM CATCH BASINS
5. CLEAR AND GRUB FOR TEMPORARY SEDIMENT BASIN / POND INSTALL
6. CONSTRUCT TEMPORARY SEDIMENT BASIN / POND (SECTION 14)
7. CLEAR AND GRUB REMAINDER OF SITE
8. STRIP AND STOCKPILE TOPSOIL
9. ROUGH GRADING OF SITE
10. STABILIZE DENUDEED AREAS AND STOCKPILES
11. INSTALL SANITARY SEWER, WATER MAIN STORM SEWER AND SERVICES
12. INSTALL SILT FENCE / INLET PROTECTION AROUND CBS
13. INSTALL STREET SECTION
14. INSTALL CURB AND GUTTER
15. BITUMINOUS ON STREETS
16. FINAL GRADE BOULEVARD, INSTALL SEED AND MULCH
17. REMOVE ACCUMULATED SEDIMENT FROM BASIN/ POND
18. FINAL GRADE POND / INFILTRATION BASINS (DO NOT COMPACT SOILS IN INFILTRATION AREAS.)
19. WHEN ALL CONSTRUCTION ACTIVITY IS COMPLETE AND THE SITE IS STABILIZED BY EITHER SEED OR SOIL/LANDSCAPING, REMOVE SILT FENCE AND RESEED ANY AREAS DISTURBED BY THE REMOVAL.

RECORDS RETENTION:

THE SWPPP (ORIGINAL OR COPIES) INCLUDING, ALL CHANGES TO IT, AND INSPECTIONS AND MAINTENANCE RECORDS MUST BE KEPT AT THE SITE DURING CONSTRUCTION BY THE PERMITTEE WHO HAS OPERATIONAL CONTROL OF THAT PORTION OF THE SITE. THE SWPPP CAN BE KEPT IN EITHER THE FIELD OFFICE OR IN AN ON SITE VEHICLE DURING NORMAL WORKING HOURS.

ALL OWNER(S) MUST KEEP THE SWPPP, ALONG WITH THE FOLLOWING ADDITIONAL RECORDS, ON FILE FOR THREE (3) YEARS AFTER SUBMITTAL OF THE NOT AS OUTLINED IN SECTION 4. THIS DOES NOT INCLUDE ANY RECORDS AFTER SUBMITTAL OF THE NOT.

1. THE FINAL SWPPP;
2. ANY OTHER STORMWATER RELATED PERMITS REQUIRED FOR THE PROJECT;
3. RECORDS OF ALL INSPECTION AND MAINTENANCE CONDUCTED DURING CONSTRUCTION (SEE SECTION 11, INSPECTIONS AND MAINTENANCE);
4. ALL PERMANENT OPERATION AND MAINTENANCE AGREEMENTS THAT HAVE BEEN IMPLEMENTED, INCLUDING ALL RIGHT OF WAY, CONTRACTS, COVENANTS AND OTHER BINDING REQUIREMENTS REGARDING PERPETUAL MAINTENANCE; AND
5. ALL REQUIRED CALCULATIONS FOR DESIGN OF THE TEMPORARY AND PERMANENT STORMWATER MANAGEMENT SYSTEMS.

SWPPP IMPLEMENTATION RESPONSIBILITIES:

1. THE OWNER AND CONTRACTOR ARE PERMITTEE(S) AS IDENTIFIED BY THE NPDES PERMIT.
2. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE IMPLEMENTATION OF THE SWPPP, INCLUDING THE ACTIVITIES OF ALL OF THE CONTRACTOR'S SUBCONTRACTORS.
3. CONTRACTOR SHALL PROVIDE A PERSON(S) KNOWLEDGEABLE AND EXPERIENCED IN THE APPLICATION OF EROSION PREVENTION AND SEDIMENT CONTROL BMP'S TO OVERSEE ALL INSTALLATION AND MAINTENANCE OF BMP'S AND IMPLEMENTATION OF THE SWPPP
4. CONTRACTOR SHALL PROVIDE PERSON(S) MEETING THE TRAINING REQUIREMENTS OF THE NPDES PERMIT TO CONDUCT INSPECTION AND MAINTENANCE OF ALL EROSION PREVENTION AND SEDIMENT CONTROL BMP'S IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERMIT. ONE OF THESE INDIVIDUAL(S) MUST BE AVAILABLE FOR AN ONSITE INSPECTION WITHIN 72 HOURS UPON REQUEST BY MPCA. CONTRACTOR SHALL PROVIDE TRAINING DOCUMENTATION FOR THESE INDIVIDUAL(S) AS REQUIRED BY THE NPDES PERMIT. THIS TRAINING DOCUMENTATION SHALL BE RECORDED IN OR WITH THE SWPPP BEFORE THE START OF CONSTRUCTION OR AS SOON AS THE PERSONNEL FOR THE PROJECT HAVE BEEN DETERMINED. DOCUMENTATION SHALL INCLUDE:
 - 4.1. NAMES OF THE PERSONNEL ASSOCIATED WITH THE PROJECT THAT ARE REQUIRED TO BE TRAINED PER SECTION 21 OF THE PERMIT.
 - 4.2. DATES OF TRAINING AND NAME OF INSTRUCTOR AND ENTITY PROVIDING TRAINING.
 - 4.3. CONTENT OF TRAINING COURSE OR WORKSHOP INCLUDING THE NUMBER OF HOURS OF TRAINING.
5. FOLLOWING FINAL STABILIZATION AND THE TERMINATION OF COVERAGE FOR THE NPDES PERMIT, THE OWNER IS EXPECTED TO FURNISH LONG TERM OPERATION AND MAINTENANCE (O & M) OF THE PERMANENT STORM WATER MANAGEMENT SYSTEM.

CONSTRUCTION ACTIVITY REQUIREMENTS

SWPPP AMENDMENTS (SECTION 6):

1. ONE OF THE INDIVIDUALS DESCRIBED IN ITEM 21.2.A OR ITEM 21.2.B OR ANOTHER QUALIFIED INDIVIDUAL MUST COMPLETE ALL SWPPP CHANGES. CHANGES INVOLVING THE USE OF A LESS STRINGENT BMP MUST INCLUDE A JUSTIFICATION DESCRIBING HOW THE REPLACEMENT BMP IS EFFECTIVE FOR THE SITE CHARACTERISTICS.
2. PERMITTEES MUST AMEND THE SWPPP TO INCLUDE ADDITIONAL OR MODIFIED BMP'S AS NECESSARY TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS WHENEVER THERE IS A CHANGE IN DESIGN, CONSTRUCTION, OPERATION, MAINTENANCE, WEATHER OR SEASONAL CONDITIONS HAVING A SIGNIFICANT EFFECT ON THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER.
3. PERMITTEES MUST AMEND THE SWPPP TO INCLUDE ADDITIONAL OR MODIFIED BMP'S AS NECESSARY TO CORRECT PROBLEMS IDENTIFIED OR ADDRESS SITUATIONS WHENEVER INSPECTIONS OR INVESTIGATIONS BY THE SITE OWNER OR OPERATOR, USEPA OR MPCA OFFICIALS INDICATE THE SWPPP IS NOT EFFECTIVE IN ELIMINATING OR SIGNIFICANTLY MINIMIZING THE DISCHARGE OF POLLUTANTS TO SURFACE WATERS OR GROUNDWATER OR THE DISCHARGES ARE CAUSING WATER QUALITY STANDARD EXCEEDANCES (E.G., NUISANCE CONDITIONS AS DEFINED IN MINN. R. 7050.0210, SUBP. 2) OR THE SWPPP IS NOT CONSISTENT WITH THE OBJECTIVES OF A USEPA APPROVED TMDL.

BMP SELECTION AND INSTALLATION (SECTION 7):

1. PERMITTEES MUST SELECT, INSTALL, AND MAINTAIN THE BMP'S IDENTIFIED IN THE SWPPP AND IN THIS PERMIT IN AN APPROPRIATE AND FUNCTIONAL MANNER AND IN ACCORDANCE WITH RELEVANT MANUFACTURER SPECIFICATIONS AND ACCEPTED ENGINEERING PRACTICES.

EROSION PREVENTION (SECTION 8):

1. BEFORE WORK BEGINS, PERMITTEES MUST DELINEATE THE LOCATION OF AREAS NOT TO BE DISTURBED.
2. PERMITTEES MUST MINIMIZE THE NEED FOR DISTURBANCE OF PORTIONS OF THE PROJECT WITH STEEP SLOPES. WHEN STEEP SLOPES MUST BE DISTURBED, PERMITTEES MUST USE TECHNIQUES SUCH AS PHASING AND STABILIZATION PRACTICES DESIGNED FOR STEEP SLOPES (E.G., SLOPE DRAINING AND TERRACING).
3. PERMITTEES MUST STABILIZE ALL EXPOSED SOIL AREAS, INCLUDING STOCKPILES. STABILIZATION MUST BE INITIATED IMMEDIATELY TO LIMIT SOIL EROSION WHEN CONSTRUCTION ACTIVITY HAS PERMANENTLY OR TEMPORARILY CEASED ON ANY PORTION OF THE SITE AND WILL NOT RESUME FOR A PERIOD EXCEEDING 14 CALENDAR DAYS. STABILIZATION MUST BE COMPLETED NO LATER THAN 14 CALENDAR DAYS AFTER THE CONSTRUCTION ACTIVITY HAS CEASED. STABILIZATION IS NOT REQUIRED ON CONSTRUCTED BASE COMPONENTS OF ROADS, PARKING LOTS AND SIMILAR SURFACES. STABILIZATION IS NOT REQUIRED ON TEMPORARY STOCKPILES WITHOUT SIGNIFICANT SILT, CLAY OR ORGANIC COMPONENTS (E.G., CLEAN AGGREGATE STOCKPILES, DEMOLITION CONCRETE STOCKPILES, SAND STOCKPILES) BUT PERMITTEES MUST PROVIDE SEDIMENT CONTROLS AT THE BASE OF THE STOCKPILE.
4. FOR PUBLIC WATERS THAT THE MINNESOTA DNR HAS PROMULGATED "WORK IN WATER RESTRICTIONS" DURING SPECIFIED FISH SPAWNING TIME FRAMES, PERMITTEES MUST COMPLETE STABILIZATION OF ALL EXPOSED SOIL AREAS WITHIN 200 FEET OF THE WATER'S EDGE, AND THAT DRAIN TO THESE WATERS, WITHIN 24 HOURS DURING THE RESTRICTION PERIOD.
5. PERMITTEES MUST STABILIZE THE NORMAL WETTED PERIMETER OF THE LAST 200 LINEAR FEET OF TEMPORARY OR PERMANENT DRAINAGE DITCHES OR SWALES THAT DRAIN WATER FROM THE SITE WITHIN 24 HOURS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE. PERMITTEES MUST COMPLETE STABILIZATION OF REMAINING PORTIONS OF TEMPORARY OR PERMANENT DITCHES OR SWALES WITHIN 14 CALENDAR DAYS AFTER CONNECTING TO A SURFACE WATER OR PROPERTY EDGE AND CONSTRUCTION IN THAT PORTION OF THE DITCH TEMPORARILY OR PERMANENTLY CEASES.
6. TEMPORARY OR PERMANENT DITCHES OR SWALES BEING USED AS A SEDIMENT CONTAINMENT SYSTEM DURING CONSTRUCTION (WITH PROPERLY DESIGNED ROCK-DITCH CHECKS, BIO ROLLS, SILT DIKES, ETC.) DO NOT NEED TO BE STABILIZED. PERMITTEES MUST STABILIZE THESE AREAS WITHIN 24 HOURS AFTER THEIR USE AS A SEDIMENT CONTAINMENT SYSTEM CEASES
7. PERMITTEES MUST NOT USE MULCH, HYDROMULCH, TACKIFIER, POLYACRYLAMIDE OR SIMILAR EROSION PREVENTION PRACTICES WITHIN ANY PORTION OF THE NORMAL WETTED PERIMETER OF A TEMPORARY OR PERMANENT DRAINAGE DITCH OR SWALE SECTION WITH A CONTINUOUS SLOPE OF GREATER THAN 2 PERCENT.
8. PERMITTEES MUST PROVIDE TEMPORARY OR PERMANENT ENERGY DISSIPATION AT ALL PIPE OUTLETS WITHIN 24 HOURS AFTER CONNECTION TO A SURFACE WATER OR PERMANENT STORMWATER TREATMENT SYSTEM.

9. PERMITTEES MUST NOT DISTURB MORE LAND (I.E., PHASING) THAN CAN BE EFFECTIVELY INSPECTED AND MAINTAINED IN ACCORDANCE WITH SECTION 11.

SEDIMENT CONTROL (SECTION 9):

1. PERMITTEES MUST ESTABLISH SEDIMENT CONTROL BMP'S ON ALL DOWNGRADIENT PERIMETERS OF THE SITE AND DOWNGRADIENT AREAS OF THE SITE THAT DRAIN TO ANY SURFACE WATER, INCLUDING CURB AND GUTTER SYSTEMS. PERMITTEES MUST LOCATE SEDIMENT CONTROL PRACTICES UPGRADIENT OF ANY BUFFER ZONES. PERMITTEES MUST INSTALL SEDIMENT CONTROL PRACTICES BEFORE ANY UPGRADIENT LAND-DISTURBING ACTIVITIES BEGIN AND MUST KEEP THE SEDIMENT CONTROL PRACTICES IN PLACE UNTIL THEY ESTABLISH PERMANENT COVER.
2. IF DOWNGRADIENT SEDIMENT CONTROLS ARE OVERLOADED, BASED ON FREQUENT FAILURE OR EXCESSIVE MAINTENANCE REQUIREMENTS, PERMITTEES MUST INSTALL ADDITIONAL UPGRADIENT SEDIMENT CONTROL PRACTICES OR REDUNDANT BMP'S TO ELIMINATE THE OVERLOADING AND AMEND THE SWPPP TO IDENTIFY THESE ADDITIONAL PRACTICES AS REQUIRED IN ITEM 6.3.
3. TEMPORARY OR PERMANENT DRAINAGE DITCHES AND SEDIMENT BASINS DESIGNED AS PART OF A SEDIMENT CONTAINMENT SYSTEM (E.G., DITCHES WITH ROCK-CHECK DAMS) REQUIRE SEDIMENT CONTROL PRACTICES ONLY AS APPROPRIATE FOR SITE CONDITIONS.
4. A FLOATING SILT CURTAIN PLACED IN THE WATER IS NOT A SEDIMENT CONTROL BMP TO SATISFY ITEM 9.2 EXCEPT WHEN WORKING ON A SHORELINE OR BELOW THE WATERLINE. IMMEDIATELY AFTER THE SHORT TERM CONSTRUCTION ACTIVITY (E.G., INSTALLATION OF RIP RAP ALONG THE SHORELINE) IN THAT AREA IS COMPLETE, PERMITTEES MUST INSTALL AN UPLAND PERIMETER CONTROL PRACTICE IF EXPOSED SOILS STILL DRAIN TO A SURFACE WATER.
5. PERMITTEES MUST RE-INSTALL ALL SEDIMENT CONTROL PRACTICES ADJUSTED OR REMOVED TO ACCOMMODATE SHORT-TERM ACTIVITIES SUCH AS CLEARING OR GRUBBING, OR PASSAGE OF VEHICLES. IMMEDIATELY AFTER THE SHORT-TERM ACTIVITY IS COMPLETED, PERMITTEES MUST RE-INSTALL SEDIMENT CONTROL PRACTICES BEFORE THE NEXT PRECIPITATION EVENT EVEN IF THE SHORT-TERM ACTIVITY IS NOT COMPLETE.
6. PERMITTEES MUST PROTECT ALL STORM DRAIN INLETS USING APPROPRIATE BMP'S DURING CONSTRUCTION UNTIL THEY ESTABLISH PERMANENT COVER ON ALL AREAS WITH POTENTIAL FOR DISCHARGING TO THE INLET.
7. PERMITTEES MAY REMOVE INLET PROTECTION FOR A PARTICULAR INLET IF A SPECIFIC SAFETY CONCERN (E.G. STREET FLOODING/FREEZING) IS IDENTIFIED BY THE PERMITTEES OR THE JURISDICTIONAL AUTHORITY (E.G., CITY/COUNTY/TOWNSHIP/MINNESOTA DEPARTMENT OF TRANSPORTATION ENGINEER). PERMITTEES MUST DOCUMENT THE NEED FOR REMOVAL IN THE SWPPP.
8. PERMITTEES MUST PROVIDE SILT FENCE OR OTHER EFFECTIVE SEDIMENT CONTROLS AT THE BASE OF STOCKPILES ON THE DOWNGRADIENT PERIMETER.
9. PERMITTEES MUST LOCATE STOCKPILES OUTSIDE OF NATURAL BUFFERS OR SURFACE WATERS, INCLUDING STORMWATER CONVEYANCES SUCH AS CURB AND GUTTER SYSTEMS UNLESS THERE IS A BYPASS IN PLACE FOR THE STORMWATER.
10. PERMITTEES MUST INSTALL A VEHICLE TRACKING BMP TO MINIMIZE THE TRACK OUT OF SEDIMENT FROM THE CONSTRUCTION SITE OR ONTO PAVED ROADS WITHIN THE SITE.
11. PERMITTEES MUST USE STREET SWEEPING IF VEHICLE TRACKING BMP'S ARE NOT ADEQUATE TO PREVENT SEDIMENT TRACKING ONTO THE STREET.
12. PERMITTEES MUST INSTALL TEMPORARY SEDIMENT BASINS AS REQUIRED IN SECTION 14.
13. IN ANY AREAS OF THE SITE WHERE FINAL VEGETATIVE STABILIZATION WILL OCCUR, PERMITTEES MUST RESTRICT VEHICLE AND EQUIPMENT USE TO MINIMIZE SOIL COMPACTION.
14. PERMITTEES MUST PRESERVE TOPSOIL ON THE SITE, UNLESS INFEASIBLE.
15. PERMITTEES MUST DIRECT DISCHARGES FROM BMP'S TO VEGETATED AREAS UNLESS INFEASIBLE.
16. PERMITTEES MUST PRESERVE A 50 FOOT NATURAL BUFFER OR, IF A BUFFER IS INFEASIBLE ON THE SITE, PROVIDE REDUNDANT (DOUBLE) PERIMETER SEDIMENT CONTROLS WHEN A SURFACE WATER IS LOCATED WITHIN 50 FEET OF THE PROJECT'S EARTH DISTURBANCES AND STORMWATER FLOWS TO THE SURFACE WATER. PERMITTEES MUST INSTALL PERIMETER SEDIMENT CONTROLS AT LEAST 5 FEET APART UNLESS LIMITED BY LACK OF AVAILABLE SPACE. NATURAL BUFFERS ARE NOT REQUIRED ADJACENT TO ROAD DITCHES, JUDICIAL DITCHES, COUNTY DITCHES, STORMWATER CONVEYANCE CHANNELS, STORM DRAIN INLETS, AND SEDIMENT BASINS. IF PRESERVING THE BUFFER IS INFEASIBLE, PERMITTEES MUST DOCUMENT THE REASONS IN THE SWPPP. SHEET PILING IS A REDUNDANT PERIMETER CONTROL IF INSTALLED IN A MANNER THAT RETAINS ALL STORMWATER.
17. PERMITTEES MUST USE POLYMERS, FLOCCULANTS, OR OTHER SEDIMENTATION TREATMENT CHEMICALS IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICES, DOSING SPECIFICATIONS AND SEDIMENT REMOVAL DESIGN SPECIFICATIONS PROVIDED BY THE MANUFACTURER OR SUPPLIER. THE PERMITTEES MUST USE CONVENTIONAL EROSION AND SEDIMENT CONTROLS PRIOR TO CHEMICAL ADDITION AND MUST DIRECT TREATED STORMWATER TO A SEDIMENT CONTROL SYSTEM FOR FILTRATION OR SETTLEMENT OF THE FLOC PRIOR TO DISCHARGE.

DEWATERING AND BASIN DRAINING (SECTION 10):

1. PERMITTEES MUST DISCHARGE TURBID OR SEDIMENT-LADEN WATERS RELATED TO DEWATERING OR BASIN DRAINING (E.G., PUMPED DISCHARGES, TRENCH/DITCH CUTS FOR DRAINAGE) TO A TEMPORARY OR PERMANENT SEDIMENT BASIN ON THE PROJECT SITE UNLESS INFEASIBLE. PERMITTEES MAY DEWATER TO SURFACE WATERS IF THEY VISUALLY CHECK TO ENSURE ADEQUATE TREATMENT HAS BEEN OBTAINED AND PERMANENCE CONDITIONS (SEE MINN. R. 7050.0210, SUBP. 2) WILL NOT RESULT FROM THE DEWATERING. IF PERMITTEES CANNOT DISCHARGE THE WATER TO A SEDIMENTATION BASIN PRIOR TO ENTERING A SURFACE WATER, PERMITTEES MUST TREAT IT WITH APPROPRIATE BMP'S SUCH THAT THE DISCHARGE DOES NOT ADVERSELY AFFECT THE SURFACE WATER OR DOWNSTREAM PROPERTIES.
2. IF PERMITTEES MUST DISCHARGE WATER CONTAINING OIL OR GREASE, THEY MUST USE AN OIL-WATER SEPARATOR OR SUITABLE FILTRATION DEVICE (E.G., CARTRIDGE FILTERS, ABSORBENTS PADS) PRIOR TO DISCHARGE.
3. PERMITTEES MUST DISCHARGE ALL WATER FROM DEWATERING OR BASIN-DRAINING ACTIVITIES IN A MANNER THAT DOES NOT CAUSE EROSION OR ACCUR IN THE IMMEDIATE VICINITY OF DISCHARGE POINTS OR FLOODING OF WETLANDS IN THE IMMEDIATE VICINITY OF DISCHARGE POINTS THAT CAUSES SIGNIFICANT ADVERSE IMPACT TO THE WETLAND.
4. IF PERMITTEES USE FILTERS WITH BACKWASH WATER, THEY MUST HAUL THE BACKWASH WATER AWAY FOR DISPOSAL, RETURN THE BACKWASH WATER TO THE BEGINNING OF THE TREATMENT PROCESS, OR INCORPORATE THE BACKWASH WATER INTO THE SITE IN A MANNER THAT DOES NOT CAUSE EROSION.

INSPECTIONS AND MAINTENANCE (SECTION 11):

1. PERMITTEES MUST ENSURE A TRAINED PERSON, AS IDENTIFIED IN ITEM 21.2.B, WILL INSPECT THE ENTIRE CONSTRUCTION SITE AT LEAST ONCE EVERY SEVEN (7) DAYS AFTER BEGINNING CONSTRUCTION AND WITHIN 24 HOURS AFTER A RAINFALL EVENT GREATER THAN 1/2 INCH IN 24 HOURS.
2. PERMITTEES MUST INSPECT AND MAINTAIN ALL PERMANENT STORMWATER TREATMENT BMP'S.
3. PERMITTEES MUST INSPECT ALL EROSION PREVENTION AND SEDIMENT CONTROL BMP'S AND POLLUTION PREVENTION MANAGEMENT MEASURES TO ENSURE INTEGRITY AND EFFECTIVENESS. PERMITTEES MUST REPAIR, REPLACE OR SUPPLEMENT ALL NONFUNCTIONAL BMP'S WITH FUNCTIONAL BMP'S BY THE END OF THE NEXT BUSINESS DAY AFTER DISCOVERY UNLESS ANOTHER TIME FRAME IS SPECIFIED IN ITEM 11.5 OR 11.6. PERMITTEES MAY TAKE ADDITIONAL TIME IF FIELD CONDITIONS PREVENT ACCESS TO THE AREA.
4. DURING EACH INSPECTION, PERMITTEES MUST INSPECT SURFACE WATERS, INCLUDING DRAINAGE DITCHES AND CONVEYANCE SYSTEMS BUT NOT CURB AND GUTTER SYSTEMS, FOR EVIDENCE OF EROSION AND SEDIMENT DEPOSITION. PERMITTEES MUST REMOVE ALL DELTAS AND SEDIMENT DEPOSITED IN SURFACE WATERS, INCLUDING DRAINAGE WAYS, CATCH BASINS, AND OTHER DRAINAGE SYSTEMS AND REESTABLISH THE AREAS WHERE SEDIMENT REMOVAL RESULTS IN EXPOSED SOIL. PERMITTEES MUST COMPLETE REMOVAL AND STABILIZATION WITHIN SEVEN (7) CALENDAR DAYS OF DISCOVERY UNLESS PRECLUDED BY LEGAL, REGULATORY, OR PHYSICAL ACCESS CONSTRAINTS. PERMITTEES MUST USE ALL REASONABLE EFFORTS TO OBTAIN ACCESS. IF PRECLUDED, REMOVAL AND STABILIZATION MUST TAKE PLACE WITHIN SEVEN (7) DAYS OF OBTAINING ACCESS. PERMITTEES ARE RESPONSIBLE FOR CONTACTING ALL LOCAL, REGIONAL, STATE AND FEDERAL AUTHORITIES AND RECEIVING ANY APPLICABLE PERMITS, PRIOR TO CONDUCTING ANY WORK IN SURFACE WATERS.
5. PERMITTEES MUST INSPECT CONSTRUCTION SITE VEHICLE EXIT LOCATIONS, STREETS AND CURB AND GUTTER SYSTEMS WITHIN AND ADJACENT TO THE PROJECT FOR SEDIMENTATION FROM EROSION OR TRACKED SEDIMENT FROM VEHICLES. PERMITTEES MUST REMOVE SEDIMENT FROM ALL PAVED SURFACES WITHIN ONE (1) CALENDAR DAY OF DISCOVERY OR, IF APPLICABLE, WITHIN A SHORTER TIME TO AVOID A SAFETY HAZARD TO USERS OF PUBLIC STREETS.
6. PERMITTEES MUST REPAIR, REPLACE OR SUPPLEMENT ALL PERIMETER CONTROL DEVICES WHEN THEY BECOME NON-FUNCTIONAL OR THE SEDIMENT REACHES 1/2 OF THE HEIGHT OF THE DEVICE.
7. PERMITTEES MUST DRAIN TEMPORARY AND PERMANENT SEDIMENTATION BASINS AND REMOVE THE SEDIMENT WHEN THE DEPTH OF SEDIMENT COLLECTED IN THE BASIN REACHES 1/2 THE STORAGE VOLUME.
8. PERMITTEES MUST ENSURE THAT AT LEAST ONE INDIVIDUAL PRESENT ON THE SITE (OR AVAILABLE TO THE PROJECT SITE IN THREE (3) CALENDAR DAYS) IS TRAINED IN THE JOB DUTIES DESCRIBED IN ITEM 21.2.B.
9. PERMITTEES MAY ADJUST THE INSPECTION SCHEDULE DESCRIBED IN ITEM 11.2 AS FOLLOWS:
 - a. INSPECTIONS OF AREAS WITH PERMANENT COVER CAN BE REDUCED TO ONCE PER MONTH, EVEN IF CONSTRUCTION ACTIVITY CONTINUES ON OTHER PORTIONS OF THE SITE; OR
 - b. WHERE THERE HAVE PERMANENT COVER ON ALL EXPOSED SOIL AND NO CONSTRUCTION ACTIVITY IS OCCURRING ANYWHERE ON THE SITE, INSPECTIONS CAN BE REDUCED TO ONCE PER MONTH AND, AFTER 12 MONTHS, MAY BE SUSPENDED COMPLETELY UNTIL CONSTRUCTION ACTIVITY RESUMES. THE MPCA MAY REQUIRE INSPECTIONS TO RESUME IF CONDITIONS WARRANT; OR
 - c. WHERE CONSTRUCTION ACTIVITY HAS BEEN SUSPENDED DUE TO FROZEN GROUND CONDITIONS, INSPECTIONS MAY BE SUSPENDED. INSPECTIONS MUST RESUME WITHIN 24 HOURS OF RUNOFF OCCURRING, OR UPON RESUMING CONSTRUCTION, WHICHEVER COMES FIRST.
10. PERMITTEES MUST RECORD ALL INSPECTIONS AND MAINTENANCE ACTIVITIES WITHIN 24 HOURS OF BEING CONDUCTED AND THESE RECORDS MUST BE RETAINED WITH THE SWPPP. THESE RECORDS MUST INCLUDE:
 - a. DATE AND TIME OF INSPECTIONS; AND
 - b. NAME OF PERSONS CONDUCTING INSPECTIONS; AND
 - c. ACCURATE FINDINGS OF INSPECTIONS, INCLUDING THE SPECIFIC LOCATION WHERE CORRECTIVE ACTIONS ARE NEEDED; AND
 - d. CORRECTIVE ACTIONS TAKEN (INCLUDING DATES, TIMES, AND PARTY COMPLETING MAINTENANCE ACTIVITIES); AND
11. DATE OF ALL RAINFALL EVENTS GREATER THAN 1/2 INCHES IN 24 HOURS, AND THE AMOUNT OF RAINFALL FOR EACH EVENT. PERMITTEES MUST OBTAIN RAINFALL AMOUNTS BY EITHER A PROPERLY MAINTAINED RAIN GAUGE INSTALLED ONSITE, A WEATHER STATION THAT IS WITHIN ONE (1) MILE OF YOUR LOCATION, OR A WEATHER REPORTING SYSTEM THAT PROVIDES SITE SPECIFIC RAINFALL DATA FROM RADAR SURVEILLANCES; AND

1. IF PERMITTEES OBSERVE A DISCHARGE DURING THE INSPECTION, THEY MUST RECORD AND SHOULD PHOTOGRAPH AND DESCRIBE THE LOCATION OF THE DISCHARGE (I.E., COLOR, ODOR, SETTLED OR SUSPENDED SOLIDS, OIL SHEEN, AND OTHER OBVIOUS INDICATORS OF POLLUTANTS); AND
9. ANY AMENDMENTS TO THE SWPPP PROPOSED AS A RESULT OF THE INSPECTION MUST BE DOCUMENTED AS REQUIRED IN SECTION 6 WITHIN SEVEN (7) CALENDAR DAYS.

POLLUTION PREVENTION MANAGEMENT (SECTION 12):

1. PERMITTEES MUST PLACE BUILDING PRODUCTS AND LANDSCAPE MATERIALS UNDER COVER (E.G., PLASTIC SHEETING OR TEMPORARY ROOFS) OR PROTECT THEM BY SIMILARLY EFFECTIVE MEANS DESIGNED TO MINIMIZE CONTACT WITH STORMWATER. PERMITTEES ARE NOT REQUIRED TO COVER OR PROTECT PRODUCTS WHICH ARE EITHER NOT A SOURCE OF CONTAMINATION TO STORMWATER OR ARE DESIGNED TO BE EXPOSED TO STORMWATER.
2. PERMITTEES MUST PLACE PESTICIDES, FERTILIZERS AND TREATMENT CHEMICALS UNDER COVER (E.G., PLASTIC SHEETING OR TEMPORARY ROOFS) OR PROTECT THEM BY SIMILARLY EFFECTIVE MEANS DESIGNED TO MINIMIZE CONTACT WITH STORMWATER.
3. PERMITTEES MUST STORE HAZARDOUS MATERIALS AND TOXIC WASTE, (INCLUDING OIL, DIESEL FUEL, GASOLINE, HYDRAULIC FLUIDS, PAINT SOLVENTS, PETROLEUM-BASED PRODUCTS, WOOD PRESERVATIVES, ADDITIVES, CURING COMPOUNDS, AND ACIDS) IN SEALED CONTAINERS TO PREVENT SPILLS, LEAKS OR OTHER DISCHARGE. STORAGE AND DISPOSAL OF HAZARDOUS WASTE MATERIALS MUST BE IN COMPLIANCE WITH MINN. R. CH. 7045 INCLUDING SECONDARY CONTAINMENT AS APPLICABLE.
4. PERMITTEES MUST PROPERLY STORE, COLLECT AND DISPOSE SOLID WASTE IN COMPLIANCE WITH MINN. R. CH. 7035.
5. PERMITTEES MUST POSITION PORTABLE TOILETS SO THEY ARE SECURE AND WILL NOT TIP OR BE KNOCKED OVER. PERMITTEES MUST PROPERLY DISPOSE SANITARY WASTE IN ACCORDANCE WITH MINN. R. CH. 7041.
6. PERMITTEES MUST TAKE REASONABLE STEPS TO PREVENT THE DISCHARGE OF SPILLED OR LEAKED CHEMICALS, INCLUDING FUEL, FROM ANY AREA WHERE CHEMICALS OR FUEL WILL BE LOADED OR UNLOADED INCLUDING THE USE OF DRIP PANS OR ABSORBENTS UNLESS INFEASIBLE. PERMITTEES MUST ENSURE ADEQUATE SUPPLIES ARE AVAILABLE AT ALL TIMES TO CLEAN UP DISCHARGED MATERIALS AND THAT AN APPROPRIATE DISPOSAL METHOD IS AVAILABLE FOR RECOVERED SPILLED MATERIALS. PERMITTEES MUST REPORT AND CLEAN UP SPILLS IMMEDIATELY AS REQUIRED BY MINN. STAT. 115.061, USING DRY CLEAN UP MEASURES WHERE POSSIBLE.
7. PERMITTEES MUST LIMIT VEHICLE EXTERIOR WASHING AND EQUIPMENT TO A DEFINED AREA OF THE SITE. PERMITTEES MUST CONTAIN RUNOFF FROM THE WASHING AREA IN A SEDIMENT BASIN OR OTHER SIMILARLY EFFECTIVE CONTROLS AND MUST DISPOSE WASTE FROM THE WASHING ACTIVITY PROPERLY. PERMITTEES MUST PROPERLY USE AND STORE SOAPS, DETERGENTS, OR SOLVENTS.
8. PERMITTEES MUST PROVIDE EFFECTIVE CONTAINMENT FOR ALL LIQUID AND SOLID WASTES GENERATED BY WASHOUT OPERATIONS (E.G., CONCRETE, STUCCO, PAINT, FORM RELEASE OILS, CURING COMPOUNDS AND OTHER CONSTRUCTION MATERIALS) RELATED TO THE CONSTRUCTION ACTIVITY. PERMITTEES MUST PREVENT LIQUID AND SOLID WASHOUT WASTES FROM CONTACTING THE GROUND AND MUST DESIGN THE CONTAINMENT SO IT DOES NOT RESULT IN RUNOFF FROM THE WASHOUT OPERATIONS OR AREAS. PERMITTEES MUST PROPERLY DISPOSE LIQUID AND SOLID WASTES IN COMPLIANCE WITH MPCA RULES. PERMITTEES MUST INSTALL A SIGN INDICATING THE LOCATION OF THE WASHOUT FACILITY.

PERMIT TERMINATION (SECTION 4 AND SECTION 13):

1. PERMITTEES MUST SUBMIT A NOT WITHIN 30 DAYS AFTER ALL TERMINATION CONDITIONS LISTED IN SECTION 13 ARE COMPLETE.
2. PERMITTEES MUST SUBMIT A NOT WITHIN 30 DAYS AFTER SELLING OR OTHERWISE LEGALLY TRANSFERRING THE ENTIRE SITE, INCLUDING PERMIT RESPONSIBILITY FOR ROADS (E.G., STREET SWEEPING) AND STORMWATER INFRASTRUCTURE FINAL CLEAN OUT, OR TRANSFERRING PORTIONS OF A SITE TO ANOTHER PARTY, THE PERMITTEES' COVERAGE UNDER THIS PERMIT TERMINATES AT MIDNIGHT ON THE SUBMISSION DATE OF THE NOT.
3. PERMITTEES MUST COMPLETE ALL CONSTRUCTION ACTIVITY AND MUST INSTALL PERMANENT COVER OVER ALL AREAS PRIOR TO SUBMITTING THE NOT. VEGETATIVE COVER MUST CONSIST OF A UNIFORM PERENNIAL VEGETATION WITH A DENSITY OF 70 PERCENT OF ITS EXPECTED FINAL GROWTH. VEGETATION IS NOT REQUIRED WHERE THE FUNCTION OF A SPECIFIC AREA DICTATES NO VEGETATION, SUCH AS IMPERVIOUS SURFACES OR THE BASE OF A SAND FILTER.
4. PERMITTEES MUST CLEAN THE PERMANENT STORMWATER TREATMENT SYSTEM OF ANY ACCUMULATED SEDIMENT AND MUST ENSURE THE SYSTEM MEETS ALL APPLICABLE REQUIREMENTS IN SECTION 15 THROUGH 19 AND IS OPERATING AS DESIGNED.
5. PERMITTEES MUST REMOVE ALL SEDIMENT FROM CONVEYANCE SYSTEMS PRIOR TO SUBMITTING THE NOT.
6. PERMITTEES MUST REMOVE ALL TEMPORARY SYNTHETIC EROSION PREVENTION AND SEDIMENT CONTROL BMP'S PRIOR TO SUBMITTING THE NOT. PERMITTEES MAY LEAVE BMP'S DESIGNED TO DECOMPOSE ON-SITE IN PLACE.
7. FOR RESIDENTIAL CONSTRUCTION ONLY, PERMIT COVERAGE TERMINATES ON INDIVIDUAL LOTS IF THE STRUCTURES ARE FINISHED AND TEMPORARY EROSION PREVENTION AND DOWNGRADIENT PERIMETER CONTROL IS COMPLETE. THE RESIDENCE SELLS TO THE HOMEOWNER, AND THE PERMITTEE DISTRIBUTES THE MPCA'S "HOMEOWNER FACT SHEET" TO THE HOMEOWNER.
8. FOR CONSTRUCTION PROJECTS ON AGRICULTURAL LAND (E.G., PIPELINES ACROSS CROPLAND), PERMITTEES MUST RETURN THE DISTURBED LAND TO ITS PRECONSTRUCTION AGRICULTURAL USE PRIOR TO SUBMITTING THE NOT.

SEED NOTES:

ALL SEED MIXES AND APPLICATION SHALL BE IN ACCORDANCE WITH THE MNDOT SEEDING MANUAL.

GENERAL RECOMMENDATIONS:

THE CONTRACTOR IS RESPONSIBLE TO SALVAGE AND PRESERVE EXISTING TOPSOIL NECESSARY FOR FINAL STABILIZATION AND TO ALSO MINIMIZE COMPACTION IN ALL LANDSCAPE AREAS. IMMEDIATELY BEFORE SEEDING THE SOIL SHALL BE TILLED TO A MINIMUM DEPTH OF 3 INCHES.

TEMPORARY EROSION CONTROL SEEDING, MULCHING & BLANKET.

SEED

- TEMPORARY SEED SHALL BE MNDOT SEED MIX 21-112 (WINTER WHEAT COVER CROP) FOR WINTER AND 21-111 (OATS COVER CROP) FOR SPRING/SUMMER APPLICATIONS. BOTH SEED MIXES SHALL BE APPLIED AT A SEEDING RATE OF 100 LBS/ACRE.

MULCH

- IMMEDIATELY AFTER SEEDING, WITHIN 24 HOURS, MNDOT TYPE 1 MULCH SHOULD BE APPLIED TO PROTECT AND ENHANCE SEED GERMINATION. MULCH SHALL BE APPLIED AT 90% COVERAGE (2 TONS PER ACRE OF STRAW MULCH)

SLOPES

- 3:1 (HORIZ:VERT.) OR FLATTER MICH SHALL BE COVERED WITH MULCH
- SLOPES STEEPER THAN 3:1 OR DITCH BOTTOMS SHALL BE COVERED WITH EROSION CONTROL BLANKET.
- SEE PLAN FOR MORE DETAILED DITCH AND STEEP SLOPE EROSION CONTROL TREATMENTS.

TRAINING SECTION 21

DESIGN ENGINEER: DAVID J. KNAEBLE P.E.
TRAINING COURSE: DESIGN OF SWPPP
TRAINING ENTITY: UNIVERSITY OF MINNESOTA
INSTRUCTOR: JOHN CHAPMAN
DATES OF TRAINING COURSE: 8/22/2012- 8/23/2012
TOTAL TRAINING HOURS: 12
DATE OF RECERTIFICATION: 4/22/22
EXPIRATION: 5/31/2025

OWNER INFORMATION

TSUNAMI EXPRESS CAR WASH, LLC.
4800 MEADOWS ROAD, SUITE 300
LAKE OSWEGO, OR 97035
CHRIS SCHULTZ
920-744-9882
CHRIS@TSUNAMIEXPRESS.COM

AREAS AND QUANTITIES:

SITE AREA CALCULATIONS		EXISTING CONDITION		PROPOSED CONDITION		
IMPERVIOUS SURFACES						
BUILDING COVERAGE		6,344 SF	17.5%		4,383 SF	12.1%
PAVEMENT		18,417 SF	50.8%		21,308 SF	58.8%
	TOTAL	24,761 SF	68.3%	0.6 AC	25,691 SF	70.8%
PERVIOUS SURFACES						0.6 AC
	TOTAL	11,507 SF	31.7%	0.3 AC	10,577 SF	29.2%
	TOTAL SITE AREA	36,268 SF	100.0%	0.8 AC	36,268 SF	100.0%
DIFFERENCE (EX. VS PROP.)		930 SF	2.6%			
DISTURBED AREA		39,500 SF	0.9 AC			
EROSION CONTROL QUANTITIES						
DISTURBED AREA		39,500 SF				
SILT FENCE/BIO-ROLL		+950 LF				
EROSION CONTROL BLANKET		6,200 SF				
INLET PROTECTION DEVICES		+12 EA				

NOTE: QUANTITIES ARE FOR INFORMATIONAL PURPOSES ONLY. CONTRACTOR SHALL DETERMINE FOR THEMSELVES THE EXACT QUANTITIES FOR BIDDING AND CONSTRUCTION.

SWPPP CONTACT PERSON

CONTRACTOR:

SWPPP INSPECTOR TRAINING:

ALL SWPPP INSPECTIONS MUST BE PERFORMED BY A PERSON THAT MEETS THE TRAINING REQUIREMENTS OF THE NPDES CONSTRUCTION SITE PERMIT. TRAINING CREDENTIALS SHALL BE PROVIDED BY THE CONTRACTOR AND KEPT ON SITE WITH THE SWPPP

PARTY RESPONSIBLE FOR LONG TERM OPERATION AND MAINTENANCE OF PERMANENT STORM WATER MANAGEMENT SYSTEM

PERMANENT STORMWATER MANAGEMENT IS NOT REQUIRED AS PART OF THIS PROJECT TO MEET NPDES PERMIT REQUIREMENTS.

SWPPP ATTACHMENTS (ONLY APPLICABLE IF SITE IS 1 ACRE OR GREATER):

NA

SUPPLEMENTARY SITE SPECIFIC EROSION CONTROL NOTES:

THESE NOTES SUPERCEDE ANY GENERAL SWPPP NOTES.

THIS PROJECT IS LESS THAN 1.0 ACRES SO AN NPDES PERMIT IS NOT REQUIRED AND DOES NOT NEED TO BE SUBMITTED TO THE MPCA.

PROJECT NARRATIVE:

PROJECT IS A REDEVELOPMENT OF AN EXISTING MULTI-STORY OFFICE BUILDING INTO AN AUTOMATED CAR WASH. SITE, GRADING, UTILITY AND LANDSCAPE IMPROVEMENTS WILL OCCUR.

NATIVE BUFFER NARRATIVE:

PRESERVING A 50 FOOT NATURAL BUFFER AROUND WATER BODIES IS NOT REQUIRED OF THIS PROJECT BECAUSE WATER BODIES ARE NOT LOCATED ON SITE.

INFILTRATION NARRATIVE:

INFILTRATION IS NOT PROVIDED AS PART OF THE PROJECTS PERMANENT STORM WATER MANAGEMENT SYSTEM.

SOIL CONTAMINATION NARRATIVE:

SOILS ONSITE HAVE NOT BEEN IDENTIFIED AS CONTAMINATED.

SPECIAL TMDL BMP REQUIREMENTS SITE SPECIFIC (IF REQUIRED):

NA

PERMANENT STABILIZATION NOTES SITE SPECIFIC:

PERMANENT SEED MIX

- FOR THIS PROJECT ALL AREAS THAT ARE NOT TO BE SODDED OR LANDSCAPED SHALL RECEIVE A NATIVE PERMANENT SEED MIX.
 - AREAS IN BUFFERS AND ADJACENT TO OR IN WET AREAS MNDOT SEED MIX 33-261 (STORMWATER SOUTH AND WEST) AT



**TSUNAMI
EXPRESS**
CAR WASH



Tsunami Express Car Wash

Cover Sheet



24056

06.20.2024

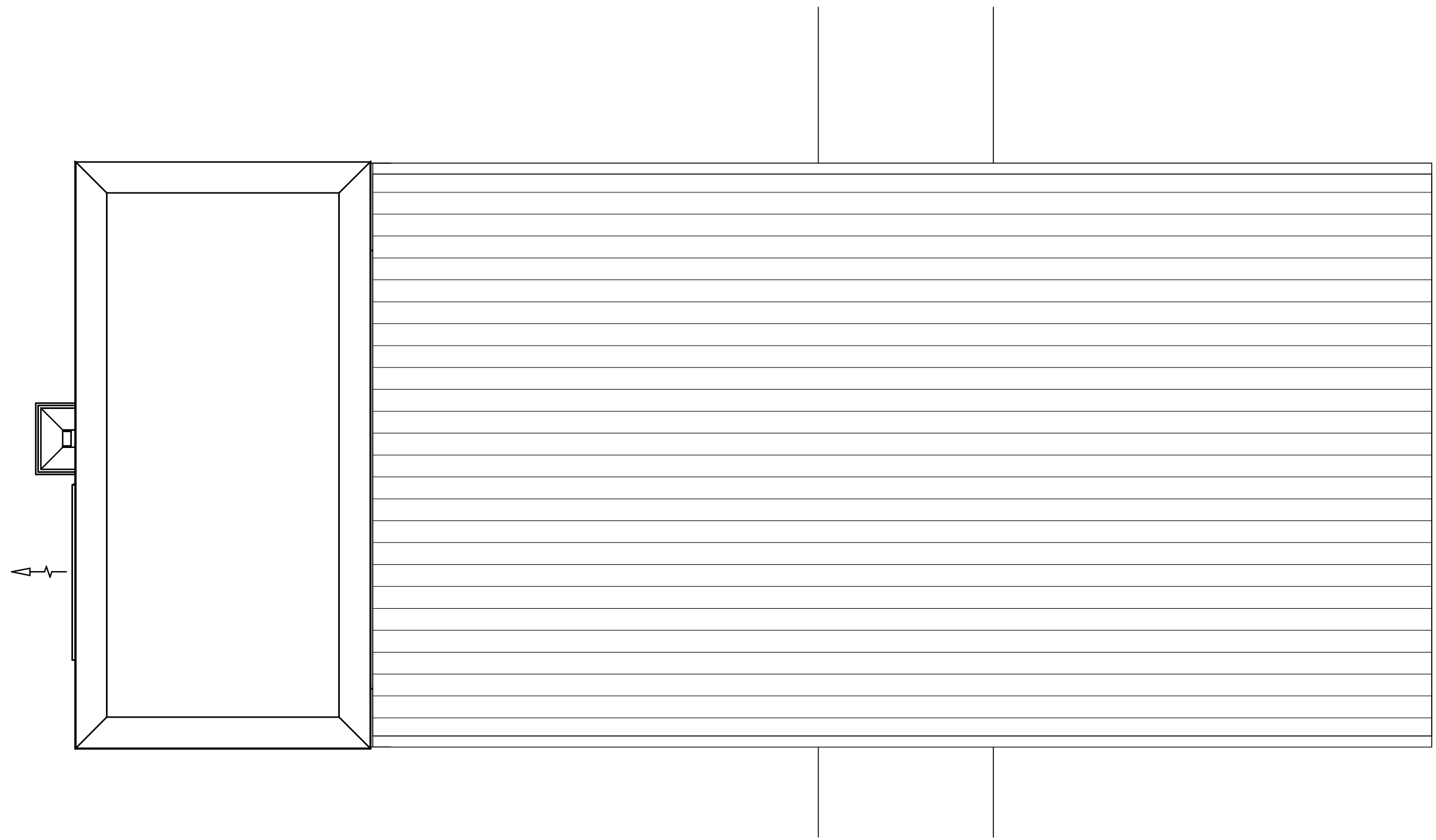
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KEYNOTES PER SHEET	
0420-14	BRICK SOLDIER COURSE
0473-07	CAST STONE DECORATIVE ELEMENT
0724-01	EIFS (SEE EXTERIOR MATERIAL SCHEDULE)
0771-05	PREFINISHED ALUMINUM SCUPPER W/ DOWNSPOUT (TYP.) SEE EXTERIOR MATERIAL LEGEND FOR COLOR. CONNECT TO STORM SEWER; SEE CIVIL DRAWINGS.
0833-02	OVERHEAD DOOR, SEE DOOR SCHED.
0841-01	THERMALLY BROKEN ALUMINUM STOREFRONT SYSTEM - CENTER GLAZED - STANDARD 2" X 4-1/2" MULLIONS, TYPICAL.
0841-06	ALUMINUM FRAMED ENTRANCE DOOR (SEE DOOR SCHEDULE)
1044-04	KNOX BOX. VERIFY LOCATION WITH AUTHORITY HAVING JURISDICTION (AHJ) PRIOR TO INSTALLATION.
1070-02	PREFABRICATED ALUMINUM CANOPY
2214-07	OVERFLOW DRAIN WITH LAMB'S TONGUE APPROXIMATELY 18" A.F.F. (SEE PLUMBING DRAWINGS)
2656-03	EXTERIOR WALL-MOUNTED LIGHT FIXTURE (SEE ELECTRICAL DRAWINGS)
AC-1	PREFINISHED ALUMINUM COPING. SEE EXTERIOR MATERIAL LEGEND.
AF-1	PREFINISHED ALUMINUM FASCIA ON EXTERIOR GRADE 2X12 RAKE BOARD AND 1X6 TRIM BOARD. SEE EXTERIOR MATERIAL LEGEND.
BR-1	4" X 4" X 16" STRUCTURAL BRICK. SEE EXTERIOR MATERIAL LEGEND.
BR-2	8" X 4" X 16" STRUCTURAL BRICK. SEE EXTERIOR MATERIAL LEGEND.
BR-3	12" X 4" X 16" STRUCTURAL BRICK. SEE EXTERIOR MATERIAL LEGEND.
BR-4	4" X 4" X 16" STRUCTURAL BRICK SOLDIER COURSE. SEE EXTERIOR MATERIAL LEGEND.
CMU-1	8" X 8" X 16" SPLIT FACE CMU. SEE EXTERIOR MATERIAL LEGEND.
CMU-2	12" X 8" X 16" SPLIT FACE CMU. SEE EXTERIOR MATERIAL LEGEND.
CS-1	CAST STONE SILL. SEE CAST STONE PROFILES.
CS-2	CAST STONE SILL. SEE CAST STONE PROFILES.
CS-3	CAST STONE BASE. SEE CAST STONE PROFILES.
CS-4	CAST STONE SILL. SEE CAST STONE PROFILES.
CS-5	CAST STONE HEAD. SEE CAST STONE PROFILES.
CS-6	CAST STONE PIER. SEE CAST STONE PROFILES.
MR-1	STANDING SEAM METAL ROOF. SEE EXTERIOR MATERIAL LEGEND.

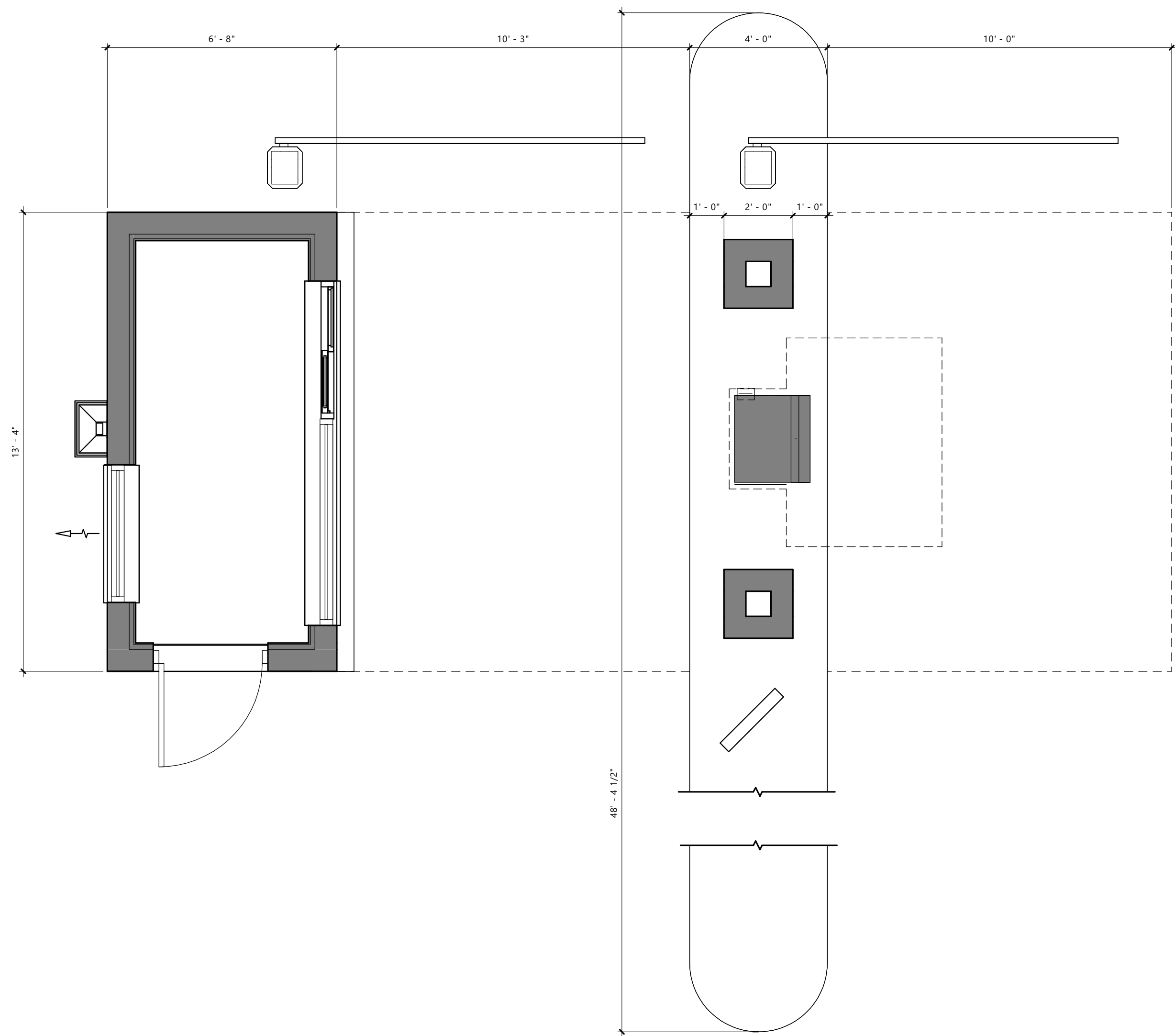
EXTERIOR MATERIAL LEGEND	
	(BR-X): STRUCTURAL BRICK MANUFACTURER: COUNTY MATERIALS PRODUCT: HERITAGE (STRUCTURAL BRICK) COLOR: GRAYSTONE MORTAR COLOR: SPECIMIX SM100 GREY (BR-1): 4" X 4" X 16" STRUCTURAL BRICK (BR-2): 8" X 4" X 16" STRUCTURAL BRICK (BR-3): 12" X 4" X 16" STRUCTURAL BRICK
	(CS-X): CAST STONE MANUFACTURER: MARCSTONE COLOR: DARK SHALE (SEE CAST STONE PROFILES)
	(CMU-X): SPLIT FACE CMU MANUFACTURER: COUNTY MATERIALS PRODUCT: SPLIT FACE COLOR: STEEL GRAY (CMU-1): 8" X 8" X 16" (CMU-2): 12" X 8" X 16"
	(MR-1): STANDING SEAM METAL ROOF: MANUFACTURER: PAC-CLAD PRODUCT: COLOR: AWARD BLUE
	(EIFS-1): EXTERIOR FINISH SYSTEM MANUFACTURER: DRYVIT PRODUCT: OUTSULATION PLUS MD COLOR: #SW 7068 GRIZZLE GRAY FINISH: SANDBLAST
	(AC-1): PREFINISHED ALUMINUM COPING MANUFACTURER: PAC-CLAD PRODUCT: PAC-TITE COPING-TAPERED COLOR: PACIFIC BLUE
	(AF-1): PREFINISHED ALUMINUM FASCIA MANUFACTURER: PAC-CLAD PRODUCT: FORMED ALUMINUM COLOR: PACIFIC BLUE
	(AS-1): PREFINISHED ALUMINUM SOFFIT PANEL MANUFACTURER: PAC-CLAD PRODUCT: VENTED ALUMINUM PANEL COLOR: PACIFIC BLUE
	(GTR-1): PREFINISHED ALUMINUM GUTTER/DOWNSPOUT MANUFACTURER: PAC-CLAD PRODUCT: 5" BEVELED PROFILE GUTTERS COLOR: PACIFIC BLUE



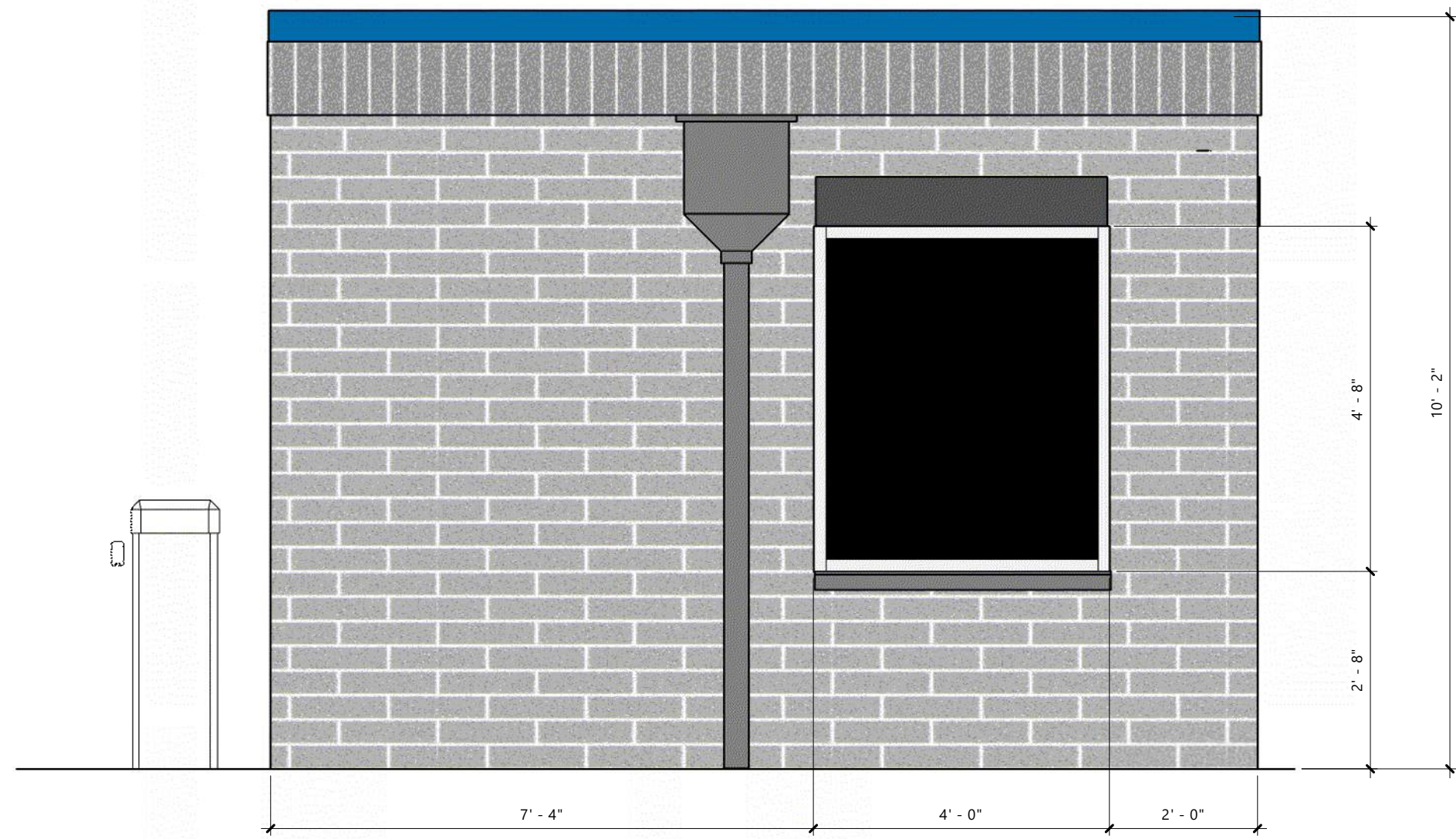
Tsunami Express Car Wash



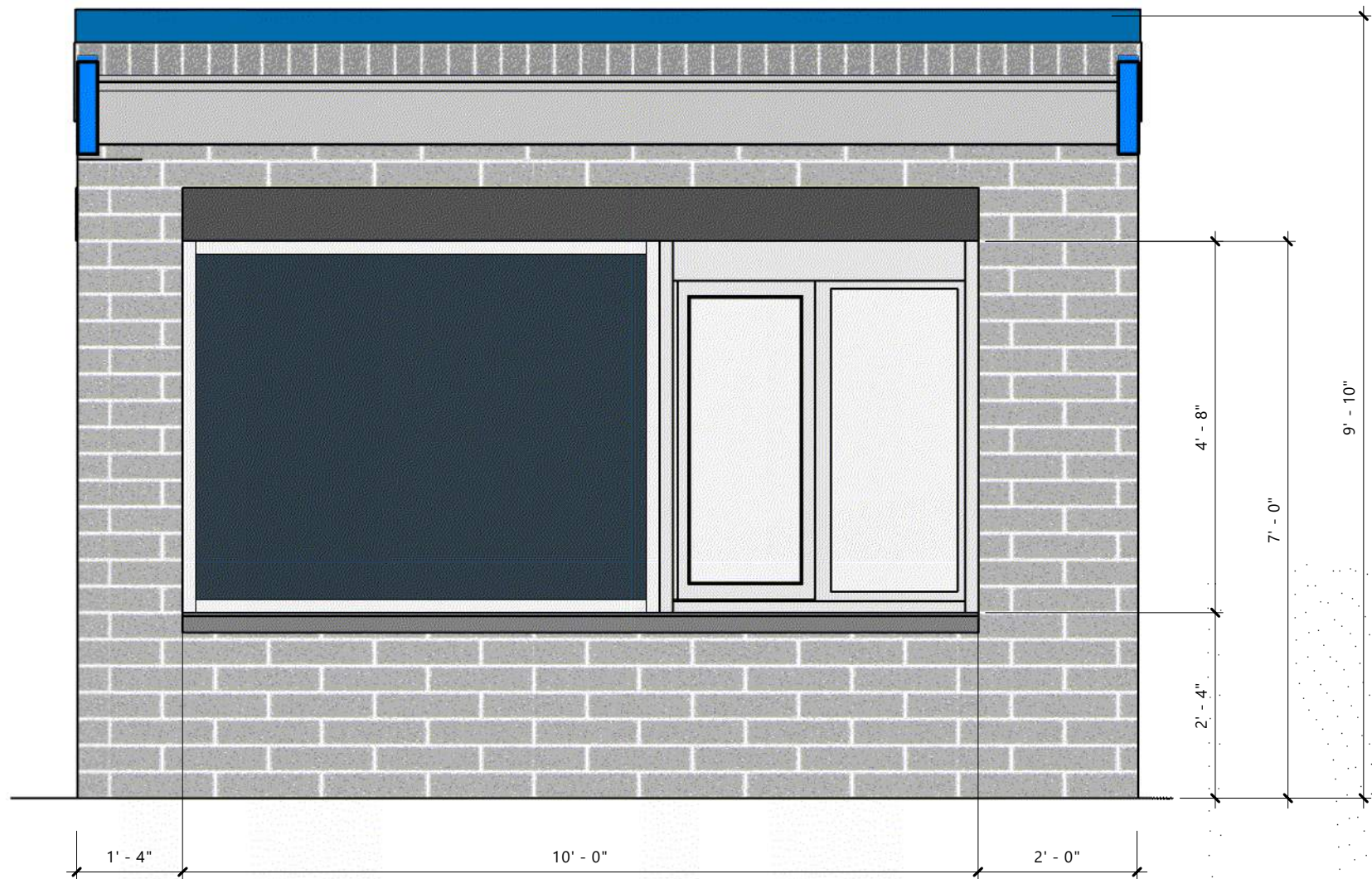
2 SALES BOOTH - ROOF PLAN
3/8" = 1'-0"



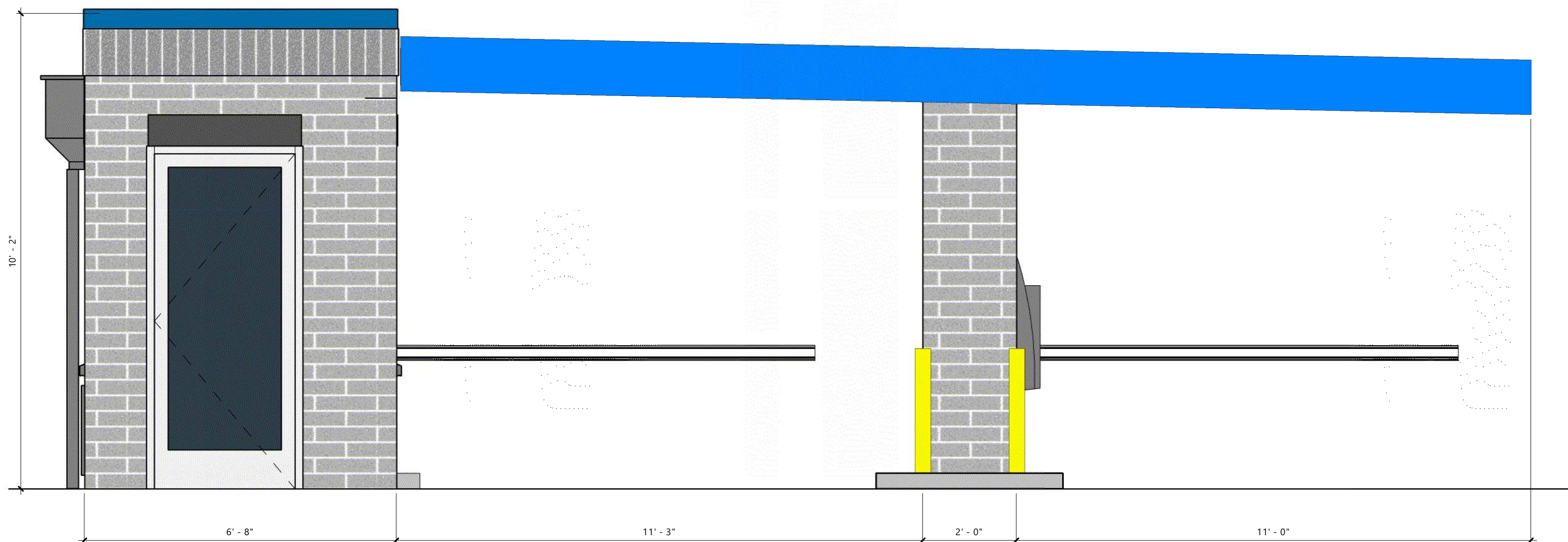
1 SALES BOOTH - FLOOR PLAN
3/8" = 1'-0"



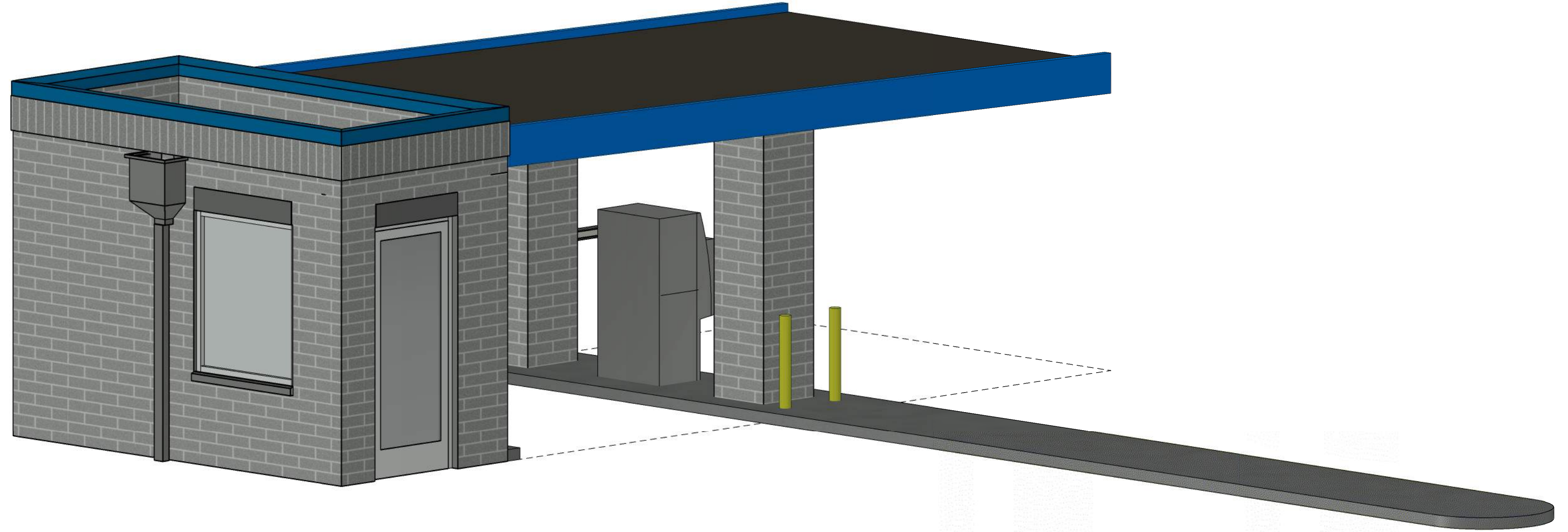
4 SALES 2 LANE - BACK ELEV
1/2" = 1'-0"



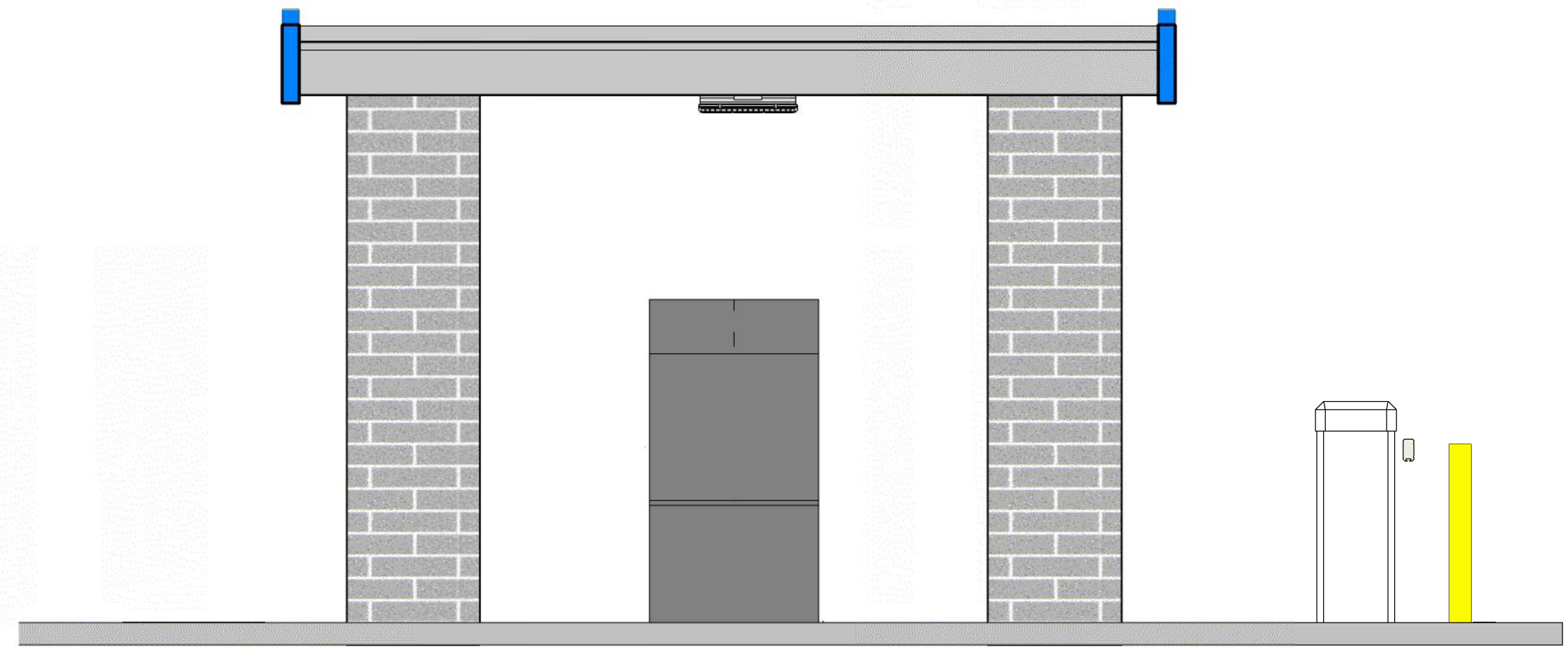
3 SALES - 2 LANE FRONT ELEV
1/2" = 1'-0"



1 SALES 2 LANE - APPROACH
1/2" = 1'-0"



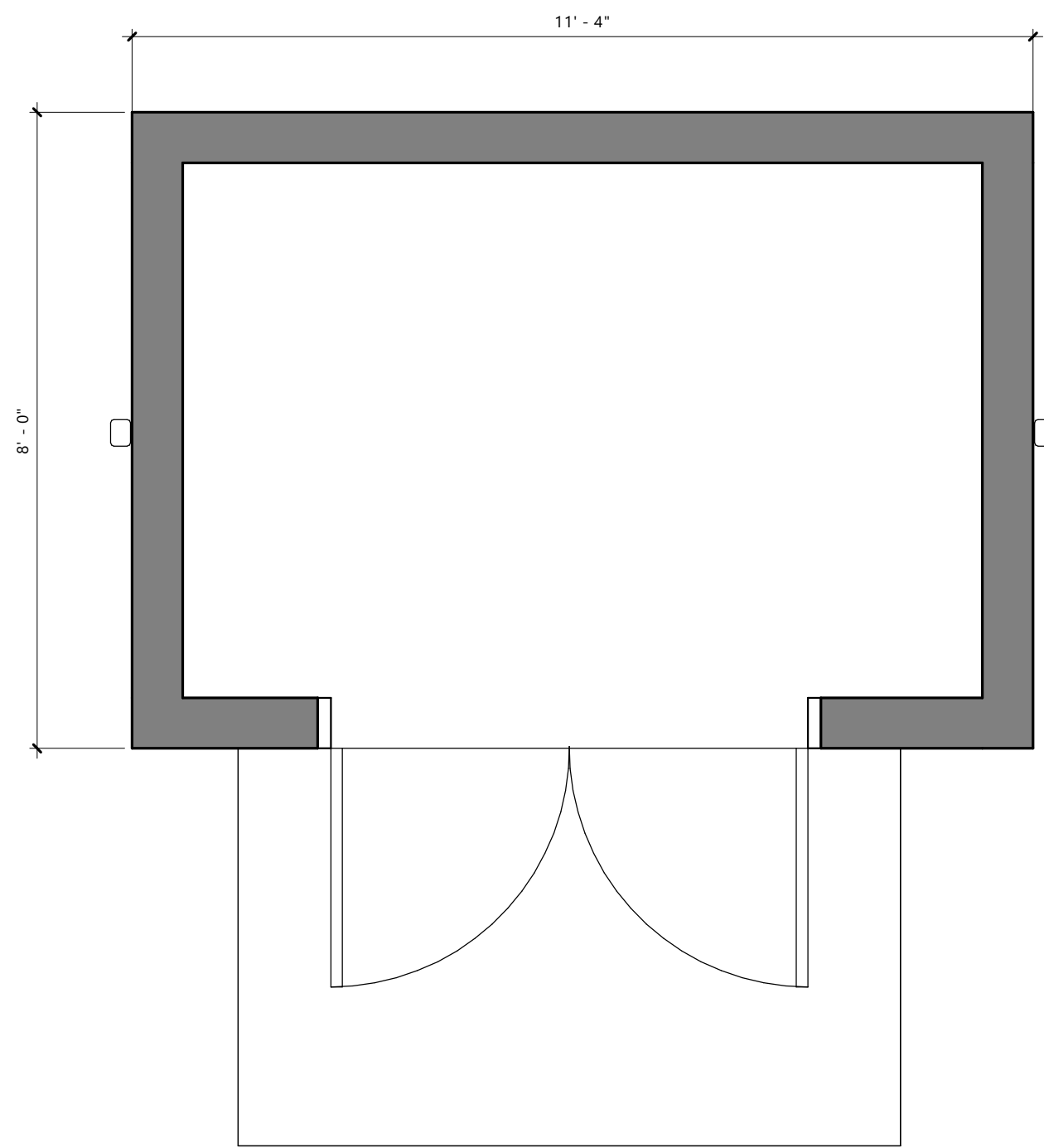
5 SALES BOOTH - 3D VIEW



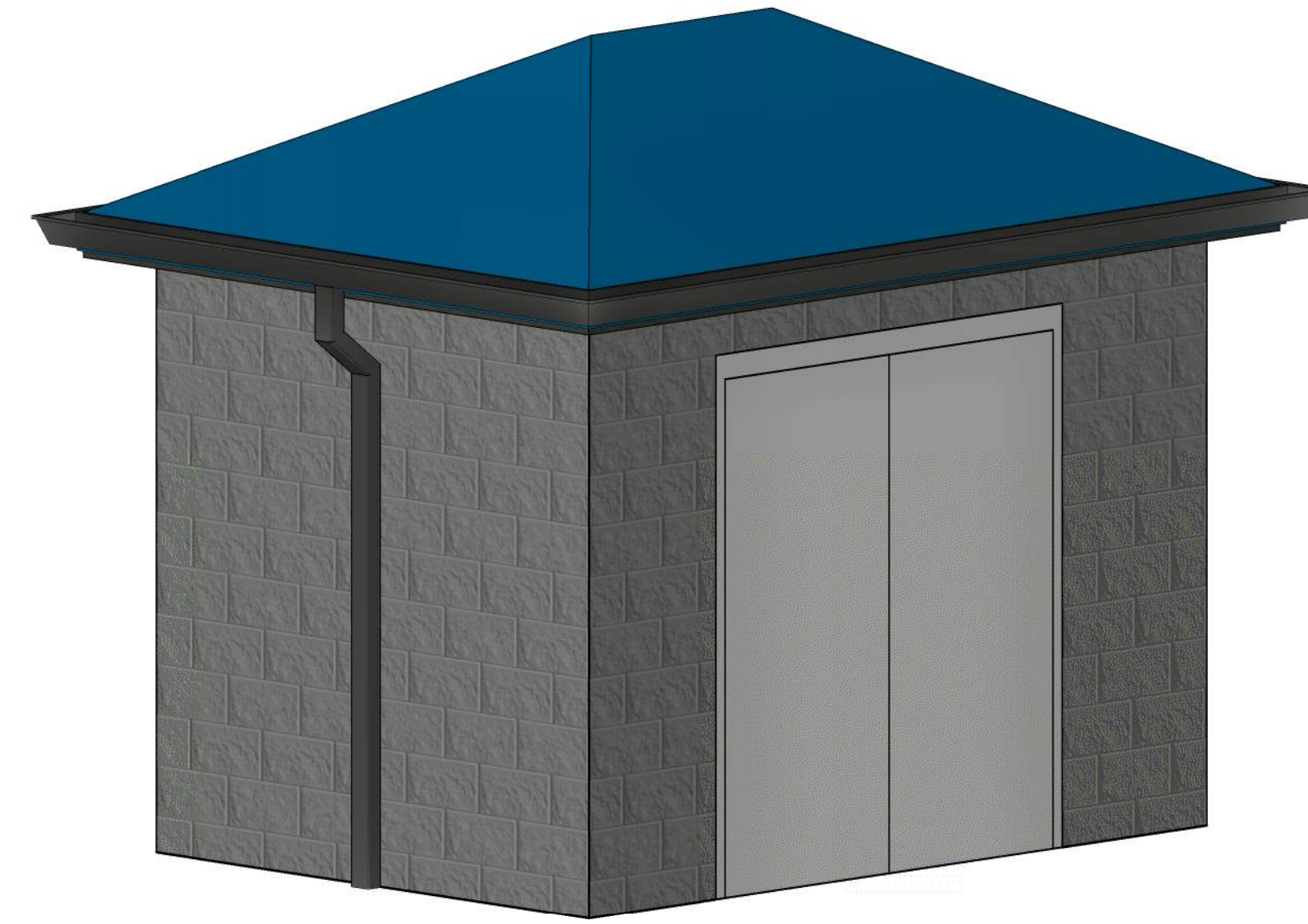
2 SALES BOOTH - SALES LANE ELEVATION
1/2" = 1'-0"

Tsunami Express Car Wash

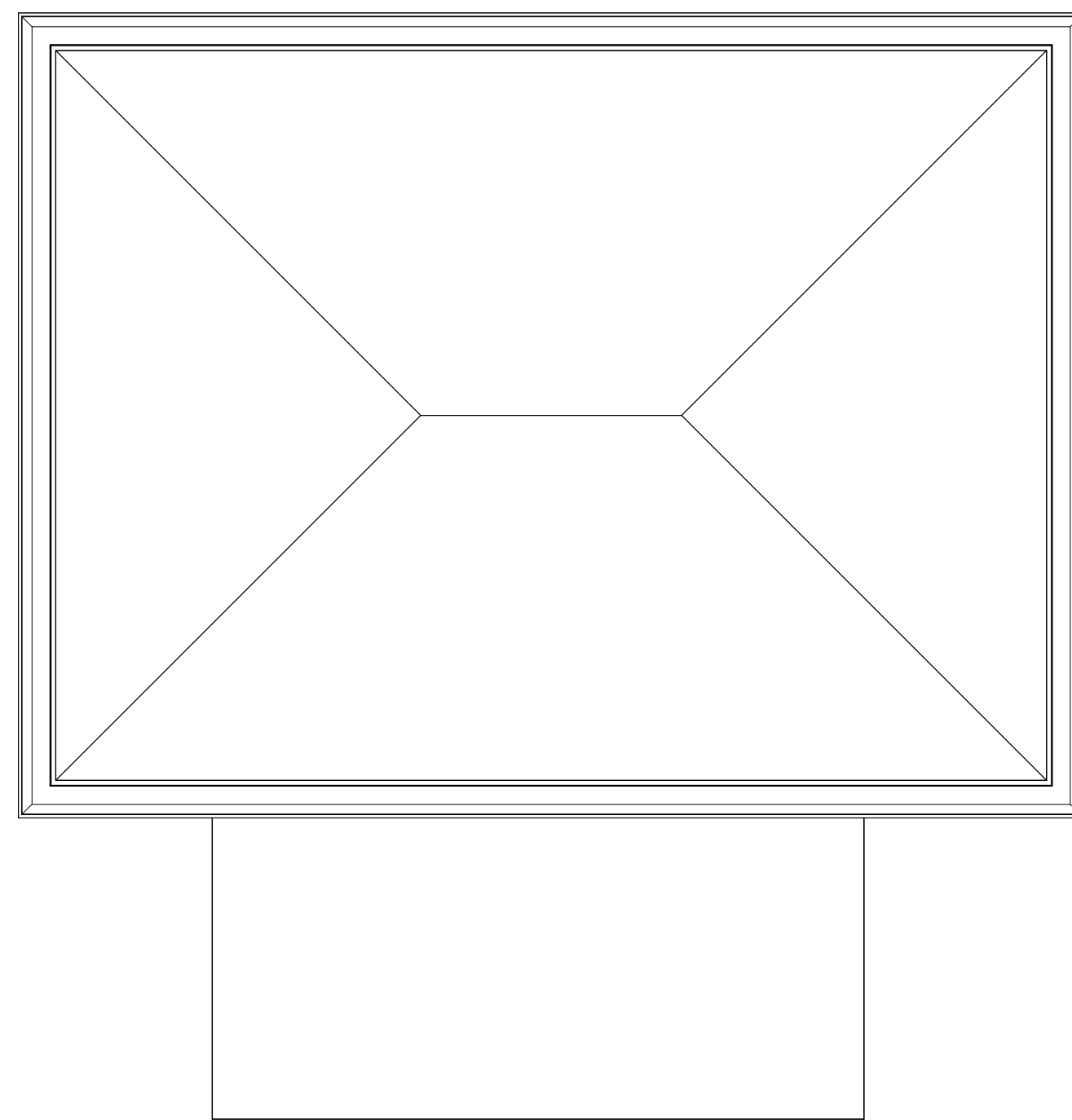
DE_Sales Booth - 2 Lane_Presentation



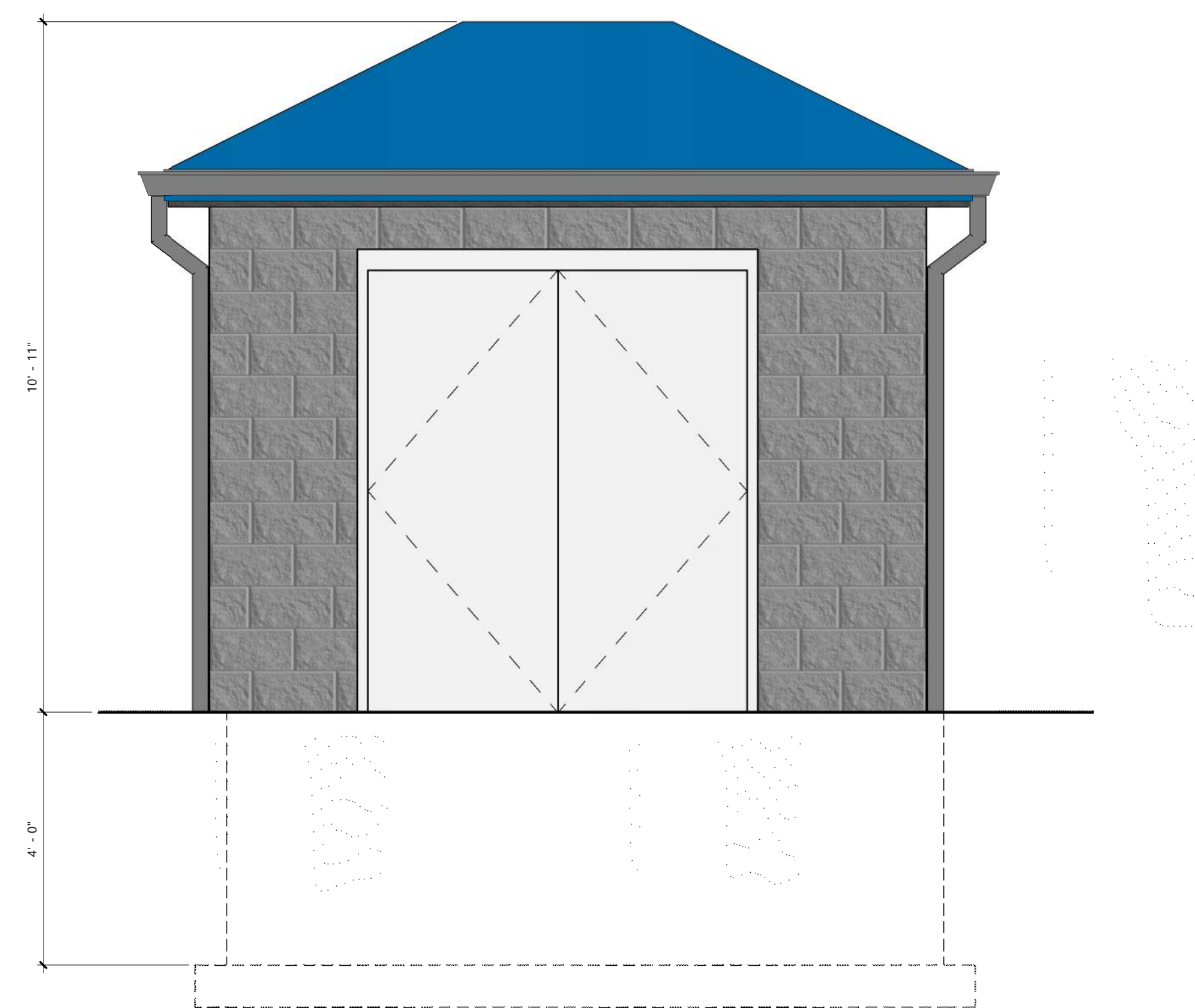
3 H_PUMP HOUSE - FLOOR PLAN PRESENTATION
1/2" = 1'-0"



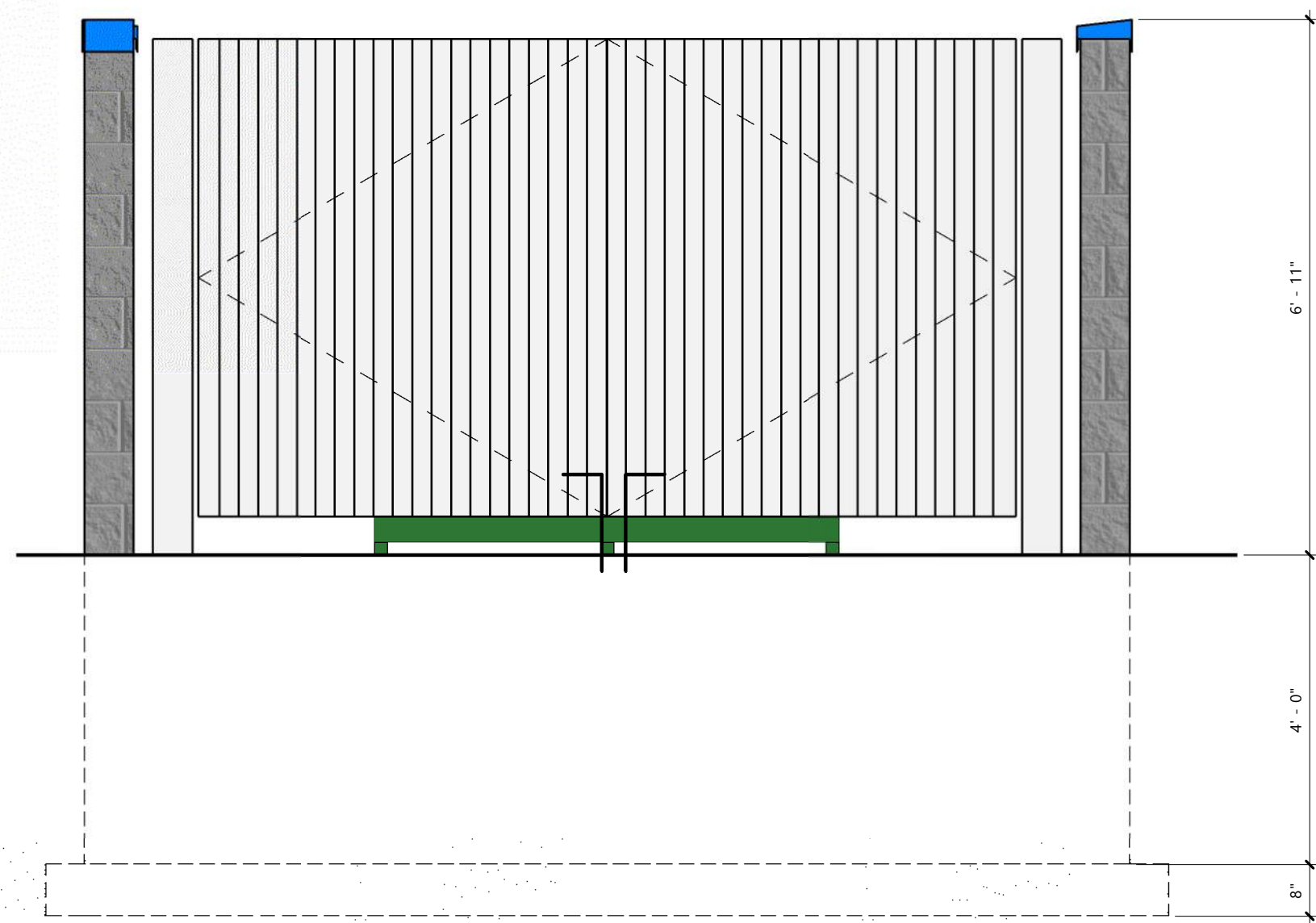
4 3D - PUMP Only



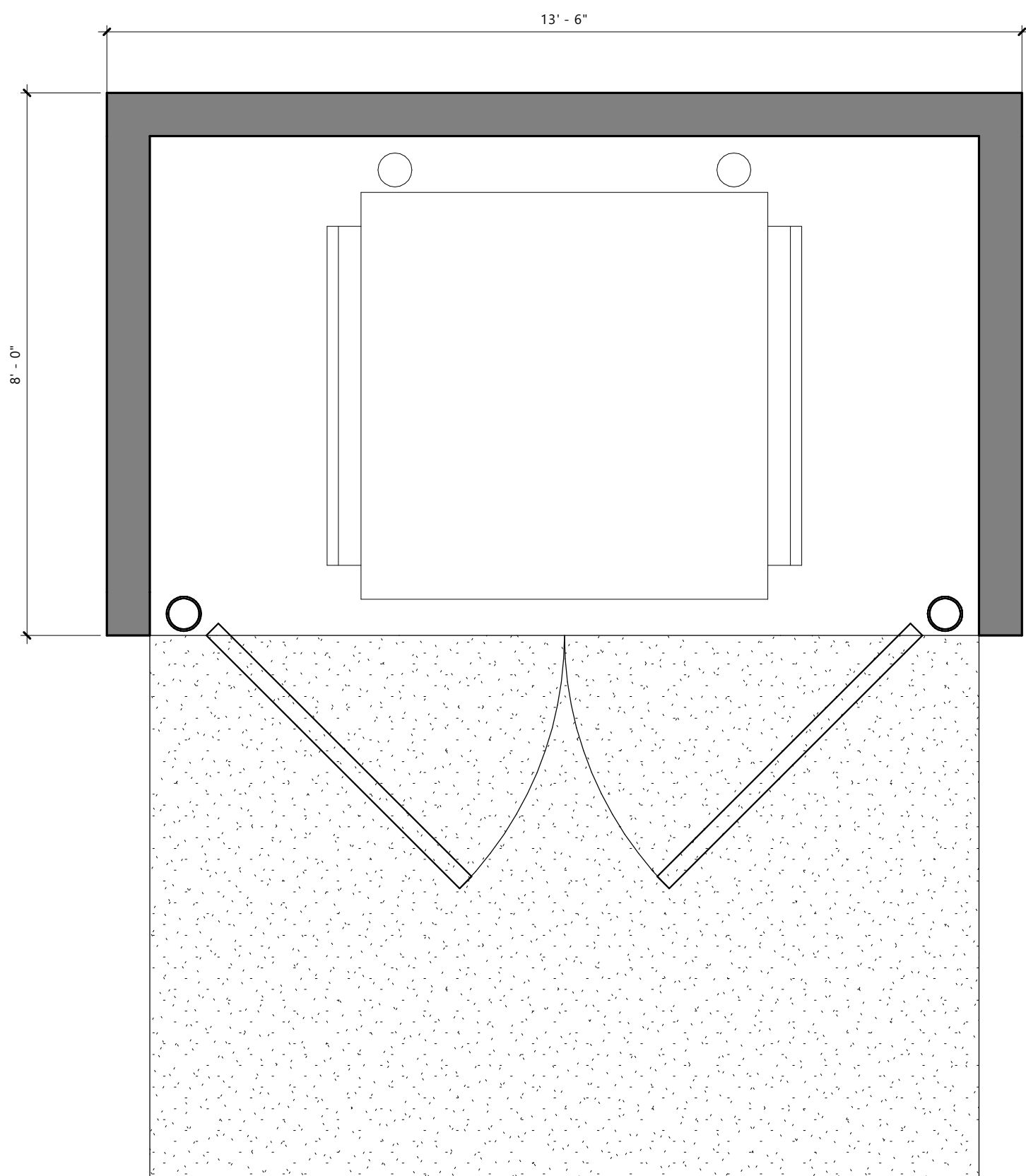
1 H_PUMP HOUSE - ROOF PLAN PRESENTATION
1/2" = 1'-0"



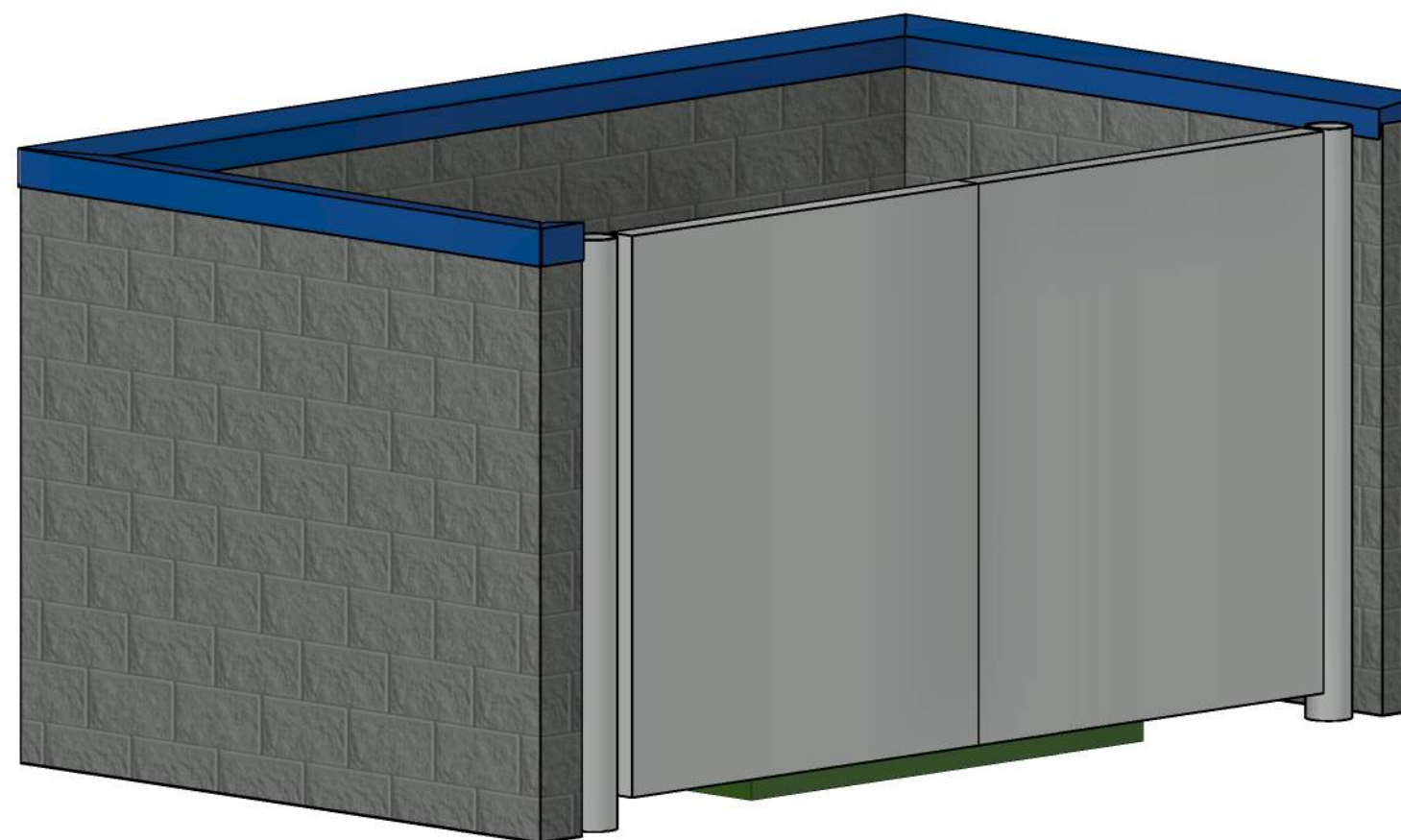
2 H_PUMP HOUSE - FRONT ELEVATION PRESENTATION
1/2" = 1'-0"



2 H TRASH ENCLOSURE - FRONT ELEVATION PRESENTATION
1/2" = 1'-0"



1 H TRASH ENCLOSURE - PLAN PRESENTATION
1/2" = 1'-0"



3 3D - TRASH Only

LOGOS



ARROWS



TYPOGRAPHY

T-01

Aa
UNIVA PRO BLACK

ABCDEFGHIJKLMNOPQRSTUVWXYZ
abcdefghijklmnopqrstuvwxyz
1234567890!@#\$%&*()?'/":;,. .

T-02

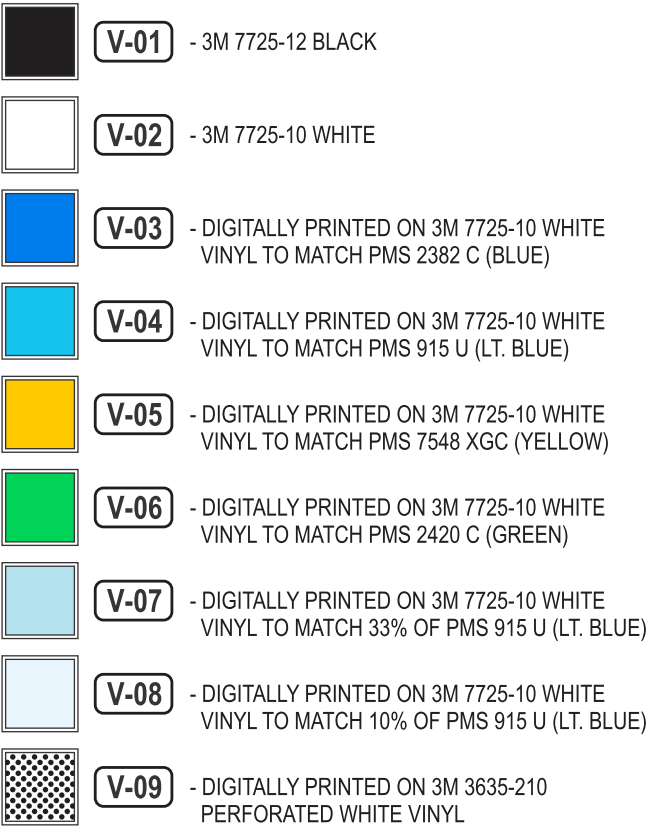
Aa
MONTERRAT REGULAR

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FINISHES

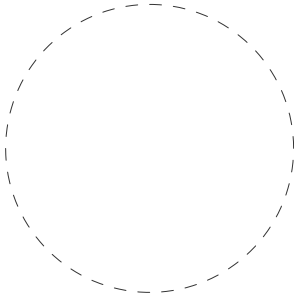


VINYLS



PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
PROJECT LOGO(S), TYPOGRAPHY,
ARROWS, FINISHES, & VINYLs

DRAWING TYPE:
CONCEPTUAL

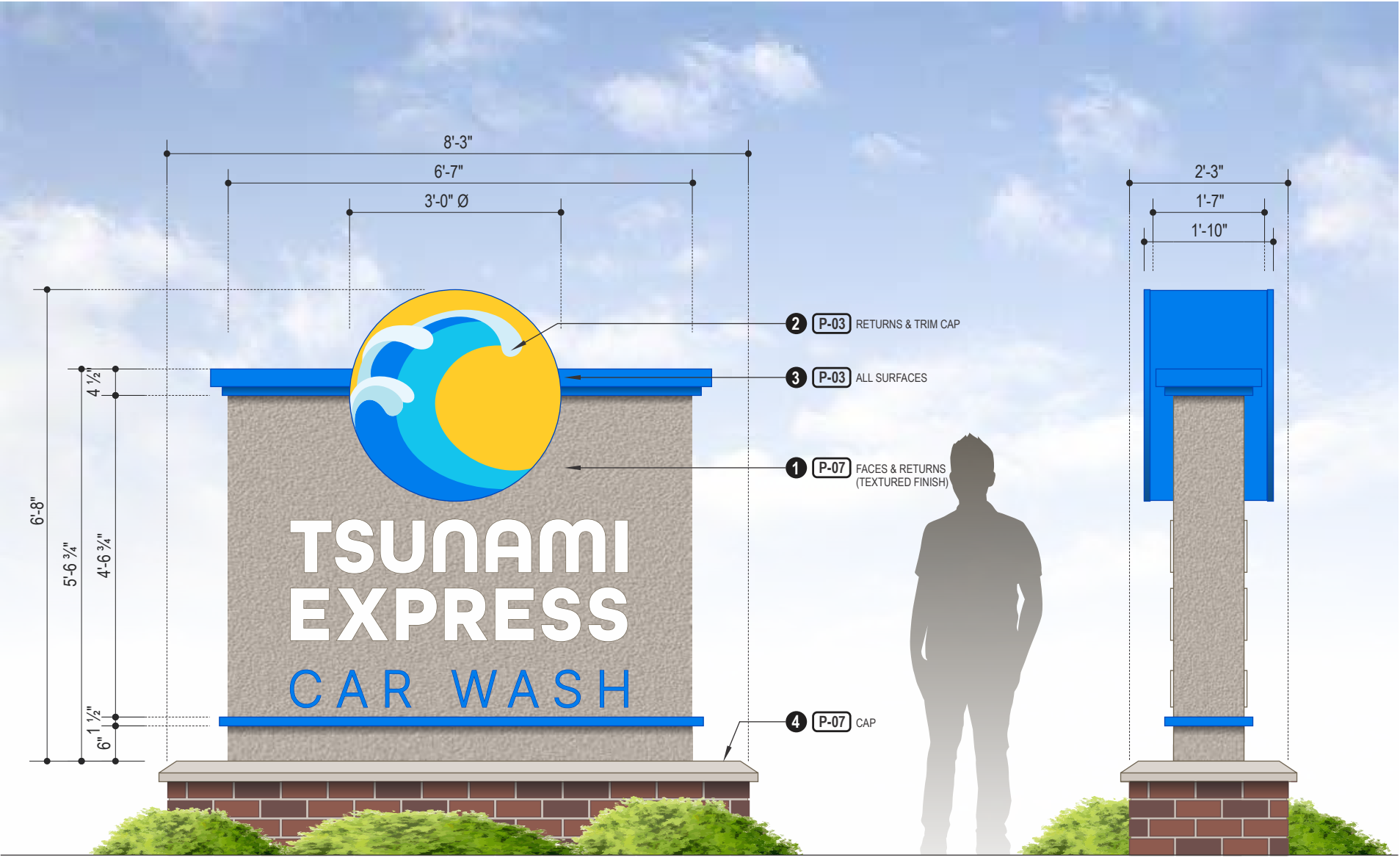
PROJECT NO.	TASK NO.	QTY.
93745	233633	-
DWG. NO.		SHEET
13323CH		2 OF 20

GENERAL NOTES:

ILLUMINATED: YES
S/F OR D/F: D/F
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.
ELECTRIC TO INSTALL LOCATION TO BE COORDINATED WITH E.C. AND TO BE PROVIDED BY THE E.C.

NOTES:

- 1 **CABINET:** D/F INTERNALLY ILLUMINATED CABINET. 1'-0" DEEP. ALUMINUM FACES & RETURNS OVER ALUMINUM ANGLE FRAME. FACES & OUTER RETURN TO HAVE A PAINTED TEXTURED FINISH. FACES TO HAVE ROUTED OUT W/ PUSHED THRU ACRYLIC COPY GRAPHICS. PUSHED THRU ACRYLIC TO BE CLEAR W/ APPLIED TRANS. VINYL OVERLAID ONTO THE FACES. INTERNAL ILLUMINATION TO BE WHITE LED'S. CABINET MOUNTED TO INSIDE OF BRICK COLUMN & BOTTOM CABINET VIA INTERNAL MAIN STEEL SUPPORT.
- 2 **LOGO CABINETS:** (2) S/F INTERNALLY ILLUMINATED 5" DEEP FAB'D CHANNEL CABINET. RETURNS & BACKS TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACES TO BE TRANS. WHITE ACRYLIC WITH APPLIED VINYL GRAPHICS. FACES ATTACHED TO RETURNS VIA 1" PLASTIC TRIM CAP. TRIM CAP FINISH TO MATCH RETURNS FINISH. INTERNALLY ILLUMINATED VIA WHITE LED'S. MOUNTED TO TOP CABINET.
- 3 **ACCENT MOLDING:** ALUMINUM TUBE DIMENSIONAL MOLDING. MOLDING TO HAVE A PAINTED FINISH. MOLDING MOUNTED TO CABINET FACE & OUTER RETURNS.
- 4 **BRICK BASE:** FAB'D STEEL FRAME WITH CEMENT BOARD CLADDING & BRICK VENEER W/ MORTAR. MOUNTED TO CONCRETE SLAB. BRICK VENEER TO MATCH BRICK ON EXISTING BUILDING. CAP TO BE FAB'D ALUMINUM WITH A PAINTED FINISH.
- 5 **BRICK COLUMN:** FAB'D STEEL FRAME WITH CEMENT BOARD CLADDING & BRICK VENEER W/ MORTAR. MOUNTED TO TOP OF BRICK BASE. INTERIOR OF COLUMN TO HAVE A STEEL TUBE SUPPORT. BRICK VENEER TO MATCH BRICK ON EXISTING BUILDING.



1 **ELEVATION VIEW**
SCALE: 1/2" = 1' - 0"

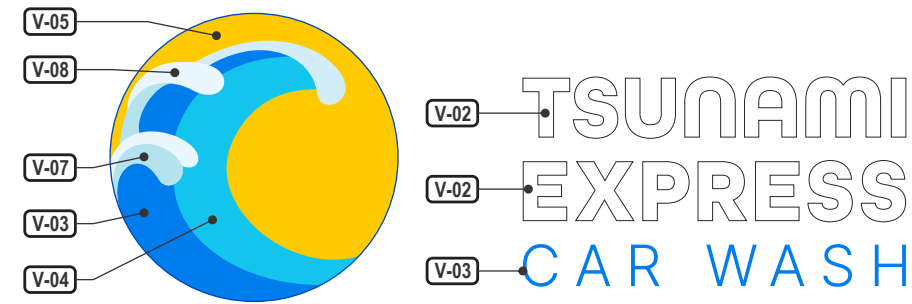
PAINTED FINISHES:

- P-03** - TO MATCH PMS 2382 C (BLUE)
- P-07** - TO MATCH EXISTING BUILDING (TBD)

VINYLS:

- V-02** - 3M 7725-10 WHITE
- V-03** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 2382 C (BLUE)
- V-04** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 915 U (LT. BLUE)
- V-05** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 7548 XGC (YELLOW)

- V-07** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH 33% OF PMS 915 U (LT. BLUE)
- V-08** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH 10% OF PMS 915 U (LT. BLUE)



3 **VINYL CALL OUTS**
SCALE: 1/2" = 1' - 0"

PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:

ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY

NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
SECONDARY MONUMENT SIGN

DRAWING TYPE:
CONCEPTUAL

PROJECT NO.	TASK NO.	QTY.
93745	233633	1
DWG. NO.	SHEET	
13323CH	6 OF 20	

GENERAL NOTES:

ILLUMINATED: YES
 S/F OR D/F: S/F
 EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.
 ELECTRIC TO INSTALL LOCATION TO BE COORDINATED WITH E.C. AND TO BE PROVIDED BY THE E.C.

NOTES:

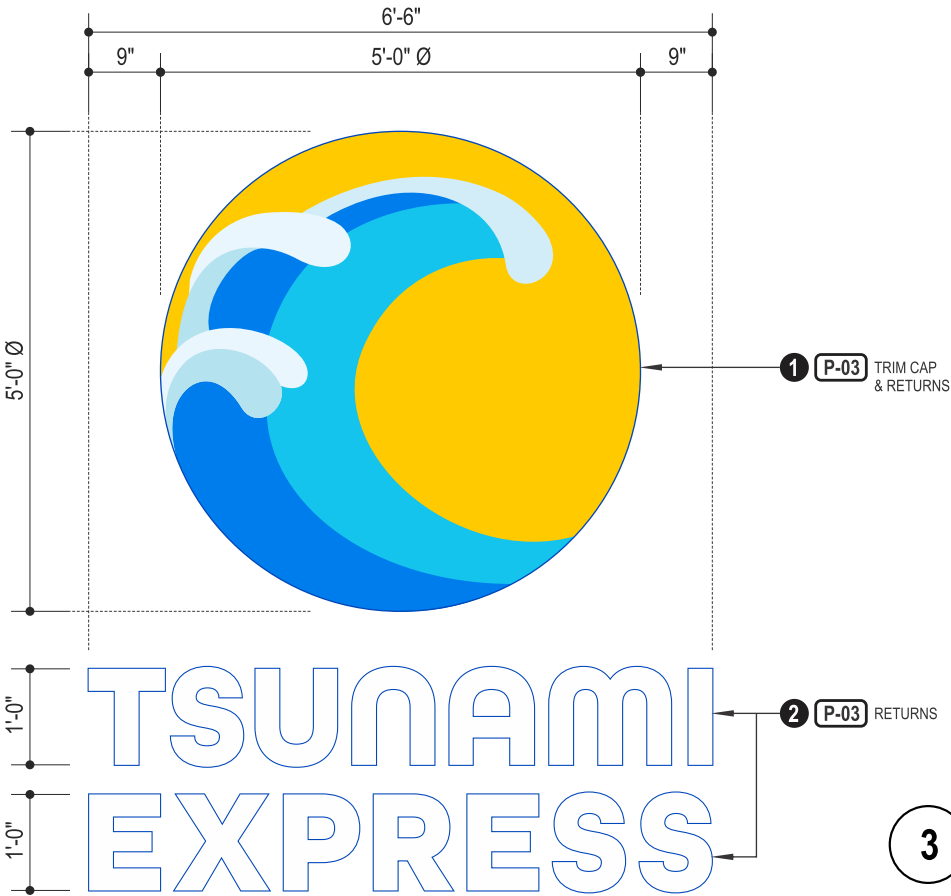
- 1 LOGO CABINET:** S/F INTERNALLY ILLUMINATED 5" DEEP FAB'D CHANNEL CABINET. RETURNS & BACK TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACE TO BE TRANS. WHITE ACRYLIC w/ APPLIED VINYL GRAPHICS. FACE ATTACHED TO RETURNS VIA 1" PLASTIC TRIM CAP. TRIM CAP FINISH TO MATCH RETURNS FINISH. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO EXISTING BRICK BUILDING.
- 2 CHANNEL LETTERS:** INTERNALLY ILLUMINATED 5" DEEP FAB'D CHANNEL LETTERS. RETURNS & BACKS TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACES TO BE TRANS. WHITE ACRYLIC. FACES ARE ATTACHED TO RETURNS VIA 1" PLASTIC TRIM CAP. TRIM CAP FINISH TO MATCH RETURNS FINISH. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO EXISTING BRICK BUILDING.
- 3 CAR WASH CABINET:** S/F INTERNALLY ILLUMINATED 5" DEEP FAB'D CABINET. RETURNS & BACK TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACE TO BE ALUMINUM - FAB'D ALUMINUM "SHOE BOX" STYLE w/ 1 1/2" WELDED ALUMINUM RETURNS. FACE AND WELDED RETURNS TO HAVE A PAINTED FINISH. COPY TO BE ROUTED OUT OF ALUMINUM FACE. THE ROUTED OPENINGS TO BE BACKED w/ TRANS. WHITE ACRYLIC. FACE ATTACHED TO CABINET RETURNS VIA 1 1/2" WELDED ALUMINUM RETURNS. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO EXISTING BRICK BUILDING.

PAINTED FINISHES:


P-03 - TO MATCH PMS 2382 C (BLUE)

VINYLS:

- 
V-03 - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 2382 C (BLUE)
- 
V-04 - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 915 U (LT. BLUE)
- 
V-05 - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 7548 XGC (YELLOW)
- 
V-07 - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH 33% OF PMS 915 U (LT. BLUE)
- 
V-08 - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH 10% OF PMS 915 U (LT. BLUE)



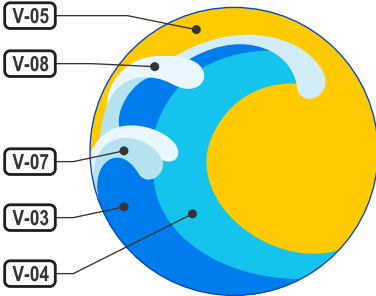
1
 ELEVATION DETAIL
 SCALE: 1/2" = 1' - 0"



2
 ELEVATION DETAIL
 SCALE: 1/2" = 1' - 0"



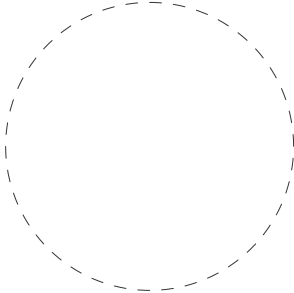
3
 PROPOSED ELEVATION VIEW
 SCALE: NTS



4
 VINYL CALL OUTS
 SCALE: NTS

PROJECT TITLE:
 TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
 SECONDARY MONUMENT SIGN

DRAWING TYPE:
 CONCEPTUAL

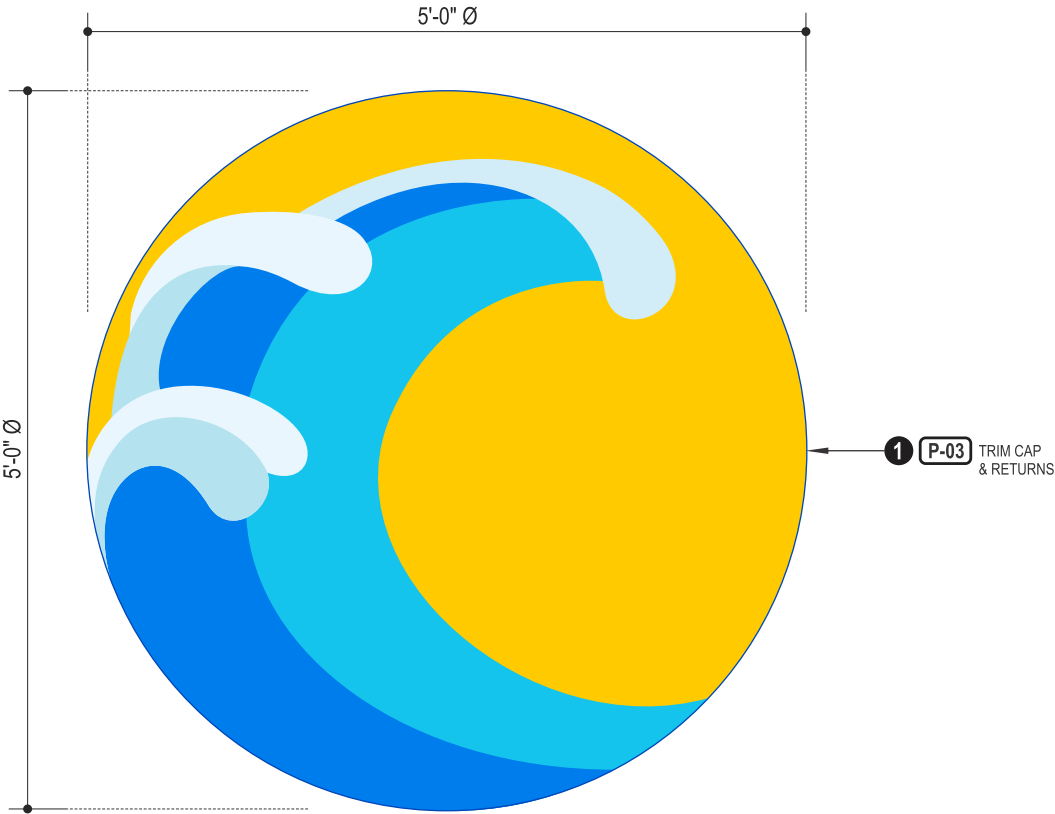
PROJECT NO.	TASK NO.	QTY.
93745	233633	1 SET
DWG. NO.	SHEET	
13323CH	7 OF 20	

GENERAL NOTES:

ILLUMINATED: YES
S/F OR D/F: S/F
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.
ELECTRIC TO INSTALL LOCATION TO BE COORDINATED WITH E.C. AND TO BE PROVIDED BY THE E.C.

NOTES:

- 1 **LOGO CABINET:** S/F INTERNALLY ILLUMINATED 5" DEEP FAB'D CHANNEL CABINET. RETURNS & BACK TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACE TO BE TRANS. WHITE ACRYLIC WITH APPLIED VINYL GRAPHICS. FACE ATTACHED TO RETURNS VIA 1" PLASTIC TRIM CAP. TRIM CAP FINISH TO MATCH RETURNS FINISH. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO EXISTING BRICK BUILDING.



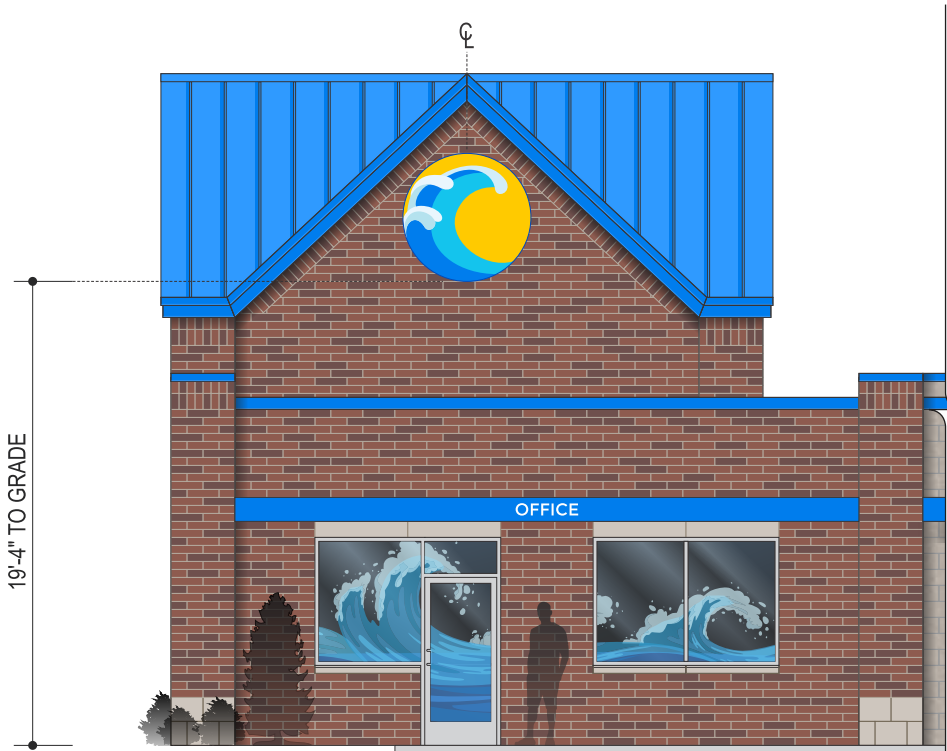
1
 ELEVATION DETAIL
 SCALE: 3/4" = 1' - 0"

PAINTED FINISHES:

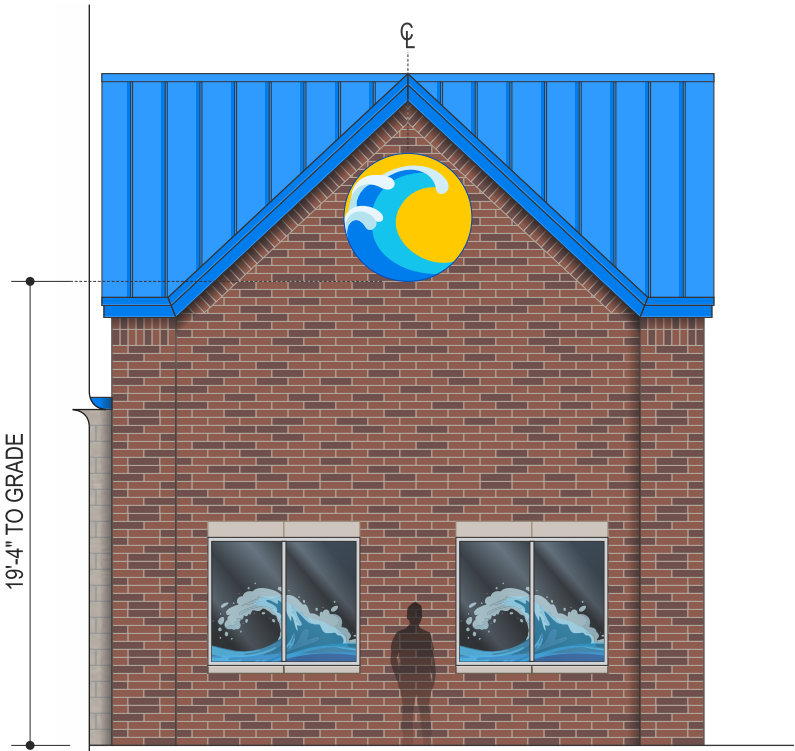
- P-03** - TO MATCH PMS 2382 C (BLUE)

VINYLS:

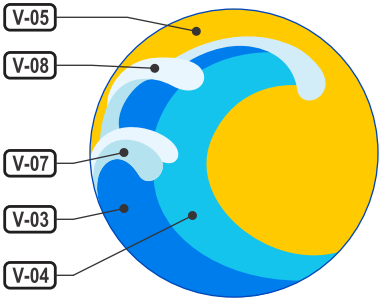
- V-03** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 2382 C (BLUE)
- V-04** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 915 U (LT. BLUE)
- V-05** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 7548 XGC (YELLOW)
- V-07** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH 33% OF PMS 915 U (LT. BLUE)
- V-08** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH 10% OF PMS 915 U (LT. BLUE)



2
 SOUTH ELEVATION VIEW - PARTIAL
 SCALE: 1/8" = 1' - 0"



3
 NORTH ELEVATION VIEW - PARTIAL
 SCALE: 1/8" = 1' - 0"

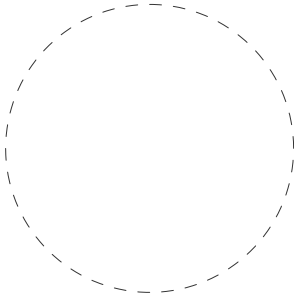


4
 VINYL CALL OUTS
 SCALE: NTS

FAST SIGNS®
of KANKAKEE

PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

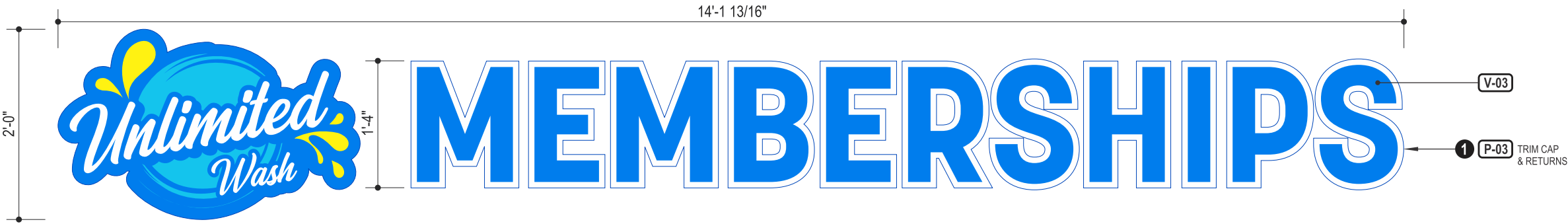
REVISION HISTORY

NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
SECONDARY MONUMENT SIGN

DRAWING TYPE:
CONCEPTUAL

PROJECT NO.	TASK NO.	QTY.
93745	233633	2
DWG. NO.	SHEET	
13323CH	8 OF 20	



1 ELEVATION DETAIL
SCALE: 3/4" = 1' - 0"

GENERAL NOTES:

ILLUMINATED: YES
S/F OR D/F: S/F
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.
ELECTRIC TO INSTALL LOCATION TO BE COORDINATED WITH E.C. AND TO BE PROVIDED BY THE E.C.

NOTES:

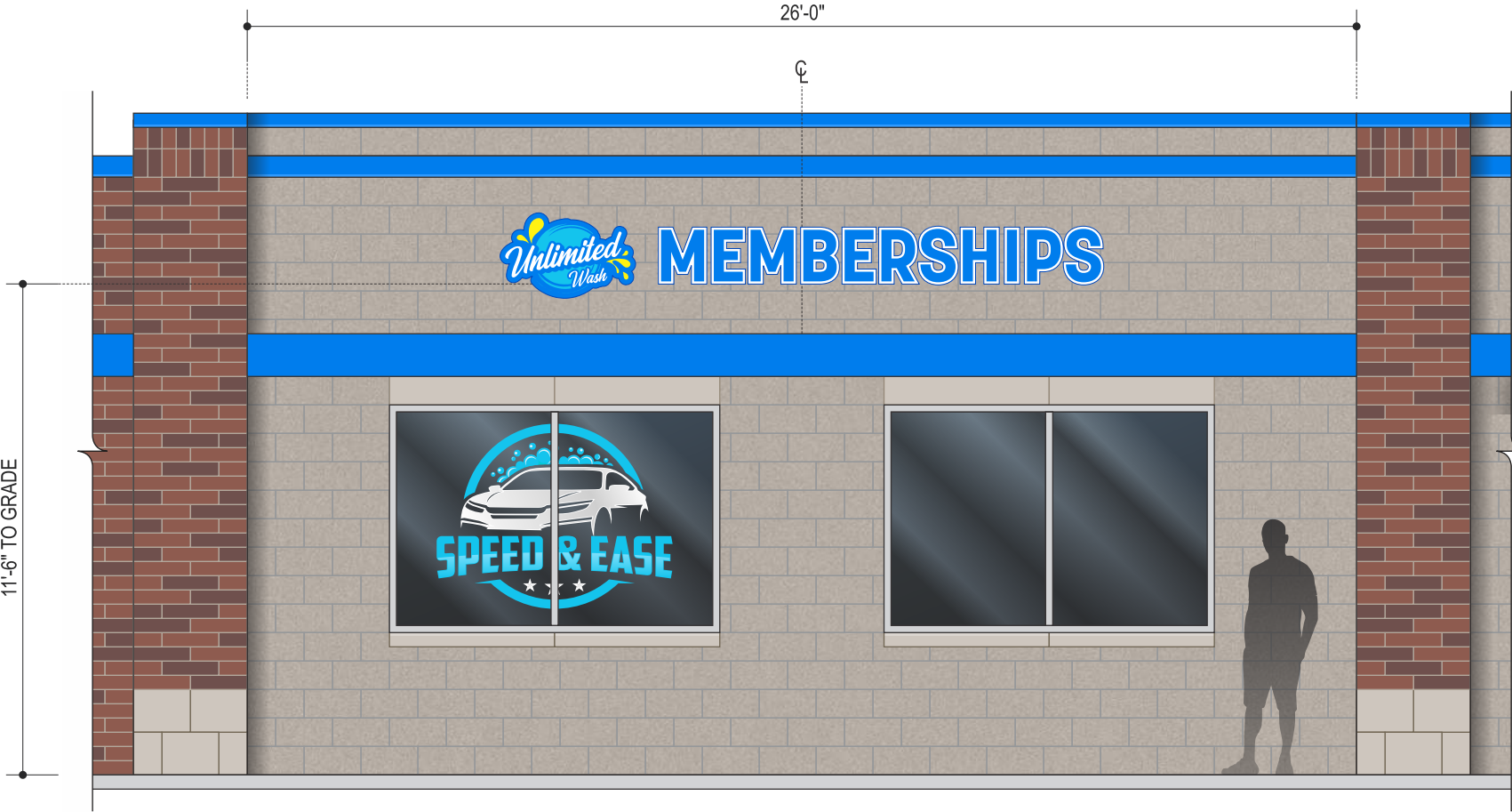
- 1 CHANNEL LETTERS: INTERNALLY ILLUMINATED 5" DEEP FAB'D CHANNEL LETTERS. RETURNS & BACKS TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACES TO BE TRANS. WHITE ACRYLIC w/ APPLIED VINYL INLAYS. FACES ARE ATTACHED TO RETURNS VIA 1" PLASTIC TRIM CAP. TRIM CAP FINISH TO MATCH RETURNS FINISH. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO CMU BLOCK OF EXISTING BUILDING.

PAINTED FINISHES:

 P-03 - TO MATCH PMS 2382 C (BLUE)

VINYLS:

 V-03 - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 2382 C (BLUE)

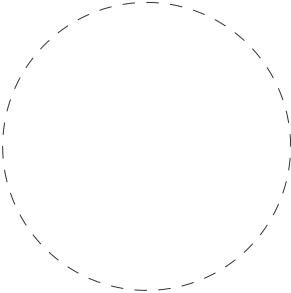


2 SOUTH ELEVATION VIEW - PARTIAL
SCALE: 1/4" = 1' - 0"



PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
CHANNEL LETTERS

DRAWING TYPE:
CONCEPTUAL

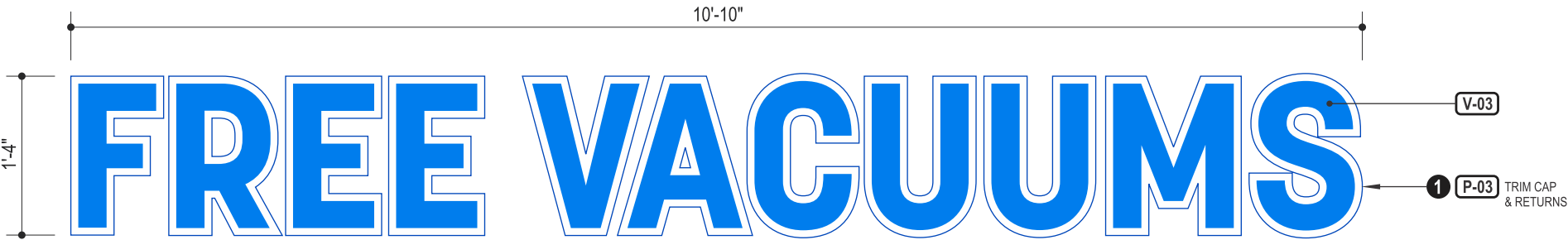
PROJECT NO.	TASK NO.	QTY.
93745	233633	1 SET
DWG. NO.		SHEET
13323CH		9 OF 20

GENERAL NOTES:

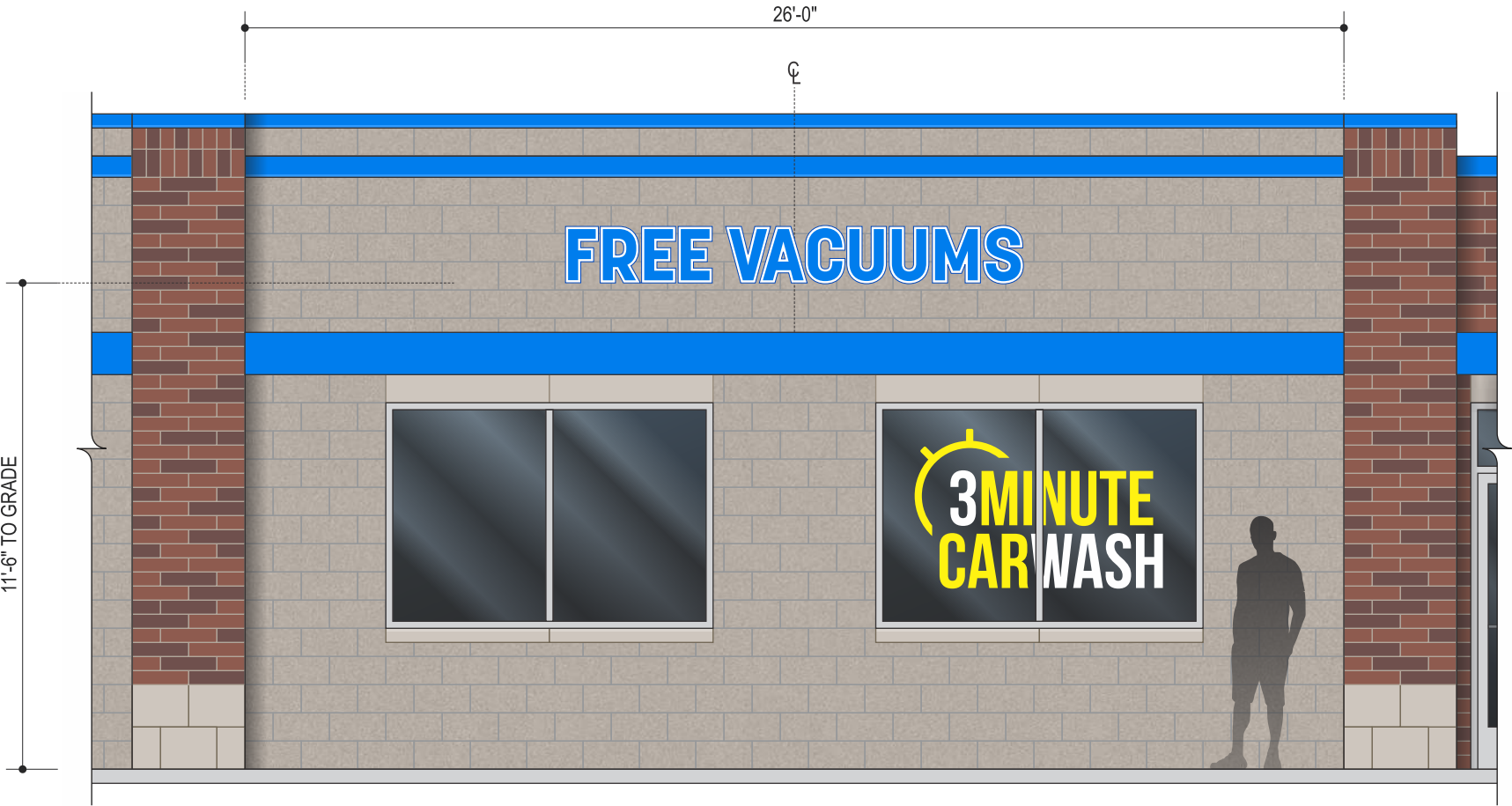
ILLUMINATED: YES
S/F OR D/F: S/F
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.
ELECTRIC TO INSTALL LOCATION TO BE COORDINATED WITH E.C. AND TO BE PROVIDED BY THE E.C.

NOTES:

- 1 **CHANNEL LETTERS:** INTERNALLY ILLUMINATED 5" DEEP FAB'D CHANNEL LETTERS. RETURNS & BACKS TO BE ALUMINUM & TO HAVE A PAINTED FINISH. FACES TO BE TRANS. WHITE ACRYLIC w/ APPLIED VINYL INLAYS. FACES ARE ATTACHED TO RETURNS VIA 1" PLASTIC TRIM CAP. TRIM CAP FINISH TO MATCH RETURNS FINISH. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO CMU BLOCK OF EXISTING BUILDING.



1 **ELEVATION DETAIL**
SCALE: 3/4" = 1' - 0"



2 **SOUTH ELEVATION VIEW - PARTIAL**
SCALE: 1/4" = 1' - 0"

PAINTED FINISHES:

 **P-03** - TO MATCH PMS 2382 C (BLUE)

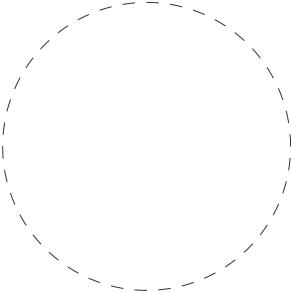
VINYLS:

 **V-03** - DIGITALLY PRINTED ON 3M 7725-10 WHITE VINYL TO MATCH PMS 2382 C (BLUE)



PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
CHANNEL LETTERS

DRAWING TYPE:
CONCEPTUAL

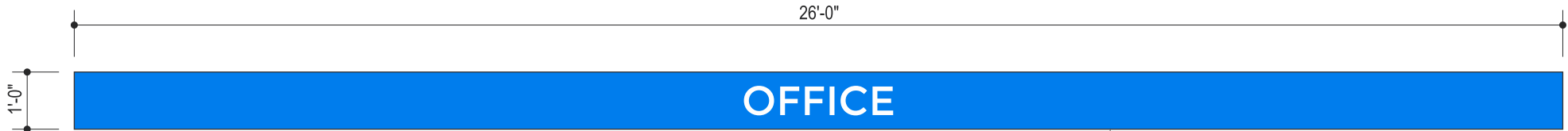
PROJECT NO.	TASK NO.	QTY.
93745	233633	1 SET
DWG. NO.		SHEET
13323CH		10 OF 20

GENERAL NOTES:

ILLUMINATED: YES
S/F OR D/F: S/F
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.
ELECTRIC TO INSTALL LOCATION TO BE COORDINATED WITH E.C. AND TO BE PROVIDED BY THE E.C.

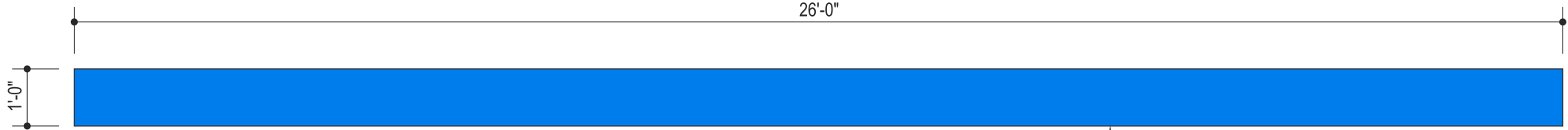
NOTES:

- 1 **LIGHT BAND:** INTERNALLY ILLUMINATED 6" DEEP FAB'D ALUMINUM TUBE FRAME. TOPS & BACKS TO HAVE ALUMINUM CLADDING. CLADDING TO HAVE A PAINTED FINISH. FACE TO BE #5025 REFLEX BLUE COOLEY BRITE®. COPY ON THE TWO OUTER LIGHT BANDS TO BE ERADICATED FROM COOLEY MATERIAL. BOTTOM OF LIGHT BAND CABINET TO HAVE TRANS. WHITE ACRYLIC LENS. INTERNALLY ILLUMINATED VIA WHITE LED'S. FLUSH MOUNTED TO CMU BLOCK OF EXISTING BUILDING.



1 **ELEVATION DETAIL**
SCALE: 3/8" = 1' - 0"
QTY: 1

- 1 **P-02** INTERIOR OF CABINET BACKS & FRAME
P-03 EXPOSED FRAME & TOP ALUMINUM CLADDING



2 **ELEVATION DETAIL**
SCALE: 3/8" = 1' - 0"
QTY: 4

- 1 **P-02** INTERIOR OF CABINET BACKS & FRAME
P-03 EXPOSED FRAME & TOP ALUMINUM CLADDING



3 **SOUTH ELEVATION VIEW**
SCALE: 3/32" = 1' - 0"

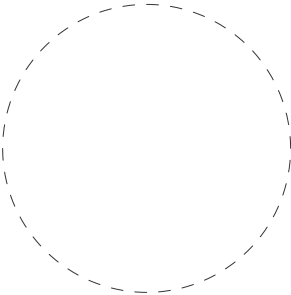
PAINTED FINISHES:

-  **P-02** - WHITE, SATIN FINISH
 **P-03** - TO MATCH PMS 2382 C (BLUE)



PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



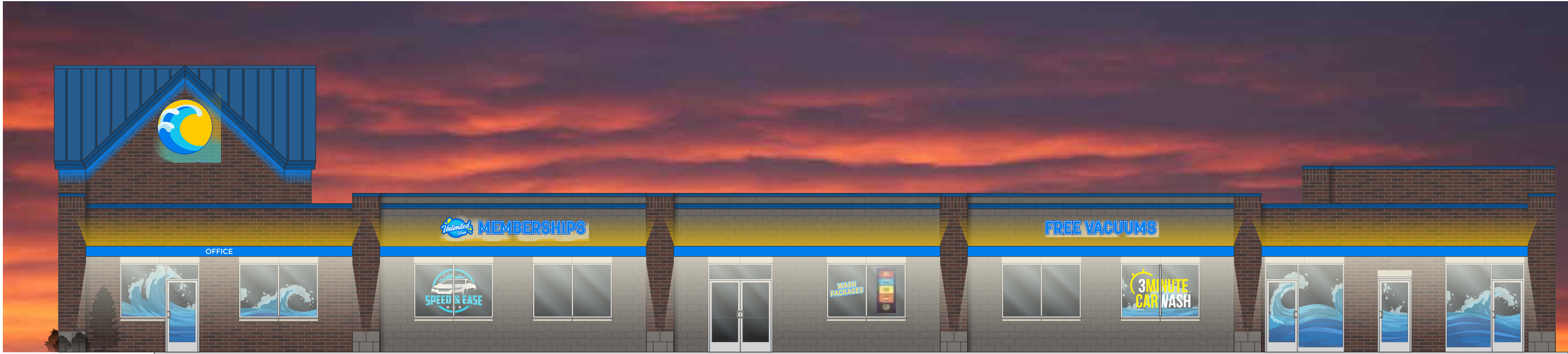
ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
LIGHT BANDS

DRAWING TYPE:
CONCEPTUAL

PROJECT NO.	TASK NO.	QTY.
93745	233633	AS NOTED
DWG. NO.		SHEET
13323CH		11 OF 20

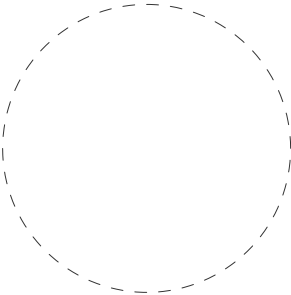


1 SOUTH ELEVATION VIEW - EVENING VIEW
SCALE: 3/32" = 1' - 0"

FAST SIGNS[®]
of KANSAS

PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
LIGHT BANDS

DRAWING TYPE:
CONCEPTUAL

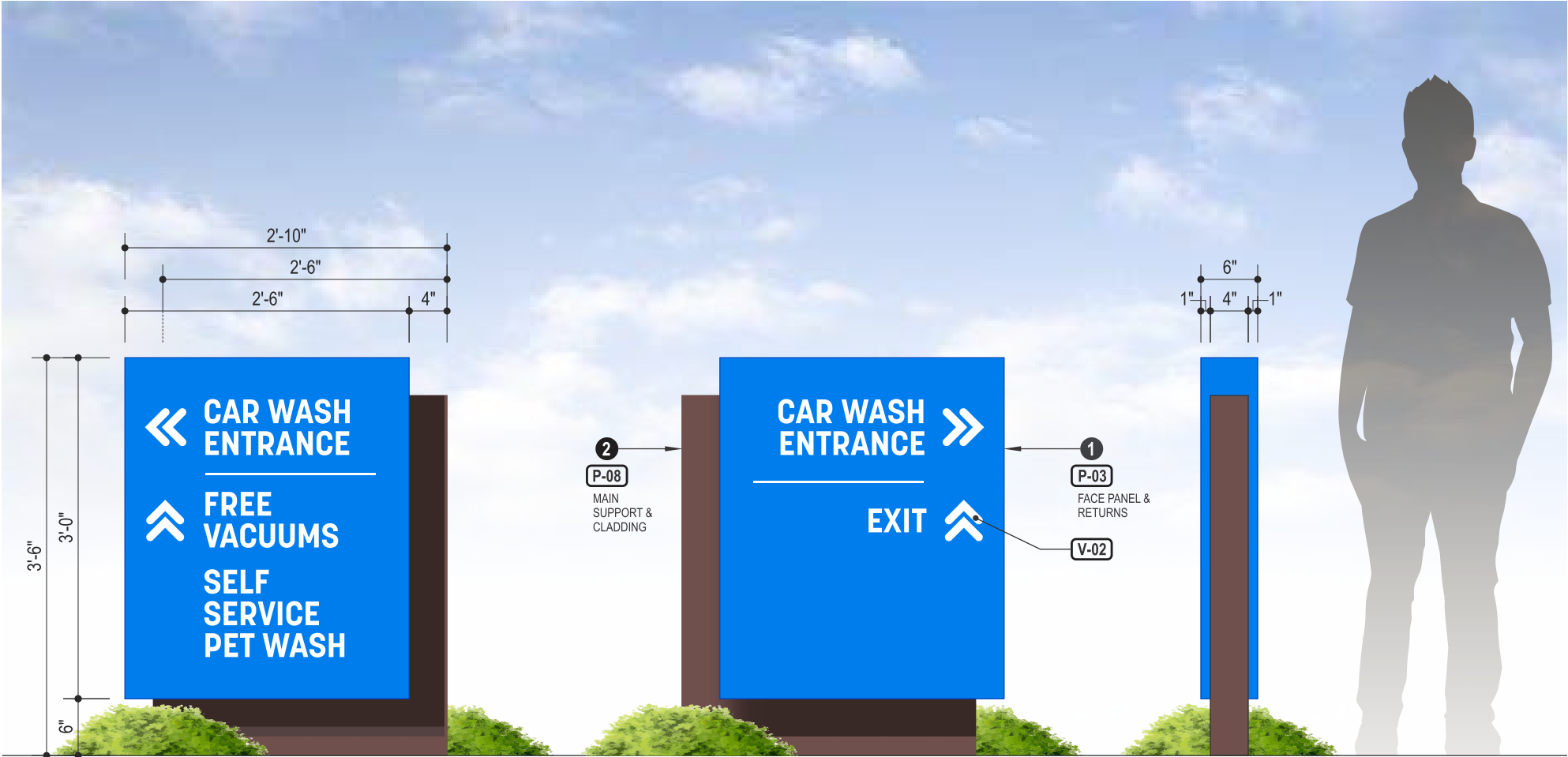
PROJECT NO.	TASK NO.	QTY.
93745	233633	AS NOTED
DWG. NO.		SHEET
13323CH		12 OF 20

GENERAL NOTES:

ILLUMINATED: NO
S/F OR D/F: D/F
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.

NOTES:

- 1 **FACE PANEL:** D/F 6" DEEP FAB'D ALUMINUM PANEL. PANEL TO HAVE A PAINTED FINISH. WHITE VINYL GRAPHICS APPLIED TO FACE. FLAG MOUNTED TO MAIN SUPPORT.
- 2 **MAIN SUPPORT:** (1) ALUMINUM TUBE SUPPORT w/ ALUMINUM CLADDING TO WRAP UNDER FACE PANEL TO GRADE. CLADDING TO HAVE A PAINTED FINISH. MAIN SUPPORT TO BE MOUNTED TO GROUND VIA CONCRETE FOOTER. MAIN SUPPORT TO BE DIRECTLY BURIED INTO CONCRETE FOOTER.



1 TYPICAL ELEVATION VIEW
SCALE: 3/4" = 1' - 0"

2 SIDE VIEW
SCALE: 3/4" = 1' - 0"

PAINTED FINISHES:

-  **P-03** - TO MATCH PMS 2382 C (BLUE)
-  **P-08** - TO MATCH PMS 4715 C (DK BRICK RED)

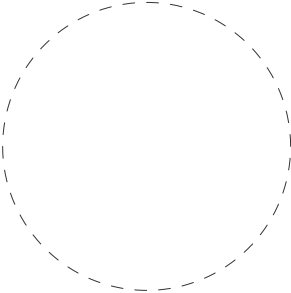
VINYLS:

-  **V-02** - 3M 7725-10 WHITE



PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
DIRECTIONAL SIGN

DRAWING TYPE:
CONCEPTUAL

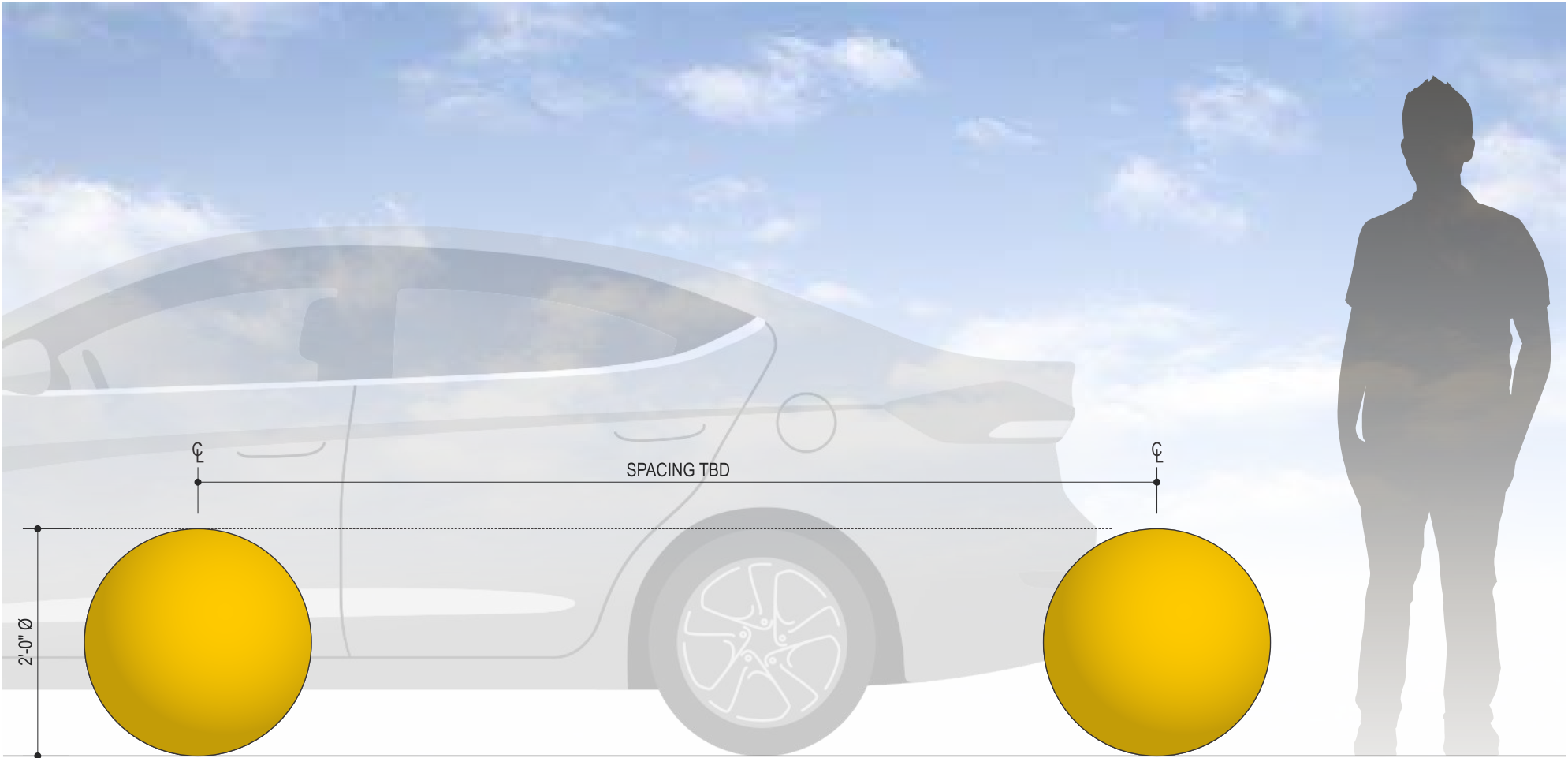
PROJECT NO.	TASK NO.	QTY.
93745	233633	3
DWG. NO.		SHEET
13323CH		17 OF 20

GENERAL NOTES:

ILLUMINATED: NO
S/F OR D/F: N/A
EXACT INSTALL LOCATION TO BE COORDINATED WITH G.C.

NOTES:

1 **CONCRETE BOLLARDS:** 2'-0"Ø PRE-CAST CONCRETE SPHERES. BOLLARDS TO HAVE A STAINED FINISH. BOLLARDS ARE PLACED ON OUTSIDE PERIMETER OF PATH TO THE CAR WASH IN THE GRASS AREA.



1 **TYPICAL ELEVATION VIEW**
SCALE: 3/4" = 1' - 0"



PAINTED FINISHES:

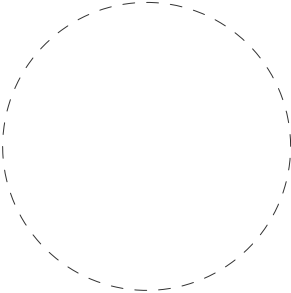
 **P-05** - TO MATCH PMS 7548 XGC (YELLOW)

2 **EXAMPLES OF CONCRETE SPHERE BOLLARDS**
SCALE: NTS



PROJECT TITLE:
TSUNAMI CAR WASH

ENGINEER OF RECORD SEAL:



ENGINEER OF RECORD SIGNATURE/DATE:

REVISION HISTORY			
NO.	DATE	PREV DRWG	DESCRIPTION

PRODUCT TYPE:
CONCRETE SPHERE BOLLARDS

DRAWING TYPE:
CONCEPTUAL

PROJECT NO.	TASK NO.	QTY.
93745	233633	14
DWG. NO.		SHEET
13323CH		18 OF 20



Scale: 1 inch= 16 Ft.

These drawings are for conceptual use only and are not intended for construction. Fixture runs and quantities should be verified prior to order. Values represented are an approximation generated from manufacturers photometric inhouse or independent lab tests with data supplied by lamp manufacturers.

Stormwater Management Memo

Developer:

Tsunami Express Car Wash
4800 Meadows Road, Suite #300
Lake Oswego, OR 97035

Project:

Tsunami Express Car Wash - Mankato
999 50th Avenue NE
Columbia Heights, MN 55421

Engineer's Certification:

All plans and supporting Documentation contained in this report have been reviewed by me and it is hereby certified that to the best of my knowledge the plans comply with the requirements of the ordinance.

I hereby certify that this report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of Minnesota.



David J. Knaeble P.E.

Registration Number: 48776

Date:

8/5/2024

Table of Contents:

1.0	Cover Sheet, Engineer's Certification
2.0	Summary Analysis / Narrative
2.1	Introduction
2.2	Existing Site Conditions
2.3	Proposed Site Conditions
2.4	Stormwater Requirements – City
2.5	Stormwater Requirements – Watershed District
2.6	Stormwater Requirements – MPCA / NPDES
3.0	Stormwater Calculations
3.1	Proposed Stormwater Management Strategy & Facilities Description
3.2	Rate Control
3.3	Volume Control
3.4	Water Quality
4.0	Conclusions

Figures:

Figure 1 – Drainage Calculations Summary Table
Figure 2 – Existing Conditions Drainage Area Map
Figure 3 – Proposed Conditions Drainage Area Map

Appendices:

- HydroCAD
 - Existing Conditions HydroCAD Modeling
 - Proposed Conditions HydroCAD Modeling
- Storm Sewer Sizing [TO BE PROVIDED AT A FUTURE DATE]
 - Storm Sewer Sizing Map
 - Storm Sewer Sizing Spreadsheet
- Geotechnical Report (On File at the Office of the Engineer)

2.0 Summary Analysis / Narrative:

2.1 Introduction:

This stormwater management report accompanies the Civil Engineering Plans prepared by Civil Site Group for the subject project dated 8/5/24. This report includes a summary of the existing and proposed site conditions, the stormwater requirements of relevant regulatory agencies, and proposed design calculations and data to meet the requirements.

2.2 Existing Site Conditions :

Site Description:

The existing site is an office building and parking lot. Below is the existing surface area tabulation.

Existing Conditions						
Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
EX1	24929	98	11339	61	36268	86

Existing Soils:

A geotechnical evaluation report has not been completed yet for this project. Based on the soils report from the neighboring ALDI site directly west of the project site, soils in this region are typically silts sands (SM) hydrologic soil group "B" designation.

Groundwater:

Groundwater has not been analyzed yet for this site and information will be provided once a geotechnical report has been completed.

2.3 Proposed Site Conditions:

Site Description:

The proposed site is a commercial car wash building with associated parking, landscaping and utility improvements. Below is the proposed surface area tabulation.

The proposed site surface coverage areas are shown in the table below:

Proposed Conditions						
Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
PR1A	15948	98	6368	61	22316	87
PR1B	9743	98	4208	61	13951	87

2.4 Stormwater Requirements City (Columbia Heights):

Requirement threshold - Projects that either create or disturb 1 acre or greater of new impervious will require the submittal of a Stormwater Management Plan. Projects that disturb less than 1 acre and down to 10,000 SF are only required to develop an erosion control plan.

Rate Control – Limit peak runoff flow rates to existing conditions for 2-YR, 10-YR, and 100-YR frequency storms (utilize Atlas 14 rainfall data).

Water Quality – The water quality control standard shall be considered satisfied if the volume control standard has been satisfied.

Volume Control – A proposed development shall capture and retain on site 1.0 inches of runoff from the net new impervious surfaces in post-construction conditions and at a minimum as per the requirements of the NPDES Construction General Permit.

This project will not be disturbing over 1.0 acre, so permanent stormwater management is not required per the City Requirements. Per discussions with the City of Columbia Heights Engineering Staff, rate control will still be required.

2.5 Stormwater Requirements Watershed District – (Mississippi Water Management Organization):

Requirement threshold – Any project creating greater than one acre of land disturbance.

Rate Control – Limit peak runoff flow rates to existing conditions for 2-YR, 10-YR, and 100-YR frequency storms (utilize Atlas 14 rainfall data).

Water Quality – The water quality control standard shall be considered satisfied if the volume control standard has been satisfied.

Volume Control – For projects without limitations that disturb one or more acre of land, 1.1 inches of runoff from the new and fully reconstructed impervious surfaces shall be captured and retained on site. For projects on sites with limitations, the MWMO Design Sequence Flow Chart shall be used.

This project will not be disturbing over 1.0 acre, so permanent stormwater management is not required per the MWMO.

2.6 Stormwater Requirements - Minnesota Pollution Control Agency – NPPDES permit (MPCA):

Requirement threshold - A permit is required for projects with a disturbed area over 1 acre in size, Stormwater management is required for a project adding 1-acre of more of NEW impervious surface (reconstructed impervious is not included).

Rate Control – No specific regulation, may not degrade downstream facilities.

Water Quality – Stormwater water quality treatment volume must be provided equal to 1.0" over all new impervious surfaces (includes all newly constructed impervious surfaces only, re-constructed impervious surfaces are not included).

Volume Control – Must consider volume reduction if feasible and not prohibited on site. The required infiltration volume is equal to the water quality volume described above.

This project will not be increasing the impervious surface area by over 1.0 acre, so permanent stormwater management is not required per the MPCA.

3.0 Stormwater Calculations:

3.1 Proposed Stormwater Management Strategy & Facilities Description

This project is disturbing approximately 0.9 acres of land. The project will be constructing approximately 0.6 acres of new/reconstructed impervious surfaces. This land disturbance and creation of impervious surfaces will not trigger stormwater management requirements from the City of Columbia Heights, the MWMP and for the MPCA NPDES Permit.

Per discussions with the City of Columbia Heights Engineering Staff, rate control will still be required.

This project is proposing to use an aboveground detention basin to meet the rate control requirements.

3.2 Rate Control

Limit peak runoff flow rates to existing conditions for 2-YR, 10-YR, and 100-YR frequency storms (utilize Atlas 14 rainfall data).

Rate control is provided by live storage within the proposed aboveground detention basin. This information was derived using HydroCAD stormwater modeling software. The existing and proposed runoff rates are shown in the summary table below.

Stormwater Rate Summary			
Drainage Area	Existing Rate (cfs)		
	2-YR [2.84"]	10-YR [4.26"]	100-YR [7.38"]
EX1	2.47	4.00	7.60
TOTAL	2.47	4.00	7.60
Drainage Area	Proposed Conditions Rate (cfs)		
	2-YR [2.84"]	10-YR [4.26"]	100-YR [7.38"]
PR1A	1.58	2.55	4.84
1P (PR1B)	0.74	1.01	1.47
TOTAL	2.32	3.56	6.31
Overall Stormwater Rate Summary			
	Existing Conditions Rate (cfs)	Proposed Conditions Rate (cfs)	
2-Year Event	2.47	2.32	
10-Year Event	4.00	3.56	
100-Year Event	7.60	6.31	

The existing project site discharges to 50th Avenue NE. The overall discharge rates from the proposed site will be less than the existing discharge rates in all events.

The overall proposed runoff rates are less than the existing peak runoff rates. – REQUIREMENT SATISFIED

3.3 Volume Control

Since this project is not disturbing over 1.0 acres of land, volume control is not required.

3.4 Water Quality

Since this project is not disturbing over 1.0 acres of land, water quality control is not required.

4.0 Conclusions:

To the best of our knowledge, this project meets all State, City and Watershed District stormwater management requirements.

Tsunami Express Car Wash - Columbia Heights
Civil Site Group - Stormwater Calculations

Existing Conditions

Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
EX1	24929	98	11339	61	36268	86

Proposed Conditions

Drainage Area	Impervious Area		Pervious Area		Total Area	
	Area [SF]	CN Value	Area [SF]	CN Value	Area [SF]	CN Value
PR1A	15948	98	6368	61	22316	87
PR1B	9743	98	4208	61	13951	87

Site Area Summary

	Impervious [SF]	Impervious [AC]	Pervious [SF]	Pervious [AC]	Total [SF]	Total [AC]
Existing Site	24929	0.57	11339	0.26	36268	0.83
Proposed Site	25691	0.59	10576	0.24	36267	0.83

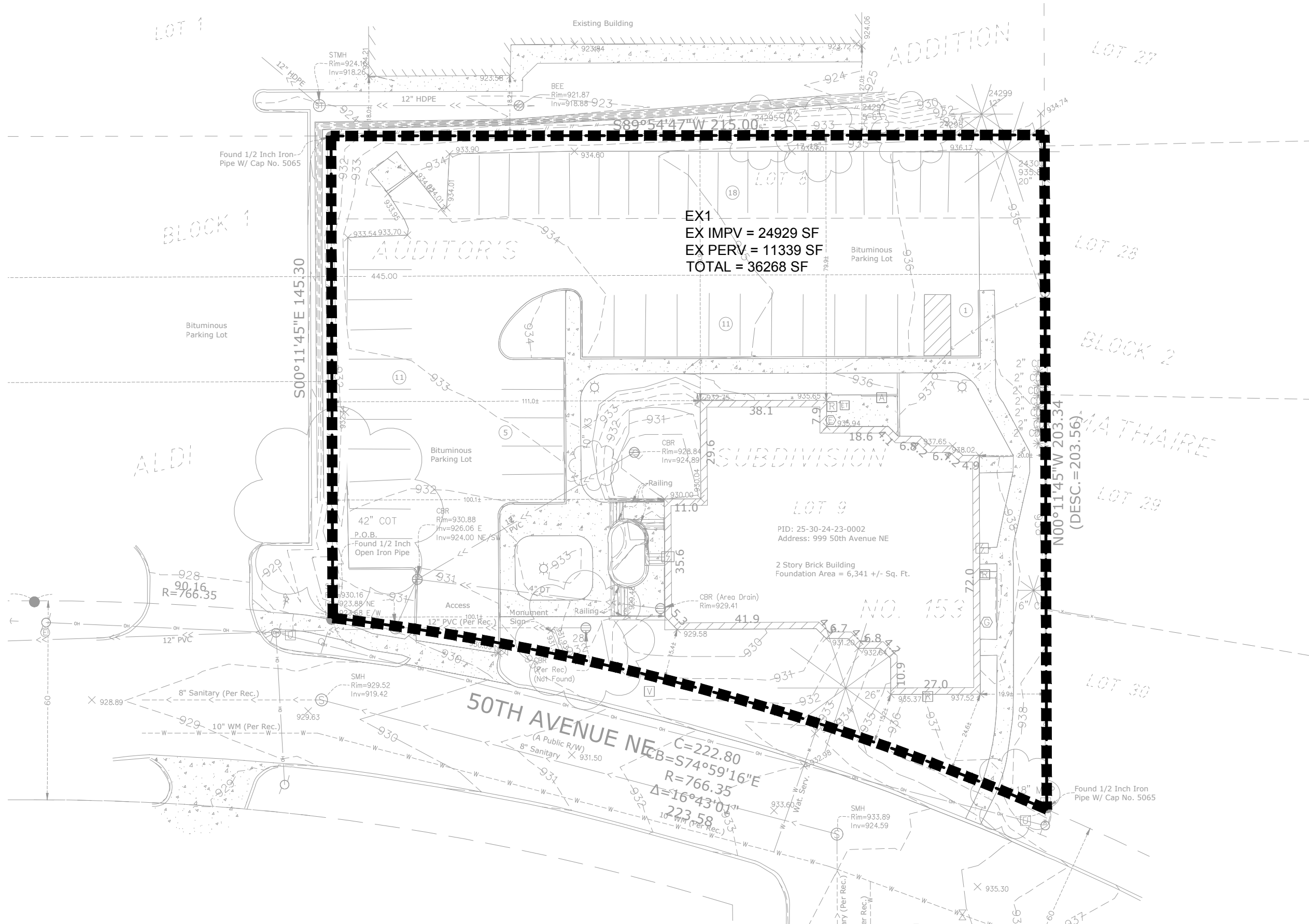
Stormwater Rate Summary

Drainage Area	Existing Rate (cfs)		
	2-YR [2.84"]	10-YR [4.26"]	100-YR [7.38"]
EX1	2.47	4.00	7.60
TOTAL	2.47	4.00	7.60

Drainage Area	Proposed Conditions Rate (cfs)		
	2-YR [2.84"]	10-YR [4.26"]	100-YR [7.38"]
PR1A	1.58	2.55	4.84
1P (PR1B)	0.74	1.01	1.47
TOTAL	2.32	3.56	6.31

Overall Stormwater Rate Summary

	Existing Conditions Rate (cfs)	Proposed Conditions Rate (cfs)
2-Year Event	2.47	2.32
10-Year Event	4.00	3.56
100-Year Event	7.60	6.31



1" = 30'-0"
15'-0" 0 30'-0"

TSUNAMI EXPRESS CAR WASH - COLUMBIA HEIGHTS

CivilSite
GROUP

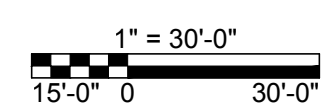
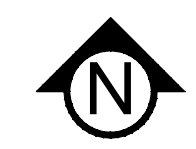
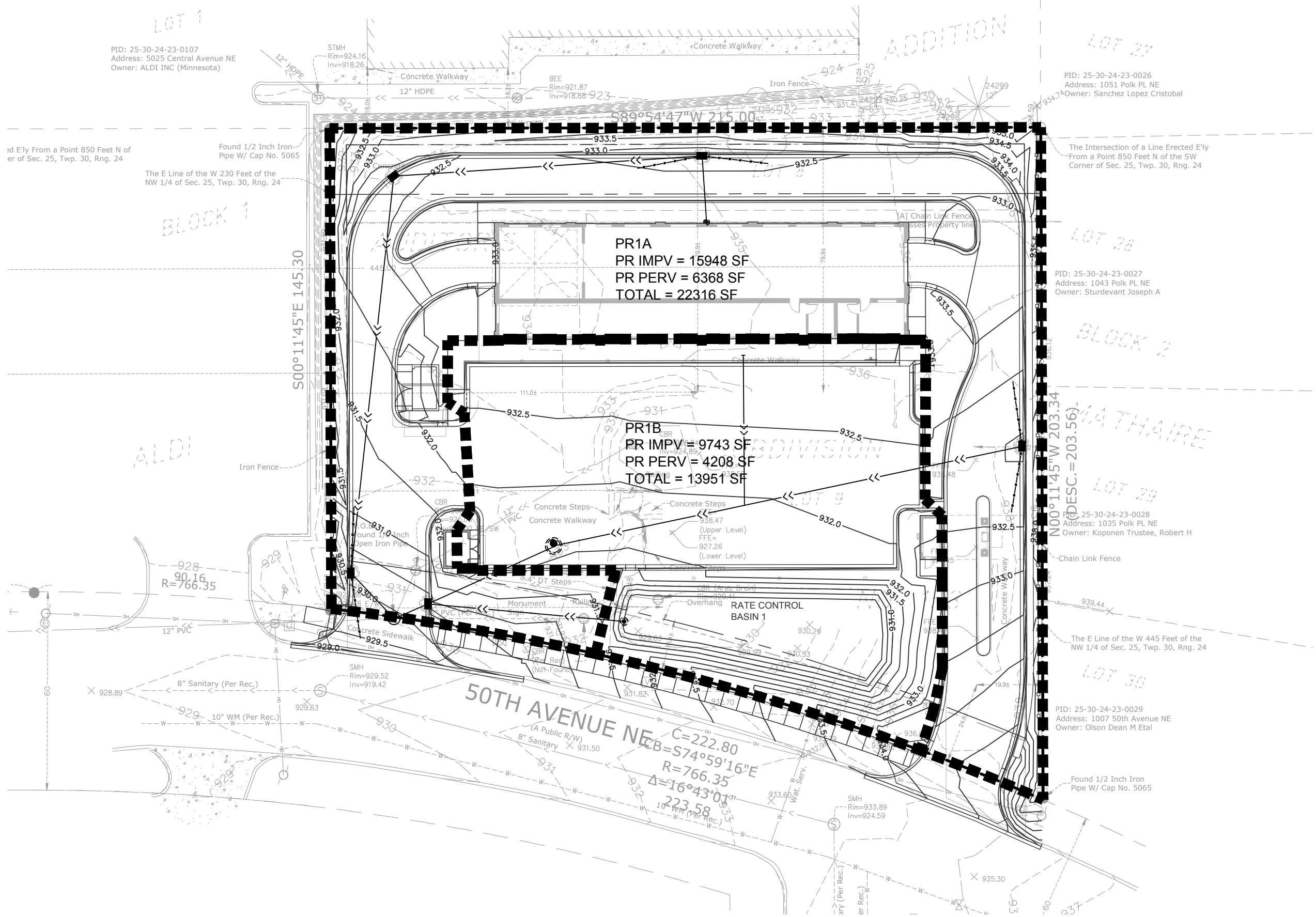
5000 Glenwood Avenue
Golden Valley, MN 55422
612-615-0060
www.CivilSiteGroup.com

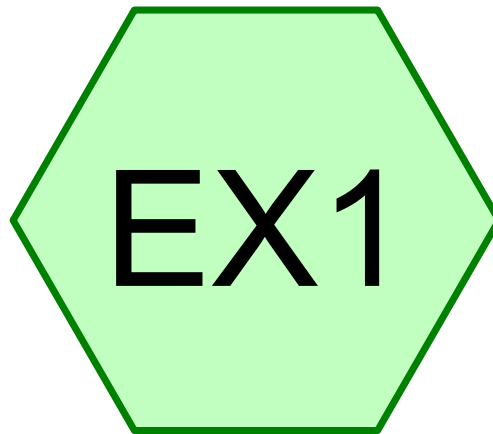
EXISTING DRAINAGE MAP

999 50TH AVENUE NE, COLUMBIA HEIGHTS, MN 55421

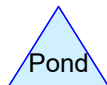
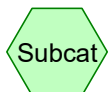
Project Number:	24289	Revision Number:	.
Issue Date:	7/29/24	Revision Date:	.

DA 1





**EX1 - DRAINS SOUTH
TO 50TH AVE.**



Routing Diagram for 24289 - TSUNAMI COLUMBIA HEIGHTS EXISTING

Prepared by Civil Site Group, Printed 7/29/2024

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24289 - TSUNAMI COLUMBIA HEIGHTS EXISTING

Prepared by Civil Site Group

Printed 7/29/2024

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Page 2

Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2y 24hr AT-14	MSE 24-hr	3	Default	24.00	1	2.84	2
2	10y 24hr AT-14	MSE 24-hr	3	Default	24.00	1	4.26	2
3	100y 24hr AT-14	MSE 24-hr	3	Default	24.00	1	7.38	2

24289 - TSUNAMI COLUMBIA HEIGHTS EXISTING

Prepared by Civil Site Group

Printed 7/29/2024

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Page 3

Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.234	61	>75% Grass cover, Good, HSG B (EX1)
0.572	98	Paved parking, HSG B (EX1)
0.806	87	TOTAL AREA

24289 - TSUNAMI COLUMBIA HEIGHTS EXISTING

Prepared by Civil Site Group

Printed 7/29/2024

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Page 4

Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	EX1
0.806	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.806		TOTAL AREA

24289 - TSUNAMI COLUMBIA HEIGHTS EXISTING

Prepared by Civil Site Group

Printed 7/29/2024

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Page 5

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	0.234	0.000	0.000	0.000	0.234	>75% Grass cover, Good	EX1
0.000	0.572	0.000	0.000	0.000	0.572	Paved parking	EX1
0.000	0.806	0.000	0.000	0.000	0.806	TOTAL AREA	

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 - DRAINS SOUTH Runoff Area=35,104 sf 71.01% Impervious Runoff Depth=1.94"
Tc=6.0 min CN=WQ Runoff=2.47 cfs 0.130 af

Total Runoff Area = 0.806 ac Runoff Volume = 0.130 af Average Runoff Depth = 1.94"
28.99% Pervious = 0.234 ac 71.01% Impervious = 0.572 ac

Summary for Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

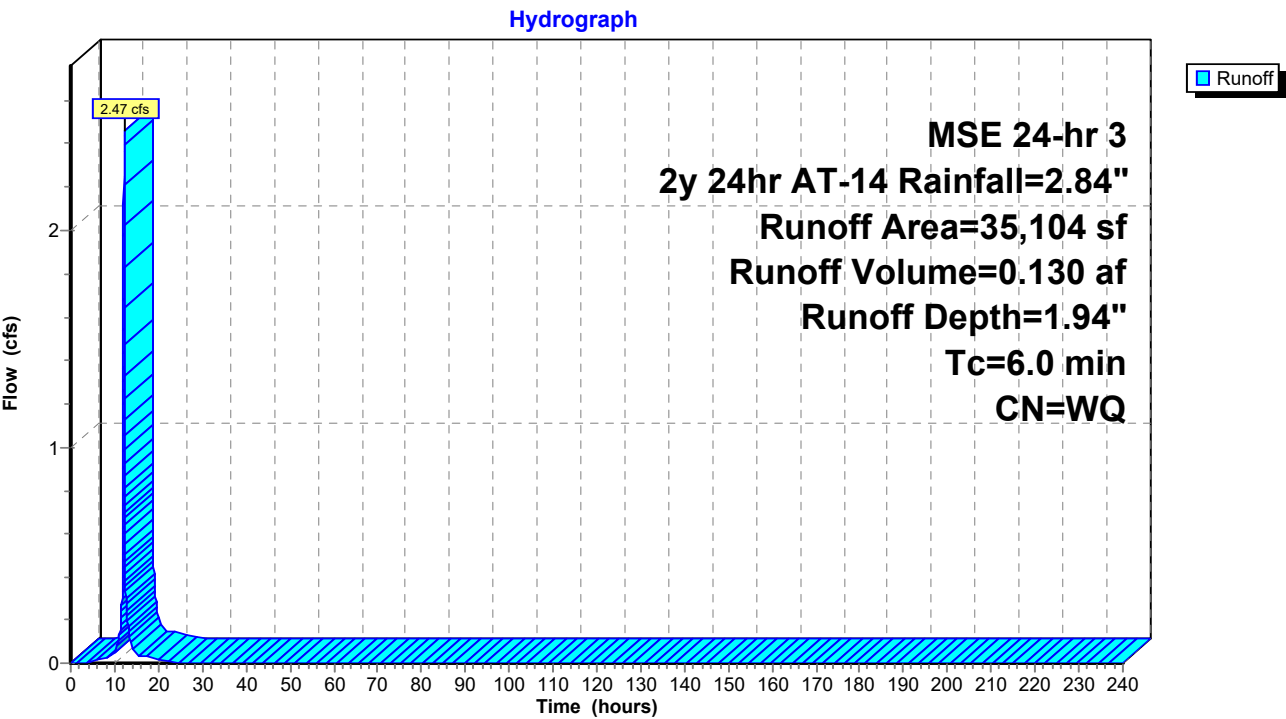
Runoff = 2.47 cfs @ 12.13 hrs, Volume= 0.130 af, Depth= 1.94"
Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.84"

Area (sf)	CN	Description
24,929	98	Paved parking, HSG B
10,175	61	>75% Grass cover, Good, HSG B
35,104		Weighted Average
10,175		28.99% Pervious Area
24,929		71.01% Impervious Area

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

Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.



Hydrograph for Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.11	0.00	0.01
10.00	0.39	0.01	0.05
15.00	2.55	1.35	0.06
20.00	2.77	1.54	0.02
25.00	2.84	1.60	0.00
30.00	2.84	1.60	0.00
35.00	2.84	1.60	0.00
40.00	2.84	1.60	0.00
45.00	2.84	1.60	0.00
50.00	2.84	1.60	0.00
55.00	2.84	1.60	0.00
60.00	2.84	1.60	0.00
65.00	2.84	1.60	0.00
70.00	2.84	1.60	0.00
75.00	2.84	1.60	0.00
80.00	2.84	1.60	0.00
85.00	2.84	1.60	0.00
90.00	2.84	1.60	0.00
95.00	2.84	1.60	0.00
100.00	2.84	1.60	0.00
105.00	2.84	1.60	0.00
110.00	2.84	1.60	0.00
115.00	2.84	1.60	0.00
120.00	2.84	1.60	0.00
125.00	2.84	1.60	0.00
130.00	2.84	1.60	0.00
135.00	2.84	1.60	0.00
140.00	2.84	1.60	0.00
145.00	2.84	1.60	0.00
150.00	2.84	1.60	0.00
155.00	2.84	1.60	0.00
160.00	2.84	1.60	0.00
165.00	2.84	1.60	0.00
170.00	2.84	1.60	0.00
175.00	2.84	1.60	0.00
180.00	2.84	1.60	0.00
185.00	2.84	1.60	0.00
190.00	2.84	1.60	0.00
195.00	2.84	1.60	0.00
200.00	2.84	1.60	0.00
205.00	2.84	1.60	0.00
210.00	2.84	1.60	0.00
215.00	2.84	1.60	0.00
220.00	2.84	1.60	0.00
225.00	2.84	1.60	0.00
230.00	2.84	1.60	0.00
235.00	2.84	1.60	0.00
240.00	2.84	1.60	0.00

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

Subcatchment EX1: EX1 - DRAINS SOUTH Runoff Area=35,104 sf 71.01% Impervious Runoff Depth=3.13"
Tc=6.0 min CN=WQ Runoff=4.00 cfs 0.210 af

Total Runoff Area = 0.806 ac Runoff Volume = 0.210 af Average Runoff Depth = 3.13"
28.99% Pervious = 0.234 ac 71.01% Impervious = 0.572 ac

Summary for Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

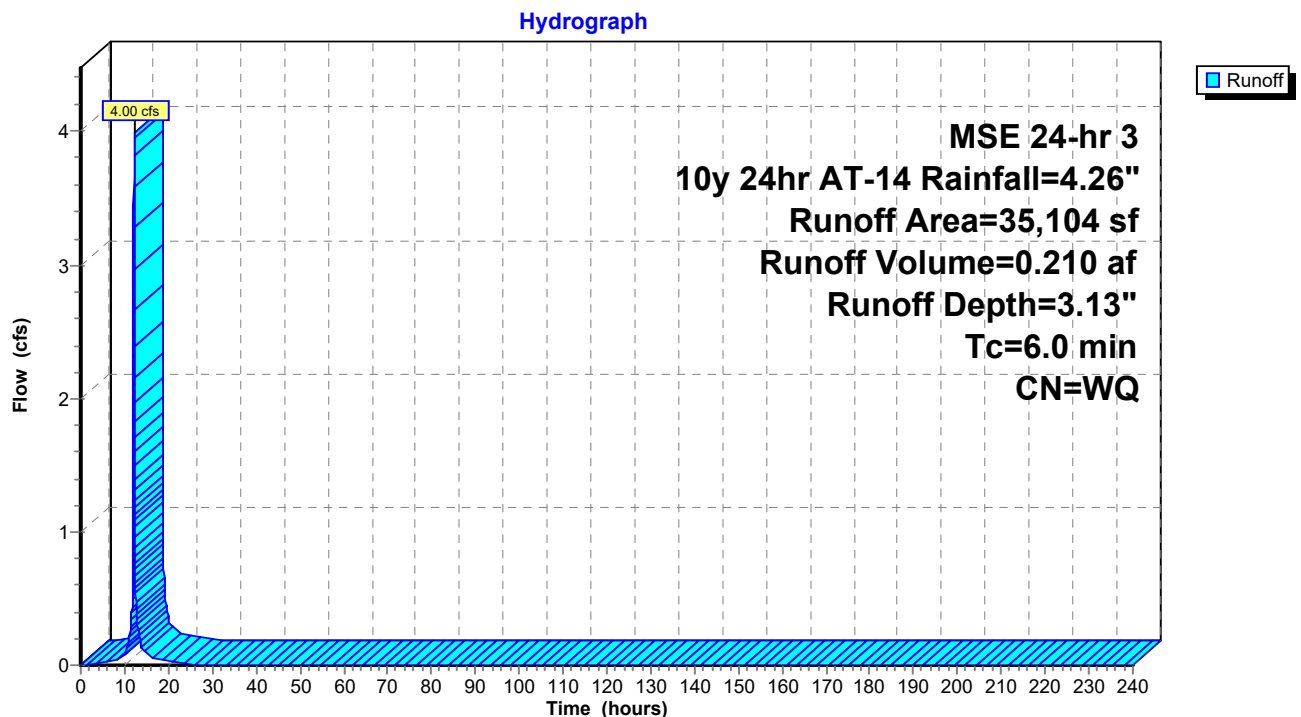
Runoff = 4.00 cfs @ 12.13 hrs, Volume= 0.210 af, Depth= 3.13"
 Routed to nonexistent node EX-DA 1

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.26"

Area (sf)	CN	Description
24,929	98	Paved parking, HSG B
10,175	61	>75% Grass cover, Good, HSG B
35,104		Weighted Average
10,175		28.99% Pervious Area
24,929		71.01% Impervious Area

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

Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.



Hydrograph for Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.16	0.00	0.02
10.00	0.59	0.05	0.08
15.00	3.82	2.47	0.10
20.00	4.15	2.77	0.03
25.00	4.26	2.88	0.00
30.00	4.26	2.88	0.00
35.00	4.26	2.88	0.00
40.00	4.26	2.88	0.00
45.00	4.26	2.88	0.00
50.00	4.26	2.88	0.00
55.00	4.26	2.88	0.00
60.00	4.26	2.88	0.00
65.00	4.26	2.88	0.00
70.00	4.26	2.88	0.00
75.00	4.26	2.88	0.00
80.00	4.26	2.88	0.00
85.00	4.26	2.88	0.00
90.00	4.26	2.88	0.00
95.00	4.26	2.88	0.00
100.00	4.26	2.88	0.00
105.00	4.26	2.88	0.00
110.00	4.26	2.88	0.00
115.00	4.26	2.88	0.00
120.00	4.26	2.88	0.00
125.00	4.26	2.88	0.00
130.00	4.26	2.88	0.00
135.00	4.26	2.88	0.00
140.00	4.26	2.88	0.00
145.00	4.26	2.88	0.00
150.00	4.26	2.88	0.00
155.00	4.26	2.88	0.00
160.00	4.26	2.88	0.00
165.00	4.26	2.88	0.00
170.00	4.26	2.88	0.00
175.00	4.26	2.88	0.00
180.00	4.26	2.88	0.00
185.00	4.26	2.88	0.00
190.00	4.26	2.88	0.00
195.00	4.26	2.88	0.00
200.00	4.26	2.88	0.00
205.00	4.26	2.88	0.00
210.00	4.26	2.88	0.00
215.00	4.26	2.88	0.00
220.00	4.26	2.88	0.00
225.00	4.26	2.88	0.00
230.00	4.26	2.88	0.00
235.00	4.26	2.88	0.00
240.00	4.26	2.88	0.00

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentEX1: EX1 - DRAINS SOUTH Runoff Area=35,104 sf 71.01% Impervious Runoff Depth=5.93"
Tc=6.0 min CN=WQ Runoff=7.60 cfs 0.399 af

Total Runoff Area = 0.806 ac Runoff Volume = 0.399 af Average Runoff Depth = 5.93"
28.99% Pervious = 0.234 ac 71.01% Impervious = 0.572 ac

Summary for Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

Runoff = 7.60 cfs @ 12.13 hrs, Volume= 0.399 af, Depth= 5.93"
 Routed to nonexistent node EX-DA 1

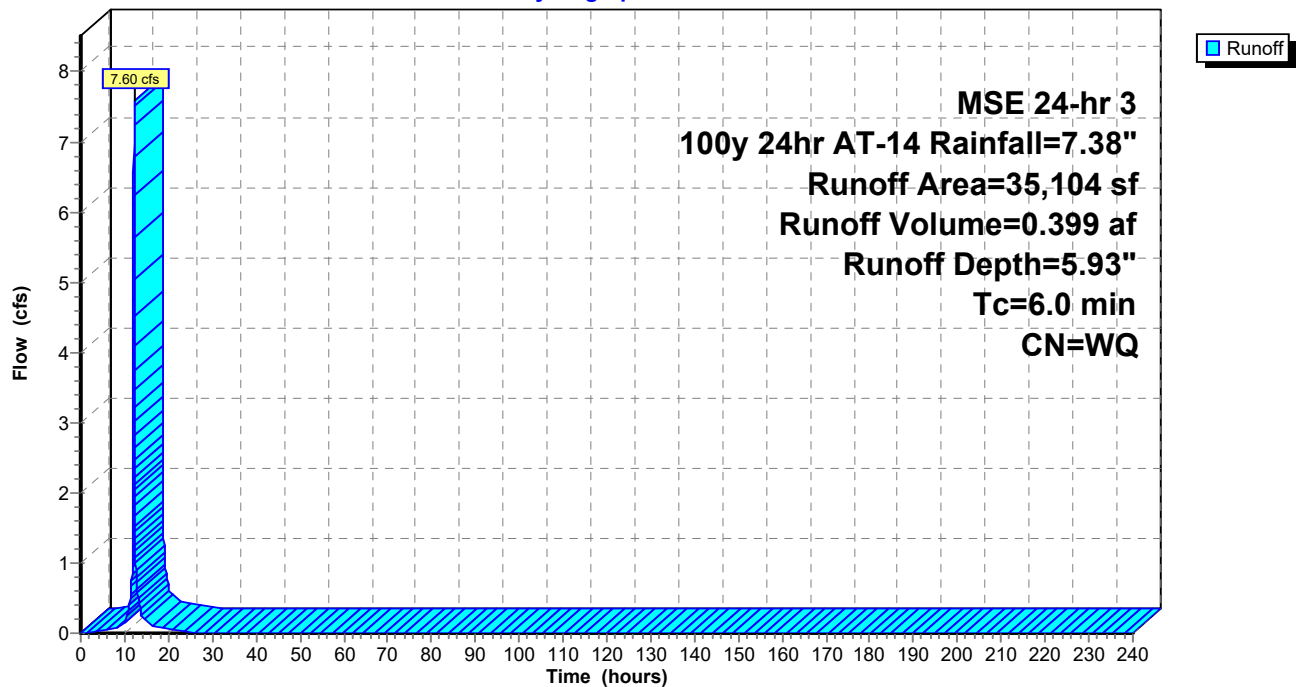
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.38"

Area (sf)	CN	Description
24,929	98	Paved parking, HSG B
10,175	61	>75% Grass cover, Good, HSG B
35,104		Weighted Average
10,175		28.99% Pervious Area
24,929		71.01% Impervious Area

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

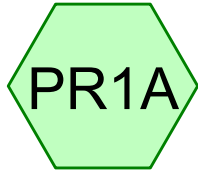
Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

Hydrograph

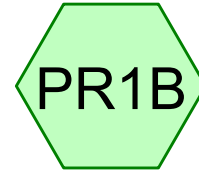


Hydrograph for Subcatchment EX1: EX1 - DRAINS SOUTH TO 50TH AVE.

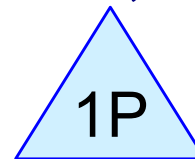
Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.28	0.00	0.04
10.00	1.01	0.23	0.15
15.00	6.62	5.11	0.18
20.00	7.19	5.66	0.06
25.00	7.38	5.85	0.00
30.00	7.38	5.85	0.00
35.00	7.38	5.85	0.00
40.00	7.38	5.85	0.00
45.00	7.38	5.85	0.00
50.00	7.38	5.85	0.00
55.00	7.38	5.85	0.00
60.00	7.38	5.85	0.00
65.00	7.38	5.85	0.00
70.00	7.38	5.85	0.00
75.00	7.38	5.85	0.00
80.00	7.38	5.85	0.00
85.00	7.38	5.85	0.00
90.00	7.38	5.85	0.00
95.00	7.38	5.85	0.00
100.00	7.38	5.85	0.00
105.00	7.38	5.85	0.00
110.00	7.38	5.85	0.00
115.00	7.38	5.85	0.00
120.00	7.38	5.85	0.00
125.00	7.38	5.85	0.00
130.00	7.38	5.85	0.00
135.00	7.38	5.85	0.00
140.00	7.38	5.85	0.00
145.00	7.38	5.85	0.00
150.00	7.38	5.85	0.00
155.00	7.38	5.85	0.00
160.00	7.38	5.85	0.00
165.00	7.38	5.85	0.00
170.00	7.38	5.85	0.00
175.00	7.38	5.85	0.00
180.00	7.38	5.85	0.00
185.00	7.38	5.85	0.00
190.00	7.38	5.85	0.00
195.00	7.38	5.85	0.00
200.00	7.38	5.85	0.00
205.00	7.38	5.85	0.00
210.00	7.38	5.85	0.00
215.00	7.38	5.85	0.00
220.00	7.38	5.85	0.00
225.00	7.38	5.85	0.00
230.00	7.38	5.85	0.00
235.00	7.38	5.85	0.00
240.00	7.38	5.85	0.00



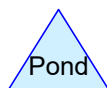
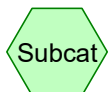
PR1A - DRAINS
SOUTH TO 50TH AVE



PR1B - DRAINS TO
DETENTION BASIN
THEN SOUTH TO
50TH AVE



1P - DETENTION
BASIN



Routing Diagram for 24289 - TSUNAMI COLUMBIA HEIGHTS PROPOSED

Prepared by Civil Site Group, Printed 7/29/2024

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24289 - TSUNAMI COLUMBIA HEIGHTS PROPOSED

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Rainfall Events Listing

Event#	Event Name	Storm Type	Curve	Mode	Duration (hours)	B/B	Depth (inches)	AMC
1	2y 24hr AT-14	MSE 24-hr	3	Default	24.00	1	2.84	2
2	10y 24hr AT-14	MSE 24-hr	3	Default	24.00	1	4.26	2
3	100y 24hr AT-14	MSE 24-hr	3	Default	24.00	1	7.38	2

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Area Listing (all nodes)

Area (acres)	CN	Description (subcatchment-numbers)
0.243	61	>75% Grass cover, Good, HSG B (PR1A, PR1B)
0.590	98	Paved parking, HSG B (PR1A, PR1B)
0.833	87	TOTAL AREA

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Soil Listing (all nodes)

Area (acres)	Soil Group	Subcatchment Numbers
0.000	HSG A	PR1A, PR1B
0.833	HSG B	
0.000	HSG C	
0.000	HSG D	
0.000	Other	
0.833		TOTAL AREA

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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	0.243	0.000	0.000	0.000	0.243	>75% Grass cover, Good	PR1A, PR1B
0.000	0.590	0.000	0.000	0.000	0.590	Paved parking	PR1A, PR1B
0.000	0.833	0.000	0.000	0.000	0.833	TOTAL AREA	

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPR1A: PR1A - DRAINS Runoff Area=22,316 sf 71.46% Impervious Runoff Depth=1.95"
Tc=6.0 min CN=WQ Runoff=1.58 cfs 0.083 af

SubcatchmentPR1B: PR1B - DRAINS TO Runoff Area=13,951 sf 69.84% Impervious Runoff Depth=1.91"
Tc=6.0 min CN=WQ Runoff=0.97 cfs 0.051 af

Pond 1P: 1P - DETENTIONBASIN Peak Elev=930.23' Storage=321 cf Inflow=0.97 cfs 0.051 af
Outflow=0.74 cfs 0.051 af

Total Runoff Area = 0.833 ac Runoff Volume = 0.134 af Average Runoff Depth = 1.94"
29.16% Pervious = 0.243 ac 70.84% Impervious = 0.590 ac

Summary for Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE

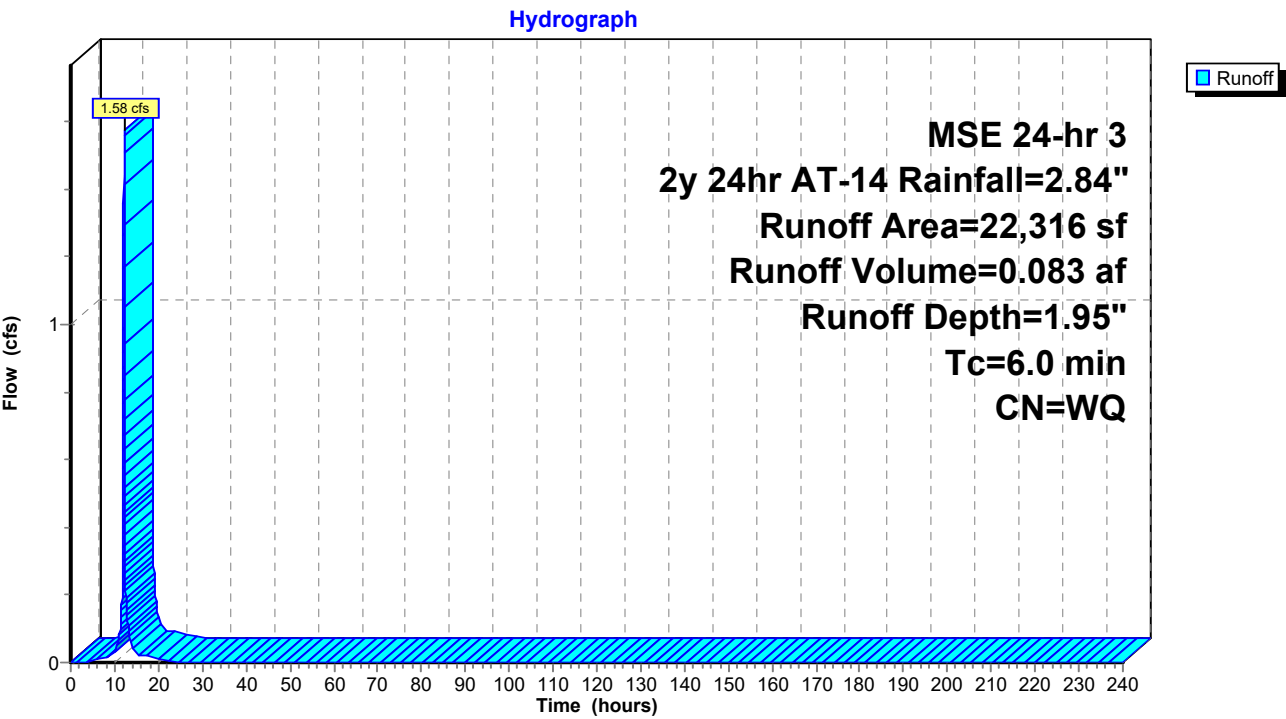
Runoff = 1.58 cfs @ 12.13 hrs, Volume= 0.083 af, Depth= 1.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.84"

Area (sf)	CN	Description
15,948	98	Paved parking, HSG B
6,368	61	>75% Grass cover, Good, HSG B
22,316		Weighted Average
6,368		28.54% Pervious Area
15,948		71.46% Impervious Area

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

Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE



Hydrograph for Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.11	0.00	0.01
10.00	0.39	0.01	0.03
15.00	2.55	1.35	0.04
20.00	2.77	1.54	0.01
25.00	2.84	1.60	0.00
30.00	2.84	1.60	0.00
35.00	2.84	1.60	0.00
40.00	2.84	1.60	0.00
45.00	2.84	1.60	0.00
50.00	2.84	1.60	0.00
55.00	2.84	1.60	0.00
60.00	2.84	1.60	0.00
65.00	2.84	1.60	0.00
70.00	2.84	1.60	0.00
75.00	2.84	1.60	0.00
80.00	2.84	1.60	0.00
85.00	2.84	1.60	0.00
90.00	2.84	1.60	0.00
95.00	2.84	1.60	0.00
100.00	2.84	1.60	0.00
105.00	2.84	1.60	0.00
110.00	2.84	1.60	0.00
115.00	2.84	1.60	0.00
120.00	2.84	1.60	0.00
125.00	2.84	1.60	0.00
130.00	2.84	1.60	0.00
135.00	2.84	1.60	0.00
140.00	2.84	1.60	0.00
145.00	2.84	1.60	0.00
150.00	2.84	1.60	0.00
155.00	2.84	1.60	0.00
160.00	2.84	1.60	0.00
165.00	2.84	1.60	0.00
170.00	2.84	1.60	0.00
175.00	2.84	1.60	0.00
180.00	2.84	1.60	0.00
185.00	2.84	1.60	0.00
190.00	2.84	1.60	0.00
195.00	2.84	1.60	0.00
200.00	2.84	1.60	0.00
205.00	2.84	1.60	0.00
210.00	2.84	1.60	0.00
215.00	2.84	1.60	0.00
220.00	2.84	1.60	0.00
225.00	2.84	1.60	0.00
230.00	2.84	1.60	0.00
235.00	2.84	1.60	0.00
240.00	2.84	1.60	0.00

Summary for Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE

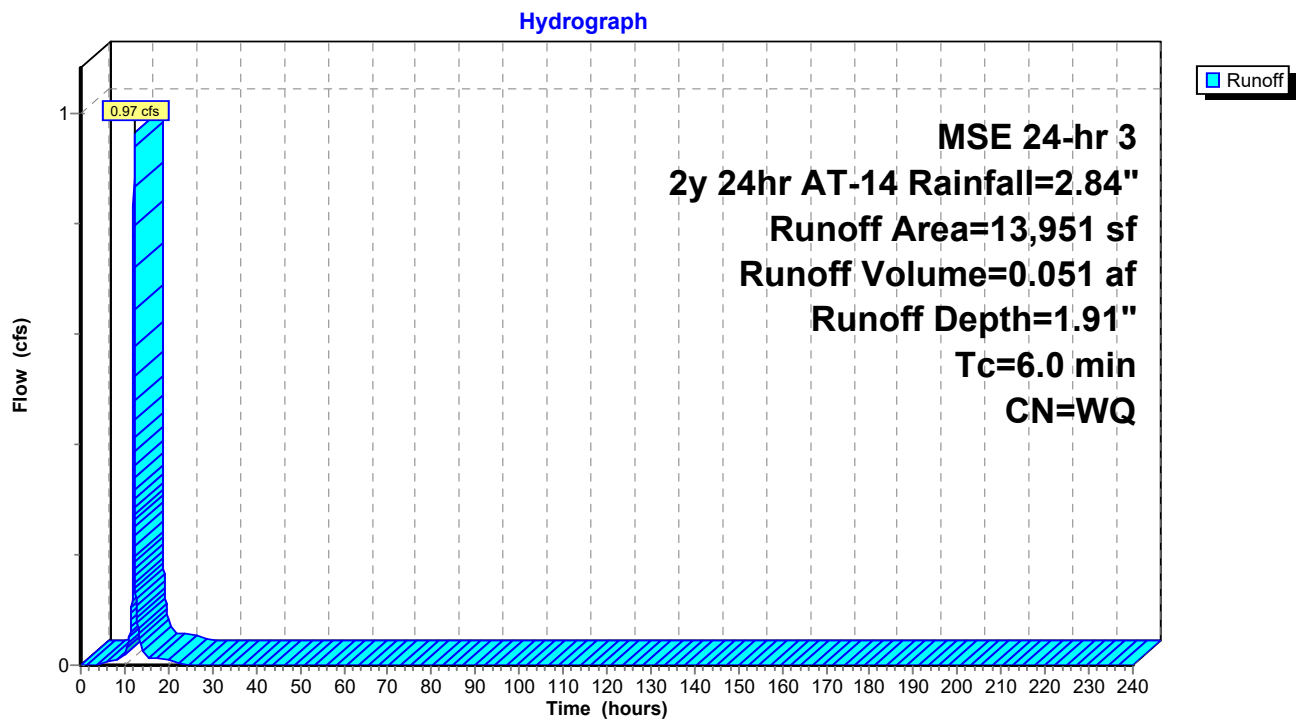
Runoff = 0.97 cfs @ 12.13 hrs, Volume= 0.051 af, Depth= 1.91"
 Routed to Pond 1P : 1P - DETENTION BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 2y 24hr AT-14 Rainfall=2.84"

Area (sf)	CN	Description
9,743	98	Paved parking, HSG B
4,208	61	>75% Grass cover, Good, HSG B
13,951		Weighted Average
4,208		30.16% Pervious Area
9,743		69.84% Impervious Area

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

Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE



Hydrograph for Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.11	0.00	0.00
10.00	0.39	0.01	0.02
15.00	2.55	1.35	0.02
20.00	2.77	1.54	0.01
25.00	2.84	1.60	0.00
30.00	2.84	1.60	0.00
35.00	2.84	1.60	0.00
40.00	2.84	1.60	0.00
45.00	2.84	1.60	0.00
50.00	2.84	1.60	0.00
55.00	2.84	1.60	0.00
60.00	2.84	1.60	0.00
65.00	2.84	1.60	0.00
70.00	2.84	1.60	0.00
75.00	2.84	1.60	0.00
80.00	2.84	1.60	0.00
85.00	2.84	1.60	0.00
90.00	2.84	1.60	0.00
95.00	2.84	1.60	0.00
100.00	2.84	1.60	0.00
105.00	2.84	1.60	0.00
110.00	2.84	1.60	0.00
115.00	2.84	1.60	0.00
120.00	2.84	1.60	0.00
125.00	2.84	1.60	0.00
130.00	2.84	1.60	0.00
135.00	2.84	1.60	0.00
140.00	2.84	1.60	0.00
145.00	2.84	1.60	0.00
150.00	2.84	1.60	0.00
155.00	2.84	1.60	0.00
160.00	2.84	1.60	0.00
165.00	2.84	1.60	0.00
170.00	2.84	1.60	0.00
175.00	2.84	1.60	0.00
180.00	2.84	1.60	0.00
185.00	2.84	1.60	0.00
190.00	2.84	1.60	0.00
195.00	2.84	1.60	0.00
200.00	2.84	1.60	0.00
205.00	2.84	1.60	0.00
210.00	2.84	1.60	0.00
215.00	2.84	1.60	0.00
220.00	2.84	1.60	0.00
225.00	2.84	1.60	0.00
230.00	2.84	1.60	0.00
235.00	2.84	1.60	0.00
240.00	2.84	1.60	0.00

Summary for Pond 1P: 1P - DETENTION BASIN

Inflow Area = 0.320 ac, 69.84% Impervious, Inflow Depth = 1.91" for 2y 24hr AT-14 event
 Inflow = 0.97 cfs @ 12.13 hrs, Volume= 0.051 af
 Outflow = 0.74 cfs @ 12.18 hrs, Volume= 0.051 af, Atten= 23%, Lag= 2.8 min
 Primary = 0.74 cfs @ 12.18 hrs, Volume= 0.051 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 930.23' @ 12.18 hrs Surf.Area= 1,478 sf Storage= 321 cf

Plug-Flow detention time= 14.2 min calculated for 0.051 af (100% of inflow)
 Center-of-Mass det. time= 14.2 min (774.3 - 760.1)

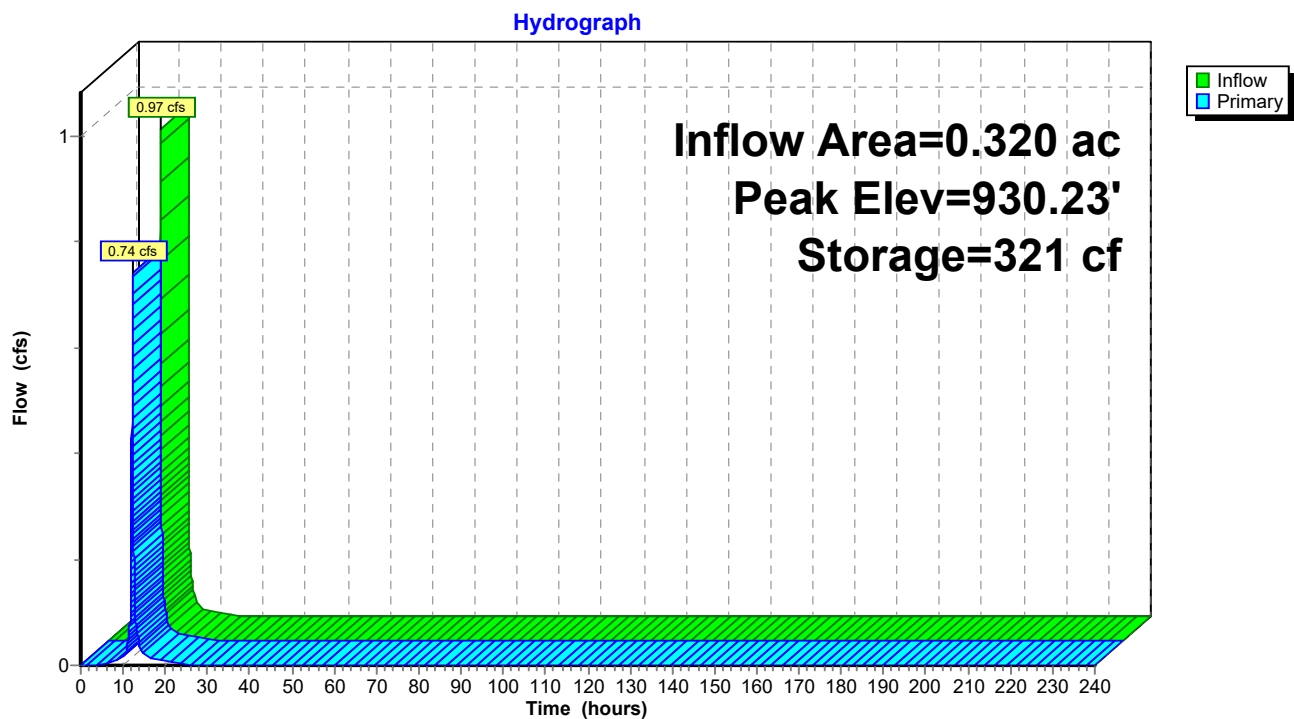
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	3,950 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
930.00	1,347	0	0
930.50	1,634	745	745
931.00	1,937	893	1,638
931.50	2,323	1,065	2,703
932.00	2,665	1,247	3,950

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=0.74 cfs @ 12.18 hrs HW=930.23' (Free Discharge)
 ↑ **1=Orifice/Grate** (Weir Controls 0.74 cfs @ 1.56 fps)

Pond 1P: 1P - DETENTION BASIN



Hydrograph for Pond 1P: 1P - DETENTION BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	930.00	0.00
5.00	0.00	4	930.00	0.00
10.00	0.02	25	930.02	0.02
15.00	0.02	31	930.02	0.02
20.00	0.01	12	930.01	0.01
25.00	0.00	0	930.00	0.00
30.00	0.00	0	930.00	0.00
35.00	0.00	0	930.00	0.00
40.00	0.00	0	930.00	0.00
45.00	0.00	0	930.00	0.00
50.00	0.00	0	930.00	0.00
55.00	0.00	0	930.00	0.00
60.00	0.00	0	930.00	0.00
65.00	0.00	0	930.00	0.00
70.00	0.00	0	930.00	0.00
75.00	0.00	0	930.00	0.00
80.00	0.00	0	930.00	0.00
85.00	0.00	0	930.00	0.00
90.00	0.00	0	930.00	0.00
95.00	0.00	0	930.00	0.00
100.00	0.00	0	930.00	0.00
105.00	0.00	0	930.00	0.00
110.00	0.00	0	930.00	0.00
115.00	0.00	0	930.00	0.00
120.00	0.00	0	930.00	0.00
125.00	0.00	0	930.00	0.00
130.00	0.00	0	930.00	0.00
135.00	0.00	0	930.00	0.00
140.00	0.00	0	930.00	0.00
145.00	0.00	0	930.00	0.00
150.00	0.00	0	930.00	0.00
155.00	0.00	0	930.00	0.00
160.00	0.00	0	930.00	0.00
165.00	0.00	0	930.00	0.00
170.00	0.00	0	930.00	0.00
175.00	0.00	0	930.00	0.00
180.00	0.00	0	930.00	0.00
185.00	0.00	0	930.00	0.00
190.00	0.00	0	930.00	0.00
195.00	0.00	0	930.00	0.00
200.00	0.00	0	930.00	0.00
205.00	0.00	0	930.00	0.00
210.00	0.00	0	930.00	0.00
215.00	0.00	0	930.00	0.00
220.00	0.00	0	930.00	0.00
225.00	0.00	0	930.00	0.00
230.00	0.00	0	930.00	0.00
235.00	0.00	0	930.00	0.00
240.00	0.00	0	930.00	0.00

Stage-Area-Storage for Pond 1P: 1P - DETENTION BASIN

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
930.00	1,347	0	931.04	1,968	1,716
930.02	1,358	27	931.06	1,983	1,756
930.04	1,370	54	931.08	1,999	1,795
930.06	1,381	82	931.10	2,014	1,836
930.08	1,393	110	931.12	2,030	1,876
930.10	1,404	138	931.14	2,045	1,917
930.12	1,416	166	931.16	2,061	1,958
930.14	1,427	194	931.18	2,076	1,999
930.16	1,439	223	931.20	2,091	2,041
930.18	1,450	252	931.22	2,107	2,083
930.20	1,462	281	931.24	2,122	2,125
930.22	1,473	310	931.26	2,138	2,168
930.24	1,485	340	931.28	2,153	2,211
930.26	1,496	370	931.30	2,169	2,254
930.28	1,508	400	931.32	2,184	2,297
930.30	1,519	430	931.34	2,199	2,341
930.32	1,531	460	931.36	2,215	2,385
930.34	1,542	491	931.38	2,230	2,430
930.36	1,554	522	931.40	2,246	2,475
930.38	1,565	553	931.42	2,261	2,520
930.40	1,577	585	931.44	2,277	2,565
930.42	1,588	616	931.46	2,292	2,611
930.44	1,600	648	931.48	2,308	2,657
930.46	1,611	680	931.50	2,323	2,703
930.48	1,623	713	931.52	2,337	2,750
930.50	1,634	745	931.54	2,350	2,796
930.52	1,646	778	931.56	2,364	2,844
930.54	1,658	811	931.58	2,378	2,891
930.56	1,670	844	931.60	2,391	2,939
930.58	1,682	878	931.62	2,405	2,987
930.60	1,695	912	931.64	2,419	3,035
930.62	1,707	946	931.66	2,432	3,083
930.64	1,719	980	931.68	2,446	3,132
930.66	1,731	1,014	931.70	2,460	3,181
930.68	1,743	1,049	931.72	2,473	3,231
930.70	1,755	1,084	931.74	2,487	3,280
930.72	1,767	1,119	931.76	2,501	3,330
930.74	1,779	1,155	931.78	2,515	3,380
930.76	1,792	1,191	931.80	2,528	3,431
930.78	1,804	1,227	931.82	2,542	3,481
930.80	1,816	1,263	931.84	2,556	3,532
930.82	1,828	1,299	931.86	2,569	3,584
930.84	1,840	1,336	931.88	2,583	3,635
930.86	1,852	1,373	931.90	2,597	3,687
930.88	1,864	1,410	931.92	2,610	3,739
930.90	1,876	1,447	931.94	2,624	3,791
930.92	1,889	1,485	931.96	2,638	3,844
930.94	1,901	1,523	931.98	2,651	3,897
930.96	1,913	1,561	932.00	2,665	3,950
930.98	1,925	1,599			
931.00	1,937	1,638			
931.02	1,952	1,677			

24289 - TSUNAMI COLUMBIA HEIGHTS PROPOMSE 24-hr 3 10y 24hr AT-14 Rainfall=4.26"

Prepared by Civil Site Group

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Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPR1A: PR1A - DRAINS Runoff Area=22,316 sf 71.46% Impervious Runoff Depth=3.15"
Tc=6.0 min CN=WQ Runoff=2.55 cfs 0.134 af

SubcatchmentPR1B: PR1B - DRAINS TO Runoff Area=13,951 sf 69.84% Impervious Runoff Depth=3.10"
Tc=6.0 min CN=WQ Runoff=1.57 cfs 0.083 af

Pond 1P: 1P - DETENTIONBASIN Peak Elev=930.36' Storage=522 cf Inflow=1.57 cfs 0.083 af
Outflow=1.01 cfs 0.083 af

Total Runoff Area = 0.833 ac Runoff Volume = 0.217 af Average Runoff Depth = 3.13"
29.16% Pervious = 0.243 ac 70.84% Impervious = 0.590 ac

Summary for Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE

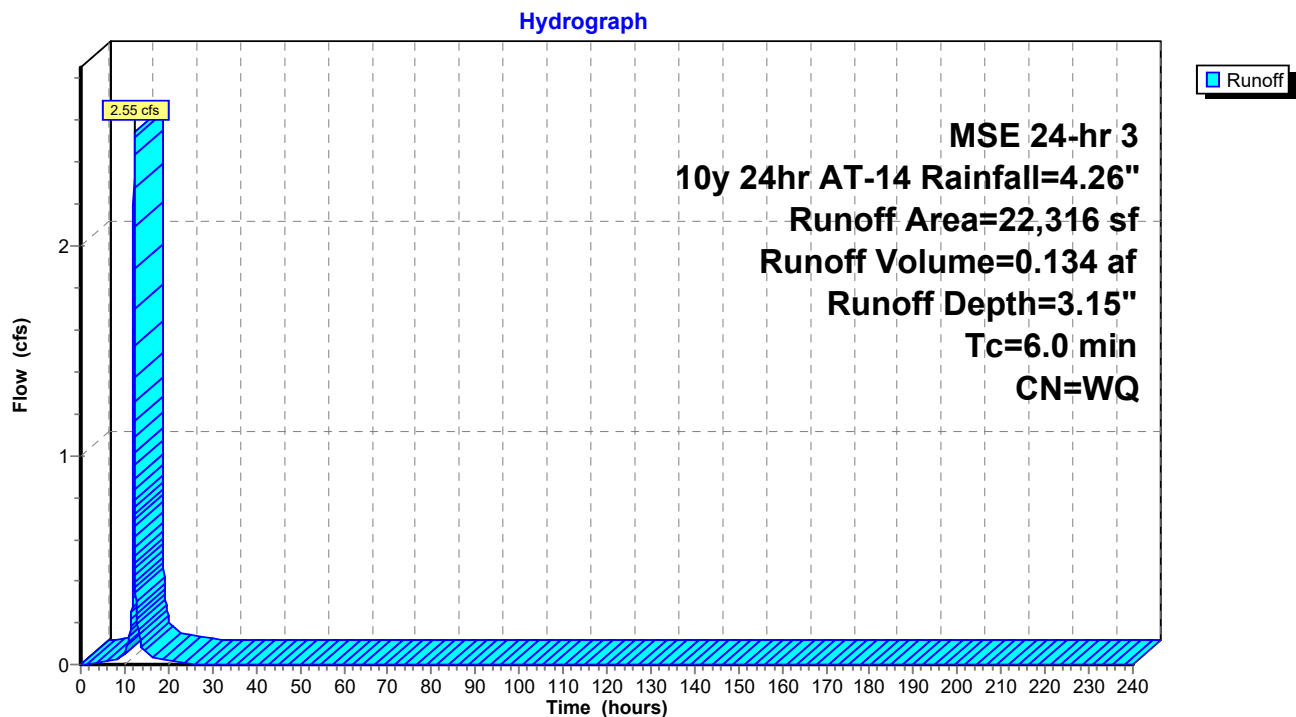
Runoff = 2.55 cfs @ 12.13 hrs, Volume= 0.134 af, Depth= 3.15"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.26"

Area (sf)	CN	Description
15,948	98	Paved parking, HSG B
6,368	61	>75% Grass cover, Good, HSG B
22,316		Weighted Average
6,368		28.54% Pervious Area
15,948		71.46% Impervious Area

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

Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE



24289 - TSUNAMI COLUMBIA HEIGHTS PROPOMSE 24-hr 3 10y 24hr AT-14 Rainfall=4.26"

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Hydrograph for Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.16	0.00	0.01
10.00	0.59	0.05	0.05
15.00	3.82	2.47	0.06
20.00	4.15	2.77	0.02
25.00	4.26	2.88	0.00
30.00	4.26	2.88	0.00
35.00	4.26	2.88	0.00
40.00	4.26	2.88	0.00
45.00	4.26	2.88	0.00
50.00	4.26	2.88	0.00
55.00	4.26	2.88	0.00
60.00	4.26	2.88	0.00
65.00	4.26	2.88	0.00
70.00	4.26	2.88	0.00
75.00	4.26	2.88	0.00
80.00	4.26	2.88	0.00
85.00	4.26	2.88	0.00
90.00	4.26	2.88	0.00
95.00	4.26	2.88	0.00
100.00	4.26	2.88	0.00
105.00	4.26	2.88	0.00
110.00	4.26	2.88	0.00
115.00	4.26	2.88	0.00
120.00	4.26	2.88	0.00
125.00	4.26	2.88	0.00
130.00	4.26	2.88	0.00
135.00	4.26	2.88	0.00
140.00	4.26	2.88	0.00
145.00	4.26	2.88	0.00
150.00	4.26	2.88	0.00
155.00	4.26	2.88	0.00
160.00	4.26	2.88	0.00
165.00	4.26	2.88	0.00
170.00	4.26	2.88	0.00
175.00	4.26	2.88	0.00
180.00	4.26	2.88	0.00
185.00	4.26	2.88	0.00
190.00	4.26	2.88	0.00
195.00	4.26	2.88	0.00
200.00	4.26	2.88	0.00
205.00	4.26	2.88	0.00
210.00	4.26	2.88	0.00
215.00	4.26	2.88	0.00
220.00	4.26	2.88	0.00
225.00	4.26	2.88	0.00
230.00	4.26	2.88	0.00
235.00	4.26	2.88	0.00
240.00	4.26	2.88	0.00

Summary for Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE

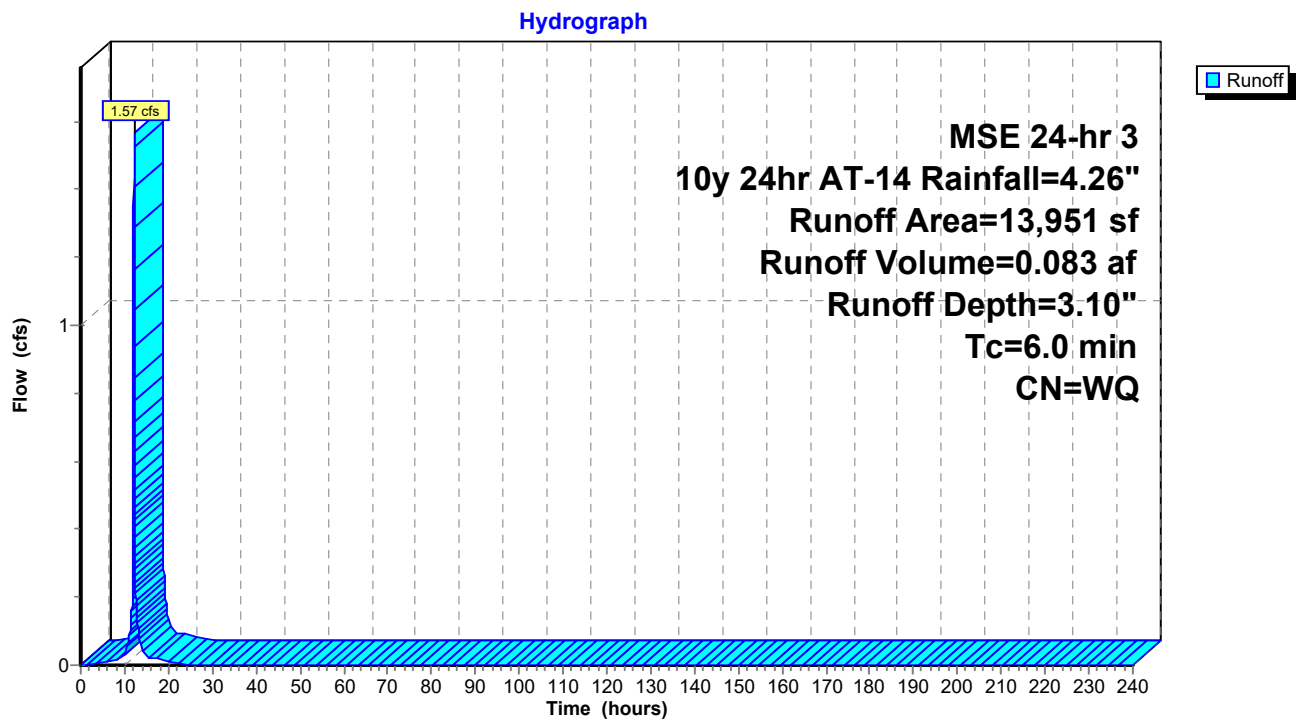
Runoff = 1.57 cfs @ 12.13 hrs, Volume= 0.083 af, Depth= 3.10"
 Routed to Pond 1P : 1P - DETENTION BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 10y 24hr AT-14 Rainfall=4.26"

Area (sf)	CN	Description
9,743	98	Paved parking, HSG B
4,208	61	>75% Grass cover, Good, HSG B
13,951		Weighted Average
4,208		30.16% Pervious Area
9,743		69.84% Impervious Area

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

Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE



24289 - TSUNAMI COLUMBIA HEIGHTS PROPOMSE 24-hr 3 10y 24hr AT-14 Rainfall=4.26"

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Hydrograph for Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.16	0.00	0.01
10.00	0.59	0.05	0.03
15.00	3.82	2.47	0.04
20.00	4.15	2.77	0.01
25.00	4.26	2.88	0.00
30.00	4.26	2.88	0.00
35.00	4.26	2.88	0.00
40.00	4.26	2.88	0.00
45.00	4.26	2.88	0.00
50.00	4.26	2.88	0.00
55.00	4.26	2.88	0.00
60.00	4.26	2.88	0.00
65.00	4.26	2.88	0.00
70.00	4.26	2.88	0.00
75.00	4.26	2.88	0.00
80.00	4.26	2.88	0.00
85.00	4.26	2.88	0.00
90.00	4.26	2.88	0.00
95.00	4.26	2.88	0.00
100.00	4.26	2.88	0.00
105.00	4.26	2.88	0.00
110.00	4.26	2.88	0.00
115.00	4.26	2.88	0.00
120.00	4.26	2.88	0.00
125.00	4.26	2.88	0.00
130.00	4.26	2.88	0.00
135.00	4.26	2.88	0.00
140.00	4.26	2.88	0.00
145.00	4.26	2.88	0.00
150.00	4.26	2.88	0.00
155.00	4.26	2.88	0.00
160.00	4.26	2.88	0.00
165.00	4.26	2.88	0.00
170.00	4.26	2.88	0.00
175.00	4.26	2.88	0.00
180.00	4.26	2.88	0.00
185.00	4.26	2.88	0.00
190.00	4.26	2.88	0.00
195.00	4.26	2.88	0.00
200.00	4.26	2.88	0.00
205.00	4.26	2.88	0.00
210.00	4.26	2.88	0.00
215.00	4.26	2.88	0.00
220.00	4.26	2.88	0.00
225.00	4.26	2.88	0.00
230.00	4.26	2.88	0.00
235.00	4.26	2.88	0.00
240.00	4.26	2.88	0.00

Summary for Pond 1P: 1P - DETENTION BASIN

Inflow Area = 0.320 ac, 69.84% Impervious, Inflow Depth = 3.10" for 10y 24hr AT-14 event
Inflow = 1.57 cfs @ 12.13 hrs, Volume= 0.083 af
Outflow = 1.01 cfs @ 12.19 hrs, Volume= 0.083 af, Atten= 36%, Lag= 3.8 min
Primary = 1.01 cfs @ 12.19 hrs, Volume= 0.083 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
Peak Elev= 930.36' @ 12.19 hrs Surf.Area= 1,553 sf Storage= 522 cf

Plug-Flow detention time= 13.1 min calculated for 0.083 af (100% of inflow)
Center-of-Mass det. time= 13.1 min (769.6 - 756.5)

Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	3,950 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

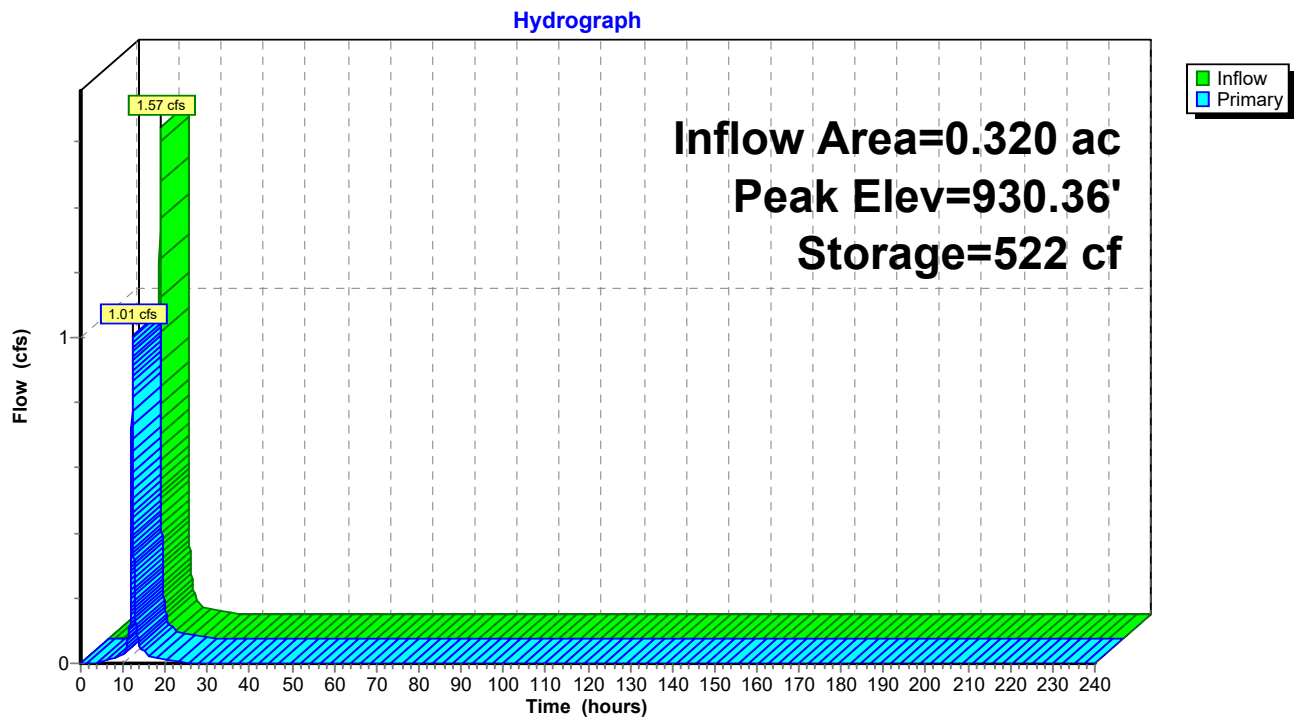
Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
930.00	1,347	0	0
930.50	1,634	745	745
931.00	1,937	893	1,638
931.50	2,323	1,065	2,703
932.00	2,665	1,247	3,950

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.01 cfs @ 12.19 hrs HW=930.36' (Free Discharge)

↑ **1=Orifice/Grate** (Orifice Controls 1.01 cfs @ 2.89 fps)

Pond 1P: 1P - DETENTION BASIN



Hydrograph for Pond 1P: 1P - DETENTION BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	930.00	0.00
5.00	0.01	8	930.01	0.01
10.00	0.03	36	930.03	0.03
15.00	0.04	42	930.03	0.04
20.00	0.01	19	930.01	0.01
25.00	0.00	1	930.00	0.00
30.00	0.00	0	930.00	0.00
35.00	0.00	0	930.00	0.00
40.00	0.00	0	930.00	0.00
45.00	0.00	0	930.00	0.00
50.00	0.00	0	930.00	0.00
55.00	0.00	0	930.00	0.00
60.00	0.00	0	930.00	0.00
65.00	0.00	0	930.00	0.00
70.00	0.00	0	930.00	0.00
75.00	0.00	0	930.00	0.00
80.00	0.00	0	930.00	0.00
85.00	0.00	0	930.00	0.00
90.00	0.00	0	930.00	0.00
95.00	0.00	0	930.00	0.00
100.00	0.00	0	930.00	0.00
105.00	0.00	0	930.00	0.00
110.00	0.00	0	930.00	0.00
115.00	0.00	0	930.00	0.00
120.00	0.00	0	930.00	0.00
125.00	0.00	0	930.00	0.00
130.00	0.00	0	930.00	0.00
135.00	0.00	0	930.00	0.00
140.00	0.00	0	930.00	0.00
145.00	0.00	0	930.00	0.00
150.00	0.00	0	930.00	0.00
155.00	0.00	0	930.00	0.00
160.00	0.00	0	930.00	0.00
165.00	0.00	0	930.00	0.00
170.00	0.00	0	930.00	0.00
175.00	0.00	0	930.00	0.00
180.00	0.00	0	930.00	0.00
185.00	0.00	0	930.00	0.00
190.00	0.00	0	930.00	0.00
195.00	0.00	0	930.00	0.00
200.00	0.00	0	930.00	0.00
205.00	0.00	0	930.00	0.00
210.00	0.00	0	930.00	0.00
215.00	0.00	0	930.00	0.00
220.00	0.00	0	930.00	0.00
225.00	0.00	0	930.00	0.00
230.00	0.00	0	930.00	0.00
235.00	0.00	0	930.00	0.00
240.00	0.00	0	930.00	0.00

Stage-Area-Storage for Pond 1P: 1P - DETENTION BASIN

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
930.00	1,347	0	931.04	1,968	1,716
930.02	1,358	27	931.06	1,983	1,756
930.04	1,370	54	931.08	1,999	1,795
930.06	1,381	82	931.10	2,014	1,836
930.08	1,393	110	931.12	2,030	1,876
930.10	1,404	138	931.14	2,045	1,917
930.12	1,416	166	931.16	2,061	1,958
930.14	1,427	194	931.18	2,076	1,999
930.16	1,439	223	931.20	2,091	2,041
930.18	1,450	252	931.22	2,107	2,083
930.20	1,462	281	931.24	2,122	2,125
930.22	1,473	310	931.26	2,138	2,168
930.24	1,485	340	931.28	2,153	2,211
930.26	1,496	370	931.30	2,169	2,254
930.28	1,508	400	931.32	2,184	2,297
930.30	1,519	430	931.34	2,199	2,341
930.32	1,531	460	931.36	2,215	2,385
930.34	1,542	491	931.38	2,230	2,430
930.36	1,554	522	931.40	2,246	2,475
930.38	1,565	553	931.42	2,261	2,520
930.40	1,577	585	931.44	2,277	2,565
930.42	1,588	616	931.46	2,292	2,611
930.44	1,600	648	931.48	2,308	2,657
930.46	1,611	680	931.50	2,323	2,703
930.48	1,623	713	931.52	2,337	2,750
930.50	1,634	745	931.54	2,350	2,796
930.52	1,646	778	931.56	2,364	2,844
930.54	1,658	811	931.58	2,378	2,891
930.56	1,670	844	931.60	2,391	2,939
930.58	1,682	878	931.62	2,405	2,987
930.60	1,695	912	931.64	2,419	3,035
930.62	1,707	946	931.66	2,432	3,083
930.64	1,719	980	931.68	2,446	3,132
930.66	1,731	1,014	931.70	2,460	3,181
930.68	1,743	1,049	931.72	2,473	3,231
930.70	1,755	1,084	931.74	2,487	3,280
930.72	1,767	1,119	931.76	2,501	3,330
930.74	1,779	1,155	931.78	2,515	3,380
930.76	1,792	1,191	931.80	2,528	3,431
930.78	1,804	1,227	931.82	2,542	3,481
930.80	1,816	1,263	931.84	2,556	3,532
930.82	1,828	1,299	931.86	2,569	3,584
930.84	1,840	1,336	931.88	2,583	3,635
930.86	1,852	1,373	931.90	2,597	3,687
930.88	1,864	1,410	931.92	2,610	3,739
930.90	1,876	1,447	931.94	2,624	3,791
930.92	1,889	1,485	931.96	2,638	3,844
930.94	1,901	1,523	931.98	2,651	3,897
930.96	1,913	1,561	932.00	2,665	3,950
930.98	1,925	1,599			
931.00	1,937	1,638			
931.02	1,952	1,677			

Time span=0.00-240.00 hrs, dt=0.01 hrs, 24001 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Stor-Ind method - Pond routing by Stor-Ind method

SubcatchmentPR1A: PR1A - DRAINS Runoff Area=22,316 sf 71.46% Impervious Runoff Depth=5.95"
Tc=6.0 min CN=WQ Runoff=4.84 cfs 0.254 af

SubcatchmentPR1B: PR1B - DRAINS TO Runoff Area=13,951 sf 69.84% Impervious Runoff Depth=5.89"
Tc=6.0 min CN=WQ Runoff=3.00 cfs 0.157 af

Pond 1P: 1P - DETENTIONBASIN Peak Elev=930.77' Storage=1,201 cf Inflow=3.00 cfs 0.157 af
Outflow=1.47 cfs 0.157 af

Total Runoff Area = 0.833 ac Runoff Volume = 0.411 af Average Runoff Depth = 5.93"
29.16% Pervious = 0.243 ac 70.84% Impervious = 0.590 ac

Summary for Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE

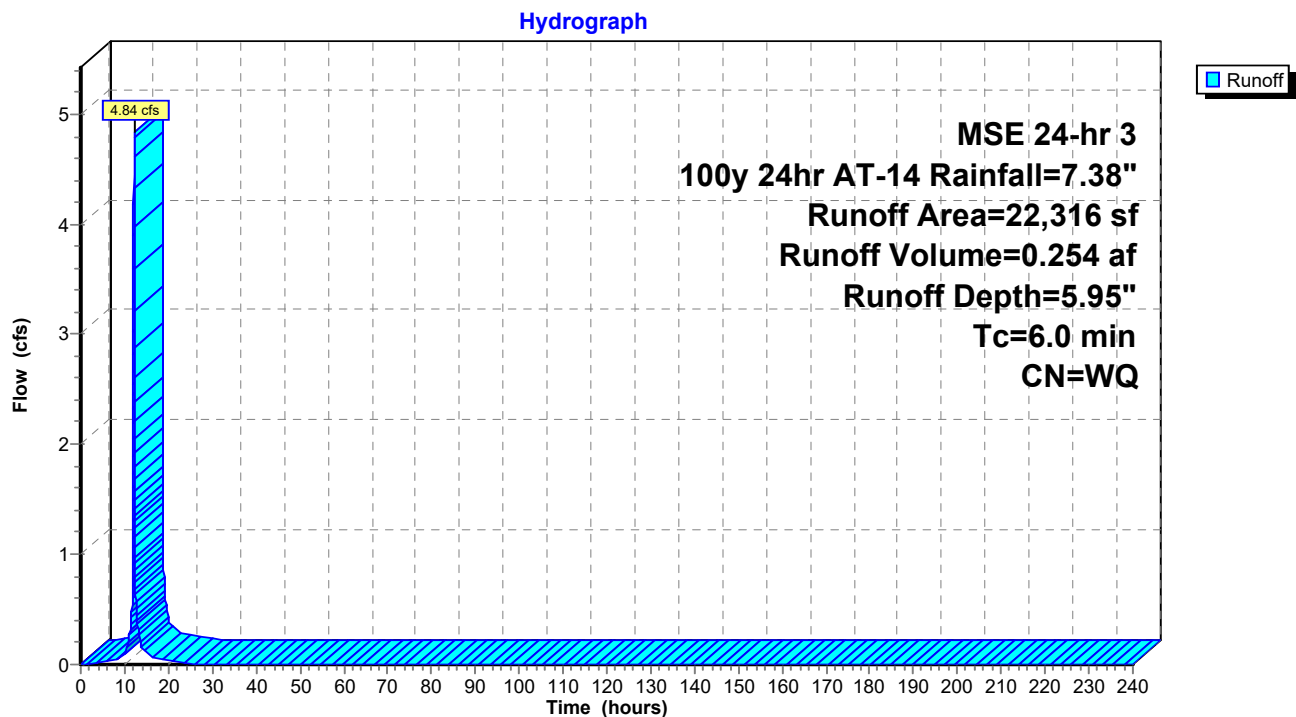
Runoff = 4.84 cfs @ 12.13 hrs, Volume= 0.254 af, Depth= 5.95"

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.38"

Area (sf)	CN	Description
15,948	98	Paved parking, HSG B
6,368	61	>75% Grass cover, Good, HSG B
22,316		Weighted Average
6,368		28.54% Pervious Area
15,948		71.46% Impervious Area

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

Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE



Hydrograph for Subcatchment PR1A: PR1A - DRAINS SOUTH TO 50TH AVE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.28	0.00	0.03
10.00	1.01	0.23	0.10
15.00	6.62	5.11	0.11
20.00	7.19	5.66	0.04
25.00	7.38	5.85	0.00
30.00	7.38	5.85	0.00
35.00	7.38	5.85	0.00
40.00	7.38	5.85	0.00
45.00	7.38	5.85	0.00
50.00	7.38	5.85	0.00
55.00	7.38	5.85	0.00
60.00	7.38	5.85	0.00
65.00	7.38	5.85	0.00
70.00	7.38	5.85	0.00
75.00	7.38	5.85	0.00
80.00	7.38	5.85	0.00
85.00	7.38	5.85	0.00
90.00	7.38	5.85	0.00
95.00	7.38	5.85	0.00
100.00	7.38	5.85	0.00
105.00	7.38	5.85	0.00
110.00	7.38	5.85	0.00
115.00	7.38	5.85	0.00
120.00	7.38	5.85	0.00
125.00	7.38	5.85	0.00
130.00	7.38	5.85	0.00
135.00	7.38	5.85	0.00
140.00	7.38	5.85	0.00
145.00	7.38	5.85	0.00
150.00	7.38	5.85	0.00
155.00	7.38	5.85	0.00
160.00	7.38	5.85	0.00
165.00	7.38	5.85	0.00
170.00	7.38	5.85	0.00
175.00	7.38	5.85	0.00
180.00	7.38	5.85	0.00
185.00	7.38	5.85	0.00
190.00	7.38	5.85	0.00
195.00	7.38	5.85	0.00
200.00	7.38	5.85	0.00
205.00	7.38	5.85	0.00
210.00	7.38	5.85	0.00
215.00	7.38	5.85	0.00
220.00	7.38	5.85	0.00
225.00	7.38	5.85	0.00
230.00	7.38	5.85	0.00
235.00	7.38	5.85	0.00
240.00	7.38	5.85	0.00

Summary for Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE

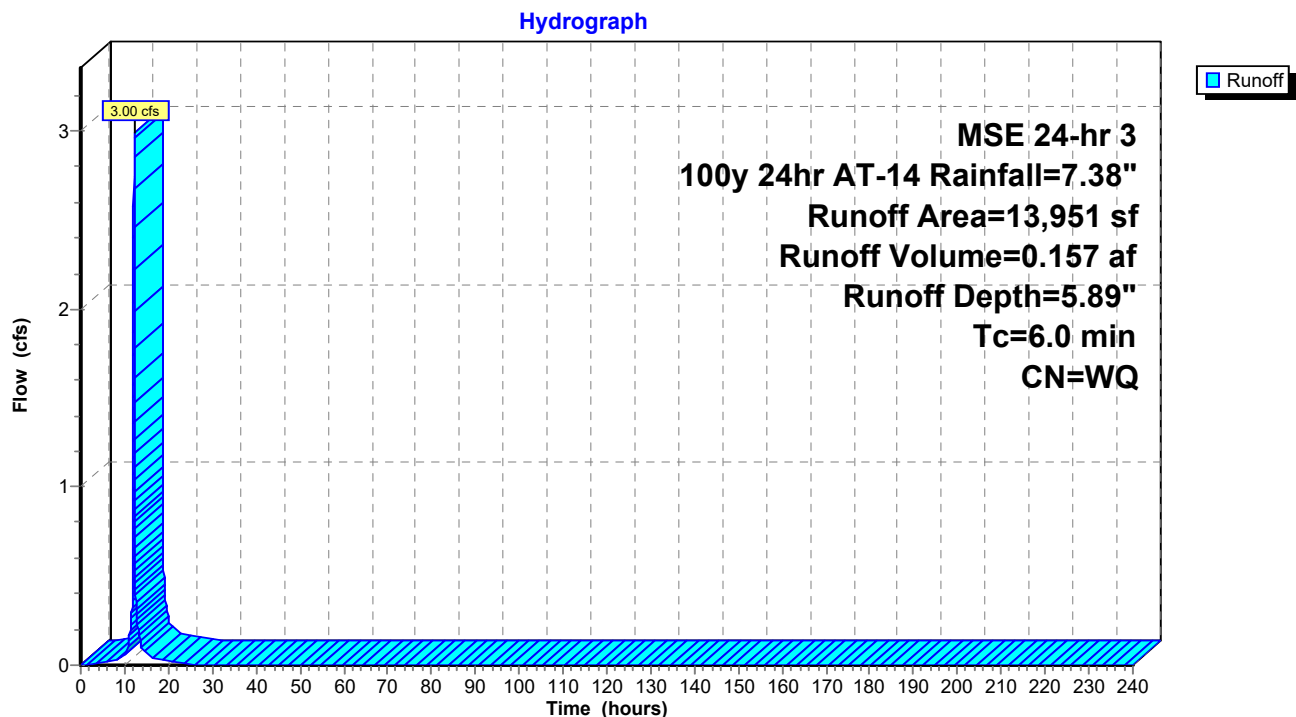
Runoff = 3.00 cfs @ 12.13 hrs, Volume= 0.157 af, Depth= 5.89"
 Routed to Pond 1P : 1P - DETENTION BASIN

Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 MSE 24-hr 3 100y 24hr AT-14 Rainfall=7.38"

Area (sf)	CN	Description
9,743	98	Paved parking, HSG B
4,208	61	>75% Grass cover, Good, HSG B
13,951		Weighted Average
4,208		30.16% Pervious Area
9,743		69.84% Impervious Area

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

Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE



Hydrograph for Subcatchment PR1B: PR1B - DRAINS TO DETENTION BASIN THEN SOUTH TO 50TH AVE

Time (hours)	Precip. (inches)	Excess (inches)	Runoff (cfs)
0.00	0.00	0.00	0.00
5.00	0.28	0.00	0.02
10.00	1.01	0.23	0.06
15.00	6.62	5.11	0.07
20.00	7.19	5.66	0.02
25.00	7.38	5.85	0.00
30.00	7.38	5.85	0.00
35.00	7.38	5.85	0.00
40.00	7.38	5.85	0.00
45.00	7.38	5.85	0.00
50.00	7.38	5.85	0.00
55.00	7.38	5.85	0.00
60.00	7.38	5.85	0.00
65.00	7.38	5.85	0.00
70.00	7.38	5.85	0.00
75.00	7.38	5.85	0.00
80.00	7.38	5.85	0.00
85.00	7.38	5.85	0.00
90.00	7.38	5.85	0.00
95.00	7.38	5.85	0.00
100.00	7.38	5.85	0.00
105.00	7.38	5.85	0.00
110.00	7.38	5.85	0.00
115.00	7.38	5.85	0.00
120.00	7.38	5.85	0.00
125.00	7.38	5.85	0.00
130.00	7.38	5.85	0.00
135.00	7.38	5.85	0.00
140.00	7.38	5.85	0.00
145.00	7.38	5.85	0.00
150.00	7.38	5.85	0.00
155.00	7.38	5.85	0.00
160.00	7.38	5.85	0.00
165.00	7.38	5.85	0.00
170.00	7.38	5.85	0.00
175.00	7.38	5.85	0.00
180.00	7.38	5.85	0.00
185.00	7.38	5.85	0.00
190.00	7.38	5.85	0.00
195.00	7.38	5.85	0.00
200.00	7.38	5.85	0.00
205.00	7.38	5.85	0.00
210.00	7.38	5.85	0.00
215.00	7.38	5.85	0.00
220.00	7.38	5.85	0.00
225.00	7.38	5.85	0.00
230.00	7.38	5.85	0.00
235.00	7.38	5.85	0.00
240.00	7.38	5.85	0.00

Summary for Pond 1P: 1P - DETENTION BASIN

Inflow Area = 0.320 ac, 69.84% Impervious, Inflow Depth = 5.89" for 100y 24hr AT-14 event
 Inflow = 3.00 cfs @ 12.13 hrs, Volume= 0.157 af
 Outflow = 1.47 cfs @ 12.22 hrs, Volume= 0.157 af, Atten= 51%, Lag= 5.4 min
 Primary = 1.47 cfs @ 12.22 hrs, Volume= 0.157 af

Routing by Stor-Ind method, Time Span= 0.00-240.00 hrs, dt= 0.01 hrs
 Peak Elev= 930.77' @ 12.22 hrs Surf.Area= 1,795 sf Storage= 1,201 cf

Plug-Flow detention time= 12.9 min calculated for 0.157 af (100% of inflow)
 Center-of-Mass det. time= 12.9 min (765.3 - 752.3)

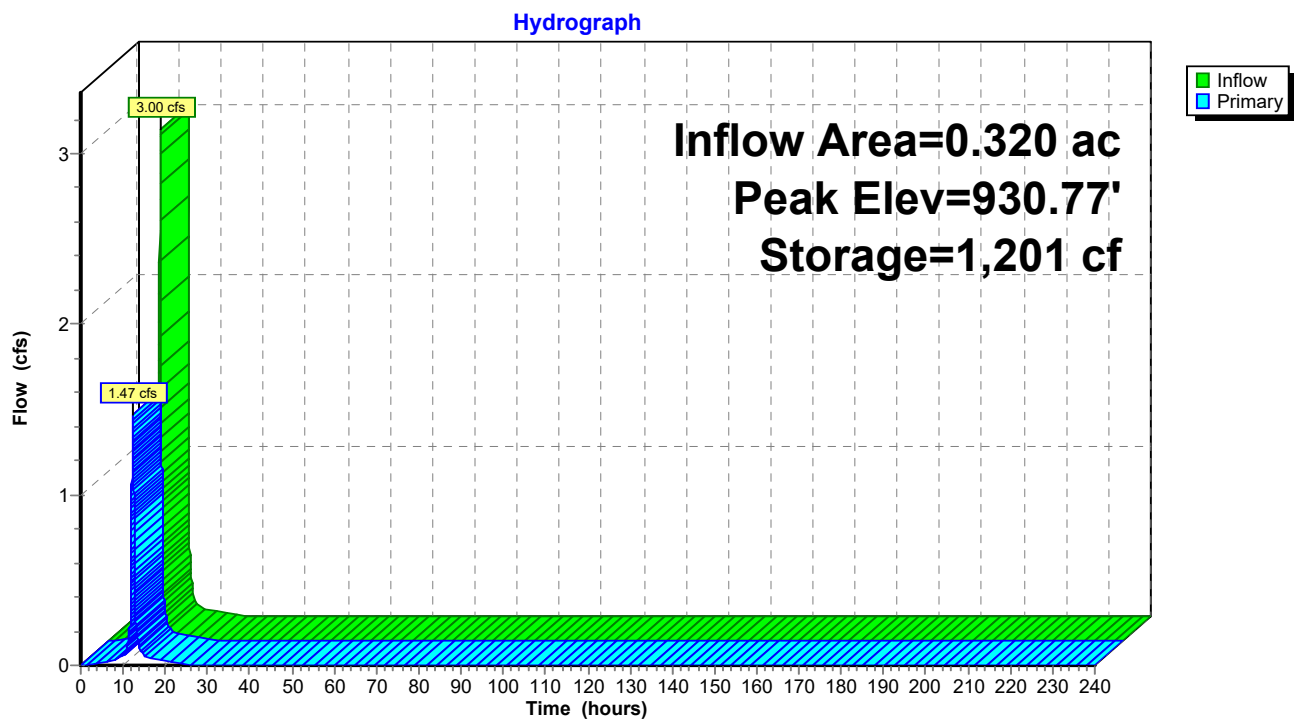
Volume	Invert	Avail.Storage	Storage Description
#1	930.00'	3,950 cf	Custom Stage Data (Prismatic) Listed below (Recalc)

Elevation (feet)	Surf.Area (sq-ft)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)
930.00	1,347	0	0
930.50	1,634	745	745
931.00	1,937	893	1,638
931.50	2,323	1,065	2,703
932.00	2,665	1,247	3,950

Device	Routing	Invert	Outlet Devices
#1	Primary	930.00'	8.0" Horiz. Orifice/Grate C= 0.600 Limited to weir flow at low heads

Primary OutFlow Max=1.47 cfs @ 12.22 hrs HW=930.77' (Free Discharge)
 ↑ **1=Orifice/Grate** (Orifice Controls 1.47 cfs @ 4.21 fps)

Pond 1P: 1P - DETENTION BASIN



Hydrograph for Pond 1P: 1P - DETENTION BASIN

Time (hours)	Inflow (cfs)	Storage (cubic-feet)	Elevation (feet)	Primary (cfs)
0.00	0.00	0	930.00	0.00
5.00	0.02	20	930.01	0.01
10.00	0.06	55	930.04	0.06
15.00	0.07	65	930.05	0.07
20.00	0.02	31	930.02	0.02
25.00	0.00	1	930.00	0.00
30.00	0.00	0	930.00	0.00
35.00	0.00	0	930.00	0.00
40.00	0.00	0	930.00	0.00
45.00	0.00	0	930.00	0.00
50.00	0.00	0	930.00	0.00
55.00	0.00	0	930.00	0.00
60.00	0.00	0	930.00	0.00
65.00	0.00	0	930.00	0.00
70.00	0.00	0	930.00	0.00
75.00	0.00	0	930.00	0.00
80.00	0.00	0	930.00	0.00
85.00	0.00	0	930.00	0.00
90.00	0.00	0	930.00	0.00
95.00	0.00	0	930.00	0.00
100.00	0.00	0	930.00	0.00
105.00	0.00	0	930.00	0.00
110.00	0.00	0	930.00	0.00
115.00	0.00	0	930.00	0.00
120.00	0.00	0	930.00	0.00
125.00	0.00	0	930.00	0.00
130.00	0.00	0	930.00	0.00
135.00	0.00	0	930.00	0.00
140.00	0.00	0	930.00	0.00
145.00	0.00	0	930.00	0.00
150.00	0.00	0	930.00	0.00
155.00	0.00	0	930.00	0.00
160.00	0.00	0	930.00	0.00
165.00	0.00	0	930.00	0.00
170.00	0.00	0	930.00	0.00
175.00	0.00	0	930.00	0.00
180.00	0.00	0	930.00	0.00
185.00	0.00	0	930.00	0.00
190.00	0.00	0	930.00	0.00
195.00	0.00	0	930.00	0.00
200.00	0.00	0	930.00	0.00
205.00	0.00	0	930.00	0.00
210.00	0.00	0	930.00	0.00
215.00	0.00	0	930.00	0.00
220.00	0.00	0	930.00	0.00
225.00	0.00	0	930.00	0.00
230.00	0.00	0	930.00	0.00
235.00	0.00	0	930.00	0.00
240.00	0.00	0	930.00	0.00

Stage-Area-Storage for Pond 1P: 1P - DETENTION BASIN

Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)	Elevation (feet)	Surface (sq-ft)	Storage (cubic-feet)
930.00	1,347	0	931.04	1,968	1,716
930.02	1,358	27	931.06	1,983	1,756
930.04	1,370	54	931.08	1,999	1,795
930.06	1,381	82	931.10	2,014	1,836
930.08	1,393	110	931.12	2,030	1,876
930.10	1,404	138	931.14	2,045	1,917
930.12	1,416	166	931.16	2,061	1,958
930.14	1,427	194	931.18	2,076	1,999
930.16	1,439	223	931.20	2,091	2,041
930.18	1,450	252	931.22	2,107	2,083
930.20	1,462	281	931.24	2,122	2,125
930.22	1,473	310	931.26	2,138	2,168
930.24	1,485	340	931.28	2,153	2,211
930.26	1,496	370	931.30	2,169	2,254
930.28	1,508	400	931.32	2,184	2,297
930.30	1,519	430	931.34	2,199	2,341
930.32	1,531	460	931.36	2,215	2,385
930.34	1,542	491	931.38	2,230	2,430
930.36	1,554	522	931.40	2,246	2,475
930.38	1,565	553	931.42	2,261	2,520
930.40	1,577	585	931.44	2,277	2,565
930.42	1,588	616	931.46	2,292	2,611
930.44	1,600	648	931.48	2,308	2,657
930.46	1,611	680	931.50	2,323	2,703
930.48	1,623	713	931.52	2,337	2,750
930.50	1,634	745	931.54	2,350	2,796
930.52	1,646	778	931.56	2,364	2,844
930.54	1,658	811	931.58	2,378	2,891
930.56	1,670	844	931.60	2,391	2,939
930.58	1,682	878	931.62	2,405	2,987
930.60	1,695	912	931.64	2,419	3,035
930.62	1,707	946	931.66	2,432	3,083
930.64	1,719	980	931.68	2,446	3,132
930.66	1,731	1,014	931.70	2,460	3,181
930.68	1,743	1,049	931.72	2,473	3,231
930.70	1,755	1,084	931.74	2,487	3,280
930.72	1,767	1,119	931.76	2,501	3,330
930.74	1,779	1,155	931.78	2,515	3,380
930.76	1,792	1,191	931.80	2,528	3,431
930.78	1,804	1,227	931.82	2,542	3,481
930.80	1,816	1,263	931.84	2,556	3,532
930.82	1,828	1,299	931.86	2,569	3,584
930.84	1,840	1,336	931.88	2,583	3,635
930.86	1,852	1,373	931.90	2,597	3,687
930.88	1,864	1,410	931.92	2,610	3,739
930.90	1,876	1,447	931.94	2,624	3,791
930.92	1,889	1,485	931.96	2,638	3,844
930.94	1,901	1,523	931.98	2,651	3,897
930.96	1,913	1,561	932.00	2,665	3,950
930.98	1,925	1,599			
931.00	1,937	1,638			
931.02	1,952	1,677			