



REI

**CIVIL & ENVIRONMENTAL
ENGINEERING, SURVEYING**

Stormwater Management Plan

**Kwik Trip Store #1283
State Highway 83 & West Capitol Drive
Village of Hartland
Waukesha County, WI**

REI# 10827



**COMPREHENSIVE
SERVICES WITH
PRACTICAL
SOLUTIONS**



Stormwater Management Plan For:

**Kwik Trip Store #1283
State Highway 83 & West Capitol Drive
Village of Hartland
Waukesha County, WI**

REI# 10827

**Prepared For:
Kwik Trip, Inc.
1626 Oak Street
La Crosse, WI 54602**

8/18/2023

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Executive Summary

The proposed project consists of constructing a new Kwik Trip convenience store with car wash, vehicle fueling, parking and driving surfaces, and miscellaneous other amenities. The development will occur on a 5.38-acre property located at the southwest quadrant of State Highway 83 and West Capitol Drive within the Village of Hartland, Waukesha County. Land disturbance associated with the project is estimated at 4.7 acres. The project site is a new development and is subject to the post-construction stormwater requirements for a new development site found within NR 151.121 - NR 151.126. The development will also require compliance defined within the *Village of Hartland Stormwater Ordinance*¹.

The area of land disturbance within the property limits was used in analyzing the site for post-construction land disturbance. Stormwater Management requirements will be achieved utilizing overland flow coupled with a storm sewer conveyance system that routes stormwater runoff to a wet detention pond. The stormwater management facilities treat and detain the stormwater runoff prior to discharging it into the municipal storm sewer system. Due to steeper grades of the existing fill site, the backslope of the proposed wet detention pond is designed with a more gradual grade leading to larger area of undetained greenspace. This will lead to a small exceedance of peak flow during the post-development 10-year storm event when compared to the 2-year storm event of the pre-development condition. The exceedance is minimal and within the nearest cubic foot per second (cfs). Furthermore, having a gentler slope on the backslope of the pond would create a safer situation. For these sited reasons, REI's professional opinion is that the site meets the Village's peak flow requirements to the maximum extent practical.

Additional detail relative to the stormwater management system design can be found within the report, appendices, stormwater figures, and plan set.

1.0 Introduction and Overview of the Proposed Project

Project Owner: Kwik Trip, Inc.

Project Location: Southeast quadrant of State Highway 83 and West Capitol Drive

Location: Northwest 1/4, Section 3, T7N, R18E

Project City: Village of Hartland

Project County/State: Waukesha County, WI

Property Area: 5.38 Acres

Area of Land Disturbance: 4.68 Acres

Existing Site Description: The existing site is a historic fill property with the raised portion gently sloping in all directions. The site then slopes steeply in all directions from the raised portion back to adjacent public streets. Current cover vegetation consists of grassland with scattered trees.

Proposed Development: The proposed project involves lowering the existing filled site about 15 to 20 feet on average to accommodate constructing a new Kwik Trip convenience store with car wash, vehicle fueling, parking and driving surfaces, and miscellaneous other amenities. Runoff of the majority of the proposed development will be conveyed to a wet detention pond, which will provide stormwater management for the site.

WDNR Compliance: Wisconsin Administrative Code ch. NR 151 and NR 216

Development Classification: New Development

Classification: (Refer to Appendix 1 for NR 151 post-construction performance standards)

Local Compliance: Village of Hartland

Anticipated Construction Start Date:

April 24, 2024

2.0 Site Soils Evaluation

Additional data regarding the site soils can be found in **Appendix 2** of this report.

Table 1A
Soils Summary per the Web Soil Survey²

Soil Type	USGS Classification	Infiltration Rate (in/hr)	Hydro Group	Water Table	Bedrock Depth
GP	Gravel Pit	-	-	-	-

note: Hydrologic Soil Group (HSG) B was used in the stormwater analysis

Table 1B
Soils Summary per Onsite Exploration

Boring/Test Pit #	Stormwater Facility	Stormwater Facility Bottom Elv	Infiltration Rate (in/hr)	Water Table Elv	Bedrock Elv
7, 8	Wet Detention Pond	958.00	-	-	-

note: infiltration rate is based off of the limiting soil layer

3.0 Water Quality

Calculation Reference: Appendix 3
Figure Reference: STM-1

Software: WinSLAMM Version 10.5.0
Rainfall: Milwaukee, 1969 (March 28 - December 6)

Table 2
Water Quality Device Summary

Water Quality Device	Permanent Pool Area (sf)	Storage Depth (in)	Control Structure
Wet Detention Pond	6,604	72	Manhole with weir plate having a primary 2"-dia. orifice and a secondary 6"-dia. orifice

Table 3A
Total Suspended Solids (TSS) Removal Summary

Development Type	Required (% of No Control)	TSS Generated (lbs)	TSS Leaving Site (lbs)	% TSS Removed
New Development	80	1,624	257.1	84.17%

Total Phosphorous (TP) Removal Summary

Development Type	Required (% of No Control)	TP Generated (lbs)	TP Leaving Site (lbs)	% TP Removed
New Development	30	5.138	1.816	64.66%

4.0 Peak Flow Reduction

Pre-development Runoff Calculation Reference: Appendix 4

Pre-development Runoff Figure Reference: STM-2

Post-development Runoff Calculation Reference: Appendix 5

Post-development Runoff Figure Reference: STM-3

Software: HydroCAD Version 10.20-3c

Rainfall: NRCS Rainfall Distributions and 24-hour Duration Rainfall Depths for each Wisconsin

Reference: County³

Rainfall Distribution: MSE 3

State Stormwater Requirements (WDNR) Developed condition shall not exceed the Pre-Developed condition for the 1-yr and 2-yr rainfall events and pass the 100-yr safely

Local Stormwater Requirements (Village of Hartland) For new development, the post-developed peak runoff rates of the 10-year, 24 hour storm event must be maintained or reduced to the pre-developed rates for the 2-year 24 hour storm event and the post-developed peak runoff rates of the 100-year, 24 hour storm event must be maintained or reduced to the pre-developed rates for the 10-year, 24 hour storm event. Safe overland conveyance must be provided for all storm events up to the 100-year design storm.

Stormwater Device Summary: Refer to Table 2

**Table 4
Peak Flow Summary**

Development Condition	1-yr Storm Peak Flow	2-yr Storm Peak Flow	10-yr Storm Peak Flow	100-yr Storm Peak Flow
Pre-Development	0.41	0.84	3.65	12.67
Post-Development	0.39	0.54	1.31	3.59

note: peak flow units are in cfs

Table 5 summarizes the results of the maximum water surface elevation in each pond. Infiltration rates for each device (if applicable) were ignored for this analysis

Calculation Reference: Appendix 5

Figure Reference: STM-3

**Table 5
100-year Peak Water Elevation**

Stormwater Device	100-Year Peak Elevation	Top of Pond Elevation	Overflow Elevation
Wet Detention Pond	967.92	969.00	968.00

5.0 Infiltration Performance

Since the project site will be used for fueling and vehicle maintenance, it qualifies for the infiltration exemption as found within NR 151.124 (3) (a) 3. The *Village of Hartland Stormwater Ordinance*¹ also includes a similar infiltration exemption for fueling and vehicle maintenance.

6.0 Protective Area Setbacks

There are no natural features located near the proposed project improvements that require special consideration for this project.

7.0 Erosion Control Plan

An erosion control plan, and associated details, were developed for the proposed construction and are included within the construction plan set. The site contractor will be responsible for implementing and maintaining the erosion control measures throughout construction until they may be removed following site stabilization.

Plan Sheet Sheets SWP1-SWP4
Reference:

A Soil Loss & Sediment Discharge Calculation Tool (USLE) and accompanying Figure were completed to assure WDNR erosion control compliance and is included within **Appendix 6**.

8.0 Long Term Maintenance

Inspection and routine maintenance of the proposed structural and non-structural stormwater best-management practices will be required to ensure they continue to function following completion of the construction project. A maintenance schedule has been prepared and is included within **Appendix 7**. It will be the landowner's responsibility to document the inspections and ensure any followup action is completed in a timely manner.

9.0 References

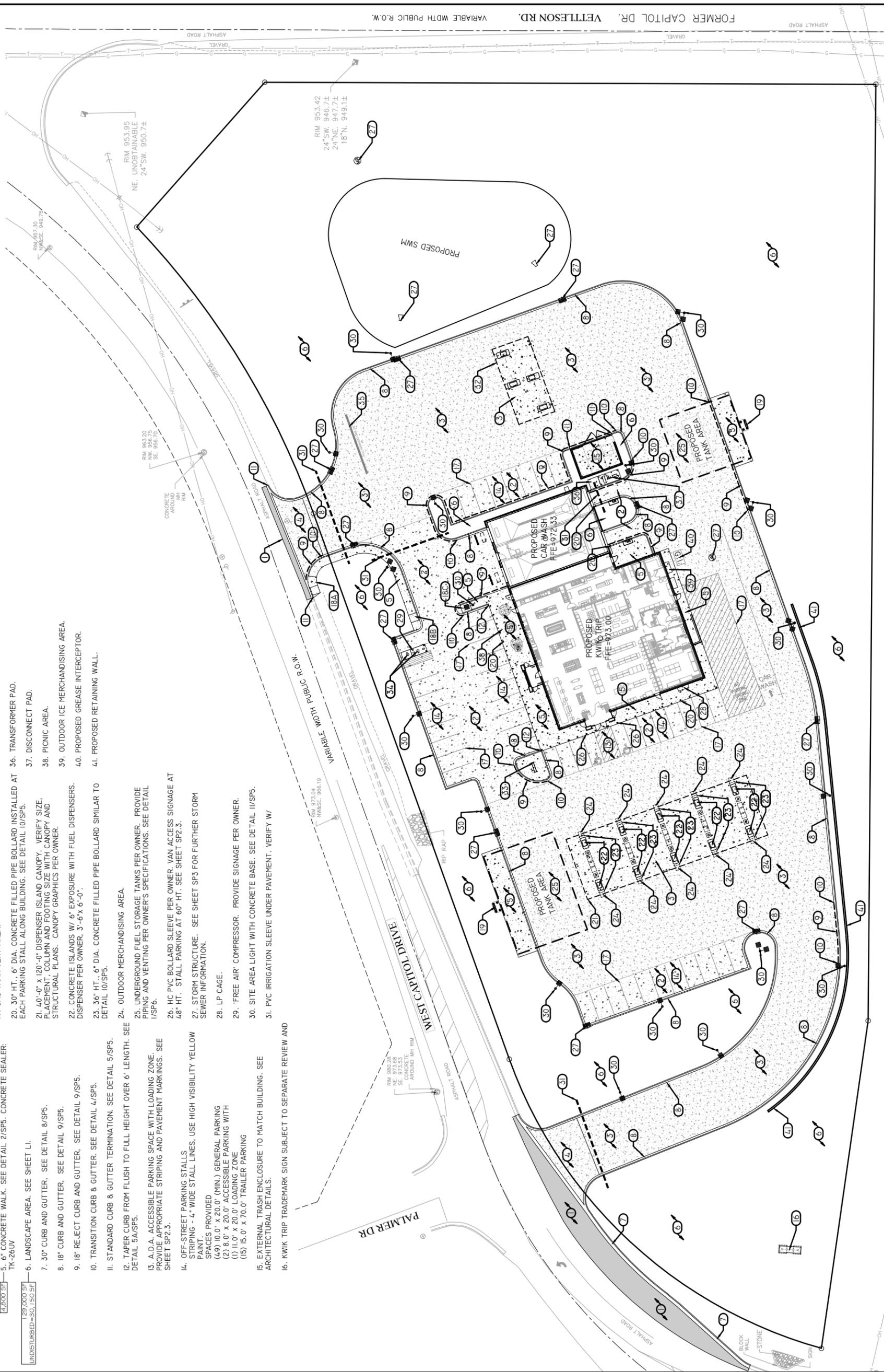
- 1) Village of Hartland Stormwater Ordinance. Village of Hartland Ordinance No. 844-17. An Ordinance to Amend Chapter 76 of the Village of Hartland Municipal Code Pertaining to Stormwater Management. October 9, 2017.
- 2) Web Soil Survey of Waukesha County, Wisconsin. United States Department of Agriculture. Soil Conservation Service. <http://websoilsurvey.nrcs.usda.gov/app/WebSoilSurvey.aspx>.
- 3) NRCS Rainfall Distributions and 24-hour Duration Rainfall Depths for each Wisconsin County. National Engineering Handbook (NEH) Part 650. Chapter 2. Appendix 1. United States Department of Agriculture.

KEYED NOTES

- 2. 2000 SF - ASPHALT PAVEMENT. SEE DETAIL 1/SP5.
- 2. 6" DEPTH (MIN.) CONCRETE SLAB-ON-GRADE WITH #3 REBAR, 3' O.C. CONCRETE SEALER: TK-26UV. SEE DETAIL 6/SP5.
- 3. 8" DEPTH (MIN.) CONCRETE SLAB-ON-GRADE WITH #4 REBAR, 4' O.C. CONCRETE SEALER: TK-26UV. SEE DETAIL 6/SP5.
- 4. 8" DEPTH CONCRETE APPROACH SIMILAR TO DETAIL 7/SP5.
- 5. 6" CONCRETE WALK. SEE DETAIL 2/SP5. CONCRETE SEALER: TK-26UV
- 6. LANDSCAPE AREA. SEE SHEET L1.
- 7. 30" CURB AND GUTTER. SEE DETAIL 8/SP5.
- 8. 18" CURB AND GUTTER. SEE DETAIL 9/SP5.
- 9. 18" REJECT CURB AND GUTTER. SEE DETAIL 9/SP5.
- 10. TRANSITION CURB & GUTTER. SEE DETAIL 4/SP5.
- 11. STANDARD CURB & GUTTER TERMINATION. SEE DETAIL 5/SP5.
- 12. TAPER CURB FROM FLUSH TO FULL HEIGHT OVER 6' LENGTH. SEE DETAIL 5A/SP5.
- 13. A.D.A. ACCESSIBLE PARKING SPACE WITH LOADING ZONE. PROVIDE APPROPRIATE STRIPING AND PAVEMENT MARKINGS. SEE SHEET SP2.3.
- 14. OFF-STREET PARKING STALLS SPACES PROVIDED (49) 10.0' x 20.0' (MIN.) GENERAL PARKING (2) 8.0' x 20.0' ACCESSIBLE PARKING WITH (1) 11.0' x 20.0' LOADING ZONE (15) 15.0' x 70.0' TRAILER PARKING
- 15. EXTERNAL TRASH ENCLOSURE TO MATCH BUILDING. SEE ARCHITECTURAL DETAILS.
- 16. KWIK TRIP TRADEMARK SIGN SUBJECT TO SEPARATE REVIEW AND

- APPROVAL (VERIFY FINAL LOCATION WITH SIGN PERMIT)
- 17. 4" WIDE, HIGH VISIBILITY, PAVEMENT STRIPING, LANE MARKINGS AND TEXT. COLOR: HC MARKINGS- YELLOW, ALL OTHERS- YELLOW.
- 18A. SIDEWALK RAMP (2:1 SLOPE MAX). SEE DETAIL 12/SP5.
- 18B. SIDEWALK RAMP (2:1 SLOPE MAX). SEE DETAIL 13/SP5.
- 18C. SIDEWALK RAMP (2:1 SLOPE MAX). SEE DETAIL 14/SP5.
- 19. GAS TANK VENT AREA.
- 20. 30" HT., 6" DIA. CONCRETE FILLED PIPE BOLLARD INSTALLED AT EACH PARKING STALL ALONG BUILDING. SEE DETAIL 10/SP5.
- 21. 40'-0" x 120'-0" DISPENSER ISLAND, CANOPY. VERIFY SIZE, PLACEMENT, COLUMN AND FOOTING SIZE WITH CANOPY AND STRUCTURAL PLANS. CANOPY GRAPHICS PER OWNER.
- 22. CONCRETE ISLANDS W/ 6" EXPOSURE WITH FUEL DISPENSERS. DISPENSER PER OWNER, 3'-6" x 6'-0".
- 23. 36" HT., 6" DIA. CONCRETE FILLED PIPE BOLLARD SIMILAR TO DETAIL 10/SP5.
- 24. OUTDOOR MERCHANDISING AREA.
- 25. UNDERGROUND FUEL STORAGE TANKS PER OWNER. PROVIDE PIPING AND VENTING PER OWNER'S SPECIFICATIONS. SEE DETAIL 1/SP6.
- 26. HC PVC BOLLARD SLEEVE PER OWNER. VAN ACCESS SIGNAGE AT 4.8' HT. STALL PARKING AT 60" HT. SEE SHEET SP2.3.
- 27. STORM STRUCTURE. SEE SHEET SP3 FOR FURTHER STORM SEWER INFORMATION.
- 28. LP CAGE.
- 29. FREE AIR COMPRESSOR. PROVIDE SIGNAGE PER OWNER.
- 30. SITE AREA LIGHT WITH CONCRETE BASE. SEE DETAIL 11/SP5.
- 31. PVC IRRIGATION SLEEVE UNDER PAVEMENT. VERIFY W/

- IRRIGATION PLAN FOR EXACT SIZE AND LOCATION BEFORE INSTALLATION. SEE DETAIL 3/SP5.
- 32. 24'-0" x 50'-0" DISPENSER ISLAND, CANOPY. VERIFY SIZE, PLACEMENT, COLUMN AND FOOTING SIZE WITH CANOPY AND STRUCTURAL PLANS. CANOPY GRAPHICS PER OWNER.
- 33. BIKE RACK.
- 34. VACUUM. SEE DETAIL 15/SP5.
- 35. 18" EPOXY STOP BAR (YELLOW).
- 36. TRANSFORMER PAD.
- 37. DISCONNECT PAD.
- 38. PICNIC AREA.
- 39. OUTDOOR ICE MERCHANDISING AREA.
- 40. PROPOSED GREASE INTERCEPTOR.
- 41. PROPOSED RETAINING WALL.



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SITE PLAN (KEYNOTES)
 CONVENIENCE STORE #1283
 STH 83 AND W. CAPITOL DRIVE
 HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: NAP
 SCALE: GRAPHIC
 PROJ. NO.: 10827
 DATE: 8/17/23 - REVIEW DOCUMENTS
 SHEET: **SP1.1**

KWIK TRIP STORES
KWIK STAR STORES

NOTE: CONTRACTOR TO OBTAIN RIGHT-OF-WAY EXCAVATION PERMIT PRIOR TO BEGINNING SITE WORK.
CALL DIGGERS HOTLINE @ 1-800-242-8511 AT LEAST 3 WORKING DAYS PRIOR TO EXCAVATING.

CONSTRUCTION NOTE:

COORDINATE WITH OWNER FOR POSSIBLE CONSTRUCTION FENCING AND GATE LOCATIONS AND APPROPRIATE SIGNAGE INSTALLATION.

NOTE:

- REFER TO OTHER PROJECT PLANS AND INFORMATION RELATED TO THIS PROJECT PRIOR TO BEGINNING ANY GRADING WORK.

- PLAN PREPARED FROM ALTA/ACSM LAND TITLE SURVEY BY:
R. A. SMITH, INC.
262.781.1000

- CONTRACTOR SHALL LOCATE ALL UTILITIES WHICH MAY AFFECT THIS WORK AND NOTIFY OWNER OF ANY CONFLICTS.

- CONTRACTOR SHALL VERIFY ALL EXISTING AND PROPOSED ELEVATIONS PRIOR TO START OF CONSTRUCTION. VERIFY CRITICAL ELEVATIONS TO ENSURE CONFORMANCE WITH GRADING PLAN. PARTICULARLY WITH WALK AND/OR PAVEMENTS TO REMAIN. MEET EXISTING GRADES ALONG STREETS, PROPERTY LINES AND DRIVEWAY

ENTRANCES. RESTORE ALL EXISTING PAVEMENTS THAT REMAIN TO THEIR ORIGINAL, IF NOT BETTER CONDITION. NOTIFY OWNER OF ANY CONFLICTS.

- AREAS NOT PAVED AND TO BE LANDSCAPED SHALL RECEIVE MINIMUM OF 4" DEPTH COMPACTED TOPSOIL.

- CONTRACTOR SHALL COORDINATE GRADING AND INSTALLATION OF DRIVES IN R.O.W. WITH APPROPRIATE GOVERNMENT AGENCIES. OBTAIN APPROPRIATE PERMITS FOR GRADING AND DRAINAGE IN ALL R.O.W.

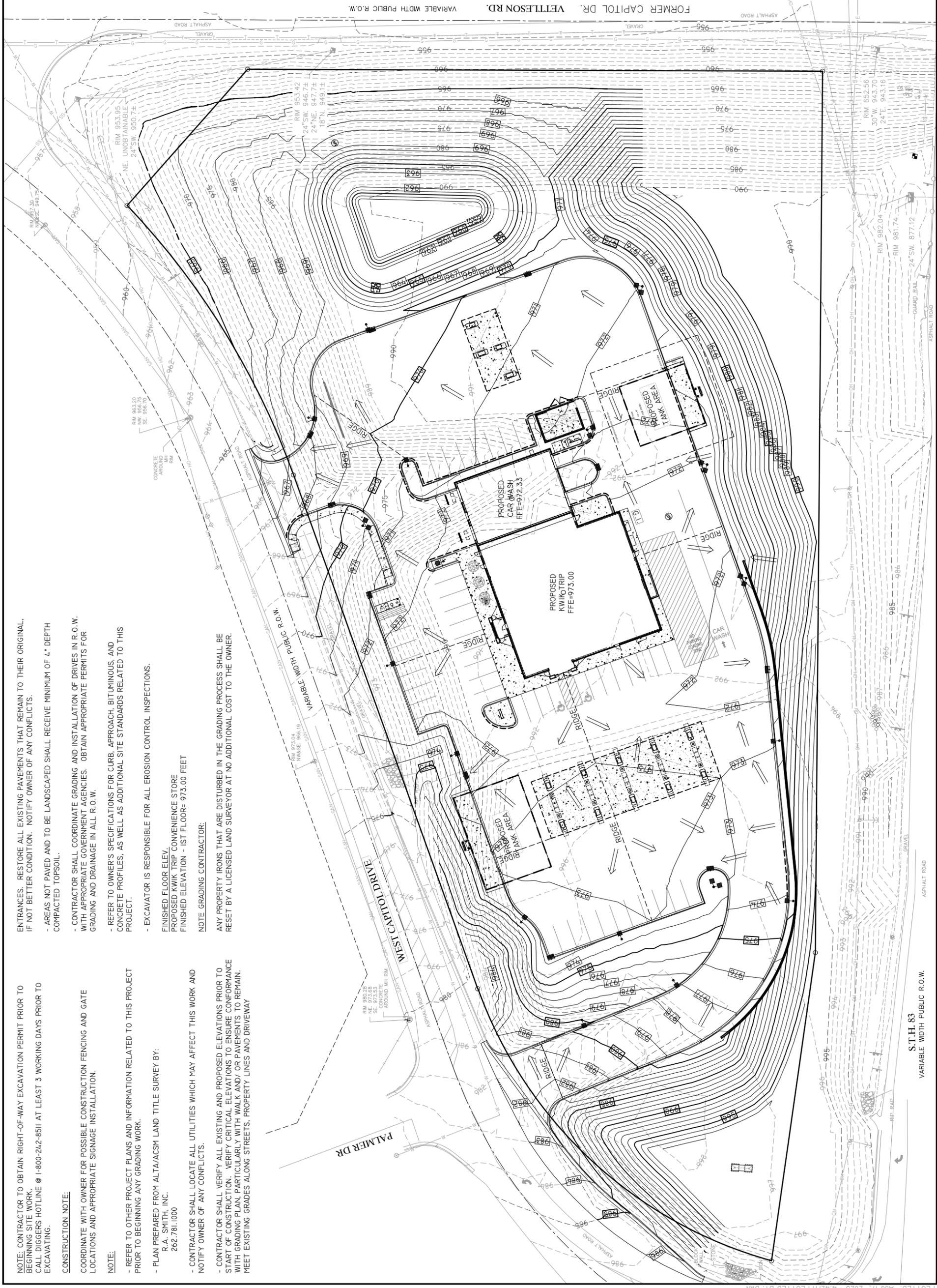
- REFER TO OWNER'S SPECIFICATIONS FOR CURB, APPROACH, BITUMINOUS, AND CONCRETE PROFILES, AS WELL AS ADDITIONAL SITE STANDARDS RELATED TO THIS PROJECT.

- EXCAVATOR IS RESPONSIBLE FOR ALL EROSION CONTROL INSPECTIONS.

FINISHED FLOOR ELEV.
PROPOSED KWIK TRIP CONVENIENCE STORE
FINISHED ELEVATION - 1ST FLOOR= 973.00 FEET

NOTE GRADING CONTRACTOR:

ANY PROPERTY IRONS THAT ARE DISTURBED IN THE GRADING PROCESS SHALL BE RESET BY A LICENSED LAND SURVEYOR AT NO ADDITIONAL COST TO THE OWNER.



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GRADING PLAN
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

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SHEET	SP2

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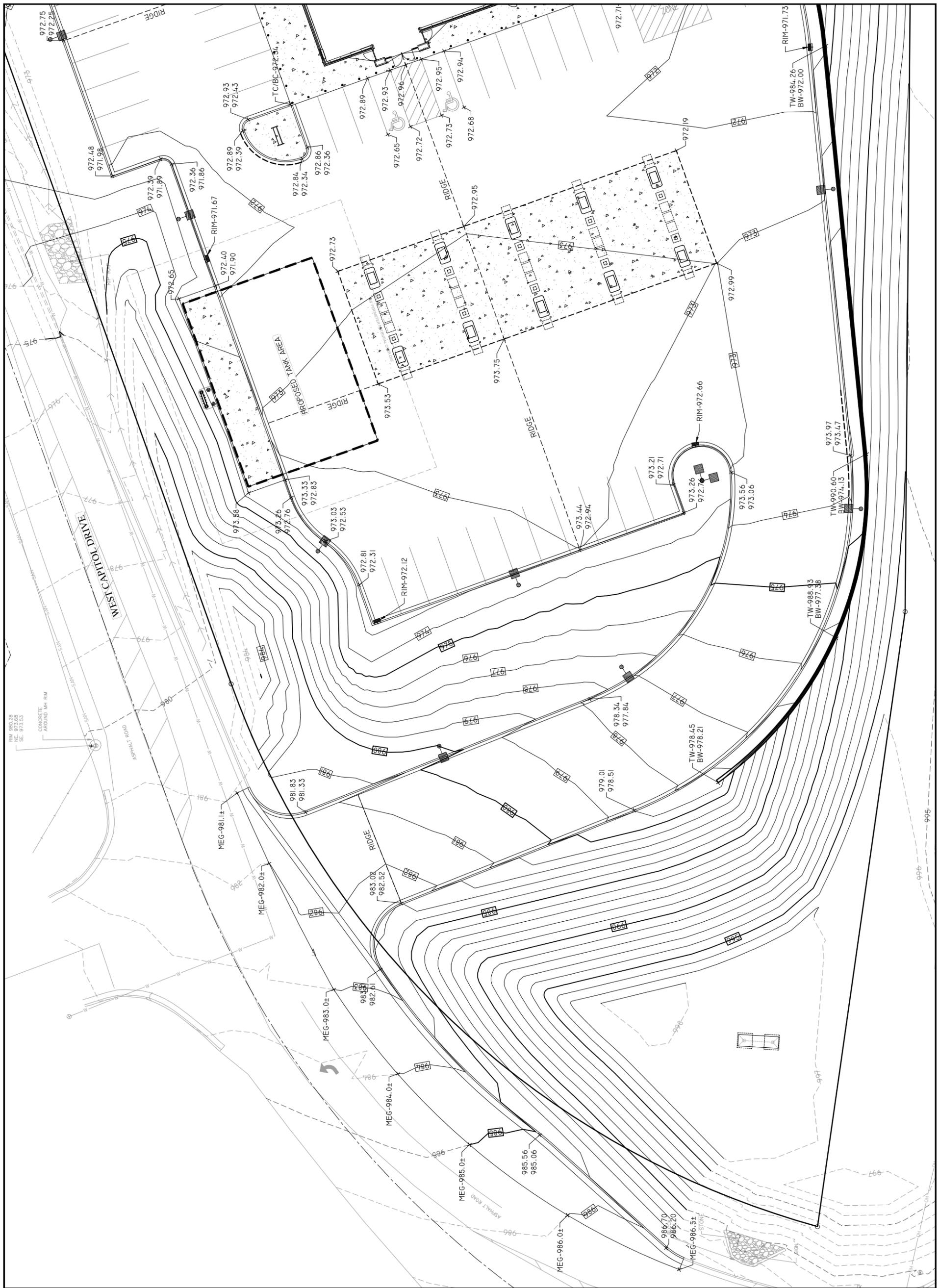
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GRADING PLAN
DETAIL - WEST
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

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SHEET	SP2.1



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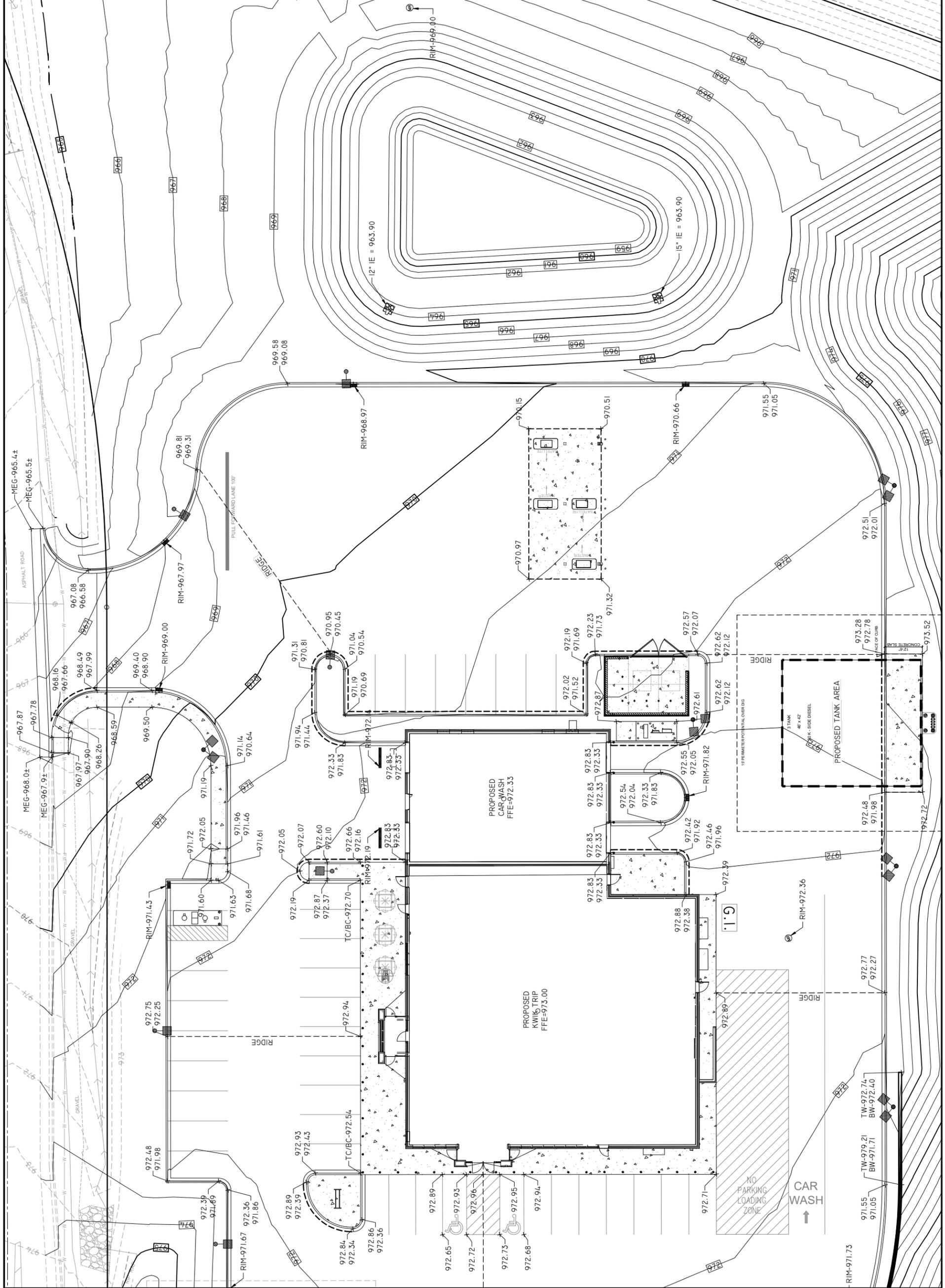
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GRADING PLAN
DETAIL - EAST
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

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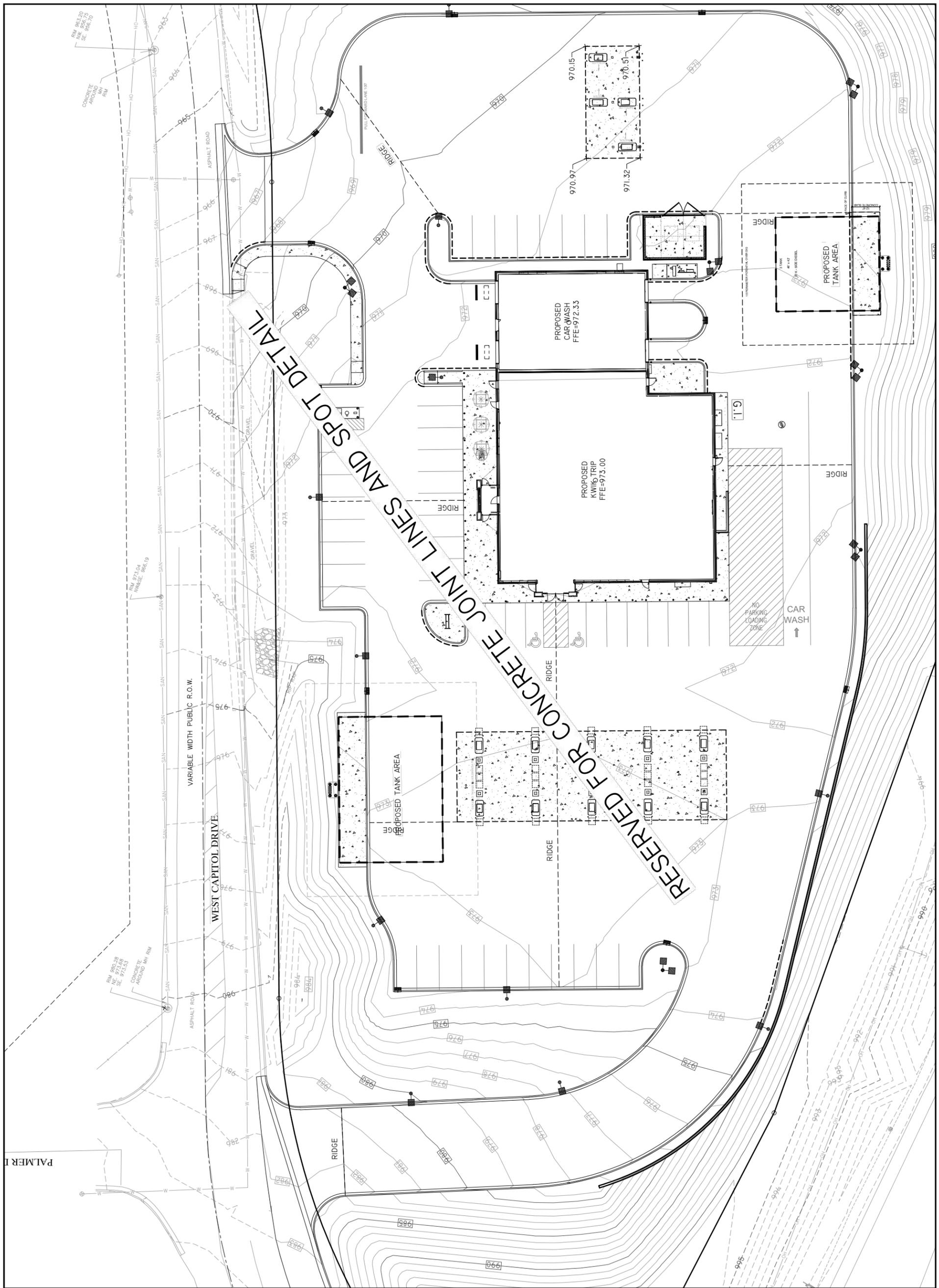
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GRADING PLAN
SPOT DETAIL
 CONVENIENCE STORE #1283
 STH 83 AND W. CAPITOL DRIVE
 HARTLAND, WI

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 SHEET: SP2.2.1



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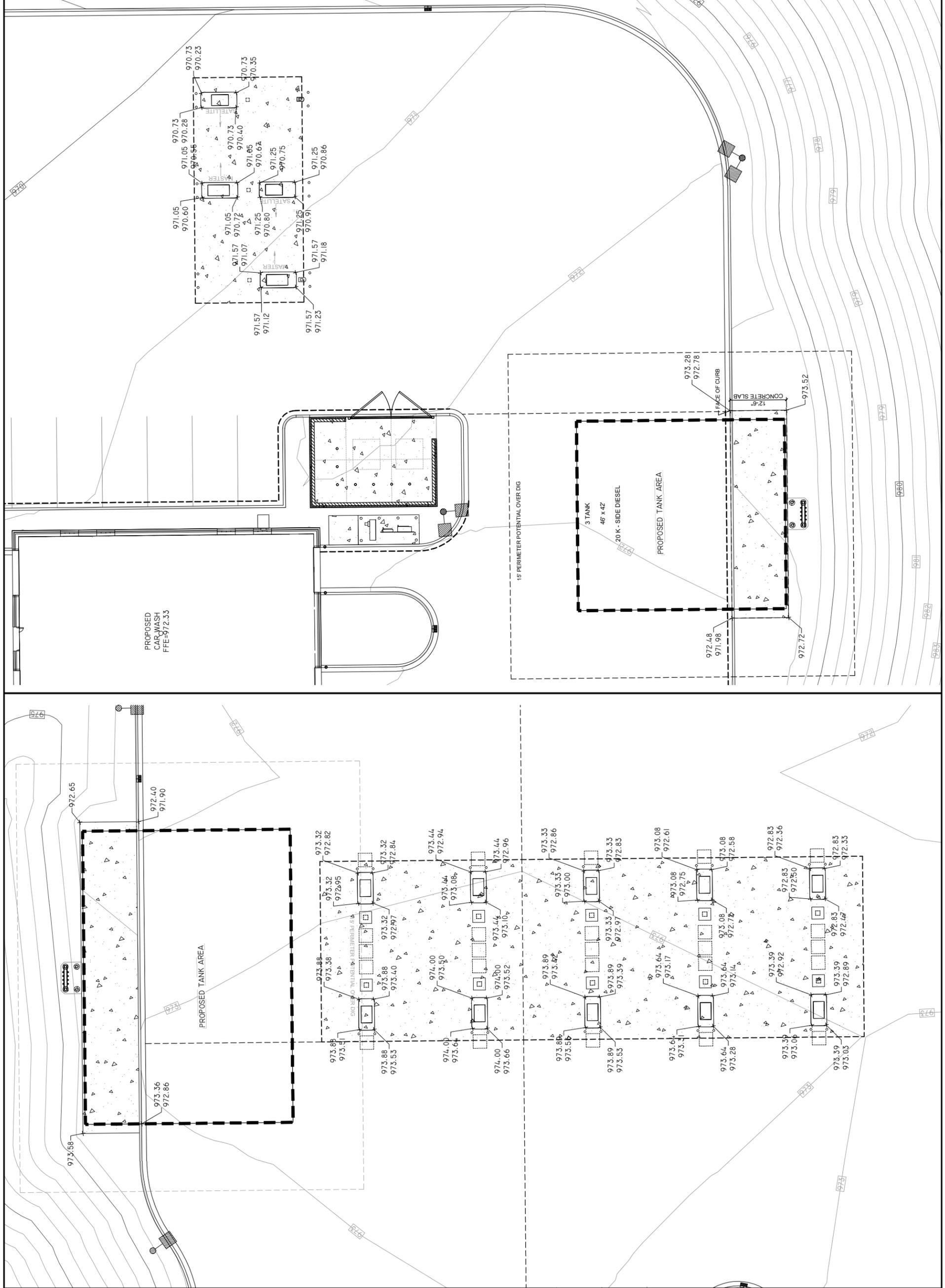
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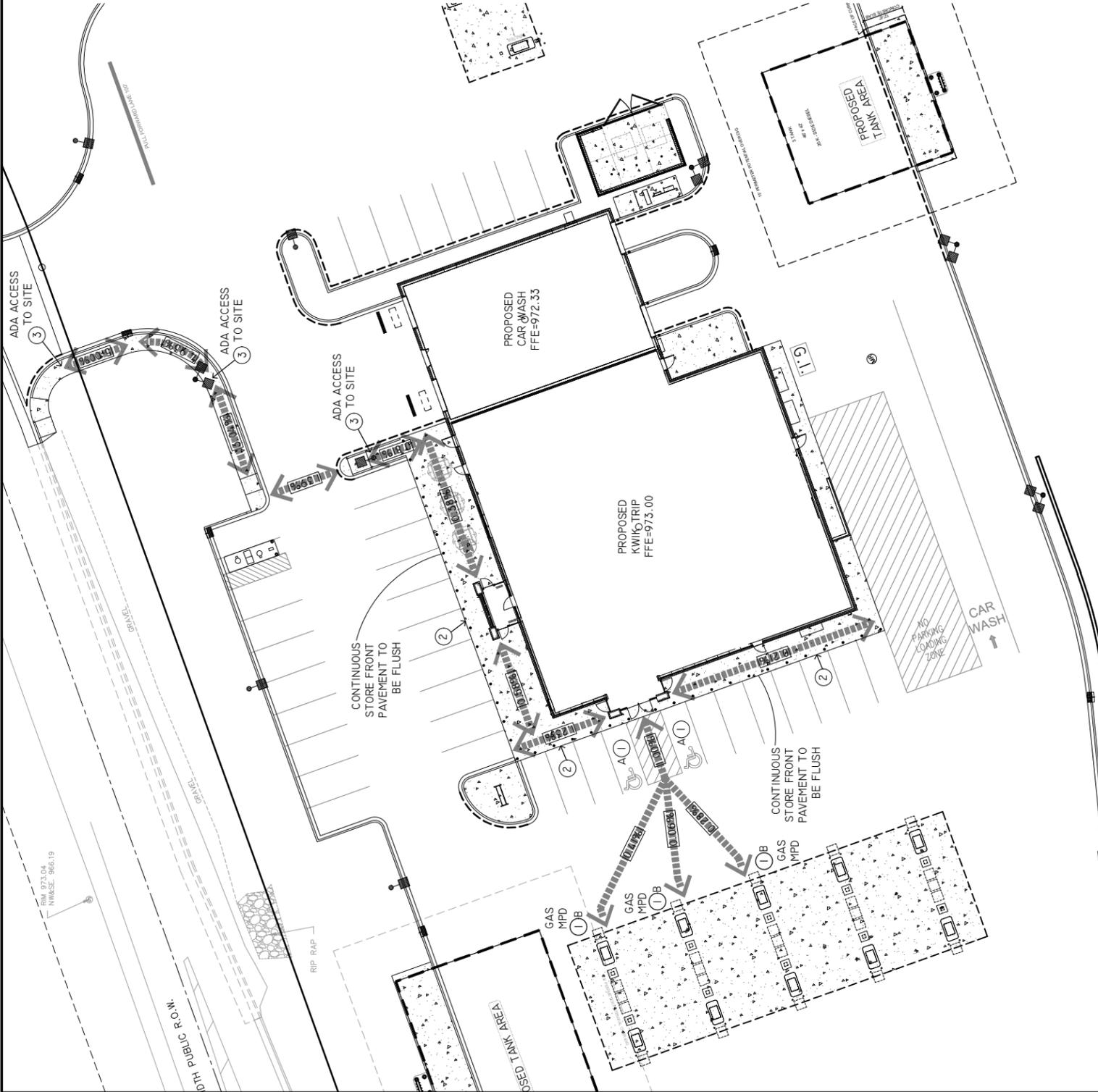


CANOPY AND TANK GRADING DETAILS
CONVENIENCE STORE #1283
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SHEET	SP2.2.2





- PLAN KEYNOTES**
- ACCESSIBLE STALLS
 - A. STRIPING - 4" WIDE STALL LINES, USE HIGH VISIBILITY BLUE PAINT.
 - (2) 8'-0" X 20'-0" ACCESSIBLE PARKING WITH (1) 11'-0" X 20'-0" LOADING ZONE
 - B. ACCESSIBLE FUELING POINT AND DISPENSER AND VALET. VALET AND KEY PAD ON PUMP SHALL CONFORM TO ADA REACH DIMENSIONS AS SHOWN IN DETAIL. SEE NOTES FOR CONVENIENCE STORE ACCESSIBILITY.
 - PAVEMENTS FLUSH FOR ACCESSIBILITY.
 - ACCESSIBLE ROUTE TO STORE.



NOTES FOR CONVENIENCE STORE ACCESSIBILITY AT LEAST 1 MPD (MULTI PRODUCT DISPENSER) COVERING ALL GRADES OF FUEL MUST BE ACCESSIBLE IN A 30'X48" CLEAR LEVEL FLOOR AREA (CLF).

ALL PUMP CONTROLS SHALL BE < 48" (2010 STANDARD). WINDOW WASHER, PAPER TOWEL DISPENSER, LITERATURE, FIRE EXTINGUISHER, EMERGENCY FUEL STOPS, ETC. BE ACCESSIBLE 30"X48" CLF SPACE AND WITHIN A FORWARD OR SIDE APPROACH REACH RANGE.

PROVIDE ISA (INDUSTRY STANDARD ARCHITECTURE) AT EACH ACCESSIBLE FUEL POSITION ON FACE OF PUMP.

PROVIDE ISA AT EACH ACCESSIBLE FUELING POSITION VISIBLE TO APPROACHING VEHICLES.

PROVIDE A SIGN AT EACH ACCESSIBLE FUELING POSITION WITH STORE TELEPHONE NUMBER, ADVISING AVAILABLE FUELING ASSISTANCE.

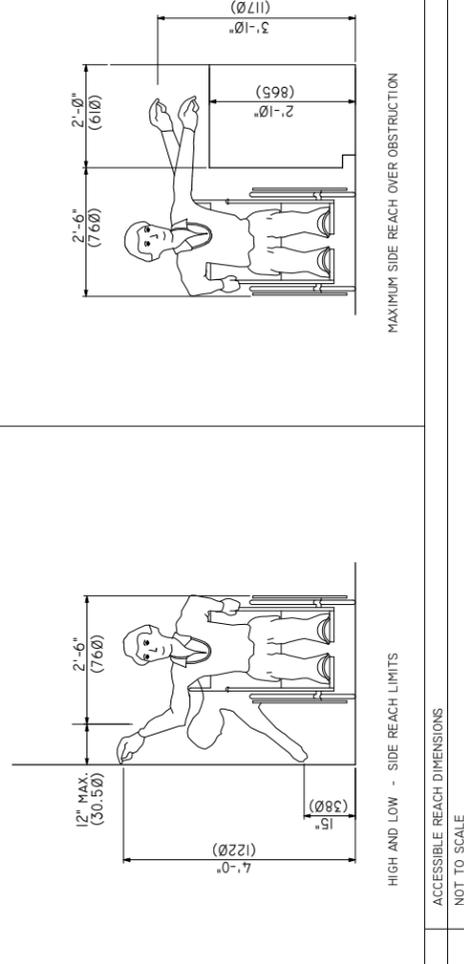
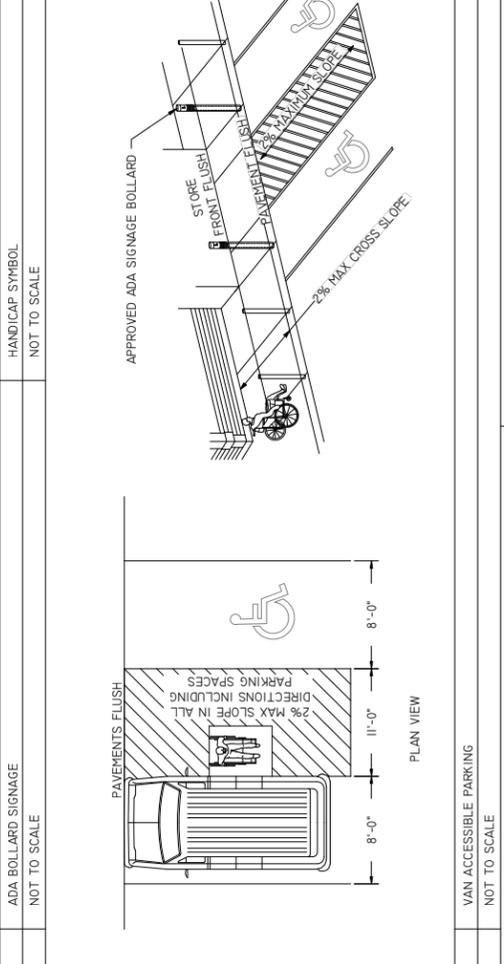
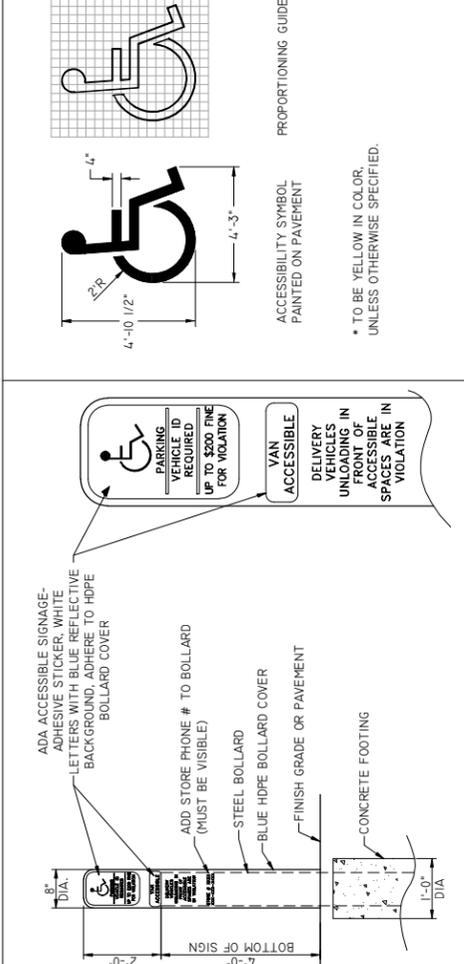
ANY PAY FUNCTION- I.E. AIR/VACUUM ETC. ARE REQUIRED TO HAVE AN ACCESSIBLE ROUTE TO STORE ENTRANCE. CONTROLS SHALL BE ACCESSIBLE 30"X48" CLF SPACE AND WITHIN A FORWARD OR SIDE APPROACH REACH RANGE.

NOTES:

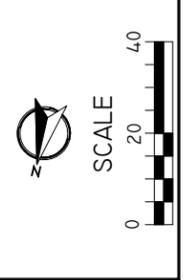
- REFER TO THE DOCUMENT FROM THE DEPARTMENT OF JUSTICE ON "2010 ADA STANDARDS FOR ACCESSIBLE DESIGN". CONTRACTOR SHALL REFERENCE CURRENT A.D.A. GUIDELINES AND LOCAL REGULATIONS FOR SITE ACCESSIBILITY. IN ALL CASES THE MINIMUM REQUIREMENTS SHALL BE PROVIDED ON SITE TO ENSURE COMPLIANCE TO ALL REGULATIONS.
- KWIK TRIP STANDARD ENTRANCE DOOR IS AUTOMATIC SLIDING DOOR SYSTEM DESIGNED TO COMPLY WITH ALL ACCESS CODES AND LAWS. ENTRANCE DOORS FOR ACCESSIBLE ROUTES WILL HAVE A MINIMUM CLEAR OPENING OF 32"
- STORE FRONTS WILL PROVIDE FLUSH PAVEMENTS ALONG INDICATED AND SPACED BETWEEN PARKING SURFACES AND BUILDING WALK PER PLAN.

NO OBJECTS OR DISPLAYS SHOULD PROTRUDE INTO THE MINIMUM CLEAR SPACE OF THE ACCESSIBLE ROUTES TO THE STORE ENTRANCE. THIS WILL INCLUDE SEASONAL DISPLAY VENDING AREAS AS WELL AS OTHER OUTDOOR STORAGE UNITS FOR PROPANE AND ICE, ETC.

- PER A.D.A GUIDELINES- CLEAR WIDTH OF ACCESSIBLE ROUTES SHALL BE 36" AND PERMITTED TO BE REDUCED TO 32" FOR A LENGTH OF 24".
- ACCESS ISLES SERVING WHEEL CHAIR LIFTS OR CHAIR ACCESS FROM VEHICLES ARE REQUIRED TO BE NEARLY LEVEL IN ALL DIRECTIONS TO PROVIDE SAFE TRANSFER OF WHEELCHAIRS TO AND FROM VEHICLES. THE EXCEPTION WOULD BE FOR DRAINAGE. MAXIMUM SLOPE FOR THE ACCESS ISLE IS 1:4.8. NO CURB RAMPS SHALL BE A PART OF THE ACCESS ISLE.
- IDENTIFICATION SIGNS SHALL INCLUDE THE INTERNATIONAL SYMBOL OF ACCESSIBILITY WITH THE DESIGNATION OF 'VAN ACCESSIBLE' IN EVERY 8 ACCESSIBLE SPACES ON SITE.



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ACCESSIBLE PLAN
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: NAP
SCALE: GRAPHIC
PROJ. NO.: 10827
DATE: 8/17/23 - REVIEW DOCUMENTS
SHEET: **SP2.3**

GENERAL:

- COMPLY WITH THE WORK SAFETY PRACTICES SPECIFIED BY THE OCCUPATIONAL SAFETY AND HEALTH ADMINISTRATION (OSHA). COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. OSHA PROHIBITS ENTRY INTO "CONFINED SPACES," SUCH AS MANHOLES AND INLETS (SEE 29 CFR SECTION 1910.166), WITHOUT UNDERTAKING CERTAIN SPECIFIC PRACTICES AND PROCEDURES. CONSTRUCTION SAFETY IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR, WHO IS ALSO SOLELY RESPONSIBLE FOR THE MEANS, METHODS, AND SEQUENCING OF THE CONSTRUCTION OPERATIONS.
- EXISTING BOUNDARY, LOCATION, TOPOGRAPHIC, AND UTILITY INFORMATION SHOWN ON THIS PLAN IS FROM A FIELD SURVEY BY R.A. SMITH, AUGUST 25 2022.
- PERFORM ALL UTILITY WORK IN ACCORDANCE WITH STATE AND CITY REQUIREMENTS.
- CONNECT TO EXISTING SANITARY SEWER MAINS BY CORE DRILLING. CONNECT TO EXISTING STORM SEWER MAINS BY EITHER SAWCUTTING OR CORE DRILLING. USE SAWS OR DRILLS THAT PROVIDE WATER TO THE BLADE. MEET ALL CITY STANDARDS AND SPECIFICATIONS FOR THE CONNECTION. RECONSTRUCT INVERTS AFTER INSTALLATION. USE WATER STOP GASKETS IN ORDER TO PROVIDE WATERTIGHT SEALS WHEN PENETRATING A STRUCTURE WALL WITH A PIPE. TAKE MEASUREMENTS BEFORE BEGINNING CONSTRUCTION TO ENSURE THAT SERVICE CONNECTIONS DO NOT CUT INTO MAINTENANCE ACCESS STRUCTURE JOINTS OR PIPE BARREL JOINTS.
- PERFORM TRENCH EXCAVATIONS FOR ALL UTILITIES IN ACCORDANCE WITH THE REQUIREMENTS OF O.S.H.A. 29 CFR, PART 1926, SUBPART P, "EXCAVATIONS AND TRENCHES;" (WWW.OSHA.GOV)
- COORDINATE BUILDING UTILITY CONNECTION LOCATIONS AT 5 FT. OUT FROM THE PROPOSED BUILDING WITH THE INTERIOR PLUMBING CONTRACTOR PRIOR TO CONSTRUCTION. VERIFY WATER AND SEWER SERVICE LOCATIONS AND ELEVATIONS WITH THE MECHANICAL ENGINEER PRIOR TO CONSTRUCTION.
- THE SUBSURFACE UTILITY INFORMATION SHOWN ON THIS PLAN IS UTILITY QUALITY LEVEL D. THIS QUALITY LEVEL WAS DETERMINED ACCORDING TO THE GUIDELINES OF CI/ASCE 38-02, ENTITLED "STANDARD GUIDELINES FOR THE COLLECTION AND DEPICTION OF EXISTING SUBSURFACE UTILITY DATA." ASCERTAIN THE FINAL VERTICAL AND HORIZONTAL LOCATION OF ALL EXISTING UTILITIES (INCLUDING WATER AND SEWER LINES AND APPURTENANCES). NOTIFY THE ENGINEER OF ANY DISCREPANCIES.
- CONTACT UTILITY COMPANIES FOR LOCATIONS OF ALL PUBLIC AND PRIVATE UTILITIES WITHIN THE WORK AREA PRIOR TO BEGINNING CONSTRUCTION. CONTACT DIGGER'S HOTLINE AT (414) 259-1181 IN THE MILWAUKEE METRO AREA, OR 1-800-242-8511 ELSEWHERE IN WISCONSIN FOR EXACT LOCATIONS OF EXISTING UTILITIES AT LEAST 72 HOURS (NOT INCLUDING WEEKENDS AND HOLIDAYS) BEFORE BEGINNING ANY CONSTRUCTION. OBTAIN TICKET NUMBER AND MEET WITH REPRESENTATIVES OF THE VARIOUS UTILITIES AT THE SITE. PROVIDE THE OWNER WITH THE TICKET NUMBER INFORMATION. DIGGER'S HOTLINE IS A FREE SERVICE THAT LOCATES MUNICIPAL AND UTILITY COMPANY LINES, BUT DOES NOT LOCATE PRIVATE UTILITY LINES. USE AN INDEPENDENT LOCATOR SERVICE OR OTHER MEANS IN ORDER TO OBTAIN LOCATIONS OF PRIVATE UTILITY LINES INCLUDING, BUT NOT LIMITED TO, UNDERGROUND ELECTRIC CABLES, TELEPHONE, TV, AND LAWN SPRINKLER LINES.

- POTHOLE TO VERIFY THE POSITIONS OF EXISTING UNDERGROUND FACILITIES AT A SUFFICIENT NUMBER OF LOCATIONS IN ORDER TO ASSURE THAT NO CONFLICT WITH THE PROPOSED WORK EXISTS AND THAT SUFFICIENT CLEARANCE IS AVAILABLE.
- WHERE EXISTING GAS, ELECTRIC, CABLE, OR TELEPHONE UTILITIES CONFLICT WITH THE WORK, COORDINATE THE ABANDONMENT, RELOCATION, OFFSET, OR SUPPORT OF THE EXISTING UTILITIES WITH THE APPROPRIATE LOCAL UTILITY COMPANIES. COORDINATE NEW GAS METER AND GAS LINE INSTALLATION, ELECTRIC METER AND ELECTRIC SERVICE INSTALLATION WITH THE LOCAL UTILITY COMPANIES.
- ARRANGE FOR AND SECURE SUITABLE DISPOSAL AREAS OFF-SITE. DISPOSE OF ALL EXCESS SOIL, WASTE MATERIAL, DEBRIS, AND ALL MATERIALS NOT DESIGNATED FOR SALVAGE. WASTE MATERIAL AND DEBRIS INCLUDES TREES, STUMPS, PIPE, CONCRETE, ASPHALTIC CONCRETE, CANS, OR OTHER WASTE MATERIAL FROM THE CONSTRUCTION OPERATIONS. OBTAIN THE RIGHTS TO ANY WASTE AREA FOR DISPOSAL OF UNSUITABLE OR SURPLUS MATERIAL EITHER SHOWN OR NOT SHOWN ON THE PLANS. ALL WORK IN DISPOSING OF SUCH MATERIAL SHALL BE CONSIDERED INCIDENTAL TO THE WORK. ALL DISPOSAL MUST CONFORM TO APPLICABLE SOLID WASTE DISPOSAL PERMIT REGULATIONS. OBTAIN ALL NECESSARY PERMITS AT NO COST TO THE OWNER.
- STRAIGHT LINE SAW-CUT EXISTING BITUMINOUS OR CONCRETE SURFACING AT THE PERIMETER OF PAVEMENT REMOVAL AREAS. USE SAWS THAT PROVIDE WATER TO THE BLADE. TACK, AND MATCH ALL CONNECTIONS TO EXISTING BITUMINOUS PAVEMENT.
- RELOCATE OVERHEAD POWER, TELEPHONE, AND CABLE LINES AS REQUIRED.
- ALL MATERIALS REQUIRED FOR THIS WORK SHALL BE NEW MATERIAL CONFORMING TO THE REQUIREMENTS FOR CLASS, KIND, GRADE, SIZE, QUALITY, AND OTHER DETAILS SPECIFIED HEREIN OR AS SHOWN ON THE PLANS. DO NOT USE RECYCLED OR SALVAGED AGGREGATE, ASPHALTIC PAVEMENT, CRUSHED CONCRETE, OR SCRAP SHINGLES, UNLESS OTHERWISE INDICATED. THE CONTRACTOR SHALL FURNISH ALL REQUIRED MATERIALS.
- RESTORE THE PUBLIC RIGHT-OF-WAY. REPLACE ANY CONCRETE CURB AND GUTTER, BITUMINOUS PAVEMENT, SIDEWALK, OR VEGETATIVE COVER DAMAGED BY THE CONSTRUCTION ACTIVITY. RESTORE DAMAGED TURF WITH SOD WITHIN THE PUBLIC RIGHT-OF-WAY. THE WORK AREA SHOWN IS GENERAL AND MAY NEED TO BE ADJUSTED IN THE FIELD.
- WHEN SAWING OR DRILLING CONCRETE OR MASONRY, USE SAWS THAT PROVIDE WATER TO THE BLADE. DO NOT ALLOW THE SLURRY PRODUCED BY THIS PROCESS TO BE TRACKED OUTSIDE OF THE IMMEDIATE WORK AREA OR DISCHARGED INTO THE SEWER SYSTEM.
- ADJUST ALL CURB STOPS, VALVE BOXES, MAINTENANCE HOLE CASTINGS, CATCH BASIN CASTINGS, CLEANOUT COVERS, AND SIMILAR ITEMS TO FINISHED GRADE.
- INSTALL ALL PIPE WITH THE ASTM IDENTIFICATION NUMBERS ON THE TOP FOR INSPECTION. COMMENCE PIPE LAYING AT THE LOWEST POINT IN THE PROPOSED SEWER LINE. LAY THE PIPE WITH THE BELL END OR RECEIVING GROOVE END OF THE PIPE POINTING UPGRADE. WHEN CONNECTING TO AN EXISTING PIPE, UNCOVER THE EXISTING PIPE IN ORDER TO ALLOW ANY ADJUSTMENTS IN THE PROPOSED LINE AND GRADE BEFORE LAYING ANY PIPE.
- OBTAIN AND PAY FOR ALL PERMITS, TESTS, INSPECTIONS, ETC., REQUIRED BY AGENCIES THAT HAVE JURISDICTION OVER THE PROJECT. THE CONTRACTOR IS RESPONSIBLE FOR ALL BONDS, LETTERS OF CREDIT, OR CASH SURETIES RELATED TO THE WORK. EXECUTE AND INSPECT WORK IN ACCORDANCE WITH ALL LOCAL AND STATE CODES, RULES, ORDINANCES, OR REGULATIONS PERTAINING TO THE PARTICULAR TYPE OF WORK INVOLVED.
- OBTAIN PERMITS FROM THE CITY FOR WORK IN THE PUBLIC RIGHT-OF-WAY.
- CONSTRUCT SANITARY SEWER, WATERMAIN, AND STORM SEWER UTILITIES IN ACCORDANCE WITH THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN, SIXTH EDITION, OR THE LATEST REVISED EDITION.
- TRACER WIRE: LOCATING REQUIREMENTS - A MEANS TO LOCATE BURIED UNDERGROUND EXTERIOR NON METALLIC SEWERS/MAINS MUST BE PROVIDED WITH TRACER WIRE OR OTHER METHODS IN ORDER TO BE LOCATED IN ACCORD WITH THE PROVISIONS OF THESE CODE SECTIONS AS PER 182.0715(ZR) OF THE STATUTES.
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WATER DISTRIBUTION SYSTEM:

- BRING ALL SITE UTILITIES TO 5' OUTSIDE OF THE BUILDING LINE WITH THE EXCEPTION OF THE WATER SERVICE. EXTEND WATER SERVICE INTO THE BUILDING AND UP TO THE FLANGE FOR THE WATER METER.
- SEPARATION OF WATER AND SEWER: PROVIDE HORIZONTAL AND VERTICAL SEPARATIONS AS REQUIRED BY CODE. SEE DETAIL A/SP4.1.
- WATERMAIN DEPTH: MAINTAIN 7.5 FEET OF COVER OVER THE TOP OF THE WATER LINES TO THE FINISHED GRADE. VERIFY ELEVATION OF PROPOSED AND EXISTING WATER LINES AT ALL UTILITY CROSSINGS. INSTALL THE WATER LINES AT GREATER DEPTHS IN ORDER TO CLEAR STORM SEWERS, SANITARY SEWERS, OR OTHER UTILITIES AS REQUIRED. INCLUDE COSTS TO LOWER WATER LINES IN THE BASE BID.
- DISINFECT: DISINFECT ALL COMPLETED WATERMAINS IN ACCORDANCE WITH AWWA STANDARD C651. IF THE TABLET OR CONTINUOUS FEED METHODS ARE USED, DISINFECT USING WATER THAT CONTAINS AT LEAST 50 PPM OF AVAILABLE CHLORINE. DO NOT USE THE TABLET METHOD ON SOLVENT-WELDED PLASTIC OR ON SCREWED-JOINT STEEL PIPE BECAUSE OF THE DANGER OF FIRE OR EXPLOSION FROM THE REACTION OF THE JOINT COMPOUNDS WITH THE CALCIUM HYPOCHLORITE. RETAIN THE TREATED WATER IN THE PIPELINE FOR AT LEAST 24 HOURS. MEASURE THE CHLORINE RESIDUAL AT THE END OF THE 24 HOUR PERIOD. THE FREE CHLORINE RESIDUAL MUST BE AT LEAST 10 MG/L MEASURED AT ANY POINT IN THE LINE. MEASUREMENT OF THE CHLORINE CONCENTRATION AT REGULAR INTERVALS SHALL BE IN ACCORDANCE WITH STANDARD METHODS, AWWA M-12, OR USING APPROPRIATE CHLORINE TEST KITS.
- TESTING: PRESSURE TEST AND PERFORM BACTERIOLOGICAL TESTS ON ALL WATER LINES UNDER THE SUPERVISION OF THE CITY PUBLIC WORKS DEPARTMENT. NOTIFY THE CITY AT LEAST 24 WORKING HOURS PRIOR TO ANY TESTING. PRESSURIZE THE WATERLINE TO 0.34-0.40 (150-175) GAUGE PRESSURE (MEASURED AT THE POINT OF LOWEST ELEVATION) BY MEANS OF A PUMP CONNECTED TO THE PIPE IN A SATISFACTORY MANNER. MAINTAIN THE TEST PRESSURE FOR A MINIMUM OF 2 HOURS. DO NOT ADD WATER TO THE WATERMAIN IN ORDER TO MAINTAIN THE REQUIRED PRESSURE DURING THE WATER MAIN PRESSURE TESTING. THE TEST SECTION OF PIPE IS ACCEPTABLE WITH A PRESSURE DROP OF 14 KPA (2 PSI) OR LESS.
- USE MUELLER H 10300 OR FORD EM 2 7057, OR APPROVED EQUAL, AT ALL CURB STOP LOCATIONS. STATIONARY ROD IS REQUIRED ON ALL CURB STOPS.
- BUILDING WATER SERVICES: WATER SERVICE PIPE SHALL MEET THE FOLLOWING SPECIFICATIONS AND BE APPROVED BY THE LOCAL GOVERNING AGENCY: 2.5 INCH OR LESS: HDPE PER ASTM D2737 SDR 9 OR TYPE K COPPER PER ASTM B - 88. 4 INCH OR GREATER: DIP PER AWWA C151 OR PVC PER AWWA C-900.

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- INSTALL STORM SEWER IN ACCORDANCE WITH SECTION 608 OF THE WISDOT STANDARD SPECIFICATIONS.
- INSTALL CATCH BASINS, MANHOLES, AND INLETS IN ACCORDANCE WITH SECTION 611 OF THE WISDOT STANDARD SPECIFICATIONS.
- CLEANOUTS: INSTALL CLEANOUTS ON ALL ROOF DRAINS IN ACCORDANCE WITH S.P.S 382.35 (3)(VC1). THE DISTANCE BETWEEN CLEANOUTS IN HORIZONTAL PIPING SHALL NOT EXCEED 100 FEET FOR PIPES 10-INCHES AND UNDER IN SIZE. CLEANOUTS SHALL BE OF THE SAME NOMINAL SIZE AS THE PIPES THEY SERVE OR 6-INCH DIAMETER MINIMUM FOR PIPES 6 INCHES IN DIAMETER OR GREATER. INSTALL A METER BOX FRAME AND SOLID LID (NEENAH R-1914-A, OR APPROVED EQUAL) OVER ALL CLEANOUTS.
- INSTALL ALL PIPE WITH THE ASTM IDENTIFICATION NUMBERS ON THE TOP FOR INSPECTION. COMMENCE PIPE LAYING AT THE LOWEST POINT IN THE PROPOSED SEWER LINE. LAY THE PIPE WITH THE BELL END OR RECEIVING GROOVE END OF THE PIPE POINTING UPGRADE. WHEN CONNECTING TO AN EXISTING PIPE, UNCOVER THE EXISTING PIPE IN ORDER TO ALLOW ANY ADJUSTMENTS IN THE PROPOSED LINE AND GRADE BEFORE LAYING ANY PIPE. DO NOT LAY PIPES IN WATER OR WHEN THE TRENCH CONDITIONS ARE UNSUITABLE FOR SUCH WORK.
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- DUAL-WALL, SMOOTH INTERIOR, CORRUGATED HIGH-DENSITY POLYETHYLENE (HDPE) POLYETHYLENE (HDPE) PIPE AT ANY POINT IN THE LINE. MEASUREMENT OF THE CHLORINE CONCENTRATION AT REGULAR INTERVALS SHALL BE IN ACCORDANCE WITH STANDARD METHODS, AWWA M-12, OR USING APPROPRIATE CHLORINE TEST KITS.
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- TESTING: TEST ALL PORTIONS OF STORM SEWER THAT ARE WITHIN 10 FEET OF BUILDINGS, WITHIN 10 FEET OF BURIED WATER, LINES, WITHIN 50 FEET OF WATER WELLS, OR THAT PASS THROUGH SOIL OR WATER IDENTIFIED AS BEING CONTAMINATED. TEST ALL FLEXIBLE STORM SEWER LINES FOR DEFLECTION AFTER THE SEWER LINE HAS BEEN INSTALLED AND BACKFILL HAS BEEN IN PLACE FOR AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF THE TEST FAILS, MAKE NECESSARY REPAIRS AND RETEST.
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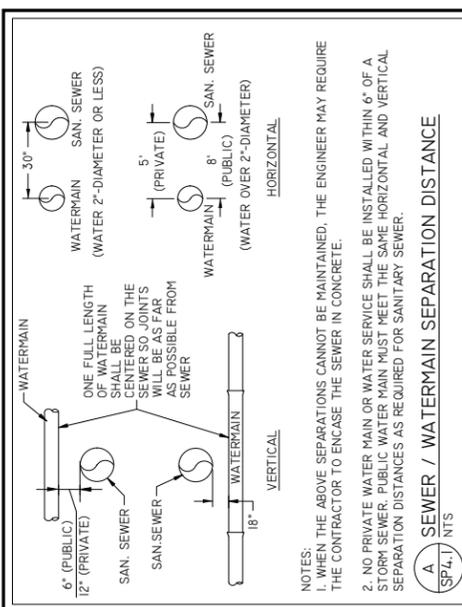
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- TESTING: TEST ALL PORTIONS OF STORM SEWER THAT ARE WITHIN 10 FEET OF BUILDINGS, WITHIN 10 FEET OF BURIED WATER, LINES, WITHIN 50 FEET OF WATER WELLS, OR THAT PASS THROUGH SOIL OR WATER IDENTIFIED AS BEING CONTAMINATED. TEST ALL FLEXIBLE STORM SEWER LINES FOR DEFLECTION AFTER THE SEWER LINE HAS BEEN INSTALLED AND BACKFILL HAS BEEN IN PLACE FOR AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF THE TEST FAILS, MAKE NECESSARY REPAIRS AND RETEST.
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SEWER / WATERMAIN SEPARATION DISTANCE

NOTES:
 1. WHEN THE ABOVE SEPARATIONS CANNOT BE MAINTAINED, THE ENGINEER MAY REQUIRE THE CONTRACTOR TO ENCASE THE SEWER IN CONCRETE.
 2. NO PRIVATE WATER MAIN OR WATER SERVICE SHALL BE INSTALLED WITHIN 6" OF A STORM SEWER. PUBLIC WATER MAIN MUST MEET THE SAME HORIZONTAL AND VERTICAL SEPARATION DISTANCES AS REQUIRED FOR SANITARY SEWER.

SANITARY SEWER:

- PIPE: USE SOLID-CORE, SDR-35, ASTM D3034 (OR APPROVED EQUAL) POLYVINYL CHLORIDE (PVC) PLASTIC PIPE FOR ALL DESIGNATED PVC SANITARY SEWER SERVICES. JOINTS FOR ALL SANITARY SEWER SHALL HAVE PUSH-ON JOINTS WITH ELASTOMERIC GASKETS. USE OF SOLVENT CEMENT JOINTS IS ALLOWED FOR BUILDING SERVICES. SOLVENT CEMENT JOINTS IN PVC PIPE MUST INCLUDE USE OF A PRIMER WHICH IS OF CONTRASTING COLOR TO THE PIPE AND CEMENT. PIPE WITH SOLVENT CEMENT JOINTS SHALL BE JOINED WITH PVC CEMENT CONFORMING TO ASTM D2564. LAY ALL PVC PIPE ON A CONTINUOUS GRANULAR BED. INSTALLATION MUST COMPLY WITH ASTM D2321.
- CLEANOUTS: INSTALL CLEANOUTS ON ALL SANITARY SEWER SERVICES. THE DISTANCE BETWEEN CLEANOUTS IN HORIZONTAL PIPING SHALL NOT EXCEED 100 FEET FOR PIPES 4-INCH AND OVER IN SIZE. CLEANOUTS SHALL BE OF THE SAME NOMINAL SIZE AS THE PIPES THEY SERVE OR 6-INCH DIAMETER MINIMUM FOR PIPES 6 INCHES IN DIAMETER OR GREATER. INCLUDE FROST SLEEVES AND CONCRETE FRAME AND PIPE SUPPORT. INSTALL A METER BOX FRAME AND SOLID LID (NEENAH R-1914-A, OR APPROVED EQUAL) OVER ALL CLEANOUTS.
- TESTING: PRESSURE TEST ALL SANITARY SEWER LINES. TEST ALL FLEXIBLE SANITARY SEWER LINES FOR DEFLECTION AFTER THE SEWER LINE HAS BEEN INSTALLED AND BACKFILL HAS BEEN IN PLACE FOR AT LEAST 30 DAYS. NO PIPE SHALL EXCEED A DEFLECTION OF 5%. IF THE TEST FAILS, MAKE NECESSARY REPAIRS AND RETEST.
- UNLESS OTHERWISE INDICATED, USE REINFORCED, PRECAST, CONCRETE MAINTENANCE HOLES CONFORMING TO ASTM C478, FURNISHED WITH PRECAST BASES. SANITARY SEWER MAINTENANCE HOLES SHALL BE SUPPLIED WITH PRE-FORMED INVERTS AND FLEXIBLE NEOPRENE SLEEVE CONNECTIONS FOR ALL LATERAL LINES 375 MM (15 INCHES) IN DIAMETER OR LESS, UNLESS OTHERWISE INDICATED. JOINTS FOR ALL PRECAST MAINTENANCE HOLE SECTIONS SHALL HAVE CONFINED, RUBBER 'O'-RING GASKETS IN ACCORDANCE WITH ASTM C923. THE INSIDE BARREL DIAMETER SHALL NOT BE LESS THAN 48 INCHES.
- INSTALL FLEXIBLE WATERTIGHT OR APPROVED CONNECTION FRAME/CHIMNEY SEALS ON ALL SANITARY SEWER MAINTENANCE HOLES. USE EITHER MANUFACTURED MAINTENANCE HOLE FRAME/CHIMNEY SEALS OR ELASTOMERIC WATERPROOFING FRAME/CHIMNEY SEALS.
- USE NEENAH FOUNDRY CO. R-1642 CASTING WITH SELF-SEALING, SOLID, TYPE B LID, OR APPROVED EQUAL, ON ALL SANITARY SEWER MAINTENANCE HOLES. COVERS SHALL BEAR THE "SANITARY SEWER" LABEL.
- THE MINIMUM DEPTH OF COVER FOR SANITARY SEWER WITHOUT INSULATION IS 5 FEET. INSULATE SANITARY SEWER SERVICES AT LOCATIONS WHERE THE DEPTH OF COVER IS LESS THAN 5 FEET. PROVIDE A MINIMUM INSULATION THICKNESS OF 2 INCHES. THE INSULATION MUST BE AT LEAST 4 FEET WIDE AND CENTERED ON THE PIPE. INSTALL THE INSULATION BOARDS 6 INCHES ABOVE THE TOPS OF THE PIPES ON MECHANICALLY COMPACTED AND LEVELED PIPE BEDDING MATERIAL. USE HIGH DENSITY, CLOSED CELL, RIGID BOARD MATERIAL EQUIVALENT TO DOW STYROFOAM HI-40 PLASTIC FOAM INSULATION.
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TRACER WIRE: LOCATING REQUIREMENTS - A MEANS TO LOCATE BURIED UNDERGROUND EXTERIOR NON METALLIC

STORM WATER POLLUTION PREVENTION PLAN

POLLUTION PREVENTION PLAN
 ALL CONTRACTORS / SUBCONTRACTORS SHALL CONDUCT THEIR OPERATIONS IN A MANNER THAT MINIMIZES EROSION AND PREVENTS SEDIMENTS FROM LEAVING THE PROJECT SITE. THE PRIME CONTRACTOR SHALL BE RESPONSIBLE FOR THE COMPLIANCE AND IMPLEMENTATION OF THE POLLUTION PREVENTION PLAN (PPP) FOR THEIR ENTIRE CONTRACT. THE RESPONSIBILITY SHALL BE FURTHER SHARED WITH SUBCONTRACTORS WHOSE WORK IS A SOURCE OF POTENTIAL POLLUTION AS DEFINED IN THE PPP.

1. SITE DESCRIPTION
 THIS POLLUTION PREVENTION PLAN IS FOR THE CONSTRUCTION OF THE KWIK TRIP CONVENIENCE STORE #1283 PROJECT. THE PROJECT IS LOCATED IN SECTION 3, TOWNSHIP 7N, RANGE 18E, VILLAGE OF HARTLAND, WAUKESHA COUNTY, WISCONSIN.
 THIS PPP COVERS 4.68 ACRES WITH AN ESTIMATED 4.68 ACRES BEING DISTURBED THROUGH EXCAVATION, GRADING, AND PAVING. THE PORTION OF THE PPP COVERED BY THIS CONTRACT HAS 4.68 ACRES BEING DISTURBED.
 THE PROJECT IS LOCATED IN AN AREA OF HOICHEIM LOAM (HMC2), THERESA SILT LOAM (THB). THE ESTIMATED CURVE NUMBER FOR THIS PPP AFTER CONSTRUCTION IS 82.
 REFER TO PLANS: KWIK TRIP CONVENIENCE STORE #1283 FOR LOCATIONS OF TYPICAL SLOPES, DITCH GRADES, AND MAJOR STRUCTURAL AND NON-STRUCTURAL CONTROLS. A COPY OF THIS PLAN WILL BE ON FILE AT THE PROJECT ENGINEER'S OFFICE AND ON-SITE. RUNOFF FROM THIS WORK WILL OVERLAND FLOW THROUGH DETENTION POND, DITCHES, STORM SEWER TO PIKE LAKE.

THIS PROJECT IS NOT LOCATED WITHIN A 100-YEAR FLOODPLAIN.
 POTENTIAL SOURCES OF POLLUTION:
 SITE SOURCES OF POLLUTION GENERATED AS A RESULT OF THIS WORK RELATE TO SILTS AND SEDIMENT WHICH MAY BE TRANSPORTED AS A RESULT OF A STORM EVENT. HOWEVER, THIS PPP PROVIDES CONVEYANCE FOR OTHER (NON-PROJECT RELATED) OPERATIONS. THESE OTHER OPERATIONS HAVE STORM WATER RUNOFF. THE REGULATION OF WHICH IS BEYOND THE CONTROL OF THIS PPP. POTENTIALLY THIS RUNOFF CAN CONTAIN POLLUTANTS RELATED TO SITE-SPECIFIC LAND USES.
 EXAMPLES ARE:

RURAL AGRICULTURAL ACTIVITIES:
 RUNOFF FROM AGRICULTURAL LAND USE CAN POTENTIALLY CONTAIN CHEMICALS INCLUDING HERBICIDES, PESTICIDES, FUNGICIDES, AND FERTILIZERS.

CONSTRUCTION ACTIVITIES:
 RUNOFF FROM CONSTRUCTION ACTIVITIES CAN POTENTIALLY CONTAIN FUELS, OILS, AND CHEMICALS FROM SPECIFIC CONSTRUCTION RELATED ACTIVITIES.

2. CONTROLS
 INLET PROTECTION DEVICES SHALL BE PLACED AROUND INTAKES. SILT FENCE SHALL BE PLACED AT LOCATIONS WHERE RUNOFF CAN MOVE OFFSITE. VEGETATION IN AREAS NOT NEEDED FOR CONSTRUCTION SHALL BE PRESERVED. AS AREAS REACH THEIR FINAL GRADE, ADDITIONAL SILT FENCES, SILT BASINS, INTERCEPTING DITCHES, SOD FLUMES, BRIDGE END DRAINS, AND EARTH DIKES SHALL BE INSTALLED AS SPECIFIED IN THE PLANS AND / OR AS REQUIRED BY PROJECT ENGINEER. THIS MAY INCLUDE USING SILT FENCE AS DITCH CHECKS. TEMPORARY STABILIZING SHALL BE COMPLETED AS THE DISTURBED AREAS ARE CONSTRUCTED. IF CONSTRUCTION ACTIVITY IS NOT PLANNED TO OCCUR IN A DISTURBED AREA IMMEDIATELY, THE AREA SHALL BE STABILIZED BY TEMPORARY SEEDING OR MULCHING WITHIN 14 DAYS. OTHER STABILIZING METHODS SHALL BE USED OUTSIDE THE SEEDING PERIOD.

THIS WORK SHALL BE DONE IN ACCORDANCE WITH THE WISCONSIN TRANSPORTATION STANDARD SPECIFICATIONS. CONTRACTOR SHALL ALSO FOLLOW ALL REQUIREMENTS OF THE WAUKESHA COUNTY EROSION AND SEDIMENT CONTROL REGULATIONS.

AS THE WORK PROGRESSES, ADDITIONAL EROSION CONTROL ITEMS SUCH AS SOD FLUMES, DITCH CHECKS, ROCK OUTLET PROTECTION, AND LETDOWN STRUCTURES AND OTHER APPROPRIATE MEASURES SHALL BE INSTALLED BY THE CONTRACTOR AS DETERMINED BY THE ENGINEER AFTER FIELD INVESTIGATION. THE CONSTRUCTION WILL BE COMPLETED WITH THE ESTABLISHMENT OF PERMANENT PERENNIAL VEGETATION OF ALL DISTURBED AREAS BY THE CONTRACTOR.

3. OTHER CONTROLS
 CONTRACTOR DISPOSAL OF UNUSED CONSTRUCTION MATERIALS AND CONSTRUCTION MATERIAL WASTE SHALL COMPLY WITH APPLICABLE STATE AND LOCAL WASTE DISPOSAL, SANITARY SEWER, OR SEPTIC SYSTEM REGULATIONS. IN THE EVENT OF A CONFLICT WITH OTHER GOVERNMENT LAWS, RULES, AND REGULATIONS, THE MORE RESTRICTIVE LAWS, RULES, OR REGULATIONS SHALL APPLY.

MUD TRACK-OUT SHALL BE CLEANED OFF THE ROADWAY NIGHTLY AND BEFORE ANY RAINFALL EVENT. WATER MAY NOT BE USED TO CLEAN THE ROADWAY.
 CONTRACTOR SHALL KEEP PERMIT, INSPECTION LOGS, SITE PLAN, AND OTHER PERMIT DATA ON SITE AT ALL TIMES. MATERIAL SHALL BE PLACED IN AN EASILY ACCESSIBLE MAILBOX THAT IS CLEARLY MARKED "SWPPP".

ALL FUELS AND OILS SHALL BE CONTAINED BY A SECONDARY CONTAINMENT BERM OR WITHIN A TRAILER.

ALL SILT FENCE AND INLET PROTECTION DEVICES AS SHOWN SHALL BE INSTALLED PRIOR TO COMMENCING CONSTRUCTION WHENEVER POSSIBLE.

A NOTICE OF DISCONTINUATION MUST BE FILED WITH THE WDNR ONCE VEGETATION HAS BEEN ESTABLISHED TO A MINIMUM COVERAGE OF 70%.

CONTRACTOR SHALL MARK ON THE INITIAL STORM WATER POLLUTION PREVENTION PLAN THE LOCATION OF STORAGE AREAS FOR FUELS AND OILS, PORTA-POTTY, DUMPSTER OR WASTE CONTAINMENT BINS. CONCRETE WAS OUT AREA, AND OTHER NECESSARY ITEMS.

ENTRANCES SHALL BE MAINTAINED TO CONTROL MUD TRACK-OUT FROM THE SITE.
 THE STORMWATER POLLUTION PREVENTION PLAN SHALL BE UPDATED AS NECESSARY DURING CONSTRUCTION.

APPROVED STATE OF LOCAL PLANS:
 DURING THE COURSE OF THIS CONSTRUCTION, IT IS POSSIBLE THAT SITUATIONS WILL ARISE WHERE UNKNOWN MATERIALS WILL BE ENCOUNTERED. WHEN SUCH SITUATIONS ARE ENCOUNTERED, THEY WILL BE HANDLED ACCORDING TO ALL FEDERAL, STATE, AND LOCAL REGULATIONS IN EFFECT AT THE TIME.

4. MAINTENANCE
 THE CONTRACTOR IS REQUIRED TO MAINTAIN ALL TEMPORARY EROSION CONTROL MEASURES IN PROPER WORKING ORDER, INCLUDING CLEANING, REPAIRING, OR REPLACING THEM THROUGHOUT THE CONTRACT PERIOD. CLEANING OF SILT CONTROL DEVICES SHALL BEGIN WHEN THE FEATURES HAVE LOST 50% OF THEIR CAPACITY.

5. INSPECTIONS
 INSPECTIONS SHALL BE MADE JOINTLY BY THE CONTRACTOR AND THE CONTRACTING AUTHORITY EVERY SEVEN CALENDAR DAYS. THE CONTRACTOR SHALL IMMEDIATELY BEGIN CORRECTIVE ACTION ON ALL DEFICIENCIES FOUND. THE FINDINGS OF THIS INSPECTION SHALL BE RECORDED IN THE PROJECT DIARY. THIS PPP MAY BE REVISED BASED ON THE FINDING OF THE INSPECTION. THE CONTRACTOR SHALL IMPLEMENT ALL REVISIONS. ALL CORRECTIVE ACTIONS SHALL BE COMPLETED WITHIN 3 CALENDAR DAYS OF THE INSPECTION.

6. NON-STORM DISCHARGES
 THIS INCLUDES SUBSURFACE DRAINS (I.E. FIELD TILE, SUBDRAINS), SLOPE DRAINS, AND BRIDGE END DRAINS. THE VELOCITY OF THE DISCHARGE FROM THESE FEATURES MAY BE CONTROLLED BY THE USE OF PATIO BLOCKS, CLASS A STONE, OR EROSION STONE.

7. SEQUENCE OF CONSTRUCTION ACTIVITIES
 ALL EROSION CONTROL DEVICES SHALL BE INSTALLED PRIOR TO COMMENCING ANY CONSTRUCTION ON-SITE. FIRST, ALL NOTED REMOVALS SHALL BE COMPLETED. SECOND, GRADING CAN COMMENCE TO BRING SOIL TO FINAL GRADE.. NEXT, INSTALLATION OF UTILITIES AND PAVING SHALL BE COMPLETED. FINALLY, THE DISTURBED AREAS SHALL BE SEEDED, FERTILIZED, AND MULCHED AS SHOWN IN THE PLANS.

OWNER CERTIFICATION:

"I CERTIFY UNDER PENALTY OF LAW THAT THIS DOCUMENT AND ALL ATTACHMENTS WERE PREPARED UNDER MY DIRECTION OR SUPERVISION IN ACCORDANCE WITH A SYSTEM DESIGNED TO ASSURE THAT QUALIFIED PERSONNEL PROPERLY GATHERED AND EVALUATED THE INFORMATION SUBMITTED. BASED ON MY INQUIRY OF THE PERSON OR PERSONS WHO MANAGE THE SYSTEM, OR THOSE PERSONS DIRECTLY RESPONSIBLE FOR GATHERING THE INFORMATION, THE INFORMATION IS, TO THE BEST OF MY KNOWLEDGE AND BELIEF, TRUE, ACCURATE, AND COMPLETE. I AM AWARE THAT THERE ARE SIGNIFICANT PENALTIES FOR SUBMITTING FALSE INFORMATION, INCLUDING THE POSSIBILITY OF FINE AND IMPRISONMENT FOR KNOWING VIOLATIONS."

NAME (PRINTED OR TYPED): _____

TITLE: _____

SIGNATURE: _____

DATE: _____

NAME OF COMPANY, IF APPLICABLE: _____

ADDRESS: _____

CITY, STATE, ZIP CODE: _____

TELEPHONE NUMBER: _____

ADDRESS OF THE SITE: _____

CONTRACTOR / SUBCONTRACTOR CERTIFICATION:

"I CERTIFY UNDER PENALTY OF LAW THAT I UNDERSTAND THE TERMS AND CONDITIONS OF THE GENERAL NATIONAL POLLUTANT DISCHARGE ELIMINATION SYSTEM (NPDES) PERMIT THAT AUTHORIZES THE STORM WATER DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY FROM THE CONSTRUCTION SITE AS PART OF THIS CERTIFICATION. FURTHER, BY MY SIGNATURE, I UNDERSTAND THAT I AM BECOMING A CO-PERMITTEE, ALONG WITH THE OWNER(S) AND OTHER CONTRACTORS AND SUBCONTRACTORS SIGNING SUCH CERTIFICATIONS. TO THE WISCONSIN DEPARTMENT OF NATURAL RESOURCES GENERAL PERMIT NO. 2 FOR "STORM WATER DISCHARGE ASSOCIATED WITH INDUSTRIAL ACTIVITY FOR CONSTRUCTION ACTIVITIES" AT THE IDENTIFIED SITE. AS A CO-PERMITTEE, I UNDERSTAND THAT I, AND MY COMPANY, ARE LEGALLY REQUIRED UNDER THE CLEAN WATER ACT AND THE CODE OF WISCONSIN, TO ENSURE COMPLIANCE WITH THE TERMS AND CONDITIONS OF THE STORM WATER POLLUTION PREVENTION PLAN DEVELOPED UNDER THE NPDES PERMIT AND THE TERMS OF THE NPDES PERMIT."

NAME (PRINTED OR TYPED): _____

TITLE: _____

SIGNATURE: _____

DATE: _____

NAME OF CONTRACTING FIRM: _____

ADDRESS: _____

CITY, STATE, ZIP CODE: _____

TELEPHONE NUMBER: _____

ADDRESS OF THE SITE: _____



**CIVIL & ENVIRONMENTAL
 ENGINEERING, SURVEYING**
REI Engineering, Inc.
 4080 N. 20TH AVENUE
 WAUKESHA, WISCONSIN 53186-1040
 PHONE: 608.781.8988
 EMAIL: MAIL@REIENGINEERING.COM

KWIK TRIP, Inc.
 P.O. BOX 2107
 1626 OAK STREET
 LA CROSSE, WI 54602-2107
 PH. (608) 781-8988
 FAX (608) 781-8960



NO SCALE

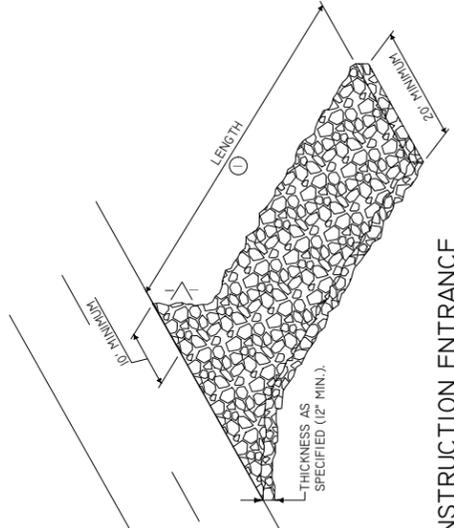
**EROSION CONTROL
 DETAILS**

CONVENIENCE STORE #1283
 STH 83 AND W. CAPITOL DRIVE
 HARTLAND, WI

#	DATE	DESCRIPTION

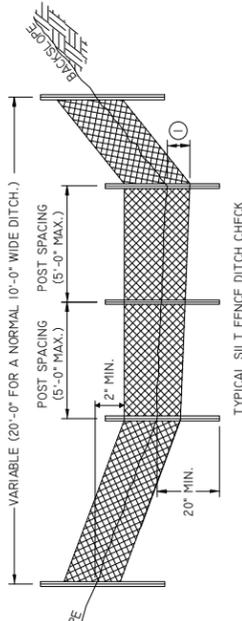
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SCALE	GRAPHIC	
PROJ. NO.	10827	
DATE	8/17/23	REVIEW DOCUMENTS
SHEET		SWP2

① ENTRANCE LENGTH: 50 FOOT MINIMUM (30 FOOT FOR SINGLE FAMILY RESIDENTIAL), OR AS SPECIFIED IN THE CONTRACT DOCUMENTS. LENGTH OF ENTRANCE MAY BE INCREASED IF SEDIMENT TRACK-OUT OCCURS.



A STABILIZED CONSTRUCTION ENTRANCE
NTS
SWP3

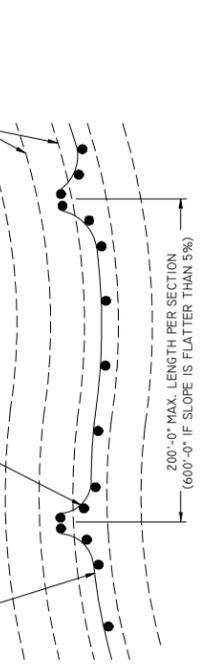
① INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE).



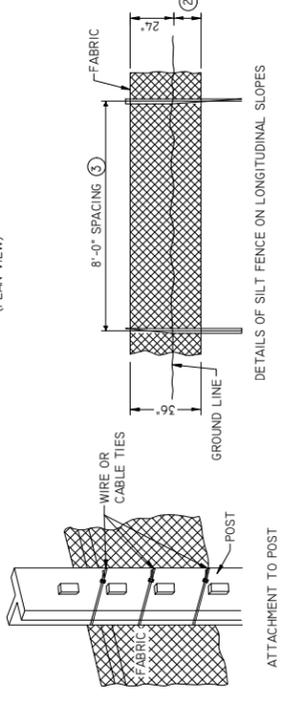
TYPICAL SILT FENCE DITCH CHECK

INSTALL PARALLEL TO GROUND CONTOUR.

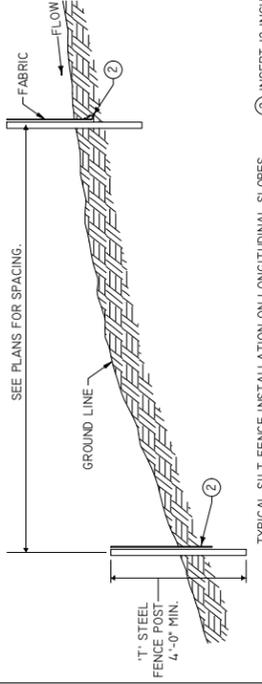
INSTALL "J-HOOK" AT EACH END OF AN INDIVIDUAL SECTION OF SILT FENCE.



TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (PLAN VIEW)



DETAILS OF SILT FENCE ON LONGITUDINAL SLOPES

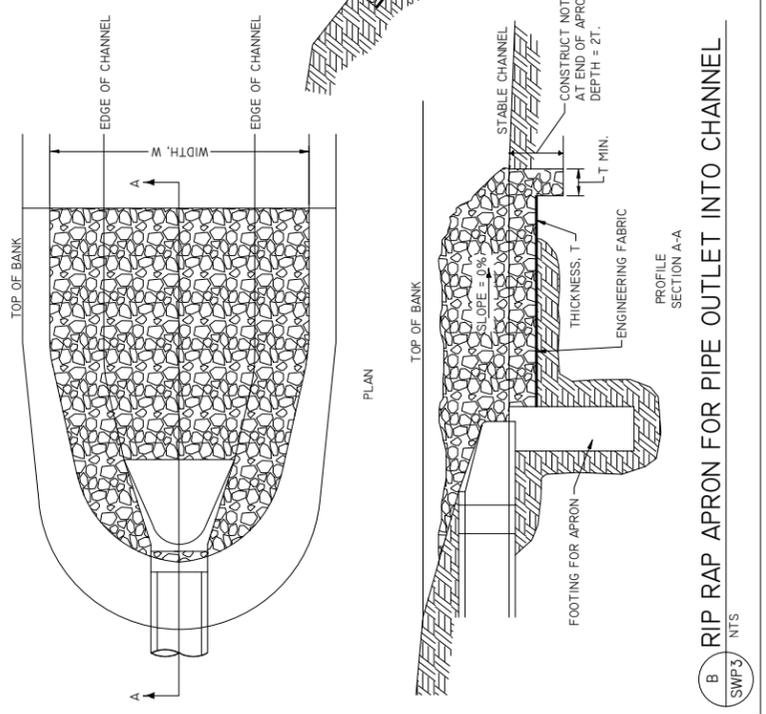


TYPICAL SILT FENCE INSTALLATION ON LONGITUDINAL SLOPES (PROFILE VIEW)

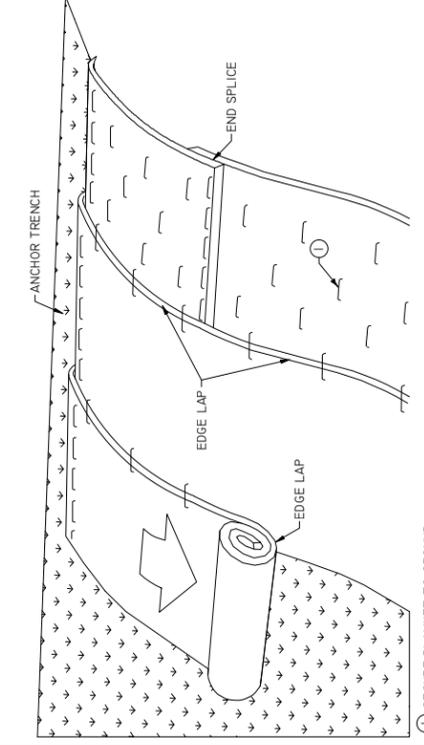
② INSERT 12 INCHES OF FABRIC A MINIMUM OF 6 INCHES DEEP (FABRIC MAY BE FOLDED BELOW THE GROUND LINE).

③ REDUCE POST SPACING TO 5'-0" AT WATER CONCENTRATION AREAS, OR AS REQUIRED TO ADEQUATELY SUPPORT FENCE.

D SILT FENCE
NTS
SWP3



B RIP RAP APRON FOR PIPE OUTLET INTO CHANNEL
NTS
SWP3



① SECURE BLANKET TO GROUND ACCORDING TO MANUFACTURER'S RECOMMENDED ANCHORING PATTERN AND MINIMUM SHOWN IN TABLE I.

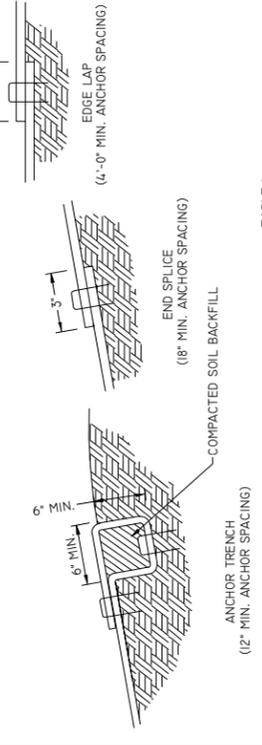
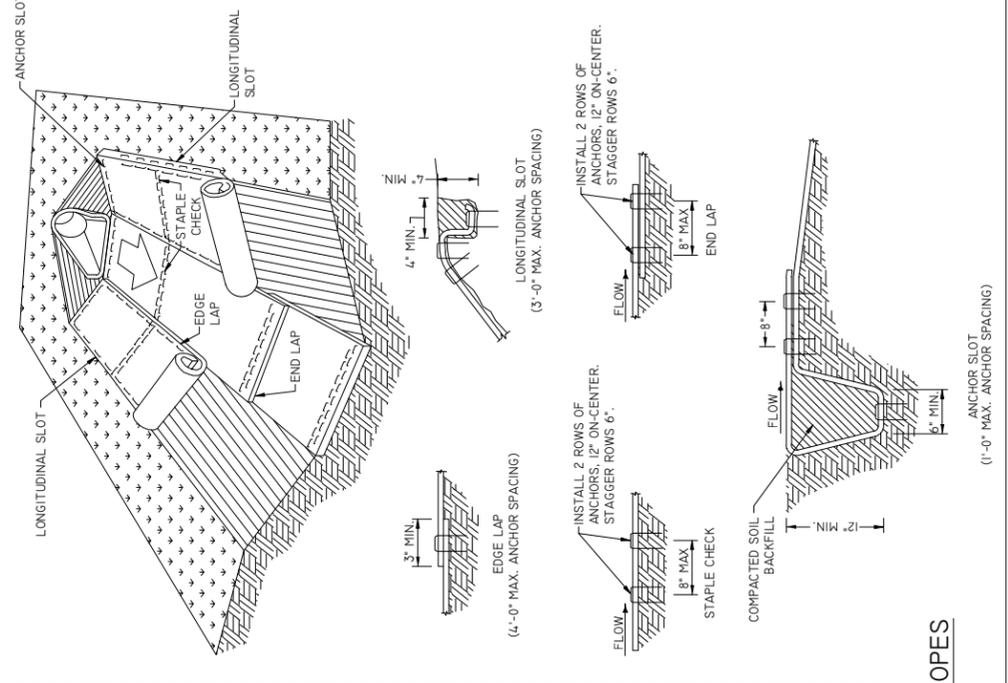


TABLE I	
MAX. SLOPE	MIN. ANCHORS
3:1	1.5/YD ²
2:1	2/YD ²
1:1	2.5/YD ²

E ROLLED EROSION CONTROL (RECP) INSTALLATION ON SLOPES
NTS
SWP3



KWIK TRIP, Inc.
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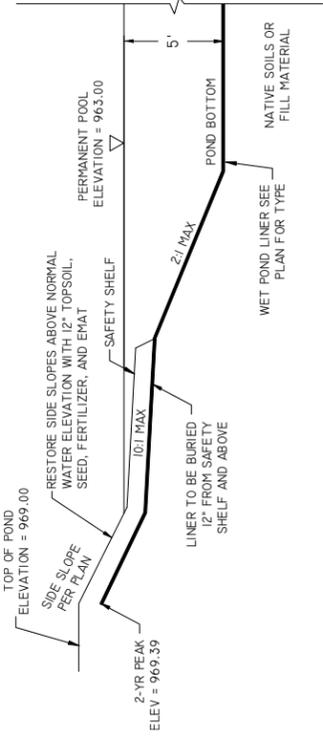
NO SCALE

EROSION CONTROL
DETAILS
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

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ALL EROSION CONTROL MEASURES TO BE
INSTALLED AND MAINTAINED PER WDNR STANDARDS
HTTP://DNR.WI.GOV/ORG/WATER/WATER/WATER/STORWATER/TECHSTDS.HTM



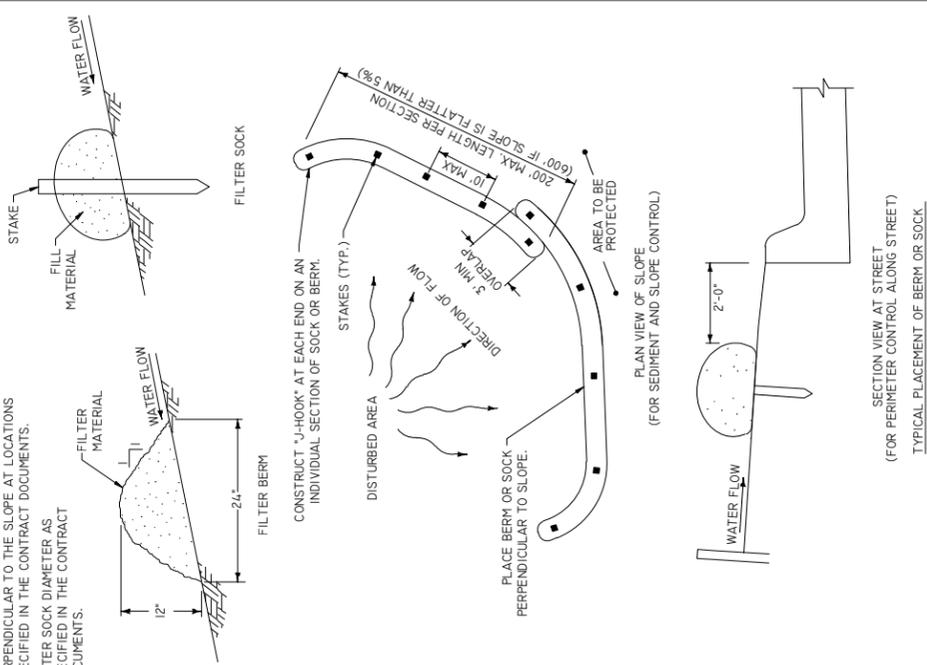
GENERAL POND LINER SPECIFICATIONS
(REFER TO APPENDIX D OF WDMR TECHNICAL STANDARD 0001 FOR DETAILED SPECIFICATIONS)

- 1. TYPE A LINER (ANY OF THE FOLLOWING)
 - CLAY LINER: MINIMUM THICKNESS OF 2 FEET WITH AN IN-PLACE HYDRAULIC CONDUCTIVITY OF 1×10^{-7} CM/SEC OR LESS.
 - HDPE: MINIMUM THICKNESS OF 60 MIL.
 - GCL: GEOSYNTHETIC CLAY LINER PER NRCS SPECIFICATIONS OUTLINED IN APPENDIX D.
- TYPE B LINER (ANY OF THE FOLLOWING)
 - CLAY LINER: MINIMUM THICKNESS OF 2 FEET WITH AN IN-PLACE HYDRAULIC CONDUCTIVITY OF 1×10^{-4} CM/SEC OR LESS.
 - HDPE: MINIMUM THICKNESS OF 40 MIL.
 - PPL: MINIMUM THICKNESS OF 30 MIL.
- TYPE C LINER (ANY OF THE FOLLOWING)
 - SILT/CLAY LINER: MINIMUM THICKNESS OF 2 FEET
 - HDPE: ANY THICKNESS
 - PPL: MINIMUM THICKNESS OF 20 MIL
 - PVC: MINIMUM THICKNESS OF 30 MIL
 - EPDM: MINIMUM THICKNESS OF 45 MIL

NOTE:
1. SHOULD THE CONTRACTOR ENCOUNTER SEASONAL OR PERCHED GROUNDWATER DURING CONSTRUCTION OF THE POND AND IT'S LINER, CONTACT ENGINEER FOR UNDERDRAIN RECOMMENDATIONS.
2. MANUFACTURED LINERS SHALL BE PROVIDED WITH AIR-RELEASE VENTS TO PREVENT FLOATING.
3. CONTRACTOR TO PROVIDE POND LINER DOCUMENTATION TO OWNER PRIOR TO FINAL ACCEPTANCE.

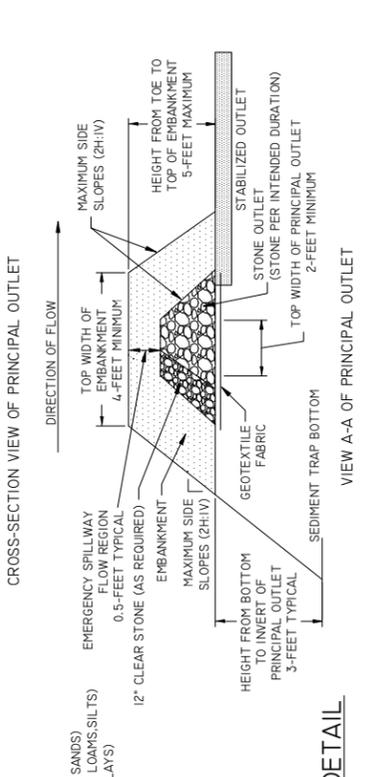
A WET POND LINER
SWP/4 NTS

BERM SHOWN IS TYPICAL FOR SLOPES FLATTER THAN 3:1. FOR STEEPER SLOPES, INCREASE BERM SIZE AS DIRECTED BY THE ENGINEER. PLACE BERM IN UNCOMPACTED WINDROW PERPENDICULAR TO THE SLOPE AT LOCATIONS SPECIFIED IN THE CONTRACT DOCUMENTS. FILTER SOCK DIAMETER AS SPECIFIED IN THE CONTRACT DOCUMENTS.



C FILTER BERM AND FILTER SOCK
SWP/4 NTS

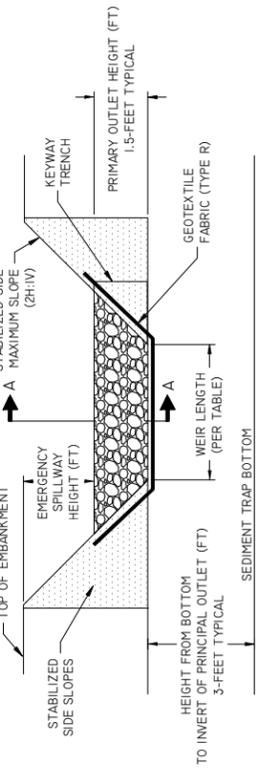
- NOTES:**
1. SIDE SLOPES AND FACES OF EARTHEN EMBANKMENT AROUND OUTLET SHALL BE ARMORED WITH RIPRAP OR STABILIZED WITH EROSION MAT SUFFICIENT TO HANDLE FLOWS FROM THE 10-YEAR STORM.
2. STONE (SHORT DURATION): 3'-6" WELL GRADED ANGULAR CLEAR STONE.
3. STONE (6+ MONTHS): COMBINATION OF LIGHT RIPRAP WITH 12"-THICK LAYER OF 1" ANGULAR CLEAR STONE.
4. REFER TO WDMR TECH STD 1063 FOR ADDITIONAL INFORMATION.



B SEDIMENT TRAP DETAIL
SWP/4 NTS

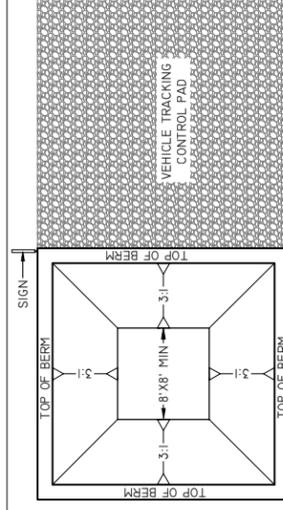
- * AS = 625 X ADR (COARSE GRAINED SOILS + SANDS)
- AS = 1500 X ADR (MEDIUM GRAINED SOILS + LOAM/SILTS)
- AS = 3500 X ADR (FINE GRAINED SOILS + CLAYS)

ADR (CC)	WEIR LENGTH (FT)
2	4
3	6
4	8
5	10
	12



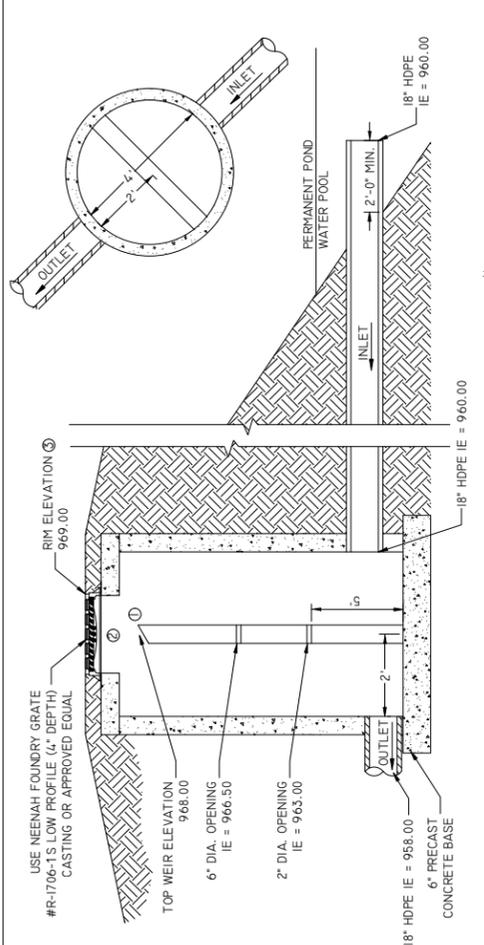
CROSS-SECTION VIEW OF PRINCIPAL OUTLET

VIEW A-A OF PRINCIPAL OUTLET



E CONCRETE WASHOUT AREA
SWP/4 NTS

- CONCRETE WASHOUT AREA INSTALLATION NOTES**
- SEE EROSION CONTROL PLAN FOR LOCATIONS OF CONCRETE WASHOUT AREAS(S). TO BE PLACED A MIN. OF 50' FROM DRAINAGEWAYS, BODIES OF WATER, AND INLETS(S).
 - THE CONCRETE WASHOUT AREAS(S) SHALL BE INSTALLED PRIOR TO ANY CONCRETE PLACEMENT ON SITE.
 - VEHICLE TRACKING CONTROL PAD(S) IS REQ'D AT THE ACCESS POINT(S)
 - SIGNS SHALL BE PLACED AT THE CONSTRUCTION ENTRANCE AT THE WASHOUT AREAS(S), AND ELSEWHERE AS NECESSARY TO CLEARLY INDICATE THE LOCATION OF THE CONCRETE WASHOUT AREAS TO OPERATORS OF CONCRETE TRUCKS AND PUMP RIGS.
 - EXCAVATED MATERIAL SHALL BE UTILIZED IN PERIMETER BERM CONSTRUCTION.
- CONCRETE WASHOUT AREA MAINTENANCE NOTES**
- THE CONCRETE WASHOUT AREA SHALL BE REPAIRED AND ENLARGED OR CLEANED OUT AS NECESSARY TO MAINTAIN CAPACITY FOR WASTED CONCRETE
 - AT THE END OF CONSTRUCTION ALL CONCRETE SHALL BE REMOVED FROM SITE AND DISPOSED OF AT AN APPROVED WASTE SITE.
 - WHEN CONCRETE WASHOUT AREAS(S) IS REMOVED, THE DISTURBED AREA SHALL BE STABILIZED PER SITE EROSION CONTROL MEASURES
 - INSPECT WEEKLY AND DURING AND AFTER ALL STORM EVENTS. CLEAN-OUT OR COVER WASHOUT AREA PRIOR TO PREDICTED STORM EVENTS TO PREVENT OVER-FLOW.



F OUTLET CONTROL STRUCTURE
SWP/4 NTS

- 4" THICK MASONRY WALL OR 1/2" STEEL PLATE.
- GROUT OR SEAL ALONG SIDES OF MANHOLE
- FORM OPENING IN TOP SLAB TO FIT CASTING
- ADJUST GRADING AT THE OUTLET STRUCTURE TO COVER CASTING TO THE PROPOSED RIM ELEVATION

KWIK TRIP STORES

KWIK STAR STORES

REI CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING

1050 N. 20TH AVENUE, SUITE 100
WILSON, WI 53091
PHONE: 715.675.9734 FAX: 715.675.4060
EMAIL: MAIL@REIENGINEERING.COM

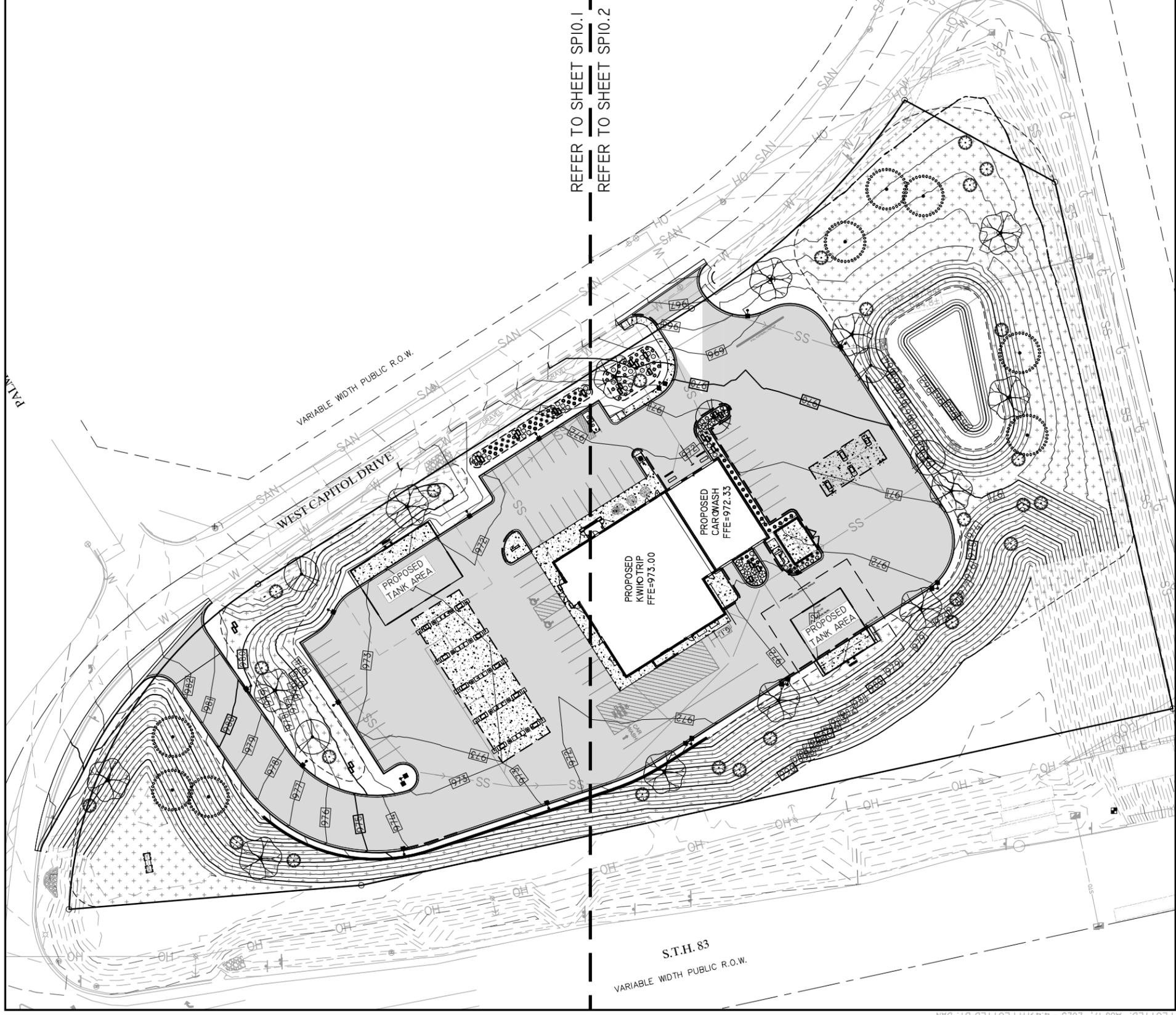
NO SCALE

EROSION CONTROL DETAILS

CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: NAP XXX
SCALE: GRAPHIC
PROJ. NO.: 10027
DATE: 8/17/23 - REVIEW DOCUMENTS
SHEET: SWP/4



GENERAL NOTES:

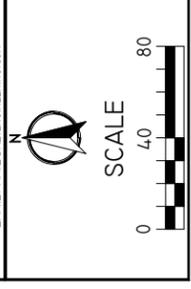
- (A) LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR LOCATING & VERIFYING ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION, AND IS RESPONSIBLE FOR ANY DAMAGE TO THEM DURING CONSTRUCTION.
- (B) CALL DIGGERS HOTLINE @ 811 OR 1-800-242-8511 AT LEAST 5 WORKING DAYS PRIOR TO DEMOLITION, EXCAVATION OR ANY CONSTRUCTION ACTIVITY.
- (C) ALL PLANT MATERIAL SHALL BE GUARANTEED ONE (1) FULL YEAR UPON TOTAL COMPLETION OF PROJECT AND ACCEPTANCE BY OWNER, WITH A ONE TIME REPLACEMENT WARRANTY UPON REQUEST BY OWNER. WARRANTY EXPIRES AFTER FIRST FULL YEAR FOLLOWING PROJECT COMPLETION.
- (D) LANDSCAPE CONTRACTOR SHALL VERIFY MINIMUM 6" TOPSOIL DEPTH FOR ALL AREAS TO BE SEEDED/SODDED THROUGHOUT PROJECT SITE. CONTRACTOR IS REQUIRED TO CORRECT ANY DEFICIENCIES PRIOR TO SEED/SOD. TOPSOIL SHALL BE CLEAN AND FREE OF STONES, WEEDS AND OTHER UNDESIRABLE DEBRIS.
- (E) LANDSCAPE CONTRACTOR SHALL VERIFY MINIMUM 12" PLANTING SOIL DEPTH FOR ALL PROPOSED PLANTING BED AREAS THROUGHOUT THE PROJECT SITE. CONTRACTOR IS REQUIRED TO CORRECT ANY DEFICIENCIES PRIOR TO PLANT INSTALLATION. PLANTING SOIL & AREA SHALL BE CLEAN AND FREE OF STONES, WEEDS, CONCRETE WASTE AND OTHER UNDESIRABLE DEBRIS.
- (F) LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR REPAIRING TOPSOIL AND SEEDING OR SODDING ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITY, INCLUDING ALL R.O.W. AND ADJACENT PROPERTIES.
- (G) CONTRACTOR SHALL CLEAN ALL PAVEMENT AREAS AFTER LANDSCAPE CONSTRUCTION ACTIVITIES ARE COMPLETE AND APPROVED BY OWNER. *THIS TO BE DONE DAILY AS DEEMED NECESSARY BY MUNICIPALITY.

PLANT SCHEDULE						
DECIDUOUS TREES	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY	
	Fall Fiesta® Sugar Maple	Acer saccharum 'Ballista'	1.5" Cal.	B&B	5	
	Swamp White Oak	Quercus bicolor	1.5" Cal.	B&B	13	
	Red Oak	Quercus rubra	1.5" Cal.	B&B	8	
EVERGREEN TREES	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY	
	White Spruce	Picea glauca	3' Ht.	Pot	25	
EVERGREEN SHRUBS	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY	
	Kalloy Compact Pfitzer Juniper	Juniperus chinensis 'Kallays Compact'	3 gal.	Pot	10	
PERENNIALS	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY	
	Karl Foerster Feather Reed Grass	Calamagrostis x acutiflora 'Karl Foerster'	1 gal.	Pot	30	
	Pale Purple Coneflower	Echinacea pallida	1 gal.	Pot	47	
	Shenandoah Switch Grass	Panicum virgatum 'Shenandoah'	1 gal.	Pot	38	
	Goldsturm Coneflower	Rudbeckia fulgida sultivanti 'Goldsturm'	1 gal.	Pot	11	
	Prairie Dropseed	Sporobolus heterolepis	1 gal.	Pot	34	



KWIK TRIP, Inc.
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 1626 OAK STREET
 LA CROSSE, WI 54602-2107
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 FAX (608) 781-8960

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 REI Engineering, Inc.
 4080 N. 20TH AVENUE
 WISCONSIN 53190-1401
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 EMAIL: MAIL@REIENGINEERING.COM



OVERALL LANDSCAPE PLAN

CONVENIENCE STORE #1283

STH 83 AND W. CAPITOL DRIVE
 HARTLAND, WI

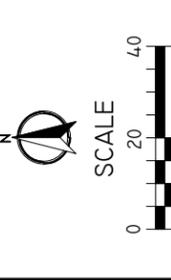
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 FAX: (262) 535-0860
 EMAIL: MAIL@REIENGINEERING.COM



LANDSCAPE PLAN
NORTH
 CONVENIENCE STORE #1283
 STH 83 AND W. CAPITOL DRIVE
 HARTLAND, WI

#	DATE	DESCRIPTION

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SHEET	SP10.1

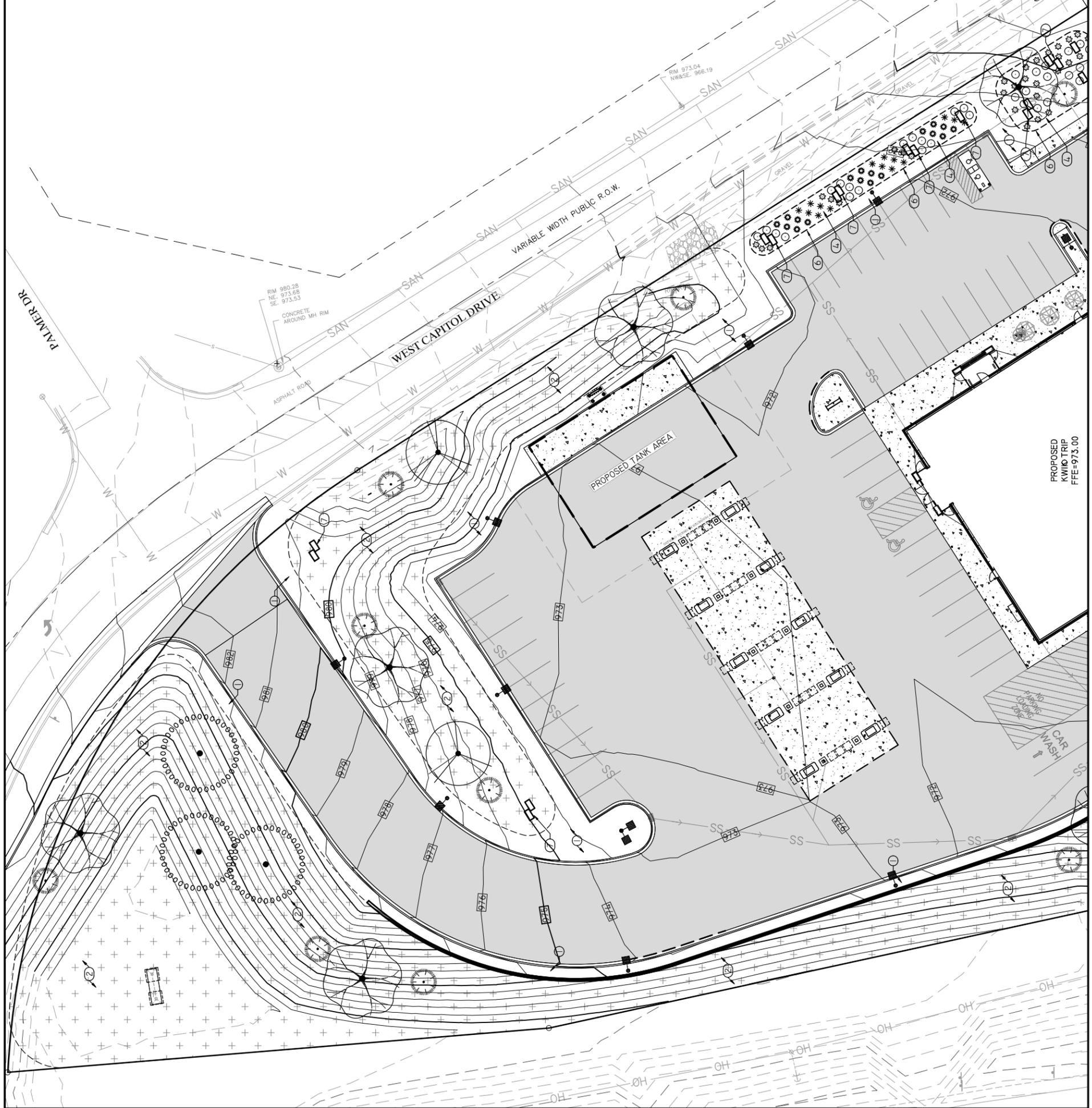
KEYED NOTES

- SOD. *ALL AREAS NOTED ON PLAN & ALL DISTURBED AREAS DUE TO CONSTRUCTION ACTIVITY.
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[HTTPS://WWW.AGRECOL.COM/NATIVE-SEEDING-INSTRUCTIONS_EP_44.HTML](https://www.agrecol.com/NATIVE-SEEDING-INSTRUCTIONS_EP_44.html)
- 6' DIAMETER WOOD MULCH TREE RING, 3'-4" DEPTH, DARK BROWN COLOR.
 *ALL TREES PLANTED WITHIN SOD AREAS.
- SHREDDED HARDWOOD MULCH, 3'-4" DEPTH, DARK BROWN COLOR.
- DECORATIVE STONE MULCH, 3'-4" ROUND COBBLES, 4"-5" DEPTH, WITH COMMERCIAL GRADE WEED BARRIER FABRIC UNDERLAYMENT.
- SHOVEL CUT EDGE, 4"-5" DEPTH CLEAN CUT EDGE AROUND PLANTING BEDS WITHIN SOD AREAS.
- ACCENT BOULDERS, (48" X 18" X 18") LIMESTONE BLOCKS/CUBES, PLAN SYMBOL:

PLANT SCHEDULE

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	White Spruce	Picea glauca
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REFER TO SHEET SP10.3 FOR COMPLETE PLANT SCHEDULE, NOTES AND SPECIFICATIONS.



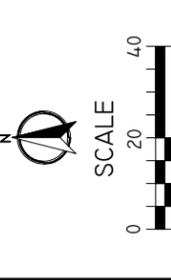
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KWIK TRIP STORES

KWIK STAR STORES

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LANDSCAPE PLAN SOUTH
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

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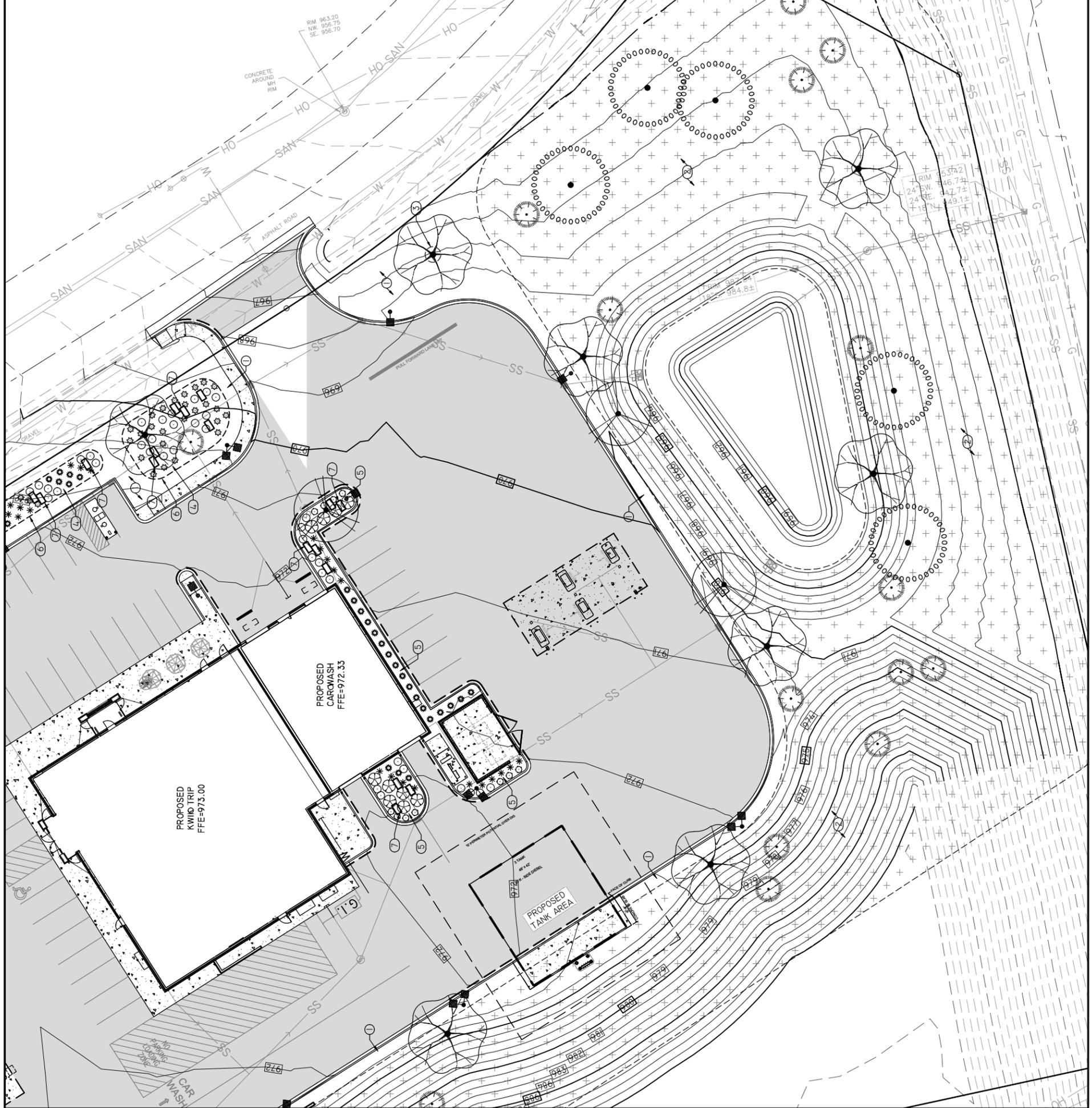
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REFER TO SHEET SP10.3 FOR COMPLETE PLANT SCHEDULE, NOTES AND SPECIFICATIONS.



GENERAL NOTES:

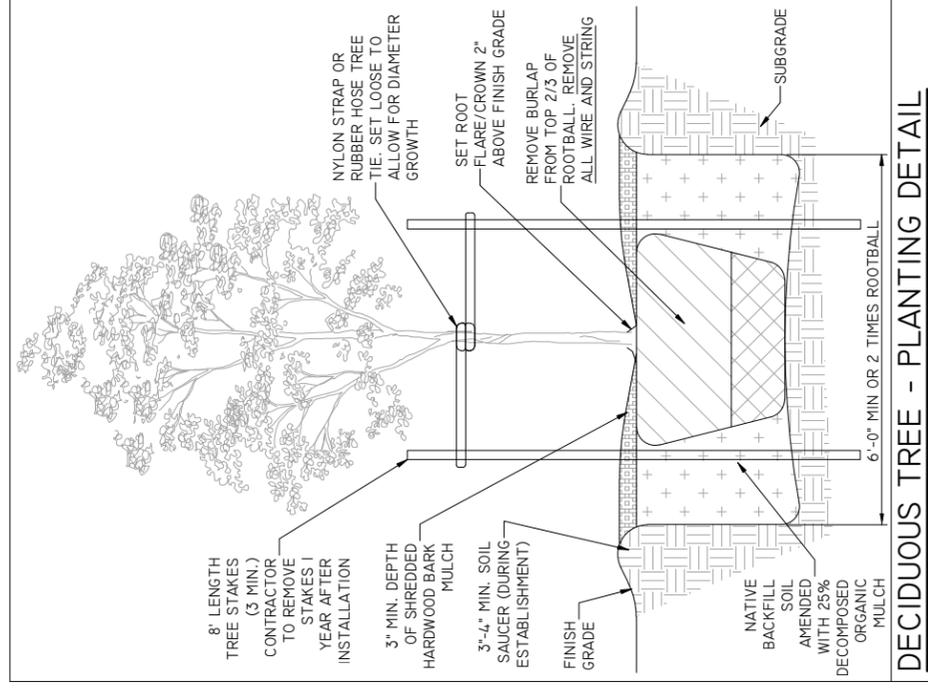
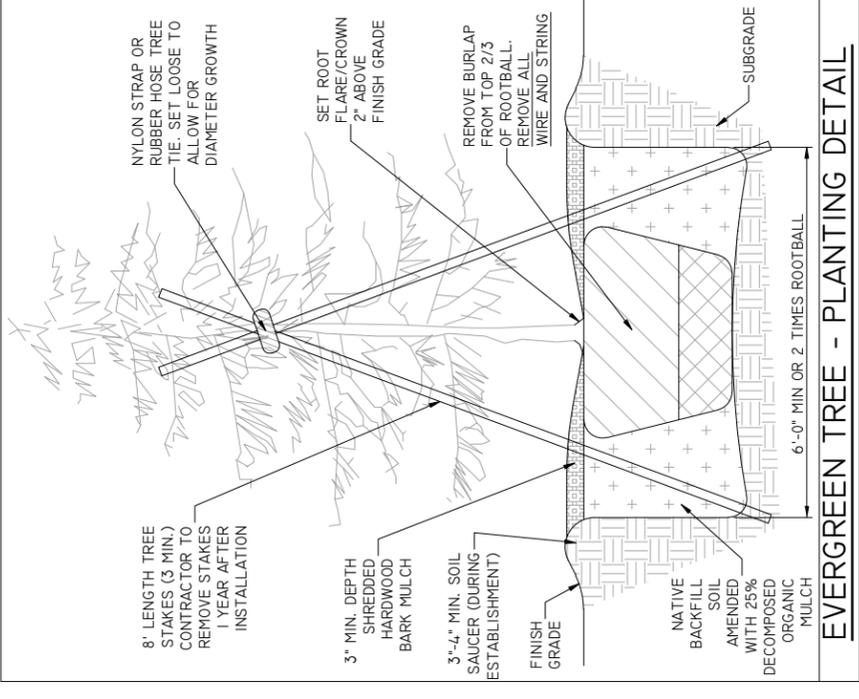
- (A) LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR LOCATING & VERIFYING ALL EXISTING UNDERGROUND UTILITIES PRIOR TO CONSTRUCTION, AND IS RESPONSIBLE FOR ANY DAMAGE TO THEM DURING CONSTRUCTION.
- (B) CALL DIGGERS HOTLINE @ 811 OR 1-800-242-8811 AT LEAST 5 WORKING DAYS PRIOR TO DEMOLITION, EXCAVATION OR ANY CONSTRUCTION ACTIVITY.
- (C) ALL PLANT MATERIAL SHALL BE GUARANTEED ONE (1) FULL YEAR UPON TOTAL COMPLETION OF PROJECT AND ACCEPTANCE BY OWNER. WITH A ONE TIME REPLACEMENT WARRANTY UPON REQUEST BY OWNER. WARRANTY EXPIRES AFTER FIRST FULL YEAR FOLLOWING PROJECT COMPLETION.
- (D) LANDSCAPE CONTRACTOR SHALL VERIFY MINIMUM 6" TOPSOIL DEPTH FOR ALL AREAS TO BE SEEDDED/SODDED THROUGHOUT PROJECT SITE. CONTRACTOR IS REQUIRED TO CORRECT ANY DEFICIENCIES PRIOR TO SEED/SOD. TOPSOIL SHALL BE CLEAN AND FREE OF STONES, WEEDS AND OTHER UNDESIRABLE DEBRIS.
- (E) LANDSCAPE CONTRACTOR SHALL VERIFY MINIMUM 12" PLANTING SOIL DEPTH FOR ALL PROPOSED PLANTING BED AREAS THROUGHOUT THE PROJECT SITE. CONTRACTOR IS REQUIRED TO CORRECT ANY DEFICIENCIES PRIOR TO PLANT INSTALLATION. PLANTING SOIL & AREA SHALL BE CLEAN AND FREE OF STONES, WEEDS, CONCRETE WASTE AND OTHER UNDESIRABLE DEBRIS.
- (F) LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR REPAIRING TOPSOIL AND SEEDING OR SODDING ALL AREAS DISTURBED BY CONSTRUCTION ACTIVITY, INCLUDING ALL R.O.W. AND ADJACENT PROPERTIES.
- (G) CONTRACTOR SHALL CLEAN ALL PAVEMENT AREAS AFTER LANDSCAPE CONSTRUCTION ACTIVITIES ARE COMPLETE AND APPROVED BY OWNER. *THIS TO BE DONE DAILY AS DEEMED NECESSARY BY MUNICIPALITY.

KEYED NOTES

- 1. SOD. *ALL AREAS NOTED ON PLAN & ALL DISTURBED AREAS DUE TO CONSTRUCTION ACTIVITY.
- 2. (90,000 SF TOTAL) AGRECOL. SHORTGRASS PRAIRIE FOR DRY SOILS. APPLY GLYPHOSATE HERBICIDE TO AREA WHEN MAJORITY OF WEEDS ARE 2'-3" TALL. 1) WAIT 10 DAYS THEN FINELY TILL THE SOIL ONLY 1'-2" DOWN AND PLANT IMMEDIATELY BY HAND BROADCASTING AT A RATE OF 11 LBS/ACRE. RAKE OR DRAG AREA LIGHTLY, COVERING THE SEED WITH ABOUT 1/4" TO 3/8" OF SOIL. 2) ROLL AREA FIRMLY AFTER RAKING. MULCH PRAIRIE SEEDS AREAS LESS THAN 4:1 SLOPE WITH 1" OF WEED FREE STRAW MULCH. APPLY WISDOT NET-FREE CLASS 1, URBAN TYPE B EROSION MAT ON SLOPING AREAS STEEPER THAN 4:1. *REFER TO AGRECOL'S "NATIVE SEEDING INSTRUCTIONS" ON THEIR WEBSITE FOR DETAILED INSTRUCTIONS/GUIDELINES FOR SUCCESSFUL SEED ESTABLISHMENT AND MANAGEMENT. (LINK BELOW)
[HTTPS://WWW.AGRECOL.COM/NATIVE-SEEDING-INSTRUCTIONS-EP-44-.HTML](https://www.agrecol.com/NATIVE-SEEDING-INSTRUCTIONS-EP-44-.HTML)
- 3. 6' DIAMETER WOOD MULCH TREE RING, 3'-4" DEPTH, DARK BROWN COLOR. *ALL TREES PLANTED WITHIN SOD AREAS.
- 4. SHREDDED HARDWOOD MULCH, 3'-4" DEPTH, DARK BROWN COLOR.
- 5. DECORATIVE STONE MULCH, 3'-4" ROUND COBBLES, 4"-5" DEPTH, WITH COMMERCIAL GRADE WEED BARRIER FABRIC UNDERLAYMENT.
- 6. SHOVEL CUT EDGE, 4"-5" DEPTH CLEAN CUT EDGE AROUND PLANTING BEDS WITHIN SOD AREAS.
- 7. (25 EA TOTAL) ACCENT BOULDERS, (48" X 18" X 18") LIMESTONE BLOCKS/CUBES, PLAN SYMBOL:

PLANT SCHEDULE

DECIDUOUS TREES	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY
	Fall Fiesta® Sugar Maple	Acer saccharum 'Baillista'	1.5" Cal.	B&B	5
	Swamp White Oak	Quercus bicolor	1.5" Cal.	B&B	13
	Red Oak	Quercus rubra	1.5" Cal.	B&B	8
EVERGREEN TREES	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY
	White Spruce	Picea glauca	3' Ht.	Pot	25
EVERGREEN SHRUBS	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY
	Kallay Compact Pfitzer Juniper	Juniperus chinensis 'Kallays Compact'	3 gal.	Pot	10
PERENNIALS	COMMON NAME	BOTANICAL NAME	SIZE	CONT.	QTY
	Karl Foerster Feather Reed Grass	Calamagrostis x acutiflora 'Karl Foerster'	1 gal.	Pot	30
	Pale Purple Coneflower	Echinacea pallida	1 gal.	Pot	47
	Shenandoah Switch Grass	Panicum virgatum 'Shenandoah'	1 gal.	Pot	38
	Goldsturm Coneflower	Rudbeckia fulgida sultivantii 'Goldsturm'	1 gal.	Pot	11
	Prairie Dropseed	Sporobolus heterolepis	1 gal.	Pot	34



KWIK TRIP STORES

KWIK STAR STORES

KWIK TRIP, Inc.
P.O. BOX 2107
1626 OAK STREET
LA CROSSE, WI 54602-2107
PH. (608) 781-8988
FAX (608) 781-8960

REI
CIVIL & ENVIRONMENTAL ENGINEERING, SURVEYING

REI Engineering, Inc.
4080 N. 20TH AVENUE
WISCONSIN 53190
PHONE: (262) 371-1515, (262) 404-0040
EMAIL: MAIL@REIENGINEERING.COM

LANDSCAPE NOTES, DETAILS & SPECIFICATIONS

CONVENIENCE STORE #1283

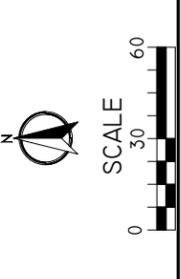
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

DATE: 8/17/23 - REVIEW DOCUMENTS
PROJ. NO.: 10827
SCALE: GRAPHIC
DRAWN BY: NAP
SHEET: SP10.3



KWIK TRIP, Inc.
 P.O. BOX 2107
 1626 OAK STREET
 LA CROSSE, WI 54602-2107
 PH. (608) 781-8988
 FAX (608) 781-8960

REI
CIVIL & ENVIRONMENTAL
ENGINEERING, SURVEYING
REI Engineering, Inc.
 1080 N. 20TH AVENUE
 WAUKESHA, WI 53186-1080
 PHONE: (262) 531-1000
 FAX: (262) 531-0060
 EMAIL: MAIL@REIENGINEERING.COM



PHOTOMETRIC
SITE PLAN
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: XXX
 SCALE: GRAPHIC
 PROJ. NO.: 10827
 DATE: 8/17/23 - REVIEW DOCUMENTS
 SHEET: E1

CALCULATION STATISTICS: FIXTURE QUANTITIES

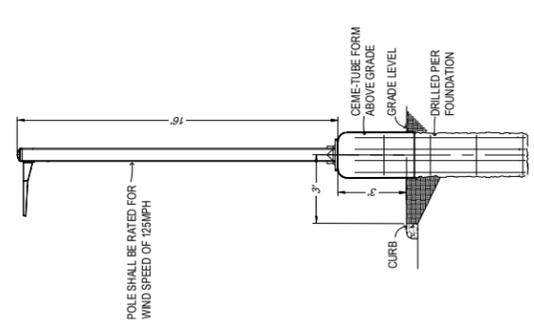
OVERALL SITE:
 AVERAGE: 25
 MAXIMUM: 790
 MINIMUM: 00

TYPE	QUANTITY
D20	46
CF	90
CS	10
CFBK	8
PI3	5
PI3L	3
PIF	13
PIFL	3

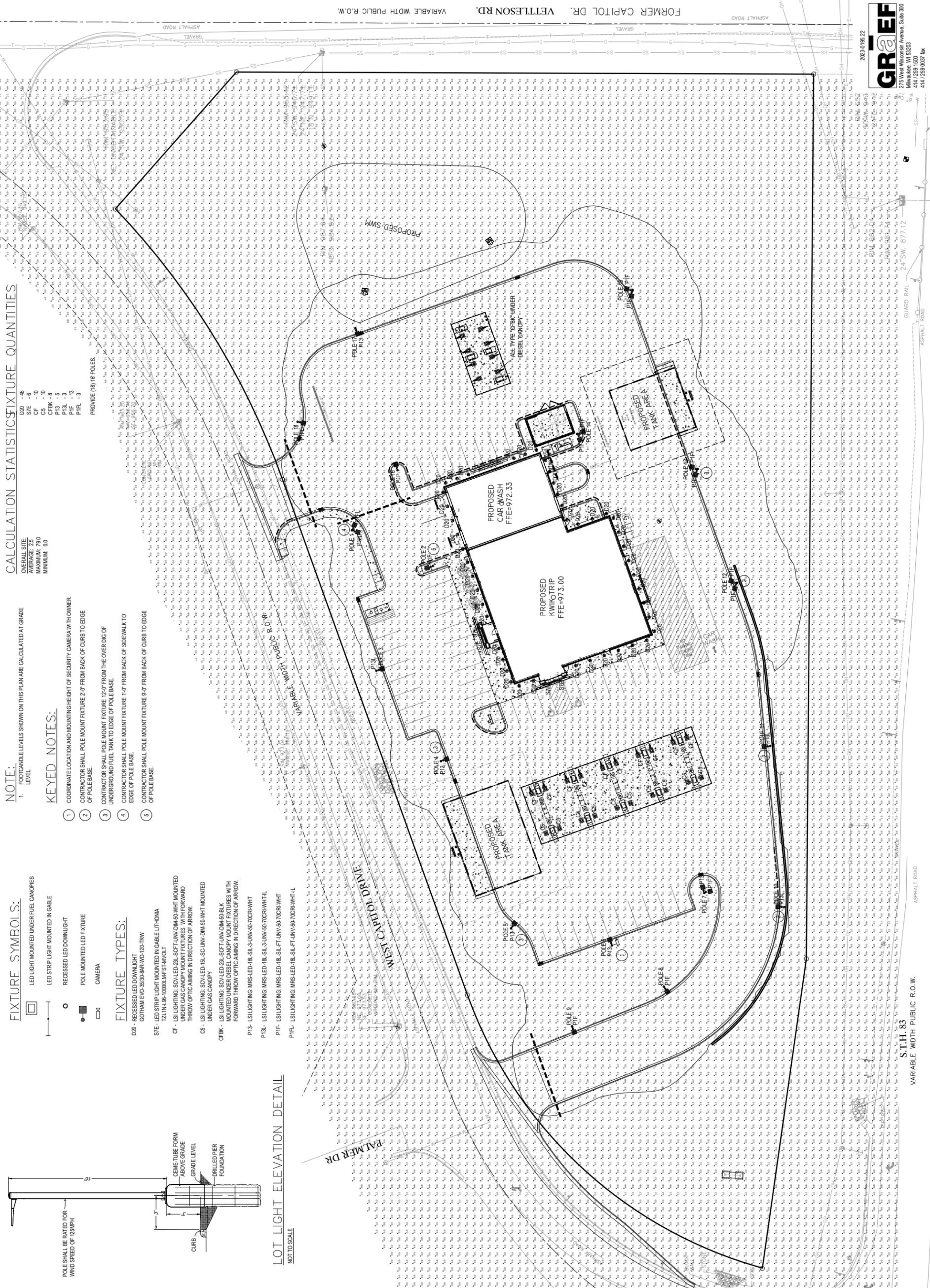
PROVIDE (18) 18 POLES

- NOTE:**
 1. FOOTCANDLE LEVELS SHOWN ON THIS PLAN ARE CALCULATED AT GRADE LEVEL.
- KEYED NOTES:**
- COORDINATE LOCATION AND MOUNTING HEIGHT OF SECURITY CAMERA WITH OWNER.
 - CONTRACTOR SHALL POLE MOUNT FIXTURE 2'-0" FROM BACK OF CURB TO EDGE OF POLE BASE.
 - CONTRACTOR SHALL POLE MOUNT FIXTURE 12'-0" FROM THE OVER DIG OF UNDERGROUND FUEL TANK TO EDGE OF POLE BASE.
 - CONTRACTOR SHALL POLE MOUNT FIXTURE 1'-0" FROM BACK OF SIDEWALK TO EDGE OF POLE BASE.
 - CONTRACTOR SHALL POLE MOUNT FIXTURE 9'-0" FROM BACK OF CURB TO EDGE OF POLE BASE.

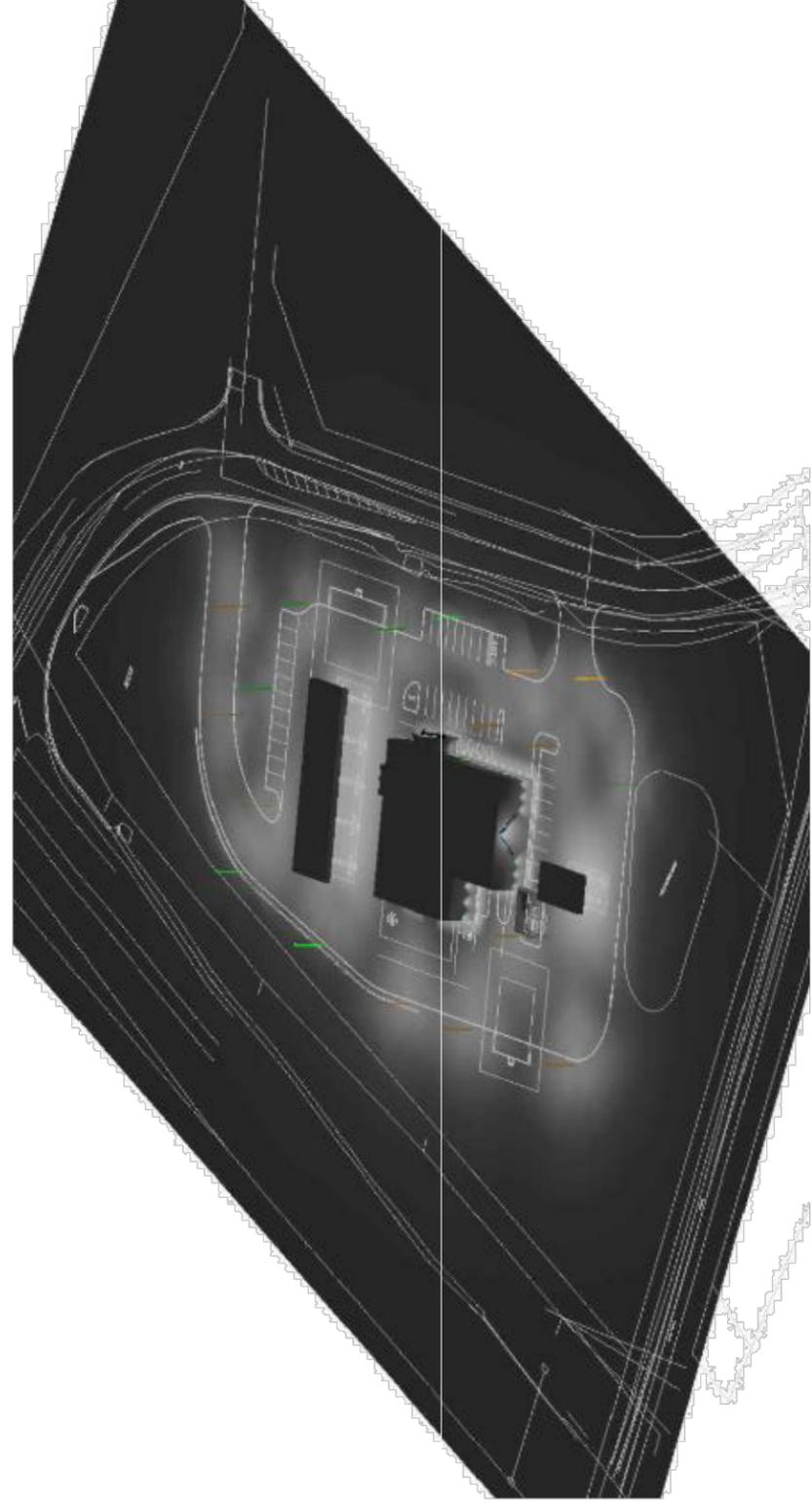
- FIXTURE SYMBOLS:**
- LED LIGHT MOUNTED UNDER FUEL CANOPIES
 - LED STRIP LIGHT MOUNTED IN GABLE
 - RECESSED LED DOWNLIGHT
 - POLE MOUNTED LED FIXTURE
 - CAMERA
- FIXTURE TYPES:**
- D20 - RECESSED LED DOWNLIGHT
 GOTHAM EVO-35-30-BAR-WD-120-TRW
 - SFE - LED STRIP LIGHT MOUNTED IN GABLE LITHONIA
 T21N-L36-1000ULMF-STAWOULT
 - CF - LS LIGHTING: SOV-LED-20L-SOFT-LINV-DIM-50-WHT MOUNTED UNDER GAS CANOPY MOUNT FIXTURES WITH FORWARD THROW OPTIC AIMING IN DIRECTION OF ARROW.
 - CS - LS LIGHTING: SOV-LED-16L-SC-LINV-DIM-50-WHT MOUNTED UNDER GAS CANOPY
 - CFBK - LS LIGHTING: SOV-LED-20L-SOFT-LINV-DIM-50-BLK MOUNTED UNDER DIESEL CANOPY MOUNT FIXTURES WITH FORWARD THROW OPTIC AIMING IN DIRECTION OF ARROW.
 - PI3 - LS LIGHTING: MRS-LED-18L-SIL-3-LINV-50-70CR-WHT
 - PI3L - LS LIGHTING: MRS-LED-18L-SIL-3-LINV-50-70CR-WHTL
 - PIF - LS LIGHTING: MRS-LED-18L-SIL-FT-LINV-50-70CR-WHT
 - PIFL - LS LIGHTING: MRS-LED-18L-SIL-FT-LINV-50-70CR-WHT-L



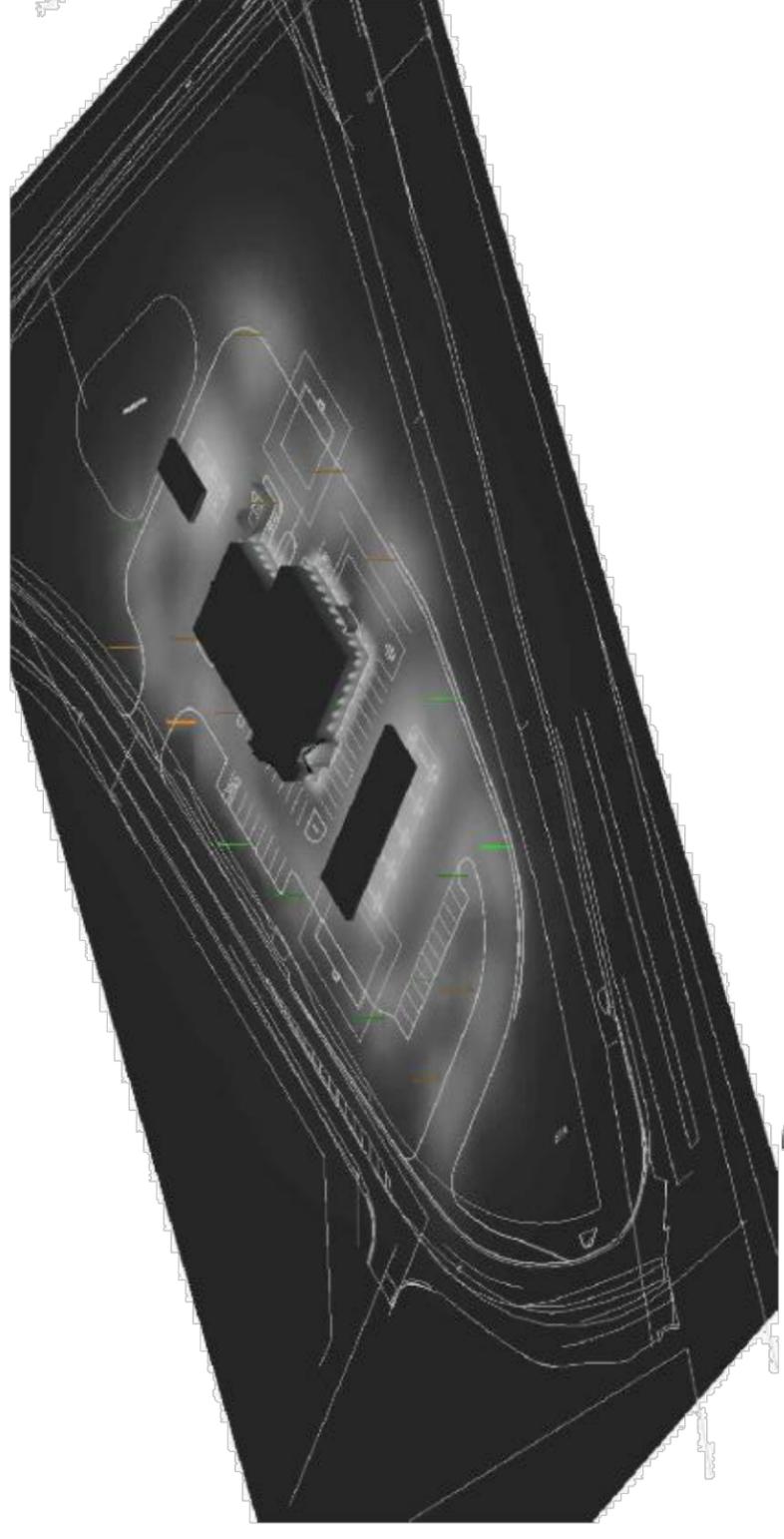
LOT LIGHT ELEVATION DETAIL
 NOT TO SCALE



2023-0106-22
GR&EF
 275 West Wisconsin Avenue, Suite 300
 Milwaukee, WI 53203
 414.259.1500
 414.259.0037 fax



PHOTOMETRIC RENDERING PLAN
NOT TO SCALE



PHOTOMETRIC RENDERING PLAN
NOT TO SCALE

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STORES

KWIK STAR™
STORES

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7080 N. 20TH AVENUE
WILSON, WISCONSIN 53190
PHONE: 262.535.8787 FAX: 262.535.4090
EMAIL: MAIL@REIENGINEERING.COM

SCALE
0 # # # # #

PHOTOMETRIC
RENDERING PLAN
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: XXX
SCALE: GRAPHIC
PROJ. NO.: 10827
DATE: 8/17/23 - REVIEW DOCUMENTS
SHEET: E2

2023-0186.22
GRÄEF
275 West Wisconsin Avenue, Suite 300
Milwaukee, WI 53203
414 / 259 1500
414 / 259 0037 fax

Appendix 1

NR 151 Post Construction Standards

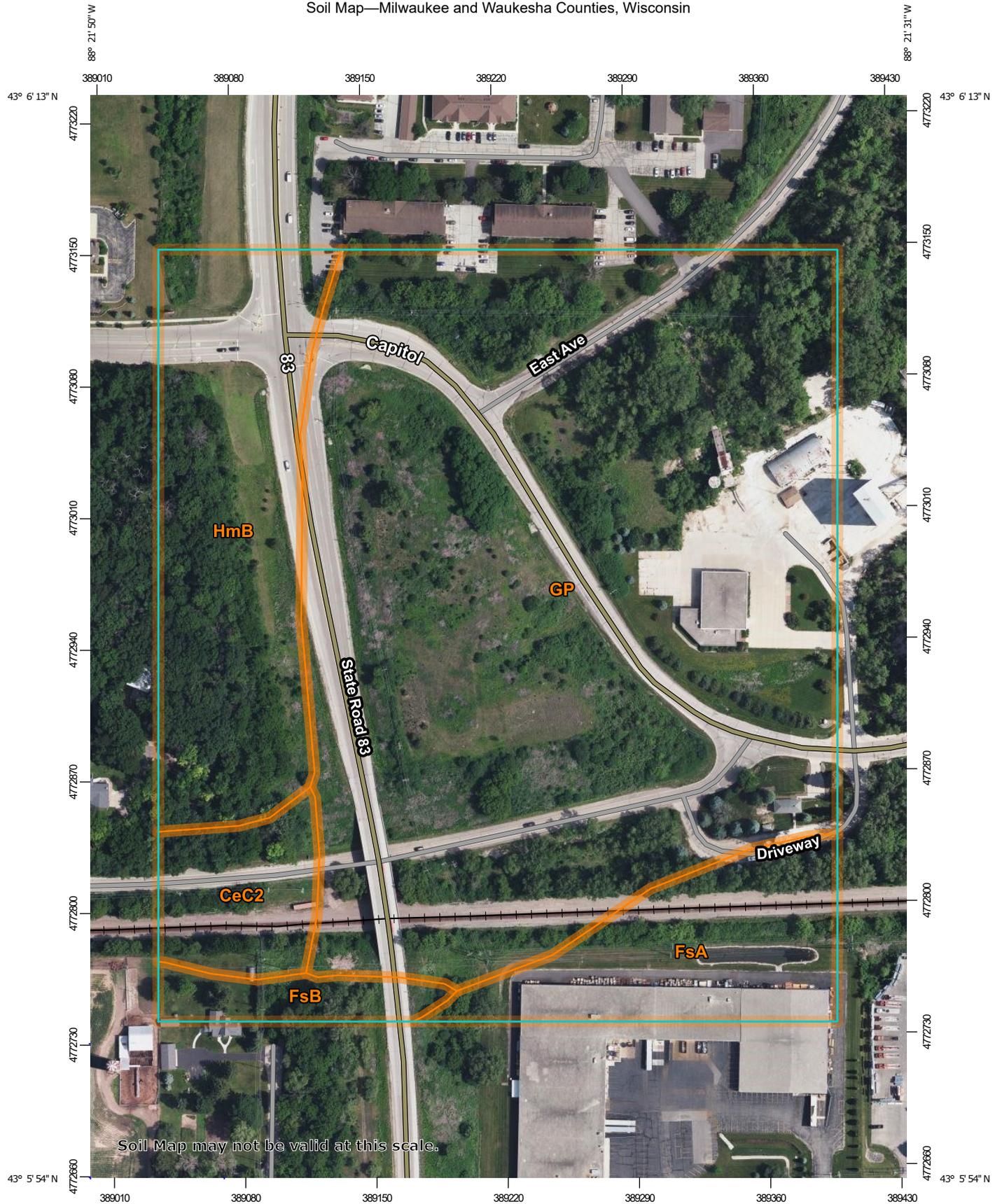


WISCONSIN DNR NR 151 STORMWATER PERFORMANCE STANDARDS APPLICABLE TO PROJECTS WITH ONE OR MORE ACRES OF DISTURBANCE (After January 1, 2011)				
DEVELOPMENT TYPE	TOTAL SUSPENDED SOLIDS (TSS)	PEAK FLOW	INFILTRATION	PROTECTIVE AREA SETBACKS
New Development Infill ≥ 5 ac Redevelopment of Sites Permitted after October 1, 2004 New Transportation Facilities	Reduce by 80% compared to no controls	Peak discharge matches pre-dev. discharge rate for 1-yr and 2-yr, 24-hr storm events	Low Impervious (up to 40% connected - eg parks, cemeteries, low density residential) – infiltrate 90% pre-development infiltration volume, w/ 1% device area cap	75 ft for outstanding resource waters and highly-susceptible wetlands
			Moderate Impervious (up to 40-80% connected - eg single- and multi-family residential, industrial, institutional, office parks) – infiltrate 75% pre-development infiltration volume w/ 2% device area cap	50 ft for lakes, perennial and intermittent streams, and wetlands that are neither classified as highly susceptible nor less susceptible
			High Impervious (Over 80% connected - eg commercial strips, shopping centers, commercial downtown) – infiltrate 60% pre-development infiltration volume w/ 2% device area cap	10-30 feet for less susceptible wetlands based upon average wetland width
			Most New Transportation Facilities (above the local residential classification) are Exempt	10 feet for concentrated flow channels with drainage areas over 130 acres
Infill < 5 acres	Reduce by 40% compared to no controls (80% on/after October 1, 2012)	Exempt	Exempt	Exempt
Highway Reconstruction	Reduce by 40% compared to no controls	Exempt	Exempt	Exempt
Redevelopment of Sites Permitted Prior to October 1, 2004	Reduce parking areas and roads by 40% compared to no controls	Exempt	Exempt	Exempt
Post-Construction Site or Transportation Facility w/ Less than 10% Connected Impervious (assuming cumulative impervious is beneath 1 acre)	Exempt	Exempt	Exempt	Follow as if New Construction

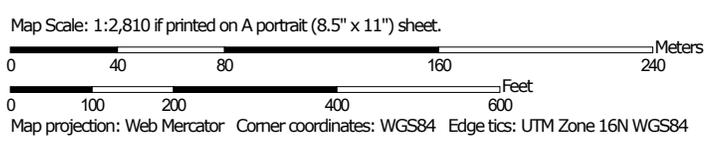
Appendix 2

Site Soils Information

Soil Map—Milwaukee and Waukesha Counties, Wisconsin



Soil Map may not be valid at this scale.



MAP LEGEND

-  Area of Interest (AOI)
-  Soil Map Unit Polygons
-  Soil Map Unit Lines
-  Soil Map Unit Points
- Special Point Features**
-  Blowout
-  Borrow Pit
-  Clay Spot
-  Closed Depression
-  Gravel Pit
-  Gravelly Spot
-  Landfill
-  Lava Flow
-  Marsh or swamp
-  Mine or Quarry
-  Miscellaneous Water
-  Perennial Water
-  Rock Outcrop
-  Saline Spot
-  Sandy Spot
-  Severely Eroded Spot
-  Sinkhole
-  Slide or Slip
-  Sodic Spot

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale. Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin
 Survey Area Data: Version 18, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 6, 2020—Jun 28, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Map Unit Legend

Map Unit Symbol	Map Unit Name	Acres in AOI	Percent of AOI
CeC2	Casco loam, 6 to 12 percent slopes, eroded	1.7	4.6%
FsA	Fox silt loam, 0 to 2 percent slopes	3.2	8.8%
FsB	Fox silt loam, 2 to 6 percent slopes	0.9	2.5%
GP	Gravel pit	25.0	67.7%
HmB	Hochheim loam, 2 to 6 percent slopes	6.1	16.4%
Totals for Area of Interest		36.9	100.0%

Milwaukee and Waukesha Counties, Wisconsin

GP—Gravel pit

Map Unit Setting

National map unit symbol: sjky

Elevation: 660 to 980 feet

Mean annual precipitation: 31 to 35 inches

Mean annual air temperature: 43 to 46 degrees F

Frost-free period: 110 to 150 days

Farmland classification: Not prime farmland

Map Unit Composition

Pits, gravel: 99 percent

Minor components: 1 percent

Estimates are based on observations, descriptions, and transects of the mapunit.

Description of Pits, Gravel

Setting

Parent material: Gravelly outwash

Typical profile

H1 - 0 to 10 inches: stratified extremely gravelly coarse sand to very gravelly sand

Interpretive groups

Land capability classification (irrigated): None specified

Land capability classification (nonirrigated): 8s

Other vegetative classification: Not Assigned (other map units)
(Noth)

Hydric soil rating: Unranked

Minor Components

Aquents

Percent of map unit: 1 percent

Landform: Depressions

Landform position (three-dimensional): Dip

Ecological site: F090AY004WI - Loamy Floodplain

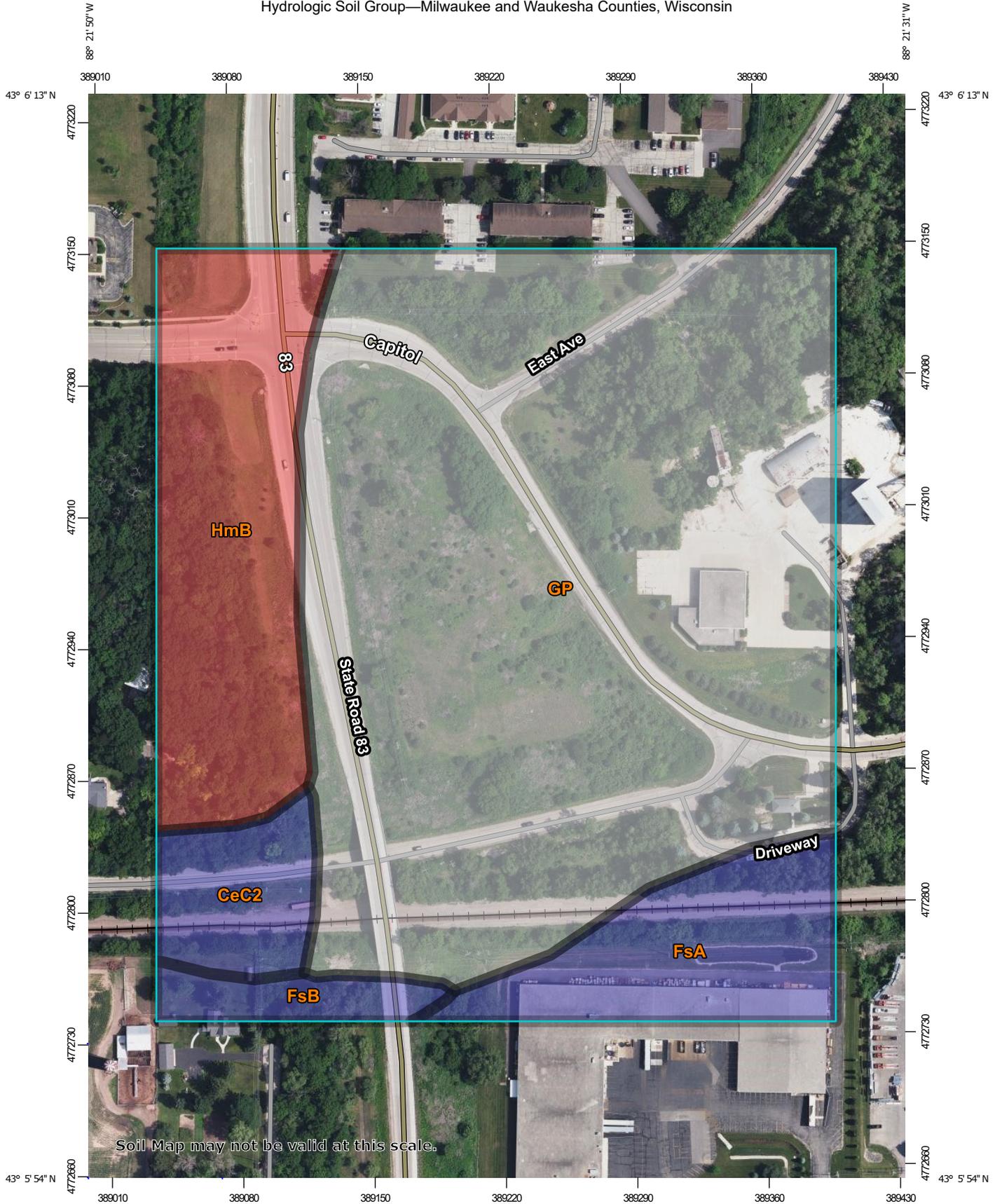
Hydric soil rating: Yes

Data Source Information

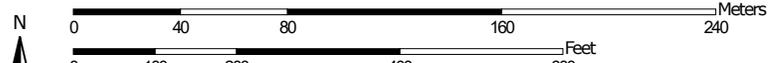
Soil Survey Area: Milwaukee and Waukesha Counties, Wisconsin

Survey Area Data: Version 18, Sep 7, 2022

Hydrologic Soil Group—Milwaukee and Waukesha Counties, Wisconsin



Map Scale: 1:2,810 if printed on A portrait (8.5" x 11") sheet.



Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 16N WGS84



MAP LEGEND

Area of Interest (AOI)
 Area of Interest (AOI)

Soils

Soil Rating Polygons

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Lines

-  A
-  A/D
-  B
-  B/D
-  C
-  C/D
-  D
-  Not rated or not available

Soil Rating Points

-  A
-  A/D
-  B
-  B/D

-  C
 -  C/D
 -  D
 -  Not rated or not available
- Water Features**
-  Streams and Canals
- Transportation**
-  Rails
 -  Interstate Highways
 -  US Routes
 -  Major Roads
 -  Local Roads
- Background**
-  Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:15,800.

Warning: Soil Map may not be valid at this scale.
 Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
 Web Soil Survey URL:
 Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

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 Survey Area Data: Version 18, Sep 7, 2022

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 6, 2020—Jun 28, 2020

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
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FsA	Fox silt loam, 0 to 2 percent slopes	B	3.2	8.8%
FsB	Fox silt loam, 2 to 6 percent slopes	B	0.9	2.5%
GP	Gravel pit		25.0	67.7%
HmB	Hochheim loam, 2 to 6 percent slopes	D	6.1	16.4%
Totals for Area of Interest			36.9	100.0%

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

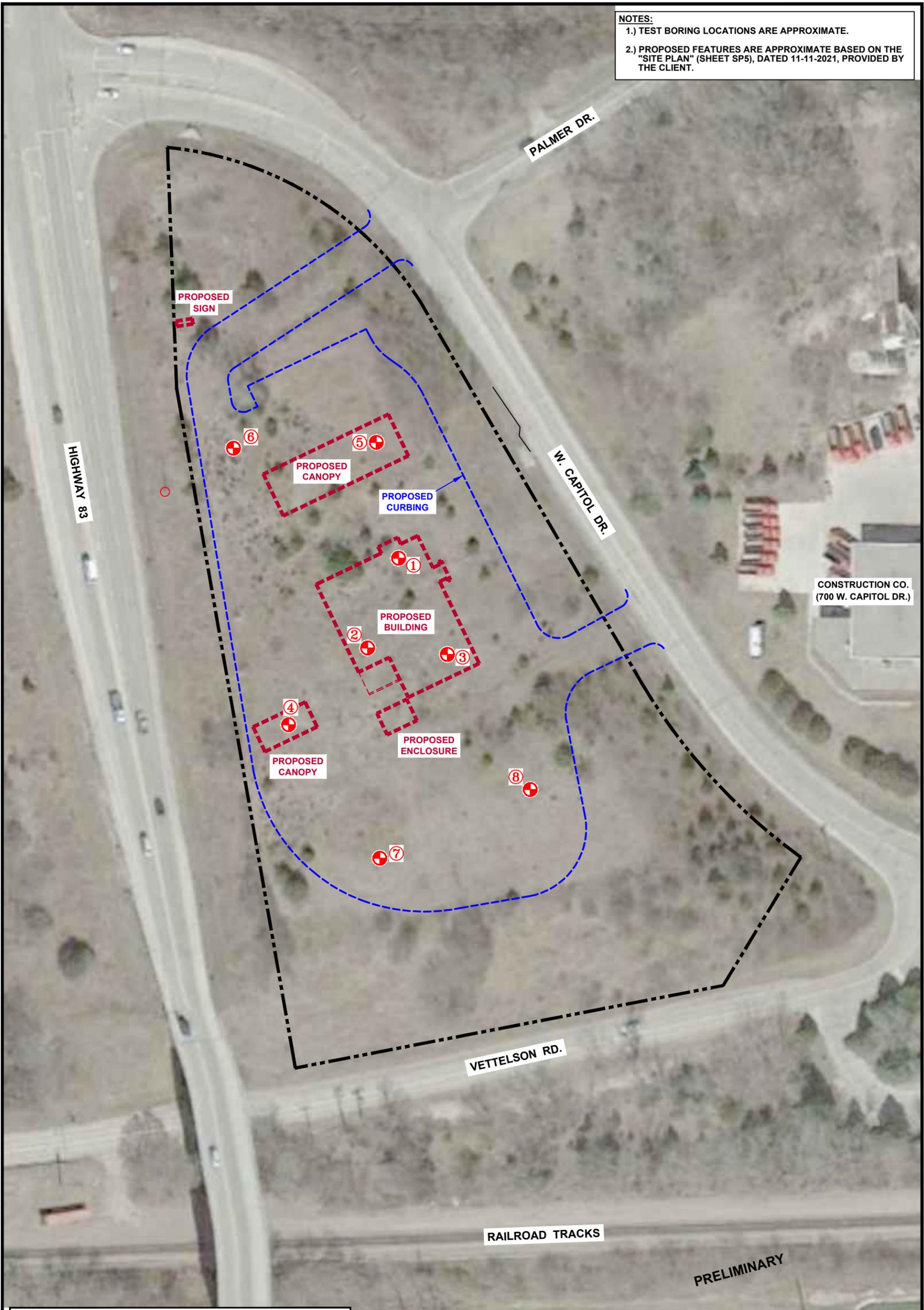
Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

NOTES:
 1.) TEST BORING LOCATIONS ARE APPROXIMATE.
 2.) PROPOSED FEATURES ARE APPROXIMATE BASED ON THE "SITE PLAN" (SHEET SP5), DATED 11-11-2021, PROVIDED BY THE CLIENT.



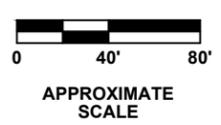
CONSTRUCTION CO.
(700 W. CAPITOL DR.)

PRELIMINARY

GILES ENGINEERING ASSOCIATES, INC.
 N8 W22350 JOHNSON DRIVE, SUITE A1
 WAUKESHA, WI 53186 (262)544-0118
 www.gilesengr.com

FIGURE 1
 TEST BORING LOCATION PLAN
 PROPOSED KWIK TRIP
 SEC OF HIGHWAY 83 AND W. CAPITOL DRIVE
 HARTLAND, WISCONSIN

DESIGNED	DRAWN	SCALE	DATE	REVISED
AJG	<i>Giles</i>	approx. 1"=80'	03-11-22	--
PROJECT NO.: 1G-2202025			CAD No. 1g2202025-blp	

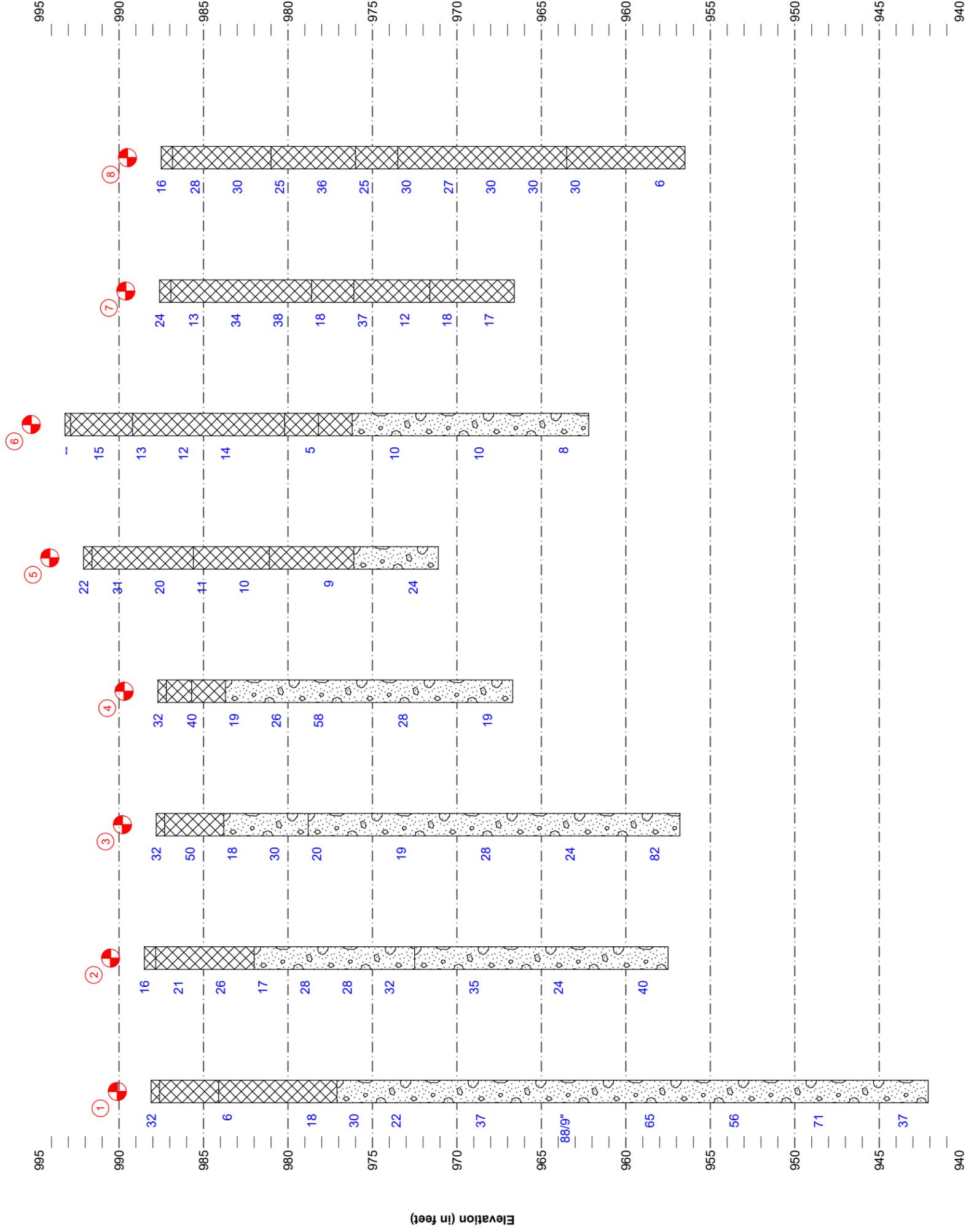


LEGEND:

	GEOTECHNICAL TEST BORING
	PROPERTY LINE
	ELECTRIC POLE

FENCE DIAGRAM

SCALE: VERTICAL: 1" = 6.67'
HORIZONTAL: N.T.S.



Unless otherwise specified, the blows per foot at the locations indicated are based on driving a 2" O.D. x 1.4" I.D. split spoon sampler with a 140# hammer having a free fall of 30". The blow count is taken in undisturbed soil immediately below a cased or open hole eliminating side friction on the drive pipe.

MATERIAL SYMBOLS

- FILL - Fill (made ground)
- SPG - USCS Poorly-graded Gravelly Sand

FIGURE 2
Proposed Kwik Trip
W. Capitol Drive
Hartland, Wisconsin
Project No. 1G-2202025



NOTES:

BORING NO. & LOCATION: 1	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 988.1 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±6" Topsoil Fill: Dark Brown Silty fine to medium Sand, little Organic Matter, trace Gravel-Moist			1-SS	32					*BDL	
Fill: Brown Gravelly Sand, trace Silt-Moist			2-SS	6				17	*BDL	
Fill: Brown Silty fine Sand, trace Gravel-Moist		980	3-SS	18					*BDL	
Brown Gravelly Sand, trace Silt (Includes Cobbles and Boulders)-Moist			4-SS	30					*BDL	
			5-SS	22					*BDL	
		970	6-SS	37					*BDL	
			7-SS	88/9"					*BDL	
		960	8-SS	65					*BDL	
			9-SS	56					*BDL	
		950	10-SS	71					*BDL	
		40	11-SS	37					*BDL	

Boring Terminated at about 46 feet (EL. 942.1')

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT: 1G2202025.GPJ GILES.GDT 3/15/22

BORING NO. & LOCATION: 2	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 988.5 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±8" Topsoil Fill: Dark Brown Silty fine Sand, little Organic Matter, trace Gravel-Moist Fill: Dark Brown Gravelly Silty Sand, trace Clay-Moist			1-SS	16					*BDL	
			2-SS	21					*BDL	
			3-SS	26					*BDL	
Brown Gravelly Sand, trace Silt (Includes Cobbles and Boulders)-Moist		980	4-SS	17					*BDL	
	10		5-SS	28					*BDL	
			6-SS	28					*BDL	
			7-SS	32					*BDL	
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist		970	8-SS	35					*BDL	
	20		9-SS	24					*BDL	
		960	10-SS	40					*BDL	

Boring Terminated at about 31 feet (EL. 957.5')

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT: 1G2202025.GPJ GILES.GDT 3/15/22

BORING NO. & LOCATION: 3	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 987.8 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±6" Topsoil Fill: Dark Brown Silty fine Sand, little Organic Matter, trace Gravel-Moist			1-SS	32						*BDL
Fill: Dark Brown and Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist			2-SS	50						*BDL
			3-SS	18						*BDL
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist		980	4-SS	30						*BDL
			5-SS	20						*BDL
Brown Gravelly Sand, trace Silt (Includes Cobbles and Boulders)-Moist			6-SS	19						*BDL
		970	7-SS	28						*BDL
			8-SS	24						*BDL
		960	9-SS	82						*BDL
		30								

Boring Terminated at about 31 feet (EL. 956.8')

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT: 1G2202025.GPJ GILES.GDT 3/15/22

BORING NO. & LOCATION: 4	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 987.7 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±6" Topsoil Fill: Dark Brown Silty fine Sand, trace Organic Matter and Gravel-Moist			1-SS	32						*BDL
Fill: Brown Gravelly Sand, trace Silt (Includes Cobbles and Boulders)-Moist			2-SS	40						*BDL
Fill: Dark Brown Silty fine Sand, trace Gravel-Moist			3-SS	19						*BDL
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist		980	4-SS	26						*BDL
	10		5-SS	58						*BDL
		970	6-SS	28						*BDL
	20		7-SS	19						*BDL

Boring Terminated at about 21 feet (EL. 966.7')

PRELIMINARY

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

BORING NO. & LOCATION: 5	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 992.1 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±6" Topsoil Fill: Dark Brown Silty fine Sand, trace Gravel and Organic Matter-Moist			1-SS	22					*BDL	±16" Frost
Fill: Brown and Dark Brown Silty fine to medium Sand, trace Gravel-Moist			2-SS	31					*BDL	
			3-SS	20		4.5		13	*BDL	
Fill: Brown Sandy Silt, trace Gravel and Clay-Moist			4-SS	11					*BDL	
			5-SS	10		2.3		21	*BDL	
Fill: Dark Brown and Gray Silty Clay, little Sand-Moist			6-SS	9				22	*BDL	
			7-SS	24					*BDL	

Boring Terminated at about 21 feet (EL. 971.1')

PRELIMINARY

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

BORING NO. & LOCATION: 6	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 993.2 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±4" Topsoil Fill: Dark Brown Sandy Silt, little Organic Matter, trace Gravel-Moist			1-AU	--						*BDL
Fill: Brown Sandy Silt, trace Clay-Moist		990	2-SS	15						*BDL
Fill: Brown Silty fine Sand-Moist			3-SS	13						*BDL
			4-SS	12						*BDL
	10		5-SS	14						*BDL
Fill: Brown Silty Clay with Sandy Silt lenses-Wet		980	6-SS	5		1.3		26		*BDL
Fill: Dark Gray Sandy Silt-Wet										
Brown Gravelly Silty Sand (Includes Cobbles and Boulders)-Moist to Wet at ±21 feet	20		7-SS	10						*BDL
		970	8-SS	10				10		*BDL
	30		9-SS	8				10		*BDL

Boring Terminated at about 31 feet (EL. 962.2')

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT: 1G2202025.GPJ GILES.GDT 3/15/22

BORING NO. & LOCATION: 7	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 987.6 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±8" Topsoil Fill: Dark Brown Silty fine Sand, little Organic Matter-Moist Fill: Brown and Dark Silty fine to medium Sand, trace Gravel (Includes Wood Debris)-Moist			1-SS	24					*BDL	
			2-SS	13					*BDL	
			3-SS	34				13	*BDL	
		980	4-SS	38					*BDL	
Fill: Gray Silty Clay, little Sand, trace Gravel-Moist		10	5-SS	18					*BDL	
Fill: Brown Silty Clay with Sandy Silt lenses (Includes Wood Debris, Metal Debris and Cinders)-Moist			6-SS	37					*BDL	
			7-SS	12					*BDL	
Possible Fill: Brown Silty Clay, little Sand-Very Moist		970	8-SS	18				17	*BDL	
	20		9-SS	17		4.3		19	*BDL	

Boring Terminated at about 21 feet (EL. 966.6')

PRELIMINARY

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

BORING NO. & LOCATION: 8	<h1>TEST BORING LOG</h1>	 GILES ENGINEERING ASSOCIATES, INC.	
SURFACE ELEVATION: 987.5 feet			PROPOSED KWIK TRIP
COMPLETION DATE: 03/02/22			W. CAPITOL DRIVE HARTLAND, WISCONSIN
FIELD REP: KEITH FLOWERS			PROJECT NO: 1G-2202025

MATERIAL DESCRIPTION	Depth (ft)	Elevation	Sample No. & Type	N	Q _u (tsf)	Q _p (tsf)	Q _s (tsf)	W (%)	PID	NOTES
±8" Topsoil Fill: Dark Brown Silty fine Sand, trace Organic Matter and GravelMoist Fill: Brown Silty fine Sand, trace Gravel-Moist			1-SS	16						*BDL
			2-SS	28						*BDL
Fill: Dark Gray Sandy Clay, trace Gravel-Moist			3-SS	30						*BDL
		980	4-SS	25						*BDL
Fill: Gray Silty fine to medium Sand, trace Gravel-Moist			5-SS	36						*BDL
			6-SS	25						*BDL
Fill: Brown and Gray Silty fine Sand with Sandy Silt lenses, trace Gravel (Includes Cinders and Metal Debris)-Moist			7-SS	30						*BDL
		970	8-SS	27						*BDL
Possible Fill: Gray Sandy Silt-Wet			9-SS	30						*BDL
			10-SS	30						*BDL
			11-SS	30						*BDL
		960								
	30		12-SS	6						*BDL

Boring Terminated at about 31 feet (EL. 956.5')

Water Observation Data		Remarks:
	Water Encountered During Drilling:	*PID Results are lab screened results that may reflect differently from field screened results.
	Water Level At End of Drilling:	
	Cave Depth At End of Drilling:	
	Water Level After Drilling:	
	Cave Depth After Drilling:	

Changes in strata indicated by the lines are approximate boundary between soil types. The actual transition may be gradual and may vary considerably between test borings. Location of test boring is shown on the Boring Location Plan.

GILES LOG REPORT: 1G2202025.GPJ GILES.GDT 3/15/22



Attachment 2:

SOIL AND SITE EVALUATION – STORM

In accordance with SPS 382.365, 385, Wis. Adm. Code, and WDNR Standard 1002

Attach a complete site plan on paper not less than 8 ½ x 11 inches in size. Plan must include, but not limited to: vertical and horizontal reference point (BM), direction and percent of slope, scale or dimensions, north arrow, and BM referenced to nearest road Please print all information Personal information you provide may be used for secondary purposes [Privacy Law, s. 15.04(1)(m)]		County Waukesha	
		Parcel I.D.	
		Reviewed by: Date:	
Property Owner		Property Location Govt. Lot NW ¼ NW ¼ Section 3 T7N R18E	
Property Owner' Mail Address		Lot #	Block # Subd. Name or CSM #
City	State Zip Code	Phone Number	City <input checked="" type="checkbox"/> Village <input type="checkbox"/> Town Nearest Road Hartland W. Capitol Drive
Drainage area _____ sq. ft. _____ acres Test site suitable for (check all that apply) <input type="checkbox"/> Site not suitable: <input type="checkbox"/> Bioretention <input type="checkbox"/> Subsurface Dispersal System: <input type="checkbox"/> Reuse: <input type="checkbox"/> Irrigation: <input type="checkbox"/> Other:		Hydraulic Application Test Method <input checked="" type="checkbox"/> Morphological Evaluation <input type="checkbox"/> Double Ring Infiltrometer <input type="checkbox"/> Other: (specify)	
		Soil Moisture Date of soil borings: USDA-NRCS WETS Value: <input type="checkbox"/> Dry = 1; <input type="checkbox"/> Normal = 2; <input type="checkbox"/> Wet = 3	

1	#OBS. <input type="checkbox"/>	Pit <input type="checkbox"/>	<input checked="" type="checkbox"/> Boring	Ground surface elevation <u>988.1</u> ft.	Elevation of limiting factor _____ ft.					
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr
FILL	0-6	10YR 3/3	--	LS	1, F, GR	M, FR	A-S	10%	15%	--
FILL	6-48	10YR 5/4	--	GR S	1, M, GR	M, FI	G-S	35%	10%	--
FILL	48-132	10YR 5/4	--	LS	1, F, GR	M, FI	G-S	10%	15%	--
C	132-552	10YR 5/4	--	GR S	1, M, GR	M, FI	--	35%	10%	3.60
Comments:										

2	#OBS. <input type="checkbox"/>	Pit <input type="checkbox"/>	<input checked="" type="checkbox"/> Boring	Ground surface elevation <u>988.5</u> ft.	Elevation of limiting factor _____ ft.					
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr
FILL	0-8	10YR 3/3	--	LS	1, F, GR	M, FR	A-S	10%	15%	--
FILL	8-78	10YR 5/4	--	GR LS	1, M, GR	M, FI	G-S	35%	15%	--
B/C	78-192	10YR 5/4	--	GR S	1, F, GR	M, FI	G-S	35%	10%	3.60
C	192-372	10YR 5/4	--	GR LS	MA	M, FI	--	35%	15%	1.63
Comments:										

Name (Please Print) Benjamin M. Stark, P.E.	Signature 	Credential Number Soil Tester: SP-111600001 P.E. No.: 48164-6
Address N8 W22350 Johnson Drive, Waukesha, WI	Date Evaluation Conducted March 2, 2022	Telephone Number 262-544-0118

<input type="text" value="3"/>	#OBS.	<input type="text"/>	Pit	<input checked="" type="checkbox"/>	Boring	Ground surface elevation	<u>987.8</u>	ft.	Elevation of limiting factor	<u> </u>	ft.
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr	
FILL	0-6	10YR 3/3	--	LS	1, F, GR	M, FR	A-S	10%	15%	--	
FILL	6-48	10YR 3/3	--	GR LS	1, M, GR	M, FI	G-S	35%	15%	--	
B/C	48-108	10YR 5/4	--	GR LS	1, F, GR	M, FI	G-S	35%	15%	1.63	
C	108-372	10YR 5/4	--	GR S	MA	M, FI	--	35%	10%	3.60	
Comments:											

<input type="text" value="4"/>	#OBS.	<input type="text"/>	Pit	<input checked="" type="checkbox"/>	Boring	Ground surface elevation	<u>987.7</u>	ft.	Elevation of limiting factor	<u> </u>	ft.
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr	
FILL	0-6	10YR 3/3	--	LS	1, F, GR	M, FR	A-S	10%	15%	--	
FILL	6-24	10YR 5/4	--	GR S	1, F, GR	M, FI	G-S	35%	10%	--	
FILL	24-48	10YR 3/3	--	LS	1, F, GR	M, FI	G-S	10%	15%	--	
C	48-252	10YR 5/4	--	GR LS	MA	M, FI	--	35%	15%	1.63	
Comments:											

<input type="text" value="5"/>	#OBS.	<input type="text"/>	Pit	<input checked="" type="checkbox"/>	Boring	Ground surface elevation	<u>992.1</u>	ft.	Elevation of limiting factor	<u> </u>	ft.
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr	
FILL	0-6	10YR 3/3	--	LS	1, F, GR	M, FR	A-S	10%	15%	--	
FILL	6-78	10YR 5/4	--	LS	MA	M, FI	G-S	10%	15%	--	
FILL	78-132	10YR 5/4	--	SL	1, F, GR	M, FI	C-S	10%	30%	--	
FILL	132-192	10YR 3/3	--	SICL	1, F, SBK	M, FI	C-S	<5%	85%	--	
C	192-252	10YR 5/4	--	GR LS	MA	M, FI	--	35%	15%	1.63	
Comments:											

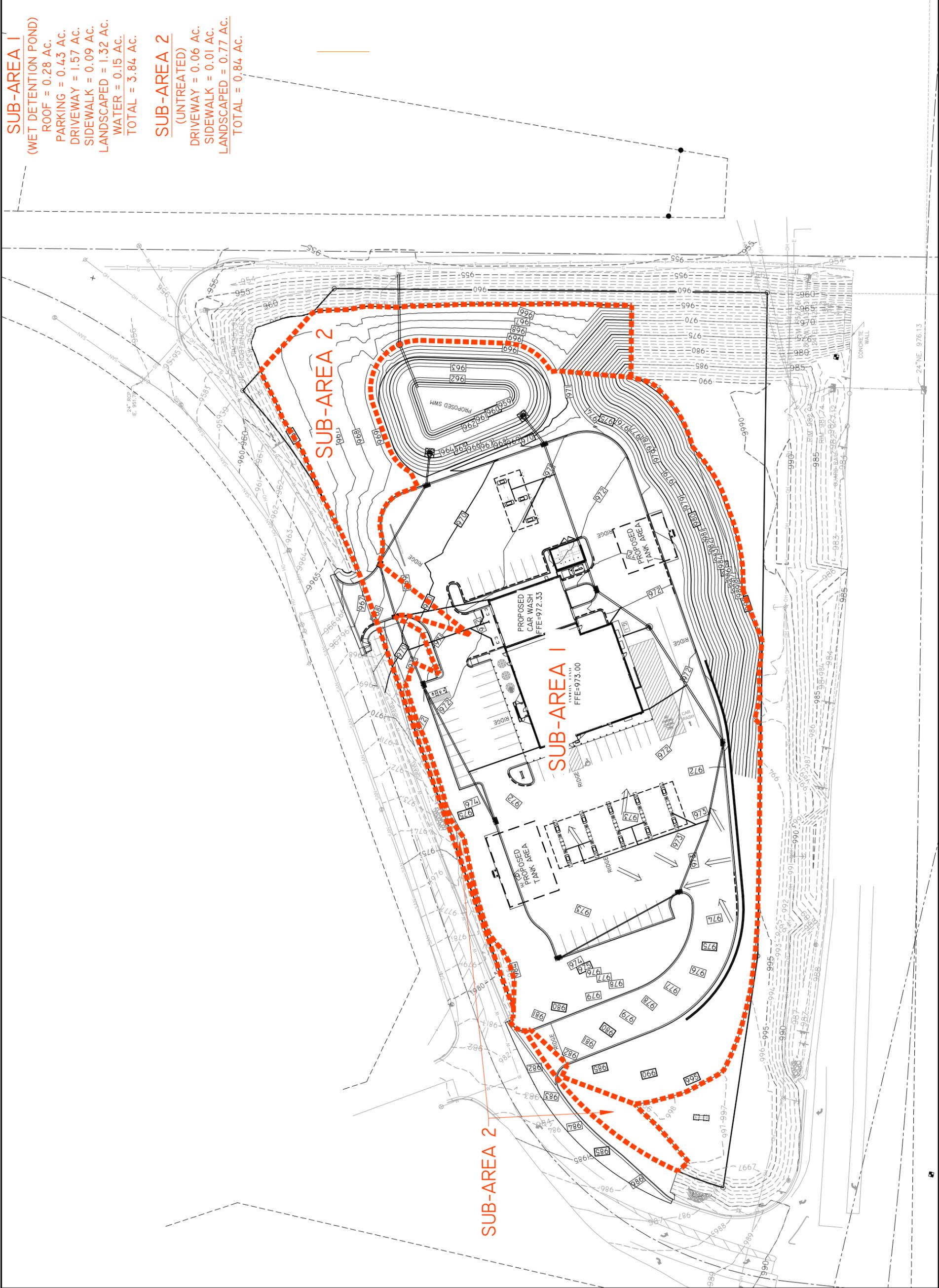
<input type="text" value="6"/>	#OBS.	<input type="text"/>	Pit	<input checked="" type="checkbox"/>	Boring	Ground surface elevation	<u>993.2</u>	ft.	Elevation of limiting factor	<u> </u>	ft.
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr	
FILL	0-4	10YR 3/3	--	SL	1, F, GR	M, FR	A-S	10%	15%	--	
FILL	4-48	10YR 5/4	--	SL	1, F, GR	M, FI	C-S	<5%	30%	--	
FILL	48-138	10YR 5/4	--	LS	1, F, GR	M, FI	C-S	<5%	15%	--	
FILL	138-168	10YR 5/4	--	SICL	MA	M, FI	C-S	<5%	85%	-	
FILL	168-204	10YR 3/1	--	SL	MA	M, FI	C-S	<5%	30%	--	
C	204-372	10YR 5/4	--	GR LS	MA	M, FI	--	35%	15%	1.63	
Comments:											

<input type="text" value="7"/>	#OBS.	<input type="text"/>	Pit	<input checked="" type="checkbox"/>	Boring	Ground surface elevation	<u>987.6</u>	ft.	Elevation of limiting factor	<u> </u>	ft.
Horizon	Depth in.	Dominant Color Munsell	Redox Description Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr	
FILL	0-8	10YR 3/3	--	SL	1, F, GR	M, FR	A-S	<5%	15%	--	
FILL	8-108	10YR 5/4	--	LS	1, F, GR	M, FI	C-S	10%	15%	--	
FILL	108-138	10YR 5/1	--	SICL	1, F, GR	M, FI	C-S	10%	85%	--	
FILL	138-192	10YR 5/4	--	SICL	MA	M, FI	C-S	<5%	80%	-	
FILL	192-252	10YR 5/4	--	SICL	MA	M, FI	C-S	<5%	85%	--	
Comments:											

<input type="text" value="8"/>	#OBS. <input type="text"/>	Pit <input type="text" value="x"/>	Boring	Ground surface elevation	<u>987.5</u>	ft.	Elevation of limiting factor				ft.
Horizon	Depth in.	Dominant Color Munsell	Redox Description	Qu. Sz. Cont. Color	Texture	Structure Gr. Sz. Sh.	Consistence	Boundary	% Rock Frags.	% Fines	Hydraulic App Rate inches/Hr
FILL	0-8	10YR 3/3	--		SL	1, F, GR	M, FR	A-S	10%	15%	--
FILL	8-78	10YR 5/4	--		LS	1, F, GR	M, FI	C-S	10%	15%	--
FILL	78-138	10YR 3/1	--		SCL	1, F, GR	M, FI	C-S	10%	55%	--
FILL	138-168	10YR 5/1	--		LS	MA	M, FI	C-S	10%	15%	-
FILL	168-264	10YR 5/4	--		LS	MA	M, FI	C-S	10%	15%	--
FILL	264-372	10YR 5/1	--		SL	MA	M, FI	C--	<5%	30%	--
Comments:											

Appendix 3

Water Quality Calculations & WinSLAMM Inputs



- SUB-AREA 1**
(WET DETENTION POND)
ROOF = 0.28 AC.
PARKING = 0.43 AC.
DRIVEWAY = 1.57 AC.
SIDEWALK = 0.09 AC.
LANDSCAPED = 1.32 AC.
WATER = 0.15 AC.
TOTAL = 3.84 AC.
- SUB-AREA 2**
(UNTREATED)
DRIVEWAY = 0.06 AC.
SIDEWALK = 0.01 AC.
LANDSCAPED = 0.77 AC.
TOTAL = 0.84 AC.



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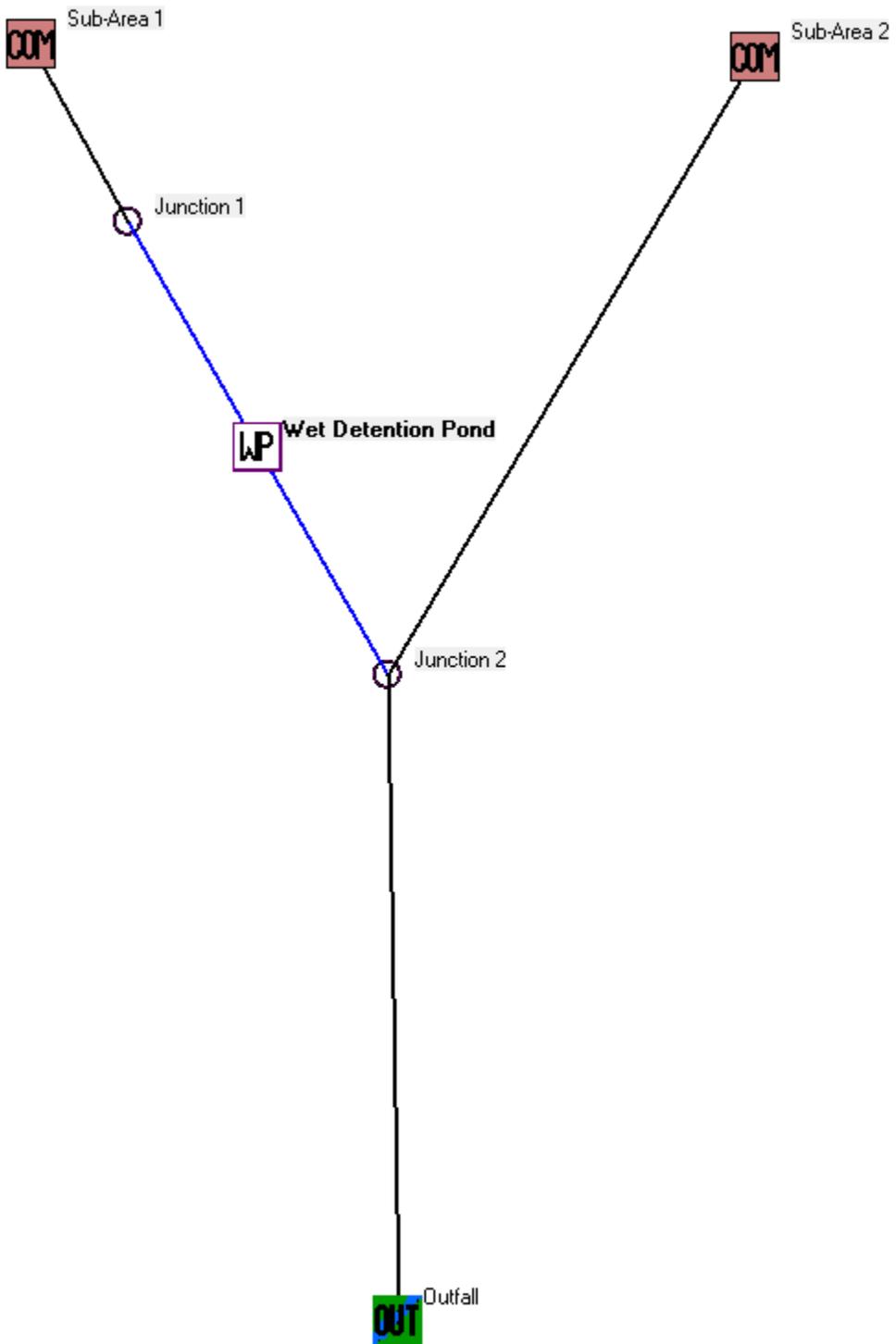


WATER QUALITY WATERSHED AREAS
CONVENIENCE STORE #1283
STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: NAP
SCALE: GRAPHIC
PROJ. NO.: 10827
DATE: 8/17/23 - REVIEW DOCUMENTS
SHEET: STM-1

SITE TSS REMOVAL WINSLamm INPUT



Data file name: Q:\10800 - 10899\10827 - Kwik Trip #1283 - Hartland\Engineer\Stormwater Modeling\WinSLAMM\10827-Water Quality Analysis.mdb
WinSLAMM Version 10.5.0

Rain file name: C:\WinSLAMM Files\Rain Files\WisReg - Milwaukee WI 1969.RAN
Particulate Solids Concentration file name: C:\WinSLAMM Files\v10.1 WI_AVG01.pscx
Runoff Coefficient file name: C:\WinSLAMM Files\WI_SL06 Dec06.rsvx
Residential Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Institutional Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Commercial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Industrial Street Delivery file name: C:\WinSLAMM Files\WI_Com Inst Indust Dec06.std
Other Urban Street Delivery file name: C:\WinSLAMM Files\WI_Res and Other Urban Dec06.std
Freeway Street Delivery file name: C:\WinSLAMM Files\Freeway Dec06.std
Apply Street Delivery Files to Adjust the After Event Load Street Dirt Mass Balance: False
Pollutant Relative Concentration file name: C:\WinSLAMM Files\WI_GEO03.ppx
Source Area PSD and Peak to Average Flow Ratio File: C:\WinSLAMM Files\NURP Source Area PSD Files.csv
Cost Data file name:

If Other Device Pollutant Load Reduction Values = 1, Off-site Pollutant Loads are Removed from Pollutant Load % Reduction calculations
Seed for random number generator: -42
Study period starting date: 01/05/69 Study period ending date: 12/31/69
Start of Winter Season: 12/07 End of Winter Season: 03/27
Date: 08-17-2023 Time: 13:29:59
Site information:

LU# 1 - Commercial: Commercial 1 Total area (ac): 3.840
1 - Roofs 1: 0.280 ac. Pitched Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
13 - Paved Parking 1: 0.430 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
25 - Driveways 1: 1.570 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.090 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 1.320 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
70 - Water Body Areas: 0.150 ac. PSD File: Source Area PSD File:

LU# 2 - Commercial: Commercial 2 Total area (ac): 0.840
25 - Driveways 1: 0.060 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
31 - Sidewalks 1: 0.010 ac. Connected PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz
45 - Large Landscaped Areas 1: 0.770 ac. Normal Sandy PSD File: C:\WinSLAMM Files\NURP.cpz Source Area PSD File: C:\WinSLAMM Files\NURP.cpz

Control Practice 1: Wet Detention Pond CP# 1 (DS) - Wet Detention Pond
Particle Size Distribution file name: Not needed - calculated by program

Initial stage elevation (ft): 5
Peak to Average Flow Ratio: 3.8
Maximum flow allowed into pond (cfs): No maximum value entered

Outlet Characteristics:

Outlet type: Sharp Crested Weir

1. Sharp crested weir length (ft): 4
2. Sharp crested weir height from invert: 1
3. Sharp crested weir invert elevation above datum (ft): 10

Outlet type: Orifice 1

1. Orifice diameter (ft): 0.17
2. Number of orifices: 1
3. Invert elevation above datum (ft): 5

Outlet type: Orifice 2

1. Orifice diameter (ft): 0.5
2. Number of orifices: 1
3. Invert elevation above datum (ft): 8.5

Outlet type: Broad Crested Weir

1. Weir crest length (ft): 6
2. Weir crest width (ft): 10
3. Height from datum to bottom of weir opening: 10

Pond stage and surface area

Entry Number	Stage (ft)	Pond Area (acres)	Natural Seepage (in/hr)	Other Outflow (cfs)
0	0.00	0.0000	0.00	0.00
1	0.01	0.0442	0.00	0.00
2	1.00	0.0538	0.00	0.00
3	2.00	0.0640	0.00	0.00
4	3.00	0.0748	0.00	0.00
5	4.00	0.0861	0.00	0.00
6	5.00	0.1516	0.00	0.00
7	6.00	0.1741	0.00	0.00
8	7.00	0.1979	0.00	0.00
9	8.00	0.2228	0.00	0.00
10	9.00	0.2496	0.00	0.00
11	10.00	0.2776	0.00	0.00
12	11.00	0.3058	0.00	0.00

WET DETENTION POND INPUT

Wet Detention Control Device

Pond Number 1

Drainage System Control Practice

Initial Stage Elevation (ft):

Maximum Inflow into Pond (cfs)
Enter 0 or leave blank for no limit:

Enter Two Stage Area Values in Rows 1 and 2, and Press to Interpolate

Create Pond Stage-Area Values

Refresh Schematic

Enter fraction (greater than 0) that you want to modify all pond areas by and then select 'Modify Pond Areas' button

Modify Pond Areas

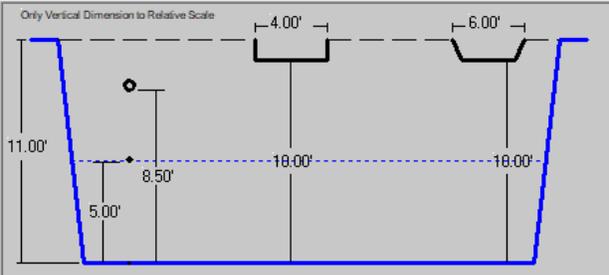
Copy Pond Data

Paste Pond Data

Recalculate Cumulative Volume

Save or Delete Pond Data to Database File

Get Pond Data From Database File



To Delete This Practice, Right Mouse Click on Icon and Select Delete

Cancel

Continue

Press 'F1' for Help

Control Practice #: 1

CP Index #: 1

	Stage (ft)	Area (acres)	Cumulative Volume (ac-ft)
0	0.00	0.0000	0.0000
1	0.01	0.0442	0.000
2	1.00	0.0538	0.049
3	2.00	0.0640	0.108
4	3.00	0.0748	0.177
5	4.00	0.0861	0.257
6	5.00	0.1516	0.376
7	6.00	0.1741	0.539
8	7.00	0.1979	0.725
9	8.00	0.2228	0.936
10	9.00	0.2496	1.172
11	10.00	0.2776	1.435
12	11.00	0.3058	1.727
13			
14			
15			
16			
17			

Remove **Sharp Crested Weir**

Weir Length (ft)	4.00
Height from datum to bottom of weir opening (ft)	10.00

Add **V-Notch Weir**

Weir Angle (<180 degrees)	
Height from datum to bottom of weir opening (ft)	
Number of V-Notch weirs	

Remove **Orifice Set 1**

Orifice Diameter (ft)	0.17
Invert elevation above datum (ft)	5.00
Number of orifices in set	1

Remove **Orifice Set 2**

Orifice Diameter (ft)	0.50
Invert elevation above datum (ft)	8.50
Number of orifices in set	1

Add **Orifice Set 3**

Orifice Diameter (ft)	
Invert elevation above datum (ft)	
Number of orifices in set	

Add **Stone Weeper**

Width at bottom of weeper (ft)	
Weeper side slope (H:1V)	
Upstream side slope (H:1V)	
Downstream side slope (H:1V)	
Horizontal flow path length at top of weeper (ft)	
Average rock diameter (ft)	
Distance from bottom to top of weeper (ft)	
Height from datum to bottom of weeper (ft)	

Add **Vertical Stand Pipe**

Pipe diameter (ft)	
Height above datum (ft)	

Month	Evaporation (in/day)	Water Withdraw Rate (ac-ft/day)
Jan	0.00	0.000
Feb	0.00	0.000
Mar	0.00	0.000
Apr	0.00	0.000
May	0.00	0.000
Jun	0.00	0.000
Jul	0.00	0.000
Aug	0.00	0.000
Sep	0.00	0.000
Oct	0.00	0.000
Nov	0.00	0.000
Dec	0.00	0.000

Stage (ft)	Natural Seepage Rate (in/hr)	Other Outflow Rate (cfs)
0.00	0.00	0.000
0.01	0.00	0.000
1.00	0.00	0.000
2.00	0.00	0.000
3.00	0.00	0.000
4.00	0.00	0.000
5.00	0.00	0.000

Remove **Broad Crested Weir (Required)**

Weir crest length (ft)	6.00
Weir crest width (ft)	10.00
Height from datum to bottom of weir opening (ft)	10.00

Add **Seepage Basin**

Infiltration rate (in/hr)	
Width of device (ft)	
Length of device (ft)	
Invert elevation of seepage basin inlet above datum (ft)	

Add **Pump**

WINSLAMM OUTPUT

File Name:

Q:\10800 - 10899\10827 - Kwik Trip #1283 - Hartland\Engineer\Stormwater Modeling\WinSLAMM\10827-Water Quality Analysis.mdb

Outfall Output Summary

	Runoff Volume (cu. ft.)	Percent Runoff Reduction	Runoff Coefficient (Rv)	Particulate Solids Conc. (mg/L)	Particulate Solids Yield (lbs)	Percent Particulate Solids Reduction
Total of All Land Uses without Controls	214974		0.38	121.0	1624	
Outfall Total with Controls	215161	-0.09 %	0.38	19.14	257.1	84.17 %
Current File Output: Annualized Total After Outfall Controls	218150	Years in Model Run:	0.99		260.6	

Pollutant (1)	Concentration - No Controls	Concentration - With Controls	Concentration Units	Pollutant Yield - No Controls	Pollutant Yield - With Controls	Pollutant Yield Units	Percent Yield Reduction
Particulate Solids	121.0	19.14	mg/L	1624	257.1	lbs	84.17 %
Total Phosphorus	0.3828	0.1352	mg/L	5.138	1.816	lbs	64.66 %

Print Output Summary to .csv File

Print Output Summary to Text File

Print Output Summary to Printer

Total Area Modeled (ac)

4.680

Total Control Practice Costs

Capital Cost	N/A
Land Cost	N/A
Annual Maintenance Cost	N/A
Present Value of All Costs	N/A
Annualized Value of All Costs	N/A

Perform Outfall
Flow Duration
Curve Calculations

Receiving Water Impacts Due To Stormwater Runoff

(CWP Impervious Cover Model)

	Calculated Rv	Approximate Urban Stream Classification
Without Controls	0.38	Poor
With Controls	0.38	Poor

ANNUAL YIELD OF TSS (NO CONTROL) = 1,624 lbs

ANNUAL YIELD OF TSS AFTER CONTROLS = 257.1 lbs

PERCENT TSS REDUCTION = 84.17%

ANNUAL YIELD OF TP (NO CONTROL) = 5.138 lbs

ANNUAL YIELD OF TP AFTER CONTROLS = 1.816 lbs

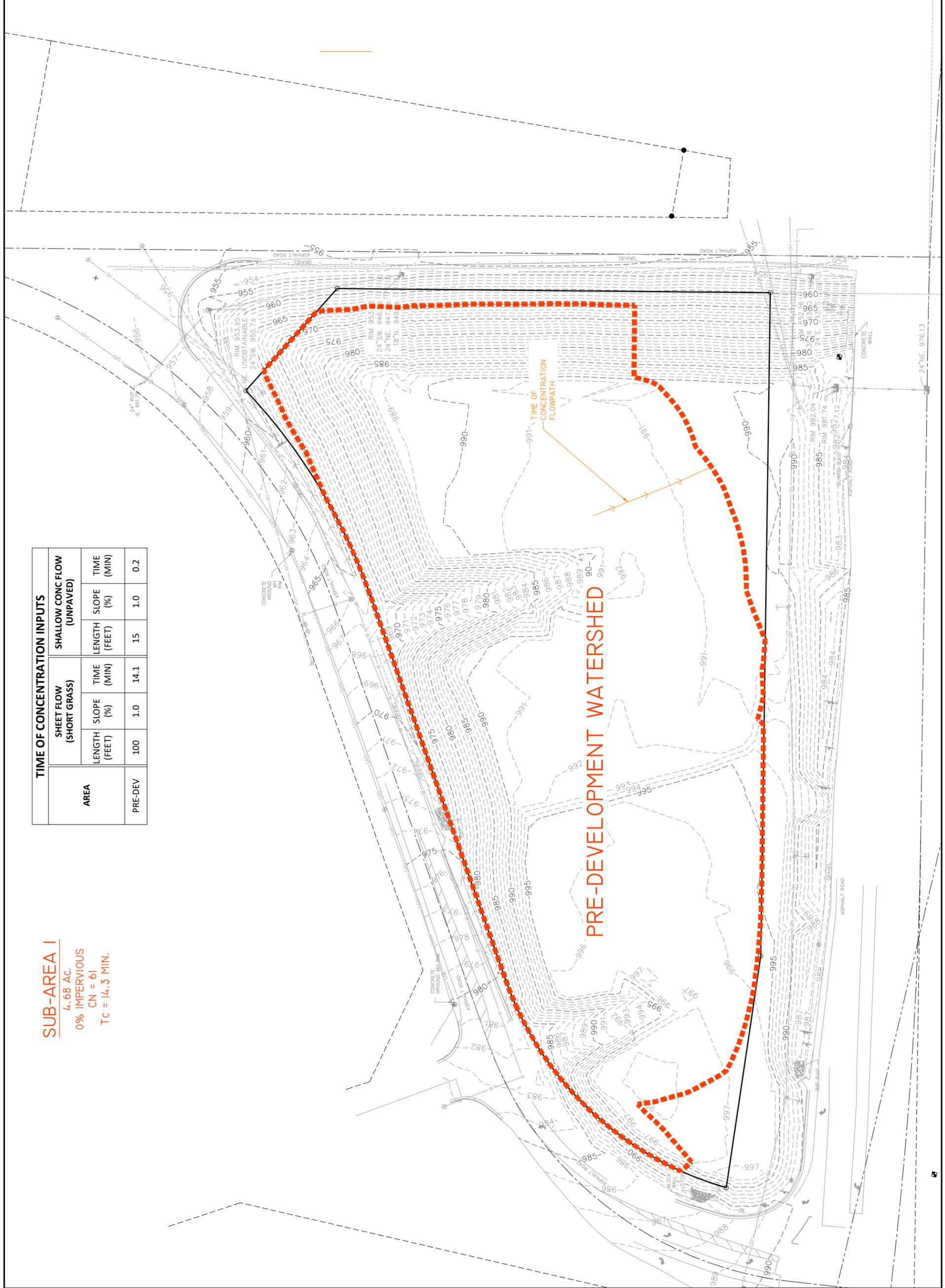
PERCENT TP REDUCTION = 64.66%

Appendix 4

Pre-Development Conditions Peak Flow Analysis

SUB-AREA I
 4.68 AC.
 0% IMPERVIOUS
 CN = 61
 Tc = 14.3 MIN.

AREA	SHEET FLOW (SHORT GRASS)		SHALLOW CONC FLOW (UNPAVED)	
	LENGTH (FEET)	SLOPE (%)	LENGTH (FEET)	SLOPE (%)
PRE-DEV	100	1.0	15	1.0
				0.2



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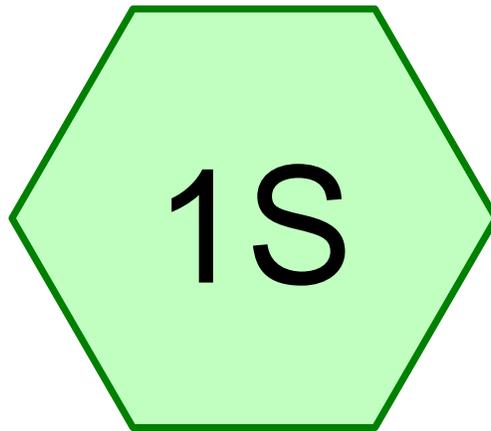
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 ENGINEERING, SURVEYING
 REI Engineering, INC.
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 EMAIL: MAIL@REIENGINEERING.COM



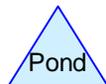
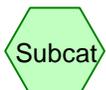
PRE-DEVELOPMENT
 WATERSHED AREAS
 CONVENIENCE STORE #1283
 STH 83 AND W. CAPITOL DRIVE
 HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY	NAP
SCALE	GRAPHIC
PROJ. NO.	10827
DATE	8/17/23 - REVIEW DOCUMENTS
SHEET	STM-2



Pre-Development Watershed



10827-PRE

Prepared by REI Engineering

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MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 8/17/2023

Page 2

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Pre-Development Watershed Runoff Area=4.680 ac 0.00% Impervious Runoff Depth=0.17"
Flow Length=115' Slope=0.0100 '/ Tc=14.3 min CN=61 Runoff=0.41 cfs 0.065 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.065 af Average Runoff Depth = 0.17"
100.00% Pervious = 4.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Development Watershed

Runoff = 0.41 cfs @ 12.40 hrs, Volume= 0.065 af, Depth= 0.17"

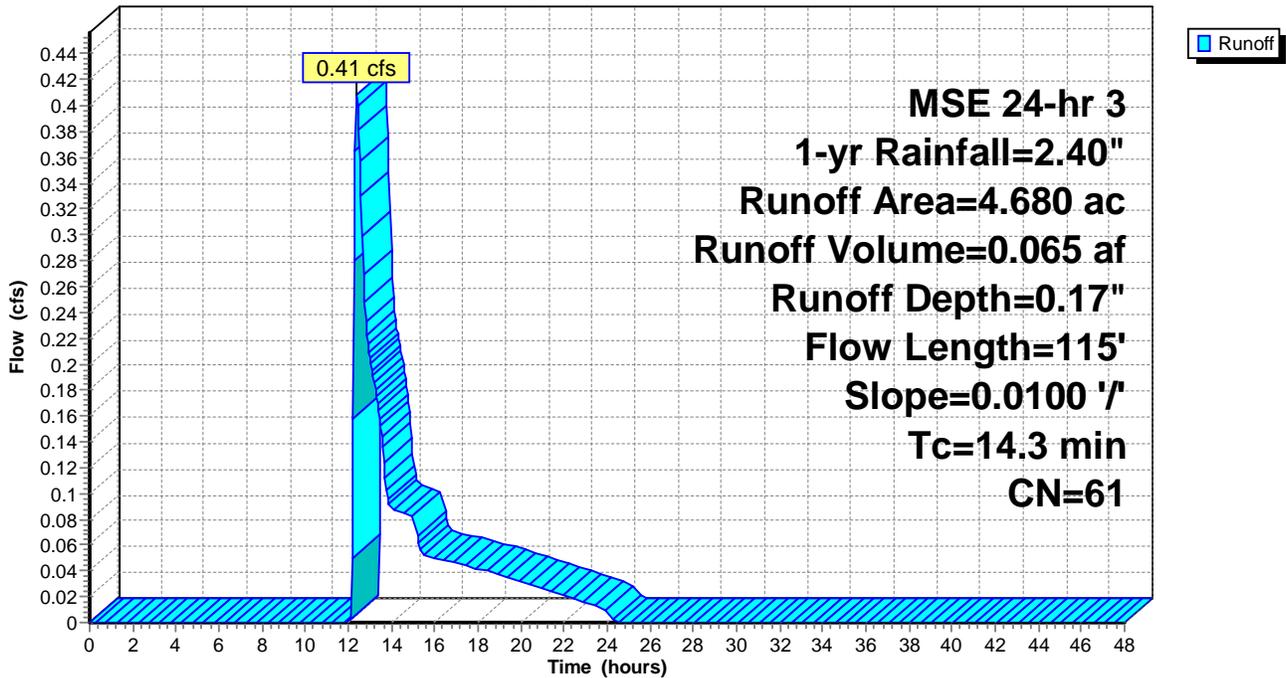
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 4.680	61	Grassland, HSG B
4.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
0.2	15	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.3	115	Total			

Subcatchment 1S: Pre-Development Watershed

Hydrograph



10827-PRE

Prepared by REI Engineering

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MSE 24-hr 3 2-yr Rainfall=2.70"

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Page 4

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Pre-Development Watershed Runoff Area=4.680 ac 0.00% Impervious Runoff Depth=0.26"
Flow Length=115' Slope=0.0100 '/ Tc=14.3 min CN=61 Runoff=0.84 cfs 0.101 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.101 af Average Runoff Depth = 0.26"
100.00% Pervious = 4.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Development Watershed

Runoff = 0.84 cfs @ 12.32 hrs, Volume= 0.101 af, Depth= 0.26"

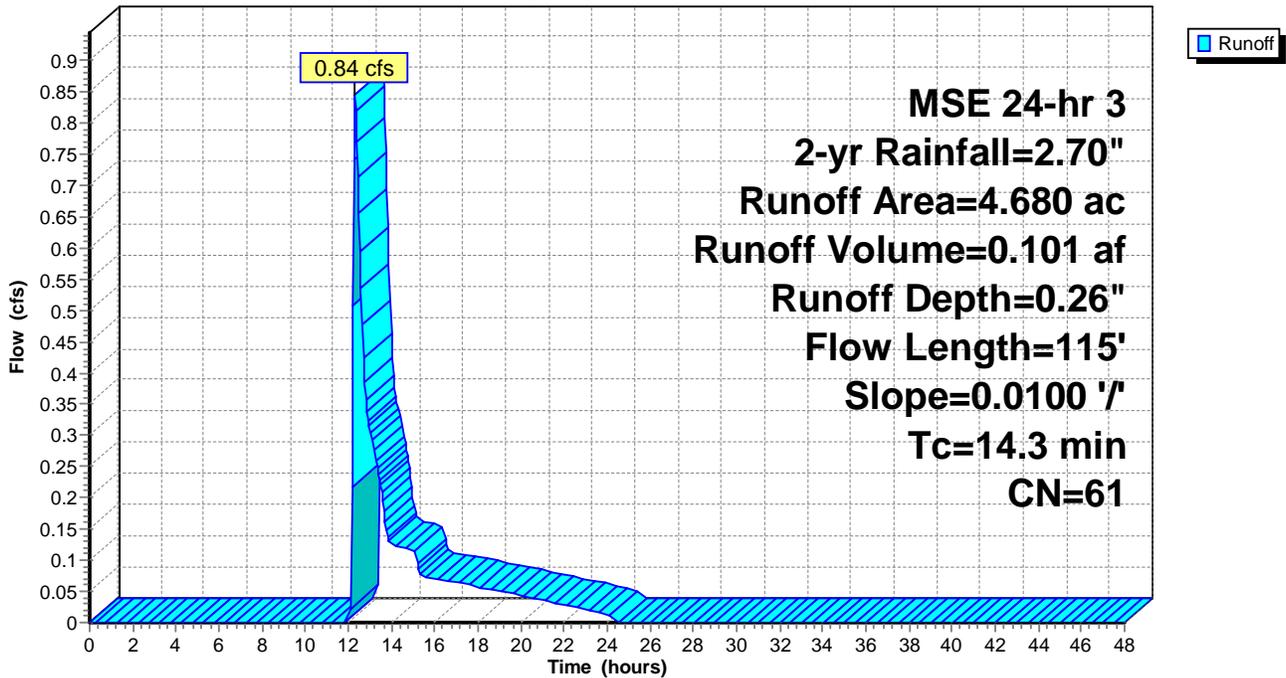
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 MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 4.680	61	Grassland, HSG B
4.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
0.2	15	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.3	115	Total			

Subcatchment 1S: Pre-Development Watershed

Hydrograph



10827-PRE

Prepared by REI Engineering

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MSE 24-hr 3 10-yr Rainfall=3.81"

Printed 8/17/2023

Page 6

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Pre-Development Watershed Runoff Area=4.680 ac 0.00% Impervious Runoff Depth=0.72"
Flow Length=115' Slope=0.0100 '/ Tc=14.3 min CN=61 Runoff=3.65 cfs 0.280 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.280 af Average Runoff Depth = 0.72"
100.00% Pervious = 4.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Development Watershed

Runoff = 3.65 cfs @ 12.26 hrs, Volume= 0.280 af, Depth= 0.72"

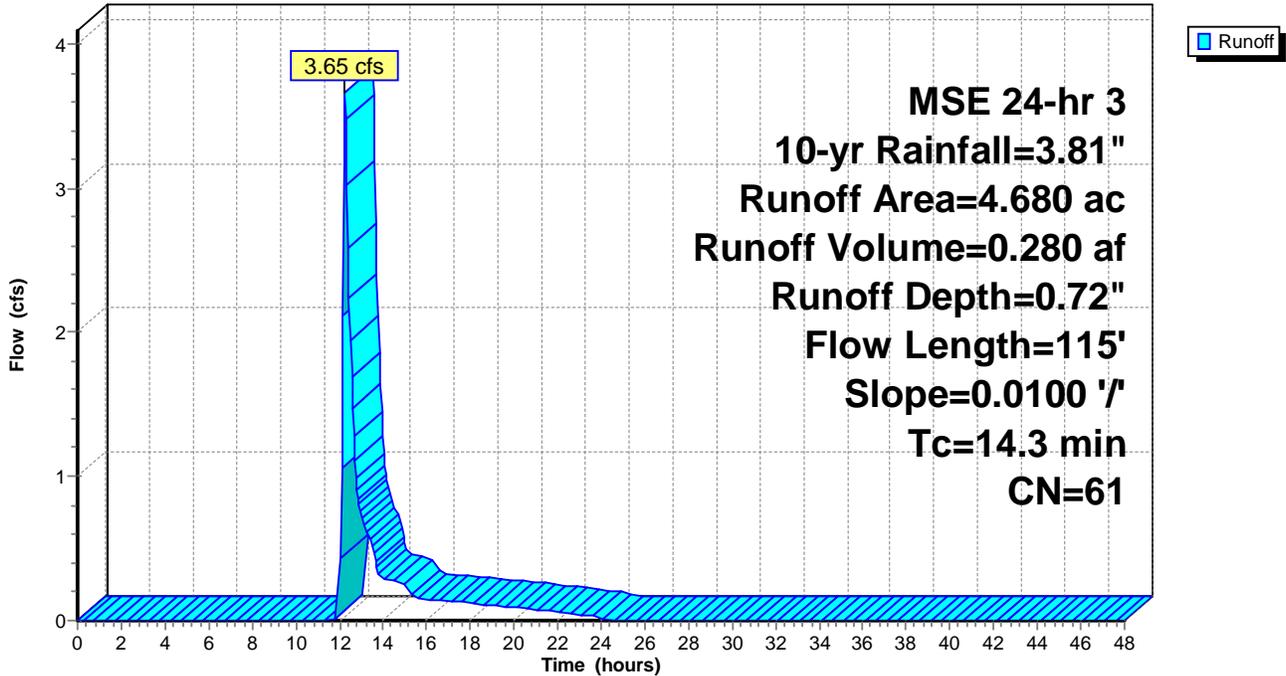
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 MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 4.680	61	Grassland, HSG B
4.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
0.2	15	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.3	115	Total			

Subcatchment 1S: Pre-Development Watershed

Hydrograph



Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Pre-Development Watershed Runoff Area=4.680 ac 0.00% Impervious Runoff Depth=2.13"
Flow Length=115' Slope=0.0100 '/' Tc=14.3 min CN=61 Runoff=12.67 cfs 0.829 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.829 af Average Runoff Depth = 2.13"
100.00% Pervious = 4.680 ac 0.00% Impervious = 0.000 ac

Summary for Subcatchment 1S: Pre-Development Watershed

Runoff = 12.67 cfs @ 12.24 hrs, Volume= 0.829 af, Depth= 2.13"

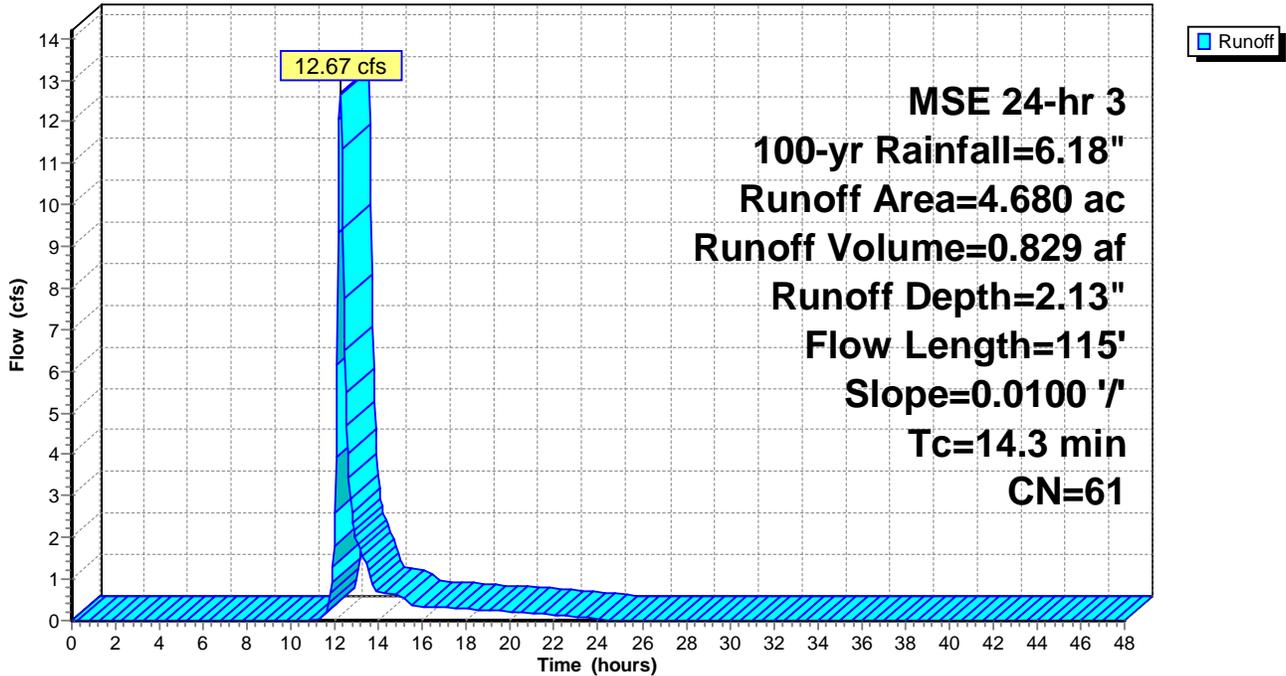
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 MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 4.680	61	Grassland, HSG B
4.680		100.00% Pervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
14.1	100	0.0100	0.12		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"
0.2	15	0.0100	1.61		Shallow Concentrated Flow, Unpaved Kv= 16.1 fps
14.3	115	Total			

Subcatchment 1S: Pre-Development Watershed

Hydrograph



Appendix 5

Post-Development Conditions Peak Flow Analysis

POST-DEVELOPMENT WATERSHED

AREA = 4.68 AC.
55% IMPERVIOUS
CN = 82

SUB-AREA 1

(WET DETENTION POND)

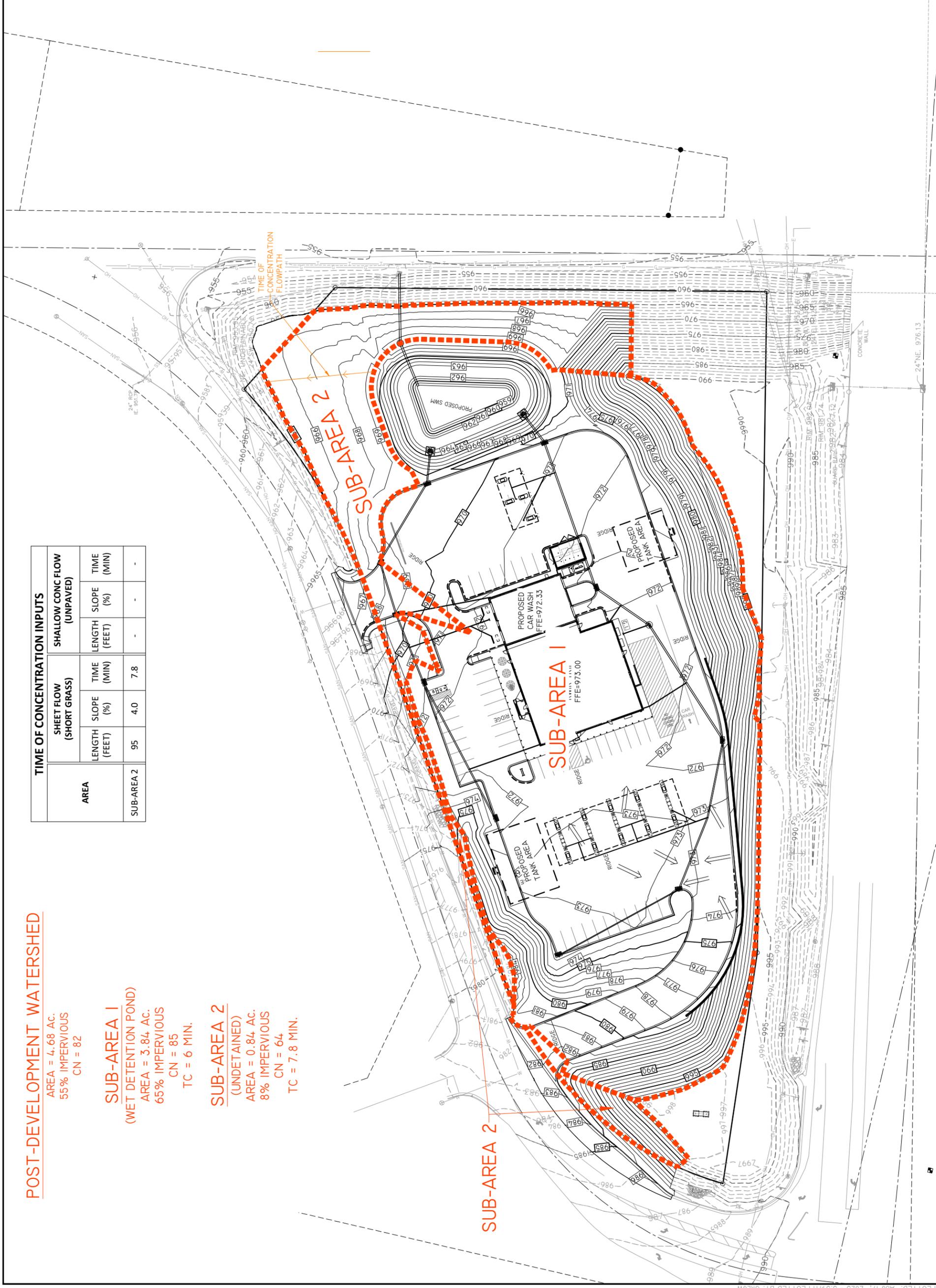
AREA = 3.84 AC.
65% IMPERVIOUS
CN = 85
TC = 6 MIN.

SUB-AREA 2

(UNDETAINED)

AREA = 0.84 AC.
8% IMPERVIOUS
CN = 64
TC = 7.8 MIN.

AREA	SHEET FLOW (SHORT GRASS)		SHALLOW CONC FLOW (UNPAVED)		TIME (MIN)
	LENGTH (FEET)	SLOPE (%)	LENGTH (FEET)	SLOPE (%)	
SUB-AREA 2	95	4.0	-	-	7.8



KWIK TRIP
STORES

KWIK STAR
STORES

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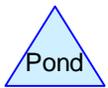
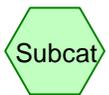
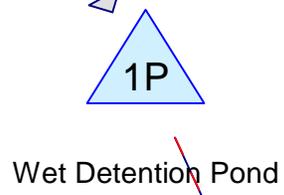
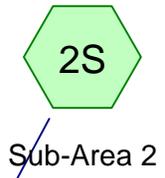
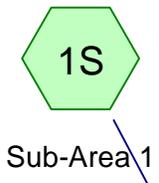
POST-DEVELOPMENT
WATERSHED AREAS

CONVENIENCE STORE #1283

STH 83 AND W. CAPITOL DRIVE
HARTLAND, WI

#	DATE	DESCRIPTION

DRAWN BY: NAP
SCALE: GRAPHIC
PROJ. NO.: 10827
DATE: 8/17/23 - REVIEW DOCUMENTS
SHEET: STM-3



10827-POST

Prepared by REI Engineering

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MSE 24-hr 3 1-yr Rainfall=2.40"

Printed 8/17/2023

Page 2

Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Sub-Area 1

Runoff Area=3.840 ac 65.63% Impervious Runoff Depth=1.49"
Tc=6.0 min CN=WQ Runoff=8.64 cfs 0.477 af

Subcatchment 2S: Sub-Area 2

Runoff Area=0.840 ac 8.33% Impervious Runoff Depth=0.33"
Flow Length=95' Slope=0.0400 1' Tc=7.8 min CN=WQ Runoff=0.27 cfs 0.023 af

Pond 1P: Wet Detention Pond

Peak Elev=965.10' Storage=16,034 cf Inflow=8.64 cfs 0.477 af
Primary=0.15 cfs 0.376 af Secondary=0.00 cfs 0.000 af Outflow=0.15 cfs 0.376 af

Link 1L: Post-Development Runoff

Inflow=0.39 cfs 0.399 af
Primary=0.39 cfs 0.399 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.501 af Average Runoff Depth = 1.28"
44.66% Pervious = 2.090 ac 55.34% Impervious = 2.590 ac

Summary for Subcatchment 1S: Sub-Area 1

Runoff = 8.64 cfs @ 12.13 hrs, Volume= 0.477 af, Depth= 1.49"
 Routed to Pond 1P : Wet Detention Pond

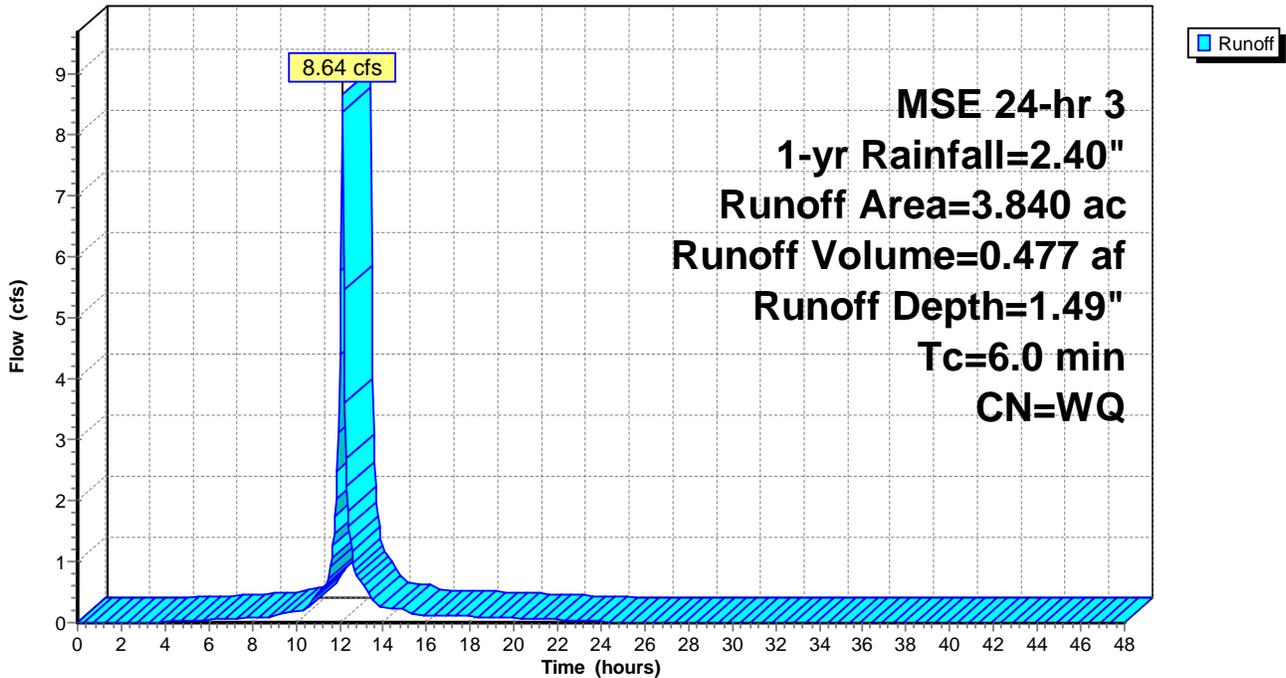
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 0.280	98	Roof
* 0.430	98	Parking
* 1.570	98	Driveway
* 0.090	98	Sidewalk
1.320	61	>75% Grass cover, Good, HSG B
* 0.150	100	Water Body
<hr/>		
3.840		Weighted Average
1.320		34.38% Pervious Area
2.520		65.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Subcatchment 1S: Sub-Area 1

Hydrograph



Summary for Subcatchment 2S: Sub-Area 2

Runoff = 0.27 cfs @ 12.17 hrs, Volume= 0.023 af, Depth= 0.33"
 Routed to Link 1L : Post-Development Runoff

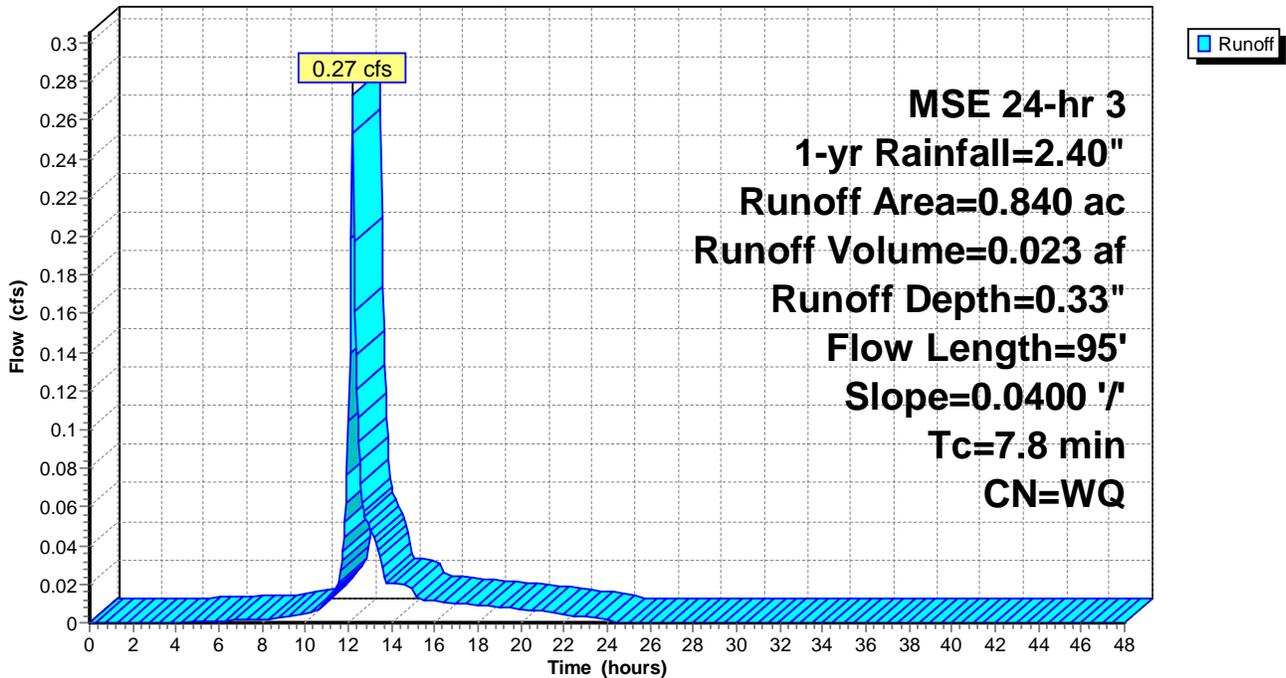
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 1-yr Rainfall=2.40"

Area (ac)	CN	Description
* 0.060	98	Driveway
* 0.010	98	Driveway
0.770	61	>75% Grass cover, Good, HSG B
0.840		Weighted Average
0.770		91.67% Pervious Area
0.070		8.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	95	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

Subcatchment 2S: Sub-Area 2

Hydrograph



Summary for Pond 1P: Wet Detention Pond

Inflow Area = 3.840 ac, 65.63% Impervious, Inflow Depth = 1.49" for 1-yr event
 Inflow = 8.64 cfs @ 12.13 hrs, Volume= 0.477 af
 Outflow = 0.15 cfs @ 15.15 hrs, Volume= 0.376 af, Atten= 98%, Lag= 181.3 min
 Primary = 0.15 cfs @ 15.15 hrs, Volume= 0.376 af
 Routed to Link 1L : Post-Development Runoff
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Post-Development Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 965.10' @ 15.15 hrs Surf.Area= 8,723 sf Storage= 16,034 cf

Plug-Flow detention time= 951.3 min calculated for 0.376 af (79% of inflow)
 Center-of-Mass det. time= 889.5 min (1,650.2 - 760.8)

Volume	Invert	Avail.Storage	Storage Description		
#1	963.00'	58,804 cf	Custom Stage Data (Irregular) Listed below (Recalc)		
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)
963.00	6,604	316.8	0	0	6,604
964.00	7,584	335.6	7,088	7,088	7,633
965.00	8,619	354.5	8,096	15,184	8,727
966.00	9,707	373.3	9,158	24,342	9,875
967.00	10,873	393.5	10,284	34,626	11,166
968.00	12,092	413.7	11,477	46,104	12,525
969.00	13,319	429.9	12,701	58,804	13,691

Device	Routing	Invert	Outlet Devices	
#1	Primary	958.00'	12.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 958.00' / 949.10' S= 0.1435 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf	
#2	Device 1	963.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#3	Device 1	966.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads	
#4	Device 1	968.00'	4.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)	
#5	Secondary	968.00'	6.0' long + 5.0 ' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64	

Primary OutFlow Max=0.15 cfs @ 15.15 hrs HW=965.10' TW=0.00' (Dynamic Tailwater)

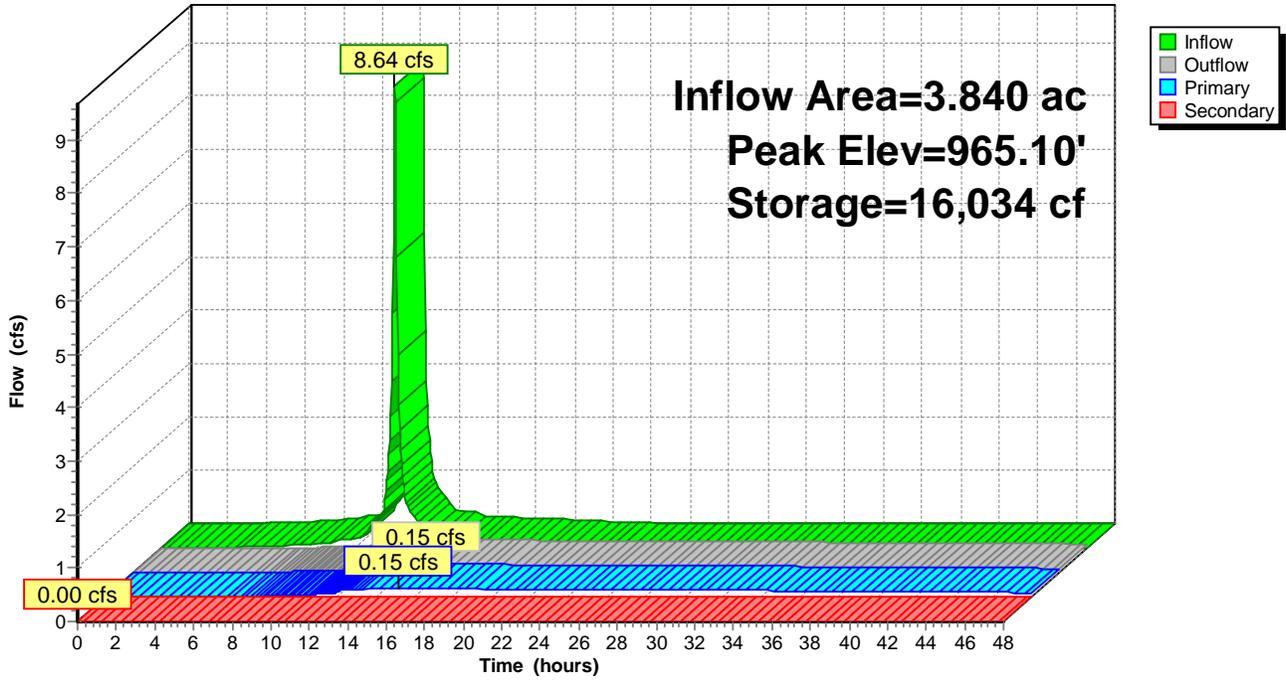
- ↑ 1=Culvert (Passes 0.15 cfs of 7.67 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.15 cfs @ 6.83 fps)
- ↑ 3=Orifice/Grate (Controls 0.00 cfs)
- ↑ 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=963.00' TW=0.00' (Dynamic Tailwater)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Wet Detention Pond

Hydrograph

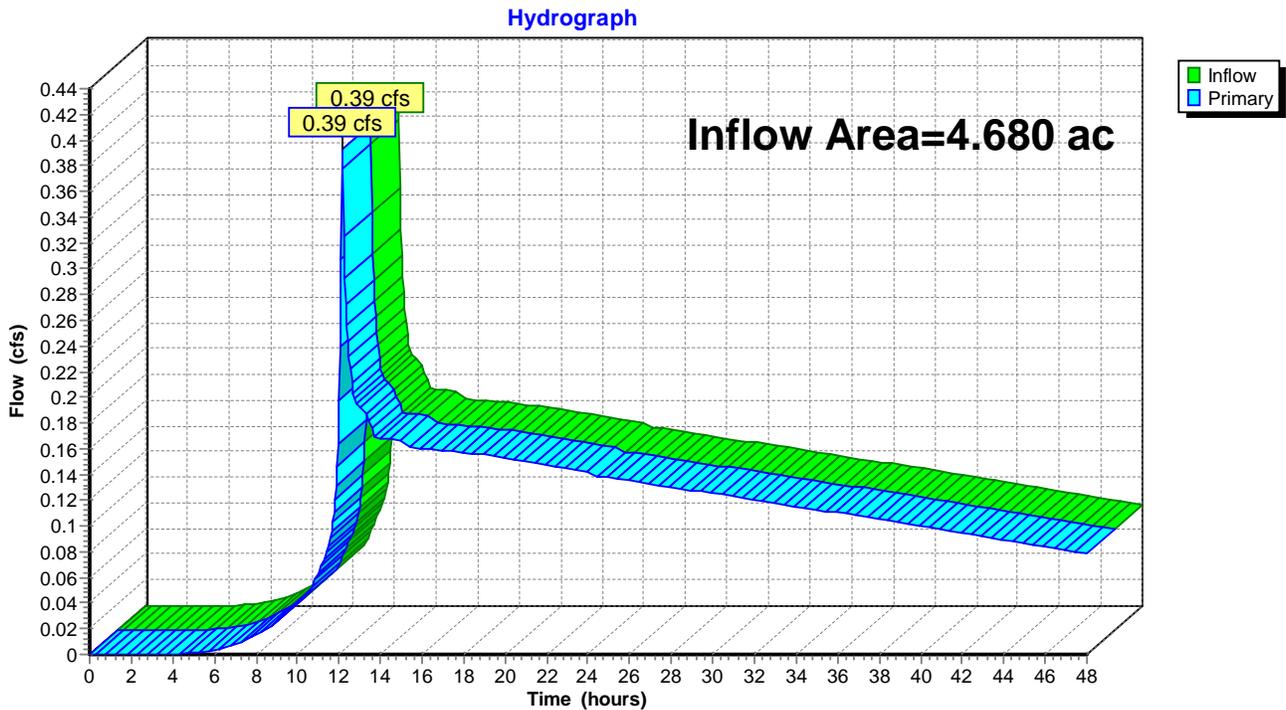


Summary for Link 1L: Post-Development Runoff

Inflow Area = 4.680 ac, 55.34% Impervious, Inflow Depth > 1.02" for 1-yr event
Inflow = 0.39 cfs @ 12.17 hrs, Volume= 0.399 af
Primary = 0.39 cfs @ 12.17 hrs, Volume= 0.399 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: Post-Development Runoff



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MSE 24-hr 3 2-yr Rainfall=2.70"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Sub-Area 1 Runoff Area=3.840 ac 65.63% Impervious Runoff Depth=1.72"
Tc=6.0 min CN=WQ Runoff=9.94 cfs 0.550 af

Subcatchment 2S: Sub-Area 2 Runoff Area=0.840 ac 8.33% Impervious Runoff Depth=0.44"
Flow Length=95' Slope=0.0400 '/' Tc=7.8 min CN=WQ Runoff=0.41 cfs 0.031 af

Pond 1P: Wet Detention Pond Peak Elev=965.39' Storage=18,595 cf Inflow=9.94 cfs 0.550 af
Primary=0.16 cfs 0.414 af Secondary=0.00 cfs 0.000 af Outflow=0.16 cfs 0.414 af

Link 1L: Post-Development Runoff Inflow=0.54 cfs 0.445 af
Primary=0.54 cfs 0.445 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.581 af Average Runoff Depth = 1.49"
44.66% Pervious = 2.090 ac 55.34% Impervious = 2.590 ac

Summary for Subcatchment 1S: Sub-Area 1

Runoff = 9.94 cfs @ 12.13 hrs, Volume= 0.550 af, Depth= 1.72"
 Routed to Pond 1P : Wet Detention Pond

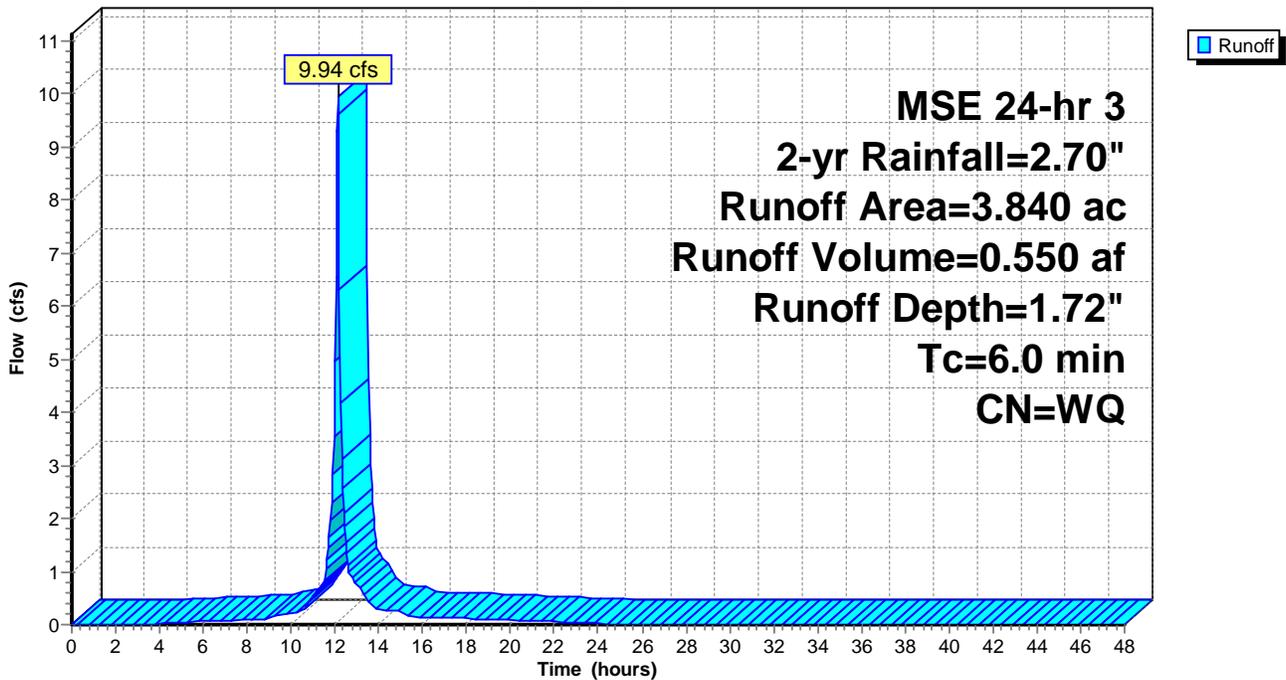
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 0.280	98	Roof
* 0.430	98	Parking
* 1.570	98	Driveway
* 0.090	98	Sidewalk
1.320	61	>75% Grass cover, Good, HSG B
* 0.150	100	Water Body
3.840		Weighted Average
1.320		34.38% Pervious Area
2.520		65.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Subcatchment 1S: Sub-Area 1

Hydrograph



Summary for Subcatchment 2S: Sub-Area 2

Runoff = 0.41 cfs @ 12.17 hrs, Volume= 0.031 af, Depth= 0.44"
 Routed to Link 1L : Post-Development Runoff

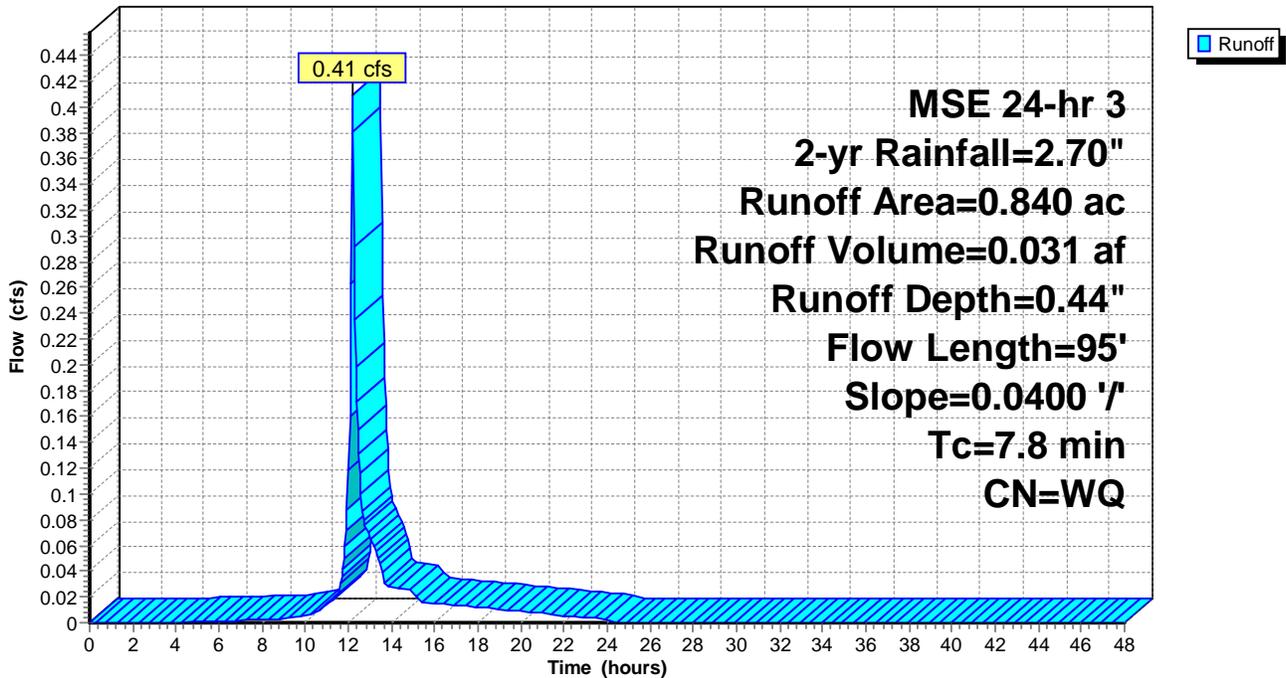
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 2-yr Rainfall=2.70"

Area (ac)	CN	Description
* 0.060	98	Driveway
* 0.010	98	Driveway
0.770	61	>75% Grass cover, Good, HSG B
0.840		Weighted Average
0.770		91.67% Pervious Area
0.070		8.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	95	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

Subcatchment 2S: Sub-Area 2

Hydrograph



Summary for Pond 1P: Wet Detention Pond

Inflow Area = 3.840 ac, 65.63% Impervious, Inflow Depth = 1.72" for 2-yr event
 Inflow = 9.94 cfs @ 12.13 hrs, Volume= 0.550 af
 Outflow = 0.16 cfs @ 15.22 hrs, Volume= 0.414 af, Atten= 98%, Lag= 185.4 min
 Primary = 0.16 cfs @ 15.22 hrs, Volume= 0.414 af
 Routed to Link 1L : Post-Development Runoff
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Post-Development Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 965.39' @ 15.22 hrs Surf.Area= 9,032 sf Storage= 18,595 cf

Plug-Flow detention time= 967.7 min calculated for 0.413 af (75% of inflow)
 Center-of-Mass det. time= 901.4 min (1,661.3 - 759.9)

Volume	Invert	Avail.Storage	Storage Description			
#1	963.00'	58,804 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
963.00	6,604	316.8	0	0	6,604	
964.00	7,584	335.6	7,088	7,088	7,633	
965.00	8,619	354.5	8,096	15,184	8,727	
966.00	9,707	373.3	9,158	24,342	9,875	
967.00	10,873	393.5	10,284	34,626	11,166	
968.00	12,092	413.7	11,477	46,104	12,525	
969.00	13,319	429.9	12,701	58,804	13,691	

Device	Routing	Invert	Outlet Devices			
#1	Primary	958.00'	12.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 958.00' / 949.10' S= 0.1435 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf			
#2	Device 1	963.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads			
#3	Device 1	966.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads			
#4	Device 1	968.00'	4.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)			
#5	Secondary	968.00'	6.0' long + 5.0 ' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64			

Primary OutFlow Max=0.16 cfs @ 15.22 hrs HW=965.39' TW=0.00' (Dynamic Tailwater)

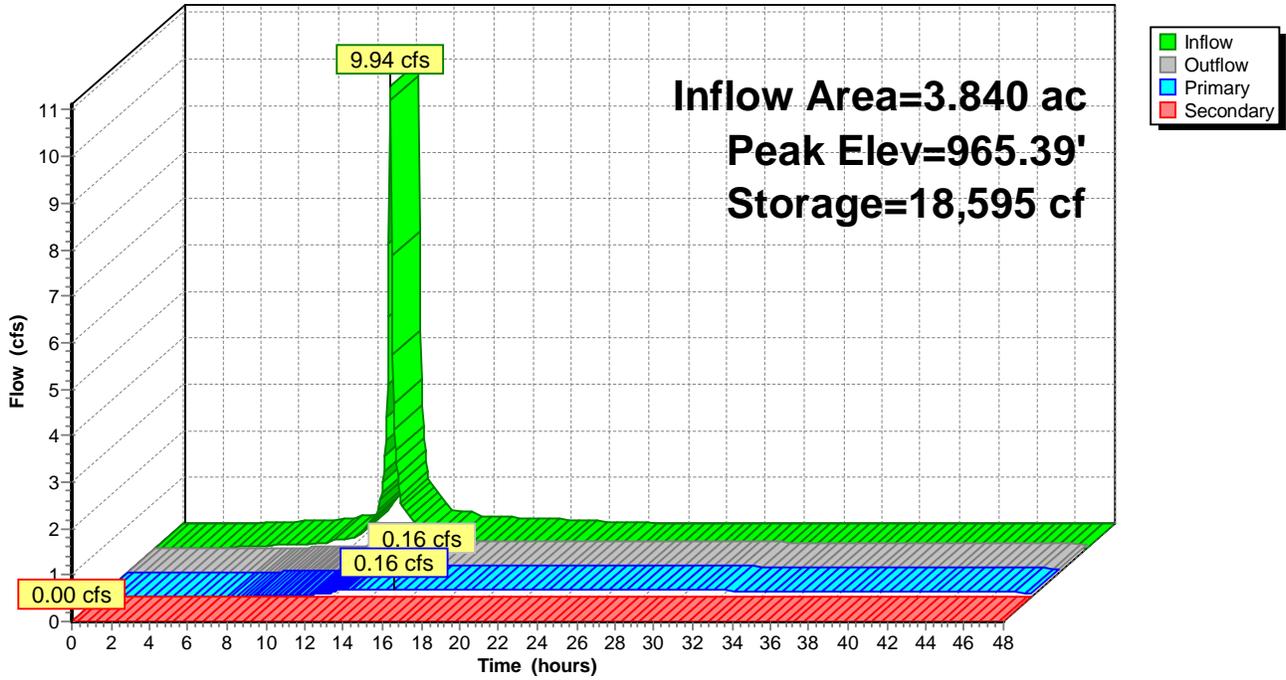
- ↑ **1=Culvert** (Passes 0.16 cfs of 7.83 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.16 cfs @ 7.31 fps)
- ↑ **3=Orifice/Grate** (Controls 0.00 cfs)
- ↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=963.00' TW=0.00' (Dynamic Tailwater)

- ↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Wet Detention Pond

Hydrograph



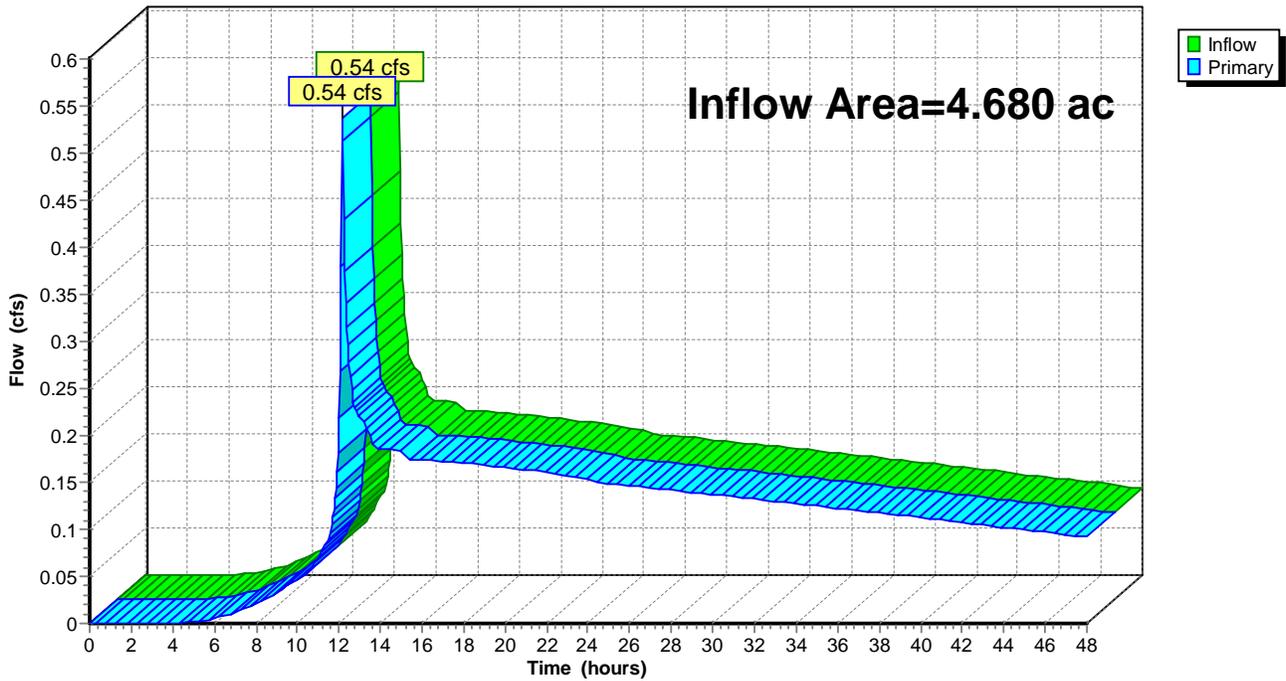
Summary for Link 1L: Post-Development Runoff

Inflow Area = 4.680 ac, 55.34% Impervious, Inflow Depth > 1.14" for 2-yr event
Inflow = 0.54 cfs @ 12.17 hrs, Volume= 0.445 af
Primary = 0.54 cfs @ 12.17 hrs, Volume= 0.445 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: Post-Development Runoff

Hydrograph



10827-POST

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MSE 24-hr 3 10-yr Rainfall=3.81"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Sub-Area 1

Runoff Area=3.840 ac 65.63% Impervious Runoff Depth=2.60"
Tc=6.0 min CN=WQ Runoff=15.18 cfs 0.833 af

Subcatchment 2S: Sub-Area 2

Runoff Area=0.840 ac 8.33% Impervious Runoff Depth=0.96"
Flow Length=95' Slope=0.0400 '/' Tc=7.8 min CN=WQ Runoff=1.15 cfs 0.067 af

Pond 1P: Wet Detention Pond

Peak Elev=966.45' Storage=28,876 cf Inflow=15.18 cfs 0.833 af
Primary=0.19 cfs 0.535 af Secondary=0.00 cfs 0.000 af Outflow=0.19 cfs 0.535 af

Link 1L: Post-Development Runoff

Inflow=1.31 cfs 0.602 af
Primary=1.31 cfs 0.602 af

Total Runoff Area = 4.680 ac Runoff Volume = 0.900 af Average Runoff Depth = 2.31"
44.66% Pervious = 2.090 ac 55.34% Impervious = 2.590 ac

Summary for Subcatchment 1S: Sub-Area 1

Runoff = 15.18 cfs @ 12.13 hrs, Volume= 0.833 af, Depth= 2.60"
 Routed to Pond 1P : Wet Detention Pond

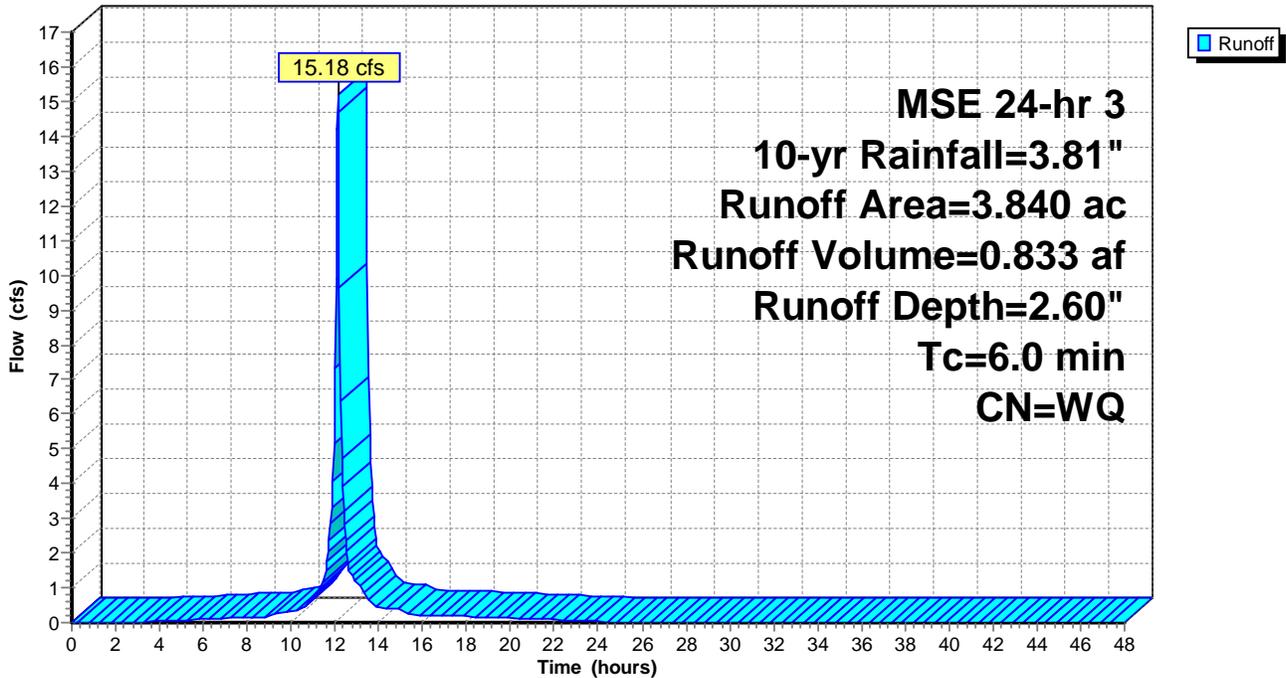
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 0.280	98	Roof
* 0.430	98	Parking
* 1.570	98	Driveway
* 0.090	98	Sidewalk
1.320	61	>75% Grass cover, Good, HSG B
* 0.150	100	Water Body
3.840		Weighted Average
1.320		34.38% Pervious Area
2.520		65.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Subcatchment 1S: Sub-Area 1

Hydrograph



Summary for Subcatchment 2S: Sub-Area 2

Runoff = 1.15 cfs @ 12.16 hrs, Volume= 0.067 af, Depth= 0.96"
Routed to Link 1L : Post-Development Runoff

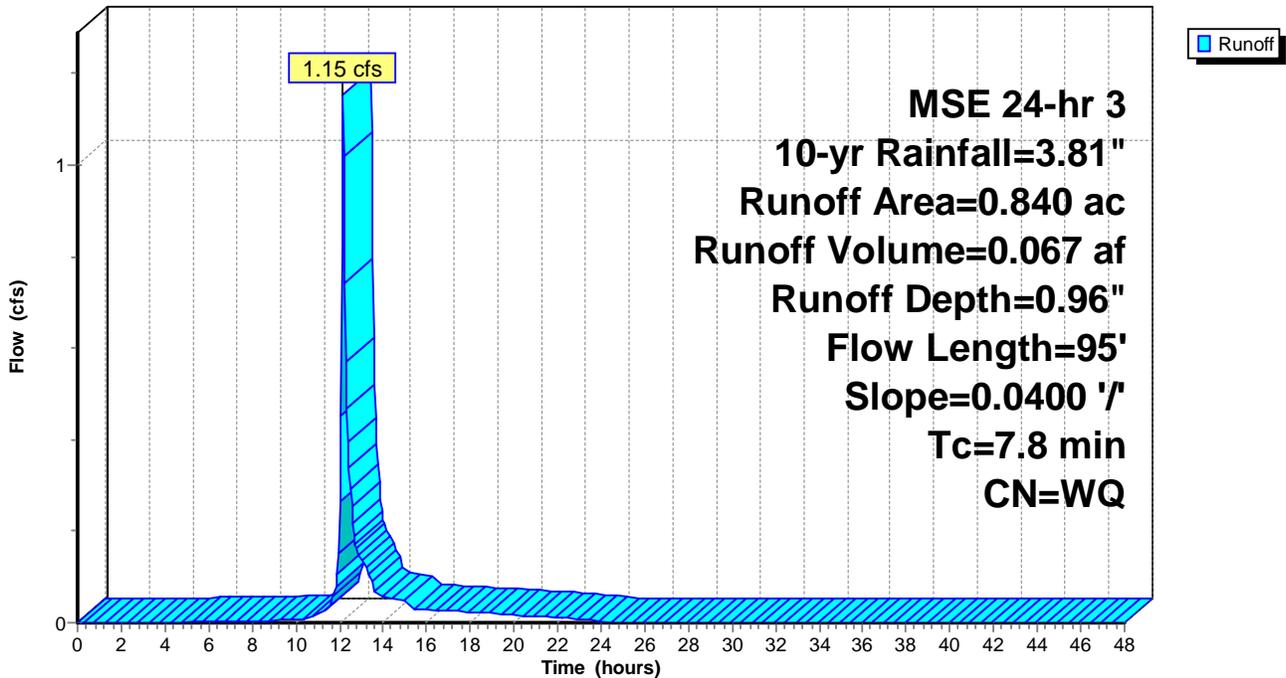
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
MSE 24-hr 3 10-yr Rainfall=3.81"

Area (ac)	CN	Description
* 0.060	98	Driveway
* 0.010	98	Driveway
0.770	61	>75% Grass cover, Good, HSG B
0.840		Weighted Average
0.770		91.67% Pervious Area
0.070		8.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	95	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

Subcatchment 2S: Sub-Area 2

Hydrograph



Summary for Pond 1P: Wet Detention Pond

Inflow Area = 3.840 ac, 65.63% Impervious, Inflow Depth = 2.60" for 10-yr event
 Inflow = 15.18 cfs @ 12.13 hrs, Volume= 0.833 af
 Outflow = 0.19 cfs @ 17.24 hrs, Volume= 0.535 af, Atten= 99%, Lag= 306.5 min
 Primary = 0.19 cfs @ 17.24 hrs, Volume= 0.535 af
 Routed to Link 1L : Post-Development Runoff
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Post-Development Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 966.45' @ 17.24 hrs Surf.Area= 10,229 sf Storage= 28,876 cf

Plug-Flow detention time= 1,005.3 min calculated for 0.534 af (64% of inflow)
 Center-of-Mass det. time= 927.1 min (1,684.8 - 757.6)

Volume	Invert	Avail.Storage	Storage Description			
#1	963.00'	58,804 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
963.00	6,604	316.8	0	0	6,604	
964.00	7,584	335.6	7,088	7,088	7,633	
965.00	8,619	354.5	8,096	15,184	8,727	
966.00	9,707	373.3	9,158	24,342	9,875	
967.00	10,873	393.5	10,284	34,626	11,166	
968.00	12,092	413.7	11,477	46,104	12,525	
969.00	13,319	429.9	12,701	58,804	13,691	

Device	Routing	Invert	Outlet Devices			
#1	Primary	958.00'	12.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 958.00' / 949.10' S= 0.1435 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf			
#2	Device 1	963.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads			
#3	Device 1	966.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads			
#4	Device 1	968.00'	4.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)			
#5	Secondary	968.00'	6.0' long + 5.0 ' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64			

Primary OutFlow Max=0.19 cfs @ 17.24 hrs HW=966.45' TW=0.00' (Dynamic Tailwater)

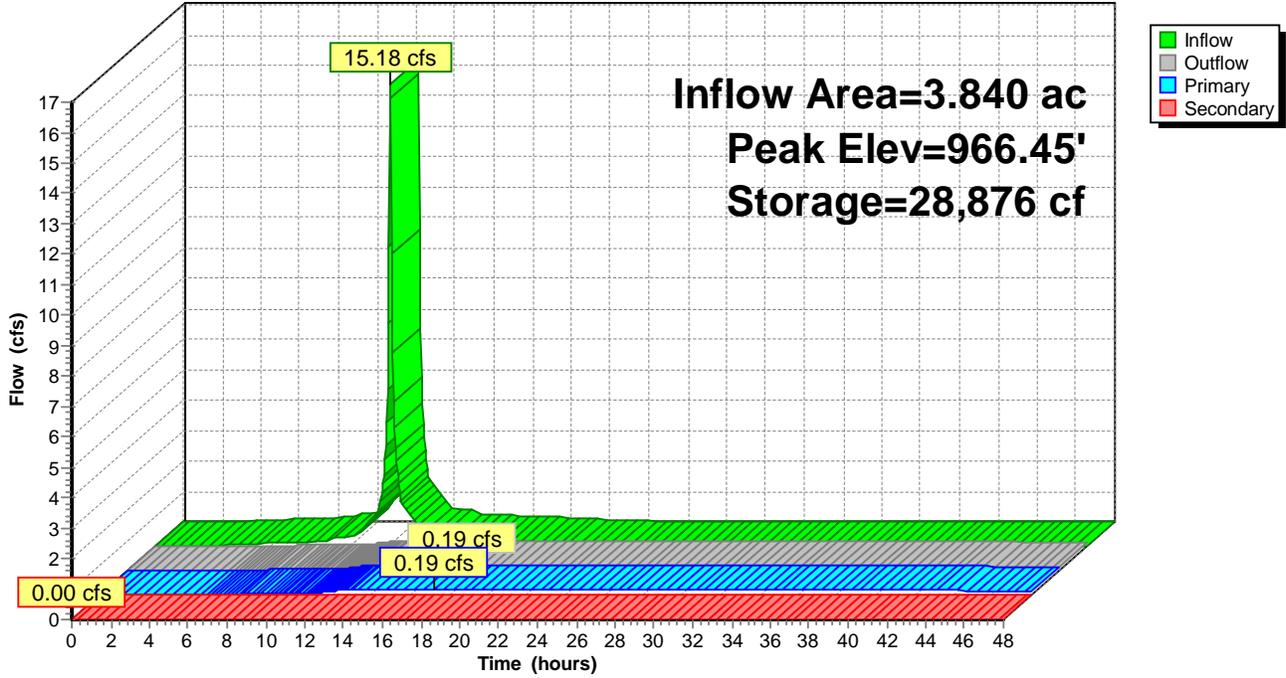
- ↑ **1=Culvert** (Passes 0.19 cfs of 8.42 cfs potential flow)
- ↑ **2=Orifice/Grate** (Orifice Controls 0.19 cfs @ 8.84 fps)
- ↑ **3=Orifice/Grate** (Controls 0.00 cfs)
- ↑ **4=Sharp-Crested Rectangular Weir** (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=963.00' TW=0.00' (Dynamic Tailwater)

- ↑ **5=Broad-Crested Rectangular Weir** (Controls 0.00 cfs)

Pond 1P: Wet Detention Pond

Hydrograph

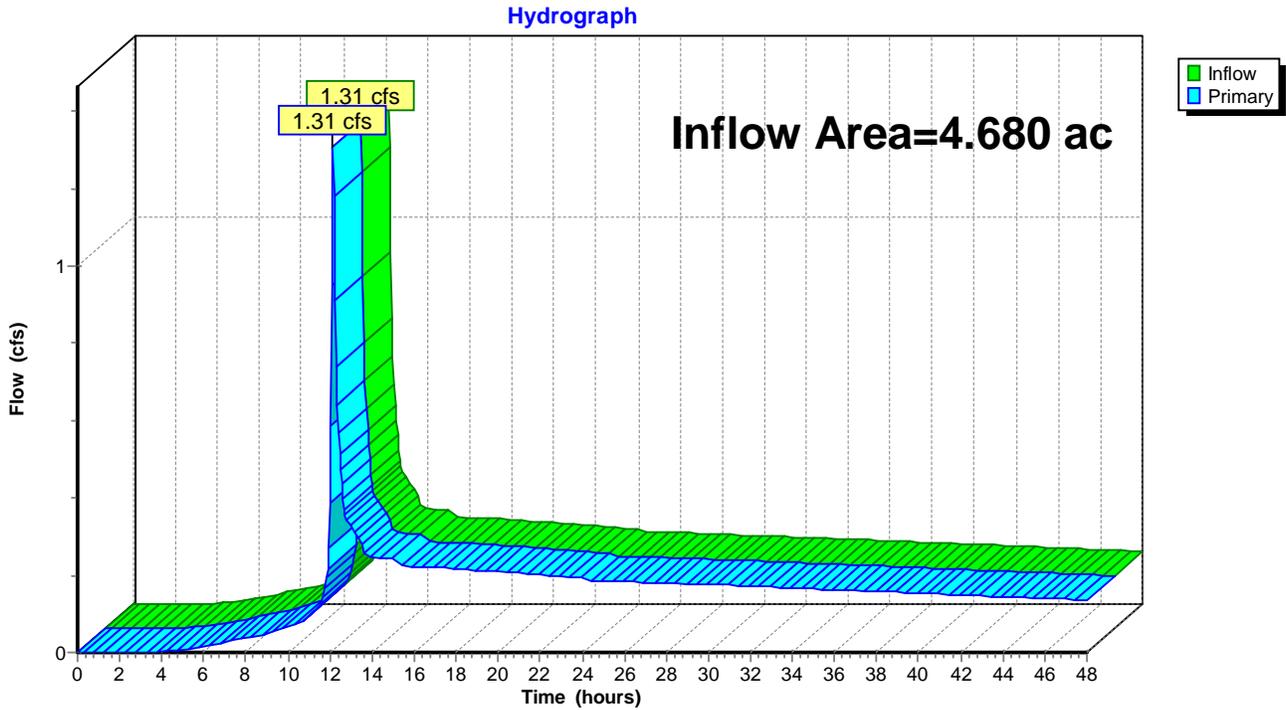


Summary for Link 1L: Post-Development Runoff

Inflow Area = 4.680 ac, 55.34% Impervious, Inflow Depth > 1.54" for 10-yr event
Inflow = 1.31 cfs @ 12.16 hrs, Volume= 0.602 af
Primary = 1.31 cfs @ 12.16 hrs, Volume= 0.602 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: Post-Development Runoff



10827-POST

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MSE 24-hr 3 100-yr Rainfall=6.18"

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Time span=0.00-48.00 hrs, dt=0.05 hrs, 961 points
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q
Reach routing by Dyn-Stor-Ind method - Pond routing by Dyn-Stor-Ind method

Subcatchment 1S: Sub-Area 1

Runoff Area=3.840 ac 65.63% Impervious Runoff Depth=4.64"
Tc=6.0 min CN=WQ Runoff=27.34 cfs 1.485 af

Subcatchment 2S: Sub-Area 2

Runoff Area=0.840 ac 8.33% Impervious Runoff Depth=2.44"
Flow Length=95' Slope=0.0400 '/ Tc=7.8 min CN=WQ Runoff=3.30 cfs 0.171 af

Pond 1P: Wet Detention Pond

Peak Elev=967.92' Storage=45,097 cf Inflow=27.34 cfs 1.485 af
Primary=1.25 cfs 1.131 af Secondary=0.00 cfs 0.000 af Outflow=1.25 cfs 1.131 af

Link 1L: Post-Development Runoff

Inflow=3.59 cfs 1.302 af
Primary=3.59 cfs 1.302 af

Total Runoff Area = 4.680 ac Runoff Volume = 1.656 af Average Runoff Depth = 4.25"
44.66% Pervious = 2.090 ac 55.34% Impervious = 2.590 ac

Summary for Subcatchment 1S: Sub-Area 1

Runoff = 27.34 cfs @ 12.13 hrs, Volume= 1.485 af, Depth= 4.64"
 Routed to Pond 1P : Wet Detention Pond

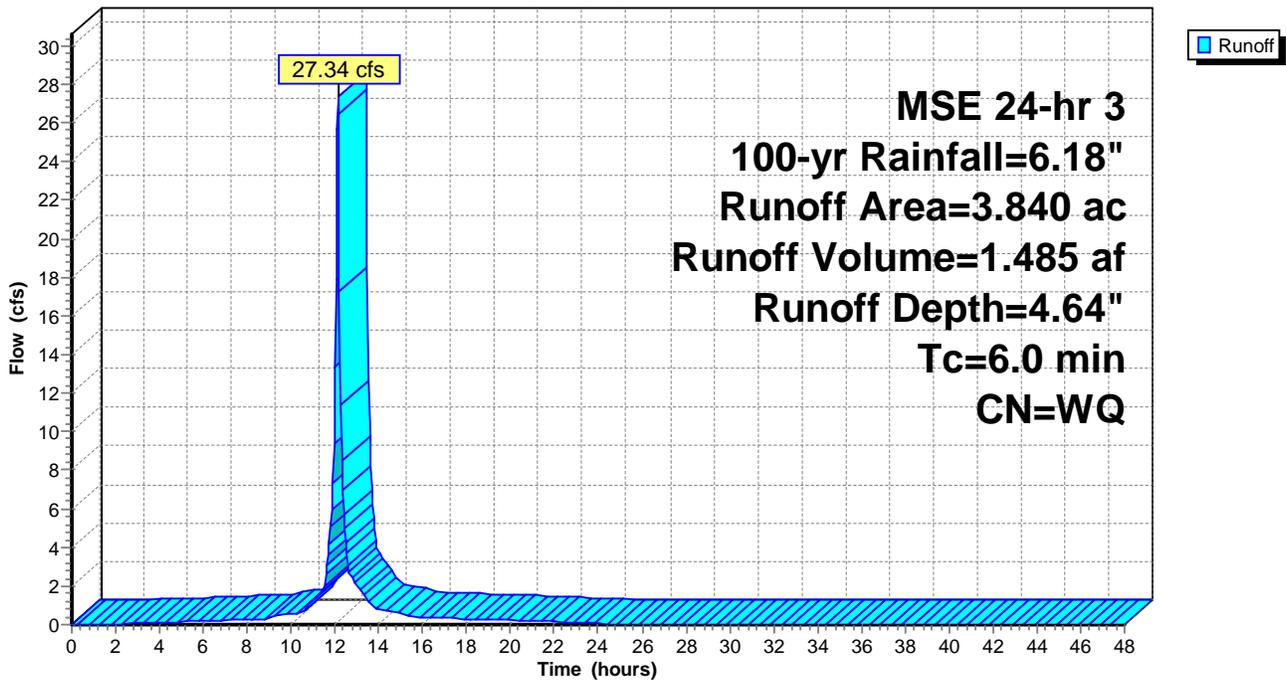
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 0.280	98	Roof
* 0.430	98	Parking
* 1.570	98	Driveway
* 0.090	98	Sidewalk
1.320	61	>75% Grass cover, Good, HSG B
* 0.150	100	Water Body
3.840		Weighted Average
1.320		34.38% Pervious Area
2.520		65.63% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
6.0					Direct Entry, TR-55 Minimum

Subcatchment 1S: Sub-Area 1

Hydrograph



Summary for Subcatchment 2S: Sub-Area 2

Runoff = 3.30 cfs @ 12.16 hrs, Volume= 0.171 af, Depth= 2.44"
 Routed to Link 1L : Post-Development Runoff

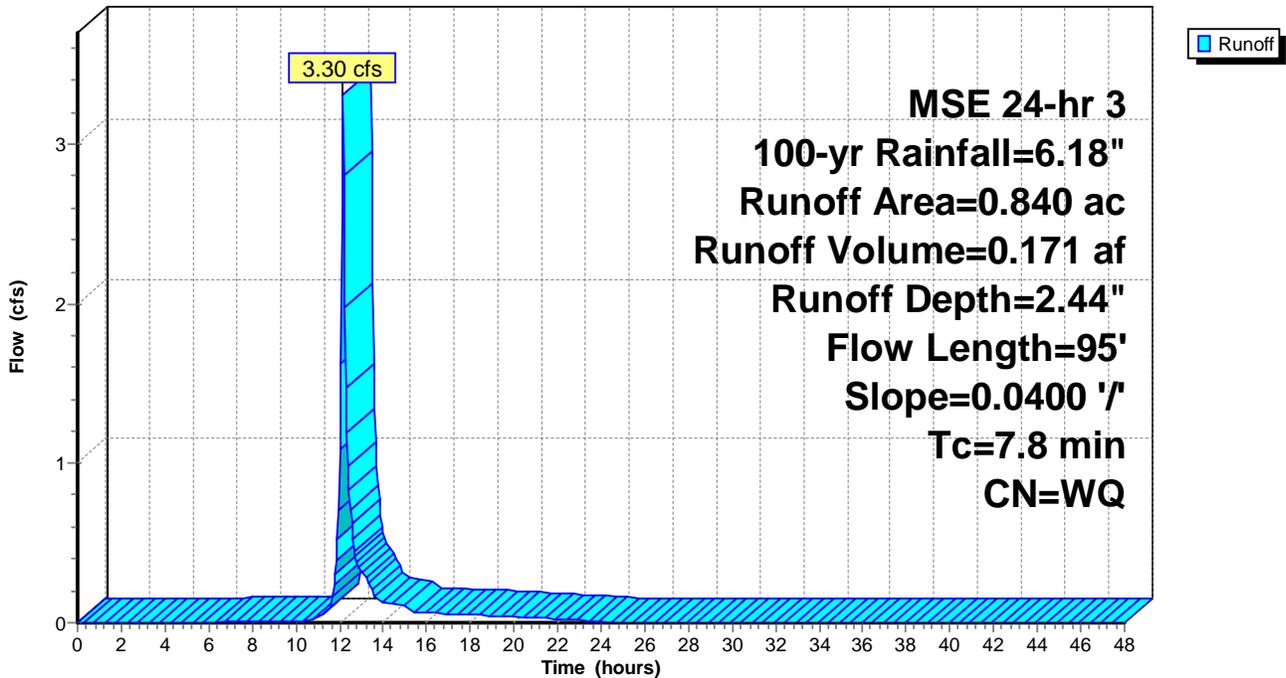
Runoff by SCS TR-20 method, UH=SCS, Weighted-Q, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 MSE 24-hr 3 100-yr Rainfall=6.18"

Area (ac)	CN	Description
* 0.060	98	Driveway
* 0.010	98	Driveway
0.770	61	>75% Grass cover, Good, HSG B
0.840		Weighted Average
0.770		91.67% Pervious Area
0.070		8.33% Impervious Area

Tc (min)	Length (feet)	Slope (ft/ft)	Velocity (ft/sec)	Capacity (cfs)	Description
7.8	95	0.0400	0.20		Sheet Flow, Grass: Short n= 0.150 P2= 2.70"

Subcatchment 2S: Sub-Area 2

Hydrograph



Summary for Pond 1P: Wet Detention Pond

Inflow Area = 3.840 ac, 65.63% Impervious, Inflow Depth = 4.64" for 100-yr event
 Inflow = 27.34 cfs @ 12.13 hrs, Volume= 1.485 af
 Outflow = 1.25 cfs @ 13.50 hrs, Volume= 1.131 af, Atten= 95%, Lag= 82.2 min
 Primary = 1.25 cfs @ 13.50 hrs, Volume= 1.131 af
 Routed to Link 1L : Post-Development Runoff
 Secondary = 0.00 cfs @ 0.00 hrs, Volume= 0.000 af
 Routed to Link 1L : Post-Development Runoff

Routing by Dyn-Stor-Ind method, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs
 Peak Elev= 967.92' @ 13.50 hrs Surf.Area= 11,988 sf Storage= 45,097 cf

Plug-Flow detention time= 633.2 min calculated for 1.131 af (76% of inflow)
 Center-of-Mass det. time= 565.9 min (1,320.6 - 754.7)

Volume	Invert	Avail.Storage	Storage Description			
#1	963.00'	58,804 cf	Custom Stage Data (Irregular) Listed below (Recalc)			
Elevation (feet)	Surf.Area (sq-ft)	Perim. (feet)	Inc.Store (cubic-feet)	Cum.Store (cubic-feet)	Wet.Area (sq-ft)	
963.00	6,604	316.8	0	0	6,604	
964.00	7,584	335.6	7,088	7,088	7,633	
965.00	8,619	354.5	8,096	15,184	8,727	
966.00	9,707	373.3	9,158	24,342	9,875	
967.00	10,873	393.5	10,284	34,626	11,166	
968.00	12,092	413.7	11,477	46,104	12,525	
969.00	13,319	429.9	12,701	58,804	13,691	

Device	Routing	Invert	Outlet Devices			
#1	Primary	958.00'	12.0" Round Culvert L= 62.0' CPP, projecting, no headwall, Ke= 0.900 Inlet / Outlet Invert= 958.00' / 949.10' S= 0.1435 ' / Cc= 0.900 n= 0.012, Flow Area= 0.79 sf			
#2	Device 1	963.00'	2.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads			
#3	Device 1	966.50'	6.0" Vert. Orifice/Grate C= 0.600 Limited to weir flow at low heads			
#4	Device 1	968.00'	4.0' long x 1.00' rise Sharp-Crested Rectangular Weir 2 End Contraction(s)			
#5	Secondary	968.00'	6.0' long + 5.0 ' SideZ x 10.0' breadth Broad-Crested Rectangular Weir Head (feet) 0.20 0.40 0.60 0.80 1.00 1.20 1.40 1.60 Coef. (English) 2.49 2.56 2.70 2.69 2.68 2.69 2.67 2.64			

Primary OutFlow Max=1.25 cfs @ 13.50 hrs HW=967.92' TW=0.00' (Dynamic Tailwater)

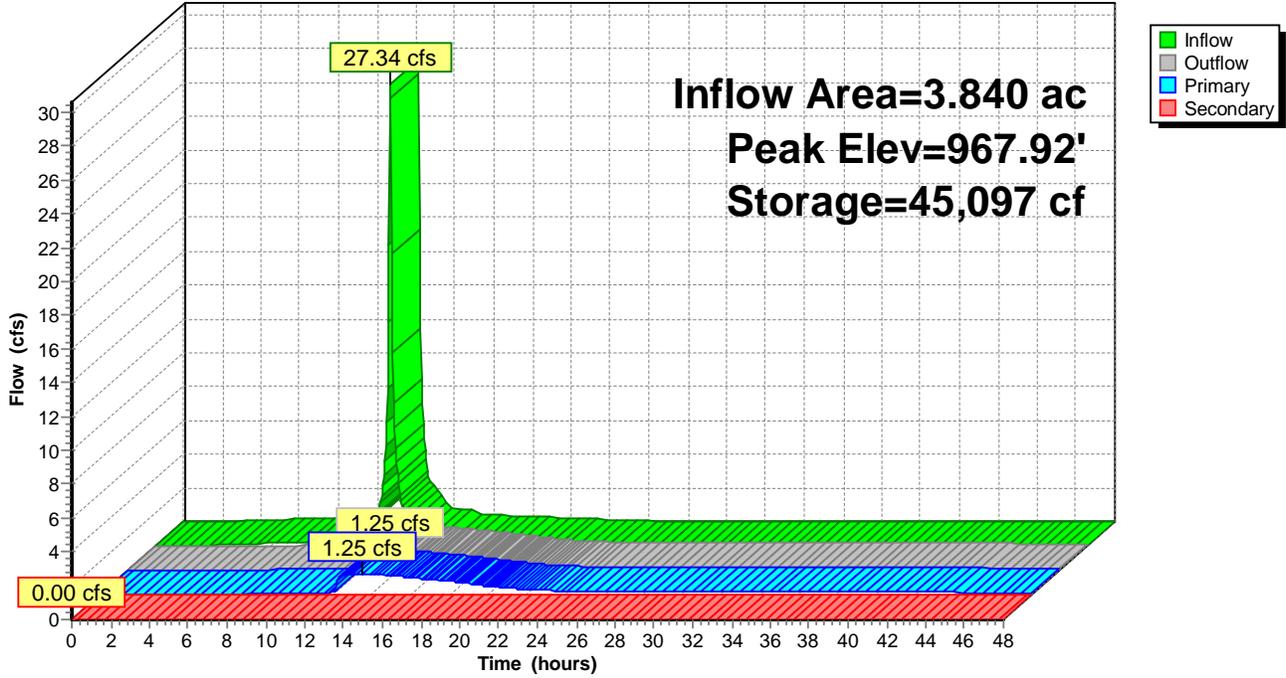
- ↑ 1=Culvert (Passes 1.25 cfs of 9.16 cfs potential flow)
- ↑ 2=Orifice/Grate (Orifice Controls 0.23 cfs @ 10.59 fps)
- ↑ 3=Orifice/Grate (Orifice Controls 1.02 cfs @ 5.20 fps)
- ↑ 4=Sharp-Crested Rectangular Weir (Controls 0.00 cfs)

Secondary OutFlow Max=0.00 cfs @ 0.00 hrs HW=963.00' TW=0.00' (Dynamic Tailwater)

- ↑ 5=Broad-Crested Rectangular Weir (Controls 0.00 cfs)

Pond 1P: Wet Detention Pond

Hydrograph

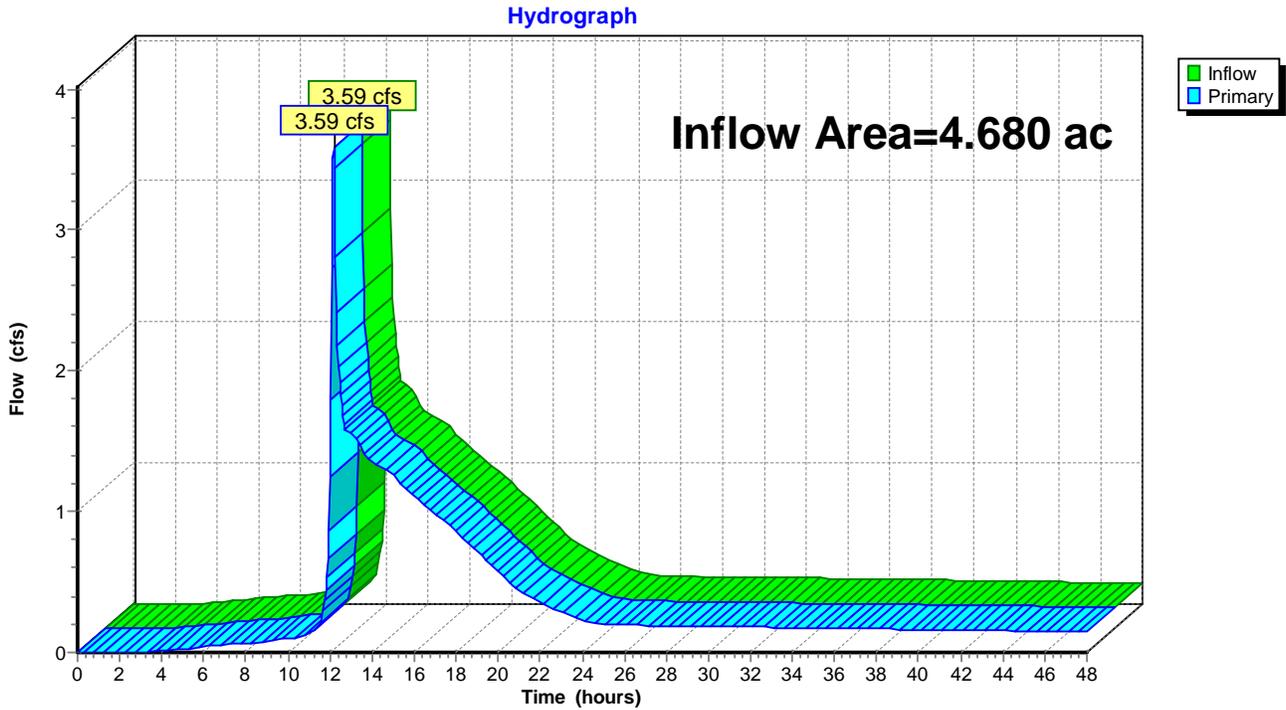


Summary for Link 1L: Post-Development Runoff

Inflow Area = 4.680 ac, 55.34% Impervious, Inflow Depth > 3.34" for 100-yr event
Inflow = 3.59 cfs @ 12.17 hrs, Volume= 1.302 af
Primary = 3.59 cfs @ 12.17 hrs, Volume= 1.302 af, Atten= 0%, Lag= 0.0 min

Primary outflow = Inflow, Time Span= 0.00-48.00 hrs, dt= 0.05 hrs

Link 1L: Post-Development Runoff



Appendix 6

USLE Map & Calculations



Soil Loss & Sediment Discharge Calculation Tool

for use on Construction Sites in the State of Wisconsin



WDNR Version 2.0 (06-29-2017)

YEAR 1

Developer: **Kwik Trip, Inc.**

Project: **Hartland - Store #1283**

Date: **08/17/23**

County: **Waukesha**

Version 1.0

Activity (1)	Begin Date (2)	End Date (3)	Period % R (4)	Annual R Factor (5)	Sub Soil Texture (6)	Soil Erodibility K Factor (7)	Slope (%) (8)	Slope Length (ft) (9)	LS Factor (10)	Land Cover C Factor (11)	Soil loss A (tons/acre) (12)	SDF (13)	Sediment Control Practice (14)	Sediment Discharge (t/ac) (15)
Bare Ground	04/01/24	05/01/24	5.2%	130	Sand	0.15	4.3%	760	0.98	1.00	1.0	1.241	Silt Fence	0.7
Bare Ground	05/01/24	08/31/24	70.6%	130	Sand	0.15	2.3%	180	0.27	1.00	3.7	0.959	Sediment Trap	0.7
Seed with Mulch or Er	08/31/24	10/31/24	17.0%	130	Sand	0.15	17.5%	50	2.38	0.10	0.8	0.613	Silt Fence	0.3
End	10/31/24						17.5%	50	2.38			0.000		0.0
							17.5%	0				0.000		0.0
							0.0%	0				0.000		0.0
TOTAL										5.5			TOTAL	1.7
													% Reduction Required	NONE

Notes:

See Help Page for further descriptions of variables and items in drop-down boxes. The last land disturbing activity on each sheet must be 'End'. This is either 12 months from the start of construction or final stabilization. For periods of construction that exceed 12 months, please demonstrate that 5 tons/acre/year is not exceeded in any given 12 month period.

Recommended Permanent Seeding Dates:

4/1-5/15 and 8/7-8/29 Turf, introduced grasses and legumes
 Thaw-6/30 Native Grasses, forbs, and legumes

NOTE: THIS TOOL ONLY ADDRESSED SOIL EROSION DUE TO SHEET FLOW. MEASURES TO CONTROL CHANNEL EROSION MAY ALSO BE REQUIRED TO MEET SEDIMENT DISCHARGE REQUIREMENTS.

Designed By:	GSW
Date	8/17/2023

Appendix 7

Storm Water Management Maintenance Schedule and Procedures

Post Construction Long Term Maintenance Plan for Kwik Trip # 1283 Village of Hartland, Wisconsin

System Description:

The property is located at the corner of Main Street and Town Line Road, Town of Lisbon, Waukesha County, Wisconsin. The site consists of a series of storm water conveyances through sheet draining, piping, bio-retention pond, wet detention pond and Manhole type control structure.

System Maintenance

Catch Basin / Manhole and Oil Skimmer

- The facility structures should be checked annually for signs of damage and cracks to top slab, walls and bottom.
- The structure's cover or grate should be fully in place.
- Metal grates shall be free of debris and vegetation.
- Grates should be checked for missing or broken members of the grate.
- Ladder should be inspected for missing rungs, wall attachments, rust, cracks or sharp edges.
- The structure bottom and pipes should be clear of vegetation and debris.
- Remove sediment when it is within 12 inches from the lowest pipe invert or 50% of sump depth.

Trench Drain

- The facility structures should be checked annually for signs of damage and cracks to top grate.
- The structure's bottom and walls to be checked for cracks.
- Metal grates shall be free of debris and vegetation.
- Grates should be checked for missing or broken members of the grate.
- The structure bottom and pipes should be clear of sediment and debris.

OUR MISSION

To serve our customers and community more effectively than anyone else by treating our customers, co-workers and suppliers as we, personally, would like to be treated, and to make a difference in someone's life.

Outflow Control Structures

- The facility structures should be checked annually for signs of damage and cracks to top slab, walls and bottom.
- The structure's cover or grate should be fully in place.
- Metal grates shall be free of debris and vegetation.
- Grates should be checked for missing or broken members of the grate.
- Ladder should be inspected for missing rungs, wall attachments, misalignment, rust, cracks or sharp edges.
- Removed debris from interior trash rack (if present).
- The connection of the interior steel plates to the structure should be inspected for cracks.
- The structure bottom and pipes should be clear of vegetation and debris.
- Remove sediment when it within 12 inches from the lowest pipe invert.

Apron and Riprap

- The facility structures should be checked annually for signs of damage to apron.
- The end of pipe, apron and surrounding riprap should be free of debris.
- Inspect for erosion around apron.
- Inspect for erosion and sediment accumulation within the riprap.

Ditches and Swales

- The facility should be checked annually for signs of erosion, vegetation loss, side slopes and channelization of the flow.
- Area should be free of any standing water.
- The grass should not be allowed to grow greater than 8" in height and shall not be cut any shorter than 2 inches.
- Keep all areas free of debris.
- Remove cuttings if necessary.
- Remove sediment by hand with a flat-bottomed shovel during dry periods if present.
- Remove only the amount of sediment necessary to restore hydraulic capacity, leaving as much of the vegetation in place as possible. Reseed or unplug any damaged turf or vegetation.

Storm Detention Areas/Wet Ponds

- The facility should be checked annually for signs of erosion or bare soil along the perimeter, inlet pipe or swale, side slopes and at the inlet/outlet devices.

- Remove any dead or invasive vegetation and trees.
- Keep all areas free of debris.
- Remove sediment by hand with a flat-bottomed shovel during dry periods. Remove only the amount of sediment necessary to restore hydraulic capacity, leaving as much of the vegetation in place as possible. Reseed or unplug any damaged turf or vegetation.

****NOTE**

- Some sediment may contain contaminants that requires special disposal. If there is uncertainty about what the sediment contains or it is known to contain contaminants, the Department of Natural Resources should be consulted through Kwik Trip's Environmental Department. Generally, special attention or sampling should be given to sediment accumulated in fueling areas, large parking lots, or other areas where pollutants (other than clean soil) are suspected to accumulate and be conveyed by storm runoff.
- Some sediment collected may be free of pollutants and can be used as fill material. It is vital that this material not be placed in any way that will promote or allow re-suspension in the storm runoff.

Tasks	Street Clean	Underground Storm Sewer System	Catch Basin	Ditches & Swales	Outflow Control Structures	Apron/Rip Rap	Wet Detention Pond	Wetland Issues	Schedule
Inspection		X	X	X	X	X	X	X	Annual
Clean Streets	X								Annual
Mowing				X			X		0-2 times per year
System Clean Out		X							1 Time per 4 years



Kwik Trip Stormwater BMP Inspection

Store #: 1283

Number of BMPs: 17

Location (City, State): Village of Hartland, Waukesha County, WI

Weather: _____

Inspection date: _____

Inspection By: _____

Inspection Results:

<u>Maintenance Required:</u>	YES	NO	N/A	<u>Maintenance Required:</u>	YES	NO	N/A
Infall Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Trench Drain	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outfall Erosion	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Oil/Debris Separator	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Outlet Structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Catch Basin/Manhole	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Depth/Sediment Accumulation	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Apron	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Wet Detention Pond Liner	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Rip Rap	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Safety Shelf	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>				
Other Structure	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	Other			

Attach pictures on last page

Communication Notes

Phone Fax Written E-Mail Personal Discussion

To whom: _____

Comments: _____

<p>Structure Quantity: 10</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th>INCH</th> <th>FEET</th> <th>INCH</th> <th>FEET</th> <th>INCH</th> <th>FEET</th> <th>INCH</th> <th>FEET</th> </tr> </thead> <tbody> <tr><td>48"</td><td>4'</td><td>60"</td><td>5'</td><td>6"</td><td>0.5'</td><td>0"</td><td>0'</td></tr> <tr><td>54"</td><td>4.5'</td><td>72"</td><td>6'</td><td>12"</td><td>1'</td><td>0"</td><td>0'</td></tr> <tr><td>60"</td><td>5'</td><td>84"</td><td>7'</td><td>18"</td><td>1.5'</td><td>0"</td><td>0'</td></tr> <tr><td>66"</td><td>5.5'</td><td>96"</td><td>8'</td><td>24"</td><td>2'</td><td>0"</td><td>0'</td></tr> <tr><td>72"</td><td>6'</td><td>108"</td><td>9'</td><td>30"</td><td>2.5'</td><td>0"</td><td>0'</td></tr> <tr><td>78"</td><td>6.5'</td><td>120"</td><td>10'</td><td>36"</td><td>3'</td><td>0"</td><td>0'</td></tr> <tr><td>84"</td><td>7'</td><td>132"</td><td>11'</td><td>42"</td><td>3.5'</td><td>0"</td><td>0'</td></tr> <tr><td>90"</td><td>7.5'</td><td>144"</td><td>12'</td><td>48"</td><td>4'</td><td>0"</td><td>0'</td></tr> <tr><td>96"</td><td>8'</td><td>156"</td><td>13'</td><td>54"</td><td>4.5'</td><td>0"</td><td>0'</td></tr> <tr><td>102"</td><td>8.5'</td><td>168"</td><td>14'</td><td>60"</td><td>5'</td><td>0"</td><td>0'</td></tr> <tr><td>108"</td><td>9'</td><td>180"</td><td>15'</td><td>66"</td><td>5.5'</td><td>0"</td><td>0'</td></tr> <tr><td>114"</td><td>9.5'</td><td>192"</td><td>16'</td><td>72"</td><td>6'</td><td>0"</td><td>0'</td></tr> <tr><td>120"</td><td>10'</td><td>204"</td><td>17'</td><td>78"</td><td>6.5'</td><td>0"</td><td>0'</td></tr> <tr><td>126"</td><td>10.5'</td><td>216"</td><td>18'</td><td>84"</td><td>7'</td><td>0"</td><td>0'</td></tr> <tr><td>132"</td><td>11'</td><td>228"</td><td>19'</td><td>90"</td><td>7.5'</td><td>0"</td><td>0'</td></tr> <tr><td>138"</td><td>11.5'</td><td>240"</td><td>20'</td><td>96"</td><td>8'</td><td>0"</td><td>0'</td></tr> <tr><td>144"</td><td>12'</td><td>252"</td><td>21'</td><td>102"</td><td>8.5'</td><td>0"</td><td>0'</td></tr> <tr><td>150"</td><td>12.5'</td><td>264"</td><td>22'</td><td>108"</td><td>9'</td><td>0"</td><td>0'</td></tr> <tr><td>156"</td><td>13'</td><td>276"</td><td>23'</td><td>114"</td><td>9.5'</td><td>0"</td><td>0'</td></tr> <tr><td>162"</td><td>13.5'</td><td>288"</td><td>24'</td><td>120"</td><td>10'</td><td>0"</td><td>0'</td></tr> <tr><td>168"</td><td>14'</td><td>300"</td><td>25'</td><td>126"</td><td>10.5'</td><td>0"</td><td>0'</td></tr> <tr><td>174"</td><td>14.5'</td><td>312"</td><td>26'</td><td>132"</td><td>11'</td><td>0"</td><td>0'</td></tr> <tr><td>180"</td><td>15'</td><td>324"</td><td>27'</td><td>138"</td><td>11.5'</td><td>0"</td><td>0'</td></tr> <tr><td>186"</td><td>15.5'</td><td>336"</td><td>28'</td><td>144"</td><td>12'</td><td>0"</td><td>0'</td></tr> <tr><td>192"</td><td>16'</td><td>348"</td><td>29'</td><td>150"</td><td>12.5'</td><td>0"</td><td>0'</td></tr> <tr><td>198"</td><td>16.5'</td><td>360"</td><td>30'</td><td>156"</td><td>13'</td><td>0"</td><td>0'</td></tr> <tr><td>204"</td><td>17'</td><td>372"</td><td>31'</td><td>162"</td><td>13.5'</td><td>0"</td><td>0'</td></tr> <tr><td>210"</td><td>17.5'</td><td>384"</td><td>32'</td><td>168"</td><td>14'</td><td>0"</td><td>0'</td></tr> <tr><td>216"</td><td>18'</td><td>396"</td><td>33'</td><td>174"</td><td>14.5'</td><td>0"</td><td>0'</td></tr> <tr><td>222"</td><td>18.5'</td><td>408"</td><td>34'</td><td>180"</td><td>15'</td><td>0"</td><td>0'</td></tr> <tr><td>228"</td><td>19'</td><td>420"</td><td>35'</td><td>186"</td><td>15.5'</td><td>0"</td><td>0'</td></tr> <tr><td>234"</td><td>19.5'</td><td>432"</td><td>36'</td><td>192"</td><td>16'</td><td>0"</td><td>0'</td></tr> <tr><td>240"</td><td>20'</td><td>444"</td><td>37'</td><td>198"</td><td>16.5'</td><td>0"</td><td>0'</td></tr> <tr><td>246"</td><td>20.5'</td><td>456"</td><td>38'</td><td>204"</td><td>17'</td><td>0"</td><td>0'</td></tr> <tr><td>252"</td><td>21'</td><td>468"</td><td>39'</td><td>210"</td><td>17.5'</td><td>0"</td><td>0'</td></tr> <tr><td>258"</td><td>21.5'</td><td>480"</td><td>40'</td><td>216"</td><td>18'</td><td>0"</td><td>0'</td></tr> <tr><td>264"</td><td>22'</td><td>492"</td><td>41'</td><td>222"</td><td>18.5'</td><td>0"</td><td>0'</td></tr> <tr><td>270"</td><td>22.5'</td><td>504"</td><td>42'</td><td>228"</td><td>19'</td><td>0"</td><td>0'</td></tr> <tr><td>276"</td><td>23'</td><td>516"</td><td>43'</td><td>234"</td><td>19.5'</td><td>0"</td><td>0'</td></tr> <tr><td>282"</td><td>23.5'</td><td>528"</td><td>44'</td><td>240"</td><td>20'</td><td>0"</td><td>0'</td></tr> <tr><td>288"</td><td>24'</td><td>540"</td><td>45'</td><td>246"</td><td>20.5'</td><td>0"</td><td>0'</td></tr> <tr><td>294"</td><td>24.5'</td><td>552"</td><td>46'</td><td>252"</td><td>21'</td><td>0"</td><td>0'</td></tr> <tr><td>300"</td><td>25'</td><td>564"</td><td>47'</td><td>258"</td><td>21.5'</td><td>0"</td><td>0'</td></tr> <tr><td>306"</td><td>25.5'</td><td>576"</td><td>48'</td><td>264"</td><td>22'</td><td>0"</td><td>0'</td></tr> <tr><td>312"</td><td>26'</td><td>588"</td><td>49'</td><td>270"</td><td>22.5'</td><td>0"</td><td>0'</td></tr> <tr><td>318"</td><td>26.5'</td><td>600"</td><td>50'</td><td>276"</td><td>23'</td><td>0"</td><td>0'</td></tr> <tr><td>324"</td><td>27'</td><td>612"</td><td>51'</td><td>282"</td><td>23.5'</td><td>0"</td><td>0'</td></tr> <tr><td>330"</td><td>27.5'</td><td>624"</td><td>52'</td><td>288"</td><td>24'</td><td>0"</td><td>0'</td></tr> <tr><td>336"</td><td>28'</td><td>636"</td><td>53'</td><td>294"</td><td>24.5'</td><td>0"</td><td>0'</td></tr> <tr><td>342"</td><td>28.5'</td><td>648"</td><td>54'</td><td>300"</td><td>25'</td><td>0"</td><td>0'</td></tr> <tr><td>348"</td><td>29'</td><td>660"</td><td>55'</td><td>306"</td><td>25.5'</td><td>0"</td><td>0'</td></tr> <tr><td>354"</td><td>29.5'</td><td>672"</td><td>56'</td><td>312"</td><td>26'</td><td>0"</td><td>0'</td></tr> <tr><td>360"</td><td>30'</td><td>684"</td><td>57'</td><td>318"</td><td>26.5'</td><td>0"</td><td>0'</td></tr> <tr><td>366"</td><td>30.5'</td><td>696"</td><td>58'</td><td>324"</td><td>27'</td><td>0"</td><td>0'</td></tr> <tr><td>372"</td><td>31'</td><td>708"</td><td>59'</td><td>330"</td><td>27.5'</td><td>0"</td><td>0'</td></tr> <tr><td>378"</td><td>31.5'</td><td>720"</td><td>60'</td><td>336"</td><td>28'</td><td>0"</td><td>0'</td></tr> <tr><td>384"</td><td>32'</td><td>732"</td><td>61'</td><td>342"</td><td>28.5'</td><td>0"</td><td>0'</td></tr> <tr><td>390"</td><td>32.5'</td><td>744"</td><td>62'</td><td>348"</td><td>29'</td><td>0"</td><td>0'</td></tr> <tr><td>396"</td><td>33'</td><td>756"</td><td>63'</td><td>354"</td><td>29.5'</td><td>0"</td><td>0'</td></tr> <tr><td>402"</td><td>33.5'</td><td>768"</td><td>64'</td><td>360"</td><td>30'</td><td>0"</td><td>0'</td></tr> <tr><td>408"</td><td>34'</td><td>780"</td><td>65'</td><td>366"</td><td>30.5'</td><td>0"</td><td>0'</td></tr> <tr><td>414"</td><td>34.5'</td><td>792"</td><td>66'</td><td>372"</td><td>31'</td><td>0"</td><td>0'</td></tr> <tr><td>420"</td><td>35'</td><td>804"</td><td>67'</td><td>378"</td><td>31.5'</td><td>0"</td><td>0'</td></tr> <tr><td>426"</td><td>35.5'</td><td>816"</td><td>68'</td><td>384"</td><td>32'</td><td>0"</td><td>0'</td></tr> <tr><td>432"</td><td>36'</td><td>828"</td><td>69'</td><td>390"</td><td>32.5'</td><td>0"</td><td>0'</td></tr> <tr><td>438"</td><td>36.5'</td><td>840"</td><td>70'</td><td>396"</td><td>33'</td><td>0"</td><td>0'</td></tr> <tr><td>444"</td><td>37'</td><td>852"</td><td>71'</td><td>402"</td><td>33.5'</td><td>0"</td><td>0'</td></tr> <tr><td>450"</td><td>37.5'</td><td>864"</td><td>72'</td><td>408"</td><td>34'</td><td>0"</td><td>0'</td></tr> <tr><td>456"</td><td>38'</td><td>876"</td><td>73'</td><td>414"</td><td>34.5'</td><td>0"</td><td>0'</td></tr> <tr><td>462"</td><td>38.5'</td><td>888"</td><td>74'</td><td>420"</td><td>35'</td><td>0"</td><td>0'</td></tr> <tr><td>468"</td><td>39'</td><td>900"</td><td>75'</td><td>426"</td><td>35.5'</td><td>0"</td><td>0'</td></tr> <tr><td>474"</td><td>39.5'</td><td>912"</td><td>76'</td><td>432"</td><td>36'</td><td>0"</td><td>0'</td></tr> <tr><td>480"</td><td>40'</td><td>924"</td><td>77'</td><td>438"</td><td>36.5'</td><td>0"</td><td>0'</td></tr> <tr><td>486"</td><td>40.5'</td><td>936"</td><td>78'</td><td>444"</td><td>37'</td><td>0"</td><td>0'</td></tr> <tr><td>492"</td><td>41'</td><td>948"</td><td>79'</td><td>450"</td><td>37.5'</td><td>0"</td><td>0'</td></tr> <tr><td>498"</td><td>41.5'</td><td>960"</td><td>80'</td><td>456"</td><td>38'</td><td>0"</td><td>0'</td></tr> <tr><td>504"</td><td>42'</td><td>972"</td><td>81'</td><td>462"</td><td>38.5'</td><td>0"</td><td>0'</td></tr> <tr><td>510"</td><td>42.5'</td><td>984"</td><td>82'</td><td>468"</td><td>39'</td><td>0"</td><td>0'</td></tr> <tr><td>516"</td><td>43'</td><td>996"</td><td>83'</td><td>474"</td><td>39.5'</td><td>0"</td><td>0'</td></tr> <tr><td>522"</td><td>43.5'</td><td>1008"</td><td>84'</td><td>480"</td><td>40'</td><td>0"</td><td>0'</td></tr> <tr><td>528"</td><td>44'</td><td>1020"</td><td>85'</td><td>486"</td><td>40.5'</td><td>0"</td><td>0'</td></tr> <tr><td>534"</td><td>44.5'</td><td>1032"</td><td>86'</td><td>492"</td><td>41'</td><td>0"</td><td>0'</td></tr> <tr><td>540"</td><td>45'</td><td>1044"</td><td>87'</td><td>498"</td><td>41.5'</td><td>0"</td><td>0'</td></tr> <tr><td>546"</td><td>45.5'</td><td>1056"</td><td>88'</td><td>504"</td><td>42'</td><td>0"</td><td>0'</td></tr> <tr><td>552"</td><td>46'</td><td>1068"</td><td>89'</td><td>510"</td><td>42.5'</td><td>0"</td><td>0'</td></tr> <tr><td>558"</td><td>46.5'</td><td>1080"</td><td>90'</td><td>516"</td><td>43'</td><td>0"</td><td>0'</td></tr> <tr><td>564"</td><td>47'</td><td>1092"</td><td>91'</td><td>522"</td><td>43.5'</td><td>0"</td><td>0'</td></tr> <tr><td>570"</td><td>47.5'</td><td>1104"</td><td>92'</td><td>528"</td><td>44'</td><td>0"</td><td>0'</td></tr> <tr><td>576"</td><td>48'</td><td>1116"</td><td>93'</td><td>534"</td><td>44.5'</td><td>0"</td><td>0'</td></tr> <tr><td>582"</td><td>48.5'</td><td>1128"</td><td>94'</td><td>540"</td><td>45'</td><td>0"</td><td>0'</td></tr> <tr><td>588"</td><td>49'</td><td>1140"</td><td>95'</td><td>546"</td><td>45.5'</td><td>0"</td><td>0'</td></tr> <tr><td>594"</td><td>49.5'</td><td>1152"</td><td>96'</td><td>552"</td><td>46'</td><td>0"</td><td>0'</td></tr> <tr><td>600"</td><td>50'</td><td>1164"</td><td>97'</td><td>558"</td><td>46.5'</td><td>0"</td><td>0'</td></tr> <tr><td>606"</td><td>50.5'</td><td>1176"</td><td>98'</td><td>564"</td><td>47'</td><td>0"</td><td>0'</td></tr> <tr><td>612"</td><td>51'</td><td>1188"</td><td>99'</td><td>570"</td><td>47.5'</td><td>0"</td><td>0'</td></tr> <tr><td>618"</td><td>51.5'</td><td>1200"</td><td>100'</td><td>576"</td><td>48'</td><td>0"</td><td>0'</td></tr> <tr><td>624"</td><td>52'</td><td>1212"</td><td>101'</td><td>582"</td><td>48.5'</td><td>0"</td><td>0'</td></tr> <tr><td>630"</td><td>52.5'</td><td>1224"</td><td>102'</td><td>588"</td><td>49'</td><td>0"</td><td>0'</td></tr> <tr><td>636"</td><td>53'</td><td>1236"</td><td>103'</td><td>594"</td><td>49.5'</td><td>0"</td><td>0'</td></tr> <tr><td>642"</td><td>53.5'</td><td>1248"</td><td>104'</td><td>600"</td><td>50'</td><td>0"</td><td>0'</td></tr> <tr><td>648"</td><td>54'</td><td>1260"</td><td>105'</td><td>606"</td><td>50.5'</td><td>0"</td><td>0'</td></tr> <tr><td>654"</td><td>54.5'</td><td>1272"</td><td>106'</td><td>612"</td><td>51'</td><td>0"</td><td>0'</td></tr> <tr><td>660"</td><td>55'</td><td>1284"</td><td>107'</td><td>618"</td><td>51.5'</td><td>0"</td><td>0'</td></tr> <tr><td>666"</td><td>55.5'</td><td>1296"</td><td>108'</td><td>624"</td><td>52'</td><td>0"</td><td>0'</td></tr> <tr><td>672"</td><td>56'</td><td>1308"</td><td>109'</td><td>630"</td><td>52.5'</td><td>0"</td><td>0'</td></tr> <tr><td>678"</td><td>56.5'</td><td>1320"</td><td>110'</td><td>636"</td><td>53'</td><td>0"</td><td>0'</td></tr> <tr><td>684"</td><td>57'</td><td>1332"</td><td>111'</td><td>642"</td><td>53.5'</td><td>0"</td><td>0'</td></tr> <tr><td>690"</td><td>57.5'</td><td>1344"</td><td>112'</td><td>648"</td><td>54'</td><td>0"</td><td>0'</td></tr> <tr><td>696"</td><td>58'</td><td>1356"</td><td>113'</td><td>654"</td><td>54.5'</td><td>0"</td><td>0'</td></tr> <tr><td>702"</td><td>58.5'</td><td>1368"</td><td>114'</td><td>660"</td><td>55'</td><td>0"</td><td>0'</td></tr> <tr><td>708"</td><td>59'</td><td>1380"</td><td>115'</td><td>666"</td><td>55.5'</td><td>0"</td><td>0'</td></tr> <tr><td>714"</td><td>59.5'</td><td>1392"</td><td>116'</td><td>672"</td><td>56'</td><td>0"</td><td>0'</td></tr> <tr><td>720"</td><td>60'</td><td>1404"</td><td>117'</td><td>678"</td><td>56.5'</td><td>0"</td><td>0'</td></tr> <tr><td>726"</td><td>60.5'</td><td>1416"</td><td>118'</td><td>684"</td><td>57'</td><td>0"</td><td>0'</td></tr> <tr><td>732"</td><td>61'</td><td>1428"</td><td>119'</td><td>690"</td><td>57.5'</td><td>0"</td><td>0'</td></tr> <tr><td>738"</td><td>61.5'</td><td>1440"</td><td>120'</td><td>696"</td><td>58'</td><td>0"</td><td>0'</td></tr> <tr><td>744"</td><td>62'</td><td>1452"</td><td>121'</td><td>702"</td><td>58.5'</td><td>0"</td><td>0'</td></tr> <tr><td>750"</td><td>62.5'</td><td>1464"</td><td>122'</td><td>708"</td><td>59'</td><td>0"</td><td>0'</td></tr> <tr><td>756"</td><td>63'</td><td>1476"</td><td>123'</td><td>714"</td><td>59.5'</td><td>0"</td><td>0'</td></tr> <tr><td>762"</td><td>63.5'</td><td>1488"</td><td>124'</td><td>720"</td><td>60'</td><td>0"</td><td>0'</td></tr> <tr><td>768"</td><td>64'</td><td>1500"</td><td>125'</td><td>726"</td><td>60.5'</td><td>0"</td><td>0'</td></tr> <tr><td>774"</td><td>64.5'</td><td>1512"</td><td>126'</td><td>732"</td><td>61'</td><td>0"</td><td>0'</td></tr> <tr><td>780"</td><td>65'</td><td>1524"</td><td>127'</td><td>738"</td><td>61.5'</td><td>0"</td><td>0'</td></tr> <tr><td>786"</td><td>65.5'</td><td>1536"</td><td>128'</td><td>744"</td><td>62'</td><td>0"</td><td>0'</td></tr> <tr><td>792"</td><td>66'</td><td>1548"</td><td>129'</td><td>750"</td><td>62.5'</td><td>0"</td><td>0'</td></tr> <tr><td>798"</td><td>66.5'</td><td>1560"</td><td>130'</td><td>756"</td><td>63'</td><td>0"</td><td>0'</td></tr> <tr><td>804"</td><td>67'</td><td>1572"</td><td>131'</td><td>762"</td><td>63.5'</td><td>0"</td><td>0'</td></tr> <tr><td>810"</td><td>67.5'</td><td>1584"</td><td>132'</td><td>768"</td><td>64'</td><td>0"</td><td>0'</td></tr> <tr><td>816"</td><td>68'</td><td>1596"</td><td>133'</td><td>774"</td><td>64.5'</td><td>0"</td><td>0'</td></tr> <tr><td>822"</td><td>68.5'</td><td>1608"</td><td>134'</td><td>780"</td><td>65'</td><td>0"</td><td>0'</td></tr> <tr><td>828"</td><td>69'</td><td>1620"</td><td>135'</td><td>786"</td><td>65.5'</td><td>0"</td><td>0'</td></tr> <tr><td>834"</td><td>69.5'</td><td>1632"</td><td>136'</td><td>792"</td><td>66'</td><td>0"</td><td>0'</td></tr> <tr><td>840"</td><td>70'</td><td>1644"</td><td>137'</td><td>798"</td><td>66.5'</td><td>0"</td><td>0'</td></tr> <tr><td>846"</td><td>70.5'</td><td>1656"</td><td>138'</td><td>804"</td><td>67'</td><td>0"</td><td>0'</td></tr> <tr><td>852"</td><td>71'</td><td>1668"</td><td>139'</td><td>810"</td><td>67.5'</td><td>0"</td><td>0'</td></tr> <tr><td>858"</td><td>71.5'</td><td>1680"</td><td>140'</td><td>816"</td><td>68'</td><td>0"</td><td>0'</td></tr> <tr><td>864"</td><td>72'</td><td>1692"</td><td>141'</td><td>822"</td><td>68.5'</td><td>0"</td><td>0'</td></tr> <tr><td>870"</td><td>72.5'</td><td>1704"</td><td>142'</td><td>828"</td><td>69'</td><td>0"</td><td>0'</td></tr> <tr><td>876"</td><td>73'</td><td>1716"</td><td>143'</td><td>834"</td><td>69.5'</td><td>0"</td><td>0'</td></tr> <tr><td>882"</td><td>73.5'</td><td>1728"</td><td>144'</td><td>840"</td><td>70'</td><td>0"</td><td>0'</td></tr> <tr><td>888"</td><td>74'</td><td>1740"</td><td>145'</td><td>846"</td><td>70.5'</td><td>0"</td><td>0'</td></tr> <tr><td>894"</td><td>74.5'</td><td>1752"</td><td>146'</td><td>852"</td><td>71'</td><td>0"</td><td>0'</td></tr> <tr><td>900"</td><td>75'</td><td>1764"</td><td>147'</td><td>858"</td><td>71.5'</td><td>0"</td><td>0'</td></tr> <tr><td>906"</td><td>75.5'</td><td>1776"</td><td>148'</td><td>864"</td><td>72'</td><td>0"</td><td>0'</td></tr> <tr><td>912"</td><td>76'</td><td>1788"</td><td>149'</td><td>870"</td><td>72.5'</td><td>0"</td><td>0'</td></tr> <tr><td>918"</td><td>76.5'</td><td>1800"</td><td>150'</td><td>876"</td><td>73'</td><td>0"</td><td>0'</td></tr> <tr><td>924"</td><td>77'</td><td>1812"</td><td>151'</td><td>882"</td><td>73.5'</td><td>0"</td><td>0'</td></tr> <tr><td>930"</td><td>77.5'</td><td>1824"</td><td>152'</td><td>888"</td><td>74'</td><td>0"</td><td>0'</td></tr> <tr><td>936"</td><td>78'</td><td>1836"</td><td>153'</td><td>894"</td><td>74.5'</td><td>0"</td><td>0'</td></tr> <tr><td>942"</td><td>78.5'</td><td>1848"</td><td>154'</td><td>900"</td><td>75'</td><td>0"</td><td>0'</td></tr> <tr><td>948"</td><td>79'</td><td>1860"</td><td>155'</td><td>906"</td><td>75.5'</td><td>0"</td><td>0'</td></tr> <tr><td>954"</td><td>79.5'</td><td>1872"</td><td>156'</td><td>912"</td><td>76'</td><td>0"</td><td>0'</td></tr> <tr><td>960"</td><td>80'</td><td>1884"</td><td>157'</td><td>918"</td><td>76.5'</td><td>0"</td><td>0'</td></tr> <tr><td>966"</td><td>80.5'</td><td>1896"</td><td>158'</td><td>924"</td><td>77'</td><td>0"</td><td>0'</td></tr> <tr><td>972"</td><td>81'</td><td>1908"</td><td>159'</td><td>930"</td><td>77.5'</td><td>0"</td><td>0'</td></tr> <tr><td>978"</td><td>81.5'</td><td>1920"</td><td>160'</td><td>936"</td><td>78'</td><td>0"</td><td>0'</td></tr> <tr><td>984"</td><td>82'</td><td>1932"</td><td>161'</td><td>942"</td><td>78.5'</td><td>0"</td><td>0'</td></tr> <tr><td>990"</td><td>82.5'</td><td>1944"</td><td>162'</td><td>948"</td><td>79'</td><td>0"</td><td>0'</td></tr> <tr><td>996"</td><td>83'</td><td>1956"</td><td>163'</td><td>954"</td><td>79.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1002"</td><td>83.5'</td><td>1968"</td><td>164'</td><td>960"</td><td>80'</td><td>0"</td><td>0'</td></tr> <tr><td>1008"</td><td>84'</td><td>1980"</td><td>165'</td><td>966"</td><td>80.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1014"</td><td>84.5'</td><td>1992"</td><td>166'</td><td>972"</td><td>81'</td><td>0"</td><td>0'</td></tr> <tr><td>1020"</td><td>85'</td><td>2004"</td><td>167'</td><td>978"</td><td>81.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1026"</td><td>85.5'</td><td>2016"</td><td>168'</td><td>984"</td><td>82'</td><td>0"</td><td>0'</td></tr> <tr><td>1032"</td><td>86'</td><td>2028"</td><td>169'</td><td>990"</td><td>82.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1038"</td><td>86.5'</td><td>2040"</td><td>170'</td><td>996"</td><td>83'</td><td>0"</td><td>0'</td></tr> <tr><td>1044"</td><td>87'</td><td>2052"</td><td>171'</td><td>1002"</td><td>83.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1050"</td><td>87.5'</td><td>2064"</td><td>172'</td><td>1008"</td><td>84'</td><td>0"</td><td>0'</td></tr> <tr><td>1056"</td><td>88'</td><td>2076"</td><td>173'</td><td>1014"</td><td>84.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1062"</td><td>88.5'</td><td>2088"</td><td>174'</td><td>1020"</td><td>85'</td><td>0"</td><td>0'</td></tr> <tr><td>1068"</td><td>89'</td><td>2100"</td><td>175'</td><td>1026"</td><td>85.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1074"</td><td>89.5'</td><td>2112"</td><td>176'</td><td>1032"</td><td>86'</td><td>0"</td><td>0'</td></tr> <tr><td>1080"</td><td>90'</td><td>2124"</td><td>177'</td><td>1038"</td><td>86.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1086"</td><td>90.5'</td><td>2136"</td><td>178'</td><td>1044"</td><td>87'</td><td>0"</td><td>0'</td></tr> <tr><td>1092"</td><td>91'</td><td>2148"</td><td>179'</td><td>1050"</td><td>87.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1098"</td><td>91.5'</td><td>2160"</td><td>180'</td><td>1056"</td><td>88'</td><td>0"</td><td>0'</td></tr> <tr><td>1104"</td><td>92'</td><td>2172"</td><td>181'</td><td>1062"</td><td>88.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1110"</td><td>92.5'</td><td>2184"</td><td>182'</td><td>1068"</td><td>89'</td><td>0"</td><td>0'</td></tr> <tr><td>1116"</td><td>93'</td><td>2196"</td><td>183'</td><td>1074"</td><td>89.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1122"</td><td>93.5'</td><td>2208"</td><td>184'</td><td>1080"</td><td>90'</td><td>0"</td><td>0'</td></tr> <tr><td>1128"</td><td>94'</td><td>2220"</td><td>185'</td><td>1086"</td><td>90.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1134"</td><td>94.5'</td><td>2232"</td><td>186'</td><td>1092"</td><td>91'</td><td>0"</td><td>0'</td></tr> <tr><td>1140"</td><td>95'</td><td>2244"</td><td>187'</td><td>1098"</td><td>91.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1146"</td><td>95.5'</td><td>2256"</td><td>188'</td><td>1104"</td><td>92'</td><td>0"</td><td>0'</td></tr> <tr><td>1152"</td><td>96'</td><td>2268"</td><td>189'</td><td>1110"</td><td>92.5'</td><td>0"</td><td>0'</td></tr> <tr><td>1158"</td><td>96.5'</td><td>2280"</td><td>190'</td><td>1116"</td><td>93'</td><td>0"</td></tr></tbody></table>	INCH	FEET	INCH	FEET	INCH	FEET	INCH	FEET	48"	4'	60"	5'	6"	0.5'	0"	0'	54"	4.5'	72"	6'	12"	1'	0"	0'	60"	5'	84"	7'	18"	1.5'	0"	0'	66"	5.5'	96"	8'	24"	2'	0"	0'	72"	6'	108"	9'	30"	2.5'	0"	0'	78"	6.5'	120"	10'	36"	3'	0"	0'	84"	7'	132"	11'	42"	3.5'	0"	0'	90"	7.5'	144"	12'	48"	4'	0"	0'	96"	8'	156"	13'	54"	4.5'	0"	0'	102"	8.5'	168"	14'	60"	5'	0"	0'	108"	9'	180"	15'	66"	5.5'	0"	0'	114"	9.5'	192"	16'	72"	6'	0"	0'	120"	10'	204"	17'	78"	6.5'	0"	0'	126"	10.5'	216"	18'	84"	7'	0"	0'	132"	11'	228"	19'	90"	7.5'	0"	0'	138"	11.5'	240"	20'	96"	8'	0"	0'	144"	12'	252"	21'	102"	8.5'	0"	0'	150"	12.5'	264"	22'	108"	9'	0"	0'	156"	13'	276"	23'	114"	9.5'	0"	0'	162"	13.5'	288"	24'	120"	10'	0"	0'	168"	14'	300"	25'	126"	10.5'	0"	0'	174"	14.5'	312"	26'	132"	11'	0"	0'	180"	15'	324"	27'	138"	11.5'	0"	0'	186"	15.5'	336"	28'	144"	12'	0"	0'	192"	16'	348"	29'	150"	12.5'	0"	0'	198"	16.5'	360"	30'	156"	13'	0"	0'	204"	17'	372"	31'	162"	13.5'	0"	0'	210"	17.5'	384"	32'	168"	14'	0"	0'	216"	18'	396"	33'	174"	14.5'	0"	0'	222"	18.5'	408"	34'	180"	15'	0"	0'	228"	19'	420"	35'	186"	15.5'	0"	0'	234"	19.5'	432"	36'	192"	16'	0"	0'	240"	20'	444"	37'	198"	16.5'	0"	0'	246"	20.5'	456"	38'	204"	17'	0"	0'	252"	21'	468"	39'	210"	17.5'	0"	0'	258"	21.5'	480"	40'	216"	18'	0"	0'	264"	22'	492"	41'	222"	18.5'	0"	0'	270"	22.5'	504"	42'	228"	19'	0"	0'	276"	23'	516"	43'	234"	19.5'	0"	0'	282"	23.5'	528"	44'	240"	20'	0"	0'	288"	24'	540"	45'	246"	20.5'	0"	0'	294"	24.5'	552"	46'	252"	21'	0"	0'	300"	25'	564"	47'	258"	21.5'	0"	0'	306"	25.5'	576"	48'	264"	22'	0"	0'	312"	26'	588"	49'	270"	22.5'	0"	0'	318"	26.5'	600"	50'	276"	23'	0"	0'	324"	27'	612"	51'	282"	23.5'	0"	0'	330"	27.5'	624"	52'	288"	24'	0"	0'	336"	28'	636"	53'	294"	24.5'	0"	0'	342"	28.5'	648"	54'	300"	25'	0"	0'	348"	29'	660"	55'	306"	25.5'	0"	0'	354"	29.5'	672"	56'	312"	26'	0"	0'	360"	30'	684"	57'	318"	26.5'	0"	0'	366"	30.5'	696"	58'	324"	27'	0"	0'	372"	31'	708"	59'	330"	27.5'	0"	0'	378"	31.5'	720"	60'	336"	28'	0"	0'	384"	32'	732"	61'	342"	28.5'	0"	0'	390"	32.5'	744"	62'	348"	29'	0"	0'	396"	33'	756"	63'	354"	29.5'	0"	0'	402"	33.5'	768"	64'	360"	30'	0"	0'	408"	34'	780"	65'	366"	30.5'	0"	0'	414"	34.5'	792"	66'	372"	31'	0"	0'	420"	35'	804"	67'	378"	31.5'	0"	0'	426"	35.5'	816"	68'	384"	32'	0"	0'	432"	36'	828"	69'	390"	32.5'	0"	0'	438"	36.5'	840"	70'	396"	33'	0"	0'	444"	37'	852"	71'	402"	33.5'	0"	0'	450"	37.5'	864"	72'	408"	34'	0"	0'	456"	38'	876"	73'	414"	34.5'	0"	0'	462"	38.5'	888"	74'	420"	35'	0"	0'	468"	39'	900"	75'	426"	35.5'	0"	0'	474"	39.5'	912"	76'	432"	36'	0"	0'	480"	40'	924"	77'	438"	36.5'	0"	0'	486"	40.5'	936"	78'	444"	37'	0"	0'	492"	41'	948"	79'	450"	37.5'	0"	0'	498"	41.5'	960"	80'	456"	38'	0"	0'	504"	42'	972"	81'	462"	38.5'	0"	0'	510"	42.5'	984"	82'	468"	39'	0"	0'	516"	43'	996"	83'	474"	39.5'	0"	0'	522"	43.5'	1008"	84'	480"	40'	0"	0'	528"	44'	1020"	85'	486"	40.5'	0"	0'	534"	44.5'	1032"	86'	492"	41'	0"	0'	540"	45'	1044"	87'	498"	41.5'	0"	0'	546"	45.5'	1056"	88'	504"	42'	0"	0'	552"	46'	1068"	89'	510"	42.5'	0"	0'	558"	46.5'	1080"	90'	516"	43'	0"	0'	564"	47'	1092"	91'	522"	43.5'	0"	0'	570"	47.5'	1104"	92'	528"	44'	0"	0'	576"	48'	1116"	93'	534"	44.5'	0"	0'	582"	48.5'	1128"	94'	540"	45'	0"	0'	588"	49'	1140"	95'	546"	45.5'	0"	0'	594"	49.5'	1152"	96'	552"	46'	0"	0'	600"	50'	1164"	97'	558"	46.5'	0"	0'	606"	50.5'	1176"	98'	564"	47'	0"	0'	612"	51'	1188"	99'	570"	47.5'	0"	0'	618"	51.5'	1200"	100'	576"	48'	0"	0'	624"	52'	1212"	101'	582"	48.5'	0"	0'	630"	52.5'	1224"	102'	588"	49'	0"	0'	636"	53'	1236"	103'	594"	49.5'	0"	0'	642"	53.5'	1248"	104'	600"	50'	0"	0'	648"	54'	1260"	105'	606"	50.5'	0"	0'	654"	54.5'	1272"	106'	612"	51'	0"	0'	660"	55'	1284"	107'	618"	51.5'	0"	0'	666"	55.5'	1296"	108'	624"	52'	0"	0'	672"	56'	1308"	109'	630"	52.5'	0"	0'	678"	56.5'	1320"	110'	636"	53'	0"	0'	684"	57'	1332"	111'	642"	53.5'	0"	0'	690"	57.5'	1344"	112'	648"	54'	0"	0'	696"	58'	1356"	113'	654"	54.5'	0"	0'	702"	58.5'	1368"	114'	660"	55'	0"	0'	708"	59'	1380"	115'	666"	55.5'	0"	0'	714"	59.5'	1392"	116'	672"	56'	0"	0'	720"	60'	1404"	117'	678"	56.5'	0"	0'	726"	60.5'	1416"	118'	684"	57'	0"	0'	732"	61'	1428"	119'	690"	57.5'	0"	0'	738"	61.5'	1440"	120'	696"	58'	0"	0'	744"	62'	1452"	121'	702"	58.5'	0"	0'	750"	62.5'	1464"	122'	708"	59'	0"	0'	756"	63'	1476"	123'	714"	59.5'	0"	0'	762"	63.5'	1488"	124'	720"	60'	0"	0'	768"	64'	1500"	125'	726"	60.5'	0"	0'	774"	64.5'	1512"	126'	732"	61'	0"	0'	780"	65'	1524"	127'	738"	61.5'	0"	0'	786"	65.5'	1536"	128'	744"	62'	0"	0'	792"	66'	1548"	129'	750"	62.5'	0"	0'	798"	66.5'	1560"	130'	756"	63'	0"	0'	804"	67'	1572"	131'	762"	63.5'	0"	0'	810"	67.5'	1584"	132'	768"	64'	0"	0'	816"	68'	1596"	133'	774"	64.5'	0"	0'	822"	68.5'	1608"	134'	780"	65'	0"	0'	828"	69'	1620"	135'	786"	65.5'	0"	0'	834"	69.5'	1632"	136'	792"	66'	0"	0'	840"	70'	1644"	137'	798"	66.5'	0"	0'	846"	70.5'	1656"	138'	804"	67'	0"	0'	852"	71'	1668"	139'	810"	67.5'	0"	0'	858"	71.5'	1680"	140'	816"	68'	0"	0'	864"	72'	1692"	141'	822"	68.5'	0"	0'	870"	72.5'	1704"	142'	828"	69'	0"	0'	876"	73'	1716"	143'	834"	69.5'	0"	0'	882"	73.5'	1728"	144'	840"	70'	0"	0'	888"	74'	1740"	145'	846"	70.5'	0"	0'	894"	74.5'	1752"	146'	852"	71'	0"	0'	900"	75'	1764"	147'	858"	71.5'	0"	0'	906"	75.5'	1776"	148'	864"	72'	0"	0'	912"	76'	1788"	149'	870"	72.5'	0"	0'	918"	76.5'	1800"	150'	876"	73'	0"	0'	924"	77'	1812"	151'	882"	73.5'	0"	0'	930"	77.5'	1824"	152'	888"	74'	0"	0'	936"	78'	1836"	153'	894"	74.5'	0"	0'	942"	78.5'	1848"	154'	900"	75'	0"	0'	948"	79'	1860"	155'	906"	75.5'	0"	0'	954"	79.5'	1872"	156'	912"	76'	0"	0'	960"	80'	1884"	157'	918"	76.5'	0"	0'	966"	80.5'	1896"	158'	924"	77'	0"	0'	972"	81'	1908"	159'	930"	77.5'	0"	0'	978"	81.5'	1920"	160'	936"	78'	0"	0'	984"	82'	1932"	161'	942"	78.5'	0"	0'	990"	82.5'	1944"	162'	948"	79'	0"	0'	996"	83'	1956"	163'	954"	79.5'	0"	0'	1002"	83.5'	1968"	164'	960"	80'	0"	0'	1008"	84'	1980"	165'	966"	80.5'	0"	0'	1014"	84.5'	1992"	166'	972"	81'	0"	0'	1020"	85'	2004"	167'	978"	81.5'	0"	0'	1026"	85.5'	2016"	168'	984"	82'	0"	0'	1032"	86'	2028"	169'	990"	82.5'	0"	0'	1038"	86.5'	2040"	170'	996"	83'	0"	0'	1044"	87'	2052"	171'	1002"	83.5'	0"	0'	1050"	87.5'	2064"	172'	1008"	84'	0"	0'	1056"	88'	2076"	173'	1014"	84.5'	0"	0'	1062"	88.5'	2088"	174'	1020"	85'	0"	0'	1068"	89'	2100"	175'	1026"	85.5'	0"	0'	1074"	89.5'	2112"	176'	1032"	86'	0"	0'	1080"	90'	2124"	177'	1038"	86.5'	0"	0'	1086"	90.5'	2136"	178'	1044"	87'	0"	0'	1092"	91'	2148"	179'	1050"	87.5'	0"	0'	1098"	91.5'	2160"	180'	1056"	88'	0"	0'	1104"	92'	2172"	181'	1062"	88.5'	0"	0'	1110"	92.5'	2184"	182'	1068"	89'	0"	0'	1116"	93'	2196"	183'	1074"	89.5'	0"	0'	1122"	93.5'	2208"	184'	1080"	90'	0"	0'	1128"	94'	2220"	185'	1086"	90.5'	0"	0'	1134"	94.5'	2232"	186'	1092"	91'	0"	0'	1140"	95'	2244"	187'	1098"	91.5'	0"	0'	1146"	95.5'	2256"	188'	1104"	92'	0"	0'	1152"	96'	2268"	189'	1110"	92.5'	0"	0'	1158"	96.5'	2280"	190'	1116"	93'	0"
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1146"	95.5'	2256"	188'	1104"	92'	0"	0'																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1152"	96'	2268"	189'	1110"	92.5'	0"	0'																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																
1158"	96.5'	2280"	190'	1116"	93'	0"																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																	

<p>Trench Drain Quantity: 02</p>	<ul style="list-style-type: none"> • Casting • Surrounding concrete / pavement • Trench condition • Pipes and seals • Sediment depth
<p>Outfall / Overflow Quantity: 01</p>	<ul style="list-style-type: none"> • Sides • Sediment depth • Signs of erosion
<p>Detention Basin / Wet Pond Quantity: 1</p>	<ul style="list-style-type: none"> • Vegetation (weeds or bare spots) • Sediment depth / odor • Erosion • Emergency spill way • Side Slopes

Photos Before Maintenance

Photos After Maintenance (if required)

Structure:	
Structure:	
Structure:	

Structure:	
Structure:	
Structure:	