Planning Commission Application

Fort Gratiot Charter Township

For Office Use Only

Project #:	☑ Site Plan
Review Fee: $150 + $1000 Eng	☐ Special Use
Meeting Date: 4-8-2025	☐ Special Use & Site Plan

APPLICATION FOR SITE PLAN AND SPECIAL APPROVAL USE REVIEW

Please complete in full the information below. Return this application with *five (5) copies* of the site plan and other pertinent data, as required and outlined in the Fort Gratiot *"Procedures Guide for Site Plan Approval"* or the *"Procedures Guide for Special Land Use Approval,"* the applicable filing fee and the preliminary review fee. All information must be submitted thirty (30) days prior to the meeting.

Project Information:

Project Name: Smart Storage Solutions

Address/Location: 3134 Keewahdin Road, Fort Gratiot, MI 48059

Parcel Number(s): 74-20-016-3015-000 Zoning District: C-2

Surrounding Zoning Districts: N: AG S: C-2 E: RM W: C-2 Master Plan Designation:

Proposed Use: Self Storage

Contact Information:

Property Owner(s) Name – Check here if this is the main contact for this project ☐	Applicant(s) Name *(if different from owner)* – Check here if this is the main contact for this project ☐
Dion Schlager	
Street Address: 3001 N. River Road	Street Address:
City/State/Zip: Fort Gratiot	City/State/Zip:
Phone: 810-300-1222 Email: dionschlager@gmail.com	Phone: Email:
Alternate/Additional Contact Name and Email:	Alternate/Additional Contact Name and Email:

☐ Architect or ☒ Engineer Contact Name – Check here if this is the main contact for this project ☒	☐ Architect or ☐ Engineer Contact Name – Check here if this is the main contact for this project ☐
Lori M. Shink, PE	
Firm or Company Name: Shink Engineering, PLC	Firm or Company Name:
Street Address: 4146 Pine Grove Road	Street Address:
City/State/Zip: Fort Gratiot, MI 48059	City/State/Zip:
Phone: 586-718-1965 Email: lmshink@yahoo.com	Phone: Email:
Alternate/Additional Contact Name and Email:	Alternate/Additional Contact Name and Email:

The undersigned deposes that foregoing statements, answers, and accompanying information are true and correct and grants permission for authorized township representatives, Planning Commissioners, and the Zoning Administrator to enter the above-described property/properties for the purposes of gathering information related to this application.

Dion Schlager — Legal Owner Signature

Dion Schlager — Applicant Signature

2-28-2025 — Date

FORT GRATIOT PLANNING COMMISSION SITE PLAN REPORT

Project Name:	Smart Storage Solutions			Parcel ID:	74-20-016-3015-000
File Number:	25-001	Meeting Date:	04/08/2025	Location:	3134 Keewahdin Road

1. PROJECT SUMMARY

PROPERTY OWNER:
Dion Schlager, Smart Storage Solutions
3001 North River Road, Fort Gratiot, MI 48059

APPLICANT:
Lori M. Shink, PE, Shink Engineering, PLC
4146 Pine Grove Road, Fort Gratiot, MI 48059
P: (586) 718-1965 E: lmshink@yahoo.com

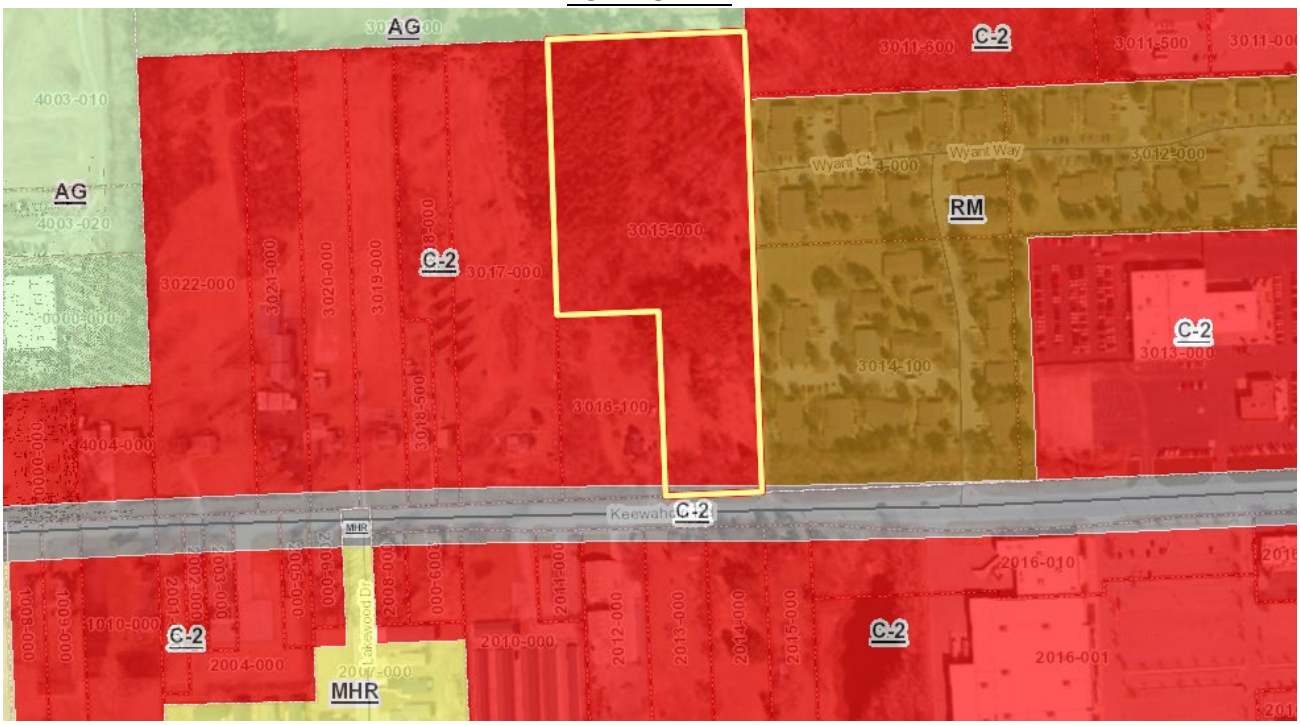
The applicant is proposing to construct a self-storage unit facility on a parcel zoned C-2 General Business in two phases. Phase One contains six buildings: two-30'x190', two-30'x200'; one-40'x190' and one-40'x200'; a gated entry, landscaping and lighting. The property is zoned C-2 General Business and the proposed is a permitted use requiring site plan approval pursuant to Division 9, Section 38-352 (35.)

SUBJECT PARCEL DATA			
Zoning:	C-2 General Business	Master Plan:	Uptown Business District
Lot Frontage:	220' – Keewahdin Road	Lot Size:	8.03 Acres – Irregular
Surrounding Properties Zoning and Land Use:			
North: AG	Dwelling and cell tower		
South: C2	Lawfully existing non-conforming residential homes, Port Huron Drywall		
East: C2/RM	Wetlands, Westmoore Apartments		
West: C2	Lawfully existing non-conforming residential homes, Certified Collision		

FORT GRATIOT PLANNING COMMISSION SITE PLAN REPORT

Project Name:	Smart Storage Solutions			Parcel ID:	74-20-016-3015-000
File Number:	25-001	Meeting Date:	04/08/2025	Location:	3134 Keewahdin Road

ZONING MAP



FUTURE LAND USE PLAN

2. REGULATORY ORDINANCE

Sec. 38-352. - Permitted uses.

In all C-2 general business districts, no land, building, structure, or premises except as otherwise provided in this chapter, shall be erected, altered, or used except for one or more of the following uses. The parenthetical number (000000) listed by each use is taken from the North American Industry Classification System (NAICS), as published by the U.S. Office of management and budget and is intended to provide a general guide of uses intended under each heading. However, where it is determined by the planning commission that the effects of a NAICS listed use may tend to extend beyond the site, special land use approval shall be required.

(35) Self-storage facilities and mini-warehouses (531130) used to provide temporary storage needs for businesses, apartment dwellers and other individuals on a self-service basis shall be a permitted use and are subject to the following extra standards:

Project Name:	Smart Storage Solutions			Parcel ID:	74-20-016-3015-000
File Number:	25-001	Meeting Date:	04/08/2025	Location:	3134 Keewahdin Road

A. NONE PROPOSED, MANDATORY ONGOING COMPLIANCE WILL BE REQUIRED.

a. No storage of combustible or flammable liquids, combustible fibers, explosive materials, or toxic materials shall be permitted with the self-storage buildings or upon the premises.

b. No outside storage shall be permitted.

c. The use of the premises shall be limited to storage only and shall not be used for operating any other business, or for maintaining or repairing of any vehicles, recreational equipment or other items, or for any recreational activity hobby or purpose other than the storage of personal items and business items.

B. MET

d. Appropriate screening as per the requirements of section 38-614 shall be provided for those portions of the site abutting a residential zoning district.

g. Buildings shall not exceed 200 feet in length and shall maintain a minimum distance of 25 feet between individual buildings.

C. MET – ADEQUATE DESIGN, WILL NEED FINAL ENGINEERING APPROVAL PRIOR TO PERMITTING

e. The site shall be graded, drained and developed with hard-surfaced pavement as per the specifications of section 38-73.

D. FIRE DEPARTMENT REVIEW PENDING – *At the time of this review, comments have not yet been received.*

f. Fire hydrants and fire suppression devices shall be provided, installed and maintained as per the requirements of the township fire chief.

3. CONSIDERATIONS:

The Planning Commission may impose such reasonable conditions of use as is determined necessary to protect the best interest of the township and the surrounding property. **Any decision MUST be accompanied by findings of fact and reasons for any decision.**

- Engineering does not recommend approval at this time. Report attached.
- The Fort Gratiot Assessing, Building and Public Works Departments have no concerns, reviews attached.
- Parking is not shown.
- Prior to any building permits being issued, proof of approval, permits issued by, proven compliance with, bonds issued to, all local, state, and federal agencies, including, but not limited to, final Fort Gratiot engineering review and approval, the St. Clair County (SCC) Health Department Soil Erosion and Sedimentation Control, the SCC Drain Office, the SCC Road Commission, and EGLE must be shown.

4. ACTIONS: Regardless of the action taken, the decision MUST be accompanied by reasons for such action.

A. Postpone the decision until a specific date, or until additional information is presented; **OR**

B. Approve the request as presented; **OR**

C. Approve the request with specific conditions:
   - A preliminary site plan approval may be considered and would require the applicant to present an updated site plan to the Planning Commission for final approval; ***OR***
   - Conditional site plan approval may be considered if the PC agrees that applicant has demonstrated the project generally meets the ordinance requirements; final compliance with all conditions verified administratively prior to building permits being issued; **OR**

D. Deny the request.

BMJ
ENGINEERS & SURVEYORS, INC.
CIVIL ENGINEERS · LAND SURVEYORS

PRINCIPALS
Philip J. Porte, P.E.
Robert J. Arnold, Jr., P.S.
Patrick R. Phelan, P.E. LEED AP
Andrew M. Bollaert, P.S.
Erik B. Schwanz

ASSOCIATES
Michael W. Quaine, P.E.

March 27, 2025

Ms. Jorja Baldwin
Planning and Zoning Administrator
Charter Township of Fort Gratiot
3720 Keewahdin Road
Fort Gratiot, MI 48059-3309

RE: Smart Storage Solutions - Mini Storage Site Plan, 3134 Keewahdin Road, Fort Gratiot Township (Plan Review No. 01)
BMJ Project Name: Keewahdin Rd. (3134) Mini-Storage Site Plan Review (JN: 2503.19)

Dear Ms. Baldwin:

We have completed our review of the site plan drawings submitted for the proposed Smart Storage Solutions mini storage site, which is located on the north side of Keewahdin Road between M-25 and Parker Road. The Site Plan was prepared by Shink Engineering, PLC under the direction of Lori M. Shink, P.E. The drawings are dated 2/28/2025. Our review comments are limited to engineering-related criteria as they pertain to site plan approval and are as follows:

A. General

1. The site is zoned C-2 General Business according to the Township Zoning Map dated November 29, 2006.
2. All minimum yard setbacks for the proposed development comply with Section 38-441 of the Township Zoning Ordinances.
3. Township Ordinance requires that topographic survey information be provided within 100 feet of the proposed work. This information is deficient at the north end and along the east side of the site. However, sufficient information has been provided to evaluate the plans for Phase 1 of the project.
4. There is an access easement shown in the northeast corner of the site. Easement dimensions/bearings, Liber and Page of the recorded easement should be added to Sheet 2 of the drawings.
5. The plans provided were not sealed. Plans required the seal and signature of a licensed professional engineer in the State of Michigan

B. Required Permits

1. The following permits will be required prior to the start of construction:
    a. Part 91 Soil Erosion and Sedimentation Control – St. Clair County Health Department.

b. Road Right-of-Way Construction- Keewahdin Road – St. Clair County Road Commission.
c. Drainage Permit – St. Clair County Drain Commissioner.
d. Part 399 Watermain - State of Michigan Dept. of EGLE, subject to the requirement to provide a water main for the purposes of fire protection (see Item C.2 below).

2. Copies of all permits should be provided to our office prior to the start of construction activity.

C. Water Main

1. An existing 12-inch water main is located along the south side of Keewahdin Road. This should be added to the plan.
2. We recommend that the Township Fire Chief review the plans for the adequacy of fire protection for the site. It is our opinion that this review should include if a watermain should be added to provide fire protection for the units within the site.
3. The Township Standard Detail Sheet for Water Main should be included as part of the complete set of engineering plans, subject to the requirement of the fire chief to add a water main for fire protection purposes.

D. Sanitary Sewer

1. An existing 12-inch sanitary sewer is located along the north side of Keewahdin Road. This should be added to the plans.
2. No extensions of the public sanitary sewer are proposed.
3. No sanitary sewer building leads are proposed.

E. Storm Drainage

1. The proposed storm drainage system will discharge into the Carrigan and Grace Drain – Keewahdin Branch along north side of Keewahdin Road. This will require a permit to be obtained from the St. Clair County Drain Commissioner.
2. Storm sewer system drainage calculations have been provided on the plans and indicate that the capacity of the system is adequate to accept the flow generated by the proposed improvements. The hydraulic grade line elevations for each section of the storm sewer should be added in drainage calculation table on Sheet 3 and the hydraulic grade line should be added to the storm sewer profiles on Sheet 4. An initial stating water surface elevation at the detention pond should be provided and substantiated.
3. We recommend that CB Structure #9 be revised to 72-inch diameter to allow the storm sewer connections to be constructed with adequate wall space between them.
4. A detention pond designed to accommodate the 100-year storm event has been provided and appears adequate for the development. An emergency overflow storm system has been provided which discharges to the Carrigan and Grace Drain – Keewahdin Branch. The hydraulic grade line elevations for the storm sewer should be added in drainage calculation table on Sheet 3 and the hydraulic grade line should be added to the storm sewer profiles on Sheet 4. An initial stating water surface elevation at the drain should be provided and substantiated.
5. The Permanent Detention Basin Outlet Filter Detail on Sheet 5 indicates eight 1-inch outlet holes are to be provided at elevation 601.00 for the 100-year outlet. These holes are not shown in the detail drawing and should be provided.

F. Traffic

1. Maneuvering lane dimensions comply with the requirements of the ordinance.
2. Adequate circulation is provided on the site.
3. We recommend that the Township Fire Chief review the plans for the adequacy of emergency vehicle access throughout the site.

G. Paving and Grading

1. Building finish floor elevations show a 1.3-foot grade differential between the north and south ends. Drawing details should be provided on how this is to be achieved. Additional grades should be provided as required to demonstrate intent.
2. A 6-foot-high decorative screening wall is proposed around the east, south and west sides of the site. The wall is shown on the neighboring properties on the east and west sides of the site and within the drain easement on the south side of the site. The wall on the east and west sides of the site may have been shown in this manner to prevent drawing linework overlapping. If this is the case, a note should be added to the drawings specifying that the wall be placed on the property line or as otherwise intended. We recommend that the wall on the south side of the site be relocated out of the county drain easement.
3. The 6-foot-high decorative screening wall around the property appears to be also functioning as a retaining wall based on the proposed 2 feet of differential between finish site grades and existing grades as provided on Sheet 3 and as shown in the masonry wall detail drawing on Sheet 5. Calculations should be provided demonstrating the ability of the wall to support the loading conditions expected.
4. Lineal footage of the 6-foot-high decorative screening wall listed on Sheet 3 of the plans appears incorrect. This should be reviewed and corrected accordingly.

F. Site Lighting

1. The plans indicate that shielded wall mounted lighting is to be provided (see Sheet 3). No fixture data has been provided. Details of fixture model type should be added to the drawings.
2. We recommend that a site photometric plan be provided to verify with compliance of Section 38-611(5) of the Township Zoning Ordinance.

At this time, we do not recommend the approval of the plans. The plans should be revised including provisions to address the items noted above and resubmitted for further review.

Sincerely,

BMJ ENGINEERS AND SURVEYORS, INC.

Philip J. Porte, P.E.
Township Consulting Engineer

Cc: Lori Shink, P.E. – Shink Engineering, PLC
Dione Schlager - Smart Storage Solutions

FORT GRATIOT CHARTER TOWNSHIP
SITE PLAN REVIEW

TO: Fort Gratiot Departments
FILE NO: 25-001 COMMENTS DUE: 04/01/2025
PROJECT: Smart Storage Solutions
MEETING: 04/08/2025
ADDRESS: Keewahdin Road
PARCEL I.D. #: 74-20-016-3015-000

YES	NO	N/A	BUILDING DEPARTMENT
X			1. Do the preliminary plans indicate the correct construction codes?
	X		2. Are there any potential conflicts with the site design that are a cause for concern?
		X	3. Are there special conditions, which may necessitate further study or information?

Comments:

Tom Jobbitt — Signature of Building Inspector
3-28-2025 — Date

YES	NO	N/A	ASSESSING DEPARTMENT
	X		1. Are lot splits required?
	X		2. Are lot combinations required?
	X		3. Are there any potential conflicts with the site or use that are a cause for concern?
	X		4. Are there special conditions, which may necessitate further study or information?

Comments:

Stephen Jones — Signature of Assessor
3-25-2025 — Date

FORT GRATIOT CHARTER TOWNSHIP
SITE PLAN REVIEW

TO: Fort Gratiot Departments FILE NO: 25-001 COMMENTS DUE: 04/01/2025

PROJECT: Smart Storage Solutions MEETING: 04/08/2025

ADDRESS: Keewahdin Road PARCEL I.D. #: 74-20-016-3015-000

YES	NO	N/A	FIRE DEPARTMENT
	X		1. Is there location and adequacy of water lines and fire hydrants?
X			2. Are additional on-site fire protection systems necessary?
X			3. Can use or building be serviced, in case of fire, from all sides?
X			4. Are the fire lanes provided adequate & accessible without moving cars or equipment?
X			5. Is there adequate vehicle access for fire equipment?
X			6. Can the facility be served in a reasonable period of time?
X			7. Has current or new address been submitted for fire department review?
X			8. Are there special conditions, which may necessitate further study or information? (i.e., paint, solvents, explosives, unstable chemicals)

Comments:

Need a fire hydrant on site. Fire hydrants along Keewahdin are too far away and on south side of road. WLS

Mark Vanderfeyst — Signature of Fire Chief

4-4-2025 — Date

FORT GRATIOT CHARTER TOWNSHIP
SITE PLAN REVIEW

TO: Fort Gratiot Departments FILE NO: 25-001 COMMENTS DUE: 04/01/2025

PROJECT: Smart Storage Solutions MEETING: 04/08/2025

ADDRESS: Keewahdin Road PARCEL I.D. #: 74-20-016-3015-000

YES	NO	N/A	PUBLIC WORKS
X			1. Will the overall system be adequate to absorb proposed use?
X			2. Are there adequate lines at the site?
X			3. Are there necessary rights-of-way for utilities?
	X		4. Are easements required for water mains, sanitary sewer, or storm drainage?
X			5. Are buildings/parking lots emptying into the municipal storm drain?
	X		6. Are buildings/parking lots emptying into the streets?

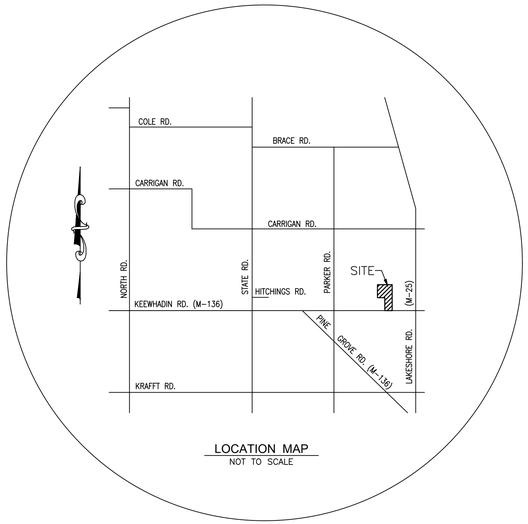
Comments:

Greg Randall — Signature of DPW Superintendent

3-31-2025 — Date

SMART STORAGE SOLUTIONS

3134 KEEWAHDIN ROAD
FORT GRATIOT, MICHIGAN 48059



LOCATION MAP
NOT TO SCALE

SHEET INDEX

OWNER:
DION SCHLAGER
3001 NORTH RIVER ROAD
FORT GRATIOT, MI 48059
CONTACT: DION SCHLAGER
EMAIL: dionschlager@gmail.com
PHONE: 810-300-1222

TOPOGRAPHY & SITE PLAN BY:
SHINK ENGINEERING, PLC
4146 PINE GROVE ROAD
FORT GRATIOT, MI 48059
CONTACT: LORI M SHINK
EMAIL: lmshink@yahoo.com
PHONE: 586-718-1965

PERMIT STATUS TABLE

PERMIT	AGENCY	REASON FOR PERMIT	DATE APPLIED FOR	DATE APPROVED
SOIL EROSION CONTROL PERMIT	SCC HEALTH DEPT.	MORE THAN 1 ACRE TO BE DISTURBED DURING CONSTRUCTION / WITHIN 500' OF A DRAIN	2/28/25	##/##/##
DRAINAGE PERMIT	SCC DRAIN COMMISSIONER	PROPOSED DISCHARGE OF FLOW TO ESTABLISHED DRAIN	2/28/25	##/##/##
ROAD COMMISSION PERMIT	SCC ROAD COMMISSION	COMMERCIAL ENTRANCE TO KEEWAHDIN ROAD R.O.W.	2/28/25	##/##/##
BUILDING PERMIT	FORT GRATIOT TOWNSHIP	SITE CONSTRUCTION	2/28/25	##/##/##

3 WORKING DAYS
BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
FOR FREE LOCATION OF PUBLIC UTILITIES

SHINK ENGINEERING, PLC
4146 PINE GROVE ROAD
FORT GRATIOT, MI 48059
lmshink@yahoo.com
586.718.1965

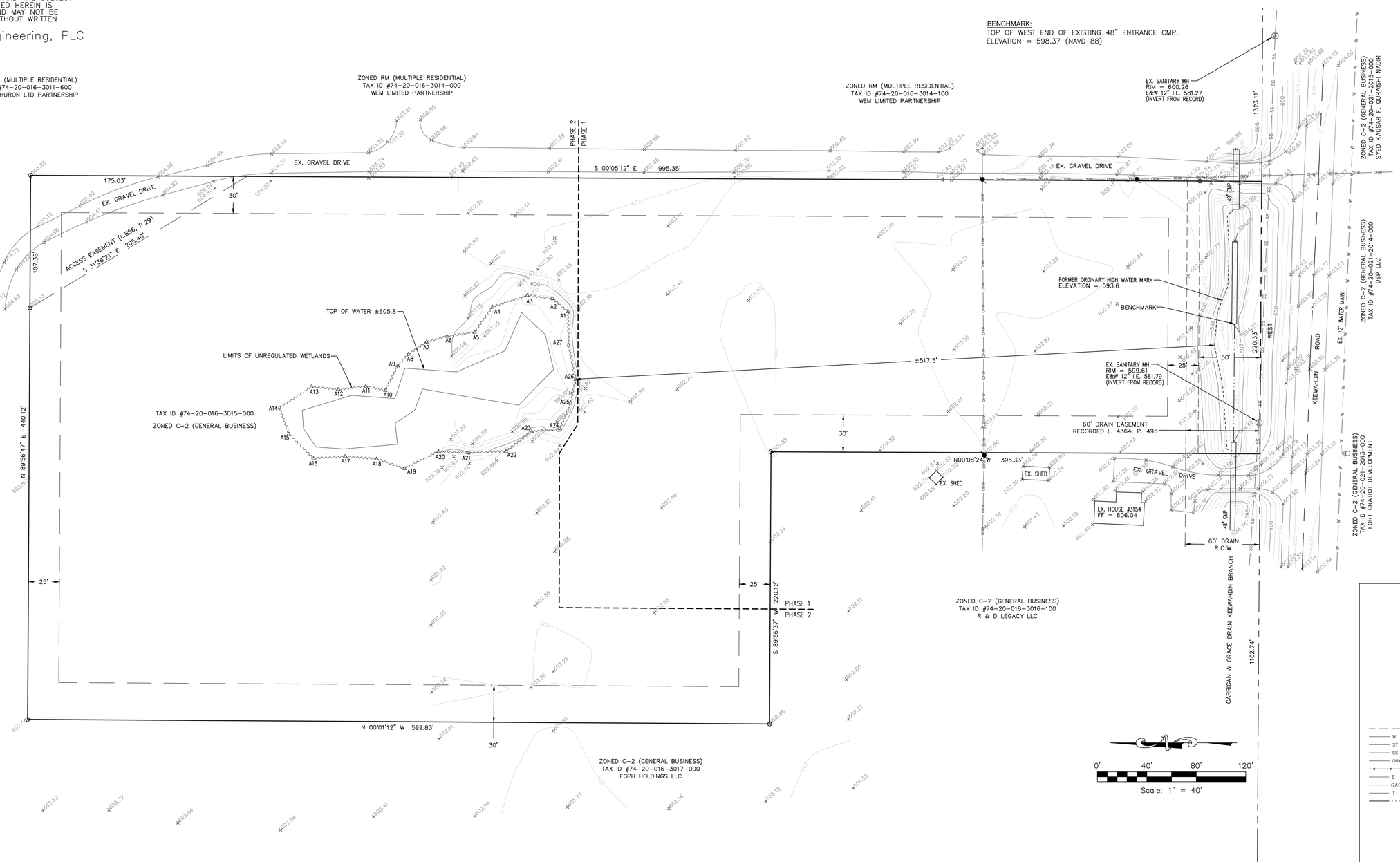
DATE:	2/28/25
DESIGNED BY:	TLE
DRAWN BY:	TLE
CHECKED BY:	LMS
APPROVED BY:	LMS

REVISIONS	
5	
4	
3	
2	
1	

COVER SHEET
SMART STORAGE SOLUTIONS
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

SCALE: N.T.S.
PROJECT NO.: 2024-0011
FILE NAME: SP-04.DWG
SHEET: 1 OF 9

1



LEGEND

- SET IRON
- FOUND IRON
- EXISTING DECIDUOUS TREE
- EXISTING EVER GREEN TREE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING ELECTRIC HOOK UP
- EXISTING FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING WATER MANHOLE
- EXISTING WELL
- EXISTING CATCHBASIN
- EXISTING MANHOLE
- EXISTING R.O.W. LINE
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING OVERHEAD WIRES
- EXISTING FENCE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND GAS MAIN
- EXISTING UNDERGROUND TELEPHONE
- EXISTING CENTERLINE DITCH/SWALE
- EXISTING GRADE
- PROPOSED GATE VALVE
- PROPOSED WATER SEE NOTE
- PROPOSED FIRE HYDRANT
- PROPOSED CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED LIGHT POLE
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED GRADE
- PROPOSED FLOW ARROW
- PROPOSED FLOW ARROW
- PROPOSED EVERGREEN TREE
- PROPOSED CANOPY TREE
- PROPOSED ORNAMENTAL TREE
- PROPOSED SHRUB

LEGAL DESCRIPTION (TAX ID #74-20-016-3015-000):
THE EAST 5 ACRES OF THE SOUTH 30 ACRES OF WEST 1/2 OF SOUTHEAST 1/4 OF SECTION 16, T7N, R17E FORT GRATIOT TOWNSHIP, ST. CLAIR COUNTY, MICHIGAN, AND BEGINNING EAST 881.85 FEET AND N. 00° 04' 50" W. 395 FEET FROM SOUTH 1/4 CORNER OF SAID SECTION 16, THENCE N. 00° 04' 50" W. 600.02 FEET, THENCE N. 89° 56' 30" E. 220.41 FEET, THENCE S. 00° 04' 50" E. 600.21 FEET, THENCE WEST 220.44 FEET TO POINT OF BEGINNING. SAID PARCEL CONTAINS 8.03 ACRES GROSS, 7.60 ACRES NET, MORE OR LESS.

UTILITY WARNING:
UNDERGROUND UTILITY LOCATIONS AS SHOWN ON THESE PLANS WERE OBTAINED FROM UTILITY OWNERS AND OR OBSERVATIONS MADE IN THE FIELD. A MINIMUM OF THREE WORKING DAYS PRIOR TO BEGINNING CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY "MISS DIG" (1-800-482-7171) AND HAVE ALL UTILITIES STAKED BEFORE ANY WORK MAY BEGIN. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE PROTECTION AND/OR RELOCATION OF ALL UTILITIES THAT MAY INTERFERE WITH CONSTRUCTION. THREE (3) WORKING DAYS BEFORE YOU DIG – CALL MISS DIG (1-800-482-7171).

UTILITY INFORMATION, AS SHOWN, INDICATES APPROXIMATE LOCATIONS AND TYPES OF UTILITIES ONLY, AS DISCLOSED TO THIS FIRM BY THE VARIOUS UTILITY COMPANY'S RECORD AND OR OBSERVATIONS MADE IN THE FIELD. NO GUARANTEE IS EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR IS RESPONSIBLE FOR FINAL VERIFICATION AS WELL AS VERIFYING THAT ALL UTILITIES WITHIN THE AREA OF WORK HAVE BEEN LOCATED.

PRIOR TO CONSTRUCTION, ALL LOCATION AND DEPTHS OF EXISTING OVERHEAD AND UNDERGROUND UTILITIES (IN CONFLICT WITH THE CONSTRUCTION OF PROPOSED IMPROVEMENTS) SHALL BE VERIFIED IN THE FIELD. DURING CONSTRUCTION, CONTRACTOR SHALL USE EXTREME CAUTION WHEN OPERATING NEAR OVERHEAD AND/OR BURIED UTILITIES.

TOPOGRAPHIC NOTES:
FIELDWORK FOR TOPOGRAPHIC SURVEY WAS PERFORMED 5/31/2024 THE CONTOURS ARE BASED ON THIS FIELD INFORMATION.

THE DRAIN CROSSING CULVERTS WERE AS-BUILT ON 7/8/2024 DUE TO A DRAIN CLEAN OUT PROJECT THAT WAS ONGOING THRU OUT THE SUMMER OF 2024.

DATE:	2/28/25
DESIGNED BY:	TLE
DRAWN BY:	TLE
CHECKED BY:	LMS
APPROVED BY:	LMS

SHINK ENGINEERING, PLC
4146 PINE GROVE ROAD
FORT GRATIOT, MI 48059
lmshink@yahoo.com
586.718.1965

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
FOR FREE LOCATION OF PUBLIC UTILITIES

REVISIONS	
5	
4	
3	
2	
1	

TOPOGRAPHIC SURVEY
SMART STORAGE SOLUTIONS
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

SCALE: 1" = 40'
PROJECT NO.: 2024-0011
FILE NAME: TP-04.DWG
SHEET: 2 OF 9

2

FROM	TO	ACRES	RUNOFF COEFF	EQUIV. AREA	ADD'L AREA	SUM OF	INTEN-SITY	TIME OF CONC.	RUNOFF (CFS)	PIPE LENGTH	PIPE DIA.	VELOCITY FLOWING	HYDRAULIC GRADIENT	ACTUAL SLOPE	MANNING FLOW	MANNING'S VELOCITY	TIME	H.G. ELEV (NAVD 88)	H.G. ELEV (NAVD 88)
		A	C	A * C	A * C	A * C	I	T_C	Q	(LF)	(IN)	FULL (FPS)	SLOPE %	USED	CAPACITY	(FT/SEC)	(MIN)	UPPER END	LOWER END
CB #1	CB #2	0.26	0.83	0.22		0.22	4.38	15.00	0.94	60	12	1.20	0.07%	0.36%	2.14	2.73	0.37	601.68	601.63
CB #2	CB #3	0.33	0.90	0.30		0.51	4.34	15.37	2.22	60	12	2.83	0.39%	0.40%	2.27	2.89	0.35	601.63	601.40
CB #3	CB #4	0.32	0.90	0.29		0.80	4.30	15.71	3.44	60	18	1.95	0.11%	0.18%	4.47	2.53	0.40	601.40	601.34
CB #4	MH #5	0.26	0.83	0.22		1.02	4.26	16.11	4.33	220	24	1.38	0.04%	0.12%	7.86	2.50	1.47	601.34	601.26
MH #5	CB #9	0.00	0.90	0.00		1.02	4.11	17.57	4.18	230	24	1.33	0.03%	0.12%	7.86	2.50	1.53	601.26	601.18
CB #9	CDS	0.54	0.87	0.47	1.60	3.08	3.97	19.11	12.23	15	24	3.89	0.29%	0.29%	12.28	3.91	0.06	601.18	601.14
CDS	POND	0.00	0.90	0.00		3.08	3.96	19.17	12.21	47	24	3.89	0.29%	0.29%	12.28	3.91	0.20	601.14	601.00
CB #6	CB #7	0.53	0.87	0.46		0.46	4.38	15.00	2.02	60	12	2.57	0.32%	0.36%	2.14	2.73	0.37	601.53	601.34
CB #7	CB #8	0.63	0.90	0.57		1.03	4.34	15.37	4.46	60	18	2.52	0.18%	0.18%	4.47	2.53	0.40	601.34	601.23
CB #8	CB #9	0.63	0.90	0.57		1.60	4.29	15.76	6.85	60	24	2.18	0.09%	0.12%	7.86	2.50	0.40	601.23	601.18
POND	OVERFLOW	7.27	0.81	5.89		5.89	4.10	17.72	24.12	60	24	7.68	1.13%	1.13%	24.12	7.68	0.13	598.12	597.44

FROM	TO	ACRES	RUNOFF COEFF	EQUIV. AREA	ADD'L AREA	SUM OF	INTEN-SITY	TIME OF CONC.	RUNOFF (CFS)	PIPE LENGTH	PIPE DIA.	VELOCITY FLOWING	HYDRAULIC GRADIENT	ACTUAL SLOPE	MANNING FLOW	MANNING'S VELOCITY	TIME	H.G. ELEV (NAVD 88)	H.G. ELEV (NAVD 88)
		A	C	A * C	A * C	A * C	I	T_C	Q	(LF)	(IN)	FULL (FPS)	SLOPE %	USED	CAPACITY	(FT/SEC)	(MIN)	UPPER END	LOWER END
100 YR OVERFLOW	MH #13	7.27	0.81	5.89		5.89	6.25	17.85	36.83	27	36	5.21	0.30%	0.30%	36.87	5.22	0.09		
MH #13	DRAIN	0.00	0.00	0.00		5.89	6.24	17.94	36.76	390	36	5.20	0.30%	0.30%	36.87	5.22	1.25		
10 YR OVERFLOW	MH #13	7.27	0.81	5.89		5.89	4.08	17.85	24.05	27	36	3.40	0.13%	0.30%	36.87	5.22	0.09	597.44	597.40
MH #13	DRAIN	0.00	0.00	0.00		5.89	4.08	17.94	24.00	390	36	3.40	0.13%	0.30%	36.87	5.22	1.25	597.40	596.90

BASIS OF DESIGN - 10 YEAR STORM EVENT:
10 YEAR INTENSITY: I = 175 / (T+25)
INITIAL TIME OF CONCENTRATION: T = 15 MINUTES

THE HYDRAULIC GRADE LINE FOR THE PROPOSED STORM SEWER UPSTREAM FROM THE DETENTION BASIN IS MEASURED FROM THE 100 YEAR WATER ELEVATION OF THE DETENTION BASIN. PER DRAIN COMMISSION RULES.

BASIS OF DESIGN - 100 YEAR STORM EVENT:
100 YEAR INTENSITY: I = 275 / (T+25)
INITIAL TIME OF CONCENTRATION: T = 17.85 MINUTES

HYDRAULIC DESIGN - 10 YEAR STORM EVENT:
10 YEAR INTENSITY: I = 175 / (T+25)
INITIAL TIME OF CONCENTRATION: T = 15 MINUTES

THE HYDRAULIC GRADE LINE FROM THE PROPOSED DETENTION BASIN TO THE EXISTING DRAIN IS MEASURED FROM THE BASE FLOOD ELEVATION 596.9. FROM DRAIN RESTORATION PLAN.

NOTE:
EXISTING POND/BORROW PIT TO BE FILLED BEFORE PHASE 2 CONSTRUCTION.

THE SOUTH END OF THE POND/BORROW PIT WILL NEED A MINIMAL AMOUNT OF ENGINEERED FILL, WITHIN THE 1:1 SIDE SLOPE FROM 10 FEET NORTH OF THE NORTH EDGE OF PAVEMENT FOR PHASE 1.

LIGHTING:
ALL EXTERIOR LIGHTING SHALL BE WALL MOUNTED, DOWN-FACING, SHIELDED SOLAR WALL PACKS. LIGHTING WILL BE ON TIMERS, TURNED ON AT DUSK AND 90% OF THE LIGHTS WILL BE SHUT OFF AT 11:00 PM NIGHTLY.

OUTLET NOTE:
ALL PIPES FROM THE POND TO DRAIN ARE SIZED FOR BOTH PHASES.

THE OUTLET STRUCTURE IS ONLY SIZED FOR PHASE 1 (SEE SHEET 5) AND SHALL BE REPLACED WHEN PHASE 2 IS CONSTRUCTED.

BENCHMARK:
TOP OF WEST END OF EXISTING 48" ENTRANCE CMP.
ELEVATION = 598.37 (NAVD 88)

GENERAL NOTES:
1. ALL CONSTRUCTION MUST BE CONFORMING TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE TOWNSHIP OF FORT GRATIOT AND THE STATE OF MICHIGAN.
2. THE CONTRACTOR SHALL NOTIFY ALL UTILITY COMPANIES, THE TOWNSHIP ENGINEER AND/OR THE AUTHORITY HAVING JURISDICTION, 48 HOURS PRIOR TO BEGINNING CONSTRUCTION.
3. CALL MISS DIG (1-800-482-7171) A MINIMUM OF 72 HOURS PRIOR TO THE START OF CONSTRUCTION.
4. FULL-TIME CONSTRUCTION REVIEW MAY BE REQUIRED DURING ALL PHASES OF CONSTRUCTION INCLUDING GRADING, PAVING, INSTALLATION OF SANITARY SEWER, STORM SEWERS, DRAINS, WATER MAINS AND APPURTENANCES, AND STREETS, WHERE APPLICABLE.
5. ALL SOIL EROSION AND SILT MUST BE CONTROLLED AND CONTAINED ON SITE.
6. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES.
7. EXISTING UNDERGROUND UTILITIES ARE SHOWN IN APPROXIMATE LOCATION. CONTRACTOR SHALL VERIFY LOCATION AND ELEVATION PRIOR TO CONSTRUCTION.
9. MEET EXISTING GRADES AT ALL PROPERTY LINES.
10. CONSTRUCTION SHALL NOT COMMENCE WITHOUT A REPRESENTATIVE OF THE OWNER PRESENT.
11. PRIOR TO CONSTRUCTION CONTRACTOR MUST HAVE IN HIS POSSESSION A COPY OF ALL PERMITS NECESSARY FOR CONSTRUCTION.
12. THE CONTRACTOR SHALL MAINTAIN HIS CONSTRUCTION OPERATIONS WITHIN THE PRESENT ROAD RIGHT-OF-WAY AND EASEMENTS AS NOTED ON THE PLANS. IN THE EVENT THE CONTRACTOR DEEMS IT NECESSARY TO OPERATE BEYOND THESE LIMITS, HE SHALL BE RESPONSIBLE FOR MAKING WRITTEN AGREEMENTS WITH THE PROPERTY OWNERS AND WILL FURNISH SAME TO OWNER AND TOWNSHIP ENGINEER.
13. THE CONTRACTOR SHALL MAINTAIN TRAFFIC AT ALL TIMES.
14. PAVED STREETS SHALL BE MAINTAINED IN A REASONABLE STATE OF CLEANLINESS.
15. FLOW IN EXISTING SEWERS SHALL BE MAINTAINED AT ALL TIMES.
16. CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING POSITIVE ON SITE DRAINAGE.
17. ALL WORK PERFORMED IN THE RIGHT-OF-WAY OF AN ESTABLISHED DRAIN SHALL BE IN ACCORDANCE WITH THE DRAIN COMMISSIONER'S RULES.

STRUCTURE SCHEDULE

CATCHBASIN #1 (48" DIA.)
RIM 602.7
W. 12" I.E. 599.19

CATCHBASIN #2 (48" DIA.)
RIM 602.7
W. 12" I.E. 598.97
E. 12" I.E. 598.97

CATCHBASIN #3 (48" DIA.)
RIM 602.7
W. 12" I.E. 598.73
E. 18" I.E. 598.33

CATCHBASIN #4 (48" DIA.)
RIM 602.7
E. 18" I.E. 598.22
N. 24" I.E. 597.82

MH #5 (48" DIA.)
RIM 604.3
S. 24" I.E. 597.56
N. 24" I.E. 597.56

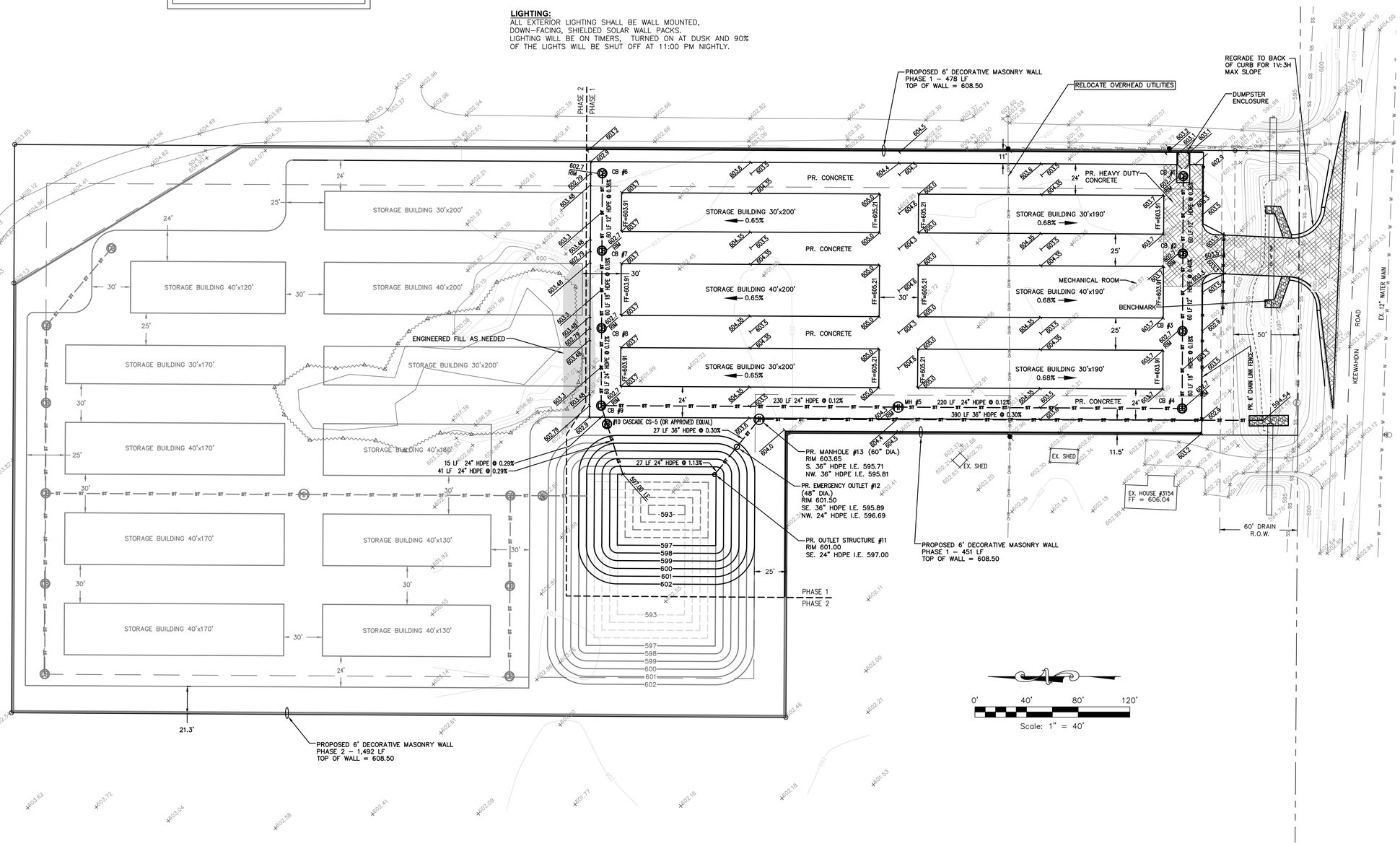
CATCHBASIN #6 (48" DIA.)
RIM 602.7
W. 12" I.E. 598.38

CATCHBASIN #7 (48" DIA.)
RIM 602.7
E. 12" I.E. 598.16
W. 18" I.E. 597.76

CATCHBASIN #8 (48" DIA.)
RIM 602.7
E. 18" I.E. 597.65
W. 24" I.E. 597.25

CATCHBASIN #9 (72" DIA.)
RIM 602.7
E. 24" I.E. 597.18
S. 24" I.E. 597.28
SW. 24" I.E. 597.18

C.D.S. #10
RIM 602.7
NE. 24" I.E. 597.14
SW. 24" I.E. 597.14



LEGEND
- SET IRON
- FOUND IRON
- EXISTING DECIDUOUS TREE
- EXISTING EVER GREEN TREE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING ELECTRIC HOOK UP
- EXISTING FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING WATER MANHOLE
- EXISTING WELL
- EXISTING CATCHBASIN
- EXISTING MANHOLE
- EXISTING R.O.W. LINE
- EXISTING WATER MAIN
- EXISTING STORM SEWER
- EXISTING SANITARY SEWER
- EXISTING OVERHEAD WIRES
- EXISTING FENCE
- EXISTING UNDERGROUND ELECTRIC
- EXISTING UNDERGROUND GAS MAIN
- EXISTING UNDERGROUND TELEPHONE
- EXISTING CENTERLINE DITCH/SWALE
- EXISTING GRADE
- PROPOSED GATE VALVE
- PROPOSED WATER SEE NOTE
- PROPOSED FIRE HYDRANT
- PROPOSED CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED LIGHT POLE
- PROPOSED WATER
- PROPOSED STORM SEWER
- PROPOSED SANITARY SEWER
- PROPOSED CHAIN LINK FENCE
- PROPOSED SILT FENCE
- PROPOSED GRADE
- PROPOSED FLOW ARROW
- PROPOSED FLOW ARROW
- PROPOSED EVERGREEN TREE
- PROPOSED CANOPY TREE
- PROPOSED ORNAMENTAL TREE
- PROPOSED SHRUB
- PROPOSED HEAVY DUTY CONCRETE

PRELIMINARY - NOT FOR CONSTRUCTION

REVISIONS	DATE
5	2/28/25
4	
3	
2	
1	

DESIGNED BY: TLE
DRAWN BY: TLE
CHECKED BY: LMS
APPROVED BY: LMS

SHINK ENGINEERING, PLC
4146 PINE GROVE ROAD
FORT GRATIOT, MI 48059
lmshink@yahoo.com
586.718.1965

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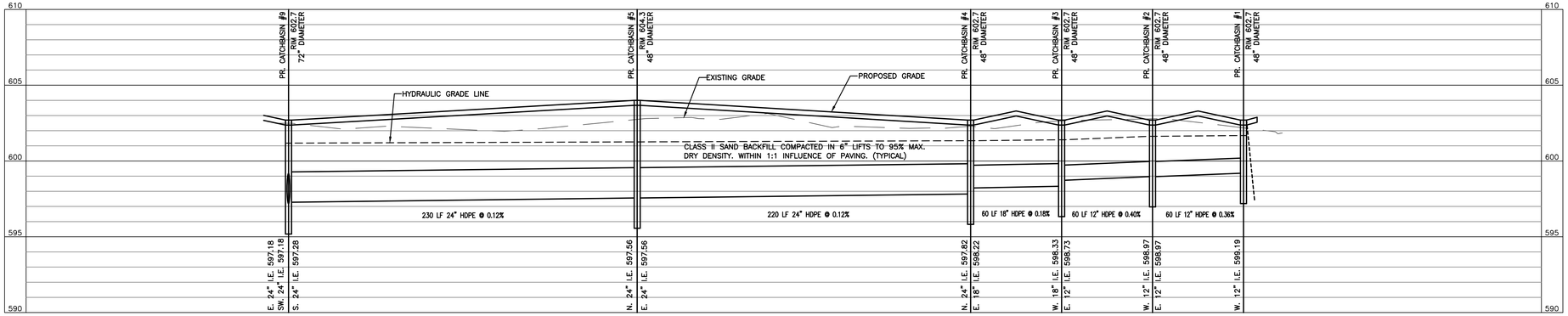
FOR FREE LOCATION OF PUBLIC UTILITIES

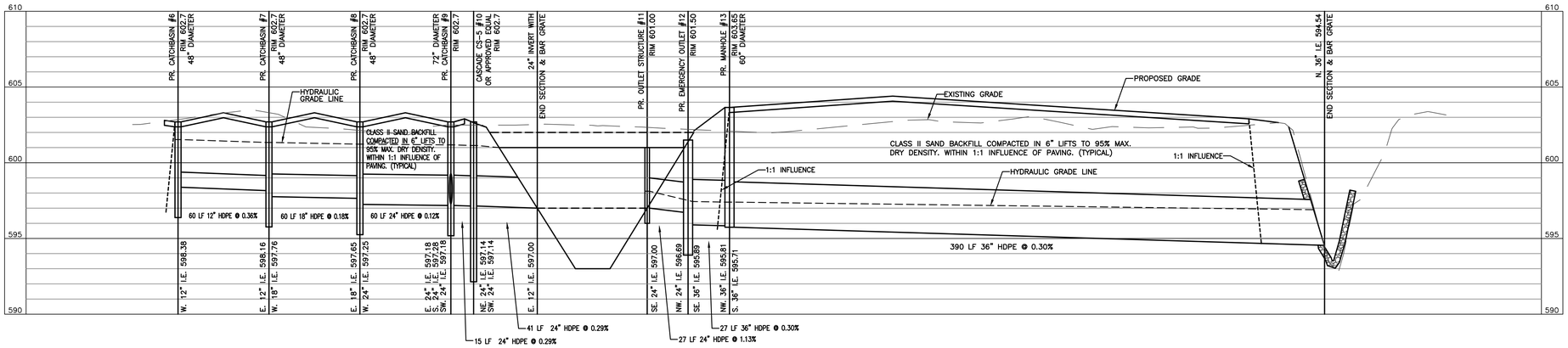
SITE PLAN
SMART STORAGE SOLUTIONS
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

SCALE: 1" = 40'
PROJECT NO.: 2024-0011
FILE NAME: TP-04.DWG
SHEET: 3 OF 9

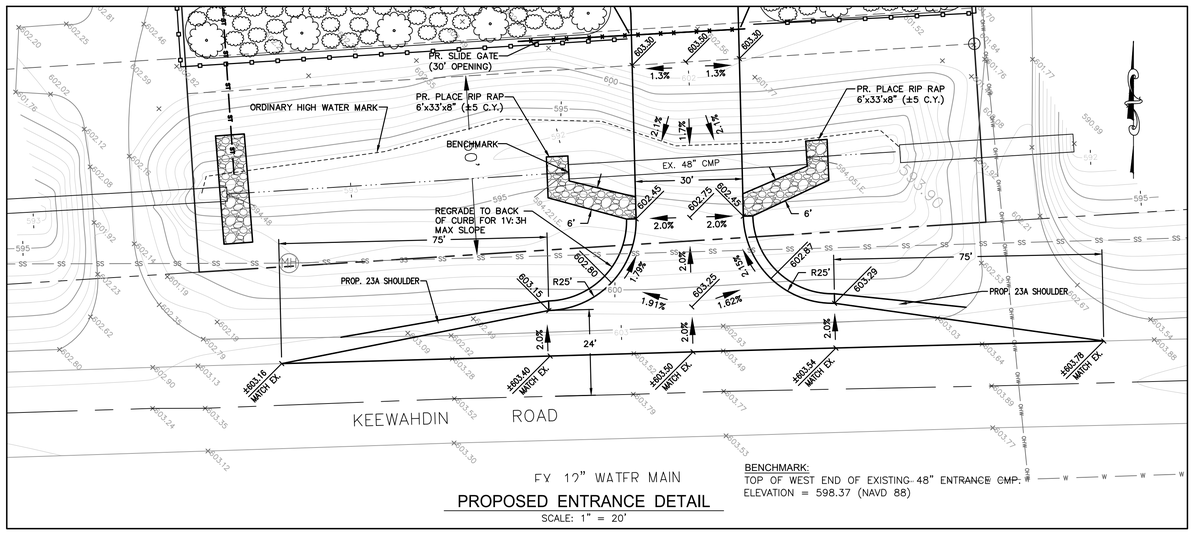
3



PROPOSED STORM SEWER PROFILE VERT. 1" = 4'
HORIZ. 1" = 40'

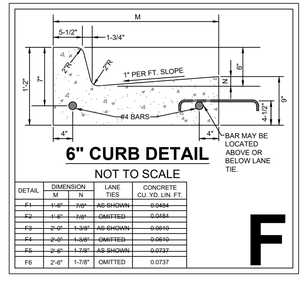


PROPOSED STORM SEWER PROFILE VERT. 1" = 4'
HORIZ. 1" = 40'



PROPOSED ENTRANCE DETAIL
SCALE: 1" = 20'

BENCHMARK:
TOP OF WEST END OF EXISTING 48" ENTRANCE CMP:
ELEVATION = 598.37 (NAVD 88)



6" CURB DETAIL
NOT TO SCALE

DETAIL	DIMENSION M	DIMENSION N	LANE TIES	CONCRETE CU. YD. LIN. FT.
F1	1'-6"	7/8"	AS SHOWN	0.0484
F2	1'-6"	7/8"	OMITTED	0.0484
F3	2'-0"	1-3/8"	AS SHOWN	0.0610
F4	2'-0"	1-3/8"	OMITTED	0.0610
F5	2'-6"	1-7/8"	AS SHOWN	0.0737
F6	2'-6"	1-7/8"	OMITTED	0.0737

F

DATE:	2/28/25
DESIGNED BY:	TLE
DRAWN BY:	TLE
CHECKED BY:	LMS
APPROVED BY:	LMS

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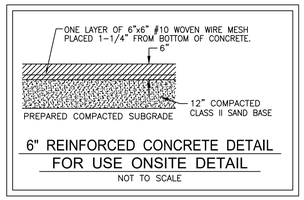
REVISIONS	
1	
2	
3	
4	
5	

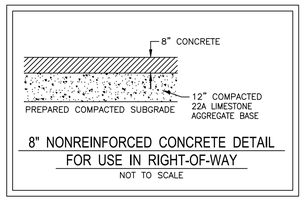
PROFILES & ENTRANCE DETAIL
SMART STORAGE SOLUTIONS
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

SCALE: 1" = 40'
PROJECT NO.: 2024-0016
FILE NAME: TP-04.DWG
SHEET: 4 OF 9

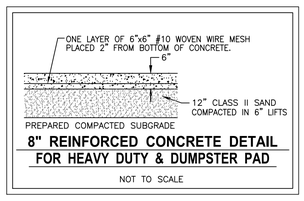
4



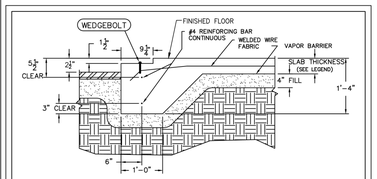
6" REINFORCED CONCRETE DETAIL
FOR USE ONSITE DETAIL
NOT TO SCALE



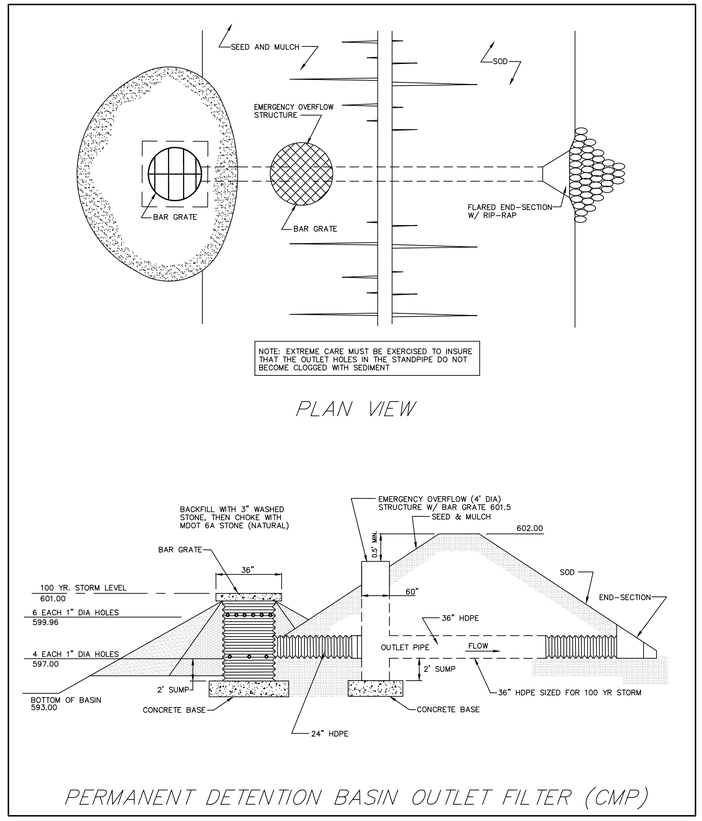
8" NONREINFORCED CONCRETE DETAIL
FOR USE IN RIGHT-OF-WAY
NOT TO SCALE



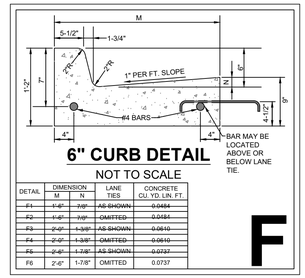
8" REINFORCED CONCRETE DETAIL
FOR HEAVY DUTY & DUMPSTER PAD
NOT TO SCALE



1 FLOATING SLAB DETAIL, NOTCHED



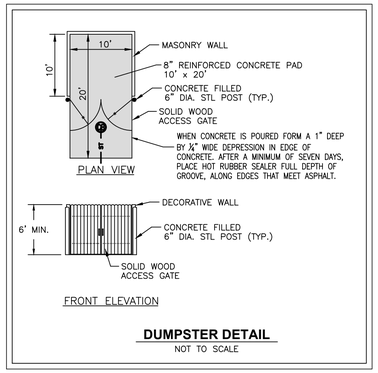
PERMANENT DETENTION BASIN OUTLET FILTER (CMP)



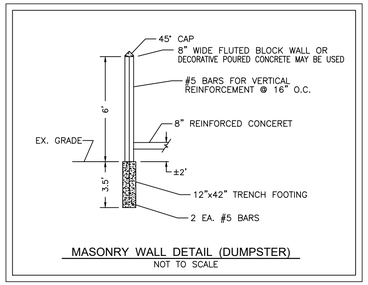
6" CURB DETAIL
NOT TO SCALE

DETAIL	DIMENSION M	DIMENSION N	LANE TIES	CONCRETE CU. YD. LIN. FT.
F1	1'-6"	7/8"	AS SHOWN	0.0484
F2	1'-6"	7/8"	OMITTED	0.0484
F3	2'-0"	1-3/8"	AS SHOWN	0.0610
F4	2'-0"	1-3/8"	OMITTED	0.0610
F5	2'-6"	1-7/8"	AS SHOWN	0.0737
F6	2'-6"	1-7/8"	OMITTED	0.0737

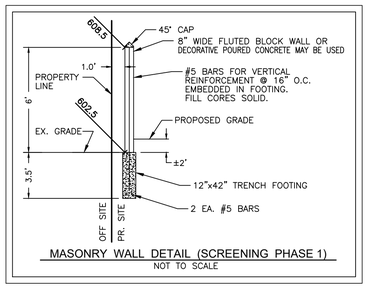
F



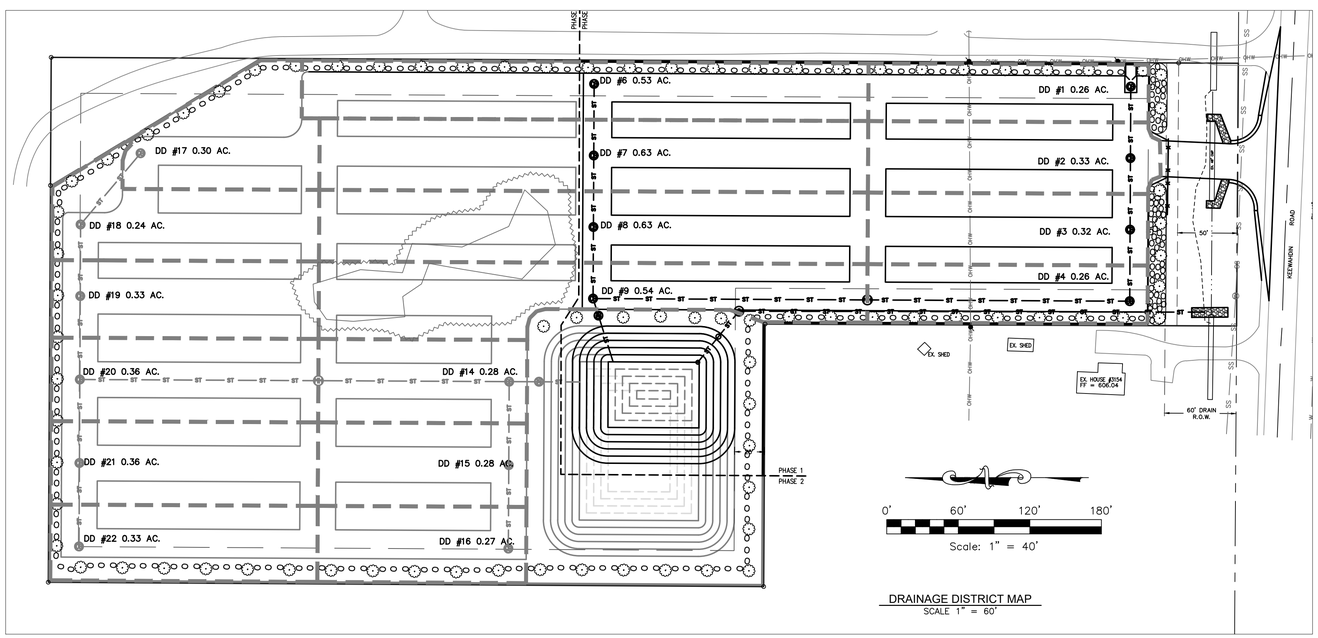
DUMPSTER DETAIL
NOT TO SCALE



MASONRY WALL DETAIL (DUMPSTER)
NOT TO SCALE



MASONRY WALL DETAIL (SCREENING PHASE 1)
NOT TO SCALE



DRAINAGE DISTRICT MAP
SCALE 1" = 60'

DETENTION CALCULATIONS - PHASE 1

AREA (ACRES)	"C" FACTOR	ACRE IMPERVIOUS		
2.22	0.90	2.00	FOOR / PAVEMENT	
0.00	0.85	0.00	GRAVEL PAVING	
0.72	0.17	0.12	GRASS	
0.33	0.95	0.31	POND	
COMPOUND C:		0.74		
TOTAL DRAINAGE AREA:		3.27	ACRES	

K1 = AxC (Design Constant) 2.4339
Qr = Allowable Release Rate = 0.15 cfs/ac.
Qa = Qr * A = 0.49 CFS

100 YR. FLOOD VOLUME REQUIRED

Qo = Qa/A*C= 0.20 CFS/AC-IMP.

T100 = -25+SQRT(10312.5/Qo) = 201.21

Vs = 16500*T100 - 40*Qa*T100
T100+25
= 13054 CF/AC-IMP.

Vt= Vs*A*C = **31773** **CF**

REQUIRED 100 YEAR DETENTION VOLUME = 31773 CF

BANKFULL FLOOD VOLUME
The Bankfull Volume is a 24 hour, 2 yr. Storm Event (2.30"*A*C)
V_{BF} = 8349 * A * C= **20321** **CF**

FIRST FLUSH VOLUME
The First Flush Volume is a first 1" of rain over entire watershed.
V_{FF} = 3630 x A x C= **8835** **CF**

STORAGE PROVIDED

ELEV.	AREA (FT²)	DEPTH (FT)	VOLUME (FT³)	TOTAL VOLUME (FT3)	
602	14897	1	13,580	45,356	FREEBOARD ELEVATION
601	12304	1	11,099	31,776	
600	9937	1	8,845	20,677	
599	7797	1	6,817	11,831	
598	5882	1	5,014	5,014	
597	4194	0	0	0	

FIRST FUUSH
X_{FF} = 598.49

BUNKFULL FLOOD
X_{BF} = 599.96

100 YEAR
X_{100} = 601.00

TOP OF BERM 602.00

OUTLET CONTROL STRUCTURE

FIRST FLUSH OF RUNOFF
THE AVERAGE ALLOWABLE RELEASE RATE FOR RUNOFF IS 1" OVER AREA OF SITE IN 24 HRS.

$Q_{FF} = V_{FF}$ x (1/24HRS) x (1HR/3600SEC)= 0.102 CFS

PLACE OPENINGS IN STANDPIPE AT BOTTOM OF BASIN = **597.00**

HEAD = h = Xff - BOTTOM BASIN ELEV x 2/3 = 1.00 FT

$A = Q_{FF} / (0.62 \times (2 \times 32.2 \times h)^{0.5})$ = 0.021 FT^2

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.0055 SF

A/ 0.0055 = 3.78

THEREFORE, USE THE FOLLOWING NUMBER OF 1 INCH DIAMETER HOLES
4.00 HOLES, AT ELEV. 597.00

QFF_{ACTUAL} = 0.108 CFS

BANKFULL FLOOD
FOR THE ALLOWABLE RELEASE RATE OF 24-40 HOURS, CHECK THE DISCHARGE THROUGH THE FIRST FLUSH ORIFICE TO SEE IF ADDITIONAL HOLES ARE NECESSARY.

HEAD = h = Xbf - BOTTOM OF BASIN * 2/3 = 1.97 FT

$Q_{BO.O} = 0.62x$ #HOLES x (AREA EACH HOLE$_{FF}$) x (2 x 32.2 x h)$^{0.5}$ = 0.152

$T_{BO.O}$ = (1SEC / $Q_{BO.O}$) x V_{BF} x (1HR / 3600SEC) = 37.02 HRS

CFS
SINCE HOLDING TIME IS LESS THAN 40 HRS. ADDITIONAL ORIFICES IN STANDPIPE ARE NOT REQUIRED.

100 YEAR FLOOD

Q_R = ALLOWABLE RELEASE RATE x AREA OF SITE IN ACRES= 0.49 CFS

Q_R IS A PEAK OR MAXIMUM FLOW. CALCULATE THE MAXIMUM FLOW PASSING THROUGH FIRST FLUSH AND BANKFULL ORIFICES, USING THE TOTAL HEAD, AND SUBTRACT FROM Q_R TO DETERMINE THE ORIFICE SIZE TO RELEASE THE 100 YEAR STORM VOLUME:

QFF_{ACTUAL}+QBF_{ACTUAL} = 0.217 CFS

Q_R - (Q_{FF} + Q_{BF}) = 0.273 CFS

A= Q_R / (0.62 * (2 *32.2 * (X_{100}-X_{FF}))$^{0.5}$) = 0.035 SF

A 1 INCH DIAMETER ORIFICE HAS AN AREA OF 0.005 SF

A/ 0.005 = 6.36

THEREFORE, USE THE FOLLOWING NUMBER OF 1 INCH DIAMETER HOLES:
6 HOLES AT ELEV. = 599.96

SUMMARY OF REQUIRED STANDPIPE HOLES:

ELEVATION	# OF HOLES	DIAMETER OF HOLES
599.96	6	1 INCHES
597.00	4	1 INCHES

REVISIONS	DATE:	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
5	2/28/25	TLE	TLE	LMS	LMS
4					
3					
2					
1					

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FORT GRATIOT, MI 48059
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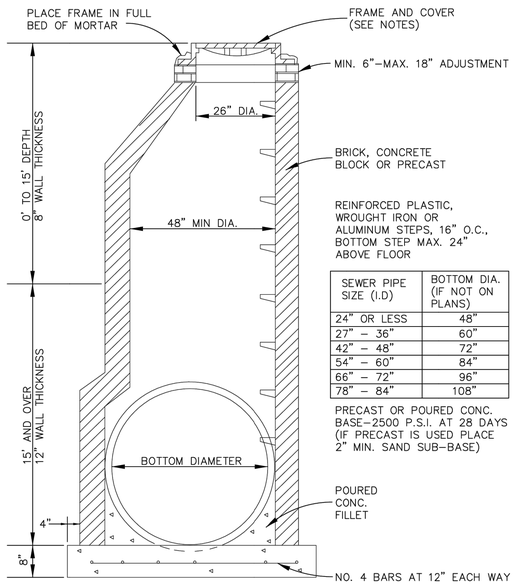
SITE DETAILS & CALCULATIONS
SMART STORAGE SOLUTIONS
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

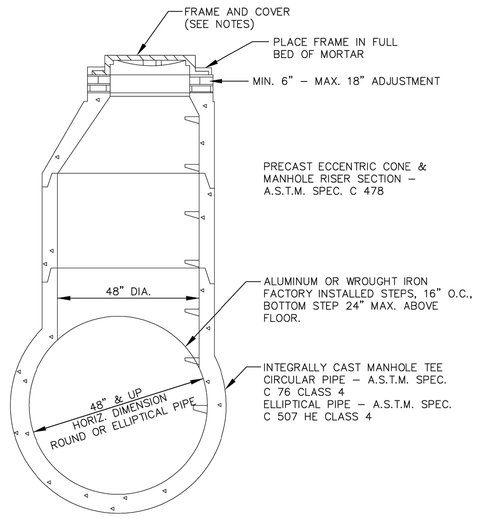
SCALE: AS SHOWN
PROJECT NO.: 2024-0011
FILE NAME: TP-04.DWG
SHEET: 5 OF 9

5

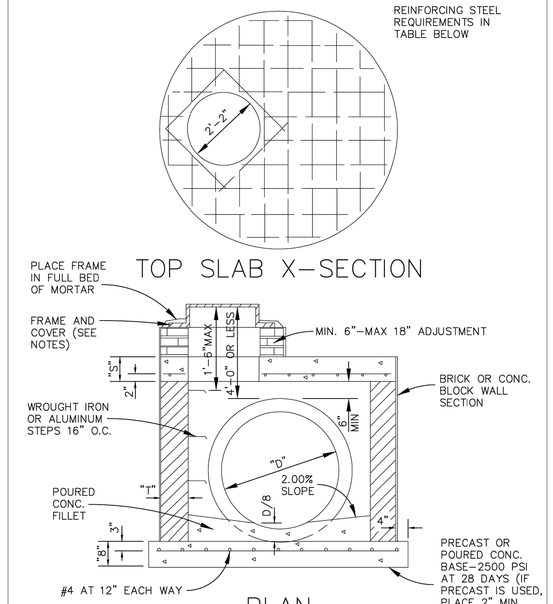


SEWER PIPE SIZE (I.D)	BOTTOM DIA. (IF NOT ON PLANS)
24" OR LESS	48"
27" – 36"	60"
42" – 48"	72"
54" – 60"	84"
66" – 72"	96"
78" – 84"	108"

STORM SEWER MANHOLE "A"



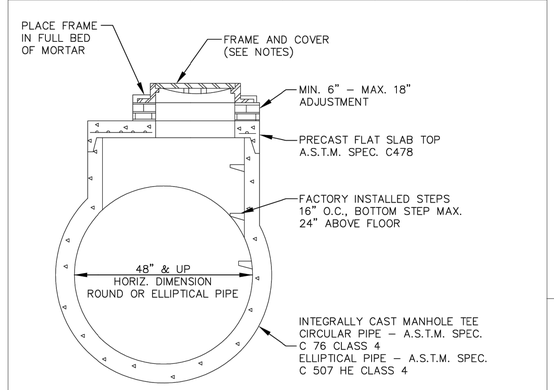
STORM SEWER TEE MANHOLE



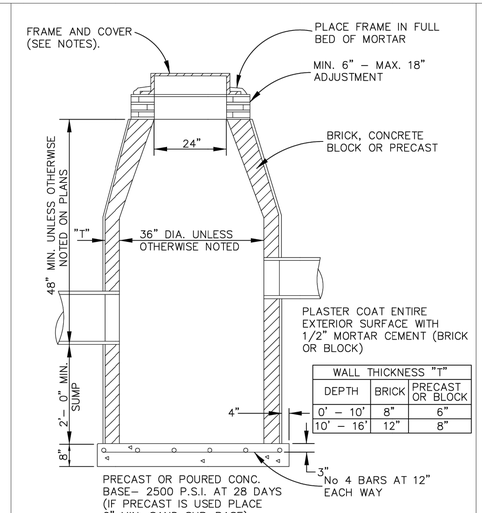
OUTLET "D"	M.H. I.D. *	TOP SLAB "S"	WALL "T"	REINFORCING STEEL
36" OR LESS	4	9"	12"	3/4"AT 9"EA WAY
42"	5	10"	12"	3/4"AT 9"EA WAY
48"–54"	6	11"	12"	7/8"AT 9"EA WAY
	5	12"	12"	1"AT 9"EA WAY
	6	12"	12"	1"AT 9"EA WAY

* DIAMETER OF MANHOLE SHALL BE INCREASED AS SHOWN ON THE PLANS DEPENDING ON THE ANGLE OF THE SEWERS

STORM SEWER MANHOLE "B"



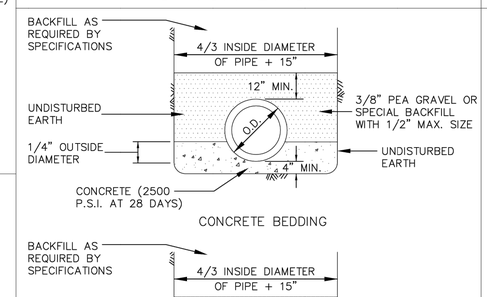
STORM SEWER TEE MANHOLE "B"



WALL THICKNESS "T"		
DEPTH	BRICK	PRECAST OR BLOCK
0' – 10'	8"	6"
10' – 16'	12"	8"

SPECIAL CATCH BASIN NOTES:
1. CATCHBASINS MUST DISCHARGE INTO MANHOLES AND NOT INTO OTHER CATCH BASINS EXCEPT
   A. WHERE CATCH BASIN IS A "PAVEMENT TYPE" DISCHARGING INTO ANOTHER CATCH BASIN LOCATED WITHIN 75 FEET.

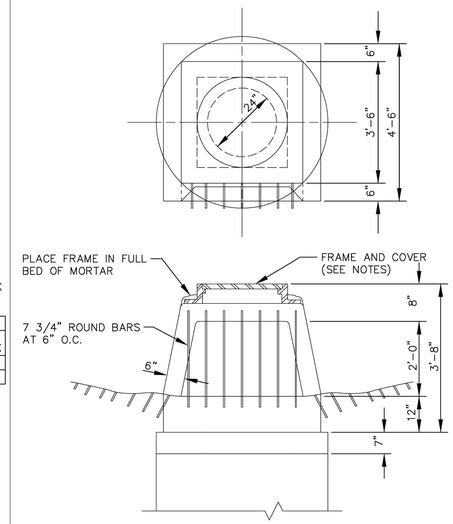
CATCH BASIN



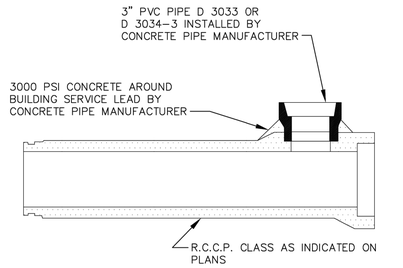
BEDDING DETAIL

SPECIAL INLET NOTES:
1. INLET SHALL NOT BE USED FOR YARD DRAINAGE.
2. INLET SHALL NOT BE USED IN COUNTY ROAD RIGHT–OF–WAY.
3. OTHER THAN ABOVE, INLET MAY BE USED, PROVIDED:
   A. THE INLET DISCHARGES INTO A CATCH BASIN LOCATED WITHIN 75 FEET.
   B. NOT MORE THAN ONE INLET DISCHARGES INTO A CATCH BASIN.

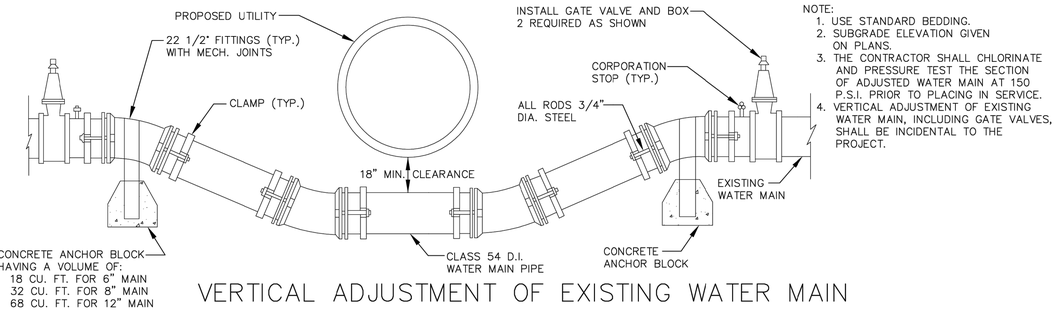
INLET



SIDE INLET

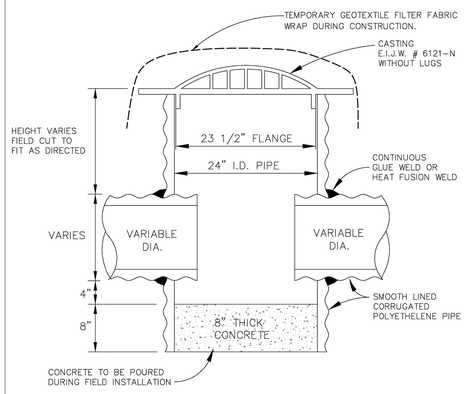


STANDARD WYE DETAIL IN CONCRETE PIPE FOR SUMP PUMP CONNECTION



NOTE:
1. USE STANDARD BEDDING.
2. SUBGRADE ELEVATION GIVEN ON PLANS.
3. THE CONTRACTOR SHALL CHLORINATE AND PRESSURE TEST THE SECTION OF ADJUSTED WATER MAIN AT 150 P.S.I. PRIOR TO PLACING IN SERVICE.
4. VERTICAL ADJUSTMENT OF EXISTING WATER MAIN, INCLUDING GATE VALVES, SHALL BE INCIDENTAL TO THE PROJECT.

VERTICAL ADJUSTMENT OF EXISTING WATER MAIN



24" SLCPP CATCH BASIN

"NO SCALE"

GENERAL STORM SEWER NOTES

1. AT LEAST FORTY–EIGHT (48) HOURS PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL GIVE NOTIFICATION OF HIS INTENTION TO BEGIN CONSTRUCTION TO THE MUNICIPAL SEWER DEPARTMENT, THE COUNTY DRAIN COMMISSIONER'S OFFICE AND THE COUNTY ROAD COMMISSION.
2. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL ATTEND A PRE–CONSTRUCTION MEETING, AT A TIME AND PLACE AS ARRANGED BY THE OWNER OR THE MUNICIPAL ENGINEER, AT WHICH VARIOUS UTILITY COMPANIES AND GOVERNMENTAL AGENCY REPRESENTATIVES WILL BE PRESENT.
3. PRIOR TO CONSTRUCTION, THE CONTRACTOR MUST HAVE IN HIS POSSESSION A COPY OF A VALID PERMIT TO CONSTRUCT A CONNECTION TO, OR AN EXTENSION OF, THE STORM WATER DRAINAGE SYSTEM.
4. THE CONTRACTOR SHALL SECURE PERMITS FROM THE COUNTY DRAIN COMMISSIONER FOR ALL TAPS AND CROSSINGS OF COUNTY DRAINS AND SHALL PAY THE COSTS OF SAID PERMITS AND THE COST OF ANY INSPECTION CHARGES BY THAT AGENCY FOR WORK DONE UNDER THE PERMITS.
5. SEVENTY TWO (72) HOURS PRIOR TO ANY CONSTRUCTION, THE CONTRACTOR SHALL NOTIFY MISS DIG 800–482–7171 FOR THE LOCATION OF UNDERGROUND FACILITIES, AND ALSO NOTIFY REPRE–SENTATIVES OF ANY OTHER FACILITIES, LOCATED IN THE VICINITY OF THE WORK WHICH MAY NOT BE HANDLED BY MISS DIG
6. ALL STORM WATER DRAINAGE SYSTEM CONSTRUCTION SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS OF THE MUNICIPALITY, COUNTY ROAD COMMISSION AND/OR COUNTY DRAIN COMMISSION, AS APPLICABLE.
7. ALL REINFORCED CONCRETE SEWER SHALL CONFORM TO ASTM SPECIFICATION C76 WITH CLASS DESIGNATION ON PLANS.
8. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL STORM SEWER JOINTS SHALL BE TONGUE AND GROOVE WITH BITUMINOUS COMPOUND JOINT FILLER MATERIAL.
9. UNLESS OTHERWISE INDICATED ON THE PLANS, ALL STORM SEWER BEDDING SHALL BE STANDARD BEDDING.
10. ALL WYES AND BUILDING SERVICE CONNECTIONS SHALL BE 3" POLY VINYL CHLORIDE (PVC) SEWER PIPE D3033 OR D3034–3.
11. ALL STORM SEWER WYE OPENINGS SHALL BE FACTORY INSTALLED EXCEPT WHEN USING ABS TRUSS PIPE FOR SUMP PUMP DISCHARGE OUTLET.
12. UNLESS OTHERWISE NOTED ON THE PLANS, STRUCTURE FRAME AND COVERS SHALL BE AS FOLLOWS:
    MANHOLE IN ROAD RIGHT OF WAY WITHIN 10 FT. OF ROW LINE
    E.J.I.W. 1040 WITH TYPE A, SOLID COVER
    MANHOLE IN ROAD RIGHT OF WAY OUTSIDE OF SIDEWALK AREA AND MANHOLE NOT IN ROAD RIGHT OF WAY
    E.J.I.W. 1040 WITH TYPE B, PERFORATED COVER
    CATCH BASIN OR INLET WITHIN PAVEMENT
    E.J.I.W. 5105 WITH SINUSOIDAL GRATE
    CATCH BASIN, YARD TYPE OR SIDE INLET
    E.J.I.W. 1040 WITH TYPE N GRATE

    E.J.I.W. 1040 OR NEENAH R–1642 WITH OVAL GRATE HAVING A RISE ABOVE THE FRAME OF 2 1/2"
    CATCH BASIN (FIELD TYPE)
    E.J.I.W. 6508

STORM SEWER DETAILS

J.N.
OF
SH. 0

REVISIONS:

Charter Township of
Fort Gratiot
3720 KEEWAHDIN ROAD
PORT HURON, MICHIGAN 48060
PHONE: (313) 385-4489 & DPW 385-3170

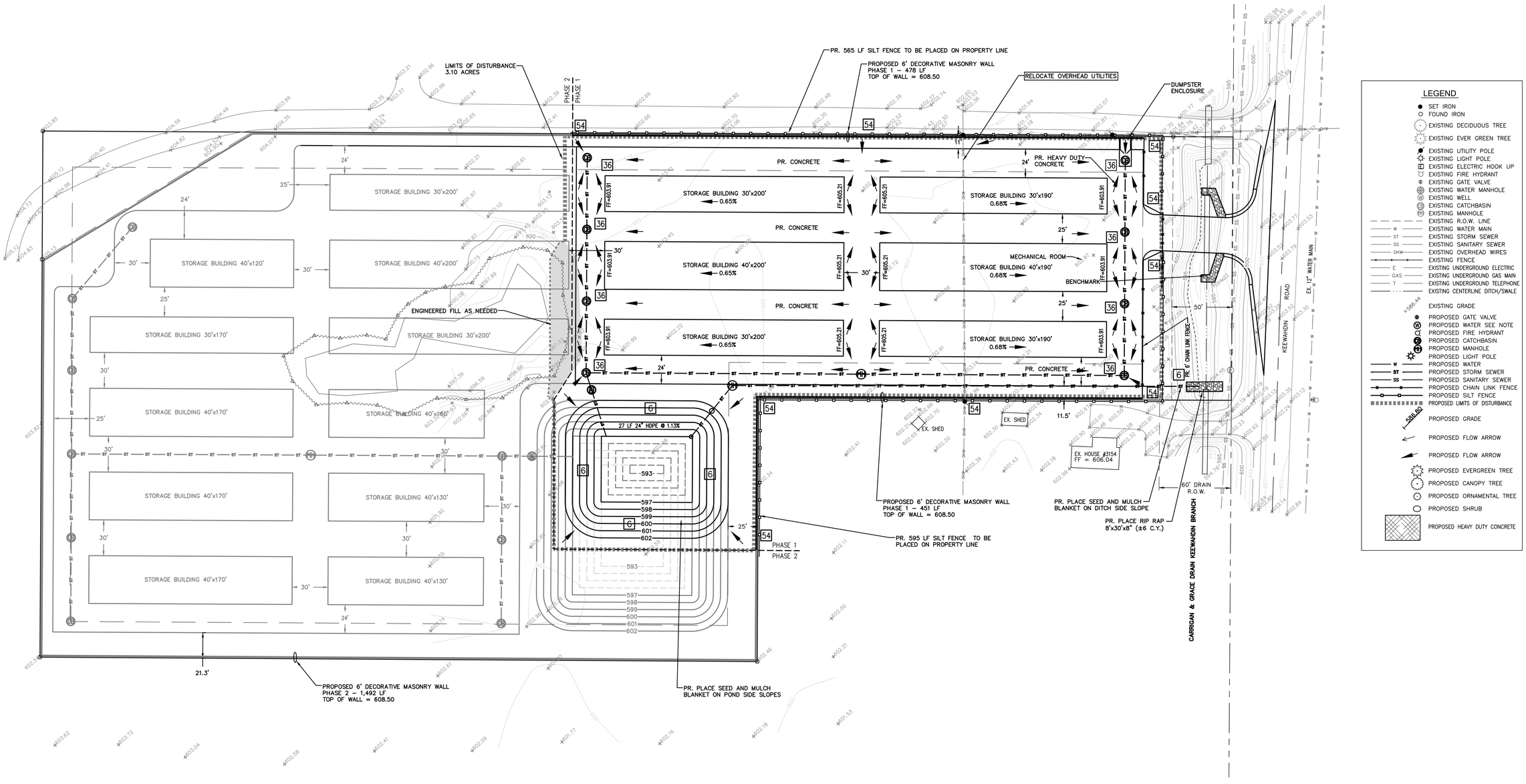
ON-SITE SOILS:

Bp	BORROW PITS
EaB	EASTPORT SAND, 0 TO 6 PERCENT SLOPES
WnA	WAINOLA–TOBICO COMPLEX, 0 TO 3 PERCENT SLOPES

SOIL EROSION NOTES:

TOTAL DISTURBED AREA 3.10 ACRES

PLACE SEED AND MULCH BLANKET ON DITCH AND POND BANKS. ALL OTHER AREAS NOT PAVED UPON SHALL HAVE SEED AND MULCH/STRAW.



LEGEND

- SET IRON
- FOUND IRON
- EXISTING DECIDUOUS TREE
- EXISTING EVER GREEN TREE
- EXISTING UTILITY POLE
- EXISTING LIGHT POLE
- EXISTING ELECTRIC HOOK UP
- EXISTING FIRE HYDRANT
- EXISTING GATE VALVE
- EXISTING WATER MANHOLE
- EXISTING WELL
- EXISTING CATCHBASIN
- EXISTING MANHOLE
- EXISTING R.O.W. LINE
- W — EXISTING WATER MAIN
- ST — EXISTING STORM SEWER
- SS — EXISTING SANITARY SEWER
- OHW — EXISTING OVERHEAD WIRES
- EXISTING FENCE
- E — EXISTING UNDERGROUND ELECTRIC
- GAS — EXISTING UNDERGROUND GAS MAIN
- T — EXISTING UNDERGROUND TELEPHONE
- EXISTING CENTERLINE DITCH/SWALE
- 586.44 — EXISTING GRADE
- PROPOSED GATE VALVE
- PROPOSED WATER SEE NOTE
- PROPOSED FIRE HYDRANT
- PROPOSED CATCHBASIN
- PROPOSED MANHOLE
- PROPOSED LIGHT POLE
- W — PROPOSED WATER
- ST — PROPOSED STORM SEWER
- SS — PROPOSED SANITARY SEWER
- PROPOSED CHAIN LINK FENCE
- PROPOSED SILT FENCE
- PROPOSED LIMITS OF DISTURBANCE
- 586.80 — PROPOSED GRADE
- PROPOSED FLOW ARROW
- PROPOSED FLOW ARROW
- PROPOSED EVERGREEN TREE
- PROPOSED CANOPY TREE
- PROPOSED ORNAMENTAL TREE
- PROPOSED SHRUB
- PROPOSED HEAVY DUTY CONCRETE

DATE:	2/28/25
DESIGNED BY:	TLE
DRAWN BY:	TLE
CHECKED BY:	LMS
APPROVED BY:	LMS

SHINK ENGINEERING, PLC
4146 PINE GROVE ROAD
FORT GRATIOT, MI 48059
lmshink@yahoo.com
586.718.1965

3 WORKING DAYS BEFORE YOU DIG
CALL MISS DIG
1-800-482-7171
FOR FREE LOCATION OF PUBLIC UTILITIES

REVISIONS	
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2	
1	

SOIL EROSION & SEDIMENTATION CONTROL PLAN
SMART STORAGE SOLUTIONS
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

SCALE: 1" = 40'
PROJECT NO.: 2024-0011
FILE NAME: TP-04.DWG
SHEET: 7 OF 9

7

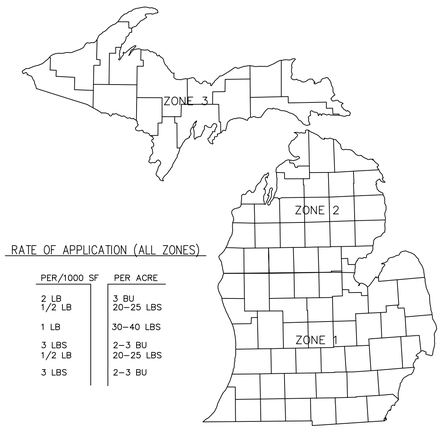
MICHIGAN UNIFIED KEYING SYSTEM
SOIL EROSION SEDIMENTATION CONTROL MEASURES

✱ INDICATES APPLICABILITY OF A SPECIFIC CONTROL MEASURE TO ONE OR MORE OF THE SEVEN PROBLEM AREAS

KEY	DETAIL	CHARACTERISTICS	A SLOPES	B STREAMS AND WATERWAYS	C SURFACE DRAINAGEWAYS	D ENCLOSED DRAINAGE (Inlet & Outfall Control)	E LARGE FLAT SURFACE AREAS	F BORROW AND STOCKPILE AREAS	G ADJACENT PROPERTIES
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION. STOCKPILE SHOULD BE TEMPORARILY SEEDED.	✱				✱	✱	
2	SELECTIVE GRADING & SHAPING	WATER CAN BE DIVERTED TO MINIMIZE EROSION. FLATTER SLOPES EASE EROSION PROBLEMS.	✱				✱	✱	✱
3	GRUBBING OMITTED	SAVES COST OF GRUBBING, PROVIDES NEW SPROUTS, RETAINS EXISTING ROOT MAT SYSTEM, REDUCES WIND FALL AT NEW FOREST EDGE DISCOURAGES EQUIPMENT ENTRANCE	✱				✱		✱
4	VEGETATIVE STABILIZATION	MAY UTILIZE A VARIETY OF PLANT MATERIAL STABILIZES SOIL SLOWS RUNOFF VELOCITY FILTERS SEDIMENT FROM RUNOFF	✱	✱	✱		✱	✱	✱
5	SEEDING	INEXPENSIVE AND VERY EFFECTIVE STABILIZES SOIL; THUS MINIMIZING EROSION PERMITS RUNOFF TO INFILTRATE SOIL, REDUCING RUNOFF VOLUME SHOULD INCLUDE PREPARED TOPSOIL BED	✱		✱		✱	✱	✱
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED	✱		✱			✱	✱
7	HYDRO-SEEDING	EFFECTIVE ON LARGE AREAS MULCH TACKING AGENT USED TO PROVIDE IMMEDIATE PROTECTION UNTIL GRASS IS ROOTED. SHOULD INCLUDE PREPARED TOPSOIL BED	✱				✱	✱	✱
8	SODDING	PROVIDES IMMEDIATE PROTECTION CAN BE USED ON STEEP SLOPES WHERE SEED MAY BE DIFFICULT TO ESTABLISH EASY TO PLACE; MAY BE REPAIRED IF DAMAGED SHOULD INCLUDE PREPARED TOPSOIL BED	✱		✱		✱	✱	✱
9	VEGETATIVE BUFFER STRIP	SLOWS RUNOFF VELOCITY FILTERS SEDIMENT FROM RUNOFF REDUCES VOLUME OF RUNOFF ON SLOPES	✱	✱					✱
10	MULCHING	USED ALONE TO PROTECT EXPOSED AREAS FOR SHORT PERIODS PROTECTS SOIL FROM IMPACT OF FALLING RAIN PRESERVES SOIL MOISTURE AND PROTECTS GERMINATING SEED FROM TEMPERATURE EXTREMES	✱				✱	✱	
11	ROUGHENED SURFACE	REDUCES VELOCITY AND INCREASES INFILTRATION RATES COLLECTS SEDIMENT HOLDS WATER, SEED, AND MULCH BETTER THAN SMOOTH SURFACES	✱				✱		✱
12	COMPACTION	HELPS HOLD SOIL IN PLACE, MAKING EXPOSED AREAS LESS VULNERABLE TO EROSION	✱				✱		✱
13	RIPRAP, RUBBLE, GABIONS	USED WHERE VEGETATION IS NOT EASILY ESTABLISHED EFFECTIVE FOR HIGH VELOCITIES OR HIGH CONCENTRATIONS PERMITS RUNOFF TO INFILTRATE SOIL DISSIPATES ENERGY FLOW AT SYSTEM OUTLETS	✱	✱	✱				
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS					✱		✱
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VOLUME AND VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY	✱				✱		✱
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY					✱		✱
17	BENCHES	REDUCES RUNOFF VELOCITY BY REDUCING EFFECTIVE SLOPE LENGTH COLLECTS SEDIMENT PROVIDES ACCESS TO SLOPES FOR SEEDING, MULCHING AND MAINTENANCE	✱					✱	
18	DIVERSION BERM	DIVERTS WATER FROM VULNERABLE AREAS COLLECTS AND DIRECTS WATER TO PREPARED DRAINAGEWAYS MAY BE PLACED AS PART OF NORMAL CONSTRUCTION OPERATION	✱					✱	✱
19	DIVERSION DITCH	COLLECTS AND DIVERTS WATER TO REDUCE EROSION POTENTIAL MAY BE INCORPORATED IN PERMANENT PROJECT DRAINAGE SYSTEMS	✱					✱	✱
20	BERM & DITCH	DIVERTS WATER TO A PREPARED DRAINAGEWAY MAY BE USED AT INTERVALS ACROSS SLOPE FACE TO REDUCE EFFECTIVE SLOPE LENGTH	✱					✱	✱
21	FILTER BERM	CONSTRUCTED OF GRAVEL OR STONE INTERCEPTS AND DIVERTS RUNOFF TO STABILIZED AREAS OR PREPARED DRAINAGE SYSTEMS SLOWS RUNOFF AND COLLECTS SEDIMENT	✱	✱					✱
22	BRUSH FILTER	USES SLASH AND LOGS FROM CLEARING OPERATIONS CAN BE COVERED AND SEEDED RATHER THAN REMOVED ELIMINATES NEED FOR BURNING OR REMOVAL OF MATERIAL FROM SITE							✱
23	BARE CHANNEL	LEAST EXPENSIVE FORM OF DRAINAGEWAY MAY BE USED ONLY WHERE GRADIENT IS VERY LOW AND WITH SOILS OF MINIMUM EROSION POTENTIAL			✱				
24	GRASSED WATERWAY	MUCH MORE STABLE FORM OF DRAINAGEWAY THAN BARE CHANNEL GRASS TENDS TO SLOW RUNOFF AND FILTER OUT SEDIMENT USED WHERE BARE CHANNEL WOULD BE ERODED			✱				✱
25	SLOPE DRAIN (SURFACE PIPE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA USUALLY PERMANENT CAN BE CONSTRUCTED OR EXTENDED AS GRADING PROGRESSES	✱						✱
26	SLOPE DRAIN (PIPE CHUTE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA USUALLY PERMANENT CAN BE CONSTRUCTED OR EXTENDED AS GRADING PROGRESSES	✱						✱
27	SLOPE DRAIN (SUBSURFACE PIPE)	PREVENTS EROSION ON SLOPES WHEN RUNOFF CANNOT BE DIVERTED TO EDGE OF SLOPE AREA USUALLY PERMANENT CAN BE CONSTRUCTED AS GRADING PROGRESSES	✱						✱

KEY	DETAIL	CHARACTERISTICS	A SLOPES	B STREAMS AND WATERWAYS	C SURFACE DRAINAGEWAYS	D ENCLOSED DRAINAGE (Inlet & Outfall Control)	E LARGE FLAT SURFACE AREAS	F BORROW AND STOCKPILE AREAS	G ADJACENT PROPERTIES
28	DROP SPILLWAY	SLOWS VELOCITY OF FLOW, REDUCING EROSIVE CAPACITY		✱	✱				
29	PIPE DROP	REDUCES RUNOFF VELOCITY REMOVES SEDIMENT AND TURBIDITY CAN BE DESIGNED TO HANDLE LARGE VOLUMES OF FLOW			✱				
30	PIPE SPILLWAY	REMOVES SEDIMENT AND TURBIDITY FROM RUNOFF MAY BE PART OF PERMANENT EROSION CONTROL PLAN			✱				
31	ENERGY DISSIPATER	SLOWS RUNOFF VELOCITY TO NON-EROSIVE LEVEL PERMITS SEDIMENT COLLECTION FROM RUNOFF	✱		✱	✱			
32	LEVEL SPREADER	CONVERTS COLLECTED CHANNEL OR PIPE FLOW BACK TO SHEET FLOW AVOIDS CHANNEL EASEMENTS AND CONSTRUCTION OFF PROJECT SITE SIMPLE TO CONSTRUCT			✱				
33	SEDIMENTATION TRAP	MAY BE CONSTRUCTED OF A VARIETY OF MATERIALS TRAPS SEDIMENT AND REDUCES VELOCITY OF FLOW CAN BE CLEANED AND EXPANDED AS NEEDED		✱	✱				
34	SEDIMENT BASIN	TRAPS SEDIMENT RELEASES RUNOFF AT NON-EROSIVE RATES CONTROLS RUNOFF AT SYSTEM OUTLETS CAN BE VISUAL AMENITIES		✱	✱	✱			
35	STORM SEWER	SYSTEM REMOVES COLLECTED RUNOFF FROM SITE, PARTICULARLY FROM PAVED AREAS CAN ACCEPT LARGE CONCENTRATIONS OF RUNOFF CONDUCTS RUNOFF TO MUNICIPAL SEWER SYSTEM OR STABILIZED OUTFALL LOCATION USE CATCH BASINS TO COLLECT SEDIMENT					✱		✱
36	CATCH BASIN, DRAIN INLET	COLLECTS HIGH VELOCITY CONCENTRATED RUNOFF MAY USE FILTER CLOTH OVER INLET					✱		✱
37	SOD FILTER	INEXPENSIVE AND EASY TO CONSTRUCT PROVIDES IMMEDIATE PROTECTION PROTECTS AREAS AROUND INLETS FROM EROSION				✱			
38	STRAW BALE FILTER	INEXPENSIVE AND EASY TO CONSTRUCT CAN BE LOCATED AS NECESSARY TO COLLECT SEDIMENT MAY BE USED IN CONJUNCTION WITH SNOW FENCE FOR ADDED STABILITY				✱			✱
39	ROCK FILTER	CAN UTILIZE MATERIAL FOUND ON SITE EASY TO CONSTRUCT FILTERS SEDIMENT FROM RUNOFF				✱			✱
40	INLET SEDIMENT TRAP	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED				✱			
41	STONE AND ROCK CROSSING	MAY BE ROCK OR CLEAN RUBBLE MINIMIZES STREAM TURBIDITY INEXPENSIVE MAY ALSO SERVE AS DITCH CHECK OR SEDIMENT TRAP		✱					
42	TEMPORARY CULVERT	ELIMINATES STREAM TURBULENCE AND TURBIDITY PROVIDES UNOBSTRUCTED PASSAGE FOR FISH AND OTHER WATER LIFE CAPACITY FOR NORMAL FLOW CAN BE PROVIDED WITH STORM WATER FLOWING OVER ROADWAY		✱					
43	CULVERT SEDIMENT TRAP	EASY TO INSTALL AT INLET KEEPS CULVERT CLEAN AND FREE FLOWING MAY BE CONSTRUCTED OF LUMBER OR LOGS		✱					✱
44	CULVERT SEDIMENT TRAP	DEFLECTS CURRENTS AWAY FROM STREAMBANK AREAS		✱					✱
45	TEMP. STREAM CHANNEL CHANGE	NEW CHANNEL KEEPS NORMAL FLOWS AWAY FROM CONSTRUCTION REQUIRES STATE PERMIT		✱					✱
46	SHEET PILING	PROTECTS ERODIBLE BANK AREAS FROM STREAM CURRENTS DURING CONSTRUCTION MINIMAL DISRUPTION WHEN REMOVED		✱					✱
47	COFFERDAM	WORK CAN BE CONTINUED DURING MOST ANTICIPATED STREAM CONDITIONS CLEAR WATER CAN BE PUMPED DIRECTLY BACK INTO STREAM		✱					✱
48	CONSTRUCTION DAM	PERMITS WORK TO CONTINUE DURING NORMAL STREAM STAGES CONTROLLED FLOODING CAN BE ACCOMPLISHED DURING PERIODS OF INACTIVITY		✱					✱
49	CHECK DAMS	REDUCES FLOW VELOCITY CATCHES SEDIMENT CAN BE CONSTRUCTED OF LOGS, STRAW, HAY ROCK, LUMBER, MASONRY, OR SAND BAGS		✱	✱				✱
50	WEIR	CONTROLS SEDIMENTATION IN LARGE STREAMS CAUSES MINIMAL TURBIDITY		✱	✱				✱
51	RETAINING WALL	REDUCES GRADIENT WHERE SLOPES ARE EXTREMELY STEEP PERMITS RETENTION OF EXISTING VEGETATION, KEEPING SOIL STABLE IN CRITICAL AREAS MINIMIZES MAINTENANCE	✱						✱
52	SEEPAGE CONTROL	PREVENTS PIPING AND SOIL SLIPPAGE ON CUT SLOPES	✱						✱
53	WINDBREAK	MINIMIZES WIND EROSION MAY BE SNOW FENCE					✱		
54	SILT FENCE	USES GEOTEXTILE FABRIC AND POSTS OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY.	✱		✱		✱		✱

MICHIGAN
SOIL EROSION & SEDIMENTATION CONTROL
GUIDEBOOK
FEBRUARY 1975 FIGURE 2



SEEDING ZONES

RATE OF APPLICATION (ALL ZONES)

PER/1000 SF	PER ACRE
2 LB 1/2 LB	3 BU 20-25 LBS
1 LB	30-40 LBS
3 LBS 1/2 LB	2-3 BU 20-25 LBS
3 LBS	2-3 BU

SOIL EROSION & SEDIMENTATION CONTROL

1. CONSTRUCTION OPERATION SHALL BE SCHEDULED AND PERFORMED SO THAT PREVENTATIVE EROSION CONTROL MEASURES ARE IN PLACE PRIOR TO EXCAVATION AND TEMPORARY STABILIZATION MEASURES ARE IN PLACE IMMEDIATELY FOLLOWING BACKFILLING AND/OR GRADING OPERATIONS.
2. BORROW AND FILL DISPOSAL AREAS WILL BE SELECTED AND APPROVED AT TIME OF PLAN REVIEW.
3. SPECIAL PRECAUTIONS WILL BE TAKEN IN THE USE OF CONSTRUCTION EQUIPMENT TO PREVENT SITUATIONS THAT PROMOTE EROSION.
4. CLEANUP WILL BE DONE IN A MANNER TO INSURE THAT EROSION CONTROL MEASURES ARE NOT DISTURBED.
5. THE PROJECT WILL CONTINUALLY BE INSPECTED FOR SOIL EROSION AND SEDIMENT CONTROL COMPLIANCE. DEFICIENCIES WILL BE CORRECTED BY THE CONTRACTOR WITHIN 24 HOURS.
6. TEMPORARY EROSION CONTROL MEASURES SHALL BE COMPLETELY REMOVED BY THE CONTRACTOR UPON ESTABLISHMENT OF PERMANENT CONTROL MEASURES.

SOIL EROSION/SEDIMENTATION CONTROL OPERATION TIME SCHEDULE

CONSTRUCTION SEQUENCE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
STRIP & STOCKPILE TOPSOIL												
ROUGH GRADE SEDIMENT CONTROL												
TEMP. CONTROL MEASURES												
STORM FACILITIES												
TEMP. CONSTRUCTION ROADS												
SITE CONSTRUCTION												
PERM. CONTROL MEASURES												
FINISH GRADING												
CLEARING												

TEMPORARY SEEDING GUIDE

ZONE 1

TYPE OF SEED	APR	MAY	JUN	JUL	AUG	SEP	OCT
SPRING OATS/BARLEY OR DOMESTIC RYEGRASS					15TH		
SUDANGRASS							
RYE OR PERENNIAL RYE							15TH
WHEAT							15TH

ZONE 2

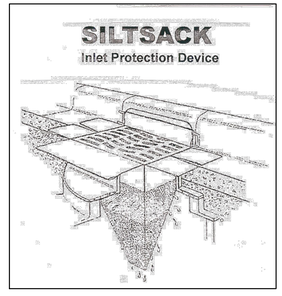
TYPE OF SEED	APR	MAY	JUN	JUL	AUG	SEP	OCT
SPRING OATS/BARLEY OR DOMESTIC RYEGRASS							
SUDANGRASS							
RYE OR PERENNIAL RYE							10TH
WHEAT							10TH

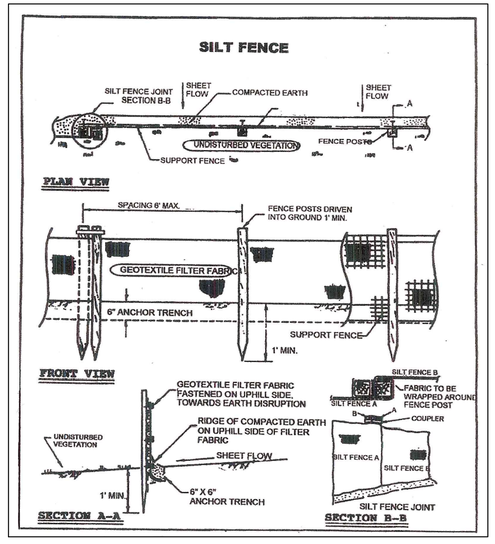
ZONE 3

TYPE OF SEED	APR	MAY	JUN	JUL	AUG	SEP	OCT
SPRING OATS/BARLEY OR DOMESTIC RYEGRASS							
SUDANGRASS							
RYE OR PERENNIAL RYE							
WHEAT							

PERMANENT SEEDING GUIDE

	APR	MAY	JUN	JUL	AUG	SEP	OCT	
IRRIGATED AND/OR MULCH								
WITHOUT IRRIGATION OR MULCH								ZONE 1
IRRIGATED AND/OR MULCHED								
WITHOUT IRRIGATION OR MULCH								ZONE 2
IRRIGATED AND/OR MULCHED								
WITHOUT IRRIGATION OR MULCH								ZONE 3





SHINK ENGINEERING, PLC
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586.718.1965

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 FOR FREE LOCATION OF PUBLIC UTILITIES

REVISIONS	DESIGNED BY:	DRAWN BY:	CHECKED BY:	APPROVED BY:
1	TLE	TLE	LMS	LMS
2				
3				
4				
5				

2/28/25

SOIL EROSION & SEDIMENTATION CONTROL DETAILS
KEEWAHDIN MINI STORAGE
FORT GRATIOT, MI 48059

SCALE: AS SHOWN
PROJECT NO.: 2024-0011
FILE NAME: TP-04.DWG
SHEET: 8 OF 9

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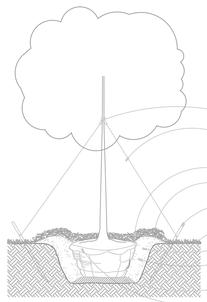
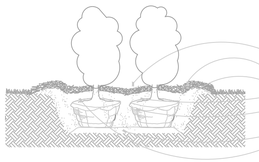
NOTES:
- LARGE DECIDUOUS TREES SHALL BE 2.5 CALIPER-INCHES*
- SMALL DECIDUOUS TREES SHALL BE 2 CALIPER-INCHES*
- ORNAMENTAL TREES SHALL BE 2 CALIPER-INCHES* OR 6 FEET OVERALL HEIGHT
- PLANT TREE AT THE SAME GRADE AS IT WAS GROWN
- NEVER CUT CENTRAL LEADER
- PRUNE ONLY TO REMOVE DAMAGED OR BROKEN BRANCHES
- DISPOSE OF ALL NON BIODEGRADABLE MATERIAL



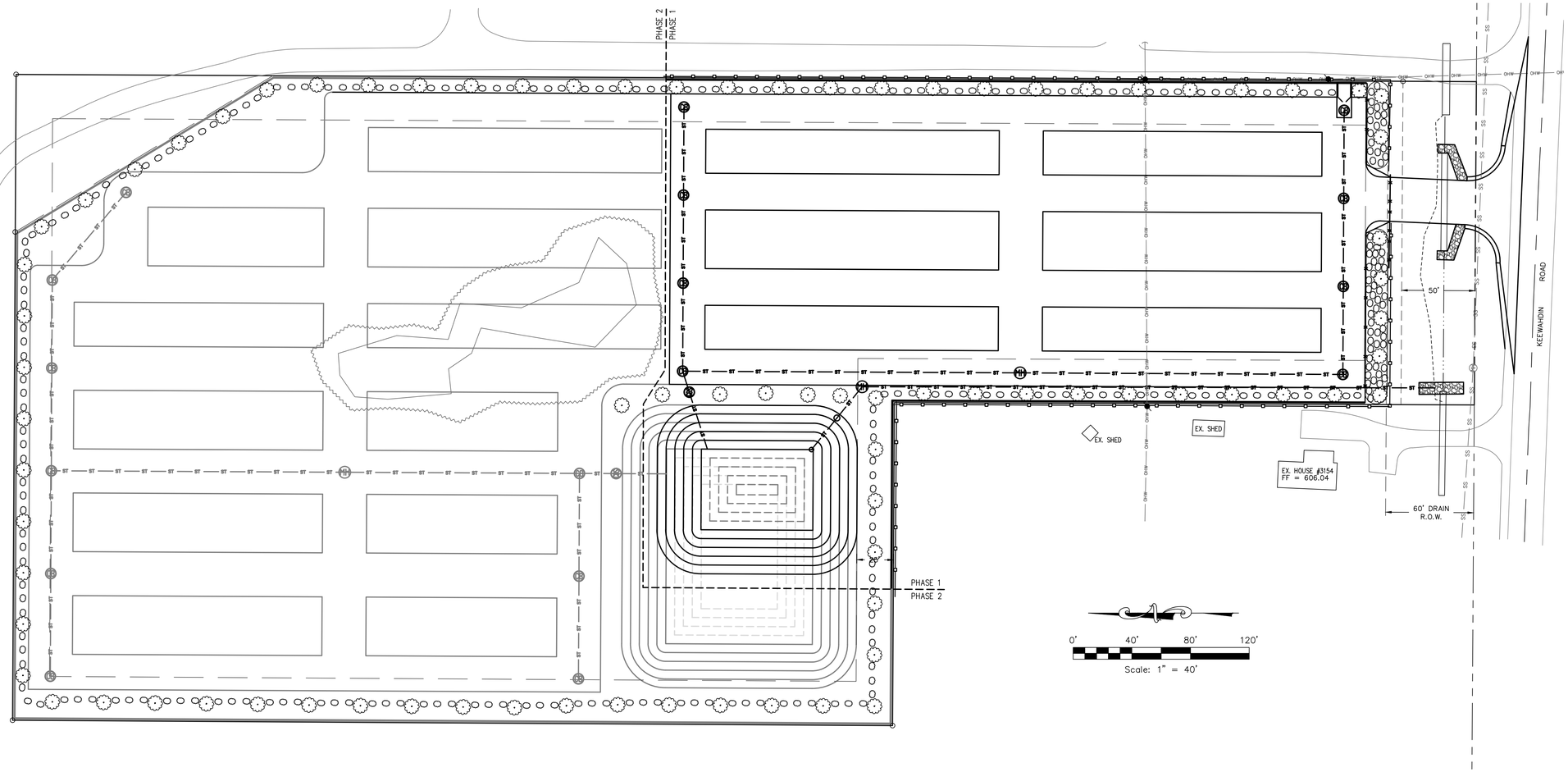
*CALIPER-INCHES MEASURED TWELVE (12) INCHES ABOVE GRADE.

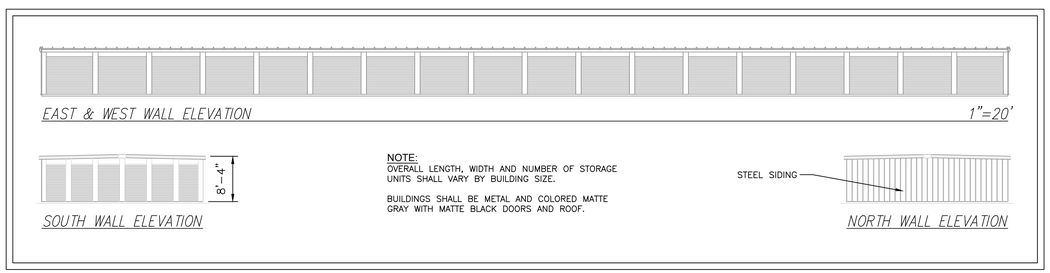
Deciduous Tree Planting
Section — No Scale

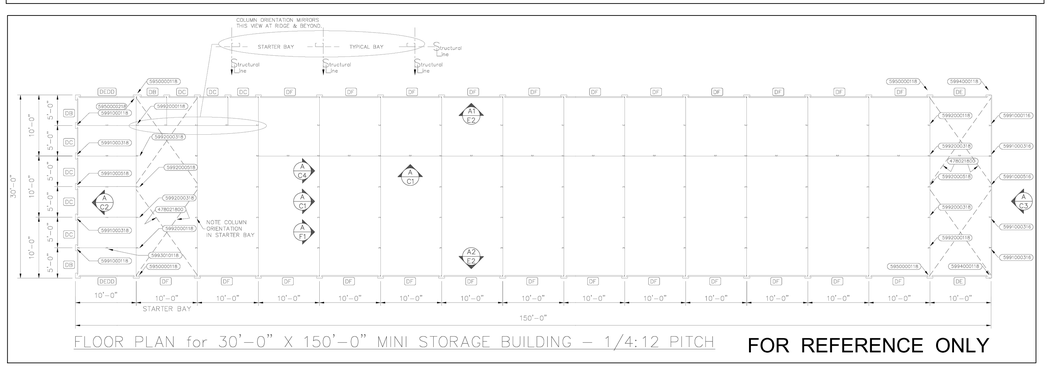
NOTES:
- SHRUBS SHALL BE 24 INCHES HIGH OR 24 INCHES SPREAD
- PLANT TREE AT THE SAME GRADE AS IT WAS GROWN
- NEVER CUT CENTRAL LEADER
- PRUNE ONLY TO REMOVE DAMAGED OR BROKEN BRANCHES
- DISPOSE OF ALL NON BIODEGRADABLE MATERIAL



Small Shrub Planting
Section — No Scale







FLOOR PLAN for 30'-0" X 150'-0" MINI STORAGE BUILDING - 1/4:12 PITCH

FOR REFERENCE ONLY

GENERAL LANDSCAPING.
In addition to any interior parking lot landscaping and/or screening/buffer between land uses required by this chapter, not less than ten percent of the site area, excluding existing thoroughfare rights-of-way, shall be landscaped. Areas used for storm drainage purposes, such as unfenced drainage courses or retention areas in front or side yards, may be included as a portion of the required landscaped area not to exceed five percent of the site area.

(1)All portions of the landscaped area shall be planted with grass, ground cover, shrubbery or other suitable plant material, except that paved patios, terraces, sidewalks and similar site features may be incorporated with planning commission approval.

(2)A mixture of evergreen and deciduous trees shall be planted at the rate of one tree for each 3,000 square feet or portion, thereof, of required landscaped open space area.

PERIMETER PARKING LOT LANDSCAPING.
The purpose of perimeter landscaping requirements is to define parking areas, shield views of parked cars to passing motorists and pedestrians and prevent two adjacent lots from becoming one large expanse of paving. The provision of the perimeter landscaping, between adjacent parking lots, shall not preclude the need to provide vehicular access between lots. Landscape strips shall be provided around the perimeter of lots, as follows:

(1)Perimeter landscape strips separating parking lots and driving lanes from abutting rights-of-way.
a. General requirements. Whenever an off-street parking lot or driving lane abuts a right-of-way, public or private, a perimeter landscape strip shall be created which meets the minimum standards established in this subsection. The perimeter boundary, between the edge of the planned right-of-way and the parking lot or driving lane. Accessways, from public rights-of-way through required landscaped strips, shall be permitted; but such accessways shall not be subtracted from the lineal dimension used to determine the minimum number of trees required, unless such calculation would result in a violation of the spacing requirements set forth in this section.
b. Landscaping; plantings. The strip shall be landscaped and planted in one of the following approved methods:
1. A 15-foot wide strip planted with one deciduous tree and ten shrubs for each 35 feet of frontage.

(2) Other perimeter landscaping strips. In addition to the perimeter landscaping required in subsection (h)(1) of this section, perimeter landscaping strips shall be required along the remaining boundaries of a parking lot or driving lane, as follows:
a. A landscaped strip, at least eight feet wide, planted with one deciduous tree and three shrubs for each 35 feet of perimeter. For small, shallow, narrow or unusually shaped lots, the planning commission may reduce the required width, modify the plantings required or waive this requirement, upon demonstration that compliance with this subsection would cause undue hardship.
b. If existing woodlands are available, the applicant may preserve a 25-foot wide strip in lieu of the landscaping requirement.

GENERAL LANDSCAPING.
7.60 AC x 10% = 0.76 AC x 43,560 SF/AC = 33,106 SF
TOTAL REQUIRED GENERAL LANDSCAPE AREA 33,106 SF

AREA ALLOWED IN DRAINAGE AREAS 16,553 SF = 0.38 AC
1.04 ACRES PROVIDED

REMAINING REQUIRED GENERAL LANDSCAPE AREA IS PROVIDED AND EXCEEDED IN THE PERIMETER PERIMETER LANDSCAPE STRIPS

PERIMETER PARKING LOT LANDSCAPING.
PERIMETER LANDSCAPE STRIPS SEPARATING PARKING LOTS AND DRIVING LANES FROM ABUTTING RIGHTS-OF-WAY. A 15-FOOT WIDE STRIP PLANTED WITH ONE DECIDUOUS TREE AND TEN SHRUBS FOR EACH 35 FEET OF FRONTAGE.
220 FT / 35 = 6.28 = 7 DECIDUOUS TREES
(OAK OR HARD MAPLES ARE RECOMMENDED, LARGE DECIDUOUS TREES)

220 FT / 35 = 6.28 x 10 = 62.8 = 63 SHRUBS
(REGAL PRIVET, COMPACT BURNING BUSH, & EUONYMOUS VARIETIES RECOMMENDED)

OTHER PERIMETER LANDSCAPING STRIPS.
A LANDSCAPED STRIP, AT LEAST EIGHT FEET WIDE, PLANTED WITH ONE DECIDUOUS TREE AND THREE SHRUBS FOR EACH 35 FEET OF PERIMETER.

2,375 LF / 35 = 67.8 = 68 DECIDUOUS TREES
(HORNBEAM OR SERVICEBERRY ARE RECOMMENDED, SMALL DECIDUOUS TREES)

2,375 LF / 35 = 67.8 x 3 = 203.4 = 204 SHRUBS
(REGAL PRIVET, COMPACT BURNING BUSH, & EUONYMOUS VARIETIES RECOMMENDED)

EXISTING VEGETATION
PHASE 1 IS MODERATELY WOODED, PHASE 2 IS DENSELY WOODED. PHASE 2 EXISTING VEGETATION IS TO REMAIN AFTER PHASE 1 CONSTRUCTION. THIS IS GREATLY IN EXCESS OF A 25 FOOT WIDE PRESERVATION STRIP.

	DATE:	2/28/25
	DESIGNED BY:	TLE
	DRAWN BY:	TLE
	CHECKED BY:	LMS
	APPROVED BY:	LMS

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3	
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1	

LANDSCAPING PLAN AND BUILDING INFORMATION
KEEWAHDIN MINI STORAGE
3134 KEEWAHDIN ROAD, FORT GRATIOT, MI 48059

SCALE: 1" = 40'
PROJECT NO.: 2024-0011
FILE NAME: TP-04.DWG
SHEET: 9 OF 9

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