

DEVELOPMENT PLANS FOR PROPOSED BLUE PHOTON TECHNOLOGY & WORKHOLDING SYSTEMS LLC 700 EAST PORTER ROAD NORTON SHORES, MI



BLUE PHOTON

NEW
MANUFACTURING
FACILITY

NORTON SHORES, MI



560 5th St. NW
Suite 305
Grand Rapids, MI 49504
office: 616.827.4270

www.bergmannpc.com

DATE	DESCRIPTION
07/02/2019	OWNER REVIEW
07/16/2019	SITE PLAN REVIEW
08/02/2019	SITE PLAN RE-SUBMITTAL
08/09/2019	MISC REVISIONS

PROJECT CONTACTS

CIVIL ENGINEER

BERGMANN ASSOCIATES
560 5th STREET NW, SUITE 305
GRAND RAPIDS, MI 49504
JON LEDY P.E.
(616) 827-4274

OWNER

BLUE PHOTON
1002 INDUSTRIAL PARK DR.
SHELBY, MICHIGAN 49455
DAN BILLINGS
PH: 855-777-2040

DEVELOPER

WESTWIND CONSTRUCTION
1435 FULTON STREET
2ND FLOOR
GRAND HAVEN, MICHIGAN 49417
MARK BOSNER
PH: 616-842-2030

UTILITY AND JURISDICTIONAL CONTACTS

PLANNING AND ZONING

CITY OF NORTON SHORES
4814 HENRY STREET
NORTON SHORES, MI 49441
TED WOODCOCK, PLANNER & ZONING ADMINISTRATOR
PH: 231-799-6803

WATER AND SANITARY SEWER

CITY OF NORTON SHORES
4814 HENRY STREET
NORTON SHORES, MI 49441
MATT ANDERSON - SUPERINTENDENT
PH: 231-799-6804

SOIL EROSION AND SEDIMENTATION

MUSKEGON COUNTY DEPARTMENT OF PUBLIC WORKS
131 EAST APPLE AVENUE, 4TH FLOOR
MUSKEGON, MI 49442
PH: 231-724-6411

STORM WATER

MUSKEGON COUNTY DRAIN COMMISSIONER'S OFFICE
141 EAST APPLE AVENUE, 2ND FLOOR
MUSKEGON, MI 49442
BRENDA MOORE, DRAIN COMMISSIONER
PH: 231-724-3480

ROADS & ENTRANCE

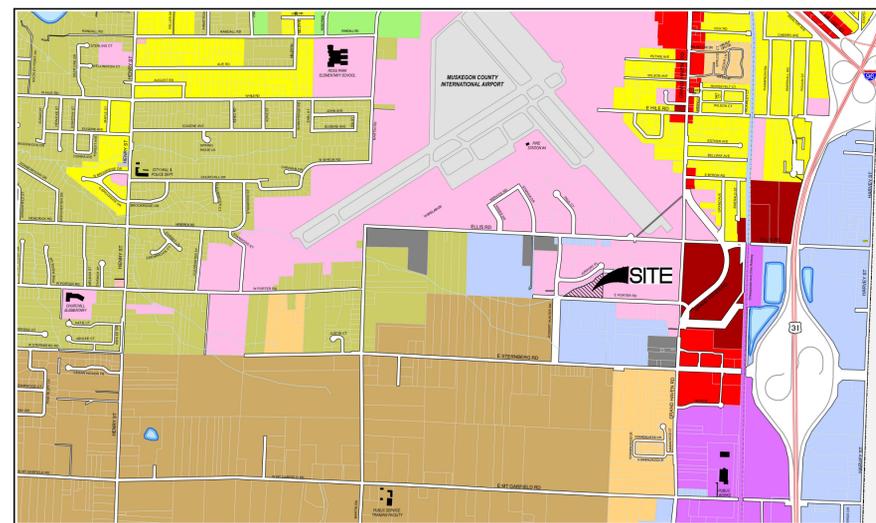
CITY OF NORTON SHORES
4814 HENRY STREET
NORTON SHORES, MI 49441
BRYAN DEGROOT STREETS AND DRAINAGE SUPERINTENDENT
PH: 231-798-2156

ELECTRIC

CONSUMERS ENERGY
ONE ENERGY PLAZA
JACKSON, MICHIGAN 49201-2276
1-800-477-5050

GAS

DTE ENERGY
ONE ENERGY PLAZA
DETROIT, MICHIGAN 48226
1-800-477-4747



SITE LOCATION MAP
NOT TO SCALE



Sheet Number	Sheet Title
C000	COVER SHEET
C001	TOPOGRAPHIC SURVEY
C080	DEMOLITION PLAN
C100	SITE PLAN
C110	UTILITY PLAN
C120	GRADING PLAN
C130	LANDSCAPE PLAN
C140	SESC PLAN
C141	SESC DETAILS
C500	DETAILS
A101	FIRST FLOOR PLAN
A201	EXTERIOR ELEVATIONS

DRAWING KEY

- INCLUDED IN PLAN SET
- NOT INCLUDED IN PLAN SET

LEGAL DESCRIPTIONS

Unit 25, of the Muskegon County Airport Business Park No. 2, a site condominium project established as Muskegon County Condominium Subdivision Plan No. 77 pursuant to the Master Deed recorded in Liber 3064, Page 443, re-recorded in Liber 3072, Page 292, and amended by an Amendment to Master Deed recorded in Liber 3594, Page 180, Muskegon County Records, together with rights in general common elements and limited common elements as set forth in the Master Deed, and amendments thereto, and as described in Public Act 59 of 1978, as amended (commonly known as 700 East Porter Road, PPN 61-27-649-000-0025-00), and

Unit 26, of the Muskegon County Airport Business Park No. 2, a site condominium project established as Muskegon County Condominium Subdivision Plan No. 77 pursuant to the Master Deed recorded in Liber 3064, Page 443, re-recorded in Liber 3072, Page 292, and amended by an Amendment to Master Deed recorded in Liber 3594, Page 180, Muskegon County Records, together with rights in general common elements and limited common elements as set forth in the Master Deed, and amendments thereto, and as described in Public Act 59 of 1978, as amended (commonly known as 740 East Porter Road, PPN 61-27-649-000-0026-00)

Not For Construction

Project Manager: B. HUYLER AIA	Checked By: XXXXXX
Designed By: JW.LEDY PE	Drawn By: JW. LEDY PE
Date Issued: JUNE 2019	Project Number: 014195.00

COVER SHEET

C000

DEMOLITION NOTES:

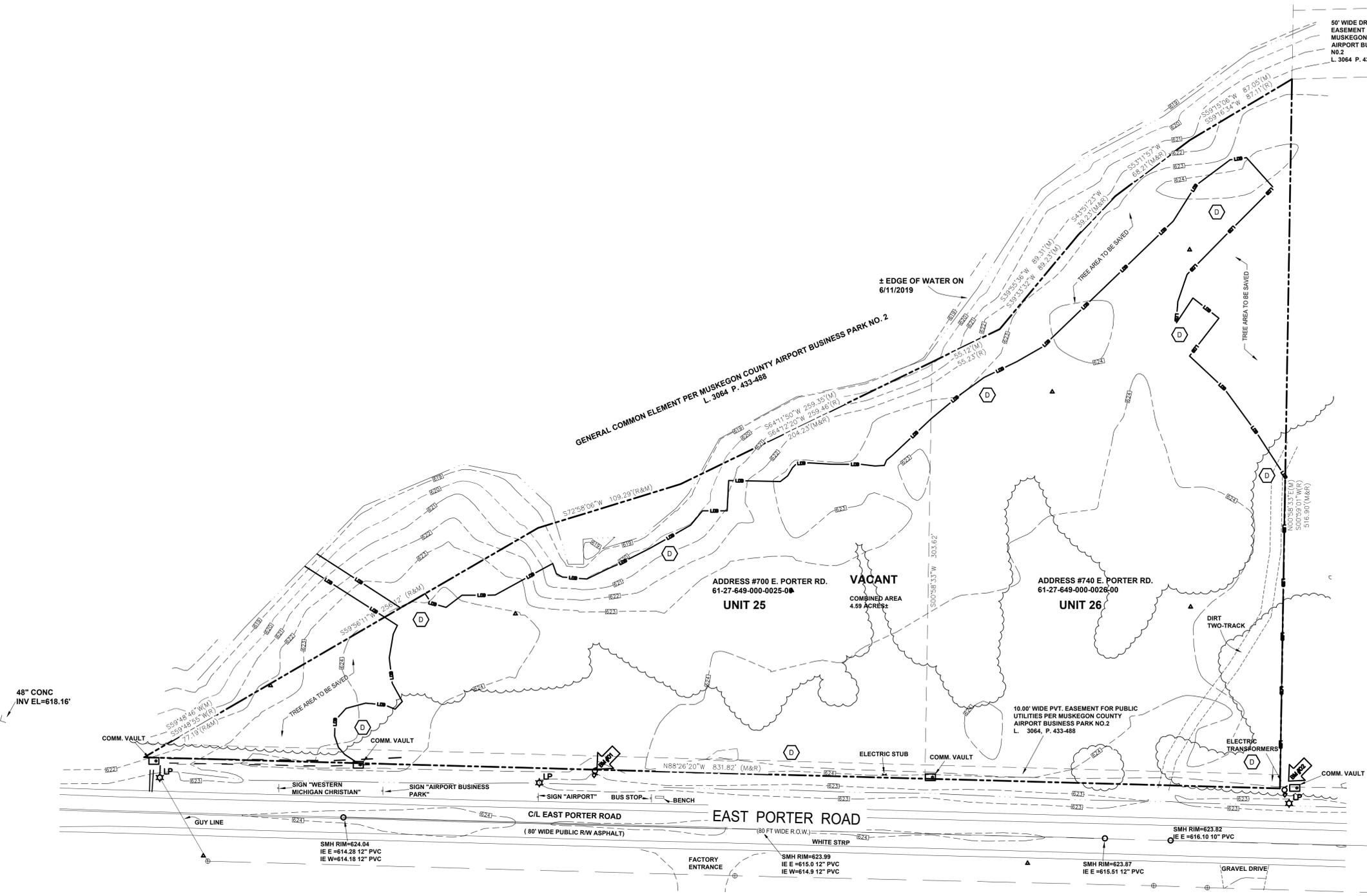
1. APPURTENANCES DESIGNATED FOR DEMOLITION SHALL NOT BE DISTURBED BY THE CONTRACTOR UNTIL FURNISHED WITH NOTICE OF POSSESSION AND APPROVAL TO PROCEED FROM OWNER. THE CONTRACTOR SHALL COORDINATE THE SCHEDULE WITH EXISTING TENANTS AND ADJACENT PROPERTY OWNERS. FOUNDATIONS, SLABS, ALL UNDERGROUND STRUCTURES, AND UTILITIES DESIGNATED FOR REMOVAL SHALL BE REMOVED ENTIRELY. AREAS TO BE BACK FILLED IN ACCORDANCE WITH GEOTECHNICAL REPORT.
2. CONTRACTOR IS SOLELY RESPONSIBLE FOR ANY DAMAGE TO EXISTING UTILITIES THAT ARE INTENDED TO PROVIDE SERVICE WHETHER SHOWN ON THE PLANS OR NOT.
3. CONTRACTOR TO VERIFY THAT ALL UTILITIES HAVE BEEN ABANDONED OR PROPERLY SHUTOFF PRIOR TO EXCAVATION.
4. EXISTING UTILITIES AND TOPO LOCATIONS ARE BASED ON THE BEST AVAILABLE INFORMATION. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR VERIFYING ALL UTILITY LOCATION WHETHER SHOWN ON PLANS OR NOT.
5. ALL DEBRIS FROM DEMOLITION, NOT BEING REUSED, SHALL BE HAULED OFF SITE AND DISPOSED OF BY LEGAL MEANS.
6. CONTRACTOR SHALL NOT RESTRICT ACCESS TO ADJOINING PROPERTIES DURING DEMOLITION OR CONSTRUCTION. ACCESS SHALL BE MAINTAINED SO AS NOT TO INTERRUPT NORMAL OPERATIONS OF ADJACENT FACILITIES.
7. CONTRACTOR SHALL NOT ALLOW ANY UTILITY OR SERVICES TO THE NEIGHBORING PROPERTY(S) TO BE INTERRUPTED WITHOUT THE EXPRESSED WRITTEN PERMISSION OF THE RESPECTIVE OWNERS. THE CONTRACTOR IS RESPONSIBLE TO MAINTAIN ALL UTILITY SERVICES TO THE NEIGHBORING BUILDINGS. IF IT IS NECESSARY FOR CONNECTIONS TO BE INTERRUPTED, THE CONTRACTOR IS RESPONSIBLE TO PROVIDE TEMPORARY SERVICES (I.E. GENERATORS, PORTABLE GAS TANKS, ETC.). THE CONTRACTOR IS RESPONSIBLE TO COORDINATE ALL UTILITY ABANDONMENT AND REMOVAL WITH THE RESPECTIVE UTILITY COMPANIES.
8. WORK CANNOT OCCUR OUTSIDE OF THE DEMOLITION LIMITS WITHOUT PRIOR CONSENT OF OWNER, ADJACENT OWNER, AND LOCAL JURISDICTION. ANY TEMPORARY EASEMENTS REQUIRED WHICH ARE NOT DEPICTED IN THE DRAWINGS SHALL BE THE CONTRACTORS RESPONSIBILITY.
9. EROSION CONTROL PRACTICES MUST BE IN PLACE AND MAINTAINED DURING DEMOLITION.

KEY NOTES:

- (A) REMOVE BUILDINGS (NOT USED)
- (B) SAWCUT AND REMOVE CONCRETE (TYP.) (NOT USED)
- (C) REMOVE UTILITIES (TYP.) (NOT USED)
- (D) REMOVE EXISTING VEGETATION (TYP.)
- (E) INSTALL TEMPORARY CONSTRUCTION FENCING (NOT USED) TO PROTECT TREES AS REQUIRED

LEGEND:

- (A) KEY NOTE
- ~ TREE LINE
- [X] REMOVE BUILDING AND APPURTENANCES (NOT USED)
- [//] REMOVE CONCRETE (NOT USED)
- [+ + +] REMOVE LAWN, GRAVEL OR LANDSCAPING AREA (NOT USED)
- LIMITS OF DISTURBANCE



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NORTON SHORES, MI



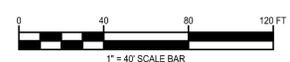
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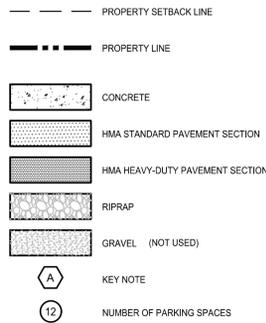
DEMOLITION PLAN

C080

KEY NOTES:

- A. STANDARD PAVEMENT SECTION
B. HEAVY DUTY PAVEMENT SECTION
C. DETENTION FACILITY
D. THICKENED EDGE WALK (NOT USED)
E. CONCRETE SIDEWALK
F. BARRIER FREE RAMP (NOT USED)
G. ADA STRIPPING AND SIGNAGE (TYP.)
H. CONCRETE CURB AND GUTTER MDOT C-4 (TYP.)
I. CONCRETE STRAIGHT CURB
J. "STOP" SIGN (NOT USED)
K. DUMPSTER ENCLOSURE
L. RIPRAP
M. RAIN GARDEN - SEE VEGETATIVE (NOT USED) CHANNEL DETAIL SHEET C500
N. SPILLWAY THROUGH CURB (TYP.) (NOT USED)
O. SCISSOR LIFT (NOT USED)
P. MDOT TYPE "M" OPENING
Q. SWALE (NOT USED)
R. RETAINING WALL - SEE STRUCTURAL PLANS
S. MONUMENT SIGN COMPLYING WITH CITY SIGN REQUIREMENTS, SIGN PERMIT TO BE APPLIED FOR SEPARATELY
T. FIRE HYDRANT
U. HEAVY DUTY CONCRETE PAVEMENT

SITE LEGEND:

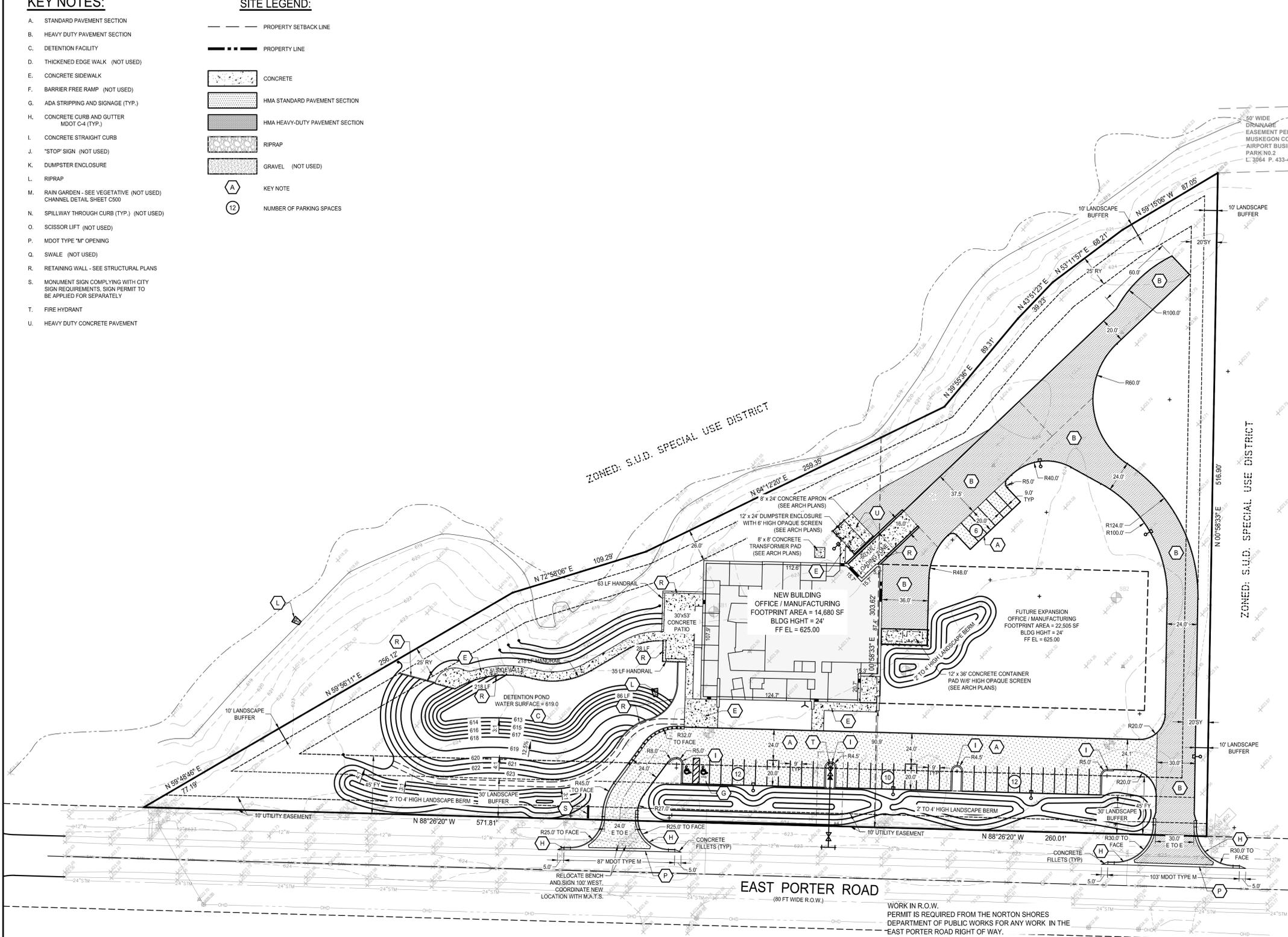


GENERAL NOTES:

- 1. THE UNDERGROUND STRUCTURES AND UTILITIES SHOWN ON THESE PLANS HAVE BEEN PLOTTED FROM AVAILABLE SURVEYS AND RECORD MAPS. THEY ARE NOT CERTIFIED TO THE ACCURACY OF THEIR LOCATION AND/OR COMPLETENESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO VERIFY THE LOCATION AND EXTENT OF ALL UNDERGROUND STRUCTURES AND UTILITIES PRIOR TO ANY DIGGING OR CONSTRUCTION ACTIVITIES IN THEIR VICINITY.
2. THE CONTRACTOR SHALL PERFORM ALL WORK IN COMPLIANCE WITH TITLE 29 OF FEDERAL REGULATIONS, PART 1926, SAFETY AND HEALTH REGULATIONS FOR CONSTRUCTION (OSHA).
3. ALL ROADS AND PRIVATE DRIVES SHALL BE KEPT CLEAN OF MUD, DEBRIS ETC. AT ALL TIMES.
4. REFER TO ARCHITECTURAL DRAWINGS FOR PRECISE BUILDING DIMENSIONS.
5. THE CONTRACTOR SHALL CONSULT THE CONSTRUCTION MANAGER BEFORE DEVIATING FROM THESE PLANS.
6. IN ALL TRENCH EXCAVATIONS, CONTRACTOR MUST LAY THE TRENCH SIDE SLOPES BACK TO A SAFE SLOPE. USE A TRENCH SHIELD OR PROVIDE SHEETING AND BRACING.
7. ALL EXISTING SURFACE APPURTENANCES (I.E. WATER VALVES, CATCH BASIN FRAMES AND GRATES, MANHOLE COVERS) WITHIN THE PROJECT LIMITS SHALL BE ADJUSTED TO FINISHED GRADE.
8. AREAS DISTURBED OR DAMAGED AS PART OF THIS PROJECT'S CONSTRUCTION THAT ARE OUTSIDE OF THE PRIMARY WORK AREA SHALL BE RESTORED, AT THE CONTRACTOR'S EXPENSE, TO THE SATISFACTION OF THE OWNER'S REPRESENTATIVE.
9. THE CONTRACTOR SHALL CALL "MISS DIG" AT LEAST 3 WORKING DAYS (EXCLUDING WEEKENDS AND HOLIDAYS) PRIOR TO CONSTRUCTION.
10. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE APPLICABLE CODES, ORDINANCES, DESIGN STANDARDS AND STANDARD SPECIFICATIONS OF THE AGENCIES WHICH HAVE THE RESPONSIBILITY OF REVIEWING PLANS AND SPECIFICATIONS FOR CONSTRUCTION OF ALL ITEMS INCLUDED IN THESE PLANS.
11. UNLESS SPECIFICALLY STATED, THE CONTRACTOR SHALL APPLY FOR AND OBTAIN ALL NECESSARY PERMITS AS REQUIRED FOR CONSTRUCTION OF THIS PROJECT PRIOR TO THE BEGINNING OF WORK FROM THE PREVIOUSLY MENTIONED AGENCIES.
12. THE CONTRACTOR WILL BE REQUIRED TO ASSUME SOLE RESPONSIBILITY FOR JOB SITE CONDITIONS DURING THE COURSE OF CONSTRUCTION OF THE PROJECT, INCLUDING THE SAFETY OF ALL PERSONS AND PROPERTY. THIS REQUIREMENT SHALL BE MADE TO APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.
13. WHEN ANY EXISTING UTILITY REQUIRES ADJUSTMENT OR RELOCATION, THE CONTRACTOR SHALL NOTIFY THE PROPER UTILITY COMPANY AND COORDINATE THE WORK ACCORDINGLY. THERE SHALL BE NO CLAIM MADE BY THE CONTRACTOR FOR ANY COSTS CAUSED BY DELAYS IN CONSTRUCTION DUE TO THE ADJUSTMENT OR RELOCATION OF UTILITIES.
14. THE CONTRACTOR IS TO VERIFY THAT THE PLANS AND SPECIFICATIONS THAT HE/SHE IS BUILDING FROM ARE THE VERY LATEST PLANS AND SPECIFICATIONS THAT HAVE BEEN APPROVED BY ALL APPLICABLE PERMIT-ISSUING AGENCIES AND THE OWNER. ALL ITEMS CONSTRUCTED BY THE CONTRACTOR PRIOR TO RECEIVING THE FINAL APPROVAL AND PERMITS HAVING TO BE ADJUSTED OR RE-DONE, SHALL BE DONE AT THE CONTRACTOR'S EXPENSE.
15. SHOULD THE CONTRACTOR ENCOUNTER CONFLICT BETWEEN THESE PLANS AND SPECIFICATIONS, EITHER AMONG THEMSELVES OR WITH THE REQUIREMENTS OF ANY AND ALL REVIEWING AND PERMIT-ISSUING AGENCIES, HE/SHE SHALL SEEK CLARIFICATION IN WRITING FROM THE CONSTRUCTION MANAGER BEFORE COMMENCEMENT OF CONSTRUCTION. FAILURE TO DO SO SHALL BE AT THE SOLE EXPENSE OF THE CONTRACTOR.
16. THE CONTRACTOR SHALL FURNISH AS-BUILT DRAWINGS INDICATING ALL CHANGES AND DEVIATIONS FROM APPROVED DRAWINGS.
17. ALL SIGNS AND TRAFFIC CONTROL MEASURES DURING CONSTRUCTION AND MAINTENANCE ACTIVITIES SHALL BE CONSTRUCTED AND INSTALLED PER THE LATEST EDITION OF THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES (M.M.U.T.C.D.).
18. ALL WORK WITHIN THE PUBLIC RIGHT OF WAY SHALL CONFORM TO THE STANDARDS OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION AND THE REQUIREMENTS OF THE CITY OF NORTON SHORES.

SITE DATA:

ZONING: SITE - S.U.D. (USE G.I. FOR SETBACKS)
NORTH - S.U.D.
EAST - S.U.D.
WEST - S.U.D.
SOUTH - P.U.D.
LAND USE: SITE - VACANT (EXISTING) OFFICE / MANUFACTURING (PROPOSED)
LOT AREA: 20,000 SF (0.46 ACRES) REQUIRED 4.88 ACRES (199,600 SF) PROVIDED
LOT FRONTAGE: 150' MIN REQUIRED 831.82' PROVIDED
SETBACKS: (USE GENERAL INDUSTRIAL ZONING REQUIREMENTS)
FRONT: 45' BUILDING
REAR: 25' BUILDING
SIDE: 20' BUILDING
MAXIMUM LOT COVERAGE BY BUILDINGS:
50% ALLOWED
PHASE 1 = 7.4% PROPOSED
PHASE 1 AND 2 = 18.6% PROPOSED
BUILDING HEIGHT: 2 STORIES OR 50' ALLOWED 24' PROPOSED
PARKING: MANUFACTURING, COMPOUNDING, PROCESSING = 1 SPACE PER EMPLOYEE ON LARGEST SHIFT + 1 SPACE PER 2,000 SF GFA
PHASE 1 = 14,600 SF/2000 = 7.3 SAY 7 SPACES + 8 EMPLOYEE SPACES = 15 TOTAL SPACES
PHASE 2 = 22,500 SF / 2000 = 11.3 SAY 11 SPACES + 8 EMPLOYEE SPACES = 19 TOTAL SPACES
TOTAL PARKING REQUIRED PH 1 & 2 = 34 SPACES
PARKING PROVIDED: REGULAR SPACES = 38 B.F. SPACES = 2 TOTAL SPACES = 40
OFF-STREET LOADING: 1 SPACE PER 20,000 SF OVER THE FIRST 20,000 SF = 1 LOADING DOCK
LOADING DOCK IS LOCATED AT THE NORTHEAST CORNER OF THE BUILDING.
SITE LIGHTING: ALL LIGHTING SHALL BE NIGHT-SKY FRIENDLY, FULLY SHIELDED AND DIRECTED FORWARD TO PREVENT OFF-SITE GLARE AND ILLUMINATION
MACHINERY AND USE INFORMATION: TYPES OF MACHINERY, POWER USAGE ELECTRICAL EQUIPMENT AND WATTS - SEE MACHINERY POWER AND AIR REQUIREMENTS TABLE THIS SHEET
DISCARDED MATERIALS - GENERAL OFFICE/SHIPPING PAPER PRODUCTS - WASTE METAL MATERIAL IS RECYCLED AND PICKED UP BY A RECYCLER
EMISSIONS - NO EMISSIONS ARE GENERATED



Not For Construction

ZONED: P.U.D. PLANNED UNIT DISTRICT

WORK IN R.O.W. PERMIT IS REQUIRED FROM THE NORTON SHORES DEPARTMENT OF PUBLIC WORKS FOR ANY WORK IN THE EAST PORTER ROAD RIGHT OF WAY.

MACHINE POWER AND AIR REQUIREMENTS TABLE

Table with columns: Status, Location, Machine, Power Supply, Air Supply, Dimensions, Notes. Lists various equipment like generators, pumps, and tools with their specifications.



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Table with columns: DATE, DESCRIPTION. Lists project milestones like '07/02/2019 OWNER REVIEW' and '07/16/2019 SITE PLAN REVIEW'.

Table with columns: DATE, DESCRIPTION. Lists revision dates like '08/02/2019 SITE PLAN RE-SUBMITTAL' and '08/09/2019 MISC REVISIONS'.

SITE PLAN

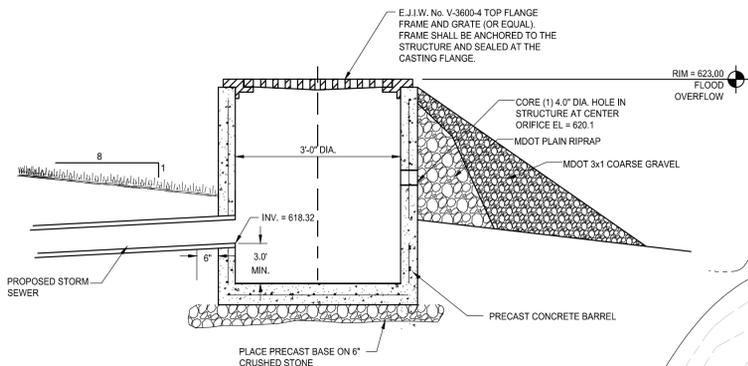
C100

STORM STRUCTURE SCHEDULE:

- FE51 = 18" HDPE FLARED END SECTION INV EL = 615.09
CB1 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=624.10
CB2 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=624.00
CB4 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=624.00
CB6 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=624.00
CB10 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
CB12 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
CB14 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
CB16 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
CB18 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
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CB82 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
CB84 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
CB86 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50
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CB100 CONSTRUCT 36" CATCH BASIN W/ 24" SUMP RIM EL=623.50

STORM PIPE SCHEDULE:

- P1 = 41 LF - 18" HDPE DOUBLE WALLED PIPE @ 0.30%
P2 = 73 LF - 18" HDPE DOUBLE WALLED PIPE @ 0.30%
P3 = 108 LF - 18" HDPE DOUBLE WALLED PIPE @ 0.30%
P4 = 108 LF - 15" HDPE DOUBLE WALLED PIPE @ 0.12%
P5 = 102 LF - 12" HDPE DOUBLE WALLED PIPE @ 0.30%
P6 = 114 LF - 12" HDPE DOUBLE WALLED PIPE @ 0.22%
P7 = 98 LF - 12" HDPE DOUBLE WALLED PIPE @ 0.22%
P8 = 88 LF - 8" HDPE DOUBLE WALLED PIPE @ 0.30%
P9 = 81 LF - 8" HDPE DOUBLE WALLED PIPE @ 0.30%
P10 = 105 LF - 8" HDPE DOUBLE WALLED PIPE @ 0.30%
P11 = 20 LF - 18" HDPE DOUBLE WALLED PIPE @ 0.30%
P12 = 88 LF - 18" HDPE DOUBLE WALLED PIPE @ 0.30%
P13 = 114 LF - 18" HDPE DOUBLE WALLED PIPE @ 0.7%
P14 = 55 LF - 8" HDPE DOUBLE WALLED PIPE @ 0.7%
P15 = 44 LF - 6" HDPE DOUBLE WALLED PIPE @ 1.0%
P17 = 30 LF - 8" HDPE DOUBLE WALLED PIPE @ 1.0%
P18 = 38 LF - 8" HDPE DOUBLE WALLED PIPE @ 2.00%

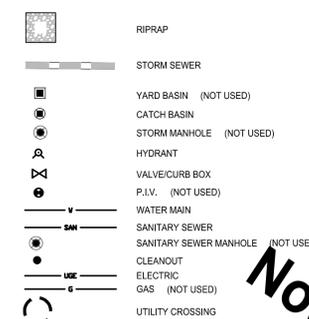


DETENTION POND OUTLET STRUCTURE CB-30 N.T.S.

UTILITY NOTES:

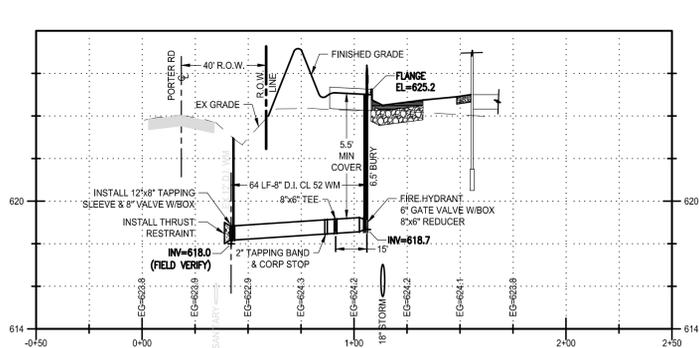
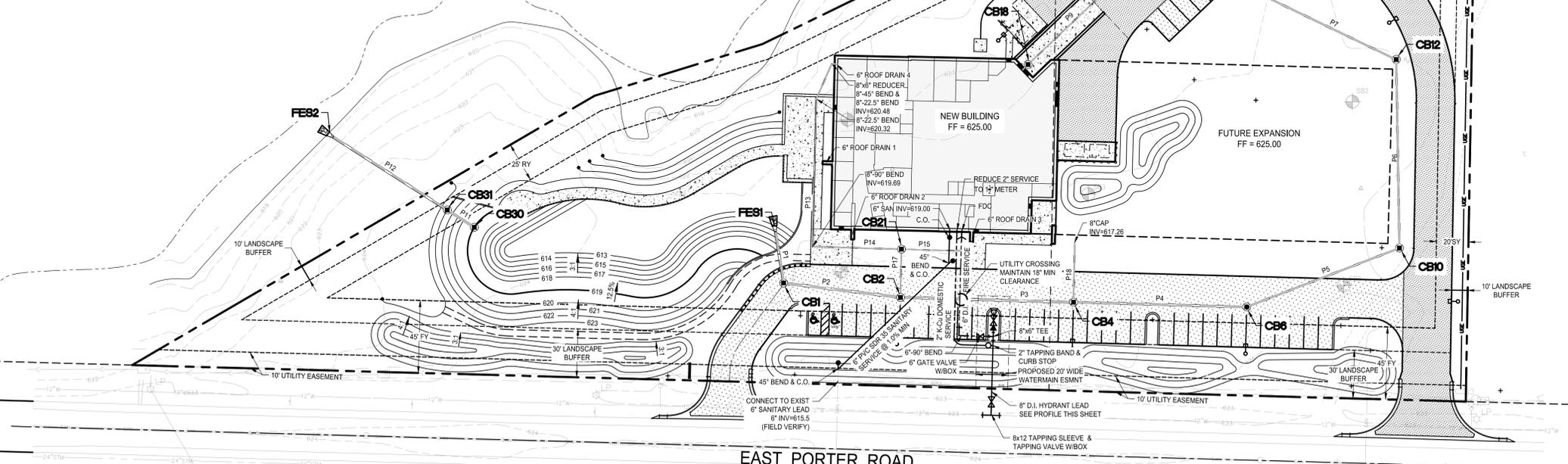
- 1. ALL WORKMANSHIP, MATERIALS, AND CONSTRUCTION PRACTICES SHALL CONFORM TO THE REQUIREMENTS OF THE CITY OF NORTON SHORES OR THE AGENCY HAVING JURISDICTION OVER THE APPLICABLE UTILITY.
2. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OR DAMAGE TO ANY EXISTING UTILITY DURING CONSTRUCTION AT NO COST TO THE OWNER.
3. ALL FILL MATERIAL IS TO BE IN PLACE, AND COMPACTED BEFORE INSTALLATION OF PROPOSED UTILITIES.
4. CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES 72 HOURS BEFORE CONNECTING TO ANY EXISTING LINE.
5. IN THE EVENT OF A VERTICAL CONFLICT BETWEEN WATERLINES, SANITARY LINES, STORM LINES AND GAS LINES (EXISTING AND PROPOSED), THE CONTRACTOR SHALL NOTIFY THE ENGINEER AS SOON AS THE CONFLICT IS DISCOVERED.
6. TOPS OF EXISTING UTILITY STRUCTURES SHALL BE ADJUSTED TO FINISHED GRADE.
7. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
8. CONTRACTOR IS RESPONSIBLE FOR COMPLYING TO THE CONSTRUCTION REQUIREMENTS OF THE UTILITY OWNERS.
9. THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH THE PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
10. CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES FOR INSTALLATION REQUIREMENTS AND SPECIFICATIONS.
11. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS AND SPECIFICATIONS FOR ACTUAL LOCATION AND ELEVATIONS OF ALL UTILITY ENTRANCES TO INCLUDE SANITARY SEWER, ELECTRICAL, TELEPHONE, AND GAS SERVICE. CONTRACTOR SHALL COORDINATE INSTALLATION OF UTILITIES, IN SUCH A MANNER AS TO AVOID CONFLICTS AND ASSURE PROPER DEPTHS ARE ACHIEVED AS WELL AS COORDINATING WITH UTILITY REQUIREMENTS AS TO LOCATION AND SCHEDULING FOR TIE-IN CONNECTIONS PRIOR TO CONNECTING TO EXISTING UTILITIES.
12. THE CONTRACTOR SHALL CONDUCT ALL REQUIRED TESTS TO THE SATISFACTION OF THE RESPECTIVE UTILITY COMPANIES AND THE OWNER'S INSPECTING AUTHORITIES.
13. CONTRACTOR SHALL COMPLY TO THE FULLEST EXTENT WITH THE LATEST STANDARDS OF OSHA DIRECTIVES OR ANY OTHER AGENCY HAVING JURISDICTION FOR EXCAVATION AND TRENCHING PROCEDURES. THE CONTRACTOR SHALL USE SUPPORT SYSTEMS, SHORING, BENCHING, AND OTHER MEANS OF PROTECTION. THIS TO INCLUDE BUT NOT LIMITED TO ACCESS AND EGRESS FROM ALL EXCAVATION AND TRENCHING. CONTRACTOR IS RESPONSIBLE TO COMPLY WITH PERFORMANCE CRITERIA FOR OSHA.
14. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING PIPE SIZES AND INVERTS ELEVATIONS BEFORE ORDERING MANHOLE AND CATCH BASIN STRUCTURES.
15. ALL UTILITIES BELOW PAVED AREAS SHALL BE BACKFILLED WITH 100% GRANULAR MATERIAL (OR APPROVED OTHER) AND COMPACTED TO 95% OF ITS MAXIMUM UNIT WEIGHT.
16. ALL RIM ELEVATIONS IN OUTLAIN AREAS ARE APPROXIMATE ONLY AND SHALL BE ADJUSTED BY THE CONTRACTOR AFTER FINAL GRADES ARE ESTABLISHED.

UTILITY LEGEND:

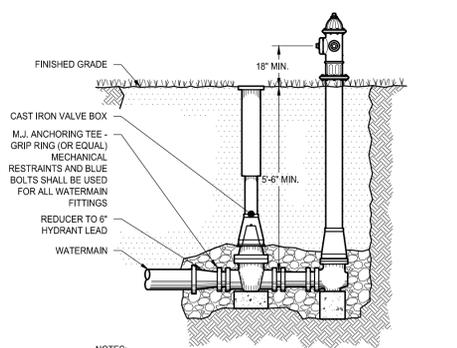


CONSTRUCTION NOTES:

- 1. ALL CONNECTIONS TO EXISTING UTILITIES, CHLORINATION OF NEW WATERMAIN AND TESTING OF NEW UTILITIES SHALL BE WITNESSED BY THE CITY. THE CITY WILL PERFORM THE SAMPLING OF THE NEW WATERMAIN AND SUBMIT THE SAMPLES TO THE CITY OF MUSKOGEE FOR TESTING. ALL CITY OWNED VALVES AND HYDRANTS ARE TO BE OPERATED BY THE CITY ONLY. CHARGES WILL APPLY IF NOT. ALL INSPECTIONS SHALL BE SCHEDULED WITH THE CITY (231-799-8864) WITH 24 HRS IN ADVANCE. ANY AND ALL OVERTIME WILL BE CHARGED TO THE CONTRACTOR.
2. CONTRACTOR SHALL ARRANGE FOR FULL TIME CONSTRUCTION OVER-SITE OF THE WATERMAIN AND SANITARY WATER SERVICES.
3. WATER AND SEWER TAPS SHALL BE COORDINATED WITH THE CITY OF NORTON SHORES.
4. WATER AND SANITARY SEWER SERVICES SHALL BE CONSTRUCTED PER CITY OF NORTON SHORES SPECIFICATIONS.
5. AS-BUILT PLANS SHALL BE PREPARED BY A LICENSED ENGINEER AT BERGMANN. MYLAR AND CAD FILES OF THE AS-BUILTS SHALL BE SUBMITTED TO THE CITY OF NORTON SHORES WATER AND SEWER DEPT.

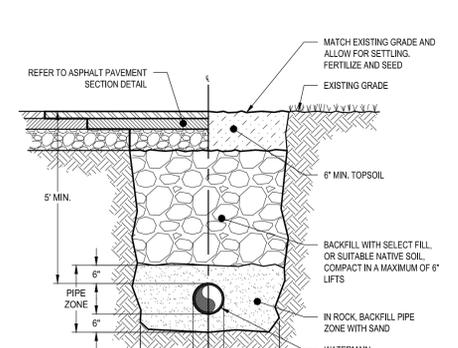


PROPOSED 8" WATERMAIN PROFILE 1" = 4" VERTICAL 1" = 40" HORIZONTAL

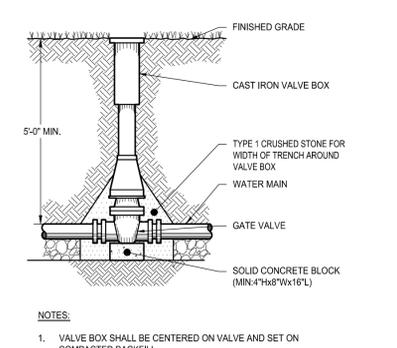


- 1. OPERATING NUT SHALL BE 5 SIDED, 1-1/2" POINT TO FLAT.
2. PAINT BONNET AND CAPS PER OWNERS STANDARD SPECIFICATIONS.
3. TRAFFIC SAFETY BREAK FLANGE AND STEM SAFETY COUPLING TO BE INSTALLED.
4. TWO (2) HYDRANT WRENCHES SHALL BE DELIVERED TO THE OWNER.
5. FIRE HYDRANT SHALL OPEN LEFT (COUNTERCLOCKWISE).

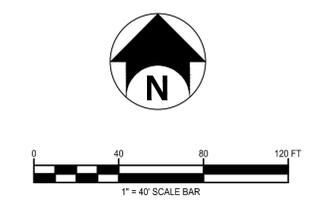
HYDRANT ASSEMBLY N.T.S.



WATERMAIN TRENCH DETAIL N.T.S.



GATE VALVE DETAIL (WATER MAIN) N.T.S.



blue photon Technology & Workholding Systems LLC
BLUE PHOTON NEW MANUFACTURING FACILITY NORTON SHORES, MI
WESTWIND CONSTRUCTION
BERGMANN ARCHITECTS ENGINEERS PLANNERS
560 5th St. NW Suite 305 Grand Rapids, MI 49504
616.827.4270
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Table with 2 columns: DATE, DESCRIPTION. Includes entries for 07/02/2019 OWNER REVIEW, 07/16/2019 SITE PLAN REVIEW, 08/02/2019 SITE PLAN RE-SUBMITTAL, 08/09/2019 MISC REVISIONS.

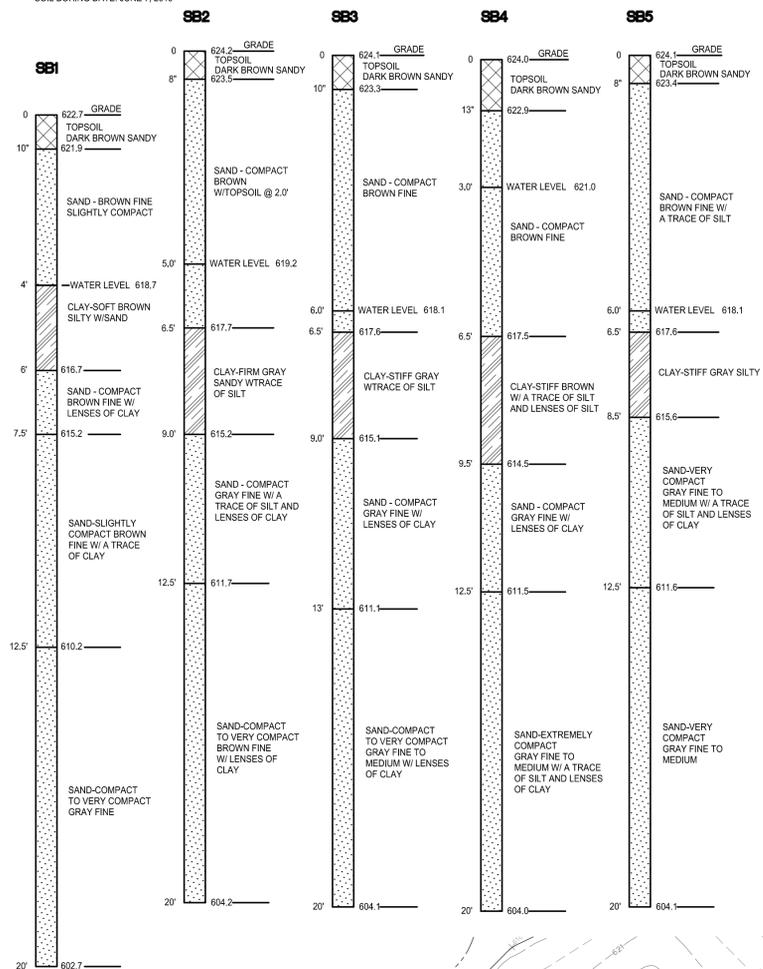
Not For Construction

UTILITY PLAN

Project Manager: B. HUYLER AIA, Checked By: XXXXXX
Designed By: JW LEDY PE, Drawn By: JW LEDY PE
Date Issued: JUNE 2019, Project Number: 014195.00

C110

SOIL BORINGS BY: SOILS & STRUCTURES, MUSKEGON, MICHIGAN
SOIL BORING DATE: JUNE 7, 2019

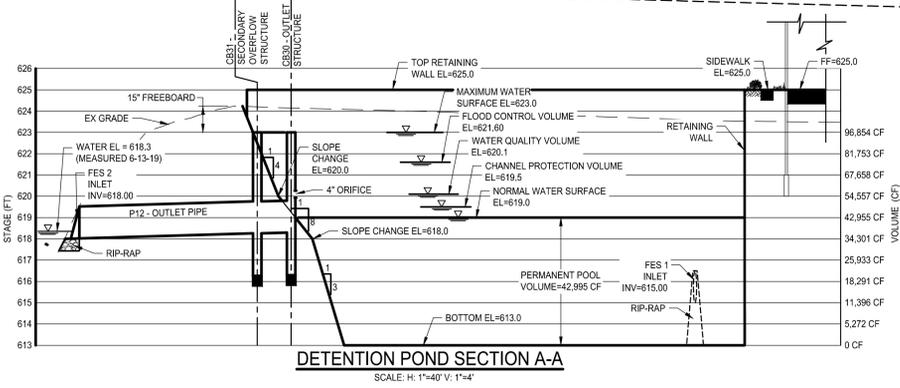
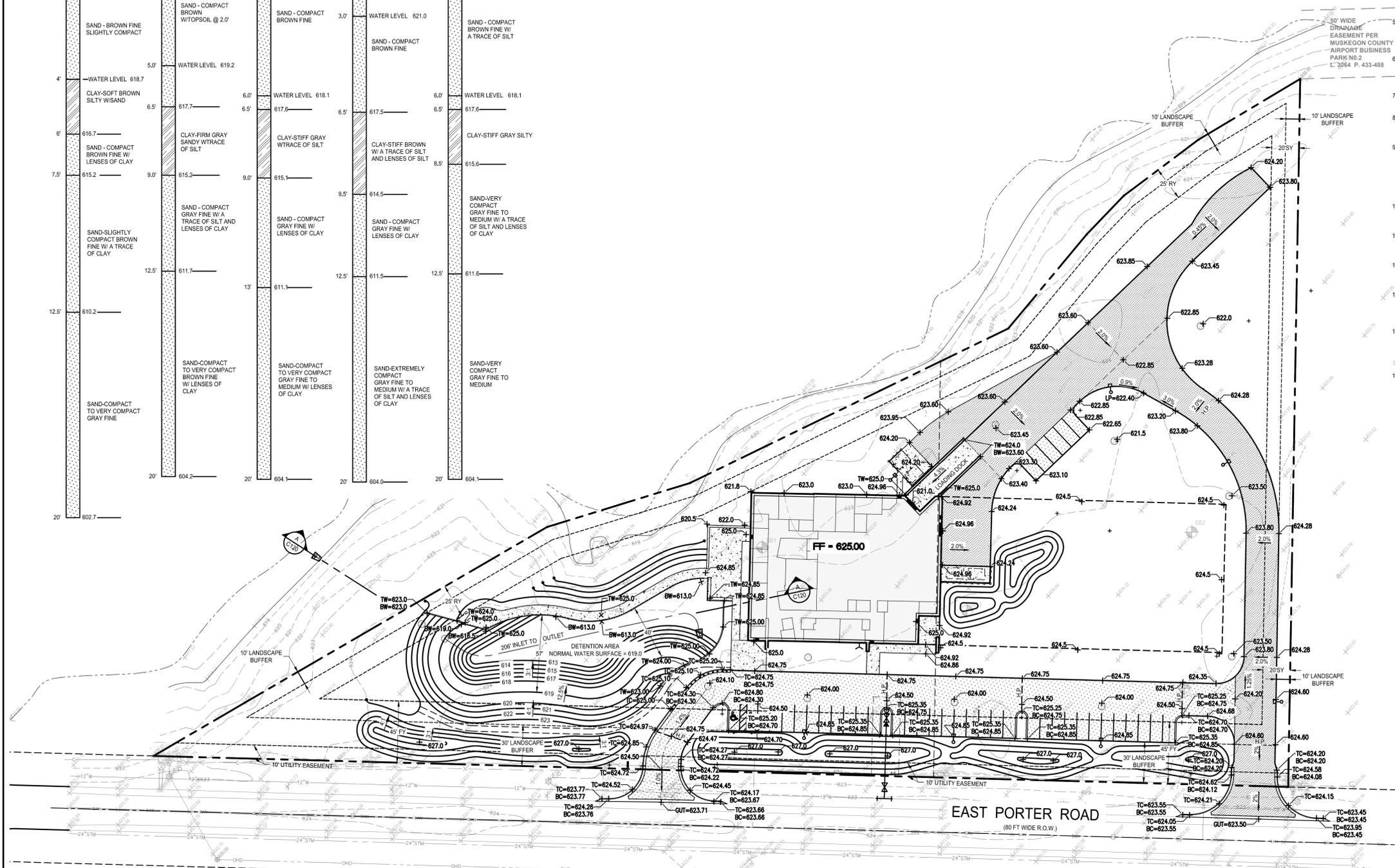


GRADING NOTES

- REFER TO EROSION AND SEDIMENT CONTROL PLAN FOR REQUIRED EROSION AND SEDIMENT CONTROL MEASURES.
- CONTRACTOR SHALL BE RESPONSIBLE FOR THE MAINTENANCE AND REMOVAL OF TEMPORARY SEDIMENTATION CONTROLS. EROSION CONTROL MEASURES SHALL NOT BE REMOVED BEFORE VEGETATION HAS OCCURRED COMPLETELY.
- ALL SILT FENCE TO BE REPLACED WHENEVER THEY BECOME CLOGGED OR INOPERABLE AND SHALL BE REPLACED AT A MINIMUM OF EVERY 3 MONTHS.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORATION OF TOPSOIL TO ALL DISTURBED AREAS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO MAINTAIN EROSION CONTROL MEASURES AT ALL TIMES.
- SILT FENCE, JUTE MESH, AND/OR EROSION CONTROL BLANKETS WILL BE USED ON STEEP SLOPES AND WHEREVER NECESSARY TO CONTROL EROSION AND SILTATION OF EXISTING DRAINAGE SYSTEMS AS ORDERED BY THE ENGINEER OR SPECIFIED ON PLANS.
- THE CONTRACTOR SHALL DESIGNATE A MEMBER OF HIS/HER FIRM TO BE RESPONSIBLE TO MONITOR EROSION CONTROL, EROSION CONTROL STRUCTURES, TREE PROTECTION AND PRESERVATION THROUGHOUT CONSTRUCTION.
- ALL DISTURBED AREAS SHALL BE PROTECTED FROM EROSION EITHER BY MULCH OR TEMPORARY SEEDING WITHIN 2 WEEKS OF DISTURBANCE.
- ALL SITE GRADING MUST BE PERFORMED TO INSURE POSITIVE DRAINAGE ACROSS THE ENTIRE SITE, THROUGHOUT THE PERIOD OF CONSTRUCTION AND AFTER PROJECT COMPLETION.
- ALL SEDIMENTATION AND SOIL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED PRIOR TO THE COMMENCEMENT OF SITE GRADING AND MUST CONFORM TO PART 91 OF ACT 451 OF THE PUBLIC ACTS OF 1994 AS AMENDED. ALL APPLICABLE PERMITS SHALL BE OBTAINED BEFORE IMPLEMENTING THESE MEASURES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING THE SEDIMENTATION AND SOIL EROSION CONTROL MEASURES THROUGHOUT CONSTRUCTION.
- IN GENERAL, EARTHWORK AND PAVEMENT CONSTRUCTION SHOULD BE PERFORMED IN ACCORDANCE WITH THE LATEST MDOT STANDARD SPECIFICATIONS FOR CONSTRUCTION UNLESS OTHERWISE NOTED.
- REMOVE ANY EXISTING TOPSOIL, ORGANIC SOILS, UNSUITABLE FILL, VEGETATION, TREES OR OTHER DELETERIOUS MATERIALS TO EXPOSE THE SUBGRADE SOIL. TREE ROOTS SHOULD BE COMPLETELY REMOVED.
- EXCAVATE TO THE DEPTH OF THE FINAL SUBGRADE ELEVATION TO ALLOW FOR GRADE CHANGES AND THE PLACEMENT OF THE RECOMMENDED PAVEMENT SYSTEM.
- ON SITE FILL MATERIAL CAN BE USED IF THE SPECIFIED COMPACTION REQUIREMENTS CAN BE ACHIEVED. IF ON SITE MATERIAL IS USED, IT SHOULD BE CLEAN AND FREE OF FROZEN SOIL, ORGANICS, OR OTHER DELETERIOUS MATERIALS.
- THE FINAL SUBGRADE SHOULD BE THOROUGHLY PROOFROLLED USING A LOADED TANDEM AXLE TRUCK UNDER THE OBSERVATION OF GEOTECHNICAL/PAVEMENT ENGINEER. LOOSE OR YIELDING AREAS THAT CANNOT BE MECHANICALLY STABILIZED SHOULD BE REMOVED AND REPLACED WITH ENGINEERED FILL OR AS DIRECTED BY FIELD CONDITIONS.
- THE AGGREGATE BASE SHOULD BE COMPACTED TO ACHIEVE A MINIMUM OF 95 PERCENT OF THE MAXIMUM MODIFIED PROCTOR DRY DENSITY. THE BASE AND SUBGRADE COMPACTION SHOULD EXTEND A MINIMUM OF 12 INCHES BEYOND THE PAVED EDGE OR BACK OF CURB.

GRADING LEGEND:

---	PROPOSED MAJOR CONTOUR
---	PROPOSED MINOR CONTOUR
X TC=78.01	PROPOSED TOP OF CURB / BOTTOM OF CURB ELEVATION
X BC=77.51	PROPOSED TOP OF WALL / BOTTOM OF WALL
X TW=152.50	PROPOSED TOP OF WALL / BOTTOM OF WALL
X 77.73	PROPOSED SPOT ELEVATION
X EG=77.73	EXISTING ELEVATION
X HP=77.73	PROPOSED HIGH POINT ELEVATION
X TG=77.73	PROPOSED TOP OF GRATE ELEVATION
X FF=77.73	FINISHED FLOOR ELEVATION
2.5%	PROPOSED SLOPE
---	EXISTING CONTOUR
---	RIDGE LINE
---	CURB AND GUTTER
---	MODIFIED CURB AND GUTTER



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NEW MANUFACTURING FACILITY

NORTON SHORES, MI

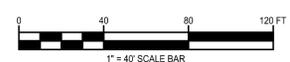


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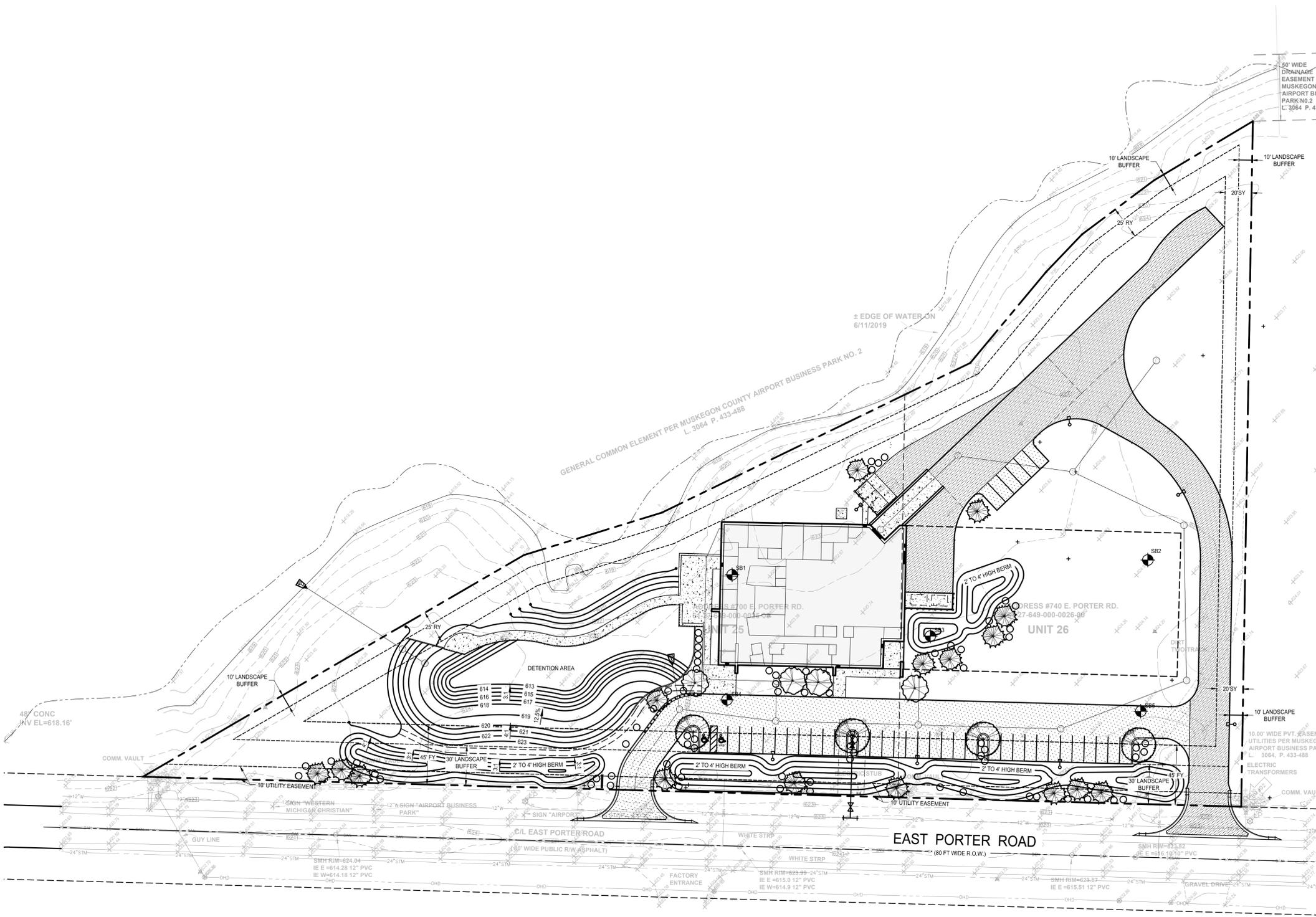
DATE	DESCRIPTION
07/02/2019	OWNER REVIEW
07/16/2019	SITE PLAN REVIEW
08/02/2019	SITE PLAN RE-SUBMITTAL
08/09/2019	MISC REVISIONS

Project Manager:	Checked By:
B. HUYLER AIA	XXXXXX
Designed By:	Drawn By:
JW. LEDY PE	JW. LEDY PE
Date Issued:	Project Number:
JUNE 2019	014195.00



GRADING PLAN

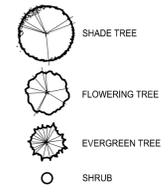
C120



LANDSCAPING NOTES:

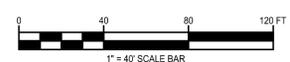
- ALL PLANTS MUST BE HEALTHY, VIGOROUS, AND FREE OF PESTS AND DISEASE.
- STANDARDS SET FORTH IN "AMERICAN STANDARD FOR NURSERY STOCK" ANSI Z60.1 (LATEST EDITION), REPRESENT GUIDELINE SPECIFICATIONS ONLY AND SHALL CONSTITUTE MINIMUM QUALITY REQUIREMENTS FOR PLANT MATERIAL.
- ALL PLANTS MUST BE HARDY UNDER CLIMATE CONDITIONS THAT EXIST AT THE PROJECT SITE AND GROWN AT A NURSERY AT THE SAME HARDINESS ZONE AS THE PROJECT LOCATION.
- NO SUBSTITUTIONS SHALL BE PERMITTED WITHOUT PRIOR WRITTEN APPROVAL OF THE OWNER OR OWNER'S REPRESENTATIVE.
- ALL TREES MUST BE STRAIGHT TRUNKED, INJURY FREE, AND FULL HEADED.
- THE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK.
- ANY DISCREPANCY WITH QUANTITIES, LOCATIONS AND / OR FIELD CONDITIONS SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- MULCH ALL ISLANDS AND PLANTINGS IN LAWN AREAS WITH SHREDDED HARDWOOD MULCH TO A MINIMUM DEPTH OF THREE (3) INCHES UNLESS OTHERWISE DIRECTED.
- ANY PLANT WHICH DIES, TURNS BROWN, OR DEFOOLIATES (PRIOR TO TOTAL ACCEPTANCE OF THE WORK) SHALL BE PROMPTLY REMOVED FROM THE SITE AND REPLACED WITH MATERIAL OF THE SAME SPECIES, QUANTITY AND SIZE MEETING ALL PLANT LIST SPECIFICATIONS.
- THE CONTRACTOR IS RESPONSIBLE FOR FULLY MAINTAINING ALL PLANT MATERIALS (INCLUDING, BUT NOT LIMITED TO, WATERING, SPRAYING, MULCHING, FERTILIZING, AND REMOVAL OF STAKES AND GUYS) AND LAWN AREAS UNTIL FINAL ACCEPTANCE BY THE OWNER.
- THE CONTRACTOR SHALL COMPLETELY GUARANTEE ALL PLANT MATERIAL FOR A PERIOD OF ONE (1) YEAR, BEGINNING ON THE DATE OF FINAL ACCEPTANCE. THE CONTRACTOR SHALL PROMPTLY MAKE ALL REPLACEMENTS BEFORE THE END OF THE GUARANTEE PERIOD.
- ALL AREAS DISTURBED BY UTILITY INSTALLATION AND SITE GRADING ACTIVITY SHALL RECEIVE APPROVED TOPSOIL TO A COMPACTED DEPTH OF FOUR (4) INCHES, UNLESS OTHERWISE SPECIFIED BY THE GOVERNING MUNICIPALITY, BE FINE GRADED, SEEDED, MULCHED AND WATERED UNTIL A HEALTHY STAND OF GRASS IS OBTAINED.
 - AN ORGANIC CONTENT OF 8-12%
 - SOIL ACIDITY RANGE OF pH 6.0 TO pH 6.8
 - SOLUBLE SALTS OF 1000 PPM OR LESS
 - MAXIMUM CLAY CONTENT OF 15-20%
- THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING, AT THEIR EXPENSE, A CERTIFIED SOIL TEST ANALYSIS OF ON SITE AND / OR IMPORTED TOPSOIL. TOPSOIL ANALYSIS TO INCLUDE THE FOLLOWING DATA:
 - pH FACTOR.
 - MECHANICAL ANALYSIS, INCLUDING SIEVE ANALYSIS PROVIDING SEPARATE SAND, SILT AND CLAY PERCENTAGES.
 - PERCENTAGE OF ORGANIC CONTENT BY WEIGHT.
 - NUTRIENT LEVELS INCLUDING NITROGEN, PHOSPHOROUS AND POTASSIUM.
- SHOULD TESTS AND ANALYSIS INDICATE THAT SOIL PROPOSED FOR USE IS DEFICIENT IN ANY OF THE ABOVE REQUIREMENTS, A SYSTEM OF AMELIORATING MAY BE PROPOSED FOR APPROVAL, ANY SYSTEM PROPOSED SHALL PROVIDE FOR AN ACIDITY RANGE OF Ph 6.0 TO 6.8 INCLUSIVE.
- COMPOST SHALL MEET THE FOLLOWING MINIMUM REQUIREMENTS:
 - ORGANIC CONTENT OF 35-60% (DRY WEIGHT BASIS)
 - LOOSE AND FRAGILE WITH MOISTURE CONTENT OF 35-60% (WET WEIGHT BASIS)
 - PARTICLE SIZE SHALL BE <1/2 INCH (100% PASSING)
 - SOLUBLE SALTS CONCENTRATION SHALL BE <4.0 MMHOS/CM (DSM), MAXIMUM
 - pH RANGE OF 6.0-8.5
- PLANTING MIX FOR PLANT PITS SHALL BE COMPOSED OF 2 PARTS IMPORTED OR ON-SITE SCREENED TOPSOIL AND 1 PART COMPOST. THE RATIO OF TOPSOIL TO COMPOST IS SUBJECT TO CHANGE BASED ON THE TESTING RESULTS FOR TOPSOIL.
- LOCATIONS OF EXISTING BURIED UTILITIES SHOWN ON THE PLAN ARE BASED UPON BEST AVAILABLE INFORMATION AND ARE TO BE CONSIDERED APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATIONS OF ALL UNDERGROUND UTILITY LINES ADJACENT TO THE WORK AREA. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ANY AND ALL DAMAGE TO UTILITIES, STRUCTURES AND SITE APPURTENANCES, ETC., WHICH OCCURS AS A RESULT OF THE LANDSCAPE INSTALLATION.
- THE CONTRACTOR IS RESPONSIBLE FOR INSTALLING ALL PLANT MATERIAL PER DETAILS. ANY DEVIATIONS FROM THE DETAIL MUST BE APPROVED BY THE OWNER'S REPRESENTATIVE OR LANDSCAPE ARCHITECT PRIOR TO INSTALLATION.
- UPON FINAL ACCEPTANCE OF THE LANDSCAPE INSTALLATION, THE OWNER WILL ASSUME MAINTENANCE OF THE LANDSCAPED AREAS.
- EXISTING TREES TO REMAIN SHALL BE PROTECTED BY INSTALLING A TEMPORARY FENCE AT THE OUTER LIMITS OF THE TREE CANOPY.

LANDSCAPING LEGEND:



PARKING LOT LANDSCAPING:

1 TREE PER 10 SPACES x 40 SPACES = 4 TREES



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NEW MANUFACTURING FACILITY

NORTON SHORES, MI



560 5th St. NW
 Suite 305
 Grand Rapids, MI 49504
 office: 616.827.4270

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DATE	DESCRIPTION
07/02/2019	OWNER REVIEW
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Not For Construction

Project Manager: B. HUYLER AIA	Checked By: XXXXXX
Designed By: JW. LEDY PE	Drawn By: JW. LEDY PE
Date Issued: JUNE 2019	Project Number: 014195.00

LANDSCAPE PLAN

Drawing Number:

C130

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7/2/2019 11:32:39 AM
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E5 DUST CONTROL SPECIFICATIONS

When

- On construction sites during periods of low precipitation, low humidity, and high temperature or high winds.

Why

- To reduce dust and sedimentation from wind and construction activities.

Where

- Use on unpaved roadways, construction sites with vehicle traffic, soil stockpile areas, and general areas with unstabilized, or fine soils.

How

- Dust control applications can include watering, chemical dust suppression, gravel or asphalt surfacing, temporary aggregate cover, and haul truck covers.
- Minimize length of time vulnerable areas are exposed on construction site.
- Identify and stabilize key access points prior to initiating construction.
- Quickly stabilize exposed soil by vegetation, mulch, soil erosion control blankets, spray-on adhesives, sprinkling, or stone layering to minimize areas in need of dust control.
- Follow manufacturers instructions regarding application of any dust palliative. Pay particular attention to mixing details.
- Apply dust suppressant to surfaces using a pressure type water distributor truck equipped with a spray system.
- The number of applications to be determined by site engineer.
- Immediately clean-up sediment tracked onto paved roads.
- Limit vehicle traffic to 15 miles per hour.
- Utilize aggregate cover on access, parking, and paved roads.
- Keep construction traffic directed to stabilized site roadways when possible.

STANDARD SYMBOL

E5 DUST CONTROL SPECIFICATIONS

Maintenance

- Frequent, even daily application may be required to increase effectiveness.
- Do not overwater, as overwatering may cause erosion.
- Oil should not be used for dust control, as it may enter a drainage way through runoff or seeping into the soil.

Limitations

- To continue its effectiveness, dust control application needs to be applied on a regular schedule.
- Applying too much water to surface may cause erosion.
- Some types of dust suppressants may make soil water repellent, increasing runoff.

STANDARD SYMBOL

E6 MULCHING SPECIFICATIONS

When

- When areas are subject to erosive surface sheet flows or severe wind.

Why

- Temporarily protects seeded areas and slopes against erosion from rain or wind. Holds soil moisture to allow for seed germination and reduces wind desiccation of germinated seeds. Inhibits seed consumption by birds.

Where

- Use on exposed slopes, newly seeded areas and other areas subject to erosion.

How

- Other surface runoff control measures should be installed prior to mulching.
- Prepare surface to proper grade and compaction requirements.
- If treatment area is to be revegetated immediately, spread or drill seed, or install vegetative strips into planting surface.
- Select mulch material appropriate for site characteristics, including grade, level of traffic, installation method, and accessibility.

Straw – Most common and widely used material. Provides organic matter as it breaks down. Effectiveness of sediment reduction high for at least 3 months. Subject to windblow and washout. For straw, apply a minimum of 2 tons/acre or approx. 50 lbs./1000 sq. ft. to cover the surface. Increase application rates 50% for dormant seeding.

Rock – Crushed stone and gravel maintain effectiveness indefinitely if maintained to repair compaction. Cover 2-3" in depth (approx. 2.27 tons/1000 sq. ft.).

Wood chips/bark – Chips decompose slowly but may require nitrogen fertilizer application to avoid nutrient deficiency. Tend to wash down slopes over 6% and may clog inlet grates. Cover 2-3" in depth.

Mulches should not be applied if free surface water is present but may be applied to wet soil.

STANDARD SYMBOL

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STANDARD SYMBOL

S51 SILT FENCE

When

- A temporary measure for preventing sediment movement.

Why

- Used to prevent sediment suspended in runoff from leaving an earth change area.

Where

- Use adjacent to critical areas, wetlands, base of slopes, and watercourses.

How

- Install parallel to a contour.
- The silt fence should be made of woven geotextile fabric.
- Silt fence should accommodate no more than 1/2 to 1 acre of drainage per 100' of fence and on slopes less than 1:2 (v:h).
- Dig a 6" trench along the area where the fence is to be installed.
- Place 6" of the silt fence bottom flap into the trench.
- Backfill the trench with soil and compact the soil on both sides. Create a small ridge on the up-slope side of the fence.
- Install wooden stakes 6 - 10' apart and drive into the ground a minimum of 12".
- Staple the geotextile fabric to the wooden stakes.
- Join sections of silt fence by wrapping ends together (See drawing).

Maintenance

- Inspect frequently and immediately after each storm event. Check several times during prolonged storm events. If necessary, repair immediately.
- If the sediment has reached 1/3 the height of the fence, the soil should be removed and disposed of in a stable upland site.
- The fence should be re-installed if water is seeping underneath it or if the fence has become ineffective.
- Silt fence should be removed once vegetation is established and up-slope area has stabilized.

STANDARD SYMBOL

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STANDARD SYMBOL

E8 PERMANENT SEEDING SPECIFICATIONS

When

- To finalize stabilization of temporary seeding areas or when an area needs permanent stabilization following completion of construction. Also used when vegetative establishment can correct existing soil erosion or sedimentation problem.
- Within 5 days of final grade.

Why

- To stabilize soil and prevent or reduce soil erosion/sedimentation problems from developing.

Where

- Used on construction and earth change sites which require permanent vegetative stabilization.

How

- Review SESC plan and construction phasing to identify areas in need of permanent vegetative stabilization.
- Select perennial grass and ground cover for permanent cover.
- Seed mixes vary. However, they should contain native species.
- Seed mixes should be selected through consultation with a certified seed provider and with consideration of soil type, light, moisture, use applications, and native species content.
- Soil tests should be performed to determine the nutrient and pH levels in the soil. The pH may need to be adjusted between 6.5 and 7.0.
- Prepare a 3-5" deep seedbed, with the top 3-4" consisting of topsoil.
- Slopes steeper than 1:3 should be roughened.
- Apply seed as soon as possible after seedbed preparation. Seed may be broadcast by hand, hydroseeding, or by using mechanical drills.
- Mulch immediately after seeding.
- Dormant seed mixes are for use after the growing season, using seed which lies dormant in the winter and begins growing as soon as site conditions become favorable.

STANDARD SYMBOL

E8 PERMANENT SEEDING SPECIFICATIONS

How (cont.)

- Protect seeded areas from pedestrian or vehicular traffic.
- Divert concentrated flows away from the seeded area until vegetation is established.

Maintenance

- Inspect weekly and within 24 hours following each rain event in the first few months following installation to be sure seed has germinated and permanent vegetative cover is being established.
- Add supplemental seed as necessary.

Limitations

- Seeds need adequate time to establish.
- May not be appropriate in areas with frequent traffic.
- Seeded areas may require irrigation during dry periods.
- Seeding success is site specific, consider mulching or sodding when necessary.

STANDARD SYMBOL

E8 PERMANENT SEEDING

Planting Zones	Lower Peninsula (South of TDN)	Lower Peninsula (North of TDN)	Upper Peninsula
	Zone 1	Zone 2	Zone 3
Seeding Window Permanent Seeding	4/15 - 10/10	5/1 - 10/1	5/1 - 9/20
Seeding Window Dormant Seeding	11/15 - Freeze	11/01 - Freeze	11/01 - Freeze

Source: Adapted from MDOT Interim 2003 Standard Specifications for Construction

Seeding Dates (with irrigation or Mulk)	Zone 1 Lower Peninsula (South of U.S. 10)	Zone 2 Lower Peninsula (North of U.S. 10)	Zone 3 Upper Peninsula
	Seeding Dates (with irrigation or Mulk)	4/1 - 8/1	5/1 - 9/20
Seeding Dates (w/o irrigation or Mulk)	4/1 - 5/20 or 8/10 - 10/1	5/1 - 6/10 or 8/1 - 9/20	5/1 - 6/15 or 8/1 - 9/20
Dormant Seeding Dates	11/1 - Freeze	10/25 - Freeze	10/25 - Freeze

Source: Adapted from USDA NRCS Technical Guide #342 (1999)

* Dormant seeding is for use in the late fall after the soil temperature remains consistently below 50°F, prior to the ground freezing. This practice is appropriate if construction on a site is completed in the fall but the seed was not planted prior to recommended seeding dates. No seed germination will take place until spring. A cool season annual grass may be added in an attempt to have some fall growth.

- Mulch must be used with dormant seed.
- Do not seed when the ground is frozen or snow covered.
- Do not use a dormant seed mix on grassed waterways.

STANDARD SYMBOL

E9 MULCH BLANKETS

When

- When seeded areas are subject to erosive surface flows, severe wind, or to protect non-vegetated slopes or areas during the winter.

Why

- Protects seeded areas and slopes against erosion from rain or wind. Holds soil moisture to allow for seed germination and reduces wind desiccation of germinated seeds.

Where

- Use on exposed slopes, newly seeded areas, new ditch bottoms, and other areas subject to erosion.

How

- Prepare subgrade to proper grade and compaction requirements.
- Remove ruts, roots, soil clods, or other debris from surface subject to mulch blanket installation.
- Spread or drill seed.
- Consult with erosion control material supplier to select mulch blanket based on slope gradient, expected surface run-off, and protection term necessary (long or short term).
- Position selected mulch blanket as close as possible to intended use location.
- Install blanket at top of slope, first anchoring toe in trench 6" wide X 6" deep, progressing down-slope or down-gradient with approximately 12" of blanket extended beyond the up-slope portion of the trench.
- Anchor the blanket with stakes/stakes placed approximately 12" apart in the bottom of the trench. Backfill and compact the trench after securing.
- Apply seed to compacted soil and fold the 12" portion of the blanket over compacted area and secure with a row of stakes/stakes placed 12" apart across the width of the blanket.
- Unroll the blankets down or horizontally across the slope.

NOTES:

- PLACE MULCH BLANKET PARALLEL TO FLOW AND ANCHOR SECURELY.
- WHEN BLANKETS ARE USED IN FLOWING DITCH, BLANKETS SHOULD NOT OVERLAP IN DITCH CENTER PARALLEL TO FLOW.
- STAPLES INSTALLED/SECURED ACCORDING TO MANUFACTURER'S SPECIFICATIONS.
- WHERE POSSIBLE, CONSTRUCT WITH BIODEGRADABLE MATERIAL.

STANDARD SYMBOL

E9 MULCH BLANKETS SPECIFICATIONS

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- Unroll the blankets down or horizontally across the slope.

STANDARD SYMBOL

E9 MULCH BLANKETS SPECIFICATIONS

How (cont.)

- Overlap blanket edges by a minimum of 4" and blanket ends by a minimum of 12". Overlaps should be in the direction of expected flow with the up-slope blanket placed over the down-slope blanket edge.
- Secure down-slope end of blanket with stakes/stakes and trench in.

Maintenance

- Check after a rain event to ensure the blanket is still in place.
- Keep eroded soil, vehicular and pedestrian traffic, and concentrated runoff away from the blanketed area.

Limitations

- Mulch blankets and anchors may inhibit mowing.

STANDARD SYMBOL

E12 RIPRAP

When

- When concentrated water flows have the potential to create scour, down-cutting, or lateral cutting.

Why

- To prevent loss of land or damage to utilities or structures. In aquatic applications, riprap is used to control channel meander and maintain capacity, protect against wave attack, and reduce sediment load.

Where

- In natural or constructed channels with areas susceptible to erosion from the action of water, ice, or debris, or to damage by livestock or vehicular traffic.
- In shoreline areas where the erosion problem may be solved through simple structural measures.
- On slopes with profiles measuring 1:1.5 or less.

How

- Review subject site to identify areas subject to concentrated flows or wave/current attack.
- The appropriateness and extent of riprap placement is site specific and should be determined in the field.
- The area under review for riprap placement must be shaped and contoured appropriately by grading prior to material placement.
- Non-woven geotextile fabric should be installed prior to riprap placement, with upper end and toe end of fabric buried or anchored to prevent movement.
- Riprap placement should be started at a stabilized location and ended at a stabilized or contoured point.
- Material selected for riprap should be hard, angular, and resistant to weathering. Appropriate material size depends on expected water energy and intended function of the material.

STANDARD SYMBOL

E12 RIPRAP SPECIFICATIONS

When

- When concentrated water flows have the potential to create scour, down-cutting, or lateral cutting.

Why

- To prevent loss of land or damage to utilities or structures. In aquatic applications, riprap is used to control channel meander and maintain capacity, protect against wave attack, and reduce sediment load.

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STANDARD SYMBOL

E12 RIPRAP SPECIFICATIONS

How (cont.)

- Riprap mixture should be an even mixture of stone sizes based on the average, or D_{50} . This means 50% of the stone, by size, will be larger than the diameter specified, and 50% will be smaller than the size specified. The diameter of the largest stone should not be more than 1.5 times the D_{50} stone size.
- See table on the following page for typical riprap stone sizes.
- Rock shall be placed so that larger rocks are uniformly distributed and in contact with one another. Smaller rocks should fill the voids.
- When in contact with moving water, riprap will tie into a stable bank at the downstream end and will be keyed into the bank at the upstream end. Riprap should extend 3 ft. above the ordinary high water mark or to the top of the bank on short slopes. Extend riprap a minimum 10 ft. beyond active erosion area.

Maintenance

- All installations should be inspected immediately after the first rainfall to confirm the stability of the placed material. Follow-up inspections should occur regularly and provisions made for prompt repair if needed.

Limitations

- Area is cleared prior to the addition of riprap, therefore no areas are preserved with native vegetation.

SIZE OF TYPICAL RIPRAP STONES			
Weight (lb.)	Average Spherical Diameter (in.) D_{50}	Typical Rectangular Stone Length (in.)	Width/Height (in.)
1000	4.75	6	3
2000	5.75	8	4
3000	6.75	10	5
4000	7.75	12	6
5000	8.75	14	7
6000	9.75	16	8
7000	10.75	18	9
8000	11.75	20	10
9000	12.75	22	11
10000	13.75	24	12
11000	14.75	26	13
12000	15.75	28	14
13000	16.75	30	15
14000	17.75	32	16
15000	18.75	34	17
16000	19.75	36	18
17000	20.75	38	19
18000	21.75	40	20
19000	22.75	42	21
20000	23.75	44	22
21000	24.75	46	23
22000	25.75	48	24
23000	26.75	50	25
24000	27.75	52	26
25000	28.75	54	27
26000	29.75	56	28
27000	30.75	58	29
28000	31.75	60	30
29000	32.75	62	31
30000	33.75	64	32

Source: Adapted from USDA NRCS

STANDARD SYMBOL

S58 INLET PROTECTION - FABRIC DROP SPECIFICATIONS

When

- When sediment laden stormwater requires treatment before entering a stormwater drainage system.

Why

- To prevent sediment from entering stormwater systems.

Where

- Use in or at stormwater inlets, especially at construction sites or in streets.

How

- A filter fabric bag is hung inside the inlet, beneath the grate.
- Replace grate, which will hold bag in place.
- Anchor filter bag with 1" rebar for removal from inlet.
- Flaps of bag that extend beyond the bag can be buried in soil in earth areas.

Maintenance

- Drop inlet filters should be inspected routinely and after each major rain event.
- Damaged filter bags should be replaced.
- Clean and/or replace filter bag when 1/2 full.
- Replace clogged fabric immediately.
- If needed, initiate repairs immediately upon inspection.
- Remove entire protective mechanism when upgradient areas are stabilized and streets have been swept.

Limitations

- Can only accommodate small flow quantities.
- Requires frequent maintenance.
- Ponding may occur around storm drains if filter is clogged.

STANDARD SYMBOL

S58 INLET PROTECTION - FABRIC DROP

When

- When sediment laden stormwater requires treatment before entering a stormwater drainage system.

Why

- To prevent sediment from entering stormwater systems.

Where

- Use in or at stormwater inlets, especially at construction sites or in streets.

How

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STANDARD SYMBOL

S53 STABILIZED CONSTRUCTION ACCESS

When

- Establish stabilized construction entrance prior to the initiation of site construction activities.

Why

- Care should be taken to prevent material movement into adjacent wetlands/waterbodies.

Where

- Care should be taken to maintain existing roadside drainage via culvert installation, with sediment sump placed downflow of culvert.

How

- Establish stabilized construction entrance prior to the initiation of site construction activities.
- Care should be taken to prevent material movement into adjacent wetlands/waterbodies.
- Care should be taken to maintain existing roadside drainage via culvert installation, with sediment sump placed downflow of culvert.

STANDARD SYMBOL

S53 STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS

When

- Construction traffic is expected to leave a construction site.
- Stabilization of interior construction roads is desired.

Why

- To minimize tracking of sediment onto public roadways and to minimize disturbance of vegetation.

Where

- Stabilized construction entrances shall be located at every point where construction traffic enters or leaves a construction site. Vehicles leaving the site must be routed over the rock ingress/egress corridor.

How

- Stabilized construction access road should be established at the onset of the construction activities and maintained in place for the duration of the construction project.
- Installation of this practice should be the responsibility of the site clearing or excavating contractor.
- Access location should be cleared of woody vegetation.
- Non-woven geotextile fabric shall be placed over the existing ground prior to placing stone.

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STANDARD SYMBOL

S53 STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS

When

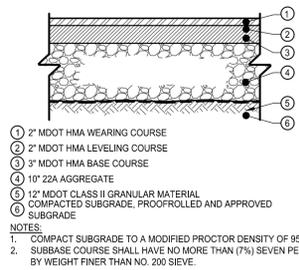
- Construction traffic is expected to leave a construction site.
- Stabilization of interior construction roads is desired.

Why

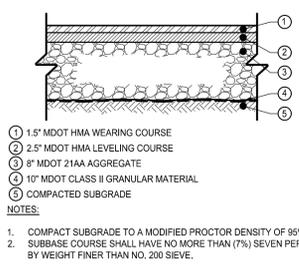
- To minimize tracking of sediment onto public roadways and to minimize disturbance of vegetation.

Where

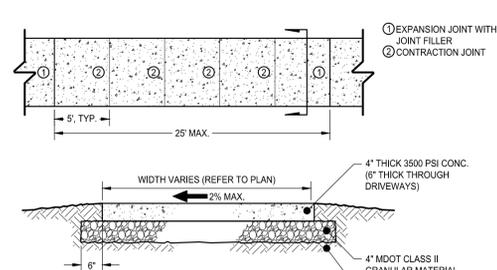
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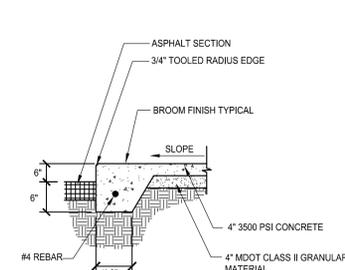
HEAVY DUTY ASPHALT PAVEMENT SECTION
N.T.S.



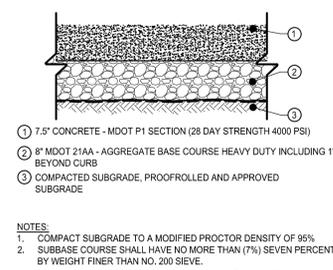
STANDARD DUTY ASPHALT PAVEMENT SECTION
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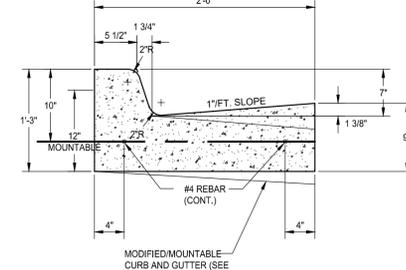
CONCRETE SIDEWALK DETAIL
N.T.S.



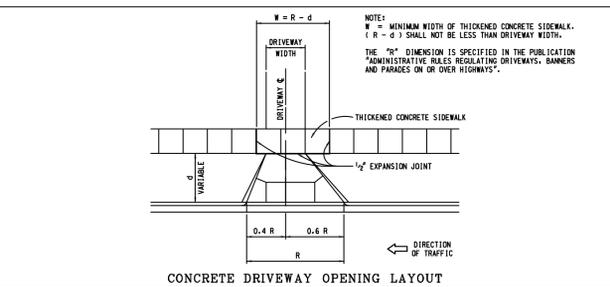
THICKENED EDGE WALK DETAIL
N.T.S.



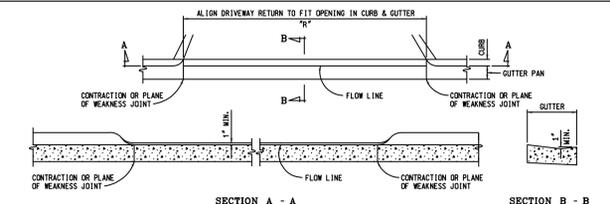
HEAVY DUTY CONCRETE PAVEMENT SECTION
N.T.S.



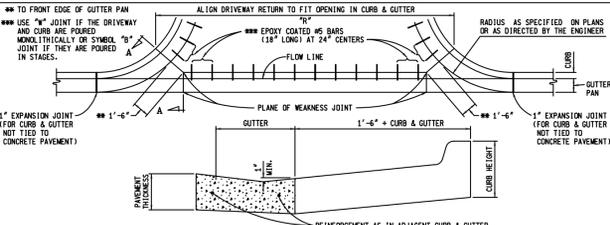
M.D.O.T. C-4 CURB & GUTTER DETAIL
NO SCALE



CONCRETE DRIVEWAY OPENING LAYOUT



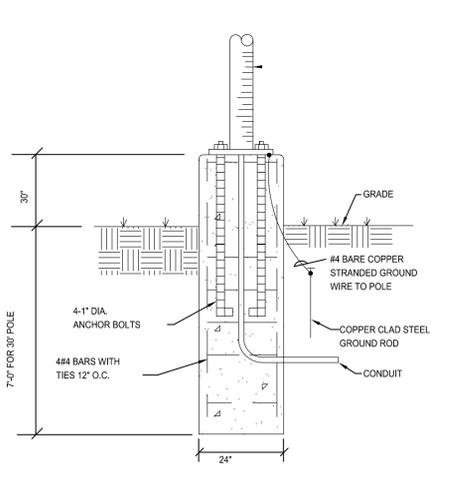
CONCRETE DRIVEWAY OPENING, DETAIL L



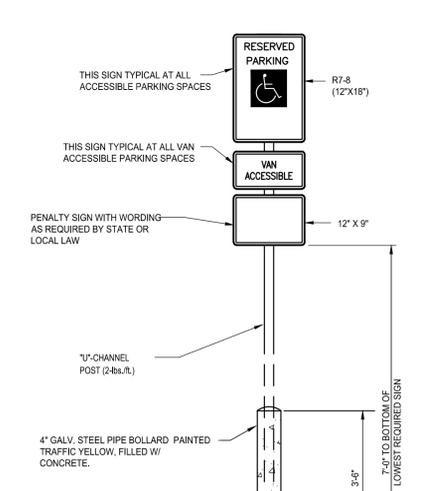
CONCRETE DRIVEWAY OPENING, DETAIL M

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR
DRIVEWAY OPENINGS & APPROACHES AND CONCRETE SIDEWALK

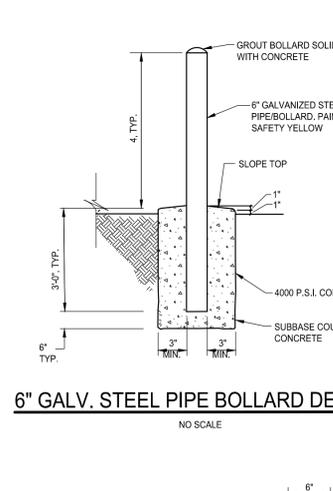
9-30-2014 F.I.E.L. APPROVAL	7-1-2014 PLAN DATE	R-29-I	SHEET 2 OF 4
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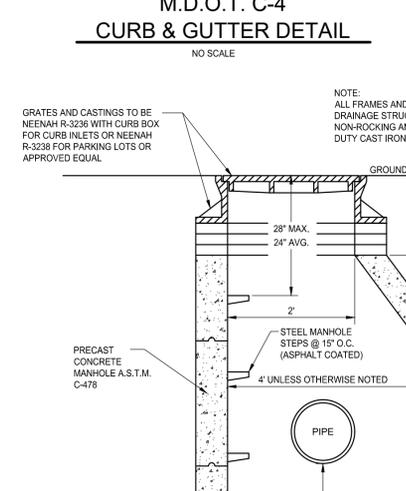
LIGHT POLE BASE DETAIL
N.T.S.



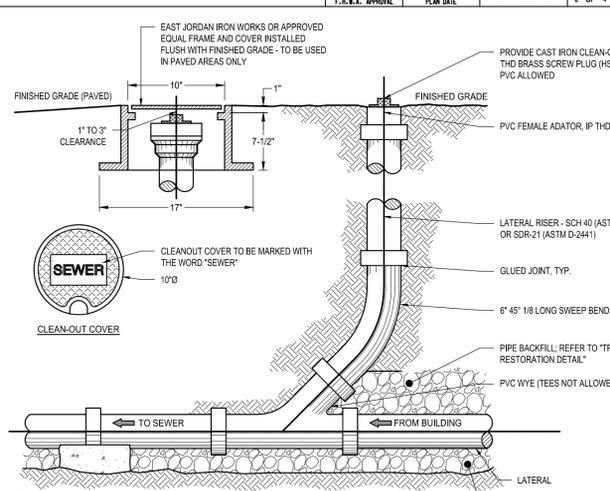
ACCESSIBLE PARKING SIGN DETAIL
N.T.S.



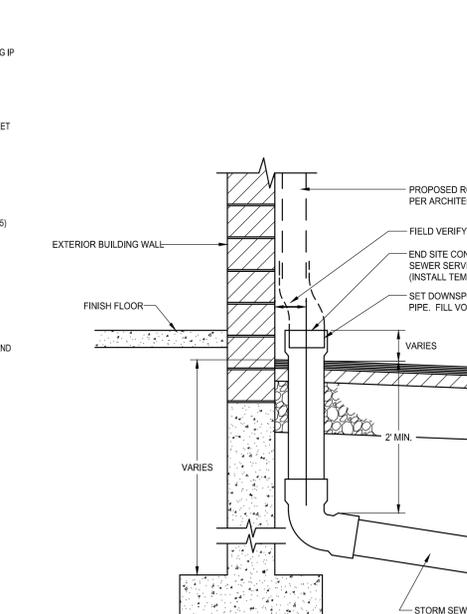
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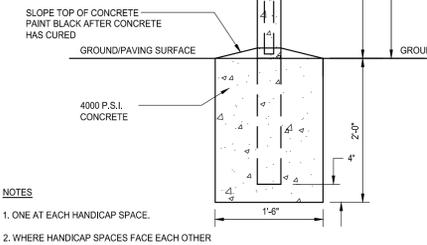
CATCH BASIN DETAIL
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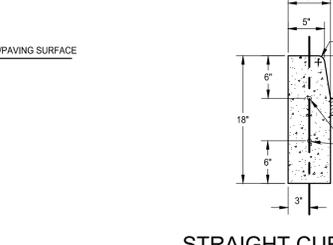
SANITARY SEWER LATERAL CLEAN-OUT
N.T.S.



STORM SEWER SERVICE DETAIL
N.T.S.



STRAIGHT CURB DETAIL
NO SCALE



FLARED END SECTION AND OUTLET PROTECTION DETAIL
N.T.S.

DATE	DESCRIPTION
07/02/2019	OWNER REVIEW
07/16/2019	SITE PLAN REVIEW
08/02/2019	SITE PLAN RE-SUBMITTAL
08/09/2019	MISC REVISIONS

Not For Construction

Project Manager: B. HUYLER AIA	Checked By: XXXXXX
Designed By: J.W. LEDY PE	Drawn By: J.W. LEDY PE
Date Issued: JUNE 2019	Project Number: 014195.00