

OVERALL LEGAL DESCRIPTION:
 A parcel of land in the Southwest 1/4 of Section 33, T4N, R1W, Meridian Township, Ingham County, Michigan, the boundary of said parcel described as: Commencing at the Southwest corner of said Section 33; thence N89°46'20"E along the South line of said Section 33 a distance of 858.00 feet to the point of beginning of this description; thence N00°36'06"W parallel with the West line of Section 33 a distance of 1996.56 feet; thence N89°46'12"E 35.84 feet; thence N00°27'14"W 642.58 feet to the East-West 1/4 line of said Section 33; thence N89°44'23"E along said East-West 1/4 line 433.70 feet to the West line of Fieldstone Village Condominium, Subdivision Plan No. 184, Ingham County Records; thence S00°18'07"E along said West line and the West line of Coyote Creek Condominium, Subdivision Plan No. 82, Ingham County Records, a distance of 989.98 feet; thence along the South line of said Coyote Creek Condominium the following three courses: N89°45'08"E 503.25 feet, South 34.97 feet and N89°45'08"E 255.61 feet to the West line of Unit 1 of Okemos Pointe Office Park Condominium, Subdivision Plan No. 267, Ingham County Records; thence along said West line the following two courses: S22°44'37"E 82.61 feet and S14°02'26"W 172.95 feet to the North line of Ferrins Parkway; thence along said North line the following four courses: S89°51'41"W 85.18 feet, Southwesterly 180.54 feet on a curve to the left, said curve having a radius of 232.50 feet, a delta angle of 44°29'30" and a chord length of 176.04 feet bearing S67°37'04"W, Southwesterly 206.25 feet on a curve to the right, said curve having a radius of 277.50 feet, a delta angle of 42°35'09" and a chord length of 201.54 feet bearing S66°39'56"W and Southwesterly 77.04 feet on a curve to the left, said curve having a radius of 197.50 feet, a delta angle of 22°20'57" and a chord length of 76.55 feet bearing S78°47'04"W to the East line of Water Lily Way; thence along said East line the following three courses: Southeasterly 106.18 feet on a curve to the right, said curve having a radius of 205.00 feet, a delta angle of 29°40'31" and a chord length of 104.99 feet bearing S14°50'20"E, S00°00'04"E 221.47 feet and Southeasterly 47.24 feet on a curve to the left, said curve having a radius of 30.00 feet, a delta angle of 90°13'36" and a chord length of 42.51 feet bearing S45°06'52"E to the North line of Jolly Oak Road; thence S89°46'20"W along the extension of said North line 90.12 feet to the West line of Jolly Oak Road; thence S00°00'04"E along said West line 805.00 feet to the Southeast corner of Lot 1 of Jolly-Okemos Industrial Park as recorded in Liber 27, Pages 20-21, Ingham County Records; thence S89°46'20"W along the South line of said Lot 1 a distance of 196.04 feet to the West line of said Jolly-Okemos Industrial Park; thence N00°48'30"W along said West line 163.00 feet; thence S89°46'20"W parallel with said South Section line 181.50 feet; thence S00°48'30"E along a line parallel with said West line of Lots 1 and 2 a distance of 213.00 feet to said South line; thence S89°46'20"W along said South line 280.06 feet to the point of beginning; said parcel containing 39.02 acres, more or less, subject to all rights-of-way for road purposes; said parcel subject to all easements and restrictions if any.

PHASE 4 LEGAL DESCRIPTION:
 A parcel of land in the Southwest 1/4 of Section 33, T4N, R1W, Meridian Township, Ingham County, Michigan, the boundary of said parcel described as: Commencing at the Southwest corner of said Section 33; thence N89°46'20"E along the South line of said Section 33 a distance of 858.00 feet; thence N00°36'06"W parallel with the West line of Section 33 a distance of 1217.85 feet to the point of beginning of this description; thence continuing N00°36'06"W parallel with said West line 778.71 feet; thence N89°46'12"E 35.84 feet; thence N00°27'14"W 642.58 feet to the East-West 1/4 line of said Section 33; thence N89°44'23"E along said East-West 1/4 line 433.70 feet to the West line of Fieldstone Village Condominium, Subdivision Plan No. 184, Ingham County Records; thence S00°18'07"E along said West line and the West line of Coyote Creek Condominium, Subdivision Plan No. 82, Ingham County Records, a distance of 989.98 feet; thence S89°45'08"E 49.74 feet; thence S08°19'09"W 276.80 feet; thence S61°38'16"W 333.53 feet; thence S89°23'54"W 78.22 feet to the point of beginning.

STANDARD CONSTRUCTION NOTES
 1. The Contractor shall notify the Charter Township of Meridian, Department of Public Works, Office of Engineering, ph# 517-453-4440, a minimum of 72 hours prior to the start of construction of public utilities or construction within the public right-of-way.
 2. All construction shall conform to the current standards and specifications of the Charter Township of Meridian which are included as part of these plans in effect at the time of construction.
 3. After the completion of construction of public utilities or construction within public right-of-way, the contractor must request a final inspection. Any punchlist items resulting from the final inspection must be resolved prior to final release and acceptance.
 4. The existing utilities indicated on the plans are in accordance with available information. It shall be the contractor's obligation to verify the exact location of all existing utilities, which might affect this job.
 5. The contractor shall notify "MISS DIRT" 1-800-482-7171 at least 72 hours prior to the start of construction.
 6. The contractor shall at all times be aware of inconvenience caused to the abutting property owners and the general public. Where the contractor does not remedy undue inconveniences, the Meridian Charter Township, upon four hours notice, reserves the right to perform the work and deduct the cost therefrom from the money due the contractor.
 7. A Registered Land Surveyor provided by the contractor at the contractor's expense shall replace all property irons and monuments disturbed or destroyed by the contractor's operations.
 8. Contractor shall provide Owner and Township Engineer a copy of written permission to use private property for storage of equipment and materials or for his construction operations.
 9. Trench backfill under existing or proposed roadways, driveways, and parking areas, shall be sand or gravel, placed in 12" layers (maximum) and consolidated to 95% of maximum density as measured by modified proctor unless otherwise noted.
 10. Trees and shrubs are to be protected during construction and bored where necessary.
 11. Existing fences shall be removed and restored to their original condition or better where in conflict with construction.
 12. Driveways, culverts, ditches, drain tile, tile fields, drainage structures, etc., that are disturbed by the contractor's operations shall be immediately restored.
 13. All established lawn areas disturbed by the contractor's operations shall be reseeded with matching sod. All other areas shall be seeded and matched. Seeding and matching shall be in accordance with the General Specifications.
 14. All ditch slopes shall have established vegetation and be protected from erosion.
 15. All utility poles in close proximity to construction shall be supported in a manner satisfactory to the utility owner.
 16. Prior to acceptance of the public utility, one complete set of acceptable sealed-as-built mylars, minimum 3 mils thick, and one diskette (AutoCAD format) of the site plans shall be submitted to the Office of Engineering.
 17. On-site parking and sanitary facilities shall be provided for construction workers. The facilities shall be constructed and operated (with minimal impact to the surrounding area) to the satisfaction of the Township.

PATHWAY / SIDEWALK NOTES
 1. Sidewalk - 5" (minimum) wide concrete 4" thick, 6" thick through single family residential driveways, 7" thick through multi-family residential and commercial driveways on 3" compacted sand backfill. To maintain constant 1/2" 4" wide concrete sidewalks shall be replaced with new 4" wide concrete sidewalk when appropriate.
 2. Pathways (adjacent to roadways) - 7" (minimum) (if when next to a wall or other object) wide concrete, 4" thick, 6" thick through residential driveways, 7" thick through commercial driveways on 3" compacted sand backfill.
 3. Pathways (off-road) - 8" (minimum) wide concrete, 6" thick concrete on 3" compacted sand backfill or 8" (minimum) wide asphalt 3" thick (Bituminous Mixture 150M/T) (1 on 4" or 2 1/4" thick minimum 9" wide).
 4. Sidewalks and pathways shall generally be placed in 1' (one) foot from the ultimate right-of-way as identified on the "Street and Highway Plan". Contact the Department of Planning and Community Development for a copy of the plan.
 5. A boardwalk may be required to be installed instead of a standard concrete sidewalk/pathway if regulations do not allow their installation.
 6. Pathways and sidewalks shall be constructed so as to promote proper positive surface drainage. Where ever possible the sidewalk/pathway shall be constructed 6" higher than the curb.
 7. Retaining walls shall only be installed where all other efforts (offsite grading easements, tree relocation, etc.) to mitigate the need for wall have been evaluated for cost effectiveness and dismissed.
 8. Guards and handrails shall be installed where the slopes adjacent to the pathway/sidewalk cannot be constructed to 1" vertical for every 3" horizontal. The depth to the toe of the slope area will be considered when implementing this requirement.
 9. Pathways and sidewalks shall not connect to an existing pathway/sidewalk shall provide a gradual transition to existing ground. A "path ends" sign shall be posted at all pathway/sidewalk termini.
 10. Maximum slope of sidewalk is 5%. Cross slope is 2%.
 11. All existing bituminous and concrete shall be removed shall be sawcut.
 12. Expansion joint to be placed at 100' intervals.
 13. All lumber to be pressure treated (Smoose 3 or 3 equal) to 0.4 retention.

SANITARY SEWER NOTES
 1. All sewers to be placed in Class "B" bedding or better.
 2. Wyes, risers, and house leads are to be placed at location shown on the plans or as directed by the Engineer. All wyes are incidental.
 3. Each wye or house lead shall have a plug of the same type of joint as the house lead.
 4. House leads shall be a minimum of 9 ft. deep at the property line. Individual site topography may require a deviation of this minimum.
 5. Downspouts or other conduits carrying storm or ground water shall not be connected to the sanitary sewer.
 6. Whenever existing manholes or sewer pipes are to be tapped, holes are to be drilled at 4-inch center to center spacing around the periphery of the proposed opening to create a plane of weakness joint (or core saw the diameter) - a 12 inch thick collar is to encase the new pipe and opening.
 7. All sanitary sewer manholes shall be provided with watertight covers.
 8. All manhole covers shall bear the legend "Meridian Sanitary Sewer" with tree logo.
 9. All public sanitary sewer main lines shall be SDR 26, or AHS Truss Pipe. Clay pipe may be installed in locations approved by the Township Engineer.
 10. The PVC (SDR-26) pipe shall be installed with bell and gasket joints in accordance with ASTM F 677.
 11. Pipe installation shall be in accordance with ASTM D 2321. All pipe shall be marked to provide ASTM designation, SDR number, manufacturer's name, and pipe diameter.
 12. The contractor shall test the flexible pipe main for deflection by pulling a mandrel through the sewer after all backfill has been placed and compacted over the pipe. The maximum allowable deflection shall not exceed 5% of the pipe's inside diameter. The outside diameter of the test mandrel shall be equal to the inside diameter of the pipe less 5%. The initial test shall be performed at least 30 days after pipe installation. A second test shall be performed after 10 months of pipe installation but just before the line is intended use.
 13. Inspection and testing of the sanitary system shall also include video inspection by CCTV method of sanitary main, air testing of sanitary main, and vacuum testing of sanitary manholes. All inspections and testing shall be performed in the presence of Township inspectors.

WATER MAIN NOTES
 1. Hydrant elevations and gate well tap elevations shall be set to existing ground elevations unless otherwise directed by the Township Engineer.
 2. All water mains shall be constructed with 3 feet of cover below finish grade, unless otherwise indicated on the plans.
 3. Connection to the existing water main shall be made until after the successful completion of pressure and bacteriological tests. Pressure testing shall be performed in accordance with AWWA standard C-600. Disinfection and bacteriological testing shall be in accordance with the AWWA Standard C-651. Before the mains are chlorinated, they shall be thoroughly flushed. All mains shall be chlorinated for a period of twenty-four (24) hours. Chlorine shall be added in sufficient quantity to give a 50-ppm residual of free chlorine after a twenty-four (24) hour period. After completion of the chlorine procedure, the main shall be flushed. Then water samples shall be taken from the main for bacteriological tests. If the tests should result in unsafe conditions, the chlorinating shall be repeated by the contractor. Two consecutive passing samples taken at least 24 hours apart must be obtained before the main can be connected to the existing water system.
 4. All valves shall be counter-clock wise open.
 5. All fire hydrants shall be 5/8" 5-BR (code 54915) Traffic Type with breakaway flange or approved equal.
 6. Hydrants shall be painted OS&A red.
 7. Two brass wedges shall be installed at each joint on ductile iron pipe.
 8. Polyethylene encasement of sewer pipe will be required in all areas. The encasement shall be V-Bio® Enhanced Polyethylene Encasement, in accordance with ANSI/AWWA C105/A21.5, installed per the manufacturer's instructions.
 9. For existing lines: service taps, shut off valves, and service line extensions to the property shall be made by Township Department of Public Works personnel for connections 2' and smaller.
 10. Where water mains must dip to pass under a storm sewer or sanitary sewer, the sections which are deeper than normal shall be kept to a minimum length by the use of 45, 22 1/2 or 1 1/4 degree bends properly restrained.
 11. All manhole covers shall bear the legend "Meridian Water" with tree logo, where available.
 12. Lead content requirements for all pipes, piping fittings, plumbing fittings, and fixtures that are used for potable water shall comply with NSF/ANSI 372 Standard.
 13. All mechanical joints and fittings shall be restrained using MEGALOC® style restrainers, or approved equal. All exposed metal components of the restrained-joint system shall be treated with a corrosion resistant coating, including the collar, breakaway bolts, wedges, and connecting nuts and bolts.

EX. LEGEND

● = SET 1/2" BAR WITH CAP	⊕ = SANITARY MANHOLE
□ = FOUND IRON AS NOTED	⊖ = DRAINAGE MANHOLE
— = DISTANCE NOT TO SCALE	⊙ = ELECTRIC MANHOLE
— = FENCE	⊕ = TELEPHONE MANHOLE
— = ASPHALT	⊕ = CATCHBASIN
— = CONCRETE	⊕ = SANITARY CLEANOUT
— = GRAVEL	⊕ = VALVE
— = EXISTING SPOT ELEVATION	⊕ = UTILITY POLE
— = EXISTING CONTOUR ELEVATION	⊕ = LIGHT POLE
— = GAS LINE	⊕ = GUY POLE
— = UNDERGROUND TELEPHONE	⊕ = GUY WIRE
— = UNDERGROUND TELEVISION	⊕ = UTILITY PEDESTAL
— = UNDERGROUND ELECTRIC	⊕ = TRANSFORMER
— = PROPERTY LINE	⊕ = ELECTRIC METER
— = UTILITY EASEMENT	⊕ = GAS METER
— = CENTER LINE OF ROAD	⊕ = WATER METER
— = ROAD RIGHT OF WAY	⊕ = SOIL BORING
— = FIRE HYDRANT	⊕ = SIGN
— = WATER VALVE	⊕ = POST
— = THRUST BLOCK	
— = PROPOSED TOP OF CURB ELEV.	

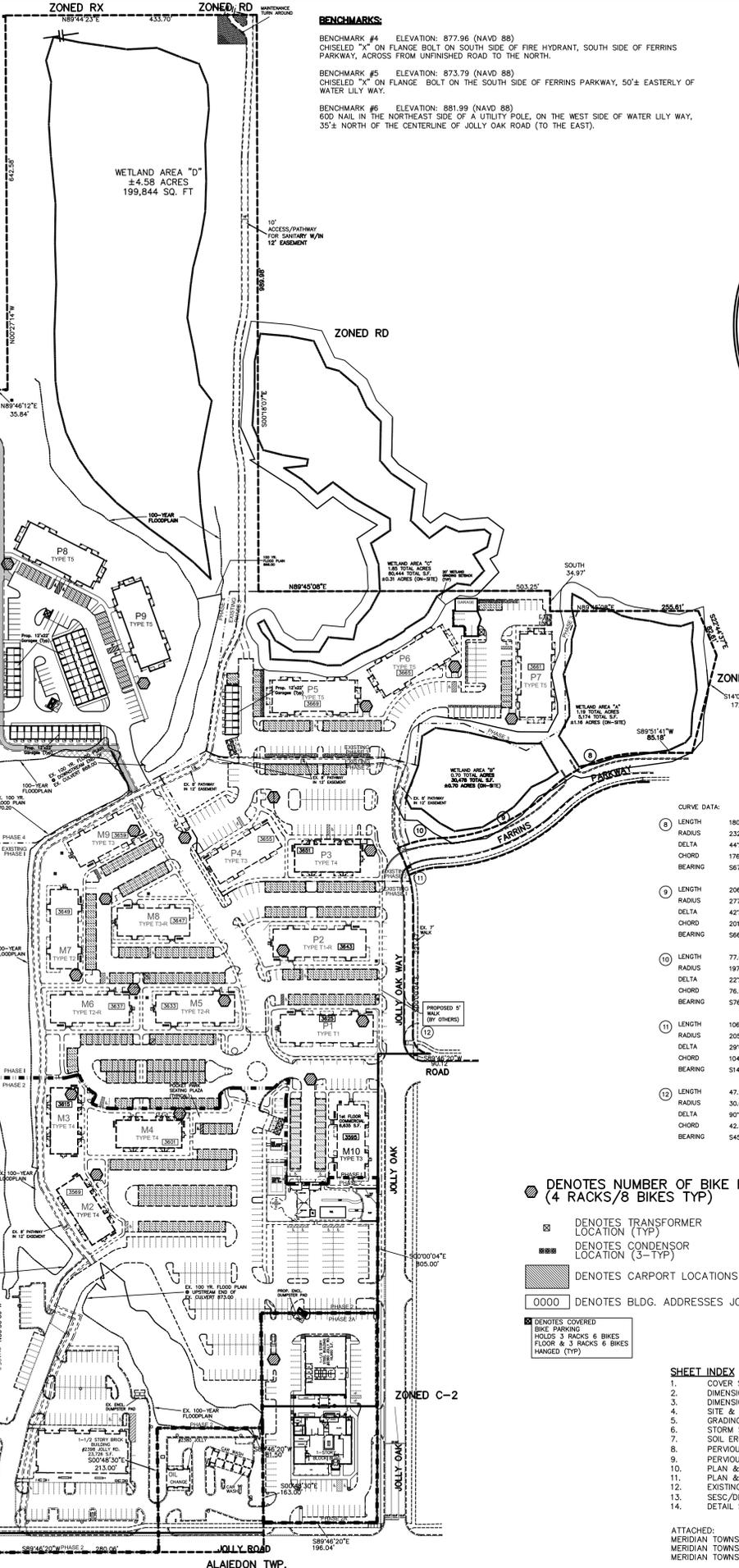
LEGEND

— = SANITARY MANHOLE	⊕ = SANITARY MANHOLE
— = DRAINAGE MANHOLE	⊖ = DRAINAGE MANHOLE
— = ELECTRIC MANHOLE	⊙ = ELECTRIC MANHOLE
— = TELEPHONE MANHOLE	⊕ = TELEPHONE MANHOLE
— = CATCHBASIN	⊕ = CATCHBASIN
— = SANITARY CLEANOUT	⊕ = SANITARY CLEANOUT
— = VALVE	⊕ = VALVE
— = UTILITY POLE	⊕ = UTILITY POLE
— = LIGHT POLE	⊕ = LIGHT POLE
— = GUY POLE	⊕ = GUY POLE
— = GUY WIRE	⊕ = GUY WIRE
— = UTILITY PEDESTAL	⊕ = UTILITY PEDESTAL
— = TRANSFORMER	⊕ = TRANSFORMER
— = ELECTRIC METER	⊕ = ELECTRIC METER
— = GAS METER	⊕ = GAS METER
— = WATER METER	⊕ = WATER METER
— = SOIL BORING	⊕ = SOIL BORING
— = SIGN	⊕ = SIGN
— = POST	⊕ = POST

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 16" VERTICAL SEPARATION FROM ALL SEWERS.

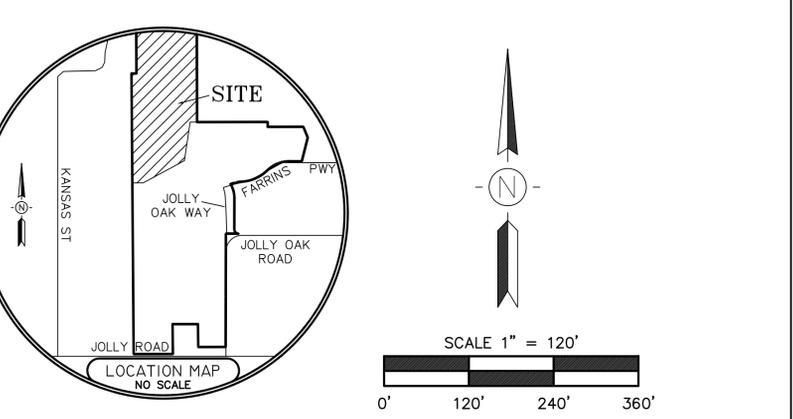
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CONSTRUCTION PLANS FOR: Elevation Ph 4

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



BUILDING DATA:

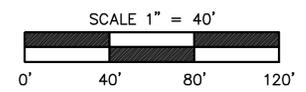
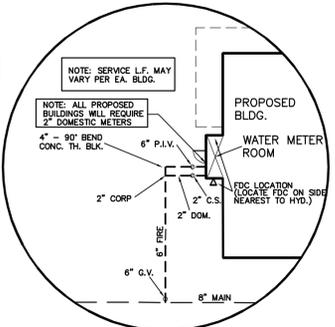
RESIDENTIAL	TYPE I = (P1, P2)	22 UNITS/BUILDING	(2) 1 BR, (20) 2 BR = 42 BEDS/BUILDING	24,044 G.S.F./BUILDING
	TYPE II (M5, M6, M7)	22 UNITS/BUILDING	(14) 1 BR, (8) 2 BR = 30 BEDS/BUILDING	21,488 G.S.F./BUILDING
	TYPE III = (M8, M9, M10, P4)	22 UNITS/BUILDING	(4) JR 1 BR, (10) 1 BR, (6) 2 BR, (2) 3 BR = 32 BEDS/BUILDING	19,904 G.S.F.
	TYPE IV = (M2, M3, M4, P3)	24 UNITS/BUILDING	(24) 1 BR = 24 BEDS/BUILDING	17,340 G.S.F./BUILDING
	TYPE V = (P5, P6, P7, P8, P9)	22 UNITS/BUILDING	(20) 2 BR, (2) 3 BR = 46 BEDS/BUILDING	17,340 G.S.F./BUILDING
	TYPE VI = (M1, M2, M3, M4, P3)	24 UNITS/BUILDING	(24) 1 BR = 24 BEDS/BUILDING	17,340 G.S.F./BUILDING
	TYPE VII = (M10, M11, M12, M13, M14, M15, M16, M17, M18, M19, M20, M21, M22, M23, M24, M25, M26, M27, M28, M29, M30, M31, M32, M33, M34, M35, M36, M37, M38, M39, M40, M41, M42, M43, M44, M45, M46, M47, M48, M49, M50, M51, M52, M53, M54, M55, M56, M57, M58, M59, M60, M61, M62, M63, M64, M65, M66, M67, M68, M69, M70, M71, M72, M73, M74, M75, M76, M77, M78, M79, M80, M81, M82, M83, M84, M85, M86, M87, M88, M89, M90, M91, M92, M93, M94, M95, M96, M97, M98, M99, M100, M101, M102, M103, M104, M105, M106, M107, M108, M109, M110, M111, M112, M113, M114, M115, M116, M117, M118, M119, M120, M121, M122, M123, M124, M125, M126, M127, M128, M129, M130, M131, M132, M133, M134, M135, M136, M137, M138, M139, M140, M141, M142, M143, M144, M145, M146, M147, M148, M149, M150, M151, M152, M153, M154, M155, M156, M157, M158, M159, M160, M161, M162, M163, M164, M165, M166, M167, M168, M169, M170, M171, M172, M173, M174, M175, M176, M177, M178, M179, M180, M181, M182, M183, M184, M185, M186, M187, M188, 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CONSTRUCTION PLANS FOR: Elevation Ph 4

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

WATER MAIN QUANTITIES		
ITEM	SIZE	AMOUNT
CL 54 W.M.	8"	1,191 LF
PC 909 PVC	8"	80 LF
CL 54 W.M.	6"	15 LF
FIRE LINE	6"	168 LF
DOMESTIC	2"	18 LF
HYDRANTS	6"	2
CURB STOPS	2"	2
CORPS	2"	2
6" CV	6"	5
TEE	8" x 6"	5
CONNECTIONS	8"	2
45" BEND	8"	3
22.5" BEND	8"	1
90" BEND	6"	2
45" BEND	6"	1

SANITARY QUANTITIES		
ITEM	SIZE	AMOUNT
MH'S	4' DIA	4
PVC SDR 26	8"	839 LF



NOTES PER MERIDIAN TOWNSHIP REQUIREMENTS:
ABANDON ALL EX. WATER LEADS NOT BEING USED.
ABANDON ALL EX. SANITARY SEWER LEADS NOT BEING USED.
ALL EX. HYDRANTS IN VICINITY OF PROJECT SHALL BE RETROFITTED WITH STORZ NOZZLES.

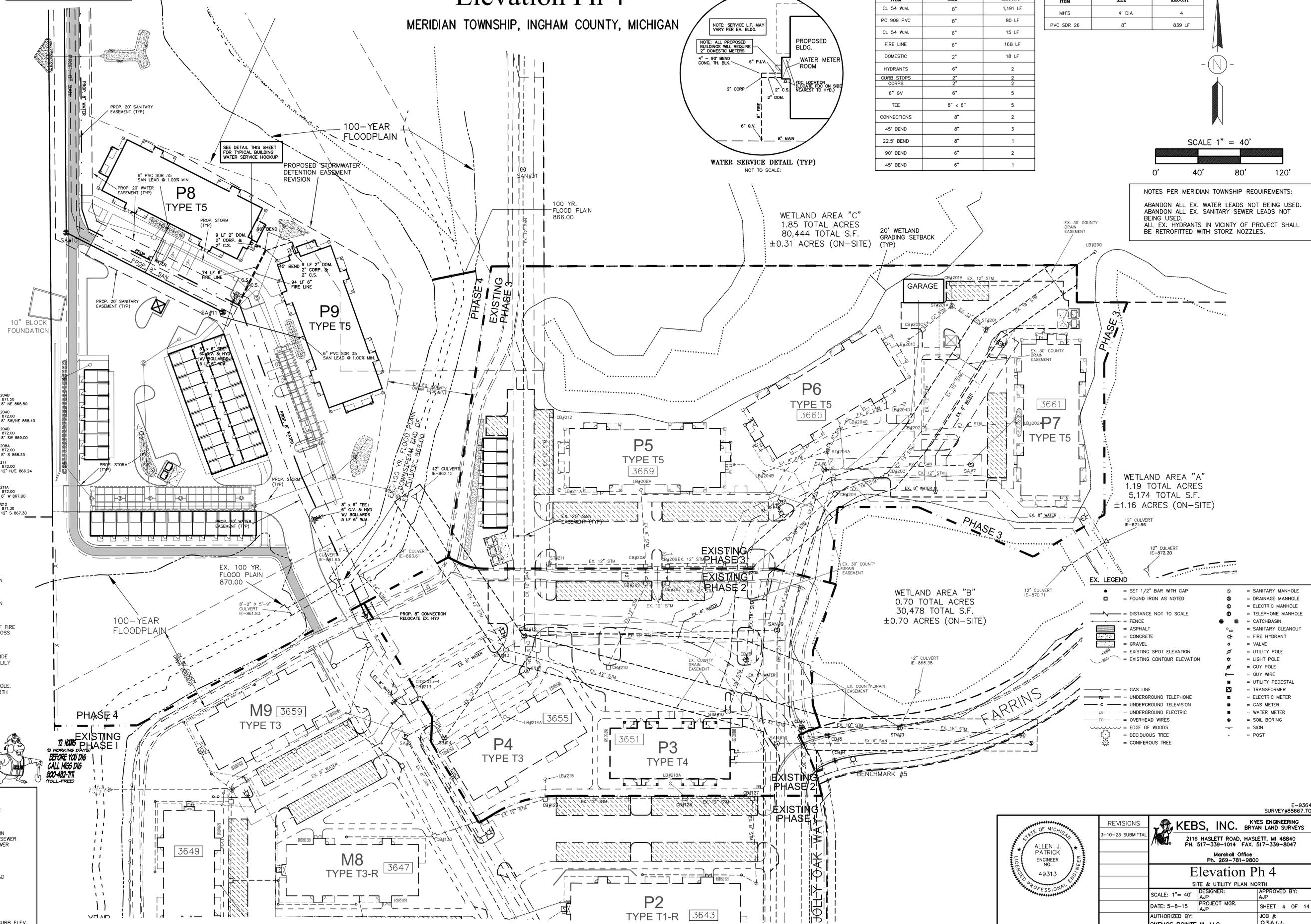
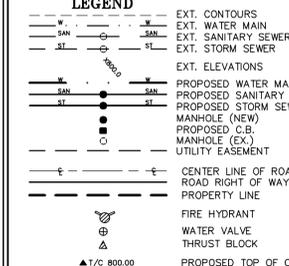
- EX. INVENTORY:**
- SANITARY MANHOLE #1
T/CAS 873.50
12" CONC. N - 861.54
12" CONC. SW - 861.77
 - CATCH BASIN #1
INLET - 875.49
 - CATCH BASIN #2
INLET - 875.59
 - STORM MANHOLE #3
T/C - 872.67
 - LB#128A
12" CONC. NE - 866.78
18" CONC. WEST - 864.89
12" CONC. NE - 866.78
18" CONC. EAST - 864.89
 - CATCH BASIN #4
INLET - 871.75
12" CONC. NORTH - 867.59
12" CONC. SOUTH - 867.75
 - CATCH BASIN #5
INLET - 871.33
12" CONC. SW - 867.31
12" CONC. SOUTH - 867.57
 - STORM MANHOLE #6
T/CAS 871.00
12" CONC. NW - 864.08
18" CONC. EAST - 864.16
36" CONC. SOUTH - 864.14
12" CONC. SE - 865.53
 - CATCH BASIN #9
(BEDRIVE)
INLET - 873.75
18" CONC. SW - 865.14
 - SANITARY MANHOLE #9
T/C - 872.15
12" CONC. WEST - 860.87
12" CONC. SOUTH - 861.00
12" CONC. EAST - 861.19
 - STORM MANHOLE #10
RM - 874.50
12" RCP NE - INACCESSIBLE
18" RCP NE - 863.93
42" RCP SE - 864.10
12" RCP SE - 861.19
42" RCP NW - 864.08
 - SANITARY MANHOLE #10
T/C - 872.50
12" RCP NORTH - 861.19
12" RCP NORTH - 861.19
8" CLAY EAST - 861.34
 - SANITARY MANHOLE #12
T/C - 873.75
12" CONC. NORTH - 860.28
12" CONC. EAST - 860.45
8" PVC SOUTH - 861.42
 - STORM MANHOLE #13
RM - 876.67
42" SC - 862.79
18" RCP SW - INACCESSIBLE
42" RCP NW - 862.77
 - CATCH BASIN #14
T/C - 873.00
12" CONC. NE - 864.17
12" CONC. WEST - 867.00
12" CONC. SOUTH - 862.10
 - SANITARY MANHOLE #15
T/C - 873.00
8" PVC NORTH - 861.83
8" PVC SOUTH - 862.10
 - SANITARY MANHOLE #16
T/C - 871.50
12" CONC. NORTH - 861.99
12" CONC. SOUTH - 862.05
 - CATCH BASIN #17
INLET - 874.10
8" TILE NW - 840.45
 - CATCH BASIN #20
INLET - 878.59
12" CONC. SOUTH - 873.84
18" CONC. WEST - 873.71
 - CATCH BASIN #21
INLET - 876.78
18" CONC. EAST - 870.90
8" PVC SE - 872.90
12" PVC WEST - 871.10
 - CATCH BASIN #22
INLET - 880.02
12" CONC. SE - 875.70
12" CONC. WEST - 875.77
 - CATCH BASIN #23
INLET - 880.16
12" CONC. EAST - 875.81
 - CATCH BASIN #29
INLET - 875.05
12" CONC. EAST - 869.35
12" CONC. NW - 869.20
 - CATCH BASIN #30
INLET - 870.06
12" CONC. NORTH - 867.31
24" CONC. NE - 867.31
12" CONC. EAST - 867.41
24" CONC. SOUTH - 867.42
 - SANITARY MANHOLE #31
T/C - 871.50
12" CONC. NORTH - 859.48
12" CONC. SOUTH - 859.52

- BENCHMARKS:**
- BENCHMARK #1 ELEVATION: 882.25 (NAVD 88)
I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #2 ELEVATION: 881.86 (NAVD 88)
I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #4 ELEVATION: 877.96 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRIS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.
 - BENCHMARK #5 ELEVATION: 873.79 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON THE SOUTH SIDE OF FERRIS PARKWAY, 50'± EASTERLY OF WATER LILY WAY.
 - BENCHMARK #6 ELEVATION: 881.99 (NAVD 88)
60D NAIL IN THE NORTHEAST SIDE OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35'± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).

NOTE: ALL PROPOSED SANITARY EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT

NOTE: ALL PROPOSED WATER MAIN EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT

NOTE: WATER SHALL HAVE 10" HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.



E-93644
SURVEY#88667.TOP

REVISIONS
3-10-23 SUBMITTAL

ALLEN J. PATRICK
ENGINEER
NO. 49313

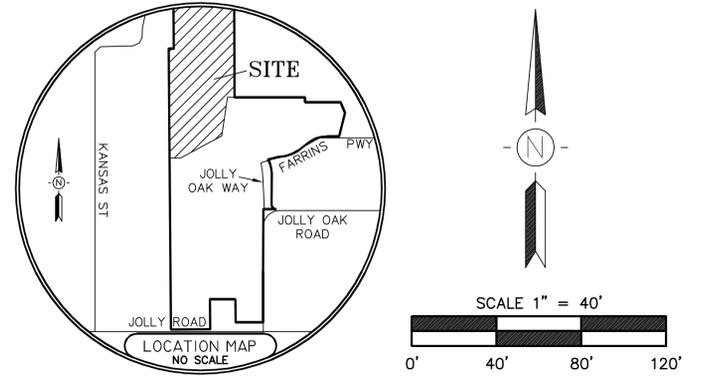
KEBS, INC. KYES ENGINEERING
BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

Elevation Ph 4
SITE & UTILITY PLAN NORTH

SCALE: 1" = 40' DESIGNER: AJP APPROVED BY: AJP
DATE: 5-8-15 PROJECT MGR. AJP SHEET 4 OF 14
AUTHORIZED BY: OKEMOS POINT III, LLC JOB #: 93644

CONSTRUCTION PLANS FOR: Elevation Ph 4

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



NOTE: SEE PROFILES FOR GRADING OF WATER, SANITARY, & PATHWAY EXTENSIONS IN KANSAS ST

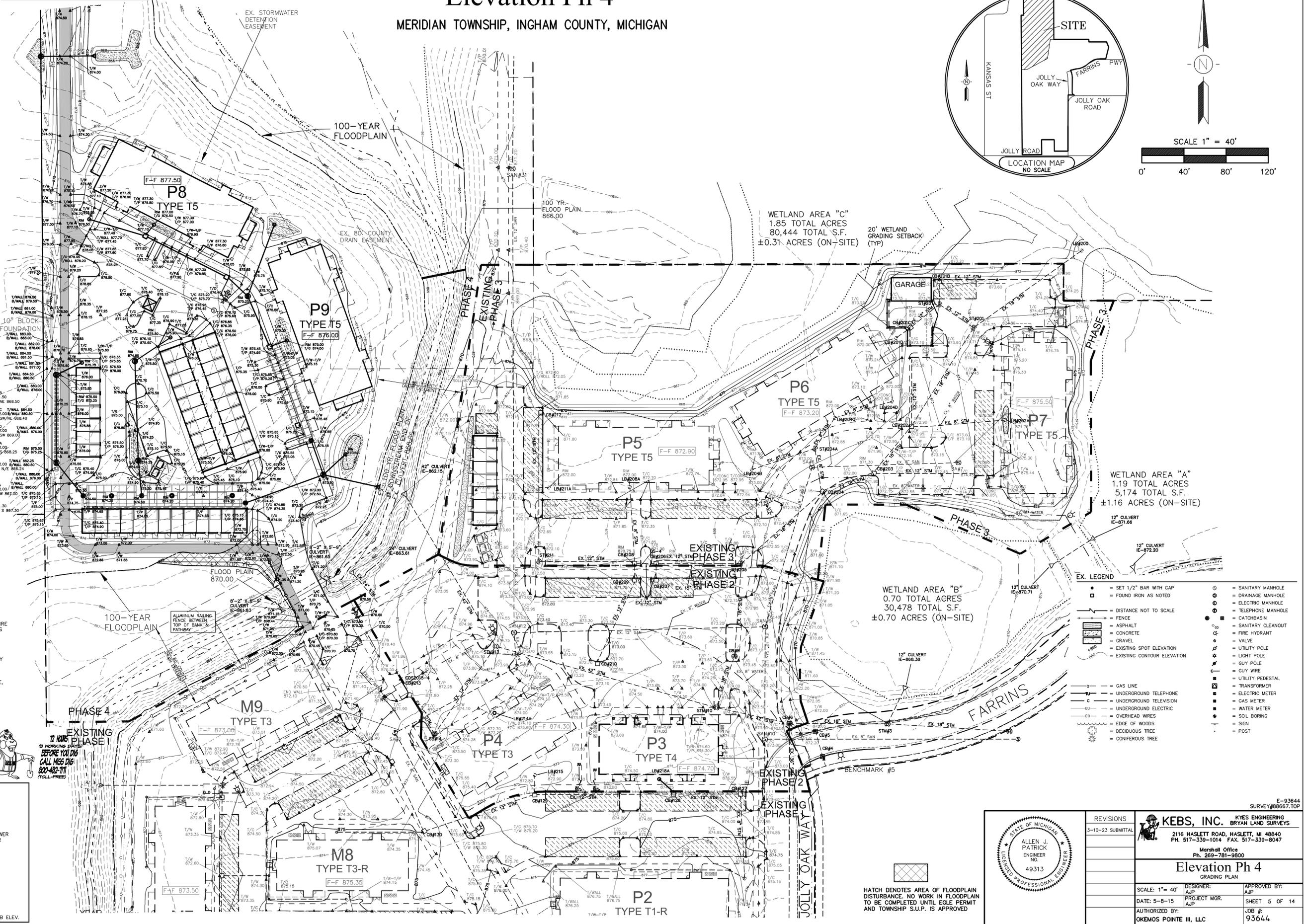
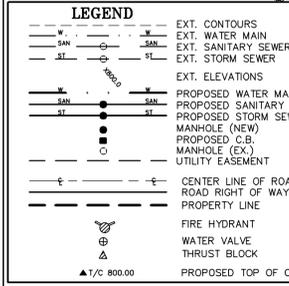
- EX. INVENTORY:**
- SANITARY MANHOLE#1
 - T/CAS 873.95
 - 12" CONC. N - 861.54
 - 8" CONC. SW - 861.77
 - CATCH BASIN #1
 - INLET - 875.49
 - CATCH BASIN #2
 - INLET - 875.98
 - STORM MANHOLE #3
 - TOC - 872.67
 - LB#28A
 - 12" CONC. NE - 866.78
 - 18" CONC. WEST - 864.89
 - 12" CONC. NE - 866.78
 - 18" CONC. EAST - 864.89
 - CATCH BASIN #4
 - INLET - 871.25
 - 12" CONC. NORTH - 867.59
 - 12" CONC. SOUTH - 867.75
 - CATCH BASIN #5
 - INLET - 871.33
 - 12" CONC. SW - 867.31
 - 12" CONC. SOUTH - 867.57
 - LB#200
 - STORM MANHOLE #6
 - TOC - 872.15
 - 42" CONC. NW - 864.08
 - 18" CONC. EAST - 864.19
 - 38" CONC. SOUTH - 864.14
 - 12" CONC. SE - 865.53
 - CATCH BASIN #9
 - (REDHIVE)
 - INLET - 873.75
 - 18" CONC. SW - 865.14
 - SANITARY MANHOLE #9
 - TOC - 872.15
 - 12" CONC. WEST - 860.87
 - 12" CONC. SOUTH - 861.00
 - 12" CONC. EAST - 862.30
 - STORM MANHOLE #10
 - RM - 874.50
 - 12" RCP NE - INACCESSIBLE
 - 18" RCP NE - 864.93
 - 42" RCP EAST - 864.10
 - 12" RCP SE - 861.19
 - 42" RCP NW - 864.08
 - ST#205
 - T/CAS 873.05
 - INLET - 875.00
 - 12" RCP NORTH - 861.19
 - 12" RCP NORTH - 861.19
 - 8" CLAY EAST - 861.34
 - SANITARY MANHOLE #12
 - TOC - 873.75
 - 12" CONC. NORTH - 860.28
 - 12" CONC. EAST - 860.45
 - 8" PVC SOUTH - 861.42
 - STORM MANHOLE #13
 - RM - 876.67
 - 18" RCP SW - INACCESSIBLE
 - 42" RCP NW - 862.77
 - CATCH BASIN #14
 - TOC - 873.00
 - 12" CONC. NE - 864.17
 - 12" NW 867.00
 - 12" NE 868.00
 - SANITARY MANHOLE #15
 - TOC - 873.00
 - 12" CONC. NE - 861.83
 - 8" PVC SOUTH - 862.10
 - SANITARY MANHOLE #16
 - TOC - 860.83
 - 12" CONC. NORTH - 861.99
 - 12" CONC. SOUTH - 862.05
 - CATCH BASIN #17
 - INLET - 874.10
 - 8" TILE 840.45
 - CATCH BASIN #20
 - INLET - 878.59
 - 12" CONC. SOUTH - 873.84
 - 18" CONC. WEST - 873.31
 - CATCH BASIN #21
 - INLET - 876.78
 - 18" CONC. EAST - 870.90
 - 8" PVC SE - 872.90
 - 8" PVC WEST - 871.10
 - CATCH BASIN #22
 - INLET - 880.02
 - 12" CONC. SE - 875.70
 - 12" CONC. WEST - 875.77
 - CATCH BASIN #23
 - INLET - 880.16
 - 12" CONC. EAST - 875.81
 - CATCH BASIN #29
 - INLET - 875.03
 - 12" CONC. EAST - 869.35
 - 12" CONC. NW - 869.20
 - 8" S/W 871.00
 - CATCH BASIN #30
 - INLET - 870.06
 - 12" CONC. NORTH - 867.31
 - 24" CONC. NE - 867.31
 - 12" CONC. EAST - 867.41
 - 24" CONC. SOUTH - 867.42
 - SANITARY MANHOLE #31
 - TOC - 871.33
 - 12" CONC. NORTH - 859.48
 - 12" CONC. SOUTH - 859.52

- BENCHMARKS:**
- BENCHMARK #1 ELEVATION: 882.25 (NAVD 88)
 - I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #2 ELEVATION: 881.86 (NAVD 88)
 - I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #4 ELEVATION: 877.96 (NAVD 88)
 - CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRIS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.
 - BENCHMARK #5 ELEVATION: 873.79 (NAVD 88)
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 - 60D NAIL IN THE NORTHEAST SIDE OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35'± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).

NOTE: ALL PROPOSED SANITARY EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT

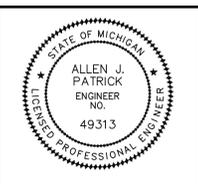
NOTE: ALL PROPOSED WATER MAIN EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.



- EX. LEGEND**
- SET 1/2" BAR WITH CAP
 - FOUND IRON AS NOTED
 - DISTANCE NOT TO SCALE
 - FENCE
 - ASPHALT
 - CONCRETE
 - GRAVEL
 - EXISTING SPOT ELEVATION
 - EXISTING CONTOUR ELEVATION
 - SANITARY MANHOLE
 - DRAINAGE MANHOLE
 - ELECTRIC MANHOLE
 - TELEPHONE MANHOLE
 - CATCHBASIN
 - SANITARY CLEANOUT
 - FIRE HYDRANT
 - VALVE
 - UTILITY POLE
 - LIGHT POLE
 - GUY POLE
 - GUY WIRE
 - UTILITY PEDESTAL
 - TRANSFORMER
 - ELECTRIC METER
 - GAS METER
 - WATER METER
 - SOIL BORING
 - SIGN
 - POST

HATCH DENOTES AREA OF FLOODPLAIN DISTURBANCE. NO WORK IN FLOODPLAIN TO BE COMPLETED UNTIL EGLE PERMIT AND TOWNSHIP S.U.P. IS APPROVED



REVISIONS 3-10-23 SUBMITTAL		KEBS, INC. KYES ENGINEERING BRYAN LAND SURVEYS 2116 HASLETT ROAD, HASLETT, MI 48840 PH. 517-339-1014 FAX. 517-339-8047 Marshall Office Ph. 269-781-9800	
Elevation Ph 4 GRADING PLAN		APPROVED BY: AJP SHEET 5 OF 14 JOB #: 93644	
SCALE: 1" = 40' DATE: 5-8-15 AUTHORIZED BY: OKEMOS POINTE III, LLC	DESIGNER: AJP PROJECT MGR. AJP	E-93644 SURVEY#88667.TOP	

CONSTRUCTION PLANS FOR: Elevation Ph 4

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

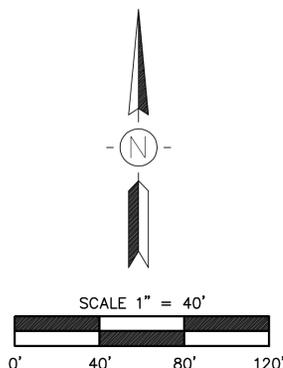
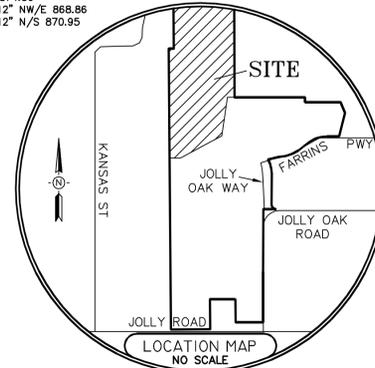
PROPOSED STORM INVENTORY:

- LB#401 RIM 871.00 T/G 870.50 I.E. 12" E 868.50
- CB#402 RIM 876.50 I.E. 12" NW/SE/NE 872.60
- LB#402A RIM 876.50 I.E. 12" SE 872.88
- LB#402B RIM 877.00 T/G 876.50 I.E. 12" SW 872.75
- CB#403 RIM 875.05 I.E. 12" NW/SE 871.05
- LB#404 RIM 875.25 I.E. 12" NW/SE/NE 870.91
- LB#404A RIM 874.00 T/G 873.50 I.E. 12" SW 871.50
- CB#405 RIM 874.80 I.E. 12" NE/SE/NE 869.25 I.E. 12" NE 871.41

- LB405A RIM 875.00 I.E. 12" SW 871.00
- CB#406 RIM 874.65 I.E. 12" NW/SE 869.30 I.E. 12" SE 831.37
- ST#406A RIM 875.25 I.E. 6" N 871.86 I.E. 6" SW 871.78 I.E. 6" S 868.36 I.E. 12" SE 868.36
- ST#407 RIM 873.00 I.E. 12" NW/SW/NE 867.36 I.E. 15" SE 867.36
- LB#407A RIM 870.50 T/G 870.00 I.E. 12" SW 867.50
- CB#408 RIM 874.85 I.E. 12" NE/S 870.85
- LB#408A RIM 875.50 I.E. 12" SW 871.50
- LB#409 RIM 874.25 T/G 873.75 I.E. 12" N/SE 869.75

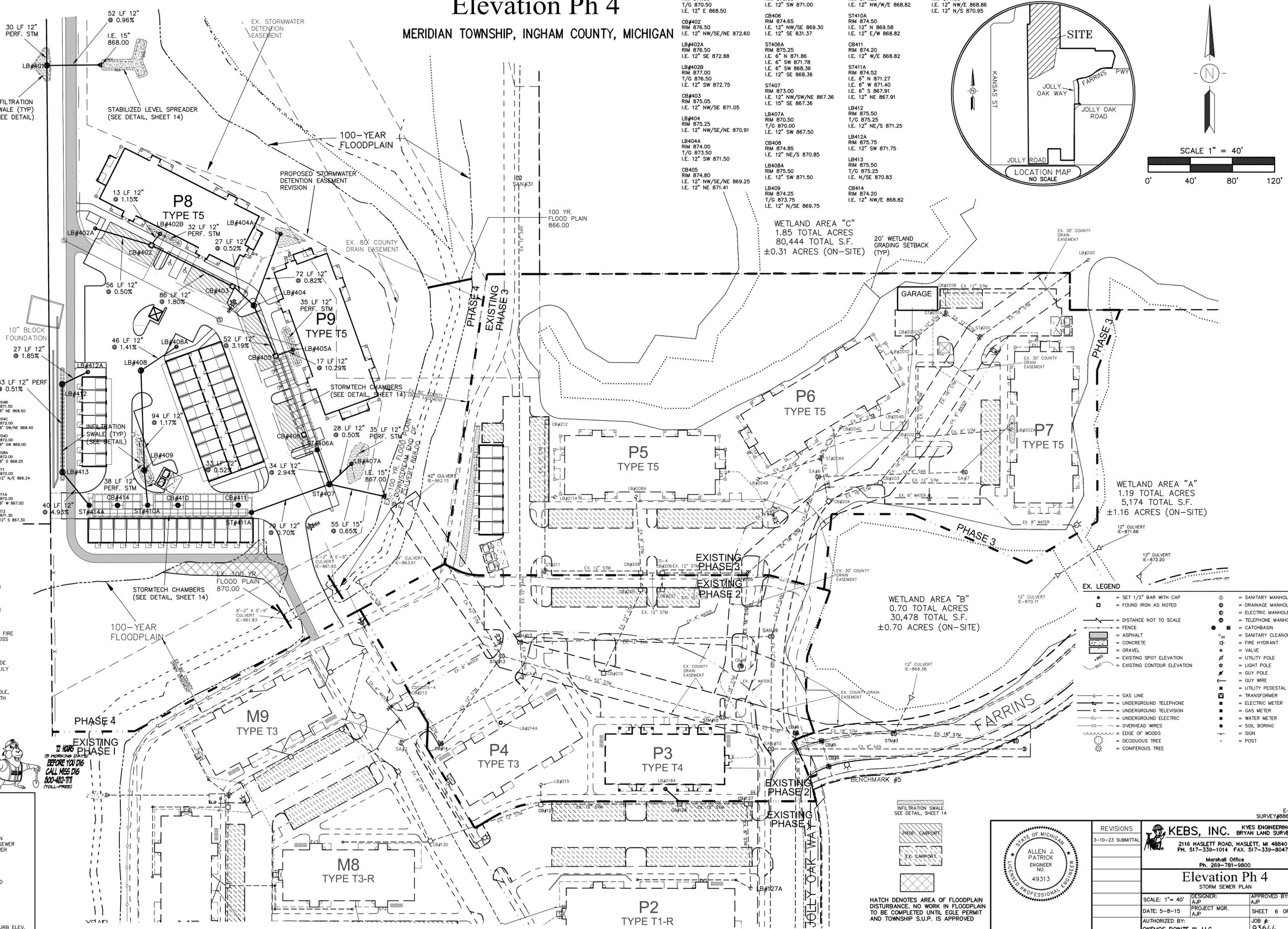
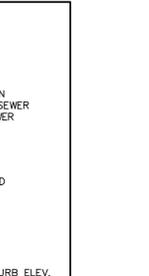
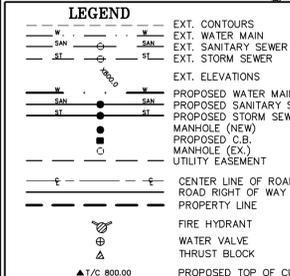
- CB#410 RIM 874.20 I.E. 12" NW/W/E 868.82
- ST#410A RIM 874.50 I.E. 12" N 869.58 I.E. 12" E/W 868.82
- CB#411 RIM 874.20 I.E. 12" W/E 868.82
- ST#411A RIM 874.52 I.E. 6" N 871.27 I.E. 6" W 871.40 I.E. 6" S 867.91 I.E. 12" NE 867.91
- LB#412 RIM 875.50 T/G 875.25 I.E. 12" NE/S 871.25
- LB#412A RIM 875.75 I.E. 12" SW 871.75
- LB#413 RIM 875.50 T/G 875.25 I.E. NW/SE 870.83
- CB#414 RIM 874.20 I.E. 12" NW/E 868.82

ST#414A RIM 874.50 I.E. 12" NW/E 868.86 I.E. 12" N/S 870.95



- EX. INVENTORY:**
- SANITARY MANHOLE#1 T/CAS 873.50 12" CONC. N - 861.54 8" CONC. SW - 861.77
 - CATCH BASIN #1 INLET - 875.49
 - CATCH BASIN #2 INLET - 873.50
 - STORM MANHOLE #3 TOC - 872.67
 - LB#28A T/CAS 874.00 I.E. 4" S 868.75 I.E. 4" N 869.25
 - CB#29 T/W 872.80 I.E. 12" N 867.97 I.E. 12" W 867.49 I.E. 8" N 868.50
 - CATCH BASIN #4 INLET - 871.75
 - CATCH BASIN #5 INLET - 871.30
 - STORM MANHOLE #6 TOC - 872.15
 - ST#203 RIM 873.85 I.E. 16" SW/NE 866.71 I.E. 12" NW 866.71
 - CB#202 RIM 872.40 I.E. 8" E 868.60 I.E. 16" NE/SW 866.28 I.E. 12" N 868.40
 - ST#205 RIM 873.30 I.E. 16" NE/SW 866.06 I.E. 12" N 867.30
 - CB#204 RIM 871.12 I.E. 12" RCP NE - INACCESSIBLE I.E. 8" N 865.48 I.E. 42" RCP EAST - 864.10 I.E. 12" RCP SE - 861.19 I.E. 42" RCP NW - 864.08
 - ST#205 T/CAS 872.05 I.E. 15" W 865.46 I.E. 16" NE 865.48 I.E. 16" S 865.48
 - ST#206 RIM 872.50 I.E. 8" N 865.38 I.E. 8" S 865.72 I.E. 12" S 866.75
 - ST#207 T/C 871.75 I.E. 12" N 865.87 I.E. 12" W 865.79
 - CB#208 T/C 871.25 I.E. 10" E 865.79 I.E. 12" S 865.79 I.E. 12" W 865.79
 - CB#209 T/C 871.75 I.E. 12" N 865.87 I.E. 12" W 865.79
 - CB#210 T/C 872.50 I.E. 12" NE 866.38 I.E. 12" S 866.75
 - CB#213 (CDS2015-4) T/C 871.80 I.E. 12" SE 867.30 I.E. 12" S 867.30
 - LB#213A T/CAS 872.50 I.E. 8" W 869.75 I.E. 8" N 874.10
 - LB#214 T/CAS 872.50 I.E. 8" S/NE 869.50
 - ST#201A (CDS2015-4) RIM 873.40 I.E. 12" SE 866.87 I.E. 12" N 868.15 I.E. 12" SW 868.15 I.E. 8" SW/NE 868.40
 - CB#201B RIM 872.70 I.E. 12" S 866.70
 - CB#201C RIM 872.30 I.E. 8" S 866.60 I.E. 8" S 866.35
 - LB#201D RIM 872.00 I.E. 8" NE 869.00
 - LB#202A RIM 872.00 I.E. 8" W 867.00
 - ST#204A (CDS2015-4) INLET - 870.06 12" CONC. NORTH - 867.31 24" CONC. NE - 867.31 12" CONC. EAST - 867.41 24" CONC. SOUTH - 867.42 I.E. 8" NE 868.00
 - SANITARY MANHOLE #31 TOC - 871.30 12" CONC. NORTH - 859.48 12" CONC. SOUTH - 859.52

- BENCHMARKS:**
- BENCHMARK #1 ELEVATION: 882.25 (NAVD 88) I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #2 ELEVATION: 881.86 (NAVD 88) I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #4 ELEVATION: 877.96 (NAVD 88) CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRINS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.
 - BENCHMARK #5 ELEVATION: 873.79 (NAVD 88) CHISELED "X" ON FLANGE BOLT ON THE SOUTH SIDE OF FERRINS PARKWAY, 50'± EASTERLY OF WATER LILY WAY.
 - BENCHMARK #6 ELEVATION: 881.99 (NAVD 88) 60D NAIL IN THE NORTHEAST SIDE OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35'± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).
- NOTES:**
- NOTE: ALL PROPOSED SANITARY EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT
 - NOTE: ALL PROPOSED WATER MAIN EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT
 - NOTE: WATER SHALL HAVE 10" HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.

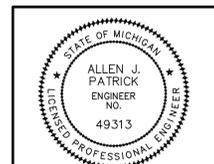


- EX. LEGEND**
- = SET 1/2" BAR WITH CAP
 - = FOUND IRON AS NOTED
 - = DISTANCE NOT TO SCALE
 - = FENCE
 - ▨ = ASPHALT
 - ▩ = CONCRETE
 - ▧ = GRAVEL
 - = EXISTING SPOT ELEVATION
 - = EXISTING CONTOUR ELEVATION
 - = SANITARY MANHOLE
 - = DRAINAGE MANHOLE
 - = ELECTRIC MANHOLE
 - = TELEPHONE MANHOLE
 - = CATCHBASIN
 - = SANITARY CLEANOUT
 - = FIRE HYDRANT
 - = VALVE
 - = UTILITY POLE
 - = LIGHT POLE
 - = GUY POLE
 - = GUY WIRE
 - = UTILITY PEDESTAL
 - = TRANSFORMER
 - = ELECTRIC METER
 - = GAS METER
 - = WATER METER
 - = SOIL BORING
 - = SIGN
 - = POST

WETLAND AREA "B"
0.70 TOTAL ACRES
30,478 TOTAL S.F.
±0.70 ACRES (ON-SITE)

WETLAND AREA "C"
1.85 TOTAL ACRES
80,444 TOTAL S.F.
±0.31 ACRES (ON-SITE)

WETLAND AREA "A"
1.19 TOTAL ACRES
5,174 TOTAL S.F.
±1.16 ACRES (ON-SITE)



E-93644 SURVEY#88667.TOP	
REVISIONS	3-10-23 SUBMITTAL
KEBS, INC. KYES ENGINEERING 2116 HASLETT ROAD, HASLETT, MI 48840 PH. 517-339-1014 FAX. 517-339-8047 Marshall Office Ph. 269-781-9800	
Elevation Ph 4 STORM SEWER PLAN	
SCALE: 1" = 40'	DESIGNER: AJP
DATE: 5-8-15	PROJECT MGR. AJP
AUTHORIZED BY: OKEMOS POINTE III, LLC	APPROVED BY: AJP
	SHEET 6 OF 14
	JOB #: 93644

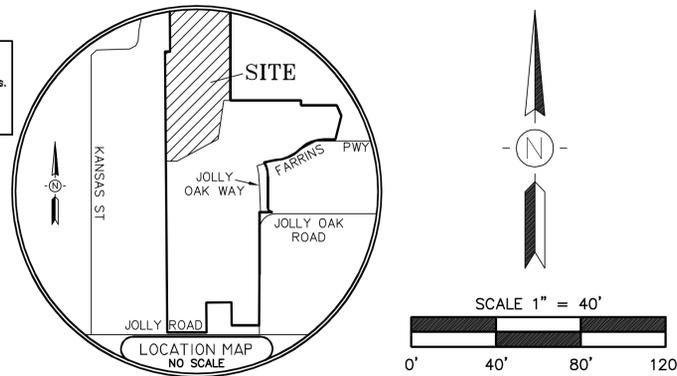
HATCH DENOTES AREA OF FLOODPLAIN DISTURBANCE. NO WORK IN FLOODPLAIN TO BE COMPLETED UNTIL EGLE PERMIT AND TOWNSHIP S.U.P. IS APPROVED

CONSTRUCTION PLANS FOR: Elevation Ph 4

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN

SS8 DENOTES ALL LAWNBASINS & CATCHBASINS (TYP)

SOIL TYPE:
 Sb Sebewa loam, 0 to 2 percent slopes
 AnA Aubbeenaubee-Capac sandy loams, 0 to 3 percent slopes.
 OsB Oshtemo sandy loam, 0 to 6 percent slopes
 MfB Metea loamy sand, 2 to 6 percent slopes
 Ovc Ovcosso-Marlette sandy loams, 6 to 12 percent slopes



LEGAL DESCRIPTION:
 Phase 4: A parcel of land in the Southwest 1/4 of Section 33, T4N, R1W, Meridian Township, Ingham County, Michigan, the boundary of said parcel described as: Commencing at the Southwest corner of said Section 33; thence N89°46'20"E along the South line of said Section 33 a distance of 858.00 feet; thence N00°36'06"W parallel with said West line of Section 33 a distance of 1217.85 feet to the point of beginning of this description; thence continuing N00°36'06"W parallel with said West line 778.71 feet; thence N89°46'12"E 35.84 feet; thence N00°27'14"W 642.58 feet to the East-West 1/4 line of said Section 33; thence N89°44'23"E along said East-West 1/4 line 433.70 feet to the West line of Fieldstone Village Condominium, Subdivision Plan No. 184, Ingham County Records; thence S00°18'07"E along said West line and the West line of Coyote Creek Condominium, Subdivision Plan No. 82, Ingham County Records, a distance of 989.98 feet; thence S89°45'08"W 49.74 feet; thence S08°19'09"W 276.80 feet; thence S61°38'16"W 333.53 feet; thence S89°23'54"W 78.22 feet to the point of beginning.

- EX. INVENTORY:**
- SANITARY MANHOLE #1
T/CAS 873.50
12" CONC. NW - 861.54
12" CONC. SW - 861.77
 - CATCH BASIN #1
INLET - 875.49
 - CATCH BASIN #2
INLET - 873.50
 - STORM MANHOLE #3
T/C - 872.67
 - 12" CONC. NW - 866.78
18" CONC. WEST - 864.89
12" CONC. NE - 866.78
18" CONC. EAST - 864.89
 - CATCH BASIN #4
INLET - 871.75
 - 12" CONC. NORTH - 867.59
12" CONC. SOUTH - 867.75
 - CATCH BASIN #5
INLET - 871.30
 - 12" CONC. SW - 867.31
12" CONC. SOUTH - 867.57
 - STORM MANHOLE #6
T/C - 872.15
 - 42" RCP NE - 864.08
18" RCP EAST - 864.16
38" CONC. SOUTH - 864.14
12" CONC. SE - 865.53
 - CATCH BASIN #8
(BEDVIEW)
T/CAS 873.50
18" CONC. SW - 865.14
 - SANITARY MANHOLE #9
T/C - 872.15
 - 12" CONC. WEST - 860.87
12" CONC. SOUTH - 861.00
12" CONC. NE - 862.50
 - STORM MANHOLE #10
RM - 874.50
 - 12" RCP NE - INACCESSIBLE
18" RCP SW - 864.10
42" RCP NW - 864.08
 - ST#205
T/CAS 872.05
12" RCP NORTH - 861.19
12" RCP NORTH - 861.19
8" CLAY EAST - 861.34
 - CATCH BASIN #12
T/C - 871.25
 - 12" CONC. NORTH - 860.28
12" CONC. EAST - 860.45
8" PVC SOUTH - 861.42
 - STORM MANHOLE #13
RM - 876.67
 - 42" RCP SW - 862.79
18" RCP SW - INACCESSIBLE
42" RCP NW - 862.77
 - CATCH BASIN #14
T/C - 873.00
 - 12" CONC. NE - 864.17
12" CONC. NW - 867.00
12" CONC. EAST - 875.81
 - SANITARY MANHOLE #15
T/C - 873.00
 - 8" PVC NORTH - 861.83
8" PVC SOUTH - 862.10
 - SANITARY MANHOLE #16
T/C - 860.83
 - 12" CONC. NORTH - 861.99
12" CONC. SOUTH - 862.95
 - CATCH BASIN #17
INLET - 874.10
 - 8" TILE NW - 840.45
 - CATCH BASIN #20
INLET - 873.84
 - 12" CONC. SOUTH - 873.84
18" CONC. WEST - 873.34
 - CATCH BASIN #21
INLET - 876.78
 - 12" CONC. EAST - 870.90
8" PVC SE - 872.90
12" PVC WEST - 871.10
 - CATCH BASIN #22
INLET - 872.70
 - 12" CONC. SE - 875.77
 - CATCH BASIN #23
INLET - 880.16
 - 12" CONC. EAST - 875.81
 - CATCH BASIN #29
INLET - 875.00
 - 12" CONC. EAST - 869.35
12" CONC. NW - 869.20
 - CATCH BASIN #30
INLET - 870.06
 - 12" CONC. NORTH - 867.31
24" CONC. NE - 867.31
12" CONC. EAST - 867.41
24" CONC. SOUTH - 867.42
 - SANITARY MANHOLE #31
T/C - 871.30
 - 12" CONC. NORTH - 859.48
12" CONC. SOUTH - 859.52

- BENCHMARKS:**
- BENCHMARK #1 ELEVATION: 882.25 (NAVD 88)
I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #2 ELEVATION: 881.86 (NAVD 88)
I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #4 ELEVATION: 877.96 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRINS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.
 - BENCHMARK #5 ELEVATION: 873.79 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON THE SOUTH SIDE OF FERRINS PARKWAY, 50' ± EASTERLY OF WATER LILY WAY.
 - BENCHMARK #6 ELEVATION: 881.99 (NAVD 88)
60D NAIL IN THE NORTHEAST SIDE OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35' ± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).

NOTE: ALL PROPOSED SANITARY EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT

NOTE: ALL PROPOSED WATER MAIN EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.



LEGEND

W	EXT. CONTOURS
SW	EXT. WATER MAIN
ST	EXT. SANITARY SEWER
ST	EXT. STORM SEWER
ST	EXT. ELEVATIONS
SW	PROPOSED WATER MAIN
ST	PROPOSED SANITARY SEWER
ST	PROPOSED STORM SEWER
○	PROPOSED C.B. MANHOLE (NEW)
○	PROPOSED C.B. MANHOLE (EX.)
○	UTILITY EASEMENT
—	CENTER LINE OF ROAD
—	ROAD RIGHT OF WAY
—	PROPERTY LINE
⊕	FIRE HYDRANT
⊕	WATER VALVE
⊕	THRUST BLOCK
▲	T/C 800.00
—	PROPOSED TOP OF CURB ELEV.

S-B-S-C KEYING SYSTEM

KEY	BEST MANAGEMENT PRACTICES	SYMBOL	WHERE USED
E8	PERMANENT SEEDING		Stabilization method utilized on sites where earth change has been completed (final grading attained).
E9	MULCH BLANKET		On exposed slopes, newly seeded areas, new ditch bottoms, or areas subject to erosion.
E12	RPRAP		Use along shorelines, waterways, or where concentrated flows occur. Slows velocity, reduces sediment load, and reduces erosion.
S51	SILT FENCE		Use adjacent to critical areas, to prevent sediment laden sheet flow from entering these areas.
S53	STABILIZED CONSTRUCTION ACCESS		Used at every point where construction traffic enters or leaves a construction site.
S58	INLET PROTECTION FABRIC DROP		Use at stormwater inlets, especially at construction sites.

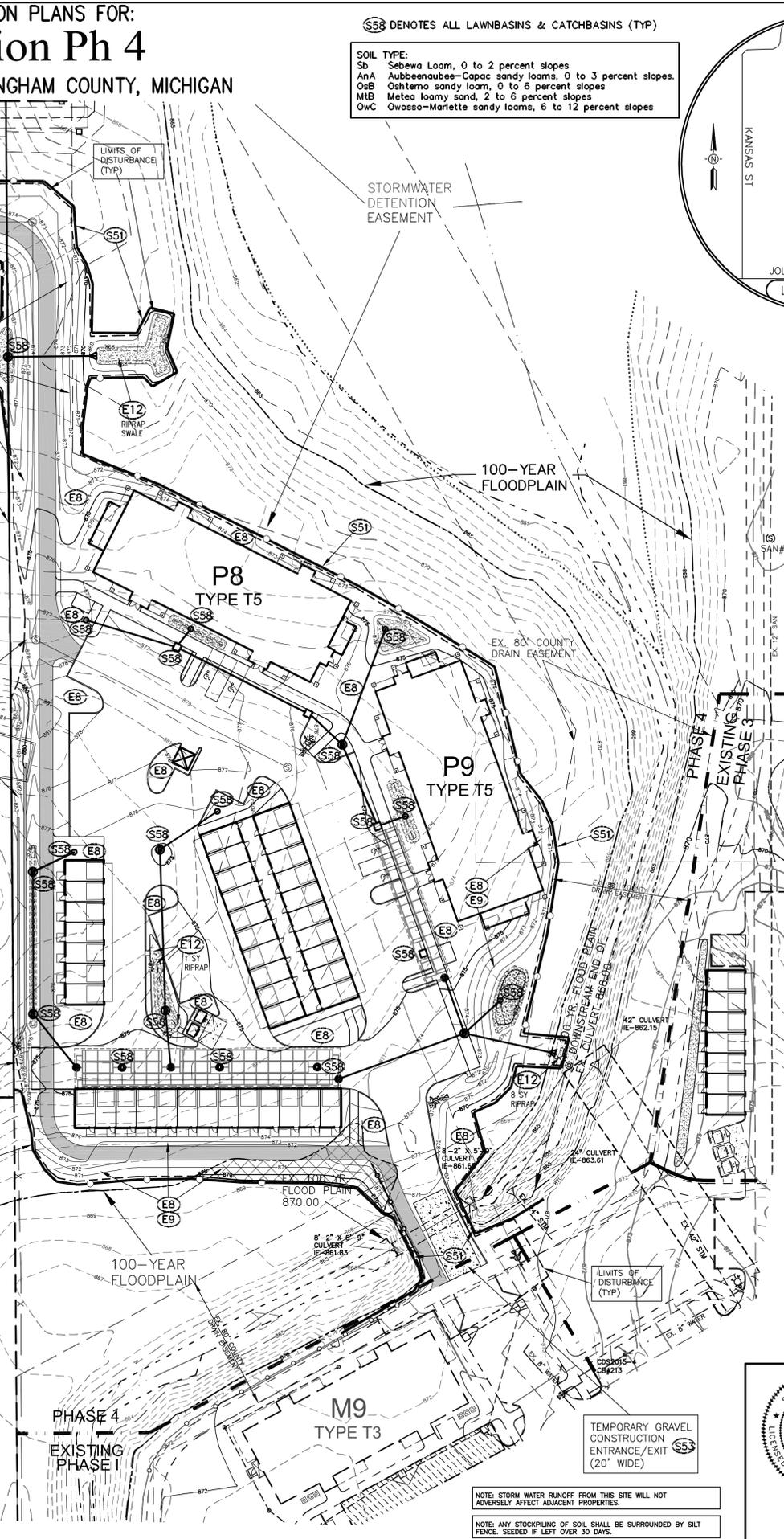
CONSTRUCTION SCHEDULE & SEQUENCING:

PLACE AND MAINTAIN TEMPORARY EROSION CONTROLS	2023											
	JANUARY	FEBRUARY	MARCH	APRIL	MAY	JUNE	JULY	AUGUST	SEPTEMBER	OCTOBER	NOVEMBER	DECEMBER
TOPSOIL STRIPPING & STOCKPILING												
ON-SITE UTILITIES CONSTRUCTION												
SITE GRADING & EARTHWORK												
PARKING LOT CONSTRUCTION												
TOPSOIL SPREADING												
PERMANENT SEEDING												
FINAL INSPECTIONS & REMOVE TEMPORARY EROSION CONTROLS												

AREA DISTURBED = 3.15 ACRES

—○— SILT FENCE (TYP.)

--- LIMITS OF EARTH DISTURBANCE (TYP.)



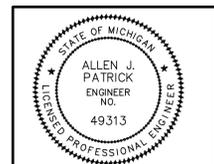
- SOIL EROSION CONTROL NOTES:**
- ALL SOIL EROSION CONTROL MEASURES SHALL BE CONSTRUCTED AND MAINTAINED IN ACCORDANCE WITH MERIDIAN TOWNSHIP PUBLIC WORKS AND ENGINEERING REQUIREMENTS AND PROJECT SPECIFICATIONS.
 - ANY EROSION OR SEDIMENT FROM WORK ON THIS SITE SHALL BE CONTAINED ON THE SITE AND NOT BE ALLOWED TO COLLECT ON ANY OFF-SITE AREAS, OR IN WATERWAYS. WATERWAYS INCLUDE BOTH NATURAL AND MANMADE OPEN DITCHES, STREAMS, STORM DRAINS, LAKES AND PONDS.
 - ALL CONSTRUCTION TRAFFIC SHALL USE THE CLEAN STONE EXIT. SEE DETAIL SHEET FOR DETAIL.
 - DUST CONTROL WILL BE EXERCISED AT ALL TIMES WITHIN THE PROJECT BY THE CONTRACTORS. SPRINKLING TANK TRUCKS SHALL BE AVAILABLE AT ALL TIMES TO BE USED ON HAUL ROUTES OR OTHER PLACES WHERE DUST BECOMES A PROBLEM.
 - SEDIMENT @ C.B.'s SHALL BE REMOVED AFTER EVERY STORM. SEEDING OF EXPOSED AREAS SHALL BE COMPLETED WITHIN 5 DAYS OF FINAL GRADING.
 - ALL DISTURBED AREAS WILL RECEIVE PERMANENT EROSION CONTROL WITHIN 5 DAYS OF FINAL GRADING. AREAS NOT STABILIZED SHALL BE DIVERTED TOWARD TEMPORARY SEDIMENT BASINS.
 - ANY CONSTRUCTION ACCESS ROAD WILL BE PROTECTED WITH PULVERIZED ASPHALT, CRUSHED STONE OR CRUSHED CONCRETE AGGREGATE SIZE 2"-3".
 - WEATHER AND UNFORESEEN DELAYS MAY RESULT IN EXTENSION OF CONSTRUCTION SCHEDULE.
 - SITE DEVELOPMENT CONTRACTOR SHALL INSPECT SOIL EROSION CONTROL MEASURES ON A DAILY BASIS, MORE OFTEN IF NECESSARY. ANY NEEDED REPAIRS SHALL BE PROMPTLY MADE.
 - SITE DEVELOPMENT CONTRACTOR SHALL MEET WITH SOIL EROSION ENFORCEMENT OFFICER PRIOR TO START OF
 - ALL TEMPORARY SEDIMENT CONTROL MEASURES ARE TO BE INSTALLED PRIOR TO EARTH DISTURBANCE ACTIVITY. CHECK DAILY FOR EFFECTIVENESS AND REPAIR AS NEEDED. A MERIDIAN TOWNSHIP INSPECTOR IS TO VERIFY PROPER INSTALLATION OF APPROVED SECS MEASURES PRIOR TO COMMENCEMENT OF EARTH DISTURBANCE ON SITE.
 - ROLLED EROSION CONTROL MATTING SHALL BE INSTALLED AS THE MULCH.

- SEQUENCE OF CONSTRUCTION**
- INSTALL ALL TEMPORARY SILT FENCE PER PLAN AND AS SHOWN ON DETAIL.
 - CONSTRUCT THE TEMPORARY GRAVEL CONSTRUCTION ENTRANCE/EXIT AT DRAIN CROSSING AT NW CORNER OF PHASE 2
 - INSTALL INLET PROTECTION FABRIC DROPS BETWEEN THE FRAME AND COVER OF ALL EXISTING YARD BASINS OR INLETS WHICH MAY BE SUSCEPTIBLE TO SEDIMENT EROSION FROM THE PROPOSED CONSTRUCTION AS SHOWN IN THESE PLANS.
 - WHILE MAINTAINING A VEGETATIVE BUFFER WHENEVER POSSIBLE STRIP AND STOCKPILE TOPSOIL ABOVE AREAS OF PROPOSED EXCAVATION OR GRADING FOR LATER USE ON SITE PLACE STOCKPILED TOPSOIL IN AREAS WHICH ARE NEITHER SUBJECT TO HIGH RUNOFF NOR ALONG STEEP SLOPES SEED AND MULCH STOCKPILES IMMEDIATELY TO PREVENT WIND BLOWN SEDIMENT POLLUTION AND EXCESSIVE DUST.
 - EXCAVATE FOR PROPOSED PARKING LOT AND UTILITY CONSTRUCTION AS NECESSARY. DO NOT EXPOSE AREAS FAR IN ADVANCE OF THE PROPOSED CONSTRUCTION FOR THAT AREA. ROUGHEN AND SCARIFY EXPOSED SURFACES TO REDUCE RUNOFF VELOCITY AND SEDIMENTATION. MAINTAIN VEGETATION WHENEVER POSSIBLE TO PROVIDE A NATURAL BUFFER.
 - AFTER COMPLETION OF THE PROPOSED UTILITIES, INSTALL INLET PROTECTION FABRIC DROPS IN ALL INLETS. PLACE INLET PROTECTION FENCE AROUND ALL INLETS.
 - INSTALL TEMPORARY STONE FILTER BERMS PERPENDICULAR TO EXPOSED STEEP SLOPES AS NECESSARY ALONG THE PROPOSED STREETS TO REDUCE RUNOFF VELOCITY AND SEDIMENTATION.
 - TOPSOIL, SEED, APS SILT STOP, FERTILIZE AND MULCH ALL EXPOSED AREAS AS SOON AS FEASIBLE TO PROTECT AND RESTORE PERMANENT VEGETATION, ESPECIALLY BERMS/SLOPES.
 - WATER EXPOSED GROUND REGULARLY TO CONTROL AIRBORNE PARTICULATE MATTER.
 - THE SITE WILL BE PERIODICALLY INSPECTED BY MERIDIAN TOWNSHIP PUBLIC WORKS AND ENGINEERING. THE CONTRACTOR SHALL BECOME FAMILIAR WITH THE RULES AND REGULATIONS OF THAT OFFICE.
 - THE CONTRACTOR SHALL REMOVE ALL TEMPORARY SOIL EROSION AND SEDIMENTATION CONTROL MEASURES AFTER PERMANENT MEASURES ARE IN PLACE AND THE AREA IS STABILIZED.

STREET SWEEPING NOTES:
 ADJACENT STREETS SHALL BE KEPT CLEAN AND FREE OF TRACKED SEDIMENT. A STREET SWEEPER OR A BOBCAT WITH A BROOM ATTACHMENT SHOULD BE KEPT ON SITE TO DEAL WITH ANY OFF-SITE TRACKING AS IT OCCURS.

ADD ADVANCED INLET PROTECTION TO ALL CATCHBASINS & LAWNBASINS.

HATCH DENOTES AREA OF FLOODPLAIN DISTURBANCE. NO WORK IN FLOODPLAIN TO BE COMPLETED UNTIL EGLE PERMIT AND TOWNSHIP S.U.P. IS APPROVED



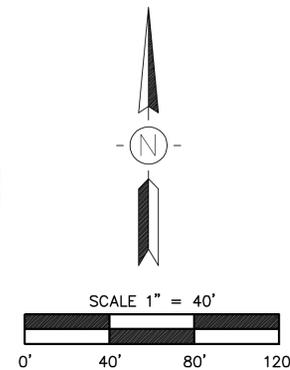
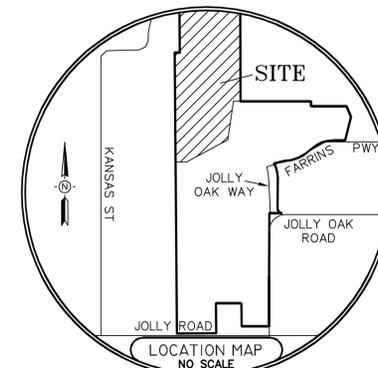
REVISIONS: 3-10-23 SUBMITTAL		E-93644 SURVEY#88667.TOP	
KEBS, INC. KYES ENGINEERING 2116 HASLETT ROAD, HASLETT, MI 48840 PH. 517-339-1014 FAX. 517-339-8047 Marshall Office Ph. 269-781-9800		APPROVED BY: A.J.P. SHEET 7 OF 14	
SCALE: 1" = 40' DATE: 5-8-15 AUTHORIZED BY: OKEMOS POINTE III, LLC		DESIGNER: A.J.P. PROJECT MGR. A.J.P. JOB #: 93644	

NOTE: STORM WATER RUNOFF FROM THIS SITE WILL NOT ADVERSELY AFFECT ADJACENT PROPERTIES.

NOTE: ANY STOCKPILING OF SOIL SHALL BE SURROUNDED BY SILT FENCE, SEEDED IF LEFT OVER 30 DAYS.

CONSTRUCTION PLANS FOR: Elevation Ph 4

MERIDIAN TOWNSHIP, INGHAM COUNTY, MICHIGAN



234,341 S.F.
(DETENTION AREA)

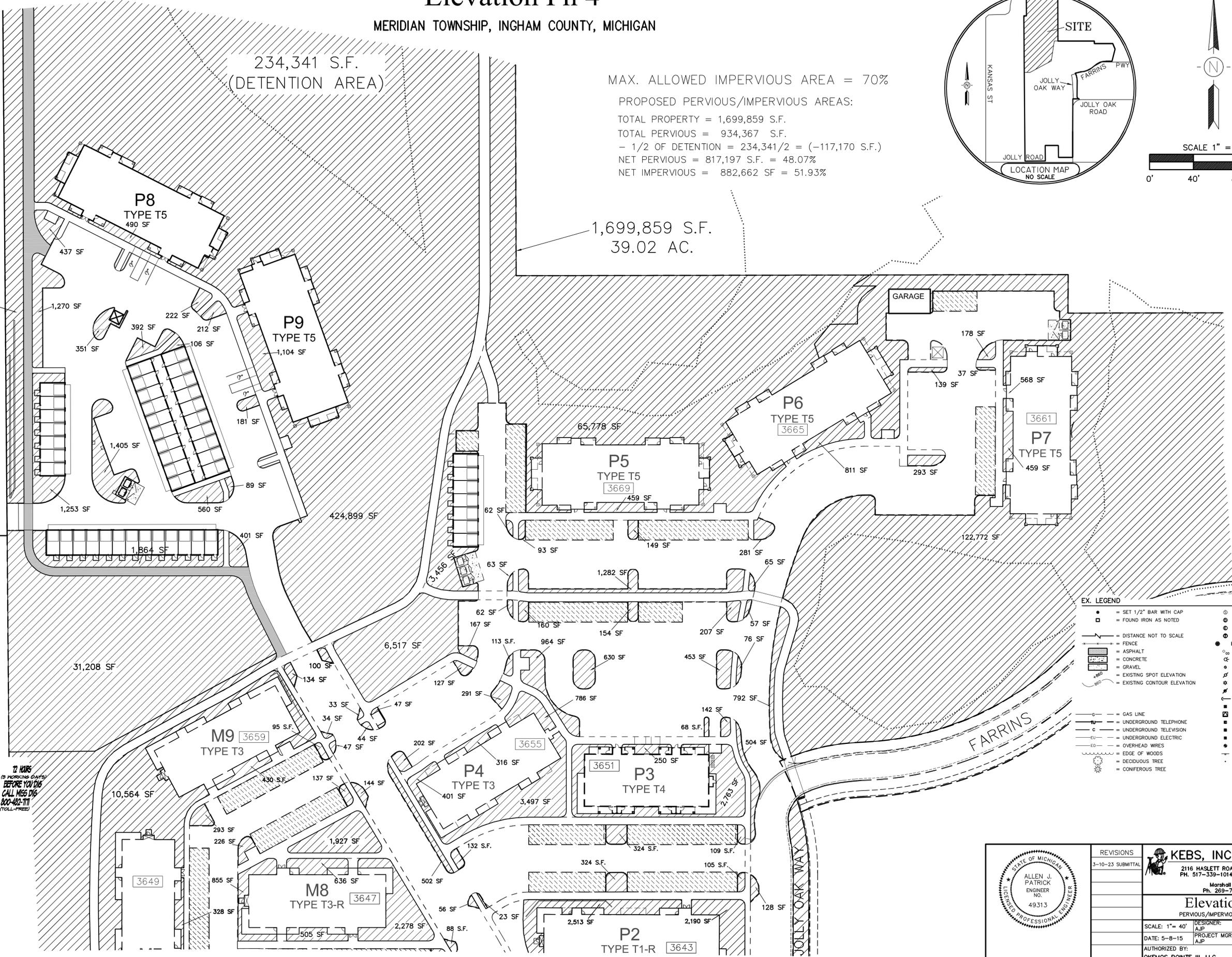
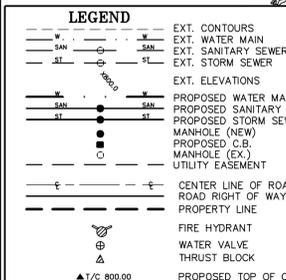
MAX. ALLOWED IMPERVIOUS AREA = 70%
PROPOSED PERVIOUS/IMPERVIOUS AREAS:
TOTAL PROPERTY = 1,699,859 S.F.
TOTAL PERVIOUS = 934,367 S.F.
- 1/2 OF DETENTION = 234,341/2 = (-117,170 S.F.)
NET PERVIOUS = 817,197 S.F. = 48.07%
NET IMPERVIOUS = 882,662 SF = 51.93%

1,699,859 S.F.
39.02 AC.

- EX. INVENTORY:**
- SANITARY MANHOLE #1
T/CAS 873.50
12" CONC. N - 861.54
6" CONC. SW - 861.77
 - CATCH BASIN #1
INLET - 875.49
 - CATCH BASIN #2
INLET - 873.50
 - STORM MANHOLE #3
TOC - 872.67
 - CS#128
T/W 873.50
INLET - 873.50
 - CS#129
T/W 872.80
INLET - 871.75
 - CATCH BASIN #4
INLET - 871.75
 - CATCH BASIN #5
INLET - 871.30
 - STORM MANHOLE #6
TOC - 872.15
 - CATCH BASIN #7
(BEDVIEW)
INLET - 873.75
 - SANITARY MANHOLE #8
TOC - 872.15
 - STORM MANHOLE #9
RM - 871.30
 - SANITARY MANHOLE #10
TOC - 872.50
 - SANITARY MANHOLE #11
TOC - 872.50
 - SANITARY MANHOLE #12
TOC - 873.75
 - STORM MANHOLE #13
TOC - 872.50
 - CATCH BASIN #14
TOC - 873.00
 - SANITARY MANHOLE #15
TOC - 873.00
 - SANITARY MANHOLE #16
TOC - 873.00
 - CATCH BASIN #17
INLET - 874.10
 - CATCH BASIN #18
INLET - 878.50
 - CATCH BASIN #19
INLET - 876.78
 - CATCH BASIN #20
INLET - 878.50
 - CATCH BASIN #21
INLET - 876.78
 - CATCH BASIN #22
INLET - 880.00
 - CATCH BASIN #23
INLET - 880.16
 - CATCH BASIN #24
INLET - 875.00
 - SANITARY MANHOLE #31
TOC - 871.50
- EX. STORM (PHASE 1, 2, & 3)**
- CS#127
T/W 873.25
 - CS#128
T/W 873.50
 - CS#129
T/W 872.80
 - CS#130
T/W 872.45
 - CS#131
T/W 872.45
 - CS#132
T/W 872.45
 - CS#133
T/W 872.45
 - CS#134
T/W 872.45
 - CS#135
T/W 872.45
 - CS#136
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 - CS#137
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 - CS#198
T/W 872.45
 - CS#199
T/W 872.45
 - CS#200
T/W 872.45

- BENCHMARKS:**
- BENCHMARK #1 ELEVATION: 882.25 (NAVD 88)
I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #2 ELEVATION: 881.86 (NAVD 88)
I HAVE NO IDEA - OFFSITE WITH NO DESCRIPTION IN FIELD NOTES.
 - BENCHMARK #4 ELEVATION: 877.96 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRINS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.
 - BENCHMARK #5 ELEVATION: 873.79 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON THE SOUTH SIDE OF FERRINS PARKWAY, 50'± EASTERLY OF WATER LILY WAY.
 - BENCHMARK #6 ELEVATION: 881.99 (NAVD 88)
60D NAIL IN THE NORTHEAST SIDE OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35'± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).

- NOTE: ALL PROPOSED SANITARY EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT**
- NOTE: ALL PROPOSED WATER MAIN EXCEPT FOR LEADS SHALL HAVE A 20' EASEMENT**
- NOTE: WATER SHALL HAVE 10" HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.**



- EX. LEGEND**
- = SET 1/2" BAR WITH CAP
 - = FOUND IRON AS NOTED
 - = DISTANCE NOT TO SCALE
 - - - = FENCE
 - ▨ = ASPHALT
 - ▩ = CONCRETE
 - ▧ = GRAVEL
 - = EXISTING SPOT ELEVATION
 - = EXISTING CONTOUR ELEVATION
 - = SANITARY MANHOLE
 - = DRAINAGE MANHOLE
 - = ELECTRIC MANHOLE
 - = TELEPHONE MANHOLE
 - = CATCHBASIN
 - = SANITARY CLEANOUT
 - = FIRE HYDRANT
 - = VALVE
 - = UTILITY POLE
 - = LIGHT POLE
 - = GUY POLE
 - = GUY WIRE
 - = UTILITY PEDESTAL
 - = TRANSFORMER
 - = ELECTRIC METER
 - = GAS METER
 - = WATER METER
 - = SOIL BORING
 - = SIGN
 - = POST

E-93644
SURVEY#88667.TOP

REVISIONS
3-10-23 SUBMITTAL

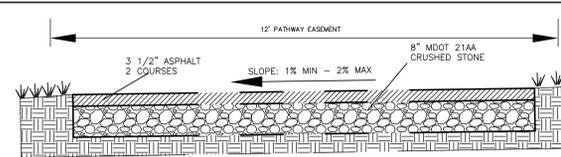
KEBS, INC. KYES ENGINEERING
BRYAN LAND SURVEYS
2116 HASLETT ROAD, HASLETT, MI 48840
PH. 517-339-1014 FAX. 517-339-8047
Marshall Office
Ph. 269-781-9800

Elevation Ph 4
PERVIOUS/IMPERVIOUS PLAN NORTH

SCALE: 1" = 40' DESIGNER: APPROVED BY:
AJP AJP
DATE: 5-8-15 PROJECT MGR. APPROVED BY:
AJP AJP SHEET 8 OF 14
AUTHORIZED BY: JOB #:
OKEMOS POINTE III, LLC 93644

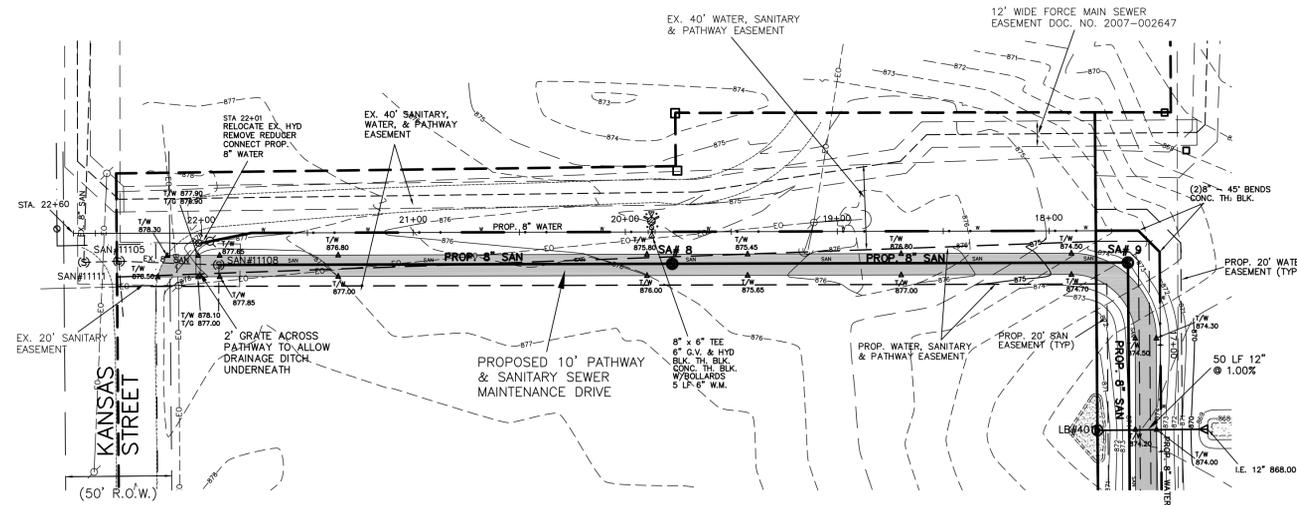
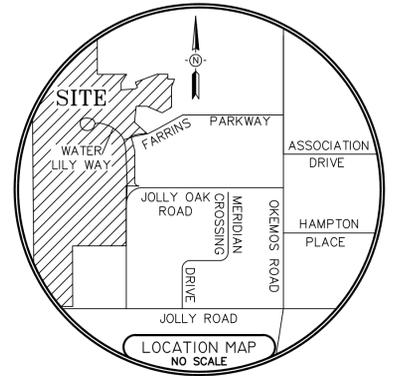
ALLEN J. PATRICK
ENGINEER
NO. 49313

PATHWAY & MAINTENANCE DRIVE TO BE WITHIN 12' WIDE PATHWAY EASEMENT

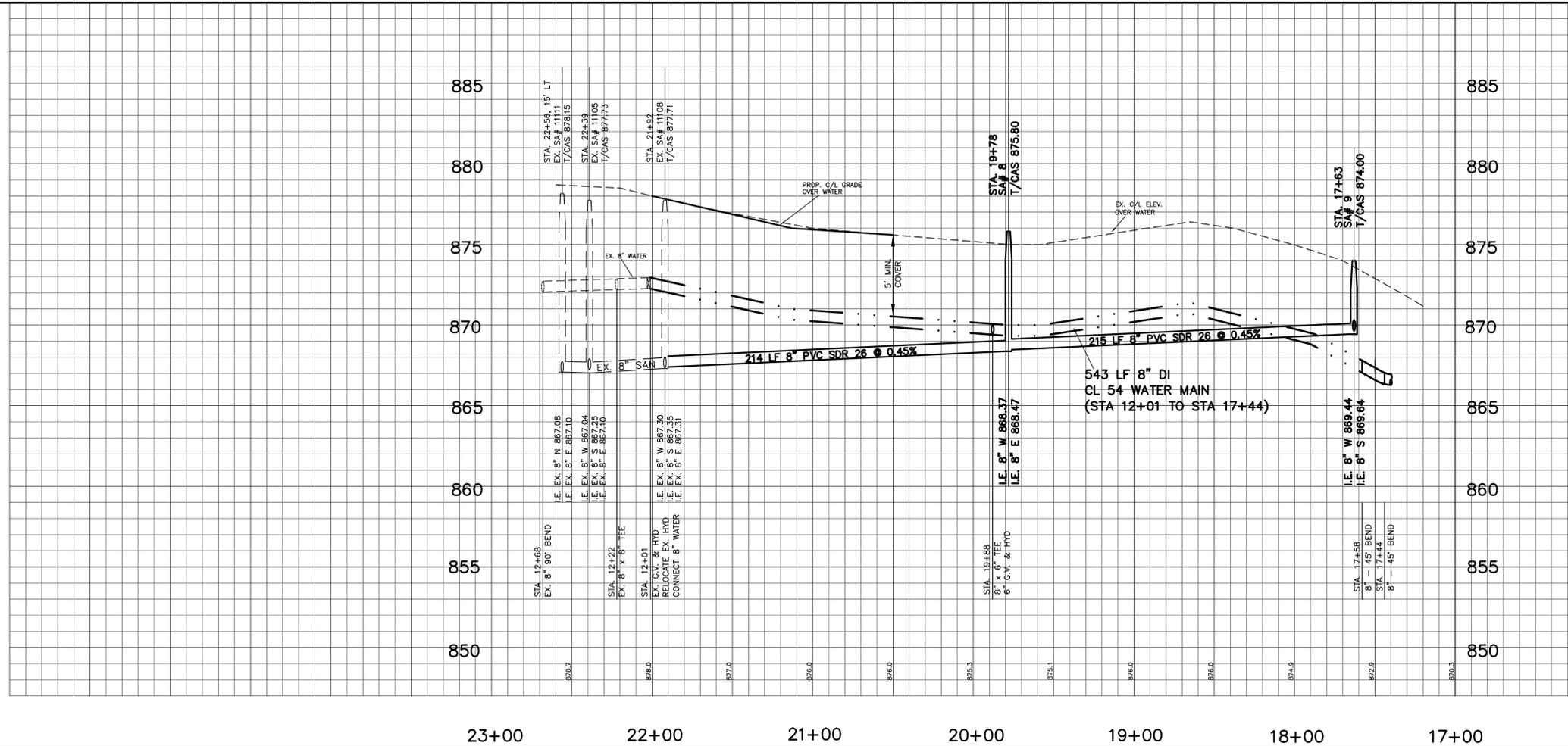


8' PATHWAY AND 10' PAVED PATHWAY/SANITARY SEWER MAINTENANCE DRIVE DETAIL
NOT TO SCALE

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.



PROP. STORM INVENTORY
LB#401
RIM 871.00
T/G 870.50
I.E. 12" E 868.50



BENCHMARKS

BENCHMARK #4 ELEVATION: 877.86 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRIS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.

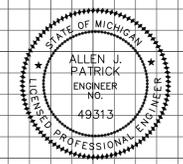
BENCHMARK #5 ELEVATION: 873.79 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON THE SOUTH SIDE OF FERRIS PARKWAY, 50± EASTERLY OF WATER LILY WAY.

BENCHMARK #6 ELEVATION: 881.99 (NAVD 88)
600 MAIL IN THE NORTHEAST CORNER OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).



LEGEND

---	EXT. CONTOURS
---	EXT. WATER MAIN
---	EXT. SANITARY SEWER
---	EXT. STORM SEWER
---	EXT. ELEVATIONS
---	PROPOSED WATER MAIN
---	PROPOSED SANITARY SEWER
---	PROPOSED STORM SEWER
---	MANHOLE (NEW)
---	PROPOSED C.B. MANHOLE (EX.)
---	UTILITY EASEMENT
---	CENTER LINE OF ROAD
---	ROAD RIGHT OF WAY
---	PROPERTY LINE
---	FIRE HYDRANT
---	WATER VALVE
---	THRUST BLOCK
---	PROPOSED TOP OF CURB ELEV.



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PH: (517) 290-4650

CONTRACTOR

Meridian Charter Township
ingham county, michigan

UTILITIES

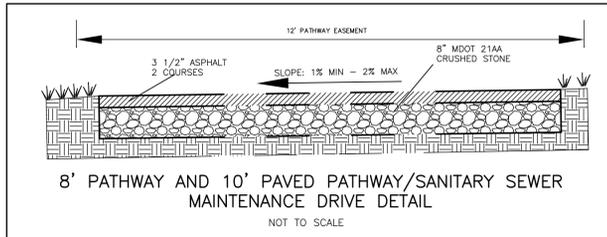
Elevation Ph 4

PLAN & PROFILE
MERIDIAN TOWNSHIP

DESIGNER: AJP CHECKED BY: AJP

REVISIONS:		
DATE:	BY:	COMMENTS:
3-10-23	AJP	SUBMITTAL
SCALE:	SHEET:	93644
1" = 40' HORIZ.	10 OF 14	FILE NAME
1" = 4' VERT.		

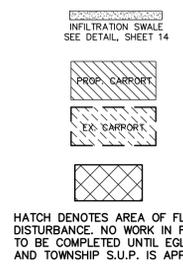
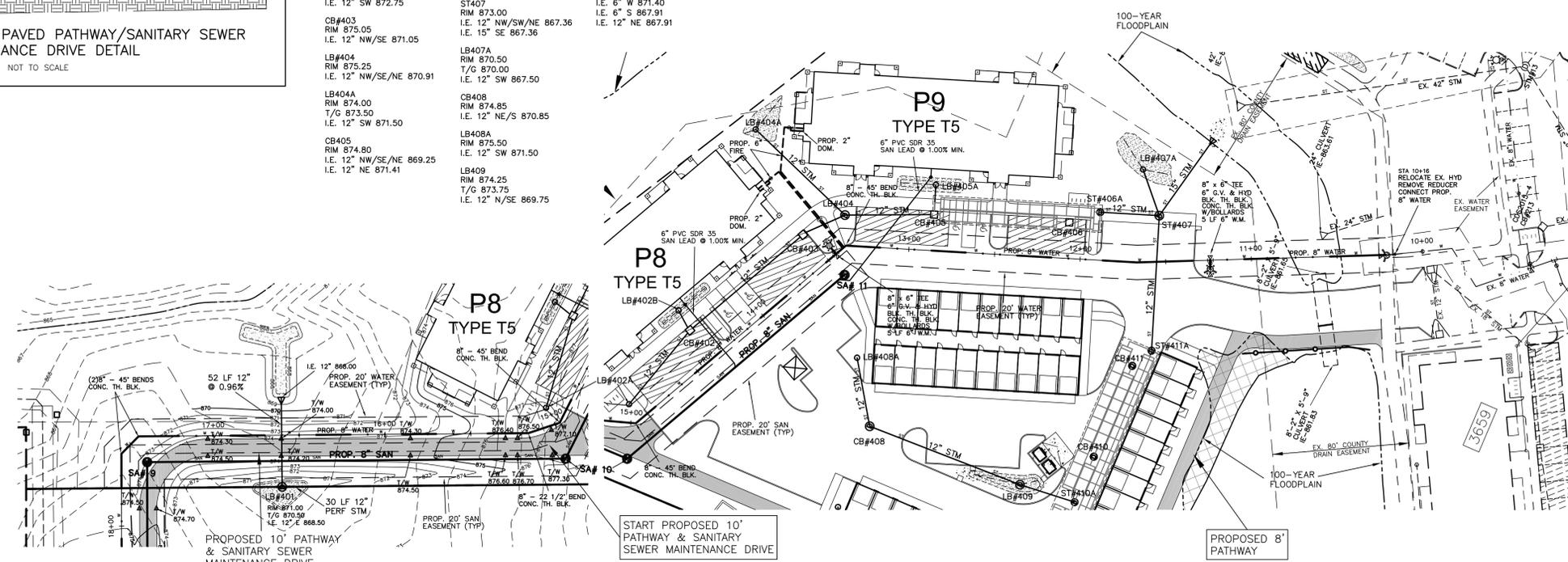
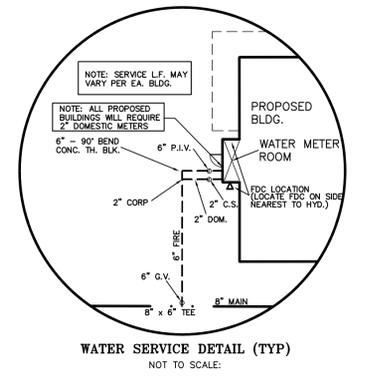
PATHWAY & MAINTENANCE DRIVE TO BE WITHIN 12' WIDE PATHWAY EASEMENT



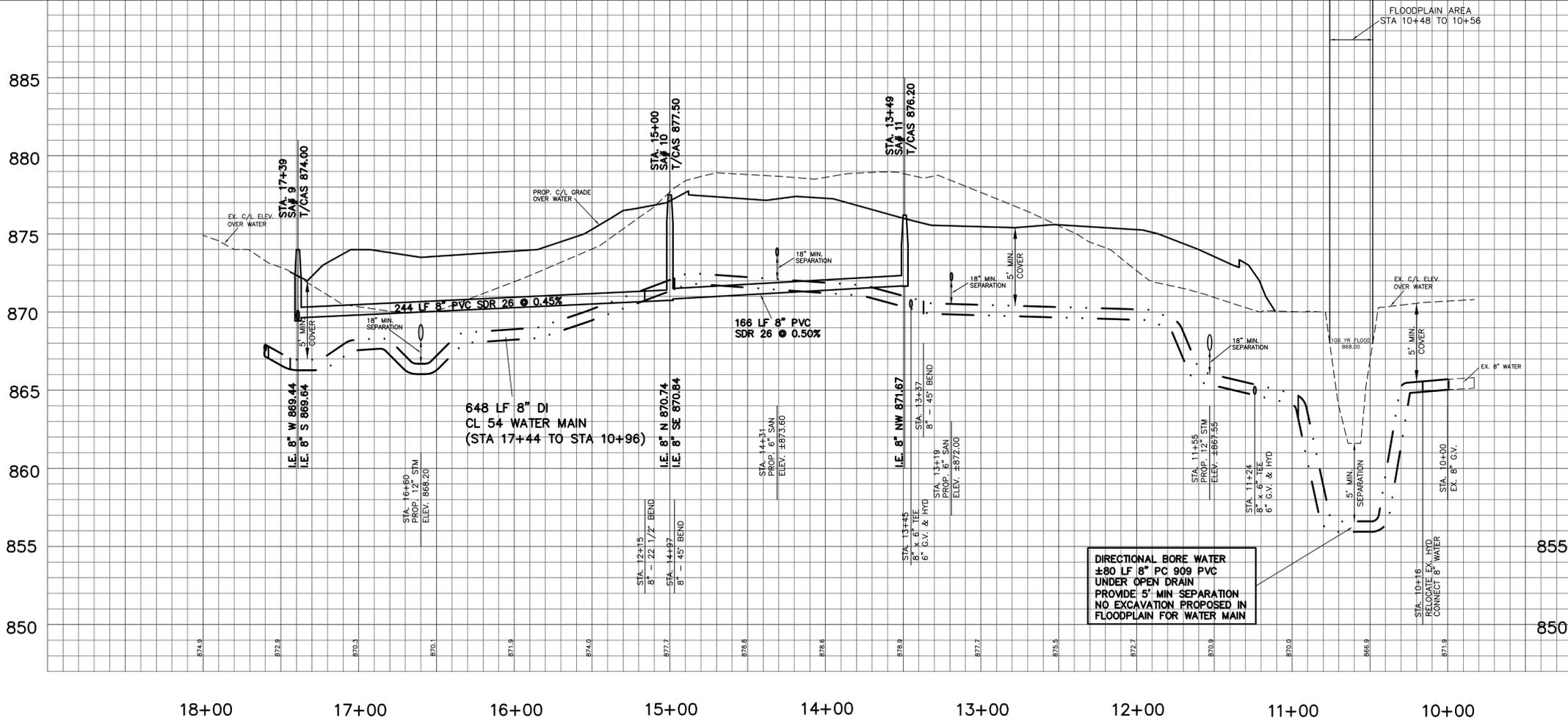
PROP. STORM SEWER INVENTORY

LB#401 RIM 871.00 T/G 870.50 I.E. 12" E 868.50	LB405A RIM 875.00 I.E. 12" SW 871.00	CB410 RIM 874.20 I.E. 12" NW/W/E 868.82
CB#402 RIM 876.50 I.E. 12" NW/SE/NE 872.60	CB406 RIM 874.65 I.E. 12" NW/SE 869.30 I.E. 12" SE 831.37	ST410A RIM 874.50 I.E. 12" N 869.58 I.E. 12" E/W 868.82
LB#402A RIM 876.50 I.E. 12" SE 872.88	ST406A RIM 875.25 I.E. 6" N 871.88 I.E. 6" SW 871.78 I.E. 6" SW 868.36	CB411 RIM 874.20 I.E. 12" W/E 868.82
LB#402B RIM 877.00 T/G 876.50 I.E. 12" SW 872.75	ST407 RIM 873.00 I.E. 12" NW/SW/NE 867.36 I.E. 15" SE 867.36	ST411A RIM 874.52 I.E. 6" N 871.27 I.E. 6" W 871.40 I.E. 6" S 867.91 I.E. 12" NE 867.91
CB#403 RIM 875.05 I.E. 12" NW/SE 871.05	LB407A RIM 870.50 T/G 870.00 I.E. 12" SW 867.50	
LB#404 RIM 875.25 I.E. 12" NW/SE/NE 870.91	CB408 RIM 874.85 I.E. 12" NE/S 870.85	
LB#404A RIM 874.00 T/G 873.50 I.E. 12" SW 871.50	LB408A RIM 875.50 I.E. 12" SW 871.50	
CB#405 RIM 874.80 I.E. 12" NW/SE/NE 869.25 I.E. 12" NE 871.41	LB409 RIM 874.25 T/G 873.75 I.E. 12" N/SE 869.75	

NOTE: WATER SHALL HAVE 10' HORIZONTAL SEPARATION & 18" VERTICAL SEPARATION FROM ALL SEWERS.



HATCH DENOTES AREA OF FLOODPLAIN DISTURBANCE. NO WORK IN FLOODPLAIN TO BE COMPLETED UNTIL EGE PERMIT AND TOWNSHIP S.U.P. IS APPROVED



BENCHMARKS

BENCHMARK #4 ELEVATION: 877.96 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON SOUTH SIDE OF FIRE HYDRANT, SOUTH SIDE OF FERRIS PARKWAY, ACROSS FROM UNFINISHED ROAD TO THE NORTH.

BENCHMARK #5 ELEVATION: 873.79 (NAVD 88)
CHISELED "X" ON FLANGE BOLT ON THE SOUTH SIDE OF FERRIS PARKWAY, 50'± EASTERLY OF WATER LILY WAY.

BENCHMARK #6 ELEVATION: 881.99 (NAVD 88)
600 MAIN IN THE NORTHEAST SIDE OF A UTILITY POLE, ON THE WEST SIDE OF WATER LILY WAY, 35'± NORTH OF THE CENTERLINE OF JOLLY OAK ROAD (TO THE EAST).

LEGEND

- EXT. CONTOURS
- EXT. WATER MAIN
- EXT. SANITARY SEWER
- EXT. STORM SEWER
- EXT. ELEVATIONS
- PROPOSED WATER MAIN
- PROPOSED SANITARY SEWER
- PROPOSED STORM SEWER
- MANHOLE (NEW)
- PROPOSED C.B. MANHOLE (EX.)
- UTILITY EASEMENT
- CENTER LINE OF ROAD
- ROAD RIGHT OF WAY
- PROPERTY LINE
- FIRE HYDRANT
- WATER VALVE
- THRUST BLOCK
- PROPOSED TOP OF CURB ELEV.

STATE OF MICHIGAN
ALLEN J. PATRICK
ENGINEER
NO. 49313
LICENSED PROFESSIONAL ENGINEER

ENGINEER
KEES, INC.
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DEVELOPER
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P.O. BOX 523
GRAND LEDGE, MI 48837
PH: (517) 290-4650

CONTRACTOR

E-93644-PRO-PH4

Meridian Charter Township
ingham county, michigan

UTILITIES

Elevation Ph 4

PLAN & PROFILE
MERIDIAN TOWNSHIP

DESIGNER: AJP CHECKED BY: AJP

REVISIONS:

DATE:	BY:	COMMENTS:
3-10-23	AJP	SUBMITTAL

SCALE: 1" = 40' HORIZ.
1" = 4' VERT.

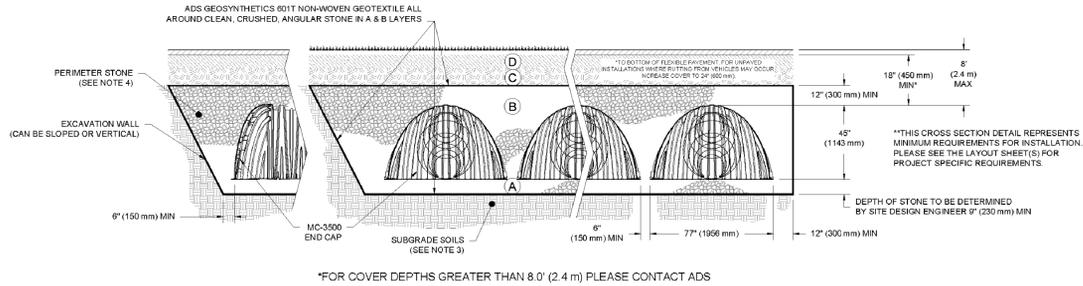
SHEET: 11 OF 14

93644
FILE NAME

ACCEPTABLE FILL MATERIALS: STORMTECH MC-3500 CHAMBER SYSTEMS

MATERIAL LOCATION	DESCRIPTION	AASHTO MATERIAL CLASSIFICATIONS	COMPACTION / DENSITY REQUIREMENT
D	FINAL FILL: FILL MATERIAL FOR LAYER 'D' STARTS FROM THE TOP OF THE 'C' LAYER TO THE BOTTOM OF FLEXIBLE PAVEMENT OR UNPAVED FINISHED GRADE ABOVE. NOTE THAT PAVEMENT SUBBASE MAY BE PART OF THE 'D' LAYER	N/A	PREPARE PER SITE DESIGN ENGINEER'S PLANS. PAVED INSTALLATIONS MAY HAVE STRINGENT MATERIAL AND PREPARATION REQUIREMENTS.
C	INITIAL FILL: FILL MATERIAL FOR LAYER 'C' STARTS FROM THE TOP OF THE EMBEDMENT STONE ('B' LAYER) TO 2" (50 mm) ABOVE THE TOP OF THE CHAMBER. NOTE THAT PAVEMENT SUBBASE MAY BE A PART OF THE 'C' LAYER.	AASHTO M145 ¹ A-1, A-2.4, A-3 OR AASHTO M43 ¹ 3, 357, 4, 487, 5, 56, 57, 6, 67, 68, 7, 78, 8, 89, 9, 10	BEGIN COMPACTIONS AFTER 2" (50 mm) OF MATERIAL OVER THE CHAMBERS IS REACHED. COMPACT ADDITIONAL LAYERS IN 12" (300 mm) MAX LIFTS TO A MIN. 95% PROCTOR DENSITY FOR WELL GRADED MATERIAL AND 95% RELATIVE DENSITY FOR PROCESSED AGGREGATE MATERIALS.
B	EMBEDMENT STONE: FILL SURROUNDING THE CHAMBERS FROM THE FOUNDATION STONE ('A' LAYER) TO THE 'C' LAYER ABOVE	AASHTO M43 ¹ 3, 4	NO COMPACTION REQUIRED.
A	FOUNDATION STONE: FILL BELOW CHAMBERS FROM THE SUBGRADE UP TO THE FOOT (BOTTOM) OF THE CHAMBER	AASHTO M43 ¹ 3, 4	PLATE COMPACT OR ROLL TO ACHIEVE A FLAT SURFACE. ^{2,3}

PLEASE NOTE:
 1. THE LISTED AASHTO DESIGNATIONS ARE FOR GRADATIONS ONLY. THE STONE MUST BE CLEAN, CRUSHED, ANGULAR. FOR EXAMPLE, A SPECIFICATION FOR #4 STONE WOULD STATE: "CLEAN, CRUSHED, ANGULAR NO. 4 (AASHTO M43) STONE".
 2. STORMTECH COMPACTION REQUIREMENTS ARE MET FOR 'A' LOCATION MATERIALS WHEN PLACED AND COMPACTED IN 6" (150 mm) MAX LIFTS USING TWO FULL COVERAGES WITH A VIBRATORY COMPACTOR.
 3. WHERE INFILTRATION SURFACES MAY BE COMPROMISED BY COMPACTION, FOR STANDARD DESIGN LOAD CONDITIONS, A FLAT SURFACE MAY BE ACHIEVED BY RAKING OR DRAGGING WITHOUT COMPACTION EQUIPMENT. FOR SPECIAL LOAD DESIGNS, CONTACT STORMTECH FOR COMPACTION REQUIREMENTS.
 4. ONCE LAYER 'C' IS PLACED, ANY SOIL MATERIAL CAN BE PLACED IN LAYER 'D' UP TO THE FINISHED GRADE. MOST PAVEMENT SUBBASE SOILS CAN BE USED TO REPLACE THE MATERIAL REQUIREMENTS OF LAYER 'C' OR 'D' AT THE SITE DESIGN ENGINEER'S DISCRETION.



- NOTES:**
- CHAMBERS SHALL MEET THE REQUIREMENTS OF ASTM F2418, "STANDARD SPECIFICATION FOR POLYPROPYLENE (PP) CORRUGATED WALL STORMWATER COLLECTION CHAMBERS" CHAMBER CLASSIFICATION 45K78 DESIGNATION SS.
 - MC-3500 CHAMBERS SHALL BE DESIGNED IN ACCORDANCE WITH ASTM F2787 "STANDARD PRACTICE FOR STRUCTURAL DESIGN OF THERMOPLASTIC CORRUGATED WALL STORMWATER COLLECTION CHAMBERS".
 - THE SITE DESIGN ENGINEER IS RESPONSIBLE FOR ASSESSING THE BEARING RESISTANCE (ALLOWABLE BEARING CAPACITY) OF THE SUBGRADE SOILS AND THE DEPTH OF FOUNDATION STONE WITH CONSIDERATION FOR THE RANGE OF EXPECTED SOIL MOISTURE CONDITIONS.
 - PERIMETER STONE MUST BE EXTENDED HORIZONTALLY TO THE EXCAVATION WALL FOR BOTH VERTICAL AND SLOPED EXCAVATION WALLS.
 - REQUIREMENTS FOR HANDLING AND INSTALLATION:
 - TO MAINTAIN THE WIDTH OF CHAMBERS DURING SHIPPING AND HANDLING, CHAMBERS SHALL HAVE INTEGRAL, INTERLOCKING STACKING LUGS.
 - TO ENSURE A SECURE JOINT DURING INSTALLATION AND BACKFILL, THE HEIGHT OF THE CHAMBER JOINT SHALL NOT BE LESS THAN 3".
 - TO ENSURE THE INTEGRITY OF THE ARCH SHAPE DURING INSTALLATION, ALL THE ARCH STIFFENERS CONSTANT AS DEFINED IN SECTION 8.2.9 OF ASTM F2418 SHALL BE GREATER THAN OR EQUAL TO 500 LBS/FT² AND B) TO RESIST CHAMBER DEFORMATION DURING INSTALLATION AT ELEVATED TEMPERATURES (ABOVE 72° F / 23° C), CHAMBERS SHALL BE PRODUCED FROM REFLECTIVE GOLD OR YELLOW COLORS.

MC-3500 STANDARD CROSS SECTION

DATE: 08/22/2013

PROJECT: K11

DESIGNED BY: KLU

CHECKED BY: KLU

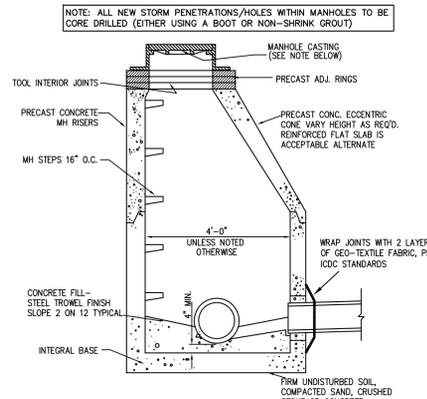
StormTech Chamber System

4840 TRUBMAN BLVD HELLARD, OH 43026

888-822-2864 WWW.STORMTECH.COM

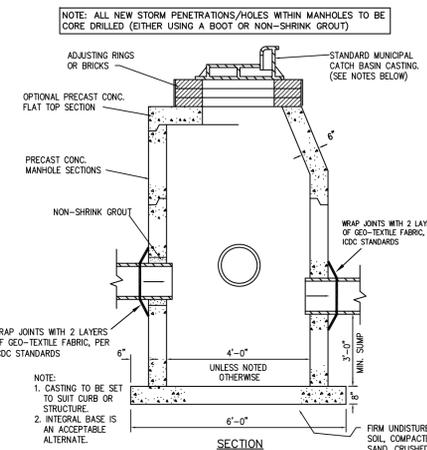
THIS DRAWING HAS BEEN PREPARED BASED ON INFORMATION PROVIDED TO US BY THE CLIENT. THE CLIENT IS RESPONSIBLE FOR THE ACCURACY OF THE INFORMATION PROVIDED. STORMTECH SHALL NOT BE RESPONSIBLE FOR ANY ERRORS OR OMISSIONS IN THIS DRAWING. STORMTECH SHALL NOT BE RESPONSIBLE FOR ANY CONSTRUCTION DEFECTS OR DAMAGE TO PROPERTY CAUSED BY THE CLIENT OR ANY OTHER PARTY.

ADS 1 SHEET OF 1



STANDARD STORM MANHOLE

NO SCALE
 (TO BE USED ONLY WHERE SPECIFIED AS 4' OR 5' DIAM. MH)

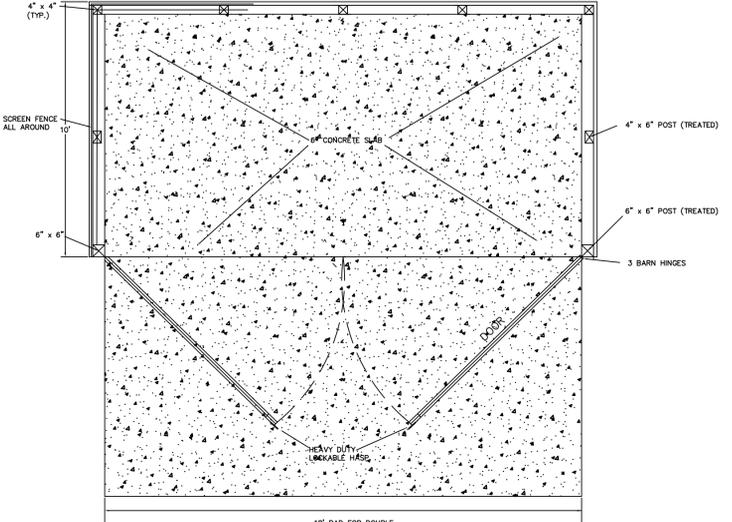


STANDARD CATCH BASIN

NO SCALE
 (TO BE USED ONLY WHERE SPECIFIED AS 4' OR 5' DIAM. CB)

NOTE: CATCH BASINS SHALL INCLUDE STEPS AND REQUIRE CASTINGS E.J.I.W. 7045 OR 1040 (M1) PER INGHAM AND CO. DRAIN COMMISSION STANDARDS.

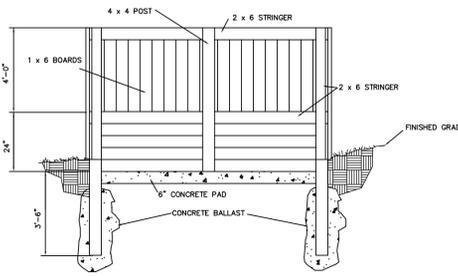
NOTE: MANHOLE COVERS AND CATCH BASIN COVERS SHALL HAVE THE FISH SYMBOL AND THE "DUMP NO WASTE... DRAINS TO WATERWAY" LOGO



NOTE: gates must swing completely open and have 8" min ground clearance w/mechanism to keep gates open.

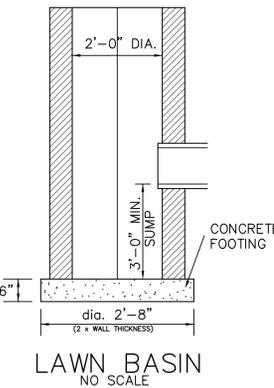
height 8 yd container - 7 min, height 4 or 6 yd container - 6 min.

45' min. straight away approach

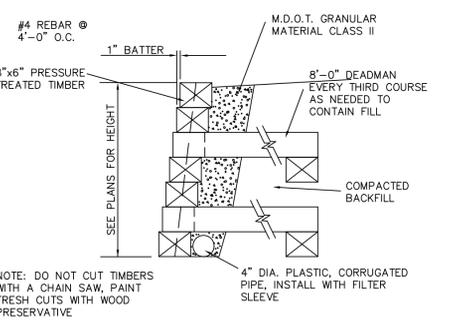


SOLID WASTE STATION

NO SCALE

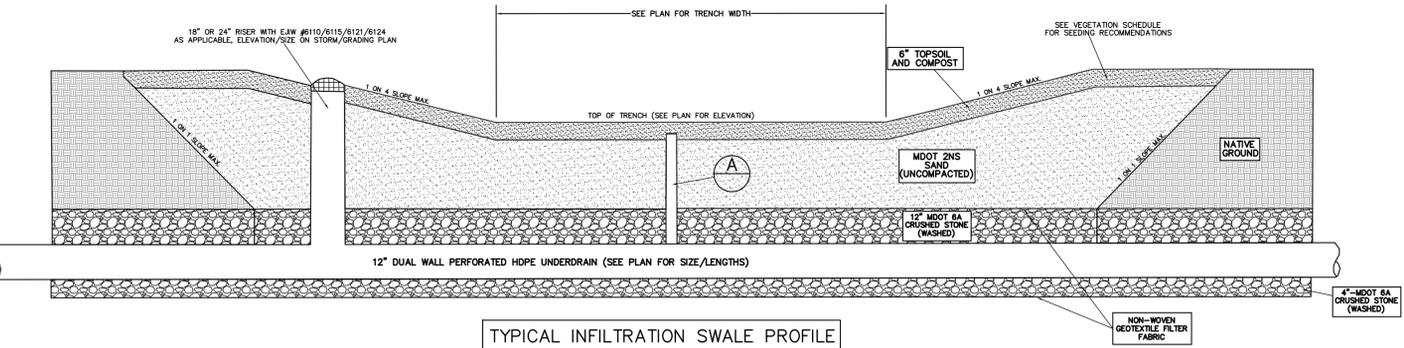


LAWN BASIN

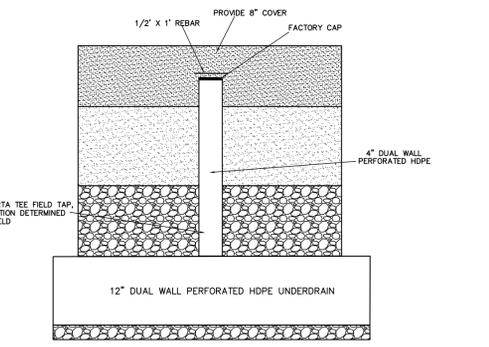


TIMBER WALL DETAIL

NO SCALE



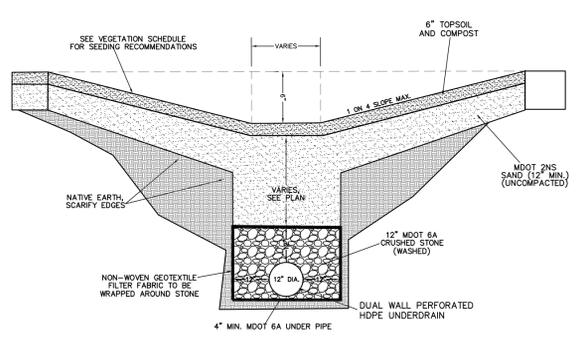
TYPICAL INFILTRATION SWALE PROFILE



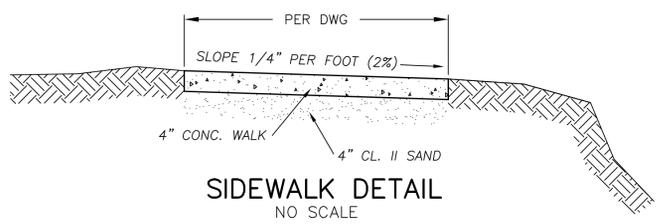
4" INFILTRATION RISER WITH CAP

SEED MIX:

- 25% TITANIUM LS TURF-TYPE TALL FESCUE
- 20% SPEEDWAY TURF-TYPE TALL FESCUE
- 20% EINSTEIN TURF-TYPE TALL FESCUE
- 20% SPEEDWAY TALL FESCUE
- 15% ANNUAL RYEGRASS

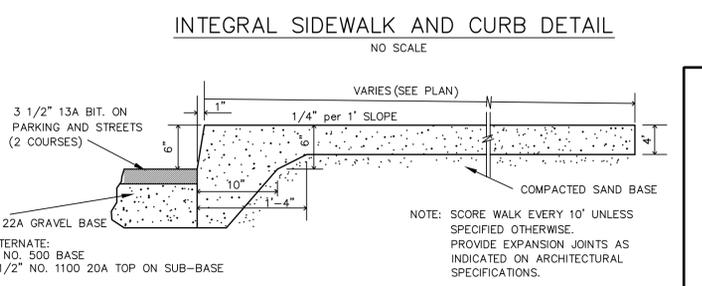


TYPICAL INFILTRATION SWALE CROSS-SECTION



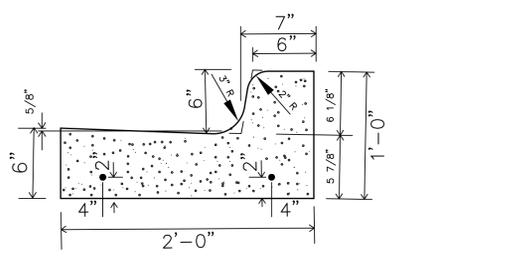
SIDEWALK DETAIL

NO SCALE



INTEGRAL SIDEWALK AND CURB DETAIL

NO SCALE



STANDARD CONCRETE CURB & GUTTER

NO SCALE

CONSTRUCTION NOTES:

- TOPSOIL COMPOSITION: <5% CLAY, 5-30% SILT, 65-80% SAND, 4-6% ORGANIC
- COMPOST TO BE BLENDED WITH TOPSOIL IN A RATION OF 1 TO 1 (50% EACH)
- SEEDING, TALL FESCUE (APPLY AT A MINIMUM RATE OF 4.35 LBS/ACRE)
- INLET GRATES TO BE SCREWED TO THE HDPE RISER USING 2 STAINLESS STEEL SELF TAPPING SCREWS LOCATED 180 DEGREES APART FROM EACH OTHER



REVISIONS		KESB, INC. KYES ENGINEERING BRYAN LAND SURVEYS	
3-10-23	SUBMITTAL	2116 HASLETT ROAD, HASLETT, MI 48840	PH. 517-339-1014 FAX. 517-339-8047
		Marshall Office	Ph. 269-781-9800
		Elevation Ph 4	
		DETAIL SHEET	
SCALE: NONE	DESIGNER: AJP	APPROVED BY: AJP	
DATE: 3-7-19	PROJECT MGR. AJP	SHEET 13 OF 14	
AUTHORIZED BY: OKEMOS POINT III, LLC		JOB #:	93644

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 to 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, hydros seeding, 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.

PERMANENT SEEDING SPECIFICATIONS (E8)

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.

PERMANENT SEEDING SPECIFICATION
 SEED ALL DISTURBED AREAS WITH THE FOLLOWING SEED MIXTURE OR APPROVED EQUAL.
 MICHIGAN GREEN - 15% BLUEGRASS, 40% FESCUE, 45% RYEGRASS
 APPLY AT A RATE OF 5 LBS./1000 SF
 -APPLY SILT STOP OR APPROVED TACKIFIER TO SEED MIX.

E8 PERMANENT SEEDING

Planting Zones:	Lower Peninsula Zone 1	Lower Peninsula Zone 2	Upper Peninsula Zone 3
	Seeding Window Permanent Seeding	4/15 - 10/10	5/1 - 10/1
Seeding Window Dormant Seeding	11/15 - Freeze	11/01 - Freeze	11/01 - Freeze

Source: Adapted from MDT Interim 2003 Standard Specifications for Construction

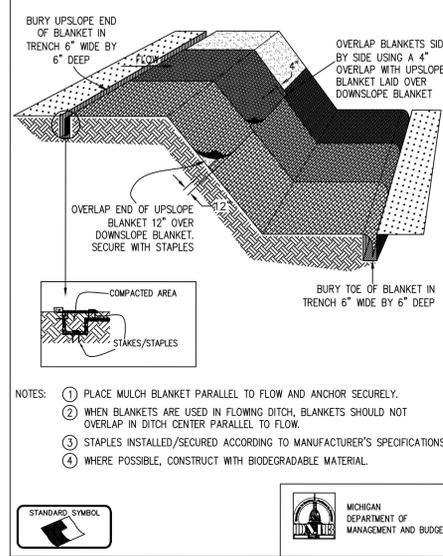
Seeding Dates (with Irrigation or Mulch)	Zone 1 Lower Peninsula (South of U.S. 10)	Zone 2 Lower Peninsula (North of U.S. 10)	Zone 3 Upper Peninsula
	4/1 - 8/1	5/1 - 9/20	5/1 - 9/10
Seeding Dates (w/o Irrigation or Mulch)	4/1 - 5/20 8/10 - 10/1	5/1 - 6/10 8/1 - 9/20	5/1 - 6/15 8/1 - 9/20
Dormant Seeding "Ideal"	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.

E9 MULCH BLANKETS



E9 MULCH BLANKETS SPECIFICATIONS

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 staples/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 staples/stakes placed 12" apart across the width of the blanket.
- Unroll the blankets down or horizontally across the slope.

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 staples/stakes and trench in.

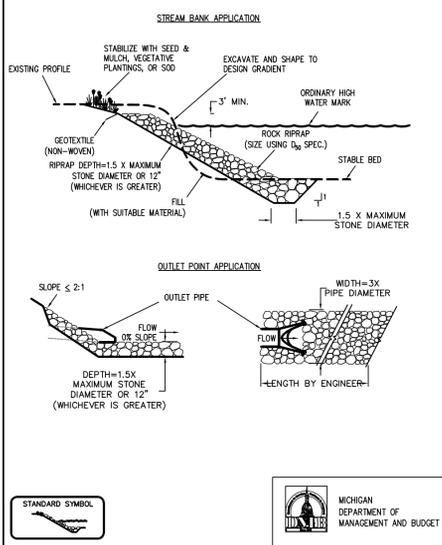
Maintenance

- 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.

E12 RIPRAP



PERMANENT SEEDING SPECIFICATIONS (E12)

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.

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.

Weight (lbs.)	Average Spherical Diameter (in.) D_{50}	Typical Rectangular Stone Length (in.)	Typical Rectangular Stone Width (in.)
50	10	10	7
100	13	14	10
150	14	21	14
200	16	21	14
300	18	30	18
400	22	36	24
500	24	45	30
1000	30	54	36
1500	36	63	42
2000	42	72	48
4000	48	81	54
6000	54	90	60

Source: Adapted from USDA NRCS

S51 SILT FENCE SPECIFICATIONS

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

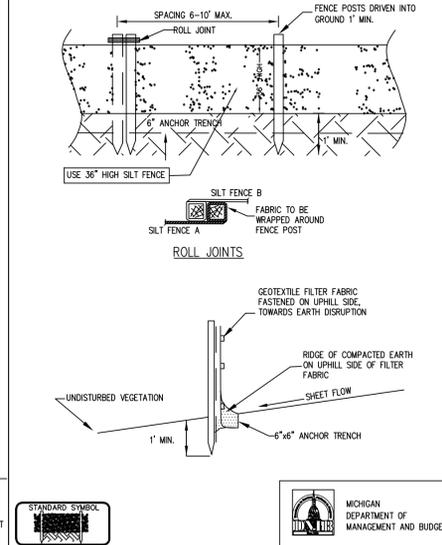
- Inspect frequently and immediately after each storm event. Check several times during prolonged storm events. If necessary, repair immediately.
- If the sediment has reached 1/3 the height of the fence, the soil should be removed and disposed of in a stable upland site.
- The fence should be re-installed 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.

S51 SILT FENCE SPECIFICATIONS

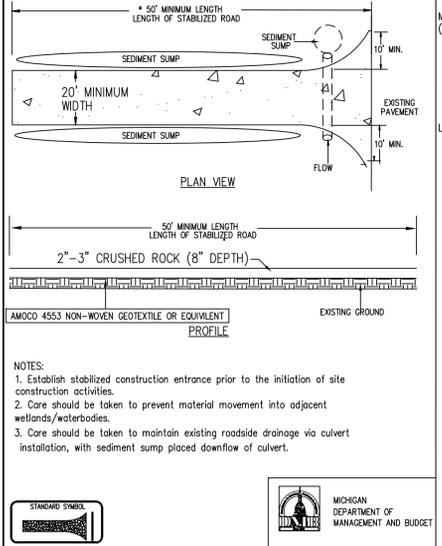
Limitations

- Silt fence may cause temporary ponding and could fail if too much water flows through the area.
- Do not use in areas with concentrated flows.
- Chance of failure increases if fence is installed incorrectly or if sediment accumulation is not removed.

S51 SILT FENCE



S53 STABILIZED CONSTRUCTION ACCESS



STABILIZED CONSTRUCTION ACCESS SPECIFICATIONS (S53)

Maintenance (cont.)

- Sediment deposited on public rights-of-way shall be removed immediately and returned to the construction site.
- If soils are such that washing of tires is required, it shall be done in a wash rock area, stabilized with stone, immediately prior to the construction access stabilized corridor.
- At the project completion, rock access road should be removed and disposed of unless utilized as subgrade for final road.
- Effectiveness limited, sediment may be tracked onto roads requiring additional action.

Limitations

- Effectiveness limited, sediment may be tracked onto roads requiring additional action.

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

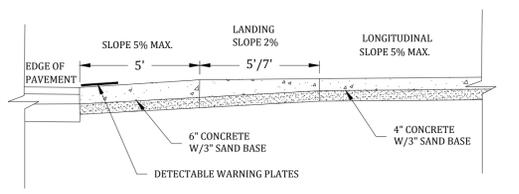
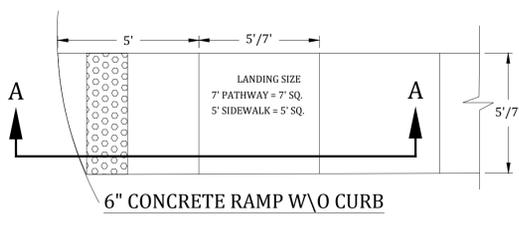
- Stabilized construction access road should be established at the onset of the construction activities and maintained in place for the duration of the construction project.
- Installation of this practice should be the responsibility of the site clearing or excavating contractor.
- Access location should be cleared of woody vegetation.
- Non-woven geotextile fabric shall be placed over the existing ground prior to placing stone.
- Access size should be a minimum of 50'. (30' for single residence lot).
- Access width should be 12" minimum, flared at the existing road to provide a turning radius.
- Crushed aggregate (2" to 3"), or reclaimed or recycled concrete equivalent, shall be placed at least 8" deep over the length and width of the ingress/egress corridor.

Maintenance

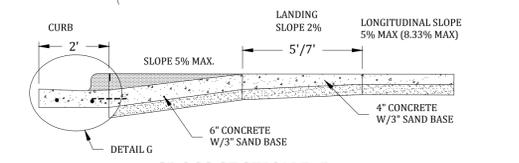
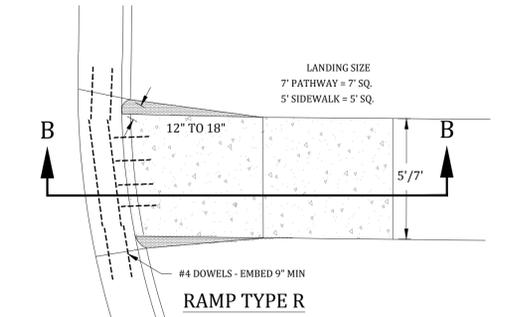
- Periodic inspection and needed maintenance shall be provided after each rain event.
- Stabilized entrances shall be repaired and rock added as necessary.

E-93644-PH4-SESC-STORMDETAILS
 E-93644
 SURVEY#88667.TOP

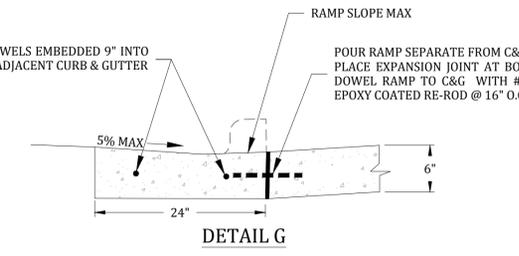
	REVISIONS 3-10-23 SUBMITTAL	KYES ENGINEERING BRYAN LAND SURVEYS 2116 HASLETT ROAD, HASLETT, MI 48840 PH. 517-339-1014 FAX. 517-339-8047 Marshall Office Ph. 269-781-9800		
	SCALE: NONE		DESIGNER: A.J.P.	APPROVED BY: A.J.P.
	DATE: 3-7-19		PROJECT MGR. A.J.P.	SHEET 14 OF 14
	AUTHORIZED BY: OKEMOS POINTE III, LLC		JOB #: 93644	SESC DETAIL SHEET



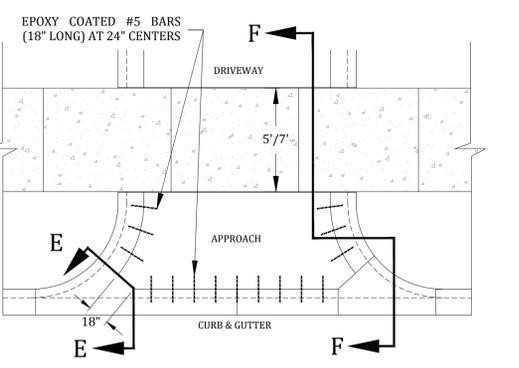
CROSS SECTION A-A



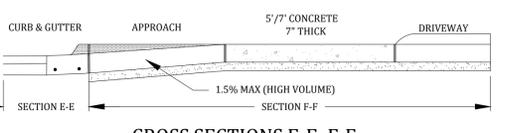
CROSS SECTION B-B



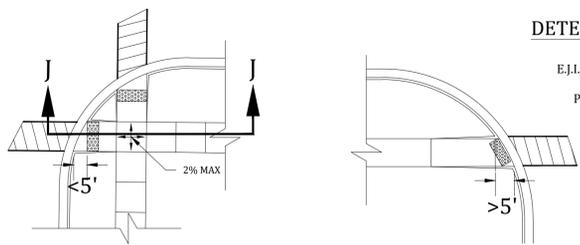
DETAIL G



TYP. COMMERCIAL DRIVEWAY PLAN

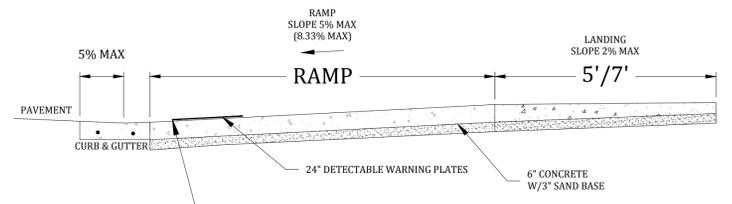


CROSS SECTIONS E-E, F-F

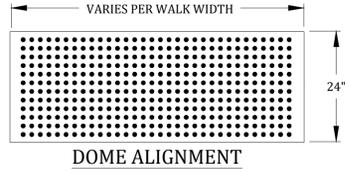


RAMPS LOCATED IN RADIUS

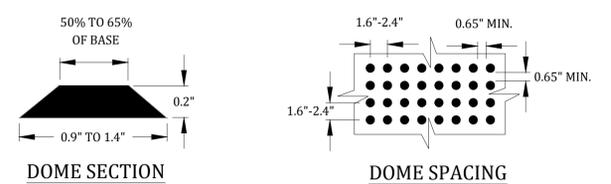
RAMP LOCATED IN RADIUS



SECTION J-J

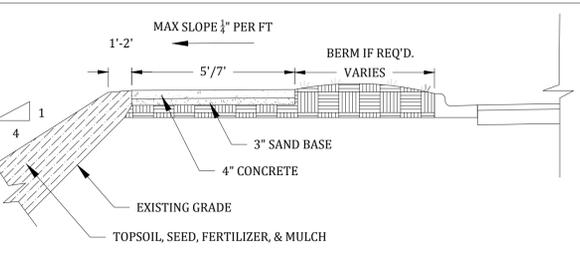


DOMES ALIGNMENT

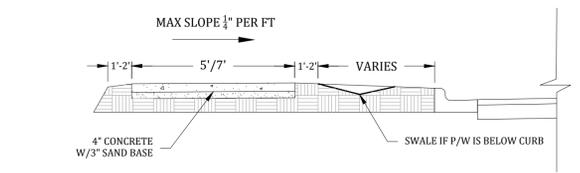


DOMES SECTION

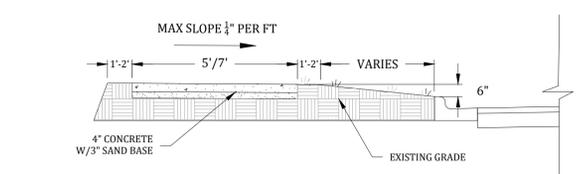
DOMES SPACING



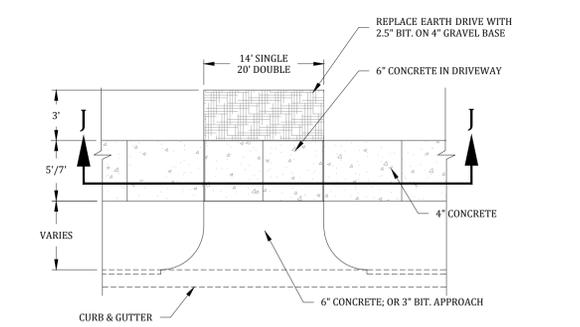
EMBANKMENT & BERM CROSS SECTION



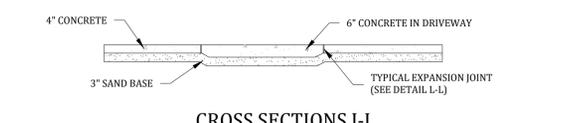
SWALE CROSS SECTION



TYPICAL CROSS SECTION



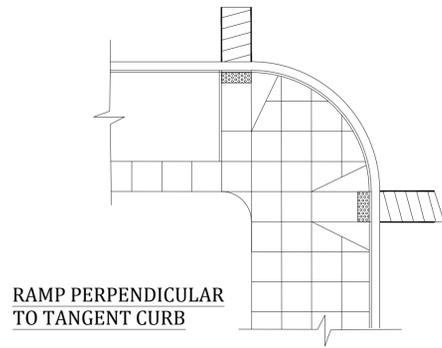
TYP. RESIDENTIAL DRIVEWAY PLAN



CROSS SECTIONS J-J

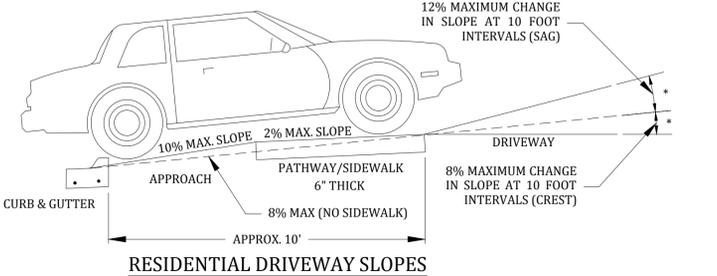
DETECTABLE WARNING DETAILS

E.J.L.W. 7005 DETECTABLE WARNING PLATE
SIZES AVAILABLE 12", 18" & 24"
PLATES MUST BE ASPHALTIC COATED

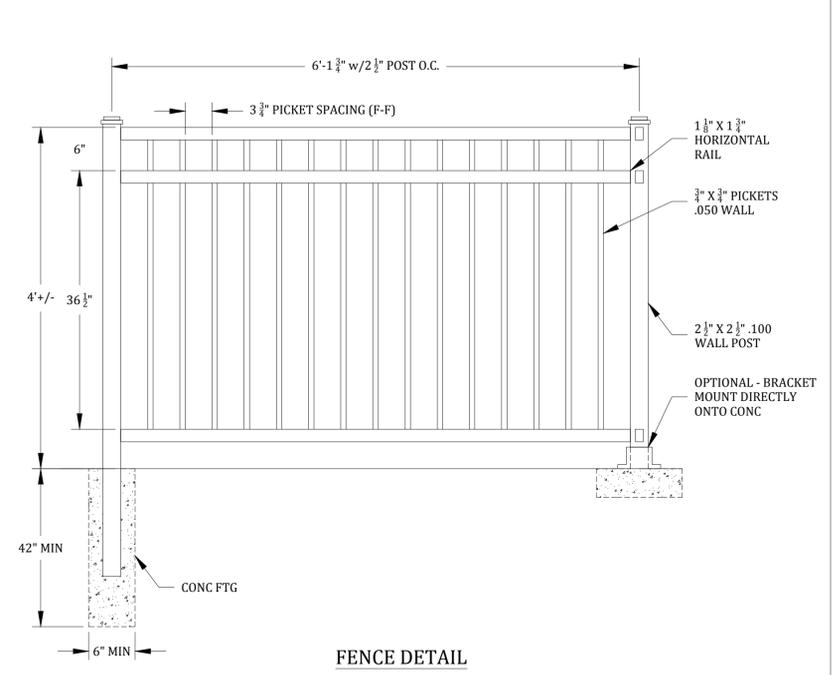


RAMP PERPENDICULAR TO TANGENT CURB

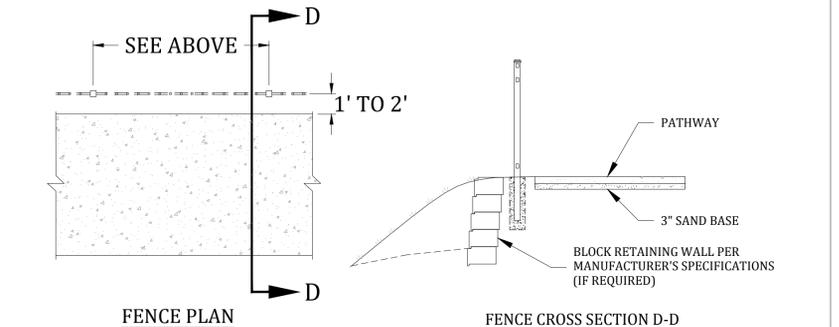
- GENERAL NOTES
1. SIDEWALKS/PATHWAYS SHALL BE 4" THICK CONCRETE EXCEPT AT DRIVEWAYS.
 2. SIDEWALKS/PATHWAYS THRU DRIVES SHALL BE: 6" (RESIDENTIAL); 7" (MULTI-RESIDENTIAL & COMMERCIAL)
 3. 3" OF COMPACTED SAND BASE SHALL BE PLACED UNDER ALL SIDEWALKS/PATHWAYS.
 4. ALL BITUMINOUS APRONS SHALL BE 2 1/2" THICK UNLESS NOTED OTHERWISE
 5. PROPERTY IRONS SHALL BE MAINTAINED BY THE CONTRACTOR.
 6. ALL EXISTING CONCRETE AND BITUMINOUS TO BE REMOVED SHALL BE SAWCUT. ALL CONCRETE AND BITUMINOUS REMOVAL SHALL BE CONSIDERED INCIDENTAL TO CONSTRUCTION.
 7. ALL AGGREGATE BASE SHALL BE 22A, 4" THICK.
 8. ALL TREE AND BUSH REMOVAL SHALL BE CONSIDERED PART OF SUB-GRADE PREPARATION.
 9. LOCATION OF NEW PLANT MATERIAL SHALL BE AS DIRECTED BY THE ENGINEER, AND SHALL BE INSTALLED IN ACCORDANCE WITH GUIDELINES ESTABLISHED BY THE A.A.O.N.
 10. ALL PLANT MATERIAL NOT MARKED FOR REMOVAL SHALL BE PROTECTED.
 11. BITUMINOUS DRIVES SHALL BE SAWCUT 18" ON EITHER SIDE OF PROPOSED PATHWAY.



RESIDENTIAL DRIVEWAY SLOPES



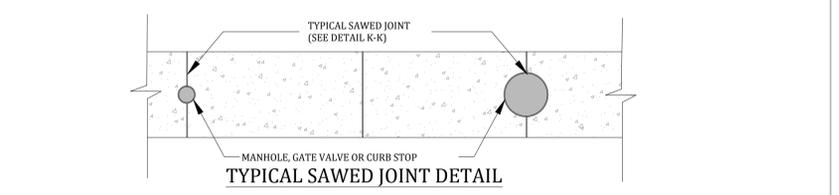
FENCE DETAIL



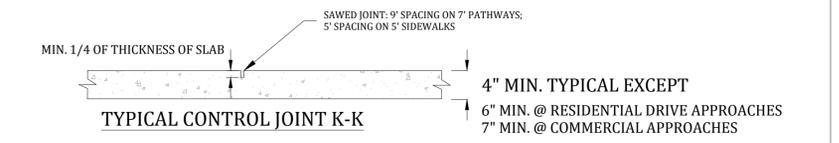
FENCE PLAN

FENCE CROSS SECTION D-D

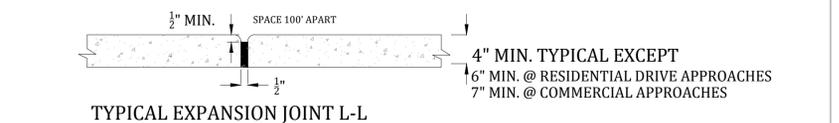
NOTE: FENCE POSTS CAN BE ANCHORED TO THE PATHWAY, THEN PATHWAY MUST BE WIDENED TO EIGHT FEET



TYPICAL SAWED JOINT DETAIL



TYPICAL CONTROL JOINT K-K



TYPICAL EXPANSION JOINT L-L

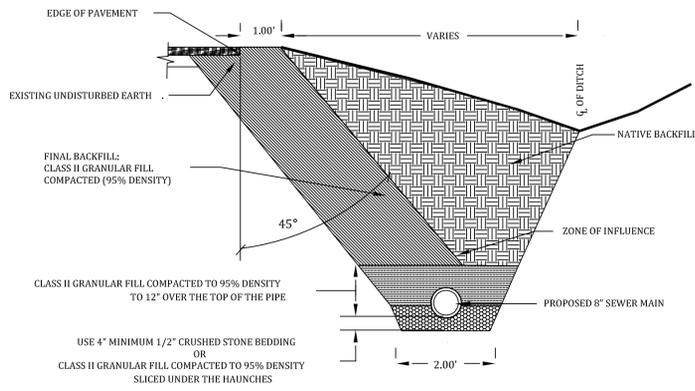
Meridian Charter Township
Ingham County, Michigan
ENGINEERING

5' SIDEWALK & 7' PATHWAY
DETAIL SHEET

REVISIONS:		
DATE:	BY:	COMMENTS:
04/30/03	JG	ADD REBAR TO CURB & GUTTER
08/01/05	JG	CLARIFY RAMP DETAILS
12/20/06	JG	FENCE POST IN PVC PIPE W/SAND
12/29/08	JG	RAMPS W/ DETECTABLE WARNING PLATES
08/14/09	NN	LANDING CROSS SECTIONS
03/18/16	JG	DOWEL DETAIL FOR NEW/EX CONCRETE
01/22/18	NN	SPEC & DETAIL SHEET OVERHAUL
04/12/19	NN	FENCE & RET. WALL REVISION
12/03/20	NN	FENCE REVISION

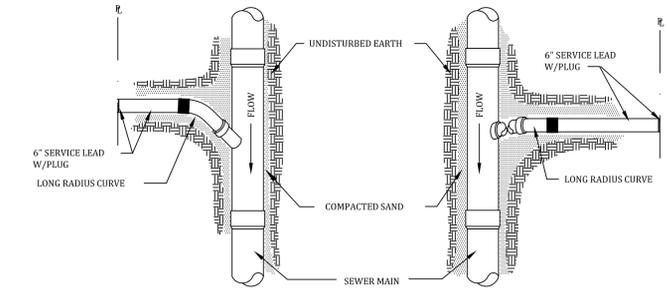
DRAWN BY: JG 08/01/05 CHECKED BY: YI 08/01/05

SCALE: NONE
PAGE: - OF -
PAGE: PATHWAY DETAIL SHEET 2021.DWG



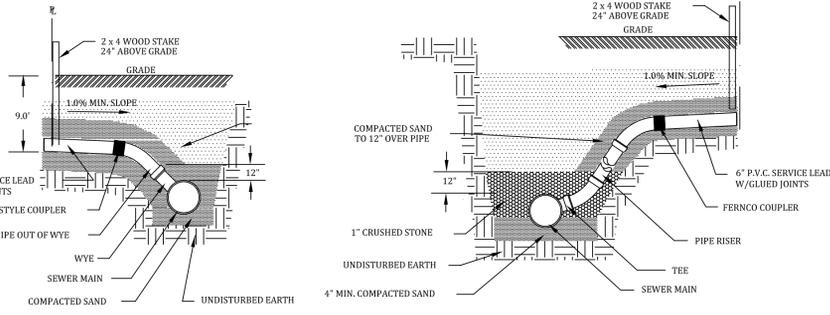
CLASS-B TRENCH DETAIL

- NOTES:**
- LEADS AND RISERS SHALL BE CONSTRUCTED OF MATERIALS AS SPECIFIED AND OF SIZES AS SHOWN ON THE PLANS.
 - DEPTH AT PROPERTY LINE SHALL BE 9' UNLESS OTHERWISE SHOWN ON THE PLANS.
 - IF CONCRETE PIPE IS USED, AN ASBESTOS CEMENT BELLS TO BE CAST IN THE WALL OF THE PIPE FOR USE AS A TIE BRANCH.
 - FERRO-STYLE FLEXIBLE COUPLINGS SHALL BE USED WHEN CONNECTING THE HOUSE TO THE STUB.
 - MIN. 3" SEPARATION BETWEEN WATER & SEWER SERVICES.
 - ALL REFERENCES TO STONE BEDDING SHALL MEAN CRUSHED STONE.



PLAN WITHOUT RISER

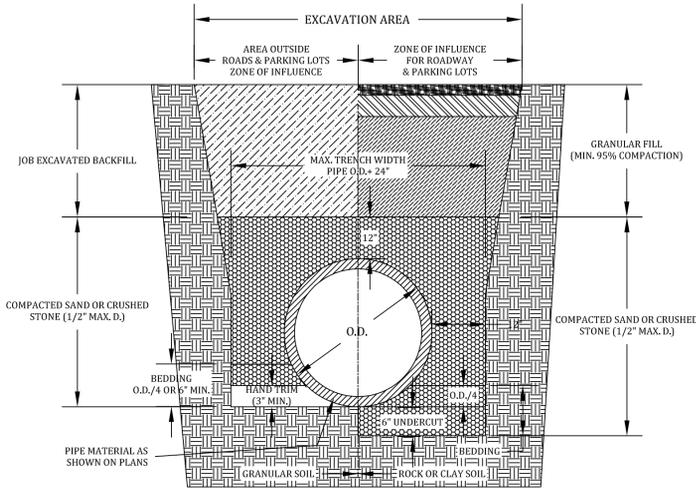
PLAN WITH RISER



SECTION WITHOUT RISER

SECTION WITH RISER

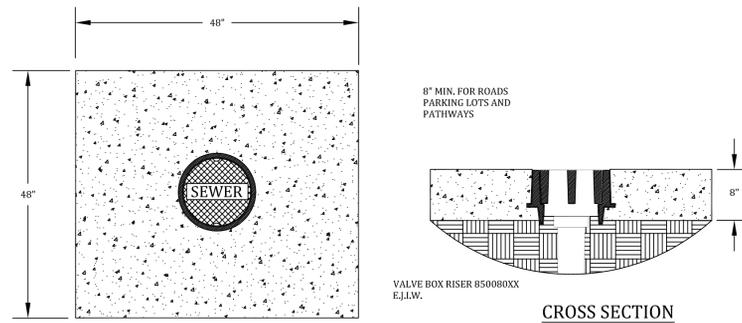
SERVICE/CONNECTION DETAIL



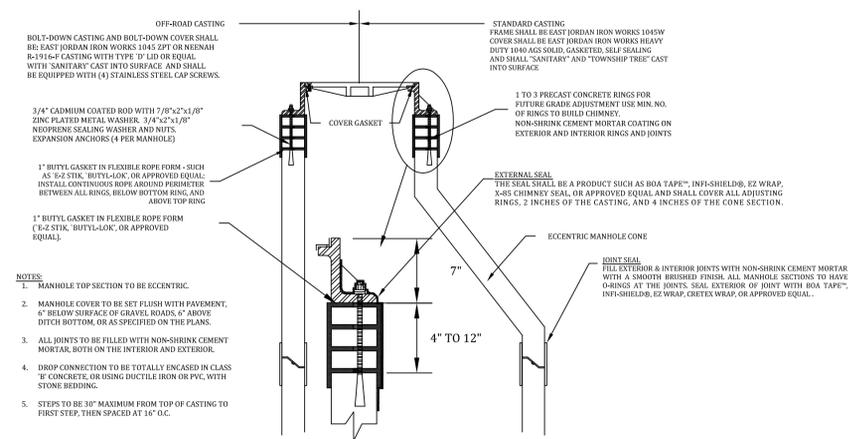
TYPICAL TRENCH DETAIL (SDR26 PVC ONLY)

THE PVC (SDR-26) PIPE MATERIAL SHALL CONFIRM TO ASTM D 2241, WITH BELL AND SPIGOT JOINTS IN ACCORDANCE WITH ASTM F 47. PIPE INSTALLATION SHALL BE IN ACCORDANCE WITH ASTM D 2321. ALL PIPE SHALL BE MARKED TO PROVIDE ASTM DESIGNATIONS, SDR NUMBER, MANUFACTURER'S NAME AND PIPE DIAMETER.

THE CONTRACTOR SHALL TEST THE MAIN FOR DEFLECTION BY PULLING A MANDREL THROUGH THE SEWER AFTER ALL BACKFILL HAS BEEN PLACED AND COMPACTED OVER THE PIPE. THE MAXIMUM ALLOWABLE DEFLECTION SHALL NOT EXCEED 5% OF THE PIPE'S INSIDE DIAMETER. THE OUTSIDE DIAMETER OF THE TEST MANDREL SHALL BE EQUAL TO THE TO THE INSIDE DIAMETER OF THE PIPE LESS 5%. THE INITIAL TEST SHALL BE PERFORMED AT LEAST 30 DAYS AFTER PIPE INSTALLATION. A SECOND TEST SHALL BE PERFORMED AFTER 10 MONTHS OF PIPE INSTALLATION.

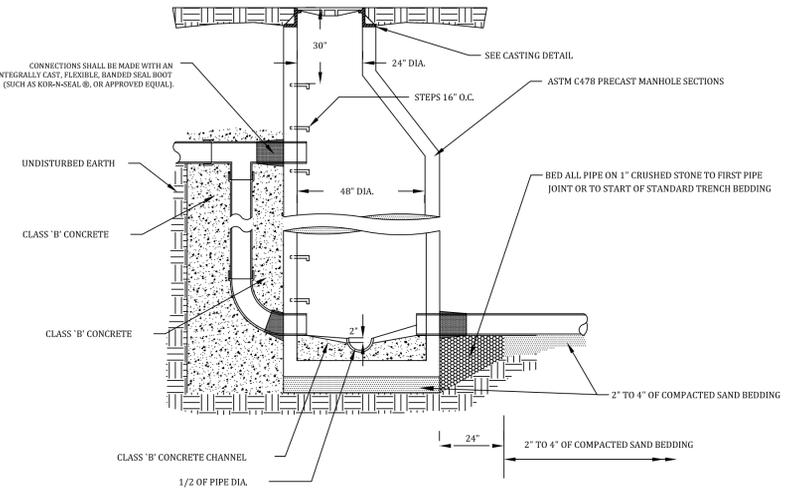


CLEANOUT BOXES IN CONCRETE

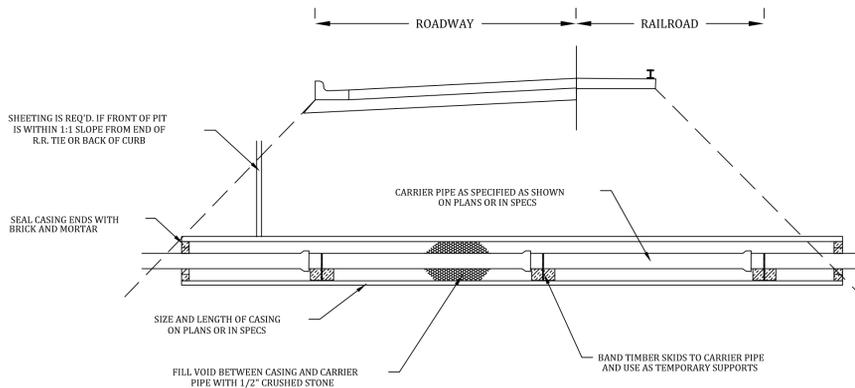


MANHOLE CASTING DETAIL

- NOTES:**
- MANHOLE TOP SECTION TO BE ECCENTRIC.
 - MANHOLE COVER TO BE SET FLUSH WITH PAVEMENT, 6\"/>

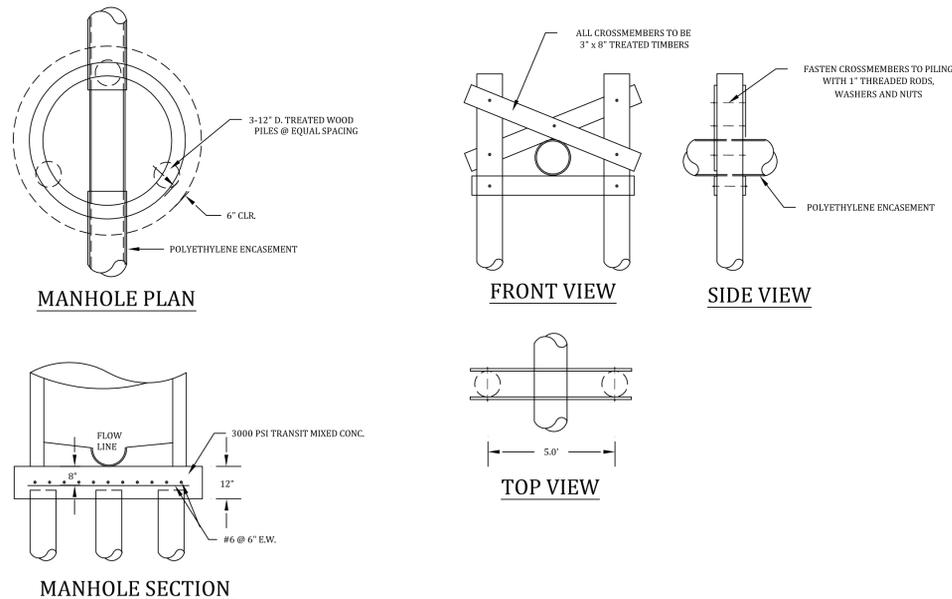


MANHOLE-SECTION DETAIL

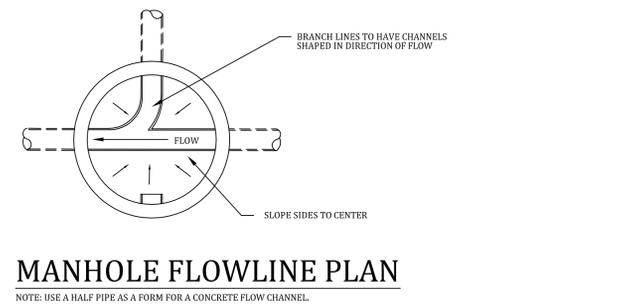


CASING INSTALLATION DETAIL FOR ROADS & RAILROADS

- NOTES:**
- WORK IN ROAD OR RAILROAD RIGHTS-OF-WAY SHALL BE IN ACCORDANCE WITH THE APPROPRIATE REGULATORY AGENCY'S REQUIREMENTS.
 - CASING PIPE SHALL MEET THE GRADE B REQUIREMENTS OF ASTM 139, ASTM A-53, OR API 5-L, WITH 0.375\"/>

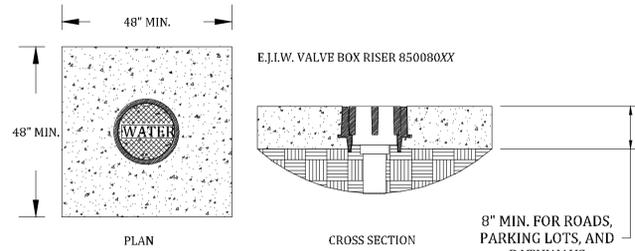


PILING DETAILS

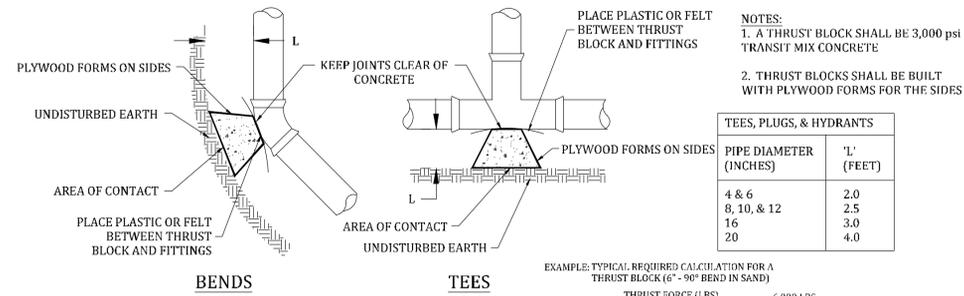


MANHOLE FLOWLINE PLAN

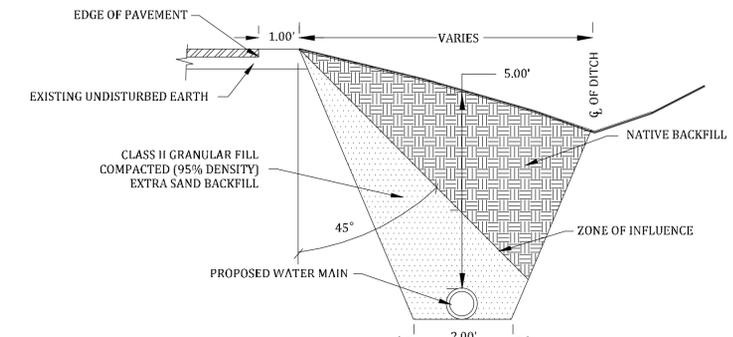
Meridian Charter Township		REVISIONS:	
Ingham County, Michigan		DATE:	BY:
Public Works Department		04/1996	JG
		07/02/99	JG
		01/13/00	JG
		05/12/08	JG
		07/31/12	JG
		05/15/15	JG
		01/10/20	NN
		03/09/21	NN
		03/23/21	NN
STANDARD DETAILS FOR SANITARY SEWER SYSTEM		COMMENTS:	FILE:
		Computer Generated	Sewer Detail Sheet
		Add Bolts to Casting Detail	2018.dwg
		Add SDR 26 Detail	
		Add "Wrapidseal" & Grout to Casting Detail	
		Clarified "Crushed Stone"	
		Add Cleanout in Concrete	
		Reorganize	
		Butyl btwn Rings	
		Additional Chimney/Join Seal	
SCALE:		PAGE:	4 OF 4
NTS			
DRAWN BY: MK 03/1983	CHECKED BY: JB 03/1983		



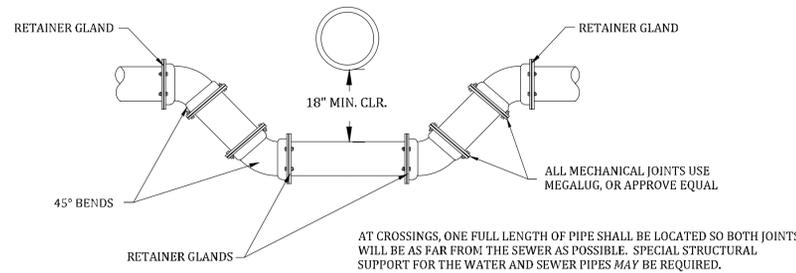
VALVES & CURB STOP BOXES IN CONCRETE



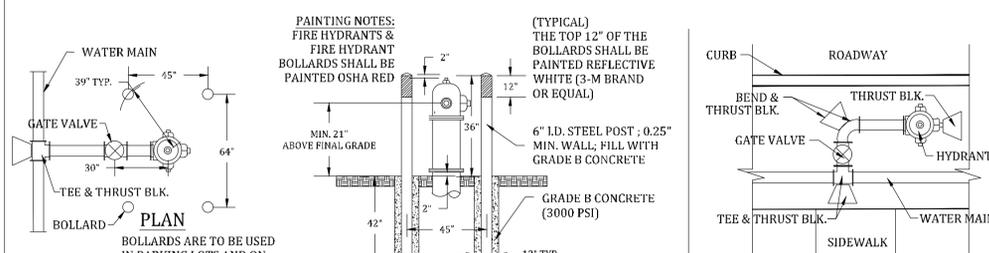
THRUST BLOCK PLAN VIEWS



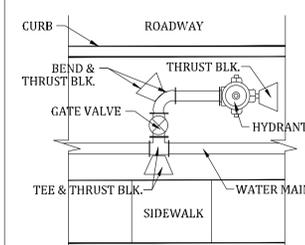
TYPE-1 TRENCH CROSS SECTION



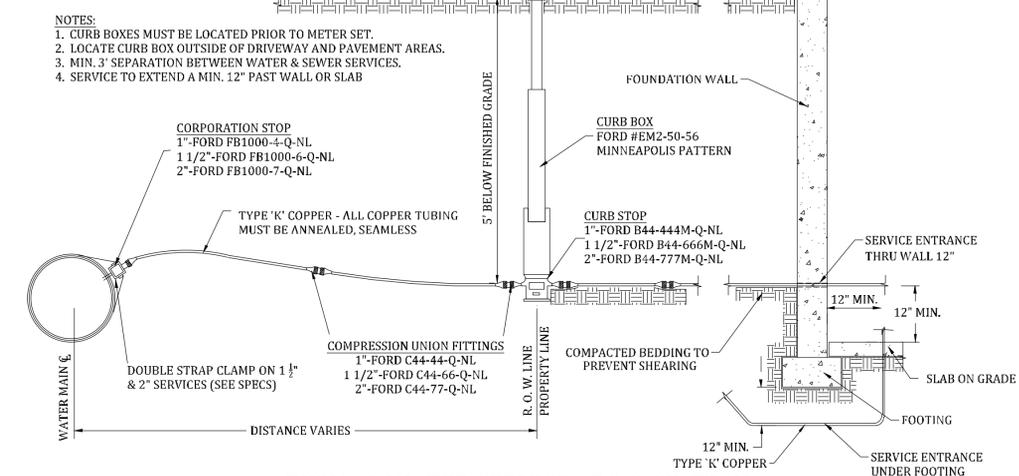
LOWERING WATER MAIN CROSS SECTION



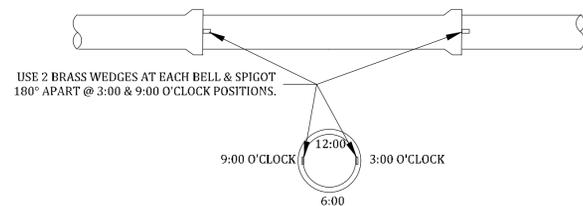
BOLLARDS AROUND FIRE HYDRANT



ALTERNATE LAYOUT FOR CONFINED AREAS



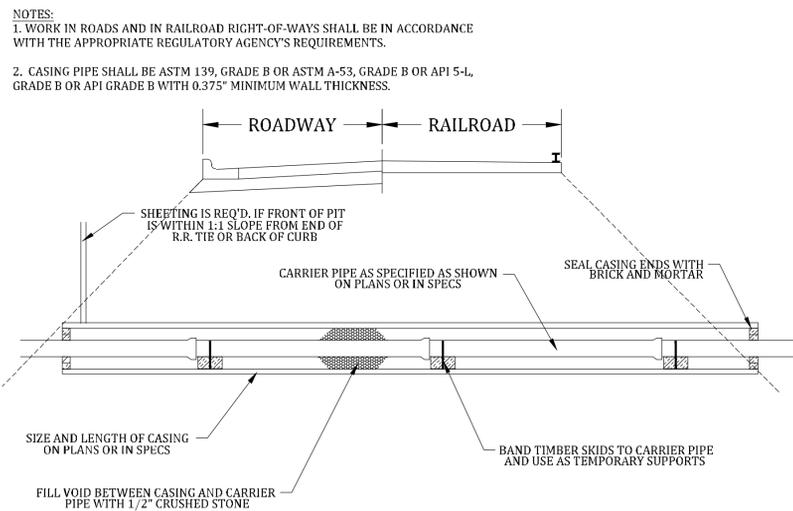
TYPICAL WATER SERVICE CROSS SECTION



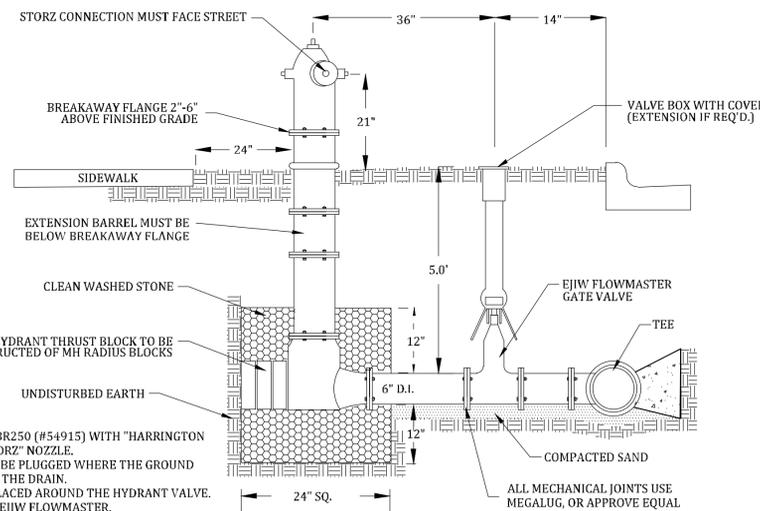
WATER MAIN JOINT DETAILS

GENERAL NOTES:

1. ALL WATER PIPES, PING FITTINGS, PLUMBING FITTINGS AND FIXTURES THAT ARE USED FOR POTABLE WATER MUST COMPLY WITH NEW LEAD-FREE REQUIREMENT AND MUST BEAR THE MARK NSF/ANSI STANDARD 61, ANNEX G OR NSF-61-G.
2. ALL VALVES SHALL BE EJIW FLOWMASTER GATE VALVES, OPEN LEFT.
3. POLYETHYLENE ENCASUREMENT IS REQUIRED AROUND ALL PIPES, FITTINGS, AND VALVES. THE ENCASUREMENT SHALL BE V-BIO@ ENHANCED POLYETHYLENE ENCASUREMENT, INSTALLED PER THE MANUFACTURER'S INSTRUCTIONS.



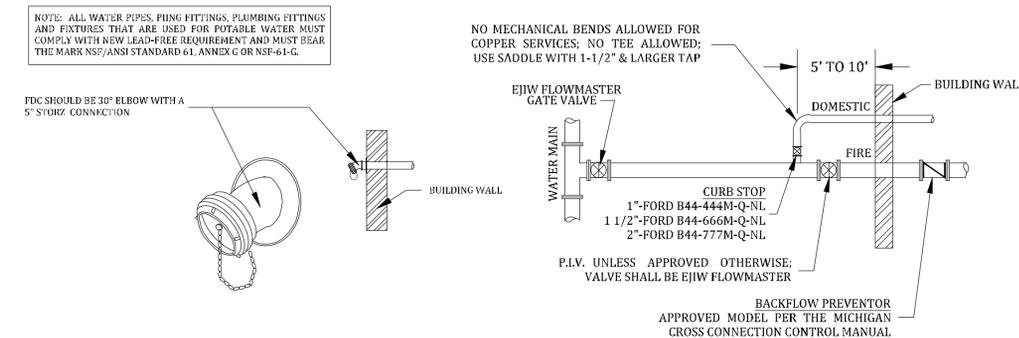
CASING INSTALLATION DETAIL FOR ROADS & RAILROADS



NOTES:

1. HYDRANT TO BE EJIW 5BR250 (#54915) WITH "HARRINGTON INTEGRAL HYDRANT STORZ" NOZZLE.
2. HYDRANT DRAIN SHALL BE PLUGGED WHERE THE GROUND WATER LEVEL IS ABOVE THE DRAIN.
3. STONE SHALL NOT BE PLACED AROUND THE HYDRANT VALVE.
4. GATE VALVES SHALL BE EJIW FLOWMASTER.

TYPICAL HYDRANT ASSEMBLY DETAIL



FIRE PROTECTION VALVING PLAN VIEW

Meridian Charter Township
Ingham County, Michigan
Public Works Department

STANDARD DETAILS FOR WATER DISTRIBUTION SYSTEM

DATE:	BY:	COMMENTS:
01/13/07	JG	Add Fire Hydrant Bollards
03/31/09	JG	Clarify Curb Stop Models
01/12/10	JG	Clarify PIV
10/22/12	JG	Clarify Water Service Make & Size
06/13/14	JG	Clarify Curb Box Manufacturer & Model
10/13/17	JG	Water Crossing Note - Full Length Pipe
01/10/20	NN	Reorganize
04/02/21	NN	Add 30° Elbow & Storz to FDC
06/11/21	NN	General Notes incl. GV & V-Bio Encasement
SCALE: NTS	PAGE: * OF *	FILE: Water Detail Sheet 2021.dwg

DRAWN BY: _____ CHECKED BY: _____