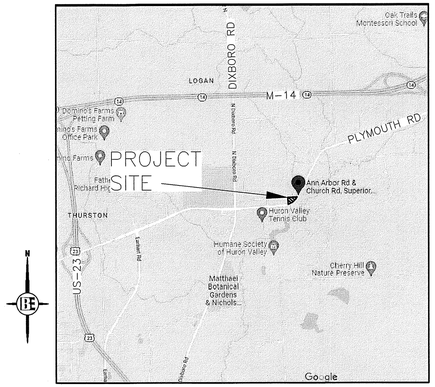
FINAL SITE PLAN
FOR
HURON DENTAL MIXED USE DEVELOPMENT
PART OF NORTHEAST QUARTER, SECTION 18
SUPERIOR TOWNSHIP, WASHTENAW COUNTY, MICHIGAN

PROPERTY DESCRIPTION:

LEGAL DESCRIPTION PER TITLE COMMITMENT NO. 81-22829169-GCM, DATED MARCH 18, 2022, AT 8:00 AM, ISSUED BY STEWART TITLE GUARANTY COMPANY, ISSUING AGENT: ATA NATIONAL TITLE GROUP, LLC:

Land situated in the Township of Superior, County of Washtenaw, State of Michigan:

Part of the North 1/2 of Section 18, Town 2 South, Range 7 East, Superior Township, Washtenaw County, Michigan described as: Beginning at a point on the Southerly line of Church Street (1/2 ROW = 33.00 feet) distant North 88 degrees 24 minutes 05 seconds East 527.00 feet from the Northeast corner of Lot 5, N.E. Section, Village of Dixboro, according to the recorded plat thereof as recorded in the Office of the Register of Deeds February 28, 1828 in Liber "A" of Deeds, Page 273, Washtenaw County Records; thence continuing North 88 degrees 24 minutes 05 seconds East 401.58 feet along said South right of way line of Church Street to a point on the Northerly right of way line of Plymouth Road (66 feet wide); thence 475.70 feet along the arc of a curve to the right having a radius of 641.60 feet a central angle of 42 degrees 28 minutes 48 seconds and a long chord bearing South 53 degrees 51 minutes 32 seconds West 464.87 feet; and thence North 05 degrees 38 minutes 55 seconds West 264.25 feet to the point of beginning.



LOCATION MAP
NO SCALE

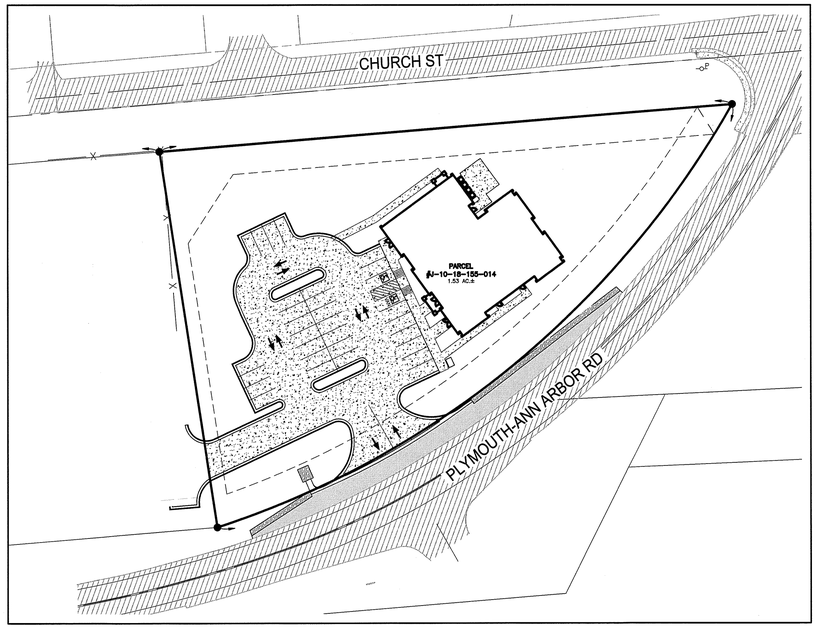
CONSTRUCTION NOTES

THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING NOTES AND ANY WORK INVOLVED SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

1. THE CONTRACTOR SHALL HOLD HARMLESS THE DESIGN PROFESSIONAL, MUNICIPALITY, COUNTY, STATE AND ALL OF ITS SUB CONSULTANTS, PUBLIC AND PRIVATE UTILITY COMPANIES, AND LANDOWNERS FOR DAMAGES TO INDIVIDUALS AND PROPERTY, REAL OR OTHERWISE, DUE TO THE OPERATIONS OF THE CONTRACTOR AND/OR THEIR SUBCONTRACTORS.
2. DO NOT SCALE THESE DRAWINGS AS IT IS A REPRODUCTION AND SUBJECT TO DISTORTION.
3. A GRADING PERMIT FOR SOIL EROSION-SEDIMENTATION CONTROL SHALL BE OBTAINED FROM THE GOVERNING AGENCY PRIOR TO THE START OF CONSTRUCTION.
4. IF DUST PROBLEM OCCURS DURING CONSTRUCTION, CONTROL WILL BE PROVIDED BY AN APPLICATION OF WATER, EITHER BY SPRINKLER OR TANK TRUCK.
5. ALL CONSTRUCTION AND MATERIALS SHALL BE IN ACCORDANCE WITH LOCAL MUNICIPAL STANDARDS AND SPECIFICATIONS.
6. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL REQUIRED TOWNSHIP, COUNTY, AND STATE OF MICHIGAN PERMITS.
7. PAVED SURFACES, WALKWAYS, SIGNS, LIGHTING AND OTHER STRUCTURES SHALL BE MAINTAINED IN A SAFE, ATTRACTIVE CONDITION AS ORIGINALLY DESIGNED AND CONSTRUCTED.
8. ALL BARRIER-FREE FEATURES SHALL BE CONSTRUCTED TO MEET ALL LOCAL, STATE AND A.D.A. REQUIREMENTS.
9. ANY DISCREPANCY IN THIS PLAN AND ACTUAL FIELD CONDITIONS SHALL BE REPORTED TO THE DESIGN ENGINEER PRIOR TO THE START OF CONSTRUCTION. CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFICATION OF ALL SETBACKS, EASEMENTS AND DIMENSIONS SHOWN HEREON BEFORE BEGINNING CONSTRUCTION.
10. THE CONTRACTOR SHALL CONTACT ALL OWNERS OF EASEMENTS, UTILITIES AND RIGHTS-OF-WAY, PUBLIC OR PRIVATE, PRIOR TO THE START OF CONSTRUCTION.
11. THE CONTRACTOR SHALL COORDINATE WITH ALL OWNERS TO DETERMINE THE LOCATION OF EXISTING LANDSCAPING, IRRIGATION LINES & PRIVATE UTILITY LINES. THE CONTRACTOR IS RESPONSIBLE FOR ANY DAMAGE TO EXISTING LANDSCAPING, IRRIGATION LINES, AND PRIVATE UTILITY LINES.
12. THE CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE UPON COMPLETION OF THE PROJECT.
13. THE CONTRACTOR SHALL MAINTAIN THE SITE IN A MANNER SO THAT WORKMEN AND PUBLIC SHALL BE PROTECTED FROM INJURY, AND ADJOINING PROPERTY PROTECTED FROM DAMAGE.
14. THE CONTRACTOR SHALL KEEP THE AREA OUTSIDE THE "CONSTRUCTION LIMITS" BROOM CLEAN AT ALL TIMES.
15. THE CONTRACTOR SHALL CALL MISS DIG A MINIMUM OF 72 HOURS PRIOR TO THE START OF CONSTRUCTION.
16. ALL EXCAVATION UNDER OR WITHIN 3 FEET OF PUBLIC PAVEMENT, EXISTING OR PROPOSED SHALL BE BACKFILLED AND COMPACTED WITH SAND (MDOT CLASS II).
17. ALL PAVEMENT REPLACEMENT AND OTHER WORKS COVERED BY THESE PLANS SHALL BE DONE IN ACCORDANCE WITH THE REQUIREMENTS OF THE TOWNSHIP, INCLUDING THE LATEST MICHIGAN DEPARTMENT OF TRANSPORTATION (MDOT) SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.
18. THE CONTRACTOR IS RESPONSIBLE FOR ALL DAMAGE TO EXISTING UTILITIES.
19. NO ADDITIONAL COMPENSATION WILL BE PAID TO THE CONTRACTOR FOR ANY DELAY OR INCONVENIENCE DUE TO THE MATERIAL SHORTAGES OR RESPONSIBLE DELAYS DUE TO THE OPERATIONS OF SUCH OTHER PARTIES DOING WORK INDICATED OR SHOWN ON THE PLANS OR IN THE SPECIFICATION OR FOR ANY REASONABLE DELAYS IN CONSTRUCTION DUE TO THE ENCOUNTERING OR EXISTING UTILITIES THAT MAY OR MAY NOT BE SHOWN ON THE PLANS.
20. DURING THE CONSTRUCTION OPERATIONS, THE CONTRACTOR SHALL NOT PERFORM WORK BY PRIVATE AGREEMENT WITH PROPERTY OWNERS ADJACENT TO THE PROJECT.
21. IF WORK EXTENDS BEYOND NOVEMBER 15, NO COMPENSATION WILL BE DUE TO THE CONTRACTOR FOR ANY WINTER PROTECTION MEASURES THAT MAY BE REQUIRED BY THE ENGINEER.
22. NO TREES ARE TO BE REMOVED UNTIL MARKED IN THE FIELD BY THE ENGINEER.
23. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGE TO THE PROPERTY BEYOND THE CONSTRUCTION LIMITS INCLUDING BUT NOT LIMITED TO EXISTING FENCE, LAWN, TREES AND SHRUBBERY.
24. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE NORMAL CONSTRUCTION LIMITS OF THE PROJECT SHALL BE SODDED OR SEEDED AS SPECIFIED OR DIRECTED BY THE ENGINEER.
25. ALL ROOTS, STUMPS AND OTHER OBJECTIONABLE MATERIALS SHALL BE REMOVED AND THE HOLE BACKFILLED WITH SUITABLE MATERIAL. WHERE GRADE CORRECTION IS REQUIRED, THE SUBGRADE SHALL BE CUT TO CONFORM TO THE CROSS-SECTION AS SHOWN IN THE PLANS.
26. TRAFFIC SHALL BE MAINTAINED DURING CONSTRUCTION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROVIDING ALL SIGNS AND TRAFFIC CONTROL DEVICES. FLAG PERSONS SHALL BE PROVIDED BY THE CONTRACTOR IF DETERMINED NECESSARY BY THE ENGINEER. ALL SIGNS SHALL CONFORM TO THE MICHIGAN MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES AT NO COST TO THE TOWNSHIP. NO WORK SHALL BE DONE UNLESS THE APPROPRIATE TRAFFIC CONTROL DEVICES ARE IN PLACE.
27. ALL DEMOLISHED MATERIALS AND SOIL SPOILS SHALL BE REMOVED FROM THE SITE AT NO ADDITIONAL COST, AND DISPOSED OF IN ACCORDANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.
28. AFTER REMOVAL OF TOPSOIL, THE SUBGRADE SHALL BE COMPACTED TO 95% OF ITS UNIT WEIGHT.
29. ALL GRADING IN THE PLANS SHALL BE DONE AS PART OF THIS CONTRACT. ALL DELETERIOUS MATERIAL SHALL BE REMOVED FROM THE SUBGRADE PRIOR TO COMPACTING.
30. NO SEEDING SHALL BE DONE AFTER OCTOBER 15 WITHOUT APPROVAL OF THE ENGINEER.
31. ANY EXISTING APPURTENANCES SUCH AS MANHOLES, GATE VALVES, ETC. SHALL BE ADJUSTED TO THE PROPOSED GRADE AND SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
32. SOIL EROSION MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR UNTIL VEGETATION HAS BEEN RE-ESTABLISHED.
33. ALL PERMANENT SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REVISION OF THE MICHIGAN MUTCD MANUAL AND SHALL BE INCIDENTAL TO THE CONTRACT.

INDEMNIFICATION STATEMENT

THE CONTRACTOR SHALL HOLD HARMLESS THE DESIGN PROFESSIONAL, MUNICIPALITY, COUNTY, STATE AND ALL OF ITS SUB CONSULTANTS, PUBLIC AND PRIVATE UTILITY COMPANIES, AND LANDOWNERS FOR DAMAGES TO INDIVIDUALS AND PROPERTY, REAL OR OTHERWISE, DUE TO THE OPERATIONS OF THE CONTRACTOR AND/OR THEIR SUBCONTRACTORS.



OVERALL SITE MAP
NO SCALE

SHEET INDEX

SHEET NO.	DESCRIPTION
1	COVER SHEET
2	GENERAL NOTES & LEGEND
3	EXISTING CONDITIONS & DEMOLITION PLAN
4	TREE REMOVAL & PROTECTION PLAN
5	SITE PLAN
6	DRIVEWAY SITE DISTANCE PER TRAFFIC ENGINEER
7	GRADING, DRAINAGE, & SESC PLAN
8	UTILITY PLAN
9	LANDSCAPE PLAN
10	LIGHTING PLAN
11	STORM PROFILES
12	CIRCULATION PLAN
13	TRAFFIC CONTROL PLAN
14	UNDERGROUND DETENTION DETAILS
15	CONSTRUCTION DETAILS
16	MAINTENANCE PLAN & BUDGET
SHEET NO.	DRAWINGS BY MARITINI-SAMARTINO DESIGN GROUP, LLC.
A1	GROUND FLOOR PLAN
A2	SECOND FLOOR PLAN
A3	NORTH AND WEST ELEVATIONS
A4	EAST AND SOUTH ELEVATIONS
	(4) 11" x 17" 3D BUILDING RENDERINGS IN ROSE COLOR (PREFERRED OPTION 1)
	(4) 11" x 17" 3D BUILDING RENDERINGS IN WHITE COLOR (OPTION 2)

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STATE OF MICHIGAN
SCOTT TOUSIGNANT
PROFESSIONAL ENGINEER
LICENSE NO: 62101-6472
LICENSED PROFESSIONAL ENGINEER

NO	BY	CK	REVISION	DATE
1	JA	BL	PER SUPERIOR TWP, WCRC & WCWRC	4/19/23

ISSUE DATE: 02/22/2023
JOB NO: 22-097

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24. ALL PERMANENT SIGNS AND PAVEMENT MARKINGS SHALL BE INSTALLED IN ACCORDANCE WITH THE LATEST REVISION OF THE MICHIGAN MUTCD MANUAL AND SHALL BE INCIDENTAL TO THE CONTRACT.
25. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO ENSURE THAT ALL ITEMS REQUIRED FOR CONSTRUCTION OF THE PROJECT ARE INCLUDED IN THE CONTRACT. ANY ITEMS NOT SPECIFICALLY DESIGNATED IN THE PLANS SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
26. THE CONTRACTOR IS RESPONSIBLE FOR HAVING A SET OF APPROVED CONSTRUCTION PLANS, WITH THE LATEST REVISION DATE, ON SITE PRIOR TO THE START OF CONSTRUCTION. IN THE EVENT OF ANY QUESTIONS PERTAINING TO THE INTENT OF THE CONSTRUCTION PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL CONTACT THE DESIGN ENGINEER FOR A FINAL DETERMINATION FROM THE DESIGN ENGINEER.
27. THE CONTRACTOR, NOT THE OWNER OR THE ENGINEER, ARE RESPONSIBLE FOR THE MEANS, METHODS, AND SEQUENCE OF CONSTRUCTION. THE CONTRACTOR IS RESPONSIBLE FOR SAFE EXECUTION OF THE PROJECT SCOPE IN ACCORDANCE WITH THE APPROVED CONSTRUCTION PLANS.
28. THE CONTRACTOR IS RESPONSIBLE FOR PRESERVING CONSTRUCTION STAKING AS NECESSARY. CONTRACTOR TO NOTIFY CONSTRUCTION SURVEYOR OF REPLACEMENT STAKES NEEDED WHICH SHALL BE AT THE CONTRACTORS EXPENSE.
29. THE OWNER AND/OR CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING FRANCHISE UTILITY SERVICES (CABLE, ELECTRIC, GAS, ETC.) OWNER AND/OR CONTRACTOR SHALL WORK WITH UTILITY COMPANIES ON FURNISHING SITE UTILITY LAYOUTS AND PROVIDING CONDUIT CROSSINGS AS REQUIRED.
30. DAMAGE TO ANY EXISTING UTILITIES OR INFRASTRUCTURE (INCLUDING PAVEMENT, CURB, SIDEWALK, ETC.) SHALL PROMPTLY BE REPLACED IN KIND AND SHALL BE AT THE CONTRACTORS EXPENSE.
31. COORDINATION OF TESTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND PER ALL CITY/TOWNSHIP/COUNTY REQUIREMENTS. COPIES OF ALL TEST REPORTS SHALL BE FURNISHED TO THE DESIGN ENGINEER.
32. PRIOR TO THE START OF CONSTRUCTION, PROTECTION FENCING SHALL BE ERECTED AROUND THE TREE DRIPLINE OF ANY TREES INDICATED TO BE SAVED WITHIN THE LIMITS OF DISTURBANCE.
33. THE CONTRACTOR SHALL MAINTAIN DRAINAGE OF THE PROJECT AREA AND ADJACENT AREAS. WHERE EXISTING DRAINAGE FACILITIES ARE IMPACTED/DISTURBED DUE TO CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE ANY NECESSARY TEMPORARY DRAINAGE PROVISIONS.
34. SOIL BORING LOGS ARE REPRESENTATIVE OF SPECIFIC POINTS ON THE PROJECT SITE, AND IF PROVIDED TO THE CONTRACTOR ARE FOR INFORMATIONAL PURPOSES ONLY.
35. WHERE CITY/TOWNSHIP STANDARD CONSTRUCTION DETAILS/SPECIFICATIONS ARE PROVIDED AND ARE IN CONFLICT WITH NOTES AND SPECIFICATIONS HEREIN, THE CITY/TOWNSHIP STANDARD SHALL GOVERN.

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GENERAL GRADING & SESC NOTES

1. THE CONTRACTOR SHALL HAVE IN PLACE ALL REQUIRED EROSION CONTROL METHODS AS INDICATED ON THE CONSTRUCTION PLANS AND AS REQUIRED BY GENERAL PRACTICE. SPECIFIC MEANS, METHODS AND SEQUENCES OF CONSTRUCTION MAY DICTATE ADDITIONAL SOIL EROSION CONTROL MEASURES BE NEEDED. THE CONTRACTOR SHALL COORDINATE WITH THE DESIGN ENGINEER ON THESE ANTICIPATED METHODS. ADDITIONAL SOIL EROSION CONTROL METHODS SHALL BE INCIDENTAL TO THE SCOPE OF WORK.
2. ACTUAL FIELD CONDITIONS MAY DICTATE ADDITIONAL OR ALTERNATE SOIL EROSION CONTROL MEASURES BE UTILIZED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DEFICIENCIES OR FIELD CONDITIONS THAT WARRANT ADDITIONAL AND/OR ALTERNATIVE SESC MEASURES BE UTILIZED.
3. AT THE CLOSE OF EACH DAY, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ENSURING ALL CONSTRUCTION OPERATIONS, MATERIALS, DEBRIS, ETC ARE CONTAINED ON–SITE.
4. AT THE CLOSE OF EACH WORKING DAY, ALL DRAINAGE STRUCTURES SHALL BE FREE OF DIRT AND DEBRIS AT THE FLOW LINE.
5. ALL SOIL EROSION CONTROL MEASURES SHALL BE INSTALLED IN ACCORDANCE PER MDEGLE REGULATIONS AND BEST PRACTICES, ALL SOIL EROSION CONTROL MEASURES SHALL BE MAINTAINED BY THE CONTRACTOR.
6. THE SOIL EROSION CONTROL MEASURES SHALL BE KEPT IN PLACE UNTIL SUCH A TIME THAT THE SITE IS DETERMINED TO BE ESTABLISHED WITH ACCEPTABLE AMOUNT OF VEGETATIVE GROUND COVER.
7. ALL AREAS DISTURBED BY THE CONTRACTOR BEYOND THE NORMAL CONSTRUCTION LIMITS OF THE PROJECT SHALL BE SODDED OR SEEDED AS SPECIFIED OR DIRECTED BY THE ENGINEER.
8. AFTER REMOVAL OF TOPSOIL, THE SUBGRADE SHALL BE COMPACTED TO 95% OF ITS UNIT WEIGHT.
9. ALL GRADING IN THE PLANS SHALL BE DONE AS PART OF THIS CONTRACT. ALL DELETERIOUS MATERIAL SHALL BE REMOVED FROM THE SUBGRADE PRIOR TO COMPACTING.
10. ALL ROOTS, STUMPS AND OTHER OBJECTIONABLE MATERIALS SHALL BE REMOVED AND THE HOLE BACKFILLED WITH SUITABLE MATERIAL. WHERE GRADE CORRECTION IS REQUIRED, THE SUBGRADE SHALL BE CUT TO CONFORM TO THE CROSS–SECTION AS SHOWN IN THE PLANS.
11. ALL EXCAVATION UNDER OR WITHIN 3 FEET OF PUBLIC PAVEMENT, EXISTING OR PROPOSED SHALL BE BACKFILLED AND COMPACTED WITH SAND (MDOT CLASS II).

GENERAL LANDSCAPE NOTES

1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY. ALL STOCK SHALL BE NURSERY GROWN, CONFORMING TO ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK", AND IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. STOCK SHALL EXHIBIT NORMAL GROWTH HABIT AND BE FREE OF DISEASE, INSECTS, EGGS, LARVAE, & DEFECTS SUCH AS KNOTS, SUN–SCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.
2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT, AND SECURELY WRAPPED AND BOUND.
3. ALL PLANT BED MATERIALS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS, OTHER EXTRANEOUS OBJECTS, AND POOR SOILS TO A MINIMUM DEPTH OF 12–INCHES AND BACKFILLED TO GRADE WITH SPECIFIED PLANTING MIX (SEE BELOW).
4. PLANTING MIXTURE SHALL CONSIST OF 5 PARTS TOPSOIL FROM ON–SITE (AS APPROVED), 4 PARTS COARSE SAND, 1 PART SPHAGNUM PEAT MOSS (OR APPROVED COMPOST), AND 5 LBS OF SUPERPHOSPHATE FERTILIZER PER CU. YD. OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED FOR UNIFORM CONSISTENCY.
5. ALL PLANT BEDS AND INDIVIDUAL PLANTS, NOT OTHERWISE NOTED SHALL BE MULCHED WITH A 4–INCH LAYER OF SHREDDED BARK MULCH. EDGE OF MULCH BEDS AS SHOWN. DECIDUOUS TREES IN LAWN AREAS SHALL RECEIVE A 5–FT DIAMETER CIRCLE OF MULCH AND CONIFER TREES 8–FT (PLANTED CROWN OF TREE) UNLESS OTHERWISE NOTED.
6. LANDSCAPE STONE SHALL BE INSTALLED WHERE NOTED OR INDICATED (HATCHED). STONE SHALL BE 3/4"–1–1/4" WASHED RIVER GRAVEL OR AS SELECTED AND SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3–INCHES.
7. ALL LANDSCAPE BEDS, UNLESS OTHERWISE NOTED SHALL BE INSTALLED OVER WEED BARRIER FABRIC – WATER PERMEABLE FILTRATION FABRIC OF NON–WOVEN POLYPROPYLENE OR POLYESTER FABRIC. FABRIC SHALL BE OF SUITABLE THICKNESS FOR APPLICATION.
8. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.
9. THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF 1 YEAR FROM THE DATE THE WORK IS ACCEPTED, IN WRITING, BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, WITHIN A SPECIFIED PERIOD OF TIME, ALL DEAD PLANTS, AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE LANDSCAPE ARCHITECT, DURING AND AT THE END OF THE GUARANTEE PERIOD. REPLACEMENT STOCK SHALL CONFORM TO THE ORIGINAL SPECIFICATIONS.
10. EDGING SHALL BE PROVIDED FOR ALL LANDSCAPE BEDS NOT ADJACENT TO CONCRETE PAVEMENT. EDGING SHALL BE BLACK ALUMINUM EDGING, 3/16–INCH X 4–INCH. INSTALL PER MANUFACTURER'S INSTRUCTIONS, ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.
11. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUE GRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4–INCH AT TIME OF PLANTING, AND CUT IN UNIFORM STRIPS NOT LESS THAN 10–INCHES BY 18–INCHES. SOD SHALL BE KEPT MOIST AND LAID WITHIN 36–HOURS AFTER CUTTING.

    IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ALL SODDED AREAS THAT BROWN–OUT OR HAVE NOT FIRMLY KNITTED TO THE SOIL BASE WITHIN A PERIOD OF 1 MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.
12. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.

    SEED MIXTURE SHALL BE AS FOLLOWS:

KENTUCKY BLUEGRASS (CHOOSE 3 VARIETIES – ADELPHI, RUGBY, GLADE, OR PARADE)	30%
RUBY RED OR DAWSON RED FINE FESCUE	30%
ATLANTA RED FESCUE	20%
PENNFINE PERENNIAL RYE	20%

    THE ABOVE SEED MIXTURE SHALL BE SOWN AT A RATE OF 250 LBS PER ACRE. PRIOR TO SEEDING, THE TOPSOIL SHALL BE FERTILIZED WITH A COMMERCIAL FERTILIZER WITH A 10–0–10 ANALYSIS:

    10% NITROGEN – MIN 25% FROM A UREA FORMALDEHYDE SOURCE
    0 % PHOSPHATE
    10% POTASH – SOURCE POTASSIUM SULFATE OR POTASSIUM NITRATE

    THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 LBS PER 1000 SQ FT OF BULK FERTILIZER.

    IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ANY PART OF THE AREA THAT FAILS TO SHOW A UNIFORM GERMINATION SHALL BE RE–SEEDED AND SUCH RE–SEEDING SHALL CONTINUE UNTIL A DENSE LAWN IS ESTABLISHED. DAMAGE TO SEEDED AREAS RESULTING FROM EROSION SHALL BE REPAIRED BY THE CONTRACTOR.
13. ALL AREAS OF THE SITE SCHEDULED FOR SEEDING OR SODDING SHALL FIRST RECEIVE A 6–INCH LAYER OF CLEAN, FRIABLE TOPSOIL. THE SOIL SHALL BE DISCED AND SHALL BE GRADED IN CONFORMANCE WITH THE GRADING PLAN.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES AND TO INFORM THE LANDSCAPE ARCHITECT OF ANY CONFLICTS PRIOR TO COMMENCING LANDSCAPING.

GENERAL UTILITY NOTES

1. BEDDING SHALL EXTEND A MINIMUM OF 4" BELOW THE PIPE, UNLESS OTHERWISE NOTED ON THE PLANS. BEDDING SHALL BE OF UNIFORM GRADATION MDOT 6AA STONE OR MDOT CLASS II GRANULAR MATERIAL FOR SANITARY AND STORM PIPE AND MDOT CLASS II GRANULAR MATERIAL ONLY FOR WATERMAIN.
2. WHERE UNSTABLE GROUND CONDITIONS ARE ENCOUNTERED, STONE BEDDING SHALL BE USED AS DIRECTED BY THE ENGINEER.
3. BACKFILL SHALL BE OF A SUITABLE MATERIAL AND SHALL BE FREE OF ANY ORGANIC MATERIALS AND ROCKS.
4. BACKFILL ABOVE THE PIPE SHALL BE OF GRANULAR MATERIAL MDOT CLASS II TO A POINT 12" ABOVE THE TOP OF THE PIPE. WHERE THE TRENCH IS NOT WITHIN THE INFLUENCE OF THE ROAD, SUITABLE SITE MATERIAL MAY BE COMPACTED AND UTILIZED FROM A POINT 12" ABOVE THE PIPE TO GRADE. WHERE THE TRENCH IS WITHIN A 1:1 INFLUENCE OF THE ROAD, GRANULAR MATERIAL, MDOT CLASS II OR III, IS TO BE PLACED AND COMPACTED IN LAYERS NOT EXCEEDING 12" IN THICKNESS. COMPACTION SHALL BE 95% AS DETERMINED BY AASHTO T99.
5. 18" MINIMUM VERTICAL SEPARATION AND 10' HORIZONTAL SEPARATION IS TO BE MAINTAINED BETWEEN WATERMAIN AND SANITARY/STORM SEWER TO THE MAXIMUM EXTENT POSSIBLE.

GENERAL STORM NOTES

1. ALL STORM PIPE LENGTHS ARE SHOWN FROM C/L TO C/L OF STRUCTURE OR FROM C/L OF STRUCTURE TO DISCHARGE END OF FLARED END SECTION.
2. STORM PIPE MATERIALS SHALL BE AS FOLLOWS:
    - 2.1. RCP(REINFORCED CONCRETE PIPE): SHALL MEET THE REQUIREMENTS OF ASTM C76 WITH MODIFIED GROOVED TONGUE AND RUBBER GASKETS MEETING THE REQUIREMENTS OF ASTM C443. RCP TO BE EITHER CLASS IV OR V AS CALLED OUT ON THE PLANS.
    - 2.2. PVC(POLYVINYL CHLORIDE): SHALL MEET THE REQUIREMENTS OF ASTM D3034.
3. STORM PIPE JOINTS SHALL MEET THE REQUIREMENTS OF ASTM D3212. HDPE AND PP PIPE GASKETS SHALL MEET THE REQUIREMENTS OF ASTM F477.
4. ALL STORM PIPE TO HAVE WATERTIGHT PREMIUM JOINTS, UNLESS OTHERWISE NOTED ON THE PLANS.
5. STORM DRAINAGE STRUCTURES SHALL BE FURNISHED WITH STEPS WHICH SHALL BE STEEL ENCASED WITH POLYPROPYLENE PLASTIC OR EQUIVALENT. STEPS SHALL BE SET AT 16" CENTER TO CENTER.
6. ALL FLARED END SECTIONS 15" AND LARGER SHALL BE FURNISHED WITH AN ANIMAL GRATE.
7. FLARED END SECTIONS DISCHARGING STORM WATER SHALL RECEIVE A MINIMUM OF 10 SQ YDS OF PLAIN STONE RIP RAP WITH A MINIMUM STONE SIZE OF 6" AND SHALL BE PLACED ON A GEOTEXTILE FABRIC WRAP.
8. ALL CATCH BASINS WITHIN THE ROADWAY SHALL INCLUDE INSTALLATION OF 6" DIAMETER PERFORATED PIPE SUBDRAIN.
9. STORM DRAINAGE STRUCTURE COVERS SHALL BE OF THE FOLLOWING (OR APPROVED EQUAL):

COVER	USE	FRAME	GRATE/BACK
'A'	MANHOLE	1040	TYPE 'B'
'B'	TYPE B2 CURB	7085	TYPE 'M1'
'C'	VALLEY CURB	7065	7045 TYPE 'M1' GRATE/7060 TYPE 'T1' BACK
'D'	PARKING LOTS	1040/5100	TYPE 'M1' GRATE OR 5105 TYPE 'M1' GRATE
'E'	LAWN	1040	TYPE 'O2' GRATE
'K'	TYPE C & F CURB	7045	TYPE 'M1' GRATE/7050 TYPE 'T1' BACK

GENERAL SANITARY NOTES

1. SEPTIC SYSTEM DESIGN TO BE PROVIDED SEPARATELY.

GENERAL WATERMAIN NOTES

1. ON–SITE WELLS TO BE UTILIZED.

LINES & HATCHES LEGEND

PROPOSED (PR) | EXISTING (EX)

- 900 — CONTOUR
- T/C XXX.XX / + 922.08 — SPOT ELEVATION
- SN — SANITARY SEWER
- SL — SANITARY LEAD
- FM — FORCE MAIN
- PS — PRESSURE SEWER
- ST — STORM SEWER
- WM — WATER MAIN
- WL — WATER LEAD
- FO — FIBER OPTIC
- OH — OVERHEAD WIRE
- C — CABLE
- E — ELECTRIC
- G — GAS
- T — TELEPHONE
- X — FENCE
- SILT FENCE
- WETLAND BOUNDARY
- LIMITS OF GRADING/CLEARING
- LIMITS OF DRAINAGE
- MODIFIED CURB
- CONCRETE
- HIGH STRENGTH CONCRETE
- ASPHALT
- HIGH STRENGTH ASPHALT
- WETLAND
- SAN #1 — SANITARY SEWER LABEL
- CB 01 — STORM SEWER LABEL
- GV 12 — WATER MAIN LABEL
- 54T — SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY)

LIGHTING LEGEND

PROPOSED (PR) | EXISTING (EX)

- DOUBLE FIXTURE LIGHT POLE
- SINGLE FIXTURE LIGHT FIXTURE
- WALL MOUNTED LIGHT FIXTURE
- GROUND LIGHT FIXTURE
- 0.1 — FOOT CANDLES ON SITE
- 2.5 — FOOT CANDLES OFF SITE
- 5 — FOOT CANDLES CONTOURS
- CANOPY MOUNTED LIGHT FIXTURE

LANDSCAPE LEGEND

- EXISTING DECIDUOUS TREE
- PROPOSED CONIFER TREE
- PROPOSED DECIDUOUS TREE
- PROPOSED TREE PROTECTION
- PROPOSED ORNAMENTAL TREE
- PROPOSED EVERGREEN SHRUBS
- PROPOSED DECIDUOUS SHRUBS
- PROPOSED ORNAMENTAL GRASS
- PROPOSED SPREADING EVERGREEN SHRUBS
- PROPOSED PERENNIAL MIX (SELECTED BY CONTRACTOR)
- PROPOSED STONE DRIP EDGE (SEE DTL FOR INSTALLATION)
- PROPOSED GERANIUM 'ROZANNE' GROUNDCOVER

ABBREVIATIONS

FFE	FINISHED FLOOR ELEVATION
BFE	BASEMENT FLOOR ELEVATION
GFE	GARAGE FLOOR ELEVATION
FG	FINISHED GRADE
T/A	TOP OF ASPHALT
T/C	TOP OF CONCRETE/CURB
T/W	TOP OF WALK
T/P	TOP OF PIPE
B/C	BACK OF CURB
B/P	BOTTOM OF PIPE
F/L	FLOW LINE
RIM	RIM ELEVATION (AT FLOW LINE)
INV	INVERT ELEVATION
MH	MANHOLE
CB	CATCH BASIN
RY	REAR YARD
YD	YARD DRAIN
RD	ROOF DRAIN
FES	FLARED END SECTION
CMP	CORRUGATED METAL PIPE
CPP	CORRUGATED PLASTIC PIPE
RCP	REINFORCED CONCRETE PIPE
HDPE	HIGH DENSITY POLYETHYLENE
PVC	POLYVINYL CHLORIDE
DIP	DUCTILE IRON PIPE
GV	GATE VALVE
GVW	GATE VALVE IN WELL
GVB	GATE VALVE IN BOX
HYD	HYDRANT
FDC	FIRE DEPARTMENT CONNECTION
UP	UTILITY POLE
NFV	NOT FIELD VERIFIED
TBR	TO BE REMOVED
L.	LIBER
P.	PAGE
L.C.R.	LIVINGSTON COUNTY RECORDS
(M&R)	MEASURED AND RECORD
L.O.B.	POINT OF BEGINNING

SYMBOL LEGEND

- STORM DRAINAGE FLOW
- GUY WIRE
- POWER POLE
- TRANSFORMER PAD
- ELECTRICAL RISER
- U.G. ELECTRIC MARKER
- ELECTRICAL METER
- AIR CONDITIONING UNIT
- TELEPHONE RISER
- U.G. TELEPHONE MARKER
- GAS RISER
- U.G. GAS MARKER
- GAS METER
- CABLE TV RISER
- U.G. CABLE TV MARKER
- MAILBOX
- WELL
- WATER MANHOLE
- GATE VALVE (EXISTING)
- GATE VALVE (PROPOSED)
- HYDRANT (EXISTING)
- HYDRANT (PROPOSED)
- CATCH BASIN (EXISTING)
- YARD CATCH BASIN (EXISTING)
- CATCH BASIN (PROPOSED)
- STORM MANHOLE (EXISTING)
- STORM MANHOLE (PROPOSED)
- END SECTION (EXISTING)
- END SECTION (PROPOSED)
- SANITARY MANHOLE (EXISTING)
- SANITARY MANHOLE (PROPOSED)
- PUMP CHAMBER
- TRAFFIC SIGN
- SIGN (EXISTING)
- SIGN (PROPOSED)
- SOIL BORING
- STEEL ROD SET
- STEEL ROD OR PIPE FOUND
- WOOD LATH SET
- HUB SET
- MONUMENT FOUND
- SECTION CORNER
- GAS PUMP
- ANTENNA
- SATELLITE DISH
- NEWSPAPER BOX
- PARKING METER
- PHONE BOOTH
- HANDICAP SYMBOL
- BENCHMARK
- LIGHT POLE
- #### — TREE SYMBOL WITH TAG #

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

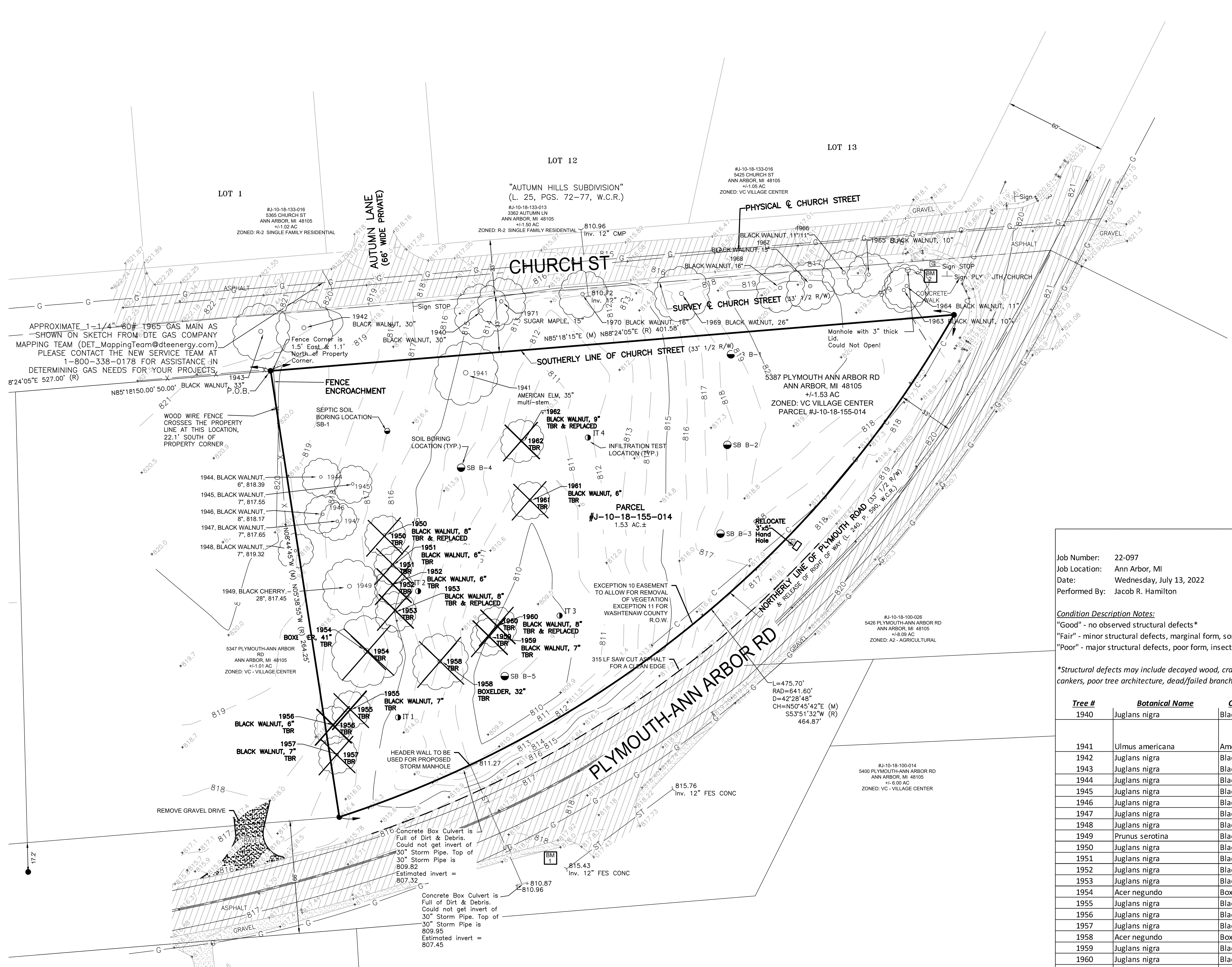
PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE: GENERAL NOTES & LEGEND

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: ST
DRAWN BY: MJD
CHECKED BY:
SCALE: NO SCALE
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 2



SCALE: 1 INCH = 30 FEET

GENERAL SURVEY NOTES:

1. BEARINGS ARE BASED ON MICHIGAN STATE PLANE COORDINATE SYSTEM, SOUTH ZONE.
2. SUBSURFACE UTILITIES NOT LOCATED FOR THIS SURVEY MAY EXIST. IT IS THE RESPONSIBILITY OF THE OWNER OF THE RESPECTIVE UTILITY TO ACCURATELY LOCATE SUCH UTILITIES.
3. ELEVATIONS WERE ESTABLISHED WITH GPS USING OPUS GPS POST-PROCESSING. (NAVD88 DATUM)
4. CONTOURS ARE SHOWN AT 1 FOOT INTERVALS.
5. NO WETLANDS ARE PRESENT ON SITE.

SITE BENCHMARKS (NAVD88 DATUM):

-BM #1 = SET MAG NAIL WITH BOSS BM TAG ON TOP OF EAST GUARDRAIL POST, S/S PLYMOUTH-ANN ARBOR ROAD, WEST OF ENTRANCE TO 5400 PLYMOUTH-ANN ARBOR ROAD ("THE BORO"). ELEVATION = 820.49

-BM #2 = SET MAG NAIL WITH BOSS BM TAG NW/S POWER POLE AT SOUTHWEST INTERSECTION OF PLYMOUTH-ANN ARBOR ROAD & CHURCH STREET. ELEVATION = 819.52

SITE SOILS:

1. BnC - BOYER LOAMY SAND, 6 TO 12 PERCENT SLOPES (HYDROLOGIC SOIL GROUP A)

SOILS TAKEN FROM USDA WEB SOIL SURVEY.

Tree Inventory List

Job Number: 22-097
Job Location: Ann Arbor, MI
Date: Wednesday, July 13, 2022
Performed By: Jacob R. Hamilton

Condition Description Notes:
"Good" - no observed structural defects*
"Fair" - minor structural defects, marginal form, some insect activity noted*
"Poor" - major structural defects, poor form, insect infested*

**Structural defects may include decayed wood, cracks, root problems, weak branch unions cankers, poor tree architecture, dead/failed branches due to various causes.*

Tree #	Botanical Name	Common Name	Dia.	Type	Other Dia.	Condition	Comments
1940	Juglans nigra	Black Walnut	30			Good	
1941	Ulmus americana	American Elm	35	Multiple	7,6	Good	
1942	Juglans nigra	Black Walnut	30			Good	
1943	Juglans nigra	Black Walnut	33			Good	
1944	Juglans nigra	Black Walnut	6			Good	
1945	Juglans nigra	Black Walnut	7			Good	
1946	Juglans nigra	Black Walnut	8			Good	
1947	Juglans nigra	Black Walnut	7			Good	
1948	Juglans nigra	Black Walnut	7			Good	
1949	Prunus serotina	Black Cherry	28			Good	
1950	Juglans nigra	Black Walnut	8			Good	
1951	Juglans nigra	Black Walnut	6			Good	
1952	Juglans nigra	Black Walnut	6			Good	
1953	Juglans nigra	Black Walnut	8			Good	
1954	Acer negundo	Boxelder	41			Poor	Lost leader, broken large limb, rot
1955	Juglans nigra	Black Walnut	7			Good	
1956	Juglans nigra	Black Walnut	6			Good	
1957	Juglans nigra	Black Walnut	7			Good	
1958	Acer negundo	Boxelder	32			Good	
1959	Juglans nigra	Black Walnut	7			Good	
1960	Juglans nigra	Black Walnut	8			Good	
1961	Juglans nigra	Black Walnut	6			Good	
1962	Juglans nigra	Black Walnut	9			Good	
1963	Juglans nigra	Black Walnut	10			Good	
1964	Juglans nigra	Black Walnut	11			Fair	Girdled by wire fence
1965	Juglans nigra	Black Walnut	10			Good	
1966	Juglans nigra	Black Walnut	11	Twin	11	Good	
1967	Juglans nigra	Black Walnut	15			Good	
1968	Juglans nigra	Black Walnut	16			Fair	Heavy vines
1969	Juglans nigra	Black Walnut	26			Good	
1970	Juglans nigra	Black Walnut	16			Good	
1971	Acer saccharum	Sugar Maple	15			Good	

LEGAL DESCRIPTION PER TITLE COMMITMENT NO. 81-22829169-GCM, DATED MARCH 18, 2022, AT 8:00 AM, ISSUED BY STEWART TITLE GUARANTY COMPANY, ISSUING AGENT: ATA NATIONAL TITLE GROUP, LLC:

Land situated in the Township of Superior, County of Washtenaw, State of Michigan:

Part of the North 1/2 of Section 18, Town 2 South, Range 7 East, Superior Township, Washtenaw County, Michigan described as: Beginning at a point on the Southerly line of Church Street (1/2 ROW = 33.00 feet) distant North 88 degrees 24 minutes 05 seconds East 527.00 feet from the Northeast corner of Lot 5, N.E. Section, Village of Dixboro, according to the recorded plat thereof as recorded in the Office of the Register of Deeds February 28, 1828 in Liber "A" of Deeds, Page 273, Washtenaw County Records; thence continuing North 88 degrees 24 minutes 05 seconds East 401.58 feet along said South right of way line of Church Street to a point on the Northerly right of way line of Plymouth Road (66 feet wide); thence 475.70 feet along the arc of a curve to the right having a radius of 641.60 feet a central angle of 42 degrees 28 minutes 48 seconds and a long chord bearing South 53 degrees 51 minutes 32 seconds West 464.87 feet; and thence North 05 degrees 38 minutes 55 seconds West 264.25 feet to the point of beginning.

SCHEDULE B - SECTION II EXCEPTIONS TITLE COMMITMENT NO. 81-22829169-GCM, DATED MARCH 18, 2022, AT 8:00 AM, ISSUED BY STEWART TITLE GUARANTY COMPANY, ISSUING AGENT: ATA NATIONAL TITLE GROUP, LLC:

10 Easement to allow for the potential removal of vegetation and potential construction of a deceleration lane recorded in Liber 5464, Page 590, Washtenaw County Records. (AFFECTS SUBJECT PROPERTY AND ADJOINING PARCEL TO THE WEST. PROVIDES EASEMENT TO ALLOW FOR THE POTENTIAL REMOVAL OF VEGETATION AND POTENTIAL CONSTRUCTION OF A DECELERATION LANE IF REQUIRED BY WASHTENAW COUNTY ROAD COMMISSION OR SUPERIOR TOWNSHIP.)

11 Release of Right of Way to the Board of County Road Commissioners recorded in Liber 240, Page 590, Washtenaw County Records. (PROVIDED RELEASE OF RIGHT OF WAY TO THE BOARD OF COUNTY ROAD COMMISSIONERS OF THe COUNTY OF WASHTENAW OVER PLYMOUTH-ANN ARBOR ROAD. THE NORTHERLY LINE OF THE RIGHT OF WAY IS THE SOUTHERLY LINE OF SUBJECT PROPERTY.)

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3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

STATE OF MICHIGAN ★ CHRISTOPHER S. FERGUS License No. 4001047055 LICENSED PROFESSIONAL SURVEYOR

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE: EXISTING CONDITIONS & DEMOLITION PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: JA
DRAWN BY: JA
CHECKED BY: BL
SCALE: 1" = 30'
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 3

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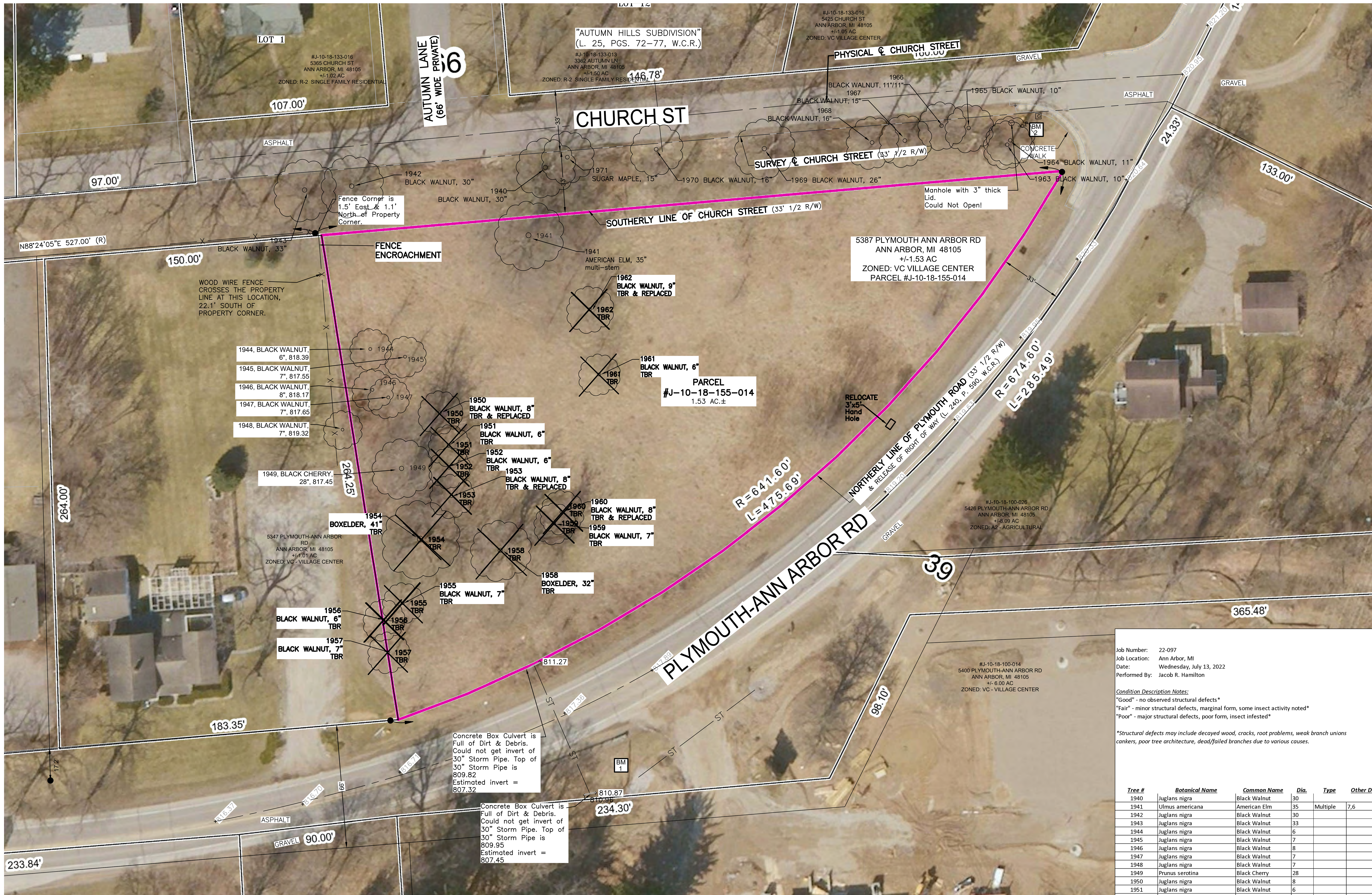

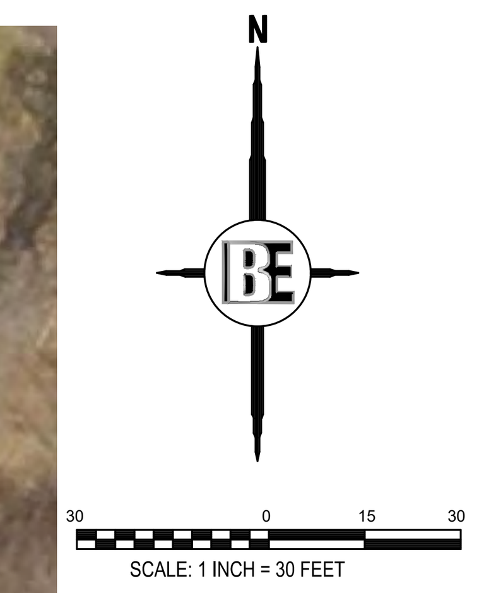

Tree Removals

Job Number: 22-097
Job Location: Ann Arbor, MI
Date: Wednesday, July 13, 2022
Performed By: Jacob R. Hamilton

Condition Description Notes:
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"Fair" - minor structural defects, marginal form, some insect activity noted*
"Poor" - major structural defects, poor form, insect infested*

**Structural defects may include decayed wood, cracks, root problems, weak branch unions cankers, poor tree architecture, dead/failed branches due to various causes.*

Tree #	Botanical Name	Common Name	Dia.	Type	Other Dia.	Condition	ON-SITE Regulated Tree	Comments	Tree to Be Removed	REPLACEMENT RATIO: Replacement Required Per Ordinance?	Number of Replacement Trees Required Per Removed Tree
1940	Juglans nigra	Black Walnut	30			Good			NO, OFF SITE		
1941	Ulmus americana	American Elm	35	Multiple	7,6	Good	REGULATED		NO		
1942	Juglans nigra	Black Walnut	30			Good			NO, OFF SITE		
1943	Juglans nigra	Black Walnut	33			Good			NO, OFF SITE		
1944	Juglans nigra	Black Walnut	6			Good	REGULATED		NO		
1945	Juglans nigra	Black Walnut	7			Good	REGULATED		NO		
1946	Juglans nigra	Black Walnut	8			Good	REGULATED		NO		
1947	Juglans nigra	Black Walnut	7			Good	REGULATED		NO		
1948	Juglans nigra	Black Walnut	7			Good			NO, OFF SITE		
1949	Prunus serotina	Black Cherry	28			Good	REGULATED		NO		
1950	Juglans nigra	Black Walnut	8			Good	REGULATED		YES	Yes, Replacement Ratio 1:1	(1) 2.5" Caliper
1951	Juglans nigra	Black Walnut	6			Good			YES	No, below 8" D.B.H. per Ordinance	
1952	Juglans nigra	Black Walnut	6			Good			YES	No, below 8" D.B.H. per Ordinance	
1953	Juglans nigra	Black Walnut	8			Good	REGULATED		YES	Yes, Replacement Ratio 1:1	(1) 2.5" Caliper
1954	Acer negundo	Boxelder	41			Poor		Lost leader, broken large limb, rot	YES	No, species not valuable per Ordinance	
1955	Juglans nigra	Black Walnut	7			Good			YES	No, below 8" D.B.H. per Ordinance	
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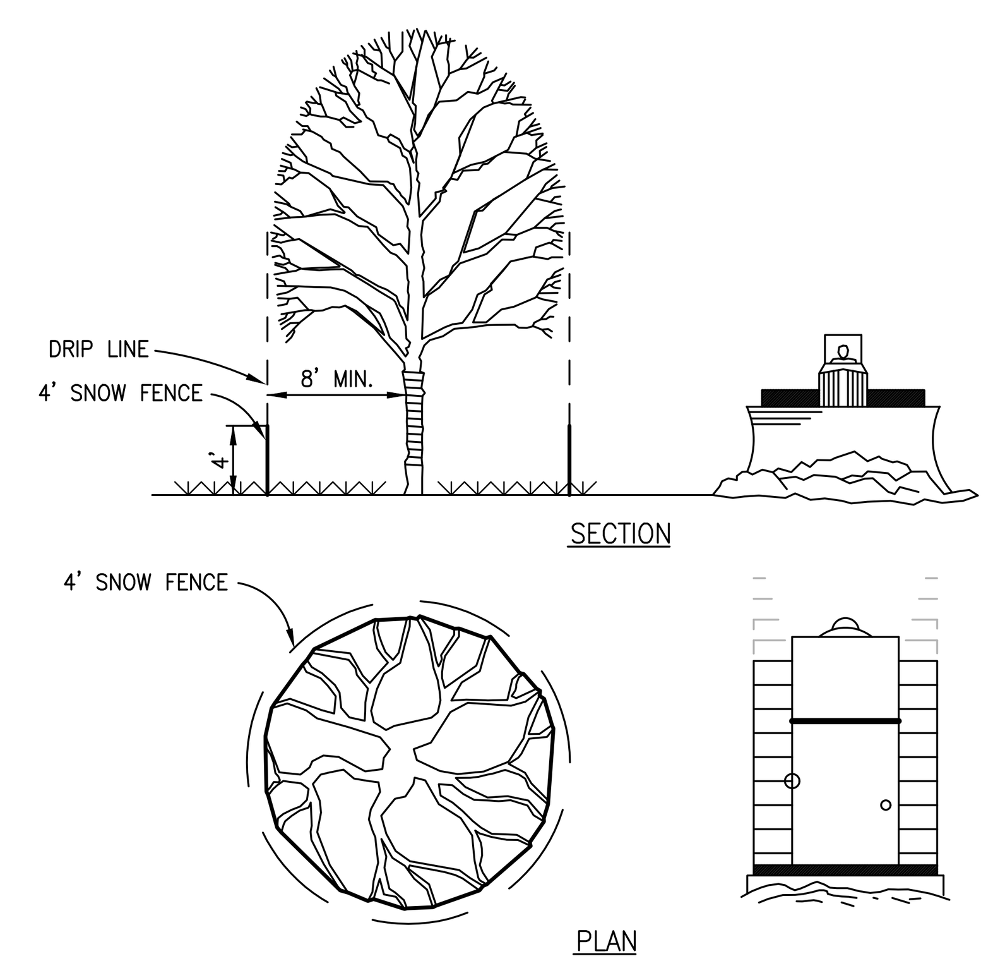
1957	Juglans nigra	Black Walnut	7			Good			YES	No, below 8" D.B.H. per Ordinance	
1958	Acer negundo	Boxelder	32			Good			YES	No, species not valuable per Ordinance	
1959	Juglans nigra	Black Walnut	7			Good			YES	No, below 8" D.B.H. per Ordinance	
1960	Juglans nigra	Black Walnut	8			Good	REGULATED		YES	Yes, Replacement Ratio 1:1	(1) 2.5" Caliper
1961	Juglans nigra	Black Walnut	6			Good			YES	No, below 8" D.B.H. per Ordinance	
1962	Juglans nigra	Black Walnut	9			Good	REGULATED		YES	Yes, Replacement Ratio 1:1	(1) 2.5" Caliper
1963	Juglans nigra	Black Walnut	10			Good			NO, OFF SITE		
1964	Juglans nigra	Black Walnut	11			Fair		Girdled by wire fence	NO, OFF SITE		
1965	Juglans nigra	Black Walnut	10			Good			NO, OFF SITE		
1966	Juglans nigra	Black Walnut	11	Twin	11	Good			NO, OFF SITE		
1967	Juglans nigra	Black Walnut	15			Good			NO, OFF SITE		
1968	Juglans nigra	Black Walnut	16			Fair		Heavy vines	NO, OFF SITE		
1969	Juglans nigra	Black Walnut	26			Good			NO, OFF SITE		
1970	Juglans nigra	Black Walnut	16			Good			NO, OFF SITE		
1971	Acer saccharum	Sugar Maple	15			Good			NO, OFF SITE		

SUMMARY

TOTAL NUMBER OF REGULATED TREES TO BE PRESERVED:	6
TOTAL NUMBER OF REGULATED TREES TO BE REMOVED:	4
NUMBER OF REGULATED TREES ON SITE BEFORE REMOVAL:	10
PERCENTAGE OF REGULATED TREES ON SITE AFTER REMOVAL:	60%
TOTAL NUMBER OF REPLACEMENT TREES REQUIRED:	4
PERCENTAGE OF REPLACEMENT TREE REQUIREMENT SATISFIED BY UP TO 50% OF BUFFERING AND SCREENING TREES ON SITE	50%

TREE PROTECTION NOTES:

1. THE LANDSCAPE ARCHITECT SHALL SUPERVISE THE TAGGING OF TREES TO BE TRANSPLANTED, TREES TO REMAIN, AND TREES TO BE REMOVED. FOR IDENTIFICATION OF PROPOSED ACTION FOR EXISTING TREES, THE FOLLOWING METHODS WILL BE USED: AN ORANGE PAINTED "X" FOR TREES TO BE REMOVED; YELLOW FLAGGING FOR TREES TO BE TRANSPLANTED; AND SNOW FENCE PROTECTION AS SHOWN IN THE DETAIL FOR TREES TO REMAIN.
2. EXISTING TREES WITHIN FIFTEEN FEET (15') OF BUILDINGS ARE TO BE PRUNED AFTER CONSTRUCTION BY A PROFESSIONAL TREE CONTRACTOR AS SPECIFIED BY THE LANDSCAPE ARCHITECT.
3. NO DAMAGING ATTACHMENTS SUCH AS WIRES (OTHER THAN CABLE WIRES FOR TREES) SIGNS, OR PERMITS MAY BE FASTENED TO ANY TREE PROTECTED BY THE ORDINANCE.
4. FOR TREES TO BE SAVED, A FOUR FOOT (4') HIGH SNOW FENCE SHALL BE ERECTED AROUND THE TREE DRIP LINE PRIOR TO LAND CLEARING AND CONSTRUCTION AND MAINTAINED THROUGHOUT SITE DEVELOPMENT. NO CUTTING, FILLING, OR TRESPASSING SHALL OCCUR INSIDE THE FENCED AREA WITH OUT APPROVAL OF THE CITY/TOWNSHIP. THE SNOW FENCING SHALL REMAIN IN ITS APPROVED LOCATION UNTIL SUCH TIME AS IT IS AUTHORIZED TO BE REMOVED BY THE CITY OR ISSUANCE OF A FINAL CERTIFICATE OF OCCUPANCY.
5. NO ACTIVITY SHALL BE CONDUCTED WITHIN THE DRIP LINE OF ANY TREE DESIGNATED TO BE RETAINED, INCLUDING BUT NOT LIMITED TO THE PLACING OF ANY SOLVENTS, MATERIAL, CONSTRUCTION MACHINERY, OR SOIL WITHIN SUCH DRIP LINE.
6. THE DEVELOPER AND/OR THE BUILDER SHALL ERECT SIGNS THROUGHOUT THE PROJECT THAT ARE CLEARLY VISIBLE STATING WORDS TO THE EFFECT THAT ALL SUBCONTRACTORS, SUPPLIERS AND TRADESMEN ARE TO HELP MAINTAIN THE TREES AND WILL BE HELD RESPONSIBLE FOR ANY UNAUTHORIZED DAMAGE TO TREES AND WOODLANDS.
7. ALL PURCHASED REPLACEMENT TREES SHALL SATISFY AMERICAN ASSOCIATION OF NURSERYMAN STANDARDS, SUCH AS:
   A. NURSERY GROWN;
   B. STATE DEPARTMENT OF AGRICULTURE INSPECTED;
   C. NO. 1 GRADE WITH STRAIGHT, UNSCARRED TRUNK AND WELL DEVELOPED UNIFORM CROWN (PARK GRADE TREES WILL NOT BE ACCEPTED);
   D. STAKED, WRAPPED, WATERED AND MULCHED IN ACCORDANCE WITH STANDARD PLANTING PRACTICES;
   E. GUARANTEED FOR ONE (1) YEAR, INCLUDING LABOR, TO REMOVE AND DISPOSE OF DEAD MATERIALS.
8. SEE NOTES PER SUPERIOR TOWNSHIP ZONING ORDINANCE ARTICLE 14.F.6.: WOODLANDS AND TREE PRESERVATION: INSTALLATION AND MAINTENANCE REQUIREMENTS, PAGES 28-37.



SNOW FENCE PROTECTION DETAIL
(NO SCALE)

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

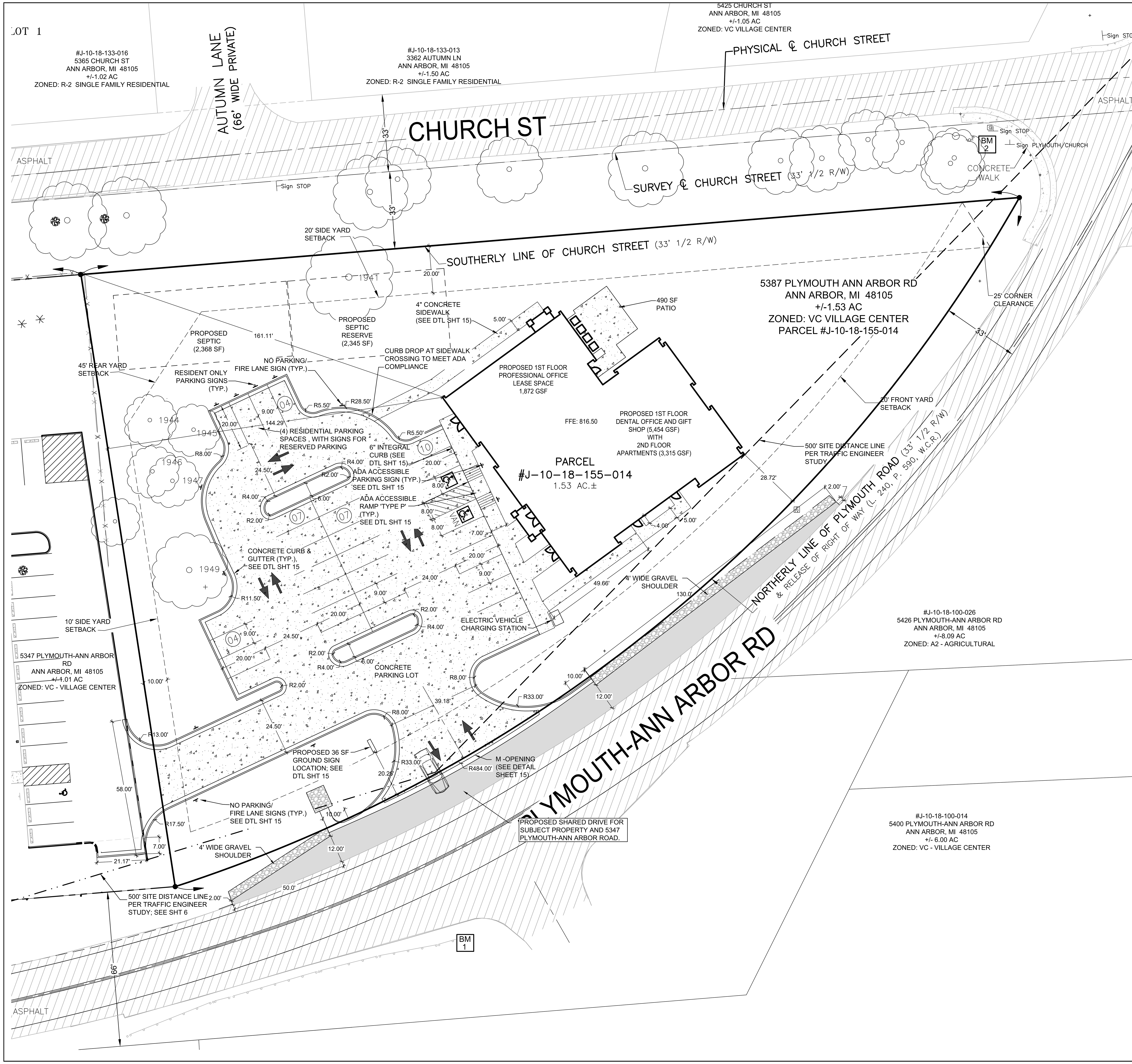
PROJECT: DENTAL OFFICE & MIXED USE

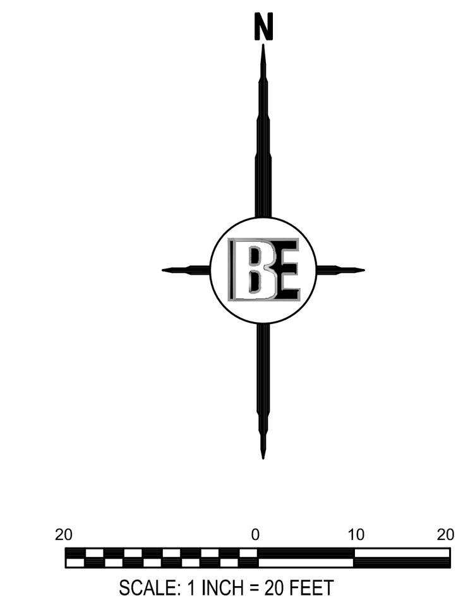
PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

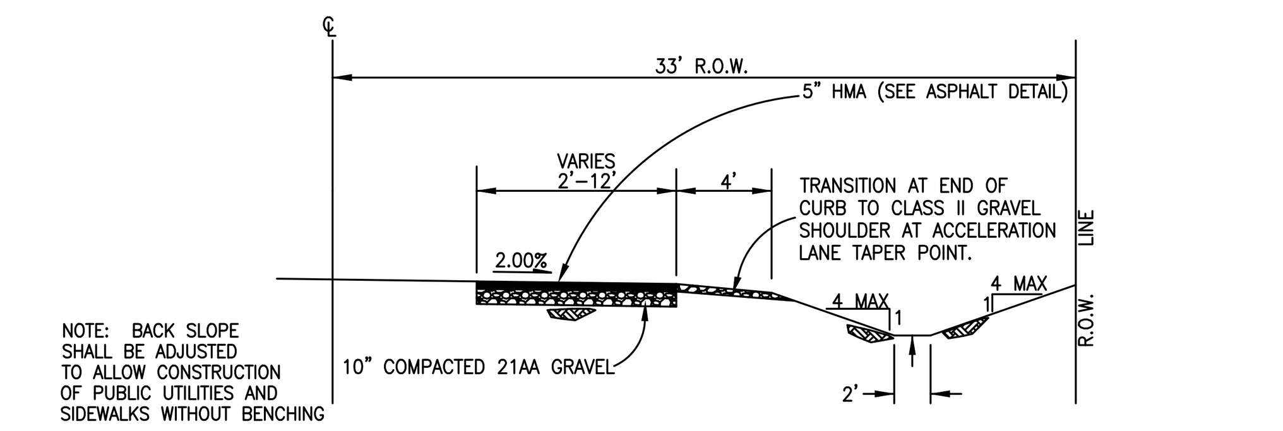
TITLE: TREE REMOVAL & PROTECTION PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

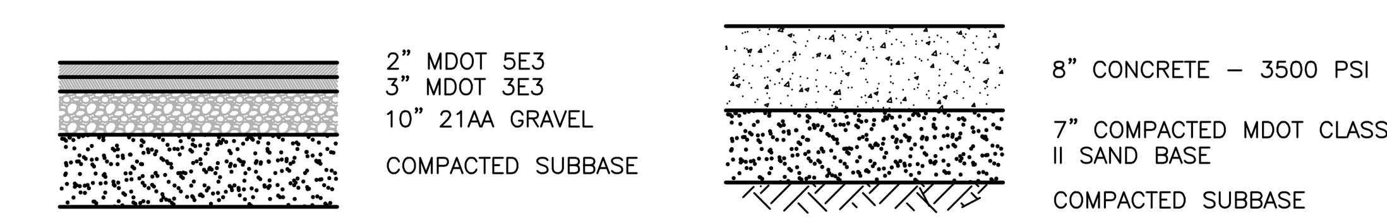
DESIGNED BY: JA
DRAWN BY: JA
CHECKED BY: BL
SCALE: 1" = 30'
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 4


CHURCH ST
PHYSICAL ℄ CHURCH STREET
SURVEY ℄ CHURCH STREET (33' 1/2 R/W)
SOUTHERLY LINE OF CHURCH STREET (33' 1/2 R/W)
AUTUMN LANE (66' WIDE PRIVATE)
LOT 1
#J-10-18-133-016
5365 CHURCH ST
ANN ARBOR, MI 48105
+/-1.02 AC
ZONED: R-2 SINGLE FAMILY RESIDENTIAL
#J-10-18-133-013
3362 AUTUMN LN
ANN ARBOR, MI 48105
+/-1.50 AC
ZONED: R-2 SINGLE FAMILY RESIDENTIAL
5425 CHURCH ST
ANN ARBOR, MI 48105
+/-1.05 AC
ZONED: VC VILLAGE CENTER
5387 PLYMOUTH ANN ARBOR RD
ANN ARBOR, MI 48105
+/-1.53 AC
ZONED: VC VILLAGE CENTER
PARCEL #J-10-18-155-014
PARCEL
#J-10-18-155-014
1.53 AC.±
PROPOSED 1ST FLOOR
PROFESSIONAL OFFICE
LEASE SPACE
1,872 GSF
PROPOSED 1ST FLOOR
DENTAL OFFICE AND GIFT
SHOP (5,454 GSF)
WITH
2ND FLOOR
APARTMENTS (3,315 GSF)
FFE: 816.50
490 SF
PATIO
PROPOSED
SEPTIC
(2,368 SF)
PROPOSED
SEPTIC
RESERVE
(2,345 SF)
20' SIDE YARD
SETBACK
45' REAR YARD
SETBACK
10' SIDE YARD
SETBACK
20' FRONT YARD
SETBACK
25' CORNER
CLEARANCE
4" CONCRETE
SIDEWALK
(SEE DTL SHT 15)
CURB DROP AT SIDEWALK
CROSSING TO MEET ADA
COMPLIANCE
NO PARKING/
FIRE LANE SIGN (TYP.)
RESIDENT ONLY
PARKING SIGNS
(TYP.)
(4) RESIDENTIAL PARKING
SPACES , WITH SIGNS FOR
RESERVED PARKING
6" INTEGRAL
CURB (SEE
DTL SHT 15)
ADA ACCESSIBLE
PARKING SIGN (TYP.)
SEE DTL SHT 15
ADA ACCESSIBLE
RAMP 'TYPE P'
(TYP.)
SEE DTL SHT 15
CONCRETE CURB &
GUTTER (TYP.),
SEE DTL SHT 15
ELECTRIC VEHICLE
CHARGING STATION
CONCRETE
PARKING LOT
500' SITE DISTANCE LINE
PER TRAFFIC ENGINEER
STUDY
4' WIDE GRAVEL
SHOULDER
PROPOSED 36 SF
GROUND SIGN
LOCATION; SEE
DTL SHT 15
M -OPENING
(SEE DETAIL
SHEET 15)
NO PARKING/
FIRE LANE SIGNS (TYP.)
SEE DTL SHT 15
PROPOSED SHARED DRIVE FOR
SUBJECT PROPERTY AND 5347
PLYMOUTH-ANN ARBOR ROAD.
500' SITE DISTANCE LINE
PER TRAFFIC ENGINEER
STUDY; SEE SHT 6
5347 PLYMOUTH-ANN ARBOR
RD
ANN ARBOR, MI 48105
+/-1.01 AC
ZONED: VC - VILLAGE CENTER
#J-10-18-100-026
5426 PLYMOUTH-ANN ARBOR RD
ANN ARBOR, MI 48105
+/-8.09 AC
ZONED: A2 - AGRICULTURAL
#J-10-18-100-014
5400 PLYMOUTH-ANN ARBOR RD
ANN ARBOR, MI 48105
+/- 6.00 AC
ZONED: VC - VILLAGE CENTER
PLYMOUTH-ANN ARBOR RD
NORTHERLY LINE OF PLYMOUTH ROAD (33' 1/2 R/W)
& RELEASE OF RIGHT OF WAY (L. 240, P. 590, W.C.R.)
CONCRETE
WALK
ASPHALT
Sign STOP
Sign PLYMOUTH/CHURCH
BM 1
BM 2




33' R.O.W.
5" HMA (SEE ASPHALT DETAIL)
TRANSITION AT END OF CURB TO CLASS II GRAVEL SHOULDER AT ACCELERATION LANE TAPER POINT.
NOTE: BACK SLOPE SHALL BE ADJUSTED TO ALLOW CONSTRUCTION OF PUBLIC UTILITIES AND SIDEWALKS WITHOUT BENCHING
10" COMPACTED 21AA GRAVEL

TYPICAL ASPHALT ACCEL./DECEL. CROSS-SECTION W/DITCH
(NO SCALE)



ASPHALT SECTION
(NO SCALE)

CONCRETE PAVEMENT SECTION
(NO SCALE)

SITE DATA:

SUPERIOR TOWNSHIP, WASHTENAW COUNTY
PARCEL # J-10-18-155- 014
5387 PLYMOUTH-ANN ARBOR RD
ANN ARBOR, MI 48105
1.53 AC +/-

ZONING: VC - VILLAGE CENTER
USE: VACANT
PROPOSED USE 1ST FLOOR: APPROX. 7,326 SF DENTAL OFFICE AND GIFT SHOP, TENANT PROFESSIONAL OFFICE SPACE
PROPOSED USE 2ND FLOOR: APPROX. 3,315 SF (2) TWO BED, TWO BATH APARTMENTS

MIN. LOT AREA REQUIRED FOR ZONING: 20,000 SF
TOTAL EX. LOT AREA: 1.53 AC +/- (~66,647 SF)
MIN. LOT WIDTH: 100 FT — TOTAL EXISTING LOT WIDTH: 401.58 FT
MAX. GROUND FLOOR COVERAGE: 25% (GROUND FLOOR AREA OF BUILDINGS / NET LOT AREA AND EXPRESSED AS %)
PROPOSED GROUND FLOOR COVERAGE: 7,326 SF / 66,647 = 11%
MAX. FLOOR AREA RATIO: 0.50

MIN. SETBACKS REQUIRED:	PROPOSED SETBACKS:
FRONT: MAX 35', MIN 20'	28.72' (PLYMOUTH RD), 30.03' (CHURCH ST)
REAR: 45'	161.11'
SIDES: 10' MIN, 20' TOTAL OF TWO	144.29' (WEST)

PARKING CALCULATION:

1. DENTAL OFFICE - 1 SPACE PER ON-DUTY EMPLOYEE, PLUS ONE PER EXAMINATION OR TREATMENT ROOM.
   (DENTAL OFFICE: 2 FRONT DESK STAFF, 2 DOCTORS, 4 HYGIENIST, 2 ASSISTANTS, PLUS 6 TREATMENT ROOMS = 16 SPACES)
2. LEASE SPACE (MEDICAL OFFICE SPACE 1,872 SF) - 1 SPACE PER ON-DUTY EMPLOYEE, PLUS ONE SPACE PER EXAM ROOM.
   (2 DOCTORS, 2 OFFICE STAFF, 2 EXAM ROOMS = 6 SPACES)
3. MULTIPLE-FAMILY HOUSING: 1.5 SPACES PER DWELLING UNIT WITH UP TO TWO BEDROOMS (APARTMENTS: 2 UNITS x 1.5 SPACES = 3 SPACES)
4. RETAIL SPACE (1 SPACE PER 250 SF FLOOR AREA 611 SF/250 SF = 2.4 ~ 3 SPACES)

SPACES REQUIRED: 16 + 6 + 3 + 3 = 28 SPACES
SPACES PROVIDED: 32 SPACES INCLUDING 2 ADA SPACES

ACCORDING TO ARTICLE 3.208 CORNER CLEARANCE ZONES
ANY INTERSECTION OF A PRIMARY ROADWAY AND A COLLECTOR OR LOCAL ROADWAY, MINIMUM CORNER CLEARANCE DISTANCE LONG R.O.W. IS 25 FEET.
ACCORDING TO ARTICLE 7.304 SPECIAL DISTRICT REGULATIONS, VILLAGE CENTER DISTRICT:
E. LANDSCAPE STRIP REQUIRED ALONG CHURCH STREET SHALL BE LANDSCAPED TO SCREEN VIEWS OF PARKING LOTS AND SERVICE AREAS FROM CHURCH STREET AND PROPERTIES TO THE NORTH.
F. DESIGN STANDARDS - VEHICULAR ACCESS TO CHURCH ST. A NON-RESIDENTIAL USE SHALL NOT HAVE VEHICULAR ACCESS TO CHURCH STREET.

TRASH PICKUP WILL BE CURBSIDE. DUMPSTER NOT REQUIRED.

SITE BENCHMARKS (NAVD88 DATUM):
–BM #1 = SET MAG NAIL WITH BOSS BM TAG ON TOP OF EAST GUARDRAIL POST, S/S PLYMOUTH–ANN ARBOR ROAD, WEST OF ENTRANCE TO 5400 PLYMOUTH–ANN ARBOR ROAD ("THE BORO"). ELEVATION = 820.49

–BM #2 = SET MAG NAIL WITH BOSS BM TAG NW/S POWER POLE AT SOUTHWEST INTERSECTION OF PLYMOUTH–ANN ARBOR ROAD & CHURCH STREET. ELEVATION = 819.52

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HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT

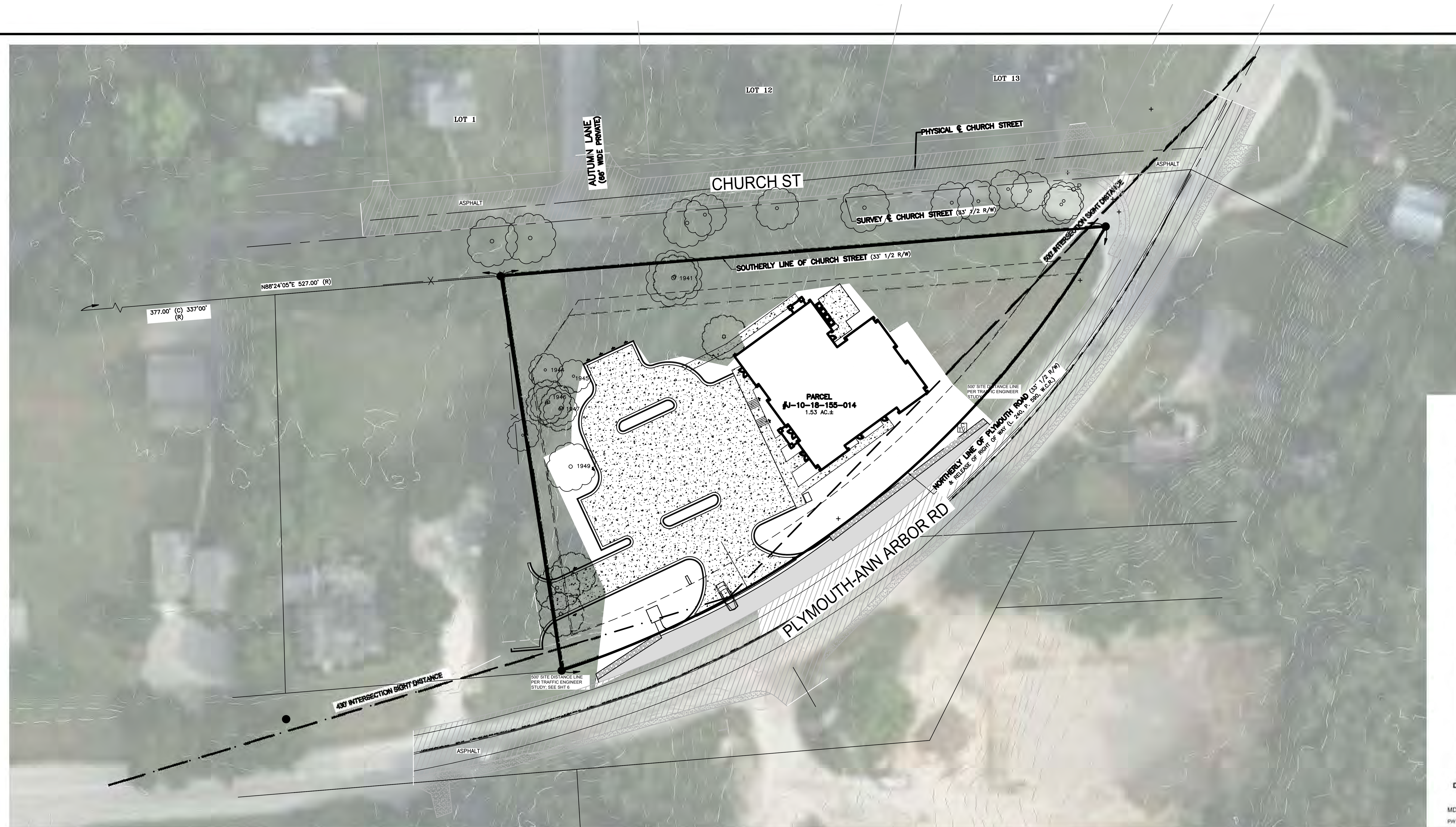
TITLE: SITE PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY:	JA
DRAWN BY:	JA
CHECKED BY:	BL
SCALE:	1" = 20'
JOB NO:	22-097
DATE:	02/22/2023
SHEET NO.	5

DENTAL OFFICE DEVELOPMENT

PLYMOUTH ROAD
SUPERIOR TWP, MI



Quick Charts for Intersection Sight Distance

Design Speed (mph)	Stopping Sight Distance (ft)	Intersection Sight Distance for Passenger Cars (ft)	
		Calculated	Design
15	80	165.4	170
20	115	220.5	225
25	155	275.6	280
30	200	330.8	335
35	250	385.9	390
40	305	441.0	445
45	360	496.1	500
50	425	551.3	555
55	495	606.4	610
60	570	661.5	665
65	645	716.6	720
70	730	771.8	775
75	820	826.9	830
80	910	882.0	885

Note: The given intersection sight distance values are for a stopped passenger car to turn left onto a two-lane road with no median and minor road approach grades of 3 percent or less. For other conditions, the sight distance must be recalculated.

Design Intersection Sight Distance – Case B1 – Left-Turn from Stop
(2011 AASHTO, Table 9-6, 9-38)

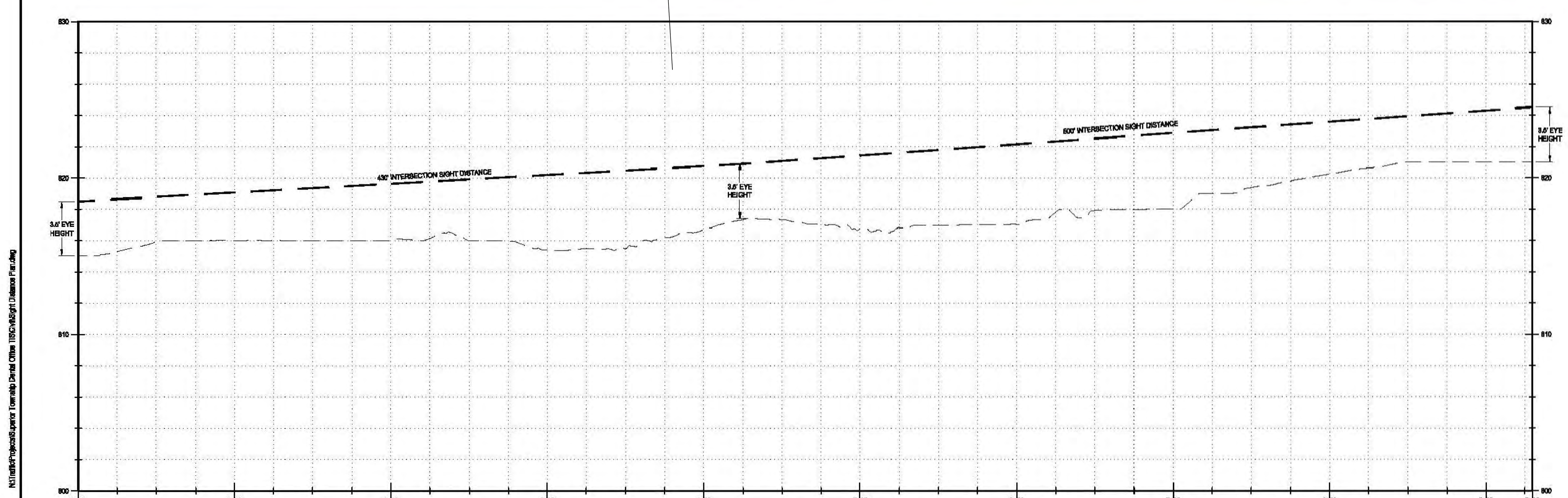
Design Speed (mph)	Stopping Sight Distance (ft)	Intersection Sight Distance for Passenger Cars (ft)	
		Calculated	Design
15	80	143.3	145
20	115	191.1	195
25	155	238.9	240
30	200	286.7	290
35	250	334.4	335
40	305	382.2	385
45	360	430.0	430
50	425	477.8	480
55	495	525.5	530
60	570	573.3	575
65	645	621.1	625
70	730	668.9	670
75	820	716.6	720
80	910	764.4	765

Note: The given intersection sight distances are for a stopped passenger car to turn right onto, or cross, a two-lane road with no median and minor road approach grades of 3 percent or less. For other conditions, the sight distance must be recalculated.

Design Intersection Sight Distance – Case B2 – Right-Turn from Stop and Case B3 – Crossing Maneuver (2011 AASHTO, Table 9-8, 9-41)

MDOT Traffic & Safety Page 39 of 52 April 22, 2015

PW Ref Docs\T&S\Typicals\Final\Geometrics\mdot_Guidelines_Sight_Distance.doc



INTERSECTION SIGHT DISTANCE
MAIN ENTRANCE - PLAN AND PROFILE
45 MPH DESIGN SPEED
1" = 4' VERT.; 1" = 40' HORZ.
STA 0+00 TO STA 9+29

BERGMANN
ARCHITECTS ENGINEERS PLANNERS

Bergmann Associates, Architects, Engineers, Landscape Architects & Surveyors, D.P.C.
7050 West Saginaw Hwy.
Suite 200
Lansing, MI 48917

office: 517.272.9835
fax: 517.272.9836

www.bergmannpc.com

DATE	DESCRIPTION

Not For Construction

Project Manager:	Checked By:
P.FURTAW	P. FURTAW
Designed By: I. GRAHAM	Drawn By: I. GRAHAM
Date Issued: SEPTEMBER 25, 2015	Project Number: 10506.00

COVER SHEET

Drawing Number

C000

SCALE: 1 INCH = 40 FEET

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517.546.4836 FAX 517.548.1670

PROJECT
DENTAL OFFICE & MIXED USE

PREPARED FOR
CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE
DRIVEWAY SITE DISTANCE PER TRAFFIC ENGINEER

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: JA
DRAWN BY: JA
CHECKED BY: BL
SCALE: 1" = 40'
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 6

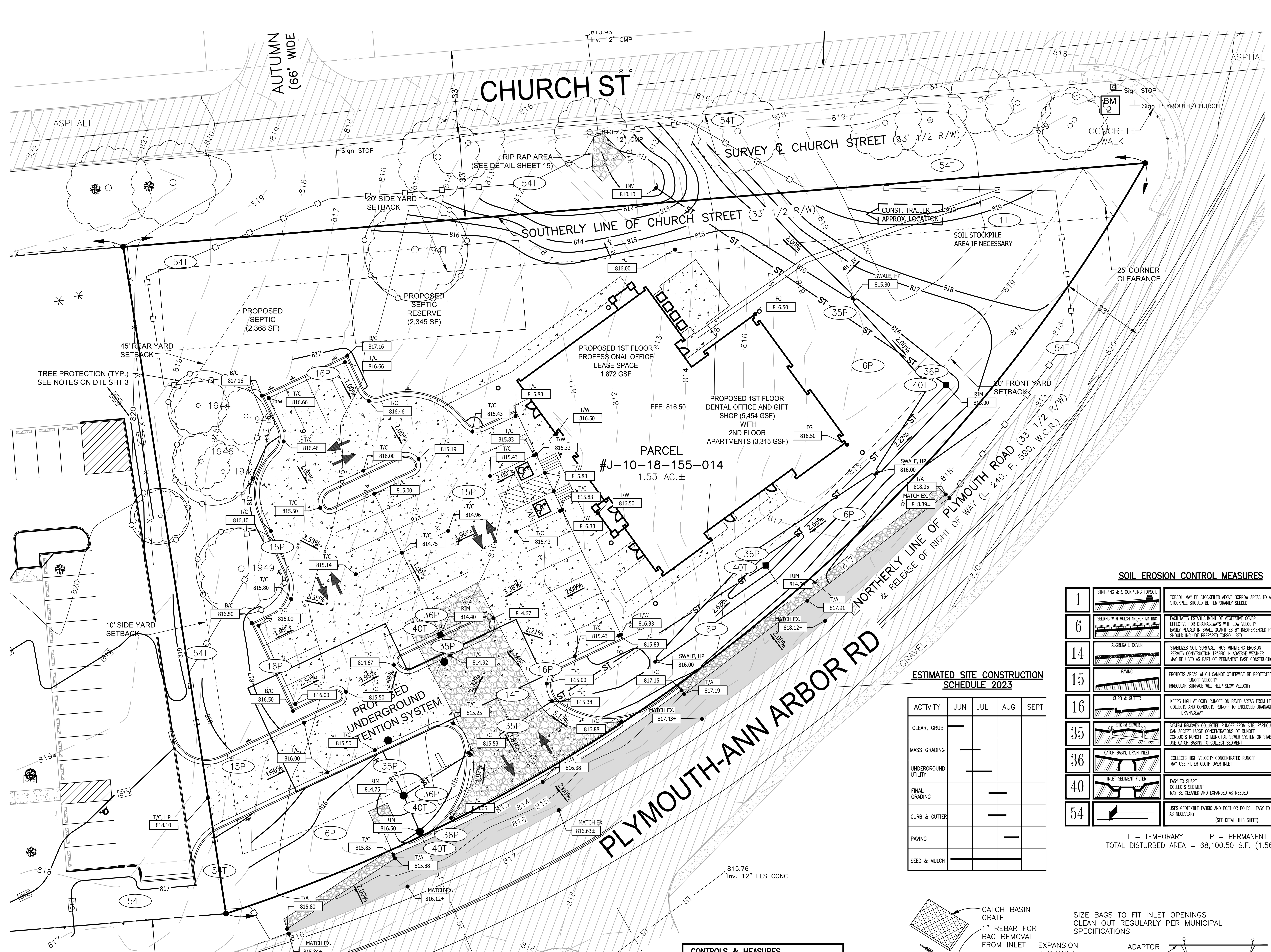
SITE DISTANCE PER WASHTENAW COUNTY ROAD COMMISSION:

PER WCRC PROCEDURES REGULATIONS FOR PERMIT ACTIVITIES FINAL 2021, 3.6.2 INTERSECTION SIGHT DISTANCE TRIANGLE, ACCORDING TO TABLES 4 AND 5 FOR 45 MPH ROADS:
- LEFT SITE DISTANCE IS 430 FEET (REPLACED BY 500 FEET AASHTO RULE)
- RIGHT SITE DISTANCE IS 500 FEET

PLYMOUTH ANN ARBOR ROAD IN THIS LOCATION IS 45 MPH

DRAWING PROVIDED BY TRAFFIC STUDY ENGINEERS: BERGMANN ARCHITECTS, ENGINEERS AND PLANNERS. SEE TRAFFIC MEMO DATED 8-19-22.

PER MEETING WITH WASHTENAW COUNTY ROAD COMMISSION OCTOBER 12, 2022 WHERE IT WAS AGREED BY APPLICANT AND WCRC THAT THE DRIVEWAY LOCATION IS ACCEPTABLE ONLY IF IT IS A SHARED DRIVE WITH NEIGHBORING PARCEL TO THE WEST (# J-10-18- 155-013).



SITE BENCHMARKS (NAVD88 DATUM):
- **BM 1** = BM BNT MAG TOP E GUARD RAIL POST
  ELEV = 820.49 (NAVD88)
- **BM 2** = 30 BNT MAG NW/S P POLE
  ELEV = 819.52 (NAVD88)

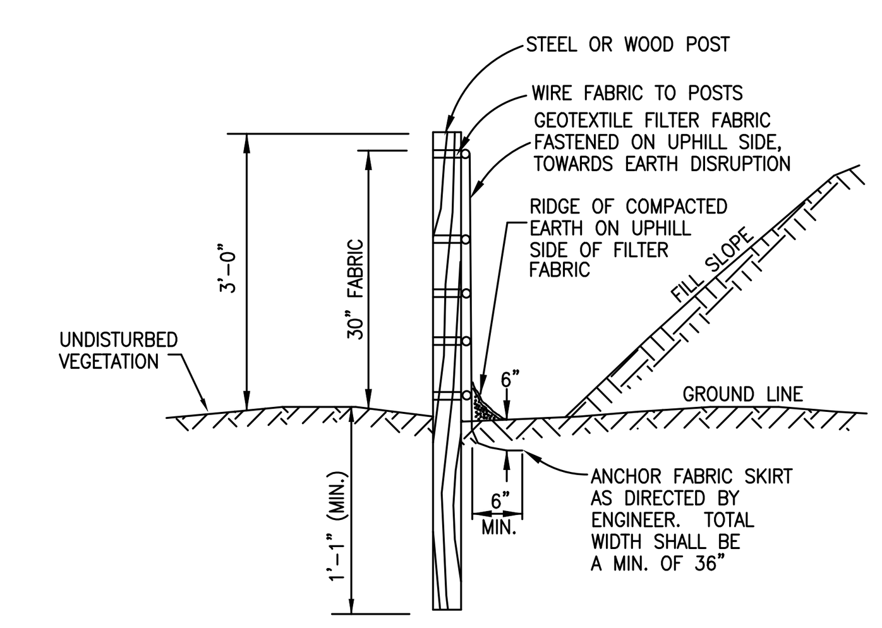
SOIL EROSION CONTROL MEASURES

No.	Measure	Description
1	STRIPPING & STOCKPILING TOPSOIL	TOPSOIL MAY BE STOCKPILED ABOVE BORROW AREAS TO ACT AS A DIVERSION STOCKPILE SHOULD BE TEMPORARILY SEEDED
6	SEEDING WITH MULCH AND/OR MATTING	FACILITATES ESTABLISHMENT OF VEGETATIVE COVER EFFECTIVE FOR DRAINAGEWAYS WITH LOW VELOCITY EASILY PLACED IN SMALL QUANTITIES BY INEXPERIENCED PERSONNEL SHOULD INCLUDE PREPARED TOPSOIL BED
14	AGGREGATE COVER	STABILIZES SOIL SURFACE, THUS MINIMIZING EROSION PERMITS CONSTRUCTION TRAFFIC IN ADVERSE WEATHER MAY BE USED AS PART OF PERMANENT BASE CONSTRUCTION OF PAVED AREAS
15	PAVING	PROTECTS AREAS WHICH CANNOT OTHERWISE BE PROTECTED, BUT INCREASES RUNOFF VELOCITY IRREGULAR SURFACE WILL HELP SLOW VELOCITY
16	CURB & GUTTER	KEEPS HIGH VELOCITY RUNOFF ON PAVED AREAS FROM LEAVING PAVED SURFACE COLLECTS AND CONDUCTS RUNOFF TO ENCLOSED DRAINAGE SYSTEM OR PREPARED DRAINAGEWAY
35	STORM SEWER	SYSTEM REMOVES COLLECTED RUNOFF FROM SITE, PARTICULARLY FROM PAVED AREAS CAN ACCEPT LARGE CONCENTRATIONS OF RUNOFF CONDUCTS RUNOFF TO MUNICIPAL SEWER SYSTEM OR STABILIZED OUTFALL LOCATION USE CATCH BASINS TO COLLECT SEDIMENT
36	CATCH BASIN, DRAIN INLET	COLLECTS HIGH VELOCITY CONCENTRATED RUNOFF MAY USE FILTER CLOTH OVER INLET
40	INLET SEDIMENT FILTER	EASY TO SHAPE COLLECTS SEDIMENT MAY BE CLEANED AND EXPANDED AS NEEDED
54		USES GEOTEXTILE FABRIC AND POST OR POLES. EASY TO CONSTRUCT AND LOCATE AS NECESSARY. (SEE DETAIL THIS SHEET)

T = TEMPORARY P = PERMANENT
TOTAL DISTURBED AREA = 68,100.50 S.F. (1.56 AC)

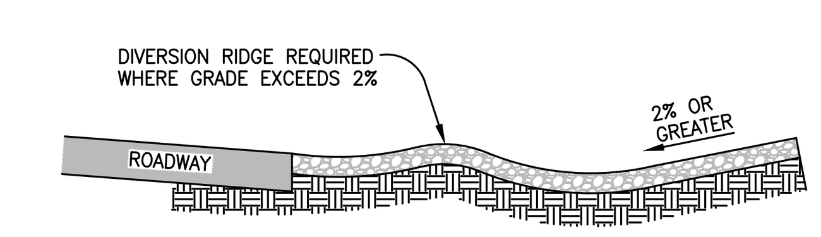
ESTIMATED SITE CONSTRUCTION SCHEDULE 2023

ACTIVITY	JUN	JUL	AUG	SEPT
CLEAR, GRUB	—			
MASS GRADING	—	—		
UNDERGROUND UTILITY	—	—		
FINAL GRADING		—	—	
CURB & GUTTER		—	—	
PAVING			—	
SEED & MULCH	—	—	—	

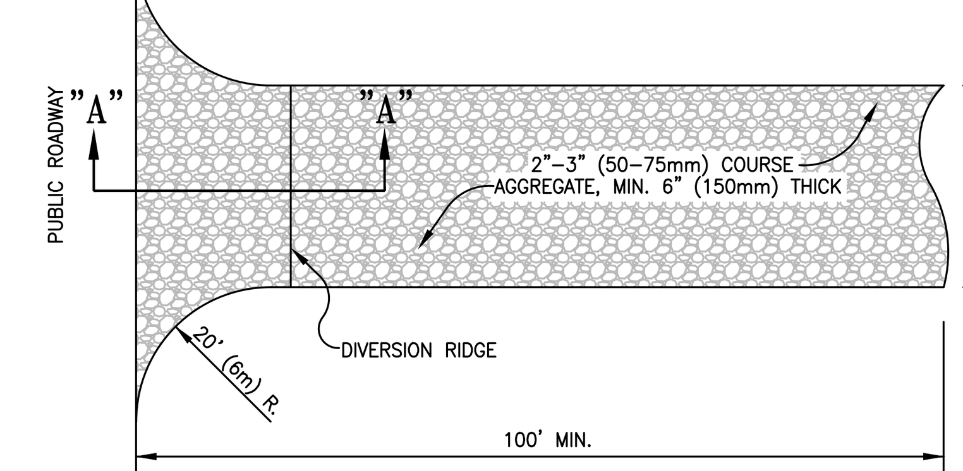


SILT FENCE DETAIL
NO SCALE

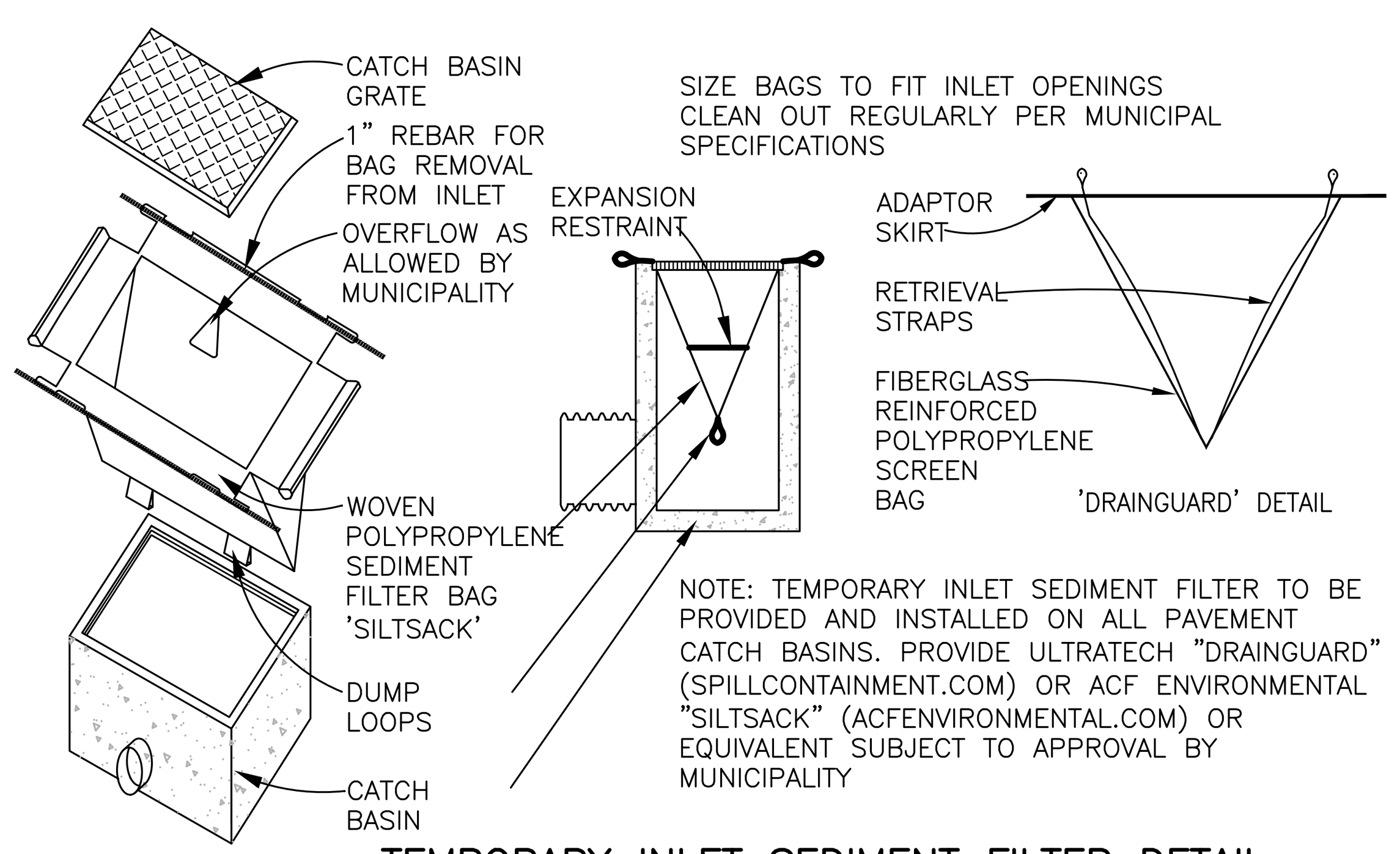
SILT FENCE SHALL BE A MINIMUM 36".



SECTION "A"-"A"



TEMPORARY GRAVEL TRACKING MAT DETAIL
NO SCALE



NOTE: TEMPORARY INLET SEDIMENT FILTER TO BE PROVIDED AND INSTALLED ON ALL PAVEMENT CATCH BASINS. PROVIDE ULTRATECH "DRAINGUARD" (SPILLCONTAINMENT.COM) OR ACF ENVIRONMENTAL "SILTSACK" (ACFENVIRONMENTAL.COM) OR EQUIVALENT SUBJECT TO APPROVAL BY MUNICIPALITY

TEMPORARY INLET SEDIMENT FILTER DETAIL
(NO SCALE)

CONSTRUCTION SEQUENCE

THE CONTRACTOR IS RESPONSIBLE FOR ENSURING THAT EROSION IS MINIMIZED AND THAT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL LAWS, REGULATIONS, AND ORDINANCES IS MAINTAINED THROUGHOUT EXECUTION OF THIS PROJECT.

Duration	No.	Task
2 DAYS	1.	INSTALL SILT FENCE AS SHOWN ON PLANS.
30 DAYS	2.	ROUGH GRADE AND INSTALL UNDERGROUND STORMWATER STRUCTURE
7 DAYS	3.	INSTALL UTILITY SERVICES.
210 DAYS	4.	BUILDING CONSTRUCTION
7 DAYS	5.	GRADE AND EXCAVATE FOR PARKING AND DRIVEWAY.
14 DAYS	6.	INSTALL PAVEMENT AND CURBING
7 DAYS	7.	FINE GRADE, SPREAD TOPSOIL, SEED OR SOD AS APPLICABLE, INSTALL PLANTS.
3 DAYS	8.	REMOVE ALL EROSION CONTROL STRUCTURES AND ACCUMULATED SILT FROM STRUCTURES.

CONTROLS & MEASURES POST CONTRUCTION SEQUENCE

ACTIVITY	WEEKLY	MONTHLY	AS REQUIRED
MAINTAIN LANDSCAPING, REPLACE MULCH	X	X	X
CLEAN INLETS		X	X
COLLECT LITTER	X		X
SWEEP PARKING LOT			X

CONTROLS & MEASURES NARRATIVE

ACTIVITY	DESCRIPTION
MAINTAIN LANDSCAPING, REPLACE MULCH	COLLECT GRASS, TREE, AND SHRUB CLIPPINGS. DISPOSE IN APPROVED CONTAINER. REPLACE DEAD SOD, TREES AND SHRUBS.
CLEAN INLETS	REMOVE LITTER, SEDIMENT, AND DEBRIS. DISPOSE OF IN APPROVED LANDFILL.
COLLECT LITTER	
SWEEP PARKING LOT	REMOVE MUD, DIRT, GREASE AND OIL WITH PERIODIC SWEEPING
DUST CONTROL	SPRINKLE WATER AS NEEDED

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PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE: GRADING, DRAINAGE, & SESC PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: JS
DRAWN BY: JS
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 7

SEPTIC SYSTEM BASIS OF DESIGN

PROPOSED SEWAGE FLOWS ARE AS FOLLOWS:

DENTIST@ 35 GALLONS PER X 2 DENTIST= 70 GALLONS
HYGIENIST@35 GALLONS PER X 2 HYGIENIST = 70 GALLONS
OFFICE STAFF @35 GALLONS PER X 5 OFFICE STAFF = 175 GALLONS
PATIENTS @3 GALLONS PER X 25 PATIENTS = 75 GALLONS
= 370 GAL PER DAY

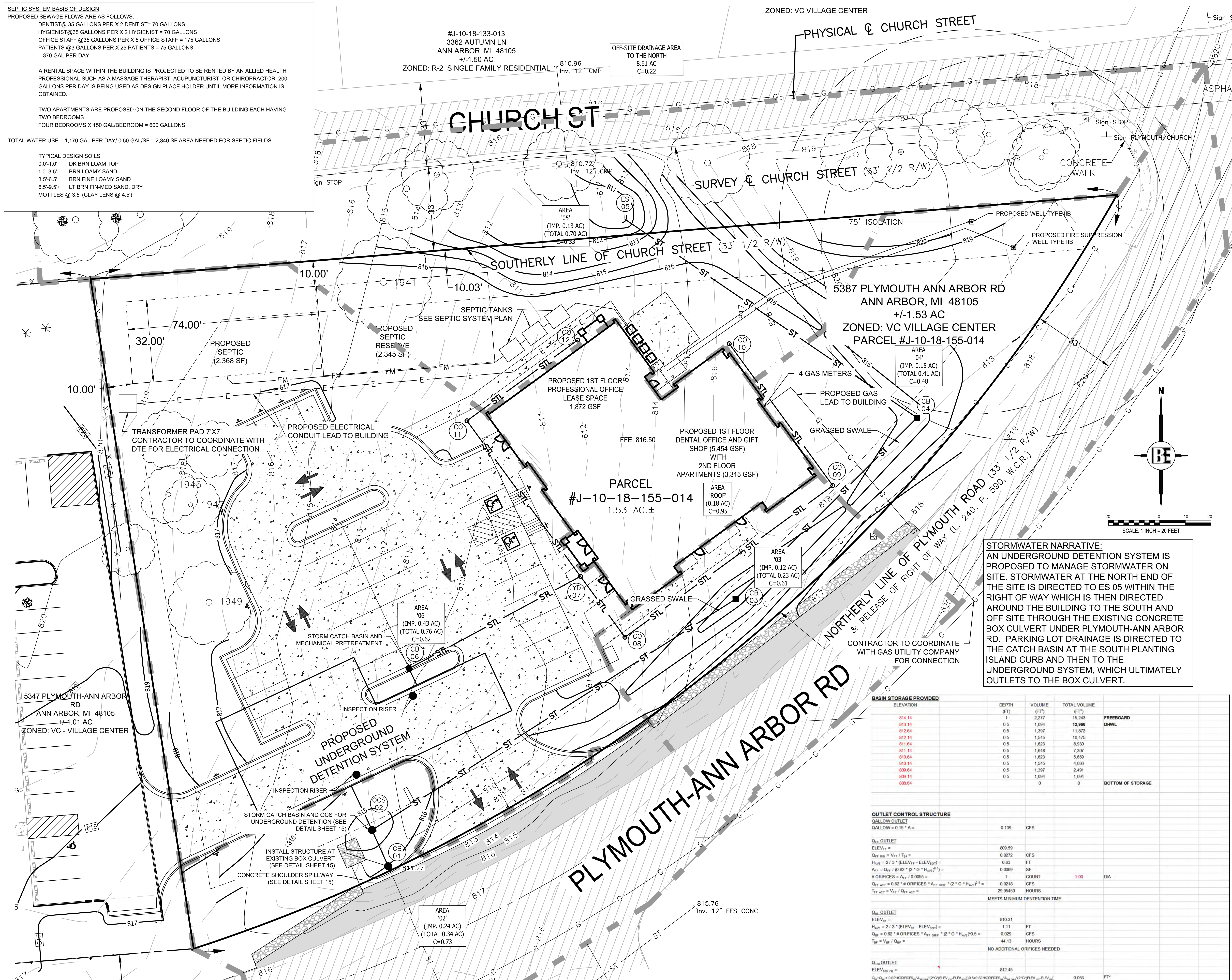
A RENTAL SPACE WITHIN THE BUILDING IS PROJECTED TO BE RENTED BY AN ALLIED HEALTH PROFESSIONAL SUCH AS A MASSAGE THERAPIST, ACUPUNCTURIST, OR CHIROPRACTOR. 200 GALLONS PER DAY IS BEING USED AS DESIGN PLACE HOLDER UNTIL MORE INFORMATION IS OBTAINED.

TWO APARTMENTS ARE PROPOSED ON THE SECOND FLOOR OF THE BUILDING EACH HAVING TWO BEDROOMS.
FOUR BEDROOMS X 150 GAL/BEDROOM = 600 GALLONS

TOTAL WATER USE = 1,170 GAL PER DAY/ 0.50 GAL/SF = 2,340 SF AREA NEEDED FOR SEPTIC FIELDS

TYPICAL DESIGN SOILS

0.0'-1.0' DK BRN LOAM TOP
1.0'-3.5' BRN LOAMY SAND
3.5'-6.5' BRN FINE LOAMY SAND
6.5'-9.5'+ LT BRN FIN-MED SAND, DRY
MOTTLES @ 3.5' (CLAY LENS @ 4.5')



STORMWATER NARRATIVE:

AN UNDERGROUND DETENTION SYSTEM IS PROPOSED TO MANAGE STORMWATER ON SITE. STORMWATER AT THE NORTH END OF THE SITE IS DIRECTED TO ES 05 WITHIN THE RIGHT OF WAY WHICH IS THEN DIRECTED AROUND THE BUILDING TO THE SOUTH AND OFF SITE THROUGH THE EXISTING CONCRETE BOX CULVERT UNDER PLYMOUTH-ANN ARBOR RD. PARKING LOT DRAINAGE IS DIRECTED TO THE CATCH BASIN AT THE SOUTH PLANTING ISLAND CURB AND THEN TO THE UNDERGROUND SYSTEM, WHICH ULTIMATELY OUTLETS TO THE BOX CULVERT.

FROM	TO	DRAIN AREA	ACRES A	AREA IMPERV 0.95	AREA PERV 0.2	RUNOFF COEFF C	EQUIV. AREA A * C	INTEN-SITY I	TIME OF CONC. T_C	ADD'L RUNOFF Q	RUNOFF (CFS) Q	PIPE LENGTH (LF)	PIPE DIA. (IN)	VELOCITY FLOWING FULL (FPS)	HYDRAULIC GRADIENT SLOPE %	ACTUAL SLOPE USED	MANNING FLOW CAPACITY	MANNING'S VELOCITY (FT/SEC)	TIME (MIN)	HG ELEV UPPER END	HG ELEV LOWER END	RIM ELEV UPPER END	INVERT UPPER END	INVERT LOWER END
5	4	5	0.70	0.12	0.57	0.33	0.23	4.38	15.00		1.02	137	24	0.32	0.00%	0.50%	16.02	5.10	0.45	811.70	811.01	815.50	810.10	809.41
4	3	4	0.41	0.15	0.26	0.48	0.20	4.33	15.45		1.87	100	24	0.60	0.01%	0.50%	16.04	5.11	0.33	810.91	810.41	815.00	809.31	808.81
3	2	3	0.23	0.12	0.10	0.61	0.14	4.29	15.78		2.46	168	24	0.78	0.01%	0.50%	16.04	5.11	0.55	810.31	809.47	814.50	808.71	807.87
12	11	12	0.09	0.09	0.00	0.95	0.09	4.38	15.00		0.38	53	8	1.10	0.10%	1.00%	1.21	3.47	0.26	812.98	812.45	816.50	812.45	811.91
11	7	11	-	-	-	-	0.00	4.35	15.26		0.38	75	8	1.10	0.10%	1.00%	1.21	3.47	0.36	812.45	811.69	816.50	811.91	811.16
10	9	10	0.08	0.08	0.00	0.95	0.08	4.38	15.00		0.34	69	8	0.96	0.08%	1.00%	1.21	3.47	0.33	813.68	812.99	816.50	813.14	812.46
9	8	9	-	-	-	-	0.00	4.34	15.33		0.34	100	8	0.96	0.08%	1.00%	1.21	3.47	0.48	812.99	811.99	816.50	812.46	811.46
8	7	8	-	-	-	-	0.00	4.29	15.81		0.34	29	8	0.96	0.08%	1.00%	1.21	3.47	0.14	811.99	811.69	816.50	811.46	811.16
7	6	7	-	-	-	-	0.00	4.27	15.95	0.38	0.72	76	8	2.06	0.35%	1.00%	1.21	3.47	0.36	811.59	810.84	816.50	811.06	810.30
6	BASIN	6	0.76	0.43	0.33	0.62	0.47	4.24	16.32		2.72	7	12	3.46	0.58%	0.50%	2.53	3.22	0.04	810.84	810.80	814.40	810.04	810.00
BASIN	2	-	-	-	-	-	0.00	4.38	15.00	0.14	0.14	19	12	0.18	0.00%	0.34%	2.08	2.65	0.12	809.44	809.37	814.00	808.64	808.57
2	1	2	0.34	0.24	0.10	0.73	0.25	4.36	15.12	2.46	3.68	15	24	1.17	0.03%	0.34%	13.23	4.21	0.06	809.37	809.32	816.00	807.77	807.72
1	EX	1	-	-	-	-	0.00	4.36	15.18		3.68	1	30	0.75	0.01%	0.40%	26.01	5.30	0.00	809.32	809.32	815.50	807.32	807.32

BASIN STORAGE PROVIDED

ELEVATION	DEPTH (FT)	VOLUME (FT^3)	TOTAL VOLUME (FT^3)	
814.14	1	2,277	15,243	FREEBOARD
813.14	0.5	1,094	**12,966**	DHWL
812.64	0.5	1,397	11,872	
812.14	0.5	1,545	10,475	
811.64	0.5	1,623	8,930	
811.14	0.5	1,648	7,307	
810.64	0.5	1,623	5,659	
810.14	0.5	1,545	4,036	
809.64	0.5	1,397	2,491	
809.14	0.5	1,094	1,094	
808.64		0	0	BOTTOM OF STORAGE

OUTLET CONTROL STRUCTURE

QALLOW OUTLET

QALLOW = 0.15 * A =	0.139	CFS		
Q_{FF} OUTLET				
$ELEV_{FF}$ =	809.59			
$Q_{FF\ MIN} = V_{FF} / T_{24}$ =	0.0272	CFS		
$H_{AVE} = 2/3 * (ELEV_{FF} - ELEV_{BOT})$ =	0.63	FT		
$A_{FF} = Q_{FF} / (0.62 * (2 * G * H_{AVE})^{0.5})$ =	0.0069	SF		
# ORIFICES = A_{FF} / 0.0055 =	1	COUNT	1.00	DIA
$Q_{FF\ ACT} = 0.62 * \#\ ORIFICES * A_{FF\ ORIF} * (2 * G * H_{AVE})^{0.5}$ =	0.0218	CFS		
$T_{FF\ ACT} = V_{FF} / Q_{FF\ ACT}$ =	29.95450	HOURS		
	MEETS MINIMUM DENTENTION TIME			
Q_{BF} OUTLET				
$ELEV_{BF}$ =	810.31			
$H_{AVE} = 2/3 * (ELEV_{BF} - ELEV_{BOT})$ =	1.11	FT		
$Q_{BF} = 0.62 * \#\ ORIFICES * A_{FF\ ORIF} * (2 * G * H_{AVE})$^0.5 =	0.029	CFS		
$T_{BF} = V_{BF} / Q_{BF}$ =	44.13	HOURS		
	NO ADDITIONAL ORIFICES NEEDED			
Q_{100} OUTLET				
$ELEV_{100\ YR}$ =	812.45			
$Q_{FF}+Q_{BF} = 0.62*\#ORIFICES_{FF}*A_{FFORIF}*(2*G*(ELEV_{100}-ELEV_{BOT}))0.5+0.62*\#ORIFICES_{BF}*A_{BF\ ORIF}*(2*G*(ELEV_{100}-ELEV_{FF})$		0.053	FT^2	
$Q_{100\ MAX} = Q_{ALLOW} - (Q_{FF} + Q_{BF})$ =	0.086	CFS		
$A_{100\ MAX} = Q_{100\ MAX} / (0.62 * (2 * G * (ELEV_{100} - ELEV_{BF}))^{0.5})$ =	0.0118	SF		
# ORIFICES = $A_{100\ MAX}$ / 0.0055	2	COUNT	1.00	DIA
$H_{AVE\ ALL} = 2/3 * (ELEV_{100} - ELEV_{BF}) + (ELEV_{BF} - ELEV_{BOT})$ =	3.10	FT		
$Q_{ALL} = 0.62 * \#ORIFICES_{FF} * A_{FF\ ORIF} * (2 * G * H_{AVE\ ALL})^{0.5}$ =	0.0482	CFS		
$H_{AVE\ BF} = 2/3 * (ELEV_{100} - ELEV_{BF}) + (ELEV_{BF} - ELEV_{FF})$ =	2.15	FT		
$Q_{BF+100} = 0.62 * \#ORIFICES_{BF} * A_{BF\ ORIF} * (2 * G * H_{AVE\ BF})^{0.5}$ =	0.0000	CFS		
$H_{AVE\ 100} = 2/3 * (ELEV_{100} - ELEV_{BF})$ =	1.43	FT		
$Q_{AVE\ 100} = 0.62 * \#ORIFICES_{100} * A_{100\ ORIF} * (2 * G * H_{AVE100})^{0.5}$ =	0.0654	CFS		
$V_{REM} = V_{100} - V_{BF}$ =	6768	CF		
$T_{100} = T_{BF} + V_{REM} / (Q_{ALL} + Q_{BF+100} + Q_{AVE\ 100})$ =	60.67	HOURS		
	MEETS DETENTION REQUIREMENTS			

BASIN DESIGN SUMMARY

BASIN SIZE REQUIRED =	12,867	FT^3
BASIN SIZE PROVIDED =	12,966	FT^3

ORIFICE DESIGN SUMMARY

ELEVATION	# OF HOLES	DIAMETER OF HOLES
809.59	1	1.00 -INCH
812.45	2	1.00 -INCH

WASHENAW COUNTY DETENTION BASIN CALCULATIONS

W1 DETERMINING POST-DEVELOPMENT

TOTAL SITE AREA: 0.93 ACRES
TOTAL SITE AREA EXCLUDING BMPS: 0.93 ACRES
BMP AREA: 0.00 ACRES

RATIONAL METHOD VARIABLES

COVER TYPE	SOIL TYPE	AREA(FT^2)	AREA(AC)	RUNOFF COEF	C(AREA)
Pavement and Roof		25890.73	0.594369286	0.95	0.564650822
Pervious	Group A (>8%)	14763.81	0.338930546	0.25	0.084732637

TOTAL CA= 0.649383458
TOTAL AREA= 0.933299832
WEIGHET C= 0.695792966

RATIONAL METHOD VARIABLES PERVIOUS

COVER TYPE	SOIL TYPE	AREA(FT^2)	AREA(AC)	CN	C(AREA)
Good Condition Open Space	Group A	14763.81	0.338930546	49	16.60759677

TOTAL CA= 16.60759677
TOTAL AREA= 0.338930546
WEIGHET CN= 49

RATIONAL METHOD VARIABLES IMPERVIOUS

COVER TYPE	SOIL TYPE	AREA(FT^2)	AREA(AC)	CN	C(AREA)
Paved Parking and Roof		25890.73	0.594369286	98	58.24819003

TOTAL CA= 58.24819003
TOTAL AREA= 0.594369286
WEIGHET CN= 98

W2 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

FIRST FLUSH RUNOFF CALCULATIONS V_{ff}

V_{ff}= 3,630(C)(A) = 2346 FT^3

W3 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

PRE-DEVELOPMENT BANKFULL CALCULATIONS $V_{BF\text{-}PRE}$

P=		2.35	IN
CN=		57	UNITLESS
S=	1000/(CN) - 10	7.54	IN
Q=	$(P-0.2*S)^2/(P+0.8*S)$	0.08	IN
A=		40465.297	SF
$V_{bf\text{-}pre}$=	Q*(1/12)*A	284.59	FT^3

W4 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

PERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATIONS $V_{bf\text{-}per\text{-}post}$

P=		2.35	IN
CN=		49	UNITLESS
S=	1000/(CN) - 10	10.41	IN
Q=	$(P-0.2*S)^2/(P+0.8*S)$	0.01	IN
A=		14763.8146	SF
$V_{bf\text{-}per\text{-}post}$=	Q*(1/12)*A	8.30	FT^3

W5 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

IMPERVIOUS COVER POST-DEVELOPMENT BANKFULL RUNOFF CALCULATIONS $V_{bf\text{-}imp\text{-}post}$

P=		2.35	IN
CN=		98	UNITLESS
S=	1000/(CN) - 10	0.20	IN
Q=	$(P-0.2*S)^2/(P+0.8*S)$	2.12	IN
A=		25890.7261	SF
$V_{bf\text{-}imp\text{-}post}$=	Q*(1/12)*A	4577.64	FT^3

W6 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

PERVIOUS COVER POST-DEVELOPMENT 100-YEAR STORM RUNOFF CALCULATIONS $V_{100\text{-}per\text{-}post}$

P=		5.11	IN
CN=		49	UNITLESS
S=	1000/(CN) - 10	10.41	IN
Q=	$(P-0.2*S)^2/(P+0.8*S)$	0.68	IN
A=		14763.8146	SF
$V_{100\text{-}per\text{-}post}$=	Q*(1/12)*A	839.74	FT^3

W7 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

IMPERVIOUS COVER POST-DEVELOPMENT 100-YEAR STORM RUNOFF CALCULATIONS $V_{100\text{-}imp\text{-}post}$

P=		5.11	IN
CN=		98	UNITLESS
S=	1000/(CN) - 10	0.20	IN
Q=	$(P-0.2*S)^2/(P+0.8*S)$	4.87	IN
A=		25890.7261	SF
$V_{100\text{-}imp\text{-}post}$=	Q*(1/12)*A	10513.79	FT^3

W8 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

DETERMINE TIME OF CONCENTRATION FOR APPLICABLE FLOW TYPES Tc-hrs

FLOW TYPE	K	CHANGE IN ELEV	LENGTH	SLOPE %	$S^{0.5}$	$V=K*S^{0.5}$	$T_C=L/(V*3600)$
Sheet Flow	0.48	3.66	82.53	0.044348155	0.210590016	0.101083208	**0.226790059**
Sheet Flow	0.48	2.26	115.41	0.019582851	0.139938739	0.067170595	**0.477255382**
Water Way	1.2	0.03	6	0.005	0.070710678	0.084852814	**0.019641855**

$T_{c\text{-}hrs}$= 0.723687296 HR

W9 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

RUNOFF SUMMARY & ONSITE INFILTRATION REQUIREMENT

RUNOFF SUMMARY

V_{ff}=	2346	FT^3
$V_{bf\text{-}pre}$=	284.59	FT^3
$V_{bf\text{-}per\text{-}post}$=	8.30	FT^3
$V_{bf\text{-}imp\text{-}post}$=	4577.64	FT^3
$V_{bf\text{-}post}$=	4585.94	FT^3
$V_{100\text{-}per\text{-}post}$=	839.74	FT^3
$V_{100\text{-}imp\text{-}post}$=	10513.79	FT^3
V_{100}=	11353.54	FT^3

ONSITE INFILTRATION REQUIREMENT

$V_{bf\text{-}diff}$= 4301.35 FT^3
V_{inf}= 4301 FT^3

W10 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

DETENTION/RETENTION REQUIREMENT

DETENTION

Q_p=	$238.6*T_c^{-0.82}$	311.06	CFS / IN-MI^2
A=		0.93	AC
Q_{100}=		6	IN
PF=		3	CFS
Δ=		2	CFS
V_{det}=		10723	FT^3

RETENTION

V_{ret}= 22707 FT^3

W11 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

DETERMINE APPLICABLE BMPs AND ASSOCIATED VOLUME CREDITS

PROPOSED BMP	AREA FT^2	STORAGE VOLUME (FT3) SURFACE	STORAGE VOLUME (FT3) SOIL	AVE DESIGN INFILTRATION RATE	INFILTRATION VOLUME DURING STORM	TOTAL VOLUME REDUCTION
PERVIOUS PAVEMENT W/ INFIL BED						
INFILTRATION BASIN						
SUBSURFACE INFILTRATION BED						
INFILTRATION TRENCH						
BIORETENTION SYSTEM						
RAIN GARDENS						
DRY WELL						
BIOSWALE						
VEGETATED FILTER STRIP						
GREEN ROOF						

TOTAL VOLUME REDUCTION CREDIT BY PROPOSED STRUCTUREAL BMPS= 0
RUNOFF VOLUME INFILTRATION REQUIREMENT V_{INF}= 4301
RUNOFF VOLUME CREDIT= 0

W12 STANDARD METHOD RUNOFF VOLUME CALCULATIONS

NATURAL FEATURES INVENTORY

EXISTING NATURAL RESOURSES	MAPPED?	TOTAL AREA	PROTECTED/UNDISTURBED AREA
WATERBODIES			
FLOODPLAINS			
REPARIAN AREAS			
WETLANDS			
WOODLANDS			
NATURAL DRAINAGE AREAS			
STEEP SLOPES, 15%-25%			
STEEP SLOPES, OVER 25%			
SPECIAL HABIT AREAS			
OTHER			
TOTAL EXISTING ACRES			

W13 SUMMARY:SITE SUMMARY OF INFILTRATION & DETENTION

STORMWATER MANAGEMENT SUMMARY

V_{inf}=	4301	FT^3
$V_{Des\text{-}inf}$=	0	FT^3
INF_{min}%	0	%
V_{det}=	10723	FT^3
$V_{det\text{-}net}$=	10723	FT^3

DETENTION VOLUME INCREASE WHERE REQUIRED INFILTRATION VOLUME CANNOT BE ACHIEVED

$INF_{NOT\text{-}prov}$%	100	%
NET_{pen}%	20	%
$V_{det\text{-}total}$	12867	FT^3

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR ELEVATION DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171

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PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42722 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE: UTILITY PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

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GENERAL LANDSCAPE SPECIFICATIONS:

1. ALL PLANT MATERIAL SHALL CONFORM TO THE REQUIREMENTS AND SPECIFICATIONS OF THE GOVERNING MUNICIPALITY. ALL STOCK SHALL BE NURSERY GROWN, CONFORMING TO ANSI Z60.1 "AMERICAN STANDARD FOR NURSERY STOCK", AND IN ACCORDANCE WITH GOOD HORTICULTURAL PRACTICE. STOCK SHALL EXHIBIT NORMAL GROWTH HABIT AND BE FREE OF DISEASE, INSECTS, EGGS, LARVAE, AND DEFECTS SUCH AS KNOTS, SUN-SCALD, INJURIES, ABRASIONS, OR DISFIGUREMENT. ALL PLANT MATERIAL SHALL BE SUBJECT TO THE APPROVAL OF THE LANDSCAPE ARCHITECT.
2. ALL PLANT MATERIALS SHALL BE BALLED AND BURLAPPED OR CONTAINER STOCK. NO BARE ROOT STOCK IS PERMITTED. ALL PLANT BALLS SHALL BE FIRM, INTACT, AND SECURELY WRAPPED AND BOUND.
3. ALL PLANT BED MATERIALS SHALL BE EXCAVATED OF ALL BUILDING MATERIALS, OTHER EXTRANEOUS OBJECTS, AND POOR SOILS TO A MINIMUM DEPTH OF 12-INCHES AND BACKFILLED TO GRADE WITH SPECIFIED PLANTING MIX (SEE BELOW).
4. PLANTING MIXTURE SHALL CONSIST OF 5 PARTS TOPSOIL FROM ON-SITE (AS APPROVED), 4 PARTS COARSE SAND, 1 PART SPHAGNUM PEAT MOSS (OR APPROVED COMPOST), AND 5 LBS OF SUPERPHOSPHATE FERTILIZER PER CU. YD. OF MIX. INGREDIENTS SHALL BE THOROUGHLY BLENDED FOR UNIFORM CONSISTENCY.
5. ALL PLANT BEDS AND INDIVIDUAL PLANTS, NOT OTHERWISE NOTED SHALL BE MULCHED WITH A 4-INCH LAYER OF SHREDDED BARK MULCH. EDGE OF MULCH BEDS AS SHOWN. DECIDUOUS TREES IN LAWN AREAS SHALL RECEIVE A 5-FT DIAMETER CIRCLE OF MULCH AND CONIFER TREES 8-FT (PLANTED CROWN OF TREE) UNLESS OTHERWISE NOTED.
6. LANDSCAPE STONE SHALL BE INSTALLED WHERE NOTED OR INDICATED (HATCHED). STONE SHALL BE 3/4"-1-1/4" WASHED RIVER GRAVEL OR AS SELECTED AND SHALL BE INSTALLED TO A MINIMUM DEPTH OF 3-INCHES.
7. ALL LANDSCAPE BEDS, UNLESS OTHERWISE NOTED SHALL BE INSTALLED OVER WEED BARRIER FABRIC – WATER PERMEABLE FILTRATION FABRIC OF NON-WOVEN POLYPROPYLENE OR POLYESTER FABRIC. FABRIC SHALL BE OF SUITABLE THICKNESS FOR APPLICATION.
8. ALL PLANTS AND PLANT BEDS SHALL BE THOROUGHLY WATERED UPON COMPLETION OF PLANTING AND STAKING OPERATIONS.
9. THE CONTRACTOR SHALL GUARANTEE ALL PLANT MATERIALS FOR A PERIOD OF 1 YEAR FROM THE DATE THE WORK IS ACCEPTED, IN WRITING, BY THE LANDSCAPE ARCHITECT. THE CONTRACTOR SHALL REPLACE, WITHOUT COST TO THE OWNER, WITHIN A SPECIFIED PERIOD OF TIME, ALL DEAD PLANTS, AND ALL PLANTS NOT IN A VIGOROUS, THRIVING CONDITION, AS DETERMINED BY THE LANDSCAPE ARCHITECT, DURING AND AT THE END OF THE GUARANTEE PERIOD. REPLACEMENT STOCK SHALL CONFORM TO THE ORIGINAL SPECIFICATIONS.
10. EDGING SHALL BE PROVIDED FOR ALL LANDSCAPE BEDS NOT ADJACENT TO CONCRETE PAVEMENT. EDGING SHALL BE BLACK ALUMINUM EDGING, 3/16-INCH X 4-INCH. INSTALL PER MANUFACTURER'S INSTRUCTIONS, ALL EDGING SHALL BE INSTALLED IN STRAIGHT LINES OR SMOOTH CURVES WITHOUT IRREGULARITIES.
11. SOD SHALL BE DENSE, WELL ROOTED TURF, FREE OF WEEDS. IT SHALL BE COMPRISED OF A BLEND OF AT LEAST TWO KENTUCKY BLUE GRASSES AND ONE FESCUE. IT SHALL HAVE A UNIFORM THICKNESS OF 3/4-INCH AT TIME OF PLANTING, AND CUT IN UNIFORM STRIPS NOT LESS THAN 10-INCHES BY 18-INCHES. SOD SHALL BE KEPT MOIST AND LAID WITHIN 36-HOURS AFTER CUTTING.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ALL SODDED AREAS THAT BROWN-OUT OR HAVE NOT FIRMLY KNITTED TO THE SOIL BASE WITHIN A PERIOD OF 1 MONTH SHALL BE REPLACED BY THE CONTRACTOR, AT NO COST TO THE OWNER.
12. ALL AREAS OF THE SITE THAT BECOME DISTURBED DURING CONSTRUCTION AND ARE NOT TO BE PAVED, STONED, LANDSCAPED, OR SODDED SHALL BE SEEDED AND MULCHED.

   SEE MIXTURE SHALL BE AS FOLLOWS:

KENTUCKY BLUEGRASS (CHOOSE 3 VARIETIES – ADELPHI, RUGBY, GLADE, OR PARADE)	30%
RUBY RED OR DAWSON RED FINE FESCUE	30%
ATLANTA RED FESCUE	20%
PENNFINE PERENNIAL RYE	20%

   THE ABOVE SEED MIXTURE SHALL BE SOWN AT A RATE OF 250 LBS PER ACRE. PRIOR TO SEEDING, THE TOPSOIL SHALL BE FERTILIZED WITH A COMMERCIAL FERTILIZER WITH A 10-0-10 ANALYSIS:

   10% NITROGEN – MIN 25% FROM A UREA FORMALDEHYDE SOURCE
   0 % PHOSPHATE
   10% POTASH – SOURCE POTASSIUM SULFATE OR POTASSIUM NITRATE

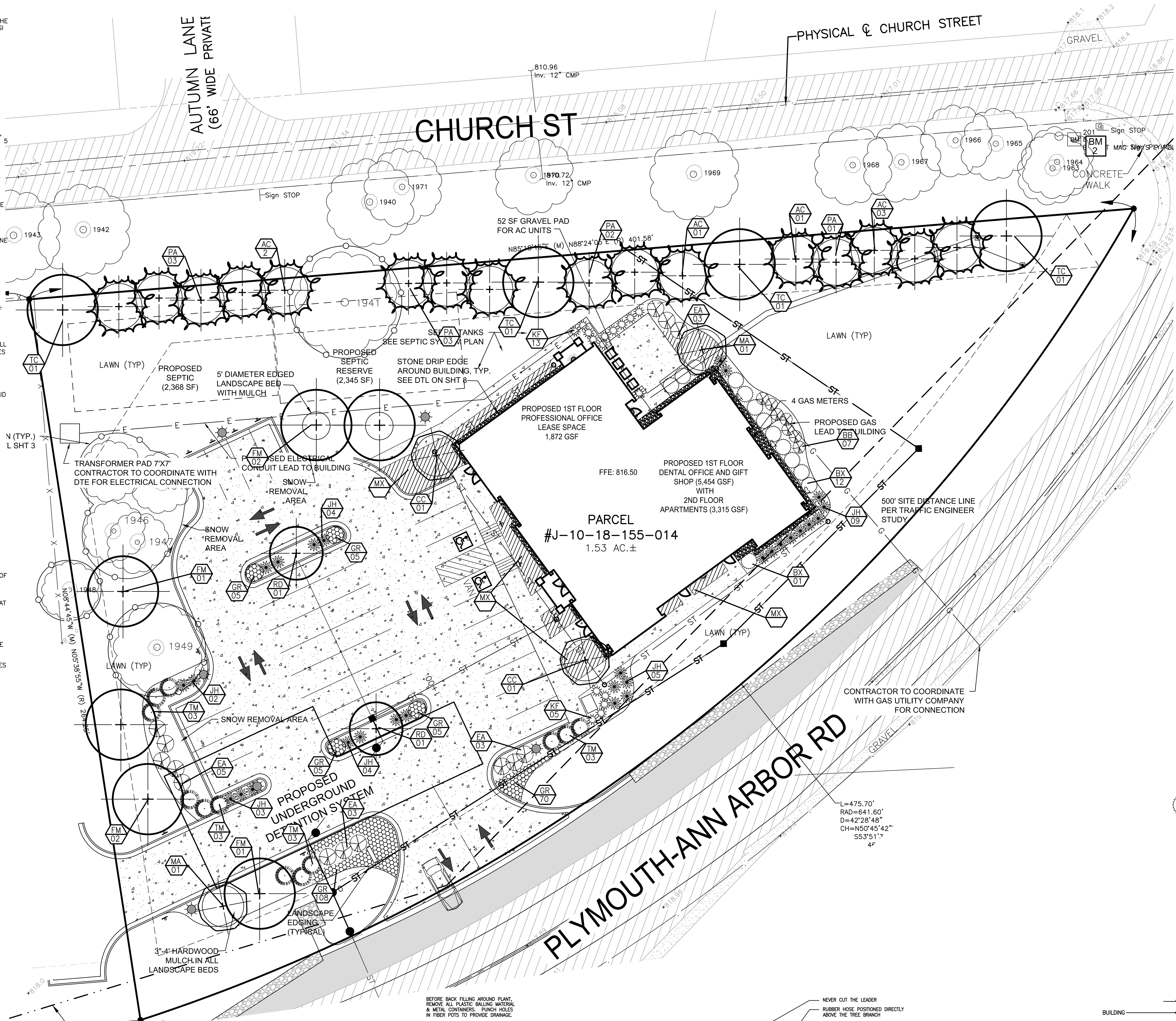
   THE FIRST FERTILIZER APPLICATION SHALL BE AT A RATE OF 10 LBS PER 1000 SQ FT OF BULK FERTILIZER.

   IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO ESTABLISH A DENSE LAWN OF PERMANENT GRASSES, FREE OF LUMPS AND DEPRESSIONS. ANY PART OF THE AREA THAT FAILS TO SHOW A UNIFORM GERMINATION SHALL BE RE-SEEDED AND SUCH RE-SEEDING SHALL CONTINUE UNTIL A DENSE LAWN IS ESTABLISHED. DAMAGE TO SEEDED AREAS RESULTING FROM EROSION SHALL BE REPAIRED BY THE CONTRACTOR.
13. ALL AREAS OF THE SITE SCHEDULED FOR SEEDING OR SODDING SHALL FIRST RECEIVE A 6-INCH LAYER OF CLEAN, FRIABLE TOPSOIL. THE SOIL SHALL BE DISCED AND SHALL BE GRADED IN CONFORMANCE WITH THE GRADING PLAN.
14. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATION OF ALL UTILITIES AND TO INFORM THE LANDSCAPE ARCHITECT OF ANY CONFLICTS PRIOR TO COMMENCING LANDSCAPING.

LANDSCAPE CALCULATIONS:
PER SUPERIOR TOWNSHIP ZONING ORDINANCE

LANDSCAPING:

- TRANSITION BUFFER REQUIRED WHERE OFFICE AND COMMERCIAL USES ABUT A LOT IN A RESIDENTIAL ZONING DISTRICT
  - ----- 20 FT MIN. WIDTH TRANSITION STRIP
  - ----- IN VILLAGE CENTER DISTRICT, THIS BUFFER CAN BE 50% OF THE WIDTH REQUIRED = 10 FT WIDE
  - ----- BUFFER SHALL BE PROVIDED ALONG EVERY LOT LINE, EXCEPT A FRONT LOT LINE WHICH IS CONTIGUOUS TO OR ACROSS THE STREET FROM A LOT IN SUCH DISTRICT (THIS PARCEL: ALONG CHURCH STREET)
- LANDSCAPING STRIP AT LEAST 20 FT WIDE SHALL BE PROVIDED ALONG AND ADJACENT TO THE FRONT PROPERTY LINE, ALONG ALL STREET FRONTAGES, AND SHALL EXTEND ACROSS THE ENTIRE WIDTH OF THE LOT, SUBJECT TO THE FOLLOWING:
  - NO PARKING AREA, SIDEWALK OR SIMILAR IMPROVEMENT LOCATED IN THIS AREA
- GREENBELTS:
  REQUIRED WITHIN THE FRONT SETBACK AREA FOR PARKING LOTS AND AROUND NON-RESIDENTIAL PARKING LOT WITHIN 100' OF A RESIDENTIAL DISTRICT:
  - WIDTH: 15' WIDE IN FRONT YARD SETBACK, AND NOT LESS THAN 10' ELSEWHERE
  - ONE TREE PER 20' OF STREET FRONTAGE: 265 LF/20 = 14 TREES REQUIRED, 19 PROVIDED
  - 1/2 OF THE TREES SHALL BE EVERGREENS
  - ONE SHRUB 24" HIGH (MIN) PER 10' OF STREET FRONTAGE: 265 LF/10 = 27 SHRUBS REQUIRED, 28 SHRUBS PROVIDED AROUND PARKING
- WITHIN PARKING LOTS WHICH CONTAIN 20 OR MORE PARKING SPACES:
  15 SF PER PARKING SPACE: 32 SPACES * 15 SF = 480 SF
  REQUIRED AREA PER ISLAND: 180 SF WITH ONE DECIDUOUS TREE PLANTING REQUIRED
  PROVIDED: TOTAL AREA PROVIDED WITHIN PARKING LOT 549 SF AND 2 DECIDUOUS TREES
- GREENBELT PROVIDED ON NORTH PROPERTY LINE : EVERGREEN SCREENING WITH 16 PROPOSED EVERGREEN TREES AND 4 PROPOSED DECIDUOUS TREES AND 1 EXISTING ELM TREE.
- REPLACEMENT TREES REQUIRED: (4)
  50% OF (4) REQUIRED REPLACEMENT TREES ARE SATISFIED BY SCREENING/BUFFER REQUIREMENTS ABOVE = (2) DECIDUOUS TREES OUTSIDE OF PARKING LOT; REMAINING 2 REPLACEMENT TREES PROVIDED OUTSIDE OF PARKING LOT
- REPLACEMENT TREE REQUIREMENT IS SATISFIED.



LEGEND

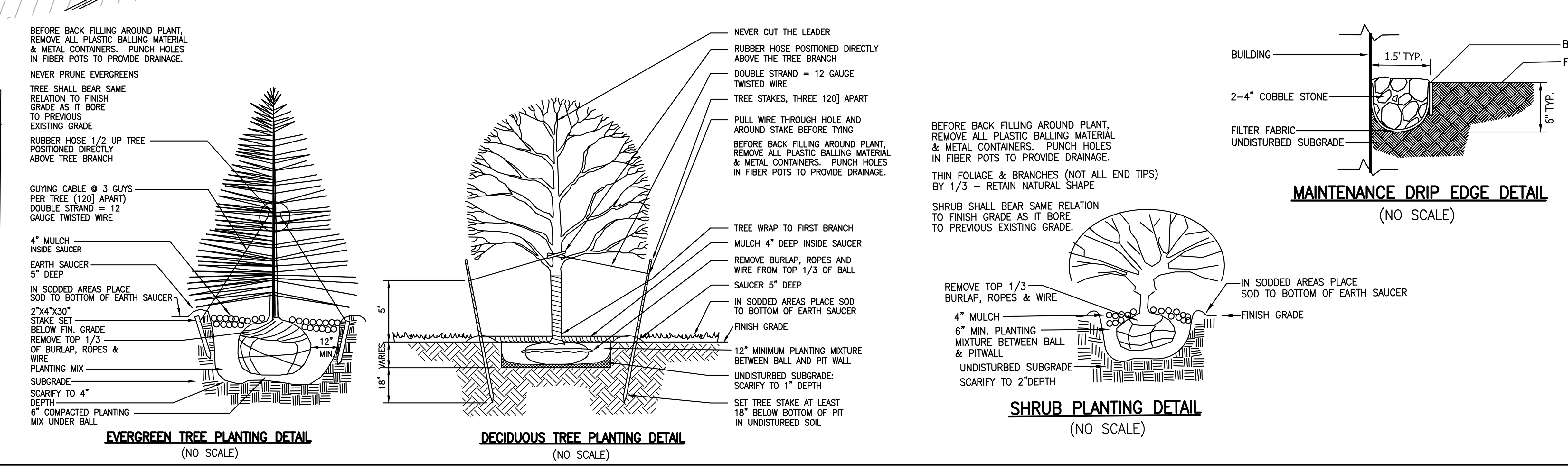
PROPOSED (PR)	EXISTING (EX)	
		CONTOUR
	+ 922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
PS	PS	PRESSURE SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
FO	FO	FIBER OPTIC
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
X	X	FENCE
		SILT FENCE
		WETLAND BOUNDARY
		LIMITS OF GRADING/CLEARING
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
		SIGN
	NFV	NOT FIELD VERIFIED
TBR		TO BE REMOVED
SAN #1		SANITARY SEWER LABEL
		STORM SEWER LABEL
GV 12		WATER MAIN LABEL
54T		SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY)
		CONCRETE
		ASPHALT
		MODIFIED CURB

LANDSCAPE LEGEND

- EXISTING DECIDUOUS TREE
- PROPOSED DECIDUOUS TREE
- PROPOSED CONIFER TREE
- PROPOSED ORNAMENTAL TREE
- PROPOSED CONIFER SHRUBS
- PROPOSED DECIDUOUS SHRUB
- PROPOSED PERENNIAL GRASS
- PROPOSED LOW EVERGREEN SHRUB
- PROPOSED PERENNIAL MIX (SELECTED BY CONTRACTOR)
- PROPOSED STONE DRIP EDGE (SEE DTL FOR INSTALLATION)
- PROPOSED GERANIUM 'ROZANNE' GROUNDCOVER
- PROPOSED TREE PROTECTION

LANDSCAPE PLANT LIST

KEY	QUAN.	BOTANICAL NAME	COMMON NAME	SIZE	REMARK
SHRUBS					
BB	07	Hydrangea paniculata 'Bobo'	Bobo Panicle Hydrangea	24" ht.	Cont.
BX	13	Buxus microphylla 'Wintergem'	Wintergem Boxwood	30" ht.	Cont.
EA	14	Euonymous alatus 'Compactus'	Dwarf Burning Bush	24" ht.	Cont.
JH	29	Juniperus horizontalis	Creeping Juniper	18" ht.	Cont.
TM	12	Taxus x media 'Densiformis'	Dense Japanese Yew	30 ht.	Cont.
DECIDUOUS AND EVERGREEN TREES					
AC	06	Abies concolor	White Fir	8' ht.	B & B
CC	02	Cercis canadensis	Eastern Redbud	2.0" cal.	B & B
FM	05	Acer x freemanii 'Jeffersred'	Autumn Blaze Maple	2.5" cal.	B & B
RD	02	Acer rubrum 'Armstrong'	'Armstrong' Red Maple	2.5" cal.	B & B
MA	02	Malus x 'JFS-KW5'	Royal Raindrops Flowering Crabapple	2.0" cal.	B & B
PA	09	Picea abies	Norway Spruce	8' ht.	B & B
TC	04	Tilia cordata 'Greenspire'	Greenspire Littleleaf Linden	2.5" cal.	B & B
PERENNIALS					
KF	18	Calamagrostis x acutiflora 'Karl Foerster'	Karl Foerster Feather Reed Grass	1 gal.	Cont.
GR	178	Geranium 'Rozanne'	Hardy Geranium, Cranesbill, planted 18" O.C.	1 gal.	Cont.
MX	680	Perennial Mix (TBD) 1,575 SF	Mix of perennials suitable to the site, planted 18" O.C. and selected by landscape contractor	1 gal.	Cont.



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HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT: DENTAL OFFICE & MIXED USE

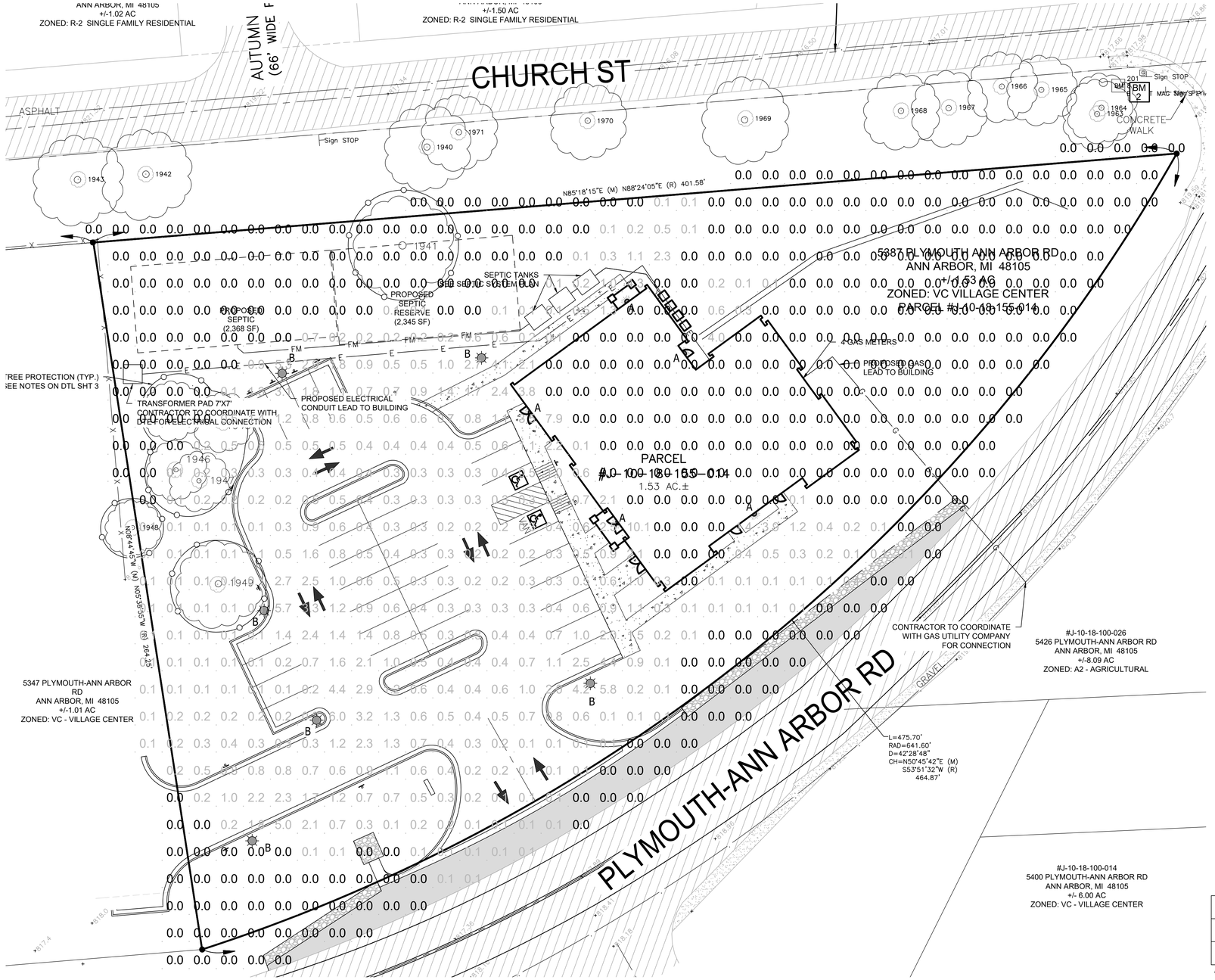
PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT, 42732 VAN DYKE AVE, STERLING HEIGHTS, MI 48314, 586-323-4462

TITLE: LANDSCAPE PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: JA
DRAWN BY: JA
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 22-097
DATE: 2/22/2023
SHEET NO. 9

SCALE: 1 INCH = 20 FEET



LEGEND

PROPOSED (PR)	EXISTING (EX)	
900	900	CONTOUR
	922.08	SPOT ELEVATION
FF	FF	FINISHED FLOOR ELEVATION
FG	FG	FINISHED GRADE ELEVATION
T/A	T/A	TOP OF ASPHALT
T/C	T/C	TOP OF CURB / CONCRETE
T/W	T/W	TOP OF WALK
F/L	F/L	FLOW LINE
T/P	T/P	TOP OF PIPE
B/P	B/P	BOTTOM OF PIPE
RIM	RIM	RIM ELEVATION
INV	INV	INVERT ELEVATION
MH	MH	MANHOLE STRUCTURE
IN	IN	INLET STRUCTURE
CB	CB	CATCHBASIN STRUCTURE
RY	RY	REARYARD STRUCTURE
ES	ES	END-SECTION
GV	GV	GATEVALVE STRUCTURE
HY	HY	HYDRANT
UP	UP	UTILITY POLE
SN	SN	SANITARY SEWER
SL	SL	SANITARY LEAD
FM	FM	FORCE MAIN
PS	PS	PRESSURE SEWER
ST	ST	STORM SEWER
WM	WM	WATER MAIN
WL	WL	WATER LEAD
FO	FO	FIBER OPTIC
OH	OH	OVERHEAD WIRE
C	C	CABLE
E	E	ELECTRIC
G	G	GAS
T	T	TELEPHONE
X	X	FENCE
		SILT FENCE
		WETLAND BOUNDARY
		LIMITS OF GRADING/CLEARING
		MANHOLE
		INLET / CATCHBASIN
		FLARED END-SECTION
		GATE VALVE
		HYDRANT
		UTILITY POLE
		SIGN
TBR	NFV	NOT FIELD VERIFIED TO BE REMOVED
SN P1		SANITARY SEWER LABEL
		STORM SEWER LABEL
GV 12		WATER MAIN LABEL
547		SOIL EROSION CONTROL MEASURE (P=PERMANENT, T=TEMPORARY)
		CONCRETE
		ASPHALT
		MODIFIED CURB
		SINGLE FIXTURE LIGHT FIXTURE
		WALL MOUNTED LIGHT FIXTURE
0.1		FOOT CANDLES

SCALE: 1 INCH = 20 FEET

SITE LIGHTING REQUIREMENTS FOR SUPERIOR TOWNSHIP

PARKING LOTS – FIXTURES 20 FEET IN HEIGHT ABOVE GRADE MAX, 15 FEET WHEN CLOSER THAN 50 FEET TO A PROPERTY LINE.

DECORATIVE EXTERIOR FIXTURES LIMITED TO LAMPS WITH MAX WATTAGE OF 100 WATTS PER FIXTURE

MAX INTENSITY OF LIGHT WITHIN ANY SITE SHALL NOT EXCEED:
AT ANY POINT WITHIN THE SITE – 10.0 FC
AT ANY LOT BOUNDARY OR ROAD RIGHT–OF–WAY LINE – 0.2 FC AT 5 FEET ABOVE GRADE

ARCHITECTURAL LIGHTING ON BUILDING FACADES SHALL BE LIMITED TO FULLY SHIELDED FIXTURES DIRECTED TOWARD THE FACADE AND CONCENTRATED ON THE WALL SURFACE.

GENERAL LIGHTING NOTES

1. THE LIGHTING PATTERN REPRESENTS ILLUMINATION LEVELS CALCULATED FROM LABORATORY DATA TAKEN UNDER CONTROLLED CONDITIONS IN ACCORDANCE WITH ILLUMINATING ENGINEERING SOCIETY APPROVED METHODS. ACTUAL PERFORMANCE OF ANY MANUFACTURER'S LUMINAIRE MAY VARY DUE TO VARIATION IN ELECTRICAL VOLTAGE, TOLERANCE IN LAMPS, AND OTHER VARIABLE FIELD CONDITIONS.

SITE LIGHTING SUMMARY

AVERAGE LIGHTING LEVEL: 0.4 FC
MAXIMUM LIGHT LEVEL: 4.3 FC
MINIMUM LIGHT LEVEL: 0.0 FC

SYMBOL	LABEL	QTY.	DESCRIPTION	CATALOG NUMBER	LAMP	LUMENS	LLF	BASE HGT	POLE HGT	TOTAL HGT
	A	05	LITHONIA LIGHTING WSQ LED WITH P1-PERFORMANCE PACKAGE, 3000K, AND SR2 OPTIC TYPE	WSQ LED P1 SR2 30K MVOLT	LED	ABSOLUTE	.93	N/A	10' WALL MOUNTED	10.0'
	B	06	LITHONIA LIGHTING EML17XT GCF LED, 1 MODULE, ONE 74-WATT LED, 63 LED'S 350mA 4000K, TYPE 2, DOWNLIGHT POS. OPTIC	EML17 GCF XT 63LED 350 mA 40K R2	LED	ABSOLUTE	.93	2.5'	12.5'	15.0'

ALL IES FILES PROVIDED BY MANUFACTURER FOR CALCULATION OF LIGHTING LEVEL.

SIMILAR PARKING LOT LIGHTING IN NEIGHBORHOOD AT 5263 PLYMOUTH ANN ARBOR ROAD

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PROJECT
DENTAL OFFICE & MIXED USE
CASSINO BUILDING AND DEVELOPMENT
4232 VANDYKE AVE.
STERLING HEIGHTS, MI 48314
586-233-4462
PREPARED FOR

TITLE
LIGHTING PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP. WCRC & WCWRC	4/19/23

DESIGNED BY: JA
DRAWN BY: JA
CHECKED BY:
SCALE: 1" = 20'
JOB NO: 22–097
DATE: 2/22/2023
SHEET NO. 10

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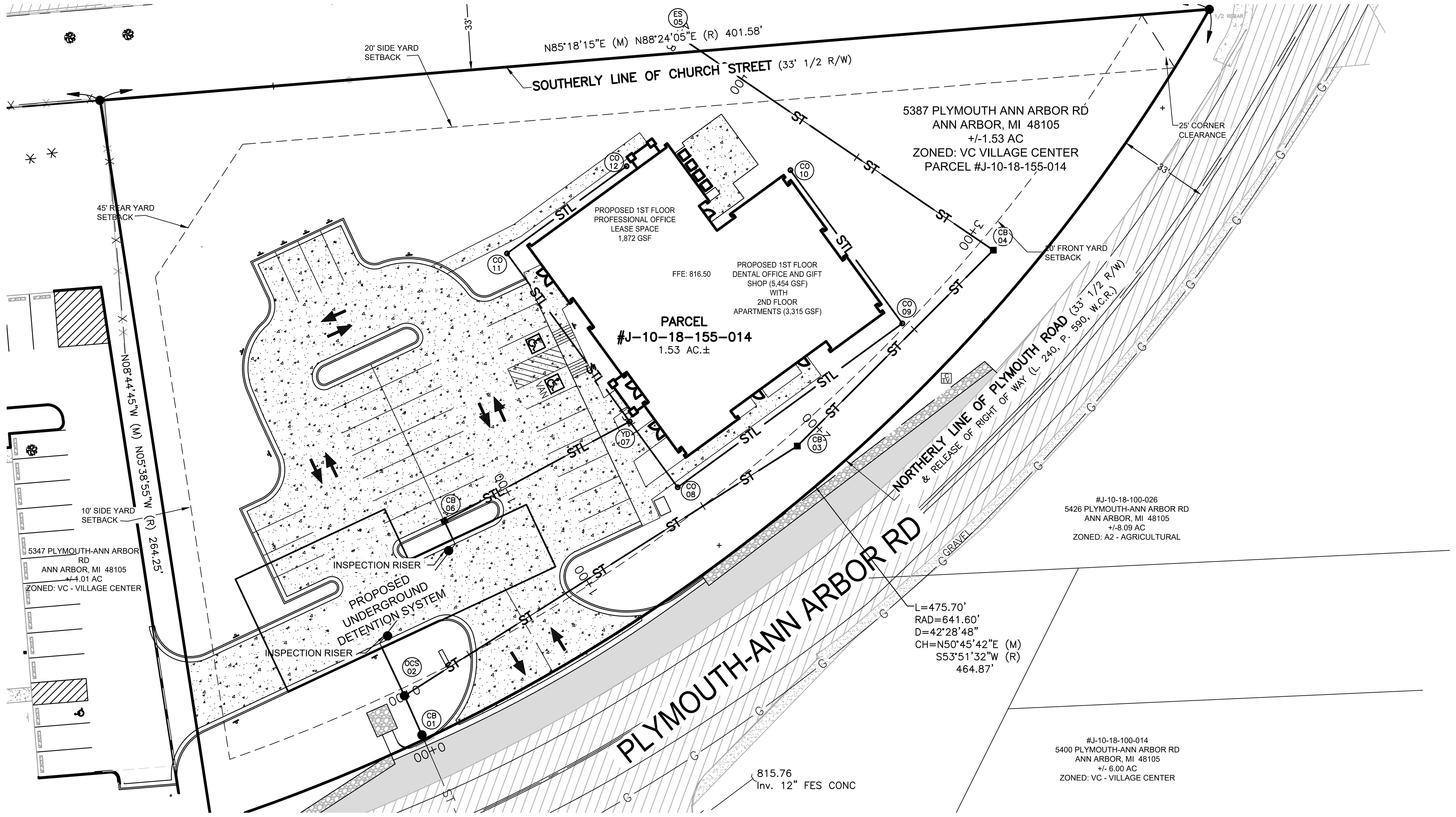
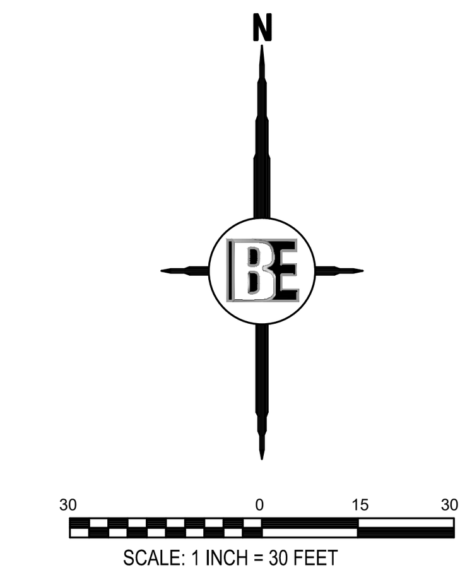
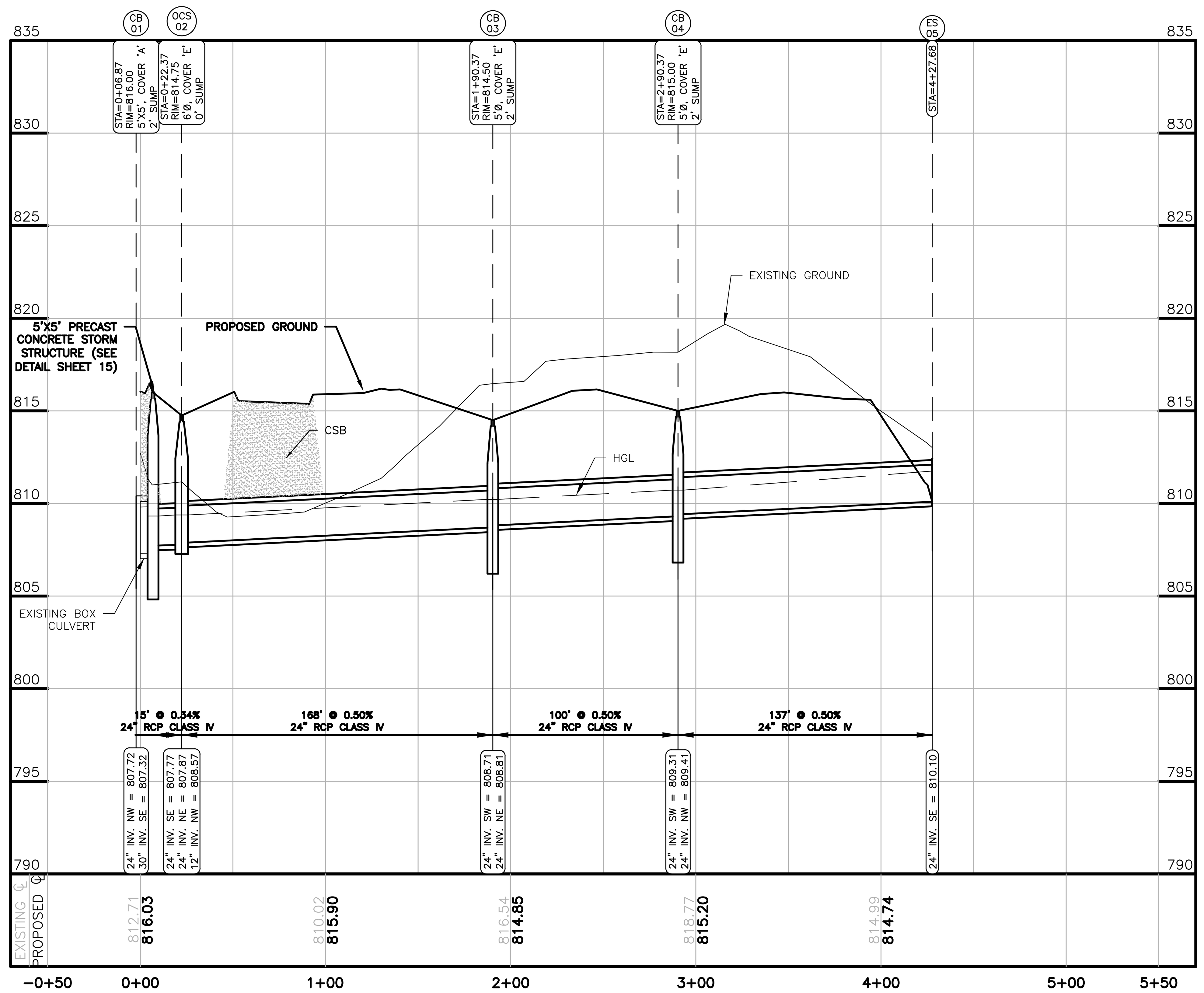
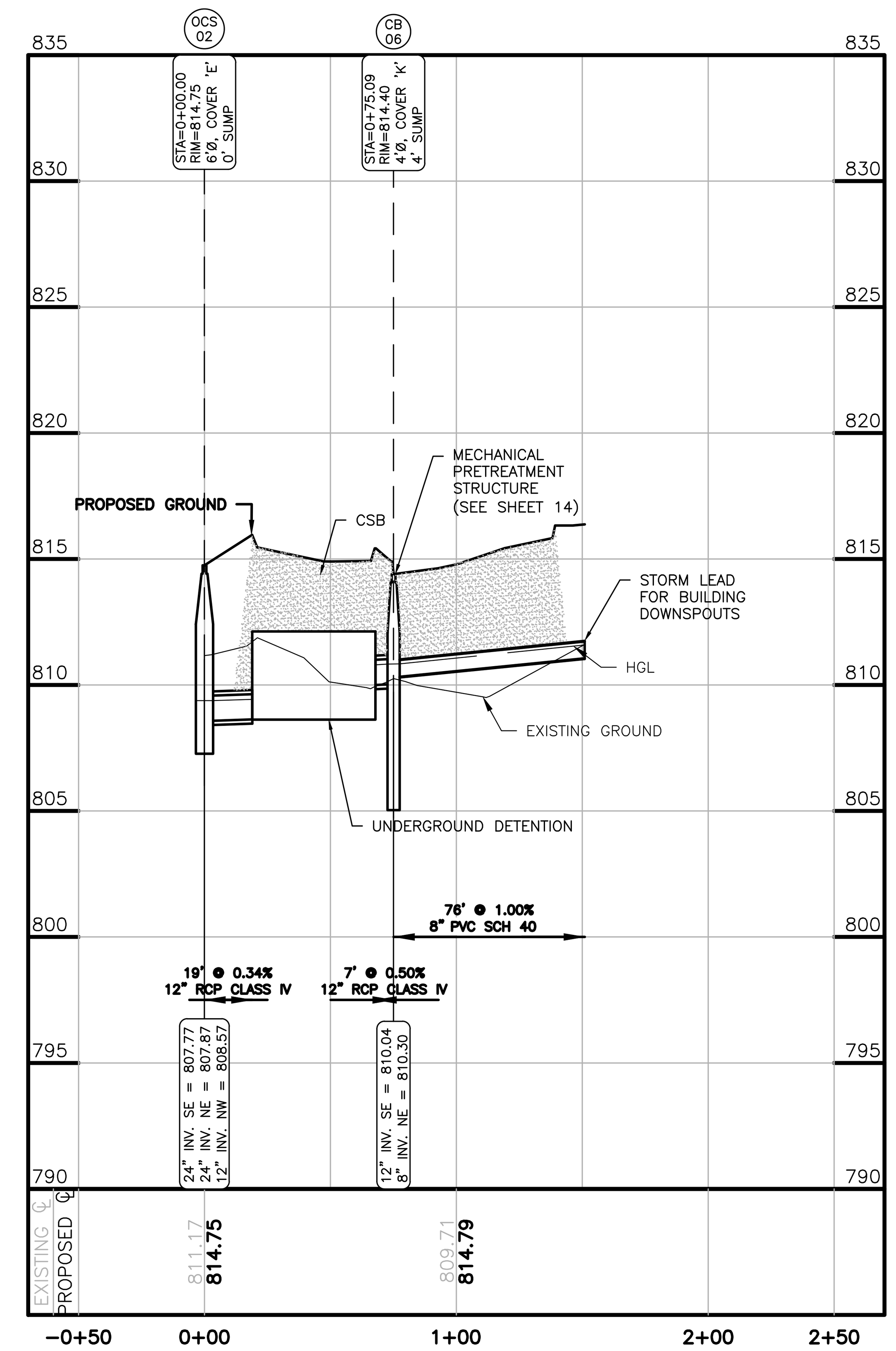






SCALE:
H: 1"=50'
V: 1"=5'



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PROJECT
DENTAL OFFICE & MIXED USE

PREPARED FOR
CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE.
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE
STORM PROFILES

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: ST
DRAWN BY: MJD
CHECKED BY:
SCALE: 1" = 30'
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 11

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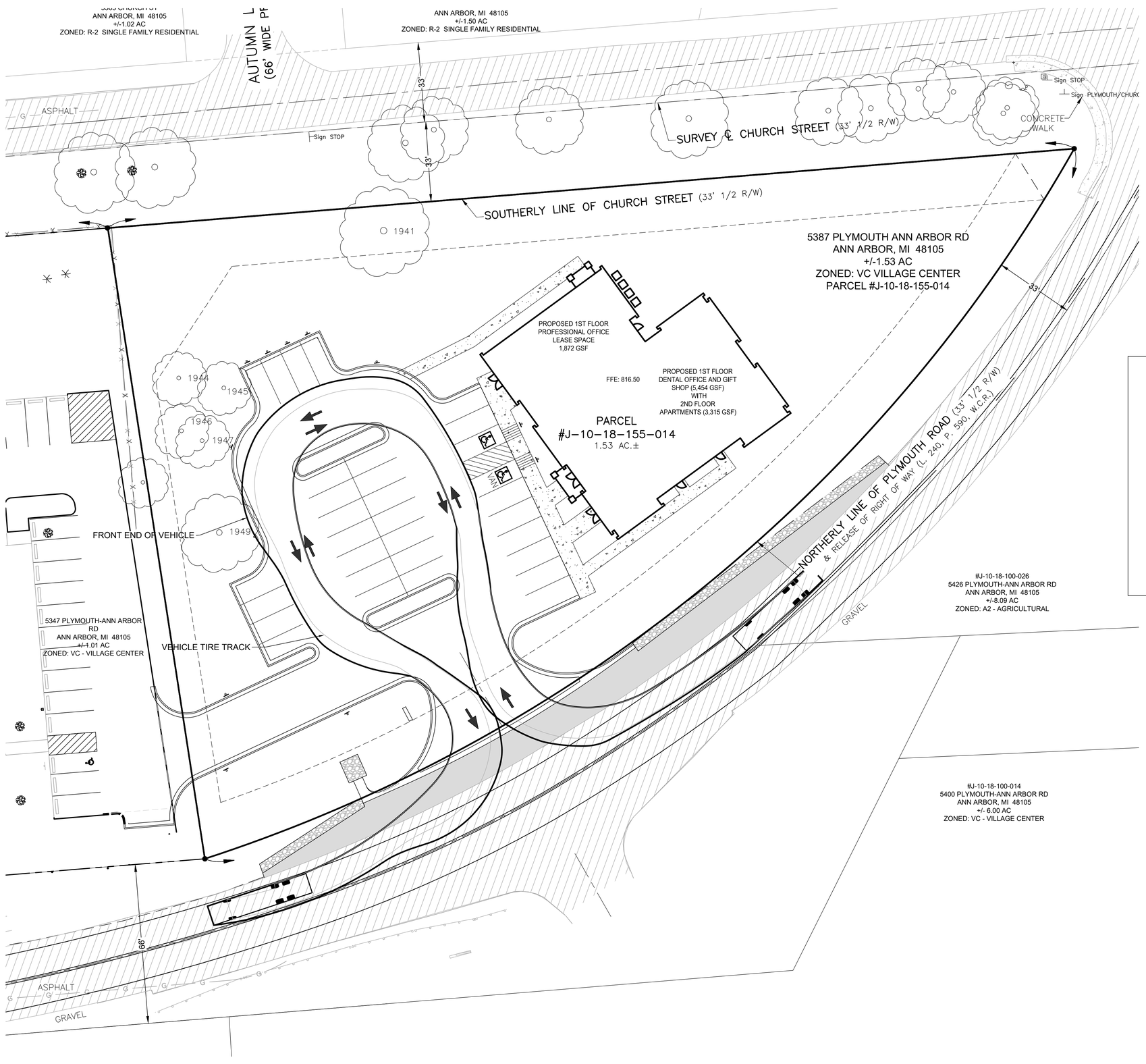

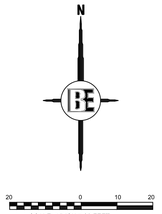

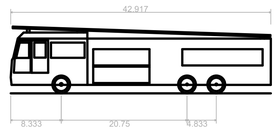

E-ONE Heavy Non Walk-In Rescue	
Overall Length	42.917ft
Overall Width	8.333ft
Overall Body Height	11.000ft
Min Body Ground Clearance	1.393ft
Track Width	8.333ft
Lock-to-lock time	6.00s
Max Wheel Angle	45.00°

EMERGENCY VEHICLE CIRCULATION
NOT TO SCALE

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517.546.4836 FAX 517.548.1670

PROJECT
DENTAL OFFICE & MIXED USE

PREPARED FOR
CASSINO BUILDING AND DEVELOPMENT
4777 E. IVAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-232-4462

TITLE
CIRCULATION PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP. WCRC & WCWRC	4/19/23

DESIGNED BY:	JA
DRAWN BY:	JA
CHECKED BY:	BL
SCALE:	1" = 20'
JOB NO:	22-097
DATE:	02/22/2023
SHEET NO.	12

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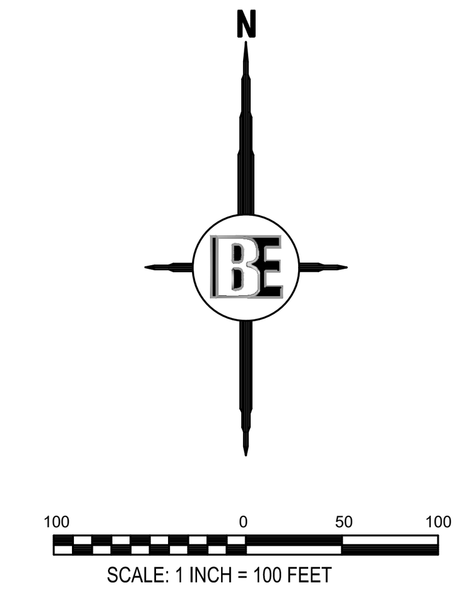
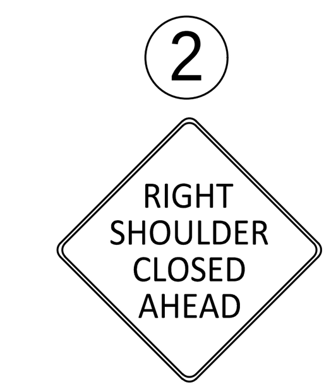


W20-1
48"x48"



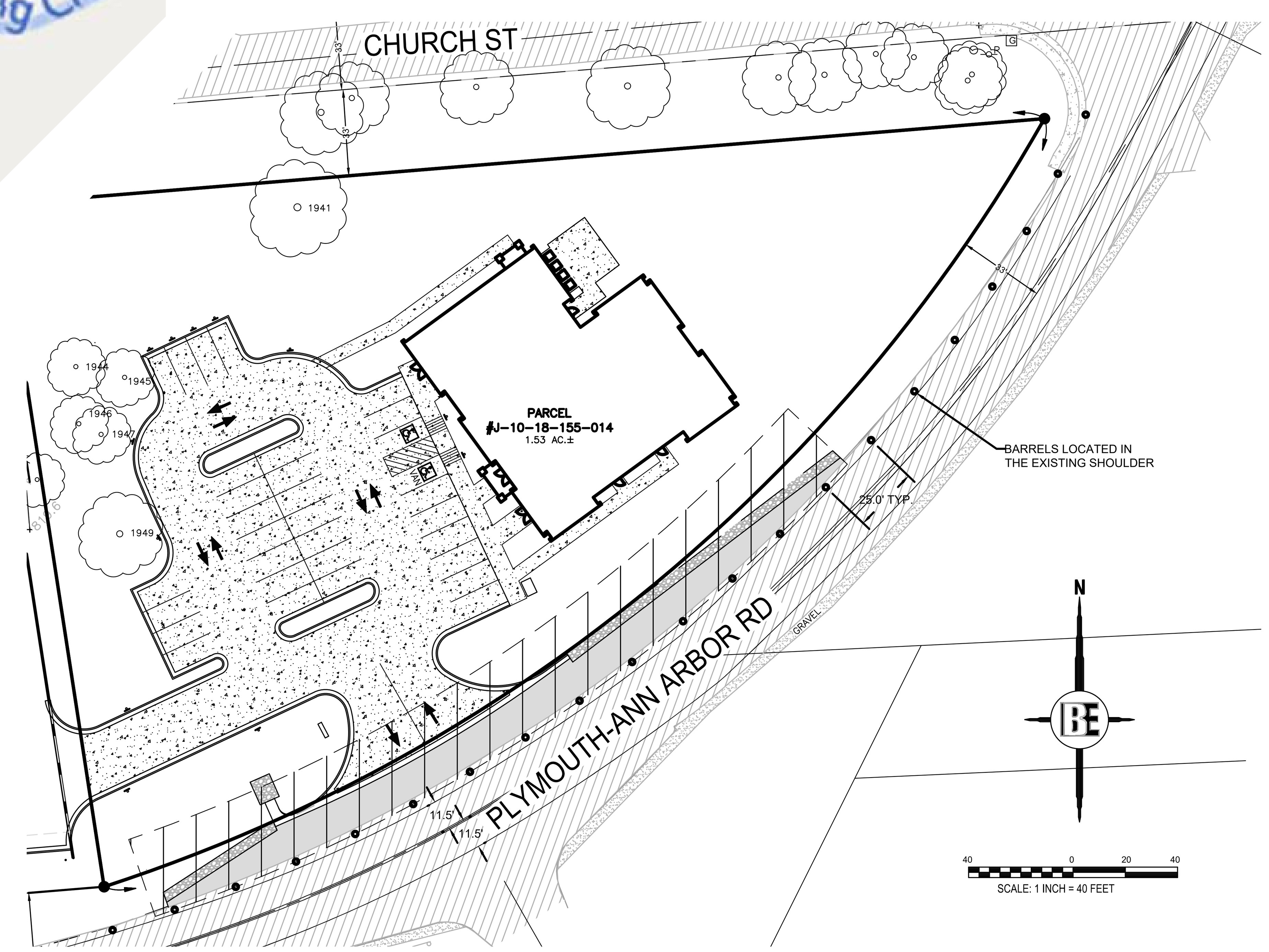
W21-5b
48"x48"

LEGEND:

- TEMPORARY TRAFFIC SIGN
- PLASTIC DRUMS
- WORK AREA

TRAFFIC CONTROL NOTES:

1. CONTRACTOR TO MAINTAIN ACCESS TO ALL DRIVEWAYS DURING CONSTRUCTION.
2. SEPARATE TRAVEL LANE AND WORK ZONE AREA WITH PLASTIC DRUMS.
3. PROVIDE TEMPORARY GRAVEL RAMPS AS NEEDED AT DRIVEWAYS, TEMPORARY RAMPS ARE INCIDENTAL TO THE CONTRACT.
4. MAILBOX RELOCATION AND/OR REPLACEMENT TO BE IN ACCORDANCE WITH THE UNITED STATES POSTAL SERVICE AND ARE INCIDENTAL TO THE CONTRACT.
5. PLYMOUTH–ANN ARBOR ROAD & CHURCH STREET TO REMAIN OPEN DURING CONSTRUCTION.



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(TOLL FREE)
FOR THE LOCATION OF UNDERGROUND FACILITIES

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PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE: TRAFFIC CONTROL PLAN

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: ST
DRAWN BY: MJD
CHECKED BY:
SCALE: VARIOUS
JOB NO: 22–097
DATE: 02/22/2023
SHEET NO. 13

PROJECT SUMMARY

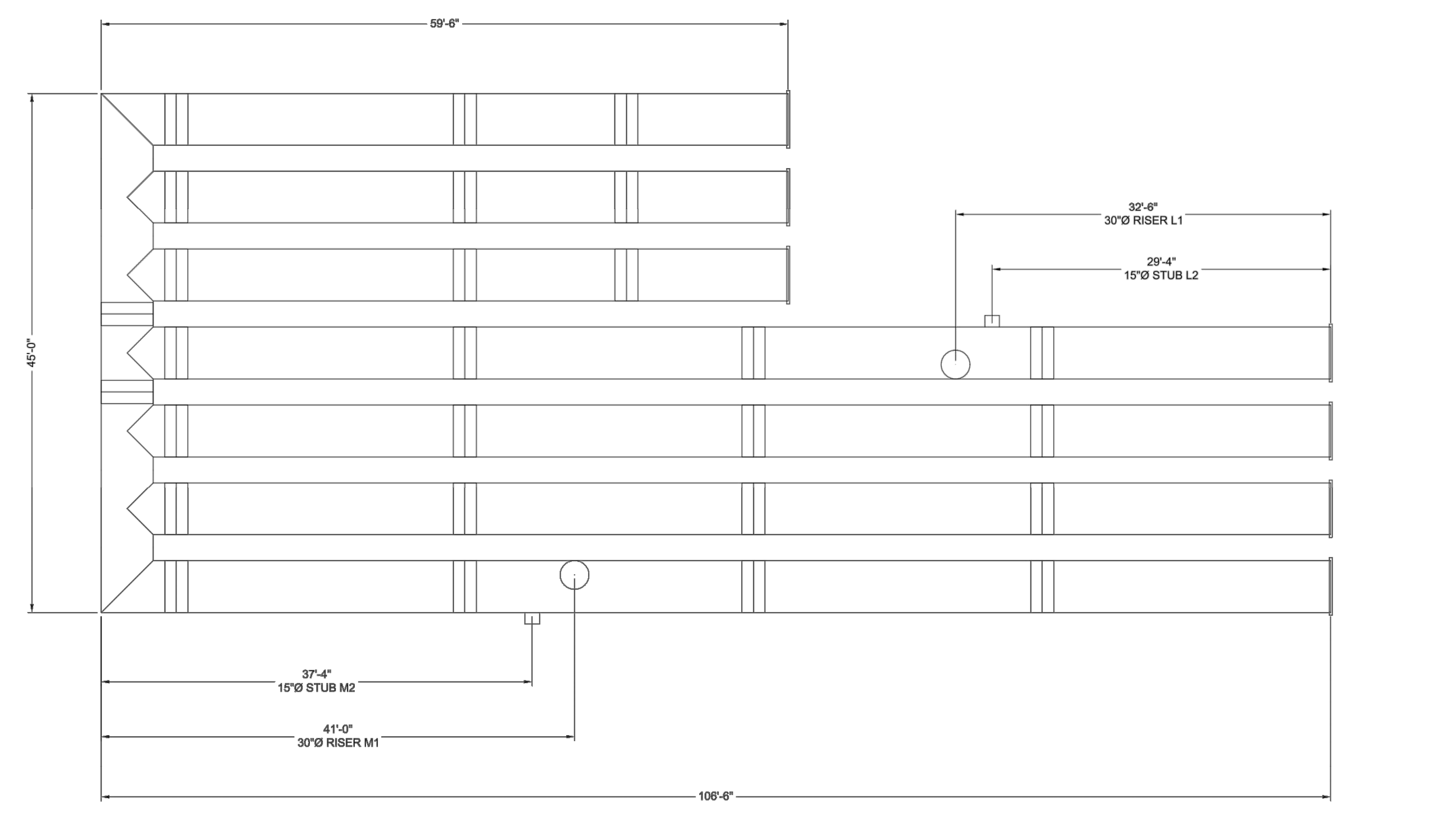
CALCULATION DETAILS
- LOADING = HS20/HS25
- APPROX. LINEAR FOOTAGE = 618 LF

STORAGE SUMMARY
- STORAGE VOLUME REQUIRED = 12,867 CF
- PIPE STORAGE VOLUME = 9,829 CF
- BACKFILL STORAGE VOLUME = 3,136 CF
- TOTAL STORAGE PROVIDED = 12,965 CF

PIPE DETAILS
- DIAMETER = 54"
- CORRUGATION = 5x1
- GAGE = 16
- COATING = ALT2
- WALL TYPE = PERFORATED
- BARREL SPACING = 27"

BACKFILL DETAILS
- WIDTH AT ENDS = 24"
- ABOVE PIPE = 0"
- WIDTH AT SIDES = 24"
- BELOW PIPE = 0"

NOTES
- ALL RISER AND STUB DIMENSIONS ARE TO CENTERLINE. ALL ELEVATIONS, DIMENSIONS, AND LOCATIONS OF RISERS AND INLETS, SHALL BE VERIFIED BY THE ENGINEER OF RECORD PRIOR TO RELEASING FOR FABRICATION.
- ALL FITTINGS AND REINFORCEMENT COMPLY WITH ASTM A998.
- ALL RISERS AND STUBS ARE 2⅔" x ½" CORRUGATION AND 16 GAGE UNLESS OTHERWISE NOTED.
- RISERS TO BE FIELD TRIMMED TO GRADE.
- QUANTITY OF PIPE SHOWN DOES NOT PROVIDE EXTRA PIPE FOR CONNECTING THE SYSTEM TO EXISTING PIPE OR DRAINAGE STRUCTURES. OUR SYSTEM AS DETAILED PROVIDES NOMINAL INLET AND/OR OUTLET PIPE STUB FOR CONNECTION TO EXISTING DRAINAGE FACILITIES. IF ADDITIONAL PIPE IS NEEDED IT IS THE RESPONSIBILITY OF THE CONTRACTOR.
- BAND TYPE TO BE DETERMINED UPON FINAL DESIGN.
- THE PROJECT SUMMARY IS REFLECTIVE OF THE DYODS DESIGN, QUANTITIES ARE APPROX. AND SHOULD BE VERIFIED UPON FINAL DESIGN AND APPROVAL. FOR EXAMPLE, TOTAL EXCAVATION DOES NOT CONSIDER ALL VARIABLES SUCH AS SHORING AND ONLY ACCOUNTS FOR MATERIAL WITHIN THE ESTIMATED EXCAVATION FOOTPRINT.
- THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

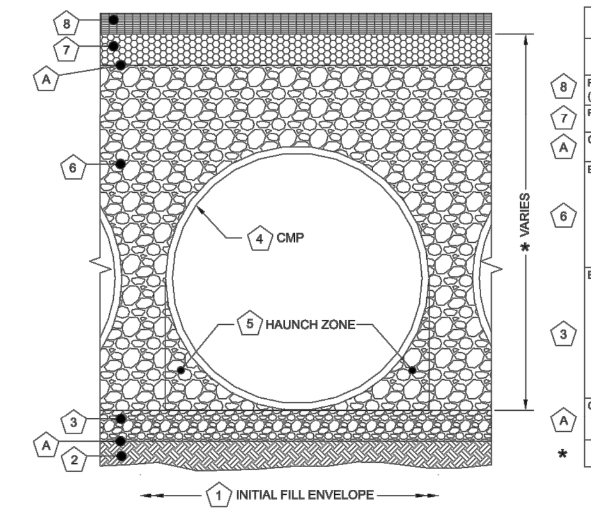


ASSEMBLY
SCALE: 1" = 10'

CONTECH ENGINEERED SOLUTIONS LLC · www.ContechES.com · 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069 · 800-338-1122 · 513-645-7000 · 513-645-7993 FAX
CONTECH CMP DETENTION SYSTEMS · CONTECH DYODS DRAWING

DYO27939 Dental Office and Mixed Use
Underground Detention (2)
Ann Arbor, MI
DETENTION SYSTEM

PROJECT No.: 18370 · SEQ. No.: 27939 · DATE: 3/2/2023 · DESIGNED: DYO · DRAWN: DYO · CHECKED: DYO · APPROVED: DYO · SHEET NO.: 1



	Infiltration Systems - CMP Infiltration & CMP Perforated Drainage Pipe			
	Material Location	Description	Material Designation	Designation
8	Rigid or Flexible Pavement (if applicable)			
7	Road Base (if applicable)			
A	Geotextile Layer	Non-Woven Geotextile	CONTECH C-40 or C-45	Engineer Decision for consideration to prevent soil migration into varying soil types. Wrap the trench only.
6	Backfill	Infiltration pipe systems have a pipe perforation sized of 3/8" diameter. An open graded, free draining stone, with a particle size of ½" – 2 ½" diameter is recommended.	AASHTO M 145-A-1 or AASHTO M 43 - 3, 4	Material shall be worked into the pipe haunches by means of shovel-slicing, rodding, air-tamper, vibratory rod, or other effective methods. Compaction of all placed fill material is necessary and shall be considered adequate when no further yielding of the material is observed under the compactor, or under foot, and the Project Engineer or his representative is satisfied with the level of compaction"
3	Bedding Stone	Well graded granular bedding material w/maximum particle size of 3"	AASHTO M43 - 3,357,4,467, 5, 56, 57	For soil aggregates larger than 3/8" a dedicated bedding layer is not required for CMP. Pipe may be placed on the trench bottom comprised of native suitable well graded & granular material. For Arch pipes it is recommended to be shaped to a relatively flat bottom or fine-grade the foundation to a slight v-shape. Soil aggregates less than 3/8" and unsuitable material should be over-excavated and re-placed with a 4"-6" layer of well graded & granular stone per the material designation.
A	Geotextile Layer	None	None	Contech does not recommend geotextiles be placed under the invert of Infiltration systems due to the propensity for geotextiles to clog over time.
*	Note: The listed AASHTO designations are for gradation only. The stone must also be angular and clean.			

1. MINIMUM WIDTH DEPENDS ON SITE CONDITIONS AND ENGINEERING JUDGEMENT.

FOUNDATION/BEDDING PREPARATION

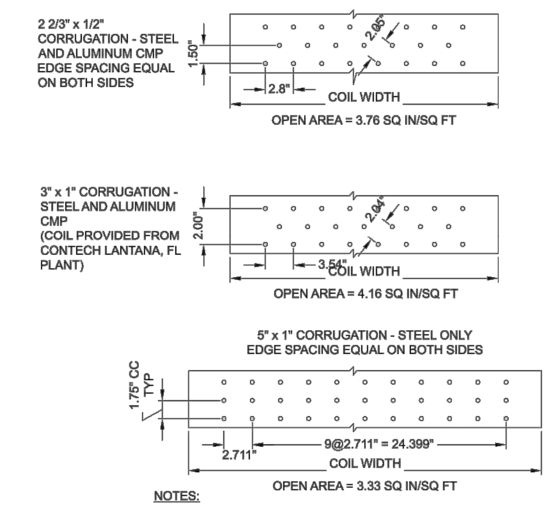
2. PRIOR TO PLACING THE BEDDING, THE FOUNDATION MUST BE CONSTRUCTED TO A UNIFORM AND STABLE GRADE. IN THE EVENT THAT UNSUITABLE FOUNDATION MATERIALS ARE ENCOUNTERED DURING EXCAVATION, THEY SHALL BE REMOVED AND BROUGHT BACK TO THE GRADE WITH A FILL MATERIAL AS APPROVED BY THE ENGINEER.

5. HAUNCH ZONE MATERIAL SHALL BE PLACED AND UNIFORMLY COMPACTED WITHOUT SOFT SPOTS.

BACKFILL
MATERIAL SHALL BE PLACED IN 8"-10" MAXIMUM LIFTS. INADEQUATE COMPACTION CAN LEAD TO EXCESSIVE DEFLECTIONS WITHIN THE SYSTEM AND SETTLEMENT OF THE SOILS OVER THE SYSTEM. BACKFILL SHALL BE PLACED SUCH THAT THERE IS NO MORE THAN A TWO-LIFT DIFFERENTIAL BETWEEN THE SIDES OF ANY PIPE IN THE SYSTEM AT ALL TIMES DURING THE BACKFILL PROCESS. BACKFILL SHALL BE ADVANCED ALONG THE LENGTH OF THE SYSTEM AT THE SAME RATE TO AVOID DIFFERENTIAL LOADING ON ANY PIPES IN THE SYSTEM.

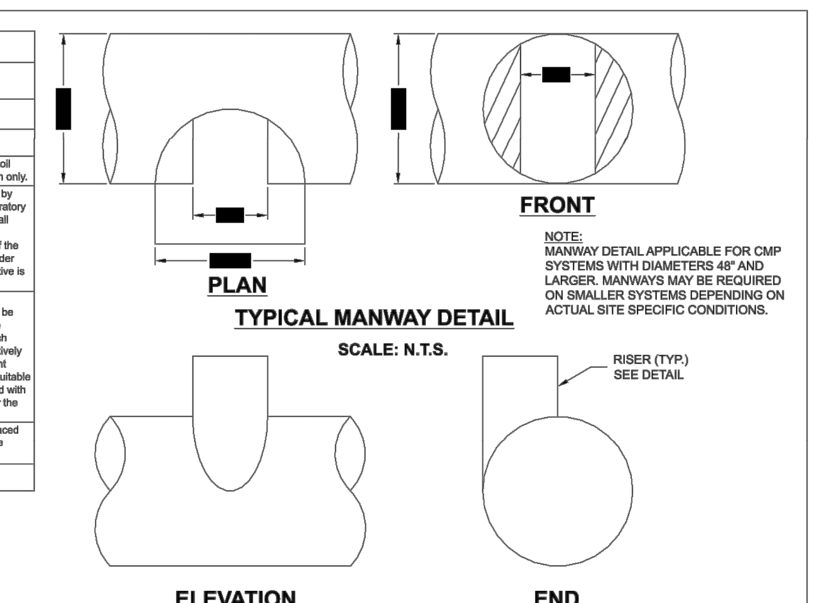
EQUIPMENT USED TO PLACE AND COMPACT THE BACKFILL SHALL BE OF A SIZE AND TYPE SO AS NOT TO DISTORT, DAMAGE, OR DISPLACE THE PIPE. ATTENTION MUST BE GIVEN TO PROVIDING ADEQUATE MINIMUM COVER FOR SUCH EQUIPMENT. MAINTAIN BALANCED LOADING ON ALL PIPES IN THE SYSTEM DURING ALL SUCH OPERATIONS.

OTHER ALTERNATE BACKFILL MATERIAL MAY BE ALLOWED DEPENDING ON SITE SPECIFIC CONDITIONS. REFER TO TYPICAL BACKFILL DETAIL FOR MATERIAL REQUIRED.



NOTES:
1. PERFORATIONS MEET AASHTO AND ASTM SPECIFICATIONS.
2. PERFORATION OPEN AREA PER SQUARE FOOT OF PIPE IS BASED ON THE NOMINAL DIAMETER AND LENGTH OF PIPE.
3. ALL DIMENSIONS ARE SUBJECT TO MANUFACTURING TOLERANCES.
4. ALL HOLES Ø3/8".

TYPICAL PERFORATION DETAIL
SCALE: N.T.S.

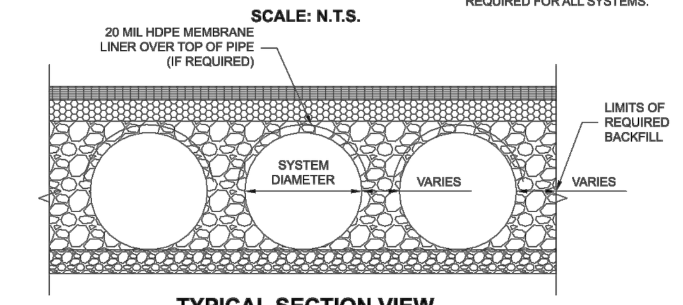


TYPICAL MANWAY DETAIL
SCALE: N.T.S.

NOTE:
MANWAY DETAIL APPLICABLE FOR CMP SYSTEMS WITH DIAMETERS 48" AND LARGER. MANWAYS MAY BE REQUIRED ON SMALLER SYSTEMS DEPENDING ON ACTUAL SITE SPECIFIC CONDITIONS.

TYPICAL RISER DETAIL
SCALE: N.T.S.

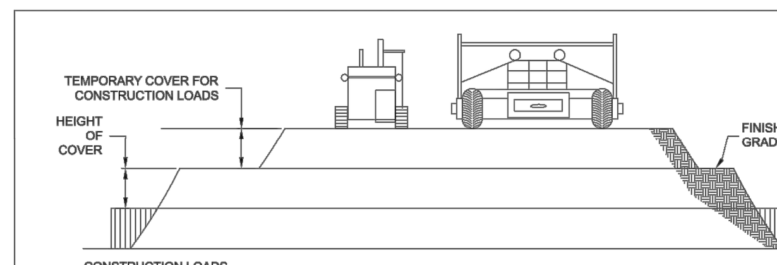
NOTE:
LADDERS ARE OPTIONAL AND ARE NOT REQUIRED FOR ALL SYSTEMS.



TYPICAL SECTION VIEW
LINER OVER ROWS
SCALE: N.T.S.

NOTE: IF SALTING AGENTS FOR SNOW AND ICE REMOVAL ARE USED ON OR NEAR THE PROJECT, AN HDPE MEMBRANE LINER IS RECOMMENDED WITH THE SYSTEM. THE IMPERMEABLE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM A CHANGE IN THE SURROUNDING ENVIRONMENT OVER A PERIOD OF TIME. PLEASE REFER TO THE CORRUGATED METAL PIPE DETENTION DESIGN GUIDE FOR ADDITIONAL INFORMATION.

DYO27939 Dental Office and Mixed Use
Underground Detention (2)
Ann Arbor, MI
DETENTION SYSTEM



CONSTRUCTION LOADS

FOR TEMPORARY CONSTRUCTION VEHICLE LOADS, AN EXTRA AMOUNT OF COMPACTED COVER MAY BE REQUIRED OVER THE TOP OF THE PIPE. THE HEIGHT-OF-COVER SHALL MEET THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE BELOW. THE USE OF HEAVY CONSTRUCTION EQUIPMENT NECESSITATES GREATER PROTECTION FOR THE PIPE THAN FINISHED GRADE COVER MINIMUMS FOR NORMAL HIGHWAY TRAFFIC.

PIPE SPAN, INCHES	AXLE LOADS (kips)			
	18-50	50-75	75-110	110-150
	MINIMUM COVER (FT)			
12-42	2.0	2.5	3.0	3.0
48-72	3.0	3.0	3.5	4.0
78-120	3.0	3.5	4.0	4.0
126-144	3.5	4.0	4.5	4.5

*MINIMUM COVER MAY VARY, DEPENDING ON LOCAL CONDITIONS. THE CONTRACTOR MUST PROVIDE THE ADDITIONAL COVER REQUIRED TO AVOID DAMAGE TO THE PIPE. MINIMUM COVER IS MEASURED FROM THE TOP OF THE PIPE TO THE TOP OF THE MAINTAINED CONSTRUCTION ROADWAY SURFACE.

CONSTRUCTION LOADING DIAGRAM
SCALE: N.T.S.

SPECIFICATION FOR DESIGNED DETENTION SYSTEM:

SCOPE
THIS SPECIFICATION COVERS THE MANUFACTURE AND INSTALLATION OF THE DESIGNED DETENTION SYSTEM DETAILED IN THE PROJECT PLANS.

MATERIAL
THE MATERIAL SHALL CONFORM TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2 STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-274 OR ASTM A-92.

THE GALVANIZED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-218 OR ASTM A-929.

THE POLYMER COATED STEEL COILS SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M-246 OR ASTM A-742.

THE ALUMINUM COILS SHALL CONFORM TO THE APPLICABLE OF AASHTO M-197 OR ASTM B-744.

CONSTRUCTION LOADS
CONSTRUCTION LOADS MAY BE HIGHER THAN FINAL LOADS. FOLLOW THE MANUFACTURER'S OR NCSPA GUIDELINES.

PIPE
THE PIPE SHALL BE MANUFACTURED IN ACCORDANCE TO THE APPLICABLE REQUIREMENTS LISTED BELOW:

ALUMINIZED TYPE 2: AASHTO M-36 OR ASTM A-760

GALVANIZED: AASHTO M-36 OR ASTM A-760

POLYMER COATED: AASHTO M-245 OR ASTM A-762

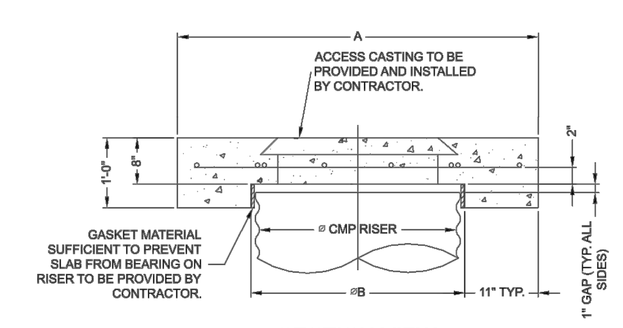
ALUMINUM: AASHTO M-196 OR ASTM B-745

HANDLING AND ASSEMBLY
SHALL BE IN ACCORDANCE WITH NCSPI'S (NATIONAL CORRUGATED STEEL PIPE ASSOCIATION) FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL. SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS FOR ALUMINUM PIPE.

INSTALLATION
SHALL BE IN ACCORDANCE WITH AASHTO STANDARD SPECIFICATIONS FOR HIGHWAY BRIDGES, SECTION 26, DIVISION II DIVISION II OR ASTM A-798 (FOR ALUMINIZED TYPE 2, GALVANIZED OR POLYMER COATED STEEL) OR ASTM B-788 (FOR ALUMINUM PIPE) AND IN CONFORMANCE WITH THE PROJECT PLANS AND SPECIFICATIONS. IF THERE ARE ANY INCONSISTENCIES OR CONFLICTS THE CONTRACTOR SHOULD DISCUSS AND RESOLVE WITH THE SITE ENGINEER.

IT IS ALWAYS THE RESPONSIBILITY OF THE CONTRACTOR TO FOLLOW OSHA GUIDELINES FOR SAFE PRACTICES.

NOTE:
THESE DRAWINGS ARE FOR CONCEPTUAL PURPOSES AND DO NOT REFLECT ANY LOCAL PREFERENCES OR REGULATIONS. PLEASE CONTACT YOUR LOCAL CONTECH REP FOR MODIFICATIONS.

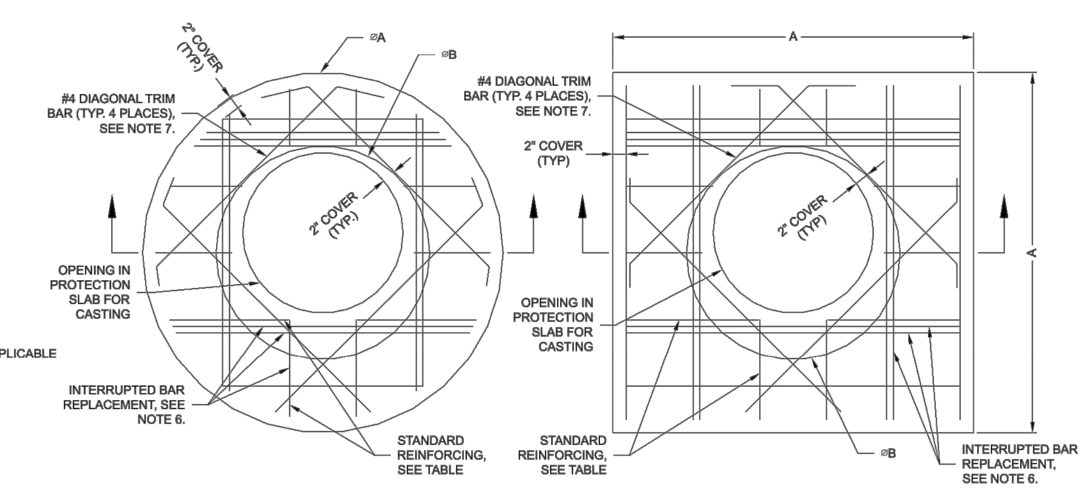


SECTION VIEW

REINFORCING TABLE

Ø CMP RISER	A	Ø B	REINFORCING	**BEARING PRESSURE (PSF)
24"	Ø 4' 4'X4'	26"	#5 @ 12" OCEW #5 @ 12" OCEW	2,410 1,780
30"	Ø 4'-6" 4'-6" X 4'-6"	32"	#5 @ 12" OCEW #5 @ 12" OCEW	2,120 1,530
36"	Ø 5' 5' X 5'	38"	#5 @ 10" OCEW #5 @ 10" OCEW	1,890 1,350
42"	Ø 5'-6" 5'-6" X 5'-6"	44"	#5 @ 10" OCEW #5 @ 9" OCEW	1,720 1,210
48"	Ø 6' 6' X 6'	50"	#5 @ 9" OCEW #5 @ 8" OCEW	1,600 1,100

** ASSUMED SOIL BEARING CAPACITY



ROUND OPTION PLAN VIEW · SQUARE OPTION PLAN VIEW

NOTES:
1. DESIGN IN ACCORDANCE WITH AASHTO, 17th EDITION.
2. DESIGN LOAD HS25.
3. EARTH COVER = 1' MAX.
4. CONCRETE STRENGTH = 3,500 psi
5. REINFORCING STEEL = ASTM A615, GRADE 60.
6. PROVIDE ADDITIONAL REINFORCING AROUND OPENINGS EQUAL TO THE BARS INTERRUPTED, HALF EACH SIDE. ADDITIONAL BARS TO BE IN THE SAME PLANE.
7. TRIM OPENING WITH DIAGONAL #4 BARS, EXTEND BARS A MINIMUM OF 12" BEYOND OPENING, BEND BARS AS REQUIRED TO MAINTAIN BAR COVER.
8. PROTECTION SLAB AND ALL MATERIALS TO BE PROVIDED AND INSTALLED BY CONTRACTOR.
9. DETAIL DESIGN BY DELTA ENGINEERING, BINGHAMTON, NY.

MANHOLE CAP DETAIL
SCALE: N.T.S.

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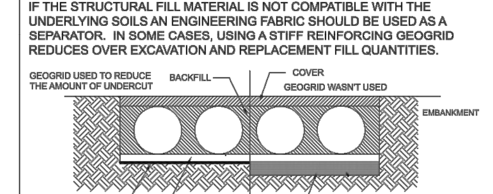
Ann Arbor, MI
DETENTION SYSTEM

CMP DETENTION INSTALLATION GUIDE
PROPER INSTALLATION OF A FLEXIBLE UNDERGROUND DETENTION SYSTEM WILL ENSURE LONG-TERM PERFORMANCE. THE CONFIGURATION OF THESE SYSTEMS OFTEN REQUIRES SPECIAL CONSTRUCTION PRACTICES THAT DIFFER FROM CONVENTIONAL FLEXIBLE PIPE CONSTRUCTION. CONTECH ENGINEERED SOLUTIONS STRONGLY SUGGESTS SCHEDULING A PRE-CONSTRUCTION MEETING WITH YOUR LOCAL SALES ENGINEER TO DETERMINE IF ADDITIONAL MEASURES, NOT COVERED IN THIS GUIDE, ARE APPROPRIATE FOR YOUR SITE.

FOUNDATION
CONSTRUCT A FOUNDATION THAT CAN SUPPORT THE DESIGN LOADING APPLIED BY THE PIPE AND ADJACENT BACKFILL WEIGHT AS WELL AS MAINTAIN ITS INTEGRITY DURING CONSTRUCTION.

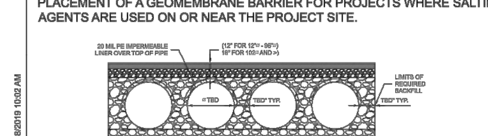
IF SOFT OR UNSUITABLE SOILS ARE ENCOUNTERED, REMOVE THE POOR SOILS DOWN TO A SUITABLE DEPTH AND THEN BUILD UP TO THE APPROPRIATE ELEVATION WITH A COMPETENT BACKFILL MATERIAL. THE STRUCTURAL FILL MATERIAL GRADATION SHOULD NOT ALLOW THE MIGRATION OF FINES, WHICH CAN CAUSE SETTLEMENT OF THE DETENTION SYSTEM OR PAVEMENT ABOVE. IF THE STRUCTURAL FILL MATERIAL IS NOT COMPATIBLE WITH THE UNDERLYING SOILS AN ENGINEERING FABRIC SHOULD BE USED AS A SEPARATOR. IN SOME CASES, USING A STIFF REINFORCING GEOGRID REDUCES OVER EXCAVATION AND REPLACEMENT FILL QUANTITIES.



GRADE THE FOUNDATION SUBGRADE TO A UNIFORM OR SLIGHTLY SLOPING GRADE. IF THE SUBGRADE IS CLAY OR RELATIVELY NON-POROUS AND THE CONSTRUCTION SEQUENCE WILL LAST FOR AN EXTENDED PERIOD OF TIME, IT IS BEST TO SLOPE THE GRADE TO ONE END OF THE SYSTEM. THIS WILL ALLOW EXCESS WATER TO DRAIN QUICKLY, PREVENTING SATURATION OF THE SUBGRADE.

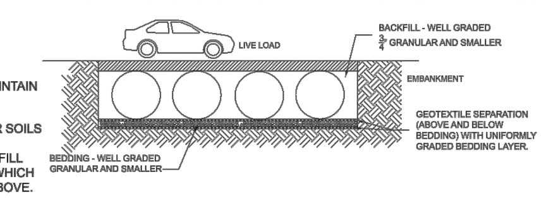
GEOMEMBRANE BARRIER
A SITE'S RESISTIVITY MAY CHANGE OVER TIME WHEN VARIOUS TYPES OF SALTING AGENTS ARE USED, SUCH AS ROAD SALTS FOR DEICING AGENTS. IF SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE, A GEOMEMBRANE BARRIER IS RECOMMENDED WITH THE SYSTEM. THE GEOMEMBRANE LINER IS INTENDED TO HELP PROTECT THE SYSTEM FROM THE POTENTIAL ADVERSE EFFECTS THAT MAY RESULT FROM THE USE OF SUCH AGENTS INCLUDING PREMATURE CORROSION AND REDUCED ACTUAL SERVICE LIFE.

THE PROJECT'S ENGINEER OF RECORD IS TO EVALUATE WHETHER SALTING AGENTS WILL BE USED ON OR NEAR THE PROJECT SITE, AND USE HIS/HER BEST JUDGEMENT TO DETERMINE IF ANY ADDITIONAL PROTECTIVE MEASURES ARE REQUIRED. BELOW IS A TYPICAL DETAIL SHOWING THE PLACEMENT OF A GEOMEMBRANE BARRIER FOR PROJECTS WHERE SALTING AGENTS ARE USED ON OR NEAR THE PROJECT SITE.

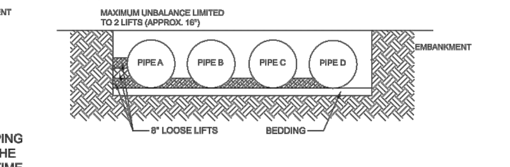


IN-SITU TRENCH WALL
IF EXCAVATION IS REQUIRED, THE TRENCH WALL NEEDS TO BE CAPABLE OF SUPPORTING THE LOAD THAT THE PIPE SHEDS AS THE SYSTEM IS LOADED. IF SOILS ARE NOT CAPABLE OF SUPPORTING THESE LOADS, THE PIPE CAN DEFLECT. PERFORM A SIMPLE SOIL PRESSURE CHECK USING THE APPLIED LOADS TO DETERMINE THE LIMITS OF EXCAVATION BEYOND THE SPRING LINE OF THE OUTER MOST PIPES.

IN MOST CASES THE REQUIREMENTS FOR A SAFE WORK ENVIRONMENT AND PROPER BACKFILL PLACEMENT AND COMPACTION TAKE CARE OF THIS CONCERN.

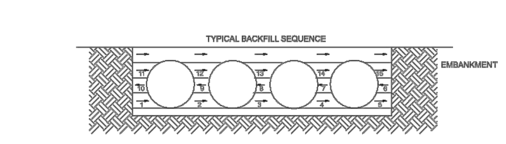


BACKFILL PLACEMENT
MATERIAL SHALL BE WORKED INTO THE PIPE HAUNCHES BY MEANS OF SHOVEL-SLICING, RODDING, AIR TAMPER, VIBRATORY ROD, OR OTHER EFFECTIVE METHODS.

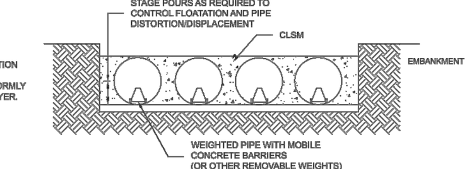


IF AASHTO T99 PROCEDURES ARE DETERMINED INFEASIBLE BY THE GEOTECHNICAL ENGINEER OF RECORD, COMPACTION IS CONSIDERED ADEQUATE WHEN NO FURTHER YIELDING OF THE MATERIAL IS OBSERVED UNDER THE COMPACTOR, OR UNDER FOOT, AND THE GEOTECHNICAL ENGINEER OF RECORD (OR REPRESENTATIVE THEREOF) IS SATISFIED WITH THE LEVEL OF COMPACTION.

FOR LARGE SYSTEMS, CONVEYOR SYSTEMS, BACKHOES WITH LONG REACHES OR DRAGLINES WITH STONE BUCKETS MAY BE USED TO PLACE BACKFILL. ONCE MINIMUM COVER FOR CONSTRUCTION LOADING ACROSS THE ENTIRE WIDTH OF THE SYSTEM IS REACHED, ADVANCE THE EQUIPMENT TO THE END OF THE RECENTLY PLACED FILL, AND BEGIN THE SEQUENCE AGAIN UNTIL THE SYSTEM IS COMPLETELY BACKFILLED. THIS TYPE OF CONSTRUCTION SEQUENCE PROVIDES ROOM FOR STOCKPILED BACKFILL DIRECTLY BEHIND THE BACKHOE, AS WELL AS THE MOVEMENT OF CONSTRUCTION TRAFFIC. MATERIAL STOCKPILES ON TOP OF THE BACKFILLED DETENTION SYSTEM SHOULD BE LIMITED TO 8- TO 10-FEET HIGH AND MUST PROVIDE BALANCED LOADING ACROSS ALL BARRELS. TO DETERMINE THE PROPER COVER OVER THE PIPES TO ALLOW THE MOVEMENT OF CONSTRUCTION EQUIPMENT SEE TABLE 1, OR CONTACT YOUR LOCAL CONTECH SALES ENGINEER.

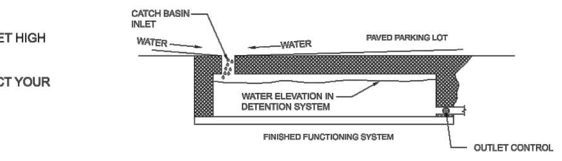


WHEN FLOWABLE FILL IS USED, YOU MUST PREVENT PIPE FLOATATION. TYPICALLY, SMALL LIFTS ARE PLACED BETWEEN THE PIPES AND THEN ALLOWED TO SET-UP PRIOR TO THE PLACEMENT OF THE NEXT LIFT. THE ALLOWABLE THICKNESS OF THE CLSM LIFT IS A FUNCTION OF A PROPER BALANCE BETWEEN THE UPLIFT FORCE OF THE CLSM, THE OPPOSING WEIGHT OF THE PIPE, AND THE EFFECT OF OTHER RESTRAINING MEASURES. THE PIPE CAN CARRY LIMITED FLUID PRESSURE WITHOUT PIPE DISTORTION OR DISPLACEMENT, WHICH ALSO AFFECTS THE CLSM LIFT THICKNESS. YOUR LOCAL CONTECH SALES ENGINEER CAN HELP DETERMINE THE PROPER LIFT THICKNESS.



CONSTRUCTION LOADING
TYPICALLY, THE MINIMUM COVER SPECIFIED FOR A PROJECT ASSUMES H-20 LIVE LOAD. BECAUSE CONSTRUCTION LOADS OFTEN EXCEED DESIGN LIVE LOADS, INCREASED TEMPORARY MINIMUM COVER REQUIREMENTS ARE NECESSARY. SINCE CONSTRUCTION EQUIPMENT VARIES FROM JOB TO JOB, IT IS BEST TO ADDRESS EQUIPMENT SPECIFIC MINIMUM COVER REQUIREMENTS WITH YOUR LOCAL CONTECH SALES ENGINEER DURING YOUR PRE-CONSTRUCTION MEETING.

ADDITIONAL CONSIDERATIONS
BECAUSE MOST SYSTEMS ARE CONSTRUCTED BELOW-GRADE, RAINFALL CAN RAPIDLY FILL THE EXCAVATION; POTENTIALLY CAUSING FLOATATION AND MOVEMENT OF THE PREVIOUSLY PLACED PIPES. TO HELP MITIGATE POTENTIAL PROBLEMS, IT IS BEST TO START THE INSTALLATION AT THE DOWNSTREAM END WITH THE OUTLET ALREADY CONSTRUCTED TO ALLOW A ROUTE FOR THE WATER TO ESCAPE. TEMPORARY DIVERSION MEASURES MAY BE REQUIRED FOR HIGH FLOWS DUE TO THE RESTRICTED NATURE OF THE OUTLET PIPE.



CMP DETENTION SYSTEM INSPECTION AND MAINTENANCE
UNDERGROUND STORMWATER DETENTION AND INFILTRATION SYSTEMS MUST BE INSPECTED AND MAINTAINED AT REGULAR INTERVALS FOR PURPOSES OF PERFORMANCE AND LONGEVITY.

INSPECTION
INSPECTION IS THE KEY TO EFFECTIVE MAINTENANCE OF CMP DETENTION SYSTEMS AND IS EASILY PERFORMED. CONTECH RECOMMENDS ONGOING, ANNUAL INSPECTIONS. SITES WITH HIGH TRASH LOAD OR SMALL OUTLET CONTROL ORIFICES MAY NEED MORE FREQUENT INSPECTIONS. THE RATE AT WHICH THE SYSTEM COLLECTS POLLUTANTS WILL DEPEND MORE ON SITE SPECIFIC ACTIVITIES RATHER THAN THE SIZE OR CONFIGURATION OF THE SYSTEM.

INSPECTIONS SHOULD BE PERFORMED MORE OFTEN IN EQUIPMENT WASHDOWN AREAS, IN CLIMATES WHERE SANDING AND/OR SALTING OPERATIONS TAKE PLACE, AND IN OTHER VARIOUS INSTANCES IN WHICH ONE WOULD EXPECT HIGHER ACCUMULATIONS OF SEDIMENT OR ABRASIVE/ CORROSIVE CONDITIONS. A RECORD OF EACH INSPECTION IS TO BE MAINTAINED FOR THE LIFE OF THE SYSTEM

MAINTENANCE
CMP DETENTION SYSTEMS SHOULD BE CLEANED WHEN AN INSPECTION REVEALS ACCUMULATED SEDIMENT OR TRASH IS CLOGGING THE DISCHARGE ORIFICE.

ACCUMULATED SEDIMENT AND TRASH CAN TYPICALLY BE EVACUATED THROUGH THE MANHOLE OVER THE OUTLET ORIFICE. IF MAINTENANCE IS NOT PERFORMED AS RECOMMENDED, SEDIMENT AND TRASH MAY ACCUMULATE IN FRONT OF THE OUTLET ORIFICE. MANHOLE COVERS SHOULD BE SECURELY SEATED FOLLOWING CLEANING ACTIVITIES. CONTECH SUGGESTS THAT ALL SYSTEMS BE DESIGNED WITH AN ACCESS/INSPECTION MANHOLE SITUATED AT OR NEAR THE INLET AND THE OUTLET ORIFICE. SHOULD IT BE NECESSARY TO GET INSIDE THE SYSTEM TO PERFORM MAINTENANCE ACTIVITIES, ALL APPROPRIATE PRECAUTIONS REGARDING CONFINED SPACE ENTRY AND OSHA REGULATIONS SHOULD BE FOLLOWED.

ANNUAL INSPECTIONS ARE BEST PRACTICE FOR ALL UNDERGROUND SYSTEMS. DURING THIS INSPECTION, IF EVIDENCE OF SALTING/DE-ICING AGENTS IS OBSERVED WITHIN THE SYSTEM, IT IS BEST PRACTICE FOR THE SYSTEM TO BE RINSED, INCLUDING ABOVE THE SPRING LINE SOON AFTER THE SPRING THAW AS PART OF THE MAINTENANCE PROGRAM FOR THE SYSTEM.

MAINTAINING AN UNDERGROUND DETENTION OR INFILTRATION SYSTEM IS EASIEST WHEN THERE IS NO FLOW ENTERING THE SYSTEM. FOR THIS REASON, IT IS A GOOD IDEA TO SCHEDULE THE CLEANOUT DURING DRY WEATHER.

THE FOREGOING INSPECTION AND MAINTENANCE EFFORTS HELP ENSURE UNDERGROUND PIPE SYSTEMS USED FOR STORMWATER STORAGE CONTINUE TO FUNCTION AS INTENDED BY IDENTIFYING RECOMMENDED REGULAR INSPECTION AND MAINTENANCE PRACTICES. INSPECTION AND MAINTENANCE RELATED TO THE STRUCTURAL INTEGRITY OF THE PIPE OR THE SOUNDNESS OF PIPE JOINT CONNECTIONS IS BEYOND THE SCOPE OF THIS GUIDE.

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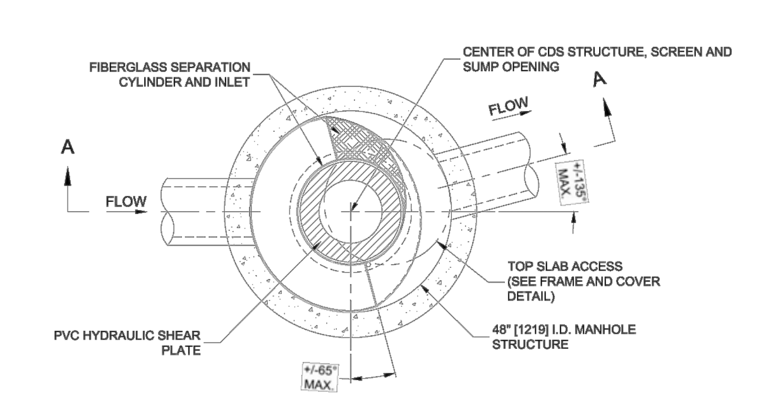
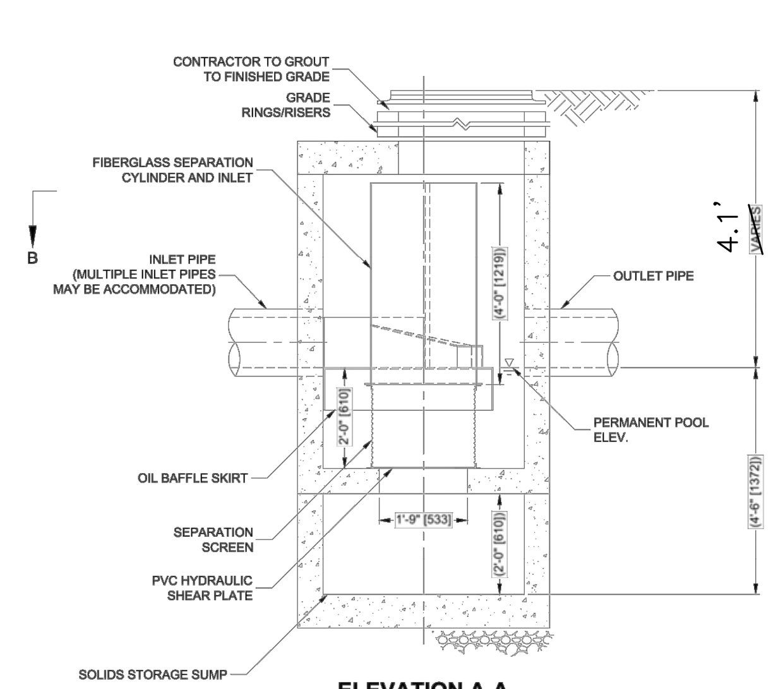


PLAN VIEW B-B
NOT TO SCALE.

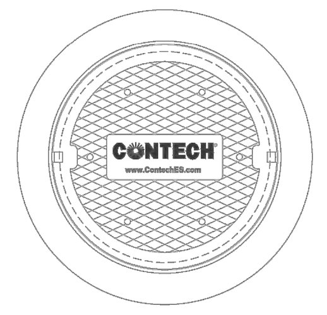


ELEVATION A-A
NOT TO SCALE.

CDS2015-4-C DESIGN NOTES

CDS2015-4-C STANDARD CONFIGURATION IS SHOWN.

FOR NJDEP PROJECTS, PLEASE CONTACT YOUR LOCAL CONTECH REPRESENTATIVE FOR APPROVED CONFIGURATIONS.



FRAME AND COVER
(DIAMETER VARIES)
NOT TO SCALE

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			06
WATER QUALITY FLOW RATE (CFS OR L/s)			0.65
PEAK FLOW RATE (CFS OR L/s)			1.35
RETURN PERIOD OF PEAK FLOW (YRS)			1"
SCREEN APERTURE (2400 OR 4700)			TBD
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	810.30	PVC	8"
INLET PIPE 2	*	*	*
OUTLET PIPE	810.04	RCP	12"
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. FOR SITE SPECIFIC DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
3. CDS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING. CONTRACTOR TO CONFIRM STRUCTURE MEETS REQUIREMENTS OF PROJECT.
4. STRUCTURE SHALL MEET AASHTO HS20 LOAD RATING, ASSUMING EARTH COVER OF 0' - 2', AND GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION. CASTINGS SHALL MEET AASHTO M306 AND BE CAST WITH THE CONTECH LOGO.
5. IF REQUIRED, PVC HYDRAULIC SHEAR PLATE IS PLACED ON SHELF AT BOTTOM OF SCREEN CYLINDER. REMOVE AND REPLACE AS NECESSARY DURING MAINTENANCE CLEANING.
6. CDS STRUCTURE SHALL BE PRECAST CONCRETE CONFORMING TO ASTM C-478 AND AASHTO LOAD FACTOR DESIGN METHOD.

INSTALLATION NOTES
A. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
B. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE CDS MANHOLE STRUCTURE.
C. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
D. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT INLET AND OUTLET PIPE(S). MATCH PIPE INVERTS WITH ELEVATIONS SHOWN. ALL PIPE CENTERLINES TO MATCH PIPE OPENING CENTERLINES.
E. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

CONTECH ENGINEERED SOLUTIONS LLC · www.contechES.com · 9025 Centre Pointe Dr., Suite 400, West Chester, OH 45069 · 800-338-1122 · 513-645-7000 · 513-645-7993 FAX

CDS2015-4-C
ONLINE CDS
STANDARD DETAIL

Project: Dental Office and Mixed Use
Location: Ann Arbor, MI

Purpose: To calculate the first flush runoff flow rate (WQF) over a given site area. In this situation the WQV to be analyzed is the runoff produced by the first 1" of rainfall.

Reference: United States Department of Agriculture Natural Resources Conservation Service TR-55 Manual.

Given:

Structure Name	A (acres)	A (miles^2)	Runoff Coefficient	Percent Imp. (%)*	t_c (min)	t_c (hr)
CB 06	0.93	0.00145	0.69	65.00	16.15	0.269

* Assumes runoff coefficient of 0.3 for pervious areas and 0.9 for impervious areas.

Procedure: The Water Quality Flow (WQF) is calculated using the Water Quality Volume (WQV). This WQV, converted to watershed inches, is substituted for the runoff depth (Q) in the Natural Resources Conservation Service (formerly Soil Conservation Service), TR-55 Graphical Peak Discharge Method.

1. Compute WQV in watershed inches using the following equation:

$$WQV = P * R$$

where: WQV = water quality volume (watershed inches)
P = design precipitation (inches)
R = volumetric runoff coefficient = 0.05 + 0.009(I)
I = percent impervious cover

Structure Name	Percent Imp. (%)	R	P (in)	WQV (in)	WQV (cf)
CB 06	65.00	0.635	1	0.635	2144

2. Compute the NRCS Runoff Curve Number (CN) using the following equation, or graphically using Figure 2-1 from TR-55 (USDA, 1986):

$$CN = 1000 / [10+5P+10Q-10(Q^2+1.25QP)^{1/2}]$$

where: CN = Runoff Curve Number
P = design precipitation (inches)
Q = runoff depth (watershed inches)

Structure Name	Q (in)	CN
CB 06	0.635	96.07

Project: Dental Office and Mixed Use
Location: Ann Arbor, MI

3. Using computed CN, read initial abstraction (I_a) from Table 4-1 in Chapter 4 of TR-55; compute I_a/P, interpolating when appropriate.

Structure Name	I_a (in)	I_a/P
CB 06	0.083	0.083

4. Compute the time of concentration (t_c) in hours and the drainage area in square miles. A minimum t_c of 0.167 hours (10 minutes) should be used.

Structure Name	t_c (hr)	A (miles^2)
CB 06	0.269	0.00145

5. Read the unit peak discharge (q_u) from Exhibit 4-II in Chapter 4 of TR-55 for appropriate t_c for type II rainfall distribution.

Structure Name	t_c (hr)	I_a/P	q_u (csm/in)
CB 06	0.269	0.083	709

6. Substituting WQV (watershed inches) for runoff depth (Q), compute the water quality flow (WQF) from the following equation:

$$WQF = (q_u)*(A)*(Q)$$

where: WQF = water quality flow (cfs)
q_u = unit peak discharge (cfs/mi^2/inch)
A = drainage area (mi^2)
Q = runoff depth (watershed inches)

Structure Name	q_u (csm/in)	A (miles^2)	Q (in)	WQF (cfs)
CB 06	709	0.00145	0.635	0.65

Estimated Net Annual Solids Load Reduction
Based on the Rational Rainfall Method

Dental Office and Mixed Use
Ann Arbor, MI
Water Quality Unit

AREA (acres): 0.93
WEIGHTED C: 0.69
Tc (minutes): 16.15

CDS MODEL: 2015-4
PARTICLE SIZE (μm): 110

Rainfall Intensity[1] (in/hr)	Percent Rainfall Volume[1]	Cumulative Rainfall Volume	Total Flowrate (cfs)	Removal Efficiency (%)	Incremental Removal (%)
0.02	12.53%	12.53%	0.01	100.00	12.53
0.04	11.32%	23.85%	0.03	100.00	11.32
0.06	10.08%	33.93%	0.04	100.00	10.08
0.08	7.49%	41.42%	0.05	99.64	7.46
0.10	7.44%	48.86%	0.06	99.20	7.38
0.12	5.31%	54.17%	0.08	98.77	5.24
0.14	4.18%	58.35%	0.09	98.33	4.11
0.16	4.82%	63.17%	0.10	97.90	4.72
0.18	3.40%	66.57%	0.12	97.46	3.31
0.20	2.89%	69.46%	0.13	97.02	2.80
0.25	6.22%	75.68%	0.16	95.94	5.97
0.30	4.12%	79.80%	0.19	94.85	3.91
0.35	3.37%	83.17%	0.22	93.76	3.16
0.40	2.90%	86.07%	0.26	92.7	2.7
0.45	2.65%	88.72%	0.29	91.6	2.4
0.50	1.68%	90.40%	0.32	90.5	1.5
0.75	5.11%	95.51%	0.48	85.0	4.3
1.00	2.18%	97.69%	0.64	79.6	1.7
1.50	1.50%	99.19%	0.96	56.5	0.8
2.00	0.50%	99.69%	1.28	42.3	0.2
2.10	0.31%	100.00%	1.35	40.3	0.1
					95.90

Removal Efficiency Adjustment[2] = 6.5%
Predicted % Annual Rainfall Treated = 92.8%
Predicted Net Annual Load Removal Efficiency = 89.4%

1 - Based on 26 Years of Rainfall Data from NCDC Station Ann Arbor University of Michigan
2 - Reduction due to use of 60-minute data for a site that has a time of concentration less than 30-minutes.

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE DRAWINGS ARE ONLY APPROXIMATE. NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL BE EXCLUSIVELY RESPONSIBLE FOR DETERMINING THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITY CROSSINGS IN THE FIELD PRIOR TO CONSTRUCTION. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE APPARENT OR IF THE LOCATION OR DEPTH DIFFERS SIGNIFICANTLY FROM THE PLANS.

3 WORKING DAYS BEFORE YOU DIG CALL MISS DIG 1-800-482-7171 (TOLL FREE) FOR THE LOCATION OF UNDERGROUND FACILITIES

BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT: DENTAL OFFICE & MIXED USE

PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
42732 VAN DYKE AVE
STERLING HEIGHTS, MI 48314
586-323-4462

TITLE: UNDERGROUND DETENTION DETAILS

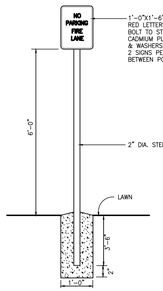
NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP, WCRC & WCWRC	4/19/23

DESIGNED BY: ST
DRAWN BY: MJD
CHECKED BY:
SCALE: NOT TO SCALE
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 14

TYPICAL GROUND SIGN TO BE INSTALLED

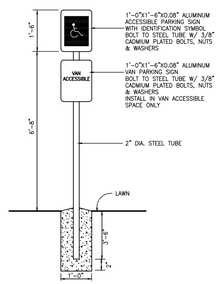
EXAMPLE SUGGESTED BY NEIGHBORHOOD PER DIXBORO DESIGN REVIEW BOARD
(NO SCALE)

MAX HEIGHT: 10 FT
MIN. SETBACK FROM BUILDINGS AND R.O.W.: EQUAL TO SIGN HEIGHT
MAX. SIGN AREA PER GROUND SIGN: 36 SF



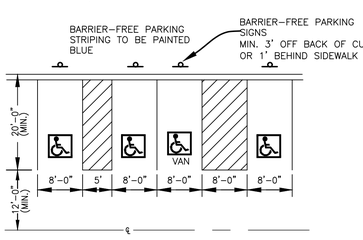
NO PARKING SIGN DETAIL

(NO SCALE)



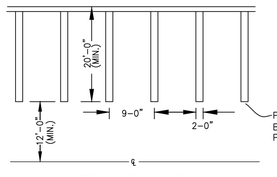
HANDICAP PARKING SIGN DETAIL

(NO SCALE)



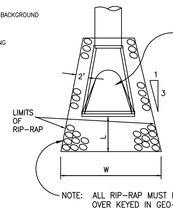
TYPICAL BARRIER FREE PARKING SPACE

(NO SCALE)



TYPICAL PARKING SPACE

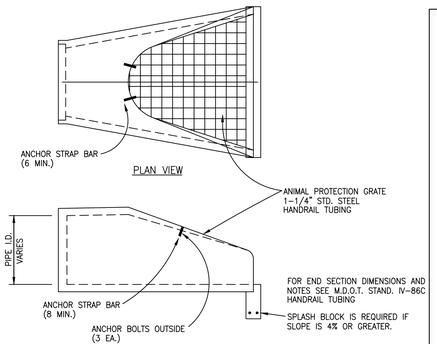
(NO SCALE)



SIZE FLARED END SECTION	DIM. L'	DIM. W'	AREA (SQ. YD.)
12"	12	14	15
15"	12	14	15
18"	15	16	20
21"	15	16	20
24"	15	16	20
27"	18	20	30
30"	17	20	30
36"	16	21	30

TYPICAL RIP-RAP DETAIL

(SCALE: NONE)

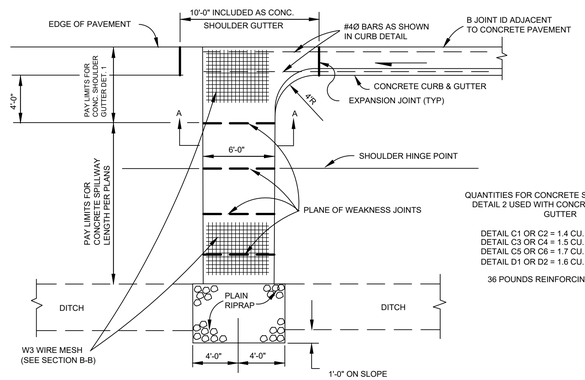


PRECAST CONCRETE END SECTION FOR PIPE CULVERT W/ ANIMAL GRATE

(NO SCALE)

STRUCTURE FRAMES & COVERS

COVER	TYPE	USE	EAST JORDAN (OR EQUAL)	TYPE OF COVER OR GRATE
A	MH	ALL	1040	TYPE 'B'
B	CB & INLET	TYPE B2 CURB	7085	TYPE 'M1'
K	CB & INLET	TYPE C & F CURB	7045	TYPE 'M1' GRATE 7050 TYPE 'T1' BACK
C	CB & INLET	VALLEY CURB	7065	TYPE 'M1' GRATE 7060 TYPE 'T1' BACK
D	CB & INLET	PARKING LOTS	1040 5100	TYPE 'M1' GRATE 5105 TYPE 'M1' GRATE
E	CB & INLET	LAWN AREA OR DITCH	1040	TYPE '02'



PLAN VIEW

MDOT CONCRETE SHOULDER GUTTER AND SPILLWAY R-35-E DETAIL 2

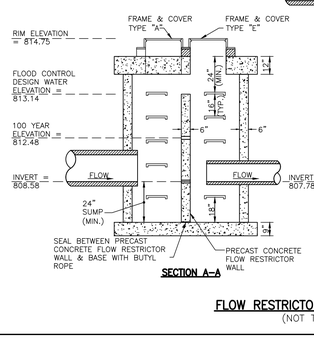
FOR USE AT END OF CURB

QUANTITIES FOR CONCRETE SHOULDER GUTTER DETAIL 2 USED WITH CONCRETE CURB AND GUTTER

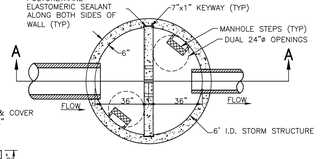
DETAIL C1 OR C2 = 1.4 CU. YDS.
DETAIL C3 OR C4 = 1.5 CU. YDS.
DETAIL C5 OR C6 = 1.7 CU. YDS.
DETAIL D1 OR D2 = 1.6 CU. YDS.

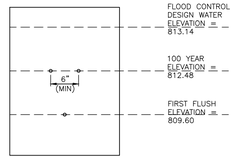
36 POUNDS REINFORCING STEEL

1. THE PRECAST REINFORCED FLOW RESTRICTOR STRUCTURE SHALL BE MANUFACTURED PER ASTM C-478 SPECIFICATIONS.



SECTION A-A



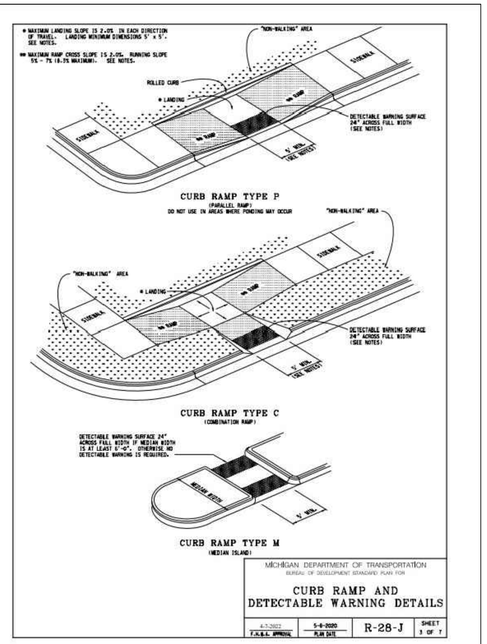


1. NUMBER AND SIZE OF ORIFICE HOLES AS PER DESIGN. MINIMUM 1" DIAMETER.

FLOW RESTRICTOR WALL
(FRONT VIEW)

FLOW RESTRICTOR WITH OVERFLOW

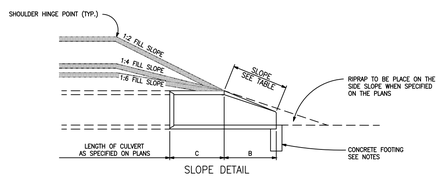
(NOT TO SCALE)



MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF DEVELOPMENT STANDARD PLAN FOR

CURB RAMP AND DETECTABLE WARNING DETAILS

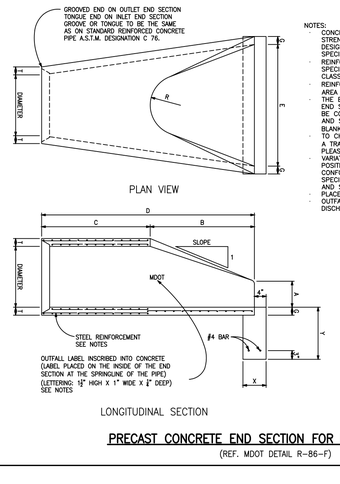
4-7-2022 F.H.W.A. APPROVAL	5-6-2020 PLAN DATE	R-28-J	SHEET 3 OF 7



SLOPE DETAIL

PIPE DIAMETER (INCHES)	APPROX. SLOPE	T (INCHES)	A (INCHES)	B (INCHES)	C (INCHES)	D (INCHES)	E (INCHES)	G (INCHES)	R (INCHES)	X (INCHES)	Y (INCHES)
12	2.4 TO 1	2	4	24	49	73	24	2	9	8	18
15	2.4 TO 1	2-1/4	6	27	46	73	30	2-1/4	11	8	18
18	2.3 TO 1	2-1/2	9	27	46	73	36	2-1/2	12	8	18
21	2.4 TO 1	2-3/4	9	36	37-1/2	73-1/2	42	2-3/4	13	8	18
24	2.5 TO 1	3	9-1/2	43-1/4	30-1/2	73-3/4	48	3	14	8	18
27	2.5 TO 1	3-1/4	10-1/2	49-1/4	24-1/2	73-3/4	54	3-1/4	14-1/2	8	18
30	2.5 TO 1	3-1/2	12	54	19-3/4	73-3/4	60	3-1/2	15	8	18
36	2.5 TO 1	4	15	63	34-3/4	97-3/4	72	4	20	8	18
42	2.5 TO 1	4-1/2	21	63	35	98	78	4-1/2	22	10	24
48	2.5 TO 1	5	24	72	26	98	84	5	22	10	24
54	2.0 TO 1	5-1/2	27	65	33-1/4	98-1/4	90	5-1/2	24	10	24
60	1.9 TO 1	6	35	60	39	99	96	5	*	12	24
66	1.7 TO 1	6-1/2	30	72	27	99	102	5-1/2	*	12	24
72	1.8 TO 1	7	36	78	21	99	108	6	*	12	24
78	1.8 TO 1	7-1/2	36	90	21	111	114	6-1/2	*	12	24
84	1.6 TO 1	8	36	90-1/2	21	111-1/2	120	6-1/2	*	12	24

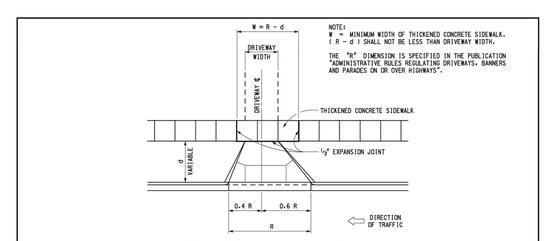
* AS FURNISHED BY THE MANUFACTURER



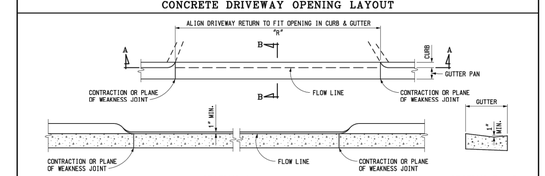
NOTES:
- CONCRETE IN THESE END SECTIONS SHALL BE THE SAME GRADE AND STRENGTH AS SPECIFIED FOR REINFORCED CONCRETE PIPE, A.S.T.M. DESIGNATION C 76 CLASS II, EXCEPT AS MODIFIED BY THE STANDARD SPECIFICATION.
- REINFORCEMENT IN THE "C" PORTION SHALL BE THE SAME AS SPECIFIED FOR REINFORCED CONCRETE, A.S.T.M. DESIGNATION C 76 CLASS II FOR THE SIZE OF CONNECTING PIPE.
- REINFORCEMENT IN THE "B" PORTION SHALL HAVE A CROSS-SECTIONAL AREA EQUAL TO THAT OF ONE LAYER OF STEEL IN THE "C" PORTION. THE END OF THE PIPE CULVERT SHALL BE PLACED IN THE CONCRETE END SECTION SO THAT THE FLOW LINES ARE FLUSH. THE JOINT MUST BE COMPLETELY FILLED WITH MORTAR ON THE INSIDE AND OUTSIDE AND STRUCK FLUSH. THE JOINT MUST BE WRAPPED WITH GEOTEXTILE BLANKET 36" WIDE WITH A 12" OVERLAP.
- TO CHANGE THE FILL SLOPE TO THE SLOPE OF THE END SECTION USE A TRANSITION SLOPE OF APPROXIMATELY 10' IN LENGTH TO PROVIDE A PLEASING APPEARANCE.
- VARIATIONS IN DIMENSIONS — THE THICKNESS OF CONCRETE, THE POSITION OF STEEL, AND THE INTERNAL DIAMETER OF THE PIPE SHALL CONFORM WITH THE VARIATIONS IN DIMENSIONS AS PROVIDED IN THE SPECIFICATIONS FOR REINFORCED CONCRETE CULVERT, STORM DRAINS, AND SEWER PIPE, A.S.T.M. DESIGNATION C 76.
- PLACE CONCRETE FOOTING AS SHOWN.
- OUTFALL LABEL TO BE USED ONLY WHERE STORMWATER WILL DISCHARGE DIRECTLY TO THE WATERS OF THE STATE.

PRECAST CONCRETE END SECTION FOR PIPE CULVERT

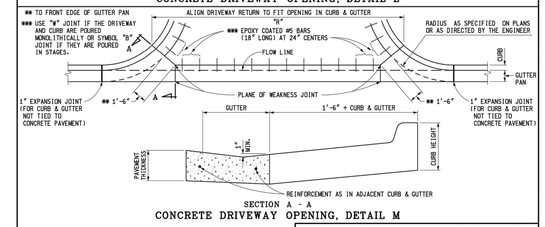
(REF. MDOT DETAIL R-86-F)



CONCRETE DRIVEWAY OPENING LAYOUT



CONCRETE DRIVEWAY OPENING, DETAIL L



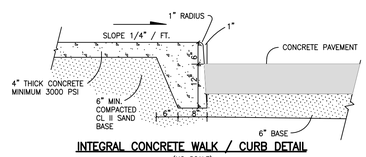
CONCRETE DRIVEWAY OPENING, DETAIL M

NOTE:
FOR ROADWAYS WITH CONCRETE PAVEMENTS, LONGITUDINAL LANE TIES WILL BE CONTINUOUS THROUGH THE DRIVEWAY OPENING AND THE SPACING OF THE #5 BARS IN CONCRETE DRIVEWAYS SHALL BE ADJUSTED TO AVOID CONFLICT WITH THE LONGITUDINAL LANE TIES.

MICHIGAN DEPARTMENT OF TRANSPORTATION
BUREAU OF HIGHWAY DEVELOPMENT STANDARD PLAN FOR

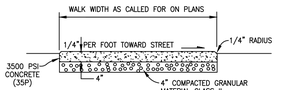
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK

9-30-2014 F.H.W.A. APPROVAL	7-1-2014 PLAN DATE	R-29-I	SHEET 2 OF 4



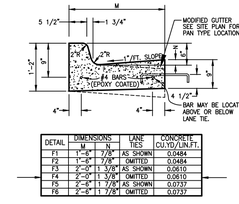
INTEGRAL CONCRETE WALK / CURB DETAIL

(NO SCALE)



4" CONCRETE SIDEWALK

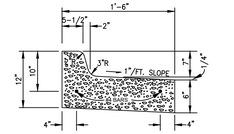
(NO SCALE)



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

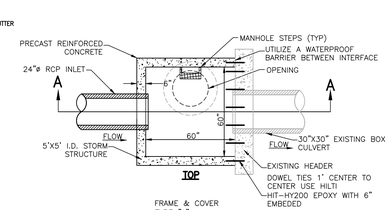
CONCRETE CURB & GUTTER TYPE F

(NO SCALE)

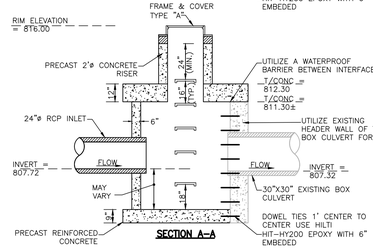


REDUCED MODIFIED SECTION CONCRETE CURB & GUTTER TYPE C4

(NO SCALE)



TOP



SECTION A-A

5'X5' 3-SIDED PRECAST STORM STRUCTURE

(NOT TO SCALE)

BE BOSS Engineering
Engineers Surveyors Planners Landscape Architects
3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
517.546.4836 FAX 517.548.1670

PROJECT
DENTAL OFFICE & MIXED USE
CASSINO BUILDING AND DEVELOPMENT
PREPARED FOR
27224 VAN DYKE AVE.
STERLING HEIGHTS, MI. 48314
586-323-4462

TITLE
CONSTRUCTION DETAILS

NO	BY	DESCRIPTION	DATE
1	JA	SUPERIOR TWP. WCRC & WCWRC REVISION PER	4/19/23

DESIGNED BY: ST
DRAWN BY: MJD
CHECKED BY:
SCALE: NOT TO SCALE
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 15

BOSS Engineering

Part K.

MAINTENANCE PLAN & BUDGET

SAMPLE MAINTENANCE PLAN & BUDGET

Fenn & Associates
Stormwater Management System Maintenance Plan

1. **Responsibility for Maintenance**
   a. During construction, it is the developer's responsibility to perform the maintenance.
   b. Following construction, it will be the responsibility of Fenn & Associates to perform the maintenance.
   c. The Master Deed will specify that routine maintenance of the stormwater facilities must be completed within 30 days of receipt of written notification that action is required, unless other acceptable arrangements are made with the (Township of Superior), (Washtenaw County Commissioner) or successors. Emergency maintenance (i.e. when there is endangerment to public health, safety or welfare) shall be performed immediately upon receipt of written notice. Should Fenn & Associates fail to act within these time frames, the (Township) (County) or successors may perform the needed maintenance and assess the costs against Fenn & Associates.
2. **Source of Financing**
   Fenn & Associates is required to pay for all maintenance activities on a continuing basis.
3. **Maintenance Tasks and Schedule**
   a. See the charts on the next two pages: The first describes maintenance tasks during construction to be performed by the developer, the second describes maintenance tasks by Fenn & Associates.
   b. Immediately following construction, the developer will have the stormwater management system inspected by an engineer to verify grades of the detention and filtration areas and make recommendations for any necessary sediment.

Refer to the ***Low Impact Development Manual for Michigan*** for maintenance task checklists for permanent BMPs and create a table of applicable maintenance tasks and schedules for the project.

The BMP maintenance checklists in the LID Manual include:
- Detention (ponds, basins, wetlands)
- Infiltration (basins, trenches)
- Bioretention
- Bioswales, vegetated filter strips

MAINTENANCE TASKS AND SCHEDULE DURING CONSTRUCTION

	COMPONENTS										
TASKS	Storm Sewer System	Catch Basin Sumps	Catch Basin Inlet Casings	Ditches and Swales	Outflow Control Structure	Rip-Rap	Filtration Basins	Storm Detention Areas	Wetlands	Emergency Overflow	SCHEDULE
Inspect for sediment accumulation	X	X		X	X		X	X			Weekly
Removal of sediment accumulation	X	X		X	X		X	X			As needed* & prior to turnover
Inspect for floatables and debris			X	X	X		X	X			Quarterly
Cleaning of floatables and debris			X	X	X		X	X			Quarterly & at turnover
Inspection for erosion				X	X		X	X			Weekly
Re-establish permanent vegetation on eroded slopes				X			X	X			As needed & at turnover
Replacement of Stone					X						As needed* & prior to turnover
Mowing			X	X	X	X	X	X			0 to 2 times per year
Inspect Stormwater system components during wet weather and compare to as-built plans (by professional engineer reporting to Fenn & Associates)				X	X		X	X			Annually and at turnover
Make adjustments or replacements as determined by annual wet weather inspection	X	X	X	X	X	X	X	X	X	X	As needed

*as needed means when sediment has accumulated to a maximum of one foot depth

PERMANENT MAINTENANCE TASKS AND SCHEDULE

	COMPONENTS								
TASKS	Catch Basin Inlet Casings	Ditches and Swales	Outflow Control Structure	Rip-Rap	Filtration Basins	Storm Detention Areas	Wetlands	Emergency Overflow	SCHEDULE
Inspect for sediment accumulation		X	X		X	X			Annually
Removal of sediment accumulation		X	X		X	X			Every 2 years as needed
Inspect for floatables and debris	X	X	X		X	X			Annually
Cleaning of floatables and debris	X	X	X		X	X			Annually
Inspection for erosion		X	X		X	X			Annually
Re-establish permanent vegetation on eroded slopes		X			X	X			As Needed
Replacement of Stone			X						Every 3-5 years as needed
Clean Streets									Semi-Annually
Mowing		X			X	X			0-2 times per year
Inspect Stormwater system components during wet weather and compare to as-built plans (by professional engineer reporting to Fenn & Associates)	X	X	X	X	X	X	X	X	Annually
Make adjustments or replacements as determined by annual wet weather inspection	X	X	X	X	X	X	X	X	As needed
Keep records of all inspections and maintenance activities and report to Fenn & Associates									Annually
Keep records of all costs for inspections, maintenance and repairs. Report to Fenn & Associates									Annually

TASKS	COST	
Annual inspection for sediment accumulation	~~$100.00~~	$250.00
Removal of sediment accumulation every 2 years as needed	$500.00	
Inspect for floatables and debris annually and after major storms	$100.00	
Removal of floatables and debris annually and after major storms	$150.00	
Inspect system for erosion annually and after major storms	$100.00	
Re-establish permanent vegetation on eroded slopes as needed	~~$350.00~~	$150.00
Replacement of stone	~~$100.00~~	
Mowing 0-2 times per year	~~$400.00~~	
Inspect structural elements during wet weather and compare to as-built plans every 2 years	~~$150.00~~	$200.00
Make structural adjustments or replacements as determined by inspection as needed	$400.00	
Have professional engineer carry out emergency inspections upon identification of severe problems	~~$200.00~~	$400.00
A. Total Annual Budget	**~~$2,550.00~~**	$2,250.00

Note: Maintenance Plans and budgets vary widely due to the size and unique characteristics of each stormwater management system proposed. Appendix K is intended for use as a starting point in the development of an appropriate maintenance plan specific to the size and components of each system.

THE LOCATION AND ELEVATION OF EXISTING UNDERGROUND UTILITIES AS SHOWN ON THESE PLANS ARE APPROXIMATE AND NO GUARANTEE IS EITHER EXPRESSED OR IMPLIED AS TO THE COMPLETENESS OR ACCURACY THEREOF. THE CONTRACTOR SHALL NOTIFY ALL UTILITIES AND DETERMINE THE EXACT LOCATION AND ELEVATION OF EXISTING UTILITIES AND PROPOSED UTILITIES CROSSINGS BEFORE ANY EXCAVATION IS STARTED. THE CONTRACTOR SHALL NOTIFY THE ENGINEER IF ANY CONFLICTS ARE FOUND BETWEEN THE PLANS AND THE LOCATION OR DEPTH OF UTILITIES AS SHOWN ON THE PLANS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT MISS DIG 3 WORKING DAYS BEFORE YOU DIG 1-800-482-7171

BE BOSS Engineering
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3121 E. GRAND RIVER AVE.
HOWELL, MI. 48843
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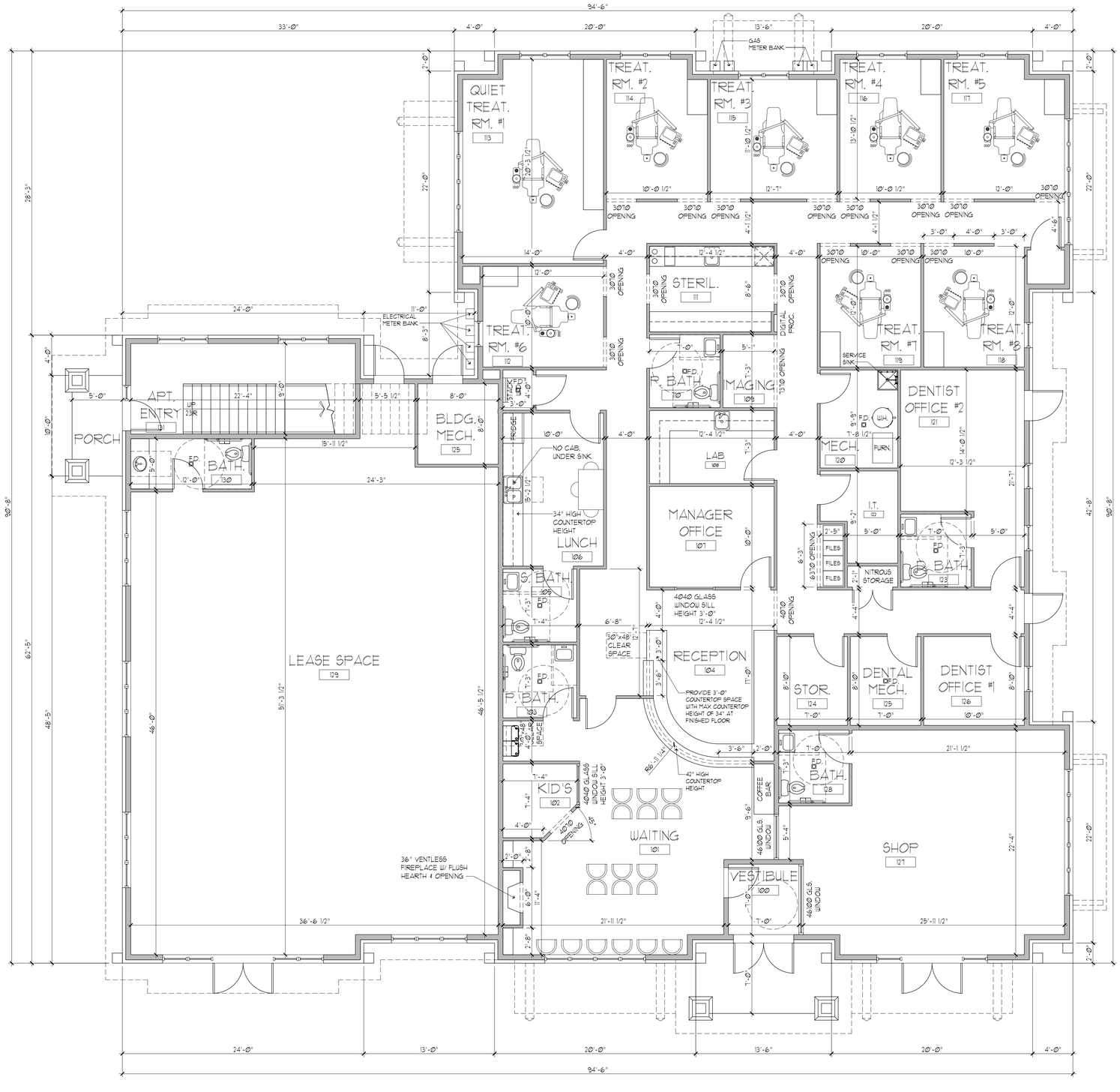
PROJECT: DENTAL OFFICE & MIXED USE
PREPARED FOR: CASSINO BUILDING AND DEVELOPMENT
47721 VAN DYKE AVE.
STERLING HEIGHTS, MI. 48314
586-323-4462
TITLE: MAINTENANCE PLAN & BUDGET

NO	BY	REVISION PER	DATE
1	JA	SUPERIOR TWP., WCRC & WCWRC	4/19/23

DESIGNED BY: ST
DRAWN BY: MJD
CHECKED BY:
SCALE: NOT TO SCALE
JOB NO: 22-097
DATE: 02/22/2023
SHEET NO. 16



NOTE:
BUILDING TO HAVE FIRE SUPPRESSION SYSTEM.

DENTAL OFFICE:	4,393 SQ. FT.
SHOP:	650 SQFT.
LEASE SPACE:	2,020 SQ. FT.
TOTAL SQUARE FOOTAGE:	7,063 SQ. FT.

GROUND FLOOR:	7,063 SQ. FT.
SECOND FLOOR:	3,552 SQ. FT.
TOTAL BUILDING SQUARE FOOTAGE:	10615 SQ. FT.

GROUND FLOOR PLAN

DENTAL OFFICE:	4,393 SQ. FT.
SHOP:	650 SQFT.
LEASE SPACE:	2,020 SQ. FT.
TOTAL SQUARE FOOTAGE:	7,063 SQ. FT.

SCALE 3/16" = 1'-0"

STATE OF MICHIGAN
ROBERT WALZ
MEMBER
No. 26704
REGISTERED PROFESSIONAL ENGINEER

ROBERT WALZ ENGINEERING
14899 TOWERING OAKS DRIVE
SHELBY TWP., MI 48315
(586) 770-6814

MARTINI SAMARTINO Design Group
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HURON DENTAL OFFICE

5387 PLYMOUTH ROAD
ANN ARBOR, MI. 48105

Site Plan Approval:	04-26-2023
Permit Set:	
Revisions:	
Final Set:	
Drawn By:	B.J.
Checked By:	D.D.

Job No:
22-241

Sheet No:
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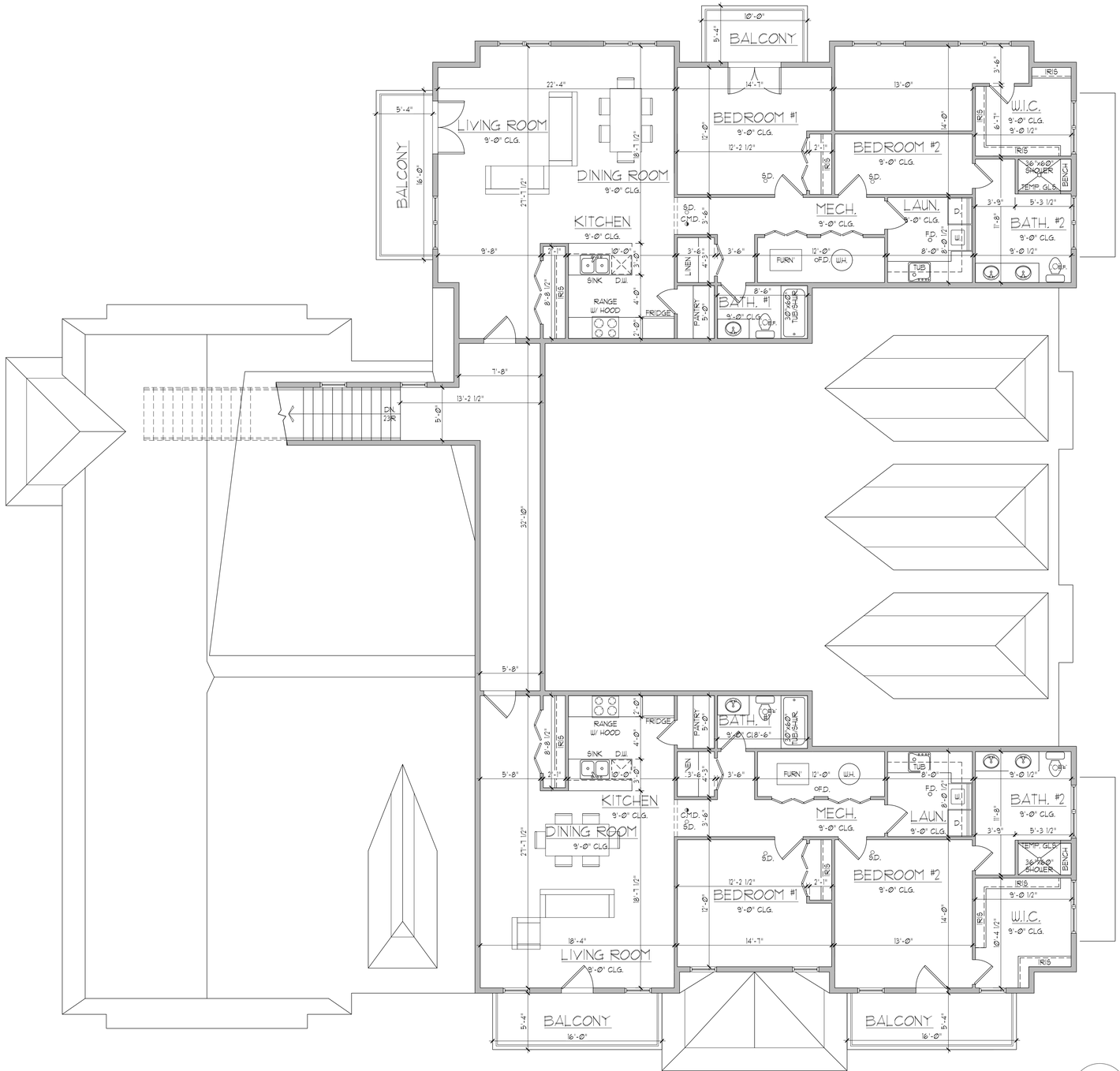

SECOND FLOOR PLAN

APARTMENT 1:	1820 SQ. FT.	SCALE 3/16" = 1'-0"
APARTMENT 2:	1732 SQ. FT.	
TOTAL SQUARE FOOTAGE:	3552 SQ. FT.	

STATE OF MICHIGAN
ROBERT WALZ
REGISTERED
No. 26704
PROFESSIONAL ENGINEER

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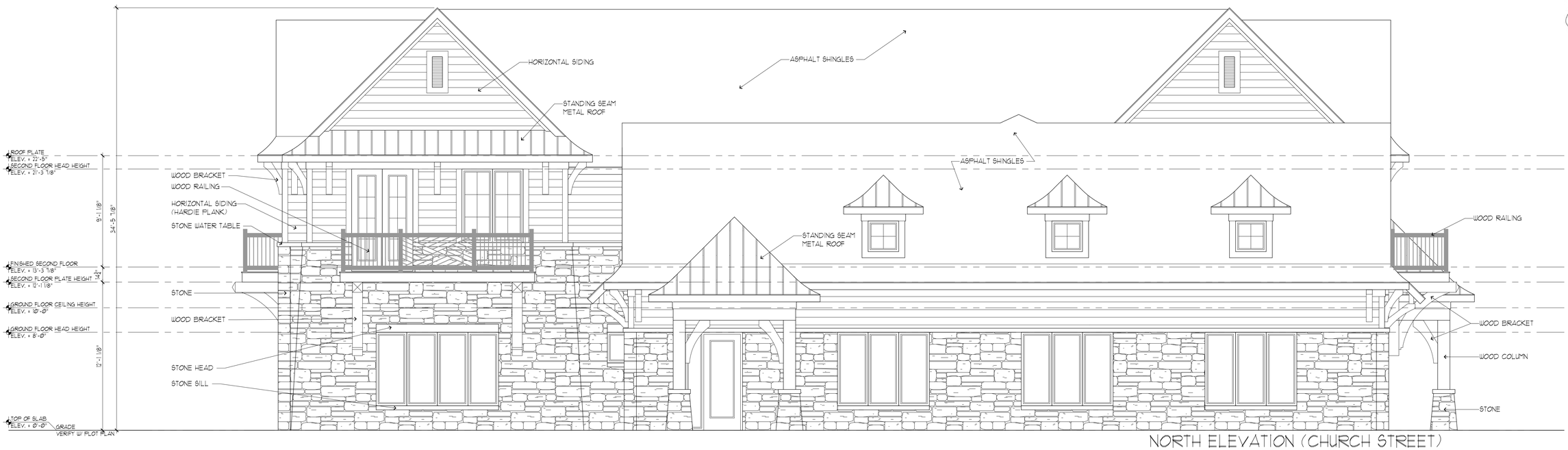
A2 OF 4

WEST ELEVATION

SCALE 1/4" = 1'-0"



NORTH ELEVATION (CHURCH STREET)

SCALE 1/4" = 1'-0"

STATE OF MICHIGAN
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ANN ARBOR, MI. 48105

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A3 OF 4

EAST ELEVATION

SCALE 1/4" = 1'-0"

SOUTH ELEVATION (PLYMOUTH - ANN ARBOR ROAD)

SCALE 1/4" = 1'-0"

STATE OF MICHIGAN
ROBERT J. WALZ
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NO. 26704
LICENSED PROFESSIONAL ENGINEER

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ANN ARBOR, MI. 48105

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Checked By:	D.D.

Job No:
22-241

Sheet No:
A4 OF 4