

EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "(PLAN)" WERE OBTAINED FROM AVAILABLE AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL JTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS

SITE SUMMARY NOTES

OR VARIANCE REQUESTS ARE REQUIRED.

USE FOR THE R4B ZONING DESIGNATION.

DETAILED PHASE BOUNDARIES.

I. IMPACT OF PROPOSED DEVELOPMENT ON AREA SCHOOLS:

II. RELATIONSHIP OF INTENDED USE TO NEIGHBORING USES:

HE SITE AND NEIGHBORING SITES:

ACCOMMODATE 200 SEATS.

TOTAL NUMBER OF VEHICLE TRIPS =429

VII. PUBLIC SIDEWALK MAINTENANCE STATEMENT

SUSTAINABILITY NARRATIVE

THE PROJECT IS SURROUNDED BY VARIETY OF USES INCLUDING SINGLE/MULTI-FAMILY RESIDENTIAL, SCHOOL,

PARKS AND HAS THREE BUS STOPS WITHIN 1/4 MILE

WALKING DISTANCE. THE PROJECT WILL ALSO PROVIDE

BICYCLE PARKING AND ELECTRIC VEHICLE CHARGING.

THE PROJECT WILL MANAGE STORM WATER UTILIZING

INSTALL LIGHTING THAT MEETS UP-LIGHT AND LIGHT

INCORPORATION OF SUSTAINABLE ELEMENTS:

LOCATION AND TRANSPORTATION

SUSTAINABLE SITES

THE FOLLOWING NARRATIVE HIGHLIGHTS THE PROJECT'S

VIII. NATURAL FEATURES GENERAL DESCRIPTION AND IMPACTS:

REQUIREMENTS, THE NATURAL FEATURES IMPACTS ARE AS FOLLOWS:

ADDITIONAL IMPACTS ARE PROPOSED FOR THIS PROJECT. WOODLAND BASAL AREA: SEE EXISTING CONDITIONS PLAN.

III. IMPACT OF ADJACENT USES ON THE PROPOSED DEVELOPMENT:

a. THERE WILL BE NO NEGATIVE IMPACT TO AIR QUALITY.

CONSTRUCTION IS CONTROLLED AND MANAGED.

V. IMPACT OF THE PROPOSED USE ON HISTORIC SITES/STRUCTURES:

C. COMMUNITY ANALYSIS

THE FOLLOWING SITE PLAN PETITION IS FOR PLANNING COMMISSION AND CITY COUNCIL APPROVAL. TYPE 2 CITIZEN PARTICIPATION NOTIFICATION IS REQUIRED. RECOMMENDATION FROM PLANNING & DEVELOPMENT SERVICES IS

REQUIRED. A SPECIAL EXCEPTION USE (SEU) WAS APPROVED BY PLANNING COMMISSION ON FERUARY 6, 2007 FOR GRACE BIBLE CHURCH AND REMAINS IN PLACE, <u>NO</u> EXTENSION IS REQUIRED. <u>NO</u> ANNEXATION PETITIONS, REZONING PETITIONS, PUD ZONING PETITIONS, PLANNED PROJECT MODIFICATIONS, LANDSCAPE MODIFICATIONS,

THE PROPOSED LAND USE SHALL REMAIN AS IT CURRENTLY EXISTS. THE CHURCH IS A PERMITTED SPECIAL LAND

THE PROJECT INVOLVES A BUILDING ADDITION OF APPROXIMATELY 34,045 SQUARE FEET AND A PARKING LOT

WATER INFRASTRUCTURE FOR BUILDING EXPANSION AND NEW PARKING LOT AND BIORETENTION SWALES.

EXPANSION OF 107 SPACES, 339 PARKING SPACES IN TOTAL. THE PROPOSED BUILDING ADDITION IS LOCATED IN

TWO SEPARATE AREAS. THE FIRST IS THE PROPOSED EXPANSION OF THE SANCTUARY INTO THE COURTYARDS

THE PROPOSED DEVELOPMENT WILL BE CONSTRUCTED IN 4 PHASES. REFER TO PROJECT PHASING PLAN FOR

PHASE 1 WILL BEGIN ON OR BEFORE OCTOBER 2021, WITH COMPLETION ON OR BEFORE OCTOBER 2022

 PHASE 2 WILL BEGIN ON OR BEFORE OCTOBER 2022, WITH COMPLETION ON OR BEFORE OCTOBER 2023. PHASE 2 WILL BEGIN ON OR BEFORE OCTOBER 2023, WITH COMPLETION ON OR BEFORE OCTOBER 2024.

PHASE 2 WILL BEGIN ON OR BEFORE OCTOBER 2024, WITH COMPLETION ON OR BEFORE OCTOBER 2025.

CONSTRUCTION PHASING MY BE COMBINED IF FINANCIALLY FEASIBLE. ESTIMATED CONSTRUCTION COSTS TBD.

THE PROPOSED ADDITION TO THE CHURCH WILL NOT IMPACT PUBLIC ELEMENTARY OR HIGH SCHOOLS.

THE CONTINUED USE OF THE SITE FOR THE CHURCH WILL NOT IMPACT NEIGHBORING PROPERTIES.

THE CONTINUED USE OF THE SITE FOR THE CHURCH WILL NOT IMPACT NEIGHBORING PROPERTIES.

IV. IMPACT OF PROPOSED DEVELOPMENT ON AIR AND WATER QUALITY, AND ON THE EXISTING NATURAL FEATURES OF

DETENTION FACILITIES. THE APPROVED REGIONAL STORM WATER DETENTION SYSTEM (MIDTOWN ANN ARBOR

b. THE AREA THAT MAKES UP THIS PROJECT IS CURRENTLY UNDEVELOPED AND HAVE NO STORM WATER

CVLP 19-016) IMPROVEMENTS ARE DESIGNED TO PRE-TREAT, DETAIN, AND RELEASE THE RUNOFF AT A

c. THE PROPOSED BUILDING EXPANSION AND PARKING LOT REQUIRE THE REMOVAL OF LANDMARK TREES.

ALTERNATIVE ANALYSIS WAS PERFORMED AND IS PROVIDED ON SHEET C-200.

OR WOODLANDS WITHIN THE PROJECT AREA. NO MITIGATION IS REQUIRED.

NO HISTORIC STRUCTURES EXIST ON-SITE. THE SITE ITSELF IS NOT HISTORIC.

3. PROPOSED SANCTUARY EXPANSION = 200 SEATS X 0.69 = 139 TRIPS

CONTROLLED RATE. WATER QUALITY CONTROLS WILL BE IMPLEMENTED TO ENSURE THAT RUNOFF DURING

d. THERE ARE NO ENDANGERED SPECIES HABITATS, FLOODPLAINS, WATER COURSES, WETLANDS, STEEP SLOPES,

THE GRACE BIBLE CHURCH CURRENTLY HAS 420 SEATS AND THE PROPOSED BUILDING ADDITION IS 30,870 SF TO

THERE ARE NO PUBLIC SIDEWALKS PROPOSED FOR THIS PROJECT. EXISTING PUBLIC SIDEWALK ALONG S. MAPLE ROAD SHALL BE KEPT & MAINTAINED IN GOOD REPAIR BY THE OWNER OF THE LAND ADJACENT TO & ABUTTING THE

SAME. PRIOR TO THE ISSUANCE OF THE FINAL CERTIFICATE OF OCCUPANCY FOR THIS SITE, ALL EXISTING

IN ACCORDANCE WITH THE CITY OF ANN ARBOR LAND DEVELOPMENT REGULATIONS REGARDING SITE PLAN

LANDMARK TREES: SEE EXISTING CONDITIONS PLAN. THERE ARE PROPOSED IMPACTS TO LANDMARK TREES.

STEEP SLOPES: SEE EXISTING CONDITIONS PLAN. THERE IS A SMALL AREA OF EXISTING STEEP SLOPES ALONG

WETLANDS: SEE EXISTING CONDITIONS PLAN. THERE ARE SEVERAL EXISTING WETLANDS ON SITE. IMPACTS AND MITIGATION TO PROTECTED WETLANDS HAVE BEEN APPROVED THROUGH MIDTOWN ANN ARBOR CVLP 19-016. NO

WATER EFFICIENCY

1. PER TRIPS DATA COLLECTION, THE GRACE BIBLE CHURCH GENERATES 0.69 TRIPS PER OCCUPIED SEAT

2. PEAK VEHICLE TRIPS AT THE EXISTING CHURCH FACILITY = 420 SEATS X 0.69 = 290 TRIPS

SIDEWALKS IN NEED OF REPAIR MUST BE REPAIRED IN ACCORDANCE WITH CITY STANDARDS.

BOUNDARY AND ELEVATION OF ANY 100-YEAR FLOODPLAIN: NOT APPLICABLE

THE EAST EDGE OF THE SITE. THERE IS NO WORK PROPOSED IN THIS AREA.

WATERCOURSES: THERE ARE NO EXISTING OR PROPOSED WATERCOURSES ON THIS SITE.

BIORETENTION AREAS WITHIN THE PARKING LOT AND WILL EXTERIOR, AND DECORATIVE WHERE POSSIBLE

SEE ALTERNATIVE ANALYSIS AND LANDSCAPE PLAN FOR MITIGATION.

WITHIN THE EXISTING CHURCH. THIS EXPANSION ALLOWS FOR AN ADDITIONAL ~300 FT OF PEW. THE SECOND, IS A LARGE EXPANSION TOWARD THE SOUTH THAT WILL CONTAIN A GYMNASIUM, YOUTH MINISTRY, CHILD MINISTRY AND

COMMON SPACE (~30,870 SF). OTHER SITE IMPROVEMENTS WILL INCLUDE NEW LANDSCAPE PLANTINGS, NEW STORM

A. PETITION FOR SITE PLAN

B. DEVELOPMENT PROGRAM

GRACE BIBLE CHURCH

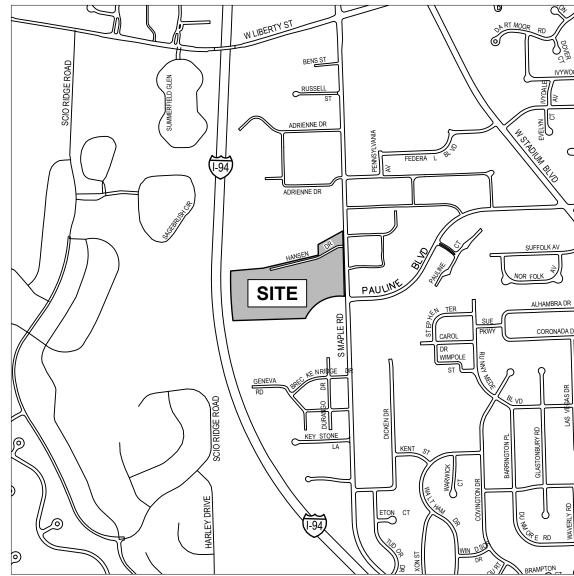
CITY OF ANN ARBOR, WASHTENAW COUNTY, MICHIGAN

SITE PLAN

ZONED R4A Summit View Condominiums BIBLE CHURCH & THE CITY OF ANN ARBOR THAT PERMITS THE ISTING ENCROACHMENT OF THE CHURCH PARKING LOT INTO THE ANSEN NATURE AREA IN RETURN FOR ESTABLISHING PERMISSION FOR USERS TO PARK IN SAID LOT WHILE USING THE PARK. **ZONED PUD** HANSEN Parcel #: 09-09-31-208-326 **NATURE AREA** Address: 1241 S MAPLE RD Public Land Owner: MARK MCCLAIN LTD. MIDTOWN ANN ARBOR Zoning: R4B Parcel #: 09-08-36-100-009 Address: 1400 South Maple Road Owner: Midtown Ann Arbor, LLC (3,175 SQ.FT. TOTAL) **ZONED R4A** Summit View Condominiums PROP. PAVILION (1.800 SQ.FT. **DICKEN WOODS** NATURE AREA MIDTOWN ANN ARBOR Public Land Parcel #: 09-08-36-100-009 Address: 1400 South Maple Road Owner: Midtown Ann Arbor, LLC **OVERALL SITE PLAN**

DEVELOPMENT SUMMARY & COMPARISON CHART

	REQUIRED / PERMITTED	EXISTING	PROPOSED
I) ZONING CLASSIFICATION:	R4B	R4B	R4B
II) LOT AREA:	14,000 SF MIN.	671,667 SF	671,667 SF
III) TOTAL AREA OF ALL FLOORS:			34,045 SF (+1,800 SF PAVILION)
FLOOR AREA:	NONE	32,371 SF	32,371 SF (EX.) + 34,045 SF (PROP.) = 66,416 SF (TOTAL) (+1,800 SF PAVILION)
IV) OPEN SPACE & ACTIVE OPEN SPACE	55% MIN.	671,667 SF - 175,542 SF = OPEN SPACE = 496,125 (73.9 %)	671,667 SF - 175,542 SF - 95,890 SF = OPEN SPACE = 400,235 SF (59.6 %)
V) SETBACKS (FRONT, SIDE & REAR):	FRONT YARD: 15 FT MIN. / 40 FT MAX. SIDE YARD: 12 FT MIN. 26 FT TOTAL REAR YARD: NA	FRONT YARD (EAST): 288.6 FT SIDE YARD (NORTH): 40.3 FT SIDE YARD (SOUTH): 195.0 FT REAR YARD (WEST): 525.9 FT	FRONT YARD (EAST): 272.9 FT SIDE YARD (NORTH): 40.3 FT SIDE YARD (SOUTH): 91.0 FT REAR YARD (WEST): 203.5 FT
VI) BUILDING HEIGHT & STORIES:	35 FT	32 FT 8 IN	29 FT 6 IN
VII) OFF-STREET VEHICULE PARKING: RELIGIOUS ASSEMBLY):	1 SP / 6 FT OF PEW 1,336 FT OF PEW / 6 = 223 SPACES 8 BF SPACES	232 SPACES 8 BF SPACES	232 (EX.) + 107 (PROP.) - 2 (EX. REMOVED) = 337 SPACES (8 EX. + 2 PROP.) 10 BF SPACES
VIII) BICYCLE PARKING, INCLUDING CLASS: RELIGIOUS ASSEMBLY):	ONE (1) BICYCLE SPACE / 100 LF PEW CLASS 'C' SPACES 1,336 FT / 100 = 14 SPACES	16 SPACES	16 SPACES (EX.)
IX) EV PARKING: RELIGIOUS ASSEMBLY)	223 RE EV-C (15% EV-C 10% EV-R 10% EV-I 0 SPACES EV-R (EV-R (EV-I (1 (1 (1 (1 (1 (1 (1 (1 (1 (223 REQUIRED SPACES: EV-C (15%) = 34 SPACES EV-R (10%) = 23 SPACES EV-I (10%) = 23 SPACES EV-I (BARRIER FREE) = 1 SPACE
X) VARIANCES OR PLANNED PROJECTS:	NA	NA NA	NA



LOCATION MAP

DESIGN TEAM CONTACTS

APPLICANT / OWNER GRACE BIBLE CHURCH 1300 SOUTH MAPLE ROAD ANN ARBOR, MI 48103 P: 734.663.0589

ATTN: REAGAN SIMS

ENGINEER / LANDSCAPE ARCHITECT NEDERVELD, INC 3037 MILLER RD. ANN ARBOR, MI 48103 P: 734.929.6963 ATTN: JASON VAN RYN

ARCHITECT OIX STUDIO, INC 2373 OAK VALLY DRIVE #180 ANN ARBOR, MI 48103 P: 734.929.9000

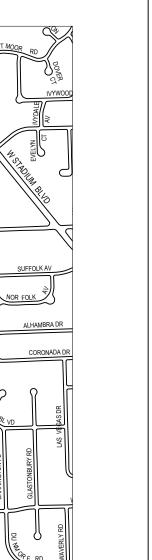
ARCHITECT INFORM STUDIO 235 E. MAIN STREET, STE 102B NORTHVILLE, MI 48167 P: 248.449.3564

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X-501



PREPARED FOR: Grace Bible Church

> 1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

Ann Arbor, MI 48103

Phone: 734.929.6963

CHICAGO

COLUMBUS

GRAND RAPIDS

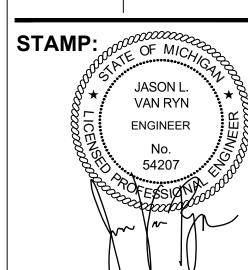
HOLLAND

INDIANAPOLIS

ST. LOUIS

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.03.24 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRO Drawn: BC/TA Checked: JVR Date: 2021.06.18 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.07.28



PROJECT NO: 18500114

SHEET NO:

LIMITS OF SOIL DISTURBANCE: SEE GRADING PLAN (SHEET C-300 - C-301) BOUNDARY AND DESCRIPTION OF ENDANGERED SPECIES HABITAT: NOT APPLICABLE

	REQUIRED / PERMITTED	EXISTING	PROPOSED
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II) LOT AREA:	14,000 SF MIN.	671,667 SF	671,667 SF
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X) VARIANCES OR PLANNED PROJECTS:	NA	NA	NA

TRESPASS REQUIREMENTS.

THROUGHOUT THE PROJECT SITE.

EFFICIENT FIXTURES WHERE POSSIBLE.

MATERIALS AND RESOURCES

INNOVATION AND DESIGN

SUITABLE DURING CONSTRUCTION.

THE PROJECT WILL NOT USE OUTDOOR IRRIGATION AND WILL REDUCE INDOOR WATER USAGE WITH WATER

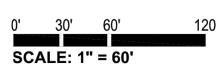
THE PROJECT WILL USE SUSTAINABLE MATERIALS WITH

ENVIRONMENTAL PRODUCT DECLARATIONS WHERE

THE PROJECT WILL USE LED LIGHTS FOR INTERIOR,

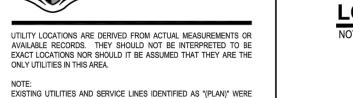
—Land Planning — Landscape Architecture — Civil Engineering — Land Surveying — High Definition Scanning — Forensic Engineering — Fire Investigation







OBTAINED FROM AVAILABLE CITY AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.





www.nederveld.com 800.222.1868

GRAND RAPIDS 217 Grandville Ave., Suite 302 Grand Rapids, MI 49503 Phone: 616.575.5190

ANN ARBOR CHICAGO **COLUMBUS** HOLLAND **INDIANAPOLIS**

ST. LOUIS

PREPARED FOR:

Grace Bible Church Reagan Sims

> 1300 S. Maple Road Ann Arbor, MI 48103

CREATED:

Drawn: R.Paramo Date: 05.17.21

REVISIONS:

STAMP:

PROJECT NO: 18500114

SHEET NO:

SHEET: 1 OF 1

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The Title Description and Schedule B items hereon are from Liberty Title Agency, Commitment No. LIB154879, dated May 7, 2021.

TITLE DESCRIPTION

The land referred to in this Commitment is located in the City of Ann Arbor, County of Washtenaw, State of Michigan, and described as follows:

Commencing at the East 1/4 corner of Section 36, Town 2 South, Range 5 East; thence North 01 degrees 19 minutes 00 seconds West 735.15 feet along the East line of said Section 36 and the centerline of Maple Road (66 feet wide) to the point of beginning; thence South 88 degrees 41 minutes 00 seconds West 95.54 feet; thence Southwesterly 433.94 feet along the arc of a circular curve to the left, radiius 363.00 feet, central angle of 64 degrees 54 minutes 57 seconds and a long chord bearing South 56 degrees 13 minutes 32 seconds West 411.10 feet; thence South 88 degrees 15 minutes 01 seconds West 755.58 feet; thence Northerly 518.20 feet along the arc of a non-tangential circular curve to the right, radius 3644.83 feet, central angle of 08 degrees 08 minutes 46 seconds and a long chord bearing North 02 degrees 44 minutes 08 seconds West 517.77 feet; thence North 85 degrees 04 minutes 06 seconds East 339.94 feet; thence North 76 degrees 41 minutes 00 seconds East 591.00 feet; thence North 01 degrees 19 minutes 00 seconds West 110.00 feet; thence North 61 degrees 13 minutes 20 seconds East 330.71 feet; thence South 01 degrees 19 minutes 00 seconds East 698.08 feet along the East line of said Section 36 and the centerline of said Maple Road to the point of beginning. Being a part of the Northeast 1/4 of Section 36 and being subject to the rights of the public over the

NOTE: There appears to be a typo in the description provided; <u>radiius 363.00</u> feet should be <u>radius 383.00</u> feet, further deed research is recommended.

SCHEDULE B - SECTION II NOTES

- (7) Terms and conditions contained in Grant as recorded in Liber 863, page 174, Washtenaw County Records. **Not a survey matter.**
- (11) Terms and conditions contained in Grant of Easement as recorded in Liber 5235, page 525, Washtenaw County Records. The easement described in this document is shown on this survey.
- (12) Terms and conditions contained in Grant of Easement as recorded in Liber 5235, page 526, Washtenaw County Records. The easement described in this document is shown on this survey.
- (13) Terms and conditions contained in Reciprocal Easement Agreement as recorded in Liber 5237, page 52, Washtenaw County Records. The easements described in this document are shown on this survey approximately per Site Plan within said document. 13-1: Grading, utility construction, restoration; 13-2: GBC driveway easement from east parking area; 13-3: GBC emergency easement from west parking area; 13-4: Condo emergency drive easement & link to Maple Road; 13-5: Drainage easement; 13-6: Wetland mitigation maintenance access; 13-7: Pedestrian use pathway easement to condo association; 13-8: Pedestrian use pathway easement to GBC.

SURVEYOR'S NOTES

- 1) ALTA TABLE "A" ITEM NO. 1 Existing and placed monuments at all major corners of the boundary of the property have been shown.
- 2) ALTA TABLE "A" ITEM NO. 2 Address of the surveyed property is 1300 S. Maple Road, Ann Arbor, MI 48103.
- 3) ALTA TABLE "A" ITEM NO. 3 Flood Zone Classification: An examination of the National Flood Insurance Program's Flood Insurance Rate Map for Community Number 260213, Map Number 26161C0244E & Map Number 26161C0243E (Not Printed), with an Effective Date of April 3, 2012, show this parcel to be located in Zone X (subject to map scale uncertainty). No field surveying was performed to determine this zone.
- 4) ALTA TABLE "A" ITEM NO. 4 Gross Land Area: 694,427.2 Square Feet / 15.94 Acres
- 5) ALTA TABLE "A" ITEM NO. 7(a) Exterior dimensions of all permanent buildings at ground level have been shown.
- 6) ALTA TABLE "A" ITEM NO. 8 Substantial features observed in the process of conducting fieldwork have been shown.
 - 7) ALTA TABLE "A" ITEM NO. 9 Parking Information 239 standard parking spaces

8 handicap parking spaces 247 total parking spaces

- 8) ALTA TABLE "A" ITEM NO. 11 See Note 10 below.
- 9) ALTA TABLE "A" ITEM NO. 13 Names of adjoining owners have been shown according to current tax records.
- 10) Note to the client, insurer, and lender With regard to Table A, item 11, information from the sources checked above will be combined with observed evidence of utilities pursuant to Section 5.E.iv. to develop a view of the underground utilities. However, lacking excavation, the exact location of underground features cannot be accurately, completely, and reliably depicted. In addition, in some jurisdictions, 811 or other similar utility locate requests from surveyors may be ignored or result in an incomplete response. Where additional or more detailed information is required, the client is advised that
- 11) Basis of Bearing: Liberty Title Agency, Commitment No. LIB154879, dated May 7, 2021.
- 12) NOTE TO CONTRACTORS: 3 (THREE) WORKING DAYS BEFORE YOU DIG, CALL MISS DIG AT TOLL FREE 1-800-482-7171 FOR UTILITY
- 13) The land shown in this survey is the same as that described in Liberty Title Agency, Commitment No. LIB154879, dated May 7, 2021.
- 14) Access to property is from S. Maple Road.

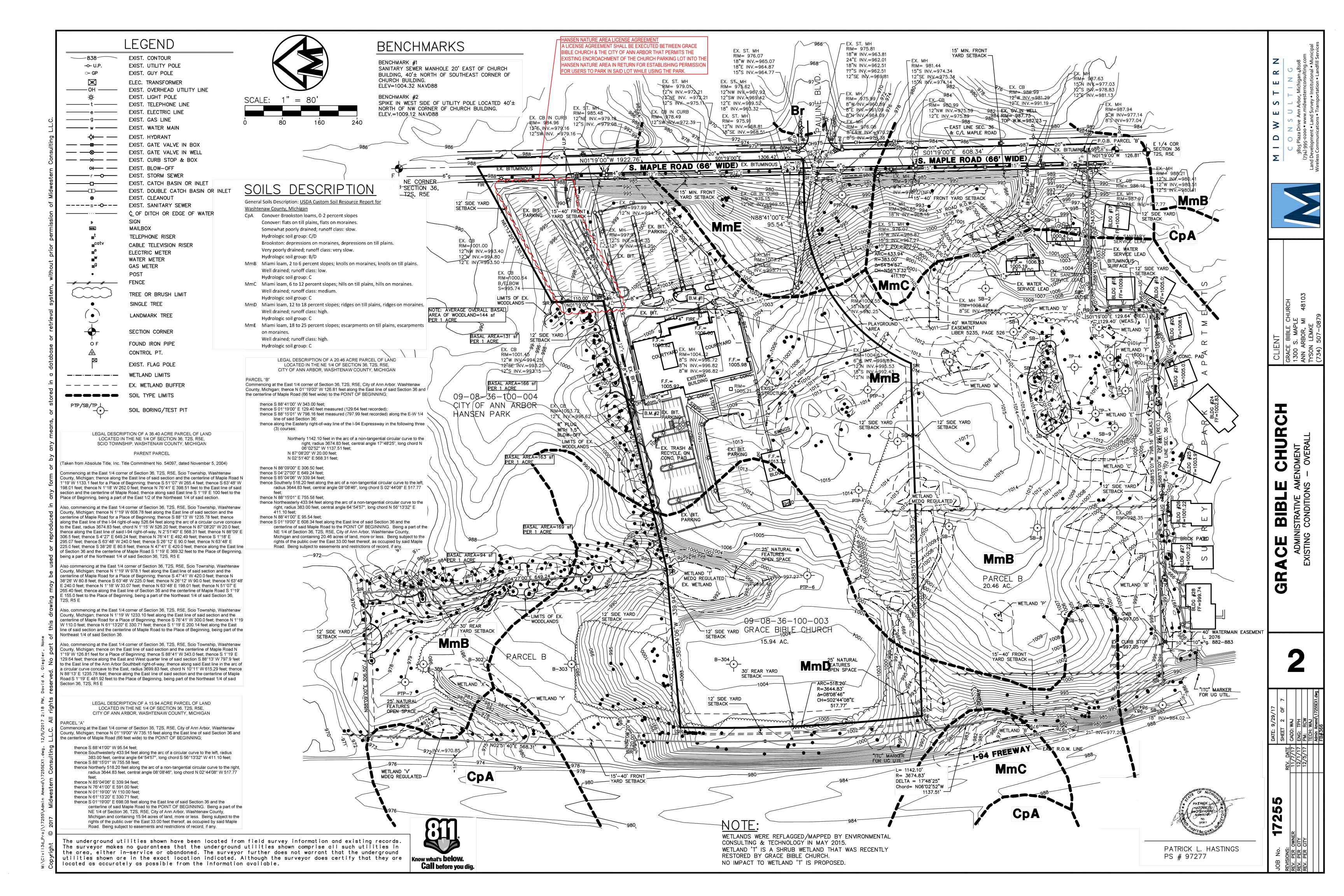
SURVEYOR'S CERTIFICATION

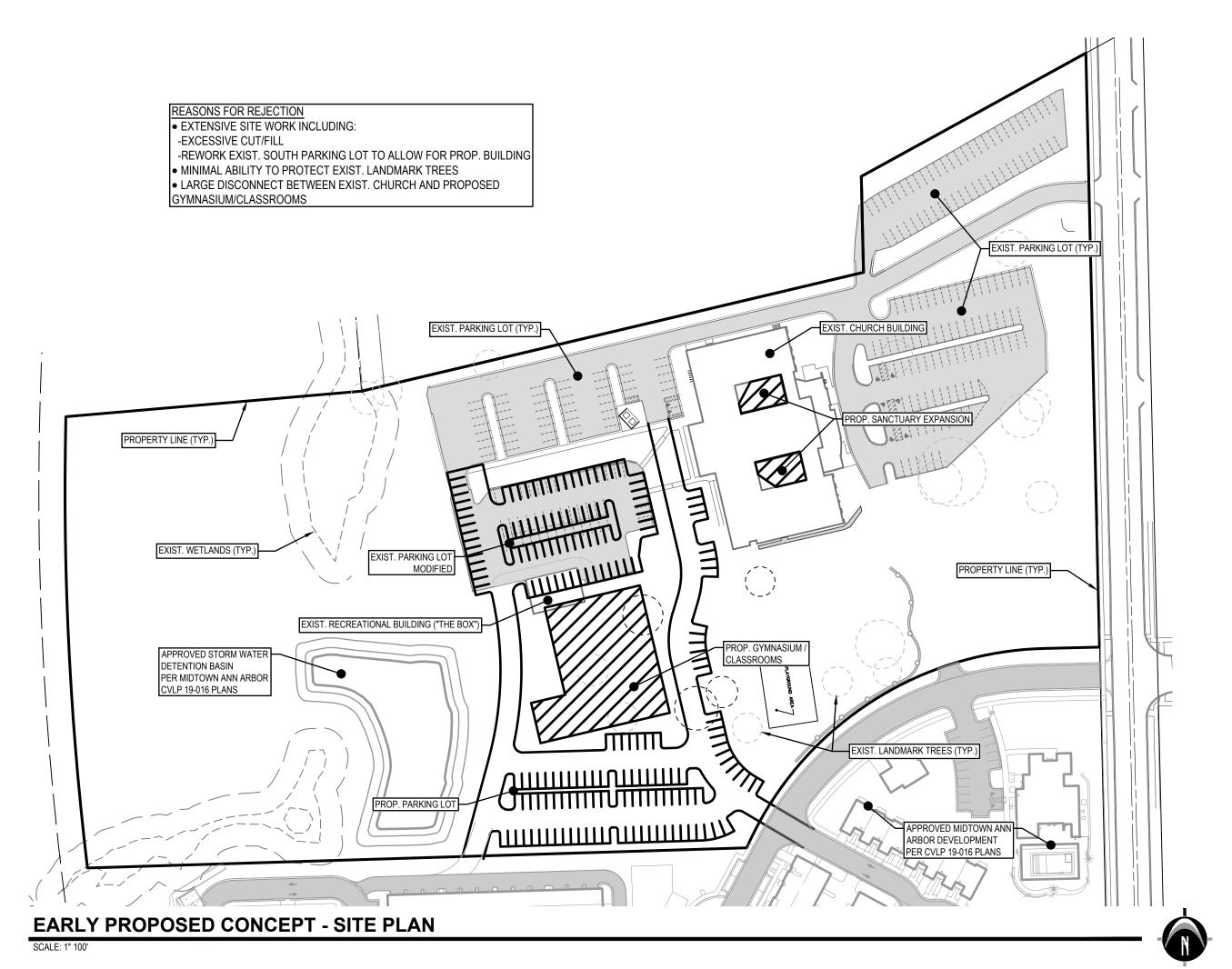
- To Liberty Title Agency; Stewart Title Guaranty Company:
- This is to certify that this map or plat and the survey on which it is based were made in accordance with the 2021 Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys, jointly established and adopted by ALTA and NSPS, and includes Items 1, 2, 3, 4, 7(a), 8, 9, 11, & 13 of Table A thereof. The fieldwork was completed on May 17, 2021.

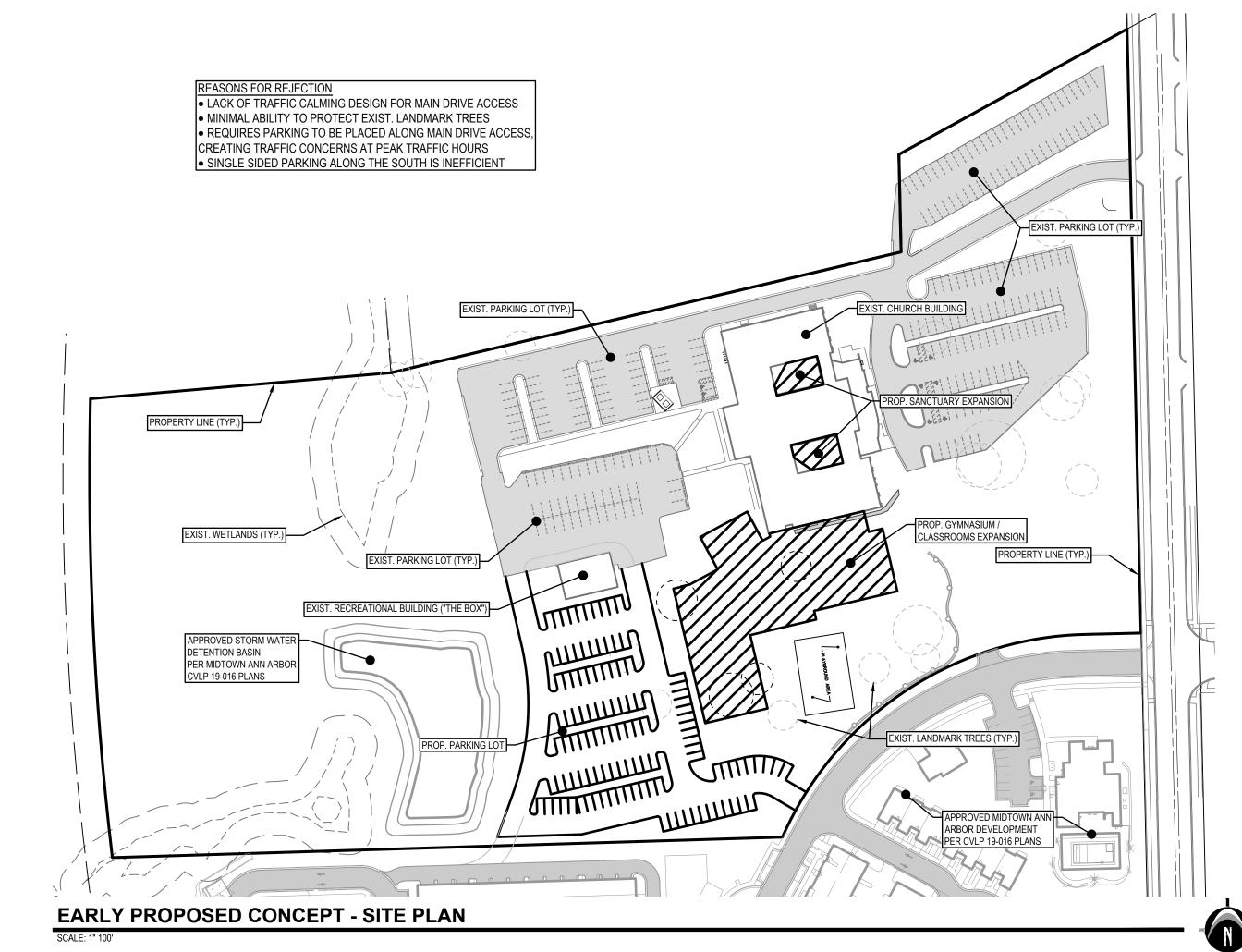
Date of Plat or Map: ___May 17, 2021 Brandon 4001063096

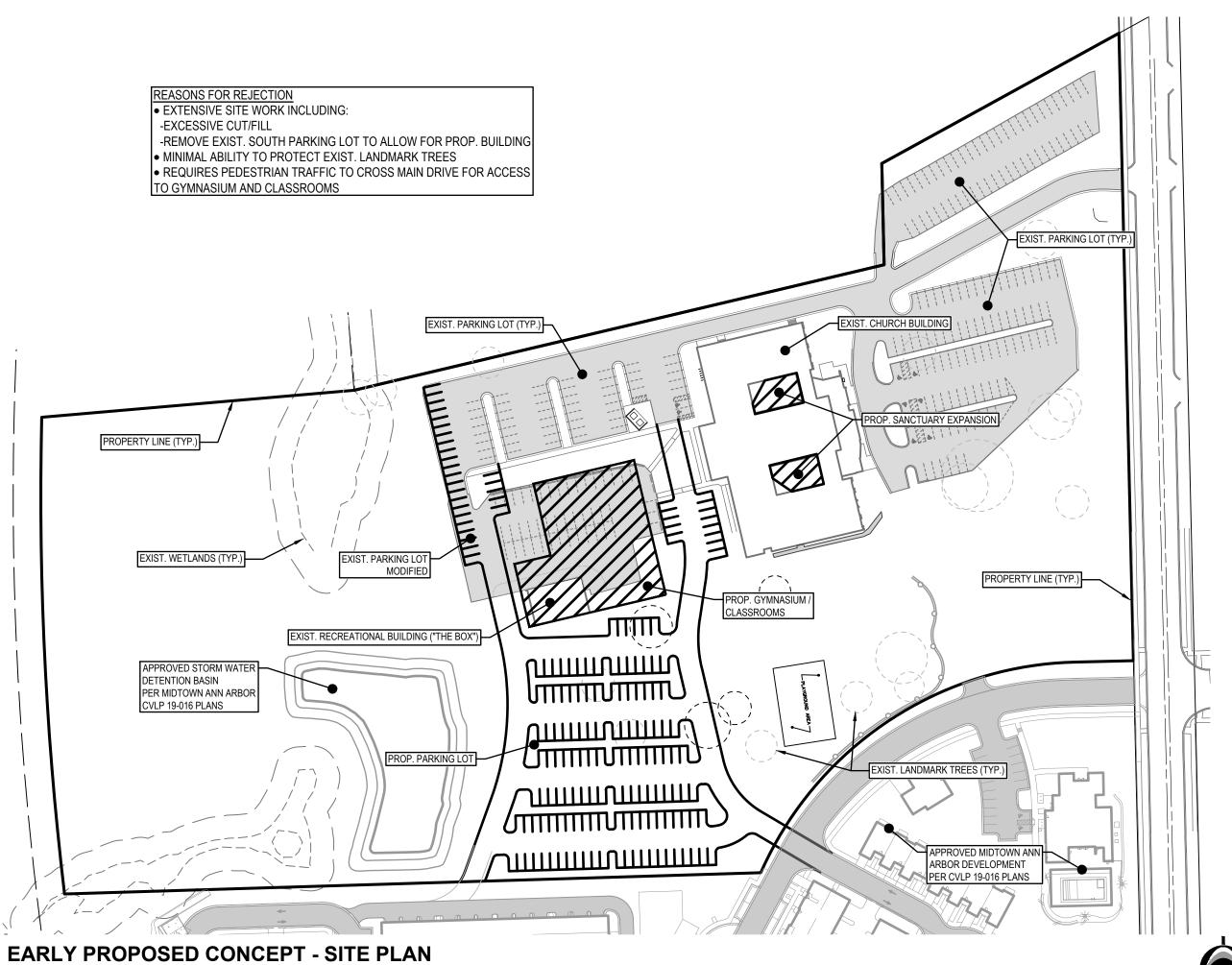
Professional Surveyor No. 4001063096

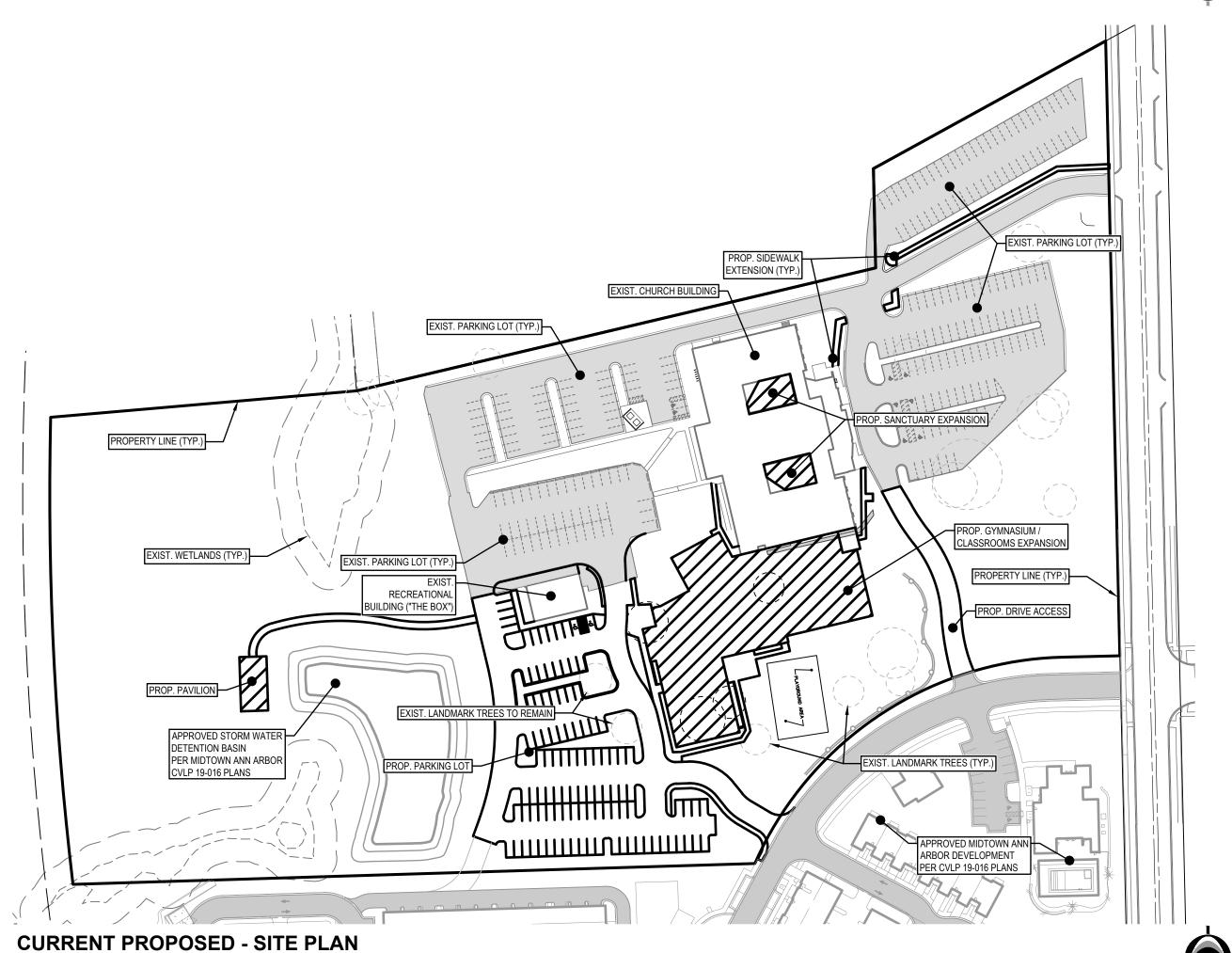
—Land Planning — Landscape Architecture — Civil Engineering — Land Surveying — High Definition Scanning — Forensic Engineering — Fire Investigation –











NEDERVELI
ANN ARBOR
3037 Miller Rd.
Ann Arbor, MI 48103
Phone: 734.929.6963

CHICAGO
COLUMBUS
GRAND RAPIDS
HOLLAND
INDIANAPOLIS

PREPARED FOR:

Grace Bible Church

ST. LOUIS

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC
Drawn: BC/TA Checked: JVR Date: 2021.03.24
Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC
Drawn: BC/TA Checked: JVR Date: 2021.06.18
Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC
Drawn: BC/TA Checked: JVR Date: 2021.07.28

CE BIBLE CHURCH

GRA

Analysis

Alternative

STAMP: OF MICHICAN

JASON L.

VAN RYN

ENGINEER

No.

54207

TO ESSIPATION

TO THE STATE OF MICHICAN

VAN RYN

ENGINEER

No.

54207

PROJECT NO: 18500114

SHEET NO:

C-200



NEDERVELI ANN ARBOR 3037 Miller Rd.

3037 Miller Rd.
Ann Arbor, MI 48103
Phone: 734.929.6963
CHICAGO
COLUMBUS

GRAND RAPIDS
HOLLAND
INDIANAPOLIS
ST. LOUIS

PREPARED FOR:
Grace Rible Church

Grace Bible Church

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC

Drawn: BC/TA Checked: JVR Date: 2021.03.24

Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC

Drawn: BC/TA Checked: JVR Date: 2021.06.18

Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC

Drawn: BC/TA Checked: JVR Date: 2021.07.28

IBLE CHURCH

Natural Features
1300 South Maple Road, Ann Arbor, M

JASON L.
VAN RYN
ENGINEER
No.
54207
FESSION

PROJECT NO: 18500114

SHEET NO:

C-201

WETLAND DELINEATION REPORT, 5/27/15

EXECUTIVE SUMMARY

Environmental Consulting & Technology, Inc. (ECT) has completed a site inspection on a property located in Section 36 of the City of Ann Arbor (Township 2 South, Range 5 East), Washtenaw County, Michigan.

The site is situated at 1300 South Maple Road, west of the South Maple Road and Pauline Boulevard intersection (Site Location Map, Appendix A). The area of investigation consisted of approximately 35 acres of partially developed land. ECT conducted an investigation in January 2015 and completed the wetland delineation on May 4 and May 6, 2015. The purpose of the investigation was to identify, delineate, and characterize wetlands and water features and assess their regulatory status.

Thirteen wetland areas were identified within the project area. ECT's believes that five of the thirteen delineated wetlands are subject to regulation by the Michigan Department of Environmental Quality (MDEQ), under Part 303, Wetlands Protection, and Part 301, Inland Lakes and Streams of P.A. 451 Michigan Natural Resources and Environmental Policy Act (NREPA) of 1994. All of the thirteen wetlands appear to be subject to regulation under the City of Ann Arbor wetland ordinance.

Wetlands in Michigan are regulated by the MDEQ, in coordination with the U.S. Army Corps of Engineers (USACE), and the Environmental Protection Agency (EPA). These agencies make their own determinations as to what is or is not wetland, and have the final decision in matters of iurisdiction and delineation.

The identification of wetland or water features herein is based on the condition of the site at the time of our investigation, our past experiences with regulatory agencies, and current regulatory policy. ECT recommends that the wetland boundaries delineated by ECT be verified by the MDEQ prior to commencement of construction activities.

It is unlawful to deposit fill, dredge material, drain surface water, or construct a structure in a wetland without a permit from the MDEQ. If wetland impacts are proposed, a wetland Joint Permit Application (JPA) through the MDEQ would be required.

Environmental Consulting & Technology, Inc.

0 INTRODUCTION AND METHODS

Environmental Consulting & Technology, Inc. (ECT) has completed a site inspection on a property located in Section 36 of the City of Ann Arbor (Township 2 South, Range 5 East), Washtenaw County, Michigan.

The site is situated at 1300 South Maple Road, west of the South Maple Road and Pauline Boulevard intersection (Site Location Map, Appendix A). The area of investigation consisted of approximately 35-acres of partially developed land. Currently, the subject site contains a commercial building and two small, associated outbuildings located on the northeastern portion of the property associated with Grace Bible Church, as well as, two residential dwellings located on the southeastern portion of the property. The subject buildings occupy approximately fifteen percent of the site with asphalt-paved parking lots, a sports recreation area, manicured landscaping and a variety of vegetation types on the remaining portions. ECT conducted initial field investigations in January of 2015, and completed the wetland delineation on May 4 and May 6, 2015.

The methodology used to identify wetlands described herein was consistent with Michigan Department of Environmental Quality (MDEQ) and the U.S. Army Corps of Engineers (USACE) wetland delineation rules as outlined in the USACE's Wetlands Delineation Manual - Technical Report Y-87-1 (January 1987) (87 Manual) and the Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Midwest Region (2011) (Regional Supplement).

Wetlands were characterized according to three diagnostic parameters: vegetation, soils, and hydrology. Plant species associated with wetland versus upland conditions were identified and checked against the National List of Plant Species (Lichvar, 2012). Soil profiles were examined by using a tile spade to dig to a depth of approximately 14 inches below the ground surface. Horizon thickness, color, texture, and presence of hydromorphic (water-formed) features were noted and compared against the Field Indicators of Hydric Soils in the United States [U.S. Department of Agriculture (USDA)-Natural Resources Council (NRCS) 2006]. Primary and secondary indicators of hydrology, as described in the USACE's 87 Manual and Regional Supplement, were used to confirm wetland hydrology.

Environmenta Consulting &

2.0 - AVAILABLE MAPPING AND DATA

2.1 USGS Topographic Map

Review of the USGS Quadrangle Map (Ann Arbor West Quadrangle), prepared in 1965 and updated in 1982, indicates that elevations within the subject site range between approximately 990 feet and 1,015 feet above sea level. The maps show the subject site to contain a dome-like terrain topography with few areas where there are steep elevation gradients. No water features or distinctly low elevations are denoted on the map. One commercial structure and two small outbuildings are depicted on the site, similar in location to the existing structures presently observed on the subject site.

USGS topographic maps typically show only the more distinct wetland and water features and should be utilized for preliminary analysis only. Field mapping is necessary to determine the actual existence, type, and boundaries of wetlands and water features.

2.2 NRCS Soils Map

The NRCS Soil Survey Map for Washtenaw County was reviewed prior to the site inspection. The soil map indicates the broad presence of the Miami loam (MmB) soil associations, which is a silty loam textured soil (Soil Map, Appendix A). Small portions of the subject site are identified as being associated with soil units MmC, MmD and MmE, which denote Miami loam soils with somewhat steeper slopes than that of the MmB soils. It should be noted that these soil units are not classified as hydric soils (Table 2.2). A small area in the northwest portion of the site is classified as Conover-Brookston loam, which is a hydric soil. A hydric soil is a soil that formed under conditions of saturation, flooding, or ponding long enough during the growing season to develop anaerobic conditions in the upper part (Federal Register, 1994). Hydric soils are one of three diagnostic criteria used to determine whether or not an area is a wetland. The Soil Survey is a generalized map and further field investigation is required. The majority of the

Table 2-2. NRCS Soil Map Units (NRCS Web Soil Survey, accessed January 2015)

Symbol	Soil Map Unit Name	Hydric
СрА	Convover-Brookston Loams, 0-2% slopes	Yes
MmB	Miami loam, 2 to 6 percent slopes	No
MmC	Miami loam, 6-12 percent slopes	No
MmD	Miami loam, 12-18 percent slopes	No
MmE	Miami loam, 18-25 percent slopes	No

subject site is within areas mapped as generally consisting of Miami loam, a non-hydric soil.

2.3 National Wetland Inventory

The U.S. Fish & Wildlife Service National Wetland Inventory (NWI), a national wetland mapping program, was reviewed prior to the site inspection (NWI Map, Appendix A). The NWI maps

show no wetlands on the subject site. Please note that NWI maps are remotely compiled from aerial photography and may not show all wetlands in a given area, nor accurately characterize all wetlands shown. These maps should be used only for preliminary analysis and field mapping is necessary to determine the actual existence, type, and boundaries of wetlands.

2.4 - Preliminary Threatened and Endangered Species Review

The Michigan Natural Features Inventory (MNFI) in collaboration with the Michigan Department of Natural Resources (MDNR) and Michigan State University maintains a natural heritage database for the State of Michigan. MNFI's continuously updated database is a comprehensive source of existing data on Michigan's endangered, threatened, or otherwise significant plant and animal species, natural plant communities, and other natural features, aka element occurrences. Records in the database indicate that a qualified observer has documented the presence of special natural features. The MNFI database query results are described in the results section of this report.

The U.S. Fish and Wildlife Service (USFWS) also maintains County distribution lists of federally listed threatened, endangered, proposed and candidate species. In Washtenaw County, Michigan the following species are listed:

Candidate Species

Eastern Massasauga (Sistrurus catenatus)

Threatened Species Eastern prairie fringed orchid (Plantathera leucophaea) Northern long-eared bat (Myotis septentrionalis)

Endangered Species Indiana bat (Myotis sodalist)

Snuffbox (Epioblasma triquetra) Mitchell's satyr butterfly (Neonympha mitchellii mitchellii) Poweshiek skipperling (Oarisma poweshiek)

Environmenta Consulting & Technology, Inc

3.0 RESULTS

3.1 Wetland Conditions

Wetlands are defined by P.A. 451 of 1994, as:

"...land characterized by the presence of water at a frequency and duration sufficient to support and that under normal circumstances does support wetland vegetation or aquatic life and is commonly referred to as a bog, swamp, or marsh...'

A review of historical aerial photographs was completed as part of the wetland delineation. The parcel appears to have been an active agricultural site from 1940 to the early 1970's. No wetland areas appear to be present during this time period. During the late 1970's, the southeast portion of the site was evidently used as a "Sediment Disposal Area". This circular dumping and landfilling area, along with a residential development constructed off-site to the south in the late 1980's appears to have disrupted the local drainage patterns and helped create the wetlands on the southern portion of the property.

The wetlands on the subject property consist of somewhat marginal forested and shrub/scrub wetlands. The dome-like topography of the site is not conducive to the formation of large wetlands. Most of the identified wetlands are small depressions perched on silty-clay soils, which appear to contain surface water only for short periods following rain or snowmelt events.

Common buckthorn (Rhamnus cathartica) is the dominant species across the site including both the wetland and upland areas. Other vegetation found in the wetland areas on-site include: American elm (Ulmus americana), cottonwood (Populus deltoides), black willow (Salix nigra), silver maple (Acer saccharinum), green/red ash (Fraxinus pennsylvanica) saplings, glossy buckthorn (Rhamnus franqula) silky dogwood (Cornus amomum), gray dogwood (Cornus foemina), panicled aster (Symphyotrichum lanceolatum), purple loosestrife (Lythrum salicaria), narrow-leaved cattail (Typha angustifolia), reed-canary grass (Phalaris arundinacea) and occasional sedge (Carex spp.) species in the wetter portions of the delineated wetlands.

Because of the thick, low canopy of common buckthorn, in many portions of the site there is no vegetation growing in the herbaceous layer. In these situations an assessment of soil characteristics and indicators of hydrology were used to determine wetland boundaries. Small areas of semi-permanent inundation were observed within Wetlands C, D, and M. Surface soils in these areas included shallow layers of muck. In other portions of the site, a depleted soil matrix indicated the presence of hydric soils. Other indicators of wetland hydrology included water stained leaves, moss trim lines, and drainage patterns.

With the exception of Wetland T, each of the wetlands on-site is considered low quality based on historical disturbance and significant inclusion of invasive species. The lack any significant areas of permanent inundation limits the functionality of the wetlands as wildlife habitat.

Wetland T is located in the northeastern portion of the site, adjacent to the Hansen Nature Area. The north portion of this wetland is relatively free of invasive species, includes larger trees adjacent to the wetland, and includes a small, intermittent stream segment. Wetland T is considered moderate quality, and is clearly the highest quality wetland on the site.

Additional details regarding the wetlands can be found in the U.S. Army Corp of Engineers Wetland Data Forms (Wetland Data Forms, Appendix B).

Upland conditions within the area of investigation consist of forested and shrub dominated areas. A significant portion of subject property is dominated by common buckthorn (Rhamnus cathartica). Other common species include black cherry (Prunus serotina), gray dogwood (Cornus foemina), Virginia creeper (Parthenocissus quinquefolia), wild strawberry (Fragaria virginiana) and tall goldenrod (Solidago altissima).

Upland areas are generally higher in elevation than the mapped wetlands and contain browner. drier soils than those found in wetland areas. The upland areas also lacked saturation and were found on flat or slightly convex, better drained surfaces. Soils were generally loam soils, which lacked redoximorphic features found in hydric soils.

3.3 – Preliminary Threatened and Endangered Species Findings

ECT checked the location of the project site and adjacent sections within a 1.5-mile radius of the project site against known localities for rare species and unique natural features, which are recorded in the MNFI natural heritage database. These known localities were accessed via MNFI's Web Database in May 2015 and a number of historic records were found. The only recent occurrence is for Northern long-eared bat, recorded in 2003.

The absence of records in the database for a particular site may mean that the site has not yet been surveyed or that element occurrence observations have not yet been reported to MNFI. Other species and unique natural features may be present that have not been recorded in the database. The only way to obtain a definitive statement on the status of natural features is to have a competent biologist perform a complete field survey during the appropriate time of year for a particular species of interest.

Based on the highly disturbed nature of the site and dominance of common buckthorn shrubs, ECT believes that suitable habitat for the federally listed species in Section 2.2 and the historic MNFI database records is not present on the subject property. The only exception is that Northern long-eared (NLE) bats are known to make summer roosts in dead trees with exfoliating bark or trees with hollows, cracks or crevices. The site does contain trees that meet the criteria of potential roost trees for NLE bats. To remain in compliance with current U.S. Fish and Wildlife Service guidelines regarding NLE bats, ECT recommends that the clearing of potential roost trees be completed outside of the summer roost season of April 1 to October 1.

4.0 REGULATORY CONSIDERATIONS & CONCLUSIONS

4.1 Wetland Regulation by the State of Michigan

Wetlands are protected under Part 303 Wetland Protection, of P.A. 451 of 1994, the Natural Resources and Environmental Protection Act (NREPA, as amended). The Michigan Department of Environmental Quality (MDEQ) assumes authority over wetlands that are 5 acres or greater in area; contiguous (directly adjacent to) to an inland lake, pond, or stream; within 500 feet of an inland lake, pond, or stream; or within 1,000 feet of a Great Lake, Lake Saint Clair, Saint Mary's River, Saint Clair River, or Detroit River.

The MDEQ may also exert regulatory control over isolated wetlands less than five acres in size: "...if the department determines that protection of the area is essential to the preservation of the natural resources of the state from pollution, impairment, or destruction and the department has so notified the owner."

- The following activities are prohibited within regulated wetlands without a MDEQ
- The placement of fill material;
- 2 Dredging; 3 Construction within; and/or
- 4 The draining of surface water from a wetland.

Table 4.1. Wetland Summary Data: Wetland Type, Anticipated Regulatory Status and Reason

ID	Type*	Anticipated Status	Reason / Notes
Wetland B	SS, FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland C	SS, FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland D	FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland E	FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland F	SS, FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland G	FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland L	SS, FO	MDEQ Regulated	Located within 500' of a water feature
Wetland M	SS	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland P	FO	Non-MDEQ Regulated	Isolated, not located within 500' of a water feature
Wetland T	EM, FO	MDEQ Regulated	Contains/contiguous with a stream segment
Wetland X	EM	MDEQ Regulated	Located within 500' of a water feature
Wetland Y	EM	MDEQ Regulated	Located within 500' of a water feature
Wetland V	EM	MDEQ Regulated	Located within 500' of a water feature

*FO = Forested; SS = Shrub-Scrub; EM = Emergent; WM = Wet Meadow; OW = Open Water ** All wetland are assumed to be regulated by the City of Ann Arbor

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4.2 Inland Lakes and Streams Regulation by the State of Michigan

Inland lakes and streams are protected under Part 301 Inland Lakes and Streams, of P.A. 451 of 1994. The Michigan Department of Environmental Quality (MDEQ) assumes authority over natural or artificial inland lakes that are greater than five acres in size, and natural or created streams that have definite banks, a bed, and visible evidence of a continued flow or continued

The following activities are prohibited within regulated inland lakes and streams without a MDEQ permit:

- Dredging or filling bottomland;
- 2. Constructing, enlarging, extending, removing or placing a structure on bottomland;
- Erecting, maintaining or operating a marina; Creating, enlarging or diminishing an inland lake or stream;
- 5. Structurally interfering with the natural flow of an inland lake or stream; 6. Constructing, dredging, commencing, extending or enlarging an artificial canal, channel, ditch, lagoon, pond, lake, or similar waterway where the purpose is ultimate connection with an existing inland lake or stream, or where any part of the artificial

waterway is located within 500 feet of the ordinary high water mark of an existing

inland lake or stream; 7. Connecting any natural or artificially constructed waterway, canal, channel, ditch, lagoon, pond, lake or similar water with an existing inland lake or stream for navigation or any other purpose.

No lakes or ponds were identified on the subject property during the site inspection. The northern portion of Wetland T includes a segment of intermittent stream that may meet the regulatory definition of a stream described above.

4.3 Wetland Regulation by the City of Ann Arbor

Under the authority of its Wetlands and Watercourses Preservation Ordinance (adopted December 5, 1994), the City of Ann Arbor regulates all wetlands and watercourses regardless of size and proximity to inland lakes and streams. The City must issue a permit for work in noncontiguous wetlands less than two acres in size unless the City determines that the wetland is essential to the preservation of the natural resources of the City. In making this determination the City must find that one or more of the following exist at the particular site:

- a. The site supports State or Federal endangered or threatened plants, fish, or wildlife appearing on a list specified in Section 6 of the Endangered Species Act of 1974, Act No. 203 of the Public Acts of 1974, being Section 299.226 of the Michigan Compiled
- b. The Site represents what is identified as a locally rare or unique ecosystem. The site supports plants or animals of an identified local importance.

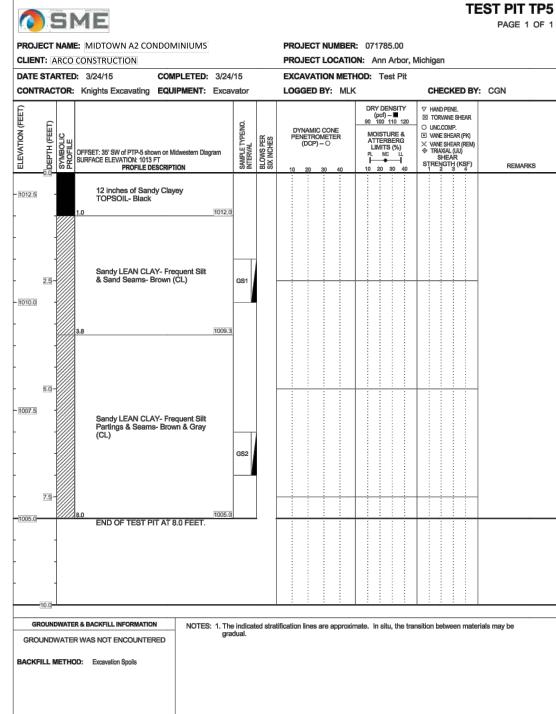
- The site provides groundwater recharge documented by a public agency. e. The site provides flood and storm control by the hydrologic absorption and storage
- capacity of the wetland. f. The site provides wildlife habitat by providing breeding, nesting, or feeding grounds or cover for forms of wildlife, waterfowl, including migratory water fowl and rare, threatened, or endangered wildlife species.
- g. The site provides protection of subsurface water resources and provision of valuable watersheds and recharging groundwater supplies. h. The site provides pollution treatment by serving as a biological and chemical
- oxidation basin. i. The site provides erosion control by serving as a sedimentation area and filtering
- basin, absorbing silt and organic matter. j. The site provides sources of nutrients in water cycles and nursery grounds and sanctuaries for fish.

We assume that each of the wetlands is subject to regulation under the local wetland ordinance. Additionally, the City of Ann Arbor enforces a natural features setback ordinance which regulates activities within a 25 foot setback surrounding wetlands.

Wetlands in Michigan are regulated by the MDEQ, in coordination with the USACE, and the EPA. Additionally, the City of Ann Arbor regulates activities within wetlands under local ordinance. These agencies make their own determinations as to what is or is not wetland, and have the final decision in matters of jurisdiction and delineation. Variability in boundary determinations may be due to, but not limited to, the agency representative conducting the determination, wetland policy, and the time of year the site was examined. In addition, the wetland boundaries and extent on a site can change over time depending upon numerous factors including, but not limited to, changes in vegetation, drainage, weather patterns, and activities on adjacent parcels that may alter the pattern of the wetland on the subject property. The identification of wetland or water features herein is based on the condition of the site at the time of our investigation, our past experiences with regulatory agencies, and current

If regulated wetland impacts are proposed in the future, ECT recommends that the determinations contained within this report be verified by the MDEQ through the MDEQ Wetland Identification Program or the submittal of a MDEQ/USACE Joint Permit Application.

Environmenta Consulting & Technology, Inc



PROJECT NUMBER: 071785.00

EXCAVATION METHOD: Test Pit

NOTES: 1. The indicated stratification lines are approximate. In situ, the transition between materials may be

LOGGED BY: MLK

PROJECT LOCATION: Ann Arbor, Michigan

MOISTURE & ATTERBERG LIMITS (%)
PL MC LL

SME

CLIENT: ARCO CONSTRUCTION

DATE STARTED: 3/24/15

PROJECT NAME: MIDTOWN A2 CONDOMINIUMS

CONTRACTOR: Knights Excavating EQUIPMENT: Excavator

10 inches of Clayey Sandy TOPSOIL- Black

Sandy LEAN CLAY- Frequent Silt Seams & Partings- Brown & Gray

GROUNDWATER & BACKFILL INFORMATION

NOTE: WETLAND DELINEATION REPORT AND

SOIL BORINGS COMPLETED BY

FOR REFERENCE.

OTHERS. SEE MIDTOWN CVLP19-016

DETAILED ENGINEERING DRAWINGS

GROUNDWATER WAS NOT ENCOUNTERE BACKFILL METHOD: Excavation Spoils

COMPLETED: 3/24/15

TEST PIT TP3

CHECKED BY: CGN

L PROFILE NO. 5

ILTY CLAY — TRACE SAND AND GRAVEL -CCASIONAL ROOT FIBERS — VERY STIFF -

SILTY CLAY - TRACE SAND

AND GRAVEL - OCCASIONAL

GRAY SAND SEAMS — HARD

MOTTLED BROWN AND

GRAY CHANGING TO BROWN

BELOW 10' - (CL)

SILTY CLAY - TRACE SAND

AND GRAVEL - VERY STIFF

- GRAY - (CL)

2996

2997

6127

20"

11"

13"

Quercus rubra

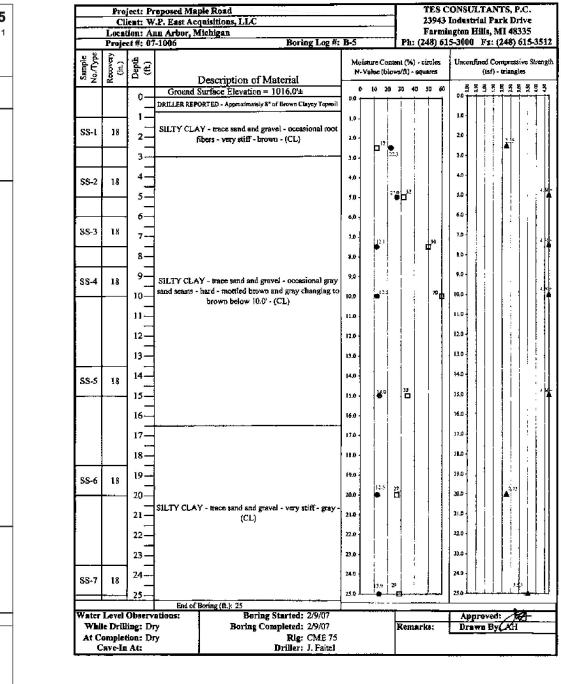
Tilia americana

Ulmus americana

8" BROWN CLAYEY TOPSOIL

∀ HAND PENE.
 ☐ TÖRVANE SHEAR

X VANE SHEAR (REM) ⊕ TRIAXIAL (UU) SHEAR STRENGTH (KSF)







PREPARED FOR: Grace Bible Church

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

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EXISTING TREE INVENTORY (PROJECT SITE)

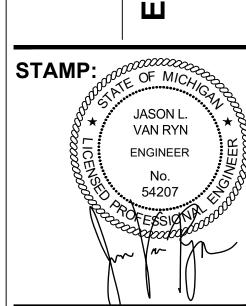
Tree Tag#	Size D.B.H. (inches)	Genus / Species	Common Name	<u>Landmark</u> <u>Tree</u>	Invasive Tree	Marked for Removal
2601	16"	Picea pungens	Blue Spruce			X
2602	16"	Picea pungens	Blue Spruce			
2603	21"	Picea abies	Norway Spruce	Х		
2604	13"	Acer platanoides	Norway Maple		Х	
2605	19"	Gleditsia tracanthos	Honey Locust	Х		
2606	15"	Gleditsia tracanthos	Honey Locust			
2607	11"	Acer platanoides	Norway Maple		Х	
2608	18"	Acer saccharum	Sugar Maple	Х		
2609	25"	Acer saccharum	Sugar Maple	Х		
2610	11"	Gleditsia tracanthos	Honey Locust			
2612	39"	Acer saccharinum	Silver Maple	Х		
2613	25"	Acer saccharinum	Silver Maple	Х		_
2614		dead	dead			_
2615	18"	Picea abies	Norway Spruce	Х		_
2616	16"	Pinus syvestris	Scotch Pine		Х	
2617	14"	Pinus syvestris	Scotch Pine		Х	
2618	21"	Pinus syvestris	Scotch Pine		Х	
2623	23"	Catalpa	Catalpa		X	
2624	28"	 Juglans nigra	Black Walnut	Х		
2625	16"	Ulmus americana	American Elm	Х		
2626	11"	Malus pumila	Apple			
2629	17"	Populus grandidentata	Bigtooth Aspen	Х		
2630	14"	Populus deltoides	Cottonwood			
2631	42"	Catalpa speciosa	Catalpa		Х	X
2634	12"	Acer nugundo	Box Elder			X
2635	14"	Acer rubrum	Red Maple			X
2637	15"	Acer nugundo	Box Elder			X
2638	17"	Picea glauca	White Spruce	Х		X
2639	11"	Picea pungens	Blue Spruce			X
2640	22"	Pinus nigra	Black Pine		X	X
2641	26"	Pinus nigra	Black Pine		X	X
2643	25"	Morus alba	White Mulberry		X	X
2644	15"	Morus alba	White Mulberry		X	X
2645	23"	Picea abies	Norway Spruce	Х		X
2648	18"	Juglans nigra	Black Walnut	X		
2649	11"	Malus coronaria	Crab Apple			X
2652	28"	Salix fragilis	Crack Willow		Х	
2653	26"	Salix fragilis	Crack Willow		X	
2654	13"	Populus deltoides	Cottonwood			X
2655	18"	Populus deltoides	Cottonwood			X
2656	17"	Juniperus virginiana	Red Cedar	X		
2658	1 <i>7</i> 15"	Ulmus americana	American Elm	^		X
2660	23"	Pinus nigra	Black Pine		X	
2661	20"	Pinus nigra	Black Pine		X	X
2662	21"	Pinus nigra Pinus nigra	Black Pine		X	X
2663	25"	Picea abies	Norway Spruce	X		
2664	25 18"	Acer rubrum	Red Maple	X		x
2665	14"	Acer rugundo	Box Elder	^		X
2666	17"	Carya ovata	Shagbark Hickory	X		
2695	17 11"	Malus pumila	Apple	^		
2696	13"	Ulmus americana	Apple Apple American Elm			
2967	19"	Ulmus americana Ulmus americana	American Elm American Elm	X		
2971	17"	Quercus rubra	Red Oak	X		
2984	13" 13"	Quercus alba	White Oak		v	
2985	9"	Prunus avuim	Sweet Cherry		Х	
2995	9" 20"	Prunus serotina	Black Cherry			

Red Oak

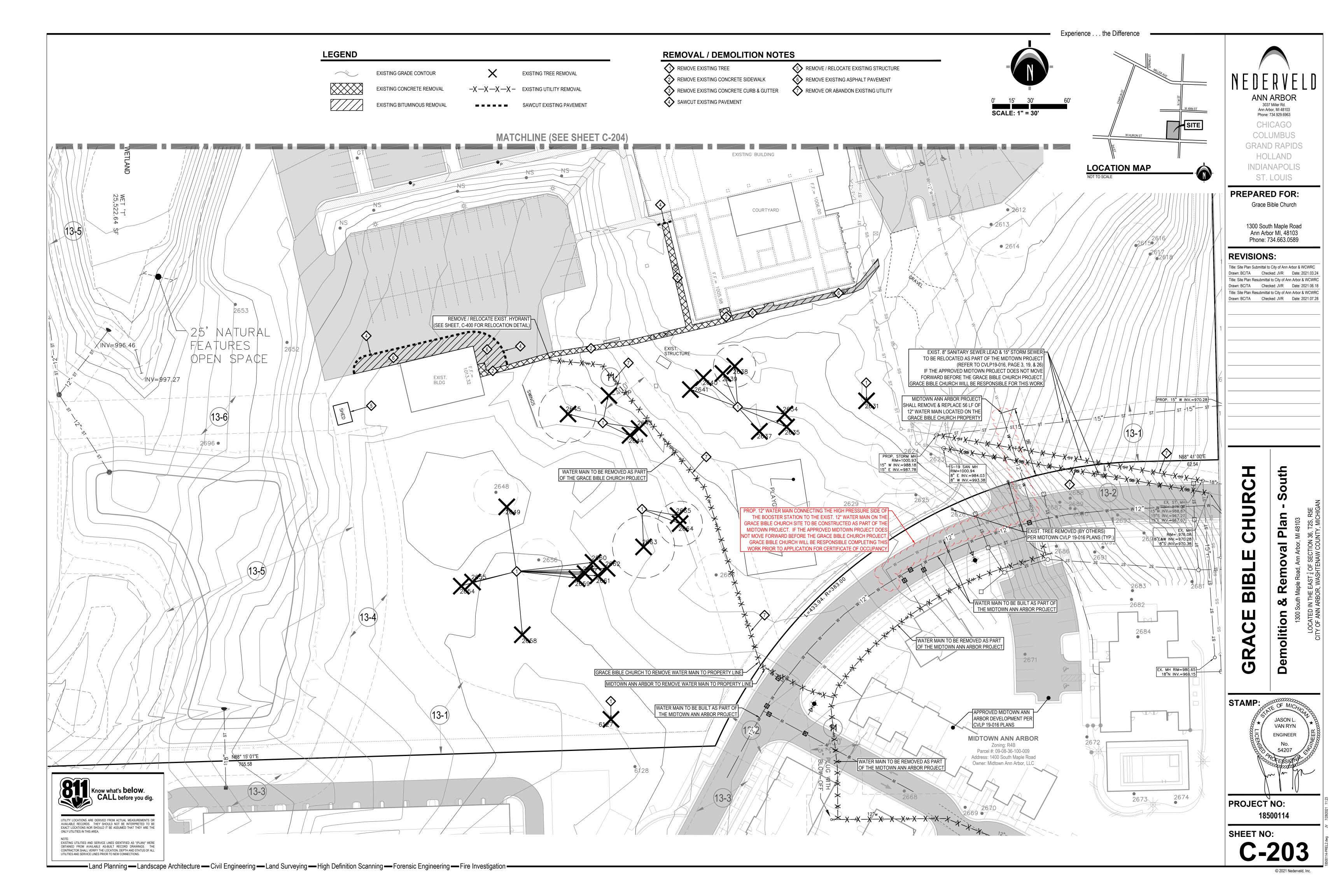
Linden

American Elm

Χ



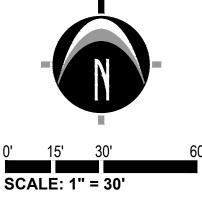
PROJECT NO: 18500114





UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

NOTE: EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "(PLAN)" WERE OBTAINED FROM AVAILABLE AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.



REMOVAL / DEMOLITION NOTES

FEMOVE / RELOCATE EXISTING STRUCTURE 6 REMOVE EXISTING ASPHALT PAVEMENT 2 REMOVE EXISTING CONCRETE SIDEWALK

REMOVE EXISTING CONCRETE CURB & GUTTER 7 REMOVE OR ABANDON EXISTING UTILITY

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3037 Miller Rd. Ann Arbor, MI 48103

Phone: 734.929.6963

CHICAGO

COLUMBUS

GRAND RAPIDS

HOLLAND

INDIANAPOLIS

ST. LOUIS

Grace Bible Church

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

PREPARED FOR:

LEGEND

EXISTING GRADE CONTOUR

EXISTING BITUMINOUS REMOVAL

EXISTING CONCRETE REMOVAL

-X -X -X - EXISTING UTILITY REMOVAL

EXISTING TREE REMOVAL

SAWCUT EXISTING PAVEMENT

REMOVAL / DEMOLITION NOTES

1) THE CONTRACTOR SHALL NOTIFY THE UTILITY COMPANIES AT LEAST THREE WEEKS PRIOR TO THE BEGINNING OF CONSTRUCTION OPERATIONS. THERE ARE EXISTING UNDERGROUND UTILITIES WHICH CROSS THE PROPOSED REPLACEMENT WORK AREAS. ALTHOUGH THEIR EXACT LOCATION CANNOT BE DETERMINED, IT IS KNOWN THESE UTILITIES ARE LOCATED WHERE DIGGING IS REQUIRED. THE CONTRACTOR SHALL CONDUCT THE REQUIRED EXCAVATION IN THESE AREAS WITH EXTREME CAUTION.

2) ALL EXISTING UTILITY INFORMATION SHOWN IS TAKEN FROM EXISTING RECORDS, AND FIELD VERIFIED WHERE ACCESSIBLE ONLY. INFORMATION OBTAINED FROM EXISTING RECORDS MAY NOT BE COMPLETE OR ACCURATE. THE LOCATION OF ALL EXISTING UTILITIES SHOWN ON THIS PLAN HAVE BEEN DETERMINED FROM THE BEST INFORMATION AVAILABLE AND ARE GIVEN FOR THE CONVENIENCE OF THE CONTRACTOR. THE ENGINEER ASSUMES NO RESPONSIBILITY FOR THEIR ACCURACY. THE CONTRACTOR SHALL FIELD VERIFY FOR ACCURACY, LOCATION AND CONDITION.

3) BEFORE ANY WORK IS STARTED ON THE PROJECT AND AGAIN BEFORE FINAL ACCEPTANCE BY THE CITY AND BY THE OWNER, REPRESENTATIVES OF THE CITY, THE OWNER AND THE CONTRACTOR SHALL MAKE AN INSPECTION OF THE EXISTING SEWERS WITHIN THE WORK LIMITS WHICH ARE TO REMAIN IN SERVICE AND WHICH MAY BE AFFECTED BY THE WORK. THE CONDITION OF THE EXISTING UTILITIES AND THEIR APPURTENANCES SHALL BE DETERMINED FROM FIELD OBSERVATIONS AND EXISTING VIDEO TAPES. RECORDS OF THE INSPECTIONS SHALL BE KEPT IN WRITING BY THE

4) THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING ALL PERMITS REQUIRED FOR DEMOLITION WORK.

5) ALL EXISTING UTILITIES, SEWERS AND WATER LINES ARE TO REMAIN UNDISTURBED UNLESS OTHERWISE NOTED ON THE PLANS. THE CONTRACTOR SHALL CONTACT AND COORDINATE WITH ALL APPLICABLE UTILITY COMPANIES, MUNICIPALITIES AND AGENCIES BEFORE COMMENCING ANY WORK.

6) THE CONTRACTOR SHALL COORDINATE WITH ALL UTILITY COMPANIES REGARDING REMOVAL OF EXISTING POLES, OVERHEAD WIRES, UNDERGROUND UTILITIES, GUY WIRES, GAS LINES, ETC. ALL ADJUSTMENT OR RECONSTRUCTION WORK, EXCEPT FOR THOSE STRUCTURES OTHERWISE NOTED ON THE PLANS, SHALL BE PERFORMED BY THE CONTRACTOR. EXISTING APPURTENANCES SUCH AS UTILITY POLES AND VALVES BOX SHALL NOT BE DISTURBED BY THE CONTRACTOR DURING CONSTRUCTION.

7) THE CONTRACTOR SHALL MAINTAIN EXISTING UTILITY SERVICE TO ALL ADJOINING PROPERTIES. 8) ALL DEBRIS SHALL BE REMOVED FROM THE SITE, AND NO STOCKPILING ON SITE SHALL BE ALLOWED UNLESS APPROVED BY THE OWNER OR THEIR REPRESENTATIVES.

9) THE CONTRACTOR SHALL LIMIT SAWCUT AND PAVEMENT REMOVAL TO ONLY THOSE AREAS WHERE REQUIRED OR AS SHOWN. ALL PAVEMENTS TO BE REMOVED SHALL BE SAWCUT AND REMOVED TO FULL DEPTH AT ALL PAVEMENT LIMITS OR EXISTING JOINTS. IF ANY DAMAGE IS INCURRED TO ANY OF THE SURROUNDING PAVEMENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR ITS REMOVAL AND REPAIR AT NO ADDITIONAL COST TO ANYONE ELSE, INCLUDING THE CITY OR OWNER. 10) ASPHALT AREAS SHOWN TO BE SAWCUT AND REMOVED FULL DEPTH ARE ACTUAL FACE OF PROPOSED CURBS. IT WILL BE NECESSARY TO MAKE OFF-SET SAWCUTS TO PROVIDE CLEARANCE FOR PROPOSED CURBS: THE CONTRACTOR SHALL DETERMINE THE AMOUNT OF OFF-SET NECESSARY TO CONSTRUCT THE PROPOSED CURBS. ADDITIONAL CUTS MAY BE DESIRED TO FACILITATE THE REMOVAL OF THE EXISTING PAVEMENT, BUT THERE WILL BE NO EXTRA PAYMENT FOR ADDITIONAL CUTS. PAVEMENT SHALL BE REMOVED WITHOUT DAMAGING OR UNDERMINING THE REMAINING PAVEMENT. IF ADJACENT PAVEMENT IS DAMAGED, THE CONTRACTOR SHALL MAKE ADDITIONAL FULL DEPTH SAWCUTS AND REMOVE THE DAMAGE AREAS AS NECESSARY.

11) ALL PAVEMENT REMOVAL AREAS SHALL BE FULL PAVEMENT CROSS-SECTION REMOVAL DOWN TO NATIVE SOIL LAYER IN ACCORDANCE WITH THE GEOTECHNICAL REPORT DATED MARCH 2, 2020.

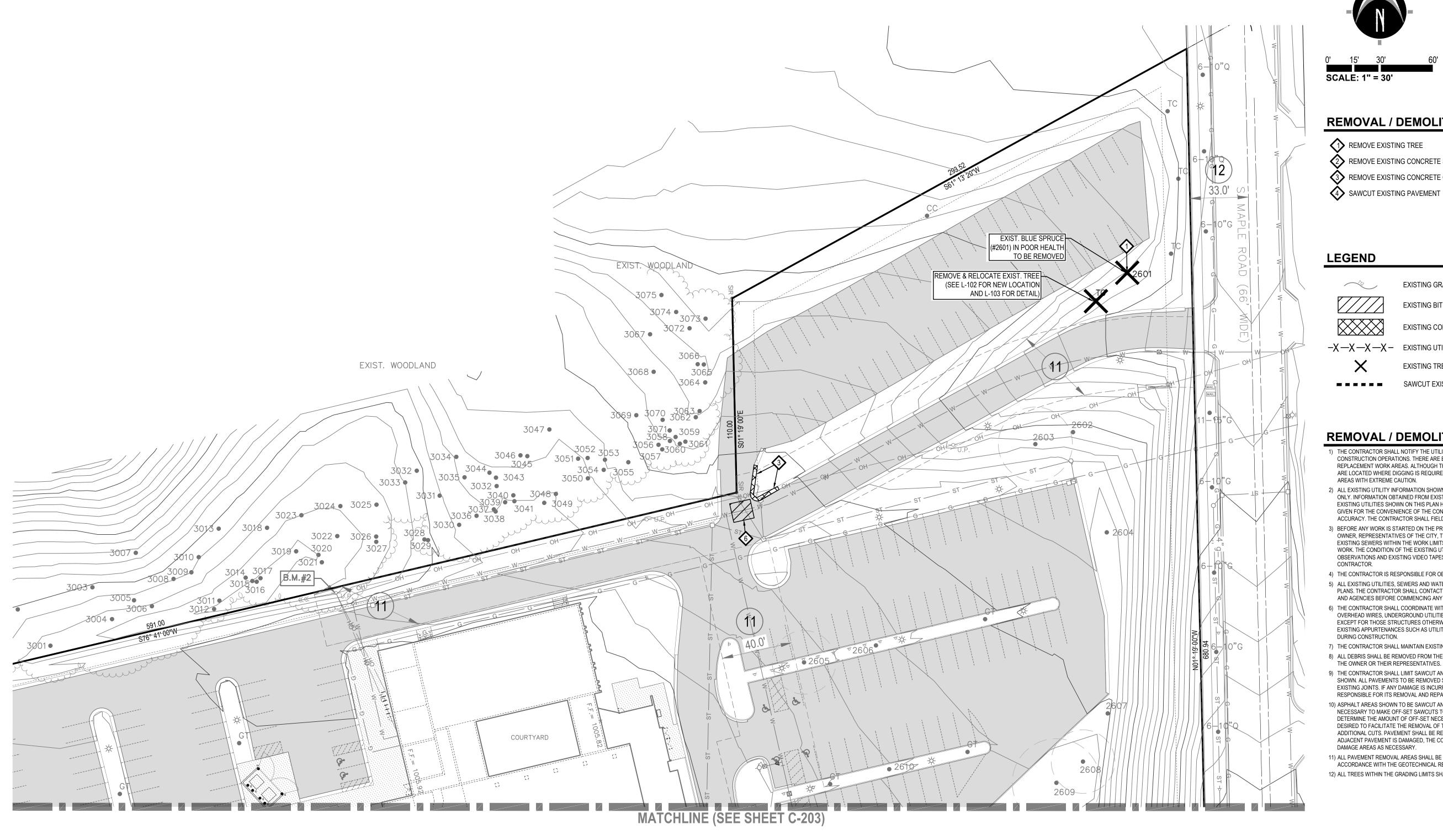
12) ALL TREES WITHIN THE GRADING LIMITS SHALL BE REMOVED UNLESS OTHERWISE NOTED.

Removal

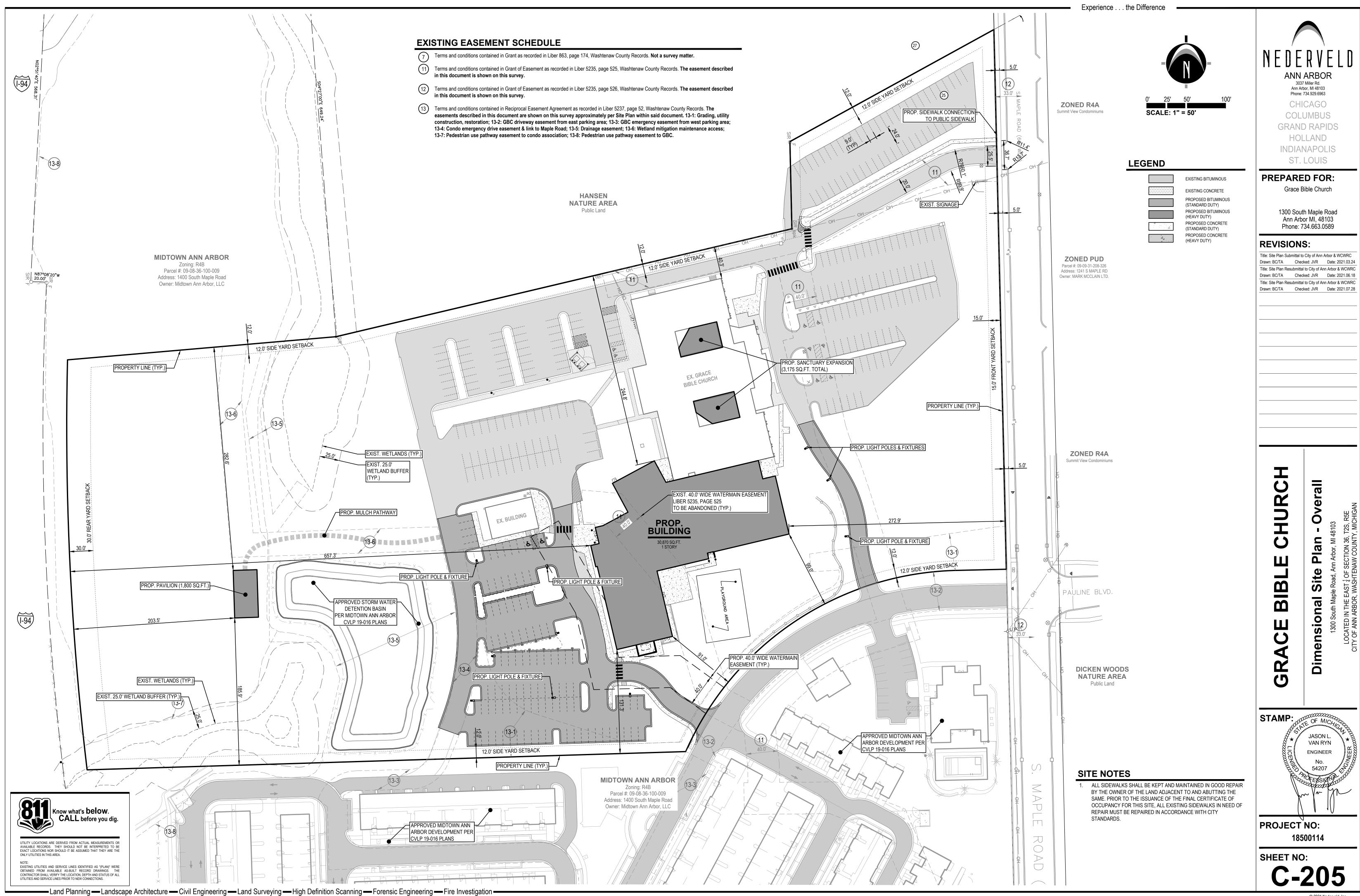
JASON L.

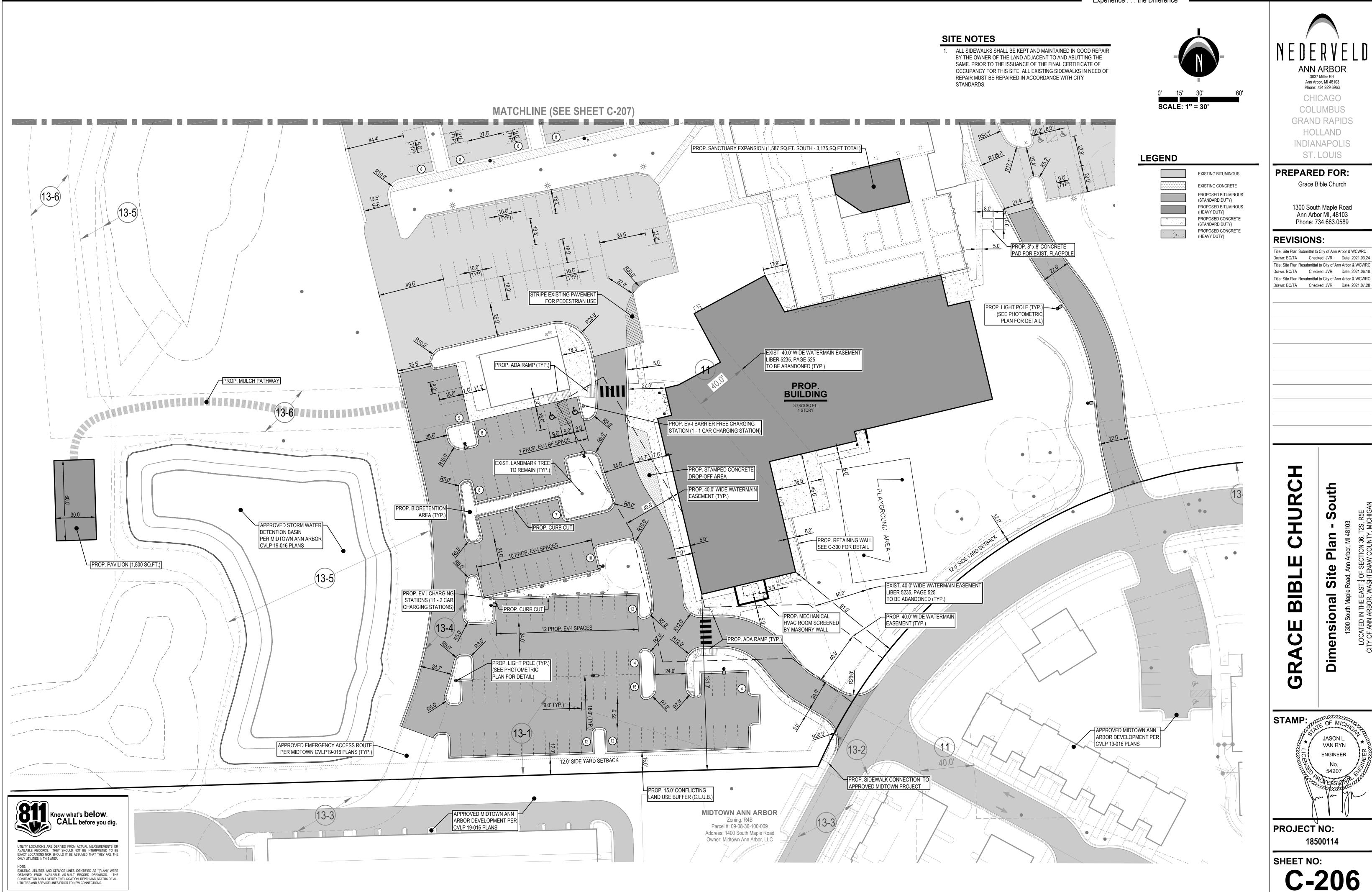
PROJECT NO: 18500114

SHEET NO:



—Land Planning — Landscape Architecture — Civil Engineering — Land Surveying — High Definition Scanning — Forensic Engineering — Fire Investigation –





EDERVEL
ANN ARBOR

ANN ARBOR
3037 Miller Rd.
Ann Arbor, MI 48103
Phone: 734.929.6963

CHICAGO

COLUMBUS
GRAND RAPIDS
HOLLAND
INDIANAPOLIS
ST. LOUIS

PREPARED FOR:

Grace Bible Church

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC
Drawn: BC/TA Checked: JVR Date: 2021.03.24

Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC
Drawn: BC/TA Checked: JVR Date: 2021.06.18

Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC
Drawn: BC/TA Checked: JVR Date: 2021.07.28

HURCH - North

BB

GRA

Dimensional Site Plan - Nort

STAMP: OF MICHICAN JASON L. VAN RYN ENGINEER

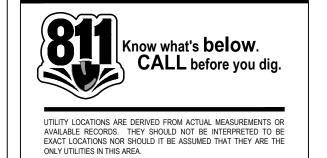
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PROJECT NO: 18500114

SHEET NO:

C-207



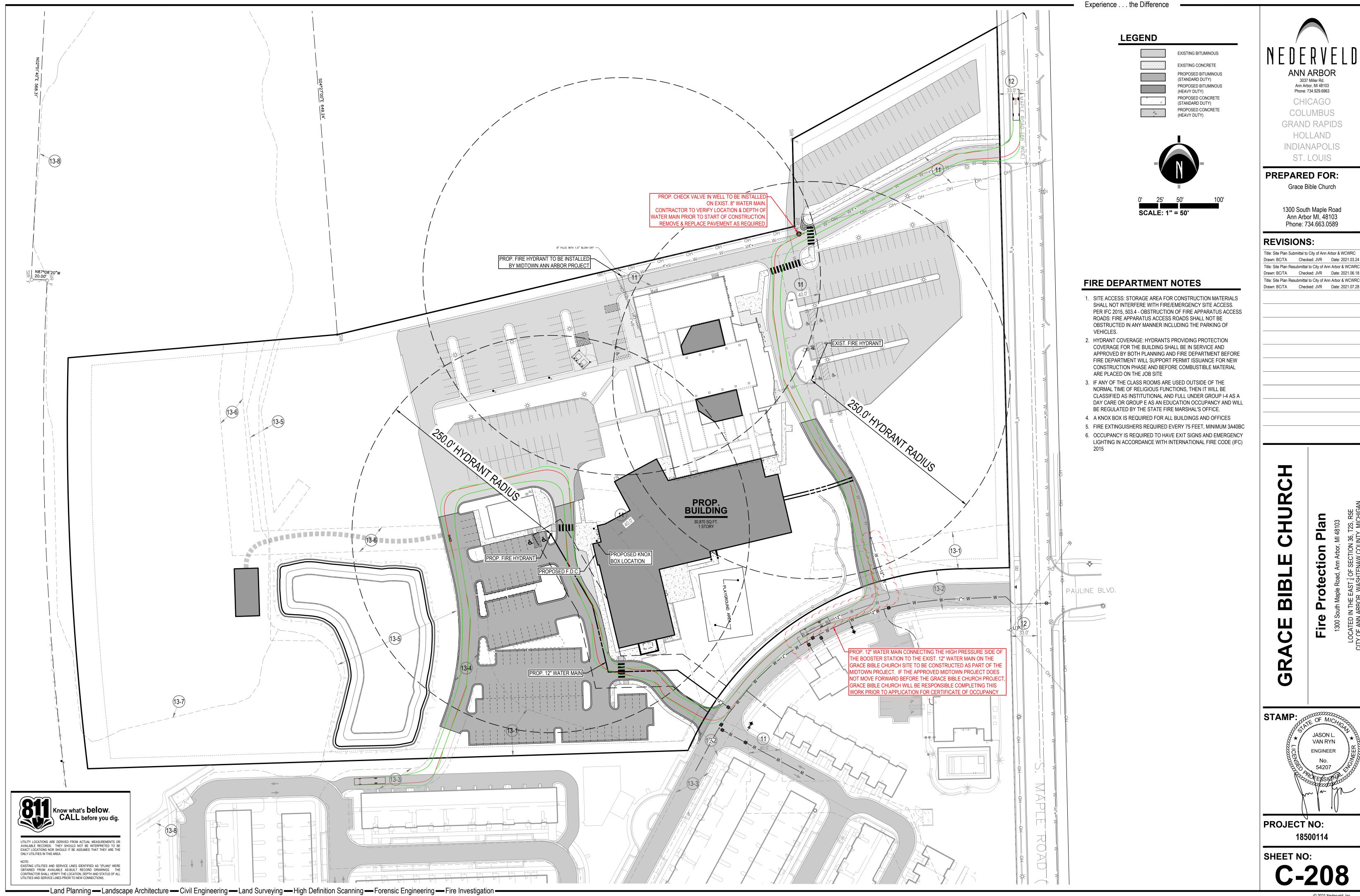
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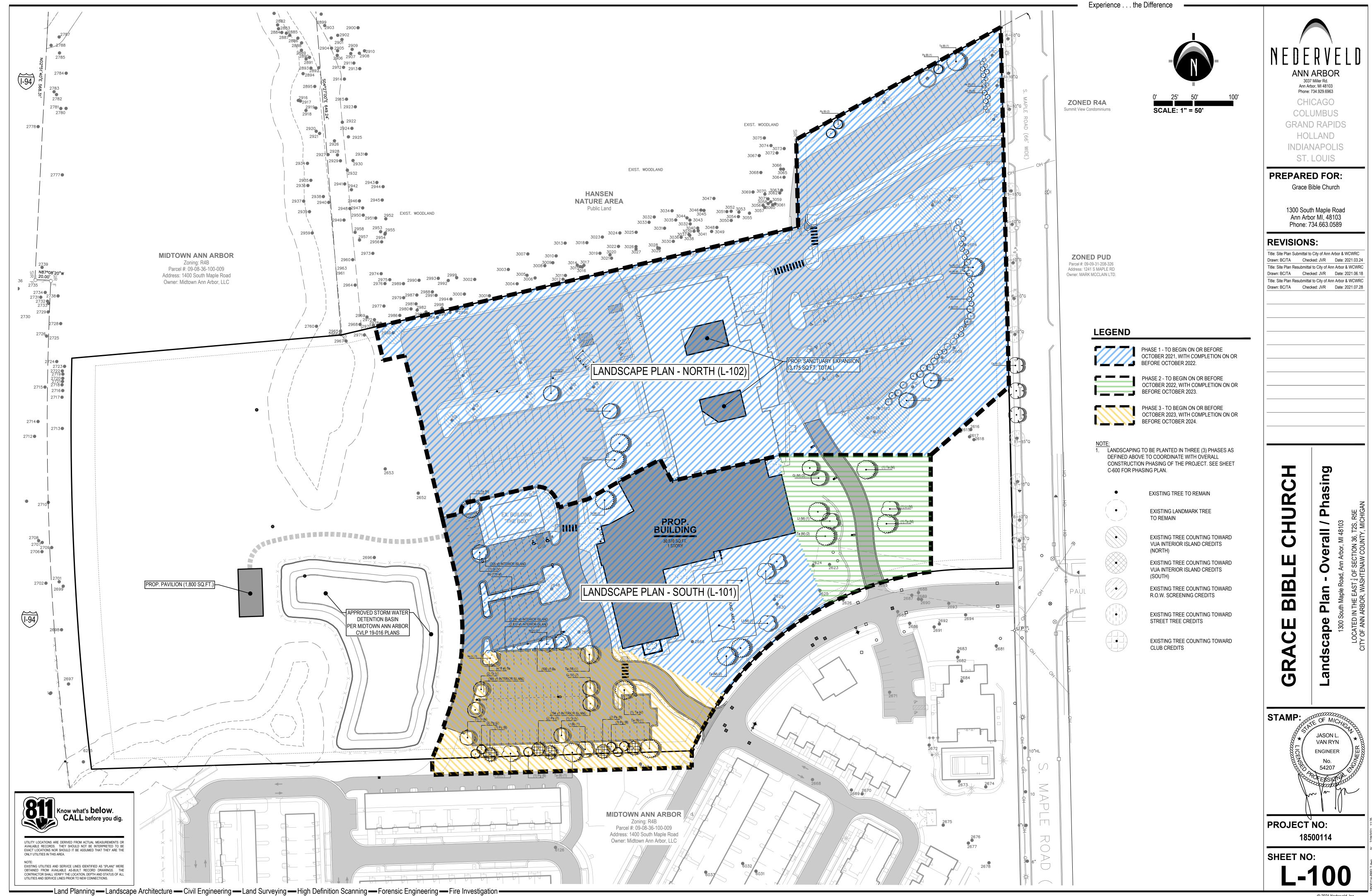
EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "(PLAN)" WERE
OBTAINED FROM AVAILABLE AS-BUILT RECORD DRAWINGS. THE
CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL
UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.

PROP. SANCTUARY EXPANSION

MATCHLINE (SEE SHEET C-206)

(1,588 SQ.FT. NORTH - 3,175,SQ.FT TOTAL)





LANDSCAPE CALCULATIONS - SOUTH **LEGEND 5.20.3 INTERIOR LANDSCAPE ISLANDS: 5.20.4 CONFLICTING LAND USE BUFFERS:** 1) VEHICULAR USE AREAS GREATER THAN 3,300 SQUARE FEET SHALL CONTAIN PROTECTED LANDSCAPE ISLANDS LOCATED ENTIRELY • WIDTH: A LANDSCAPED BUFFER STRIP MUST BE AT LEAST 15 FEET WIDE. EXISTING LANDMARK TREE EXISTING GRADE CONTOUR WITHIN THE PERIMETERS OF THE VEHICULAR USE AREA, FOR THE PURPOSE OF BREAKING UP THE EXPANSE OF PAVEMENT. • PLANTINGS: ONE TREE FOR EACH 15 FEET OR FRACTION THEREOF OF ABUTTING LAND. AT LEAST 50% OF THE TREES WITHIN THE TO REMAIN CONFLICTING LAND USE BUFFER SHALL BE EVERGREEN. REQUIRED: PROPOSED VEHICLE USE AREA (15:1) = 47,739 SQ.FT. (VUA - 1) / 15 = 3,183 SQ.FT. OF INTERIOR LANDSCAPE ISLANDS (ILI) • CONTINUOUS SCREENING: A HEDGE, LANDFORM BERM, WALL, FENCE OR COMBINATION OF THOSE FEATURES FORMING A PROPOSED: 6,074 SQ.FT. INTERIOR LANDSCAPE ISLANDS (ILI) EXISTING TREE TO REMAIN PROP. TREE PROTECTION FENCE CONTINUOUS SCREEN AT LEAST FOUR FEET HIGH. FOR PARCELS PRINCIPALLY USED OR ZONED FOR RESIDENTIAL PURPOSES THE REQUIREMENT FOR A HEDGE, LANDFORM BERM, WALL OR FENCE IS ONLY REQUIRED TO SCREEN VEHICULAR USE AREAS AND 2) THE TOTAL NUMBER OF TREES REQUIRED IN THE INTERIOR LANDSCAPED ISLAND SHALL BE CALCULATED AND PROVIDED AT A RATE REFUSE/RECYCLING CONTAINERS THAT ARE ADJACENT TO THE CONFLICTING LAND USE BUFFER. EXISTING TREE COUNTING TOWARD OF ONE DECIDUOUS SHADE TREE FOR EACH 250 SQUARE FEET OR FRACTION OF 250 SQUARE FEET OF REQUIRED INTERIOR EXISTING WETLAND REQUIRED: PLANTINGS (1 TREE PER 15'): 225' / 15' = 15 TREES REQ. (50% EVERGREEN) VUA INTERIOR ISLAND CREDITS LANDSCAPED ISLAND. CONTINUOUS SCREENING: 225' (VEHICLE USE AREA - SOUTH PROPERTY LINE) OF CONTINUOUS SCREENING (NORTH) **SCALE: 1" = 30'** REQUIRED: 3,183 SQ.FT (REQ. ILI) / 250 SQ.FT. = 13 TREES REQUIRED PROPOSED: PLANTINGS = 15 C.L.U.B. TREES (2 Ta (B) + 2 Lt (B) + 6 Pg (B) + 5 Ps (B)) EXIST. TREE CREDIT (1 TREE PER 8" DBH PROTECTED): EXIST. TREE #2648 (13") + #2656 (15") = 28" / 8" = 4 EXIST. CONTINUOUS SCREENING = MIDTOWN TO CONSTRUCT BERM PER APPROVED PLANS (CVLP19-016) EXISTING TREE COUNTING TOWARD PROP. SNOW STORAGE TREE CREDITS VUA INTERIOR ISLAND CREDITS TOTAL INTERIOR TREES REQUIRED: 10 TREES - 4 EXIST. TREE CREDIT = 9 INTERIOR TREES REQUIRED **5.23.6 LANDMARK TREES (MITIGATION):** (SOUTH) PROPOSED: 9 INTERIOR TREES (6 - Gi (V) & 3 - Ns (V)) 1) A REPLACEMENT TREE OR A COMBINATION OF TREES OF A SPECIES NATIVE TO MICHIGAN SHALL BE PROVIDED TO EQUAL A MINIMUM OF 50% OF THE ORIGINAL DBH FOR EACH LANDMARK TREE THAT IS REMOVED. EXISTING TREE COUNTING TOWARD EXISTING TREE COUNTING TOWARD 3) WHEN THE TOTAL AREA REQUIRED IN INTERIOR LANDSCAPE ISLANDS FOR ALL OF THE VEHICULAR USE AREAS ON SITE EXCEEDS 750 REQUIRED: TOTAL LANDMARK TREE REMOVAL (TREES) = 4 TREES (#: 2638, 2645, 2663, 2664) R.O.W. SCREENING CREDITS CLUB CREDITS SQUARE FEET, AT LEAST 50% OF THE AREA IN THE REQUIRED INTERIOR LANDSCAPE AREA MUST BE DEPRESSED BIORETENTION TOTAL LANDMARK TREE REMOVAL (DBH) = **86"** (**18"+23"+26"+19"**) TOTAL MITIGATION REQUIRED = 86" X 0.5 (50%) = 43" REQ. DBH REPLACEMENT <u>REQUIRED:</u> 3,183 SQ.FT. (REQ. ILI) x 0.50 (50%) = **1,591 SQ.FT. OF BIORETENTION AREA** PROPOSED: 45" DBH REPLACEMENT (3 Gi (M) + 5 Lt (M) + 10 Ta (M)) PROPOSED: 1,793 SQ.FT. OF BIORETENTION AREA EXISTING TREE COUNTING TOWARD PLANT LABEL LEGEND STREET TREE CREDITS (B) CONFLICTING LAND USE BUFFER PLANTINGS (M) MITIGATION PLANTINGS (V) INTERIOR VEHICLE USE AREA PLANTINGS (R) R.O.W. SCREENING (S) STREET TREE PLANTINGS FF ### PROP. MULCH PATHWAY VEHICLE USE AREA (~47,739 SQ.FT.) (305 sf) INTERIOR ISLAND (1) Gi (V) TRIANGLE (TYP.) PROP. BIORETENTION AREA (T (SEE L-103 FOR SEED MIX) EXIST. LANDMARK WALL (TYP.) TREE TO REMAIN (TYP. (2,297 sf) INTERIOR ISLAND (2,813 sf) INTERIOR ISLAND EXIST. LANDMARK TREE TO REMAIN (T DETENTION BASIN PER MIDTOWN ANN ARBOR CVLP 19-016 PLANS PROPOSED SNOW STORAGE (T PROPOSED SNOW STORAGE (TY (600 sf) Bs PLANT MATERIAL SELECTED FOR PLANT MATERIAL SELECTED FOR (2) Gi (V) Ta (M) (2) WINTER HARDINE WINTER HARDINESS (365 sf) INTERIOR ISLAND PROP. PARKING ISLAND (T VEHICLE USE AREA (6,074 SQ.FT. TOTAL AREA) (~47,739 SQ.FT.) (294 sf) INTERIOR ISLAND (SEE PHOTOMETRIC (2) Ps (B) PLAN FOR DETAIL) ARBOR DEVELOPMENT PER CVLP 19-016 PLANS TRIANGLE (TYP.) APPROVED LANDSCAPE BERM PER MIDTOWN ANN ARBOR DEVELOPMENT CVLP 19-016 PLANS **MIDTOWN ANN ARBOR** Know what's below. PROP. 226.0' CONFLICTING LAND USE BUFFER (C.L.U.B.) CALL before you dig. Parcel #: 09-08-36-100-009 APPROVED LANDSCAPE BERM PER Address: 1400 South Maple Road MIDTOWN ANN ARBOR Owner: Midtown Ann Arbor, LLC ARBOR DEVELOPMENT PER DEVELOPMENT CVLP 19-016 PLANS CVLP 19-016 PLANS JTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OR AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

ANN ARBOR 3037 Miller Rd.

Ann Arbor, MI 48103 Phone: 734.929.6963 CHICAGO COLUMBUS **GRAND RAPIDS** HOLLAND INDIANAPOLIS ST. LOUIS

PREPARED FOR: Grace Bible Church

> 1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.03.24 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.06.18 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.07.28

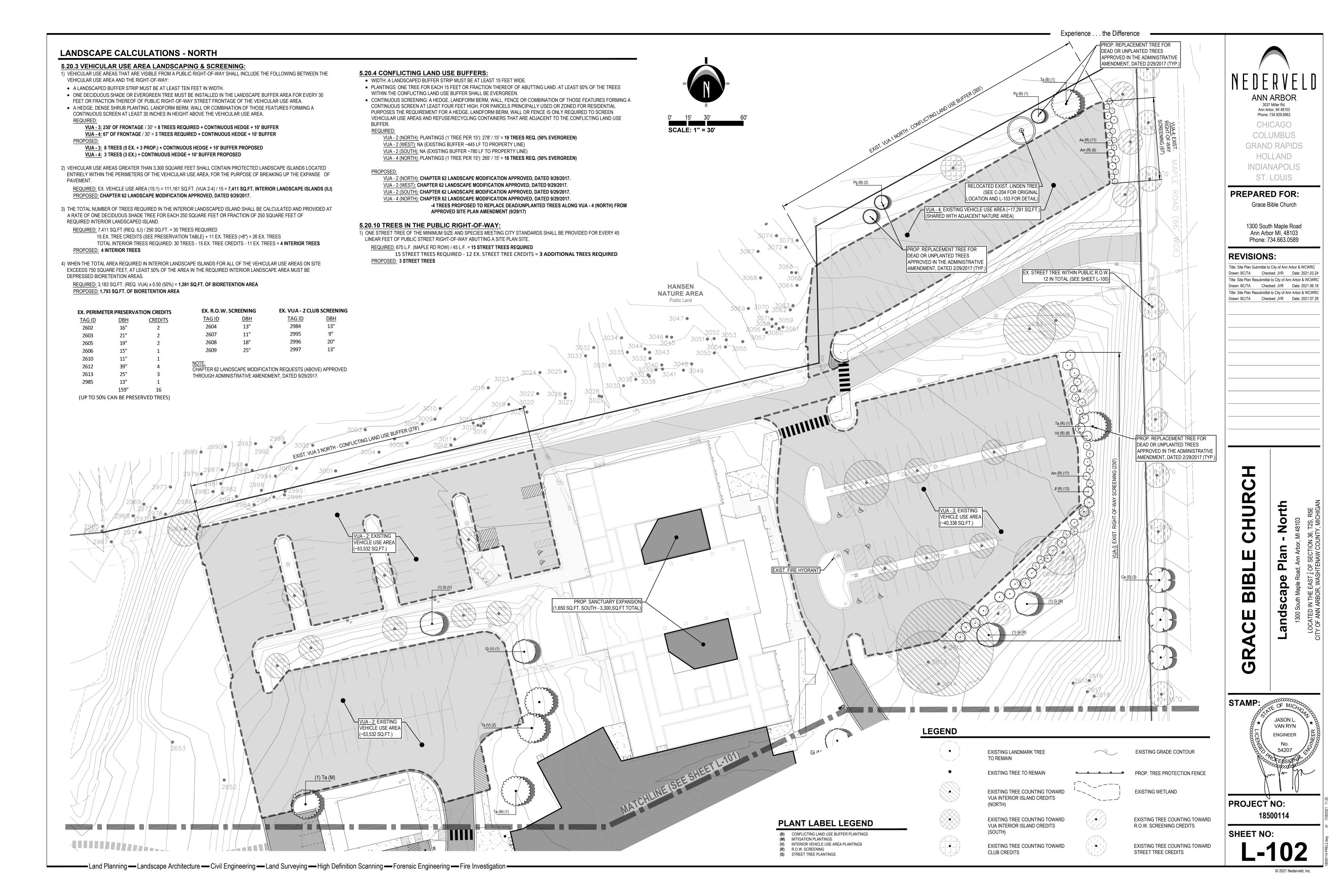
> <u>lan</u> $\overline{\mathbf{m}}$ scape and

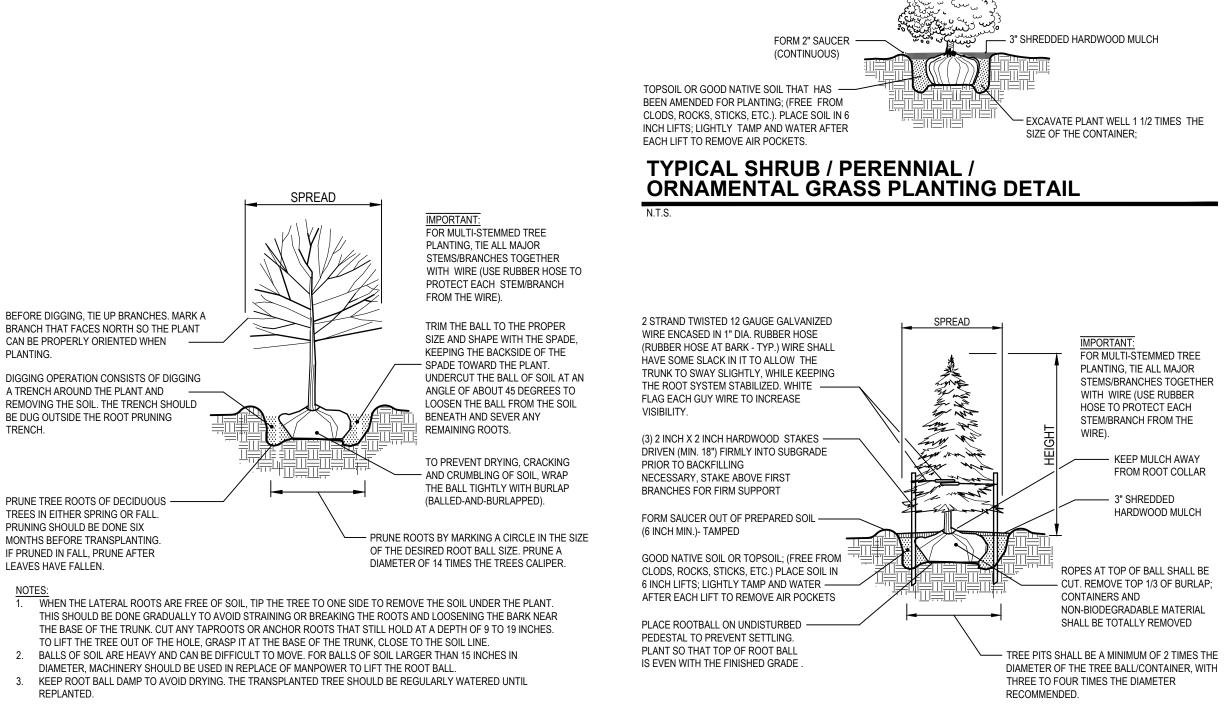
JASON L. VAN RYN **ENGINEER**

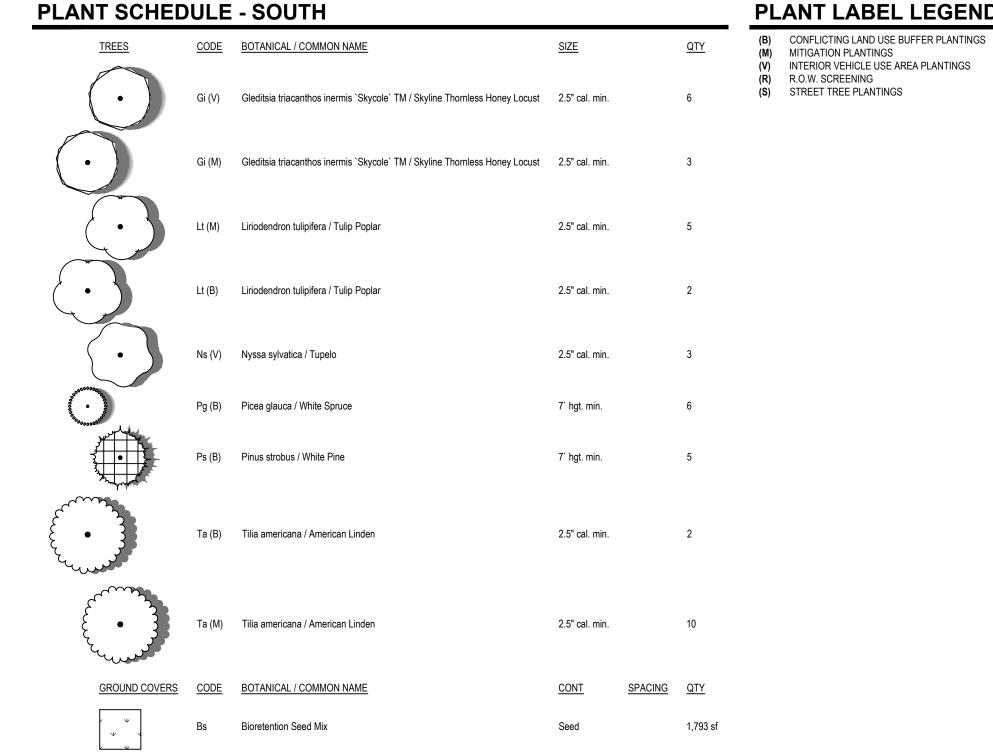
PROJECT NO: 18500114

SHEET NO:

EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "(PLAN)" WERE OBTAINED FROM AVAILABLE AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.







2.5" cal. min. 3

7` hgt. min.

2.5" cal. min.

2.5" cal. min. 2

2.5" cal. min. 1

3037 Miller Rd. PLANT LABEL LEGEND Ann Arbor, MI 48103 Phone: 734.929.6963 CHICAGO COLUMBUS **GRAND RAPIDS** HOLLAND **INDIANAPOLIS** ST. LOUIS PREPARED FOR: Grace Bible Church 1300 South Maple Road Ann Arbor MI. 48103 Phone: 734.663.0589 **REVISIONS:** Title: Site Plan Submittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.03.24 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.06.18 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRO Drawn: BC/TA Checked: JVR Date: 2021.07.28

LANDSCAPE MAINTENANCE SCHEDULE

Perennial Beds																							
Maintenance Task	Jan	uary	Feb	ruary	Ма	rch	Αŗ	oril	Ма	ay	Jun	е	July	Αι	gust	Septe	ember	Octo	ober	Nove	mber	Dece	:mbe
Prune shade trees & summer flowering shrubs																							
Remove mulch from around crown of perennials; remove winter mulch																							
Fertilize Trees and Shrubs, planting beds																							
Clean flower beds, remove winter weeds and dead plant material left for winter interest																							
Apply double shredded bark mulch to tree/shrub beds and ground leaf compost to flower beds																							
Pressurize irrigation system and perform spring audit																							Г
Divide and replant summer and fall blooming perennials (when growth is 3-4in high), cut back if needed																							
Replace dead/poor health perennials and grasses																							Г
Prune spring blooming shrubs immediately after flowering																							Г
Prune wither damaged branches or plants that have not begun to grow after last frost																							
Replace mulch as necessary																							Г
Prune/pinch back perennials and grasses for height control and shaping																							
Inspect plants for pests and treat as necessary						П																	Γ
Clean up planting beds - remove yellowing foliage not left for winter interest, remove stakes/hoops																							
Turn off irrigation system and flush out																							Г
Winter mulch tender plants once ground is frozen						П							T										Γ

1. ALL DISEASED, DAMAGED OR DEAD MATERIAL BE REPLACED IN ACCORDANCE WITH CITY CODE BY THE END OF THE FOLLOWING PLANTING SEASON, AS A CONTINUING OBLIGATION FOR THE DURATION OF THE SITE PLAN.

LANDSCAPE	NOTES	

TYPICAL TREE TRANSPLANT DETAIL

Do not prune terminal leader or branch tips.

Prune away dead or broken branches only.

Remove all labels, tags, tree wrap, tape or

Fold down or pull back string, burlap, plastic or

soil to expose the trunk flare. Set rootball so that trunk flare is level to grade, or very slightly

string from tree trunk and crown.

Prune off suckers.

higher in clay soil.

1) ALL PLANT MATERIAL SHALL BE LOCALLY NURSERY GROWN NO.1 GRADE AND INSTALLED ACCORDING TO ACCEPTED PLANTING PROCEDURES. ALL PLANT MATERIALS SHALL MEET CURRENT AMERICAN ASSOCIATION OR NURSERYMEN STANDARDS. DO NOT PLANT MATERIALS UNTIL DIRECTED BY OWNER, LANDSCAPE ARCHITECT, AND/OR CONSTRUCTION MANAGER. THE LANDSCAPE ARCHITECT RESERVES THE RIGHT TO REJECT ANY PLANT MATERIAL, FOR ANY REASON BEFORE OR AFTER IT IS INSTALLED.

- 2) SIZES SPECIFIED ARE MINIMUM SIZES TO WHICH THE PLANTS ARE TO BE INSTALLED.
- 3) ANY PLANT SUBSTITUTIONS SHALL BE APPROVED BY THE LANDSCAPE ARCHITECT. 4) MAINTENANCE OF LANDSCAPING ITEMS, TREES, AND PLANTS SHALL BE PERFORMED BY THE PROPERTY OWNER OR A QUALIFIED PROFESSIONAL. ALL LANDSCAPING SHALL BE INSTALLED AND MAINTAINED IN ACCORDANCE WITH APPLICABLE MUNICIPAL STANDARDS AND IN ACCORDANCE WITH CURRENT INDUSTRY STANDARDS IN A NEAT, HEALTHY AND WEED FREE CONDITION. ANY
- DEAD, DISEASED OR DAMAGED PLANT MATERIALS ARE TO BE REPLACED IMMEDIATELY AFTER 5) PLANT TREES AND SHRUBS IN ACCORDANCE WITH PLANTING DETAILS. DIG TREE PITS PER DETAILS. PLANT TREES AND SHRUBS AT THE SAME GRADE LEVEL AT WHICH THEY WERE GROWN AT THE NURSERY. IF HEAVY CLAY SOILS ARE EVIDENT, PLANT TREES AND SHRUBS HIGHER,
- 6) REMOVE ALL TWINE, WIRE, NURSERY TREE GUARDS, TAGS AND INORGANIC MATERIAL FROM ROOT BALLS. REMOVE THE TOP 1/3 OF BURLAP FROM EARTH BALLS AND REMOVE BURLAP FROM

APPROX. 1/4 OF THE ROOT BALL ABOVE GRADE, AND BACKFILL TO TOP OF ROOT BALL.

7) FINELY SHREDDED HARDWOOD BARK MULCH, NATURAL COLOR (NON-COLORED), IS REQUIRED FOR ALL PLANTINGS AND PLANTING BEDS. MULCH PER PLANTING DETAILS. MULCH IN PLANT BEDS SHALL BE 3" THICK AT TIME OF INSPECTION AND AFTER COMPACTED BY RAIN OR IRRIGATION. ALL PLANTING BEDS SHALL BE EDGED WITH 6" X 12 GAUGE STEEL LANDSCAPE

- 8) LANDSCAPE CONTRACTOR SHALL BE RESPONSIBLE FOR THE VERIFICATION OF ALL UNDERGROUND AND OVERHEAD UTILITIES. IF A CONFLICT WITH UTILITIES EXIST, NOTIFY OWNER/CONSTRUCTION MANAGER PRIOR TO PLANTING.
- 9) PLANT MATERIAL SHALL BE GUARANTEED FOR ONE YEAR AFTER PLANTING AND ACCEPTANCE. 10) ALL SPECIES DEVIATION FROM THE APPROVED SITE PLAN MUST BE APPROVED PRIOR TO
- INSTALLATION BY THE CITY OF ANN ARBOR. 11) APPLICATIONS OF FERTILIZER BEYOND THE INITIAL TOPSOIL AND SEEDING SHALL BE A FERTILIZER WITH NO PHOSPHORUS.
- 12) SNOW SHALL NOT BE PUSHED ONTO INTERIOR LANDSCAPE ISLANDS UNLESS DESIGNED FOR SNOW

TOPSOIL AND TURF NOTES:

TYPICAL EVERGREEN TREE PLANTING DETAIL

1) WHEREVER GROUND IN ITS NATURAL STATE HAS BEEN DISTURBED, APPROVED LANDSCAPING OR GRASS SHALL BE FULLY INSTALLED, AND ESTABLISHED WITHIN A REASONABLE PERIOD OF TIME, BUT NO LONGER THAN ONE GROWING SEASON (UNLESS OTHERWISE NOTED AND APPROVED). 2) DURING EXCAVATION, GRADING, AND INSTALLATION OF REQUIRED LANDSCAPING, ALL SOIL

EROSION AND SEDIMENTATION CONTROL REGULATIONS SHALL BE STRICTLY FOLLOWED AND

PLANT LABEL LEGEND

- (B) CONFLICTING LAND USE BUFFER PLANTINGS (M) MITIGATION PLANTINGS (V) INTERIOR VEHICLE USE AREA PLANTINGS (R) R.O.W. SCREENING
- (S) STREET TREE PLANTINGS

JASON L. VAN RYN ENGINEER

ap

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and

PROJECT NO: 18500114

SHEET NO:

Juniperus chinensis 'Sea Green' / Sea Green Juniper Viburnum dentatum 'Arrowwood' / Arrowwood Viburnum **BIORETENTION BASIN SEED MIX** BOTANICAL NAME COMMON NAME APPLICATION ANDROPOGON GERARDII **BIG BLUE STEM** 8 OZ/ACRE CAREX VULPINOIDEA FOX SEDGE 4 OZ/ACRE ELYMUS CANADENSIS CANADA WILD RICE 8 OZ/ACRE KOELERIA MACRANTHA JUNE GRASS 1 LBS/ACRE PANICUM VIRGATUM SWITCH GRASS 2 LBS/ACRE SCHIZACHYRIUM SCOPARIUM LITTLE BLUE STEM 1.5 LBS/ACRE LOLIUM MULTIFLORUM ANNUAL RYE 200 LBS/ACRE A BI-ANNUAL, MOWABLE, SEMI-NATURAL, COOL SEASON SEED MIX SUITED FOR BIORETENTION BASIN BOTTOM AND SIDE SLOPES. MULCH WITH STRAW MULCH AT THE RATE OF TWO (2) BALES PER 1,000 SF

PLANT SCHEDULE - NORTH

CODE BOTANICAL / COMMON NAME

Ca (S) Carpinus caroliniana / American Hornbeam

Picea glauca / White Spruce

Tilia americana / American Linden

Tilia americana / American Linden

BOTANICAL / COMMON NAME

Aronia melanocarpa / Black Chokeberry

Aronia arbutifolia `Brilliantissima` / Brilliant Red Chokeberr

Ta (R) Tilia americana / American Linden

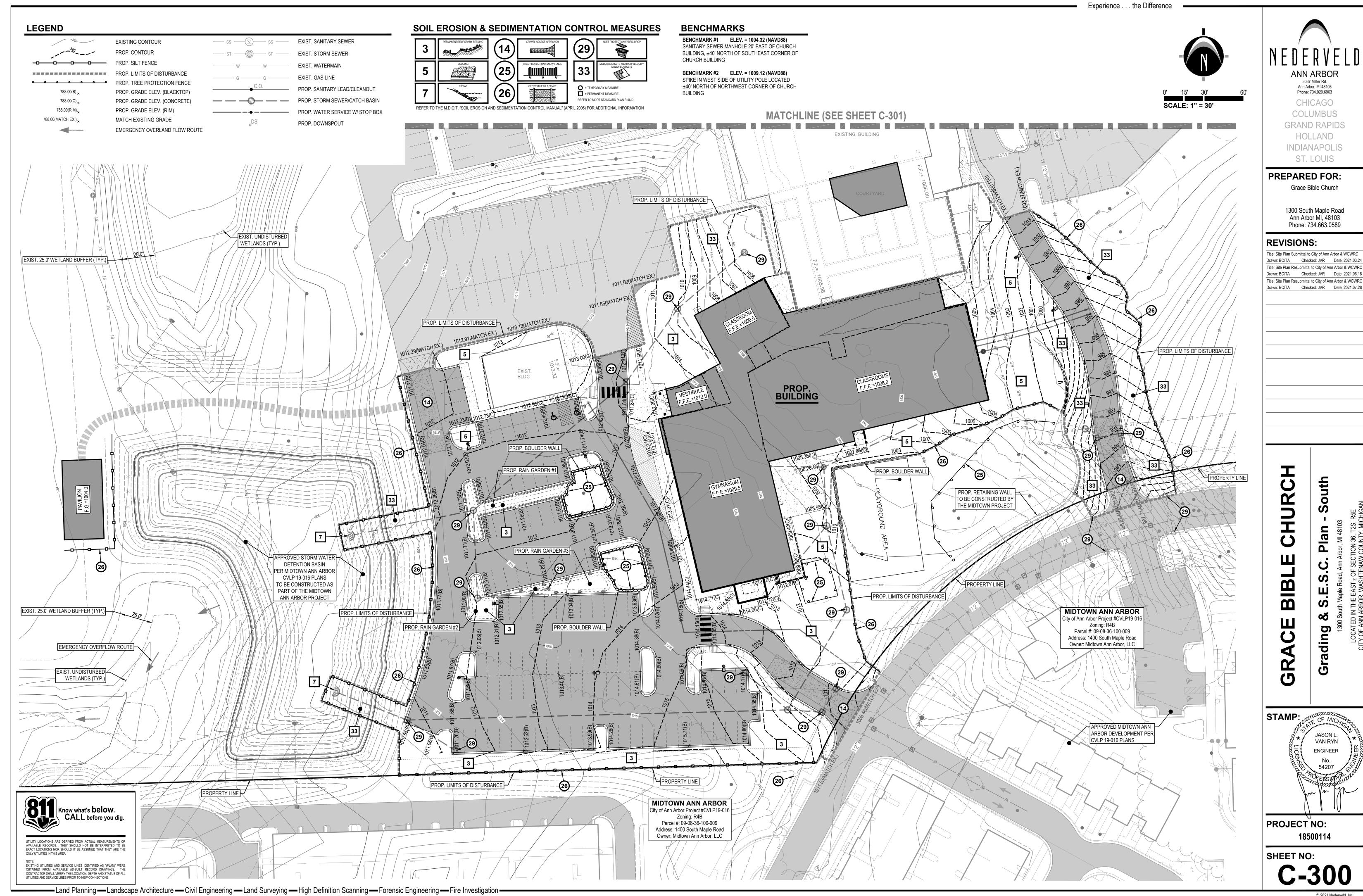
Gi (V) Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust 2.5" cal. min.

Gi (R) Gleditsia triacanthos inermis `Skycole` TM / Skyline Thornless Honey Locust 2.5" cal. min.

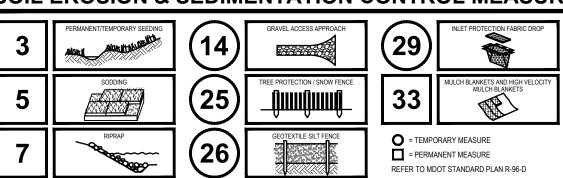
Mulch 2" - 3.5" deep leaving 3" circle of bare soil around trunk of tree. If possible, without disturbing developed roots, fold down or cut away burlap to expose rootball. Remove all non-degradable materials, cutting away wire basket to 10" depth. Break up (scarify) sides of planting hole. Center rootball in planting hole. Leave bottom of planting hole firm. Do not amend soil unless planting in severely disturbed soil or building rubble. Use shovels and water to settle soil and remove air pockets and firmly set tree. Hole width = 2 - 3x width of rootball Do not stake unless in heavy clay soil, windy conditions, 3" or greater diameter tree trunk or large crown. If staking is needed due to these conditions: Stake with 2 x 2 hardwood stakes, or approved equal, driven 6" - 8" outside of rootball. Loosely stake tree trunk to allow for trunk flexing. Stake trees just below first branch with 2" - 3" wide belt-like, nylon or plastic straps (2 per tree on opposite sides of tree, connect from tree to stake horizontally. Do not use rope or wire through a hose.) Remove all staking materials after 1 year.

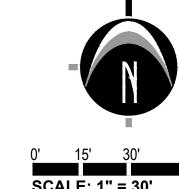
TREE PLANTING DETAIL

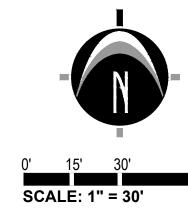
Driginal: Dr. Bonnie Appleton, Virginia Polytechnic Institute and State University, modified by the Michigan Department of Natural Resources, Forest Management Division, and the City of Ann Arboi



SOIL EROSION & SEDIMENTATION CONTROL MEASURES



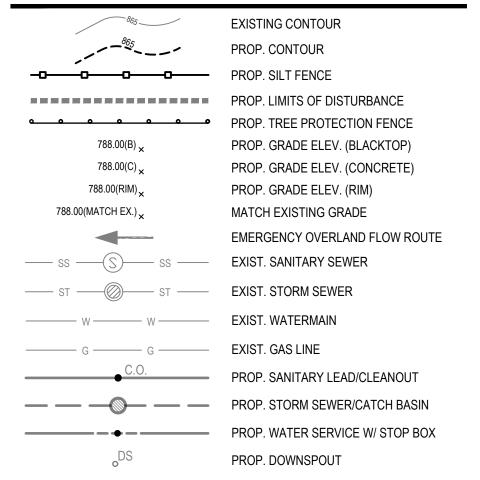


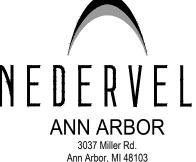


GRADING & SOIL EROSION CONTROL NOTES:

- 1. ALL PROPOSED PAVING AND GRADING IMPROVEMENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF STANDARD SPECIFICATIONS.
- 2. ALL SOIL EROSION CONTROL MEASURES SHALL COMPLY WITH THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS, DIVISION VII: SOIL EROSION AND SEDIMENTATION CONTROL
- 3. CONTRACTOR SHALL REFERENCE AND ABIDE BY THE RECOMMENDATIONS SET FORTH IN THE GEOTECHNICAL EVALUATION. THE EARTHWORK FOR ALL BUILDING FOUNDATIONS AND SLABS SHALL BE IN ACCORDANCE WITH THE GEOTECHNICAL REPORT AND ARCHITECTURAL BUILDING PLANS AND SPECIFICATIONS.
- 4. ESTABLISH PERMANENT BENCH MARK ON-SITE PRIOR TO GRADING.
- 5. PROPOSED SPOT GRADES ARE TO BOTTOM OF CURB UNLESS OTHERWISE NOTED.
- 6. EXISTING AND PROPOSED GRADE CONTOURS SHOWN AT 1 FOOT INTERVALS.
- 7. CONTRACTOR IS RESPONSIBLE FOR UNDERCUTTING EXISTING POOR SOIL AND REPLACING WITH APPROVED FILL. IF POOR SOIL IS ENCOUNTERED THE GENERAL CONTRACTOR SHALL NOTIFY THE OWNER PRIOR TO MAKING ANY SOIL CORRECTIONS & SHALL PROVIDE UNIT COSTS IN THEIR BID FOR SUCH WORK
- 8. BEST MANAGEMENT PRACTICES WILL BE UTILIZED DURING AND AFTER CONSTRUCTION OF THE PROJECT. MEASURES WILL INCLUDE THE USE OF SEEDING AND MULCHING, SEDIMENT INLET FILTERS, COMPACTION AND PAVING. THE OWNER OF THE SUBJECT PARCEL SHALL HAVE THE RESPONSIBILITY TO MAINTAIN THE PERMANENT SOIL EROSION PROTECTION MEASURES.
- 9. PERMANENT SEEDING SHALL COMPLY WITH SPECIFICATIONS FOR "PERMANENT SEEDING" AS SET FORTH IN THE WASHTENAW COUNTY STANDARDS. BASIC REQUIREMENTS CONSIST OF 200 LBS/ACRE OF SEED, 500 LBS/ACRE OF 10-10-10 ANALYSIS FERTILIZER (OR EQUAL), AND STRAW MULCH AT A RATE OF 1.5 TONS PER
- 10. TEMPORARY SEEDING AND SEEDING OF THE TOPSOIL STOCKPILE IS TO BE PER CITY OF ANN ARBOR STANDARD SPECIFICATIONS, DIVISION VII SOIL EROSION AND SEDIMENTATION CONTROL, SECTION 4 CONSTRUCTION METHODS, ITEM 4A VEGETATIVE PROTECTION AND MULCHING.
- 11. THE GRADING CONTRACTOR WILL BE RESPONSIBLE FOR IMPLEMENTING THE INITIAL SOIL EROSION CONTROL MEASURES (CURB INLET FILTER AND SILT FENCE) PRIOR TO COMMENCING EARTHMOVING OPERATIONS. OTHER MEASURE ARE TO BE IMPLEMENTED AS SOON AS FEASIBLE IN THE CONSTRUCTION SEQUENCE.
- 12. THE UTILITY CONTRACTOR WILL BE RESPONSIBLE FOR RESTORING ANY EXISTING SOIL EROSION CONTROL MEASURE THAT IS DISTURBED DURING UTILITY CONSTRUCTION.
- 13. ANY LAWN AREA WHICH WILL HAVE A SLOPE STEEPER THAN 3:1 (3 HORIZONTAL TO 1 VERTICAL) SHALL BE SODDED AND PEGGED OR SEEDED AND MULCHED USING A SOIL EROSION CONTROL FABRIC OR BLANKET WITHIN 15 DAYS AFTER ESTABLISHING THE FINAL GRADE.
- 14. THE ESTIMATED QUANTITY OF EARTH EXCAVATION FOR THIS DEVELOPMENT IS 7,000 CY OF CUT AND 2,000 CY OF FILL. THIS QUANTITY DOES NOT INCLUDE TRENCH CUT/FILL, PAVEMENT BASE OR UNDERCUT.
- 15. THE ESTIMATED COST OF SOIL EROSION CONTROL SHOWN ON THESE PLANS IS
- 16. THE ESTIMATED COST OF PROTECTING ALL EXPOSED SURFACES FROM EROSION SHOULD CONSTRUCTION CEASE IS \$12,000. (RE-SPREAD 3" TOPSOIL, SEED AND
- 17. CONTRACTOR SHALL POSSESS THE SOIL EROSION AND SEDIMENTATION CONTROL PERMIT PRIOR TO START OF ANY EARTH WORK.
- 18. EROSION PROTECTION SHALL BE PROVIDED AT ALL STORM SEWER INLETS AND OUTLETS. ALL BARE EARTH SHALL BE STABILIZED WITH SEEDING.
- 19. THE ENTIRE STORM SEWER SYSTEM SHALL BE CLEANED AND FLUSHED FOLLOWING CONSTRUCTION AND PAID RECEIPT THEREOF PROVIDED TO THE ENGINEER AND MUNICIPAL SESC AGENT PRIOR TO FINAL PAYMENT TO THE CONTRACTOR OR FINAL ACCEPTANCE OF THE CONSTRUCTION BY THE OWNER.
- 20. THE CONTRACTOR SHALL BE RESPONSIBLE TO INSPECT, TAKE CORRECTIVE ACTION AND MAINTAIN ALL TEMPORARY SESC MEASURES DAILY AND AFTER EACH RAIN EVENT UNIT FINAL COMPLETION AND ACCEPTANCE OF THE PROJECT.

LEGEND





Phone: 734.929.6963 CHICAGO COLUMBUS **GRAND RAPIDS** HOLLAND **INDIANAPOLIS** ST. LOUIS

PREPARED FOR:

Grace Bible Church

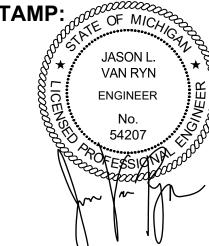
1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.03.24 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.06.18 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.07.28

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PROJECT NO: 18500114

SHEET NO:

CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL

XIST. 4" FIRE SERVICE LEAD

EXIST. 12" WATERMAIN

9. ALL CATCH BASINS SHOULD BE PROVIDED WITH A MINIMUM 2' SUMP.

EXIST. FIRE HYDRAN

UTILITY NOTES

GENERAL

1. CONSTRUCTION MUST CONFORM TO THE CITY OF ANN ARBOR STANDARD SPECIFICATIONS AND STANDARD DETAILS.

- 2. EXISTING UTILITIES SHALL BE VERIFIED IN FIELD PRIOR TO INSTALLATION OF ANY NEW LINES.
- 3. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING UTILITY DURING CONSTRUCTION. 4. UTILITY TRENCHES WITHIN A 1 ON 1 INFLUENCE OF PAVED AREAS SHALL BE BACKFILLED W/ M.D.O.T. CLASS II OR
- BETTER AND COMPACTED TO 95% MAXIMUM UNIT DENSITY. 5. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS OR DATA CUT SHEETS FOR PIPE MATERIALS, VALVES, CASTINGS,
- STEPS, AND MANHOLE STRUCTURES FOR REVIEW. 6. MAINTAIN A MINIMUM OF 10' HORIZONTAL AND 18" VERTICAL SEPARATION BETWEEN WATER AND SEWERS, AND A

MINIMUM OF 5' HORIZONTAL AND 12" VERTICAL SEPARATION BETWEEN WATER AND OTHER UTILITIES.

1. ALL WATER SUPPLY IMPROVEMENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ANN ARBOR ENGINEERING DESIGN STANDARDS.

2. THE PROPOSED BUILDING WILL BE SERVICED BY A NEW 2" TYPE K COPPER WATER LINE AND 4" DUCTILE IRON FIRE

Know what's **below**. **CALL** before you dig.

UTILITY LOCATIONS ARE DERIVED FROM ACTUAL MEASUREMENTS OF

AVAILABLE RECORDS. THEY SHOULD NOT BE INTERPRETED TO BE EXACT LOCATIONS NOR SHOULD IT BE ASSUMED THAT THEY ARE THE ONLY UTILITIES IN THIS AREA.

EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "(PLAN)" WERE OBTAINED FROM AVAILABLE AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALL

JTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.

- SUPPRESSION SERVICE LINE. 3. WATER SERVICE AND METER SET TO BE INSTALLED IN ACCORDANCE WITH THE CITY OF ANN ARBOR PUBLIC WORKS
- DEPARTMENT STANDARDS & SPECIFICATIONS.
- 4. ALL WATER SERVICE PIPES MUST BE LAID WITH A MINIMUM OF FIVE (5) FEET, OF COVER, SIX (6) FEET IS PREFERRED. 5. THE WATER SERVICE MAY BE PLACED IN THE SAME TRENCH WITH THE SEWER LINE IF APPROVAL IS GIVEN BY THE WATER AND SEWER DEPARTMENT, AND ALL OF THE FOLLOWING CONDITIONS ARE MET:
 - THE BOTTOM OF THE WATER SERVICE PIPE AT ALL POINTS SHALL NOT BE LESS THAN 18 INCHES ABOVE THE
- TOP OF THE SEWER LINE AT IT'S HIGHEST POINT. • THE WATER SERVICE PIPE SHALL BE PLACED ON A SOLID SHELF EXCAVATED AT ONE SIDE OF THE COMMON

IF THE ABOVE CONDITIONS CANNOT BE MET, THE WATER SERVICE AND SEWER LINE SHALL BE SEPARATED BY A

MINIMUM OF 10 FEET OF UNEXCAVATED EARTH. 6. PROJECT ARCHITECT & MEP ENGINEER SHALL DETERMINE IF BOOSTER PUMPS ARE REQUIRED FOR THE PROPOSED

BUILDING PRIOR TO THE ISSUANCE OF ANY BUILDING PERMITS, INCLUDING PERMITS FOR BUILDING FOUNDATIONS.

PROP. 92 LF OF 18" STORM SEWER @ 0.50%

PROP. 67 LF OF 12" STORM SEWER @ 1.0%

PROP. 6" UNDERDRAIN

PROP. 55 LF OF 15" STORM SEWER @ 0.50%

PROP. 42 LF OF 12" STORM SEWER @ 1.0%

13-4

PPROVED STORM WATER

DETENTION BASIN

PER MIDTOWN ANN ARBOR

CVLP 19-016 PLANS

TO BE CONSTRUCTED AS

PART OF THE MIDTOWN

ANN ARBOR PROJECT

- SANITARY SERVICE 1. ALL SANITARY SEWER IMPROVEMENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF
- ANN ARBOR ENGINEERING DESIGN STANDARDS. 2. SANITARY SEWER SERVICE & TAP TO EXISTING SEWER SHALL BE IN ACCORDANCE WITH THE CITY OF ANN ARBOR

STANDARDS & SPECIFICATIONS.

- 3. THE PROPOSED SANITARY SEWER LEAD SHALL BE PVC SDR-23.5 OR PVC SCH 40 UNLESS OTHERWISE NOTED. 4. NO CONNECTION TO RECEIVING STORM WATER, SURFACE WATER OR GROUNDWATER SHALL BE MADE TO SANITARY
- 5. NO FOOTING DRAINS SHALL BE CONNECTED TO THE BUILDING SANITARY SEWER.
- 6. TAPS & LEADS MUST BE INSPECTED AND APPROVED BY THE SEWER DEPARTMENT INSPECTORS, BEFORE BEING COVERED.

1. ALL STORM SEWER IMPROVEMENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF ANN

- ARBOR ENGINEERING DESIGN STANDARDS. 2. AN AGREEMENT FOR OPERATION AND MAINTENANCE OF ALL DETENTION SYSTEMS MUST BE COMPLETED BY THE
- OWNER AND SUBMITTED TO THE CITY PRIOR TO FINAL ACCEPTANCE OF THE PROJECT BY THE CITY. 3. STORM WATER RUNOFF GENERATED BY THE PROPOSED SITE IMPROVEMENTS WILL BE DETAINED ON-SITE, PER THE
- CITY OF ANN ARBOR REQUIREMENTS 4. STORM SEWER PIPE SHALL BE SMOOTH LINED CORRUGATED POLYPROPYLENE PIPE (SLCPP) CONFORMING TO AASHTO M-330 AND ASTM F2881

RIM=1005.2

PROP. 44 LF OF 8" STORM SEWER @ 1.0%

5. JOINTS SHALL BE TONGUE AND GROOVE PREMIUM JOINTS WITH RUBBER GASKETS 6. A PRE-FABRICATED BAR SCREEN SHALL BE INSTALLED ON ALL STORM SEWERS 18 INCH IN DIAMETER AND LARGER 7. 6" UNDERDRAIN SHALL BE PERFORATED PIPE WITH SOCK, MEETING THE REQUIREMENTS OF AASHTO M-252 AND THE GEOTEXTILE SHALL MEET AASHTO M-88 REQUIREMENTS. 8. ALL CATCH BASINS AND MANHOLES SHALL BE CONCRETE, CONFORMING TO ASTM C-478 WITH BUTYL RUBBER GASKETED JOINTS AND BOOT TYPE PIPE CONNECTED, CONFORMING TO ASTM C-923 ARE REQUIRED FOR ALL PIPE CONNECTIONS 24" DIAMETER AND SMALLER.

EXIST. 40.0' WIDE WATERMAIN EASEMENT

LIBER 5235, PAGE 525

PROP. 2" CUSTOMER SERVICE VALVE

CONNECT TO EXIST. 15" STORM SEWER

PROP. 4" GATE VALVE IN BOX

-CONNECT TO EXIST. 8" SANITARY SEWER W/ 8"x8"x6" WYE

15"N&SE INV. ≠991.25

EX. MH RIM=1003.21 8"N&SE INV.=995.71

CATCH BASIN & HYDRODYNAMI

CDS2015-4-C OR APPROVED EQUAL

PROP. STORM MH 15" W INV.=9\$8.18

15" E INV.=987.78

WATER QUALITY DEVICE

3037 Miller Rd. Ann Arbor, MI 48103 Phone: 734.929.6963 CHICAGO

COLUMBUS **GRAND RAPIDS** HOLLAND INDIANAPOLIS ST. LOUIS

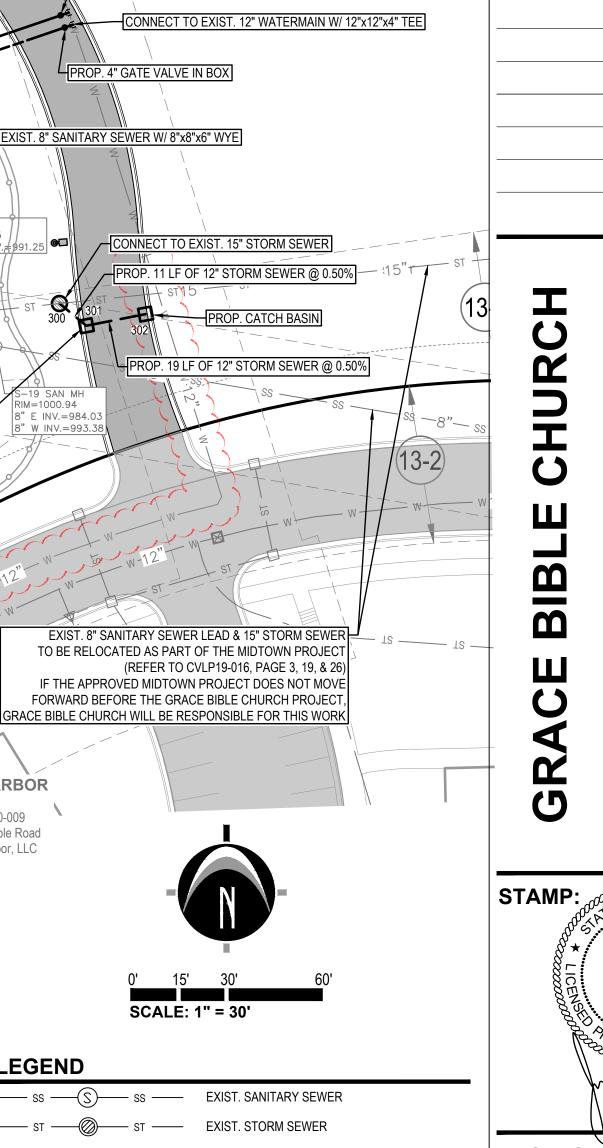
PREPARED FOR:

Grace Bible Church

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

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SANITA	ARY SEWER BASIS (OF DESIGN				
		Quantity of Base	Unit	Flow Rate For Given Use	Avg.	Flow
		Unit		(gpd/unit)	(gpd)	(gpm)
Existing	g Flows					
Uses:	Existing Church	400	seats	1.50	600	0.42
Total Ex	kisting Flow				600	0.42

		Quantity of Base	Unit	Flow Rate For Given Use	Avg. Flow					
		Unit		(gpd/unit)	(gpd)	(gpm)				
Propos	ed Site									
	Sanctuary Expansion	200	seats	1.5	300	0.21				
	Nursery & Elementary Classrooms	35	students	10	350	0.24				
Uses:	Middle & High School	15	students	20	300	0.21				
	Non-Medical Office Space	304	GFA	0.06	18	0.01				
	Gymnasium - associated use with the classroom space, therefore no additional flow anticipated									
Total Pi	roposed Flow				968	0.67				

Sanitary Flow Offset Mitigation Summary		
Increase in sanitary flow =	968	gpd
Increase in sanitary flow x 4 (Peaking Factor) x 1.1 (System Recovery Factor) =	4,260	gpd
(4,260 x 1 day / 24 hrs x 1 hr / 60 min) =	2.96	gpm
3 gpm Peak Flow to be mitigated		

-OUTLET CONTROL STRUCTURE (REFER TO MIDTOWN PLANS)

PROP. 67 LF OF 12" STORM SEWER @ 0.50%

PROP. 151 LF OF 12" STORM SEWER @ 0.50%

PROP. 6" UNDERDRA

PROP. 40.0' WIDE WATERMAI

PROP. 54 LF OF 8" STORM SEWER @ 1.0%

IN THE EVENT OF UTILITY MAIN MAINTENANCE, REPAIR, OR

THE RESPONSIBILITY OF THE PROPERTY OWNER TO

PROP. 288 LF OF 15" STORM SEWER @ 0.80%

REMOVE & REPLACE THE PROP. BOULDER WALL THAT IS

OCATED WITHIN THE 40' FT WIDE WATER MAIN EASEMENT.

REPLACEMENT OF THE PROP. 12" WATER MAIN, IT SHALL BE

PROP. CATCH BASIN

PROP. 6" UNDERDRAIN

EASEMENT (TYP.)

EXIST. 40.0' WIDE WATERMAIN EASEMENT LIBER 5235, PAGE 525 TO BE ABANDONED (TYP.) PROP. FIRE HYDRAN

PROP. 66 LF OF 12" STORM SEWER @ 0.50%

PROP. 84 LF OF 8" STORM SEWER @ 0.50% PROP. KNOX BOX PROPOSED F.D.C. PROP. 13 LF OF 8" STORM SEWER @ 4.0%

> PROP. 38 LF OF 8" STORM SEWER @ 2.5% PROP. 44 LF OF 12" STORM SEWER @ 0.40%

> > PROP. 37 LF OF 8" STORM SEWER @ 2.0%

GRACE BIBLE CHURCH WILL BE RESPONSIBLE COMPLETING TH WORK PRIOR TO APPLICATION FOR CERTIFICATE OF OCCUPAN LIBER 5235, PAGE 525

FIREWALLS EXIST WITHIN

2" WATERMAIN (DOMESTIC SERVICE LEAD)

4" WATERMAIN (FIRE SERVICE LEAD)

PROP. 6" SANITARY SEWER @ 2.0%

THE EXISTING BUILDING

TO BE ABANDONED (TYP. PROP. 66 LF OF 12" STORM SEWER @ 0.50%

PROP. 12" WATER MAIN CONNECTING THE HIGH PRESSURE SIDE O

THE BOOSTER STATION TO THE EXIST. 12" WATER MAIN ON THE

PROP. 40.0' WIDE WATERMAIN EASEMENT (TYP.)

CONNECT TO EXIST. 12" WATER MAIN STUB

Address: 1400 South Maple Road Owner: Midtown Ann Arbor, LLC

SCALE: 1" = 30'

LEGEND

MIDTOWN ANN ARBOR

Zoning: R4B

Parcel #: 09-08-36-100-009

— ss — (S)— ss — EXIST. SANITARY SEWER - ST --- EXIST. STORM SEWER

PROJECT NO: 18500114

SHEET NO:

Land Planning — Landscape Architecture — Civil Engineering — Land Surveying — High Definition Scanning — Forensic Engineering — Fire Investigation -

PROP. 26 LF OF 12" STORM SEWER @ 0.50%

Address: 1400 South Maple Road Owner: Midtown Ann Arbor, LLC

MIDTOWN ANN ARBOR

PROP. 42 LF OF 12" STORM SEWER @ 3.0%

PROP. 88 LF OF 12" STORM SEWER @ 0.60%

Parcel #: 09-08-36-100-009

Zoning: R4B

PROP. 21 LF OF 12" STORM SEWER @ 0.50%

APPROVED MIDTOWN ANN ARBOR DEVELOPMENT PER CVLP 19-016 PLANS

PROP. SANITARY LEAD/CLEANOUT PROP. STORM SEWER/CATCH BASIN

PROP. WATER MAIN

PROP. DOWNSPOUT

JASON L. VAN RYN

ENGINEER

PROPERTY LINE

ALLEN CREEK

DRAINAGE AREA

TOTAL DRAINAGE AREA: 6.1 ACRES TOTAL IMPERVIOUS AREA: 2.8 ACRES

RUNOFF COEFFICIENT: 0.62

10-YR PEAK RUNOFF: 14.8 CFS

ROP. WATERSHED BOUNDARY

EXIST. OUTFALL TO

(ALLEN CREEK WATERSHED)

MIDTOWN ANN ARBOR

City of Ann Arbor Project #CVLP19-016

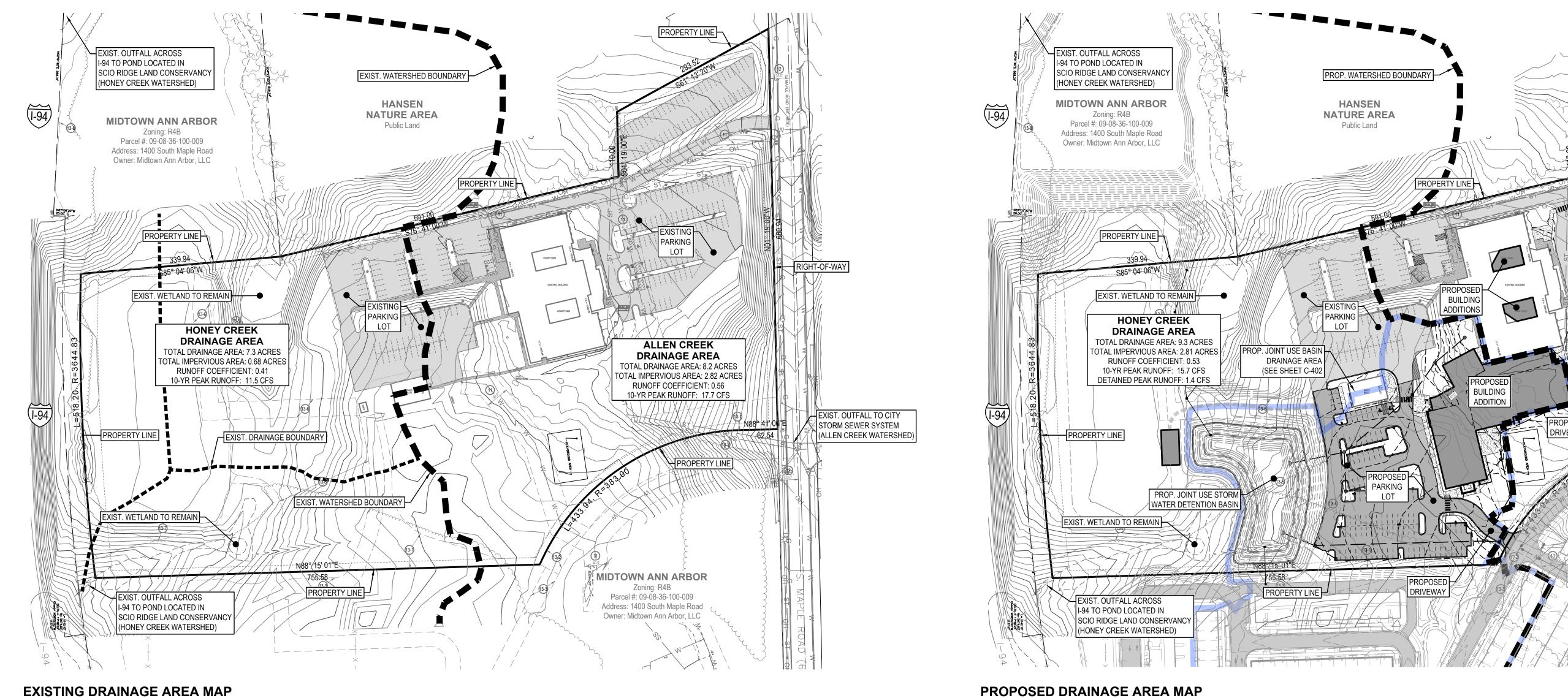
Zoning: R4B

Parcel #: 09-08-36-100-009

Address: 1400 South Maple Road

Owner: Midtown Ann Arbor, LLC

STORM SEWER SYSTEM



STORM SEWER CALCULATIONS

																									<u>=</u>	=	
PIPE	RUN			Н	YDROLOGY	Y							HYDRA	ULICS						H.G. ELE	/ATION (1)	F.G. ELI	VATION	INV ER	FELEV.	HGL (CHECK
FROM STR	TO STR	INC RE- MENT A REA A CRES (A)	RUNOFF COEFF. (C)	EQUIV. AREA 100% (CA)	TOTAL AREA 100% ACRES SUM (CA)	TIME (T) MIN.	10 YR INTEN- SITY (I) INCHES PER HOUR	10-YR FLOW (C.F.S.) Q=CIA	CAPACITY OF SEWER (C.F.S.)	DIAM. OF PIPE (IN)	LENGTH OF LINE (FEET)	PIPE MATERIAL	SLOPE OF PIPE (%)	ENERGY GRA DE SLOPE	HG BA SED ON "Q" (%)	HG FOR 3 FPS GIVEN "D" (%)	ACTUA	VEL. FULL (FT./ SEC.)	TIME OF FLOW (MIN)	UPPER END	LOWER END	UPPER END	LOWER END	UPPER END	LOWER END	RIM vs. HGL	T/P vs. HGL
302	301	0.12	0.60	0.07	0.07	15.00	4.38	0.3	3.0	12	18.9	SLCPP	0.50	0.026%	0.006	0.31	0.026%	3.8	0.1	986.71	986.70	991.10	991.10	986.30	986.21	4.39	0.60
301	300	0.65	0.40	0.26	0.34	15.10	4.36	1.5	3.0	12	10.9	SLCPP	0.50	0.519%	0.121	0.31	0.500%	3.8	0.0	986.70	986.65	991.10	992.50	986.21	986.16	4.40	0.51
300	ex	0.00	0.00	0.00	0.34	15.10	4.36	1.5	17.7	15	209.0	RCP	7.50	13.022%	0.051	0.32	7.500%	14.4	0.2	986.18	970.50	992.50	992.50	985.96	970.28	6.33	1.03
BLDG 4	205	0.26	0.95	0.24	0.24	15.00	4.38	1.1	2.9	8	12.7	PVC	4.00	4.073%	0.552	0.54	4.000%	8.2	0.0	1004.87	1004.36	1008.50	1008.10	1004.59	1004.08	-	0.39
BLDG 3	205	0.09	0.95	0.09	0.09	15.00	4.38	0.4	2.3	8	37.5	PVC	2.50	2.675%	0.068	0.54	2.500%	6.5	0.1	1005.20	1004.26	1009.00	1008.10	1005.02	1004.08	-	0.48
BLDG 2	204	0.09	0.95	80.0	0.08	15.00	4.38	0.4	2.0	8	36.8	PVC	2.00	2.002%	0.067	0.54	2.000%	5.8	0.1	1005.73	1005.00	1009.50	1008.70	1005.54	1004.80	-	0.47
209	208	0.05	0.90	0.04	0.04	15.00	4.38	0.2	3.0	12	21.0	SLCPP	0.50	0.114%	0.002	0.31	0.114%	3.8	0.1	1006.69	1006.67	1010.75	1011.15	1006.52	1006.41	4.06	0.83
208	202	0.06	0.90	0.05	0.10	15.10	4.36	0.4	3.0	12	26.1	SLCPP	0.50	0.564%	0.011	0.31	0.500%	3.8	0.1	1006.67	1006.54	1011.15	1012.15	1006.41	1006.28	4.48	0.74
207	202	0.09	0.75	0.06	0.06	15.00	4.38	0.3	7.3	12	42.4	SLCPP	3.00	89.174%	0.004	0.31	3.000%	9.3	0.1	1009.12	1007.85	1014.10	1012.15	1009.05	1007.78	4.98	0.93
206	201	0.19	0.75	0.14	0.14	15.00	4.38	0.6	4.2	12	42.2	SLCPP	1.00	1.138%	0.021	0.31	1.000%	5.4	0.1	1006.66	1006.23	1011.20	1010.50	1006.40	1005.98	4.54	0.74
BLDG 5	205	0.21	0.95	0.20	0.20	15.00	4.38	0.9	1.0	8	84.2	PVC	0.50	0.362%	0.384	0.54	0.362%	2.9	0.5	1003.98	1003.65	1006.00	1008.10	1003.50	1003.08	-	0.19
205	204	0.07	0.65	0.05	0.58	15.50	4.32	2.5	2.7	12	44.4	SLCPP	0.40	0.322%	0.353	0.31	0.322%	3.4	0.2	1003.65	1003.51	1008.10	1008.70	1002.81	1002.63	4.45	0.16
204	203	0.02	0.45	0.01	0.67	15.70	4.30	2.9	3.0	12	65.5	SLCPP	0.50	0.430%	0.471	0.31	0.430%	3.8	0.3	1003.51	1003.18	1008.70	1011.30	1002.63	1002.31	5.19	0.13
203	202	0.09	0.45	0.04	0.71	16.00	4.27	3.0	3.3	12	87.8	SLCPP	0.60	0.612%	0.524	0.31	0.600%	4.2	0.4	1003.07	1002.55	1011.30	1012.15	1002.31	1001.78	8.23	0.23
202	201	0.04	0.45	0.02	0.89	16.40	4.23	3.8	6.8	15	287.9	SLCPP	0.80	0.245%	0.245	0.23	0.245%	5.6	0.9	1002.25	1000.95	1012.15	1010.50	1001.58	999.28	9.90	0.58
201	200	0.28	0.95	0.27	1.30	17.30	4.14	5.4	5.4	15	55.4	SLCPP	0.50	0.498%	0.498	0.23	0.498%	4.4	0.2	1000.95	1000.67	1010.50	998.90	999.28	999.00	9.55	-0.42
BLDG 1	103	0.06	0.95	0.05	0.05	15.00	4.38	0.2	1.4	8	44.3	PVC	1.00	1.091%	0.028	0.54	1.000%	4.1	0.2	1006.25	1005.80	1010.00	1009.85	1006.06	1005.62	-	0.48
106	105	0.12	1.45	0.18	0.18	15.00	4.38	8.0	1.4	8	54.3	PVC	1.00	1.027%	0.293	0.54	1.000%	4.1	0.2	1007.59	1007.04	1011.50	1011.00	1007.23	1006.69	3.91	0.31
105	101	0.06	1.50	0.09	0.27	15.20	4.35	1.2	4.2	12	66.5	SLCPP	1.00	1.116%	0.077	0.31	1.000%	5.4	0.2	1006.78	1006.12	1011.00	1010.00	1006.42	1005.76	4.22	0.64
104	103	0.21	0.65	0.14	0.14	15.00	4.38	0.6	3.0	12	65.9	SLCPP	0.50	0.118%	0.020	0.31	0.118%	3.8	0.3	1001.49	1001.31	1005.00	1009.85	1001.18	1000.85	3.51	0.69
103	102	0.16	0.65	0.11	0.30	15.30	4.34	1.3	3.0	12	67.3	SLCPP	0.50	0.329%	0.094	0.31	0.329%	3.8	0.3	1001.31	1001.04	1009.85	1011.70	1000.85	1000.52	8.54	0.54
102	101	0.07	0.95	0.07	0.37	15.60	4.31	1.6	3.0	12	151.4	SLCPP	0.50	0.141%	0.141	0.31	0.141%	3.8	0.7	1001.04	1000.80	1011.70	1010.00	1000.52	999.76	10.66	0.48
101	100	0.56	0.85	0.48	1.11	16.30	4.24	4.7	8.8	18	91.9	SLCPP	0.50	0.144%	0.144	0.18	0.144%	5.0	0.3	1000.80	1000.67	1010.00	998.90	999.36	998.90	9.20	0.06

(1) The Hydraulic Grade Line of the system starts at the greater of either the 2-year storm elevation (1000.67) in the detention basin or the 8/10th point of the storm pipe

STORM SEWER STRUCTURE SCHEDULE

	I SEV	VER STRUCTURE	30	HEDULE
STR NUMBER	RIM	SIZE, DIRECTION & INVERT ELEVATION	STR DIA. (FT)	CASTING/ GRATE (OR APPROVED EQUAL)
100	998.90	18" E INV.= 998.9	-	END SECTION GRATE
101	1010.00	18" W INV.= 999.36 12" NE INV.= 999.76 12" S INV.= 1005.76 6" E INV.= 1006.5	4	E.J.I.W. 1040, TYPE 02
102	1011.70	12" SW INV.= 1000.52 12" NE INV.= 1000.52 6" N,S INV.= 1008.2	4	E.J.I.W. 5080, TYPE M2
103	1009.85	12" SW INV.= 1000.85 12" NE INV.= 1000.85 8" S INV.= 1005.62	4	E.J.I.W. 1040, TYPE M1
104	1005.00	12" SW INV.= 1001.18	2	E.J.I.W. 1040, TYPE M1
BLDG 1	1010.00	8" N INV.= 1006.06		¥
105	1011.00	12" N INV.= 1006.42 8" E INV.= 1006.69 6" SE INV.= 1007.5	2	E.J.I.W. 1040, TYPE 02
106	1011.50	8" W INV.= 1007.23 6" E INV.= 1008	2	E.J.I.W. 1040, TYPE 02
200	998.90	15" E INV.= 999		END SECTION GRATE
201	1010.50	15" W INV.= 999.28 15" E INV.= 999.28 12" SE INV.= 1005.98 6" N,S INV.= 1007	4	E.J.I.W. 7045, TYPE M1
202	1012.15	15" W INV.= 1001.58 12" NE INV.= 1001.78 12" NW INV.= 1007.78 12" E INV.= 1006.28	4	E.J.I.W. 1040, TYPE M1
203	1011.30	12" SW INV.= 1002.31 12" N INV.= 1002.31	4	E.J.I.W. 1040, TYPE M1
204	1008.70	12" S INV.= 1002.63 12" N INV.= 1002.63 8" SW INV.= 1004.8	4	E.J.I.W. 1040, TYPE M1
205	1008.10	12" S INV.= 1002.81 8" E INV.= 1003.08 8" W INV.= 1004.08 8" N INV.= 1004.08	2	E.J.I.W. 1040, TYPE M1
206	1011.20	12" NW INV.=1006.4 6" N,E INV.=1007.7	2	E.J.I.W. 7045, TYPE M1
207	1014.10	12" SE INV.=1009.05 6" W,S INV.=1010.6	2	E.J.I.W. 7045, TYPE M1
208	1011.15	12" W INV.= 1006.41 12" NE INV.= 1006.41 6" NW,SE INV.= 1007.65	4	E.J.I.W. 7045, TYPE M1
209	1010.75	12" SW INV.= 1006.52 6" NW,SE INV.= 1007.25	2	E.J.I.W. 7045, TYPE M1
BLDG 2	1009.50	8" NE INV.= 1005.54	-	CONNECT TO ROOF DRAIN
BLDG 3	1009.00	8" E INV.= 1005.02	-	CONNECT TO ROOF DRAIN
BLDG 4	1008.50	8" S INV.= 1004.59	•	CONNECT TO ROOF DRAIN
BLDG 5	1006.00	8" W INV.= 1003.5	=	CONNECT TO ROOF DRAIN
300	992.50	15" E,W INV.=985.96 12" SE INV.=986.16	4	E.J.I.W. 1040, TYPE B
301	991.10	12" NW INV.= 986.21 12" E INV.= 986.21 6" N,S INV.= 987.6	4	E.J.I.W. 7045, TYPE M1
302	991.10	12" W INV.= 986.3 6" N,E INV.= 987.6	2	E.J.I.W. 7045, TYPE M1

STORM SEWER PIPE SCHEDULE

PIPE RUN	LENGTH OF LINE (FT)	DIAM. OF PIPE (IN)	SLOPE OF PIPE (%)	PIPE MATERIAL
100 - 101	91.9	18	0.50	SLCPP
101 - 105	66.5	12	1.00	SLCPP
101 - 102	151.4	12	0.50	SLCPP
102 - 103	67.3	12	0.50	SLCPP
103 - BLDG 1	44.3	8	1.00	PVC
103 - 104	65.9	12	0.50	SLCPP
105 - 106	54.3	8	1.00	PVC
200 - 201	55.4	15	0.50	SLCPP
201 - 206	42.2	12	1.00	SLCPP
201 - 202	287.9	15	0.80	SLCPP
202 - 208	26.1	12	0.50	SLCPP
202 - 207	42.4	12	3.00	SLCPP
202 - 203	87.8	12	0.60	SLCPP
203 - 204	65.5	12	0.50	SLCPP
204 - BLDG 2	36.8	8	2.00	PVC
204 - 205	44.4	12	0.40	SLCPP
205 - BLDG 4	12.7	8	4.00	PVC
205 - BLDG 3	37.5	8	2.50	PVC
205 - BLDG 5	84.2	8	0.50	PVC
208 - 209	21.0	12	0.50	SLCPP
ex - 300	209.0	15	7.50	RCP
300 - 301	10.9	12	0.50	SLCPP
301 - 302	18.9	12	0.50	SLCPP

ENGINEERS CERTIFICATE OF OUTLET

Date: May 17, 2021 Development: Grace Bible Church City, Village or Township of: City of Ann Arbor Washtenaw County, Michigan

Section: 36

I hereby certify that the existing drain is the only reasonable stormwater outlet for the proposed stormwater management system and that the existing drain has sufficient capacity to serve as an adequate outlet for the proposed system, without detriment to or diminution of the drainage service that the existing outlet presently provides.



Michigan license No.: 54207

3037 Miller Rd. Ann Arbor, MI 48103 Phone: 734.929.6963

> CHICAGO COLUMBUS **GRAND RAPIDS** HOLLAND INDIANAPOLIS ST. LOUIS

PREPARED FOR: Grace Bible Church

1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.03.24 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.06.18 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRO Drawn: BC/TA Checked: JVR Date: 2021.07.28

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> JASON L. VAN RYN

PROJECT NO: 18500114

SHEET NO:

STORM WATER MANAGEMENT PLAN NARRATIVE

THE EXISTING DEVELOPED SITE CONSISTS OF THE EXISTING GRACE BIBLE CHURCH BUILDING AND ASSOCIATED ON-SITE PARKING FACILITIES. THE SITE IS PRIMARILY COVERED BY MAINTAINED LAWN AREAS AND TWO AREAS OF WETLANDS. THERE IS CURRENTLY NO STORM WATER MANAGEMENT SYSTEM PROVIDED ON THE PARCEL.

THE EXISTING SITE DRAINS TO BOTH THE ALLEN CREEK WATERSHED TO THE EAST, AND THE HONEY CREEK WATERSHED TO THE WEST. THE EASTERN HALF OF THE SITE DRAINS EAST TOWARD S. MAPLE ROAD AND ENTERS THE CITY OF ANN ARBOR STORM SEWER SYSTEM. THE WESTERN HALF OF THE SITE DRAINS TO A SERIES OF ON-SITE EXISTING WETLANDS BEFORE PASSING THROUGH TWO CULVERTS CROSSING I-94 TO A POND LOCATED IN THE SCIO RIDGE LAND CONSERVANCY.

THE PROPOSED PROJECT CONSISTS OF A ±30,000 S.F. BUILDING ADDITION AND ±60,000 S.F. OF PARKING, DRIVEWAYS AND SIDEWALK. THE MAJORITY OF THESE IMPROVEMENTS WILL BE CONSTRUCTED WITHIN THE HONEY CREEK WATERSHED. A SHARED/JOINT USE STORM WATER DETENTION BASIN WILL BE CONSTRUCTED AS PART OF THE MIDTOWN ANN ARBOR PROJECT (CVLP19-016 - REFERRED TO AS THE NORTHWEST BASIN) AND WILL PROVIDE THE REQUIRED STORM WATER STORAGE VOLUME FOR THE PROPOSED GRACE BIBLE CHURCH SITE IMPROVEMENTS. THE JOINT USE BASIN IS APPROVED BY THE WASHTENAW COUNTY WATER RESOURCE COMMISSIONERS OFFICE AND THE CITY OF ANN ARBOR. THE OUTLET CONTROL STRUCTURE WILL BE MODIFIED SLIGHTLY TO ACCOMMODATE THE ADDITIONAL FLOW FROM THE GRACE BIBLE CHURCH SITE. THE CONTROLLED OUTFLOW FROM THE JOINT USE BASIN WILL BE RELEASED INTO THE PROPOSED WETLAND MITIGATION AREA TO THE NORTH THAT WAS APPROVED AND CONSTRUCTED AS PART OF THE MIDTOWN ANN ARBOR PROJECT.

STORM WATER MANAGEMENT CALCULATIONS

Determining Post-Development Cover	r Types, Areas	s, Curve Numbers	s, and Runoπ (
Midtown Drainage Area				=	170,463	sf
Grace Bible Church (GBC) Drainage An	ea			=	173,005	sf
Total Drainage Area	III D14D			=	343,468	sf
Total Drainage Area Excluding "Self-Cre	editing" BIMPs			=	343,468	sf
Rational Method Variables						
Cover Type		<u>Slope</u>	Soil Group	Area (sq. ft)	C factor	(C) x (Area)
Midtown Building/Pavement		-		129,405	0.95	122,935
Midtown Semi-pervious: lawns & planting	g beds	4-8%	D	41,058	0.45	18,476
GBC Building/Pavement		-		90,459	0.95	85,936
GBC Semi-pervious: lawns & planting be	eds	4-8%	D	60,270	0.45	27,122
Joint Basin Water Surface		-		22,276	1.00	22,276
					Total = $\Sigma(C)$ (Area)	
					Area Total = ∑sf =	
				Weighted ($C = \sum (C)(Area)/\sum sf =$	0.81
NRCS Variables (Pervious)						
Cover Type		gic Condition	Soil Group	Area (sq. ft)	Curve Number	
Open Space: lawns & planting beds		s cover < 50%)	D	41,058	89	3,654,162
Open Space: lawns & planting beds	(0	over 50% to 75%)	D	60,270	84	5,062,680
Open Space: lawns & planting beds	Good (gras	s cover > 75%)	D		74	0
					Total = $\Sigma(C)$ (Area)	
					Area Total = ∑sf =	
				Weighted ($C = \sum (C)(Area)/\sum sf =$	86
NRCS Variables (Impervious) Cover Type	Hydrolog	gic Condition	Soil Group	Aroo (og fl)	Cunto Number	(C) v (Araa)
Cover Type Roof & Pavement	<u> Hyurolo</u> (-	Soil Group D	Area (sq. ft) 219,864	Curve Number 98	(C) x (Area) 21,546,672
Water Surface		-	D	219,004	98	2,183,048
vvater Juriace		-	D	22,210		00 700 700
					Total = $\sum(C)(Area)$	0.40.4.40
					Area Total = ∑sf =	98

ŀ	Volume of 1 inch rain over total site area			
W2	$V_{ff} = (1'') \left(\frac{1'}{12''}\right) \left(\frac{43560 \text{ ft}^2}{1 \text{ ac}}\right) \times A \times C$	=	23,062	ft ³
	Pre-Development Bankfull Runoff Calculations (V _{bf-pre})			
	A. 2-year / 24 hour storm event = P	=	2.35	in
	B. Curve Number (CN) (Cover Description: Woods, Good, Hydrologic Soil Group D)	=	79	
wз	C. S = 1000/CN - 10	=	2.66	in
	D. $Q = (P-0.2S)^2/(P+0.8S)$	=	0.739	in
	E. Total Site Area	=	343,468	ft ²
	F. $V_{bf-pre} = Q(1/12)$ (site area)	=	21,141	ft ³

	Pervious Cover Post-Development Bankfull Runoff Calculations (V _{bf-per-post})			
Γ	A. 2-year / 24 hour storm event = P	=	2.35	in
	B. Curve Number (CN)	=	86	
N4	C. S = 1000/CN - 10	=	1.62	in
	D. $Q = (P-0.2S)^2/(P+0.8S)$	=	1.124	in
	E. Pervious Cover Area	=	101,328	ft ²
	F. $V_{bf-per-post}$ = Q(1/12)(site area)	=	9,489	ft^3

1 4	Impervious Cover Post-Development Bankfull Runoff Calculations (V _{bf-imp-post})			
	A. 2-year / 24 hour storm event = P	=	2.35	in
	B. Curve Number (CN)	=	98	
W5	C. S = 1000/CN - 10	=	0.20	in
	D. $Q = (P-0.2S)^2/(P+0.8S)$	=	2.122	in
	E. Impervious Cover Area	=	242,140	ft²
	F. V _{bf-imp-post} = Q(1/12)(proposed impervious area)	=	42,812	ft ³
L	Pervious Cover Post-Development 100-year Storm Runoff Calculations (V _{100-per-post})			
	A. 100-year / 24 hour storm event = P	=	5.11	in

- 1	,		0.11	
	B. Curve Number (CN)	=	86	
W6	C. S = 1000/CN - 10	=	1.62	in
	D. $Q_{100-per} = (P-0.2S)^2/(P+0.8S)$	=	3.572	in
	E. Pervious Cover Area	=	101,328	ft ²
	F. V _{100-per-post} = Q(1/12)(proposed impervious area)	=	30,165	ft ³
L	Impervious Cover Post-Development 100-year Storm Runoff Calculations (V ₁	100-imp-post)		
	A. 100-year / 24 hour storm event = P	=	5.11	in
	B. Curve Number (CN)	=	98	

W7 C. S = 1000/CN - 10

D. $Q_{100-post} = (P-0.2S)^2/(P+0.8S)$

Total Time of Concentration (T_{c-hrs})

	E. Impervious Cover A	rea				=	242,140	ft ²
	F. V _{100-imp-post} = Q(1/12)(proposed impe	rvious area)			=	98,329	ft ³
			A 1: 11 E1					
	Determine Time of Co	ncentration for	Applicable Flow Change In	v lypes (I _{c-hrs})	l .			T _c =
	Flow Type	к	Elevation	Length (L)	Slope % (S)	S ^{0.5}	$V = K*S^{0.5}$	L/(V*3600)
	Sheet Flow	0.48	0.5	200	0.25	0.50	0.24	0.23
ws	Sheet Flow	0.48	0.5	1	50.00	7.07	3.39	0.00
	Sheet Flow	0.48	0.5	1	50.00	7.07	3.39	0.00
	Waterway	1.2	0.1	40	0.25	0.50	0.60	0.02
	Small Tributary	2.1	-	-	-	-	-	0.00

= 0.20

= 4.873 in

	Runoff Summary and Onsite Infiltration Requirement			
	A. Runoff Summary from Previous Worksheets			
	First Flush Runoff Calculations (Vff)	=	23,062	ft ³
	Pre-Development Bankfull Runoff Calculations (Vbf-pre)	=	21,141	ft ³
	Pervious Cover Post-Development Bankfull Runoff Calculations (Vbf-per-post)	=	9,489	ft^3
	Impervious Cover Post-Development Bankfull Runoff Calculations (Vbf-imp-post)		42,812	ft^3
	Total Post-Development Bankfull Volume (V _{bf-post})	=	52,301	ft ³
,,,,	Pervious Cover Post-Development 100-year Storm Runoff Calculations (V100-per-post)	=	30,165	ft^3
W9	Impervious Cover Post-Development 100-year Storm Runoff Calculations (V100-imp-post)	=	98,329	ft^3
	Total 100-year Volume (V ₁₀₀)	=	128,494	ft ³
	B. Determine Onsite Infiltration Requirement			
	Subtract the Pre-Development Bankfull from the Post-Development Bankfull Volume			
	Total Post-Development Bankfull Volume (Vbf-post)	=	52,301	ft^3
	Pre-Development Bankfull Runoff Calculations (Vbf-pre)	=	21,141	ft^3
	Bankfull Volume Difference (V _{bf-post} - V _{bf-pre})	=	31,160	ft ³
	Onsite Infiltration Requirement = Greater of Bankfull Volume Difference and First Flush Volume = (V _{inf})	=	31,160	ft ³

	Detention/Retention Requirement			
	A. Peak of Unit Hydrograph = $Q_p = 238.6T_c^{-0.82}$	=	743.24	cfs/in-mi ²
	B. Total Site Area (ac) excluding "Self-Crediting" BMPs	=	7.88	acres
W10	C. $Q_{100} = Q_{100-per} + Q_{100-imp}$	=	8.45	in
WIO	D. Peak Flow (PF) = $\left(\frac{Q_p \times Q_{100} \times Area \text{ (ac)}}{640}\right)$	=	77.33	ft ³
	E. Δ = PF - 0.15*(area)	=	76.15	ft ³
	$F. V_{det} = \left(\frac{\Delta}{PF} \times V_{100}\right)$	=	126,529	ft ³

	Proposed BMP	Area (ft²)	Storage Vo	olume (ft ³)	Ave. Design Infiltration Rate	Infiltration Volume During Storm	Total Volume Reduction	
			Surface		(in/hr)	(ft ³)	(ft ³)	
Г	Porous Pavement w/Infiltration Bed							
	Infiltration Basin							
	Subsuface Infiltration Bed							
W11	Infiltration Trench							
	Rain Garden 1	775	553	199	0			
	Rain Garden 2	418	330	146	0			
	Rain Garden 3	600	467	200	0			
	Dry Well							
	Bioswale							
	Vegetated Filter Strip							
	Green Roof							
ι Γ	TOTAL					0.00	0	

	Existing Natural Reasources	Mapped (yes, no, n/a)	Total Area (ac)	Protected/Undisturbed Area (ac)
Γ	Waterbodies			
	Floodplains			
	Riparian Areas			
W12	Wetlands	Please refer to		
	Woodlands	Sheet 2 of the		
	Natural Drainage Area	plan set		
	Steep Slopes, 15%-25%			
	Steep Slopes, over 25%			
	Special Habitat Areas			
	TOTAL EXISTING (ac)			

	Site Summary of Infiltration & Detention			
	A. Stormwater Management Summary			
	Minimum Onsite Infiltration Requirement (V _{inf})	=	31,160	ft ³
	Designed/Provided Infiltration Volume Credits	=	0	ft^3
	% Minimum Required Infiltration Provided	=	0.0	%
	Based on the results of the Phase II ESA, the potential for contamination exists on the si	te and therefor	e no infiltration is	s propose
W13	Total Calculated Detention Volume, V _{det}	=	126,529	ft ³
	Net Required Detention Volume (V _{det} - Designed/Provided Infiltration Volume)	=	126,529	ft ³
	B. Detention Volume Increase for site if required infiltration volume not achieved			
	% Required Infiltration NOT provided (100% - % Minimum Required Infiltration Provided)	=	100.0	%
	Net % Penalty (20% × % Required Infiltration Not Provided)	=	20.0	%
	Total Required Detention Volume, including penalty	=	151,835	ft ³
	[(100% + Net % Penalty) × Net Required Detention Volume)]			

n Garden 1 Storage	Volume						
Ponding Area =	775	ft ²	Top of	Surface Storage	Elev. =		1011.5
Bed Area =	331	ft^2	Bottor	n of Surface Stora	age Elev	.=	1010.5
Infiltration Area =	553	ft ³	Bottor	Elev.=		1007.0	
			Voids in Soil Filter (Porosity):				30%
Elevation	Area	Average Area	Volume	Total Volume			
(feet)	(square feet)	(square feet)	(cubic feet)	(cubic feet)			
1011.50	775	701	234	883	e	u u	
1011.17	627	553	184	650	Surface	Storage	
1010.83	479	405	135	465	Ĭ	Į.	
1010.50	331	0	0	330	S	S	
1010.50	331	325	114	330		e	
1009.33	320	314	110	216	Soil	ag	
1008.17	309	303	106	106	ŏ	Storage	
1007.00	298	0	0	0		0)	

Ponding Area =	418	ft ²	Top of	Surface Storage	Elev. =	1012.0
Bed Area =	243	ft^2	Bottom of Surface Storage Elev.=			1011.0
Infiltration Area =	331	ft ³	Botton	n of Soil Storage	Elev.=	1007.5
			Voids	in Soil Filter (Por	osity):	30%
Elevation	Area	Average Area	Volume	Total Volume		
(feet)	(square feet)	(square feet)	(cubic feet)	(cubic feet)		
1012.00	418	344	115	480	9 9	1
1011.67	270	196	65	365	Surface Storage	
1011.33	122	183	61	300	io id	
1011.00	243	0	0	239	S	
1011.00	243	237	83	239	e	
1009.83	232	226	79	156	ic ag	
1008.67	221	220	77	77	Soil Storage	
1007.50	219	0	0	0	S	1

Ponding Area =	600	ft ²	Top of	f Surface Storage	Elev. =	1012.5
Bed Area =	334	ft^2	Bottor	n of Surface Stora	age Elev.=	1011.5
Infiltration Area =	467	ft ³	Bottor	n of Soil Storage	Elev.=	1008.0
			Voids	30%		
Elevation	Area	Average Area	Volume	Total Volume		
(feet)	(square feet)	(square feet)	(cubic feet)	(cubic feet)		
1012.50	600	526	175	741	9 9	1
1012.17	452	378	126	566	Surface Storage	
1011.83	304	319	106	440	ig il	
1011.50	334	0	0	333	S	
1011.50	334	328	115	333	e	1
1010.33	323	317	111	218	Soil Storage	
1009.17	312	306	107	107	اؤ ق	
1008.00	301	0	0	0	S	1

Elevation	Area	Average Area	Volume	Total Storage Volume	
(feet)	(square feet)	(square feet)	(cubic feet)	(cubic feet)	
1006.00	36,423	34,358	34,358	204,253	
1005.00	32,293	31,089	31,089	169,895	
1004.00	29,885	28,713	28,713	138,806	
1003.00	27,540	26,397	26,397	110,094	
1002.00	25,253	24,140	24,140	83,697	
1001.00	23,027	21,949	21,949	59,557	
1000.00	20,871	19,829	19,829	37,608	
999.00	18,786	17,780	17,780	17,780	
998.00	16,773	0	0	0	
Storage Elevations	X ₀ =	998.00	X _{ff} =	= 999.27	
	$X_{bf} =$	1000.67	X _{100 + 20%} =	= 1004.35	
Storage Elevations	X ₀ =	998.00	X _{ff} =	- 998.96	
rom Midtown Project	_	1000.00	X _{100 + 20%} =		

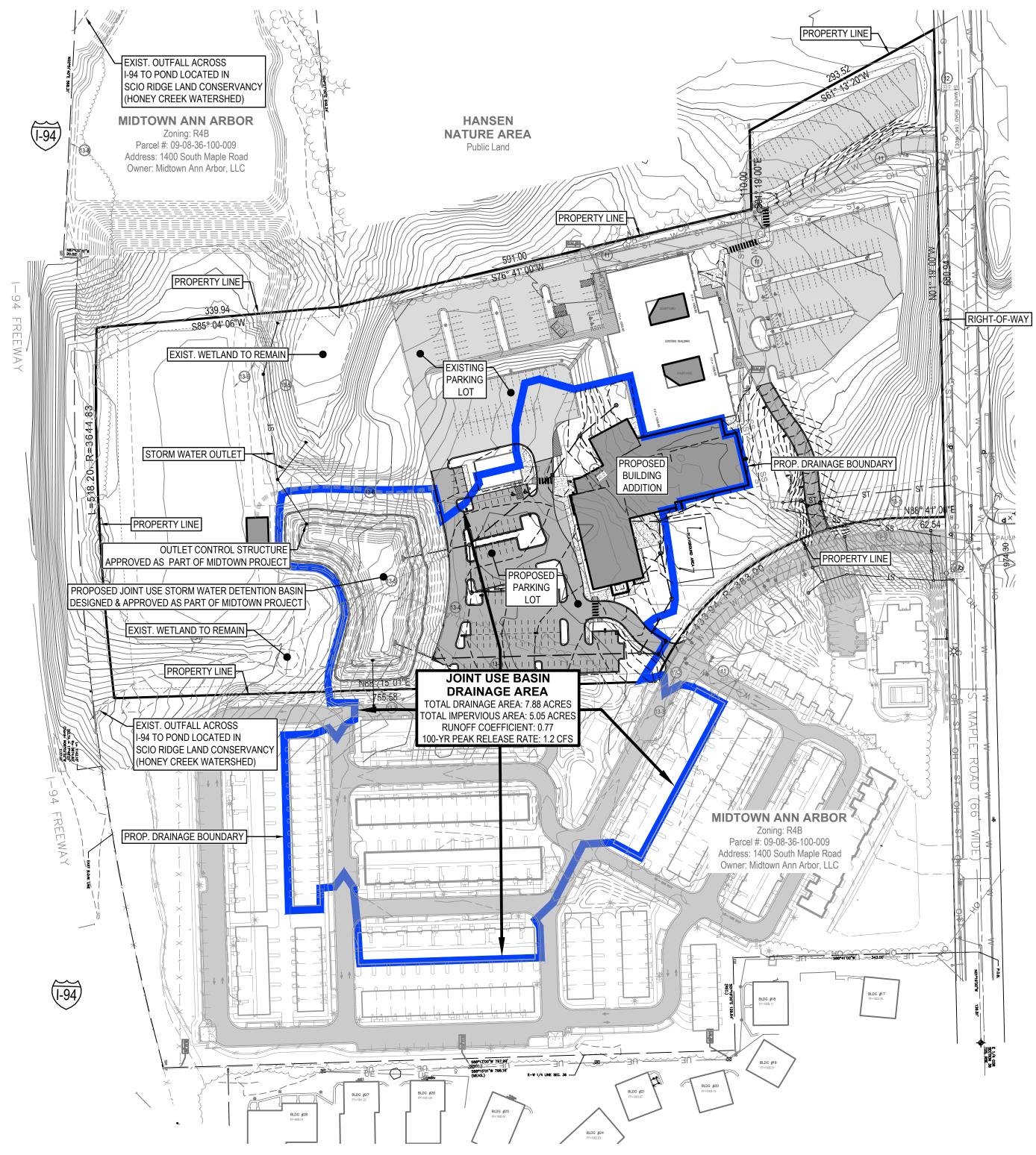
0.267 ft³/s

 $Q_{ff} =$

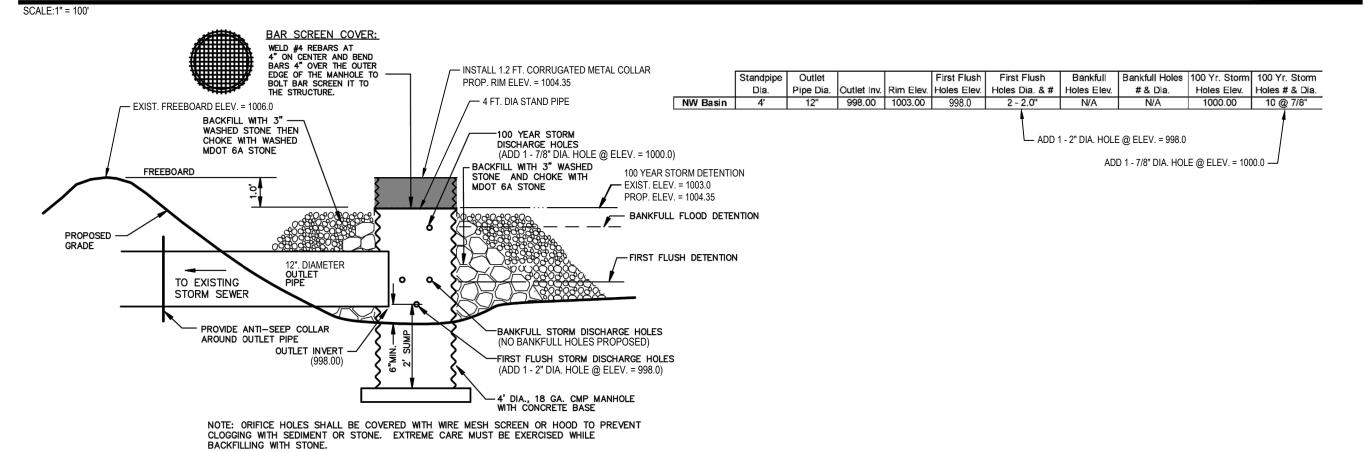
Orifice hole(s) sizing - "first flush" discharge

 $Q_{ff} = V_{ff} / 24 \text{ hrs} / 3600 \text{ sec}$

Qff - Vff / 24 IIIS / 3000 Sec	Off -	0.207	11 /5
$h_{ave} = \frac{2}{3} \times (X_{ff} - X_0)$	h _{ave} =	0.640	ft
$A_{ff} = Q_{ff} / .62 \times sqrt(2 \times 32.2 \times h_{ave})$	A =	0.0671	${\rm ft}^2$
Area of an orifice with diameter (in) = 2		0.0218	ft^2
Number of orifice holes	=	3	holes at elev = 998
Q _{ff} design	=	0.261	ft ³ /s
Time to Discharge (greater than 24 hours)	=	24.6	hrs > 24 hrs
Orifice hole(s) sizing - "Bankfull flood" discharge			
Bankfull should discharge within 36 to 48 hours			_
$h_{ave} = {}^{2}/_{3} \times (X_{bf} - X_{o})$	h _{ave} =	1.33	tt
Release from first flush holes only	0 -	0.070	-3.
$Q_{bf} = A \times .62 \times sqrt(2 \times 32.2 \times ^2/_3 h_{ave}) =$	$Q_{bf} =$	0.376	
T _{bf} with first flush holes only =			hrs < 44 hrs
Time is between 36-48 hours, therefore no additional Bankf	ull orifices are re	quired	
Orifice hole(s) sizing - "100-yr flood" discharge			
Peak Flow, Q _a = 0.15 cfs/acre x drainage area (A)	$Q_a =$	1.183	ft ³ /s
$h_{\text{tot}} = (X_{100} - X_{\text{o}})$	h _{tot} =	5.00	ft
$h_{\text{tot}}^{\text{bf}} = (X_{100} - X_{\text{ff}})$	h ^{bf} tot =	4.04	ft
$Q_{ff} + Q_{bf} =$			
a x 0.62 x sqrt(2 x 32.2 x h _{tot})+a x .62 x sqrt(2 x 32.2 x h ^{bf} _{tot}) =	$Q_{ff} + Q_{bf} =$	0.728	ft ³ /e
$Q_{100} = Q_a - (Q_{ff} - Q_{hf}) =$	Q ₁₀₀ =	0.455	
$A_{100} = Q_{100} / (.62 \times \text{sqrt}(2 \times 32.2 \times h_{100}))$	A ₁₀₀ =	0.0527	
Area of an orifice with diameter (in) = 7/8	, (100	0.0042	**
Number of orifice holes	=		holes at elev = 1000
Confirm allowable flow rate is not exceeded		• • •	noise at siev 1995
$Q_{\text{ff}} + Q_{\text{bf}} + 0.62 \times \#_{\text{orif}} \times A_{100} \times \text{sqrt}(2 \times g \times h^{100}_{\text{tot}}) < Q_{\text{allow}}$	=	1.167	cfs < 1.183 cfs
100-year storm volume discharge < 72 hours			
$h_{\text{ave}}^{\text{all}} = \frac{2}{3}(X_{100} - X_{\text{bf}}) + (X_{\text{bf}} - X_{\text{o}})$	=	5.12	ft
$Q_{all} = 0.62 \times \#_{orif}^{ff} \times A_{orif}^{ff} \times sqrt(2 \times g \times h_{ave}^{all})$	=	2.703	ft ³ /s
Calculate Q _{bf+100}			
$h_{\text{ave}}^{\text{bf}} = \frac{2}{3}(X_{100} - X_{\text{bf}}) + (X_{\text{bf}} - X_{\text{ff}})$	=	3.86	ft
$Q_{bf+100} = 0.62 \times \#_{orif}^{bf} \times A_{orif}^{bf} \times sqrt(2 \times g \times h_{ave}^{bf})$	=	0.000	ft ³ /s
Average Discharge through 100-year Orifice(s) when other	Orifice (s) are co		
$h^{100}_{ave} = \frac{2}{3}(X_{100} - X_{bf})$	=	2.45	ft
$Q_{\text{ave}}^{100} = 0.62 \times \#_{\text{orif}}^{100} \times A_{\text{orif}}^{100} \times \text{sqrt}(2 \times g \times h_{\text{ave}}^{100})$	=	0.358	ft ³ /s
Check to confirm 100-year storm volume discharge in less t			
V ₁₀₀ = Total Required Detention - BMP Volume Reduction (151,835	ft ³
$V_{rem} = V_{100} - V_{bf}$		99,534	**
$T_{100} = T_{bf} + V_{rem} / (Q_{all} + Q_{bf+100} + Q_{ave}^{100}) <= 72 \text{ hrs}$	=	<i>'</i>	hrs <= 72 hrs
Design meets both the time of detention and flow rate required		55.6	



JOINT DETENTION BASIN DRAINAGE AREA MAP



APPROVED DETENTION BASIN OUTLET CONTROL STRUCTURE (MIDTOWN ANN ARBOR - CVLP12-016)

3037 Miller Rd. Ann Arbor, MI 48103

> CHICAGO COLUMBUS **GRAND RAPIDS** HOLLAND **INDIANAPOLIS** ST. LOUIS

Phone: 734.929.6963

PREPARED FOR: Grace Bible Church

> 1300 South Maple Road Ann Arbor MI, 48103 Phone: 734.663.0589

REVISIONS:

Title: Site Plan Submittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.03.24 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.06.18 Title: Site Plan Resubmittal to City of Ann Arbor & WCWRC Drawn: BC/TA Checked: JVR Date: 2021.07.28

15

Calculatio Management /ater

F OF MICH JASON L. VAN RYN **ENGINEER**

PROJECT NO: 18500114

SHEET NO:

GR

30" WOOD LATH, —

¾" THICK

FILTER FABRIC ANCHORED -

BETWEEN LATH AND STAKE

COMPACTED SOIL IN -

SECTION VIEW

6"x6" ANCHOR TRENCH -

PLAN VIEW

SILT FENCE DETAIL

ANCHOR TRENCH

SHEET FLOW

EXTRA STRENGTH —

SYNTHETIC FILTER

— 2"x2" NO. 2 HARDWOOD STAKE

-HEAVY DUTY STAPLES,

MIN. 5 PER LATH

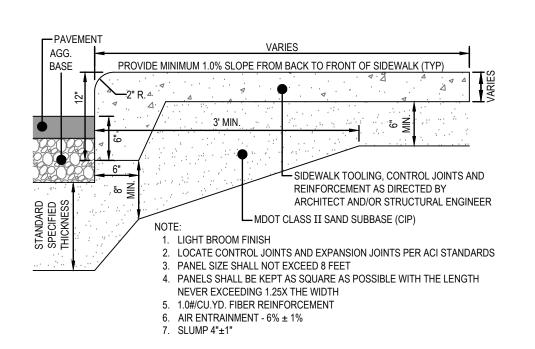
UNDISTURBED AREA

2"x2" HARDWOOD STAKES

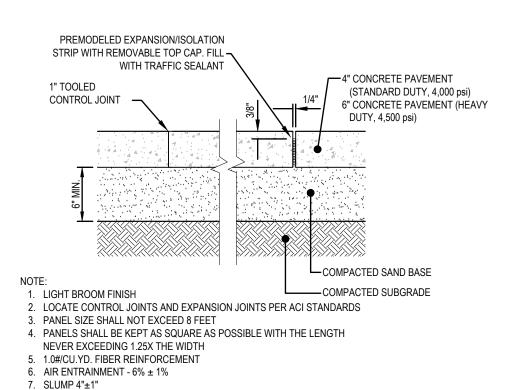
DRIVEN 12" INTO GROUND FABRIC ANCHORED BY WOOD

LATH STAPLED TO STAKES

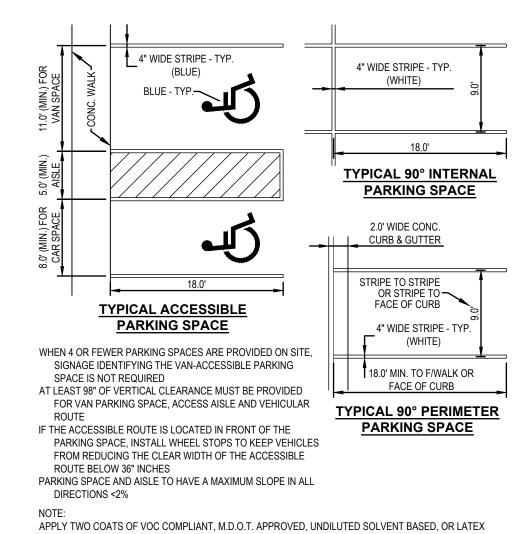
UNDISTURBED AREA



INTEGRAL CURB AND WALK DETAIL



CONCRETE PAVEMENT DETAIL

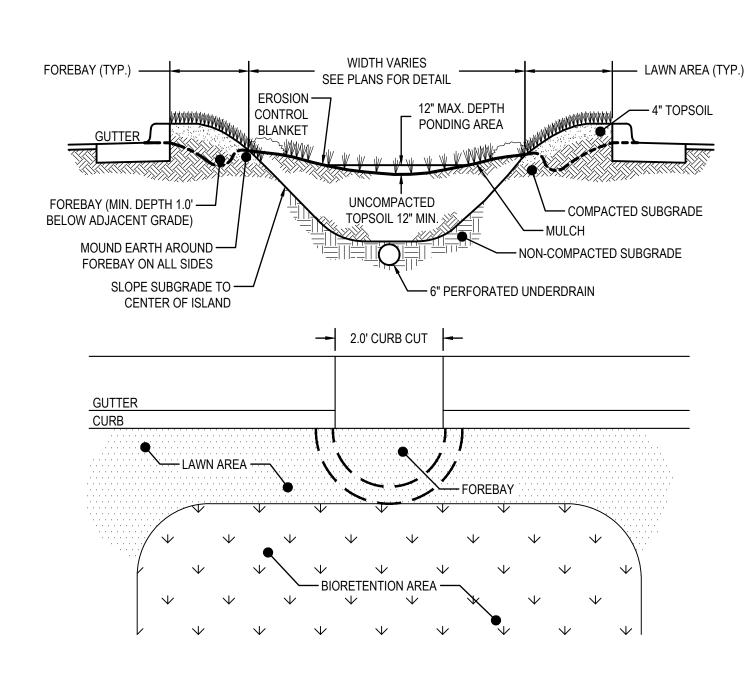


TRAFFIC PAINT TO ALL PAVEMENT MARKINGS. USE MANUFACTURERS RECOMMENDED APPLICATION RATE, WITHOUT ADDITION OF THINNER, WITH A MAXIMUM OF 100 SFT PER GALLON, OR MINIMUM 15 MILS WET FILM THICKNESS, AND 7.5 MILS DRY FILM THICKNESS PER COAT, WITH MINIMUM 30 DAYS BETWEEN APPLICATIONS. SECOND COAT MUST NOT BE APPLIED EARLIER THAN 7 DAYS BEFORE OCCUPANCY.

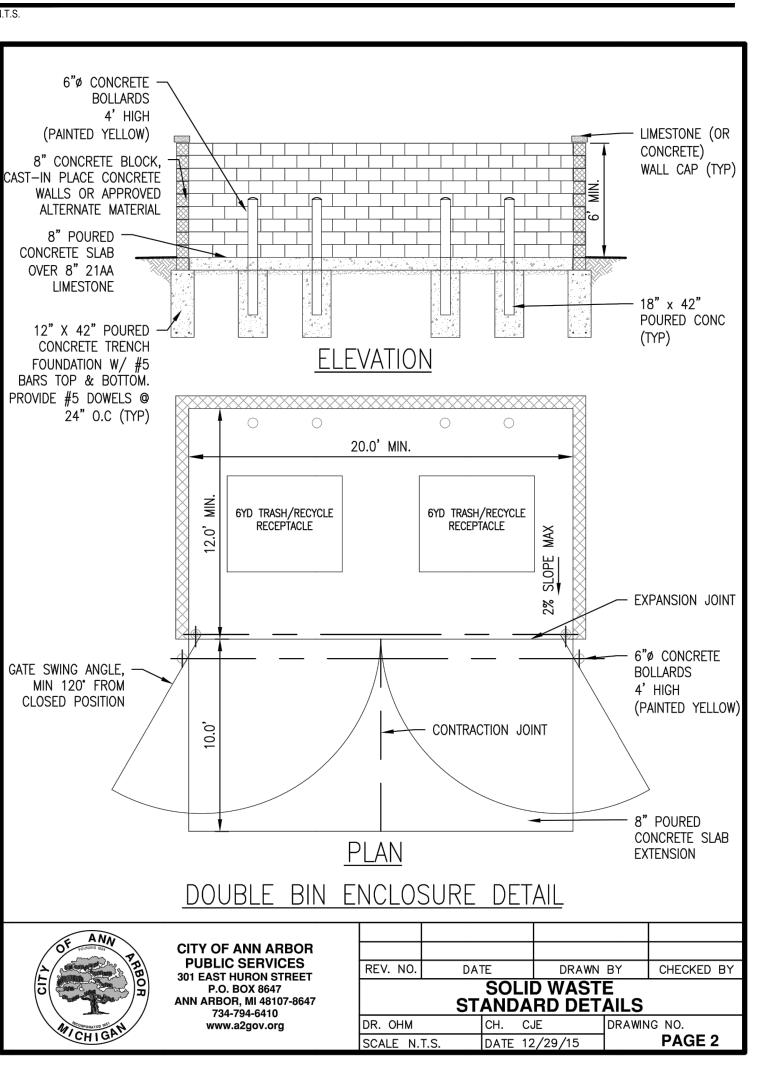
PAVEMENT MARKING DETAILS

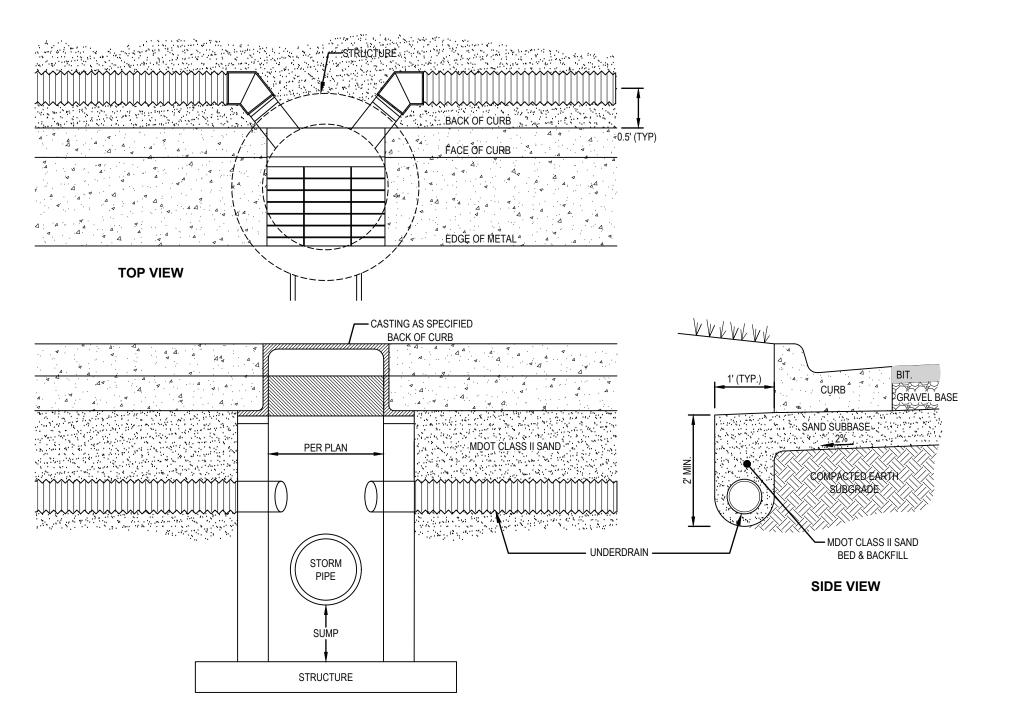
ABOVE OR BELOW LANE TO BE USED ON-SITE 2'-0" 1³/₈" AS SHOWN 0.0610

CONCRETE CURB & GUTTER MDOT DETAIL "F"



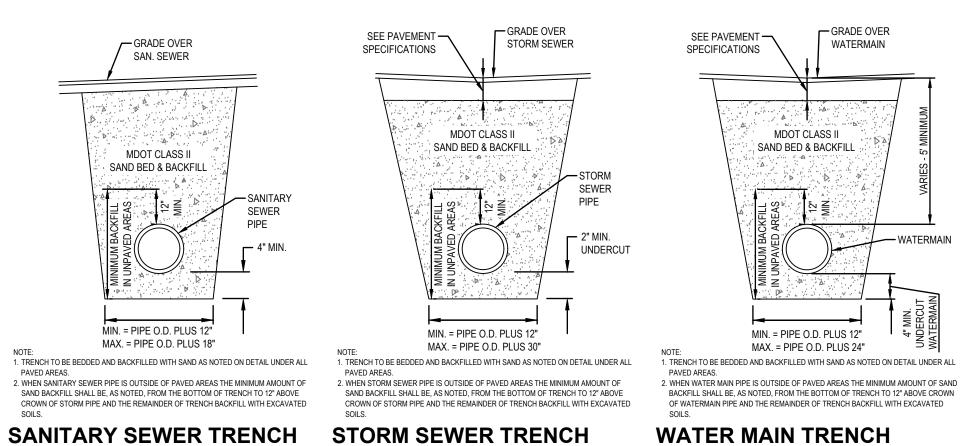
BIO-RETENTION AREA DETAIL





UNDER DRAIN AT CURB DETAIL

AND BACKFILL DETAIL



STORM SEWER TRENCH AND BACKFILL DETAIL

WATER MAIN TRENCH

- MIN. 8" CRUSHED AGGREGATE

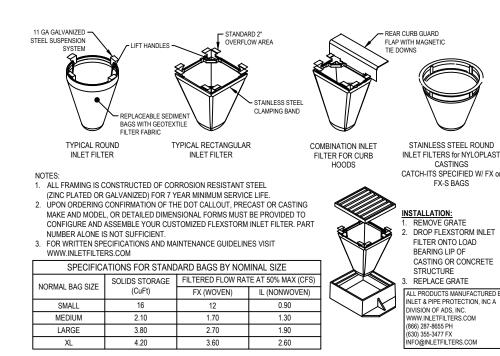
OVER GEOTEXTILE FABRIC

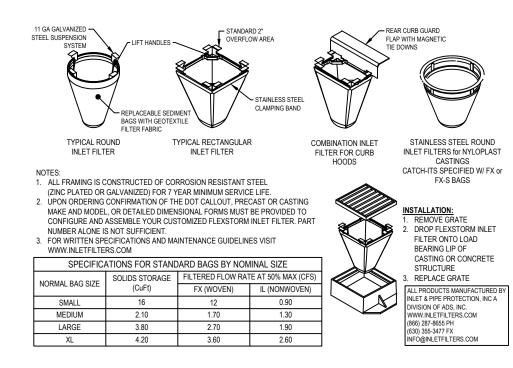
TEMPORARY CRUSHED

ROCK TRACKING PAD

AND BACKFILL DETAIL

EROSION CONTROL BLANKET DETAIL







EXISTING UTILITIES AND SERVICE LINES IDENTIFIED AS "(PLAN)" WERE OBTAINED FROM AVAILABLE AS-BUILT RECORD DRAWINGS. THE CONTRACTOR SHALL VERIFY THE LOCATION, DEPTH AND STATUS OF ALI UTILITIES AND SERVICE LINES PRIOR TO NEW CONNECTIONS.

3037 Miller Rd. Ann Arbor, MI 48103 Phone: 734.929.6963 CHICAGO

COLUMBUS

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Drawn: BC/TA Checked: JVR Date: 2021.07.28

Specification

∞

Details

JASON L.

VAN RYN

ENGINEER

 \mathbf{M}

C

NOTES:
1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" DEEP X 6" WIDE TRENCH WITH APPROXIMATELY 12" OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH, ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING, APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" APART ACROSS THE WIDTH OF THE BLANKET.

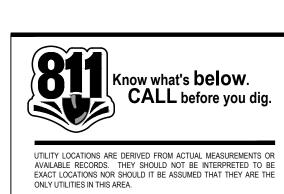
ROLL THE BLANKETS (A.) DOWN OR (B.) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN

THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 4"-6" OVERLAP DEPENDING ON BLANKET TYPE. T ENSURE PROPER SEAM ALIGNMENT, PLACE THE EDGE OF THE OVERLAPPING BLANKET (BLANKET BEING INSTALLED ON TOP) EVEN WITH THE SEAM STITCH ON THE PREVIOUSLY INSTALLED BLANKET. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3"OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12"APART ACROSS ENTIRE BLANKET WIDTH. PLACE STAPLES/STAKES PER MANUFACTURE RECOMMENDATION FOR THE APPROPRIATE SLOPE BEING APPLIED.

IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" MAY BE NECESSARY TO PROPERLY SECURE FOLLOW EROSION CONTROL TECHNOLOGY COUNCIL SPECIFICATION FOR PRODUCT SELECTION

CATCH-ITS SPECIFIED W/ FX or

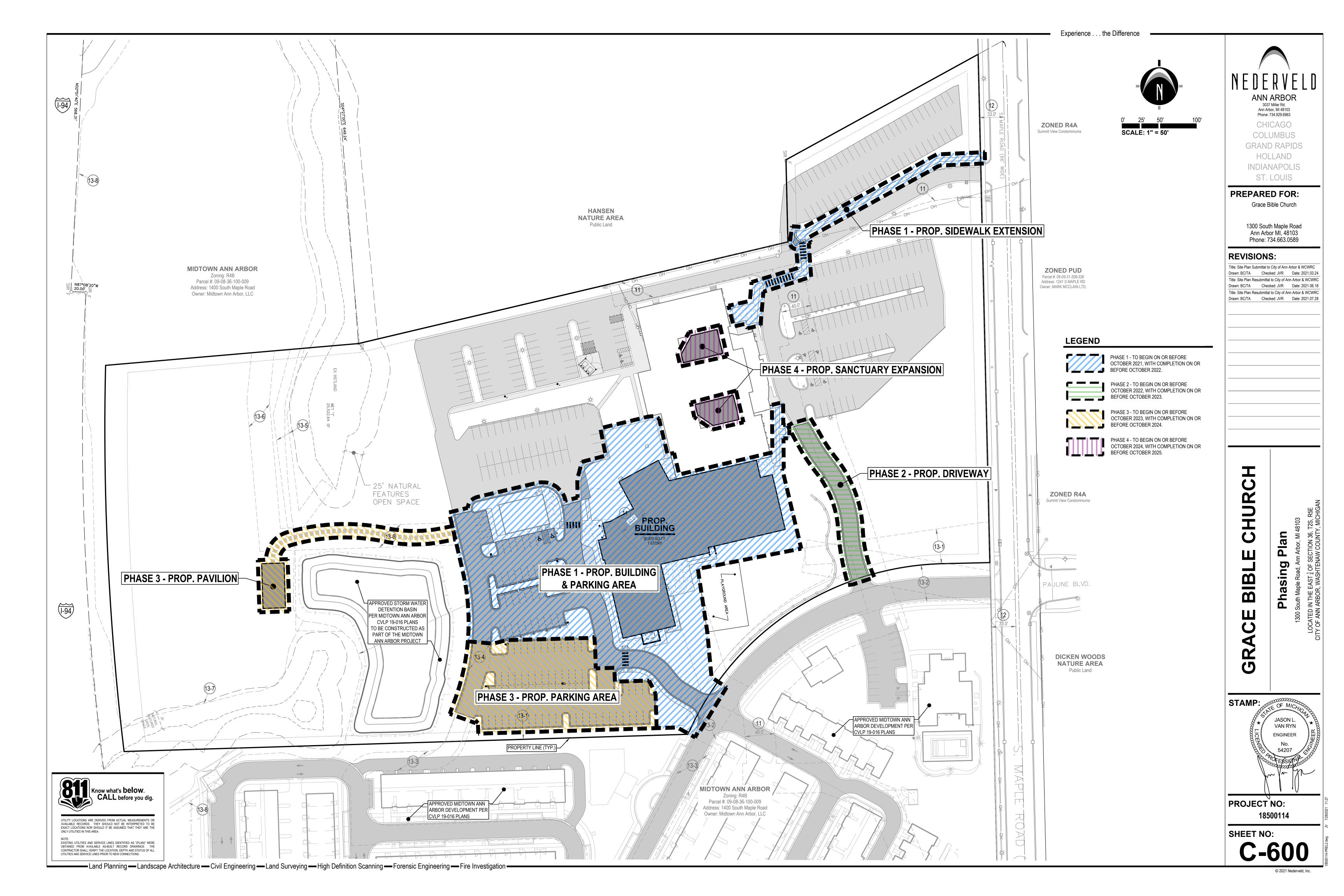
FLEXSTORM INLET FILTER DETAIL



SHEET NO:

18500114

PROJECT NO:



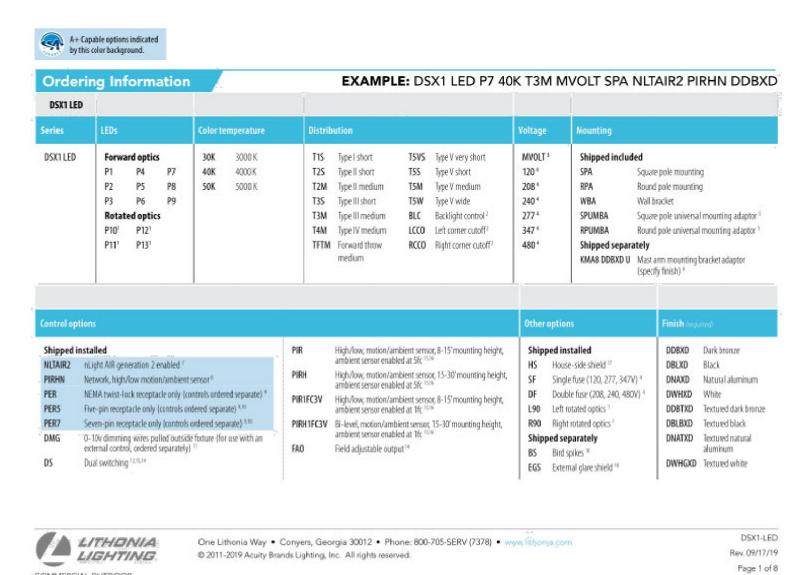




Introduction

The modern styling of the D-Series is striking yet unobtrusive - making a bold, progressive statement even as it blends seamlessly with its environment. The D-Series distills the benefits of the latest in LED technology into a high performance, high efficacy, long-life luminaire.

The outstanding photometric performance results in sites with excellent uniformity, greater pole spacing and lower power density. It is ideal for replacing up to 750W metal halide in pedestrian and area lighting applications with typical energy savings of 65% and expected service life of over 100,000 hours.



Statistics									
Description	Symbol	Avg	Max	Min	Max/Min	Avg/Min	Avg/Max		
DRIVE AISLE	Ж	3.0 fc	5.2 fc	0.2 fc	26.0:1	15.0:1	0.6:1		
PARKING EXPANSION	ж	1.5 fc	7.5 fc	0.3 fc	25.0:1	5.0:1	0.2:1		
SITE	+	0.4 fc	8.2 fc	0.0 fc	N/A	N/A	0.0:1		

General Note

COMMERCIAL OUTDOOR

- 1. SEE SCHEDULE FOR LUMINAIRE MOUNTING HEIGHT.
- 2. CALCULATIONS ARE SHOWN IN FOOTCANDLES AT: 3' 0" ABOVE GRADE
- 3. LIGHTING ALTERNATES REQUIRE NEW PHOTOMETRIC CALCULATION AND RESUBMISSION TO CITY FOR APPROVAL.

THE ENGINEER AND/OR ARCHITECT MUST DETERMINE APPLICABILITY OF THE LAYOUT TO EXISTING / FUTURE FIELD CONDITIONS. THIS LIGHTING LAYOUT 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. MOUNTING HEIGHTS INDICATED ARE FROM GRADE AND/OR FLOOR UP.

THESE LIGHTING CALCULATIONS ARE NOT A SUBSTITUTE FOR INDEPENDENT ENGINEERING ANALYSIS OF LIGHTING SYSTEM SUITABILITY AND SAFETY. THE ENGINEER AND/OR ARCHITECT IS RESPONSIBLE TO REVIEW FOR MICHIGAN ENERGY CODE AND LIGHTING QUALITY COMPLIANCE.

UNLESS EXEMPT, PROJECT MUST COMPLY WITH LIGHTING CONTROLS REQUIRMENTS DEFINED IN ASHRAE 90.1 2013. FOR SPECIFIC INFORMATION CONTACT GBA CONTROLS GROUP AT ASG@GASSERBUSH.COM OR 734-266-6705.

FOR ORDERING INQUIRIES CONTACT GASSER BUSH AT QUOTES@GASSERBUSH.COM OR 734-266-6705.

THIS DRAWING WAS GENERATED FROM AN ELECTRONIC IMAGE FOR ESTIMATION PURPOSE ONLY. LAYOUT TO BE VERIFIED IN FIELD BY OTHERS.

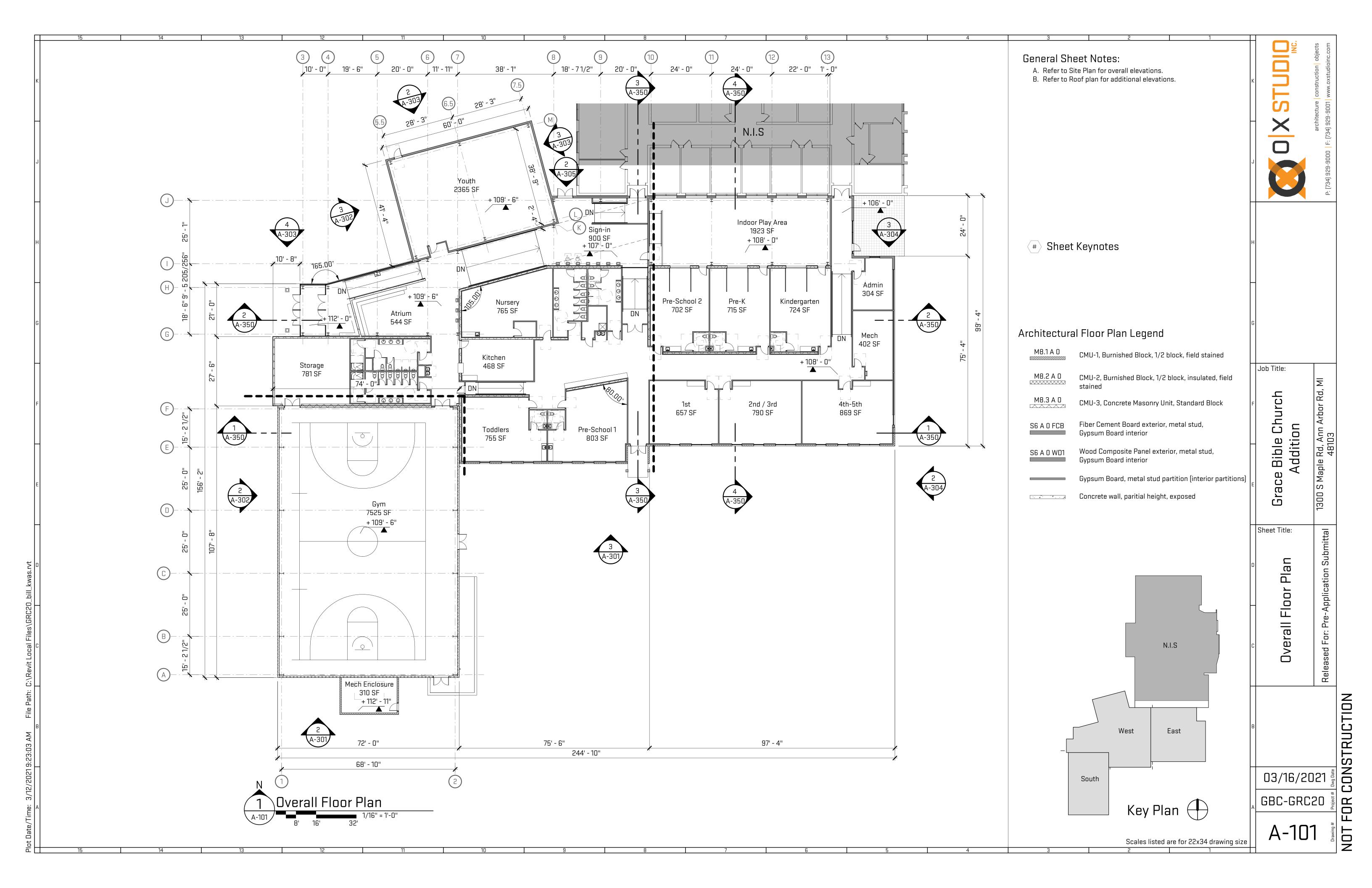
MOUNTING HEIGHT IS MEASURED FROM GRADE TO FACE OF FIXTURE. POLE HEIGHT SHOULD BE CALCULATED AS THE MOUNTING HEIGHT LESS BASE HEIGHT.

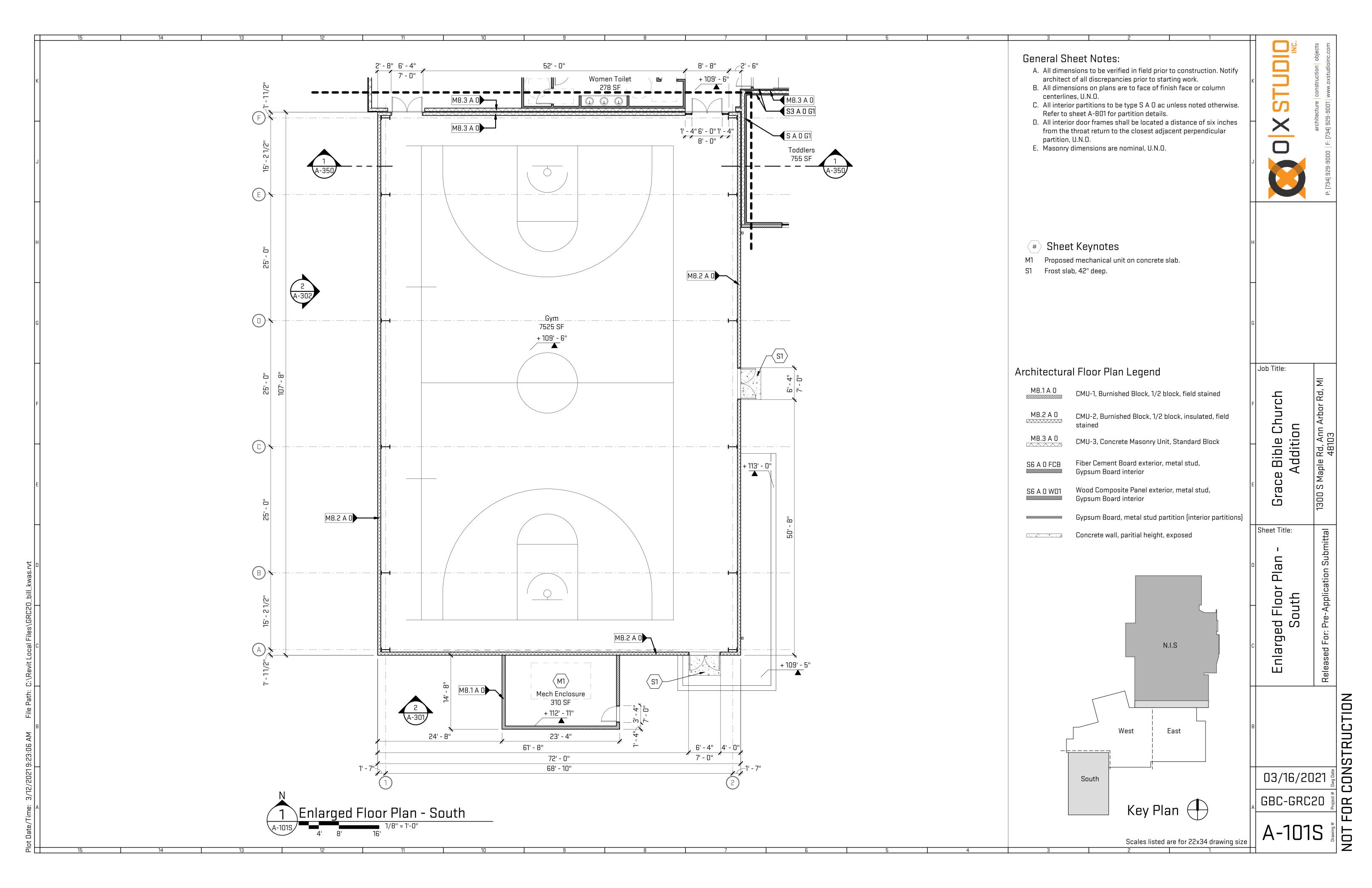
SERVICE INITARY SEWER IMPROVEMENTS SHALL BE DESIGNED AND CONSTRUCTED IN ACCORDANCE WITH THE CITY OF RBOR ENGINEERING DESIGN STANDARDS. BRY SEWEROSER WICE & CLAP TO CEXISTING SEWEROSHALD, BEIN ACCORDANCE WITH THE CITY OF CAND ARBOR 0.0 0.0	OWNER AND SUBMITTED TO THE CITY PRIOR TO FINAL ACCEPTANCE OF THE PROJECT BY THE CITY. STORM WATER RUNOFF GENERATED BY THE PROPOSED SITE IMPROVEMENTS WILL BE DETAINED ON-SITE, PER THE CITY OF ANN ARBOR REQUIREMENTS O STORM SEWER PIPE SHAID. BE SMOOTH LINED CORRUGATED POLYPROPYDENE PIPE (SLOPP) CONFORMING TO AASHTO.0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
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	F 12" STORM SEWER @ 0.50% 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0	0.0 0.0 0.0 0.0 0.0 0.1 0.4 12 M IN 5-19 43 4.2 36 2.7 1.2 0.4 0.1 EXIST. 40 WIDE WATERMAIN EASEMENT
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$0.0 \ \ ^{+}0.0 \ \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.$	0.0 0.0	10.0 00 0.0 0.1 0.1 0.3 0.6 30 4.0 5.0 3.8 PROP. 23CUSTOMER SERVICE VALVED 0.0 0.0
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0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0		CONNECT TO EXIST. 12" WATERMAIN W/ 12"x1" 0.0 0.0 0.1 0.2 0.9 4.0 3 1.1 0.3 0.1 0.1 0.0 0.0 0.0 0.0
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0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.1	EXIST. 40.0' WIDE WATERMAIN EASEMENT IDEAD 6" SAN	NITARY SEWER @ 2.0%
0.0 0.0 0.1 0.1 0.1 0.1 0.1 0.1 0.1 0.1	TO BE ABANDONED (TYP.)	0.0 0.0 0.9 0.9 CONNECT TO EXIST. & SANITARY SEWER W/8 X8 X6 WATE 0.1 0.0 0.0 0.0
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$0.0 \ \ 0.1 \ \ 0.1 \ \ 0.2 \ \ 0.3 \ \ 0.5 \ \ 0.7 \ \ 0.8 \ \ 1.0 \ \ 1.1 \ \ 1.2 \ \ 1.0 \ \ 0.8 \ \ 0.6 \ \ 0.5 \ \ 0.5 \ \ 0.6 \ \ 0.5 \ \ 0.6 \ \ \ 0.6 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	0.7 0.3 0.2	0.0 0,0 0.0 0,0 0,0 0,0 0.0 0.0 0.0 0.0
0.0 0.1 0.1 0.2 0.4 0.6 0.9 1.3 1.6 1.9 1.5 1.2 0.9 0.7 0.8 2.3 2.1	7 1.0 0.5 0.3 PROP. 84 LF OF 8" STORM SEWER @ 0.50%	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.1 0.2 0.8 5.0 6.1 48 7.7 0.5 0.1 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.1 0.1 0.2 0.4 0.8 1.2 1.7 22 2.7 2.4 2.2 1.5 1.2 1.1 1.3 1.2 1.4 3.2 3.6 3.3	1.4. 0.8 PROP. KNOX BOX	$0.0 \ 0.0 $
0.0 +0.0 +0.1 +0.2 +0.4 +0.7 PROP: 2.51 LIE. OF 12" STORM SEWER 1 0 0.50% 1.5 1.9 2.6 3.6 4.4 4.7 4.3	PROPOSED F.D.C. PROP. 13 LF OF 8" STORM SEWER @ 1.0%	0.0 0.0 0.0 0.0 0.0 0.0 EXO. 6H 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
$0.0 \times 0.0 \ \downarrow 0.1 \ \ \downarrow 0.2 \ \ \ \downarrow 0.3 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \$	1 2.8 1.7 11	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.1 0.1 0.3 0.5 1.0 1.7 2.1 2.3 2 2 2 1 1 7 1 5 1 7 2.2 3.2 4.4 5.7 8 5 5 5	1 2.7 1.7 1.1	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 0.0 0.1 0.1 0.2 0.5 0.9 1.2 1.6 1.7 1.6 1.5 1.3 1.2 1.4 1.8 2.5 3.7 4.6 4.9 4.4	205 1.7 \ 1.1 PROP. 38 LF OF 8" STORM SEWER @ 1.0%	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
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RM SEWER @ 0.50%	8 1 0 0.7 0 PROP. 44 LF OF 12" STORM SEWER @ 0.49% 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
0.0 0.0 0.1 0.1 0.2 0.3 0.3 0.4 0.4 0.3 0.3 0.4 0.4 0.5 0.7 0.9 1.3 1.8 2.0 2.1 1.9	6 *1.3 *1.0 0.7 *0.5 *0.0 *0.0 *0.0 *0.0 *0.0 *0.0 *0.0	
0.0 0.1 0.2 0.2 0.3 0.3 0.3 0.3 0.3 0.3 0.5 0.6 0.7 0.9 1.EASEMENT. (TYPE) 2.0	.8 × 1.5 × 1.1 \ 0.8 \ 0.5 \ \ IPROP. 37 LE OE 8" STORM SEWER\@ 1900 \ 0.0 \ 0	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 +0.0 +0.1 +0.2 +0.2 +0.3 +0.3 +0.4 +0.5 +0.6 +0.5 +0.6 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.5 +0.6 +0.7 +0.7 +0.7 +0.7 +0.7 +0.7 +0.7 +0.7		0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
0.0 \(^{\dagger}0.1\) \(^{\dagger}0.1\) \(^{\dagger}0.2\) \(^{\dagger}0.2\) \(^{\dagger}0.3\) \(^{\dagger}0.5\) \(^{\dagger}0.6\) \(^{\dagger}0.9\) \(^{\dagger}1.0\) \(^{\dagger}1.2\) \(^{\dagger}1.1\) \(^{\dagger}1.0\) \(^{\dagger}1.2\) \(^{\dagger}1.1\) \(^{\dagger}1.0\) \(^{\dagger}1.2\) \(^{\dagger}1.1\) \(^{\dag	.1 +2.9 1.6 10 0.5 0.8 +0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.	$0.0 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $
0.0 +0.0 +0.1 +0.1 +0.2 +0.3 +0.4 +0.6 *0.9 *1.2 +1.5 *1.7 *1.8 *1.5 *1.3 *1.1 *1.0 *1.8 *1.9 *1.6 +2.7 +	0 +2.5 1.8 ×1.1 ×0.6 ×0.3 EXIST. 40.0 WID	DE WATERMAIN EASEMENT 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
0.0 0.0 0.1 0.1 0.2 0.3 0.4 0.7 1.1 16 2 2 2.5 2.4 2.1 1.0 1.2 1.8 2.4 3.0	TO BE ABANDON	NED (TYP.) O.O O.O O.O O.O O.O O.O O.O O.O O.O O.
0.0 0.0 0.1 0.1 0.2 0.3 0.4 0.8 1.3 20 3.5 3.4 2.4 1.8 1.3 1.1 1.3 1.7 2.0 2.3	PROP. 66 LE OF 12" ST	TORM SEWER @ 0.50% 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
	[FROP. CATCH BASIN]	0.0 0.0
0.0 +0.1 +0.1 +0.2 +0.3 +0.4 +0.5 +0.7 +1.2 +1.9 +2.4 +2.7 +2.7 +2.4 +1.9 +1.6 +1.6 +1.6 +1.6 +1.6 +1.6 +1.6 +1.6	PROP. 40.0' WIDE WAT	TERMAIN 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
PROP. 6" UNDERDRAIN *** PROP. 6" UNDERDRAIN *** *** *** *** *** *** ***	12" WATERMAIN	
0.0 41 0.1 0.2 0.3 0.5 0.7 1.0 1.4 1.8 2.1 2.3 2.2 2.0 1.8 1.6 1.7 1.8 1.9 1.9 1.7	5 1.2 1.0 1.0 1.1 1.2 1.5 1.7 1.7 1.5 1.2 0.8 0.6 0.3 0.2 0.1 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
	7 1 0 0.9 1.1 18 2.0 2.3 2.3 2.1 1.6 1.1 0.6 0.3 01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0	
0.0 0.1 0.1 0.1 0.3 0.5 0.9 1.3 1.9 2 2 2.3 2.3 1.8 1.4 1.2 1.1 1.3 1.8 2.4 2.8 3.5 2.5 3		
		0.0 0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +
		/ / / w / / / w / / / / / / / / / / / /
0.1 0.2 0.5 1.0 1.7 2.4 3.5 3.A 1.4 0 8 1 8 ROP. 288 LF OF 92" STORM SEWER @ 0.80%.0	PROP. 21 LF OF 12" STORM SEV	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 \(^10.1 \) 0.1 \(^10.5 \) \(^10.0 \) \(^1.5 \) \(^10.0 \) \(^1.5 \) \(^10.1 \) \(^10	202	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 \(^1\)0.1 \(^1\)0.3 \(^1\)0.5 \(^1\)0.1 \(^1\)0.3 \(^1\)0.5 \(^1\)0.1 \(^1\)0.7 \(PROP. 26 LF OF 12" STORM SEWER @ 0.50%	0.0 \(^{\dagger}0.0 \) \)
0.0 +0.1 +0.2 +0.4 +0.6 +0.8 +0.9 +0.9 +0.9 +0.9 +0.9 +0.9 +0.9 +0.9		0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
05 12 STORM SEWER @3.00 4 0.5 0.5 0.5 0.5 0.4 0.4 0.3 0.3 0.2 0.2 0.2 0.2 0.2		0,0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
0.0 $^{+}0.1$ $^{+}0.1$ $^{+}0.1$ $^{+}0.2$ $^{+}0.2$ $^{+}0.2$ $^{+}0.2$ $^{+}0.2$ $^{+}0.2$ $^{+}0.2$ $^{+}0.3$ $^{+}0.3$ $^{+}0.3$ $^{+}0.2$ $^{+}0.2$ $^{+}0.2$ $^{+}0.1$ $^{+}0.1$ $^{+}0.1$ $^{+}0.1$ $^{+}0.1$ $^{+}0.1$ $^{+}0.1$	1 +0.1 +0.1 +0.1 +0.1 +0.1 +0.1 +0.1 +0.	0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0
$0.0 {}^{+}0.0 {}^{+}0.1 $	0 0.1 0.1 0.1 0.1 0.1 0.0 0.0 0.0 0.0 0.	$ \begin{array}{cccccccccccccccccccccccccccccccccccc$
$0.0 \ \ ^{+}0.0 \ \ ^{+}0.1 \ \ ^{+}0.1 \ \ ^{+}0.1 \ \ ^{+}0.1 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.1 \ \ ^{+}0.1 \ \ ^{+}0.1 \ \ ^{+}0.1 \ \ ^{+}0.0 \ \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.$	$0 {}^{+}0.0 $	$ \begin{smallmatrix} + \\ 0.0 \end{smallmatrix} \stackrel{+}{0.0} \stackrel$
$0.0 \ \ ^{+}0.0 \ \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.0 \ \ ^{+}0.$	$0.0 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	$ \begin{smallmatrix} + \\ 0.0 \end{smallmatrix} \stackrel{+}{0}.0 \stackrel$
$0.0 \ \ ^{+}0.0 $	$0.0 \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ \ $	$ \begin{smallmatrix} +0.0 & +0.0$
$0.0 \ \ ^{+}0.0 $	$0 {}^{+}0.0 $	$ \begin{smallmatrix} +0.0 & +0.0$
$0.0 \ \ ^{+}0.0 $	0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0	0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0 +0.0
	Scale - 1" = 32ft	

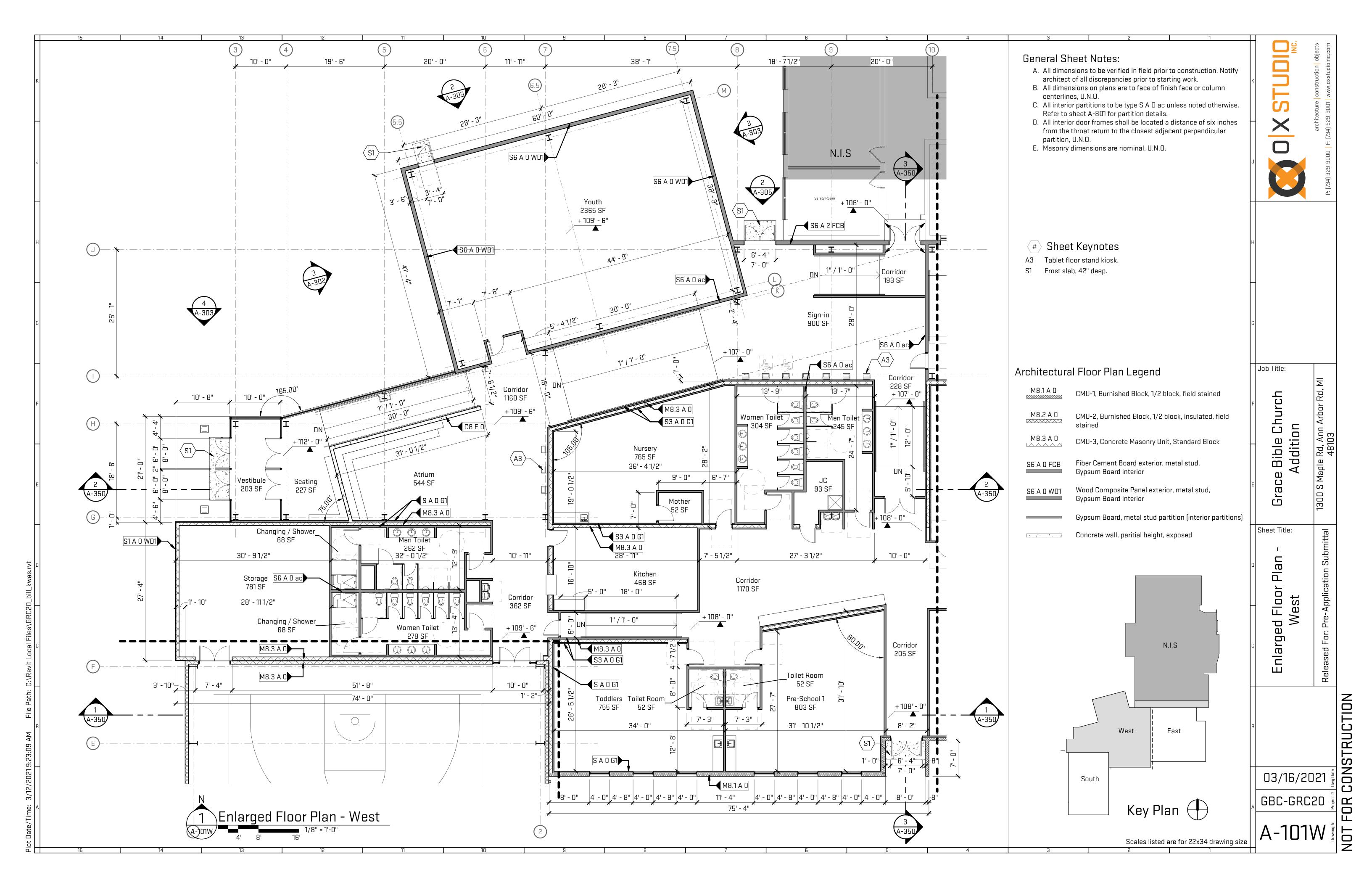
1 JENIOTA LINE LITERANTI

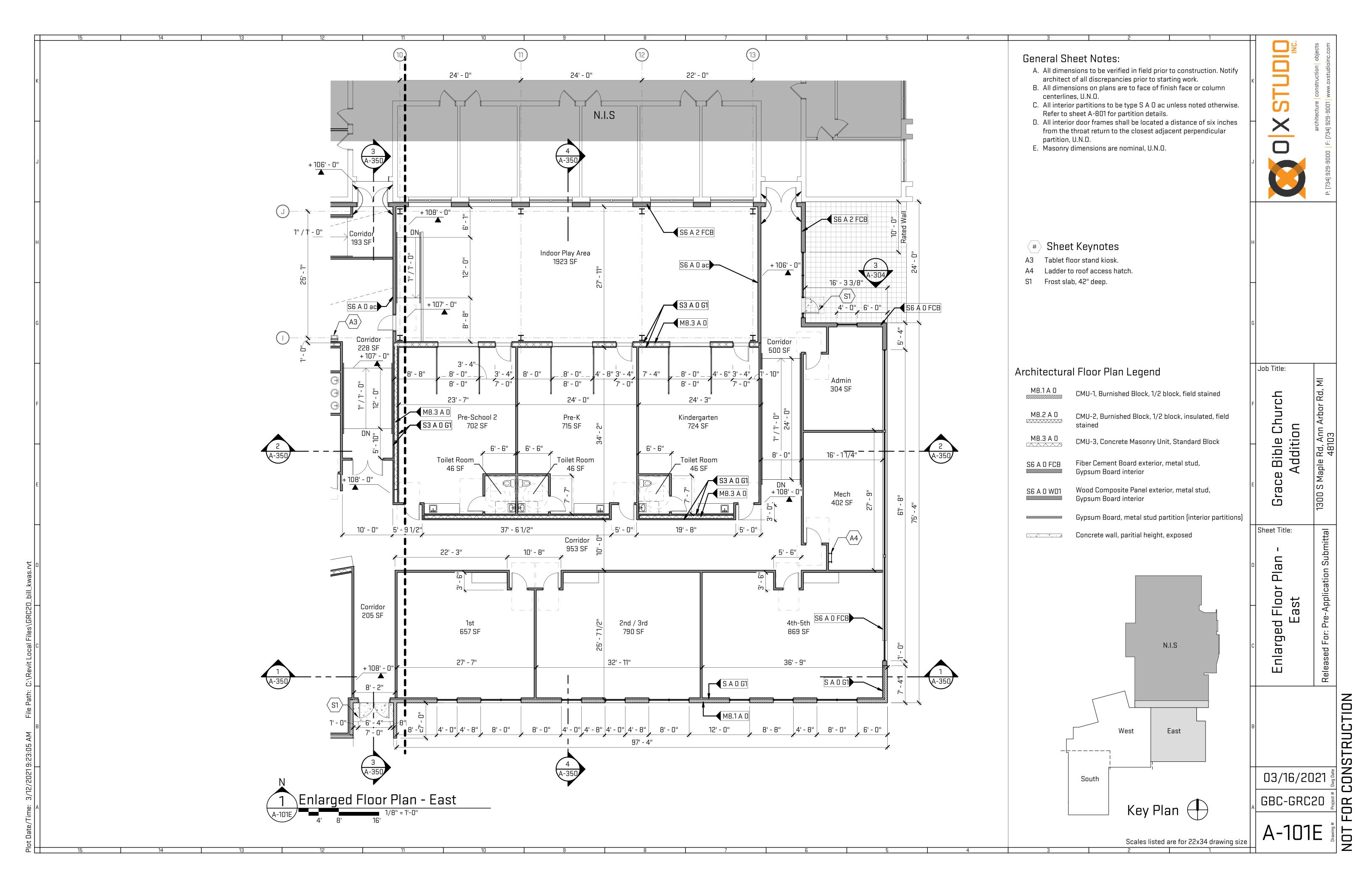
Schedule									
Symbol	Label	QTY	Manufacturer	Catalog Number	Description	Lamp	Lumens per Lamp	LLF	Wattage
	A1	6	Lithonia Lighting	DSX1 LED P4 40K T5W MVOLT	DSX1 LED P4 40K T5W MVOLT	LED	14943	0.9	125
	A2	1	Lithonia Lighting	DSX1 LED P4 40K T5W MVOLT	DSX1 LED P4 40K T5W MVOLT	LED	14943	0.9	250
	В	3	Lithonia Lighting	DSX1 LED P3 40K TFTM MVOLT HS	DSX1 LED P3 40K TFTM MVOLT with houseside shield	LED	9818	0.9	102

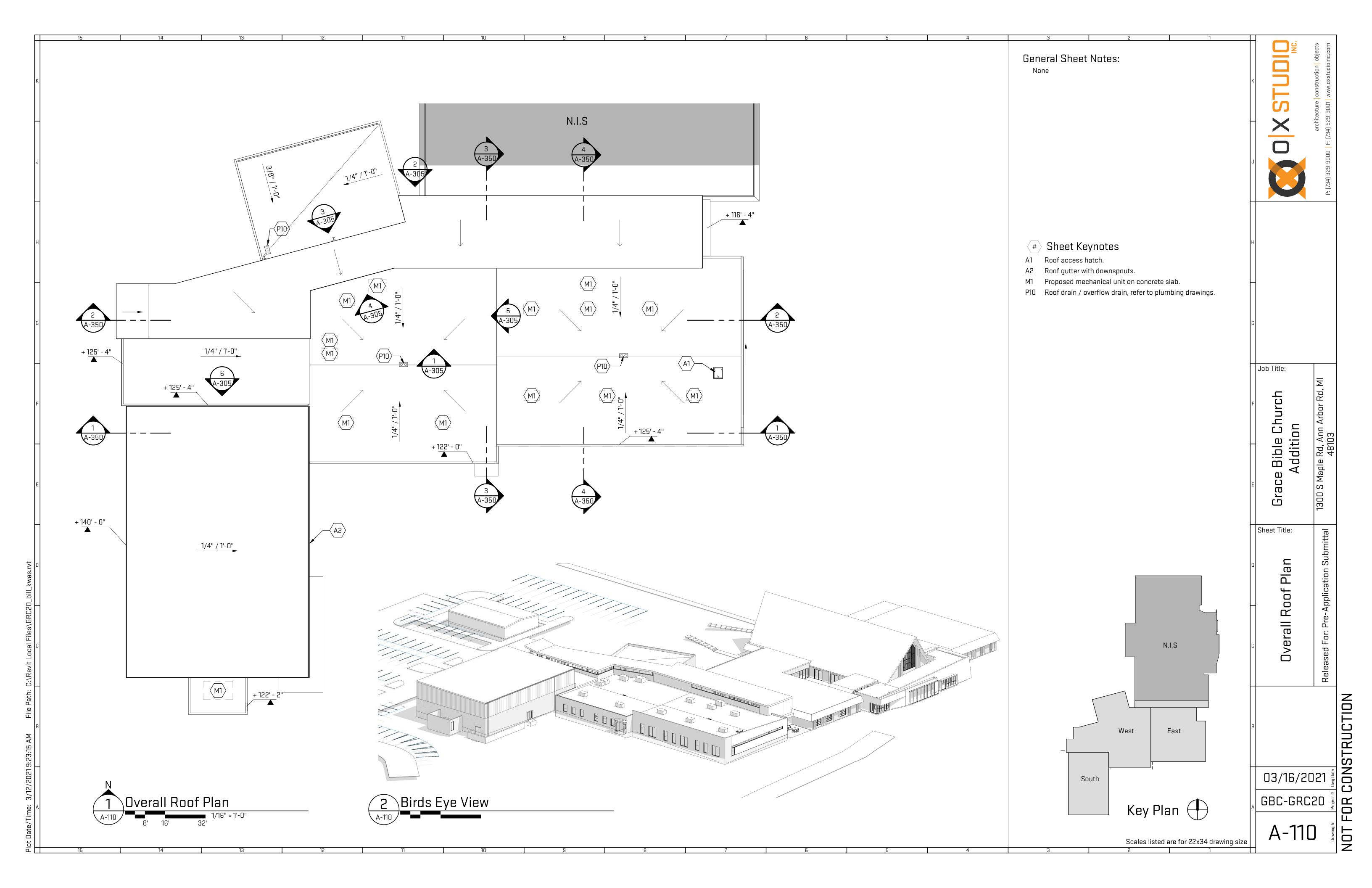
3/19/2021 Scale Not to Scale Drawing No. #21-60295 V2 1 of 1

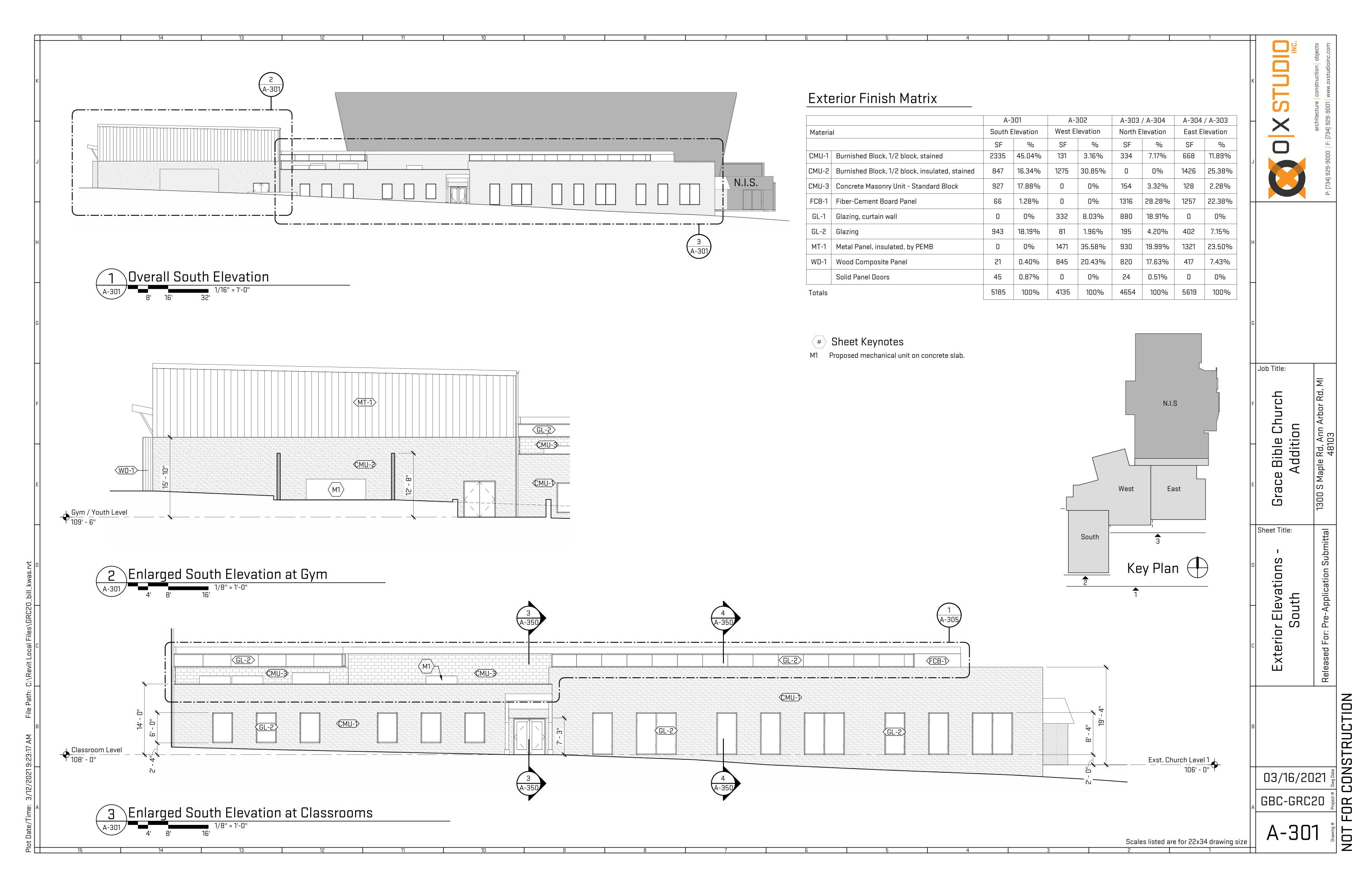


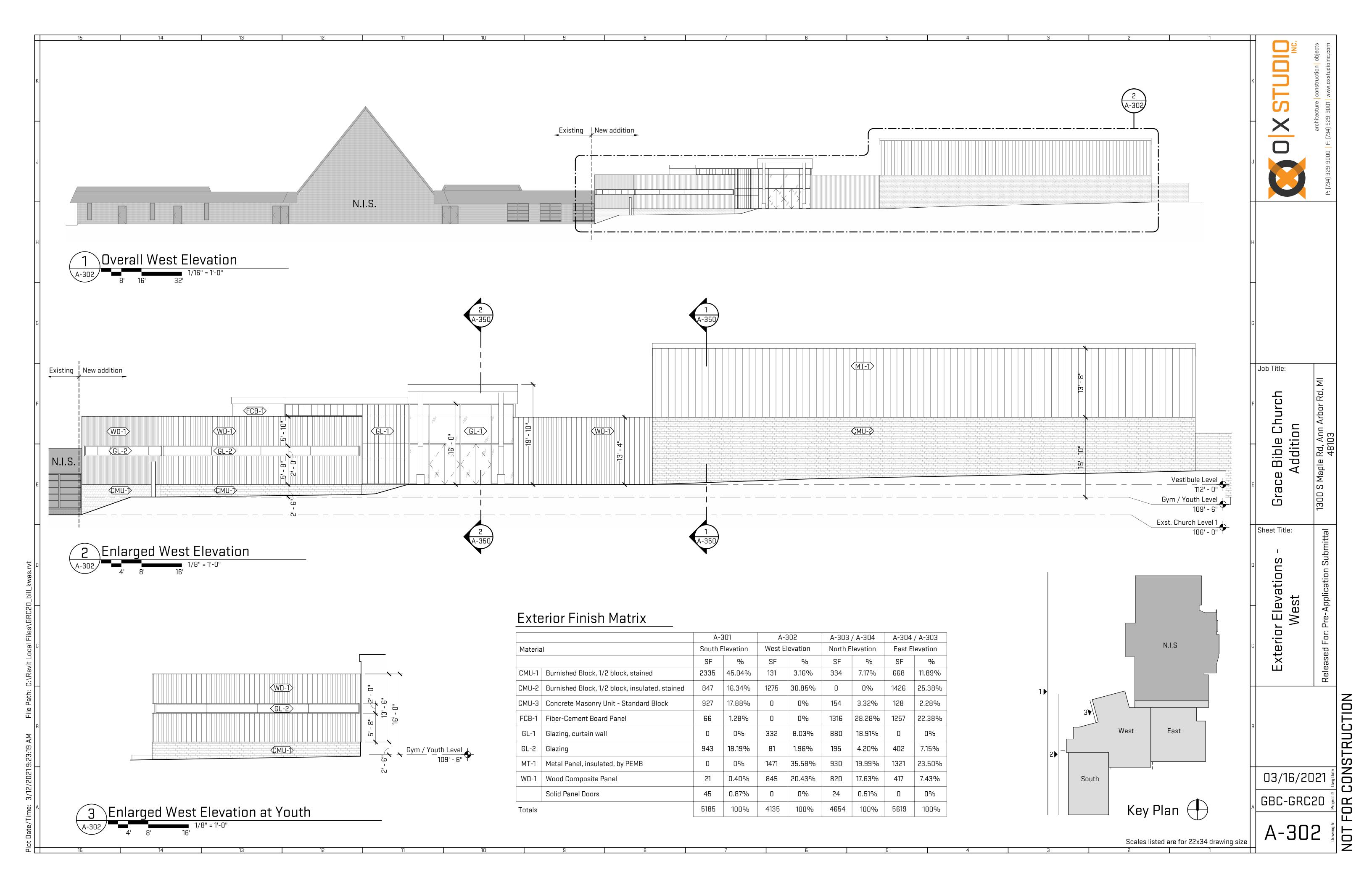


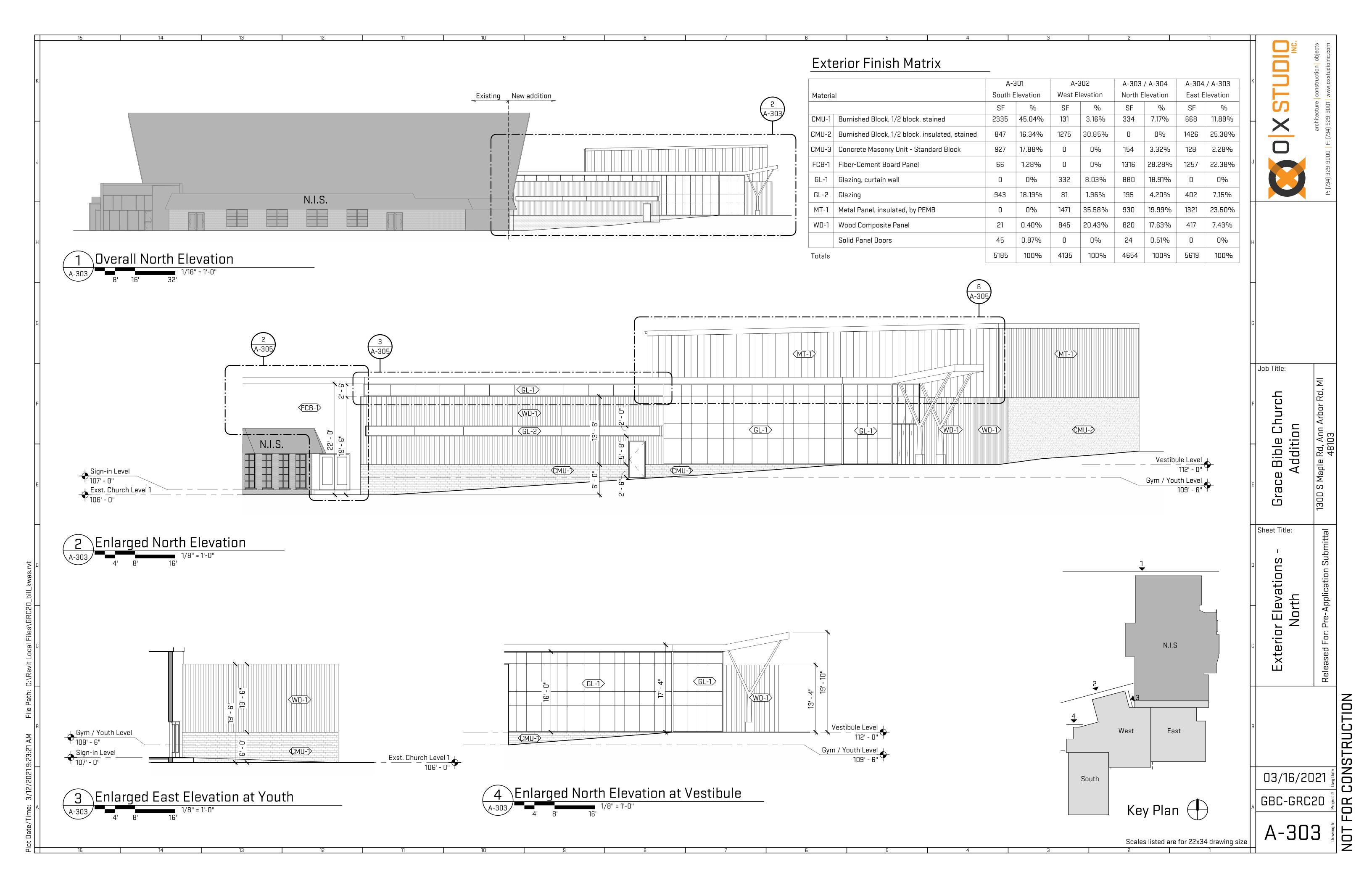


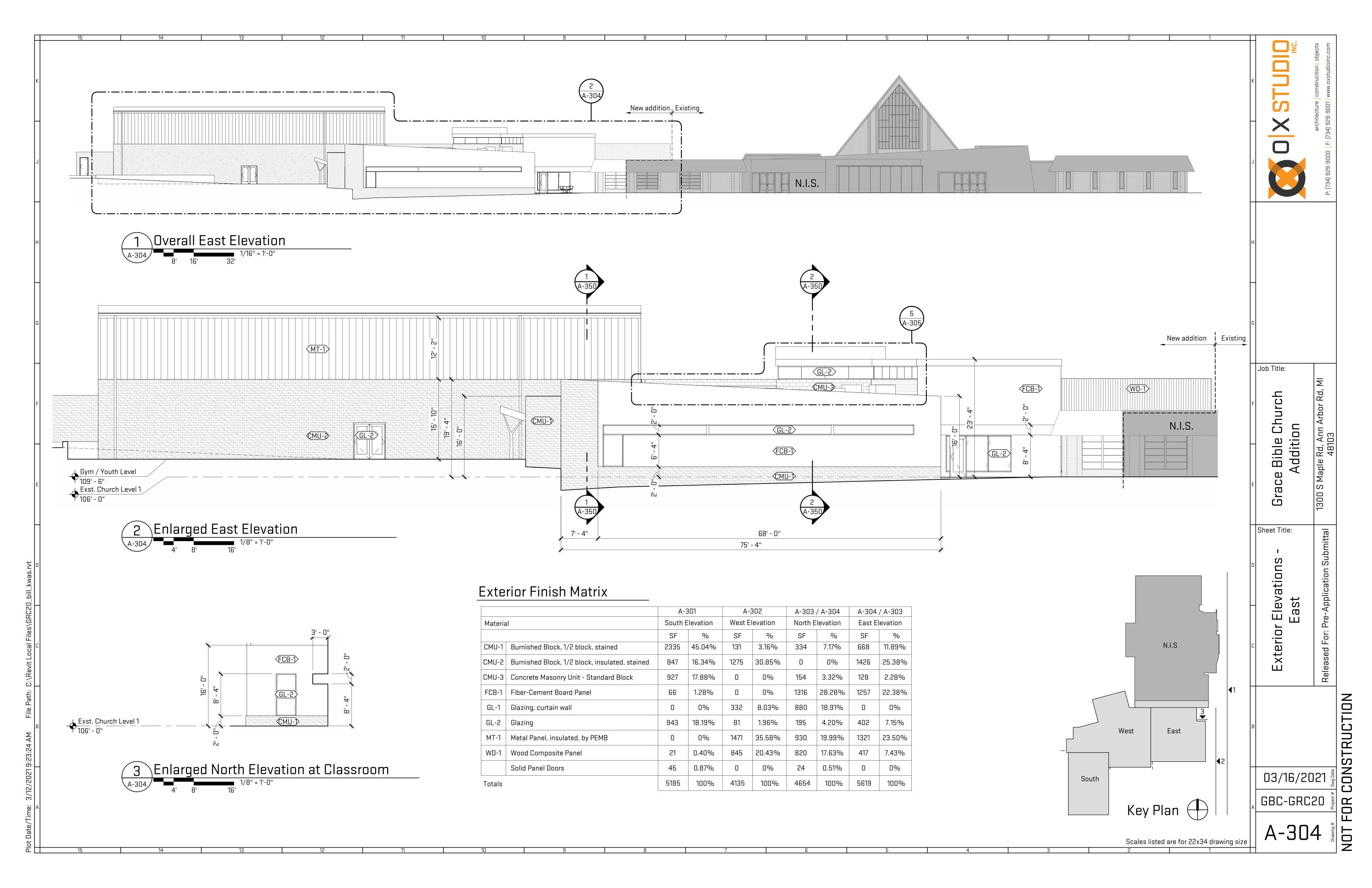


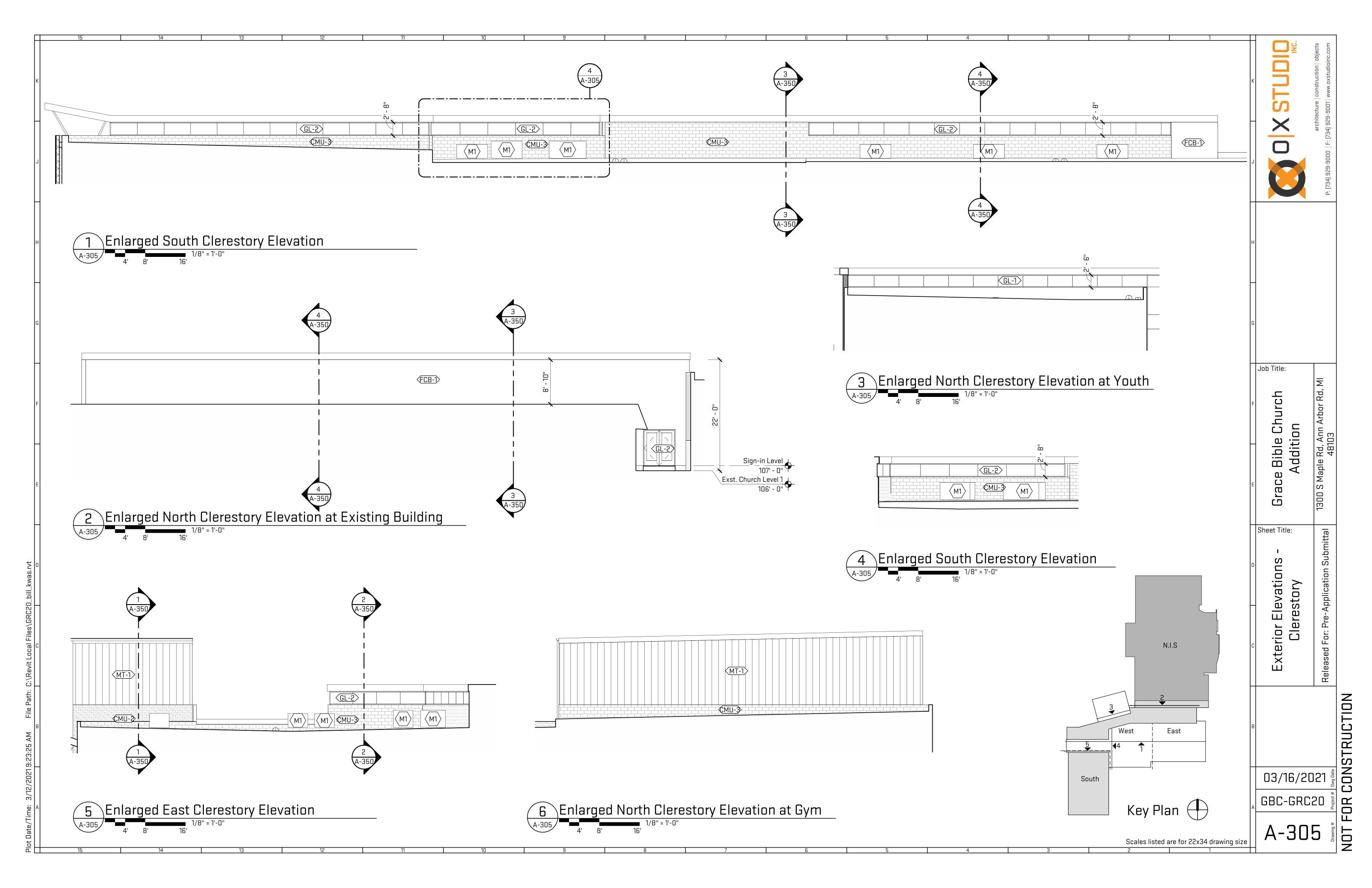


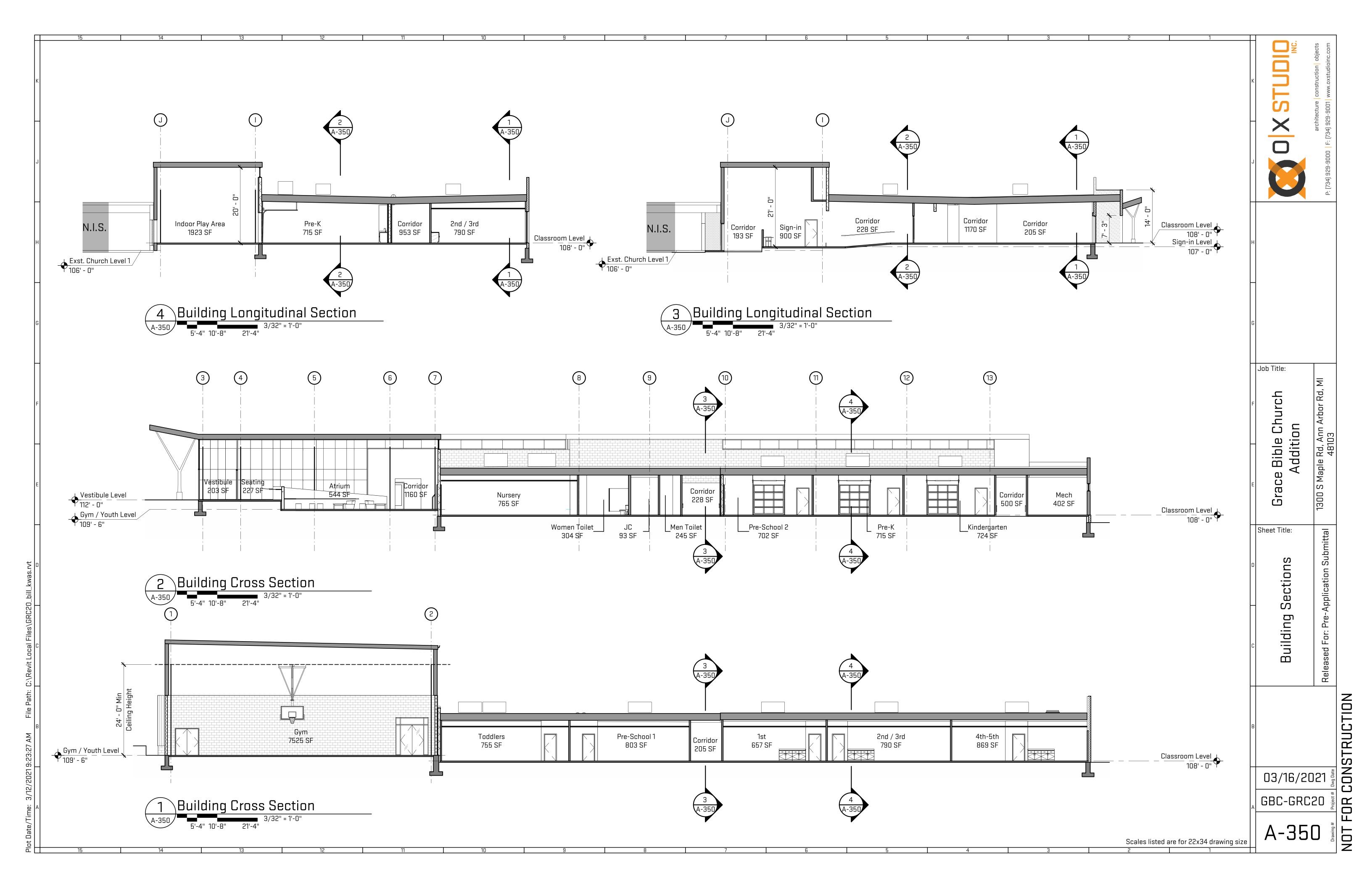












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X-102.2

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235 e. main street, suite 102b, northville, mi 48167 voice: 248.449.3564 fax: 248.449.6984

inFORM

TOTAL SANCTUARY AREA AFTER EXPANSION: 7365 SF

SANCTUARY 118

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EX.F.4 EX.F.8

SANCTUARY EXPANSION FLOORPLAN PERPENDICULAR PEW ORIENTATION

1/8" = 1'-0"

—— — EX.2.1

—— — EX.0.1

REFERENCE STRUCTURAL

SANCTUARY EXPANSION SECTION
3/16" = 1'-0"

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inFORM s t u d i o

GRACE BIBLE CHURCH RESTROOM RENOVATIONS
1300 S. MAPLE ROAD

PROJECT# 2014.2147.03

X-301

PROPOSED RTU 'B'

PROPOSED RTU 'A'

ACOUSTIC CEILING TILE SYSTEM —
TO MATCH NARTHEX & NORTH
FOYER LAYOUT PATTERN

ALT-A -EXPOSED CLT ——/

INSULATED ALUMINUM ——
COMPOSITE PANEL OVER
6" METAL STUD FRAMING

EXPOSED STRUCTURAL STEEL -COLUMNS - REFERENCE STRUCTURAL



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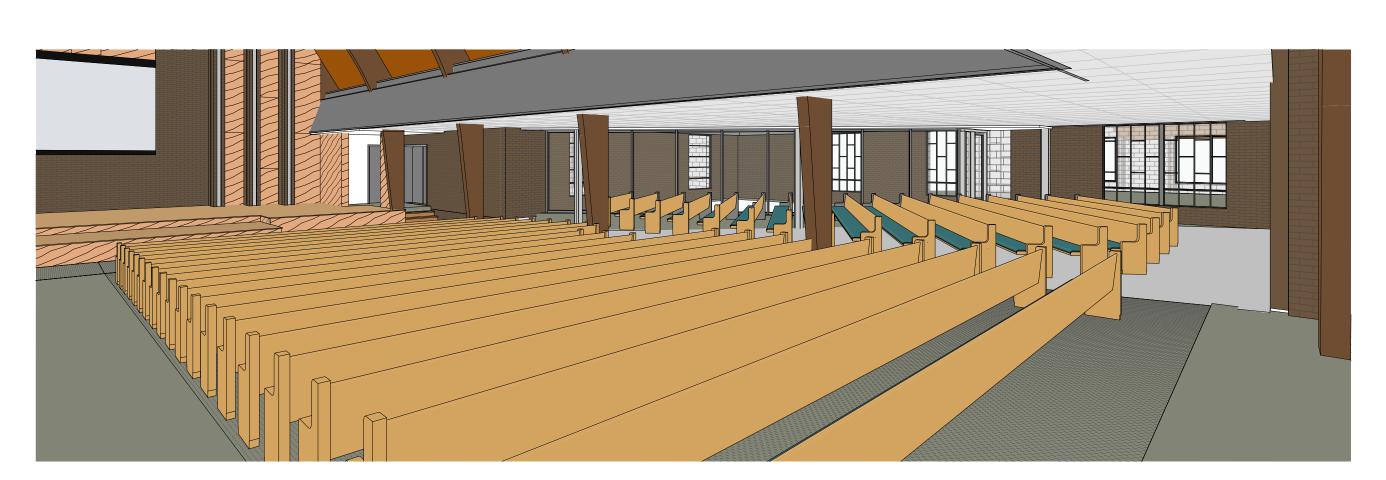




4 SOUTH WING PERSPECTIVE VIEW A



3 NORTH WING PERSPECTIVE VIEW C



2 NORTH WING PERSPECTIVE VIEW B



NORTH WING PERSPECTIVE VIEW A

PERSPECTIVE VIEWS

GRACE BIBLE CHURCH RESTROOM RENOVATIONS
1300 S. MAPLE ROAD

PROJECT# 2014.2147.03

X-501 ½