TECHNOLOGY CORRIDOR DEVELOPMENT

Report of Staff Recommendation

File No.: 5-B-21-TOB

Applicant:	**VALLEY CHURCH**
Request:	**BUILDING PERMIT**
Meeting Date:	**5/10/2021**
Address:	11012 Hardin Valley Rd.
Map/Parcel Number:	103 11102
Location:	Southeast quadrant of intersection of Hardin Valley Road and Award Winning Way
Existing Zoning:	OB (Office, Medical, and Related Services) / TO (Technology Overlay) and PR (Planned Residential) / TO (Technology Overlay)
Proposed Zoning:	N/A
Existing Land Use:	Undeveloped land
Proposed Land Use:	Church
Appx. Size of Tract:	20 acres
Accessibility:	Access is off of Hardin Valley Road, a minor arterial with a pavement width of 42.2 ft inside a 88-ft right-of-way.
Surrounding Zoning and Land Uses:	North: PR (Planned Residential) with up to 3 du/ac / TO (Technology Overlay) - South: RA (Low Density Residential) / TO (Technology Overlay) - East: BP (Business and Technology Park) / TO (Technology Overlay) - West: PR (Planned Residential) / TO (Technology Overlay) -

Comments:

1) This is a request for approval of a building permit for a 12,339 square foot church, though plans indicate a potential future addition.
2) The proposed church would be located on a 20-acre site, 14.62 acres of which is in the Hillside and Ridgetop Protection Area (HP). The TTCDA has more stringent criteria for sites in HP areas with regard to the ground area coverage (GAC) and floor area ratio (FAR) than their standard requirements of 25% and 30%, respectively.

a. The GAC requirement in HP areas allows a maximum of 5,000 sq ft of building footprint per 2 acres. At 20 acres, the site would allow a total building footprint of up to 50,000 sq ft. The proposed GAC is 1,234 square feet per 2 acres.

b. The FAR requirement in the HP area is a ratio between the building footprint and the maximum amount of the site that can be disturbed per a slope analysis based on the HP plan for Knox County. For this site, the maximum buildable acreage is 11.42 acres, or 497,455 sq ft, which yields an IAR of 25%, which is below the maximum allowed by the TTCDA Guidelines.

3) The impervious area ratio (IAR) in HP areas is limited to 50% within slopes ranging from 15% to 25%; otherwise, the IAR must be below 70%. The proposal shows the building outside of this slope range. The proposal yields an IAR of 6.4%.
4) The site has two drainage features, one of which ("Channel 2" in the hydrology report) was depicted on the County's Quad Map as a blue-line stream. The other ("Channel 1") was not identified on the Quad Map. GEOServices performed a hydrological determination on both drainage features and determined that Channel 1 was a blue-line stream subject to the required buffer. It crosses into the site on the northeast and requires a 50-ft buffer on each side of the stream. Channel 2 is a dry upland channel with no visible bed or bank and did not pass the threshold to be considered a blue-line stream, so Channel 2 is not subject to stream buffers.

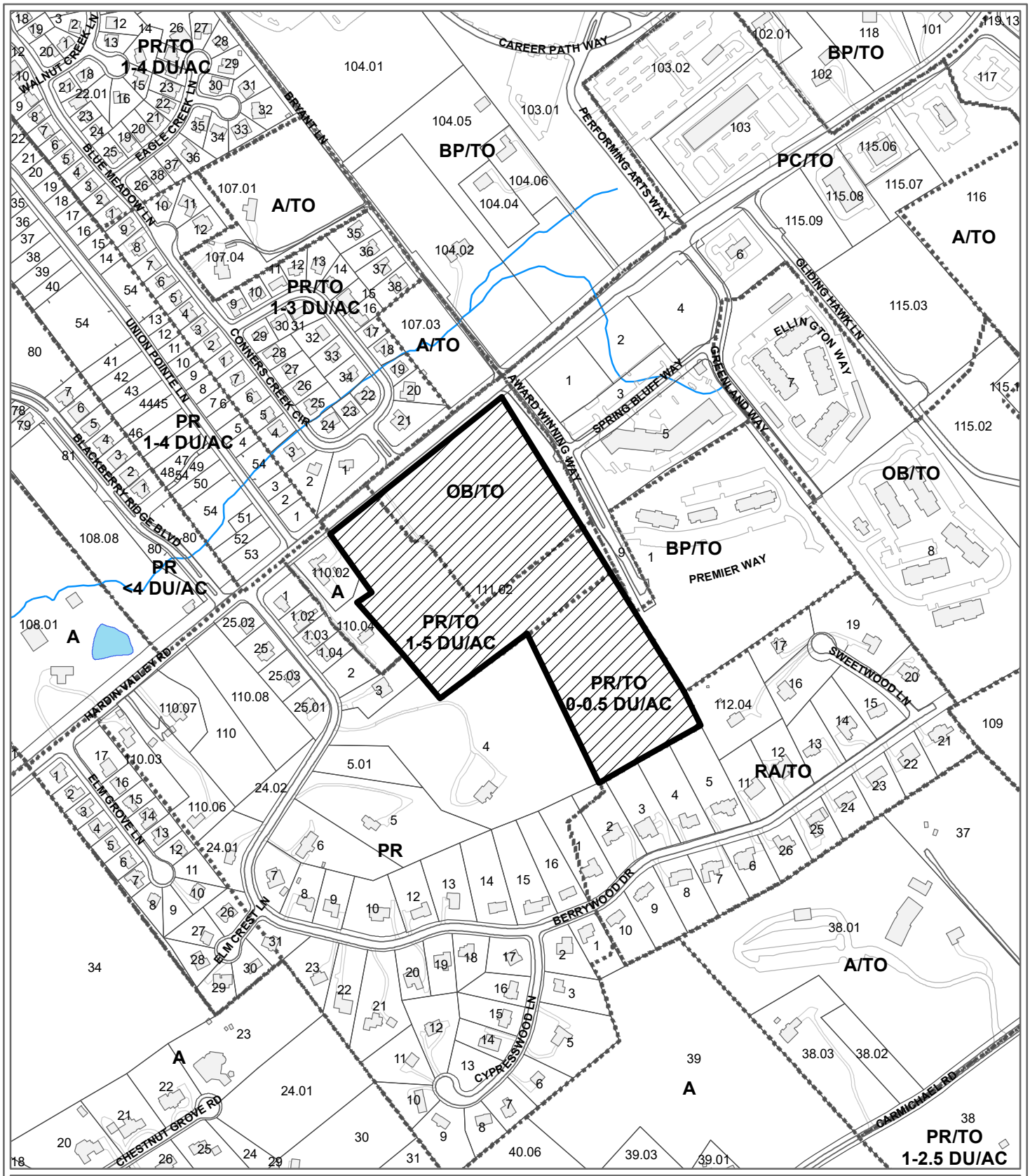
5) The site has frontage on Hardin Valley Road and Award Winning Way. Access to the site will be from Award Winning Way via a private drive into the site.
6) The TTCDA Guidelines requires between 85 and 113 new parking spaces; there are 102 spaces proposed, including 5 handicap spaces.
7) A sidewalk runs alongside the driveway entry from Award Winning Way to the sidewalks at the church entry. The County has requested a crosswalk from the proposed sidewalk along the driveway to the sidewalks at the entry to the shopping center on the other side of Award Winning Way. This can be finalized with the County's Engineering staff during the permitting stage.
8) The proposed landscaping is in compliance with TTCDA Guidelines.
9) The proposed lighting plan includes full cut-off LED fixtures for all building and site lighting. Fixtures will be bronze and all light poles specified meet TTCDA height requirements. The proposed lighting complies with TTCDA Guidelines with the exception of the following requested waiver:
a. A waiver of section 1.8.D to increase the allowable footcandles to 5.5 fc on the entry drive (versus the 0.5 maximum allowed in the Guidelines) to increase safety and security on the site.
10) The proposed structure is 35 ft tall, which meets TTCDA Guidelines.
11) The building will feature brick, wood panels, and decorative metal panels. The roof system is a combination of flat roofs and pitched roofs; the pitched roofs will have standing seam metal. Windows will have a bronze glaze. An aluminum canopy system provides shelter from the elements at the entry doors.
12) The dumpster is appropriately screened from Award Winning Way.
13) There is no signage proposed with this submittal. Any signage would require TTCDA approval as a separate application.
14) Any future proposed building addition would require TTCDA approval of the addition.

Design Guideline Conformity:	With approval of the waivers and conditions, the proposed development plan will be in conformity with the Design Guidelines.
Waivers and Variances Requested:	1) Waiver to allow 5.5 fc on the entry drive.

Staff Recommendation:

Based on the application and plans as submitted and revised, Staff recommends the following actions on the required waivers from the Design Guidelines:
1) APPROVE the waiver to allow 5.5 fc on the entry drive to increase safety and security on the site.

Based on the application and plans as submitted and revised, Staff recommends APPROVAL of this request for a Certificate of Appropriateness for a building permit, subject to the following conditions:
1) Connection to sanitary sewer and meeting any other relevant requirements of the utility provider.
2) Installing all landscaping as identified on the approved landscape plan within six months of the issuance of an occupancy permit for this project, or posting a bond with the Knox County Department of Engineering and Public Works to guarantee such installation.
3) Meeting all applicable requirements of the Knox County Department of Engineering and Public Works.
4) Meeting all applicable requirements of the Knox County Zoning Ordinance.
5) Any proposed signage will require a separate TTCDA application and approval.
6) Any proposed future addition would require a separate TTCDA application and approval.



5-B-21-TOB
CERTIFICATE OF APPROPRIATENESS

Petitioner: Valley Church

Purpose of Request: Building Permit - New Construction

Map No: 103
Jurisdiction: County

0 500
Feet

N

Original Print Date: 4/13/2021 Revised:

*Knoxville - Knox County Planning Commission * City / County Building * Knoxville, TN 37902*

CATEGORY	ACRES	RECOMMENDED LAND DISTURBANCE FACTOR	ACRES OF DISTURBANCE ALLOWED
Non-Hillside	**5.33**	**1.00**	**5.33**
0-15% Slope	2.04	1.00	2.04
15-25% Slope	5.30	0.50	2.65
25-40% Slope	6.71	0.20	1.34
Greater than 40% Slope	0.57	0.10	0.06
Ridgetops	0	0.00	0.00
Subtotal: Sloped Land	**14.62**		**6.09**
Site Total, Disturbed Area (Hillside & Ridgetop Protection Plan)	**19.95**	**0.57**	**11.42**

From Hillside & Ridgetop Protection Plan, page 33

Density and Land Disturbance Guidelines

As proposals for changes to the zoning map and development plans/concept plans are considered, the following factors are recommended to determine the overall allowable density for residential rezonings and the overall land disturbance allowable in new development or subdivisions for those portions of parcels that are within the Hillside and Ridgetop Protection Area. These factors should be codified as regulations in the future. The areas of the Growth Policy Plan referenced below are presented on page 18.

Table 3: Residential Density and Land Disturbance Guidelines
for Recommendations on Changes to the Zoning Map and Development Plan/ Concept Plan Review within the Hillside and Ridgetop Protection Area that is within the Urban Growth and the Planned Growth Area

Percent of Slope	*Recommended Maximum Density Factor**	*Recommended Maximum Land Disturbance Factor***
0 - 15	Knox County: 5 dua City of Knoxville: 6 dua	100%
15 - 25	2 dua	50%
25 - 40	0.5 dua	20%
40 or more	0.2 dua	10%
Ridgetops***	***	***

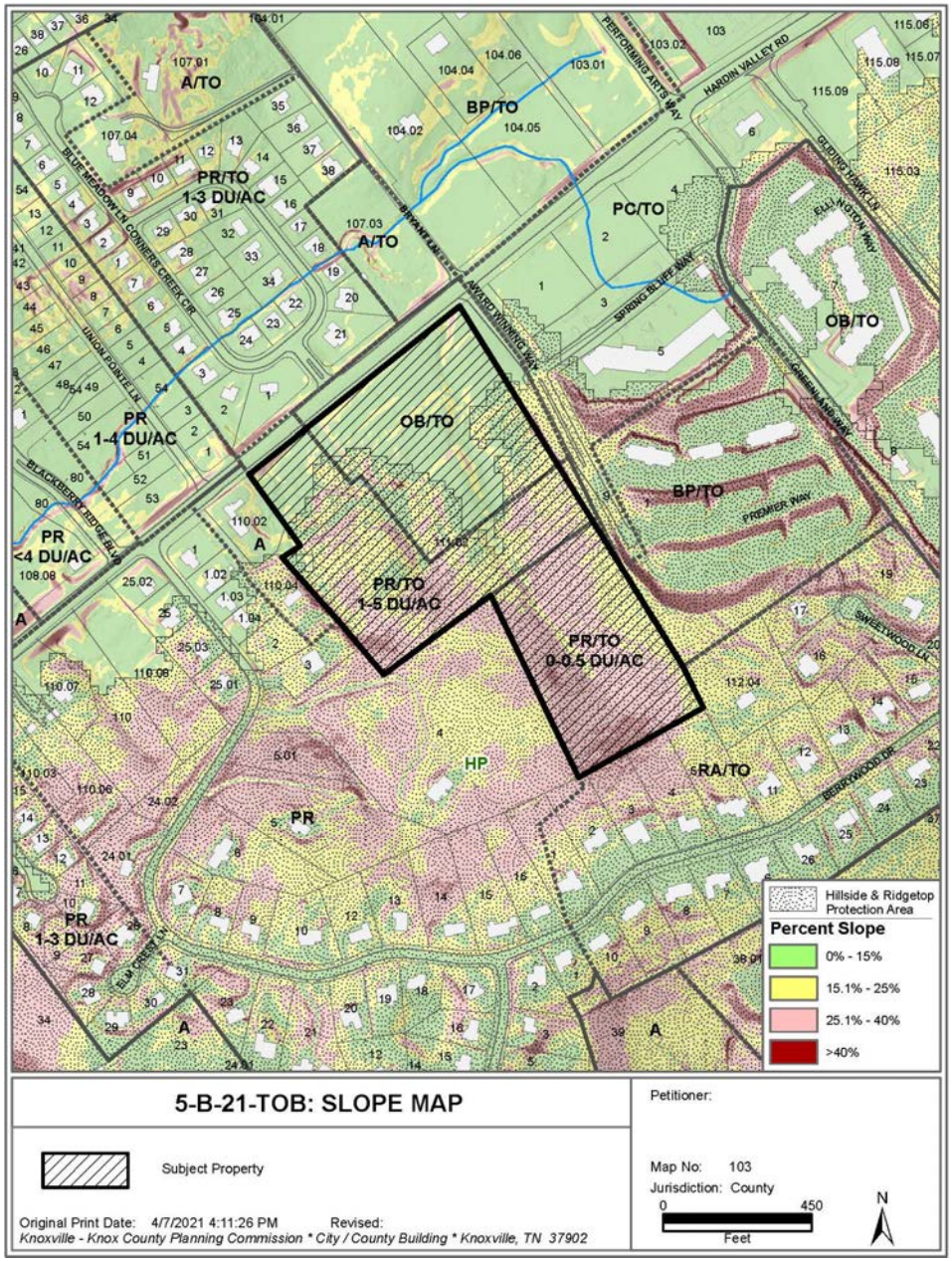
dua: dwelling units per acre

* These factors should be considered guidelines to determine an overall recommended residential density for requests for changes to the zoning map to planned residential (RP-1 in the city and PR in the county) zone districts that are considered by the Metropolitan Planning Commission prior to being considered by the appropriate legislative body. The resulting zone district development right would be considered a budget for dwelling units to be applied over the entire proposed development.

** Until such time as regulations are codified by the appropriate legislate body, these factors should be considered guidelines to determine an overall recommended land disturbance area for development plans and concept plans that are considered for approval by the Metropolitan Planning Commission. The overall land disturbance area would be considered a budget for land disturbance to be applied over the entire proposed development.

*** Ridgetops are generally the more level areas on the highest elevations of a ridge. Because the shapes of Knox County ridges are so varied (see pages 8 – 9), the ridgetop area should be determined on a case-by-case basis with each rezoning and related development proposal.

The Knoxville Knox County Hillside and Ridgetop Protection Plan — 33



April 23, 2021

Michelle Portier, AICP
Senior Planner
Knoxville-Knox County Planning
400 Mina St., Suite 403
Knoxville, TN 37902

Re: Valley Church UMC

Ms. Portier:

On behalf of John Gargis, applicant for Valley Church UMC, we would like to request a waiver to specific subsections of the TTCDA Guidelines for Lighting (i.e., Section 1.8) noting that the submitted plans strive to meet the intent of the guidelines either directly or as best alternative measures. Please consider granting the following waiver:

Section 1.8.5.D: Increase the maximum intensity of lighting from 0.5 foot candles to 2.0 foot candles along streets and driveways. If approved, this waiver will provide greater illumination along the entrance drive, increasing the safety for those traveling along it.

We appreciate your time and consideration of this request. Please contact me if you have any questions.

Thank you,

William C. Fulghum, Jr. P.E.

c: John Gargis, Valley Church UMC

10330 HARDIN VALLEY ROAD SUITE 201 KNOXVILLE, TN 37932 T 865.690.6419 F 865.690.6448 www.fulghummacindoe.com

U.S. Fish and Wildlife Service

National Wetlands Inventory

11012 hardin valley rd

April 9, 2021

Wetlands

- Estuarine and Marine Deepwater
- Estuarine and Marine Wetland
- Freshwater Emergent Wetland
- Freshwater Forested/Shrub Wetland
- Freshwater Pond
- Lake
- Other
- Riverine

April 19, 2021

Valley Church
10629 Hardin Valley Road #279
Knoxville, Tennessee 38932

Attention: Mr. John Gargis
john@valleychurch.church

Subject: **Hydrologic Determination Report**
Valley Church – 11012 Hardin Valley Road
Knox County, Tennessee
GEOServices Project No. 24-21344

Dear Mr. Gargis:

GEOServices, LLC has completed a Stream Determination Report for two (2) drainage features at the referenced project, located along Hardin Valley Road in Knox County, Tennessee. Please see our findings in the attached report.

GEOServices appreciates the opportunity to continue providing services to you and looks forward to working with you in the future. If you have any questions, please do not hesitate to contact us at your convenience.

Sincerely,
GEOServices, LLC

Ryan Hennessey
Staff Geologist

Jason Mann, EI, TN-QHP # 1042-TN10
Environmental Project Manager

HYDROLOGIC DETERMINATION REPORT

FOR

VALLEY CHURCH – 11012 HARDIN VALLEY ROAD

KNOX COUNTY, TENNESSEE

Prepared For:

Valley Church
10629 Hardin Valley Road #279
Knoxville, Tennessee 38932

Prepared by:

GEOServices, LLC
2561 Willow Point Way
Knoxville, Tennessee 37931

April 19, 2021

GEOServices Project No.: 24-21344

1.0 INTRODUCTION

GEOServices, LLC (GEOServices) performed a hydrological determination on two (2) drainage feature located in the headwaters of Conner Creek along Hardin Valley Road, Knox County, Tennessee. The site investigation and stream determination was conducted on April 9, 2021 by Ryan Hennessey of GEOServices.

2.0 SITE DESCRIPTION

The subject project location is on a single parcel within Knox County. Specifically, the project is located at Parcel ID: 103 11102 according to the KGIS website. The overall parcel footprint is roughly 20.00-acres in size; **Map 1** in **Appendix A** provides an overview of the subject location. The site is primarily surrounded by commercial properties.

Map 2 in **Appendix A** illustrates the location of the hydrologic resources evaluated on site. One channel, **Channel 1** is located on the western portion of the property and drains towards Connor Creek. **Channel 1** begins from groundwater seep located within the hillslope of the property and exits the property via a culvert beneath Hardin Valley Road. **Channel 1** achieved moderate scores in all secondary field indicator categories (i.e. Geomorphology, Hydrology, and Biology). **Channel 2** was requested to be evaluated by the client due to the location of a "blue-line" depiction on a USGS map. **Channel 2** was observed on the eastern portion of the property draining towards a culvert beneath Harden Valley Road. **Channel 2** did not pass primary field characteristics of stream indicators.

Based on the Lovell USGS 7.5 - Minute Topographic Quadrangle (**Map 3** in **Appendix A**), only the eastern hydrologic feature is depicted as a "blue-line". Additionally, the topography of the parcel has an approximate elevation range between approximately 965 and 1220 feet above mean sea level.

The soils map associated with this site is shown as **Map 4** in **Appendix A**. The dominant soil type found within the property was Heiskell silt loam, 2 to 5 percent slopes and Minvale-Fullerton complex, 12 to 25 percent slopes, stony. The Heiskell silt loam is moderately well drained with a high available water capacity and the Minvale-Fullerton complex is well drained with a moderate available water capacity. One of the soils at the base of **Channel 1**, Steadman silt loam, 0 to 3 percent slopes, occasionally flooded, is associated with hydric conditions. No additional soils mapped in the general area are correlated with hydric conditions.

The entire project is located within the Clinch River-Conner Creek Watershed (HUC12 060102070404), which is nested within Lower Clinch River Watershed (HUC8 06010207). Conner Creek is not listed on the 2020 303(d) list of impaired waterways in Tennessee; the receiving stream is considered to be in attainment for all parameters.

3.0 RESOURCE DESCRIPTION

Channel 1 - The channel in question is located on the western portion of the property. The channel was flowing at the time of the site reconnaissance and drained towards Connor Creek via a culvert. The channel begins at a surficial groundwater seep located on the hillslope of the property.

Channel 2 – This channel is a dry upland channel with no visible bed or bank present.

No other water resources were found or evaluated during this investigation.

4.0 METHODS

The channel was evaluated using the Tennessee Department of Environment and Conservation Hydrologic Determination Field Data form v1.5. Weather calculations, field data sheets, photos, and a copy of QHP Certification 1042-TN10 is provided in the attached appendices.

5.0 RESULTS

Channel 1 – Stream due to primary and secondary stream indicators; a secondary score of **21.5** was calculated using a reasonable amount of effort.

Channel 2 - Wet Weather Conveyance due to primary stream indicators.

Map 2 illustrates the georeferenced location of the water resources in question, and is included in Appendix A.

Appendix A

Maps

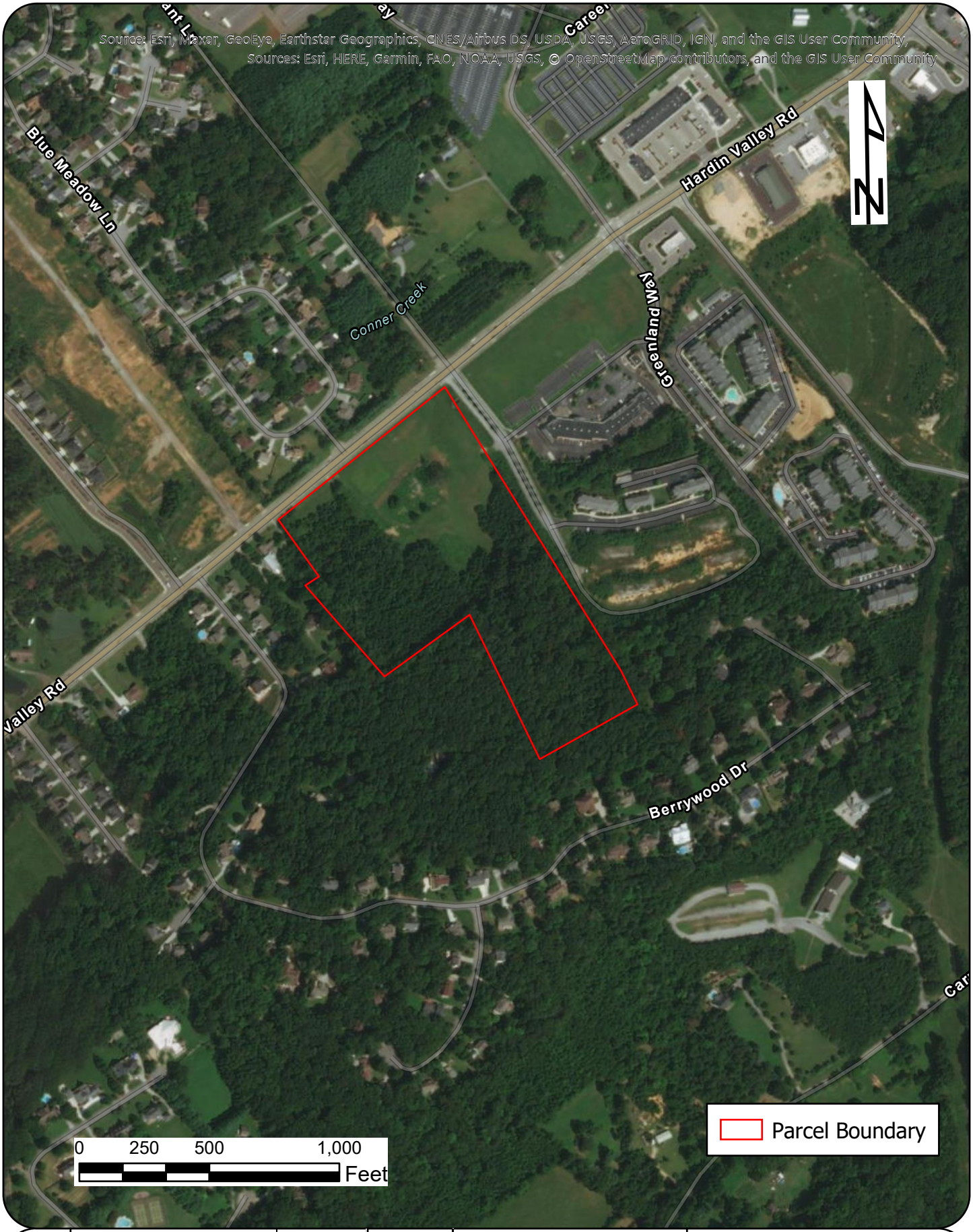


FIGURE 1

GEOS
Geotechnical, Environmental and Materials Engineers

DRAWN BY:	RH
REVIEWED BY:	BB
SCALE:	AS SHOWN
JOB NO.:	24-21344
DATE:	APRIL 2021

SITE LOCATION MAP

VALLEY CHURCH
STREAM DETERMINATION
HARDIN VALLEY, TENNESSEE

NOTES:

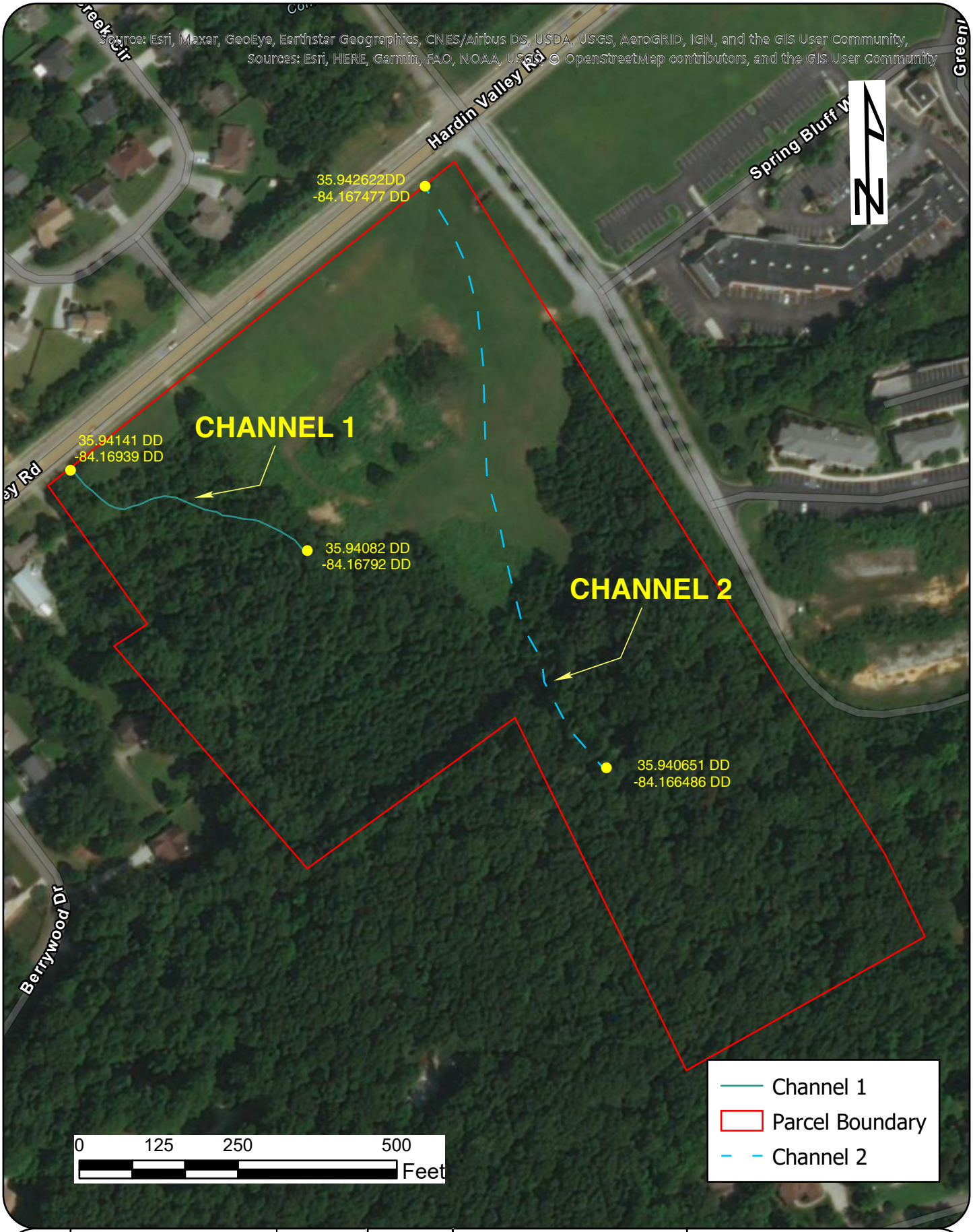


FIGURE 2

GEOS Geotechnical, Environmental and Materials Engineers

DRAWN BY:	RH
REVIEWED BY:	BB
SCALE:	AS SHOWN
JOB NO.:	24-21344
DATE:	APRIL 2021

HYDROLOGIC RESOURCES

VALLEY CHURCH
STREAM DETERMINATION
HARDIN VALLEY, TENNESSEE

NOTES:

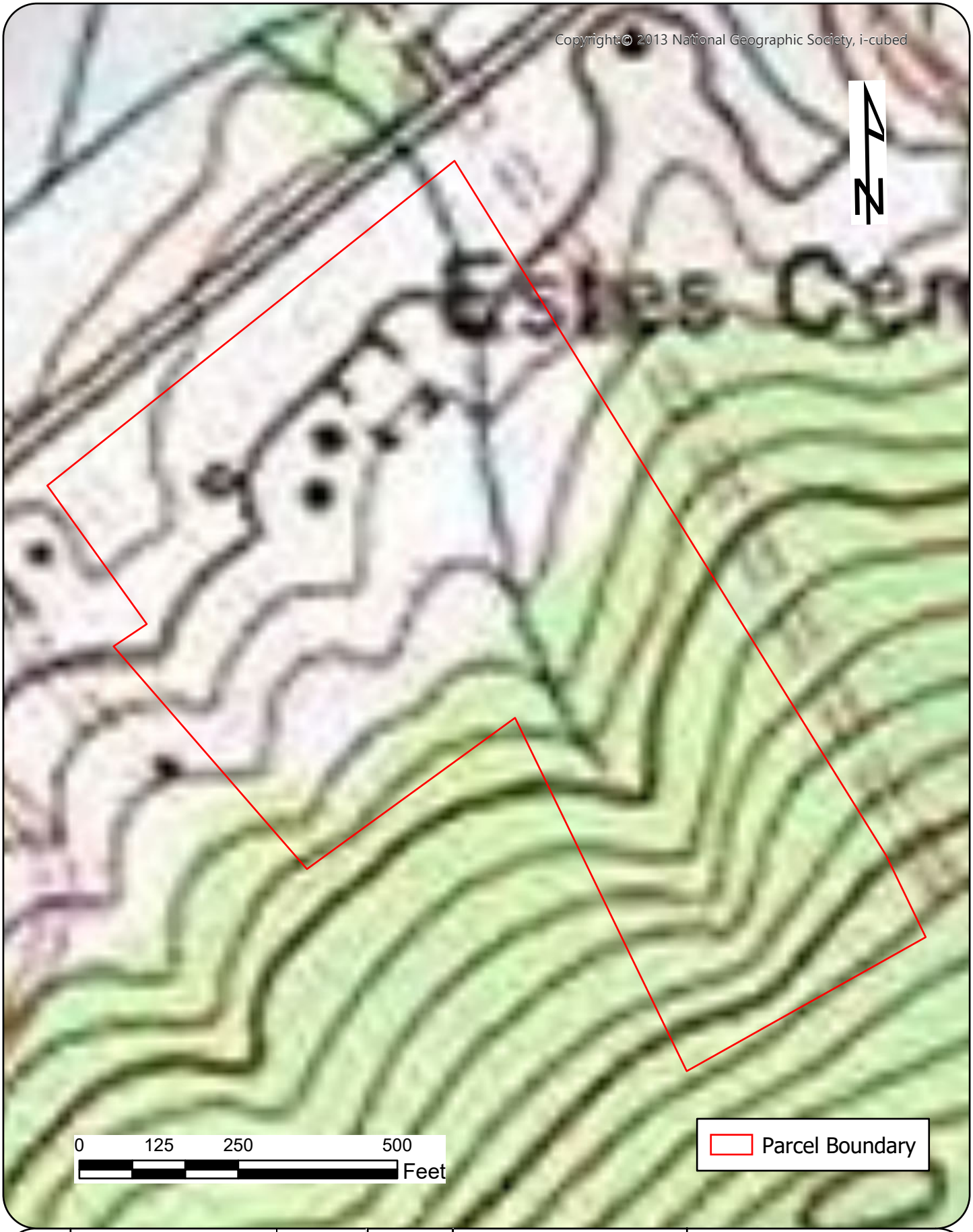


FIGURE 3

GEOS
Geotechnical, Environmental and Materials Engineers

DRAWN BY:	RH
REVIEWED BY:	BB
SCALE:	AS SHOWN
JOB NO.:	24-21344
DATE:	APRIL 2021

TOPOGRAPHIC MAP

VALLEY CHURCH
STREAM DETERMINATION
HARDIN VALLEY, TENNESSEE

NOTES:

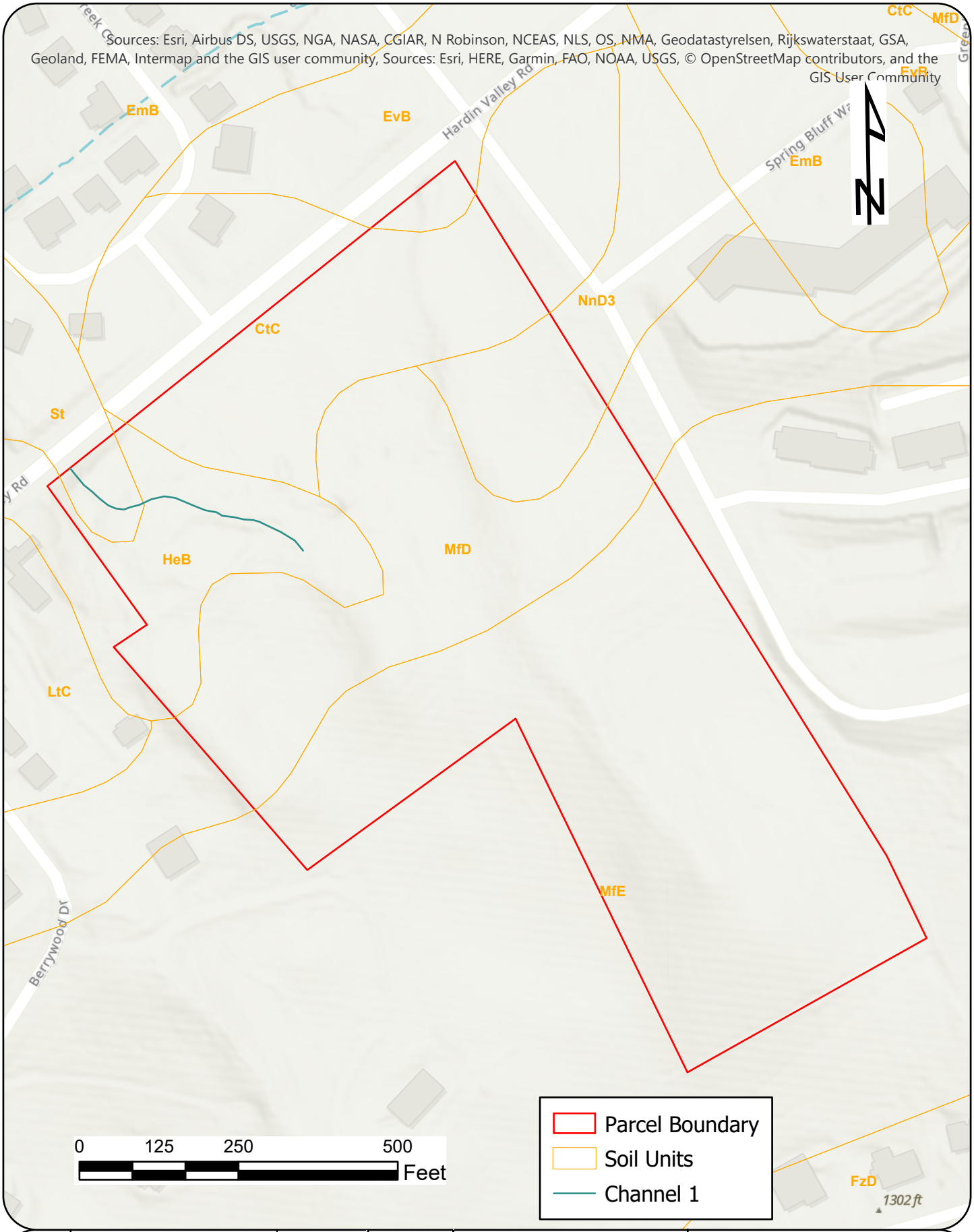


FIGURE 4

GEOS Geotechnical, Environmental and Materials Engineers

DRAWN BY:	RH
REVIEWED BY:	BB
SCALE:	AS SHOWN
JOB NO.:	24-21344
DATE:	APRIL 2021

SOILS MAP

VALLEY CHURCH
STREAM DETERMINATION
HARDIN VALLEY, TENNESSEE

NOTES:

Appendix B

Photographs

Photograph 1: Photograph of Channel 1 showing aquatic plants within bank.

Photograph 2: Typical section of Channel 1.

Photograph 3: Area depicted as Channel 2 draining towards culvert.

Photograph 4: Photograph of Channel 2.

Appendix C

Field Data Sheets

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Channel 1	Date/Time: 4/9/21 - 11:30
Assessors/Affiliation: R. Hennessey / GEOServices, LLC	Project ID : 24-21344
Site Name/Description: Valley Church	
Site Location: 11012 Hardin Valley Road	
HUC (12 digit): Clinch River - Conner Creek (060102070404)	Lat/Long: 35.94109, -84.16862
Previous Rainfall (7-days) : 0.18"	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data :	
Watershed Size : 5.8-acres	County: Knox
Soil Type(s) / Geology : Heiskell silt loam / Chickamauga Group	Source: WSS/ Macrostrat
Surrounding Land Use : Residential/ Commercial	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge	X	WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species	X	WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions	X	WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall	X	WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase	X	Stream
6. Presence of fish (except *Gambusia*)	X	Stream
7. Presence of naturally occurring ground water table connection	X	Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed	X	Stream
9. Evidence watercourse has been used as a supply of drinking water	X	Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = STREAM

Secondary Indicator Score (if applicable) = 21.5

Justification / Notes : Upstream: 35.94082, -84.16792

Downstream: 35.94141, -84.16939

Channel has been altered by the dumping of miscellaneous trash/debris.

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal = 6)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	0.5	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal = 8.5)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal = 7)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = 21.5

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

True aquatic plants found near bottom of the channel.

Hydric soils located on teh side of the channel in multiple areas.

Mayflies and other macrobenthic organisms readily found on overturned rocks.

Channel begins at a surficial spring feature at the ridge.

Hydrologic Determination Field Data Sheet

Tennessee Division of Water Pollution Control, Version 1.5

Named Waterbody: Channel 2	Date/Time: 4/9/21 - 11:30
Assessors/Affiliation: R. Hennessey / GEOServices, LLC	Project ID : 24-21344
Site Name/Description: Valley Church	
Site Location: 11012 Hardin Valley Road	
HUC (12 digit): Clinch River - Conner Creek (060102070404)	Lat/Long: 35.94109, -84.16862
Previous Rainfall (7-days) : 0.18"	
Precipitation this Season vs. Normal : abnormally wet elevated average low abnormally dry unknown Source of recent & seasonal precip data :	
Watershed Size : 5.8-acres	County: Knox
Soil Type(s) / Geology : Heiskell silt loam / Chickamauga Group	Source: WSS/ Macrostrat
Surrounding Land Use : Residential/ Commercial	
Degree of historical alteration to natural channel morphology & hydrology (circle one & describe fully in Notes) : Severe Moderate Slight Absent	

Primary Field Indicators Observed

Primary Indicators	NO	YES
1. Hydrologic feature exists solely due to a process discharge		WWC
2. Defined bed and bank absent, vegetation composed of upland and FACU species		WWC
3. Watercourse dry anytime during February through April 15th, under normal precipitation / groundwater conditions		WWC
4. Daily flow and precipitation records showing feature only flows in direct response to rainfall		WWC
5. Presence of multiple populations of obligate lotic organisms with ≥ 2 month aquatic phase		Stream
6. Presence of fish (except *Gambusia*)		Stream
7. Presence of naturally occurring ground water table connection		Stream
8. Flowing water in channel and 7 days since last precip >0.1" in local watershed		Stream
9. Evidence watercourse has been used as a supply of drinking water		Stream

NOTE: If any Primary Indicators 1-9 = "Yes", then no further investigation is necessary. However, assessors may choose to score secondary indicators as supporting evidence.

In the absence of a primary indicator, or other definitive evidence, complete the secondary indicator table on page 2 of this sheet, and provide score below.

Guidance for the interpretation and scoring of both the primary & secondary indicators is provided in *TDEC-WPC Guidance For Making Hydrologic Determinations, Version 1.5*

Overall Hydrologic Determination = WWC

Secondary Indicator Score (if applicable) = NA

Justification / Notes : Upstream: 35.940651, -84.166486

Downstream: 35.942622, -84.167477

Secondary Field Indicator Evaluation

A. Geomorphology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
1. Continuous bed and bank	0	1	2	3
2. Sinuous channel	0	1	2	3
3. In-channel structure: riffle-pool sequences	0	1	2	3
4. Sorting of soil textures or other substrate	0	1	2	3
5. Active/relic floodplain	0	0.5	1	1.5
6. Depositional bars or benches	0	1	2	3
7. Braided channel	0	1	2	3
8. Recent alluvial deposits	0	0.5	1	1.5
9. Natural levees	0	1	2	3
10. Headcuts	0	1	2	3
11. Grade controls	0	0.5	1	1.5
12. Natural valley or drainageway	0	0.5	1	1.5
13. At least second order channel on existing USGS or NRCS map	No = 0		Yes = 3	

B. Hydrology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
14. Subsurface flow/discharge into channel	0	1	2	3
15. Water in channel and >48 hours since sig. rain	0	1	2	3
16. Leaf litter in channel (January – September)	1.5	1	0.5	0
17. Sediment on plants or on debris	0	0.5	1	1.5
18. Organic debris lines or piles (wrack lines)	0	0.5	1	1.5
19. Hydric soils in channel bed or sides of channel	No = 0		Yes = 1.5	

C. Biology (Subtotal =)	**Absent**	**Weak**	**Moderate**	**Strong**
20. Fibrous roots in channel bed [1]	3	2	1	0
21. Rooted plants in the thalweg [1]	3	2	1	0
22. Crayfish in stream (exclude in floodplain)	0	1	2	3
23. Bivalves/mussels	0	1	2	3
24. Amphibians	0	0.5	1	1.5
25. Macrobenthos (record type & abundance)	0	1	2	3
26. Filamentous algae; periphyton	0	1	2	3
27. Iron oxidizing bacteria/fungus	0	0.5	1	1.5
28.Wetland plants in channel bed [2]	0	0.5	1	1.5

[1] Focus is on the presence of terrestrial plants.

[2] Focus is on the presence of aquatic or wetland plants.

Total Points = _____

Under Normal Conditions, Watercourse is a Wet Weather Conveyance if Secondary Indicator Score < 19 points

Notes :

Appendix D

Climate & Weather Data

Select Other Date

[Explanation of the Preliminary Monthly Climate Data (F6) Product]

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

WFO Monthly/Daily Climate Data

```
000
CXUS54 KMRX 121030
CF6TYS
PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6)

                                        STATION:   KNOXVILLE MCGHEE TYSON AIRPORT
                                        MONTH:     APRIL
                                        YEAR:      2021
                                        LATITUDE:   35 49 N
                                        LONGITUDE:  83 59 W

  TEMPERATURE IN F:       :PCPN:    SNOW:  WIND      :SUNSHINE: SKY     :PK WND
================================================================================
1   2   3   4   5  6A  6B    7    8   9   10  11  12  13   14  15   16   17  18
                                      12Z  AVG MX 2MIN
DY MAX MIN AVG DEP HDD CDD  WTR  SNW DPTH SPD SPD DIR MIN PSBL S-S WX    SPD DR
================================================================================

 1  47  35  41 -14  24   0 0.00  0.0    0  8.0 15  10   M    M   3        23  10
 2  49  28  39 -16  26   0 0.00  0.0    0  6.6 20  30   M    M   0        24  40
 3  62  27  45 -10  20   0 0.00  0.0    0  2.8 12 270   M    M   0        19 290
 4  71  36  54  -2  11   0 0.00  0.0    0  2.1 10 310   M    M   0        15 320
 5  76  41  59   3   6   0 0.00  0.0    0  2.4 15 260   M    M   1        22 250
 6  78  48  63   7   2   0 0.00  0.0    0  3.4 15 250   M    M   3 8      20 260
 7  80  50  65   9   0   0 0.00  0.0    0  3.4 14 230   M    M   4        18 250
 8  76  61  69  12   0   4 0.18  0.0    0  8.1 26 200   M    M   7 1      37 210
 9  83  56  70  13   0   5 0.00  0.0    0  5.1 18 230   M    M   4        23 220
10  72  57  65   8   0   0 0.02  0.0    0  8.6 24 170   M    M   8 1      34 170
11  72  54  63   5   2   0 0.00  0.0    0 14.6 28 220   M    M   1        36 220
================================================================================
SM  766  493        91   9  0.20  0.0     65.1          M       31
================================================================================
AV 69.6 44.8                              5.9 FASTST   M    M   3    MAX(MPH)
                                MISC ---->    28 220                 37 210
================================================================================
NOTES:
# LAST OF SEVERAL OCCURRENCES

COLUMN 17 PEAK WIND IN M.P.H.

PRELIMINARY LOCAL CLIMATOLOGICAL DATA (WS FORM: F-6) , PAGE 2

                                        STATION:   KNOXVILLE MCGHEE TYSON AIRPORT
                                        MONTH:     APRIL
                                        YEAR:      2021
                                        LATITUDE:   35 49 N
                                        LONGITUDE:  83 59 W

[TEMPERATURE DATA]      [PRECIPITATION DATA]       SYMBOLS USED IN COLUMN 16

AVERAGE MONTHLY: 57.2   TOTAL FOR MONTH:   0.20    1 = FOG OR MIST
```

DPTR FM NORMAL: 1.0
HIGHEST: 83 ON 9
LOWEST: 27 ON 3

[NO. OF DAYS WITH]

MAX 32 OR BELOW: 0
MAX 90 OR ABOVE: 0
MIN 32 OR BELOW: 2
MIN 0 OR BELOW: 0

[HDD (BASE 65)]
TOTAL THIS MO. 91
DPTR FM NORMAL -15
TOTAL FM JUL 1 3130
DPTR FM NORMAL -333

[CDD (BASE 65)]
TOTAL THIS MO. 9
DPTR FM NORMAL 0
TOTAL FM JAN 1 10
DPTR FM NORMAL -4

[REMARKS]

DPTR FM NORMAL: -1.27
GRTST 24HR 0.18 ON 7- 8

SNOW, ICE PELLETS, HAIL
TOTAL MONTH: 0.0 INCH
GRTST 24HR 0.0
GRTST DEPTH: 0

[WEATHER - DAYS WITH]

0.01 INCH OR MORE: 2
0.10 INCH OR MORE: 1
0.50 INCH OR MORE: 0
1.00 INCH OR MORE: 0

CLEAR (SCALE 0-3) 6
PTCLDY (SCALE 4-7) 5
CLOUDY (SCALE 8-10) 0

[PRESSURE DATA]
HIGHEST SLP M ON M
LOWEST SLP 29.54 ON 11

2 = FOG REDUCING VISIBILITY TO 1/4 MILE OR LESS
3 = THUNDER
4 = ICE PELLETS
5 = HAIL
6 = FREEZING RAIN OR DRIZZLE
7 = DUSTSTORM OR SANDSTORM: VSBY 1/2 MILE OR LESS
8 = SMOKE OR HAZE
9 = BLOWING SNOW
X = TORNADO

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Monthly)

```
000
CXUS54 KMRX 020849
CLMTYS

CLIMATE REPORT
NATIONAL WEATHER SERVICE MORRISTOWN, TN
449 AM EDT FRI APR 02 2021

.................................

...THE KNOXVILLE MCGHEE TYSON AIRPORT CLIMATE SUMMARY FOR THE MONTH OF MARCH 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010
CLIMATE RECORD PERIOD: 1871 TO 2021
```

WEATHER	OBSERVED VALUE	OBSERVED DATE(S)	NORMAL VALUE	DEPART FROM NORMAL
TEMPERATURE (F)				
HIGHEST	77	03/24		
LOWEST	27	03/08		
AVG. MAXIMUM	65.7		61.4	4.3
AVG. MINIMUM	42.5		39.2	3.3
MEAN	54.1		50.3	3.8
DAYS MAX >= 90	0			
DAYS MAX <= 32	0			
DAYS MIN <= 32	3			
DAYS MIN <= 0	0			
PRECIPITATION (INCHES)				
RECORD				
MAXIMUM	13.35	1917		
MINIMUM	0.72	1910		
TOTALS	9.12		4.34	4.78
DAYS >= .01	12			
DAYS >= .10	10			
DAYS >= .50	7			
DAYS >= 1.00	6			
GREATEST				
24 HR. TOTAL	2.23	03/17 TO 03/18		
SNOWFALL (INCHES)				
TOTALS	0.0		0.9	-0.9
SINCE 7/1	5.3			
SNOWDEPTH AVG.	0			
DAYS >= TRACE	0			
GREATEST				
SNOW DEPTH	0			
DEGREE DAYS				
HEATING TOTAL	332		461	-129
SINCE 7/1	3039		3356	-317
COOLING TOTAL	1		5	-4
SINCE 1/1	1		5	-4

.....

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	5	RAIN	9
SNOW	0	FOG	13
FOG W/VIS <= 1/4 MILE	0		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Monthly)

```
918
CXUS54 KMRX 011829
CLMTYS

CLIMATE REPORT
NATIONAL WEATHER SERVICE MORRISTOWN, TN
129 PM EST MON MAR 01 2021

.................................

...THE KNOXVILLE MCGHEE TYSON AIRPORT CLIMATE SUMMARY FOR THE MONTH OF FEBRUARY 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010
CLIMATE RECORD PERIOD: 1871 TO 2021

WEATHER         OBSERVED          NORMAL  DEPART
                VALUE   DATE(S)   VALUE   FROM
                                          NORMAL
.............................................
TEMPERATURE (F)
HIGHEST           75   02/28
LOWEST            20   02/17
AVG. MAXIMUM    51.2              52.3    -1.1
AVG. MINIMUM    32.4              32.4     0.0
MEAN            41.8              42.4    -0.6
DAYS MAX >= 90     0
DAYS MAX <= 32     0
DAYS MIN <= 32    15
DAYS MIN <= 0      0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM       13.08   2019
 MINIMUM        0.56   1898
TOTALS          4.35              4.26    0.09
DAYS >= .01       14
DAYS >= .10       10
DAYS >= .50        3
DAYS >= 1.00       0
GREATEST
 24 HR. TOTAL   0.91   02/17 TO 02/18

SNOWFALL (INCHES)
TOTALS           1.4               1.6    -0.2
SINCE 7/1        5.3
SNOWDEPTH AVG.     T
DAYS >= TRACE      6
GREATEST
 SNOW DEPTH       MM

DEGREE DAYS
HEATING TOTAL    643               634       9
 SINCE 7/1      2707              2896    -189
COOLING TOTAL      0                 0       0
 SINCE 1/1         0                 0       0
```

.....

WEATHER CONDITIONS. NUMBER OF DAYS WITH

THUNDERSTORM	0	RAIN	11
SNOW	1	FOG	17
FOG W/VIS <= 1/4 MILE	1		

- INDICATES NEGATIVE NUMBERS.
R INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T INDICATES TRACE AMOUNT.

These data are preliminary and have not undergone final quality control by the National Climatic Data Center (NCDC). Therefore, these data are subject to revision. Final and certified climate data can be accessed at the NCDC - http://www.ncdc.noaa.gov.

Climatological Report (Monthly)

```
140
CXUS54 KMRX 011447
CLMTYS

CLIMATE REPORT
NATIONAL WEATHER SERVICE MORRISTOWN, TN
947 AM EST MON FEB 01 2021

.................................

...THE KNOXVILLE MCGHEE TYSON AIRPORT CLIMATE SUMMARY FOR THE MONTH OF JANUARY 2021...

CLIMATE NORMAL PERIOD: 1981 TO 2010
CLIMATE RECORD PERIOD: 1871 TO 2021

WEATHER         OBSERVED          NORMAL  DEPART
                VALUE   DATE(S)   VALUE   FROM
                                          NORMAL
.............................................
TEMPERATURE (F)
HIGHEST           64   01/02
                       01/26
LOWEST            21   01/29
AVG. MAXIMUM    46.8              47.3    -0.5
AVG. MINIMUM    32.5              29.2     3.3
MEAN            39.7              38.2     1.5
DAYS MAX >= 90     0
DAYS MAX <= 32     0
DAYS MIN <= 32    16
DAYS MIN <= 0      0

PRECIPITATION (INCHES)
RECORD
 MAXIMUM       16.98   1882
 MINIMUM        0.95   1986
TOTALS          2.66              4.32   -1.66
DAYS >= .01       12
DAYS >= .10        8
DAYS >= .50        1
DAYS >= 1.00       0
GREATEST
 24 HR. TOTAL   0.80   01/25 TO 01/26

SNOWFALL (INCHES)
TOTALS             T               2.7    -2.7
SINCE 7/1        3.9
SNOWDEPTH AVG.     0
DAYS >= TRACE      7
GREATEST
 SNOW DEPTH        0

DEGREE DAYS
HEATING TOTAL    779               829     -50
 SINCE 7/1      2064              2263    -199
COOLING TOTAL      0                 0       0
```

```
 SINCE 1/1         0                 0       0
.............................................
```

```
WEATHER CONDITIONS. NUMBER OF DAYS WITH
THUNDERSTORM              1     RAIN                      7
SNOW                      1     FOG                      15
FOG W/VIS <= 1/4 MILE     5

-  INDICATES NEGATIVE NUMBERS.
R  INDICATES RECORD WAS SET OR TIED.
MM INDICATES DATA IS MISSING.
T  INDICATES TRACE AMOUNT.
```

Normal Weather Conditions Calculations Table

			Long-term rainfall records							
	Month	Standard Deviation	Minus One Std. Dev. (DRY)	Normal (Mean inches)	Plus One Std. Dev. (WET)	Actual Rainfall	Condition (elevated, low, average)	Condition value	Month weight value	Product of previous two columns
1st prior month*	MARCH	2.18	2.61	4.79	6.97	9.12	Wet	3	x3	9
2nd prior month*	FEB	1.92	2.12	4.04	5.96	4.35	Avg	2	x2	4
3rd prior month*	JAN	2.00	2.35	4.35	6.35	2.66	Avg	2	x 1	2
									Sum =	15

Note:

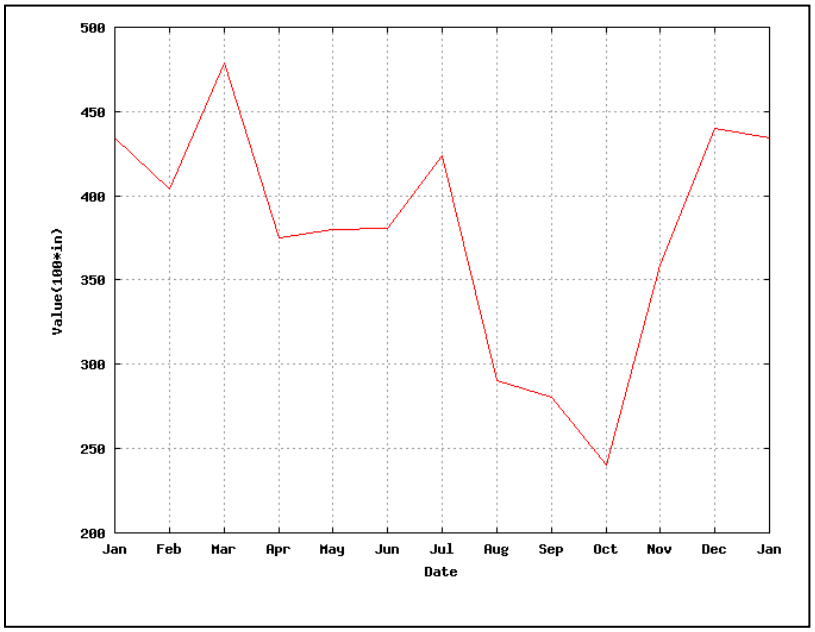
If sum is:	
6-9	then prior period has been abnormally dry
10-14	then prior period has been normal (average)
15-18	Then prior period has been abnormally wet

Condition value:	
Low =	1
Average =	2
Elevated =	3

Knoxville, TN
1981-2011

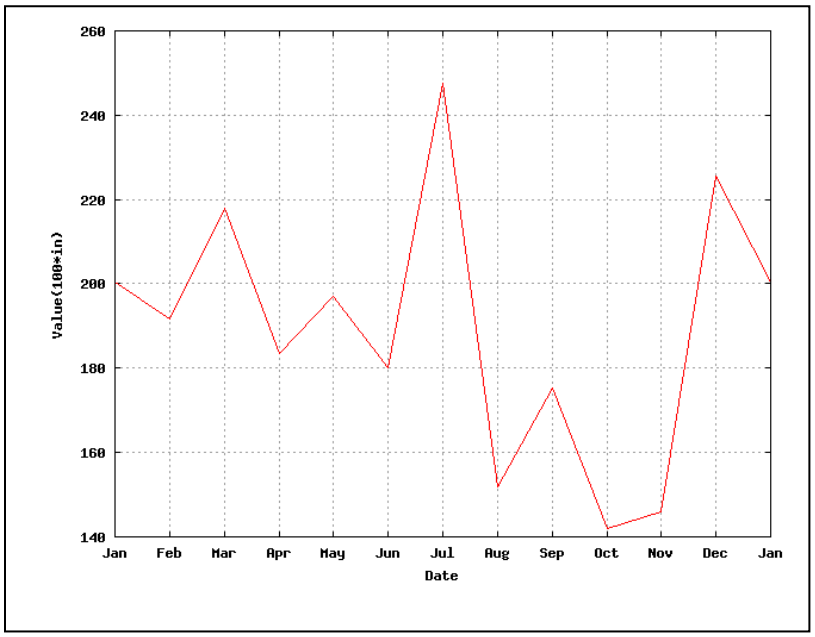
MEAN (in):

1) 4.3462
2) 4.0378
3) 4.7904
4) 3.7504
5) 3.8022
6) 3.807
7) 4.2392
8) 2.9066
9) 2.8032
10) 2.404
11) 3.5864
12) 4.4014



STANDARD DEVIATION (in):

1) 2.00287027711202
2) 1.91593989296882
3) 2.18017688853591
4) 1.83554691844036
5) 1.96992104886859
6) 1.80070876068739
7) 2.47482824800891
8) 1.51909157870413
9) 1.75434555505197
10) 1.41944513447893
11) 1.45927261724072
12) 2.25684628250511



Appendix E

Certifications

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

TN QHP
TENNESSEE QUALIFIED HYDROLOGIC PROFESSIONAL

11/1/10

Jason Mann
TDEC
3711 Middlebrook Pike
Knoxville, TN 37921

RE: Tennessee Qualified Hydrologic Professional Certification

Dear Mr. Mann

Congratulations, you have successfully completed the Tennessee Hydrologic Determination course. By completing the TN-HDT course, you have also earned 20 Professional Development Hours (PDH). You have now met all the requirements to become a certificated Tennessee Qualified Hydrologic Professional (TN-QHP). Your TN-QHP certification card is attached below.

The TN-QHP certification is valid for three years. You must complete a refresher course within that three year period and submit evidence of course completion along with a renewal application at least 90 days before expiration of your certificate. Should you allow your certification to lapse after 3 years, you will be required to retake the TN-HDT course and submit a new application in order to become a certified TN-QHP.

Please refer to the TDEC website, http://tn.gov/environment/wpc or the TN-HDT training website, www.tnhdt.org for refresher course details and application forms.

Sincerely,

Paul E. Davis

Paul E. Davis, Director
Water Pollution Control

Cc: Timothy Gangaware
TN-HDT Training Program
Coordinator

TDEC TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

Tennessee Qualified Hydrologic Professional

TN QHP TENNESSEE QUALIFIED HYDROLOGIC PROFESSIONAL

This card certifies that:

Jason Mann

has successfully completed the 3-day TN HDT course and is a Tennessee Qualified Hydrologic Professional

Certification number **1042-TN10** Expires: **12/31/2014**

Paul E. Davis

Paul E. Davis, P.E.
Director, TDEC-WPC

Timothy Gangaware, AICP
Director, TNWRRC-UT

C-1
8/11

Tennessee Department of Environment & Conservation

This is to certify that

Jason Mann

has successfully completed the three day course to become a
Tennessee Qualified Hydrologic Professional

TN QHP Number **1042-TN10**

Paul E. Davis, P.E.

Timothy Gangaware, A.I.C.P

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

This certifies that the recipient has earned 20 Professional Development Hours

TNQHP
TENNESSEE QUALIFIED HYDROLOGIC PROFESSIONAL

Tennessee Department of Environment & Conservation

This is to certify that

Jason Mann

successfully completed the one-day
Tennessee Hydrologic Determination Refresher Course

June 6, 2017

Jonathon Burr, DWR

Timothy Gangaware, TNWRRC

TENNESSEE DEPARTMENT OF ENVIRONMENT AND CONSERVATION

This certifies that the recipient has earned 6 Professional Development Hours

TNQHP
TENNESSEE QUALIFIED HYDROLOGIC PROFESSIONAL

Tennessee Department of Environment & Conservation

This is to certify that

Ryan Hennessey

has successfully completed the four-day
Tennessee Hydrologic Determination Training Course

March 16-19, 2020

Jennifer Dodd, Director DWR

Timothy Gangaware, TNWRRC

TN Department of Environment & Conservation

This certifies that the recipient has earned 25 Professional Development Hours

TNQHP
TENNESSEE QUALIFIED HYDROLOGIC PROFESSIONAL

HORIZONTAL CURVE DATA TABLE

CURVE NO.	P.I. COORDINATES		DELTA ANGLE	RADIUS	TANGENT	LENGTH
	NORTHING	EASTING				
C1	590,611.5615	2,511,065.0762	50° 33' 01" (LT)	113.00	53.35	99.70
C2	590,449.9160	2,511,039.6725	41° 43' 12" (RT)	113.00	43.06	82.28

HILLSIDE PROTECTION AREA

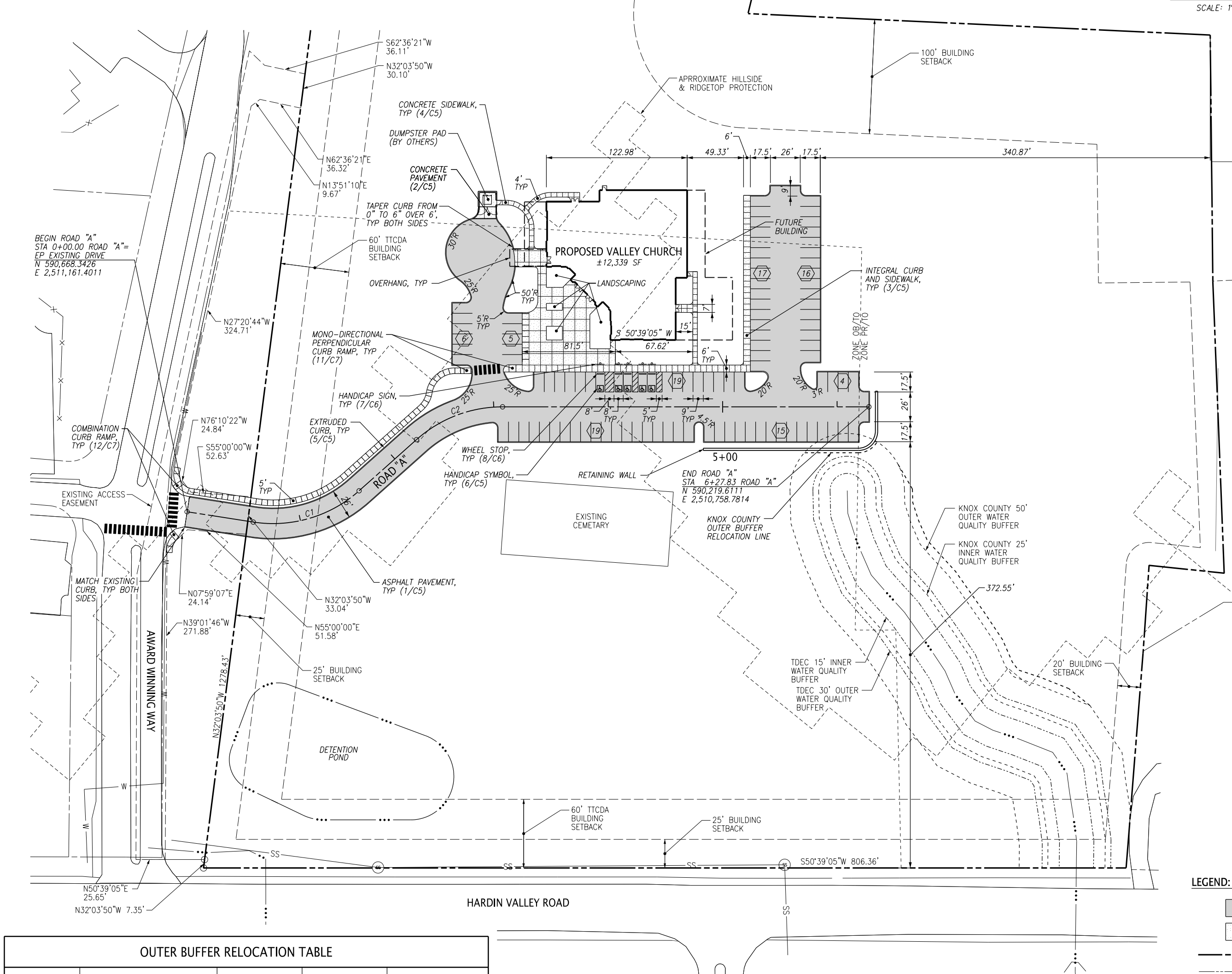
HILLSIDE PROTECTION AREA DISTURBANCE CALCULATION

HILLSIDE PROTECTION AREA ON PROPERTY	14.60 AC.
DISTURBED HILLSIDE PROTECTION AREA ON PROPERTY	2.84 AC.
PERCENTAGE OF HILLSIDE PROTECTION DISTURBED	19.45 %

INSTRUMENT NORTH

0 50 100

SCALE: 1" = 50'



NOTES:

1. THE BOUNDARY DATA WAS TAKEN FROM MILLER LAND SURVEYING, LLC DATED FEBRUARY 17, 2020.
2. UNLESS NOTED OTHERWISE, DIMENSIONS ARE TAKEN FROM THE FENCE LINE, PROPERTY LINE, FACE OF CURB, EDGE OF PAVEMENT OR OUTSIDE FACE OF BUILDING.
3. THE MINERAL AGGREGATE BASE AND ASPHALTIC SURFACE COURSES SHALL MEET THE MATERIALS, EQUIPMENT, CONSTRUCTION, AND TESTING REQUIREMENTS OF THESE DRAWINGS, AND THE KNOX COUNTY DEPARTMENT OF ENGINEERING STANDARD SPECIFICATIONS.
4. CONCRETE CURB AND PAVEMENT SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS. CONCRETE CURB AND PAVEMENT SHALL MEET THE MATERIALS, EQUIPMENT, AND CONSTRUCTION REQUIREMENTS OF THE KNOX COUNTY DEPARTMENT OF ENGINEERING STANDARD SPECIFICATIONS.
5. TRAFFIC CONTROL DEVICES AND PAVEMENT MARKING SHALL CONFORM TO THE FEDERAL HIGHWAY ADMINISTRATIONS "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES."
6. PROPERTY CONCERNED REFLECTS PARCEL 111.02 AS SHOWN IN KNOX COUNTY CLT MAP 103. A PORTION OF THE PROPERTY IS ZONED OB/TO, OFFICE & MEDICAL SERVICES DISTRICT IN THE TECHNOLOGY OVERLAY. REMAINDER OF THE PROPERTY IS ZONED PR/TO, PLANNED RESIDENTIAL IN THE TECHNOLOGY OVERLAY. TOTAL AREA = 20.0± AC.

   OWNER: BOARD OF TRUSTEES OF THE UNITED METHODIST CHURCH, OAK RIDGE DISTRICT
   706 SOUTH ILLINOIS AVENUE STE 102D
   OAK RIDGE, TN 37830
7. BUILDING SETBACKS ARE 25-FT IN FRONT, 20-FT ON SIDE AND 20-FT IN REAR. WHERE PROPERTY ABUTS A RESIDENTIAL ZONE, BUILDING SETBACK IS 100-FT. PER TTCDA DESIGN GUIDELINES, THE FRONT SETBACK IS 60-FT WHERE PARKING IS BETWEEN THE BUILIDING AND THE RIGHT-OF-WAY.
8. REMOVE OVER-PAVEMENT OF ASPHALT AND STONE FROM UNDERNEATH LANDSCAPE AREAS UP TO THE LIMITS THAT HAVE BEEN SPECIFIED (REFER TO THE CURB DETAIL) IN ORDER TO PROVIDE A SOLID BASE FOR THE CONCRETE CURB.
9. REFER TO ARCHITECTURAL PLANS FOR ACTUAL BUILDING DIMENSIONS.
10. TTCDA FILE NUMBER: 5-B-21-TOB.

DEVELOPMENT INTENSITY

GROUND AREA COVERAGE (GAC)

REQUIREMENT: GAC < 5,000 SF PER 2 AC.	
LA = AREA COVERED BY A BUILDING	12,339 SF
GA = GROSS AREA OF LOT / 2 AC.	10.00 AC.
GAC = LA/GA	1,234 SF PER 2 AC.

FLOOR AREA RATIO (FAR)

REQUIREMENT: FAR < 50%	
GAF = GROSS FLOOR AREA OF BUILDING	12,339 SF
GA = GROSS AREA OF LOT	871,200 SF
FAR = GAF/GA	1.42 %

IMPERVIOUS AREA RATIO (IAR)

REQUIREMENT: IAR < 50%	
IA = GROSS IMPERVIOUS AREA	1.28 AC.
GA = GROSS AREA OF LOT	20.00 AC.
IAR = IA/GA	6.40 %

PARKING SURFACE AREA

PARKING SURFACE AREA = 32,880 SF

PARKING SUMMARY

KNOX COUNTY REQUIRED PARKING FOR CHURCH BUILDING

1 SPACE PER 4 SEATS IN MAIN WORSHIP AREA OR 1 SPACE PER 30 SF OF USABLE FLOOW AREA OF AUDITIORIUM, WHICHEVER IS GREATER	
338 SEATS @ 1 SPACE PER 4 SEATS	85
3,595 SQ FT @ 1 SPACE PER 30 SF OF USABLE FLOOR AREA	120
TOTAL REQUIRED PARKING	120 SPACES

TTCDA REQUIRED PARKING FOR CHURCH BUILDING

338 SEATS @ 1 PARKING SPACE PER 4 SEATS IN MAIN WORSHIP AREA (MINIMUM)	85
338 SEATS @ 1 PARKING SPACE PER 3 SEATS IN MAIN WORSHIP AREA (MAXIMUM)	113
TOTAL REQUIRED PARKING	85 SPACES
MAXIMUM ALLOWABLE PARKING	113 SPACES

TOTAL PARKING PROVIDED

STANDARD SPACES (9'x17.5')	96
HANDICAP (2 VAN ACCESSIBLE)	5
TOTAL	101 SPACES

OUTER BUFFER RELOCATION TABLE

BUFFER TYPE	REQUIRED (SF)	ENCROACHED INTO (SF)	PROVIDED BY RELOCATION (SF)	TOTAL PROVIDED (SF)	CHECK
KNOX COUNTY	45,104	1,573	1,800	45,331	45,331>45,104 OK

LEGEND:

(shaded)	ASPHALT PAVEMENT
(dotted)	CONCRETE PAVEMENT
(line)	PROPERTY LINE
(line)	EXISTING PROPERTY LINE
(line)	BUILDING SETBACK
(10)	NUMBER OF PARKING SPACES
TYP	TYPICAL

CIVIL ENGINEER:

FULGHUM MACINDOE & ASSOCIATES, INC.

10330 HARDIN VALLEY ROAD
SUITE 201
KNOXVILLE, TN 37932
OFFICE: 865.690.6419
FAX: 865.690.6448
www.fulghummacindoe.com

FMA PROJECT: 243.203

STUDIO FOUR DESIGN INC.
ARCHITECTURE & INTERIORS
414 Clinch Ave. Knoxville, TN 37902
p 865 523-5001 f 865 523-5003
studiofourdesign.com

Valley Church

11012 Hardin Valley Rd.
Knoxville, TN 37932

NOT FOR CONSTRUCTION

SD

Concept Package

Project Phase: Concept Package

Issue Date: 04/05/2021

Revisions

No.	Descripton	Date
A	TTCDA REVIEW	04/05/2021
B	MPC COMMENTS	04/23/2021

Job Number: 20011.00

Layout & Paving Plan

C1

Date: 9/28/2020 10:20:50 AM
Drawn By: Author Checked By: Checker
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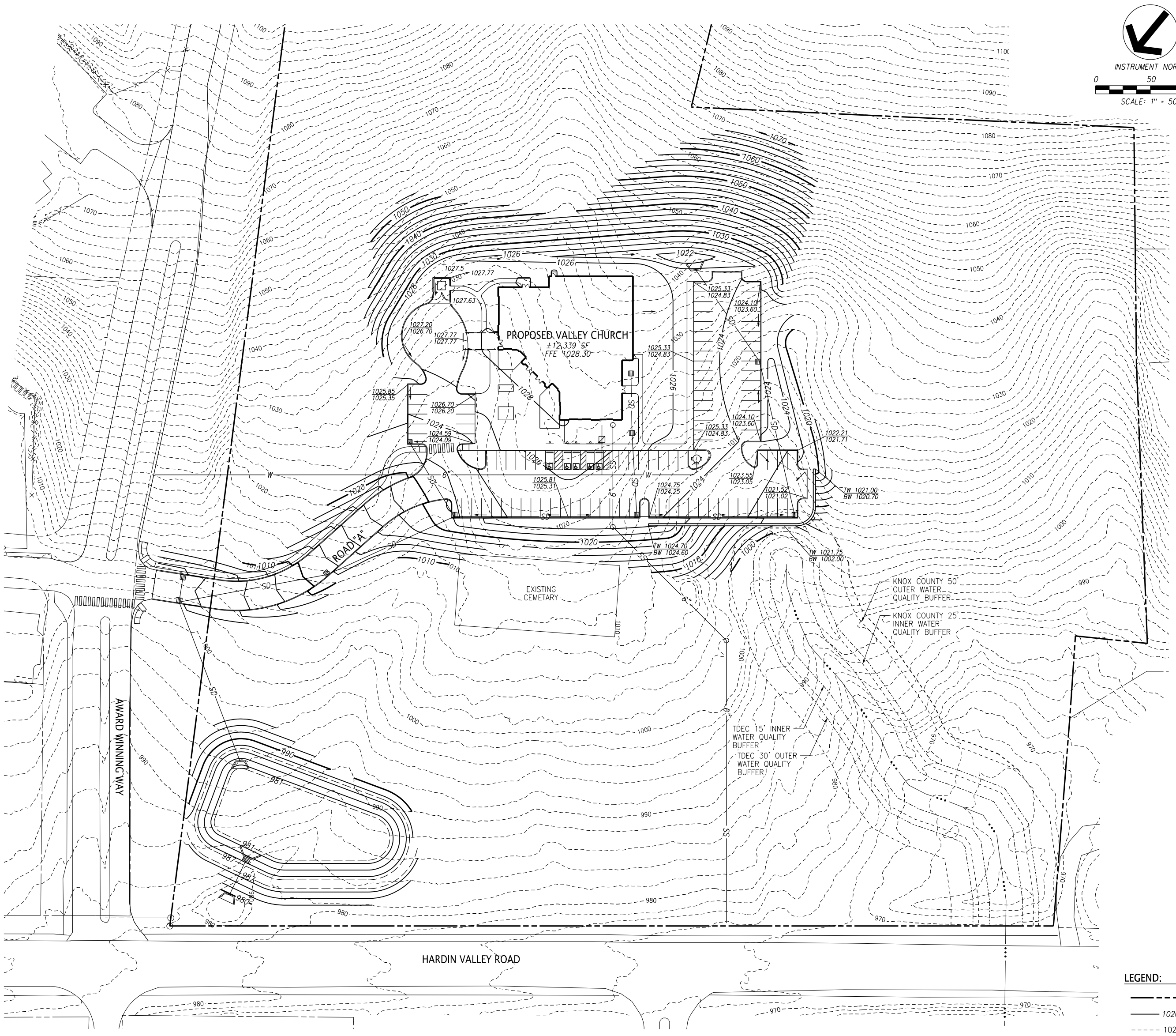

GRADING NOTES:

1. THE TOPOGRAPHIC DATA WAS TAKEN FROM AVAILABLE KGIS MAPS.
2. UNLESS NOTED OTHERWISE, THE PROPOSED GRADES SHOWN ON THESE DRAWINGS ARE FINISHED GRADE. EXISTING AND PROPOSED CONTOURS ARE SHOWN AT 2-FT. INTERVALS.
3. THE ACCURACY OF THE GRADES IS DEPENDANT ON THE DATA PROVIDED BY THE OWNER OR OWNER'S REPRESENTATIVE. FIELD VERIFY AS NECESSARY PRIOR TO CONSTRUCTION.
4. THE SITE SHALL BE CLEARED AND GRUBBED WITHIN THE LIMITS OF EXCAVATION. COMPLETELY DISPOSE OF ALL MATERIALS RESULTING FROM CLEARING AND GRUBBING OFF-SITE. BURNING SHALL NOT BE PERMITTED UNLESS PRIOR APPROVAL IS OBTAINED BY THE LOCAL FIRE DEPARTMENT. THE CONTRACTOR MUST OBTAIN A PERMIT AND MEET ALL OF THE REQUIREMENTS AS SPECIFIED BY THE FIRE DEPARTMENT.
5. ALL TREES STUMPS, BOULDERS, AND OTHER OBSTRUCTIONS SHALL BE REMOVED TO A DEPTH OF 2 FT BELOW THE SUBGRADE. ROCK SHALL BE SCARIFIED TO DEPTH OF 1 FT BELOW SUBGRADE.
6. STRIP TOPSOIL FULL DEPTH (6-IN. MIN.) AND TEMPORARILY STOCKPILE EXCAVATED MATERIALS. INSTALL SILT FENCE OR OTHER APPROPRIATE EROSION CONTROL STRUCTURES ON THE DOWN HILL SIDE OF THE STOCKPILE.
7. PROOF ROLL ALL AREAS TO RECEIVE FILL. PROOF ROLL WITH A FULLY LOADED TANDEM AXLE DUMP TRUCK USING A CRISS-CROSS PATTERN (4 PASSES MIN.) AREAS FAILING THE PROOF ROLLING SHALL BE UNDERCUT AND BACKFILLED USING AN ENGINEERED FILL OR STABILIZED BY A METHOD APPROVED BY THE PROJECT GEOTECHNICAL ENGINEER.
8. AREAS THAT EXHIBIT WEAK SOIL OR OTHERWISE UNSUITABLE CONDITIONS SHALL BE UNDERCUT TO A FIRM LEVEL OF SOIL FOLLOWED BY BACKFILLING THE UNDERCUT AREAS USING AN ENGINEERED FILL. TDOT NO. 57, OR TDOT NO. 67 STONE.
9. FILL MATERIAL SHALL BE SATISFACTORY MATERIAL FREE FROM ROOTS AND OTHER ORGANIC MATERIAL, FROZEN MATERIAL, AND TRASH. FILL MATERIAL SHALL ALSO BE FREE OF STONE OR OTHER MATERIAL LARGER THAN 6 IN. AND LARGER THAN 4 IN. IN THE TOP 6 IN. OF AN EMBANKMENT.
10. FILL SOILS SHALL HAVE A PI LESS THAN 30 & A MAXIMUM DRY DENSITY OF 90 PCF OR GREATER.
11. UNSATISFACTORY SOILS INCLUDE MATERIALS THAT ARE TOO WET OR TOO SOFT, EXPANSIVE SOILS AND SOILS CLASSIFIED PT, OH, AND OL. LEGALLY DISPOSE OF UNSATISFACTORY SOILS OFF-SITE UNLESS OTHERWISE APPROVED BY THE OWNER OR GEOTECHNICAL ENGINEER.
12. FILL MATERIAL SHALL BE PLACED IN LOOSE, HORIZONTAL LIFTS NOT EXCEEDING 8 IN. THICKNESS. UNLESS NOTED OTHERWISE, COMPACT EACH LAYER TO AT LEAST 98% MAXIMUM DRY DENSITY. COMPACT THE UPPER 24 IN. OF FILL BENEATH PAVEMENTS AND THE UPPER 12 IN. BENEATH BUILDING SLABS TO 100% MAXIMUM DRY DENSITY. MAINTAIN THE MOISTURE CONTENT TO WITHIN -1 TO +3 PERCENT OF THE OPTIMUM MOISTURE CONTENT.
13. A 6 IN. (MIN.) LAYER OF TOPSOIL SHALL BE PLACED OVER THE AREAS TO BE SEEDED AND TO THE FINISH GRADE ELEVATIONS AS SHOWN ON THE DRAWINGS.
14. DO NOT ALLOW WATER TO ACCUMULATE IN EXCAVATIONS OR POND ON-SITE. PROVIDE NECESSARY MEASURES TO KEEP THE SITE FREE-DRAINING.
15. NO SLOPE SHALL EXCEED 2:1 UNLESS PROPER SLOPE STABILIZATION MEASURES ARE IMPLEMENTED.
16. PROTECT AND MAINTAIN SUBGRADES UNTIL PLACEMENT OF THE FINAL SURFACE IS ACHIEVED.
17. CONTRACTOR IS RESPONSIBLE TO ASSURE THAT THE FINISHED GRADES CONFORM WITH THE DETENTION POND DESIGN PARAMETERS. ONCE GRADING IS COMPLETE AND PRIOR TO FINAL SEEDING, SUBMIT AN AS-BUILT SURVEY FOR THE OWNER'S REVIEW.
18. VERIFY GRADES WHEREVER NECESSARY TO BRING THE PROPOSED LINES, ELEVATIONS, SLOPES, AND CROSS-SECTIONS OF THE GRADING WORK TO WITHIN THE FOLLOWING TOLERANCES ABOVE OR BELOW THAT AS SHOWN ON THE PLANS: SUBGRADE 0.1', UNPAVED AREAS 0.1', SIDEWALKS 0.10', PAVEMENTS 0.04', AND BUILDINGS 0.04'.
19. SLOPES GREATER THAN 4:1 SLOPE AT A HEIGHT GREATER THAN 6-FT SHALL BE TESTED BY THE PROJECT GEOTECHNICAL ENGINEER TO DETERMINE STABILITY.
20. DISTURBED AREAS SHALL BE STABILIZED IN AN EXPEDIENT MANNER TO MINIMIZE TIME OF EXPOSURE TO WEATHER.

LEGEND:

— - —	PROPERTY LINE
—— 1020 ——	PROPOSED CONTOUR
- - - 1020 - - -	EXISTING CONTOUR
972.6	PROPOSED SPOT ELEVATION
973.59 / 973.09	TOP CURB/TOP PVMT.

CIVIL ENGINEER:

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Valley Church

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Knoxville, TN 37932

NOT FOR CONSTRUCTION

SD

Concept Package

Project Phase: Concept Package

Issue Date: 04/05/2021

Revisions

No.	Descripton	Date
A	TTCDA REVIEW	04/05/2021
B	MPC COMMENTS	04/23/2021

Job Number: 20011.00

Grading Plan

C2

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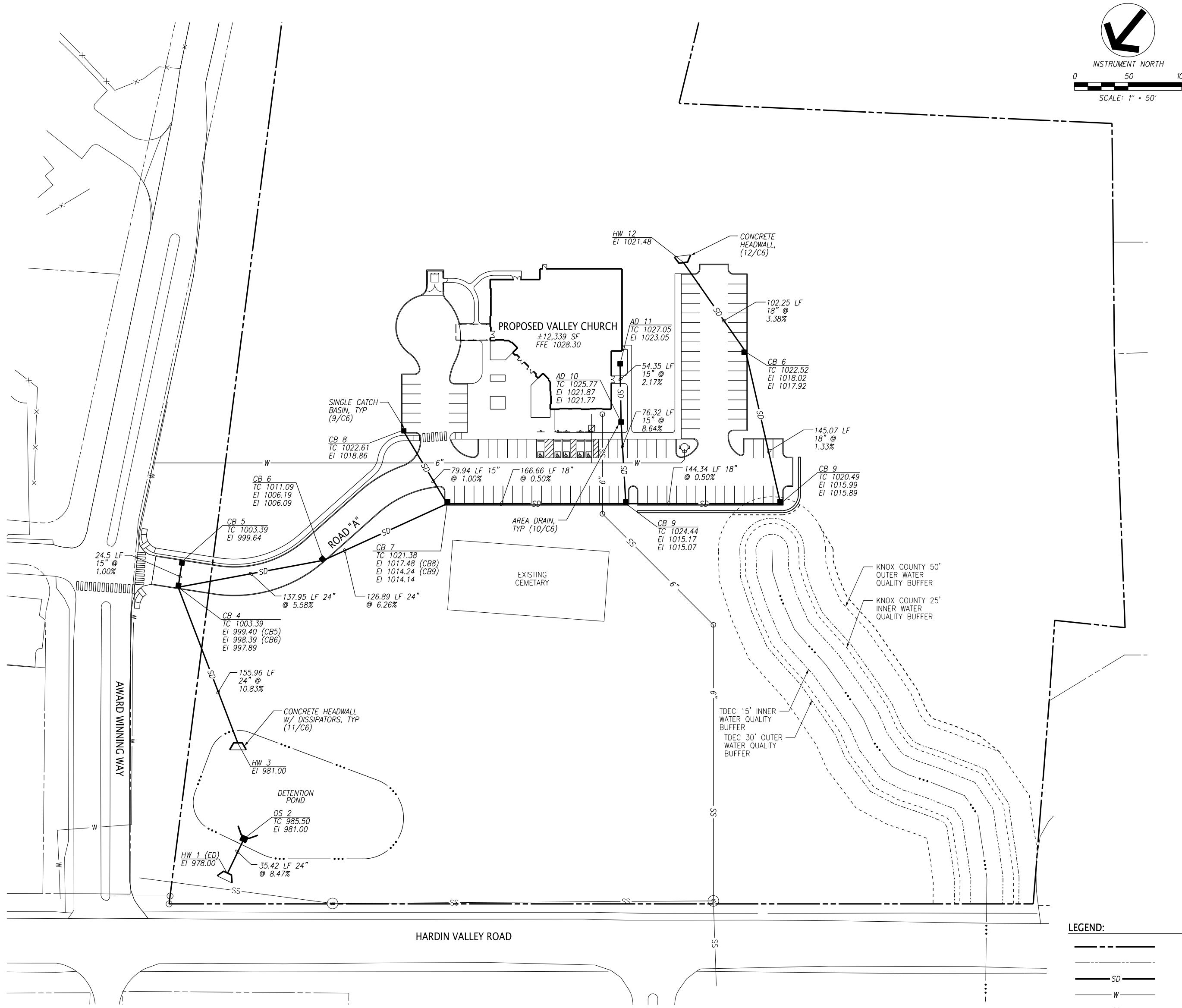

STORM PIPE NOTES:

1. INSTALL STORM SEWER PIPING AND APPURTENANCES TO MEET THE MATERIALS, EQUIPMENT, AND CONSTRUCTION REQUIREMENTS OF THE CITY OF KNOXVILLE STANDARD SPECIFICATIONS.
2. TRENCH DESIGN AND SAFETY FOR PIPELINE CONSTRUCTION IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL CONFORM WITH ALL APPLICABLE LOCAL, STATE, AND OSHA REGULATIONS.
3. UNLESS NOTED OTHERWISE, STORM SEWER PIPE SHALL BE EITHER CLASS III REINFORCED CONCRETE PIPE (RCP) OR SMOOTH INTERIOR HIGH DENSITY POLYETHYLENE PIPE (HDPE). RCP SHALL BE INSTALLED IN ACCORDANCE WITH AASHTO M170 (ASTM C76). HDPE PIPE SHALL BE INSTALLED IN ACCORDANCE WITH AASHTO M294. ALL STORM SEWER PIPE LOCATED WITHIN A PERMANENT DETENTION/RETENTION BASIN SHALL BE CLASS III RCP AND SHALL BE INSTALLED PER LOCAL REQUIREMENTS.
4. HDPE PIPE SHALL BE INSTALLED WITH WATERTIGHT (WT) JOINTS MEETING ALL AASHTO AND ASTM REQUIREMENTS. JOINTS SHALL BE MADE OF POLYISOPRENE AND INSTALLED AND COVERED WITH A REMOVABLE, PROTECTIVE WRAP BY THE MANUFACTURER.
5. PIPE DEFLECTION AND ALIGNMENT SHALL BE CHECKED AFTER BACKFILLING AND COMPACTION ARE COMPLETE AND PRIOR TO PLACING THE BASE. TEST DEFLECTION WITH A MANDREL OR OTHER APPROVED METHOD.
6. PIPE WITH DEFLECTION 5% OR GREATER OR WITH UNDUE MISALIGNMENT SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
7. PIPE/CULVERTS ARE MEASURED IN TERMS OF HORIZONTAL LENGTH COMPLETE IN PLACE REGARDLESS OF TYPE, DEPTH, CLASS, SHAPE AND SIZE, AS MEASURED ALONG THE CENTERLINE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE (NO DEDUCTIONS FOR STRUCTURES). ACTUAL QUANTITY OF PIPE MAY VARY. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE NECESSARY QUANTITY OF PIPE TO CONSTRUCT THE COMPLETE SYSTEM AS SHOWN. INSTALLATION INCLUDES EXCAVATION, SHORING, FURNISHING AND INSTALLATION OF PIPES, JOINT MATERIALS, COUPLINGS, AND BACKFILL.
8. FOR RCP PIPE WITH SLOPES GREATER THAN 15% USE JOINT TIES OR JOINT FASTENERS AS SPECIFIED BY THE MANUFACTURER. FOR HDPE PIPE WITH SLOPES GREATER THAN 12% USE CONCRETE PIPE ANCHORS AS SPECIFIED BY THE MANUFACTURER.
9. PRIOR TO INSTALLING NEW PIPING, CONTRACTOR SHALL LOCATE EXISTING UTILITIES/STRUCTURES WHERE NEW PIPES CROSS BY POT-HOLING. AFTER EXPOSING EXISTING UTILITY/STRUCTURE, CONTRACTOR SHALL OBTAIN HORIZONTAL AND VERTICAL LOCATIONS BY FIELD SURVEY, AND RESOLVE ANY CONFLICTS BETWEEN UNDERGROUND UTILITIES/STRUCTURES AND NEW PIPING UNDER THE DIRECTION OF THE OWNER PRIOR TO INSTALLING NEW PIPING.

LEGEND:

- PROPERTY LINE
- EXISTING PROPERTY LINE
- PROPOSED STORM LINE (SD)
- PROPOSED WATER LINE (W)
- PROPOSED SEWER LINE (SS)
- PROPOSED AREA DRAIN/CATCH BASIN
- PROPOSED HEADWALL

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Storm Drainage Plan

C3

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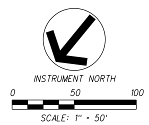
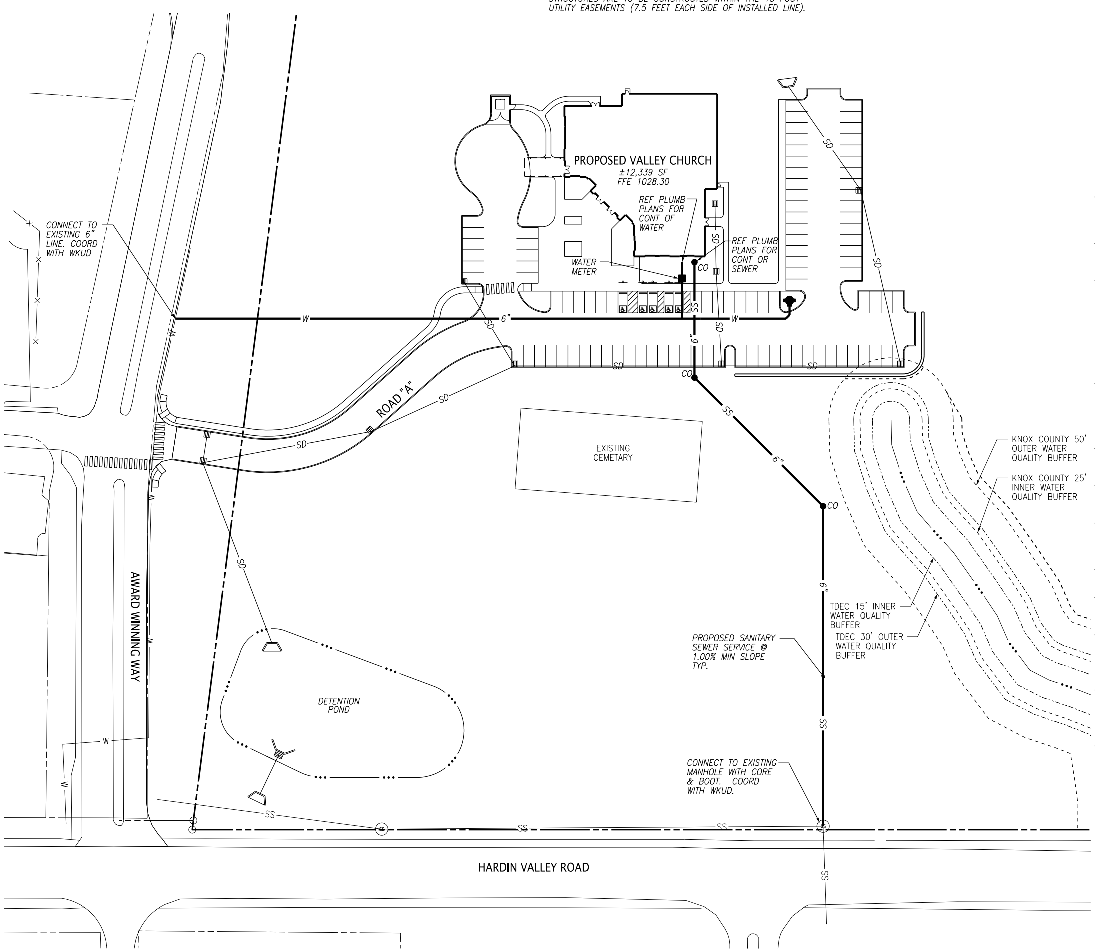


UTILITY NOTES:

1. ALL WORK TO BE PERFORMED IN ACCORDANCE WITH WKUD'S STANDARD SPECIFICATIONS. IF CONFLICTS ARISE DURING CONSTRUCTION, CONSULT WITH WKUD'S INSPECTOR AS TO NECESSARY FIELD CHANGES. WKUD RESERVES THE RIGHT TO MODIFY THE MATERIAL OR CONSTRUCTION REQUIREMENTS IF SUCH CONFLICTS ARISE.
2. THE LOCATIONS OF THE EXISTING UTILITIES SHOWN ON THESE DRAWINGS ARE APPROXIMATE. CONTRACTOR TO REFERENCE PLANS AND COORDINATE WITH UTILITY OWNER TO DETERMINE THE ACTUAL FIELD LOCATION. UTILITIES CAN BE LOCATED BY CALLING THE TENNESSEE ONE CALL SYSTEM, AT 1-800-351-1111.
3. PRIOR TO COMMENCING WORK, THE CONTRACTOR SHALL CONTACT THE UTILITY OWNERS TO NOTIFY THEM OF WORK IN THE AREA AND REQUEST THEM TO PROPERLY LOCATE THEIR RESPECTIVE UTILITY. NOTIFICATION SHALL BE GIVEN AT LEAST THREE BUSINESS DAYS PRIOR TO COMMENCEMENT OF OPERATIONS AROUND THE UTILITY.
4. PROVIDE ALL NECESSARY PROTECTIVE MEASURES TO SAFEGUARD THE EXISTING UTILITIES FROM DAMAGE DURING THE CONSTRUCTION OF THIS PROJECT. FURNISH ANY SPECIAL EQUIPMENT REQUIRED TO WORK OVER AND AROUND THE UTILITIES.
5. WKUD REQUIRES 24 INCHES OF HORIZONTAL SEPARATION AND 12 INCHES OF VERTICAL SEPARATION FROM OTHER UTILITIES IF THEY ARE INSTALLED ALONGSIDE THE SEWER OR WATER MAINS, AND THEY SHOULD NOT BE CONSTRUCTED IN SAME TRENCH.
6. HORIZONTAL SEPARATION BETWEEN WATER AND SANITARY SEWER LINES SHALL BE 10 FEET. IF 10 FEET OF SEPARATION IS NOT AVAILABLE, THE SEWER SHALL BE INSTALLED UNDERNEATH THE WATER LINE WITH A MINIMUM OF 18 INCHES OF SEPARATION BETWEEN THE OUTSIDES OF THE PIPES.
7. NO BUILDINGS, BUILDING FOOTINGS, OR OTHER PERMANENT STRUCTURES ARE TO BE CONSTRUCTED WITHIN THE 15 FOOT UTILITY EASEMENTS (7.5 FEET EACH SIDE OF INSTALLED LINE).
8. TRENCH DESIGN AND SAFETY FOR PIPELINE CONSTRUCTION IS SOLELY THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL CONFORM WITH ALL APPLICABLE LOCAL, STATE, AND OSHA REGULATIONS.
9. THE STONE BEDDING AND BACKFILL SHALL BE DONE IN STRICT COMPLIANCE WITH THE PIPE MANUFACTURER'S RECOMMENDATIONS, BUT MUST COMPLY WITH WKUD'S SPECIFICATIONS.
10. UTILITIES SHALL BE INSTALLED AFTER GRADING IS COMPLETED AND APPROVED AND BEFORE ANY PAVEMENT IS INSTALLED.
11. CONTRACTOR SHALL TAKE SPECIAL CARE TO BED, BACKFILL, AND COMPACT PIPE CROSSINGS WHERE A SANITARY SEWER MAIN OR WATER MAIN CROSSES WITH STORM SEWERS. CROSSING SHALL BE CONSTRUCTED WITH A WELL COMPACTED FULL STONE (#57) 6-INCH ENVELOPE SUCH THAT STORM SEWER DOES NOT BEAR DIRECTLY ON SANITARY SEWER MAINS OR WATER MAINS.

11. ALL SANITARY SEWER LINES, WATER LINES, AND APPURTENANCES SHALL BE INSTALLED AND TESTED IN ACCORDANCE WITH WKUD'S STANDARD SEWER SYSTEM SPECIFICATIONS.
12. ALL WORK MUST BE INSPECTED BY WKUD PRIOR TO BACKFILLING.
13. ALL SANITARY SEWER LINES SHALL BE SDR 26 PVC OR PROTECTO 401 LINED CLASS 350 DIP, (MIN.) UNLESS NOTED OTHERWISE.
14. ALL LOW PRESSURE SEWER PIPE SHALL BE SDR11 HIGH DENSITY POLYETHYLENE (HDPE) PIPE AND SHALL BE INSTALLED WITH NO. 10 SOLID COPPER INSULATED WIRE THROUGHOUT.
15. DUTILE IRON PIPE PROTECTO 401 LINED PRESSURE CLASS 350 SHALL BE USED ON DEPTHS GREATER THAN 16 FEET. FOR CREEK CROSSINGS WITH STEEL CASINGS, AND FOR ROAD BORES WHERE STEEL CASING IS USED.
16. DROP CONNECTION SHALL BE "INSIDE DROP SYSTEM" BY RELINER OR EQUAL. INSTALL PER WKUD'S SPECIFICATIONS.
17. ALL SEWER SERVICE LATERALS SHALL BE INSTALLED WITH A MINIMUM 1% SLOPE. CLEANOUTS IN PAVEMENT SHALL HAVE SOLID BRASS, THREADED, TRAFFIC-RATED CAPS. EFFORTS SHOULD BE MADE TO PLACE CLEANOUTS IN UNPAVED AREAS WHERE POSSIBLE.
18. ALL 6 INCH CLEANOUTS SHALL BE CONNECTED TO THE SERVICE WITH DOUBLE SWEEP TEE (SDR 26 PVC GPK OR APPROVED EQUAL).
19. ALL SANITARY SEWER LINES SHALL HAVE A MINIMUM OF 36 INCHES COVER. UNDER ROADWAYS AND CROSSINGS, SEWER SHALL HAVE A MINIMUM OF 48 INCHES COVER AND IF 48 INCHES IS NOT AVAILABLE, THEN DUCTILE IRON PIPE MUST BE USED, PROTECTO 401 LINED CLASS 350 (MIN).
20. GRAVITY SEWER PIPE DEFLECTION AND ALIGNMENT SHALL BE CHECKED AFTER BACKFILLING AND COMPACTION ARE COMPLETE AND PRIOR TO PLACING THE MANHOLE BASE. TEST DEFLECTION WITH A MANDREL OR OTHER APPROVED METHOD.
21. PIPE WITH DEFLECTION OF 5% OR GREATER OR WITH UNDUE MISALIGNMENT SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.
22. PIPE IS MEASURED IN TERMS OF HORIZONTAL LENGTH COMPLETE IN PLACE, REGARDLESS OF TYPE, DEPTH, CLASS, SHAPE, AND SIZE AS MEASURED ALONG THE CENTERLINE FROM CENTER OF STRUCTURE TO CENTER OF STRUCTURE (NO DEDUCTIONS FOR STRUCTURES). ACTUAL QUANTITY OF PIPE MAY VARY. THE CONTRACTOR SHALL SUPPLY AND INSTALL THE NECESSARY QUANTITY OF PIPE TO CONSTRUCT THE COMPLETE SYSTEM AS SHOWN. INSTALLATION INCLUDES EXCAVATION, SHORING, FURNISHING, AND INSTALLATION OF PIPES, JOINT MATERIALS, COUPLINGS, AND BACKFILL.
23. A RUBBER BOOT CONNECTOR ("A-LOK" OR APPROVED EQUAL) SHALL BE FITTED WITHIN EACH PRECAST CONCRETE MANHOLE FOR EACH SANITARY SEWER MAIN OR LATERAL CONNECTING TO A MANHOLE. EACH TAP TO AN EXISTING MANHOLE TO BE MECHANICALLY CORED AND A "KOR-N-SEAL" (OR APPROVED EQUAL) PIPE ENTRANCE SHALL BE PROVIDED.
24. ADJUST TOP OF CASTING (TC) ELEVATIONS (ALL SIDES) FLUSH WITH FINAL GRADES TO MATCH CROSS SLOPES AND LONGITUDINAL SLOPES.
25. INSTALL FITTINGS (FOR SERVICE LATERALS) AS REQUIRED TO AVOID CONFLICTS WITH EXISTING AND PROPOSED UNDERGROUND CONFLICTS AND OBSTRUCTIONS.
26. GROUT INSIDE MANHOLE JOINTS WITH NON-SHRINK GROUT. ALL EXTERIOR JOINTS TO BE WRAPPED WITH BUTYL AND CON-SEAL WRAP, APPLIED WITH PRIMER TO WKUD STANDARDS.
27. BOLT ALL MANHOLE FRAMES TO CONES WITH 4, 3/4 INCH STAINLESS STEEL WEDGE ANCHORS.
28. FOR SEWER PIPE WITH SLOPES GREATER THAN 15% USE CONCRETE PIPE ANCHORS AS SPECIFIED BY THE MANUFACTURER.
29. WATER LINE MATERIALS, INSTALLATION, AND TESTING SHALL BE PER WKUD'S STANDARDS. MATERIAL SUMITTALS SHALL BE MADE TO WKUD ENGINEERING DEPARTMENT PRIOR TO CONSTRUCTION AT 2328 LOVELL RD, KNOXVILLE, TN 37932. OFFICE: (865)690-2521.
30. DISINFECTION AND STERILIZATION SHALL BE COMPLETED BY CONTRACTOR WHEN INSTALLATION AND TESTING ARE COMPLETE. TAPS FOR STERILIZATION SHALL BE PROVIDED BY THE CONTRACTOR. WATER QUALITY TESTING WILL BE PERFORMED BY WKUD.
31. ALL WATER LINES SHALL HAVE A MINIMUM OF 36 INCHES COVER. BACKFILL WITH STONE TO GRADE REQUIRED UNDER ALL PROPOSED ROADWAYS.
32. ALL WATER LINES 4 INCHES OR LARGER SHALL BE CLASS 350 DIP. ALL FITTINGS SHALL BE APPROPRIATE FOR THE CLASS AND TYPE OF PIPE BEING JOINED.
33. ALL 2 INCH WATER LINES SHALL BE PVC (SDR 13.5-315 PSI), POLYETHYLENE (SDR 9), OR TYPE K COPPER. COORDINATE WITH WKUD ON DESIRED MATERIAL BASED ON THE APPLICATION. ALL FITTINGS SHALL BE APPROPIATE FOR THE CLASS AND TYPE OF PIPE BEING JOINED.
34. AIR RELEASE VALVES (APCO 200A/A.R.I. D-40 OR EQUAL) SHALL BE INSTALLED ON HIGH POINTS ON THE MAINS IN ACCORDANCE WITH THE PLANS OR AS REQUIRED BY WKUD'S INSPECTOR.
35. TO THE GREATEST EXTENT POSSIBLE, DO NOT LOCATE WATER METERS OR SERVICES AT THE SAME PROPERTY CORNERS AS ELECTRICAL TRANSFORMERS OR CATV/TELEPHONE PEDESTALS.
36. ALL WATER MAINS, INCLUDING DIP, SHALL BE INSTALLED WITH NO. 10 SOLID COPPER INSULATED WIRE THROUGHOUT THE ENTIRE SYSTEM, INCLUDING SERVICE LATERALS TO THE METER BOX. WIRE SHALL BE INSTALLED DIRECTLY ON TOP OF THE WATER MAIN. KEEP WIRE AS CONTINUOUS AS POSSIBLE. WHERE CONNECTIONS ARE NEEDED, STRIP WIRE BACK APPROX. 1 INCH AND CONNECT WITH SPLIT-BOLT CONNECTORS. WRAP CONNECTIONS WELL ON EACH SIDE OF CONNECTION WITH ELECTRICAL TAPE. WHEN INSTALLATION IS COMPLETE, THE ENTIRE SYSTEM MUST BE TESTED FOR CONTINUITY IN THE PRESENCE OF A WKUD INSPECTOR. WKUD WILL REQUIRE RE-EXCAVATION AND IMPROVEMENT TO AREAS THAT DO NOT "TRACE" WELL AND SHOW LOW OR POOR CONTINUITY.
37. BLOW-OFFS SHALL BE INSTALLED ON ENDS OF MAINS. FROM THE END OF THE MAIN BACK THROUGH THE FIRST THREE FULL LENGTH JOINTS OF PIPE SHALL BE INSTALLED FULLY RESTRAINED USING RESTRAINING GASKETS "FAST GRIP","FIELD LOK 350" OR EQUAL MECHANICAL RESTRAINT AS APPROVED BY WKUD INSPECTOR.
38. WATER MAINS REQUIRE CONCRETE THRUST BLOCKING AND MEGALUG MECHANICAL JOINT RESTRAINT AT ALL CHANGES IN DIRECTION REQUIRING BENDS, TEES, PLUGS, AND FIRE HYDRANTS. FIELD-LOK GASKETS MUST BE INSTALLED FOR AT LEAST 2 PIPE JOINTS ON EACH SIDE OF FITTINGS. ALL VALVES SHALL BE INSTALLED WITH MEGALUG MECHANICAL JOINT RESTRAINTS. WRAP ALL FITTINGS, BOLTS, FLANGES, ETC. IN 6 MIL PLASTIC PRIOR TO PLACING CONCRETE. HYDRANT TEES AND SWIVEL-X COUPLINGS SHALL BE USED FOR HYDRANTS.
39. WHERE MEGALUGS ARE SPECIFIED, THEY SHALL BE MANUFACTURED BY BEAA IRON INC. OR APPROVED EQUAL BY WKUD.
40. DEVELOPER/OWNER SHALL INSTALL ALL METER YOKES AND BOXES AND PROVIDE MATERIAL PER WKUD STANDARD SPECIFICATIONS. METER BOXES SHALL BE AT THE PROPERTY LINE (NO MORE THAN 2 FEET +/- INSIDE PROPERTY). ALL VALVE BOXES TO BE INSTALLED OUTSIDE OF PAVED AREAS WITH BOX LOK'S.
41. SINGLE WATER SERVICES SHALL BE 3/4-INCH TYPE K COPPER AND DOUBLE WATER SERVICES SHALL BE 1-INCH TYPE K COPPER. ALL METERS SHALL HAVE 3/4-INCH CURB STOP INSIDE METER BOX BEFORE YOKE.
42. LONG SIDE LATERALS MUST BE WRAPPED WITH POLY C WRAPPING.
43. ALL METER BOX LIDS SHALL BE CAST IRON APPROVED BY WKUD INSPECTOR.
44. ALL METER YOKES SHALL BE FORD 3/4-INCH COPPERSETTER 70 SERIES OR MUELLER B2404-R-2 OR APPROVED EQUAL.
45. FIRE, IRRIGATION, AND COMMERCIAL LINES MUST BE BACKFLOW PROTECTED PER WKUD POLICY. COORDINATE WITH WKUD.
46. ALL FIRE HYDRANTS BARREL SHALL BE 5.25-INCH.
47. ALL FIRE HYDRANTS SHALL BE FACTORY PAINTED YELLOW.
48. ALL FIRE HYDRANTS SHALL BE ROTATED TO FACE CLOSEST POINT OF PAVED ACCESS AND MUST HAVE AN ISOLATION GATE VALVE WITH BOX LOK-2 INSTALLED ON HYDRANT LATERAL.
49. WATER SERVICES SHOWN ON THESE DRAWINGS ARE FOR GENERAL LOCATION ONLY. CONTRACTOR TO REFERENCE PLUMBING PLANS AND COORDINATE WITH THE UTILITY OWNER TO DETERMINE THE ACTUAL FIELD LOCATION OF WATER METERS AND WATER SERVICE LINES.
50. INSTALL FITTINGS AS REQUIRED TO AVOID CONFLICTS WITH EXISTING AND PROPOSED UNDERGROUND CONFLICTS AND OBSTRUCTIONS.
51. INSTALL WATER LINES AT A POSITIVE GRADE BETWEEN DESIGNATED HIGH AND LOW POINTS TO PREVENT TRAPPING OF AIR.



LEGEND:

— — - - — —	PROPERTY LINE
—SD—	PROPOSED STORM LINE
—W—	PROPOSED WATER LINE
—W—	EXISTING WATER LINE
—SS—	PROPOSED WATER LINE
—SS—	PROPOSED SEWER LINE
■	PROPOSED WATER METER
(hydrant symbol)	PROPOSED FIRE HYDRANT ASSEMBLY
●CO	PROPOSED SEWER CLEANOUT

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Utilities Plan

C4

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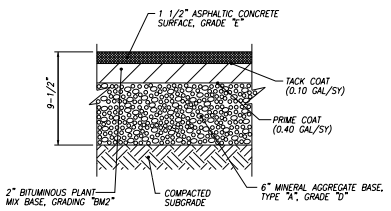
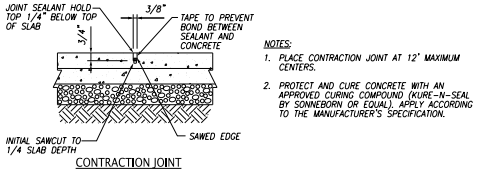


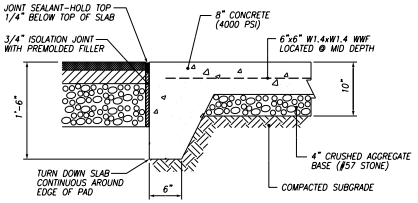
NOTES:
1. PAVEMENT HAS NOT BEEN DESIGNED FOR CONSTRUCTION TRAFFIC/ACTIVITIES. USE OF THESE SURFACES FOR CONSTRUCTION ACTIVITIES SHALL BE DONE AT THE CONTRACTOR'S CONVENIENCE AND RISK. DAMAGE TO PAVEMENT RESULTING FROM THESE ACTIVITIES SHALL BE REPAIRED IN CONFORMANCE WITH THE INITIAL PAVEMENT SPECIFICATIONS.

1 / C5 ASPHALT PAVEMENT SECTION
NTS



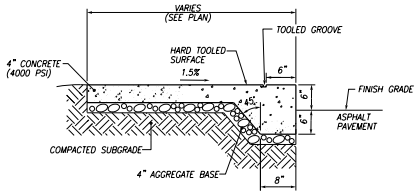
CONTRACTION JOINT

NOTES:
1. PLACE CONTRACTION JOINT AT 12' MAXIMUM CENTERS.
2. PROTECT AND CURE CONCRETE WITH AN APPROVED CURING COMPOUND (KURE-N-SEAL BY SONNEBORN OR EQUAL). APPLY ACCORDING TO THE MANUFACTURER'S SPECIFICATION.



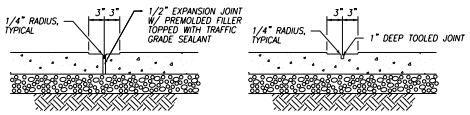
TURNDOWN AT ASPHALT

2 / C5 CONCRETE DUMPSTER PAD SECTION
NTS

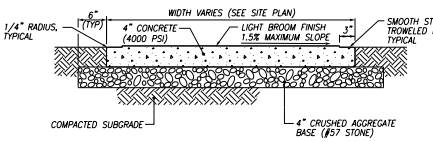


NOTES:
1. PREFORMED 1/2" EXPANSION JOINTS SHALL BE EQUALLY SPACED AT 30' MAXIMUM CENTERS, EQUALLY SPACE 1/4" CONTRACTION JOINTS AT 10' MAXIMUM CENTERS BETWEEN EXPANSION JOINTS.
2. EXACT CURB DIMENSIONS MAY BE ALTERED SLIGHTLY TO FIT STANDARD EXTRUDED CURB MACHINES, BUT SUCH VARIANCES MUST BE APPROVED BY THE ENGINEER.
3. MAXIMUM SLOPE FOR RAMPS SHALL BE 12:1 IN ACCORDANCE WITH ADA REQUIREMENTS.

3 / C5 INTEGRAL CURB & SIDEWALK
NTS



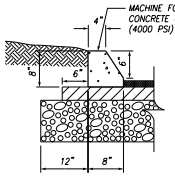
EXPANSION JOINT CONTROL JOINT



CROSS-SECTION

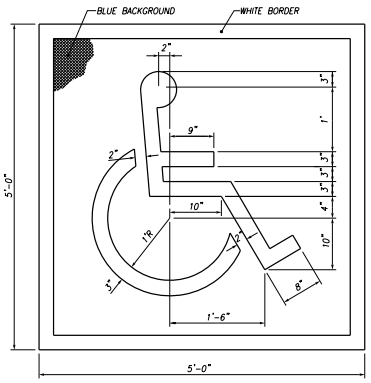
NOTES:
1. PREFORMED EXPANSION JOINTS SHALL BE EQUALLY SPACED AT 20' MAXIMUM CENTERS AND WHERE THE SIDEWALK IS IN CONTACT WITH THE STREET RETURNS, ON BUILDING LINES, AND AT OTHER FIXED OBJECTS. EXPANSION JOINT AT BUILDINGS AND RETAINING WALLS SHALL BE INCREASED TO 1" WIDTH.
2. EQUALLY SPACE CONTRACTION JOINTS AT 5' MAXIMUM CENTERS BETWEEN EXPANSION JOINTS.
3. PROTECT AND CURE CONCRETE WITH AN APPROVED CURING COMPOUND (KURE-N-SEAL BY SONNEBORN OR EQUAL). APPLY ACCORDING TO THE MANUFACTURER'S SPECIFICATION.

4 / C5 CONCRETE SIDEWALK
NTS



NOTES:
1. PREFORMED 1/2" EXPANSION JOINTS SHALL BE EQUALLY SPACED AT 25' MAXIMUM CENTERS. EQUALLY SPACE 1/4" CONTRACTION JOINTS AT 5' MAXIMUM CENTERS BETWEEN EXPANSION JOINTS.
2. EXPANSION JOINT MATERIAL REQUIRED FOR GRASS MEDIANS.
3. EXACT CURB DIMENSIONS MAY BE ALTERED SLIGHTLY TO FIT STANDARD EXTRUDED CURB MACHINES, BUT SUCH VARIANCES MUST BE APPROVED BY THE ENGINEER.
4. IMMEDIATELY AFTER THE CONCRETE HAS SUFFICIENTLY SET, BACKFILL BEHIND CURBS TO PREVENT PONDING OF SURFACE WATER.

5 / C5 EXTRUDED CURB
NTS



NOTES:
1. ALL STRIPES TO BE 4" PAINTED WHITE

6 / C5 HANDICAP SYMBOL
NTS

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C5

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FULGHUM MACINDOE & ASSOCIATES, INC.
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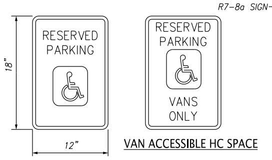
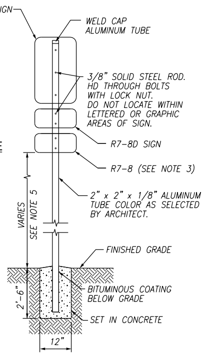
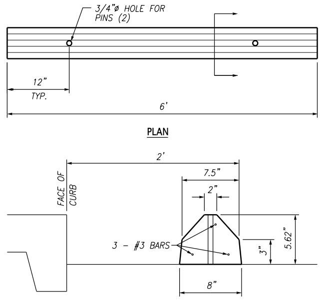




NOTES:

1. USE TYPE R7-8a SIGNAGE.
2. USE TYPE R7-8D SIGNAGE "MAXIMUM PENALTY $200" WITH R7-8a SIGNS.
3. SIGN SHALL HAVE TYPE R7-8 PLAQUE (OR EQUAL) WITH CONTACT INFORMATION FOR THE OWNER, TOWING COMPANY OR OTHER REPRESENTIVE AGENT OF THE FACILITY.
4. COLORS: LEGEND AND BORDER - GREEN WHITE SYMBOL ON BLUE BACKGROUND.
5. SIGN MAY BE MOUNTED TO BUILDING FACE OR COLUMN AT A HEIGHT OF 60" ABOVE FINISHED GRADE. COORDINATE LOCATION WITH OWNER.
6. HEIGHT OF SIGN IN ACCESSABLE PEDESTRIAN PATHS SHALL BE 7'. HEIGHT OF SIGN IN NON-ACCESSABLE AREAS SHALL BE 5'.

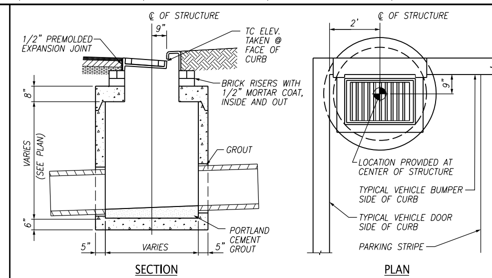
7 / C6 HANDICAP SIGN
NTS



NOTES:

1. WHEEL STOPS SHALL BE 4500 PSI CONCRETE @ 28 DAYS.
2. WHEEL STOPS SHALL BE 6' LONG AND ±225 POUNDS.
3. INSTALL 5/8" x 12" LONG REBAR PINS TO ANCHOR WHEEL STOPS.

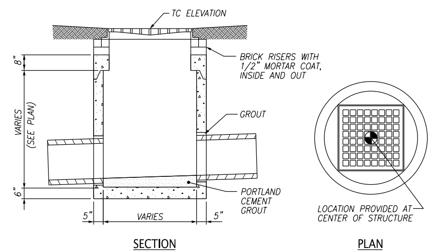
8 / C6 WHEEL STOP
NTS



NOTES:

1. CATCH BASINS SHALL BE CIRCULAR OR SQUARE PRECAST CONCRETE STRUCTURE IN ACCORDANCE WITH ASTM C478 OR C913 (LATEST REVISION). DIMENSIONS VARY DEPENDING ON PIPE SIZE AND ANGLE OF PIPES IN AND OUT OF STRUCTURE. THE OPENING IN THE STRUCTURE TOP SHALL NOT BE LESS THAN THE GRATE DIMENSIONS.
2. LADDER BARS SHALL BE PROVIDED PER OSHA REGULATIONS.
3. CATCH BASIN FRAME AND GRATE SHALL BE EJ USA INC. NO. 7510, TYPE M3, T1 BACK OR EQUAL. THE GRATE AND CURB BACKS SHALL BE STAMPED WITH "DUMP NO WASTE... DRAINS TO WATERWAYS" WITH FISH IMAGE, OR EQUAL.
4. SHIM THE FRAME TO MATCH THE CROSS SLOPE AND GUTTER LINE SLOPES OF THE PAVEMENT.

9 / C6 SINGLE CATCH BASIN
NTS



NOTES:

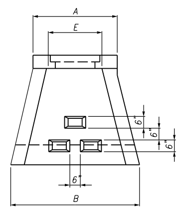
1. AREA DRAINS SHALL BE CIRCULAR OR SQUARE PRECAST CONCRETE STRUCTURE IN ACCORDANCE WITH ASTM C478 OR C913 (LATEST REVISION). DIMENSIONS VARY DEPENDING ON SIZE AND ANGLE OF PIPES IN AND OUT OF STRUCTURE. THE OPENING IN THE STRUCTURE TOP SHALL NOT BE LESS THAN THE GRATE DIMENSIONS.
2. LADDER BARS SHALL BE PROVIDED PER OSHA REGULATIONS.
3. LOCATION AND TC ELEVATIONS GIVEN AT CENTER OF THE STRUCTURE.
4. FRAME AND GRATE SHALL BE EJ USA INCORPORATED MODEL NO. V-5630 OR EQUAL. THE GRATE SHALL BE STAMPED WITH "DUMP NO WASTE... DRAINS TO WATERWAYS" WITH FISH IMAGE, OR EQUAL.
5. SHIM THE FRAME TO MATCH THE CROSS SLOPE AND GUTTER LINE SLOPES OF THE PAVEMENT.

10 / C6 AREA DRAIN
NTS

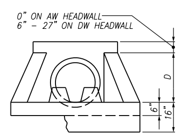
TC ELEVATION

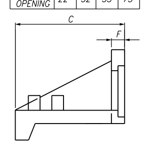
NOTES:

1. CONCRETE: 4500 PSI @ 28 DAYS. REINFORCING: 4x4 W7xW7
2. ENERGY DISSIPATES AS NEEDED (12"x6"x12") PIPE OPENING IN FACE OF WALL WILL
3. EQUAL PIPE ID FOR 12"-36" DIAMETER PIPE

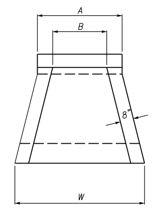


SIZE	AW	BW	CW	DW
A	32"	48"	80"	99"
B	48"	72"	102"	120"
C	30"	44"	54"	56"
D	26"	36"	54"	60"
E	24"	36"	64"	83"
F	6"	8"	8"	8"
MAX OPENING	22"	32"	55"	75"





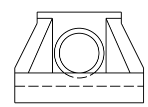
11 / C6 PRECAST CONCRETE HEADWALL W/DISSIPATORS
NTS

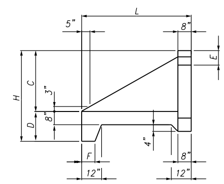


PIPE SIZE	HOLE SIZE	"W"	"L"	"H"	"A"	"B"	"C"	"D"	"E"	"F"
15"	22"	48"	30"	42"	32"	24"	26"	16"	4"	6"
18"	22"	48"	30"	42"	32"	24"	26"	16"	4"	6"
24"	32"	72"	44"	52"	48"	36"	36"	16"	4"	8"
36"	55"	102"	54"	76"	80"	64"	60"	16"	5"	8"
48"	55"	102"	54"	76"	80"	64"	60"	16"	5"	8"

NOTES:

1. CONCRETE: 4500 PSI @ 28 DAYS
2. REINFORCING: #4 BAR @ 12" EACH WAY, GRADE 60
3. MINIMUM REBAR COVERAGE - 2"
4. 3/4" CHAMFER ON ALL EXPOSED EDGES





12 / C6 PRECAST CONCRETE HEADWALL
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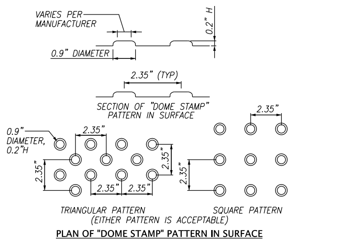
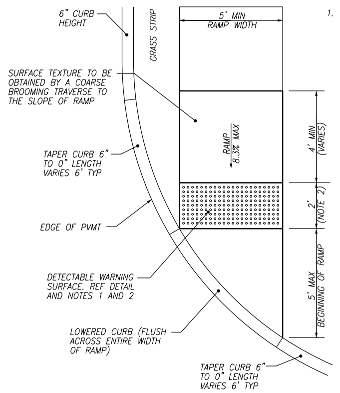


NOTES:

1. DETECTABLE WARNING SURFACE SHALL EXTEND ACROSS THE ENTIRE WIDTH OF CURB RAMP (4' MIN).
2. DETECTABLE WARNING SURFACE SHALL EXTEND 2' IN THE DIRECTION OF PEDESTRIAN TRAVEL REGARDLESS OF THE CURB RAMP LENGTH.
3. DETECTABLE WARNING AREA SHALL BE COLORED YELLOW AT ALL LOCATIONS.
4. SURFACE APPLIED SYSTEMS SHALL HAVE BEVELED EDGES TO ELIMINATE TRIP HAZARDS.
5. USE ARMOR-TILE OR ADA SOLUTIONS TACTILE WARNING CAST-IN-PLACE SYSTEMS OR EQUAL.

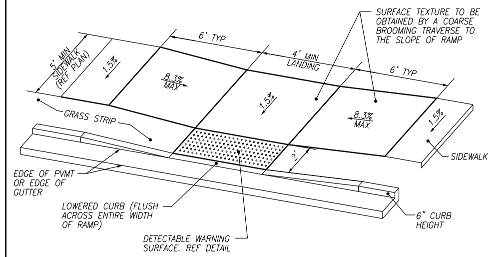
10 / C7 DETECTABLE WARNING SURFACE
NTS



NOTES:

1. DETECTABLE WARNING SHALL BE INSTALLED AT ALL LOCATIONS WHERE RAMP EXITS TO VEHICULAR DRIVE PATH.

11 / C7 MONO-DIRECTIONAL PERPENDICULAR CURB RAMP
NTS



NOTES:

1. DETECTABLE WARNING SHALL BE INSTALLED AT ALL LOCATIONS WHERE RAMP EXITS TO VEHICULAR DRIVE PATH.

12 / C7 COMBINATION CURB RAMP
NTS

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Valley Church UMC
Turning Template
April 23, 2021

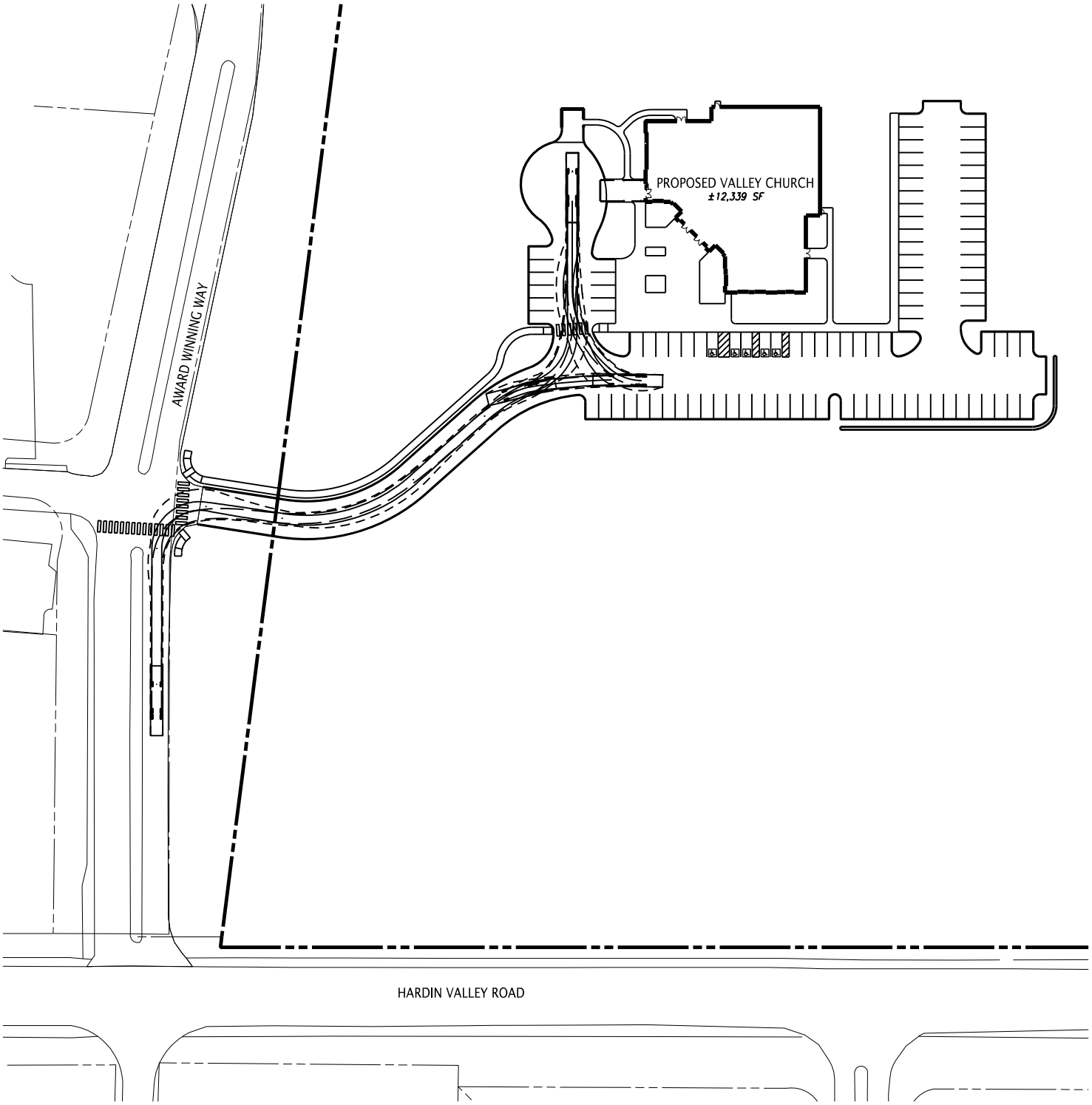


Figure 1: Fire Truck Turning Template

Scale: 1" = 100'

Valley Church UMC
Turning Template
April 23, 2021

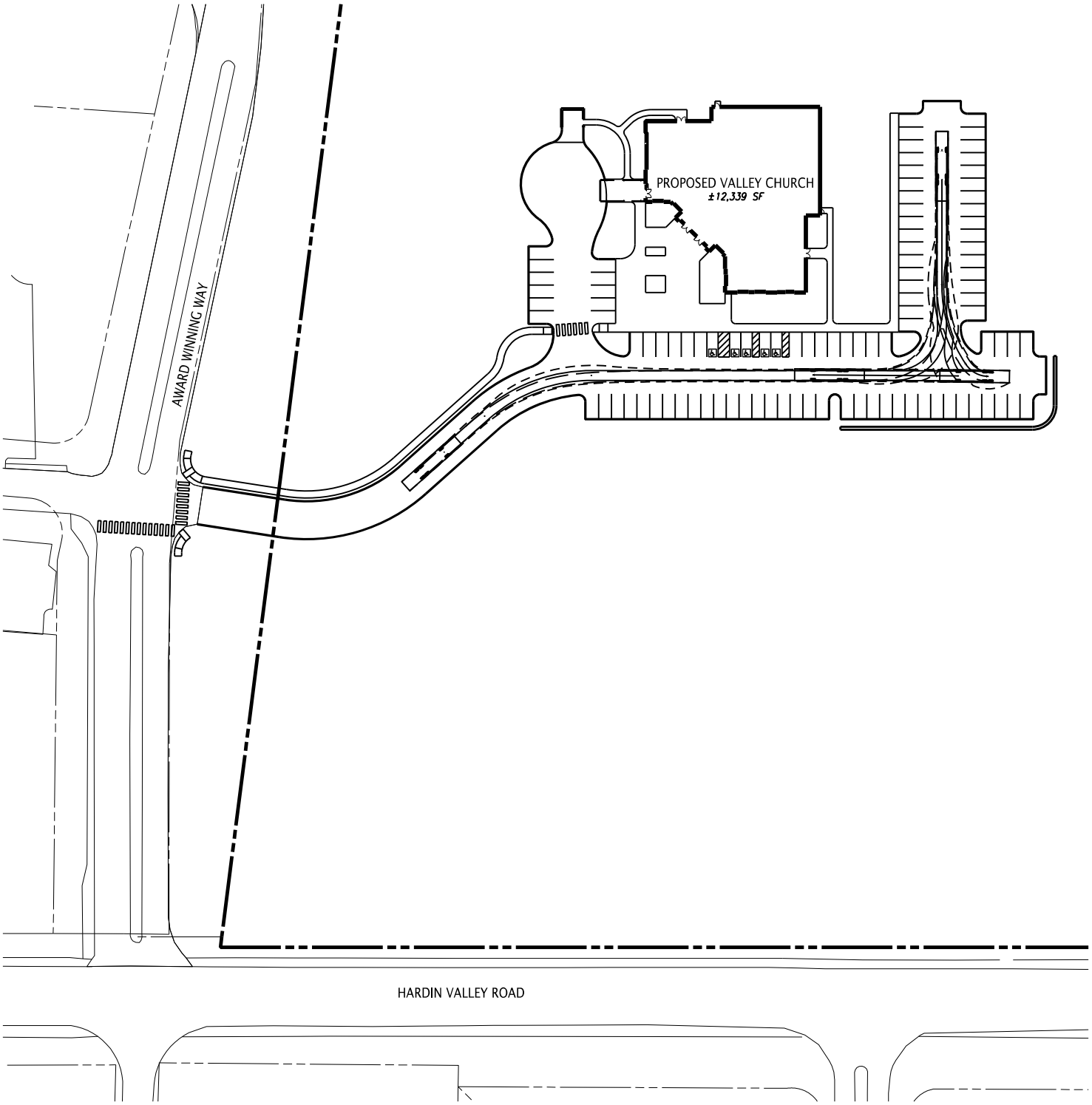
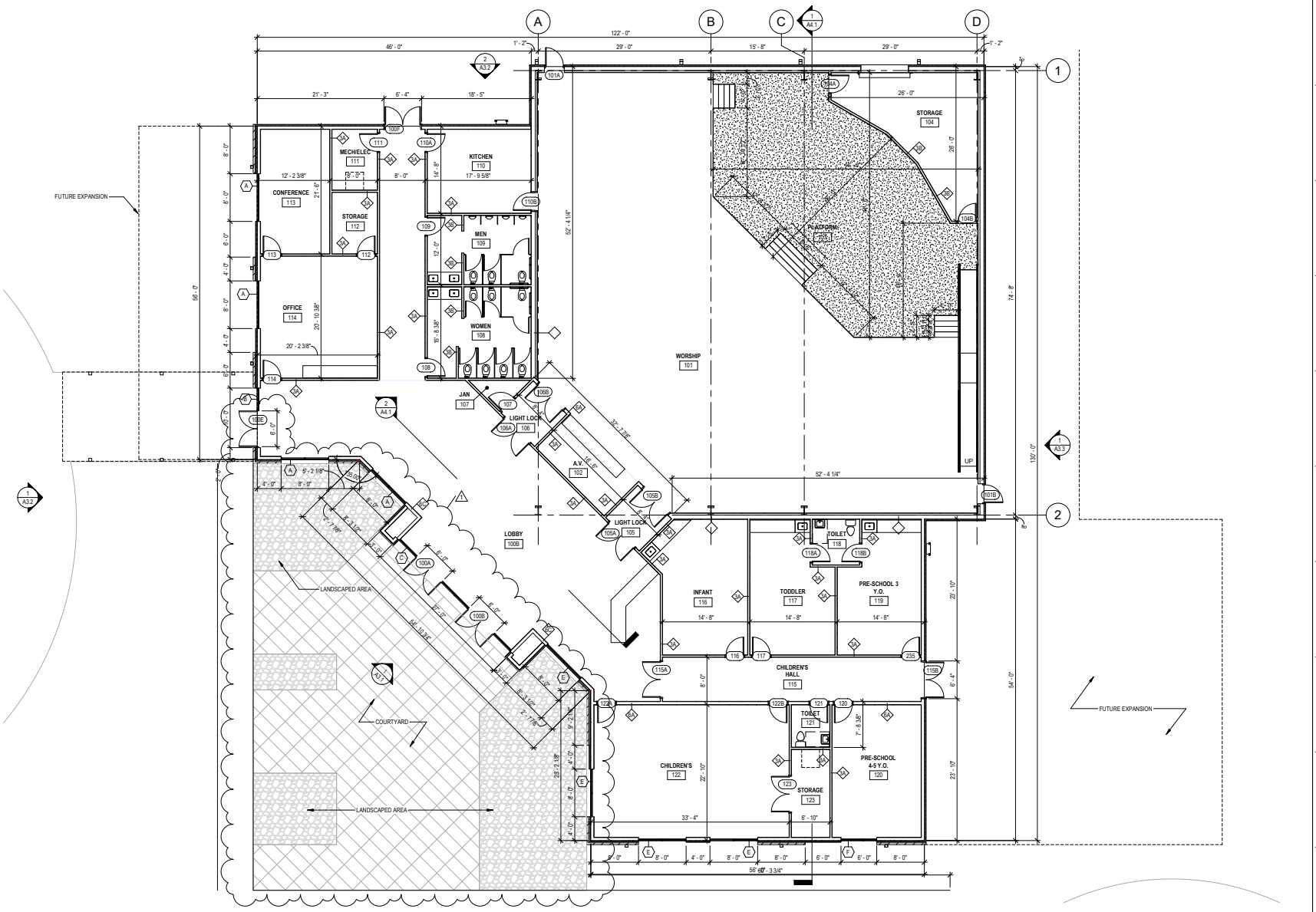


Figure 2: Fire Truck Turning Template

Scale: 1" = 100'



2 **Level 1**
1/8" = 1'-0"

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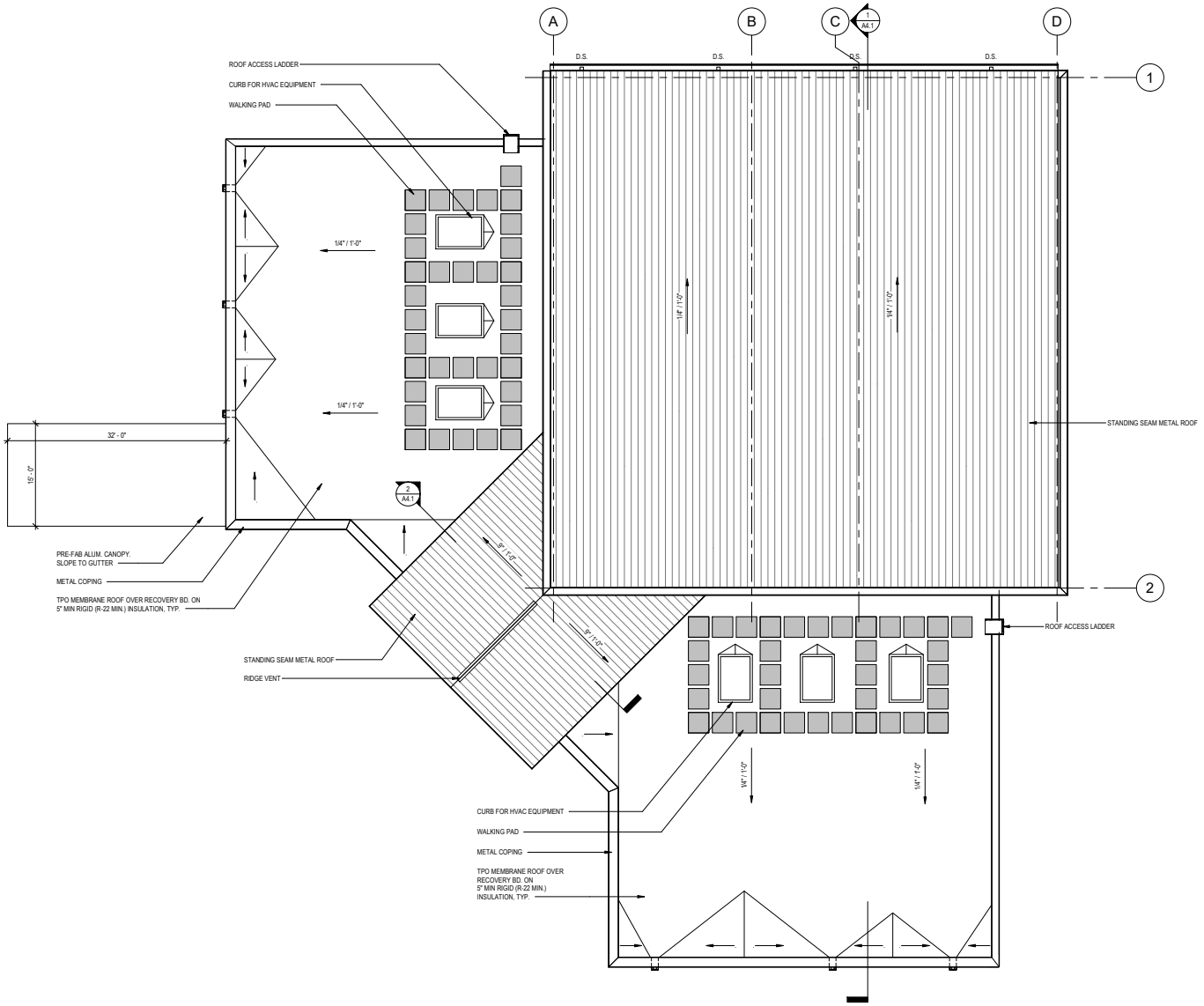
First Floor Plan

A1.1



1 **Roof Plan**
1/8" = 1'-0"

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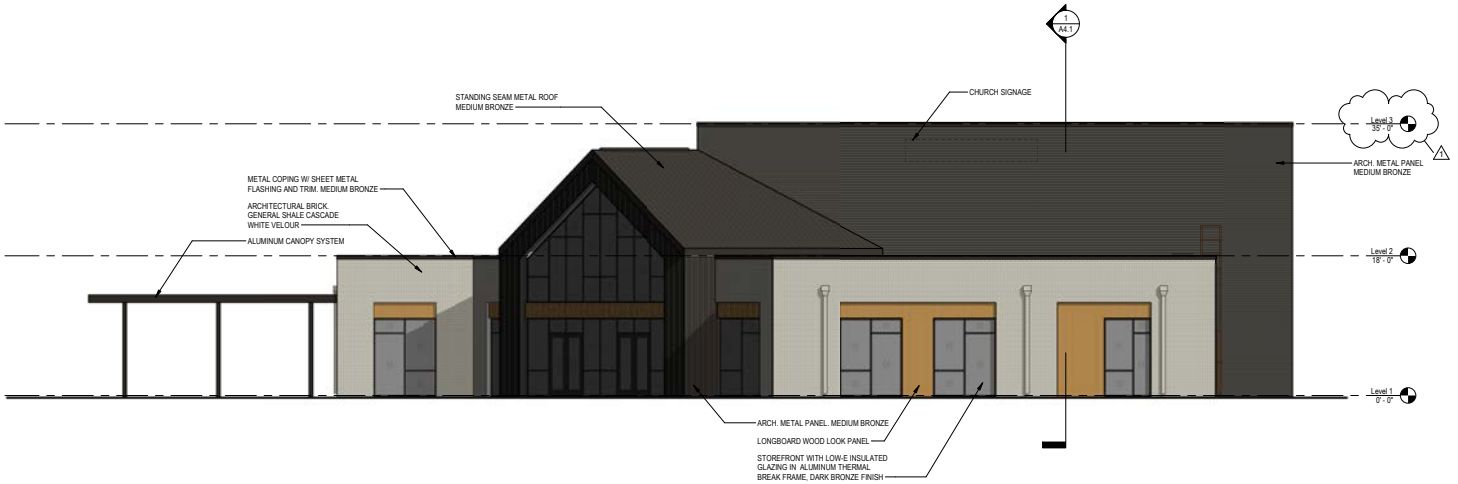
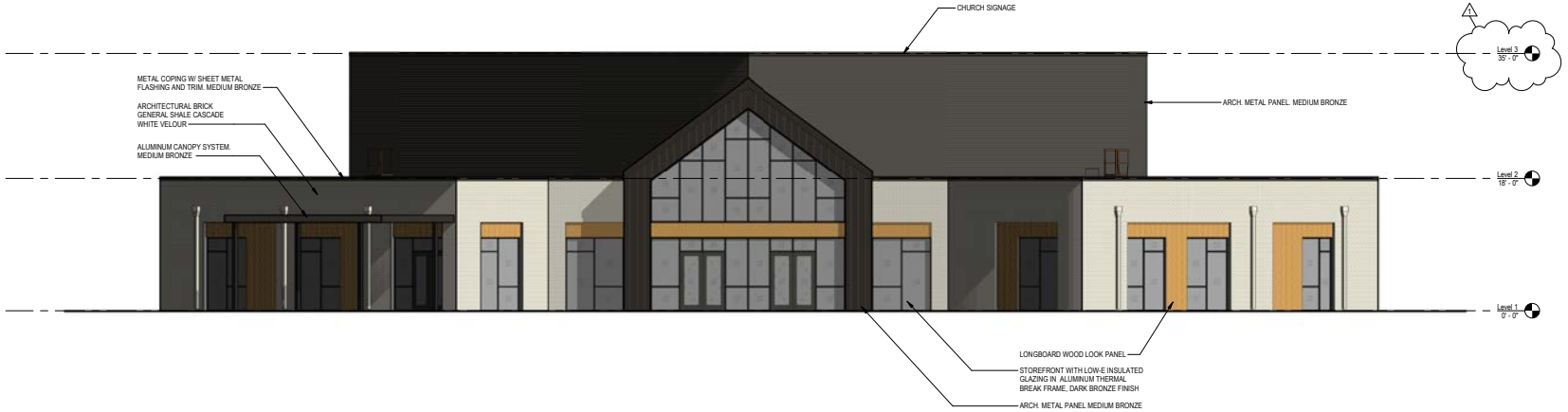
Roof Plan

A1.2



2 **Building Elevation 2**
1/8" = 1'-0"



1 **Building Elevation 1**
1/8" = 1'-0"

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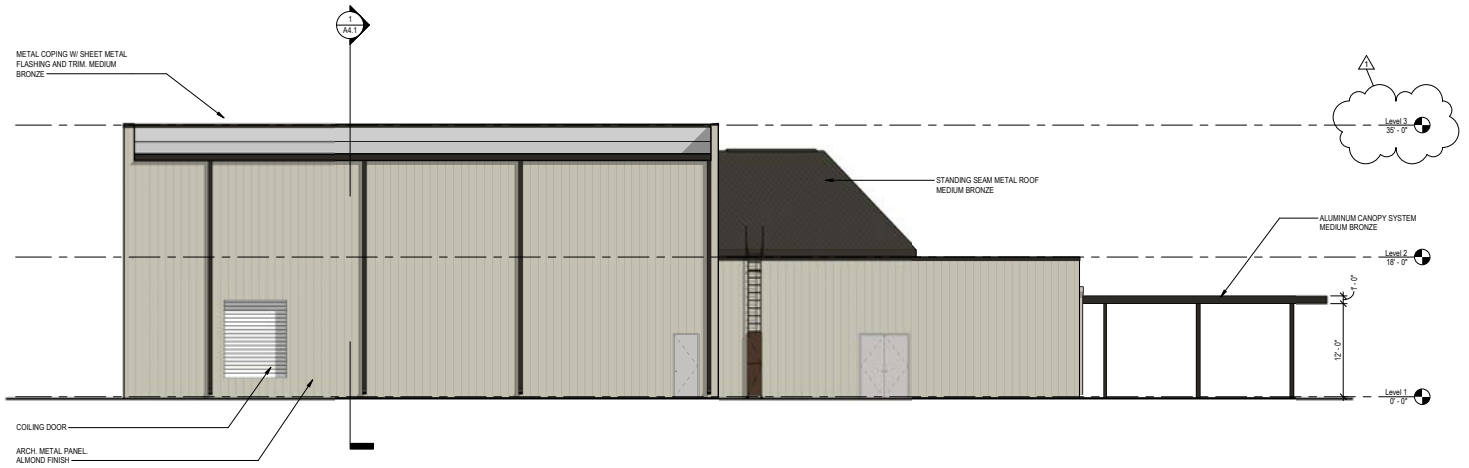
Elevations

A3.1



2 **Building Elevation 4**
1/8" = 1'-0"

1 **Building Elevation 3**
1/8" = 1'-0"

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Elevations

A3.2

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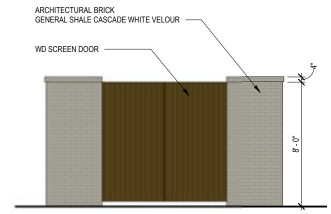
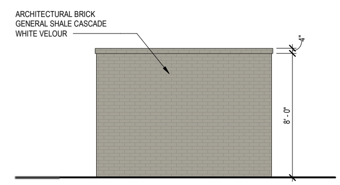
8 Metal Panel Material Selection
NTS

7 Masonry Material Selection
NTS

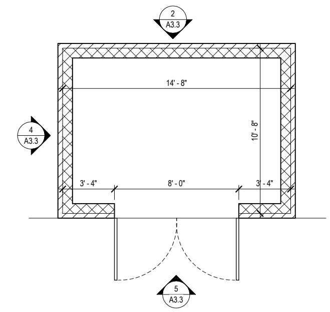
6 Wood Look Metal Panel Material Selection
NTS



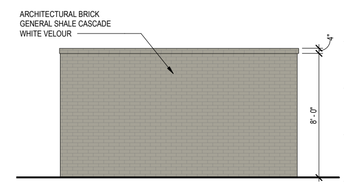
5 Dumpster Enclosure Front Elevation
1/4" = 1'-0"



4 Dumpster Enclosure Side Elevation
1/4" = 1'-0"



3 Level 1 - Callout 1
1/4" = 1'-0"



2 Dumpster Enclosure Back Elevation
1/4" = 1'-0"

1 Building Elevation 5
1/8" = 1'-0"

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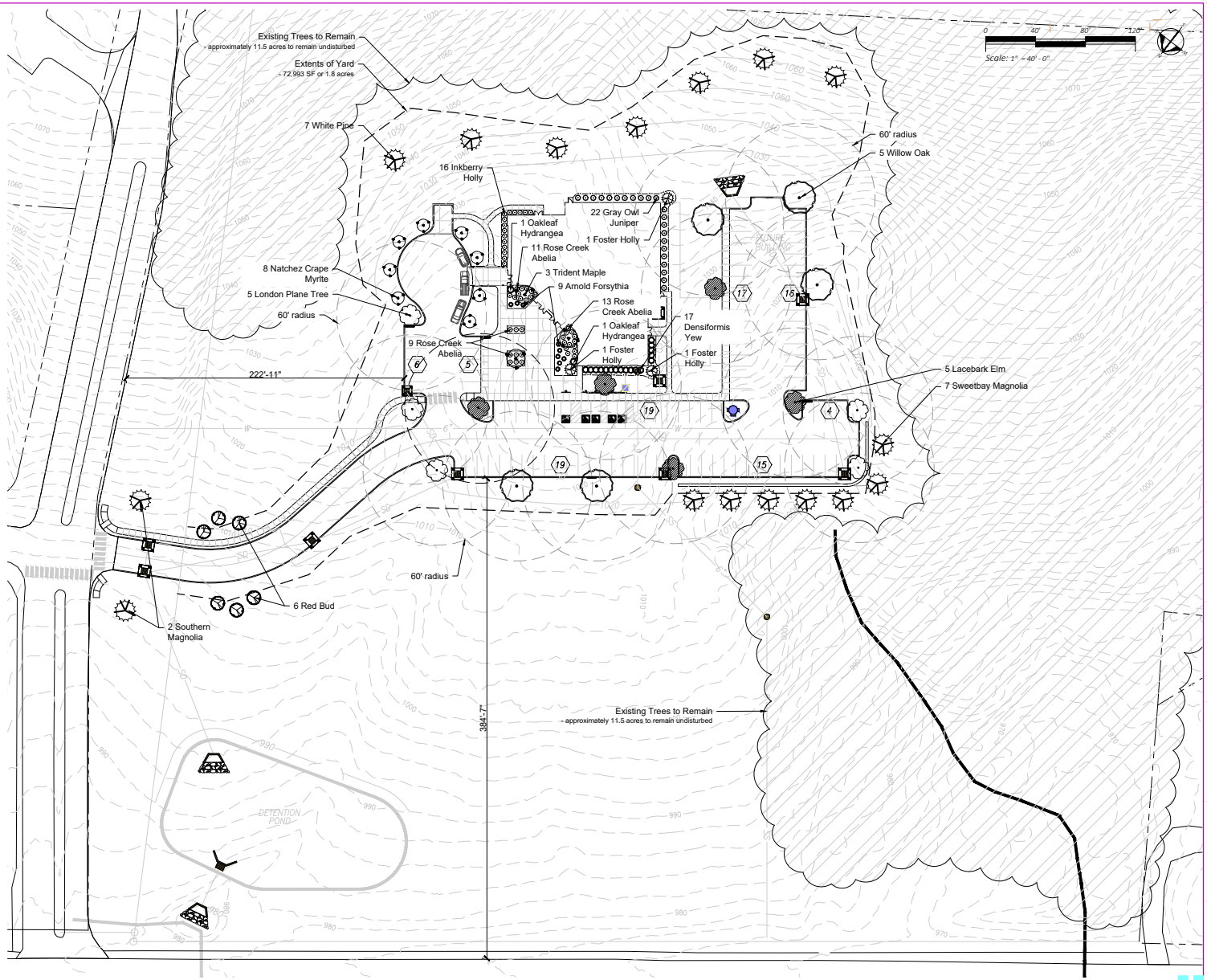
Elevations

A3.3



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Patrick Beasley
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PATRICK D. BEASLEY REGISTERED LANDSCAPE ARCHITECT TN 04.05.21

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Landscape Plan

L1.0

Date: 4/5/2021 8:14:55 AM
Drawn By: Author Checked By: Checker
File: C:\Users\bosa\Documents\Revit Local Files\20011_Valley Church Central_bosa.rvt

Planting Requirement Notes:

3.1.4 requires 25% newly planted trees to be evergreen. This plan provides (31) trees of which (16) are evergreen, achieving 51% evergreen trees.

3.1.5 requires 10 large maturing trees per 1 acre of yard. There is approximately 76,993 square feet (1.8 acres) of yard. 10 x 1.8 = 18 required large trees. This plan proposes (22) large trees (5 Willow Oak, 5 Lacebark Elm, 5 London Plane Tree, and 7 White Pine). See note on plan for extents of 'yard'.

3.1.6, no invasive exotic species have been proposed

3.3.6 requires landscaping to screen mechanical units. Mechanical units located on roof.

3.4.1, no parking areas are adjacent to public right of ways

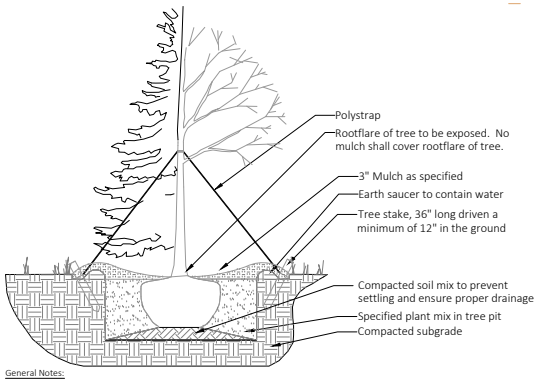
3.4.3 requires (1) tree per (10) parking spaces. There are 101 proposed parking spaces. 101\10 = 10.1 trees required. This plan provides (31) trees.

3.4.4 requires no less than 5% of the surface area devoted to parking to be landscaped. The proposed parking area is approximately 32,880 square feet. 5% of 32,880 = 1,644 square feet. This plan provides approximately 3,190 square feet of shrubbery and bedding plants adjacent to the parking area and building.

3.3.7 requires that no parking space be located more than 60 feet from the trunk of a larger canopy tree. See note on plan. All proposed parking spaces are within 60' of a large tree.

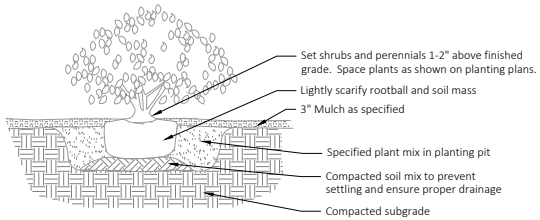
Planting Notes:

1. Contractor's base bid to include all materials, labor, permits, equipment, tools, insurance, etc. to perform the work as described in the contract documents.
2. Contractor to provide allowance for soil ammendments, percolation tests, soil tests, mulch and irrigation.
3. Contractor to complete work within schedule established by owner.
4. Contractor to provide one year warranty for all plant material from date of substantial completion.
5. Contractor to provide interim maintenance (watering, pruning, fertilizing, guying, mowing, trimming, adequate drainage of ponding areas, edging, weeding, mulching, application of insecticides/herbicides, and general landscape clean-up) until substantial completion notice is provided by the owner or landscape architect.
6. The contractor shall locate and verify all existing utilities prior to planting and report any conflicts to the landscape architect. Perform work in compliance with all applicable laws, codes, and regulations required by authorities having jurisdiction over such work and provide for permits required by local authorities.
7. All plant material to be specimen quality as established by the American Association of Nurserymen, horticultural standards, latest edition. quality of the plant material to be judged by the landscape architect. Inferior plant material to be rejected.
8. Plant material to be free of disease, weeds and insect pests. Damaged plant material shall be rejected.
9. No planting shall take place until rough grade has been reviewed and approved by the landscape architect.
10. Planting plans may need to be adjusted in the field. Contractor to coordinate layout of plant material with landscape architect for on site approval prior to installation.
11. Test plant beds and plant pits for adequate drainage. Hardpan or moisture barriers shall be broken, or drain pipes to be installed to provide proper drainage of plant areas. Plant pits shall be excavated to the bottom of the pit. Fill each plant pit with water and observe the pit for 2 hours. If the water has not dissipated by 50% within 2 hours, notify landscape architect of such in writing before installing plants in the questionable area. Otherwise contractor shall be held liable for plants.
12. Trees shall be installed 3" above finish grade in hardpan areas to provide good drainage unless otherwise directed.
13. Groundcover and shrub mass beds shall be cultivated to a depth of 12 inches below grade to break through compacted or hardpan soil. Remove all stones, roots, and weeds. Add specified soil amendments and fertilizer. Install plants, edge bed area, mulch and water thoroughly.
14. Set all plants plumb and turned so that the most attractive side is viewed.
15. Plants shall be measured to their main structure, not tip to tip of branches.
16. Tree pit and shrub pit to be twice the size of the root mass. Fill with plant mix.
17. Broken root balls for trees shall be rejected. Contractor to check root balls and expose rootflares to check for root girdling. Do not assume the rootflare is exposed upon purchase from the nursery.
18. Any plant materials shipped to site in uncovered vehicles/ trailer shall be rejected regardless of season.
19. All tree scars over 1 -1/2" shall be rejected and tree to be replaced.
20. All shrubs to be dense and full. All trees to have a symmetrical growth habit (360 degrees) unless uncharacteristic to plant type or otherwise noted on plans.
21. Remove all excess growth of trees and shrubs as directed by landscape architect. Do not cut central leader.
22. If rootball is wrapped in non-biodegradeable burlap, remove entire wrap after placed in pit.



General Notes:
1. Excavate tree pit to a depth equal to depth of rootball plus 24", and a width equal to two times the diameter of the rootball.
2. Fill tree pit with water and confirm percolation rate. (Notify landscape architect if poor drainage conditions exist.)
3. Install tree 2-3" above finished grade. Avoid any damage to rootball or trunk of tree.
4. Add specified plant mix and soil ammedments.
5. Remove burlap on top 2/3 of tree rootball.
6. Immediately soak tree pit with water and remove any air pockets that may have occurred during backfilling.
7. Stake and guy tree with specified materials.

General Tree Planting
Scale: NTS



Shrub & Perennial Planting
Scale: NTS

PLANTING SCHEDULE:

Evergreen Trees

Qnty	Botanical Name	Common Name	Size	Notes
3	Ilex x attenuata 'Fosteri'	Foster Holly	4' height	central leader, full and dense *(not in tree count)*
2	Magnolia grandiflora	Southern Magnolia	6' height	central leader, full and dense
7	Magnolia virginiana	Sweetbay Magnolia	6' height	multi-trunk
7	Pinus strobus	White Pine	6' height	central leader, full and dense

Deciduous Trees

Qnty	Botanical Name	Common Name	Size	Notes
3	Acer buergerianum	Trident Maple	1.5" cal.	central leader, full and dense *(not in tree count)*
6	Cercis canadensis	Red Bud	1" cal.	central leader, full and dense *(not in tree count)*
8	Lagerstroemia indica x 'fauriei'	Natchez Crape Myrtle	15 gallon	central leader, full and dense *(not in tree count)*
5	Platanus x acerifolia	London Plane Tree	2" cal.	central leader, full and dense
5	Quercus phellow	Willow Oak	2" cal.	central leader, full and dense
5	Ulmus parvifolia	Lacebark Elm	2" cal.	central leader, full and dense

Evergreen Shrubs

Qnty	Botanical Name	Common Name	Size	Notes
16	Ilex glabra	Inkberry Holly	3 gallon	full and dense
17	Taxus x media	Densiformis Yew	3 gallon	full and dense
22	Juniperus virginiana	Grey Owl Juniper	3 gallon	full and dense
33	Abelia x chinensis	Rose Creek Abelia	3 gallon	full and dense

Deciduous Shrubs

Qnty	Botanical Name	Common Name	Size	Notes
9	Forsythia 'Arnold Dwarf'	Dwarf Forsythia	3 gallon	full and dense
2	Hydrangea quercifolia	Oakleaf Hydrangea	3 gallon	full and dense

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ARCHITECTURE & INTERIORS
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PATRICK D. BEASLEY REGISTERED LANDSCAPE ARCHITECT 04.05.21

Valley Church
11012 Hardin Valley Rd.
Knoxville, TN 37932

NOT FOR CONSTRUCTION
DD
Concept Package

Project Phase: Concept Package

Issue Date: 09/23/2020		
Revisions		
No.	Descripton	Date
1	Comments	04.23.2021

Job Number: 20011.00

Landscape Notes and Details

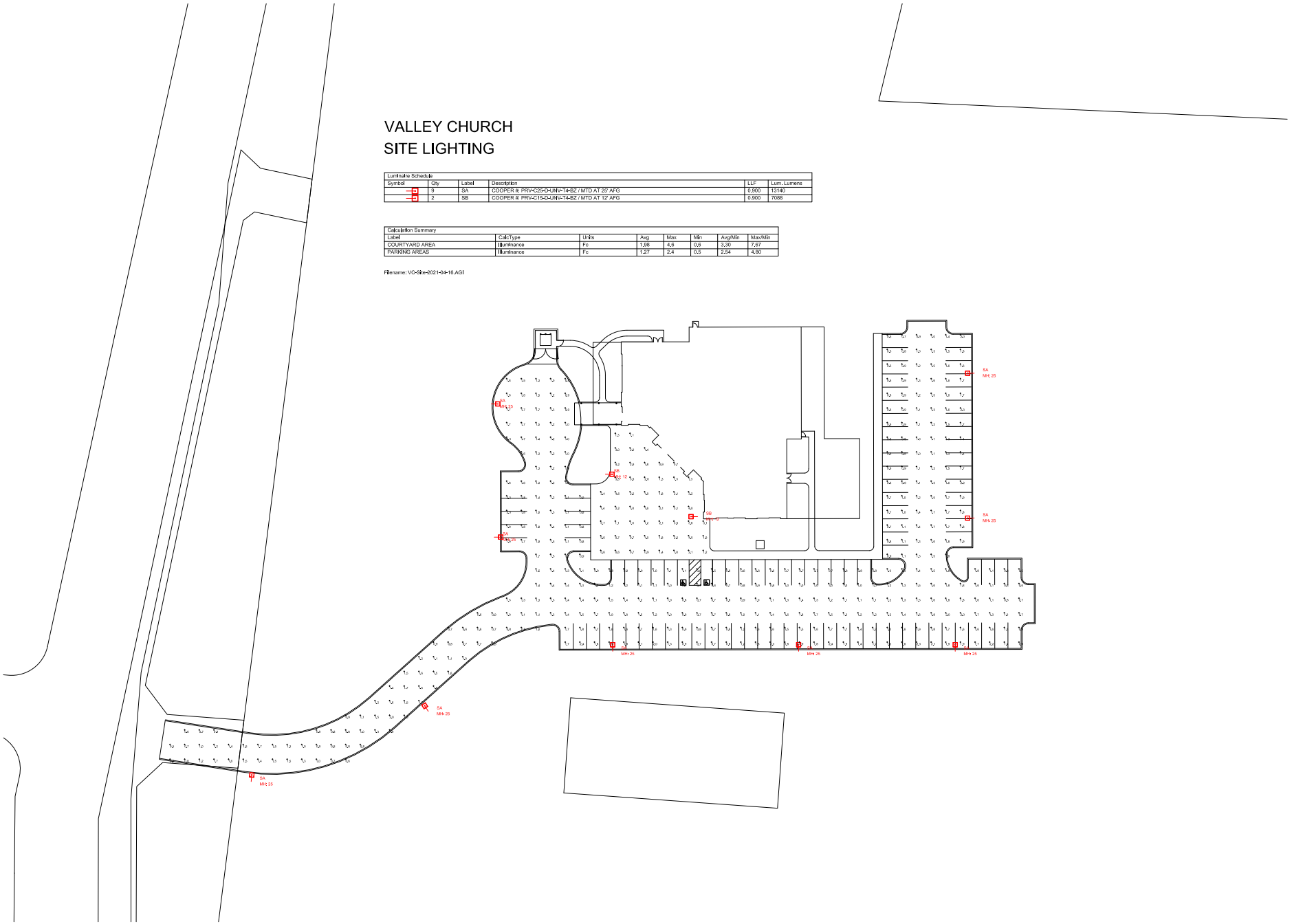
L1.1

VALLEY CHURCH
SITE LIGHTING

Luminaire Schedule					
Symbol	Qty	Label	Description	LLF	Lum. Lumens
	9	SA	COOPER ® PRV-C25-D-UNV-T4-BZ / MTD AT 25' AFG	0.900	13140
	2	SB	COOPER ® PRV-C15-D-UNV-T4-BZ / MTD AT 12' AFG	0.900	7088

Calculation Summary							
Label	CalcType	Units	Avg	Max	Min	Avg/Min	Max/Min
COURTYARD AREA	Illuminance	Fc	1.98	4.6	0.6	3.30	7.67
PARKING AREAS	Illuminance	Fc	1.27	2.4	0.5	2.54	4.80

Filename: VC-Site-2021-04-16.AGI



Project		**Catalog #**		**Type**	
Prepared by		**Notes**		**Date**	

Lumark

Prevail / Prevail XL Discrete LED

Area / Site Luminaire

Typical Applications

Outdoor • Parking Lots • Walkways • Roadways • Building Areas

Interactive Menu

- Ordering Information page 2
- Mounting Details page 3
- Optical Configurations page 3
- Product Specifications page 4
- Energy and Performance Data page 4
- Control Options page 5

Product Certifications

Product Features

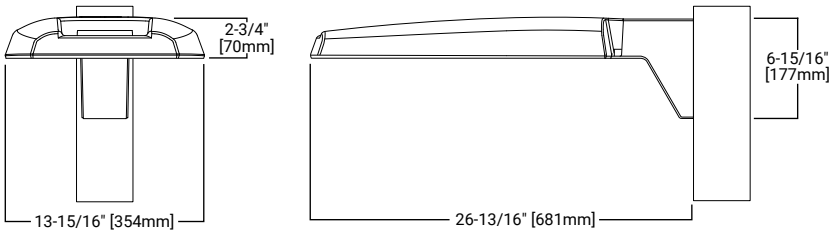
LumenSafe Technology · Enlighted · WaveLinx

Quick Facts

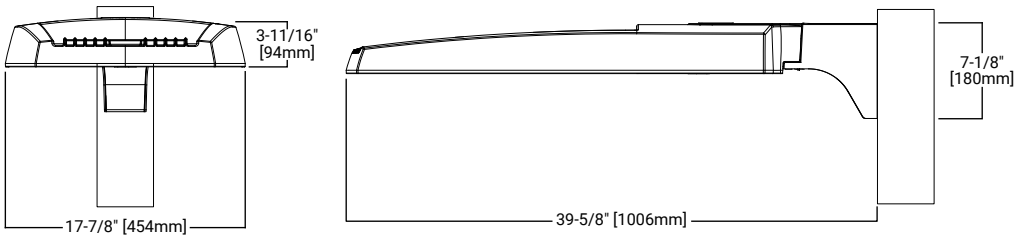
- Direct-mounted discrete light engine for improved optical uniformity and visual comfort
- Lumen packages range from 7,500 - 41,000 nominal lumens (50W - 300W)
- Replaces 70W up to 1,000W HID equivalents
- Efficacies up to 148 lumens per watt
- Standard universal quick mount arm with universal drill pattern

Dimensional Details

Prevail



Prevail XL



Ordering Information

SAMPLE NUMBER: **PRV-XL-PA4B-740-U-T4W-BZ**

Product Family [1, 2]	Light Engine		Color Temperature	Voltage	Distribution	Mounting (Included)	Finish
	Configuration	Drive Current [3]					
PRV=Prevail	**PA1**=1 Panel, 24 LED Rectangle **PA2**=2 Panels, 48 LED Rectangles	**A**=745mA Nominal **B**=950mA Nominal	**740**=70CRI, 4000K **730**=70CRI, 3000K **750**=70CRI, 5000K	**U**=Universal, 120-277V **H**=High Voltage, 347-480V **9**=347V **8**=480V [4]	**T2R**=Type II Roadway **T2U**=Type II Urban **T3**=Type III **T4W**=Type IV Wide **5WQ**=Type V Square Wide	**[Blank]**=Standard Versatile Arm **MA**=Mast Arm **WM**=Wall Mount Arm	**AP**=Grey **BK**=Black **BZ**=Bronze **DP**=Dark Platinum **GM**=Graphite Metallic **WH**=White **CC**=Coastal Construction
PRV-XL=Prevail XL	**PA3**=3 Panels, 72 LED Rectangles **PA4**=4 Panels, 96 LED Rectangles						

Options (Add as Suffix)	**Accessories** (Order Separately) [17]
10K=10kV UL 1449 Fused Surge Protective Device **20MSP**=20kV MOV Surge Protective Device **20K**=20kV UL 1449 Fused Surge Protective Device **HA**=50°C High Ambient Temperature **HSS**=House Side Shield (Factory Installed) [5] **L90**=Optics Rotated 90° Left **R90**=Optics Rotated 90° Right **PR**=NEMA 3-PIN Twistlock Photocontrol Receptacle [6] **PR7**=NEMA 7-PIN Twistlock Photocontrol Receptacle [6] **MS/DIM-L08**=Motion Sensor for Dimming Operation, Up to 8' Mounting Height [7, 8, 9] **MS/DIM-L20**=Motion Sensor for Dimming Operation, 9' - 20' Mounting Height [7, 8, 9] **MS/DIM-L40**=Motion Sensor for Dimming Operation, 21' - 40' Mounting Height [7, 8, 9] **MS-L08**=Motion Sensor for ON/OFF Operation, Up to 8' Mounting Height [7, 8, 9] **MS-L20**=Motion Sensor for ON/OFF Operation, 9' - 20' Mounting Height [7, 8, 9] **MS-L40**=Motion Sensor for ON/OFF Operation, 21' - 40' Mounting Height [7, 8, 9] **ZD**=DALI-enabled 4-PIN Twistlock Receptacle [7, 8, 10, 11] **ZW**=Wavelinx-enabled 4-PIN Twistlock Receptacle [7, 8, 10, 11] **SWPD4XX**=Wavelinx Wireless Sensor, 7' - 15' Mounting Height [7, 8, 10, 11, 12, 13] **SWPD5XX**=Wavelinx Wireless Sensor, 15' - 40' Mounting Height [7, 8, 10, 11, 12, 13] **LWR-LW**=Enlighted Wireless Sensor, Wide Lens for 8' - 16' Mounting Height [7, 8, 14] **LWR-LN**=Enlighted Wireless Sensor, Narrow Lens for 16' - 40' Mounting Height [7, 8, 14] **(See Table Below)**=LumenSafe Integrated Network Security Camera [15, 16]	**PRVWM-XX**=Wall Mount Kit [18] **PRVMA-XX**=Mast Arm Mounting Kit [18] **PRVSA-XX**=Standard Arm Mounting Kit [18] **PRVXLWM-XX**=Wall Mount Kit (for Prevail XL) [15] **PRVXLMA-XX**=Mast Arm Mounting Kit (for Prevail XL) [15] **PRVXLSA-XX**=Standard Arm Mounting Kit (for Prevail XL) [15] **MA1010-XX**=Single Tenon Adapter for 3-1/2" O.D. Tenon **MA1011-XX**=2@180° Tenon Adapter for 3-1/2" O.D. Tenon **MA1017-XX**=Single Tenon Adapter for 2-3/8" O.D. Tenon **MA1018-XX**=2@180° Tenon Adapter for 2-3/8" O.D. Tenon **HSS-VP**=House Side Shield, Vertical Panel [5, 19] **HSS-HP**=House Side Shield, Horizontal Panel [5, 19] **OA/RA1013**=Photocontrol Shorting Cap **OA/RA1014**=NEMA Photocontrol - 120V **OA/RA1016**=NEMA Photocontrol - Multi-Tap 105-285V **OA/RA1201**=NEMA Photocontrol - 347V **OA/RA1027**=NEMA Photocontrol - 480V **FSIR-100**=Wireless Configuration Tool for Motion Sensor [20] **SWPD4-XX**=WaveLinx Wireless Sensor, 7' - 15' Mounting Height [11, 12, 13] **SWPD5-XX**=WaveLinx Wireless Sensor, 15' - 40' Mounting Height [11, 12, 13] **WOLC-7P-10A**=WaveLinx Outdoor Control Module (7-PIN) [21]

NOTES:

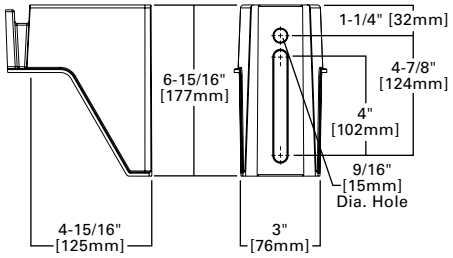
1. DesignLights Consortium® Qualified. Refer to www.designlights.org Qualified Products List under Family Models for details.
2. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for applications. Refer to installation instructions and pole white paper WP513001EN for additional support information.
3. Nominal drive currents shown here. For actual drive current by configuration, refer to Power and Lumen tables.
4. Only for use with 480V Wye systems. Per NEC, not for use with ungrounded systems, impedance grounded systems or corner grounded systems (commonly known as Three Phase Three Wire Delta, Three Phase High Leg Delta and Three Phase Corner Grounded Delta systems).
5. House Side Shield not for use with 5WQ distribution.
6. If High Voltage (H) is specified, use a photocontrol that matches the input voltage used (either 347V or 480V).
7. Option not available with High Voltage (H). Must specify Universal (U), 347V (9), or 480V (8) voltage.
8. Controls system is not available with photocontrol receptacle (PR or PR7) or other controls systems (MS, ZW, ZD or LWR).
9. Utilizes the Wattstopper sensor FSP-211.
10. Sensor passive infrared (PIR) may be overly sensitive when operating below -20°C (-4°F).
11. For the device to be field-configurable, requires WAC Gateway components WAC-PoE and WPOE-120 in appropriate quantities. Only compatible with WaveLinx system and software and requires system components to be installed for operation. See website for more Wavelinx application information.
12. Replace XX with sensor color (WH, BZ or BK).
13. Requires 4-PIN twistlock receptacle (ZD or ZW) option.
14. Enlighted wireless sensors are factory installed and require network components LWP-EM-1, LWP-GW-1, and LWP-PoE8 in appropriate quantities. See website for application information.
15. Only available in PRV-XL configurations PA3X or PA4X.
16. Not available with High Voltage (H, 8 or 9) or HA options. Consult LumenSafe system product pages for additional details and compatibility information.
17. Replace XX with paint color.
18. Only available in PRV configurations PA1X or PA2X.
19. Must order one per optic/LED when ordering as a field-installable accessory (1, 2, 3 or 4). Refer to House Side Shield reference table for details.
20. This tool enables adjustment to Motion Sensor (MS) parameters including high and low modes, sensitivity, time delay, cutoff and more. Consult your lighting representative for more information.
21. Requires 7-PIN NEMA twistlock photocontrol receptacle (PR7) option. The WOLC-7 cannot be used in conjunction with other controls systems (MS, ZW, ZD or LWR). Only for use at 120-347V.

LumenSafe Integrated Network Security Camera Technology Options (Add as Suffix)

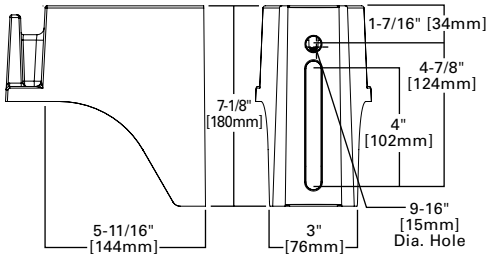
Product Family	Camera Type	Data Backhaul	
L=LumenSafe Technology	**D**=Dome Camera	**C**=Cellular, Customer Installed SIM Card **A**=Cellular, Factory Installed AT&T SIM Card **V**=Cellular, Factory Installed Verizon SIM Card **S**=Cellular, Factory Installed Sprint SIM Card	**E**=Ethernet Networking

Mounting Details

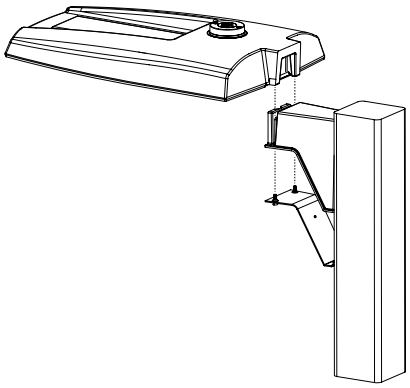
Pole Mount Arm (PRV)



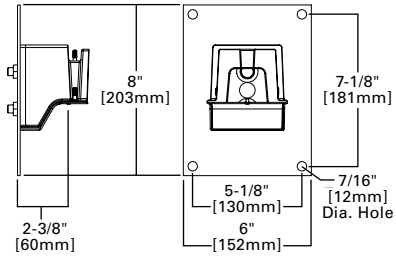
Pole Mount Arm (PRV-XL)



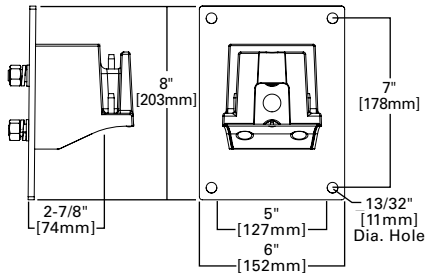
Versatile Mount System



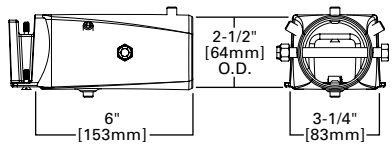
Wall Mount (PRV)



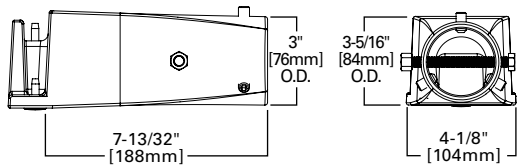
Wall Mount (PRV-XL)



Mast Arm Mount (PRV)



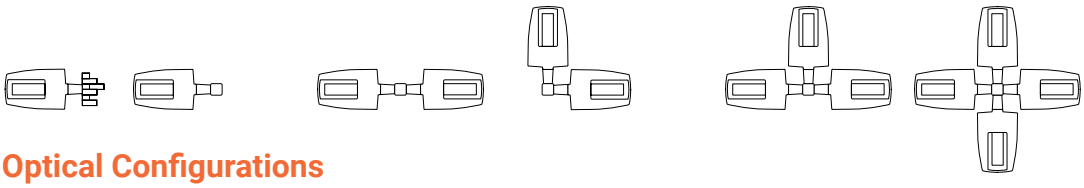
Mast Arm Mount (PRV-XL)



Mounting Configurations and EPAs

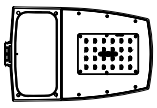
NOTE: For 2 PRV's mounted at 90°, requires minimum 3" square or 4" round pole for fixture clearance. For 2 PRV-XL's mounted at 90°, requires minimum 4" square or round pole for fixture clearance. Customer is responsible for engineering analysis to confirm pole and fixture compatibility for applications.

Wall Mount	Arm Mount Single	Arm Mount 2 @ 180°	Arm Mount 2 @ 90°	Arm Mount 3 @ 90°	Arm Mount 4 @ 90°
	EPA 0.92 (PRV) EPA 1.12 (PRV-XL)	EPA 1.35 (PRV) EPA 2.25 (PRV-XL)	EPA 1.42 (PRV) EPA 2.13 (PRV-XL)	EPA 1.63 (PRV) EPA 2.52 (PRV-XL)	EPA 1.63 (PRV) EPA 2.52 (PRV-XL)

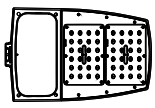


Optical Configurations

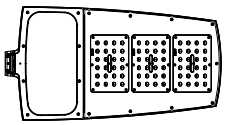
PRV-PA1X



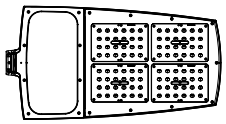
PRV-PA2X



PRV-XL-PA3X

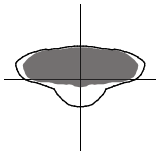


PRV-XL-PA4X

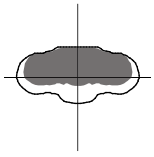


Optical Distributions

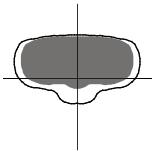
T2R
(Type II Roadway)



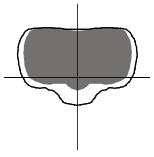
T2U
(Type II Urban)



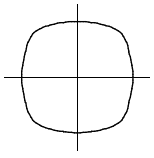
T3
(Type III)



T4W
(Type IV Wide)



5WQ
(Type V Square Wide)



= Distribution with House Side Shield (HSS)

= Optical Distribution

Product Specifications

Construction
- Single-piece die-cast aluminum housing
- Tethered die-cast aluminum door

Optics
- Dark Sky Approved (3000K CCT and warmer only)
- Precision molded polycarbonate optics

Electrical
- -40°C minimum operating temperature
- 40°C maximum operating temperature
- >.9 power factor
- <20% total harmonic distortion
- Class 1 electronic drivers have expected life of 100,000 hours with <1% failure rate
- 0-10V dimming driver is standard with leads external to the fixture

Mounting
- Versatile, patented, standard mount arm accommodates multiple drill patterns ranging from 1-1/2" to 4-7/8" (Type M drilling recommended for new installations)
- A knock-out on the standard mounting arm enables round pole mounting
- Prevail: 3G vibration rated (all arms)
- Prevail XL Mast Arm: 3G vibration rated
- Prevail XL Standard Arm: 1.5G vibration rated

Finish
- Five-stage super TGIC polyester powder coat paint, 2.5 mil nominal thickness

Shipping Data
- Prevail: 20 lbs. (9.09 kgs.)
- Prevail XL: 45 lbs. (20.41 kgs.)

Energy and Performance Data

View PRV Discrete IES files

Power and Lumens (PRV)

Light Engine		PA1A	PA1B	PA2A	PA2B
Power (Watts)		54	74	113	151
Drive Current (mA)		670	930	720	970
Input Current @ 120V (A)		0.45	0.62	0.93	1.26
Input Current @ 277V (A)		0.21	0.28	0.41	0.55
Input Current @ 347V (A)		0.17	0.23	0.33	0.45
Input Current @ 480V (A)		0.12	0.17	0.24	0.33
Distribution					
Type II Roadway	4000K/5000K Lumens	7,605	9,896	15,811	19,745
	BUG Rating	B1-U0-G2	B1-U0-G2	B2-U0-G3	B2-U0-G3
	Lumens per Watt	141	134	141	131
	3000K Lumens [1]	6,926	9,012	14,399	17,982
Type II Urban	4000K/5000K Lumens	7,597	9,886	15,795	19,724
	BUG Rating	B2-U0-G2	B3-U0-G3	B3-U0-G3	B3-U0-G3
	Lumens per Watt	141	134	141	131
	3000K Lumens [1]	6,919	9,003	14,384	17,963
Type III	4000K/5000K Lumens	7,575	9,857	15,749	19,667
	BUG Rating	B1-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G3
	Lumens per Watt	140	133	141	130
	3000K Lumens [1]	6,899	8,977	14,343	17,911
Type IV Wide	4000K/5000K Lumens	7,484	9,738	15,560	19,431
	BUG Rating	B2-U0-G2	B2-U0-G3	B3-U0-G3	B3-U0-G4
	Lumens per Watt	139	132	139	129
	3000K Lumens [1]	6,816	8,869	14,170	17,696
Type V Square Wide	4000K/5000K Lumens	7,831	10,190	16,281	20,332
	BUG Rating	B3-U0-G2	B4-U0-G3	B4-U0-G3	B5-U0-G3
	Lumens per Watt	145	138	145	135
	3000K Lumens [1]	7,132	9,280	14,827	18,517

NOTES:
1. For 3000K BUG Ratings, refer to published IES files.

View PRV-XL Discrete IES files

Power and Lumens (PRV-XL)

Light Engine		PA3A	PA3B	PA4A	PA4B
Power (Watts)		172	234	245	303
Drive Current (mA)		750	980	785	970
Input Current @ 120V (A)		1.44	1.95	2.04	2.53
Input Current @ 277V (A)		0.62	0.85	0.93	1.12
Input Current @ 347V (A)		0.52	0.70	0.74	0.90
Input Current @ 480V (A)		0.39	0.52	0.53	0.65
Distribution					
Type II Roadway	4000K/5000K Lumens	24,718	30,648	34,067	39,689
	BUG Rating	B3-U0-G3	B3-U0-G4	B3-U0-G4	B3-U0-G4
	Lumens per Watt	144	131	139	131
	3000K Lumens [1]	22,511	27,912	31,025	36,145
Type II Urban	4000K/5000K Lumens	24,692	30,616	34,031	39,647
	BUG Rating	B4-U0-G4	B4-U0-G4	B4-U0-G4	B4-U0-G4
	Lumens per Watt	144	131	139	131
	3000K Lumens [1]	22,488	27,882	30,992	36,107
Type III	4000K/5000K Lumens	24,621	30,527	33,932	39,532
	BUG Rating	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	143	130	138	130
	3000K Lumens [1]	22,423	27,802	30,903	36,002
Type IV Wide	4000K/5000K Lumens	24,325	30,161	33,525	39,057
	BUG Rating	B3-U0-G4	B3-U0-G5	B3-U0-G5	B4-U0-G5
	Lumens per Watt	141	129	137	129
	3000K Lumens [1]	22,153	27,468	30,531	35,570
Type V Square Wide	4000K/5000K Lumens	25,453	31,559	35,079	40,868
	BUG Rating	B5-U0-G4	B5-U0-G5	B5-U0-G5	B5-U0-G5
	Lumens per Watt	148	135	143	135
	3000K Lumens [1]	23,180	28,741	31,947	37,219

NOTES:
1. For 3000K BUG Ratings, refer to published IES files.

Lumen Maintenance

Ambient Temperature	TM-21 Lumen Maintenance (78,000 Hours)
Up to 50°C	96.76%

House Side Shield Reference Table

		Light Engine Configuration			
		PA1	PA2	PA3	PA4
Rotated Optics	Standard	HSS-VP (qty 1)	HSS-HP (qty 2)	HSS-HP (qty 3)	HSS-VP (qty 4)
	L90 or R90 option	HSS-HP (qty 1)	HSS-VP (qty 2)	HSS-VP (qty 3)	HSS-HP (qty 4)

Control Options

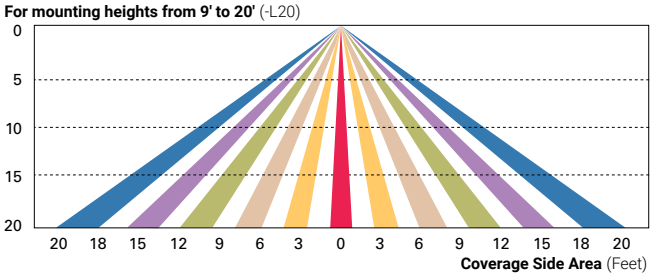
0-10V This fixture provides 0-10V dimming wire leads for use with a lighting control panel or other control method.

Photocontrol (PR and PR7) Photocontrol receptacles provide a flexible solution to enable "dusk-to-dawn" lighting by sensing light levels. Advanced control systems compatible with NEMA 7-pin standards can be utilized with the PR7 receptacle.

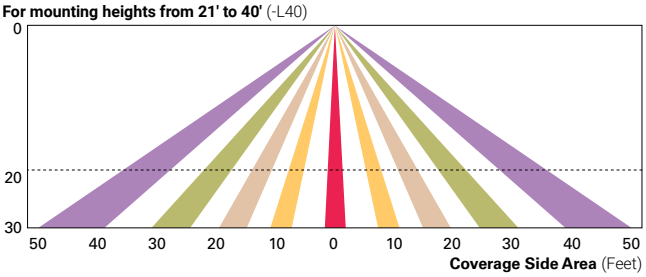
Dimming Occupancy Sensor (MS) These sensors are factory installed in the luminaire housing. When a sensor for dimming operation (MS/DIM) option is selected, the luminaire will dim down to approximately 50 percent power after five minutes of no activity detected. When activity is detected, the luminaire returns to full light output. When a sensor for ON/OFF operation (MS-LXX) is selected, the luminaire will turn off after five minutes of no activity.

These occupancy sensors include an integral photocell that can be activated or inactivated with the programming remote / configuration tool for "dusk-to-dawn" control or "daylight harvesting". **Note:** For MS sensors, the factory preset is OFF (Disabled). The programming remote / tool is a wireless tool that can be utilized to change the dimming level, time delay, sensitivity and other parameters. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 8'-40'.

For mounting heights from 9' to 20' (-L20)



For mounting heights from 21' to 40' (-L40)

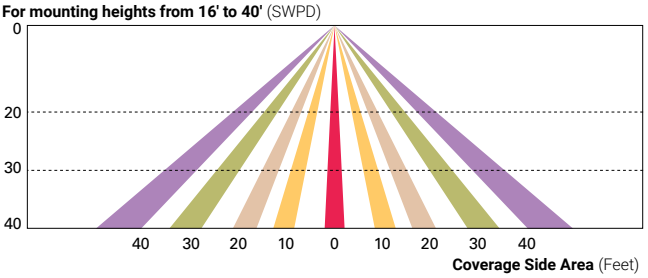


WaveLinx Wireless Control and Monitoring System Available in 7-PIN or 4-PIN configurations, the WaveLinx Outdoor control platform operates on a wireless mesh network based on IEEE 802.15.4 standards enabling wireless control of outdoor lighting. Use the WaveLinx Mobile application for set-up and configuration. At least one Wireless Area Controller (WAC) is required for full functionality and remote communication (including adjustment of any factory pre-sets).

WaveLinx Outdoor Control Module (WOLC-7P-10A) A photocontrol that enables astronomic or time-based schedules to provide ON, OFF and dimming control of fixtures utilizing a 7-PIN receptacle. The out-of-box functionality is ON at dusk and OFF at dawn.

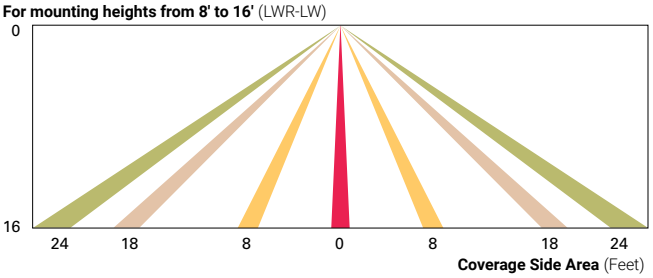
WaveLinx Wireless Sensor (SWPD4 and SWPD5) These outdoor sensors offer passive infrared (PIR) occupancy and a photocell for closed loop daylight sensing. These sensors can be factory installed or field-installed via simple, tool-less integration into luminaires equipped with the Zhaga Book 18 compliant 4-PIN receptacle (ZD or ZW). These sensors are factory preset to dim down to approximately 50 percent power after 15 minutes of no activity detected. These occupancy sensors include an integral photocell for "dusk-to-dawn" control or daylight harvesting that is factory-enabled. A variety of sensor lenses are available to optimize the coverage pattern for mounting heights from 7'-40'.

For mounting heights from 16' to 40' (SWPD)

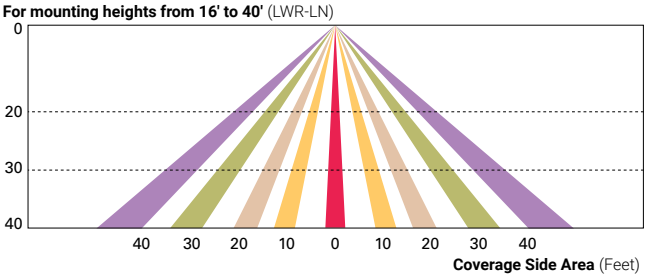


Enlighted Wireless Control and Monitoring System (LWR-LW and LWR-LN) The Enlighted System is a connected lighting solution that combines LED luminaires with an integrated wireless sensor system. The sensor controls the lighting system in compliance with the latest energy codes and collects valuable data about building performance and use. Software applications turn the granular data into information through energy dashboards and specialized apps that make it simple and help optimize the use of other resources beyond lighting.

For mounting heights from 8' to 16' (LWR-LW)



For mounting heights from 16' to 40' (LWR-LN)



LumenSafe (LD) The LumenSafe integrated network camera is a streamlined, outdoor-ready camera that provides high definition video surveillance. This IP camera solution is optimally designed to integrate into virtually any video management system or security software platform of choice. No additional wiring is needed beyond providing line power to the luminaire. LumenSafe features factory-installed power and networking gear in a variety of networking options allowing security integrators to design the optimal solution for active surveillance.

Cooper Lighting Solutions
1121 Highway 74 South
Peachtree City, GA 30269
P: 770-486-4800
www.cooperlighting.com

TTCDA
Tennessee Technology Corridor
DEVELOPMENT AUTHORITY

CERTIFICATE OF APPROPRIATENESS

Name of Applicant: Valley Church UMC

Date Filed: 4/6/2021 Fee Paid: $400 File Number: 5-B-21-TOB

Map Number: 103 Zoning District: OB/TO & PR/TO

Jurisdiction: ☐ City ____ Councilmanic District ☒ County 6 Commission District

PROPERTY INFORMATION

ADDRESS: 11012 Hardin Valley Road
STREET NUMBER AND NAME

GENERAL LOCATION: Hardin Valley Road adjacent to Award Winning Way

PARCEL NUMBER(S): 103 11102 PLANNING SECTOR: Northwest County

SIZE OF TRACT: 20.0 ☒ ACRES ☐ SQUARE FEET

PURPOSE OF REQUEST

- ☒ BUILDING PERMIT – New Construction
- ☐ BUILDING PERMIT – Expansion or Renovation
- ☐ BUILDING PERMIT – Grading Plan
- ☐ REZONING
  - From: ____
  - To: ____
- ☐ SIGNAGE
- ☐ ZONING VARIANCE – (Describe and give reason)

NOTE: Four (4) copies of all plan materials are required to process the application. Please check all that apply:

- ☒ DEVELOPMENT PLAN
- ☒ BUILDING ELEVATIONS
- ☒ FLOOR PLAN
- ☒ LANDSCAPE PLAN WITH SCHEDULE
- ☐ SIGNAGE PLAN
- ☒ OFF-STREET PARKING PLAN
- ☒ OTHER: Site Lighting Plans

APPLICATION CORRESPONDENCE – All correspondence relating to this application should be sent to:

PLEASE PRINT

Name: Valley Church UMC (John Gargis) Phone: 865-310-4783 Fax: ____

Mailing Address: 706 South Illinois Avenue Suite 102D, Oak Ridge, TN 37830

APPLICATION AUTHORIZATION – I hereby certify that I am the authorized applicant, representing ALL property owners involved in this request or holders of option on same, whose signatures are included on the back of this form.

Signature: [signature]

PLEASE PRINT

Name: Valley Church UMC (John Gargis) Phone: 865-310-4783 Fax: ____

Mailing Address: 706 South Illinois Avenue Suite 102D, Oak Ridge, TN 37830

APPLICATION ACCEPTANCE – Staff Member who accepted this application: Michelle Portier

SIGNATURES OF ALL PROPERTY OWNERS INVOLVED OR HOLDERS OF OPTION ON SAME MUST BE LISTED BELOW:

(Please sign in black or blue ink)

NAME	Complete Mailing Address	Owner	Option
Board of Trustees of the United Methodist Church, Oak Ridge District	706 South Illinois Avenue Suite 102D, Oak Ridge, TN 37830	X	