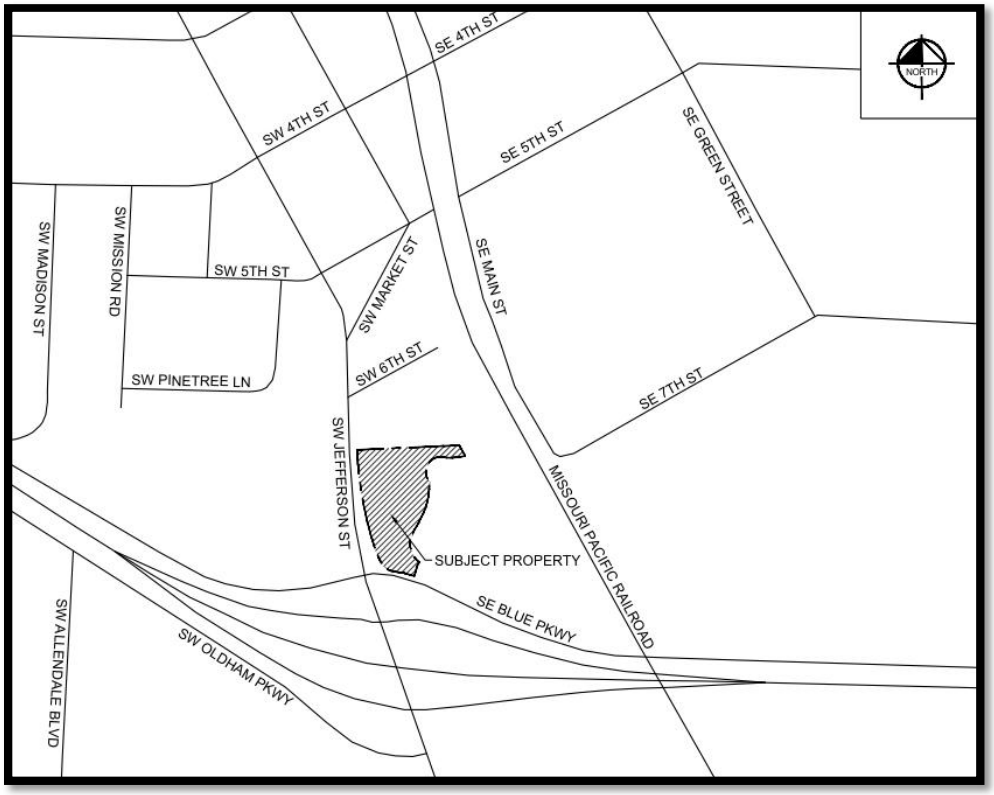
Stormwater Report for Summit Waves – Wave Pool Addition

City of Lee's Summit, Missouri



Prepared for:
City of Lee's Summit, Missouri – Parks and Recreation
220 SE Green Street
Lee's Summit, MO 64063

Prepared by:
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PRELIMINARY			
FOR REVIEW ONLY Not for construction or permit purposes. Kimley»Horn			
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ENGINEERING FIRM REGISTRATION NUMBER F-928

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1.0 Introduction

1.1 AUTHORITY

The City of Lee's Summit Parks and Recreation Board (LSPR) has retained the services of Kimley-Horn and Associates, Inc. (Kimley-Horn) to prepare a stormwater assessment for the proposed wave pool addition in the existing Summit Waves Aquatic Park in Lee's Summit, Missouri. The contacts for the study are as follows:

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1.2 PURPOSE OF STUDY

The subject property is located at the northeast corner of SW Jefferson Street and SE Blue Parkway in the City of Lee's Summit, Missouri. The subject property is located adjacent to the existing Summit Waves Aquatic Park and is proposed to be a wave pool addition to the existing park. This study was performed to evaluate the impacts of the proposed development on the peak flow rates within the watershed and to design the adequate detention and water quality needed in accordance with City criteria.

1.3 SITE DESCRIPTION

The subject property is approximately 3.27 acres and the limits of disturbance for the proposed project is approximately 1.92 acres. In existing conditions, the site drains in four different directions and ultimately to three different existing storm sewer systems. There are no FEMA classifications associated with this site. The site consists of all Type C soil, which can be seen on the NRCS Soil Map in **Appendix A**. See **Table 1** below for the soil classification information.

Table 1. Subject Property Soil Classification

Symbol	Name	Slopes	HSG
10082	Arisburg-Urban land complex	1-5%	C
10180	Udarents-Urban land-Sampsel complex	2-5%	C
10181	Udarents-Urban land-Sampsel complex	5-9%	C
99012	Urban land, upland	5-9%	C
99033	Udarents-Urban land complex	2-9%	C

1.4 METHODOLOGY

This study was completed using unit hydrograph modeling methods in accordance with The Kansas City Metropolitan Chapter American Public Works Association Standard Specifications and Design Criteria Section 5600 (APWA 5600) published in February 2011. Hydrologic modeling was performed using HEC-HMS version 4.1. More details on methodologies are provided in the following sections.

The following criteria was used for the hydrologic model:

- Hydrologic Method: Unit Hydrograph
- Return Frequency Storms: 2-year, 10-year, and 100-year
- Soil Moisture Conditions: AMC II
- Transform Method: SCS Unit Hydrograph, Lag Time
- Loss Method: SCS Curve Number
- Curve Number Reference: Kansas City APWA 5600
- Rainfall Distribution: 24-Hour Frequency Storm
- Rainfall Depths: NOAA Atlas 14 Point Precipitation Frequency Estimates, September 2018

2.0 Hydrology

2.1 EXISTING CONDITION ANALYSIS

The existing subject property is an undeveloped tract of land adjacent to the existing Summit Waves Aquatic Park. The majority of the site consists of short grass with a few trees and an existing asphalt sidewalk connecting the aquatic park to a playground located north of the subject property. There is an existing hill located in the middle of the subject property.

The subject property drains in four different directions and ultimately to three different existing storm sewer systems. Each of the four outfall locations are shown as Points of Interest (POI) on the *Existing Condition Drainage Area Map* in **Appendix A**. Each existing drainage basin was analyzed for only the on-site areas in order to determine the excess runoff at each outfall from the proposed site alone. The northwest corner of the site drains to an existing grassed ditch along SW Jefferson Street, which drains to the storm sewer and the curb inlet along SW 6th Street (Outfall A). A small portion of the northeast corner of the site drains through the existing park/playground north of the subject property and directly into the curb inlet along SW 6th street (Outfall B). The eastern portion of the site drains to the existing grate inlet located in the existing aquatic park connecting to the Summit Waves storm sewer system (Outfall C). The southern portion of the site drains to two curb inlets and a catch basin which connect to the storm sewer system underneath Jefferson Street just north of Blue Parkway (Outfall D).

Curve numbers were determined from Table 5602-3 in APWA 5600 based on a hydrologic soil type of C. Times of concentration were determined using SCS TR-55 methods. Where times of concentration were less than 5 minutes, a minimum inlet time of 5 minutes was used per APWA 5600. **Table 2** below summarizes the existing condition input data for each on-site drainage basin and its corresponding POI.

Table 2. Summary of Existing Condition Hydrologic Parameters

Point of Interest	Outfall	Drainage Area	Area (ac)	Area (mi^2)	CN	TC (min)	TC$_{lag}$ (min)
Ditch along SW Jefferson Street	A	A	1.17	0.00183	75.2	4.52	2.71
Curb Inlet on SW 6th Street	B	B	0.16	0.00025	75.5	4.22	2.53
Existing Summit Waves Aquatic Park Storm Sewer	C	C1	0.13	0.00020	77.7	7.64	4.58
		C2	0.38	0.00059	75.3	5.91	3.54
Storm Sewer at Jefferson Street North of Blue Parkway	D	D	1.42	0.00222	75.5	7.20	4.32

The peak flows for each outfall were analyzed to determine the allowable release rates. The existing condition 2-, 10- and 100-year peak flows leaving the subject property are summarized in **Table 3**. The allowable release rates for each outfall are equal to the corresponding existing condition peak flows.

Table 3. Summary of Existing Condition Peak Flows

Outfall	2-Year (cfs)	10-Year (cfs)	100-Year (cfs)
A	2.2	5.7	10.8
B	0.3	0.8	1.5
C	0.9	2.3	4.3
D	2.4	6.1	11.6

2.2 PROPOSED CONDITION ANALYSIS

The subject property is proposed as a wave pool addition to the existing Summit Waves Aquatic Park. The development consists of a wave pool, a paved patio, a mechanical/restroom building, service drives, parking, and shade structures.

The grading associated with the proposed development will create a hill on the south side of the existing hill in the middle of the subject property. The drainage from the subject property is proposed to drain to the same four locations as in existing conditions. The majority of the proposed site will be sent to outfall A, the ditch along the western boundary of the subject property.

Table 4 below summarizes the input data for the proposed condition drainage areas.

Table 4. Summary of Proposed Condition Hydrologic Parameters

Point of Interest	Outfall	Drainage Area	Area (ac)	Area (mi^2)	CN	TC (min)	TC_{lag} (min)
Ditch along SW Jefferson Street	A	A1	0.86	0.00134	75.7	3.97	2.38
		A2	0.07	0.00011	98.0	5.00	3.00
		A3	0.24	0.00038	92.0	5.23	3.14
		A4	0.23	0.00036	98.0	5.35	3.21
		A5	0.32	0.00050	88.3	5.98	3.59
		A6	0.11	0.00017	89.3	5.62	3.37
		Pool	0.22	0.00034	98.0	5.19	3.11
Curb Inlet on SW 6th Street	B	B	0.13	0.00020	75.8	4.09	2.45
Existing Summit Waves Aquatic Park Storm Sewer	C	C1	0.14	0.00022	87.7	7.49	4.49
		C2	0.05	0.00008	83.6	5.00	3.00
Storm Sewer at Jefferson Street North of Blue Parkway	D	D	0.88	0.00138	76.5	7.24	4.35

The majority of the runoff from the subject property will be detained in an underground detention vault located in the northeast corner of the site. Runoff will collect from two proposed bioretention areas through a proposed 24" RCP running along the eastern and southern portion of the pool deck. In all storm events, the peak flow rates at each outfall will either decrease or match the existing condition peak flow rate. Detention pond details can be seen in the attached Summit Waves – Wave Pool Addition Construction Plans included in **Appendix A**. **Table 5** below summarizes the peak flow rates at each outfall location. **Table 6** compares the proposed condition flow rates to existing condition flow rates at each outfall location. A digital copy of the model is included in **Appendix B**.

Table 5. Summary of Proposed Condition Peak Flows

Outfall	2-Year (cfs)	10-Year (cfs)	100-Year (cfs)
A	2.1	5.6	10.2
B	0.3	0.6	1.2
C	0.6	1.1	1.8
D	1.6	3.9	7.3

Table 6. Comparison of Existing and Proposed Condition Peak Flows

Outfall	2-Year (Prop-Ex) (cfs)	10-Year (Prop-Ex) (cfs)	100-Year (Prop-Ex) (cfs)
A	-0.1	-0.1	-0.6
B	-0.1	-0.2	-0.3
C	-0.4	-1.2	-2.5
D	-0.8	-2.2	-4.3

2.3 WATER QUALITY

The proposed subject property includes water quality in accordance with APWA 5600 and the Manual of Best Management Practices for Stormwater Quality published by Kansas City Metropolitan Chapter APWA in October 2012 (APWA/MARC BMP Manual). A Level of Service was calculated at each of the outfall locations for the proposed site.

At outfalls B and D there is minimal change in curve number from existing to proposed conditions therefore there are no water quality measures required at these locations per criteria. At outfall C the proposed runoff drains to the existing aquatic park which includes existing water quality elements, so no new water quality elements were proposed.

At outfall A, there is a change in curve number of 17.9 for the disturbed project area, which corresponds to a Level of Service of 8. In order to achieve this Level of Service, there will be two bioretention swales located along the west and south edges of the site. The pool deck will drain directly to the bioretention swales and then drain into the 24" RCP by means of a perforated pipe beneath the length of each swale. The underground detention vault will provide extended dry detention, releasing the runoff from the local 90% mean annual event (1.37"/24-hour rainfall) over a 40-hour time period. The proposed site is 75% impervious, resulting in a water quality volume of 0.11 acre-feet. In addition to the bioretention and extended dry detention, a hydrodynamic separator will be installed downstream of the outfall of the detention vault. The hydrodynamic separator will achieve an efficiency of 80% removal of total suspended solids. A detail for the hydrodynamic separator can be seen in the attached Summit Waves – Wave Pool Addition Construction Plans included in **Appendix A**. The combination of these 3 Best Management Practices (BMPs) will achieve an overall water quality rating of 9.78, exceeding the required water quality rating value of 8. Water quality calculations are included in the hydrologic calculations and the attached Summit Waves – Wave Pool Addition Construction Plans included in **Appendix A**.

3.0 Conclusion

This stormwater report has been prepared to evaluate the hydrologic and water quality impacts from the proposed development of Summit Waves – Wave Pool Addition. The proposed development includes an underground detention facility to reduce peak discharge rates in the 2-, 10-, and 100-year storm events. The results of the study support that the peak stormwater discharge from the subject property will not increase above existing conditions as a result of the development. Additionally, multiple water quality features will be constructed to ensure that the required water quality Level of Service is being met. These water quality features include bioretention swales, extended dry detention, and a hydrodynamic separator.

4.0 References

Chow, Ven Te. *Open Channel Hydraulics*. McGraw-Hill, 1959.

Kansas City Metropolitan Chapter American Public Works Association Standard Specifications and Design Criteria. *Storm Drainage Systems and Facilities, Section 5600.* APWA, February 2011.

Kansas City Metropolitan Chapter American Public Works Association. *Manual of Best Management Practices For Stormwater Quality.* APWA / MARC, October 2012.

U.S. Army Corps of Engineers. *HEC-HMS, v. 4.1 (software package)*. U.S. Army Corps of Engineers, July 2015.

Appendix A:
Hydrology

Existing Condition Drainage Area Map
Proposed Condition Drainage Area Map
NRCS Soil Map
Hydrologic Calculations
HEC-HMS Output
Summit Waves – Wave Pool Addition Construction Plans

Existing Condition Hydrologic Parameters

DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A	1.17	0.00183	75.2	4.52	2.71	2.2	5.7	10.8
B	0.16	0.00025	75.5	4.22	2.53	0.3	0.8	1.5
C1	0.13	0.00020	77.7	7.64	4.58	0.2	0.6	1.1
C2	0.38	0.00059	75.3	5.91	3.54	0.7	1.7	3.2
D	1.42	0.00222	75.5	7.20	4.32	2.4	6.1	11.6

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MISSOURI REGISTRATION NUMBER 001512

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Kimley»Horn
Engineer KEVIN GASKEY
P.E. No. 28441 Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

EXISTING CONDITION DRAINAGE AREA MAP

Scale: AS SHOWN
Designed by: DHA
Drawn by: DHA
Checked by: CFC
Date: 04/15/2019
Project No. 064538700

SHEET
A.1

Proposed Hydrologic Parameters

DA	Area (ac)	Area (mi²)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A1	0.86	0.00134	75.7	3.97	2.38	1.8	4.3	8.1
A2	0.07	0.00011	98.0	5.00	3.00	0.3	0.5	0.8
A3	0.24	0.00038	92.0	5.23	3.14	1.0	1.7	2.7
A4	0.23	0.00036	98.0	5.35	3.21	1.0	1.7	2.6
A5	0.32	0.00050	88.3	5.98	3.59	1.1	2.0	3.3
A6	0.11	0.00017	89.3	5.62	3.37	0.4	0.7	1.1
B	0.13	0.00020	75.8	4.09	2.45	0.3	0.6	1.2
C1	0.14	0.00022	87.7	7.49	4.49	0.4	0.8	1.3
C2	0.05	0.00008	83.6	5.00	3.00	0.2	0.3	0.5
D	0.88	0.00138	76.5	7.24	4.35	1.6	3.9	7.3
Pool	0.22	0.00034	98.0	5.19	3.11	1.0	1.6	2.4

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Engineer KEVIN GASKEY
P.E. No. 28441 Date APRIL 2019

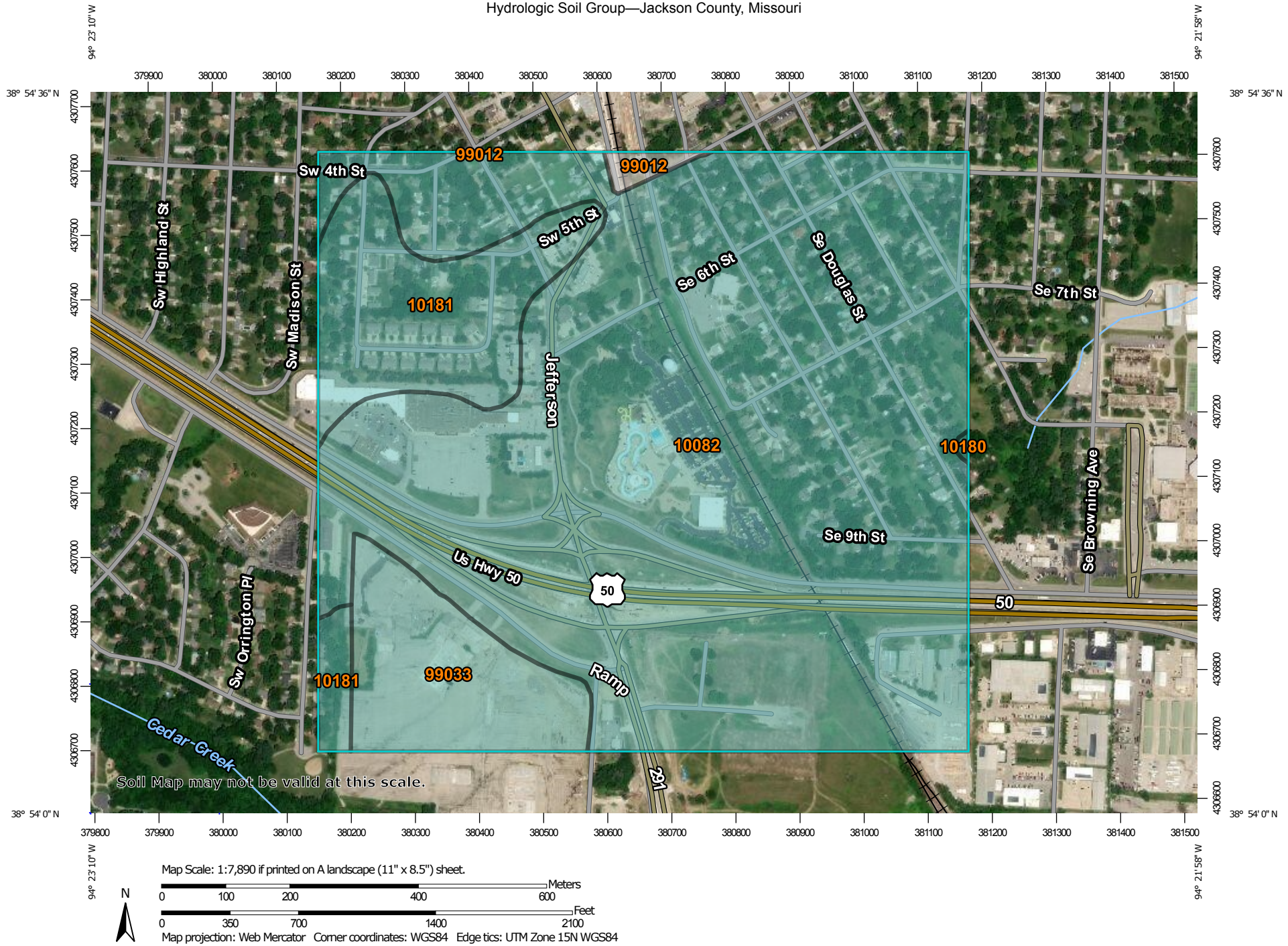
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

PROPOSED CONDITION DRAINAGE AREA MAP

Scale:	AS SHOWN
Designed by:	DHA
Drawn by:	DHA
Checked by:	CFC
Date:	04/15/2019
Project No.	064538700

SHEET
A.2

File: K:\DAL_Hydro\064538700 - Lee's Summit Wave Pool\DWG\EXH\Drainage Area Map.dwg [Proposed] 4/15/2019
Xrefs: xAerial x24x36 - h&h xDAM xGrad xBndy xsite xLiDAR xPond Images: EPSG32614_Date20



Map Scale: 1:7,890 if printed on A landscape (11" x 8.5") sheet.

N

Meters: 0 100 200 400 600

Feet: 0 350 700 1400 2100

Map projection: Web Mercator Corner coordinates: WGS84 Edge tics: UTM Zone 15N WGS84

MAP LEGEND

Area of Interest (AOI)

- Area of Interest (AOI)

Soils

Soil Rating Polygons

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Lines

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Soil Rating Points

- A
- A/D
- B
- B/D
- C
- C/D
- D
- Not rated or not available

Water Features

- Streams and Canals

Transportation

- Rails
- Interstate Highways
- US Routes
- Major Roads
- Local Roads

Background

- Aerial Photography

MAP INFORMATION

The soil surveys that comprise your AOI were mapped at 1:24,000.

Warning: Soil Map may not be valid at this scale.

Enlargement of maps beyond the scale of mapping can cause misunderstanding of the detail of mapping and accuracy of soil line placement. The maps do not show the small areas of contrasting soils that could have been shown at a more detailed scale.

Please rely on the bar scale on each map sheet for map measurements.

Source of Map: Natural Resources Conservation Service
Web Soil Survey URL:
Coordinate System: Web Mercator (EPSG:3857)

Maps from the Web Soil Survey are based on the Web Mercator projection, which preserves direction and shape but distorts distance and area. A projection that preserves area, such as the Albers equal-area conic projection, should be used if more accurate calculations of distance or area are required.

This product is generated from the USDA-NRCS certified data as of the version date(s) listed below.

Soil Survey Area: Jackson County, Missouri
Survey Area Data: Version 19, Sep 13, 2018

Soil map units are labeled (as space allows) for map scales 1:50,000 or larger.

Date(s) aerial images were photographed: Jun 11, 2017—Sep 22, 2017

The orthophoto or other base map on which the soil lines were compiled and digitized probably differs from the background imagery displayed on these maps. As a result, some minor shifting of map unit boundaries may be evident.

Hydrologic Soil Group

Map unit symbol	Map unit name	Rating	Acres in AOI	Percent of AOI
10082	Arisburg-Urban land complex, 1 to 5 percent slopes	C	186.2	79.4%
10180	Udarents-Urban land-Sampsel complex, 2 to 5 percent slopes	C	0.2	0.1%
10181	Udarents-Urban land-Sampsel complex, 5 to 9 percent slopes	C	27.0	11.5%
99012	Urban land, upland, 5 to 9 percent slopes		1.4	0.6%
99033	Udarents-Urban land complex, 2 to 9 percent slopes	C	19.7	8.4%
Totals for Area of Interest			**234.4**	**100.0%**

Description

Hydrologic soil groups are based on estimates of runoff potential. Soils are assigned to one of four groups according to the rate of water infiltration when the soils are not protected by vegetation, are thoroughly wet, and receive precipitation from long-duration storms.

The soils in the United States are assigned to four groups (A, B, C, and D) and three dual classes (A/D, B/D, and C/D). The groups are defined as follows:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to a dual hydrologic group (A/D, B/D, or C/D), the first letter is for drained areas and the second is for undrained areas. Only the soils that in their natural condition are in group D are assigned to dual classes.

Rating Options

Aggregation Method: Dominant Condition

Component Percent Cutoff: None Specified

Tie-break Rule: Higher

Existing Condition Hydrologic Parameters								
DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A	1.17	0.00183	75.2	4.52	2.71	2.2	5.7	10.8
B	0.16	0.00025	75.5	4.22	2.53	0.3	0.8	1.5
C1	0.13	0.00020	77.7	7.64	4.58	0.2	0.6	1.1
C2	0.38	0.00059	75.3	5.91	3.54	0.7	1.7	3.2
D	1.42	0.00222	75.5	7.20	4.32	2.4	6.1	11.6

Proposed Hydrologic Parameters								
DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A1	0.86	0.00134	75.7	3.97	2.38	1.8	4.3	8.1
A2	0.07	0.00011	98.0	5.00	3.00	0.3	0.5	0.8
A3	0.24	0.00038	92.0	5.23	3.14	1.0	1.7	2.7
A4	0.23	0.00036	98.0	5.35	3.21	1.0	1.7	2.6
A5	0.32	0.00050	88.3	5.98	3.59	1.1	2.0	3.3
A6	0.11	0.00017	89.3	5.62	3.37	0.4	0.7	1.1
B	0.13	0.00020	75.8	4.09	2.45	0.3	0.6	1.2
C1	0.14	0.00022	87.7	7.49	4.49	0.4	0.8	1.3
C2	0.05	0.00008	83.6	5.00	3.00	0.2	0.3	0.5
D	0.88	0.00138	76.5	7.24	4.35	1.6	3.9	7.3
Pool	0.22	0.00034	98.0	5.19	3.11	1.0	1.6	2.4

TIME OF CONCENTRATION & LAG TIME
EXISTING
TR-55 Methodology

Basin	SHEET FLOW Tc = (0.007(nL)^0.8)/(P2^0.5)(s^0.4) 2-year/24-hr Rainfall Depth (in.) = 3.71						SHALLOW CONCENTRATED FLOW Tc = L / 60*V							STORM SEWER FLOW Assumed Velocity = 4 ft/s (swale)					TOTAL	
	Length (ft)	$Elev_1$	$Elev_2$	Slope (ft/ft)	Manning's "n"	T_{c1} (min)	Length (ft)	$Elev_2$	$Elev_3$	Slope (ft/ft)	Condition TR-55 Fig. 3-1	V_{avg} (ft/s)	T_{c2} (min)	Inlet Time (min)	Travel Length (ft)	Travel Velocity (ft/s)	Travel Time (min)	T_{c3} (min)	T_{cTOTAL} (min)	T_{lag} (min)
A	50	1066.0	1063.0	0.0600	0.150	3.4	137	1063.0	1052.0	0.080	Unpaved	4.57	0.5		156	4.0	0.7	0.7	4.5	2.7
B	50	1063.0	1061.0	0.0400	0.150	4.0	40	1061.0	1060.0	0.025	Unpaved	2.55	0.3						4.2	2.5
C1	50	1061.5	1061.0	0.0100	0.150	6.9	116	1061.0	1058.0	0.026	Unpaved	2.59	0.7						7.6	4.6
C2	50	1066.0	1065.0	0.0200	0.150	5.2	145	1065.0	1058.0	0.048	Unpaved	3.55	0.7						5.9	3.5
D	50	1066.0	1065.0	0.0200	0.150	5.2	342	1065.0	1054.0	0.032	Unpaved	2.89	2.0						7.2	4.3

TIME OF CONCENTRATION & LAG TIME
PROPOSED
TR-55 Methodology

Basin	SHEET FLOW Tc = (0.007(nL)^0.8)/(P2^0.5)(s^0.4) n = 0.24 (dense grass)						SHALLOW CONCENTRATED FLOW Tc = L / 60*V							STORM SEWER FLOW Assumed Velocity = 4 ft/s (swale) Assumed Velocity = 6 ft/s (storm sewer) Assumed Velocity = 3 ft/s (bioretention)					TOTAL	
	Length (ft)	$Elev_1$	$Elev_2$	Slope (ft/ft)	Manning's "n"	T_{c1} (min)	Length (ft)	$Elev_2$	$Elev_3$	Slope (ft/ft)	Condition TR-55 Fig. 3-1	V_{avg} (ft/s)	T_{c2} (min)	Inlet Time (min)	Travel Length (ft)	Travel Velocity (ft/s)	Travel Time (min)	T_{c3} (min)	T_{cTOTAL} (min)	T_{lag} (min)
A1	50	1059.5	1056.0	0.0700	0.150	3.2	44	1056.0	1052.0	0.091	Unpaved	4.86	0.2		156	4.0	0.7	0.7	4.0	2.4
A2														5.0					5.0	3.0
A3														5.0	81	6.0	0.2	5.2	5.2	3.1
A4														5.0	127	6.0	0.4	5.4	5.4	3.2
A5														5.0	176	3.0	1.0	6.0	6.0	3.6
A6														5.0	112	3.0	0.6	5.6	5.6	3.4
B	50	1062.5	1060.5	0.0400	0.150	4.0	20	1060.5	1060.0	0.025	Unpaved	2.55	0.1						4.1	2.5
C1	50	1061.5	1061.0	0.0100	0.150	6.9	116	1061.0	1058.0	0.026	Paved	3.27	0.6						7.5	4.5
C2														5.0					5.0	3.0
D	50	1059.0	1058.0	0.0200	0.150	5.2	248	1058.0	1054.0	0.016	Unpaved	2.05	2.0						7.2	4.3
Pool														5.0	67	6.0	0.2	5.2	5.2	3.1

Existing Conditions Curve Number Calculations				
Drainage Area	Surface Description/Soil Type	CN	Area	Weighed CN
A	Undeveloped Area HSG C	74	1.11	75.2
	Parking lots, roofs, streets/HSG C	98	0.06	
B	Undeveloped Area HSG C	74	0.15	75.5
	Parking lots, roofs, streets/HSG C	98	0.01	
C	Undeveloped Area HSG C	74	0.11	77.7
	Parking lots, roofs, streets/HSG C	98	0.02	
D	Undeveloped Area HSG C	74	0.36	75.3
	Parking lots, roofs, streets/HSG C	98	0.02	

Proposed Condition Curve Number Calculations				
Drainage Area	Surface Description/Soil Type	CN	Area	Weighed CN
A1	Undeveloped Area HSG C	74	0.80	75.7
	Parking lots, roofs, streets/HSG C	98	0.06	
A2	Undeveloped Area HSG C	74	0.00	98.0
	Parking lots, roofs, streets/HSG C	98	0.07	
A3	Undeveloped Area HSG C	74	0.06	92.0
	Parking lots, roofs, streets/HSG C	98	0.18	
A4	Undeveloped Area HSG C	74	0.00	98.0
	Parking lots, roofs, streets/HSG C	98	0.23	
A5	Undeveloped Area HSG C	74	0.13	88.3
	Parking lots, roofs, streets/HSG C	98	0.19	
A6	Undeveloped Area HSG C	74	0.04	89.3
	Parking lots, roofs, streets/HSG C	98	0.07	
B	Undeveloped Area HSG C	74	0.12	75.8
	Parking lots, roofs, streets/HSG C	98	0.01	
C1	Undeveloped Area HSG C	74	0.07	87.7
	Parking lots, roofs, streets/HSG C	98	0.08	
C2	Undeveloped Area HSG C	74	0.03	83.6
	Parking lots, roofs, streets/HSG C	98	0.02	
D	Undeveloped Area HSG C	74	0.79	76.5
	Parking lots, roofs, streets/HSG C	98	0.09	
Pool	Undeveloped Area HSG C	74	0.00	98.0
	Parking lots, roofs, streets/HSG C	98	0.22	

Water Quality Calculations - Outfall A (Disturbed Area):

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	1.27	74	93.98
Pavement	0.01	98	0.98
		$CN_{PreWeighted}$ =	74.2

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.32	74	23.68
Pavement	0.97	98	95.06
		$CN_{PostWeighted}$ =	92.0

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	74.2
$CN_{PostWeighted}$ =	92.0
Difference =	17.9
LS Requried (Table 4.2)=	8

D. Proposed BMP Package

DA	Cover/BMP Description	Treatment Area	VR	VR*Area
A1 (Bypass, Disturbed)	None	0.10	0.00	0.00
A2 (Bypass)	None	0.07	0.00	0.00
A3	Extended Dry Detention + Hydrodynamic Seperator	0.24	8.00	1.92
A4	Extended Dry Detention + Hydrodynamic Seperator	0.23	8.00	1.84
A5	Bioretention, Extended Dry Detention, + Hydrodynamic	0.32	16.50	5.28
A6	Bioretention, Extended Dry Detention, + Hydrodynamic	0.11	16.50	1.82
Pool	Extended Dry Detention + Hydrodynamic Seperator	0.22	8.00	1.76
			Total =	12.62
			Weighted VR =	9.78
			Required VR =	8.00

E. Water Quality Volume

% Site Impervious	75%
Rv	0.73
WQV (in)	1.00
WQV (ac-ft)	0.11
Release Rate (hr)	40
Q_{WQV} (cfs)	0.03

Water Quality Calculations - Outfall B:

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	0.15	74	11.1
Pavement	0.01	98	0.98
		$CN_{PreWeighted}$ =	75.5

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.12	74	8.88
Pavement	0.01	98	0.98
		$CN_{PostWeighted}$ =	75.8

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	75.5
$CN_{PostWeighted}$ =	75.8
Difference =	0.3
LS Requried (Table 4.2)=	n/a

Water Quality Calculatior

A. Predevelopment CN

Land Use	Area
Grass	1.33
Pavement	0.09

B. Postdevelopment CN

Land Use	Area
Grass	0.79
Pavement	0.10

C. Level of Service (LS) Ca

$CN_{PreWeighted}$ =	75.5
$CN_{PostWeighted}$ =	76.7
Difference =	1.2
LS Requried (Table 4.2)=	n/a

TABLE 4.2
LS for Previously Undeveloped Sites

Change in CN	Impact	LS
17 or greater	High water quality impact	8
7 to 16	Moderate water quality impact	7
4 to 6	Low water quality impact	6
1 to 3	Minimal water quality impact	5

ıs - Outfall D:

CN	CN*A
74	98.42
98	8.82
$CN_{PreWeighted}$ =	75.5

CN	CN*A
74	58.46
98	9.8
$CN_{PostWeighted}$ =	76.7

alculation

Outfall Structure Summary											
			Opening #1			Opening #2			Opening #3			Total
Design Storm	Volume (ac-ft)	Elevation (ft)	Weir	Orifice	Actual	Weir	Orifice	Actual	Weir	Orifice	Actual	Actual
WQV	0.11	1051.30	0.29	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
2-year	0.20	1051.70	0.46	0.03	0.03	0.38	0.37	0.37	0.00	0.00	0.00	0.40
10-year	0.30	1052.80	1.05	0.04	0.04	2.76	1.06	1.06	0.00	0.00	0.00	1.10
100-year	0.43	1054.30	2.08	0.05	0.05	7.79	1.57	1.57	0.00	0.00	0.00	1.62

Elevation Discharge Summary Table										
Elevation	Opening #1			Opening #2			Opening #3			Total
	Weir	Orifice	Actual	Weir	Orifice	Actual	Weir	Orifice	Actual	Actual
1050.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1051.2	0.25	0.03	0.03	0.00	0.00	0.00	0.00	0.00	0.00	0.03
1052.2	0.71	0.04	0.04	1.28	0.76	0.76	0.00	0.00	0.00	0.80
1053.2	1.30	0.05	0.05	3.93	1.21	1.21	0.00	0.00	0.00	1.26
1054.2	2.00	0.05	0.05	7.41	1.54	1.54	0.00	0.00	0.00	1.59
1054.72	2.40	0.06	0.06	9.49	1.68	1.68	0.00	0.00	0.00	1.74

Stage Storage Summary Table		
Elevation (ft)	Area (ac)	Volume (ac-ft)
1050.20	0.10	0.00
1054.72	0.10	0.45

Detention Outfall Calculations

g (ft^2/s) = 32.2

$C_{Orifice}$ = 0.6

C_{weir} = 3

Opening #1 (WQV)

Shape = Circular

Height (ft)= 0.08 = 1 inches

Length (ft) = 0.08 = 1 inches

Area (ft)= 0.01

Centroid (ft) = 1050.24

Invert Elevation (ft) = 1050.20

Top of Pipe Elevation (ft) = 1050.28

Opening #2

Shape = Circular

Height (ft)= 0.50 = 6 inches

Length (ft) = 0.50 = 6 inches

Area (ft^2)= 0.20

Centroid (ft) = 1051.55

Invert Elevation (ft) = 1051.30

Top of Pipe Elevation (ft) = 1051.80

Water Quality Calculations - Outfall B:

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	0.15	74	11.1
Pavement	0.01	98	0.98
		$CN_{PreWeighted}$ =	75.5

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.12	74	8.88
Pavement	0.01	98	0.98
		$CN_{PostWeighted}$ =	75.8

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	75.5
$CN_{PostWeighted}$ =	75.8
Difference =	0.3
LS Requried (Table 4.2)=	n/a

Water Quality Calculations - Outfall D:

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	1.33	74	98.42
Pavement	0.09	98	8.82
		$CN_{PreWeighted}$ =	75.5

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.79	74	58.46
Pavement	0.10	98	9.8
		$CN_{PostWeighted}$ =	76.7

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	75.5
$CN_{PostWeighted}$ =	76.7
Difference =	1.2
LS Requried (Table 4.2)=	n/a

TABLE 4.2
LS for Previously Undeveloped Sites

Change in CN	Impact	LS
17 or greater	High water quality impact	8
7 to 16	Moderate water quality impact	7
4 to 6	Low water quality impact	6
1 to 3	Minimal water quality impact	5

Existing Condition Hydrologic Parameters										
Point of Interest	Outfall	DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
Ditch along SW Jefferson Street	A	A	1.17	0.00183	75.2	4.52	2.71	2.2	5.7	10.8
Curb Inlet on SW 6th Street	B	B	0.16	0.00025	75.5	4.22	2.53	0.3	0.8	1.5
Existing Summit Waves Aquatic Park Storm Sewer	C	C1	0.13	0.00020	77.7	7.64	4.58	0.2	0.6	1.1
		C2	0.38	0.00059	75.3	5.91	3.54	0.7	1.7	3.2
Storm Sewer at SE Blue Parkway	D	D	1.42	0.00222	75.5	7.20	4.32	2.4	6.1	11.6

Proposed Hydrologic Parameters										
Point of Interest	Outfall	DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
Ditch along SW Jefferson Street	A	A1	0.86	0.00134	75.7	3.97	2.38	1.8	4.3	8.1
		A2	0.07	0.00011	98.0	5.00	3.00	0.3	0.5	0.8
		A3	0.24	0.00038	92.0	5.23	3.14	1.0	1.7	2.7
		A4	0.23	0.00036	98.0	5.35	3.21	1.0	1.7	2.6
		A5	0.32	0.00050	88.3	5.98	3.59	1.1	2.0	3.3
		A6	0.11	0.00017	89.3	5.62	3.37	0.4	0.7	1.1
Curb Inlet on SW 6th Street	B	B	0.13	0.00020	75.8	4.09	2.45	0.3	0.6	1.2
Existing Summit Waves Aquatic Park Storm Sewer	C	C1	0.14	0.00022	87.7	7.49	4.49	0.4	0.8	1.3
		C2	0.05	0.00008	83.6	5.00	3.00	0.2	0.3	0.5
Storm Sewer at SE Blue Parkway	D	D	0.88	0.00138	76.5	7.24	4.35	1.6	3.9	7.3
Ditch along SW Jefferson Street	A	Pool	0.22	0.00034	98.0	5.19	3.11	1.0	1.6	2.4

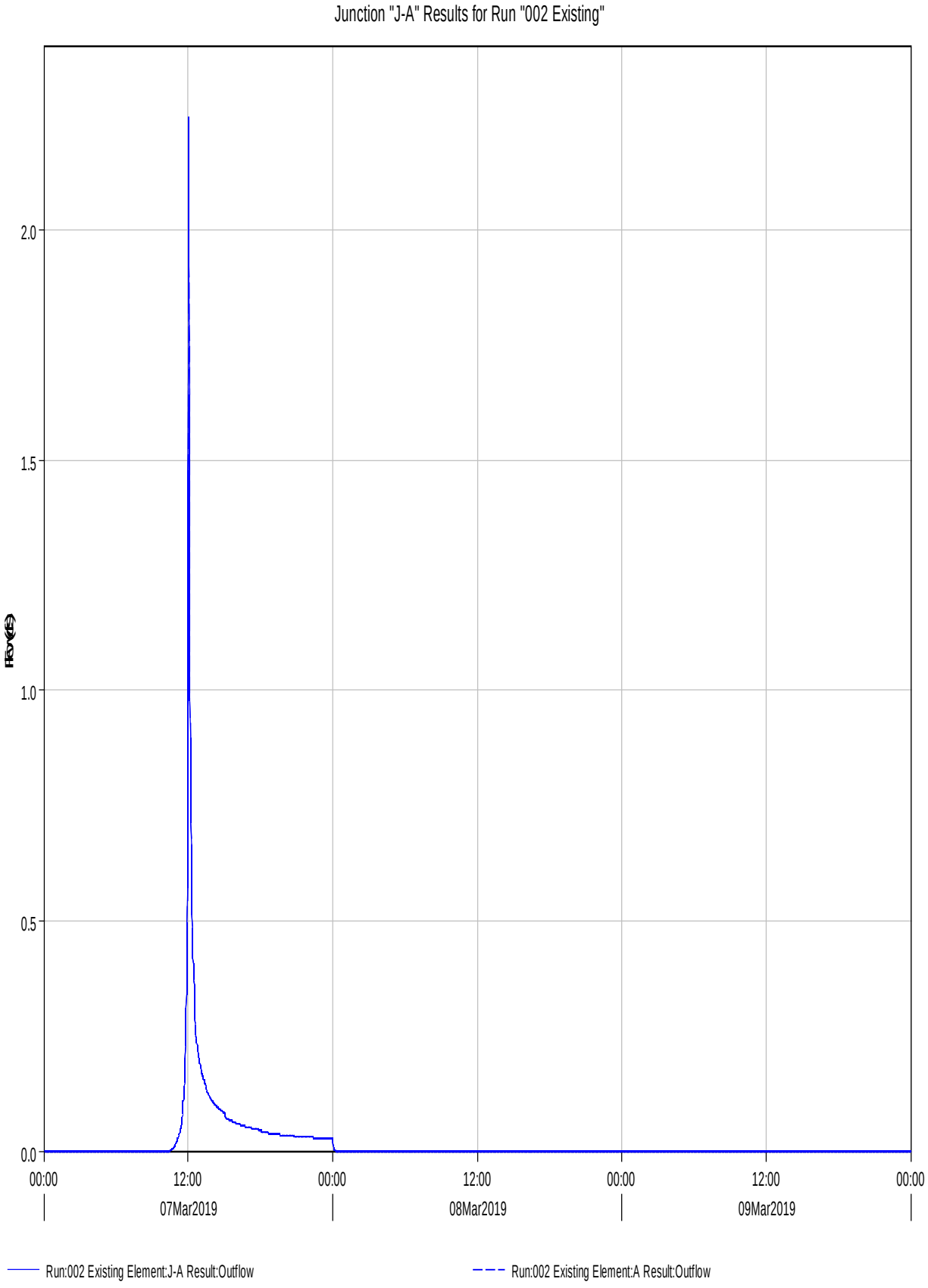
Existing Condition Hydrologic Parameters										
Point of Interest	Outfall	DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
Ditch along SW Jefferson Street	A	A	1.17	0.00183	75.2	4.52	2.71	2.2	5.7	10.8
Curb Inlet on SW 6th Street	B	B	0.16	0.00025	75.5	4.22	2.53	0.3	0.8	1.5
Existing Summit Waves Aquatic Park Storm Sewer	C	C1	0.13	0.00020	77.7	7.64	4.58	0.2	0.6	1.1
		C2	0.38	0.00059	75.3	5.91	3.54	0.7	1.7	3.2
Storm Sewer at Jefferson Street North of Blue Parkway	D	D	1.42	0.00222	75.5	7.20	4.32	2.4	6.1	11.6

Proposed Hydrologic Parameters										
Point of Interest	Outfall	DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
Ditch along SW Jefferson Street	A	A1	0.86	0.00134	75.7	3.97	2.38	1.8	4.3	8.1
		A2	0.07	0.00011	98.0	5.00	3.00	0.3	0.5	0.8
		A3	0.24	0.00038	92.0	5.23	3.14	1.0	1.7	2.7
		A4	0.23	0.00036	98.0	5.35	3.21	1.0	1.7	2.6
		A5	0.32	0.00050	88.3	5.98	3.59	1.1	2.0	3.3
		A6	0.11	0.00017	89.3	5.62	3.37	0.4	0.7	1.1
Curb Inlet on SW 6th Street	B	B	0.13	0.00020	75.8	4.09	2.45	0.3	0.6	1.2
Existing Summit Waves Aquatic Park Storm Sewer	C	C1	0.14	0.00022	87.7	7.49	4.49	0.4	0.8	1.3
		C2	0.05	0.00008	83.6	5.00	3.00	0.2	0.3	0.5
Storm Sewer at SE Blue Parkway	D	D	0.88	0.00138	76.5	7.24	4.35	1.6	3.9	7.3
Storm Sewer at Jefferson Street North of Blue Parkway	A	Pool	0.22	0.00034	98.0	5.19	3.11	1.0	1.6	2.4

Project: Lee's Summit Simulation Run: 002 Existing

Start of Run: 07Mar2019, 00:00 Basin Model: Existing
End of Run: 10Mar2019, 00:00 Meteorologic Model: 002-Year
Compute Time: 11Apr2019, 19:00:06 Control Specifications: 72-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A	0.00183	2.24	07Mar2019, 12:04	0.1
B	0.00025	0.32	07Mar2019, 12:04	0.0
C1	0.00020	0.24	07Mar2019, 12:06	0.0
C2	0.00059	0.68	07Mar2019, 12:05	0.0
D	0.00222	2.42	07Mar2019, 12:06	0.1
J-A	0.00183	2.24	07Mar2019, 12:04	0.1
J-B	0.00025	0.32	07Mar2019, 12:04	0.0
J-C	0.00079	0.92	07Mar2019, 12:05	0.1
J-D	0.00222	2.42	07Mar2019, 12:06	0.1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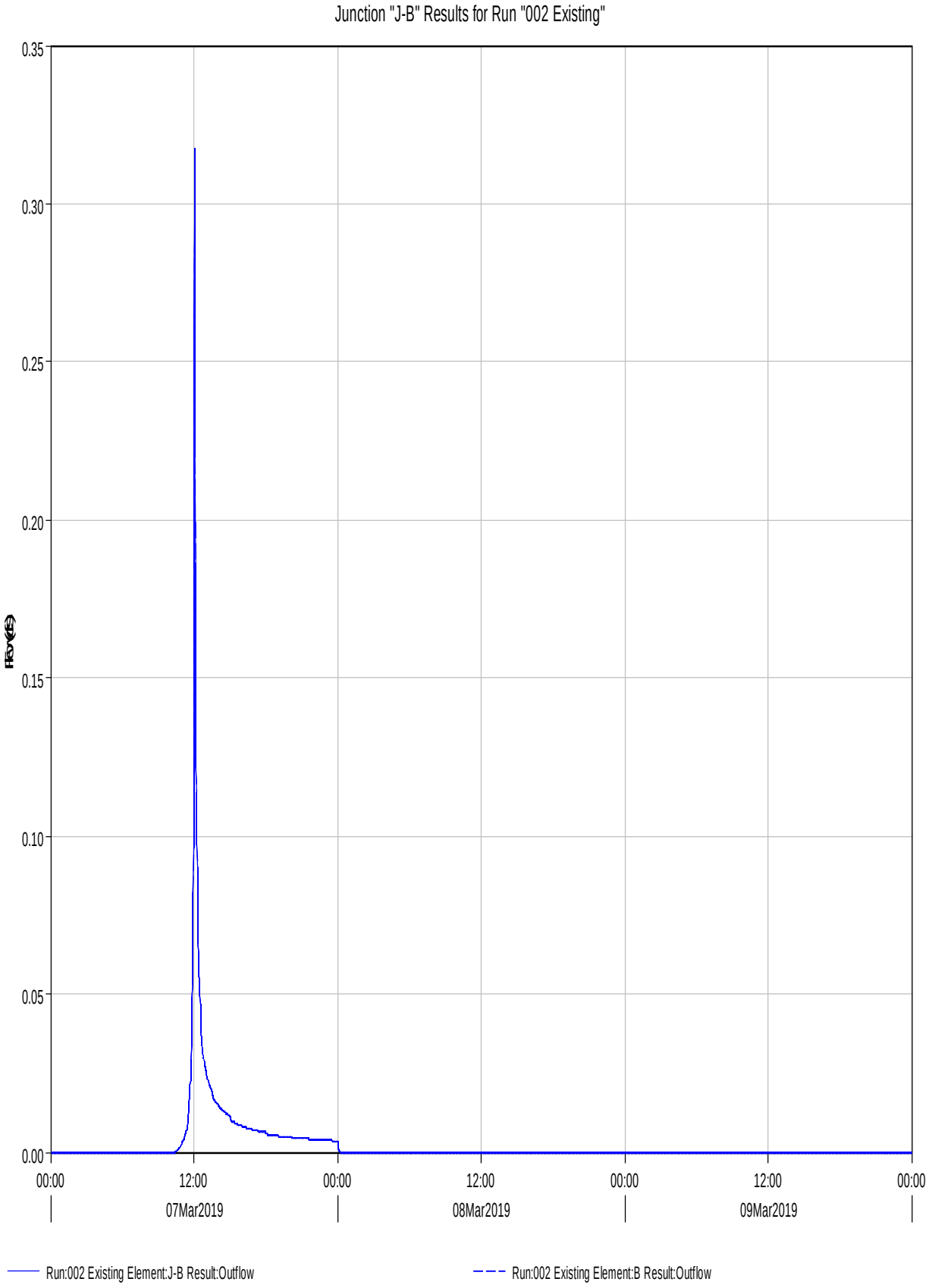
1.5
1.0
0.5
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Existing Element:J-A Result:Outflow
Run:002 Existing Element:A Result:Outflow


Junction "J-B" Results for Run "002 Existing"
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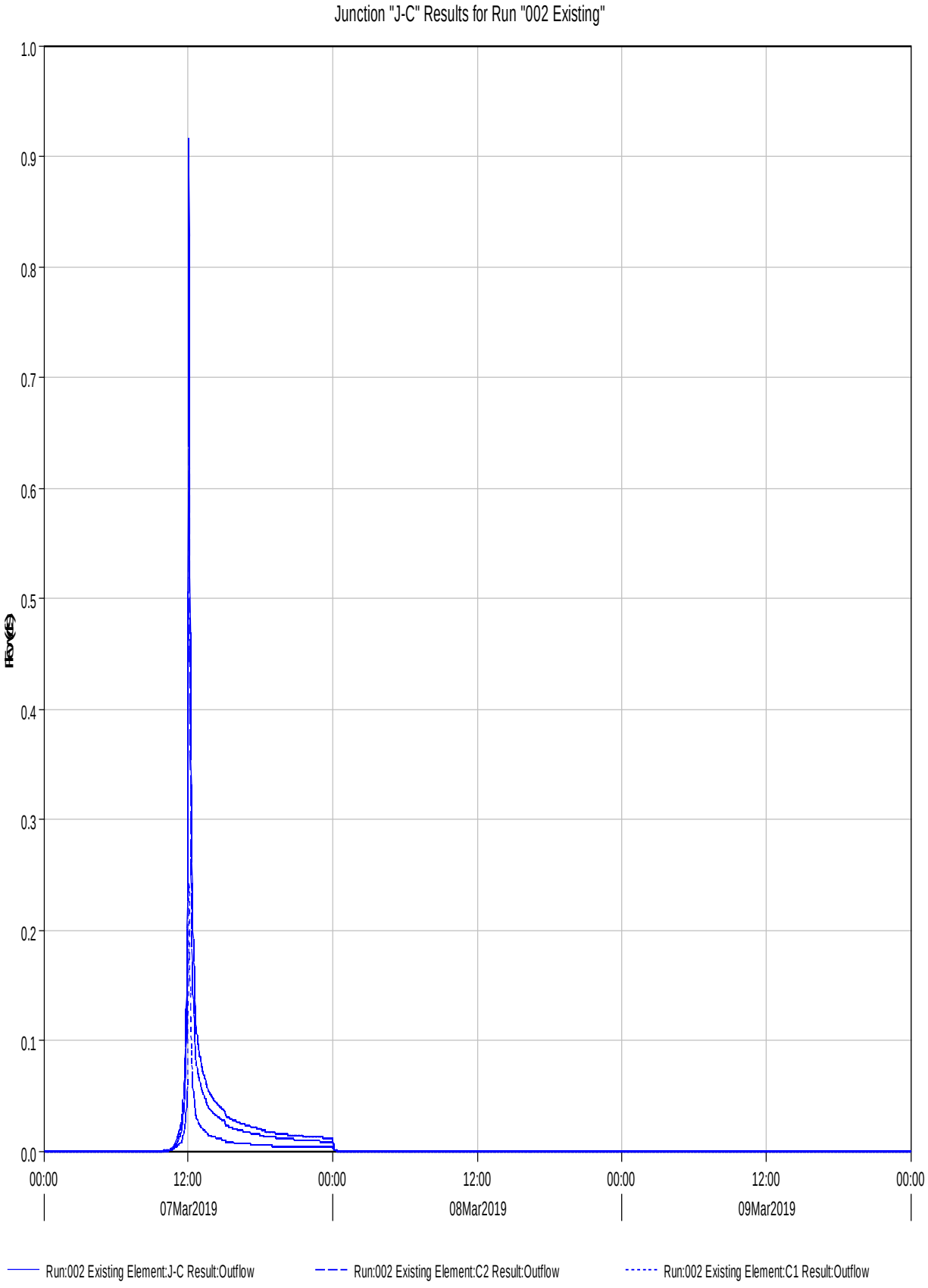
0.25
0.20
0.15
0.10
0.05
0.00
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Existing Element:J-B Result:Outflow
Run:002 Existing Element:B Result:Outflow


Junction "J-C" Results for Run "002 Existing"
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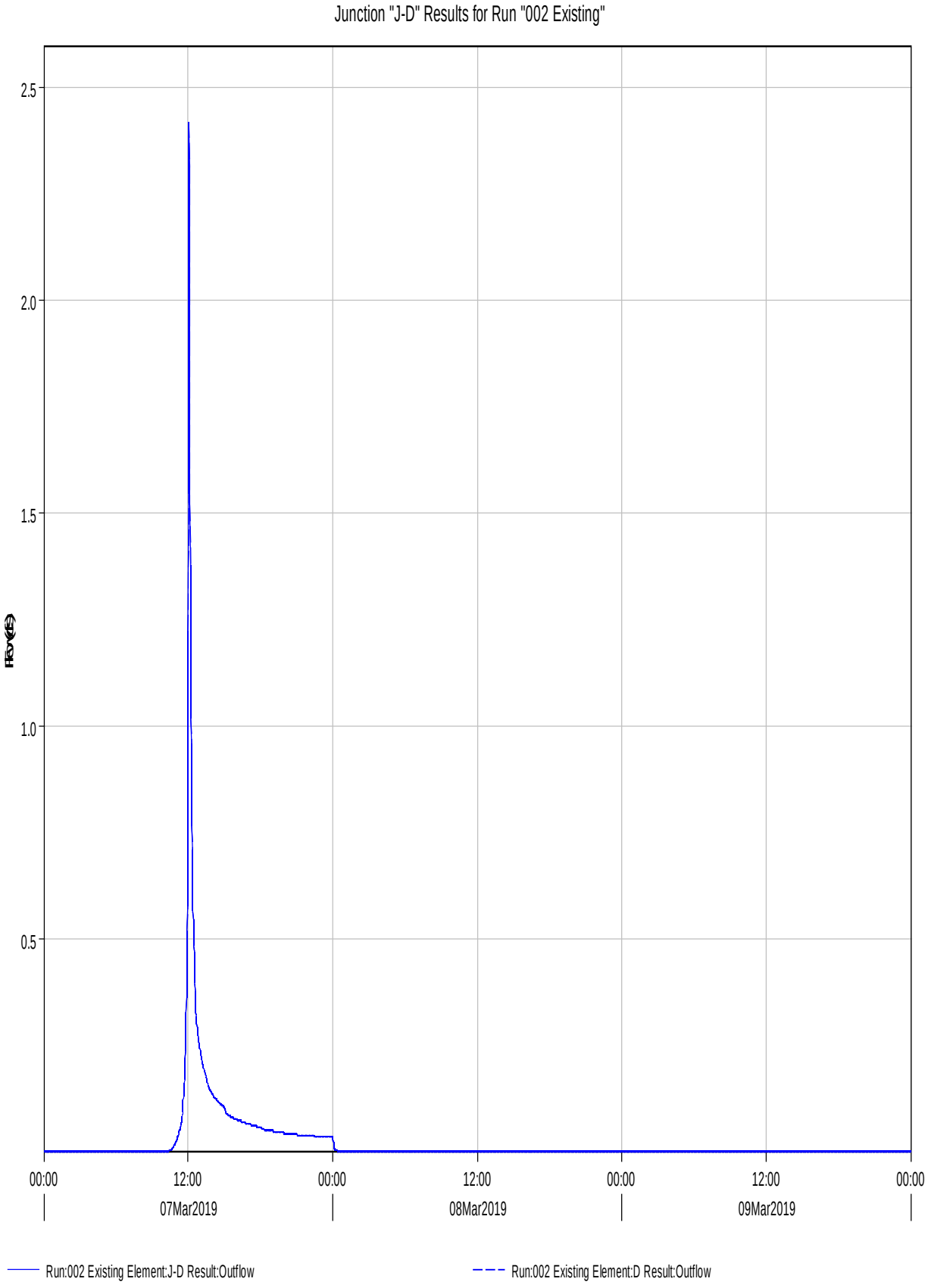
0.6
0.5
0.4
0.3
0.2
0.1
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Existing Element:J-C Result:Outflow
Run:002 Existing Element:C2 Result:Outflow
Run:002 Existing Element:C1 Result:Outflow


Junction "J-D" Results for Run "002 Existing"
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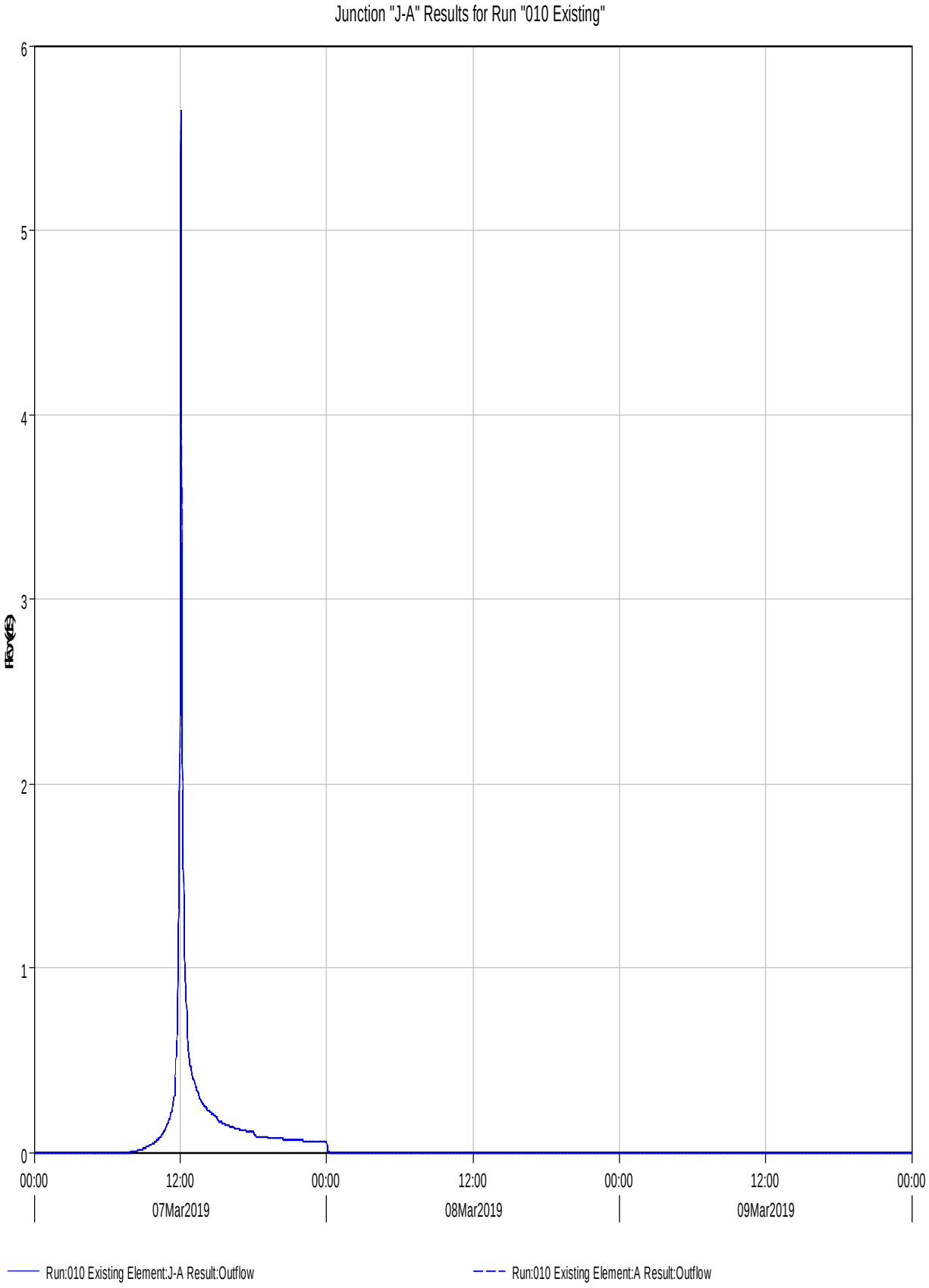
0.5
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Existing Element:J-D Result:Outflow
Run:002 Existing Element:D Result:Outflow

Project: Lee's Summit Simulation Run: 010 Existing

Start of Run: 07Mar2019, 00:00 Basin Model: Existing
End of Run: 10Mar2019, 00:00 Meteorologic Model: 010-Year
Compute Time: 11Apr2019, 19:00:09 Control Specifications: 72-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A	0.00183	5.65	07Mar2019, 12:04	0.3
B	0.00025	0.79	07Mar2019, 12:04	0.0
C1	0.00020	0.57	07Mar2019, 12:06	0.0
C2	0.00059	1.71	07Mar2019, 12:05	0.1
D	0.00222	6.05	07Mar2019, 12:05	0.4
J-A	0.00183	5.65	07Mar2019, 12:04	0.3
J-B	0.00025	0.79	07Mar2019, 12:04	0.0
J-C	0.00079	2.27	07Mar2019, 12:05	0.1
J-D	0.00222	6.05	07Mar2019, 12:05	0.4


Junction "J-A" Results for Run "010 Existing"
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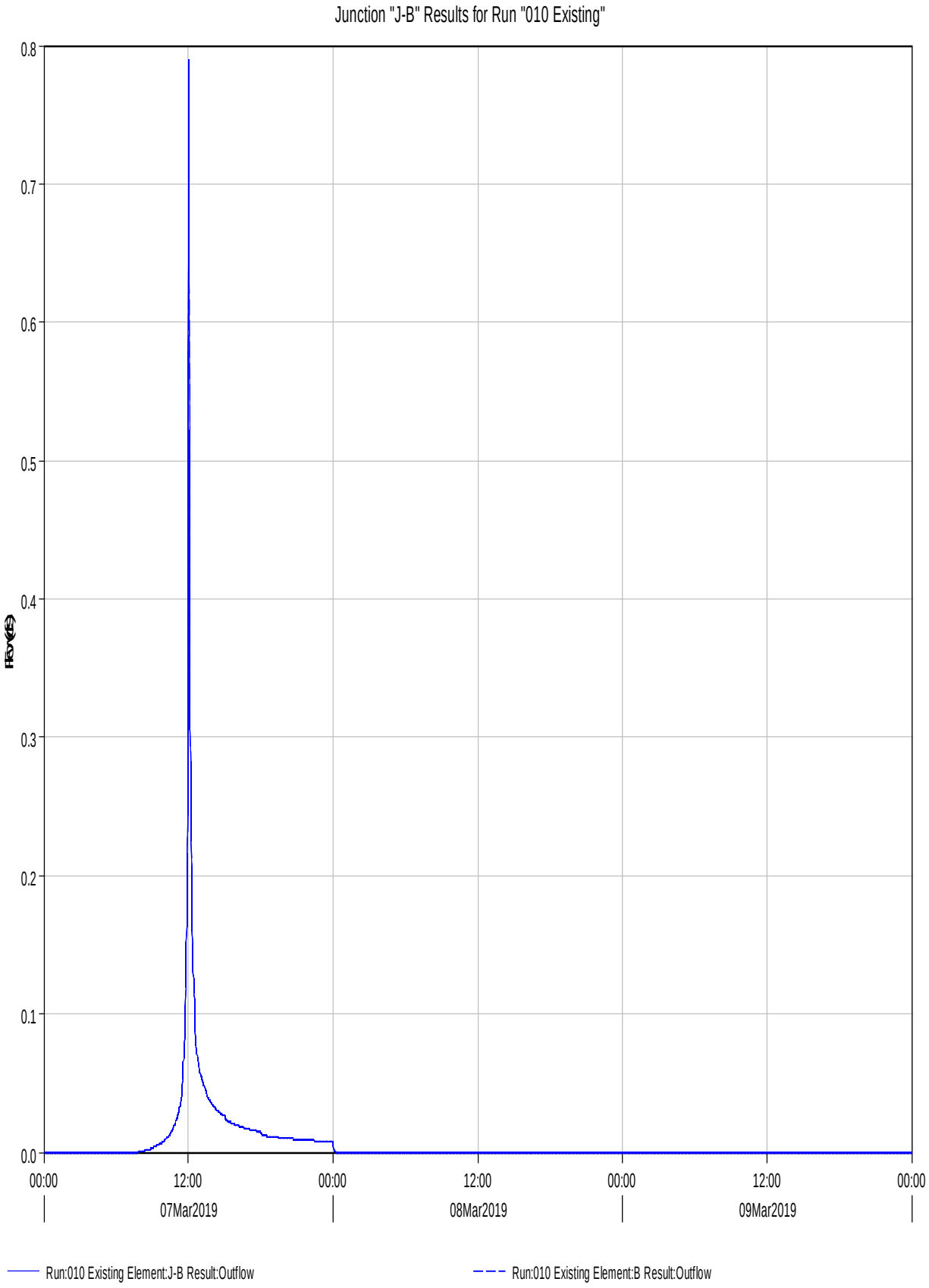
4
3
2
1
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Existing Element:J-A Result:Outflow
Run:010 Existing Element:A Result:Outflow


Junction "J-B" Results for Run "010 Existing"
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0.6
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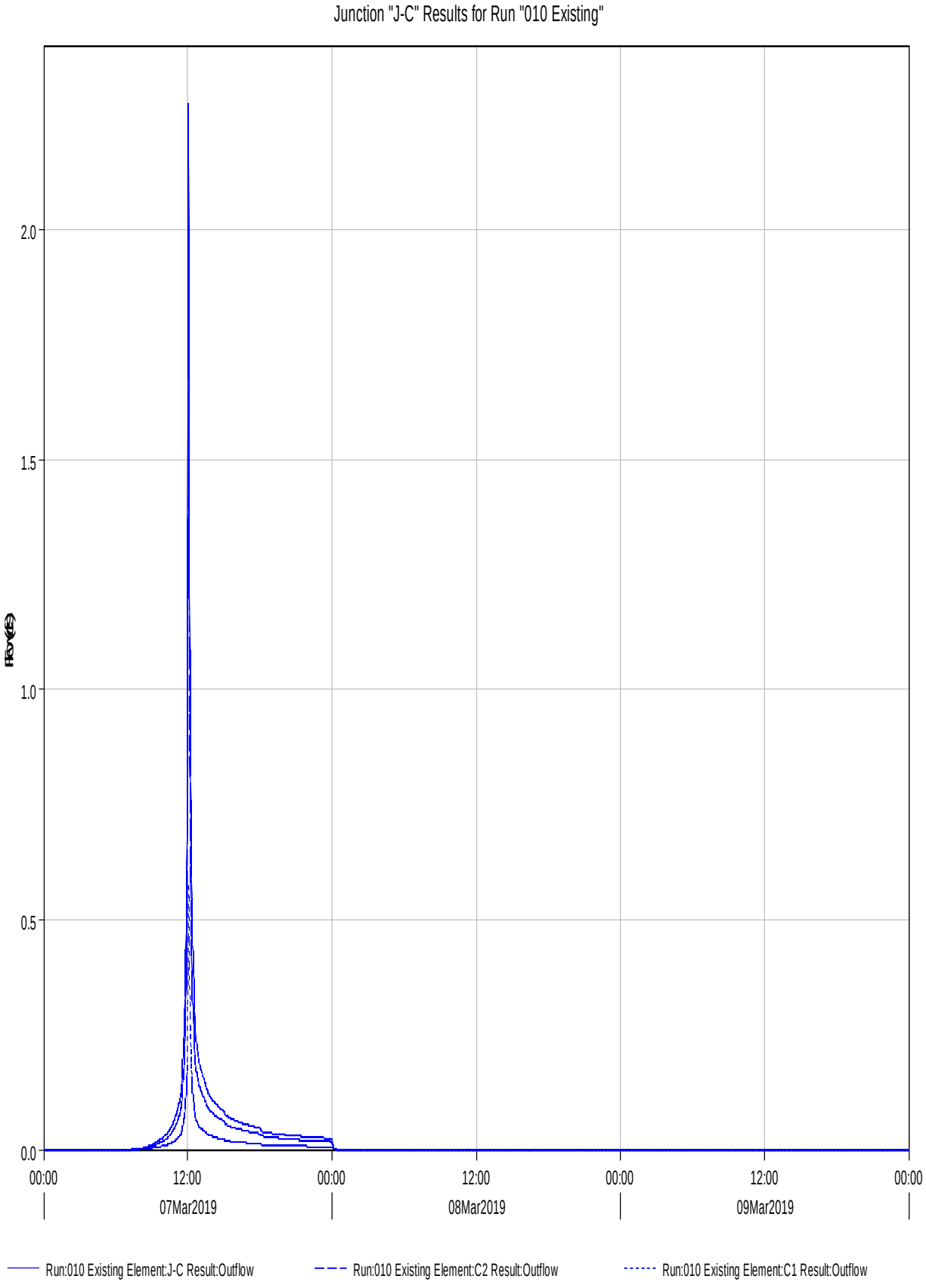
0.4
0.3
0.2
0.1
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Existing Element:J-B Result:Outflow
Run:010 Existing Element:B Result:Outflow


Junction "J-C" Results for Run "010 Existing"
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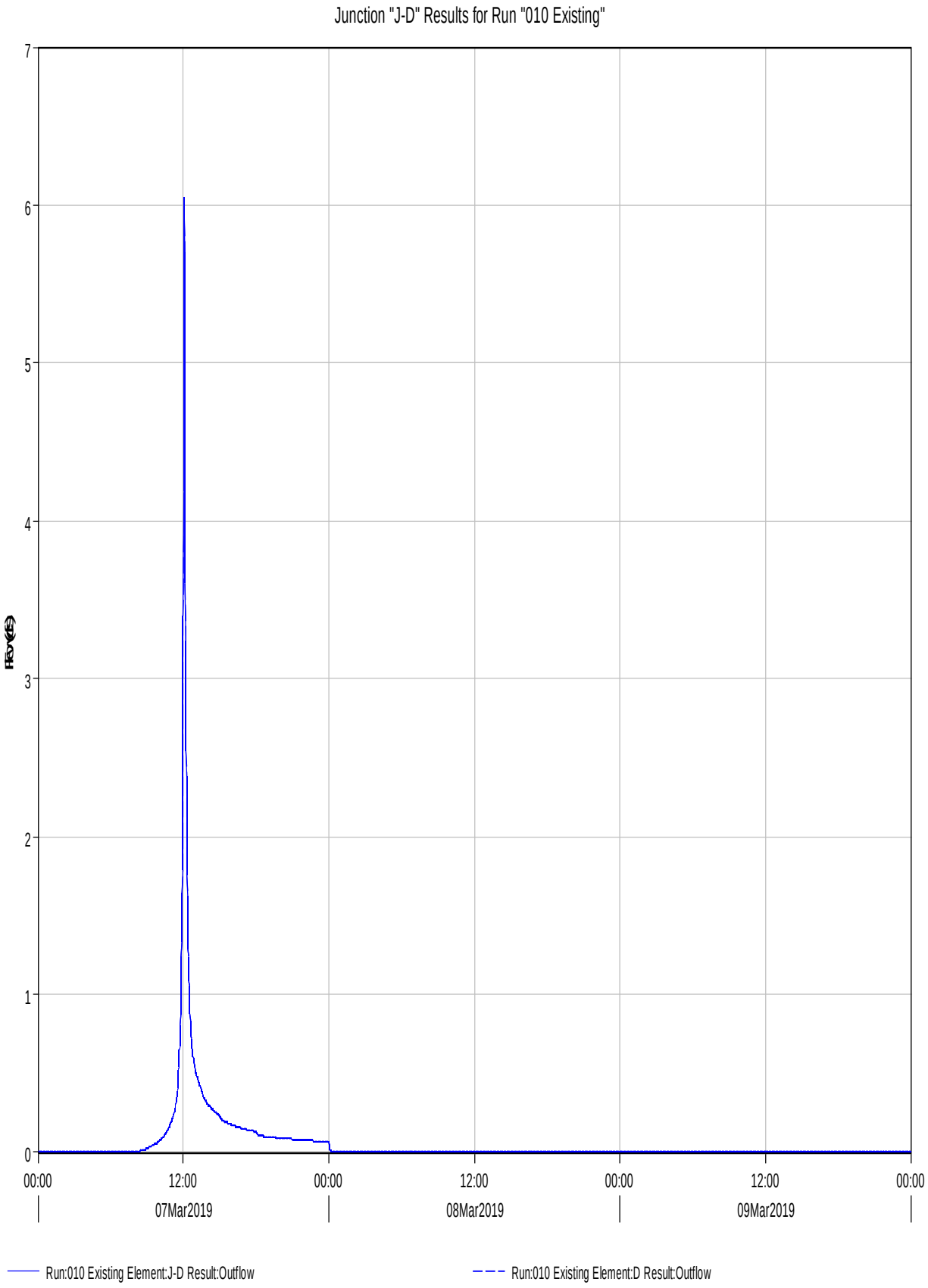
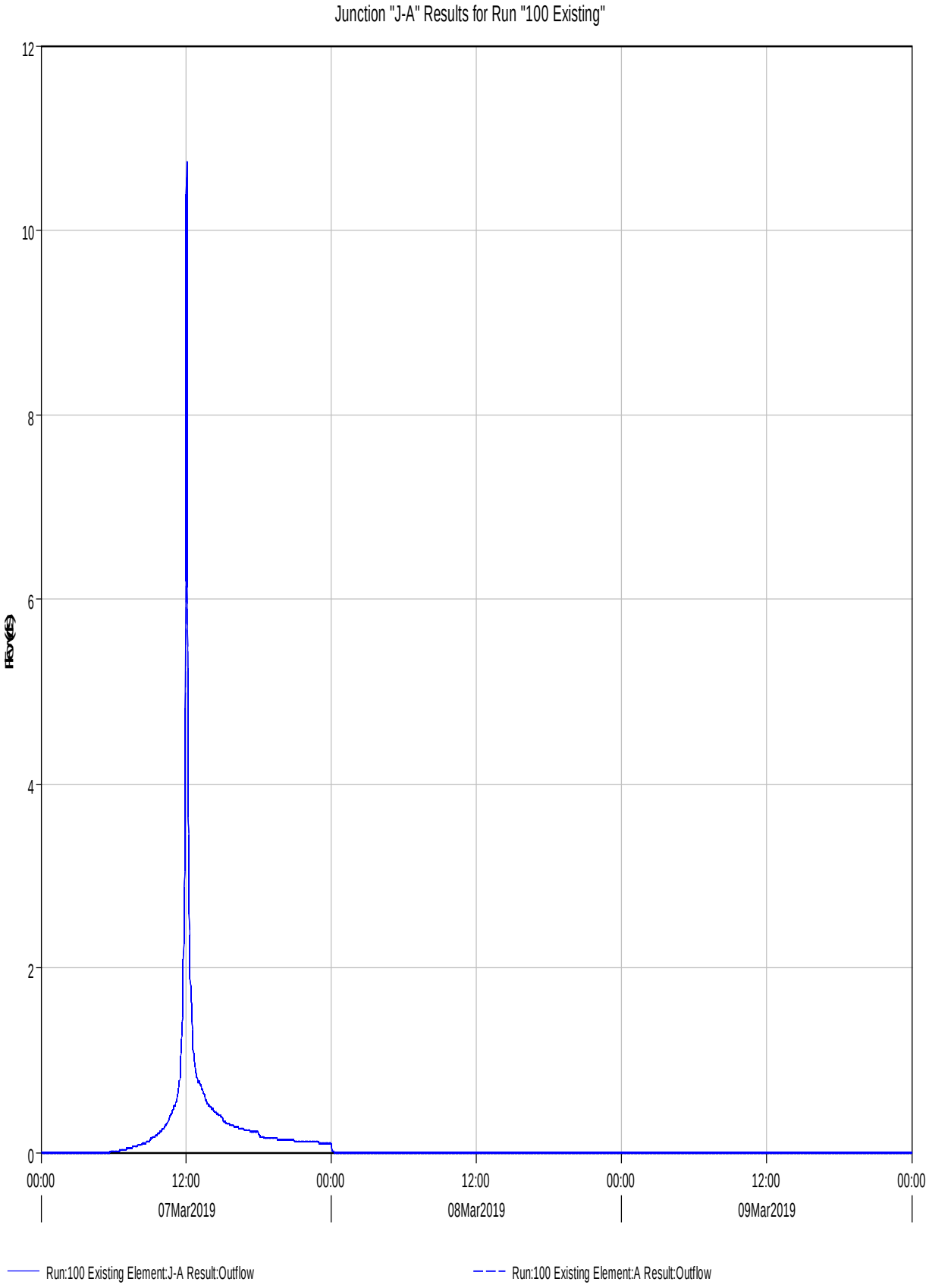
1.0
0.5
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Existing Element:J-C Result:Outflow
Run:010 Existing Element:C2 Result:Outflow
Run:010 Existing Element:C1 Result:Outflow

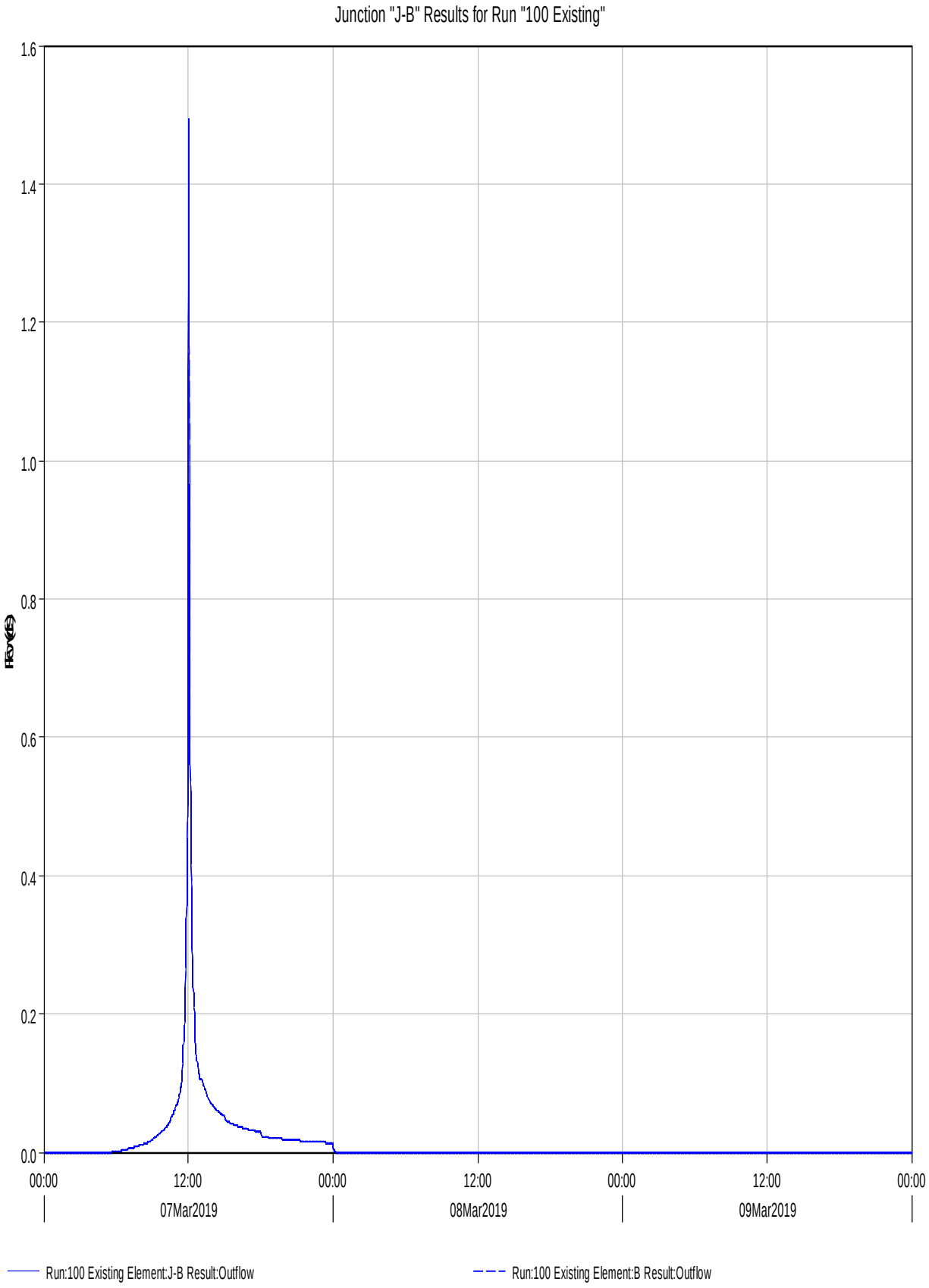

Junction "J-D" Results for Run "010 Existing"
7
6
5
4
3
2
1
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Existing Element:J-D Result:Outflow
Run:010 Existing Element:D Result:Outflow

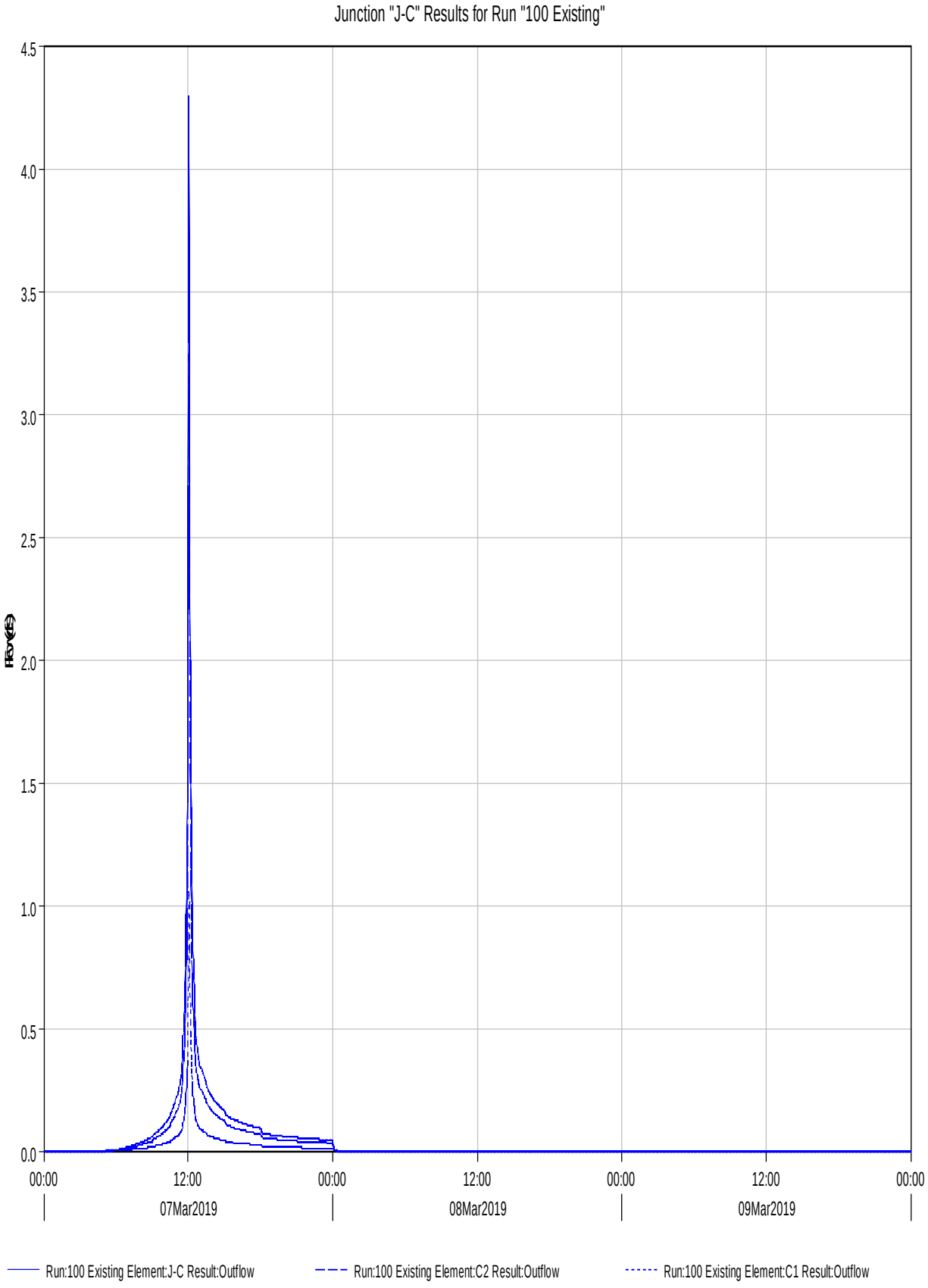
Project: Lee's Summit Simulation Run: 100 Existing

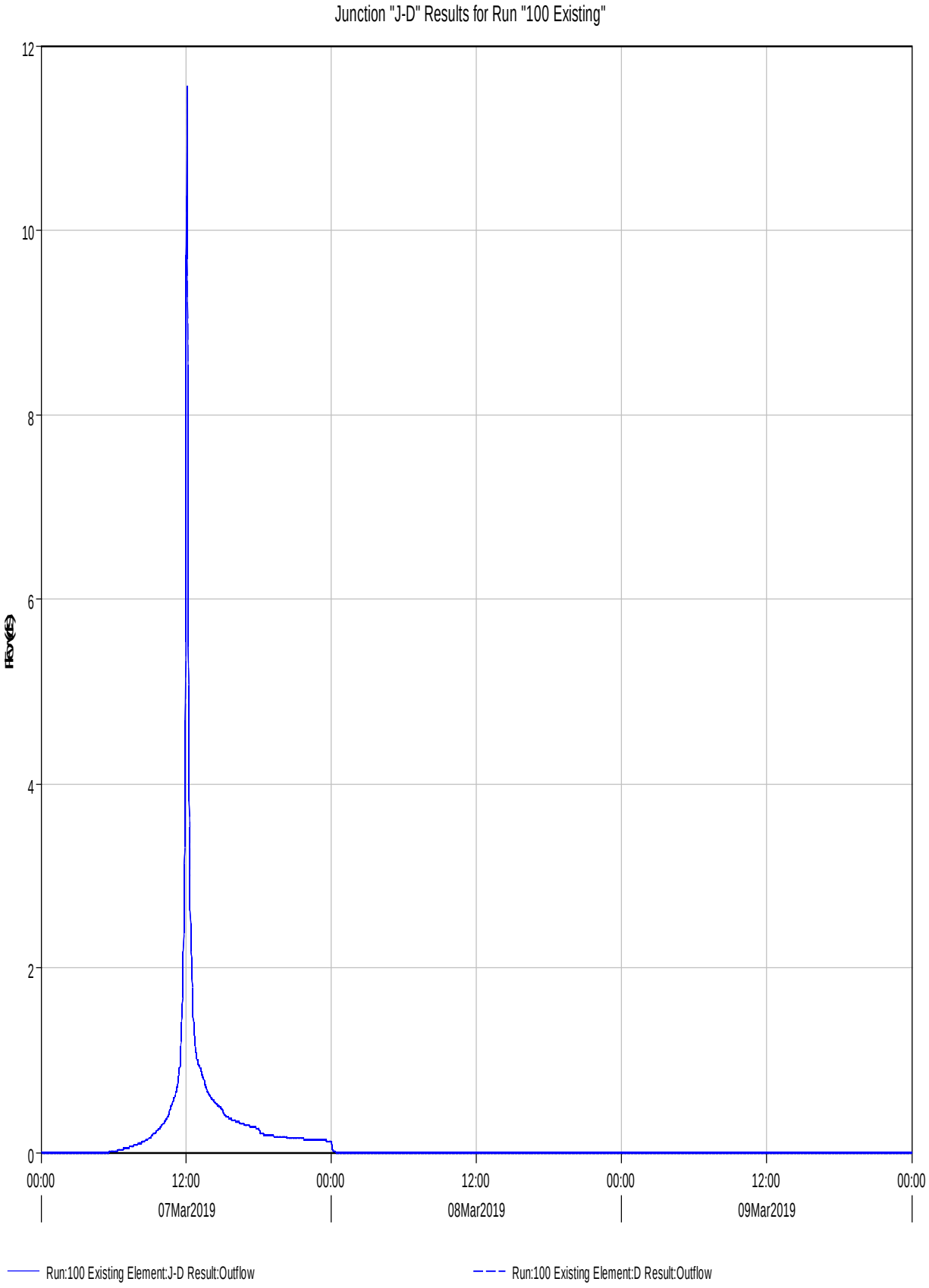
Start of Run: 07Mar2019, 00:00 Basin Model: Existing
End of Run: 10Mar2019, 00:00 Meteorologic Model: 100-Year
Compute Time: 11Apr2019, 19:00:12 Control Specifications: 72-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A	0.00183	10.75	07Mar2019, 12:04	0.6
B	0.00025	1.49	07Mar2019, 12:04	0.1
C1	0.00020	1.06	07Mar2019, 12:06	0.1
C2	0.00059	3.24	07Mar2019, 12:05	0.2
D	0.00222	11.57	07Mar2019, 12:05	0.7
J-A	0.00183	10.75	07Mar2019, 12:04	0.6
J-B	0.00025	1.49	07Mar2019, 12:04	0.1
J-C	0.00079	4.30	07Mar2019, 12:05	0.3
J-D	0.00222	11.57	07Mar2019, 12:05	0.7


Junction "J-A" Results for Run "100 Existing"
12
10
8
6
4
2
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Existing Element:J-A Result:Outflow
Run:100 Existing Element:A Result:Outflow


Junction "J-B" Results for Run "100 Existing"
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Existing Element:J-B Result:Outflow
Run:100 Existing Element:B Result:Outflow

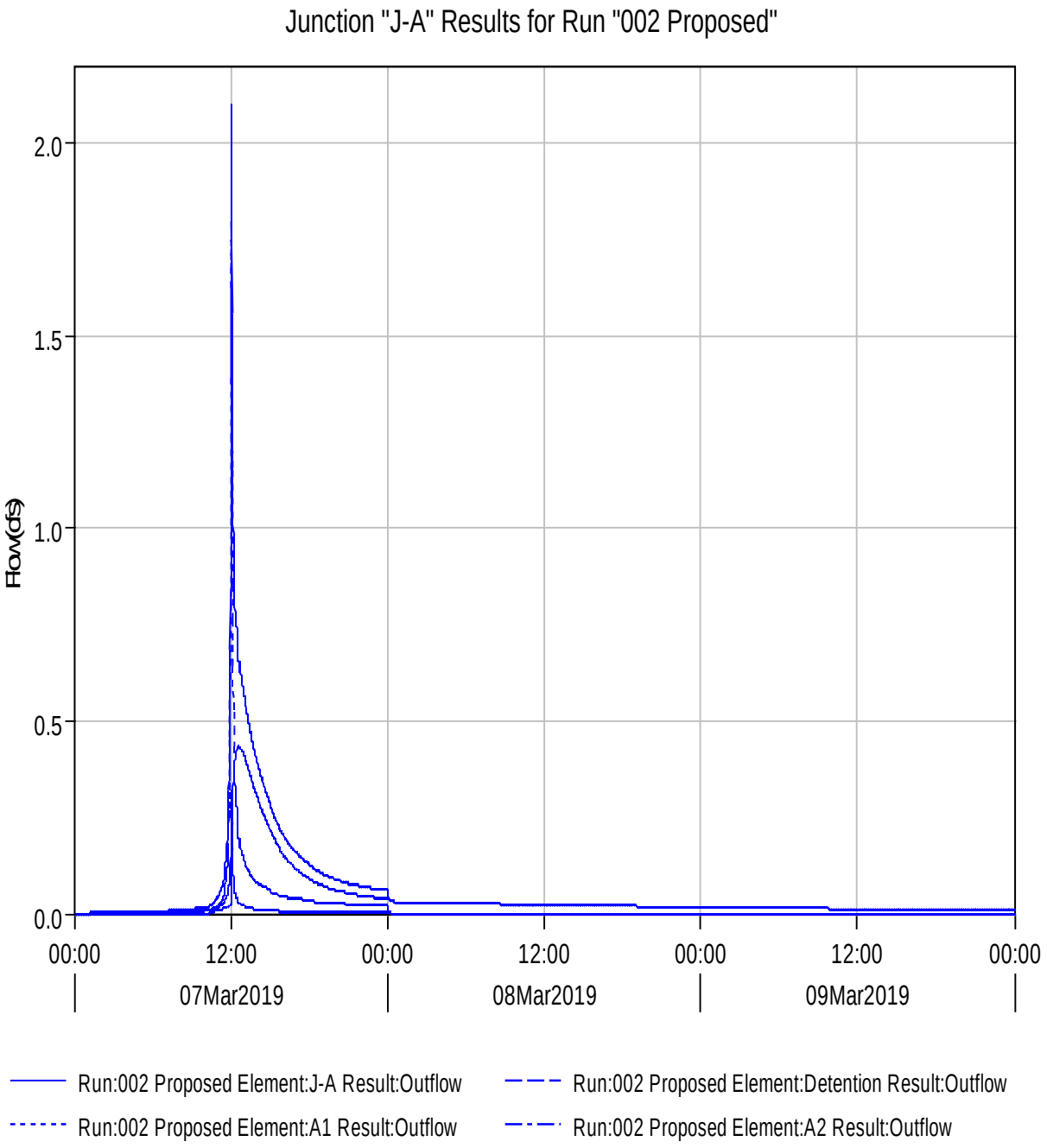

Junction "J-C" Results for Run "100 Existing"
4.5
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Existing Element:J-C Result:Outflow
Run:100 Existing Element:C2 Result:Outflow
Run:100 Existing Element:C1 Result:Outflow

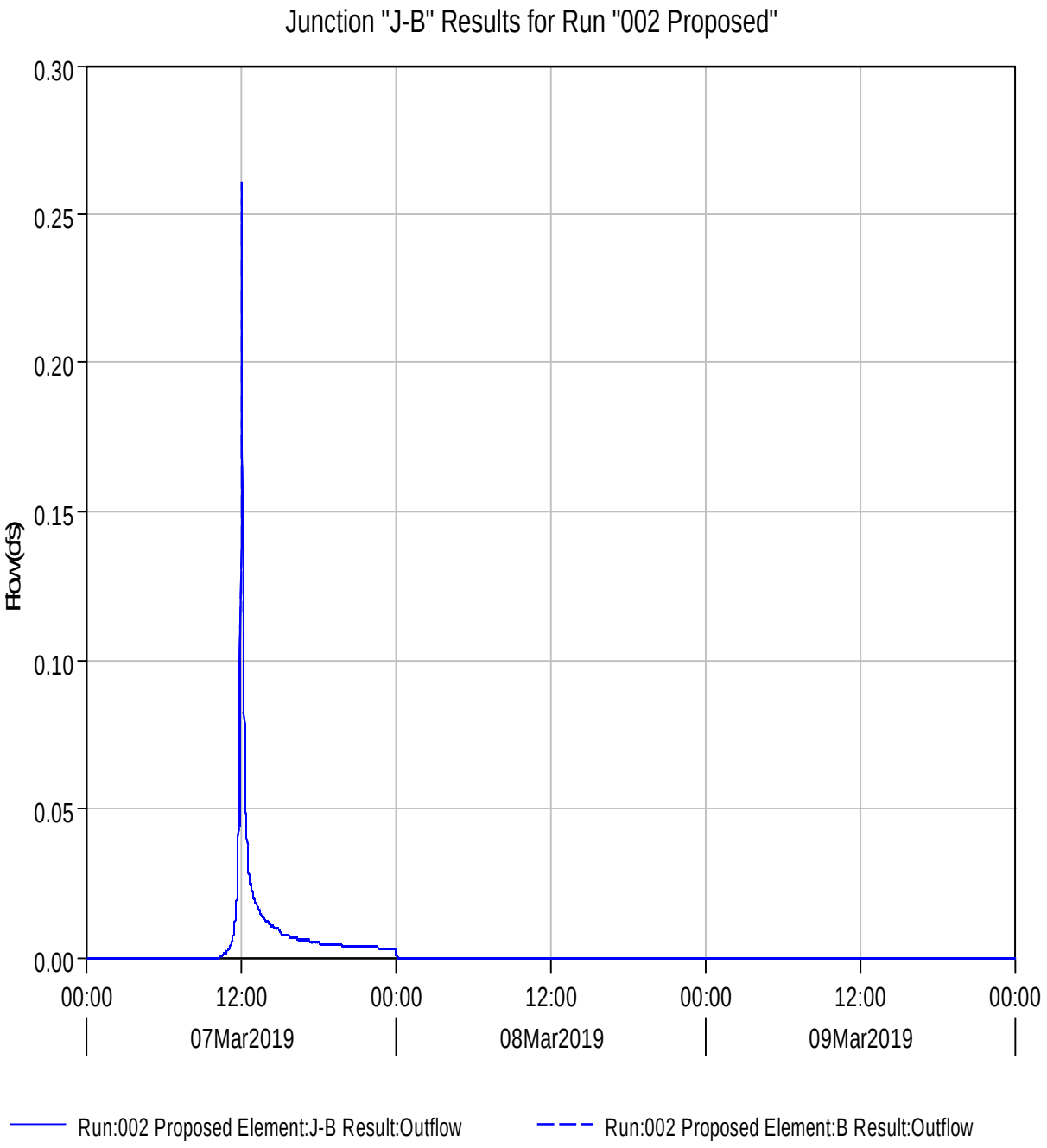

Junction "J-D" Results for Run "100 Existing"
12
10
8
6
4
2
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Existing Element:J-D Result:Outflow
Run:100 Existing Element:D Result:Outflow

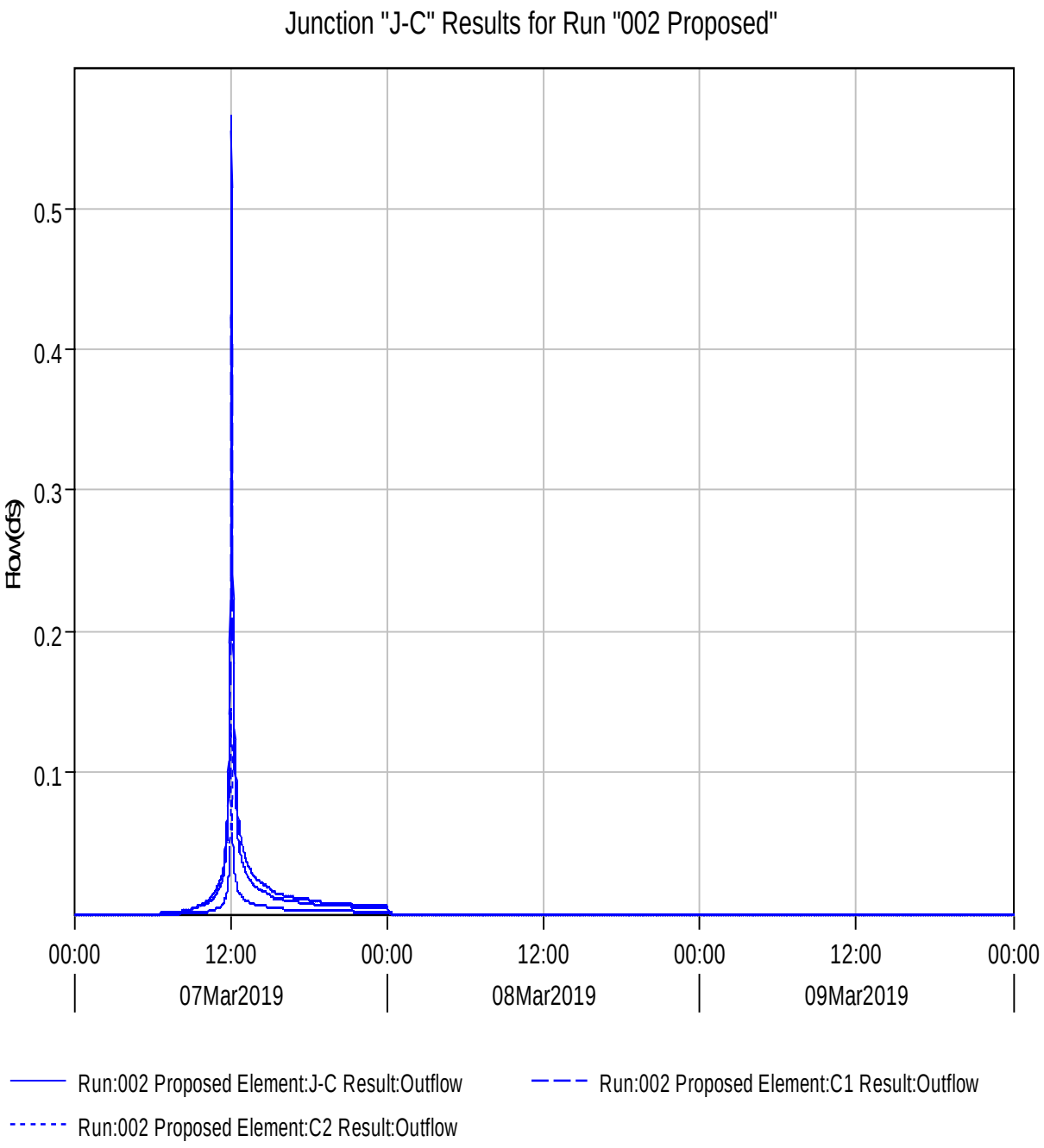
Project: Lee's Summit Simulation Run: 002 Proposed

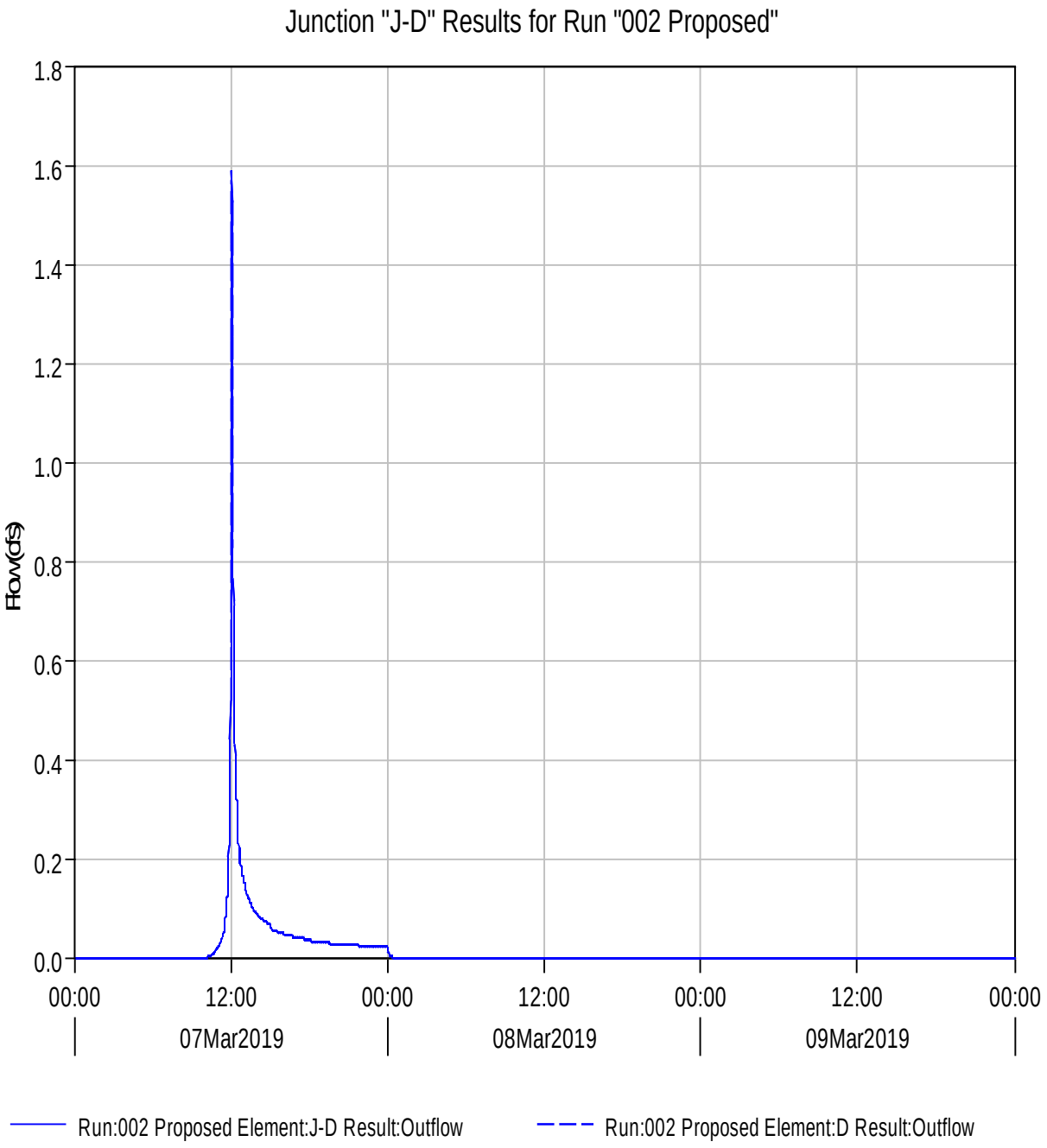
Start of Run: 07Mar2019, 00:00 Basin Model: Proposed
End of Run: 10Mar2019, 00:00 Meteorologic Model: 002-Year
Compute Time: 12Apr2019, 07:06:44 Control Specifications: 72-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A5	0.00050	1.1	07Mar2019, 12:05	0.06
A3	0.00038	0.9	07Mar2019, 12:04	0.05
A4	0.00036	1.0	07Mar2019, 12:04	0.06
Pool	0.00034	1.0	07Mar2019, 12:04	0.05
Detention	0.00175	0.4	07Mar2019, 12:37	0.21
A1	0.00134	1.7	07Mar2019, 12:04	0.08
A2	0.00011	0.3	07Mar2019, 12:04	0.02
J-A	0.00320	2.1	07Mar2019, 12:04	0.32
D	0.00138	1.6	07Mar2019, 12:06	0.09
J-D	0.00138	1.6	07Mar2019, 12:06	0.09
C1	0.00022	0.4	07Mar2019, 12:06	0.02
C2	0.00008	0.1	07Mar2019, 12:04	0.01
J-C	0.00030	0.6	07Mar2019, 12:05	0.03
B	0.00020	0.3	07Mar2019, 12:04	0.01
J-B	0.00020	0.3	07Mar2019, 12:04	0.01
A6	0.00017	0.4	07Mar2019, 12:05	0.02


Junction "J-A" Results for Run "002 Proposed"
Flow(cfs)
2.0
1.5
1.0
0.5
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Proposed Element:J-A Result:Outflow
Run:002 Proposed Element:Detention Result:Outflow
Run:002 Proposed Element:A1 Result:Outflow
Run:002 Proposed Element:A2 Result:Outflow


Junction "J-B" Results for Run "002 Proposed"
0.30
0.25
0.20
0.15
0.10
0.05
0.00
Flow(cfs)
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Proposed Element:J-B Result:Outflow
Run:002 Proposed Element:B Result:Outflow

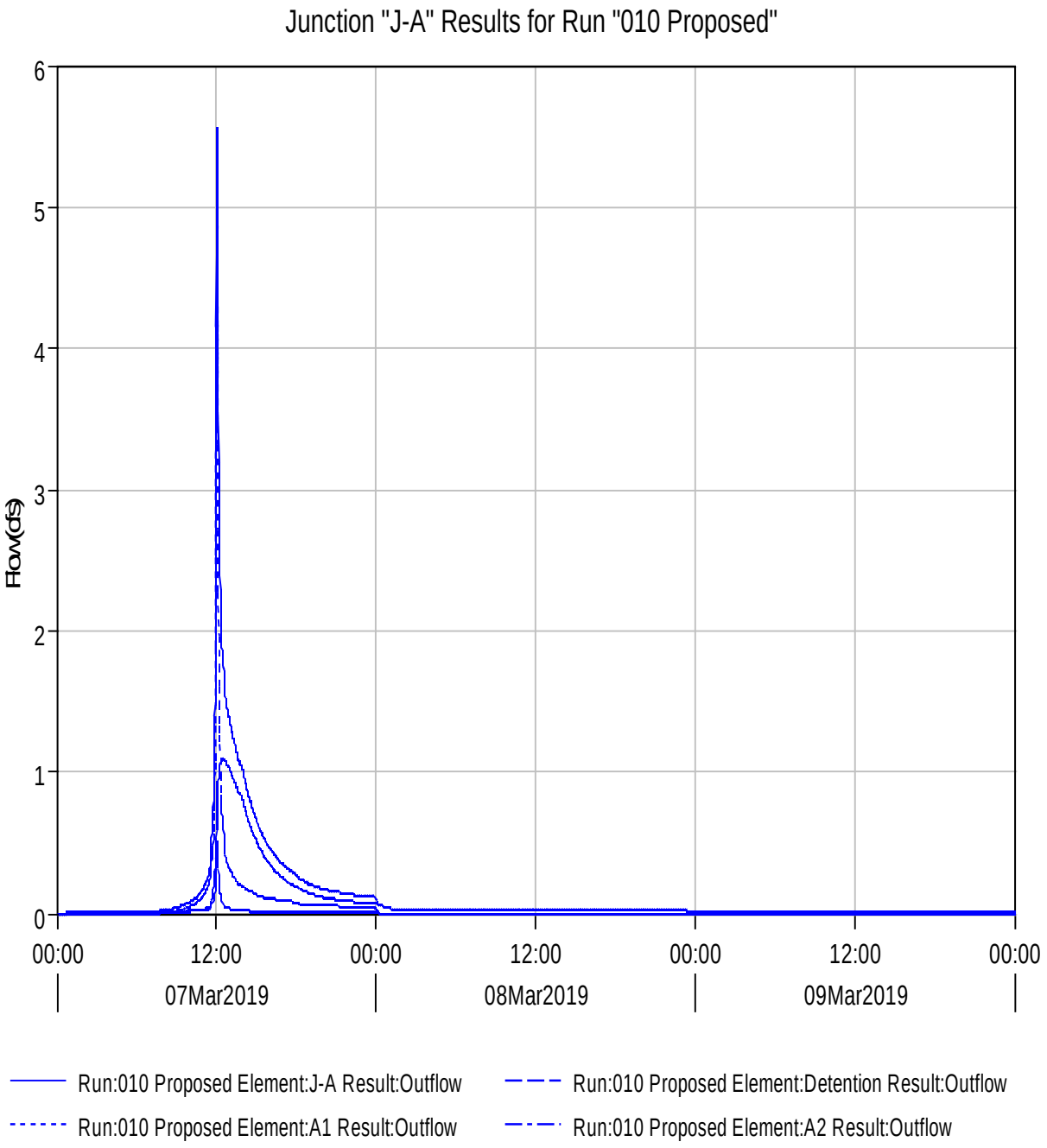

Junction "J-C" Results for Run "002 Proposed"
Flow(cfs)
0.5
0.4
0.3
0.2
0.1
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Proposed Element:J-C Result:Outflow
Run:002 Proposed Element:C1 Result:Outflow
Run:002 Proposed Element:C2 Result:Outflow

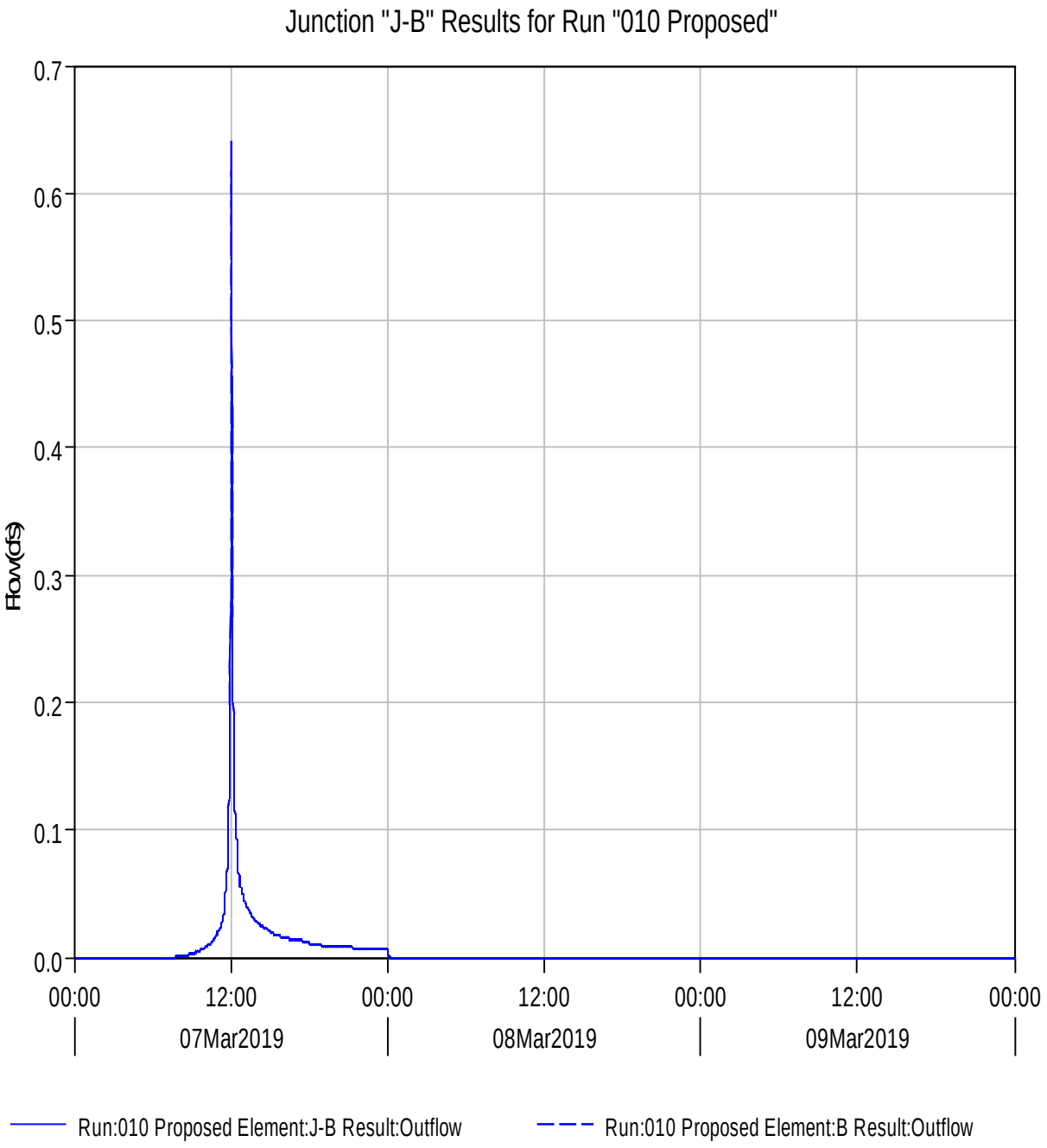

Junction "J-D" Results for Run "002 Proposed"
Flow (cfs)
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:002 Proposed Element:J-D Result:Outflow
Run:002 Proposed Element:D Result:Outflow

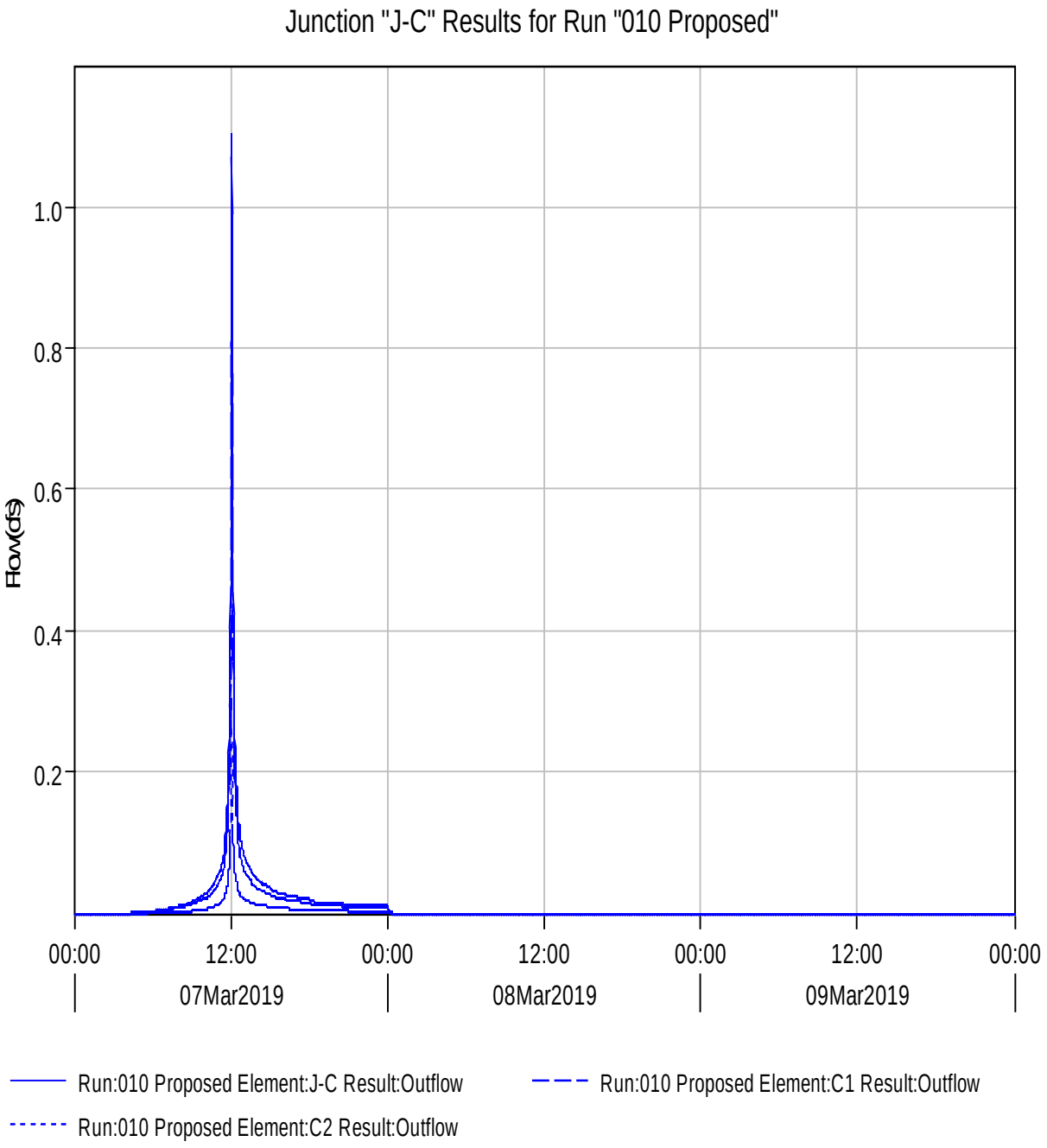
Project: Lee's Summit Simulation Run: 010 Proposed

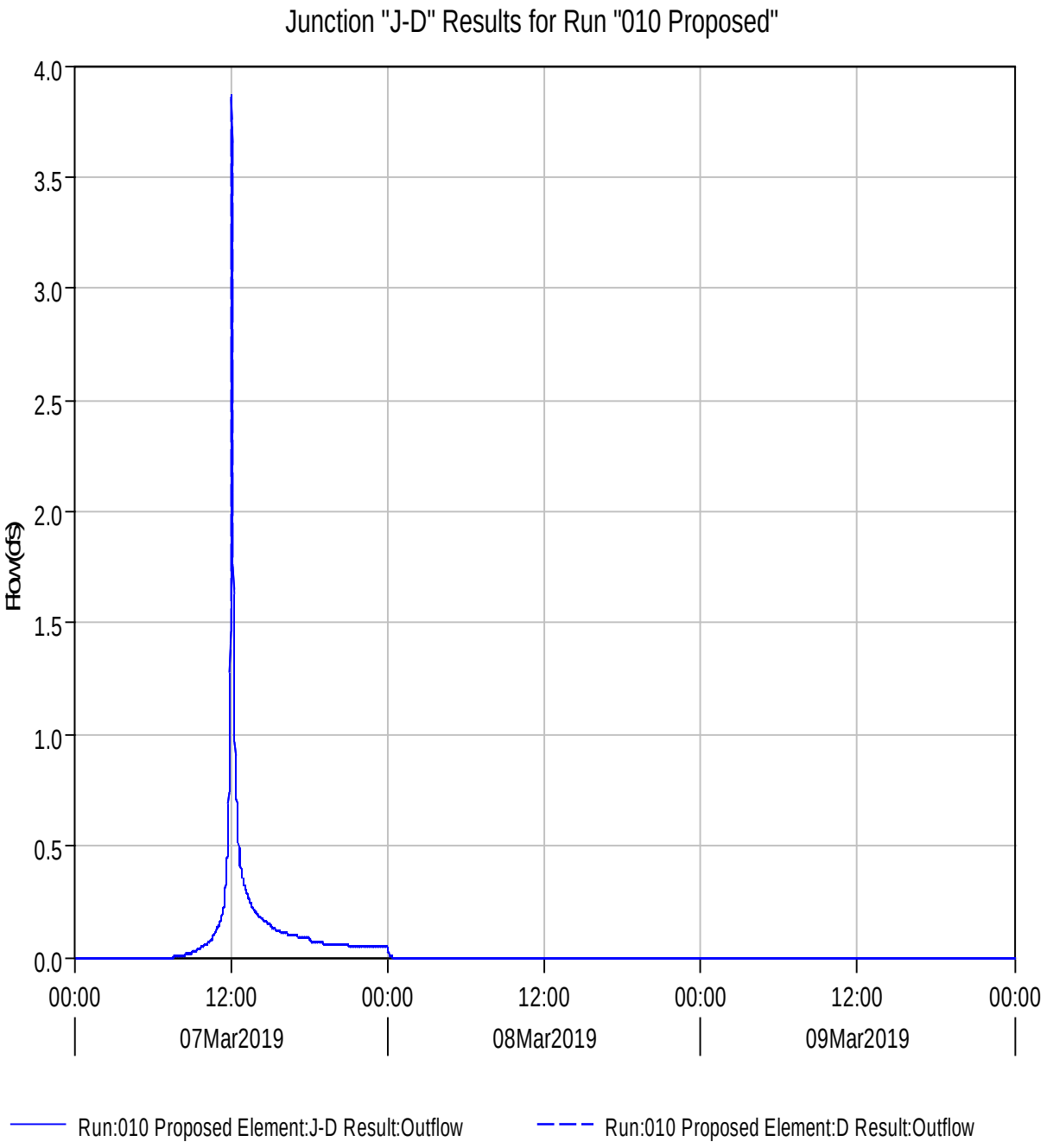
Start of Run: 07Mar2019, 00:00 Basin Model: Proposed
End of Run: 10Mar2019, 00:00 Meteorologic Model: 010-Year
Compute Time: 15Apr2019, 16:58:29 Control Specifications: 72-Hour

Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A5	0.00050	2.0	07Mar2019, 12:05	0.11
A3	0.00038	1.7	07Mar2019, 12:04	0.10
A4	0.00036	1.7	07Mar2019, 12:04	0.10
Pool	0.00034	1.6	07Mar2019, 12:04	0.10
Detention	0.00175	1.1	07Mar2019, 12:29	0.43
A1	0.00134	4.3	07Mar2019, 12:04	0.22
A2	0.00011	0.5	07Mar2019, 12:04	0.03
J-A	0.00320	5.6	07Mar2019, 12:04	0.67
D	0.00138	3.9	07Mar2019, 12:05	0.23
J-D	0.00138	3.9	07Mar2019, 12:05	0.23
C1	0.00022	0.8	07Mar2019, 12:05	0.05
C2	0.00008	0.3	07Mar2019, 12:04	0.02
J-C	0.00030	1.1	07Mar2019, 12:05	0.07
B	0.00020	0.6	07Mar2019, 12:04	0.03
J-B	0.00020	0.6	07Mar2019, 12:04	0.03
A6	0.00017	0.7	07Mar2019, 12:04	0.04


Junction "J-A" Results for Run "010 Proposed"
Flow(cfs)
6
5
4
3
2
1
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Proposed Element:J-A Result:Outflow
Run:010 Proposed Element:Detention Result:Outflow
Run:010 Proposed Element:A1 Result:Outflow
Run:010 Proposed Element:A2 Result:Outflow


Junction "J-B" Results for Run "010 Proposed"
0.7
0.6
0.5
0.4
0.3
0.2
0.1
0.0
Flow(cfs)
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Proposed Element:J-B Result:Outflow
Run:010 Proposed Element:B Result:Outflow

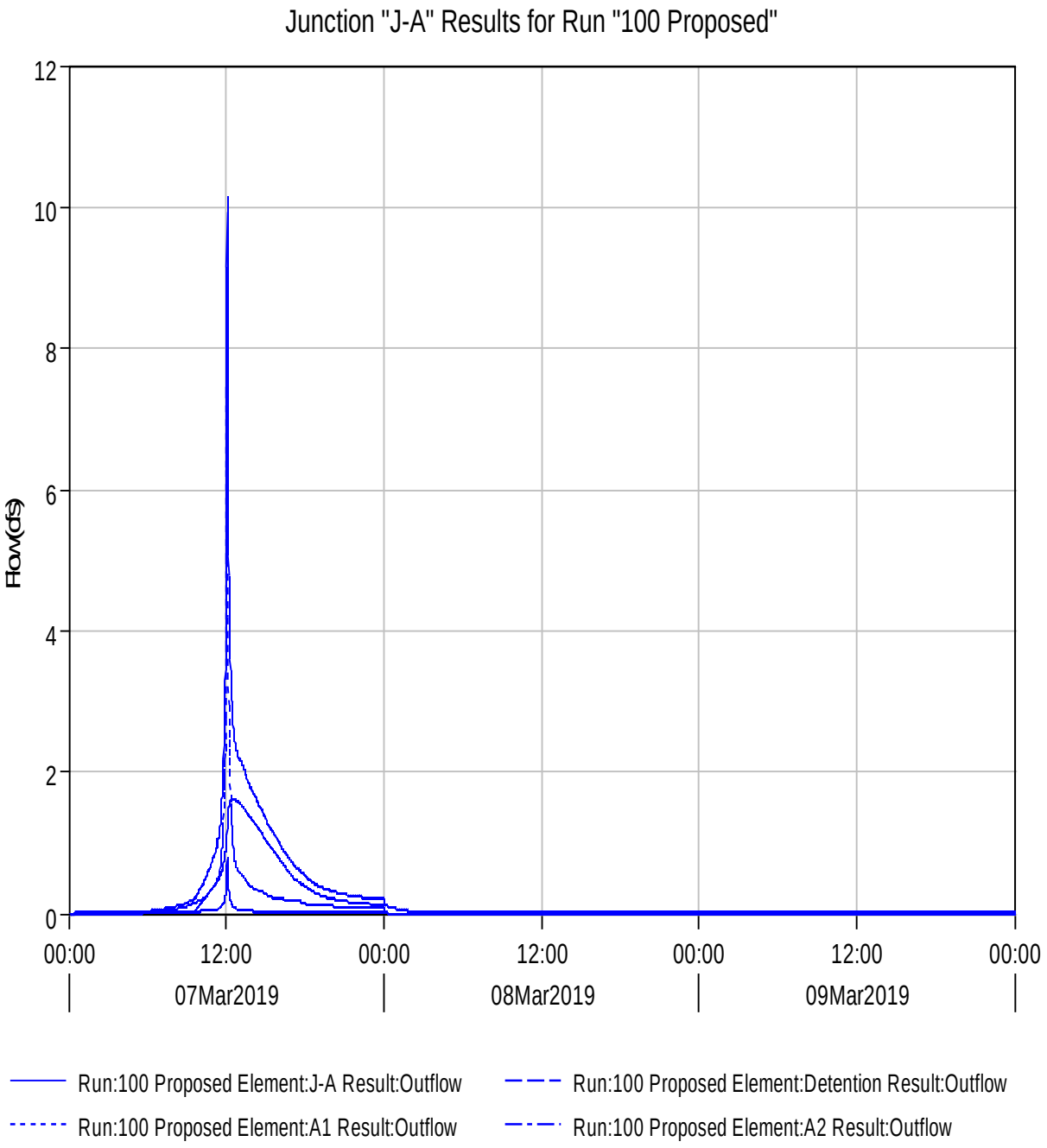

Junction "J-C" Results for Run "010 Proposed"
Flow(cfs)
1.0
0.8
0.6
0.4
0.2
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Proposed Element:J-C Result:Outflow
Run:010 Proposed Element:C1 Result:Outflow
Run:010 Proposed Element:C2 Result:Outflow

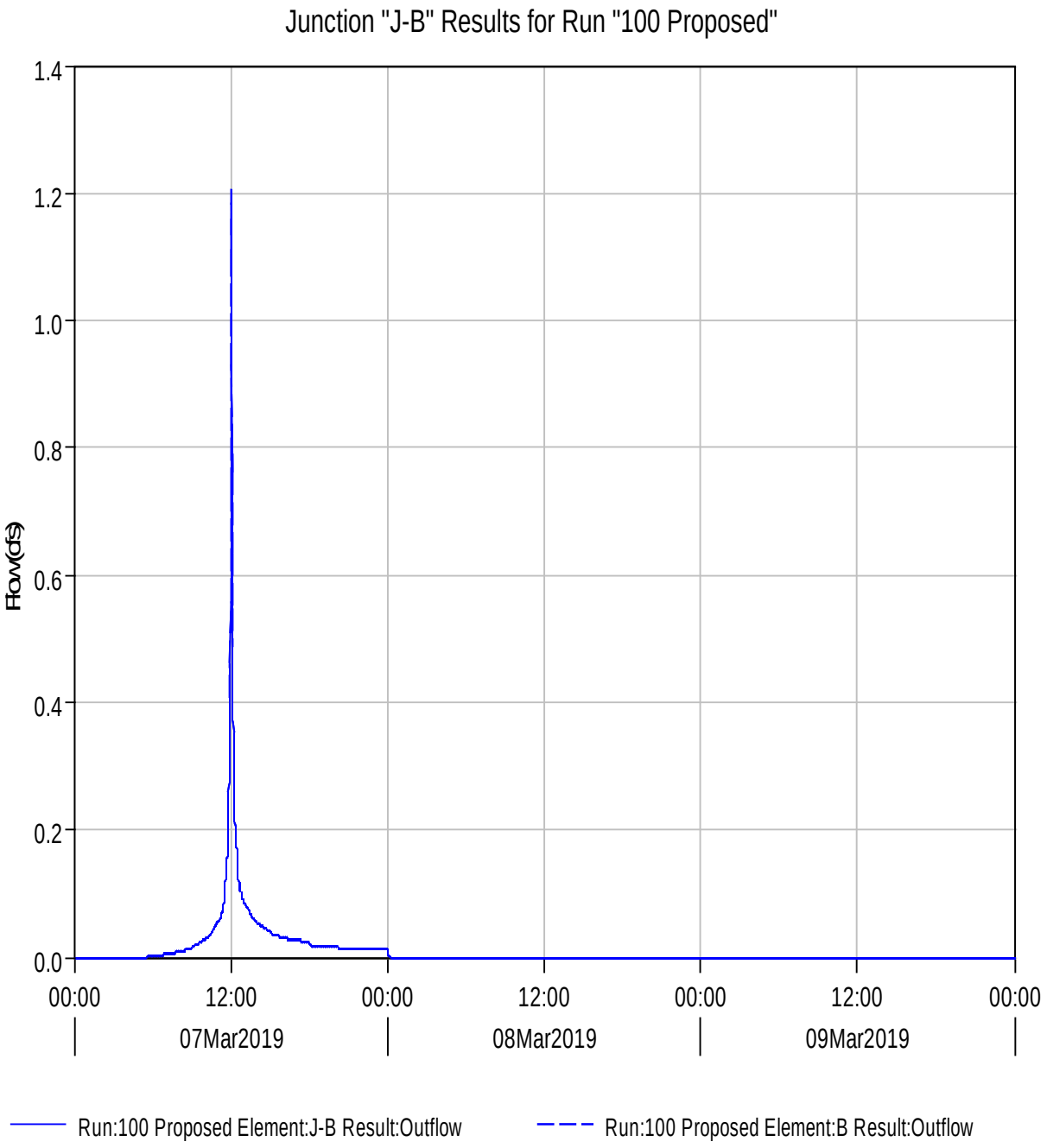

Junction "J-D" Results for Run "010 Proposed"
Flow(cfs)
4.0
3.5
3.0
2.5
2.0
1.5
1.0
0.5
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:010 Proposed Element:J-D Result:Outflow
Run:010 Proposed Element:D Result:Outflow

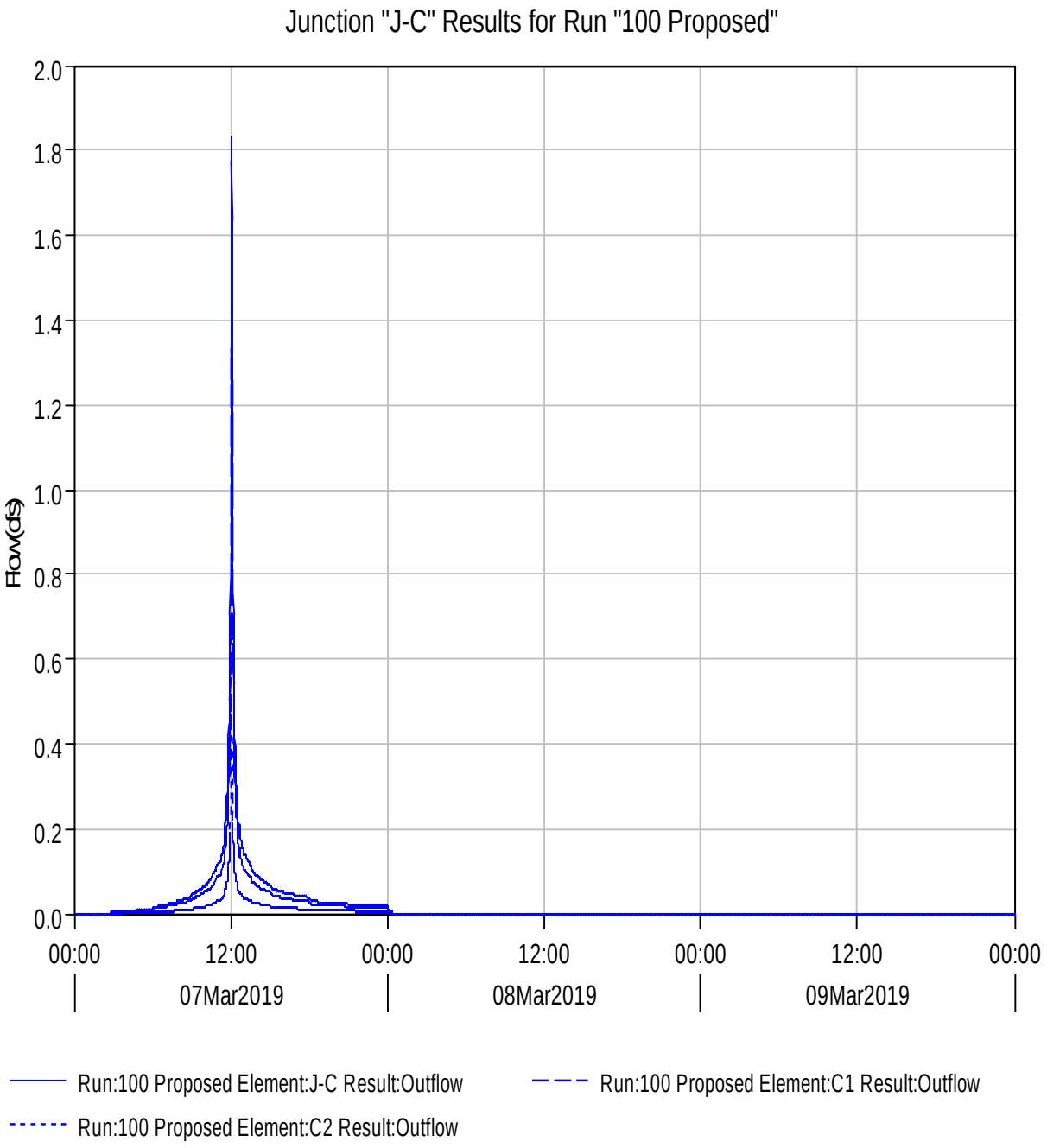
Project: Lee's Summit Simulation Run: 100 Proposed

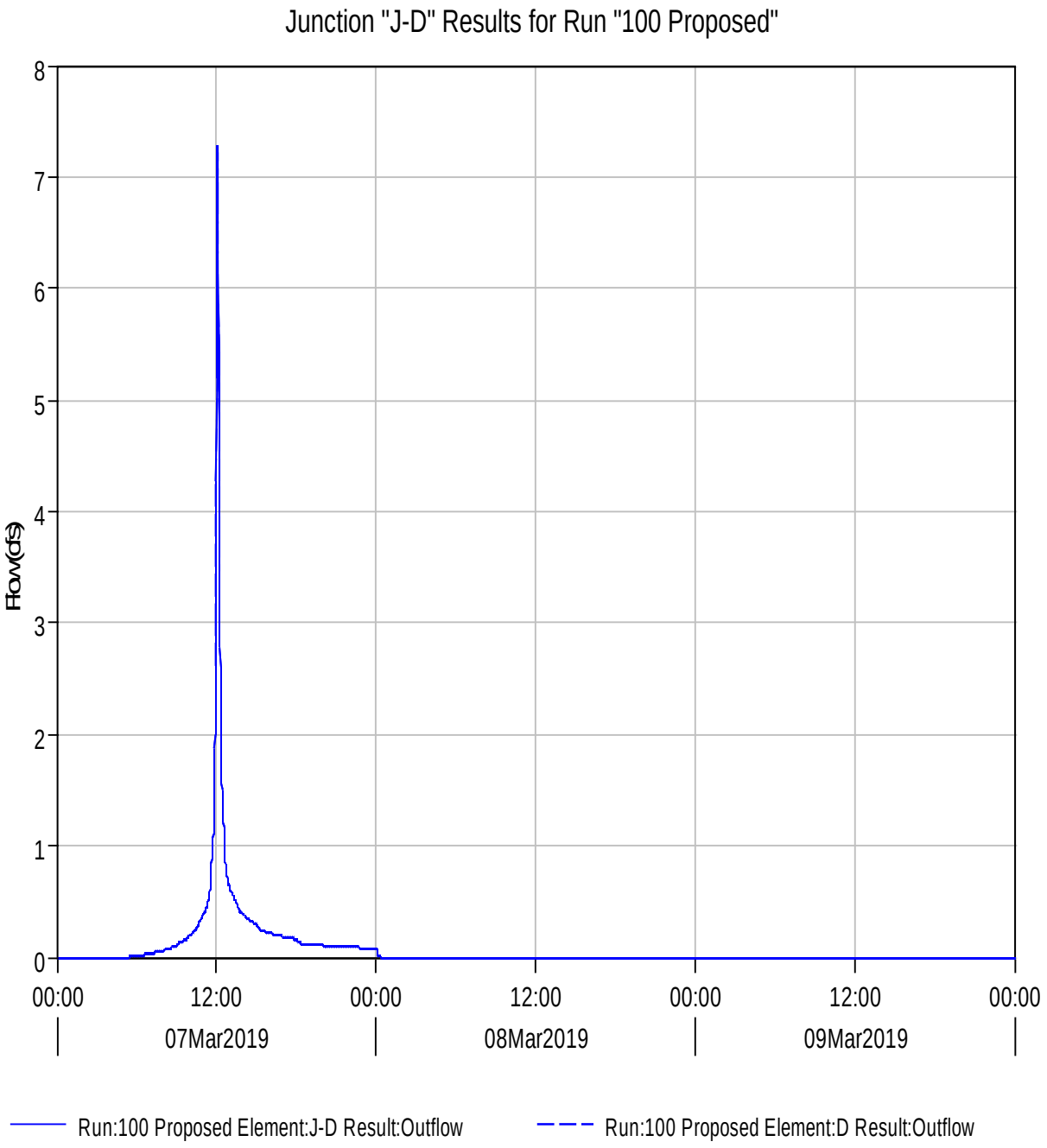
Start of Run: 07Mar2019, 00:00 Basin Model: Proposed
End of Run: 10Mar2019, 00:00 Meteorologic Model: 100-Year
Compute Time: 15Apr2019, 16:59:37 Control Specifications: 72-Hour

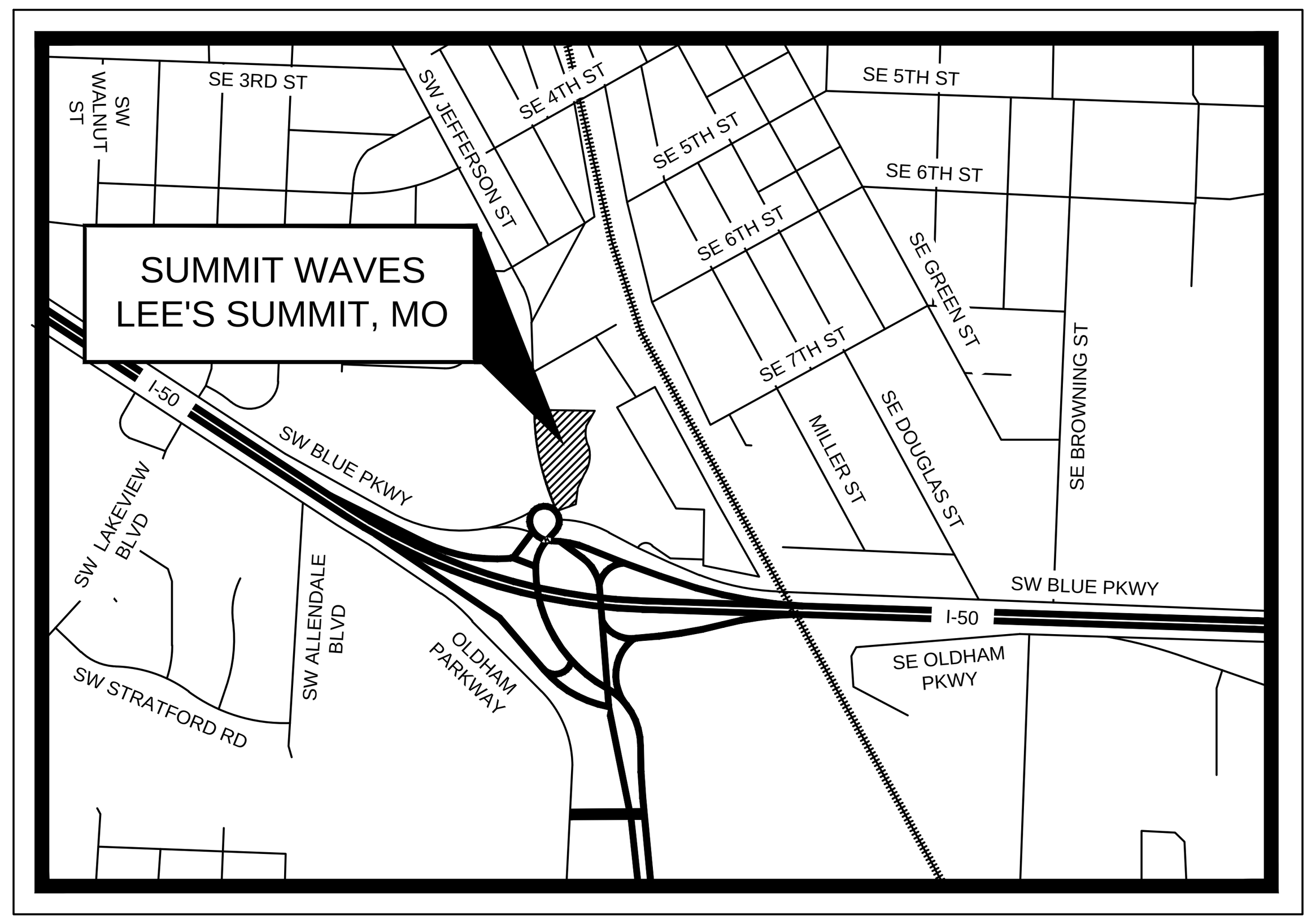
Hydrologic Element	Drainage Area (MI2)	Peak Discharge (CFS)	Time of Peak	Volume (AC-FT)
A5	0.00050	3.3	07Mar2019, 12:05	0.21
A3	0.00038	2.6	07Mar2019, 12:04	0.17
A4	0.00036	2.6	07Mar2019, 12:04	0.17
Pool	0.00034	2.4	07Mar2019, 12:04	0.16
Detention	0.00175	1.6	07Mar2019, 12:31	0.76
A1	0.00134	8.1	07Mar2019, 12:04	0.45
A2	0.00011	0.8	07Mar2019, 12:04	0.05
J-A	0.00320	10.1	07Mar2019, 12:04	1.26
D	0.00138	7.3	07Mar2019, 12:05	0.47
J-D	0.00138	7.3	07Mar2019, 12:05	0.47
C1	0.00022	1.3	07Mar2019, 12:05	0.09
C2	0.00008	0.5	07Mar2019, 12:04	0.03
J-C	0.00030	1.8	07Mar2019, 12:05	0.12
B	0.00020	1.2	07Mar2019, 12:04	0.07
J-B	0.00020	1.2	07Mar2019, 12:04	0.07
A6	0.00017	1.1	07Mar2019, 12:04	0.07


Junction "J-A" Results for Run "100 Proposed"
Flow (cfs)
12
10
8
6
4
2
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Proposed Element:J-A Result:Outflow
Run:100 Proposed Element:Detention Result:Outflow
Run:100 Proposed Element:A1 Result:Outflow
Run:100 Proposed Element:A2 Result:Outflow


Junction "J-B" Results for Run "100 Proposed"
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
Flow(cfs)
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Proposed Element:J-B Result:Outflow
Run:100 Proposed Element:B Result:Outflow


Junction "J-C" Results for Run "100 Proposed"
Flow(cfs)
2.0
1.8
1.6
1.4
1.2
1.0
0.8
0.6
0.4
0.2
0.0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Proposed Element:J-C Result:Outflow
Run:100 Proposed Element:C1 Result:Outflow
Run:100 Proposed Element:C2 Result:Outflow


Junction "J-D" Results for Run "100 Proposed"
Flow(cfs)
8
7
6
5
4
3
2
1
0
00:00
12:00
00:00
12:00
00:00
12:00
00:00
07Mar2019
08Mar2019
09Mar2019
Run:100 Proposed Element:J-D Result:Outflow
Run:100 Proposed Element:D Result:Outflow



LOCATION MAP
NOT TO SCALE

SUMMIT WAVES
WAVE POOL ADDITION

CONSTRUCTION DOCUMENTS
APRIL 2019

FOR

LEE'S SUMMIT PARKS & RECREATION

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(CONTACT: TRENT CRAGIN, PE)

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E-7	WAVE POOL PHOTOMETRICS
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P-2	SCHEDULES & DETAILS - PLUMBING
SWIMMING POOL (COUNSILMAN/HUNSAKER & ASSOCIATES)	
SP-0.0	POOL REFERENCE PLAN
SP-1.0	WAVE POOL PLAN
SP-1.1	WAVE POOL SECTIONS
SP-1.2	WAVE POOL DETAILS
SP-1.3	WAVE POOL DETAILS
SP-2.0	WAVE POOL LOCATION POINT PLAN
SP-3.0	WAVE POOL SUCTION PIPING PLAN
SP-3.1	WAVE POOL RETURN PIPING PLAN
SP-4.0	WAVE POOL MECHANICAL ROOM PLAN
SP-4.1	WAVE POOL MECHANICAL ROOM SECTIONS
SP-4.2	SURGE TANK PLAN & SECTIONS
SP-4.3	MECHANICAL DETAILS
SP-4.4	MECHANICAL DETAILS
SP-4.5	MECHANICAL DETAILS
SP-5.0	POOL SYSTEMS SCHEMATIC

95% REVIEW SET
FOR REVIEW ONLY
Kimley»Horn

SUMMIT WAVES WAVE POOL ADDITION, LEE'S SUMMIT MISSOURI

GENERAL CONSTRUCTION NOTES

1. ALL MATERIAL AND CONSTRUCTION SHALL CONFORM TO THE CITY OF LEE'S SUMMIT MUNICIPAL CODES.

2. THE CONTRACTOR SHALL BE RESPONSIBLE TO FURNISH ALL MATERIAL AND LABOR TO CONSTRUCT THE FACILITY AS SHOWN AND DESCRIBED IN THE CONSTRUCTION DOCUMENTS IN ACCORDANCE WITH THE APPROPRIATE APPROVING AUTHORITIES, SPECIFICATIONS AND REQUIREMENTS.

3. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT THE VARIOUS UTILITY COMPANIES WHICH MAY HAVE UNDERGROUND OR AERIAL UTILITIES WITHIN OR NEAR THE CONSTRUCTION AREA BEFORE COMMENCING WORK. THE CONTRACTOR SHALL PROVIDE 48 HOURS MINIMUM NOTICE TO ALL UTILITY COMPANIES AND THE CITY OF LEE'S SUMMIT PRIOR TO BEGINNING CONSTRUCTION. AN INFORMAL LIST OF UTILITY COMPANIES ARE AS FOLLOWS:

   ELECTRIC - KANSAS CITY POWER AND LIGHT
   PHONE: (816) 701-7800
   GAS - SPIRE ENERGY
   PHONE: (314) 776-9517
   CABLE - COMCAST
   PHONE: 1-866-641-1625
   TELEPHONE - AT&T
   PHONE: (816) 275-2721
   WATER - LEE'S SUMMIT WATER UTILITIES
   PHONE: (816) 969-1900
   SANITARY SEWER - LEE'S SUMMIT WATER UTILITIES
   PHONE: (816) 969-1900

4. IT WILL BE THE RESPONSIBILITY OF THE CONTRACTOR TO PROTECT ALL PUBLIC UTILITIES IN THE CONSTRUCTION OF THIS PROJECT. ALL MANHOLES, CLEANOUTS, VALVE BOXES, FIRE HYDRANTS, ETC., MUST BE ADJUSTED TO PROPER GRADE BY THE CONTRACTOR PRIOR TO AND AFTER PLACING OF PERMANENT PAVING. UTILITIES MUST BE MAINTAINED TO PROPER LINE AND GRADE DURING CONSTRUCTION OF THE PAVING FOR THIS PROJECT.

5. BRACING OF UTILITY POLES MAY BE REQUIRED BY UTILITY COMPANIES WHEN TRENCHING OR EXCAVATION IS IN CLOSE PROXIMITY TO THE POLES. THE COST OF BRACING POLES WILL BE BORNE BY THE CONTRACTOR AND IS INCIDENTAL TO

6. THE LOCATIONS, ELEVATIONS, AND DIMENSIONS OF EXISTING UTILITIES SHOWN ON THE PLANS WERE OBTAINED FROM AVAILABLE UTILITY COMPANY RECORDS AND PLANS AND ARE CONSIDERED APPROXIMATE. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO VERIFY LOCATIONS, ELEVATIONS, AND DIMENSIONS OF ADJACENT AND/OR CONFLICTING UTILITIES SUFFICIENTLY IN ADVANCE OF CONSTRUCTION IN ORDER THAT ADJUSTMENTS CAN BE MADE TO PROVIDE ADEQUATE CLEARANCES. THE CONTRACTOR SHALL PRESERVE AND PROTECT PUBLIC UTILITIES AT ALL TIMES DURING CONSTRUCTION. ANY DAMAGE TO UTILITIES RESULTING FROM CONTRACTOR'S OPERATIONS SHALL BE RESTORED AT CONTRACTOR'S EXPENSE. THE ARCHITECT/ENGINEER SHALL BE IMMEDIATELY NOTIFIED WHEN PROPOSED GRADES CONFLICT WITH EXISTING UTILITIES.

7. THE CONTRACTOR SHALL COORDINATE THE EXACT LOCATION AND DEPTH OF ALL FRANCHISE UTILITY SERVICES AND ANY REQUIRED RELOCATIONS AND/OR EXTENSIONS.

8. THE CONTRACTOR SHALL IMMEDIATELY REPAIR OR REPLACE ANY PHYSICAL DAMAGE TO OWNER'S PROPERTY OR ANY ADJACENT PROPERTIES, INCLUDING, BUT NOT LIMITED TO FENCES, WALLS, PAVEMENT, GRASS, TREES, AND LAWN SPRINKLER AND IRRIGATION SYSTEMS AT NO COST TO THE OWNER, OR OWNER'S AGENTS.

9. THE CONTRACTOR SHALL REMOVE AND DISPOSE ALL SURPLUS MATERIALS, SPOILS, AND DEBRIS OFF SITE. THIS WORK IS INCIDENTAL TO THE CONTRACT.

10. THE CONTRACTOR SHALL BE RESPONSIBLE TO OBTAIN ALL NECESSARY PERMITS AND APPROVALS PRIOR TO CONSTRUCTION.

11. THE CONTRACTOR SHALL HAVE AVAILABLE AT THE JOB SITE AT ALL TIMES ONE COPY OF THE CONTRACT DOCUMENTS INCLUDING PLANS, SPECIFICATIONS, AND SPECIAL CONDITIONS, COPIES OF ANY REQUIRED CONSTRUCTION PERMITS, EROSION CONTROL PLANS, SWPPP AND INSPECTION REPORTS.

12. ANY DISCREPANCIES ON THE DRAWINGS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ARCHITECT/ENGINEER BEFORE COMMENCING WORK. NO FIELD CHANGES OR DEVIATIONS FROM DESIGN ARE TO BE MADE WITHOUT PRIOR APPROVAL OF THE OWNER AND NOTIFICATION TO THE ARCHITECT/ ENGINEER.

13. ALL COPIES OF COMPACTION, CONCRETE AND OTHER REQUIRED TEST RESULTS ARE TO BE SENT TO THE OWNER, ARCHITECT AND ENGINEER. ALLIANCE GEOTECHNICAL GROUP WILL PROVIDE TESTING FOR CONSTRUCTION.

14. ALL NECESSARY INSPECTIONS AND/OR CERTIFICATIONS REQUIRED BY CODES, JURISDICTIONAL AGENCIES AND/OR UTILITY SERVICE COMPANIES SHALL BE PERFORMED PRIOR TO THE FINAL CONNECTION OF SERVICES.

15. CONTRACTOR SHALL VERIFY BENCHMARKS AND DATUMS PRIOR TO COMMENCING CONSTRUCTION OR STAKING OF IMPROVEMENTS. CONTRACTOR SHALL IMMEDIATELY REPORT DISCREPANCIES TO THE ARCHITECT AND ENGINEER.

16. CONTRACTOR SHALL THOROUGHLY CHECK COORDINATION OF CIVIL, LANDSCAPE, MEP, ARCHITECTURAL, AND OTHER PLANS PRIOR TO COMMENCING CONSTRUCTION. OWNER AND ENGINEER SHALL BE NOTIFIED OF ANY DISCREPANCY PRIOR TO COMMENCING WITH CONSTRUCTION.

17. ALL HORIZONTAL DIMENSIONS GIVEN ARE TO BACK OF CURB AND TO PIPE CENTERLINES, UNLESS OTHERWISE NOTED ON PLANS.

18. REFER TO REMOVAL ITEMS SHEET FOR ALL TREE REMOVAL REQUIREMENTS.

19. CONTRACTOR ADJUSTMENTS TO SPOT GRADES TO MAINTAIN POSITIVE DRAINAGE IS ALLOWED WITH THE PRIOR APPROVAL OF THE ARCHITECT / ENGINEER.

20. THE CONTRACTOR SHALL SALVAGE AND PROTECT ALL EXISTING POWER POLES, SIGNS, MANHOLES, TELEPHONE RISERS, WATER VALVES, ETC. DURING ALL CONSTRUCTION PHASES UNLESS NOTED OTHERWISE.

21. CONTRACTOR STAGING AREA TO BE AGREED UPON BY OWNER PRIOR TO CONSTRUCTION.

22. ALL EXISTING CONCRETE PAVING, SIDEWALK, STRUCTURES AND CURBS NOTED FOR DEMOLITION SHALL BE REMOVED IN THEIR ENTIRETY AND DISPOSED OF BY THE CONTRACTOR, OFFSITE UNLESS OTHERWISE DIRECTED BY THE OWNER, ARCHITECT / ENGINEER.

23. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL PROVIDE AS-BUILT PLANS IDENTIFYING ALL DEVIATIONS OR VARIATIONS OF ORIGINAL PLANS.

24. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION. THIS OR ANY OTHER MEANS OF CONTROL SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.

25. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING MEASURES TO MINIMIZE DAMAGE TO TREE LIMBS, TREE TRUNKS, AND TREE ROOTS ALONG THE ROUTE OF THE PROJECT. ALL SUCH MEASURES SHALL BE CONSIDERED AS INCIDENTAL WORK INCLUDED IN THE CONTRACT UNIT PRICE BID FOR APPLICABLE SITE WORK OR STRUCTURE INSTALLATION. WHEN CONSTRUCTION PASSES BY OR CLOSE TO TREES, THE CONTRACTOR SHALL ERECT TEMPORARY CONSTRUCTION FENCE TO LIMIT ACTIVITY OUTSIDE OF THE EASEMENT IN THE TREE AREAS. NO PARKING WILL BE ALLOWED UNDER DRIP LINE OR MINIMUM OF TEN (10) FEET OF ANY TREE TO REMAIN. CONTRACTOR SHALL INSPECT EACH WORK SITE IN ADVANCE AND ARRANGE TO HAVE ANY TREE LIMBS PRUNED THAT MIGHT BE DAMAGED BY EQUIPMENT OPERATIONS. THE OWNER SHALL BE NOTIFIED AT LEAST 24 HOURS PRIOR TO ANY TREE TRIMMING WORK. NOTHING SHALL BE STORED OVER THE TREE ROOT SYSTEM WITHIN THE DRIP LINE AREA OF ANY TREE. THE CONTRACTOR SHALL EMPLOY A QUALIFIED LANDSCAPER FOR ALL THE WORK REQUIRED FOR TREE CARE TO ENSURE UTILIZATION OF THE BEST AGRICULTURAL PRACTICES AND PROCEDURES.

GRADING NOTES

1. ALL PUBLIC WORKS CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE LOCAL DESIGN AND TECHNICAL CONSTRUCTION STANDARDS.

2. CONTRACTOR SHALL FIELD VERIFY HORIZONTAL AND VERTICAL LOCATION OF ALL EXISTING UTILITIES BEFORE CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR PROTECTING EXISTING UTILITIES (SHOWN OR NOT SHOWN) WITHIN SCOPE OF CONSTRUCTION. IF ANY EXISTING UTILITIES ARE DAMAGED, THE CONTRACTOR SHALL REPLACE THEM AT HIS OWN EXPENSE.

3. UPON COMPLETION OF CONSTRUCTION, CONTRACTOR SHALL PROVIDE AS-BUILT PLANS IDENTIFYING ALL DEVIATIONS OR VARIATIONS OF ORIGINAL PLANS.

4. ALL SPOT ELEVATIONS ARE PROPOSED PAVEMENT, OR TOP OF GRADE ELEVATIONS UNLESS OTHERWISE NOTED. TC= TOP OF CURB, EX= EXIST. GRADE, FF= FINISH FLOOR, ME = MATCH EXISTING, TD = TOP OF DRAIN, TW = TOP OF WALL, BW= BOTTOM OF WALL,TS = TOP OF STAIRS

5. THE CONTRACTOR SHALL PROTECT ALL MANHOLE COVERS, VALVE COVERS, VAULT LIDS, FIRE HYDRANTS, POWER POLES, GUY WIRES, AND TELEPHONE BOXES WHICH ARE TO REMAIN IN PLACE AND UNDISTURBED DURING CONSTRUCTION.

6. REFERENCE GEOTECH REPORT AND SPECIFICATIONS PREPARED BY INTERTEK PSI, DATED DECEMBER 14TH, 2018 FOR BUILDING SLAB, POOL, PAVEMENT PREPARATION, COMPACTION, AND ALL EARTHWORK OPERATIONS.

7. THE CONTRACTOR SHALL CLEAR AND GRUB THE SITE AND PLACE, COMPACT, AND MOISTURE CONDITION ALL FILL PER THE GEOTECHNICAL ENGINEER'S SPECIFICATIONS. ANY FILL MATERIAL TO BE USED SHALL BE APPROVED BY THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT.

8. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH. THE AREAS SHALL THEN BE SEEDED, IRRIGATED, AND STABILIZED AS INDICATED IN THE PLANS AND SPECIFICATIONS, AND MAINTAINED UNTIL SOIL IS STABILIZED IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON PRIOR TO FINAL ACCEPTANCE OF THE CONSTRUCTION SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER. ALL EARTHEN AREAS WILL BE STABILIZED AND MULCHED AS SHOWN ON THE LANDSCAPE, GRADING, AND EROSION CONTROL PLANS.

9. ALL CUT OR FILL SLOPES SHALL BE 4:1 OR FLATTER UNLESS OTHERWISE INDICATED.

ACCESSIBILITY NOTES

1. ALL ACCESSIBLE SPACES AND ACCESSIBLE ROUTES SHALL COMPLY WITH THE CITY OF LEE'S SUMMIT AND MISSOURI ACCESSIBILITY STANDARDS AND CITY REQUIREMENTS.

2. PARKING SPACES AND ACCESS AISLES SHALL BE LEVEL WITH SURFACE SLOPES NOT EXCEEDING 1:50 (2%) IN ALL DIRECTIONS.

3. EACH ACCESSIBLE PARKING SPACE SHALL BE DESIGNATED AS RESERVED BY A VERTICALLY MOUNTED OR SUSPENDED SIGN SHOWING THE SYMBOL OF ACCESSIBILITY. VAN ACCESSIBLE SPACES SHALL HAVE AN ADDITIONAL SIGN "VAN-ACCESSIBLE" MOUNTED BELOW THE SYMBOL OF ACCESSIBILITY.

(A) CHARACTERS AND SYMBOLS ON SUCH SIGNS SHALL BE LOCATED 60" (1525 MM) MINIMUM ABOVE THE GROUND, FLOOR, OR PAVING SURFACE SO THEY CANNOT BE OBSCURED BY A VEHICLE PARKED IN THE SPACE.

(B) SIGNS LOCATED WITHIN AN ACCESSIBLE ROUTE SHALL COMPLY WITH THE LATEST STANDARDS.

(C) CHARACTERS AND SYMBOLS ON OVERHEAD SIGNS SHALL COMPLY WITH THE LATEST STANDARDS.

4. SLOPES OF CURB RAMPS SHALL COMPLY WITH 2010 ADA STANDARDS FOR ACCESSIBLE DESIGN. TRANSITIONS FROM RAMPS TO WALKS, GUTTERS, OR STREETS SHALL BE FLUSH AND FREE OF ABRUPT CHANGES. MAXIMUM SLOPES OF ADJOINING GUTTERS, ROAD SURFACE IMMEDIATELY ADJACENT TO THE CURB RAMP, OR ACCESSIBLE ROUTE SHALL NOT EXCEED 1:20.

5. ALL ACCESSIBLE RAMPS, CURB RAMPS, STRIPING, AND PAVEMENT MARKING SHALL CONFORM TO ADA , LATEST EDITION.

6. CURB RAMPS ALONG PUBLIC STREETS AND IN THE PUBLIC RIGHT-OF-WAY SHALL BE CONSTRUCTED BASED ON THE CITY STANDARD CONSTRUCTION DETAIL AND SPECIFICATIONS.

7. PRIVATE CURB RAMPS ON THE SITE (I.E. OUTSIDE PUBLIC STREET RIGHT-OF-WAY) SHALL CONFORM TO ADA AND SHALL HAVE A DETECTABLE WARNING SURFACE THAT IS FULL WIDTH AND FULL DEPTH OF THE CURB RAMP, NOT INCLUDING FLARES.

8. CONTRACTOR SHALL CONSTRUCT PROPOSED PAVEMENT TO MATCH EXISTING PAVEMENT WITH A SMOOTH, FLUSH, CONNECTION.

9. CONTRACTOR SHALL FURNISH AND INSTALL ALL PAVEMENT MARKING FOR FIRE LANES, PARKING STALLS, HANDICAPPED PARKING SYMBOLS, AND MISCELLANEOUS STRIPING WITHIN PARKING LOT AND AROUND BUILDING AS SHOWN ON THE PLANS. ALL PAINTED AND PAVEMENT MARKINGS SHALL ADHERE TO CITY AND OWNER STANDARDS.

10. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY THAT SUITABLE ACCESSIBLE PEDESTRIAN ROUTES (PER ADA, AND FHA) EXIST TO AND FROM EVERY DOOR AND ALONG SIDEWALKS, ACCESSIBLE PARKING SPACES, ACCESS AISLES, AND ACCESSIBLE ROUTES. IN NO CASE SHALL AN ACCESSIBLE RAMP SLOPE EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPE EXCEED 2.0 PERCENT. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPE EXCEED 5.0 PERCENT. ACCESSIBLE PARKING SPACES AND ACCESS AISLES SHALL NOT EXCEED 2.0 PERCENT SLOPE IN ANY DIRECTION.

11. CONTRACTOR SHALL TAKE FIELD SLOPE MEASUREMENTS ON FINISHED SUBGRADE AND FORM BOARDS PRIOR TO PLACING PAVEMENT TO VERIFY THAT ADA SLOPE REQUIREMENTS ARE PROVIDED. CONTRACTOR SHALL CONTACT ENGINEER PRIOR TO PAVING IF ANY EXCESSIVE SLOPES ARE ENCOUNTERED. NO CONTRACTOR CHANGE ORDER WILL BE ACCEPTED FOR ADA SLOPE COMPLIANCE ISSUES.

PAVING AND STRIPING NOTES

1. PAVEMENT DESIGN AND SOIL PREPARATION RECOMMENDATIONS GIVEN IN THE GEOTECHNICAL REPORT PREPARED BY INTERTEK PSI, DATED DECEMBER 14TH, 2018 (REPORT NO. 03381842) SHALL BE ADHERED TO FOR BOTH MATERIALS AND PRACTICE OF INSTALLATION.

2. ALL SIGNS, PAVEMENT MARKINGS, AND OTHER TRAFFIC CONTROL DEVICES SHALL CONFORM TO THE "MISSOURI" MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES" (M.U.T.C.D.) AND CITY STANDARDS.

3. CONTRACTOR SHALL FURNISH ALL PAVEMENT MARKINGS FOR FIRE LANES, ROADWAY LANES, PARKING STALLS, HANDICAPPED PARKING SYMBOLS, ACCESS AISLES, STOP BARS AND SIGNS, AND MISCELLANEOUS STRIPING WITHIN PARKING LOT AS SHOWN ON THE PLANS.

4. ALL JOINTS SHALL EXTEND THROUGH THE CURB.

5. THE MINIMUM LENGTH OF OFFSET JOINTS AT RADIUS POINTS SHALL BE 2 FEET.

6. ALL JOINTS, INCLUDING EXPANSION JOINTS SHALL BE SEALED WITH JOINT SEALANT.

7. THE MATERIALS AND PROPERTIES OF ALL CONCRETE SHALL MEET THE APPLICABLE REQUIREMENTS IN THE A.C.I. (AMERICAN CONCRETE INSTITUTE) MANUAL OF CONCRETE PRACTICE.

8. CONTRACTOR SHALL APPLY A SECOND COATING OVER ALL PAVEMENT MARKINGS PRIOR TO ACCEPTANCE BY OWNER. REFER TO SECTION 02580 IN THE PROJECT MANUAL FOR COMPLETE SPECIFICATION

9. ANY EXISTING PAVEMENT, CURBS AND/OR SIDEWALKS DAMAGED OR REMOVED WILL BE REPAIRED BY THE CONTRACTOR AT HIS EXPENSE TO THE SATISFACTION OF THE OWNER.

10. BEFORE PLACING PAVEMENT, CONTRACTOR SHALL VERIFY THAT SUITABLE HANDICAPPED ROUTES (PER A.D.A.) EXIST TO AND FROM EVERY DOOR. IN NO CASE SHALL HANDICAP RAMP SLOPES EXCEED 1 VERTICAL TO 12 HORIZONTAL. IN NO CASE SHALL SIDEWALK CROSS SLOPES EXCEED 2.0 PERCENT. IN NO CASE SHALL LONGITUDINAL SIDEWALK SLOPES EXCEED 5.0 PERCENT. CONTRACTOR SHALL CONTACT OWNER PRIOR TO PAVING IF ANY EXCESSIVE SLOPES ARE ENCOUNTERED. NO CONTRACTOR CHANGE ORDERS WILL BE ACCEPTED FOR A.D.A. COMPLIANCE ISSUES.

STORM DRAINAGE NOTES

1. ALL STORM SEWER MATERIALS AND CONSTRUCTION SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.

2. THE SITE UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE STORM SEWER.

3. THE CONTRACTOR SHALL FIELD VERIFY THE SIZE, CONDITION, HORIZONTAL, AND VERTICAL LOCATIONS OF ALL EXISTING STORM SEWER FACILITIES THAT ARE TO BE CONNECTED TO, PRIOR TO START OF CONSTRUCTION OF ANY STORM SEWER, AND SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS DISCOVERED.

4. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF CURB INLETS AND GRATE INLETS AND ALL UTILITIES CROSSING THE STORM SEWER.

5. FLOW LINE, TOP-OF-CURB, RIM, THROAT, AND GRATE ELEVATIONS OF PROPOSED INLETS SHALL BE VERIFIED WITH THE GRADING PLAN AND FIELD CONDITIONS PRIOR TO THEIR INSTALLATION.

6. ALL PUBLIC STORM SEWER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO CITY PUBLIC WORKS STANDARD DETAILS AND SPECIFICATIONS. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.

7. ALL PRIVATE STORM SEWER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO THE APPLICABLE PLUMBING CODE. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.

8. ALL PVC TO RCP CONNECTIONS AND ALL STORM PIPE CONNECTIONS ENTERING STRUCTURES OR OTHER STORM PIPES SHALL HAVE A CONCRETE COLLAR AND BE GROUTED TO ASSURE THE CONNECTION IS WATERTIGHT.

9. ALL PUBLIC STORM SEWER LINES SHALL BE MINIMUM CLASS III RCP. PRIVATE STORM SEWER LINES 18-INCHES AND GREATER SHALL BE CLASS III RCP OR OTHER APPROVED MATERIAL.

10. WHERE COVER EXCEEDS 20-FEET OR IS LESS THAN 2-FEET, CLASS IV RCP SHALL BE USED.

11. IF CONTRACTOR PROPOSES TO USE HDPE OR PVC IN LIEU OF RCP FOR PRIVATE STORM SEWER, CONTRACTOR SHALL SUBMIT TECHNICAL DATA TO THE OWNER, ENGINEER AND CITY ENGINEER/INSPECTOR FOR APPROVAL PRIOR TO ORDERING THE MATERIAL. ANY PROPOSED HDPE AND PVC SHALL BE WATERTIGHT.

13. EMBEDMENT FOR ALL STORM SEWER LINES, PUBLIC OR PRIVATE, SHALL BE PER CITY STANDARD DETAILS.

14. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF MISSOURI, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.

15. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.

WATER AND WASTEWATER NOTES

1. ALL WATER AND WASTEWATER MATERIALS AND CONSTRUCTION SHALL COMPLY WITH CITY STANDARD CONSTRUCTION DETAILS AND SPECIFICATIONS.

2. CONTRACTOR SHALL FIELD VERIFY THE SIZE, CONDITION, HORIZONTAL, AND VERTICAL LOCATIONS OF ALL EXISTING WATER AND WASTEWATER FACILITIES THAT ARE TO BE CONNECTED TO, PRIOR TO START OF CONSTRUCTION OF ANY WATER OR WASTEWATER CONSTRUCTION, AND SHALL NOTIFY THE ENGINEER OF ANY CONFLICTS DISCOVERED.

3. CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS SHOWN, INCLUDING THE HORIZONTAL AND VERTICAL LOCATION OF ALL UTILITY SERVICES ENTERING THE BUILDING.

4. THE CONTRACTOR SHALL FIELD VERIFY THE ELEVATION OF ALL UTILITY CROSSINGS PRIOR TO THE INSTALLATION OF ANY PIPE.

5. THE SITE UTILITY CONTRACTOR SHALL PROVIDE ALL MATERIALS AND APPURTENANCES NECESSARY FOR COMPLETE INSTALLATION OF THE WATER AND WASTEWATER IMPROVEMENTS.

6. ALL PUBLIC WATER AND WASTEWATER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO CITY PUBLIC WORKS STANDARD DETAILS AND SPECIFICATIONS. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.

7. ALL PRIVATE WATER AND WASTEWATER CONSTRUCTION, PIPE, STRUCTURES, AND FITTINGS SHALL ADHERE TO THE APPLICABLE PLUMBING CODE. CONTRACTOR SHALL ARRANGE FOR REQUIRED CITY INSPECTIONS.

8. EMBEDMENT FOR ALL WATER AND WASTEWATER LINES, PUBLIC OR PRIVATE, SHALL BE PER CITY STANDARD DETAILS.

9. CONTRACTOR SHALL TAKE REQUIRED SANITARY PRECAUTIONS, FOLLOWING ANY CITY, MDNR, AND AWWA STANDARDS, TO KEEP WATER PIPE AND FITTINGS CLEAN AND CAPPED AT TIMES WHEN INSTALLATION IS NOT IN PROGRESS.

10. ALL WATER AND WASTEWATER SERVICES SHALL TERMINATE 5-FEET OUTSIDE THE BUILDING, UNLESS NOTED OTHERWISE.

11. CONTRACTOR SHALL COMPLY WITH CITY REQUIREMENTS FOR WATER AND WASTEWATER SERVICE DISRUPTIONS AND THE AMOUNT OF PRIOR NOTICE THAT IS REQUIRED, AND SHALL COORDINATE DIRECTLY WITH THE APPROPRIATE CITY DEPARTMENT.

12. CONTRACTOR SHALL SEQUENCE WATER AND WASTEWATER CONSTRUCTION TO AVOID INTERRUPTION OF SERVICE TO SURROUNDING PROPERTIES.

13. CONTRACTOR SHALL MAINTAIN WATER SERVICE AND WASTEWATER SERVICE TO ALL CUSTOMERS THROUGHOUT CONSTRUCTION (IF NECESSARY, BY USE OF TEMPORARY METHODS APPROVED BY THE CITY AND OWNER). THIS WORK SHALL BE CONSIDERED SUBSIDIARY TO THE PROJECT AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.

14. THE CONTRACTOR IS RESPONSIBLE TO PROTECT ALL WATER AND WASTEWATER LINES CROSSING THE PROJECT. THE CONTRACTOR SHALL REPAIR ALL DAMAGED LINES IMMEDIATELY. ALL REPAIRS OF EXISTING WATER MAINS, WATER SERVICES, SEWER MAINS, AND SANITARY SEWER SERVICES ARE SUBSIDIARY TO THE WORK, AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.

15. VALVE ADJUSTMENTS SHALL BE CONSTRUCTED SUCH THAT THE COVERS ARE AT FINISHED SURFACE GRADE OF THE PROPOSED PAVEMENT.

16. THE ENDS OF ALL EXISTING WATER MAINS THAT ARE CUT, BUT NOT REMOVED, SHALL BE PLUGGED AND ABANDONED IN PLACE. THIS WORK SHALL BE CONSIDERED AS A SUBSIDIARY COST TO THE PROJECT AND NO ADDITIONAL COMPENSATION SHALL BE ALLOWED.

17. ALL FIRE HYDRANTS, VALVES, TEES, BENDS, WYES, REDUCERS, FITTINGS, AND ENDS SHALL BE MECHANICALLY RESTRAINED AND/OR THRUST BLOCKED TO CITY STANDARDS.

18. CONTRACTOR SHALL INSTALL A FULL SEGMENT OF WATER OR WASTEWATER PIPE CENTERED AT ALL UTILITY CROSSINGS SO THAT THE JOINTS ARE GREATER THAN 9-FEET FROM THE CROSSING.

19. ALL CROSSINGS AND LOCATIONS WHERE WASTEWATER IS LESS THAN 9-FEET FROM WATER, WASTEWATER CONSTRUCTION AND MATERIALS SHALL COMPLY WITH MDNR STANDARDS.

20. ALL CROSSING AND LOCATIONS WHERE WATER IS LESS THAN 9-FEET FROM WASTEWATER, WATER CONSTRUCTION AND MATERIALS SHALL COMPLY WITH MDNR STANDARDS.

21. ALL WATER AND WASTEWATER SHALL BE TESTED IN ACCORDANCE WITH THE CITY, AWWA, AND MDNR STANDARDS AND SPECIFICATIONS. AT A MINIMUM, THIS SHALL CONSIST OF THE FOLLOWING:
22. ALL WATERLINES SHALL BE HYDROSTATICALLY TESTED AND CHLORINATED BEFORE BEING PLACED INTO SERVICE. CONTRACTOR SHALL COORDINATE WITH THE CITY FOR THEIR REQUIRED PROCEDURES AND SHALL ALSO COMPLY WITH MDNR REGULATIONS.
23. WASTEWATER LINES AND MANHOLES SHALL BE PRESSURE TESTED. CONTRACTOR SHALL COORDINATE WITH THE CITY FOR THEIR REQUIRED PROCEDURES AND SHALL ALSO COMPLY WITH MDNR REGULATIONS. AFTER COMPLETION OF THESE TESTS, A TELEVISION INSPECTION SHALL BE PERFORMED AND PROVIDED TO THE CITY AND OWNER ON A DVD.

24. CONTRACTOR SHALL INSTALL DETECTABLE WIRING OR MARKING TAPE A MINIMUM OF 12” ABOVE WATER AND WASTEWATER LINES. MARKER DECALS SHALL BE LABELED “CAUTION - WATER LINE”, OR “CAUTION - SEWER LINE”. DETECTABLE WIRING AND MARKING TAPE SHALL COMPLY WITH CITY STANDARDS, AND SHALL BE INCLUDED IN THE COST OF THE WATER AND WASTEWATER PIPE.

25. DUCTILE IRON PIPE SHALL BE PROTECTED FROM CORROSION BY A LOW-DENSITY POLYETHYLENE LINER WRAP THAT IS AT LEAST A SINGLE LAYER OF 8-MIL. ALL DUCTILE IRON JOINTS SHALL BE BONDED.

26. WATERLINES SHALL BE INSTALLED AT NO LESS THAN THE MINIMUM COVER REQUIRED BY THE CITY.

27. CONTRACTOR SHALL PROVIDE CLEAN-OUTS FOR PRIVATE SANITARY SEWER LINES AT ALL CHANGES IN DIRECTION AND 100-FOOT INTERVALS, OR AS REQUIRED BY THE APPLICABLE PLUMBING CODE. CLEAN-OUTS REQUIRED IN PAVEMENT OR SIDEWALKS SHALL HAVE CAST IRON COVERS FLUSH WITH FINISHED GRADE.

28. CONTRACTOR SHALL PROVIDE BACKWATER VALVES FOR PLUMBING FIXTURES AS REQUIRED BY THE APPLICABLE PLUMBING CODE (E.G. FLOOR ELEVATION OF FIXTURE UNIT IS BELOW THE ELEVATION OF THE MANHOLE COVER OF THE NEXT UPSTREAM MANHOLE IN THE PUBLIC SEWER). CONTRACTOR SHALL REVIEW BOTH MEP AND CIVIL PLANS TO CONFIRM WHERE THESE ARE REQUIRED.

29. THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND SUBMITTING A TRENCH SAFETY PLAN, PREPARED BY A PROFESSIONAL ENGINEER IN THE STATE OF MISSOURI, TO THE CITY PRIOR TO CONSTRUCTION. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING TRENCH SAFETY REQUIREMENTS IN ACCORDANCE WITH CITY, STATE, AND FEDERAL REQUIREMENTS, INCLUDING OSHA FOR ALL TRENCHES. NO OPEN TRENCHES SHALL BE ALLOWED OVERNIGHT WITHOUT PRIOR WRITTEN APPROVAL OF THE CITY.

30. THE CONTRACTOR SHALL KEEP TRENCHES FREE FROM WATER.

EROSION CONTROL NOTES

1. THE CONTRACTOR SHALL COMPLY WITH ALL LOCAL, STATE, AND FEDERAL EROSION CONTROL AND WATER QUALITY REQUIREMENTS, LAWS, AND ORDINANCES THAT APPLY TO THE CONSTRUCTION SITE LAND DISTURBANCE.

2. EROSION CONTROL DEVICES SHOWN ON THE EROSION CONTROL PLAN FOR THE PROJECT SHALL BE INSTALLED PRIOR TO THE START OF LAND DISTURBANCE.

3. ALL EROSION CONTROL DEVICES ARE TO BE INSTALLED IN ACCORDANCE WITH THE APPROVED PLANS AND SPECIFICATIONS FOR THE PROJECT.

4. CONTRACTOR IS SOLELY RESPONSIBLE FOR INSTALLATION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL EROSION CONTROL DEVICES, BEST MANAGEMENT PRACTICES (BMPS), AND FOR UPDATING THE EROSION CONTROL PLAN DURING CONSTRUCTION AS FIELD CONDITIONS CHANGE.

5. CONTRACTOR SHALL DOCUMENT THE DATES OF INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL FOR EACH BMP EMPLOYED IN THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE.

6. AS STORM SEWER INLETS ARE INSTALLED ON-SITE, TEMPORARY EROSION CONTROL DEVICES SHALL BE INSTALLED AT EACH INLET PER APPROVED DETAILS.

7. THE EROSION CONTROL DEVICES SHALL REMAIN IN PLACE UNTIL THE AREA IT PROTECTS HAS BEEN PERMANENTLY STABILIZED.

8. CONTRACTOR SHALL PROVIDE ADEQUATE EROSION CONTROL DEVICES NEEDED DUE TO PROJECT PHASING.

9. CONTRACTOR SHALL OBSERVE THE EFFECTIVENESS OF THE EROSION CONTROL DEVICES AND MAKE FIELD ADJUSTMENTS AND MODIFICATIONS AS NEEDED TO PREVENT SEDIMENT FROM LEAVING THE SITE. IF THE EROSION CONTROL DEVICES DO NOT EFFECTIVELY CONTROL EROSION AND PREVENT SEDIMENTATION FROM WASHING OFF THE SITE, THEN THE CONTRACTOR SHALL NOTIFY THE ENGINEER.

10. OFF-SITE SOIL BORROW, SPOIL, AND STORAGE AREAS (IF APPLICABLE) ARE CONSIDERED AS PART OF THE PROJECT SITE AND MUST ALSO COMPLY WITH THE EROSION CONTROL REQUIREMENTS FOR THIS PROJECT. THIS INCLUDES THE INSTALLATION OF BMP'S TO CONTROL EROSION AND SEDIMENTATION AND THE ESTABLISHMENT OF PERMANENT GROUND COVER ON DISTURBED AREAS PRIOR TO FINAL APPROVAL OF THE PROJECT. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP AND EROSION CONTROL PLAN TO INCLUDE BMPS FOR ANY OFF-SITE THAT ARE NOT ANTICIPATED OR SHOWN ON THE EROSION CONTROL PLAN.

11. ALL STAGING, STOCKPILES, SPOIL, AND STORAGE SHALL BE LOCATED SUCH THAT THEY WILL NOT ADVERSELY AFFECT STORM WATER QUALITY. PROTECTIVE MEASURES SHALL BE PROVIDED IF NEEDED TO ACCOMPLISH THIS REQUIREMENT, SUCH AS COVERING OR ENCIRCLING THE AREA WITH AN APPROPRIATE BARRIER.

12. CONTRACTORS SHALL INSPECT ALL EROSION CONTROL DEVICES, BMPS, DISTURBED AREAS, AND VEHICLE ENTRY AND EXIT AREAS WEEKLY AND WITHIN 24 HOURS OF ALL RAINFALL EVENTS OF 0.5 INCHES OR GREATER, AND KEEP A RECORD OF THIS INSPECTION IN THE SWPPP BOOKLET IF APPLICABLE, TO VERIFY THAT THE DEVICES AND EROSION CONTROL PLAN ARE FUNCTIONING PROPERLY.

13. CONTRACTOR SHALL CONSTRUCT A STABILIZED CONSTRUCTION ENTRANCE AT ALL PRIMARY POINTS OF ACCESS IN ACCORDANCE WITH CITY SPECIFICATIONS. CONTRACTOR SHALL ENSURE THAT ALL CONSTRUCTION TRAFFIC USES THE STABILIZED ENTRANCE AT ALL TIMES FOR ALL INGRESS/EGRESS.

14. SITE ENTRY AND EXITS SHALL BE MAINTAINED IN A CONDITION THAT WILL PREVENT THE TRACKING AND FLOWING OF SEDIMENT AND DIRT ONTO OFF-SITE ROADWAYS. ALL SEDIMENT AND DIRT FROM THE SITE THAT IS DEPOSITED ONTO AN OFF-SITE ROADWAY SHALL BE REMOVED IMMEDIATELY.

15. THE CONTRACTOR IS RESPONSIBLE FOR REMOVING ALL SILT AND DEBRIS FROM THE AFFECTED OFF-SITE ROADWAYS THAT ARE A RESULT OF THE CONSTRUCTION, AS REQUESTED BY OWNER AND CITY. AT A MINIMUM, THIS SHOULD OCCUR ONCE PER DAY FOR THE OFF-SITE ROADWAYS.

16. WHEN WASHING OF VEHICLES IS REQUIRED TO REMOVE SEDIMENT PRIOR TO EXITING THE SITE, IT SHALL BE DONE IN AN AREA STABILIZED WITH CRUSHED STONE THAT DRAINS INTO AN APPROVED SEDIMENT TRAP BMP.

17. ALL FINES IMPOSED FOR SEDIMENT OR DIRT DISCHARGED FROM THE SITE SHALL BE PAID BY THE RESPONSIBLE CONTRACTOR.

18. WHEN SEDIMENT OR DIRT HAS CLOGGED THE CONSTRUCTION ENTRANCE VOID SPACES BETWEEN STONES OR DIRT IS BEING TRACKED ONTO A ROADWAY, THE AGGREGATE PAD MUST BE WASHED DOWN OR REPLACED. RUNOFF FROM THE WASH-DOWN OPERATION SHALL NOT BE ALLOWED TO DRAIN DIRECTLY OFF SITE WITHOUT FIRST FLOWING THROUGH ANOTHER BMP TO CONTROL SEDIMENTATION. PERIODIC RE-GRADING OR NEW STONE MAY BE REQUIRED TO MAINTAIN THE EFFECTIVENESS OF THE CONSTRUCTION ENTRANCE.

19. TEMPORARY SEEDING OR OTHER APPROVED STABILIZATION SHALL BE INITIATED WITHIN 14 DAYS OF THE LAST DISTURBANCE OF ANY AREA, UNLESS ADDITIONAL CONSTRUCTION IN THE AREA IS EXPECTED WITHIN 21 DAYS OF THE LAST DISTURBANCE.

20. CONTRACTOR SHALL FOLLOW GOOD HOUSEKEEPING PRACTICES DURING CONSTRUCTION, ALWAYS CLEANING UP DIRT, LOOSE MATERIAL, AND TRASH AS CONSTRUCTION PROGRESSES.

21. UPON COMPLETION OF FINE GRADING, ALL SURFACES OF DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED. STABILIZATION IS ACHIEVED WHEN THE AREA IS EITHER COVERED BY PERMANENT IMPERVIOUS STRUCTURES, SUCH AS BUILDINGS, SIDEWALK, PAVEMENT, OR A UNIFORM PERENNIAL VEGETATIVE COVER.

22. AT THE CONCLUSION OF THE PROJECT, ALL INLETS, DRAIN PIPE, CHANNELS, DRAINAGEWAYS AND BORROW DITCHES AFFECTED BY THE CONSTRUCTION SHALL BE DREDGED, AND THE SEDIMENT GENERATED BY THE PROJECT SHALL BE REMOVED AND DISPOSED IN ACCORDANCE WITH APPLICABLE REGULATIONS.

STORM WATER DISCHARGE AUTHORIZATION NOTES

1. CONTRACTOR SHALL COMPLY WITH ALL MDNR AND EPA STORM WATER POLLUTION PREVENTION REQUIREMENTS.

2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE IMPLEMENTATION OF THE STORM WATER POLLUTION PREVENTION PLAN (SWPPP) IF APPLICABLE, INCLUDING POSTING SITE NOTICE, INSPECTIONS, DOCUMENTATION, AND SUBMISSION OF ANY INFORMATION REQUIRED BY THE MDNR AND EPA (E.G. NOI).

3. ALL CONTRACTORS AND SUBCONTRACTORS PROVIDING SERVICES RELATED TO THE SWPPP SHALL SIGN THE REQUIRED CONTRACTOR CERTIFICATION STATEMENT ACKNOWLEDGING THEIR RESPONSIBILITIES AS SPECIFIED IN THE SWPPP.

4. A COPY OF THE SWPPP, INCLUDING NOI, SITE NOTICE, CONTRACTOR CERTIFICATIONS, AND ANY REVISIONS, SHALL BE SUBMITTED TO THE CITY BY THE CONTRACTOR AND SHALL BE RETAINED ON-SITE DURING CONSTRUCTION.

5. A NOTICE OF TERMINATION (NOT) SHALL BE SUBMITTED TO MDNR BY ANY PRIMARY OPERATOR WITHIN 30 DAYS AFTER ALL SOIL DISTURBING ACTIVITIES AT THE SITE HAVE BEEN COMPLETED AND A UNIFORM VEGETATIVE COVER HAS BEEN ESTABLISHED ON ALL UNPAVED AREAS AND AREAS NOT COVERED BY STRUCTURES, A TRANSFER OF OPERATIONAL CONTROL HAS OCCURRED, OR THE OPERATOR HAS OBTAINED ALTERNATIVE AUTHORIZATION UNDER A DIFFERENT PERMIT. A COPY OF THE NOT SHALL BE PROVIDED TO THE OPERATOR OF ANY MS4 RECEIVING DISCHARGE FROM THE SITE.

Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
PHONE: 214-420-5600 FAX: 214-420-5680
WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

95% REVIEW SET
FOR REVIEW ONLY
Not for construction or permit purposes.
Kimley»Horn
P.L.A. MARK HATCHEL
L.A. No. 2011010334 Date APRIL 2019

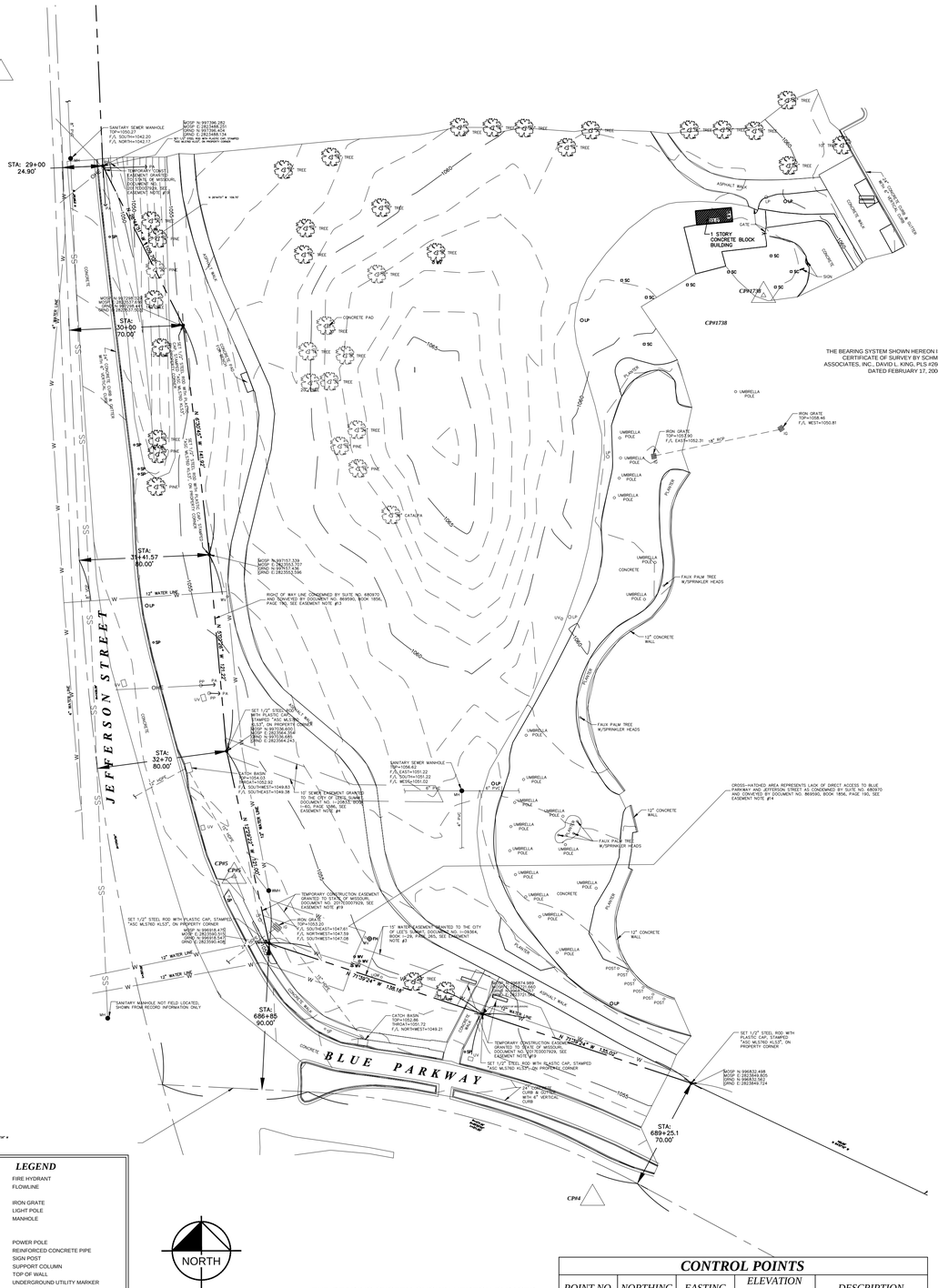
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

GENERAL NOTES

Scale: AS SHOWN
Designed by: ABP
Drawn by: KWS
Checked by: MCH
Date: 04/15/2019
Project No. 064538700

SHEET
L-1

File: K:\DAL_LALP\LAC_LALP\064538700_lees summit\Dwg\Sheet\L-1 GENERAL NOTES.dwg [GENERAL NOTES] 4/15/2019 12:45pm
Xrefs: x24X36 Images:



THE BEARING SYSTEM SHOWN HEREON IS BASED UPON A CERTIFICATE OF SURVEY BY SCHMITZ, KING & ASSOCIATES, INC., DAVID L. KING, PLS #2602, JOB NO. 06003, DATED FEBRUARY 17, 2006.

LEGEND

◎	FH	FIRE HYDRANT
	F/L	FLOWLINE
▦	IG	IRON GRATE
○	LP	LIGHT POLE
●	MH	MANHOLE
○	PP	POWER POLE
	RCP	REINFORCED CONCRETE PIPE
∘	SP	SIGN POST
□	SC	SUPPORT COLUMN
	T/W	TOP OF WALL
∘	UGM	UNDERGROUND UTILITY MARKER
	UV	UTILITY VAULT
●	WMH	WATER MANHOLE
∘	WV	WATER VALVE
——X——		FENCE
——P——		OVERHEAD POWER LINE
——SS——		SANITARY SEWER LINE

THE BEARING SYSTEM SHOWN HEREON IS BASED UPON A CERTIFICATE OF SURVEY BY SCHMITZ, KING & ASSOCIATES, INC., DAVID L. KING, PLS #2602, JOB NO. 06003, DATED FEBRUARY 17, 2006.

CONTROL POINTS

POINT NO.	NORTHING	EASTING	ELEVATION (NAVD88)	DESCRIPTION
3	997456.643	2823425.518	1048.30	3/8" STEEL ROD
4	996762.077	2823789.001	1051.49	MAG NAIL
5	996959.975	2823568.819	1054.63	CUT "+" ON CURB OF SIDEWALK
1738	997316.994	2823894.058	1061.53	60D NAIL

THE ELEVATION OF CONTROL POINT NO.'S 3, 4, & 5 HAVE BEEN OBTAINED VIA RTK GPS METHODS, UTILIZING THE MoDOT GNSS SYSTEM.

THE ELEVATION OF CONTROL POINT NO. 1738 HAS BEEN OBTAINED VIA TRIGONOMETRIC LEVELING.

7&8-47-31
18-11-42374-1
42374dw1_2018-11-14.dwg

1 EXISTING CONDITIONS

SCALE: 1" = 40'

BOUNDARY DETAIL
SCALE" 1"=100'

DESCRIPTION:

A TRACT OF LAND SITUATED IN THE NORTHWEST QUARTER OF SECTION 8, TOWNSHIP 47 NORTH, RANGE 31 WEST AND THE NORTHEAST QUARTER OF SECTION 7, TOWNSHIP 47 NORTH, RANGE 31 WEST OF THE FIFTH PRINCIPAL MERIDIAN IN THE CITY OF LEE'S SUMMIT, JACKSON COUNTY, MISSOURI, SAID TRACT BEING MORE PARTICULARLY DESCRIBED AS FOLLOWS:

(NOTE: THE BEARING SYSTEM IN THE FOLLOWING DESCRIPTION IS BASED ON GRID NORTH, MISSOURI COORDINATE SYSTEM OF 1983).

COMMENCING AT THE SOUTHWEST CORNER OF THE NORTHWEST QUARTER OF SAID SECTION 8; THENCE NORTH 02°21'56" EAST 366.17 FEET, ALONG THE WEST LINE OF THE NORTHWEST QUARTER OF SAID SECTION 8, TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF U.S. HIGHWAY NO. 50, AS NOW ESTABLISHED, SAID POINT ALSO BEING THE "TRUE POINT OF BEGINNING"; THENCE NORTH 71°39'24" WEST 138.18 FEET, ALONG SAID NORTHERLY RIGHT-OF-WAY LINE, TO A POINT ON THE EASTERLY RIGHT-OF-WAY LINE OF JEFFERSON STREET, AS NOW ESTABLISHED; THENCE NORTH 12°29'22" WEST 121.00 FEET ALONG SAID EASTERLY RIGHT-OF-WAY LINE; THENCE NORTH 05°02'26" WEST 121.22 FEET ALONG SAID EASTERLY RIGHT-OF-WAY LINE; THENCE NORTH 06°30'45" WEST 141.92 FEET ALONG SAID EASTERLY RIGHT-OF-WAY LINE; THENCE NORTH 26°44'51" WEST 109.70 FEET ALONG SAID EASTERLY RIGHT-OF-WAY LINE; THENCE NORTH 02°28'20" WEST 203.21 FEET, ALONG SAID EASTERLY RIGHT-OF-WAY LINE, TO A POINT ON THE SOUTHEASTERLY RIGHT-OF-WAY LINE OF 6th STREET, AS NOW ESTABLISHED; THENCE NORTH 61°10'38" EAST 543.92 FEET, ALONG SAID SOUTHEASTERLY RIGHT-OF-WAY LINE, TO A POINT ON THE SOUTHWESTERLY RIGHT-OF-WAY LINE OF THE MISSOURI PACIFIC RAILROAD, AS NOW ESTABLISHED, SAID POINT BEING ON A NON-TANGENT CURVE CONCAVE TO THE NORTHEAST HAVING A RADIUS OF 2,845.06 FEET; THENCE SOUTHEASTERLY 266.02 FEET, ALONG SAID SOUTHWESTERLY RIGHT-OF-WAY LINE AND SAID CURVE TO THE LEFT HAVING A CHORD BEARING SOUTH 25°42'54" EAST 265.93 FEET, TO THE BEGINNING OF A SPIRAL CURVE HAVING A RADIUS OF 2,845.07 FEET; THENCE SOUTHEASTERLY 103.42 FEET, ALONG SAID SOUTHWESTERLY RIGHT-OF-WAY LINE AND SAID SPIRAL CURVE TO THE LEFT HAVING A CHORD BEARING SOUTH 29°05'33" EAST 103.42 FEET, TO A POINT OF TANGENCY; THENCE SOUTH 29°26'40" EAST 1,123.70 FEET, ALONG SAID SOUTHWESTERLY RIGHT-OF-WAY LINE, TO A POINT ON THE NORTHERLY RIGHT-OF-WAY LINE OF SAID U.S. HIGHWAY NO. 50; THENCE NORTH 75°40'11" WEST 491.58 FEET ALONG SAID NORTHERLY RIGHT-OF-WAY LINE; THENCE NORTH 66°40'36" WEST 183.44 FEET ALONG SAID NORTHERLY RIGHT-OF-WAY LINE; THENCE NORTH 64°37'15" WEST 198.66 FEET ALONG SAID NORTHERLY RIGHT-OF-WAY LINE; THENCE NORTH 71°39'24" WEST 135.02 FEET, ALONG SAID NORTHERLY RIGHT-OF-WAY LINE, TO THE "TRUE POINT OF BEGINNING" OF THE TRACT HEREIN DESCRIBED, CONTAINING 762,441 SQUARE FEET OR 17.5032 ACRES, MORE OR LESS. EXCEPT THAT PART LYING IN EXISTING UTILITY EASEMENTS.

THE ABOVE DESCRIPTION HAS BEEN TAKEN FROM A CERTIFICATE OF SURVEY BY SCHMITZ, KING & ASSOCIATES, INC., DAVID L. KING, PLS #2602, JOB NO. 06003, DATED FEBRUARY 17, 2006.

UTILITIES:

THE INFORMATION CONCERNING THE EXISTENCE, LOCATION, SIZE OR TYPE OF MATERIALS OF UNDERGROUND UTILITIES SHOWN HEREON, WHICH ARE NOT VISIBLE FROM THE SURFACE, HAS BEEN COMPILED FROM THE RECORDS OF THE VARIOUS UTILITY COMPANIES OR OTHER SOURCES OF INFORMATION ALONG WITH FIELD LOCATIONS OF PAINTED MARKINGS BY MISSOURI ONE CALL, TICKET NUMBERS 183161667, 183161668, & 183161669. THIS INFORMATION IS NOT TO BE CONSTRUED AS ACCURATE, COMPLETE, NOR EXACT. ANY INFORMATION CONCERNING UNDERGROUND UTILITIES SHOWN HEREON MUST BE CONFIRMED BY THE DESIGN PROFESSIONAL PRIOR TO DESIGNING ANY IMPROVEMENTS WHICH MAY BE AFFECTED BY THIS INFORMATION OR BY THE CONTRACTOR PRIOR TO ANY CONSTRUCTION ACTIVITY.

EASEMENT INFORMATION:

1: THE EASEMENT INFORMATION SHOWN HEREON HAS BEEN TAKEN FROM AN OWNERSHIP AND ENCUMBRANCE REPORT WITH EASEMENTS, ISSUED BY ASSURED QUALITY TITLE COMPANY, REPORT NO. 0E112817, DATED DECEMBER 4, 2018.

2: ITEM NO.'S 5c, 5q, OF THE ABOVE REFERRED TO REPORT ARE NOT SURVEY RELATED ISSUES AND HAVE NOT BEEN ADDRESSED HEREON.

3: ITEM NO. 5a OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT OVER THE SOUTHERLY 15 FEET OF THE PREMISES IN QUESTION, GRANTED TO CITY OF LEE'S SUMMIT, BY THE INSTRUMENT RECORDED AS DOCUMENT NO. I-09364, MORE FULLY DESCRIBED THEREIN," AS SHOWN HEREON.

4: ITEM NO. 5b OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT OVER A PORTION OF THE PREMISES IN QUESTION, GRANTED TO THE CITY OF LEE'S SUMMIT, BY INSTRUMENT RECORDED AS DOCUMENT NO. I-20833 IN BOOK I-60 AT PAGE 1586," AS SHOWN HEREON.

5: ITEM NO. 5d OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT GRANTED TO AQUILA, INC., FORMERLY UTILICORP UNITED, INC. FILED APRIL 16, 2007 AS DOCUMENT NO. 2007E0050059." THIS DOCUMENT DOES NOT APPEAR TO AFFECT THE SURVEYED AREA AND IS NOT SHOWN HEREON.

6: ITEM NO. 5e OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT FOR RIGHT OF WAY AS CONVEYED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD JULY 8, 1926 AS DOCUMENT NO. 216830 IN BOOK 444 AT PAGE 30." THE REAL PROPERTY DESCRIBED WITHIN THIS DOCUMENT APPEARS TO LIE ENTIRELY WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50 AND IS NOT SHOWN HEREON.

7: ITEM NO. 5f OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT FOR RIGHT OF WAY FOR HIGHWAY PURPOSES AS CONVEYED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD APRIL 4, 1934 AS DOCUMENT NO. 330276 IN BOOK 587 AT PAGE 567." THE REAL PROPERTY DESCRIBED WITHIN THIS DOCUMENT APPEARS TO LIE ENTIRELY WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50 AND IS NOT SHOWN HEREON.

8: ITEM NO. 5g OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT FOR RIGHT OF WAY FOR HIGHWAY PURPOSES AS CONVEYED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD MAY 22, 1934 AS DOCUMENT NO. 332491 IN BOOK 599 AT PAGE 114." THE REAL PROPERTY DESCRIBED WITHIN THIS DOCUMENT APPEARS TO LIE ENTIRELY WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50 AND IS NOT SHOWN HEREON.

9: ITEM NO. 5h OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO, "THE INTEREST CONVEYED TO THE STATE OF MISSOURI BY A WARRANTY DEED FILED FOR RECORD MARCH 3, 1938 AS DOCUMENT NO. 397786, RECORDED IN BOOK 628 AT PAGE 494." THIS DOCUMENT DOES NOT APPEAR TO AFFECT THE SURVEYED AREA AND IS NOT SHOWN HEREON.

10: ITEM NO. 5i OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT FOR RIGHT OF WAY FOR HIGHWAY 50 AS CONVEYED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD JUNE 20, 1939 AS DOCUMENT NO. 423582, RECORDED IN BOOK 649 AT PAGE 216." THE REAL PROPERTY DESCRIBED WITHIN THIS DOCUMENT APPEARS TO LIE ENTIRELY WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50 AND IS NOT SHOWN HEREON.

11: ITEM NO. 5j OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT FOR RIGHT OF WAY FOR HIGHWAY 50 AS CONVEYED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD JUNE 20, 1939 AS DOCUMENT NO. 423583 IN BOOK 649 AT PAGE 217." THE REAL PROPERTY DESCRIBED WITHIN THIS DOCUMENT APPEARS TO LIE ENTIRELY WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50 AND IS NOT SHOWN HEREON.

12: ITEM NO. 5k OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT FOR RIGHT OF WAY FOR HIGHWAY 50 AS CONVEYED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD JULY 26, 1940 AS DOCUMENT NO. 447756, RECORDED IN BOOK 61 AT PAGE 159." THE REAL PROPERTY DESCRIBED WITHIN THIS DOCUMENT APPEARS TO LIE ENTIRELY WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50 AND IS NOT SHOWN HEREON.

13: ITEM NO. 5l OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO, "EASEMENTS FOR RIGHTS OF WAY FOR U.S. ROUTE 50, RELOCATION OF ROUTE 71 BY-PASS, ROUTE 71 BY-PASS CONNECTION OF SAID ROUTES, ADDITIONAL RIGHT OF WAY, AND OUTER ROADWAY TO THE STATE OF MISSOURI AS CONDEMNED BY SUITE NO. 680970 AND AS CONVEYED BY AN INSTRUMENT FILED FOR RECORD OCTOBER 17, 1966 AS DOCUMENT NO. 896590," AS SHOWN HEREON.

14: ITEM NO. 5m OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO, "LACK OF DIRECT ACCESS TO HIGHWAYS 50 AND 71 BY-PASS FROM THE PREMISES IN QUESTION, SUCH RIGHT OF ACCESS HAVING BEEN CONDEMNED IN SUIT NO. 680970 AND GRANTED TO THE STATE OF MISSOURI BY AN INSTRUMENT FILED FOR RECORD OCTOBER 17, 1966 AS DOCUMENT NO. 896590. SAID INSTRUMENTS SPECIFY LIMITED ACCESS FROM THE PREMISES IN QUESTION TO AN OUTER ROADWAY," AS SHOWN HEREON.

15: ITEM NO. 5n OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO, "TEMPORARY CONSTRUCTION EASEMENT TO THE STATE OF MISSOURI AS CONVEYED BY AN INSTRUMENT FILED FOR RECORD JANUARY 30, 1967 AS DOCUMENT NO. 901498." THIS DOCUMENT APPEARS TO AFFECT ONLY THOSE EASEMENTS OWNED BY THE CITY OF LEE'S SUMMIT PRIOR TO JANUARY 30, 1967 AND LYING WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50.

16: ITEM NO. 5o OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO, "CITY EASEMENTS AS ALLUDED TO IN AN INSTRUMENT FILED FOR RECORD JANUARY 30, 1967 AS DOCUMENT NO. 901498." ANY EASEMENTS ALLUDED TO IN THIS DOCUMENT WOULD APPEAR TO LIE WITHIN THE CURRENT RIGHT OF WAY FOR U.S. HIGHWAY NO. 50.

17: ITEM NO. 5p OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO, "LACK OF DIRECT ACCESS TO ROUTE 50 FROM TRACT 3 OF THE PREMISES IN QUESTION, SUCH RIGHT HAVING BEEN RESERVED BY THE STATE OF MISSOURI BY INSTRUMENT FILED JUNE 15, 1967 AS DOCUMENT NO. 909567." THIS DOCUMENT DOES NOT APPEAR TO AFFECT THE SURVEYED AREA AND IS NOT SHOWN HEREON.

18: ITEM NO. 5r OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO AN, "EASEMENT GRANTED TO LEE'S SUMMIT REORGANIZED SCHOOL DISTRICT # R-7 FILED FEBRUARY 2, 1999 AS DOCUMENT NO. 1999I0008769." THIS DOCUMENT DOES NOT APPEAR TO AFFECT THE SURVEYED AREA AND IS NOT SHOWN HEREON.

19: ITEM NO. 5s OF THE ABOVE REFERRED TO REPORT STATES THAT THE SURVEYED PROPERTY IS SUBJECT TO A, "TEMPORARY EASEMENT GRANTED TO STATE OF MISSOURI, ACTING BY AND THROUGH THE MISSOURI HIGHWAY AND TRANSPORTATION COMMISSION FILE JANUARY 27, 2017 AS DOCUMENT NO 2017E0007929," AS SHOWN HEREON.

GENERAL NOTES:

1: THIS IS A SURVEY OF A PART SOUTHWESTERN PORTION OF THE ABOVE DESCRIBED PROPERTY.

2: THE ELEVATIONS SHOWN HEREON ARE BASED UPON THE NAVD88 DATUM.

DATE	REVISION	BY

PLAT OF SURVEY

THIS IS TO CERTIFY THAT THIS SURVEY WAS EXECUTED IN ACCORDANCE WITH THE CURRENT STANDARDS FOR PROPERTY BOUNDARY SURVEYS AS ESTABLISHED BY THE MISSOURI BOARD FOR ARCHITECTS, PROFESSIONAL ENGINEERS, PROFESSIONAL LAND SURVEYORS AND LANDSCAPE ARCHITECTS AND MEETS OR EXCEEDS THE ACCURACY STANDARDS OF A CLASS URBAN SURVEY.

DATE: NOVEMBER 14, 2018
FOR: *KIMLEY - HORN*
13455 NOEL ROAD
TWO GALLERIA OFFICE TOWER, SUITE 700
DALLAS, TEXAS 75240
ATTN.: MARK C. HATCHEL, PLA, ASLA

PROJECT LOCATION:

LEE'S SUMMIT
JACKSON COUNTY
MISSOURI

ANDERSON
SURVEY COMPANY
1270 NE DELTA SCHOOL ROAD
LEE'S SUMMIT, MISSOURI 64064
(816) 246-5050
MISSOURI STATE CERTIFICATE OF AUTHORITY, 000076

JAMES S. ANDERSON,
PLS #1726

Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
PHONE: 214-420-5600 FAX: 214-420-5680
WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

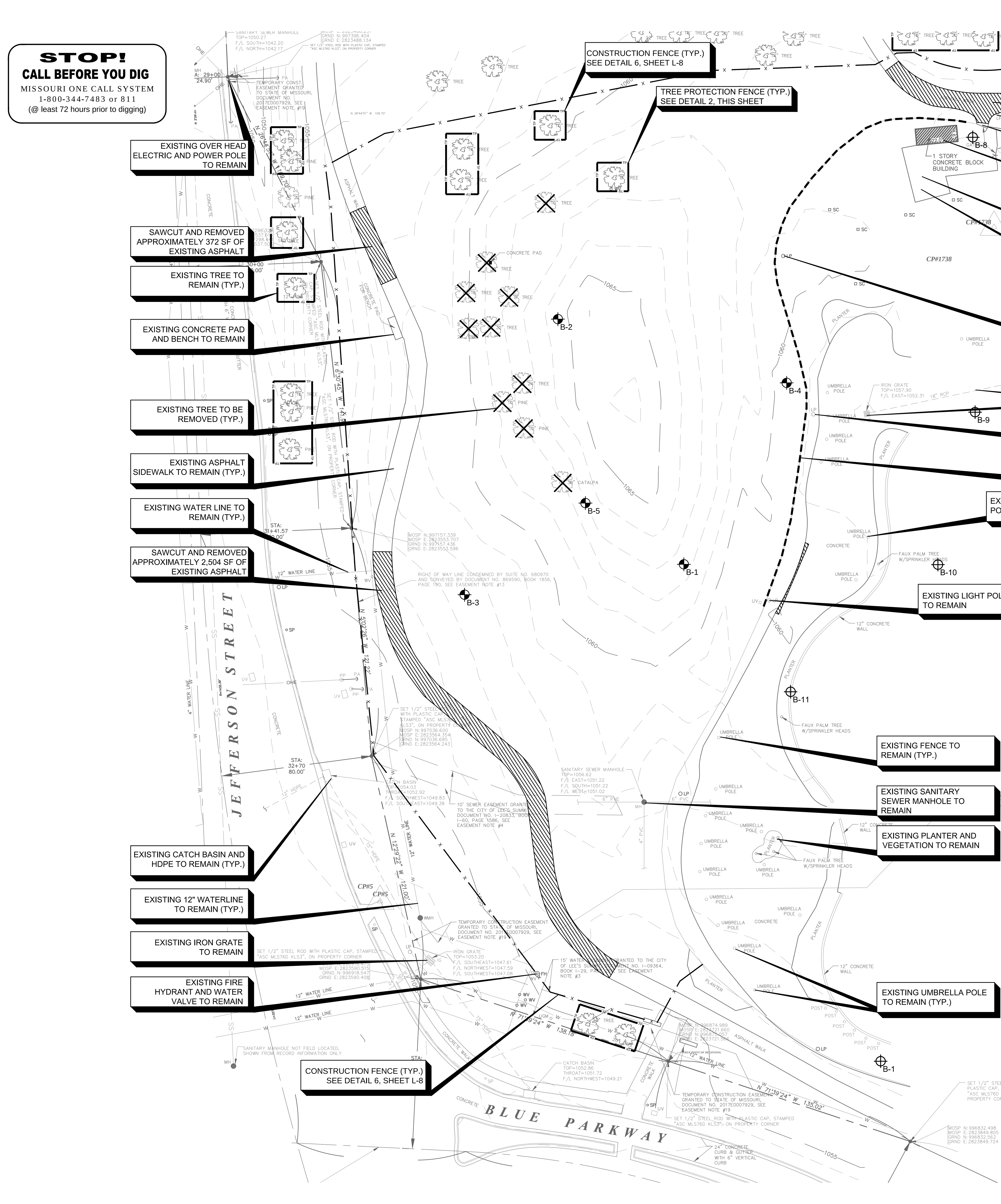
FOR INFORMATION ONLY

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

EXISTING CONDITIONS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-2



1 REMOVAL ITEMS

SCALE: 1" = 30'

UTILITY COMPANY CONTRACTS

NOTE: THE FOLLOWING LIST OF UTILITY COMPANY CONTACTS IS NOT A COMPLETE LIST OF ALL UTILITY COMPANIES WITH FACILITIES IN THE AREA. IT IS SIMPLY A LIST OF THOSE UTILITY COMPANIES THAT KIMLEY-HORN & ASSOCIATES HAS KNOWLEDGE OF. CONTRACTOR IS RESPONSIBLE TO COORDINATE WITH ALL UTILITIES TO BE AFFECTED, NOT JUST THOSE LISTED BELOW.

ELECTRIC - Kansas City Power & Light
PHONE: (816) 701-7800

GAS - Spire
PHONE: (314) 776-9517

WATER - Lee's Summit Water Utilities
PHONE: (816) 969-1900

TELEPHONE - AT&T
PHONE: (816) 275 - 2721

CABLE - Comcast
PHONE: (866) 641 - 1625

SANITARY SEWER - Lee's Summit Water Utilities
PHONE: (816) 969-1900

LEGEND

——1060——	CONTOUR LINE	- - - -	TO BE REMOVED
	EXISTING TREE WITH TREE PROTECTION FENCE TO REMAIN	——x——	CONSTRUCTION FENCE
	EXISTING TREE TO BE REMOVED		ASPHALT PAVING TO BE REMOVED
B-1	2018 GEOTECHNICAL BORE LOCATION		CONCRETE PAVING TO BE REMOVED
		B-1	2007 GEOTECHNICAL BORE LOCATION

REMOVAL NOTES

1. REFER TO ELECTRICAL AND LANDSCAPE PLANS FOR ANY ADDITIONAL REMOVAL ITEMS ASSOCIATED WITH THAT WORK.
2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING THE LOCATION OF ALL EXISTING UTILITIES WITH THE CITY, AND THE VARIOUS UTILITY COMPANIES. ANY UTILITIES WHICH ARE DAMAGED BY THE CONTRACTOR SHALL BE PROMPTLY REPAIRED AT NO ADDITIONAL EXPENSE TO THE OWNER. SHOULD ANY MODIFICATIONS BE REQUIRED, CONTACT THE OWNER IMMEDIATELY, PRIOR TO MAKING THE CHANGE. CALL MISSOURI ONE CALL TO MARK AND LOCATE UTILITIES.
3. THE CONTRACTOR SHALL COORDINATE THE LIMITS OF REMOVAL WORK WITH THE OWNER.
4. ALL REMOVAL ITEM DEBRIS (UNLESS OTHERWISE NOTED) BECOMES THE PROPERTY OF THE CONTRACTOR AND MUST BE REMOVED FROM THE SITE.
5. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REMOVING THE EXISTING PAVING, FENCING, LANDSCAPING AND SAW CUTTING AND REMOVAL OF EXISTING CURBS AND PAVING AS REQUIRED AT TIE-INS.
6. QUANTITIES ARE APPROXIMATE AND PROVIDED ONLY FOR REFERENCE. THE CONTRACTOR IS RESPONSIBLE FOR DETERMINING ALL FINAL QUANTITIES AS REQUIRED TO COMPLETE THE PROJECT AS PER THE PLANS AND SPECIFICATIONS.
7. CONTRACTOR SHALL PROTECT REMAINING EXISTING TREES NOT SHOWN FOR REMOVAL.
8. CONTRACTOR WILL BE RESPONSIBLE FOR ANY UNDERGROUND UTILITY DEMOLITION AND MISCELLANEOUS SAW CUTTING AND TIE-INS AT EXISTING PAVING AND UTILITIES.

BENCHMARK

EXISTING TOPOGRAPHIC AND SITE SURVEY INFORMATION PROVIDED BY ANDERSON SURVEYING COMPANY.

BEARING SYSTEM BASED ON THE MoDOT GNSS SYSTEM VIA RTK GPS METHODS.

BENCHMARK DESCRIPTIONS:

CP 3 - 3/8" STEEL ROD

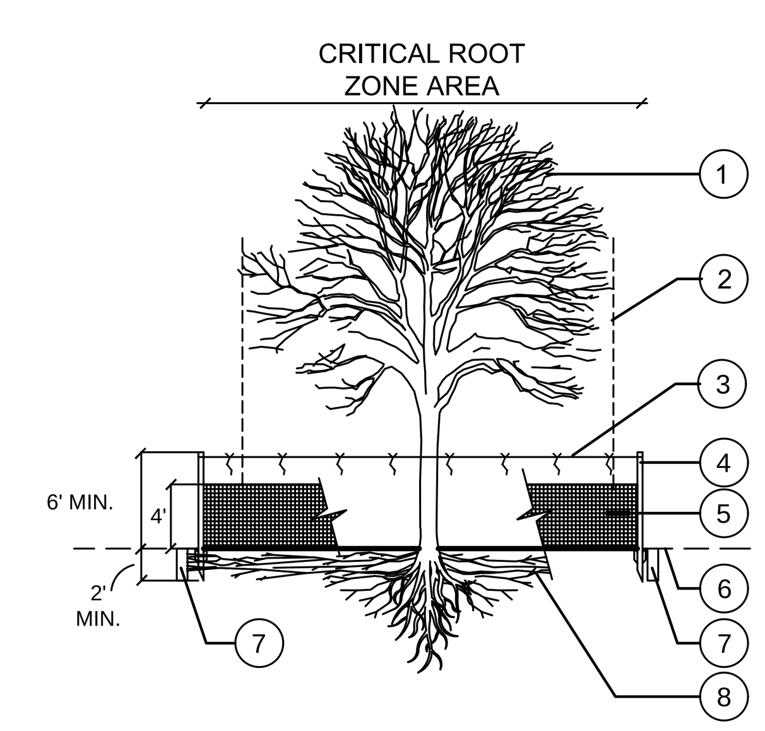
N:997456.643'
E:2823789.001'
ELEV= 1051.49'

CP 5 - "+" ON CURB OF SIDEWALK

N:996959.975'
E:2823568.819'
ELEV= 1054.63'

CP 1738 - 60D NAIL

N:997316.994'
E:2823894.058'
ELEV= 1061.53'
*THE ELEVATION OF CONTROL POINT NO. 1738 HAS BEEN OBTAINED VIA TRIGONOMETRIC LEVELING'



1. EXISTING TREE(S) TO REMAIN.
2. DRIPLINE OF EXISTING TREE (TYP)
3. CONTINUOUS NYLON TIE STRING TIED TO STAKE TOPS W/ 2' TUNDRA WEIGHT ORANGE STREAMERS @ 3' O.C.
4. 8' METAL T-STAKES: 8' O.C. MIN., DRIVEN 2' INTO GROUND AT (OR OUTSIDE) TREE DRIPLINE
5. 4' MIN. HEIGHT ORANGE PLASTIC FENCING INSTALLED PER MANF. RECOMMENDATIONS (TYP). SUPPLEMENT W/ SILT FENCE FABRIC @ PRUNING TRENCH AS REQ'D.
6. EXISTING GRADE TO BE DISTURBED.
7. ROOT PRUNING TRENCH 12" OUTSIDE FENCE - SEE NOTES.
8. EXISTING GRADE TO REMAIN.

NOTES:

1. PERFORM ROOT PRUNING ON ALL EXISTING TREES TO REMAIN WHERE CONSTRUCTION ACTIVITY FALLS WITHIN DRIP LINE OF EXISTING TREES.
2. ROOT PRUNING METHOD: 2 MONTHS MIN. PRIOR TO EXCAVATION & CONSTRUCTION ACTIVITIES, HAND CUT ROOTS BY DIGGING A 18"-24" DEEP x 8" WIDE TRENCH ALONG THE OUTSIDE PERIMETER OF EXISTING TREE(S) ADJACENT TO CONSTRUCTION AREAS. MAXIMIZE PRUNING TRENCH DISTANCE FROM TRUNK TO THE FULLEST EXTENT POSSIBLE, W/ THE ROOT PRUNING LINE PLACED @ THE EDGE OF CONSTRUCTION LIMITS.

2 TREE PROTECTION DETAIL

SCALE: N.T.S

No.	Date	Revisions	App.

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WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

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Kimley»Horn
MARK HATCHEL
APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

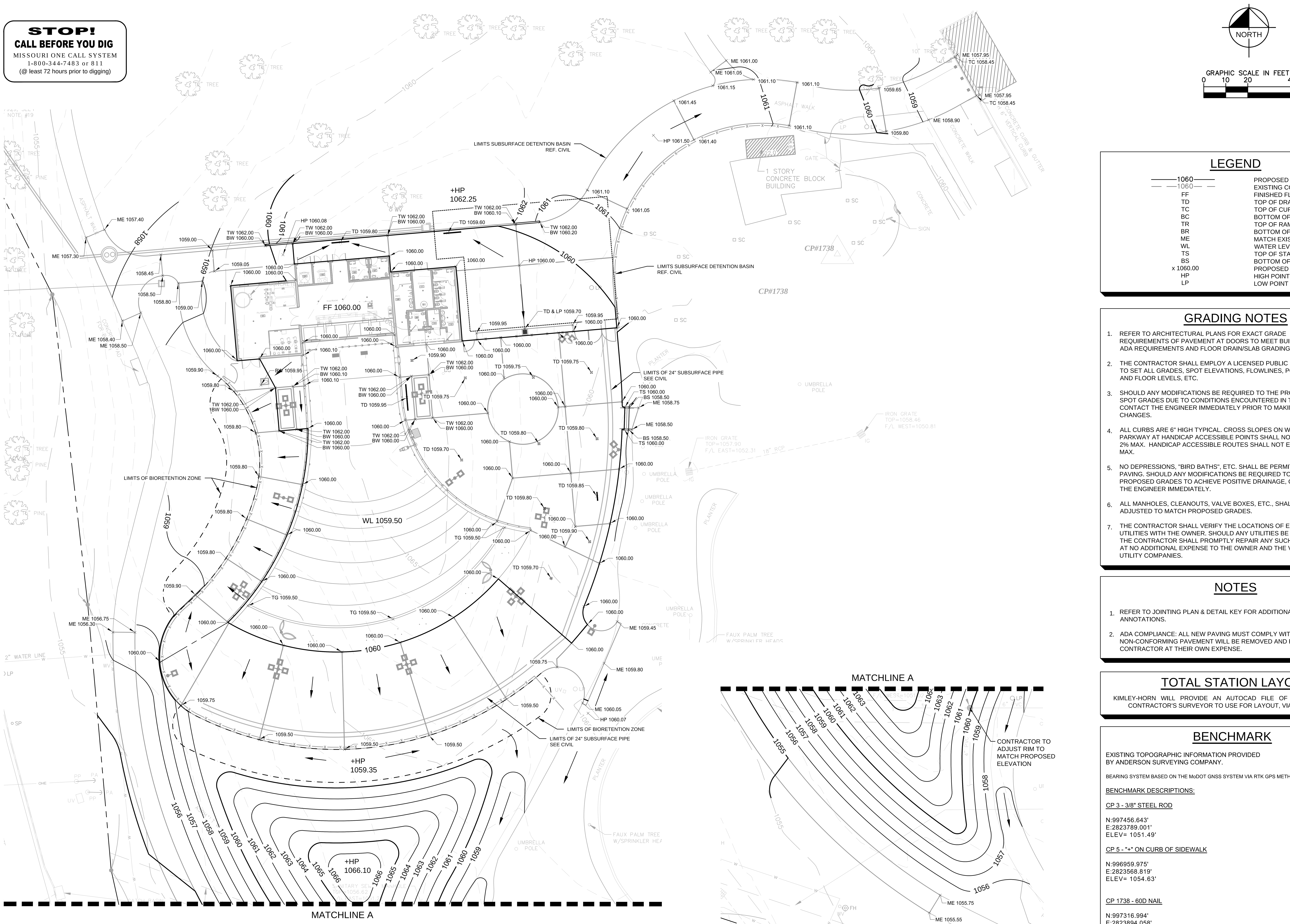
REMOVAL ITEMS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET

L-3

STOP!
CALL BEFORE YOU DIG
MISSOURI ONE CALL SYSTEM
1-800-344-7483 or 811
(@ least 72 hours prior to digging)



1 GRADING PLAN
SCALE: 1" = 20'

LEGEND

——1060——	PROPOSED CONTOUR
— —1060— —	EXISTING CONTOUR
FF	FINISHED FLOOR
TD	TOP OF DRAIN
TC	TOP OF CURB
BC	BOTTOM OF CURB
TR	TOP OF RAMP
BR	BOTTOM OF RAMP
ME	MATCH EXISTING
WL	WATER LEVEL
TS	TOP OF STAIR
BS	BOTTOM OF STAIR
x 1060.00	PROPOSED ELEVATION
HP	HIGH POINT
LP	LOW POINT

GRADING NOTES

1. REFER TO ARCHITECTURAL PLANS FOR EXACT GRADE REQUIREMENTS OF PAVEMENT AT DOORS TO MEET BUILDINGS AND ADA REQUIREMENTS AND FLOOR DRAIN/SLAB GRADING.
2. THE CONTRACTOR SHALL EMPLOY A LICENSED PUBLIC SURVEYOR TO SET ALL GRADES, SPOT ELEVATIONS, FLOWLINES, POOL COPING AND FLOOR LEVELS, ETC.
3. SHOULD ANY MODIFICATIONS BE REQUIRED TO THE PROPOSED SPOT GRADES DUE TO CONDITIONS ENCOUNTERED IN THE FIELD, CONTACT THE ENGINEER IMMEDIATELY PRIOR TO MAKING ANY CHANGES.
4. ALL CURBS ARE 6" HIGH TYPICAL. CROSS SLOPES ON WALKS AND PARKWAY AT HANDICAP ACCESSIBLE POINTS SHALL NOT EXCEED 2% MAX. HANDICAP ACCESSIBLE ROUTES SHALL NOT EXCEED 5% MAX.
5. NO DEPRESSIONS, "BIRD BATHS", ETC. SHALL BE PERMITTED IN THE PAVING. SHOULD ANY MODIFICATIONS BE REQUIRED TO THE PROPOSED GRADES TO ACHIEVE POSITIVE DRAINAGE, CONTACT THE ENGINEER IMMEDIATELY.
6. ALL MANHOLES, CLEANOUTS, VALVE BOXES, ETC., SHALL BE ADJUSTED TO MATCH PROPOSED GRADES.
7. THE CONTRACTOR SHALL VERIFY THE LOCATIONS OF EXISTING UTILITIES WITH THE OWNER. SHOULD ANY UTILITIES BE DAMAGED, THE CONTRACTOR SHALL PROMPTLY REPAIR ANY SUCH DAMAGE AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE VARIOUS UTILITY COMPANIES.

NOTES

1. REFER TO JOINTING PLAN & DETAIL KEY FOR ADDITIONAL SITE PLAN ANNOTATIONS.
2. ADA COMPLIANCE: ALL NEW PAVING MUST COMPLY WITH ADA. NON-CONFORMING PAVEMENT WILL BE REMOVED AND REPLACED BY CONTRACTOR AT THEIR OWN EXPENSE.

TOTAL STATION LAYOUT

KIMLEY-HORN WILL PROVIDE AN AUTOCAD FILE OF THIS PLAN TO THE CONTRACTOR'S SURVEYOR TO USE FOR LAYOUT, VIA TOTAL STATION.

BENCHMARK

EXISTING TOPOGRAPHIC INFORMATION PROVIDED BY ANDERSON SURVEYING COMPANY.

BEARING SYSTEM BASED ON THE MoDOT GNSS SYSTEM VIA RTK GPS METHODS.

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Kimley»Horn
MARK HATCHEL
P.L.A. 2011015334 Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

GRADING PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-4

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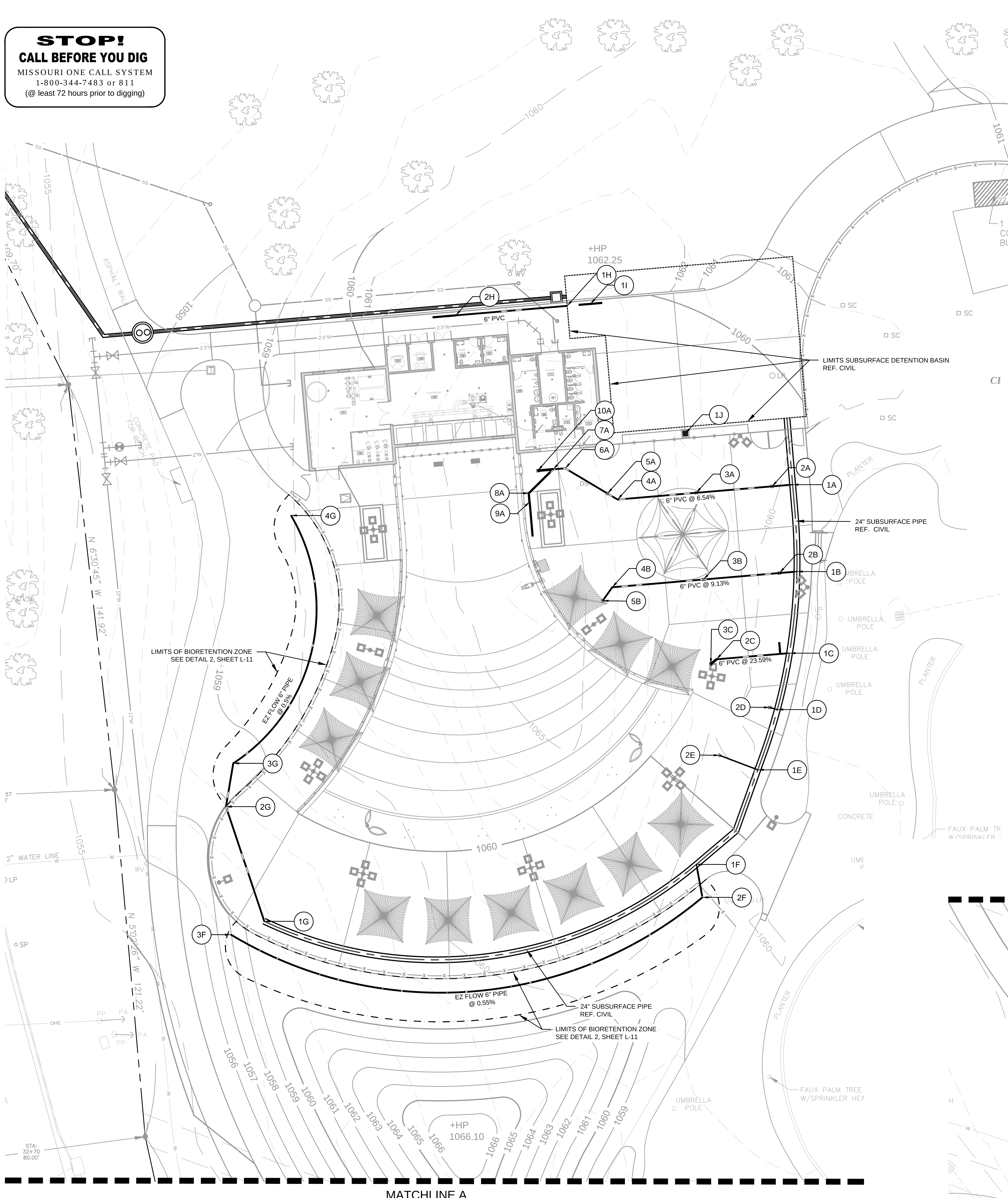
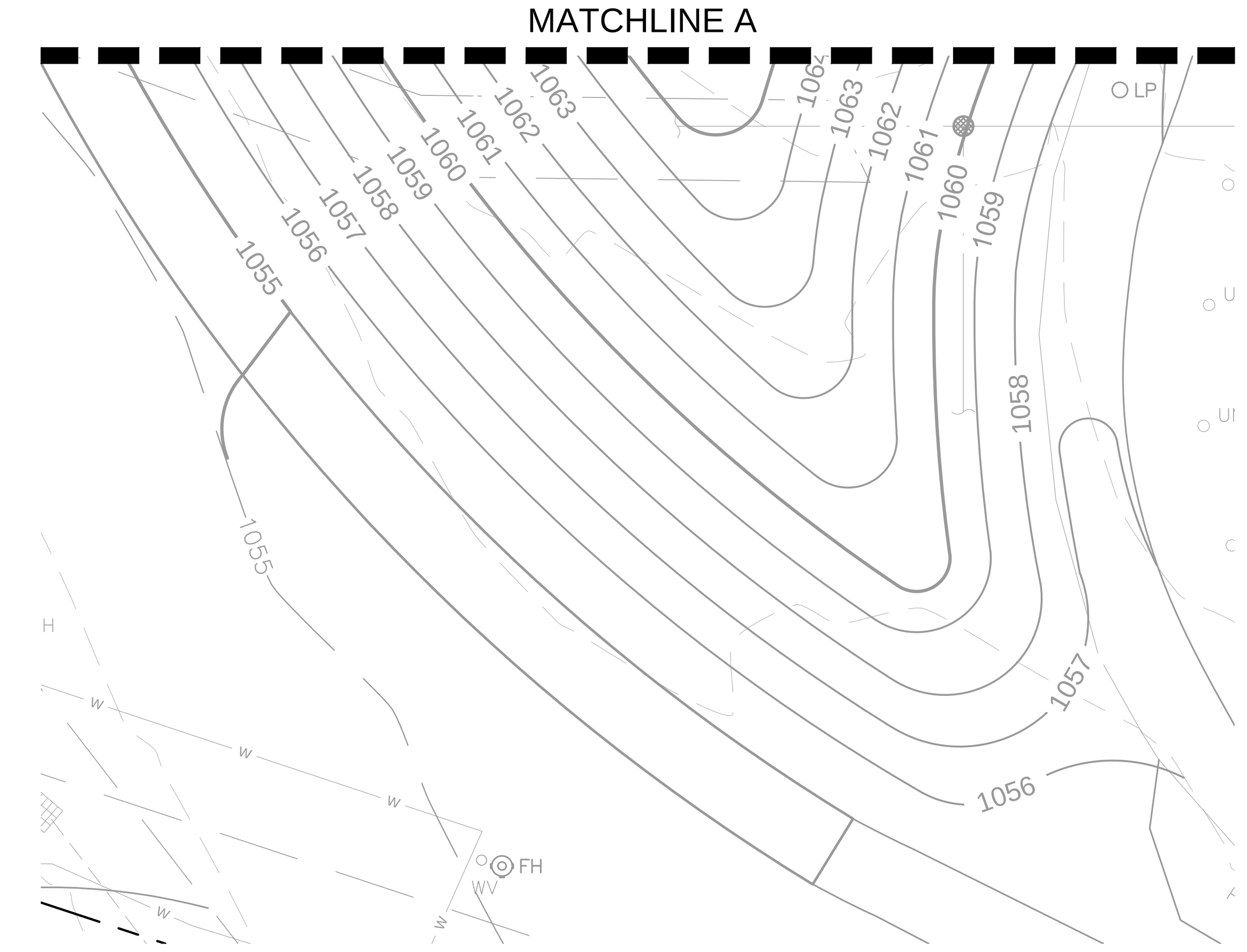
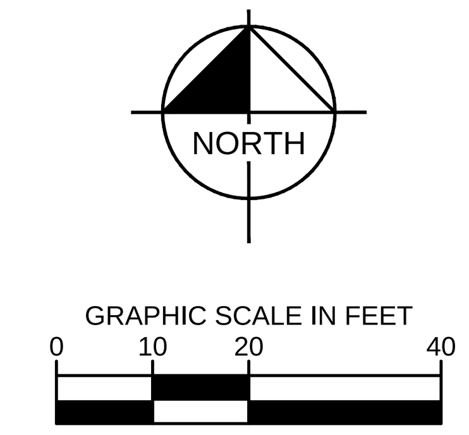


DECK DRAINAGE CALLOUTS						
NO	STATION	LINE	INSTALL	TOP ELEV.	FLOW LINE	FLOW LINE
LINE A						
1A	0+00.00	A	CONNECT TO SUBSURFACE DETENTION		6" = 1051.77	
2A	0+07.17	A	12" DECK DRAIN	1059.75	6" = 1052.24	
3A	0+33.66	A	12" DECK DRAIN	1059.75	6" = 1053.97	
4A	0+61.13	A	6"X6" 30° BEND		6" = 1055.77	
5A	0+65.21	A	12" DECK DRAIN	1059.75	6" = 1056.03	
6A	0+82.33	A	6"X6" 30° WYE		6" = 1057.16	
7A	0+86.55	A	6"X6" 30° WYE		6" = 1057.43	
8A	0+98.39	A	6"X6" 30° BEND		6" = 1058.20	
9A	1+01.35	A	144" TRENCH DRAIN	1059.90	6" = 1058.40	
10A	0+05.40	LAT-A1	12" DECK DRAIN	1059.90	6" = 1058.40	
LINE B						
1B	0+00.00	B	CONNECT TO SUBSURFACE DETENTION		6" = 1051.92	
2B	0+04.57	B	12" DECK DRAIN	1059.85	6" = 1052.33	
3B	0+31.06	B	12" DECK DRAIN	1059.80	6" = 1054.75	
4B	0+62.96	B	6"X6" 30° BEND		6" = 1057.66	
5B	0+68.72	B	12" DECK DRAIN	1059.70	6" = 1058.20	
LINE C						
1C	0+00.00	C	48" TRENCH DRAIN & CONNECT TO SUBSURFACE DETENTION	1059.85	6" = 1052.06	
2C	0+23.88	C	6"X6" 30° BEND		6" = 1057.69	
3C	0+26.45	C	12" DECK DRAIN	1059.80	6" = 1058.30	
LINE D						
1D	0+00.00	D	CONNECT TO SUBSURFACE DETENTION		6" = 1052.16	
2D	0+02.00	D	12" DECK DRAIN	1059.90	6" = 1058.40	
LINE E						
1E	0+00.00	E	CONNECT TO SUBSURFACE DETENTION		6" = 1052.27	
2E	0+13.55	E	12" DECK DRAIN	1059.70	6" = 1058.20	
LINE F						
1F	0+00.00	F	CONNECT TO SUBSURFACE DETENTION		6" = 1052.22	
2F	0+12.50	F	END OF EZ FLOW 6" PIPE & 6"X6" 30° BEND		6" = 1052.23	
3F	1+87.86	F	START OF EZ FLOW 6" PIPE		6" = 1053.25	
LINE G						
1G	0+00.00	G	CONNECT TO SUBSURFACE DETENTION		6" = 1053.02	
2G	0+41.98	G	6"X6" 45° BEND		6" = 1053.25	
3G	0+58.14	G	END OF EZ FLOW 6" PIPE & 6"X6" 45° BEND		6" = 1053.35	
4G	1+55.07	G	START OF EZ FLOW 6" PIPE		6" = 1053.89	
LINE H						
1H	0+00.00	H	CONNECT TO SUBSURFACE DETENTION		REF. CVIL	
2H	0+35.88	H	96" TRENCH DRAIN	1059.80	6" = 1058.30	
LINE I						
1I	0+00.00	I	96" TRENCH DRAIN & CONNECT TO SUBSURFACE DETENTION	1059.60	REF. CVIL	
LINE J						
1J	0+00.00	J	24" LANDSCAPE DRAIN & CONNECT TO SUBSURFACE DETENTION	1059.70	REF. CVIL	

MATCHLINE A





LEGEND:

- PROPOSED DECK DRAIN LINE PVC AS INDICATED ON PLANS
- PROPOSED 12" DECK DRAIN DRAIN SEE DET. 4, SHEET L-7
- PROPOSED 24" LANDSCAPE DRAIN SEE DET. 1, SHEET L-9
- PROPOSED TRENCH DRAIN SEE DET. 5, SHEET L-7
- PROPOSED EZ FLOW 1001F WITH 6" ASTM F-405 PERFORATED PIPE
- PROPOSED 24" SUBSURFACE PIPE & DETENTION SEE CIVIL
- PROPOSED BIORETENTION ZONE SEE DET. 2, SHEET L-11

NOTES:

1. ALL EXISTING AND PROPOSED MANHOLE RIMS AND VALVE STACKS TO BE ADJUSTED TO FINAL PAVING GRADE.
2. CONTRACTOR SHALL STAKE OUT CURB LINE TO ENSURE NO SANITARY SEWER OR STORM SEWER MANHOLE OR WATER VALVES FALL ON A CURB.
3. CONTRACTOR SHALL COMPLETE ALL FILL OPERATIONS PRIOR TO INSTALLING ANY UTILITIES (I.E., WATER, SEWER, STORM WATER). AFTER FILL OPERATIONS ARE COMPLETED, THE CONTRACTOR SHALL EXCAVATE THE UTILITY TRENCH, INSTALL UTILITIES, COMPACT THE TRENCH AND ENSURE ALL PUBLIC WORKS INSPECTIONS ARE PROPERLY PERFORMED.
4. 24" SUBSURFACE PIPE AND DETENTION ZONE SHOWN SCHEMATICALLY. REFERENCE CIVIL FOR FULL DESIGN AND DETAILS.

TOTAL STATION LAYOUT

KIMLEY-HORN WILL PROVIDE AN AUTOCAD FILE OF THIS PLAN TO THE CONTRACTOR'S SURVEYOR TO USE FOR LAYOUT, VIA TOTAL STATION.

BENCHMARK

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BEARING SYSTEM BASED ON THE MoDOT GNSS SYSTEM VIA RTK GPS METHODS.

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1 DECK DRAINAGE PLAN
SCALE: 1" = 20'

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Kimley»Horn
P.L.A. MARK HATCHEL
L.A. No. 2011010334 Date APRIL 2019

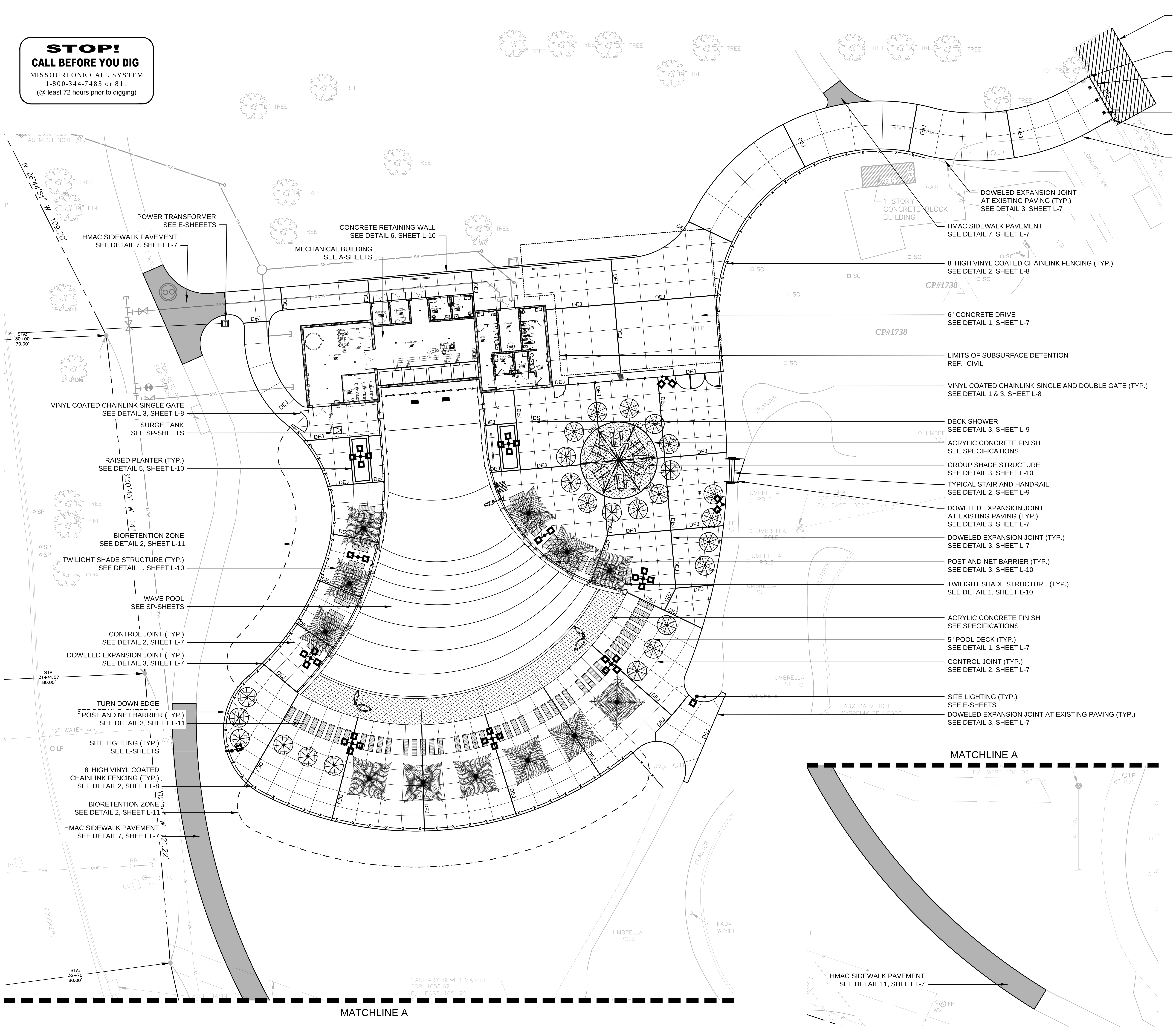
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

DECK DRAINAGE PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-5

File: K:\DAL_LALP\LAC_LALP\064538700_lees summit\Dwg\Sheet\L-5 DECK DRAINAGE PLAN.dwg [DECK DRAINAGE PLAN] 4/15/2019 11:18am
Xrefs: x24X36 xgrad xsite xsurvey xstorm xpond xutil Images:



NORTH

GRAPHIC SCALE IN FEET
0 10 20 40

1 JOINTING PLAN & DETAIL KEY

SCALE: 1" = 20'

SITE FURNISHINGS

BY OWNER

SYMBOL	DESCRIPTION	QTY	SYMBOL	DESCRIPTION	QTY
	GROSFILLEX LOUNGE CHAIR "SUNSET" (COLOR: PLATINUM GRAY) OR APPROVED EQUAL	75		9' GROSFILLEX UMBRELLA & BASE MODEL #98819431	25
	PICNIC TABLE BY WABASH VALLEY, MODE:L P-SY110	43		RECTANGULAR PICNIC TABLE BY WABASH VALLEY MODEL: P-SY150 (COLOR: GRAY)	5
	ADA PICNIC TABLE BY WABASH VALLEY, MODEL: P-SY111	6		ADA RECTANGULAR PICNIC TABLE BY WABASH VALLEY MODEL: P-SY151 (COLOR: GRAY)	1

LEGEND

SYMBOL	DESCRIPTION
D.E.J.	DOWELED EXPANSION JOINT DETAIL 3, SHEET L-7
	SAWED CONTROL JOINT DETAIL 2, SHEET L-7
	5" CONCRETE POOL DECK DETAIL 1, SHEET L-7
—x—x—x—	VINYL COATED CHAIN LINK FENCE DETAIL 2, SHEET L-8
	CONCRETE DRIVE AND CURB AND GUTTER SEE DETAIL 10, SHEET L-7
	4" CONCRETE SIDEWALK DETAIL 9, SHEET L-7
	HMAC SIDEWALK DETAIL 7, SHEET L-7
	PROPOSED EZ FLOW 1001F WITH 6" ASTM F-405 PERFORATED PIPE
	PROPOSED 24" SUBSURFACE PIPE & DETENTION SEE CIVIL
	PROPOSED BIORETENTION ZONE SEE DET. 2, SHEET L-11
	PROPOSED POST AND NET BARRIER SEE DETAIL3, SHEET L-11

NOTES

1. PROVIDE DOWELED EXPANSION JOINTS WITH SEALER ADJACENT WHERE PAVING ABUTS BUILDINGS.
2. EXPANSION JOINTS AND SAWCUTS SHALL BE CONTINUOUS THROUGH ADJACENT CURBS. (TYP.)
3. ALL QUANTITIES ARE APPROXIMATE, CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES AND PROVIDING SUFFICIENT MATERIALS TO ACHIEVE THE DESIGN LAYOUT FOR ALL ELEMENTS AS SHOWN.
4. SHADE STRUCTURE WITH ENGINEER SEALS TO BE SUBMITTED BY GENERAL CONTRACTOR FOR SEPARATE PERMIT.

PROJECT DATA

5" CONCRETE POOL DECK	±20,839 SF
6" CONCRETE DRIVE	±8,193 SF
4" CONCRETE SIDEWALK	±230 SF
1 1/2"" HMAC SIDEWALK PAVEMENT	±3,287 SF
8' VINYL CHAIN LINK FENCE	±560 LF
WAVE POOL	±7,955 SF

TOTAL STATION LAYOUT

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JOINTING PLAN & DETAIL KEY

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
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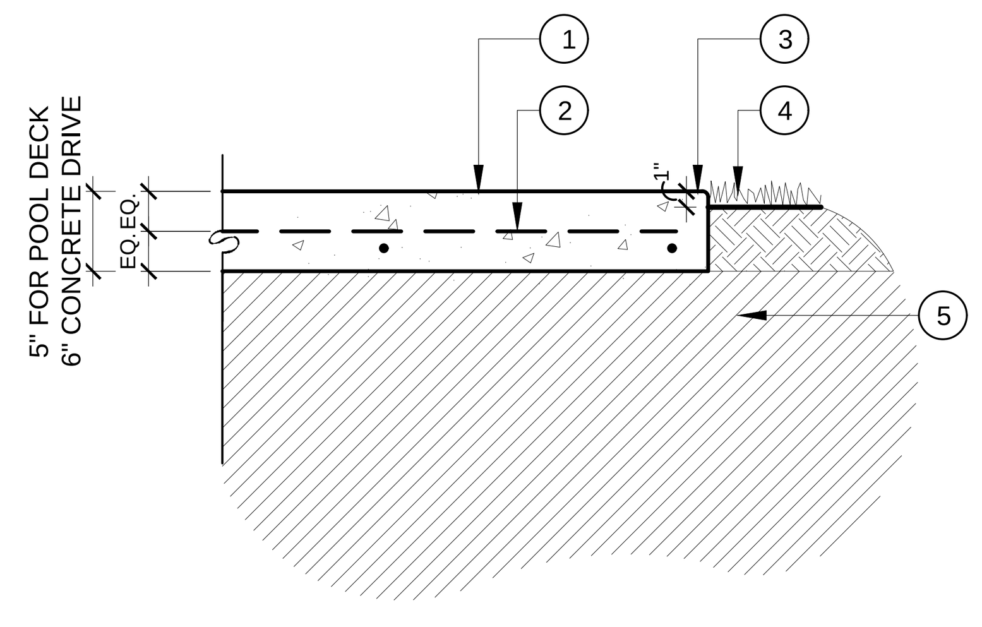
Date:	04/15/2019
Project No.	064538700

SHEET

L-6

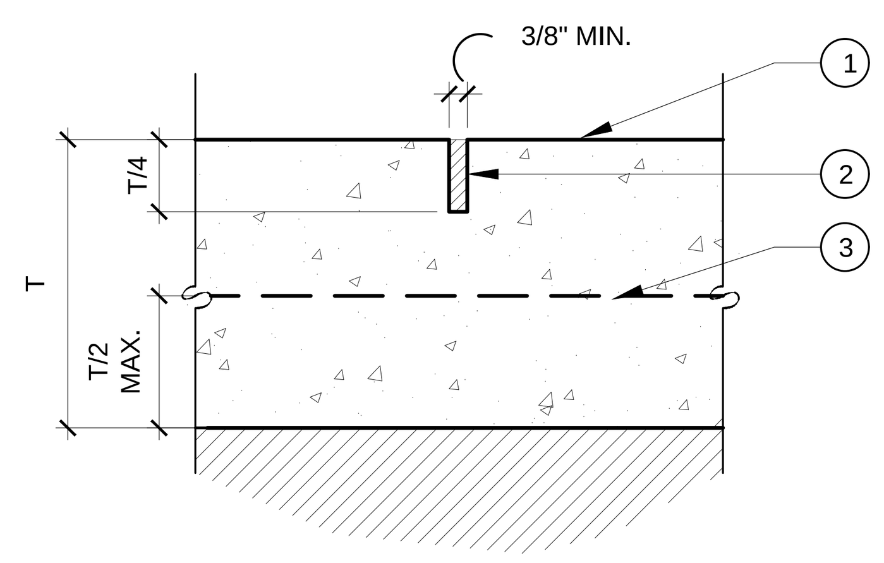


1. SLAB FINISH: SLIP RESISTANT DRY BRUSH FINISH. PROVIDE 4'x4' SAMPLE FOR APPROVAL BY ARCHITECT/ ENGINEER FOR DRY BRUSH CONCRETE PAVING
2. #3 REBAR @ 18" O.C. BOTH WAYS, 2" MIN. CLEAR TO SLAB SURFACE AND SIDES
3. 1/2" RADIUS SMOOTH TROWELED EDGE (TYPICAL)
4. FINISH SODDED, OR MULCHED BED GRADE @ 1" BELOW PAVEMENT
5. SUBGRADE PER GEOTECHNICAL REPORT RECOMMENDATIONS

NOTES:
1. REFER TO PLAN (SHEET L-6) FOR EXPANSION & SAW JOINT LOCATIONS.
2. REFER TO GEOTECHNICAL INVESTIGATION COMPLETED BY INTERTEK-PSI REPORT NO. 03381842, DATED DECEMBER 14, 2018.

1 CONCRETE PAVING (POOL DECK AND DRIVE)

SCALE: 1"=1'-0"

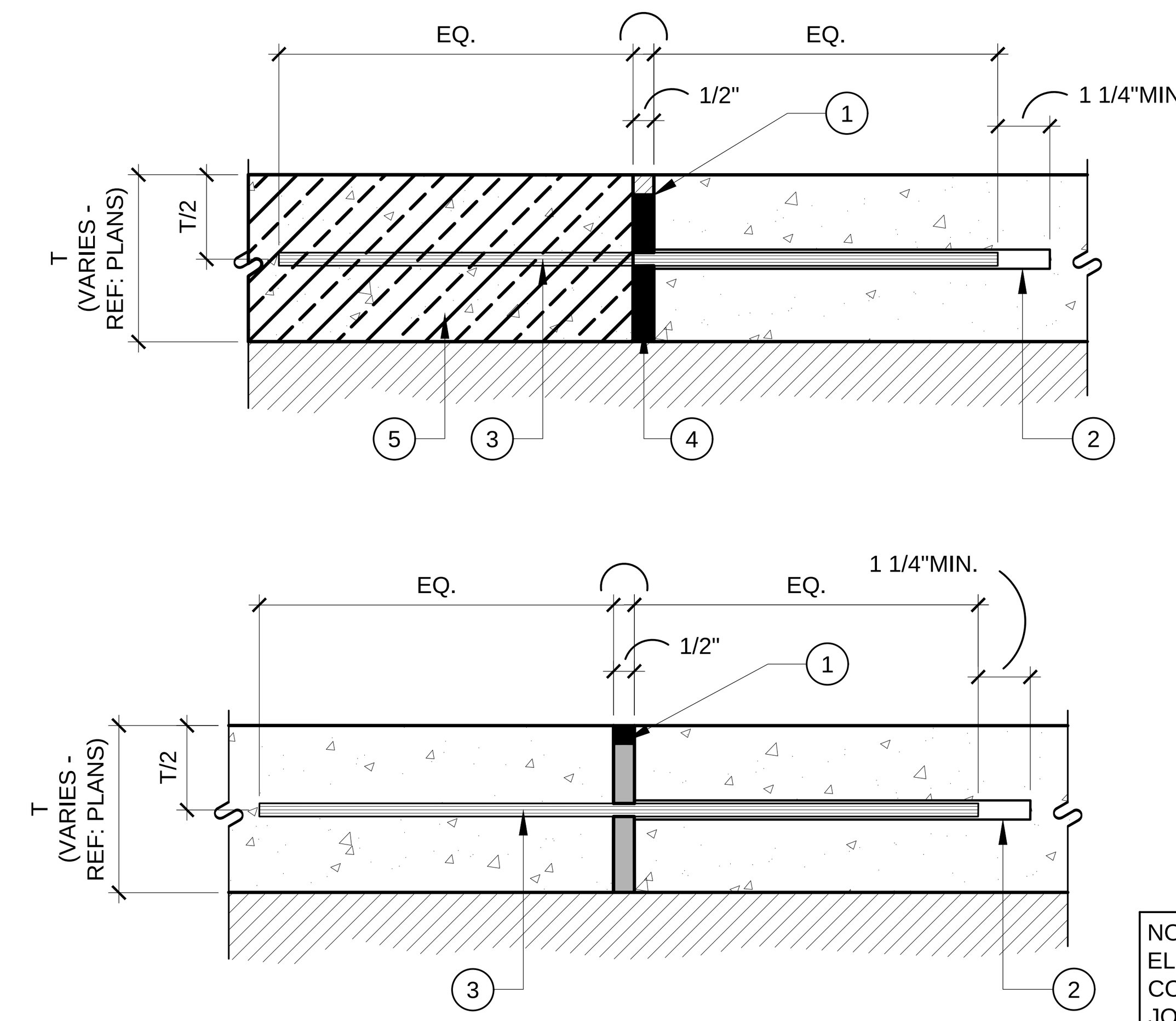


1. CONCRETE FINISH: REFER TO DETAIL 1, THIS SHEET
2. SAWCUT JOINT FILLED W/ SYNTHETIC JOINT SEALER (CHLORINE RESISTANT) COMPOUND TO W/ IN 1/4" OF FINISH SURFACE
3. PAVING REINF.: REFER TO DETAIL 1, THIS SHEET

NOTE:
JOINTS SHALL BE SAWED AS SOON AS SAWING CAN BE PERFORMED WITHOUT STRIPPING AGGREGATE FROM THE CONCRETE, GENERALLY WITHIN 24 HOURS AFTER PLACEMENT. REFER TO GEOTECHNICAL REPORT.

2 CONTROL JOINT - SAW CUT

SCALE: 3"=1'-0"



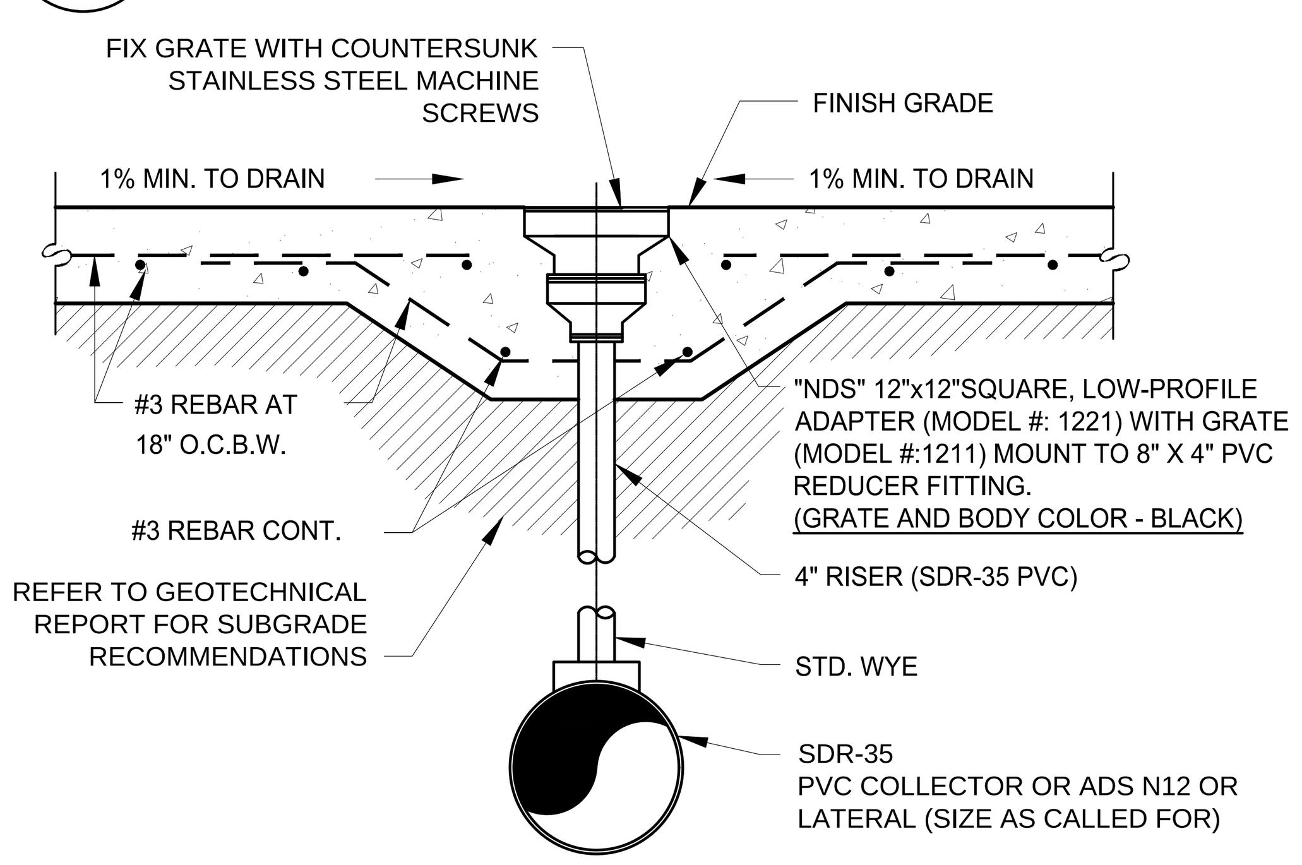
1. SEAL WITH A SYNTHETIC JOINT SEAL COMPOUND (SEE SPECIFICATIONS)
2. CLOSED END DOWEL SLEEVE W/ 1 1/4" MIN. CLEARANCE TO END. FIT & SECURE TO DOWEL
3. 2'-6" " NO. 4 SMOOTH STEEL DOWEL. SPACING EQ. TO SLAB REBAR. WRAP ONE END FOR EXPANSION AS SHOWN. DRILL AND SET IN EPOXY CEMENT
4. 1/2" PREMOULDED ASPHALTIC FIBER EXPANSION JOINT FILLER
5. EXISTING CONCRETE

1. JOINT FILLER W/ ZIP STRIP BLACK SYNTHETIC FIBER EXPANSION JOINT MATERIAL SUBMIT COLOR TO OWNER FOR APPROVAL
2. CLOSED END DOWEL SLEEVE W/ 1 1/4" MIN. CLEARANCE TO END. FIT & SECURE TO DOWEL.
3. 18" NO. 4 SMOOTH STEEL DOWEL. SPACING EQ. TO SLAB REBAR. WRAP ONE END FOR EXPANSION AS SHOWN

NOTE:
ELECTRICAL BONDING MUST BE CONTINUOUS THROUGH EXPANSION JOINTS.

3 DOWELED EXPANSION JOINT

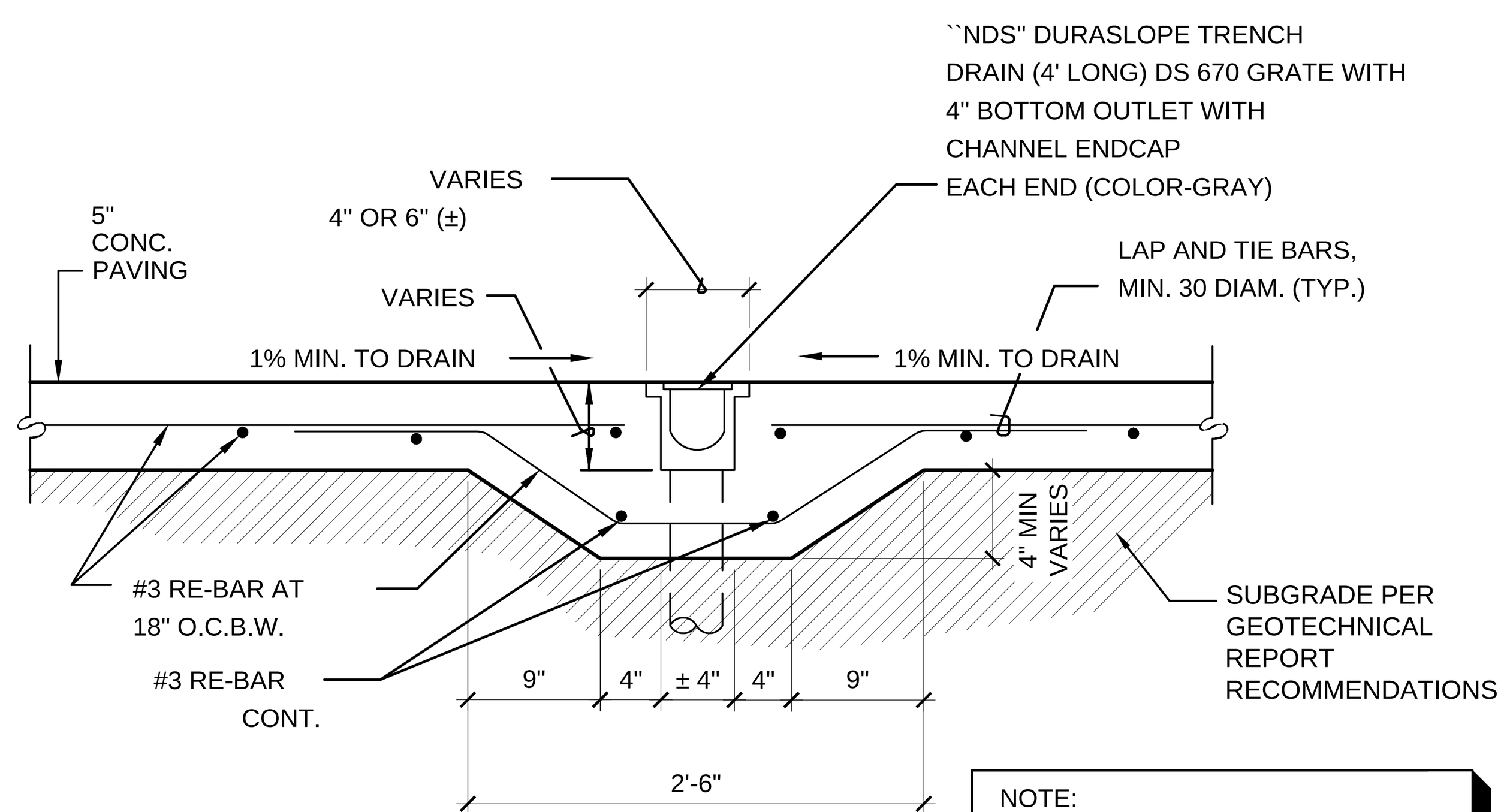
SCALE: 3"=1'-0"



NOTE
1. DO NOT USE FLEXIBLE PIPING FOR DECK DRAINAGE PIPING.
2. SET DRAINS STRAIGHT AND AS PER SHEET L-5. MIS-ALIGNED DRAINS WILL BE REMOVED AND PAVING REPLACED JOINT TO JOINT AT CONTRACTORS EXPENSE.

4 DECK DRAIN DETAIL (TYP.)

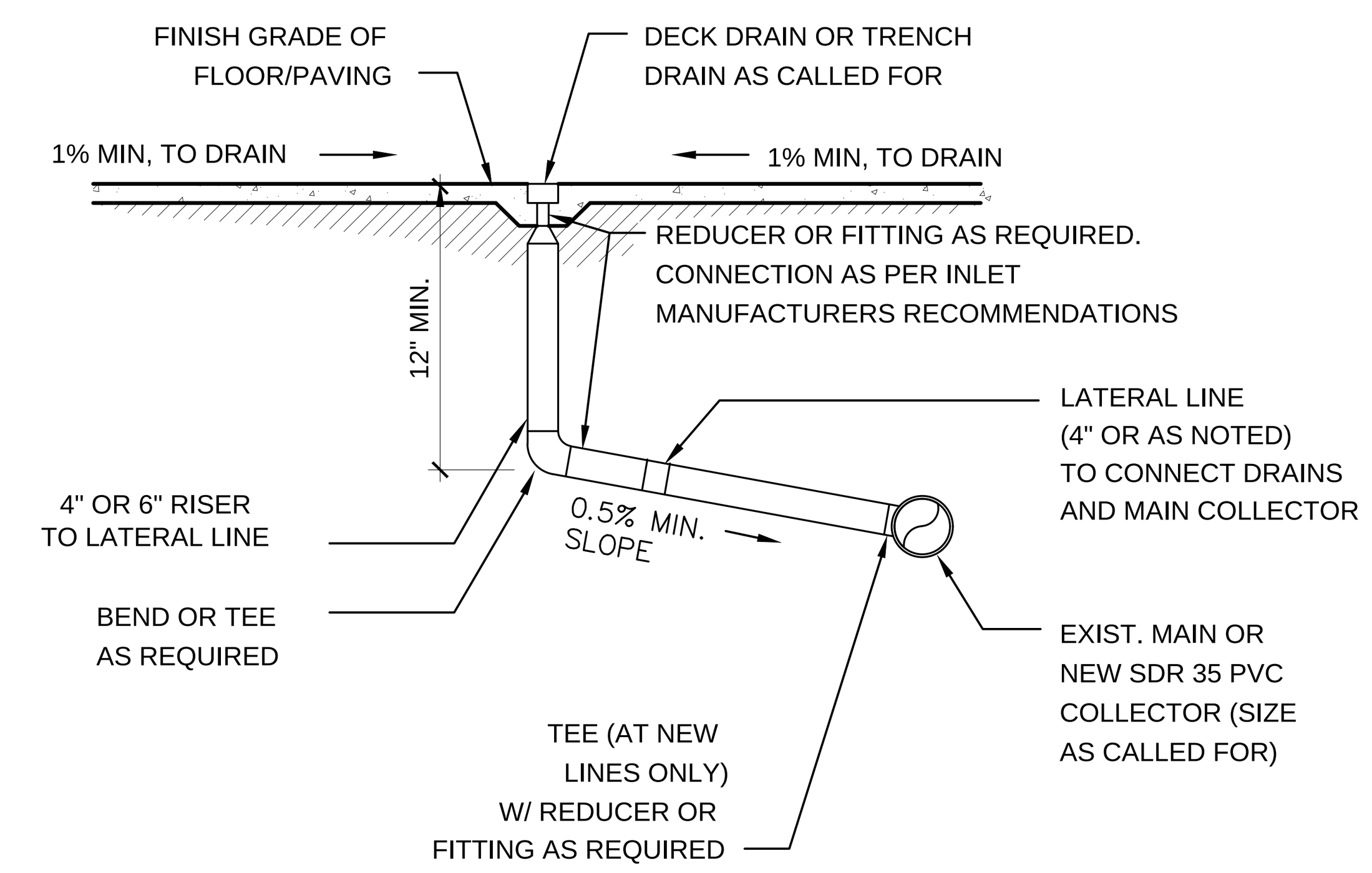
SCALE: N.T.S.



NOTE:
USE RECESS MACHINE SCREWS TO SECURE GRATES ON ``NDS" PRODUCTS.

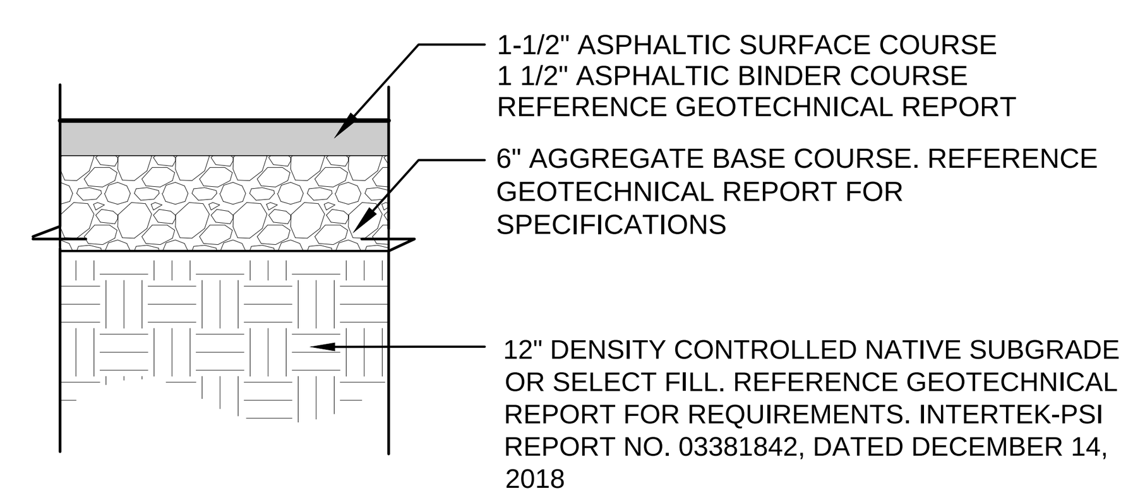
5 TRENCH DRAIN (TYP.)

SCALE: N.T.S.



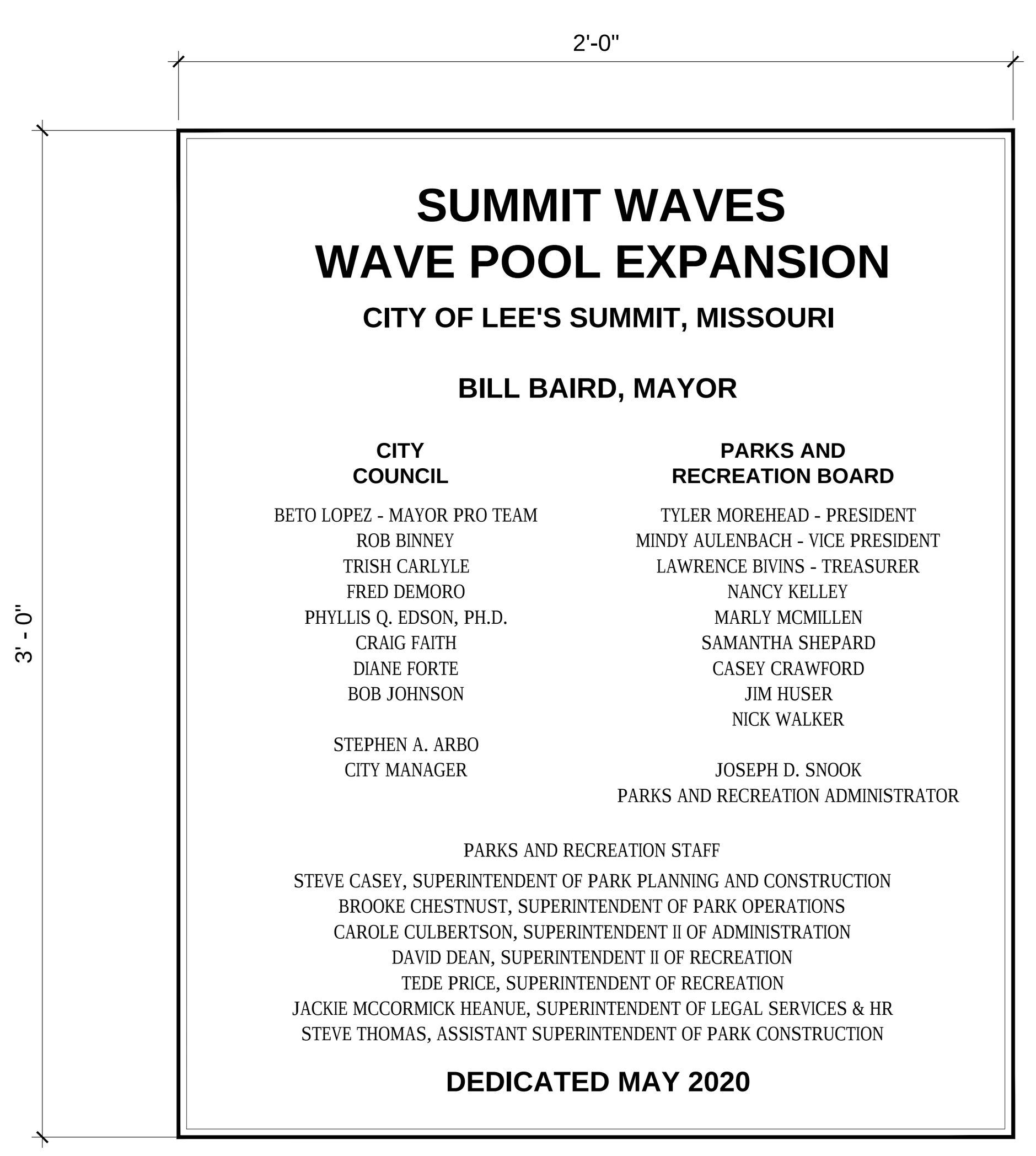
6 INLET CONNECTION DETAIL (TYP.)

SCALE: N.T.S.



7 HMAC PAVEMENT SECTION

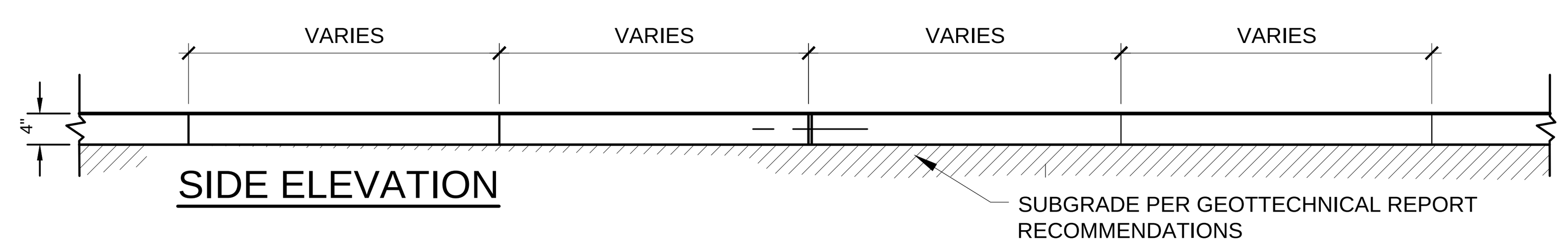
SCALE: N.T.S.



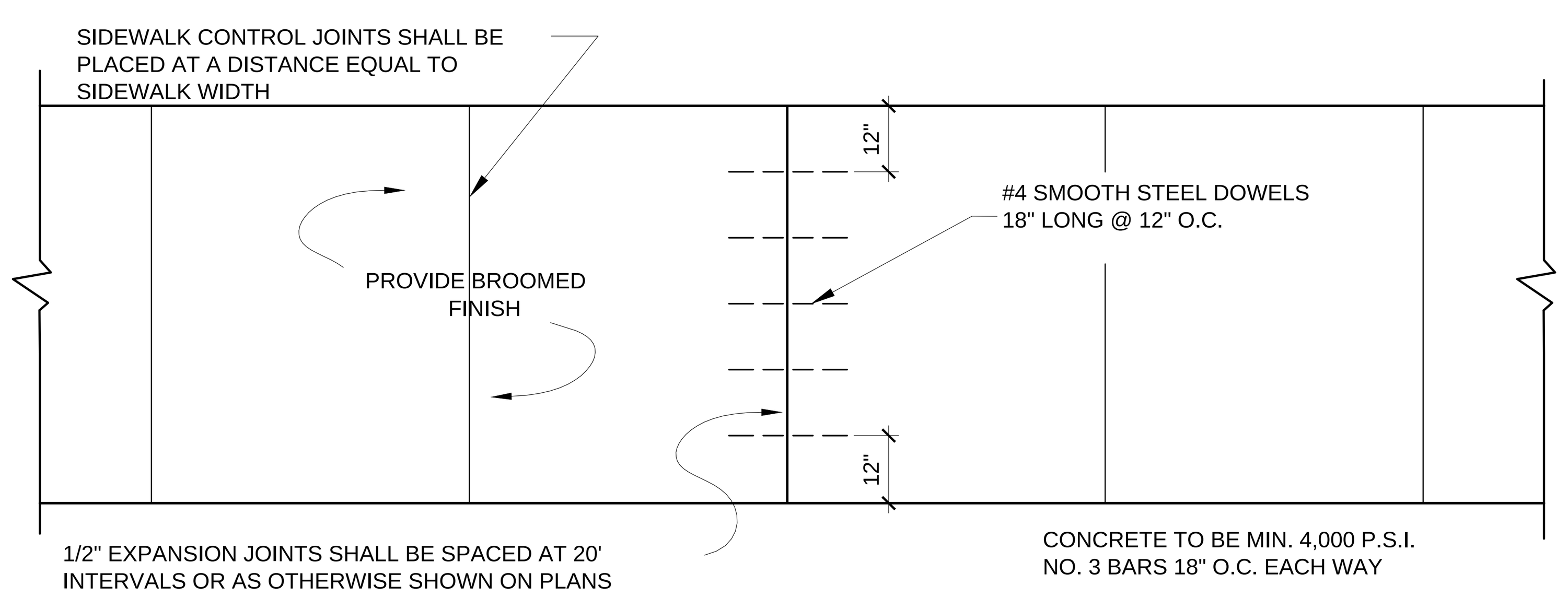
NOTES:
1. SUBMIT SHOP DRAWINGS FOR BRONZE PLAQUE FOR REVIEW BY THE OWNER.
2. PLAQUE SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR. LOCATION OF PLAQUE TO BE DETERMINED BY OWNER. (PROVIDE ONE)

8 CAST ALUMINUM PLAQUE (PROVIDE 1)

SCALE: N.T.S.

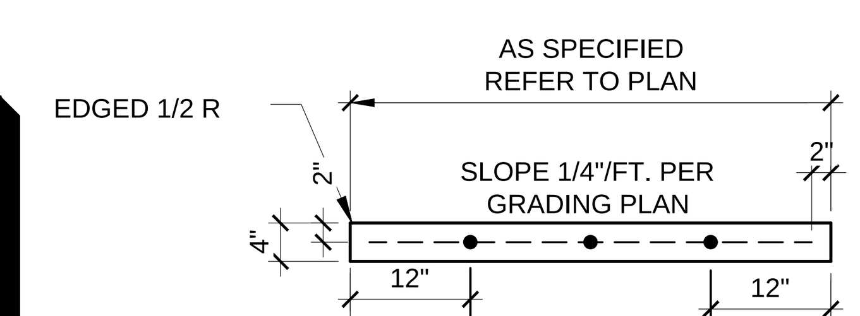


SIDE ELEVATION



PLAN

NOTES:
SYNTHETIC EXPANSION JOINT FILLER W/ ZIPSTRIP AND 1" SEALER (GRAY) ABOVE (SUBMIT COLOR AND MATERIAL TO ARCHITECT/ ENGINEER FOR APPROVAL) WALK SHALL BE 6'-0" MIN. WHEN NEXT TO CURB

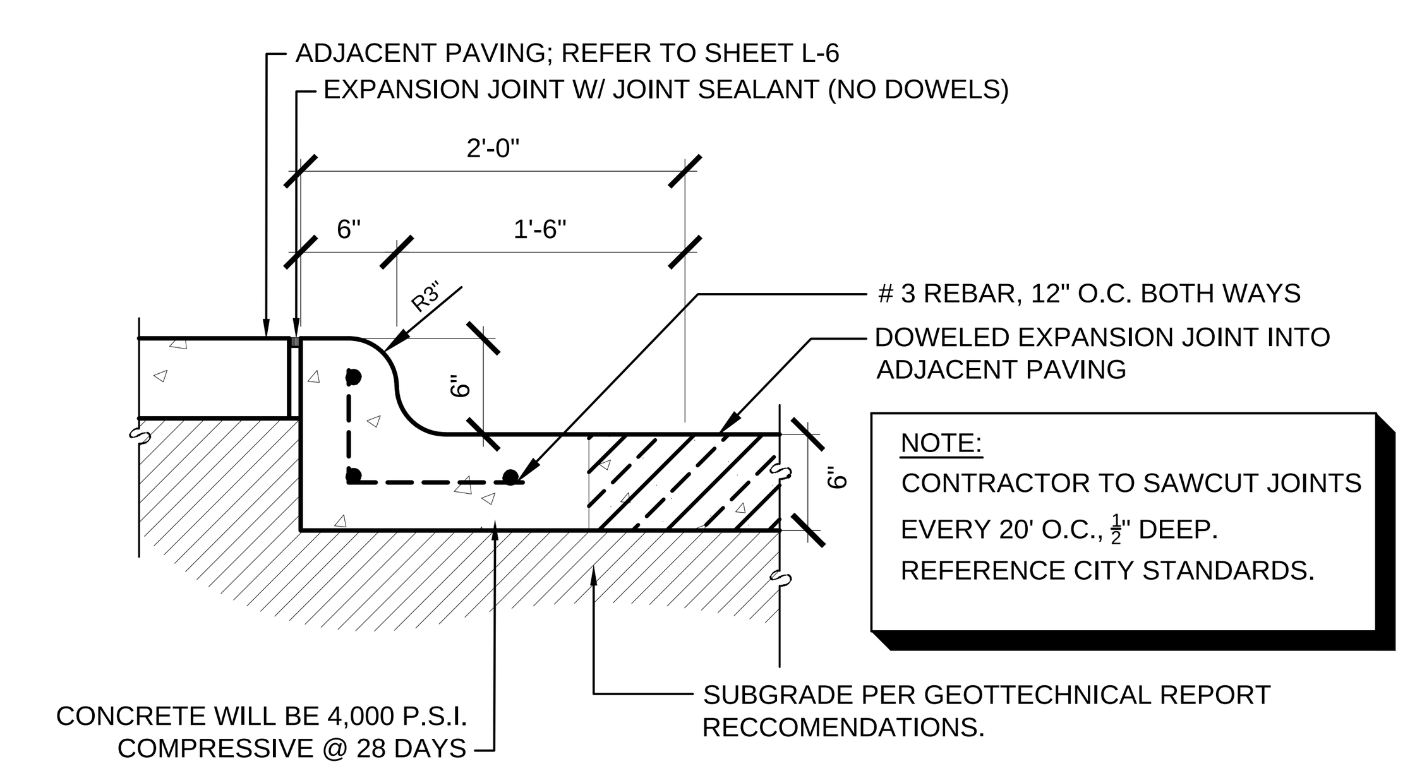


SECTION

NOTES:
1. CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4,000 PSI
2. REINFORCEMENT SHALL BE #3 BARS ON 18" CENTERS.

9 4" CONCRETE SIDEWALK

SCALE: N.T.S



NOTE:
CONTRACTOR TO SAWCUT JOINTS EVERY 20' O.C., 1/4" DEEP. REFERENCE CITY STANDARDS.

10 6" CONCRETE CURB AND GUTTER

SCALE: 1"=1'-0"

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MISSOURI REGISTRATION NUMBER 001512

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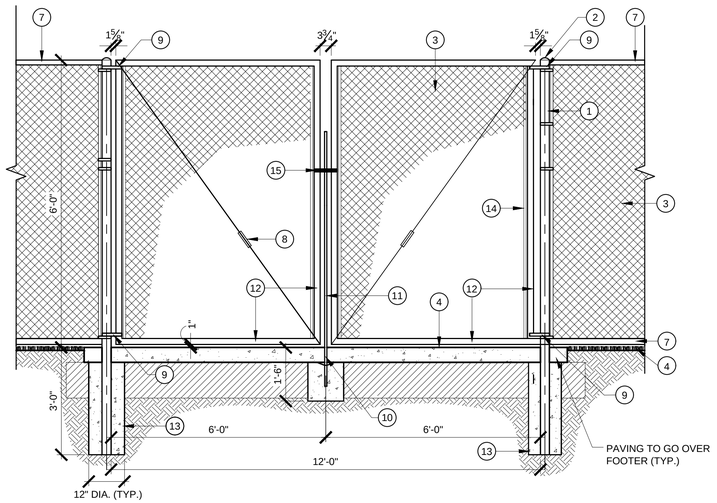
Kimley»Horn
P.L.A. MARK HATCHEL
L.A. No. 2011010334 Date APRIL 2019

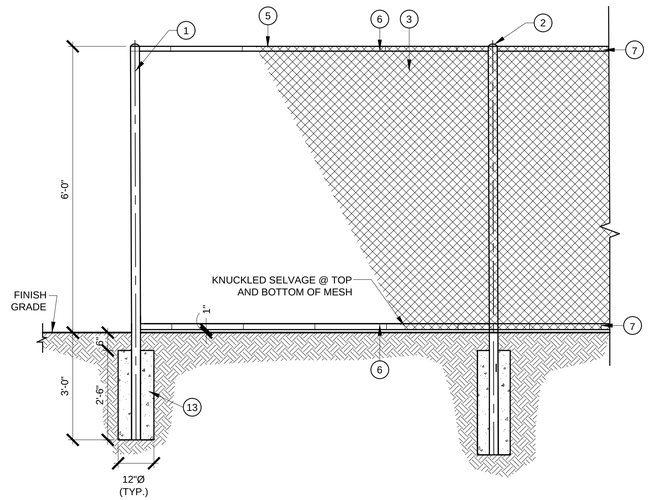
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

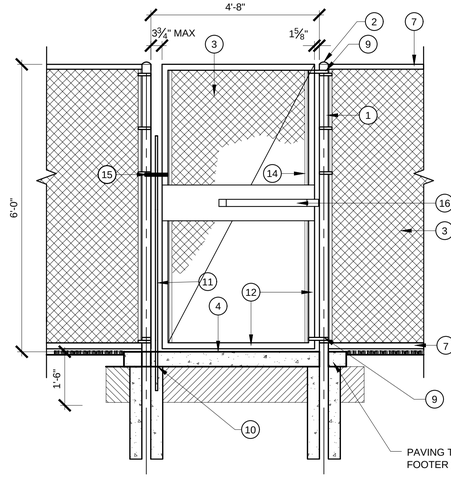
SITE DETAILS - 1

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-7







LEGEND:

1. 3" (2.875") O.D. LINE POST PIPE @ 5.79 LBS/FT, TIES SHALL BE BLACK GALVANIZED STEEL, ALUMINUM TIES ARE NOT ACCEPTABLE.
2. DOMED POST CAP (TYPICAL)
3. 1.25"#9 GAUGE (CORE WIRE) MESH (TYP.) WITH VINYL COATING. COLOR: BLACK
4. GRASS AREA (TYP.)
5. CHAINLINK W/ KNUCKLED SELVAGE SET EVEN W/ TOP OF RAIL. RAIL TIES AS REQ'D
6. #9 GAUGE CONTINUOUS BLACK VINYL TENSION WIRE AS REQ'D
7. 1 5/8" O.D. RAIL PIPE: 2.27 LBS/ FT
8. 3/8" D. GALV. ROD W/ TRUSS AND ROD TIGHTENER
9. TUBULAR POST HINGE (TOP & BOTTOM) HEAVY PR. STEEL
10. PLUNGER ROD CATCH SET IN CONCRETE
11. PLUNGER ROD
12. 2" O.D. GATE FRAME
13. TYPICAL CONCRETE FOOTING (3,000 PSI)
14. ¾"X¾" MESH END TIE BAND
15. LATCH FORK, LOCK KEEPER, LOCK KEEPER GUIDE (USE APPROPRIATE FOR DOUBLE AND SINGLE GATES)
16. WEATHERIZED EXIT ALARM PUSH BAR WITH ALARM AND STEEL BACKING PLATE

NOTES:

1. FENCE SHALL HAVE TOP AND BOTTOM RAIL
2. SUBMIT SHOP DRAWINGS OF FENCE AND GATES TO ARCHITECT/ ENGINEER
3. SUBMIT MANUFACTURER'S COATING AND MATERIALS CERTIFICATIONS TO ARCHITECT/ ENGINEER
4. ALL GATES TO BE WELDED AND GROUND SMOOTH
5. FENCE GATE SHALL BE VINYL COATED. ALL POSTS, FITTINGS, AND HARDWARE TO BE VINYL COATED OR POWDER COATED TO MATCH (BLACK)
6. CONTRACTOR TO COORDINATE WITH GUIER FENCING FOR INSTALLTION TECHNIQUES AND LEE'S SUMMIT STANDARDS

NOTES:

1. DETEX WEATHERIZED EXIST ALARM WITH BATTERY TO MATCH EXISTING, MODEL # V50 EB W.
2. CONTRACTOR TO VERIFY EXISTING MOUNTING PLATE AND ALARM PUSH BAR AND NOTIFY LANDSCAPE ARCHITECT OF MODEL DISCREPANCY PRIOR TO INSTALLATION.
3. CONTRACTOR TO MATCH EXISTING PUSH BAR AND MOUNTING STEEL PLATE

1 VINYL COATED CHAINLINK DOUBLE GATE (PROVIDE 1)

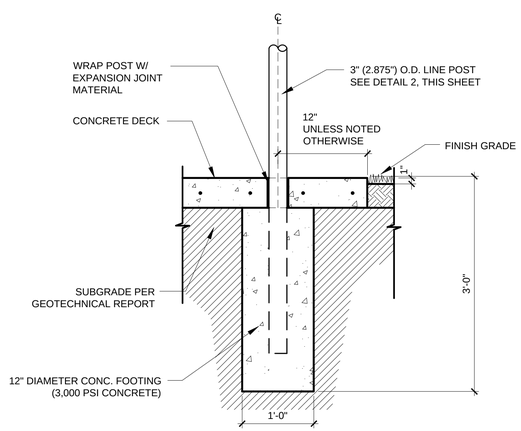
SCALE: N.T.S.

2 6' HIGH VINYL COATED CHAINLINK FENCING (±614 LF)

SCALE: N.T.S.

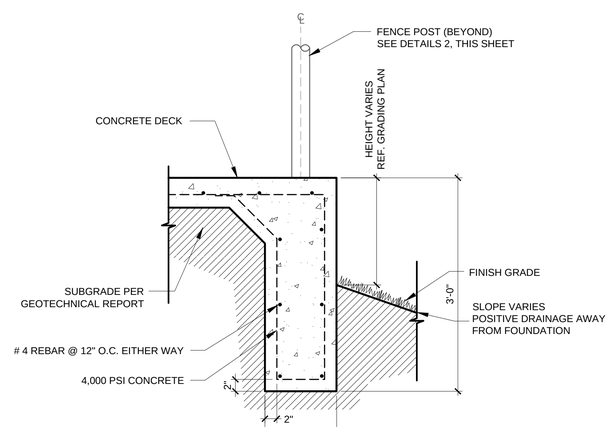
3 VINYL COATED CHAINLINK SINGLE GATE (PROVIDE 3)

SCALE: N.T.S.



4 TYP. FENCE SECTION AT POOL DECK

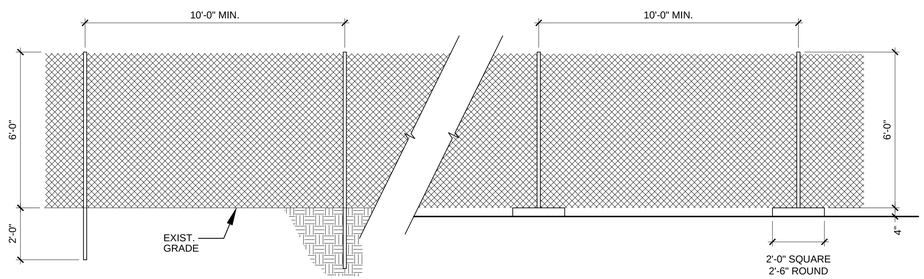
SCALE: 1" = 1'-0"



5 TURN DOWN EDGE (±53 LF)

SCALE: 1" = 1'-0"

CHAIN LINK FENCE FABRIC IS TO BE 11 GAUGE HOT DIPPED ZINC COATED (GALVANIZED) IRON OR STEEL 8'-0" HIGH W/2 1/2" SQUARE DIAMOND. USE 8'-0" x 1 5/8" DIA. O.D. GALVANIZED IRON POSTS. CORNER AND GATE POSTS WILL BE 8'-0" x 2 3/4" DIA. O.D. ALL NON-MOVABLE FENCE POSTS TO BE SET IN A MIN. 2'-0" IN GROUND OR SET IN 4" THICK CONCRETE PAD 2'-0" SQUARE OR 2'-6" ROUND W/CORNER & GATE POSTS ADEQUATELY BRACED.



6 CONSTRUCTION FENCE

SCALE: N.T.S.

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Kimley»Horn
P.I.A. MARK HATCHEL
LA. No. 2011010334 Date APRIL 2019

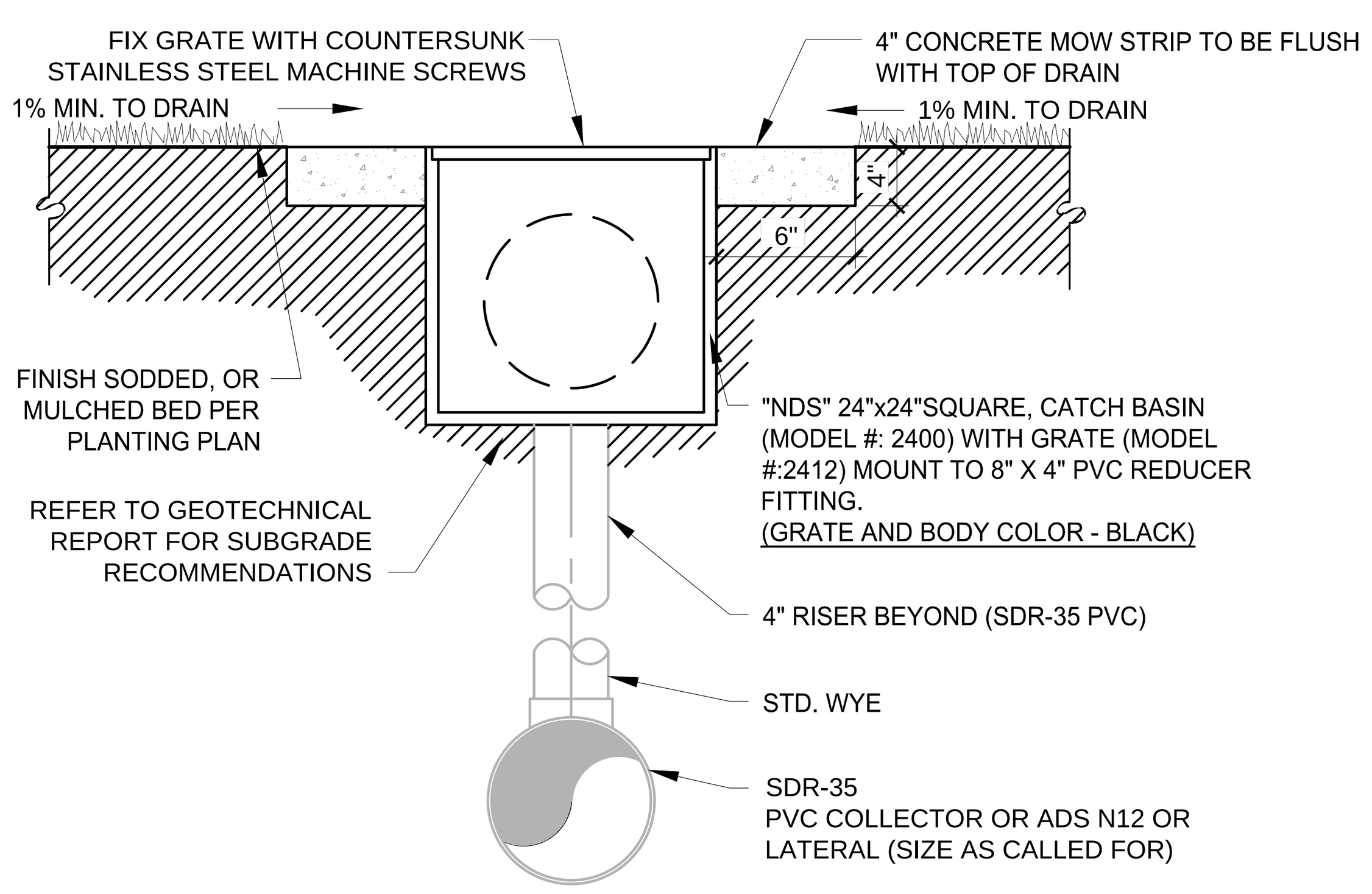
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

SITE DETAILS - 2

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-8

File: K:\DAL_LAP\LAE_LAP\064538700_lees summit\Dwg\Sheet\L-8 DETAIL 2.dwg [SITE DETAILS - 2] 4/15/2019 11:19am
Xrefs: v24.t36
Images:

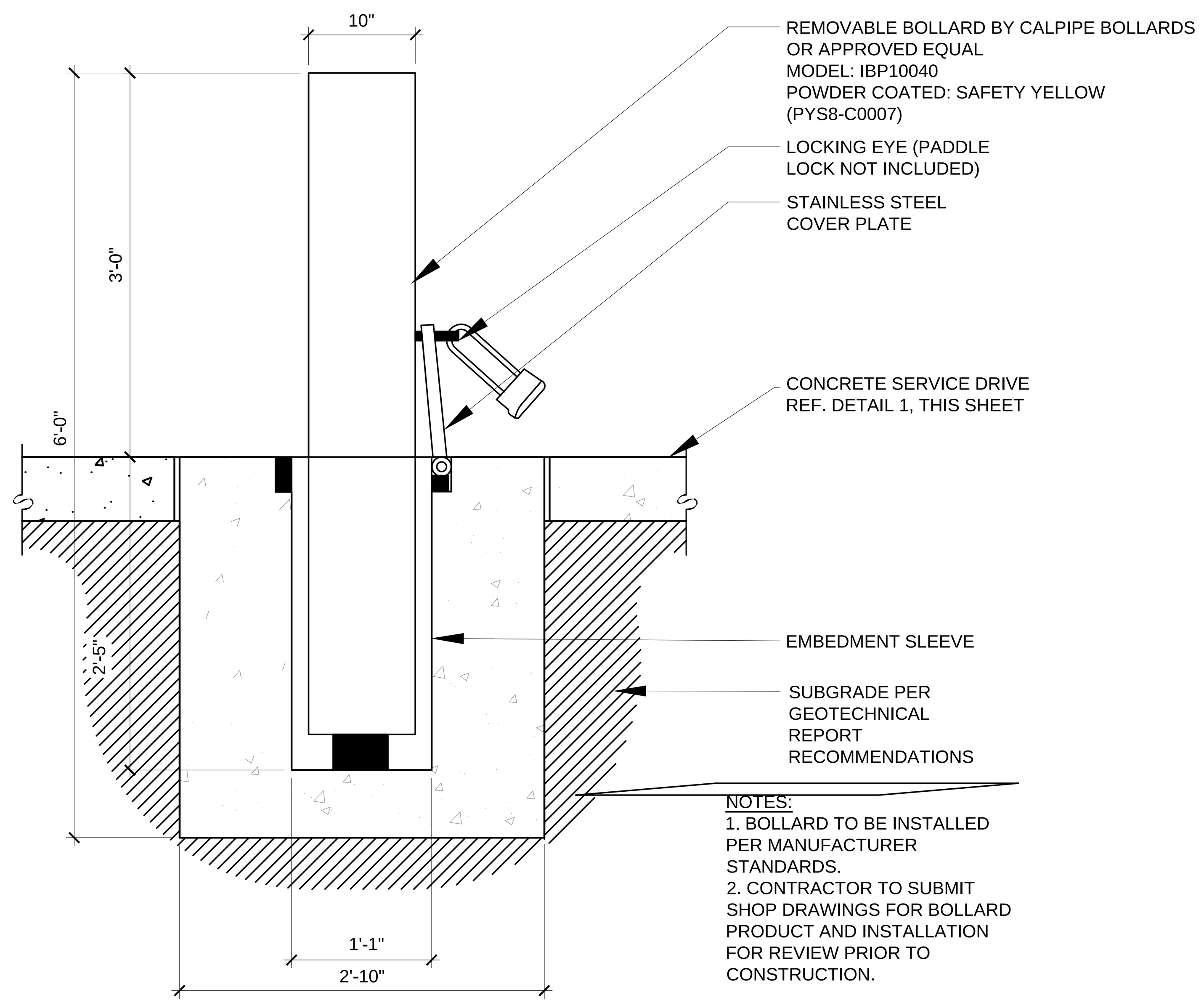


NOTE

1. DO NOT USE FLEXIBLE PIPING FOR DECK DRAINAGE PIPING.

1 LANDSCAPE DRAIN DETAIL (TYP.)

SCALE: N.T.S.

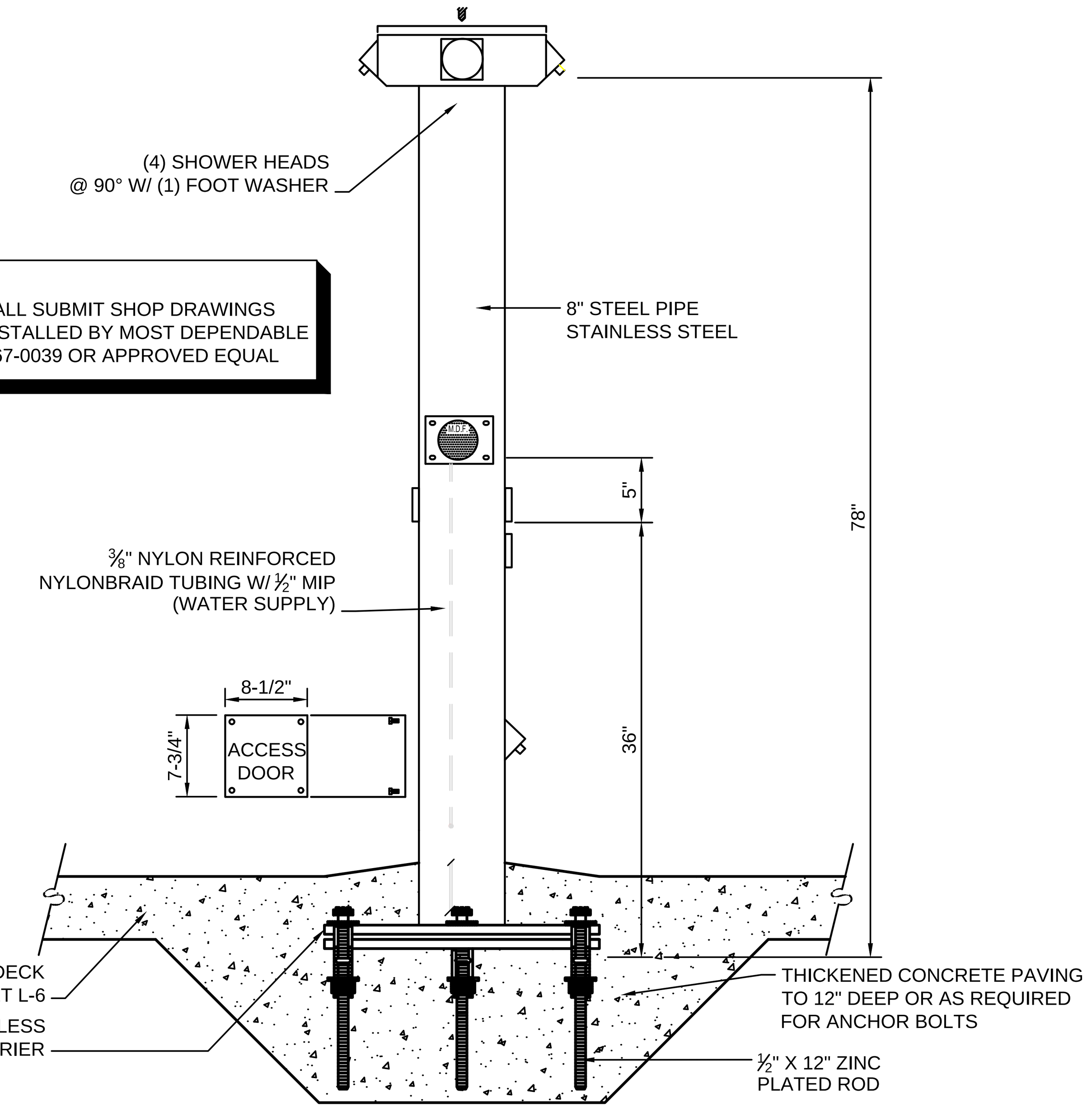


NOTES:
1. BOLLARD TO BE INSTALLED PER MANUFACTURER STANDARDS.
2. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR BOLLARD PRODUCT AND INSTALLATION FOR REVIEW PRIOR TO CONSTRUCTION.

2 10" REMOVABLE BOLLARDS (PROVIDE 3)

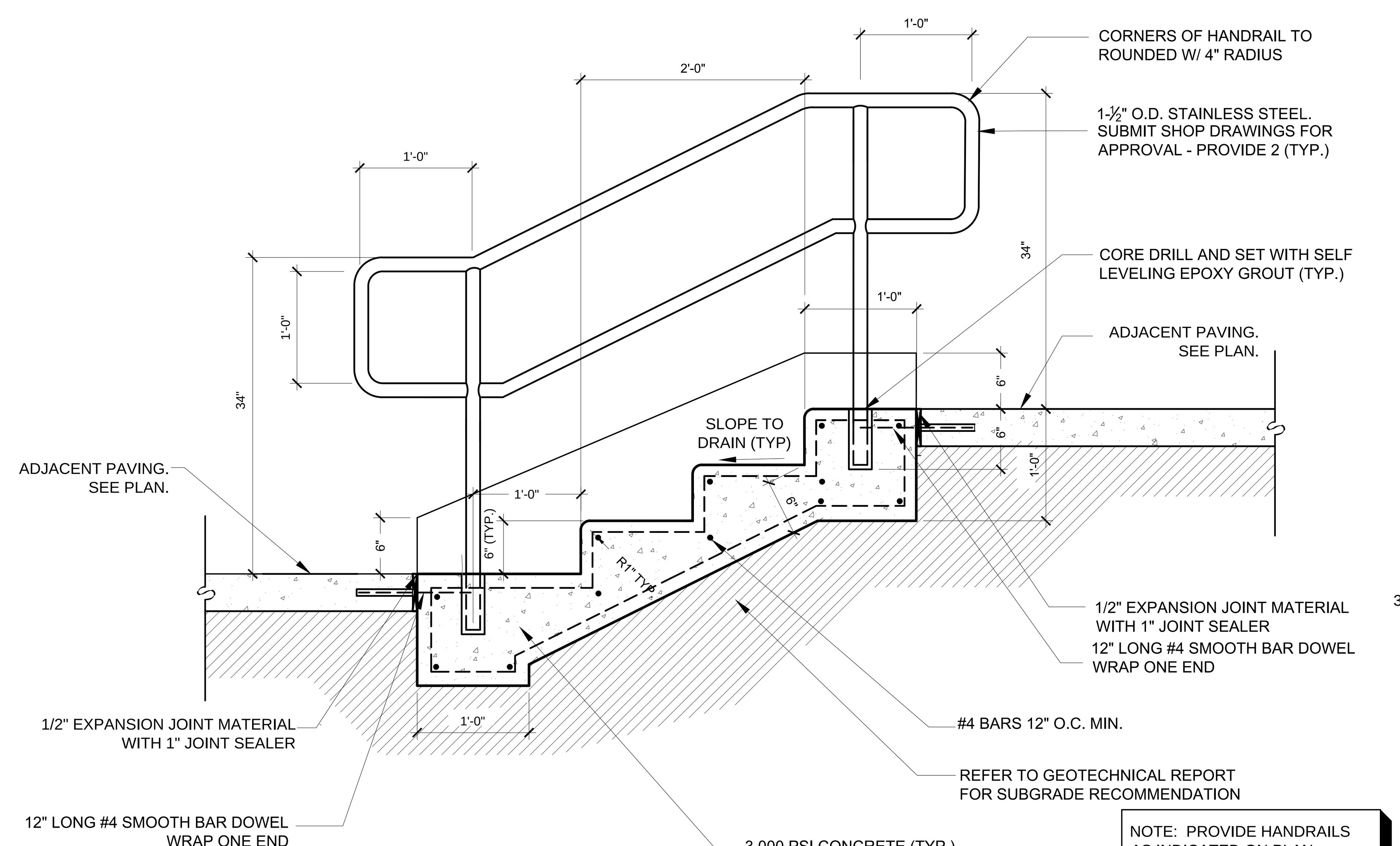
SCALE: N.T.S.

NOTE:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS
2. PROVIDED AND INSTALLED BY MOST DEPENDABLE FOUNTAINS. 1-903-867-0039 OR APPROVED EQUAL



3 DECK SHOWER - 4 SPRAYS (PROVIDE 1)

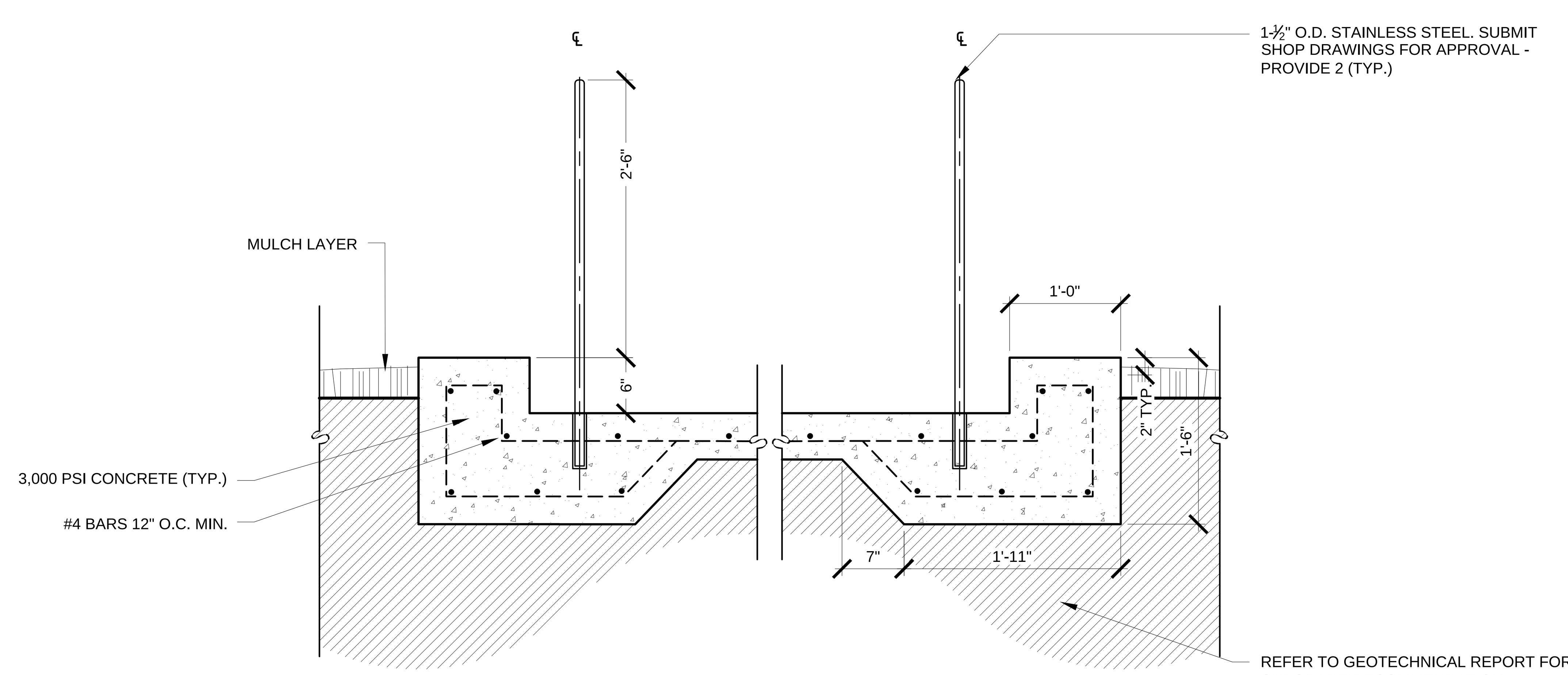
SCALE: N.T.S



NOTE: PROVIDE HANDRAILS AS INDICATED ON PLAN.

4 TYPICAL STAIR AND HANDRAIL

SCALE: N.T.S.



SECTION 2.A

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Kimley»Horn
P.L.A. MARK HATCHEL
L.A. No. 2011010334 Date APRIL 2019

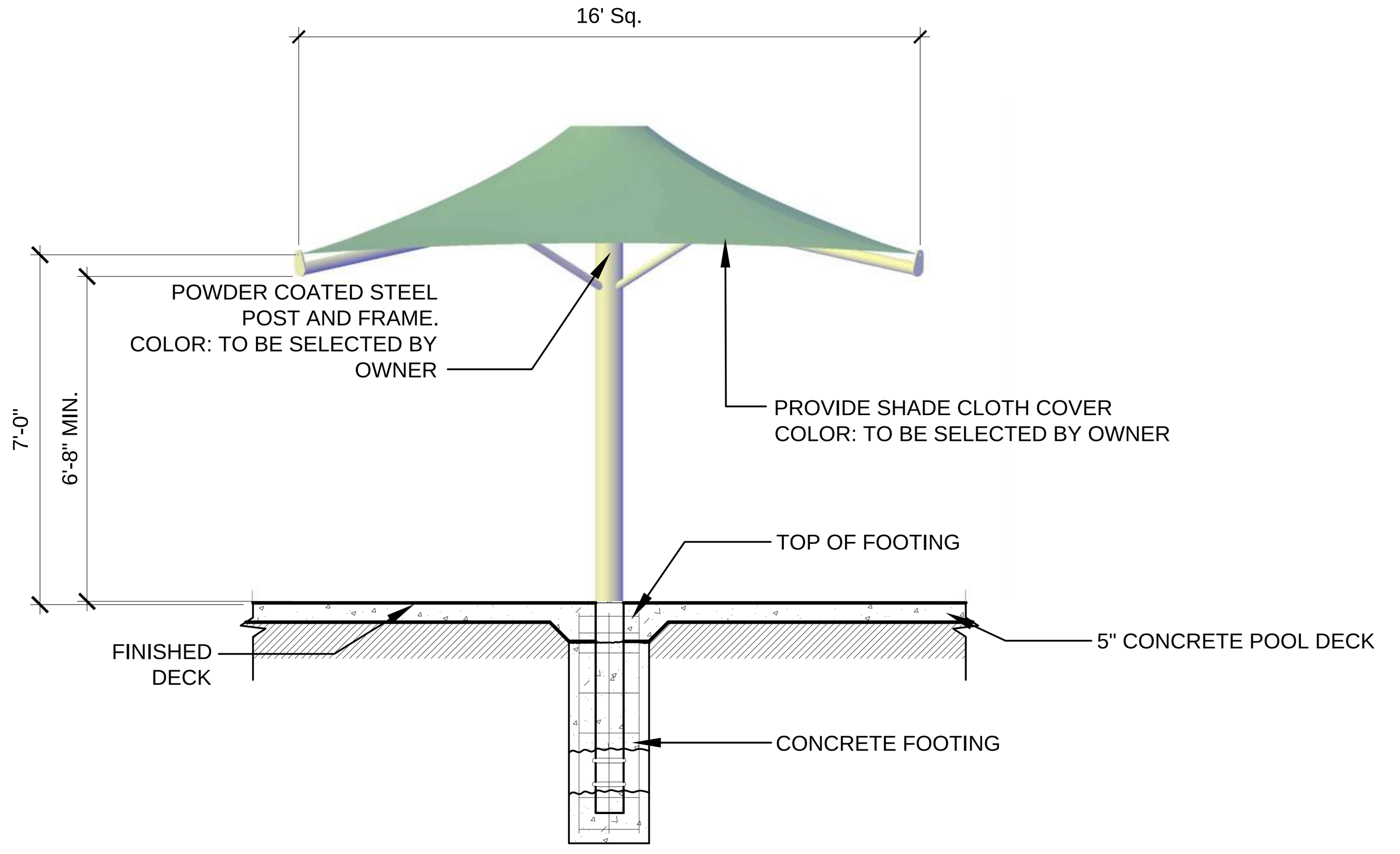
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

SITE DETAILS - 3

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET

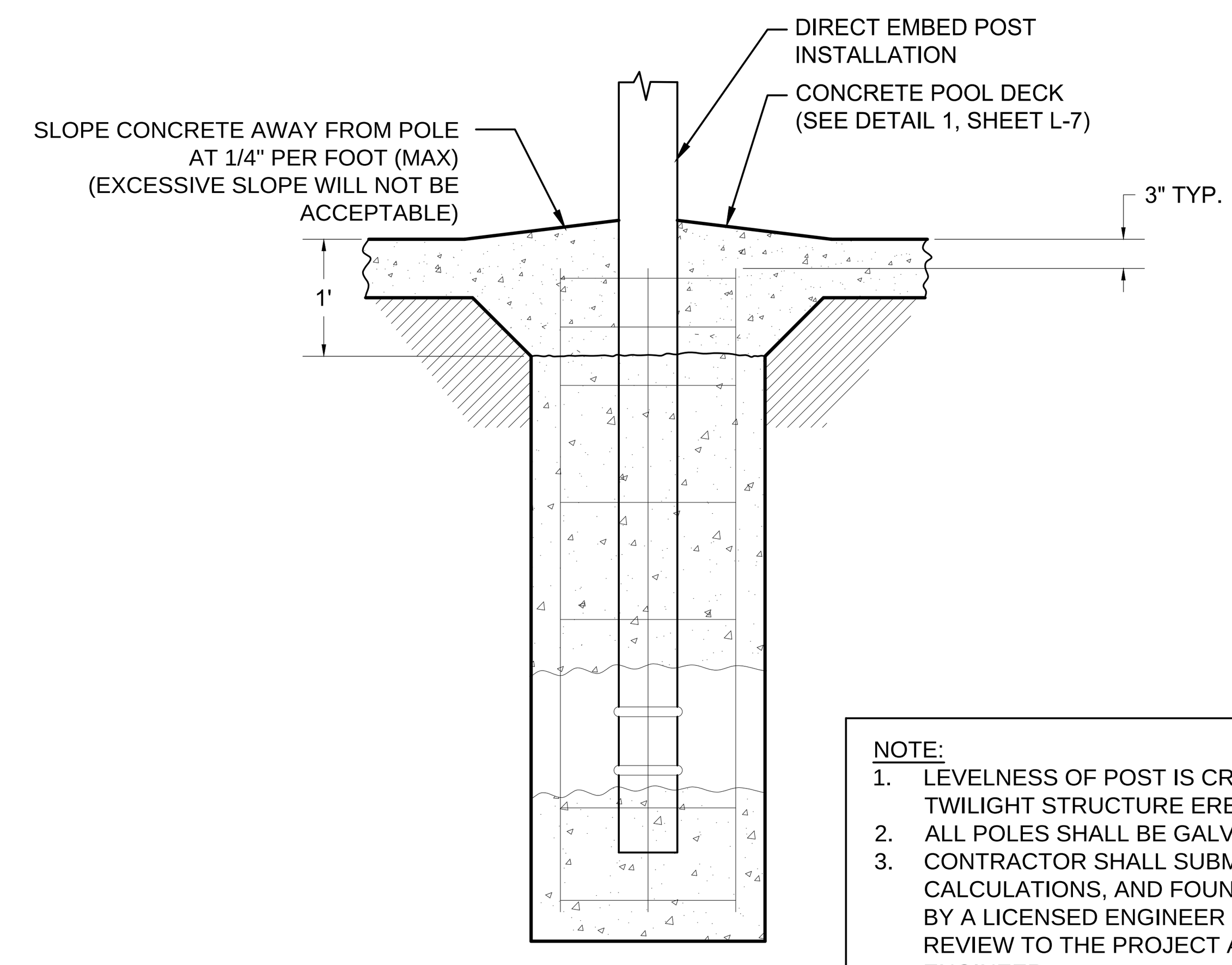
L-9



NOTE:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, CALCULATIONS, AND FOUNDATION DRAWINGS BY A LICENSED ENGINEER (MISSOURI) FOR REVIEW TO THE PROJECT ARCHITECT / ENGINEER.
2. PROVIDED AND INSTALLED BY USA SHADE PHONE (800) 966-5005 OR APPROVED EQUAL.
3. CONTRACTOR TO COORDINATE WITH USA SHADE ON PEDESTALS AND FOOTINGS. SEE DETAIL 2, THIS SHEET.

1 TWILIGHT SHADE STRUCTURE (PROVIDE 12)

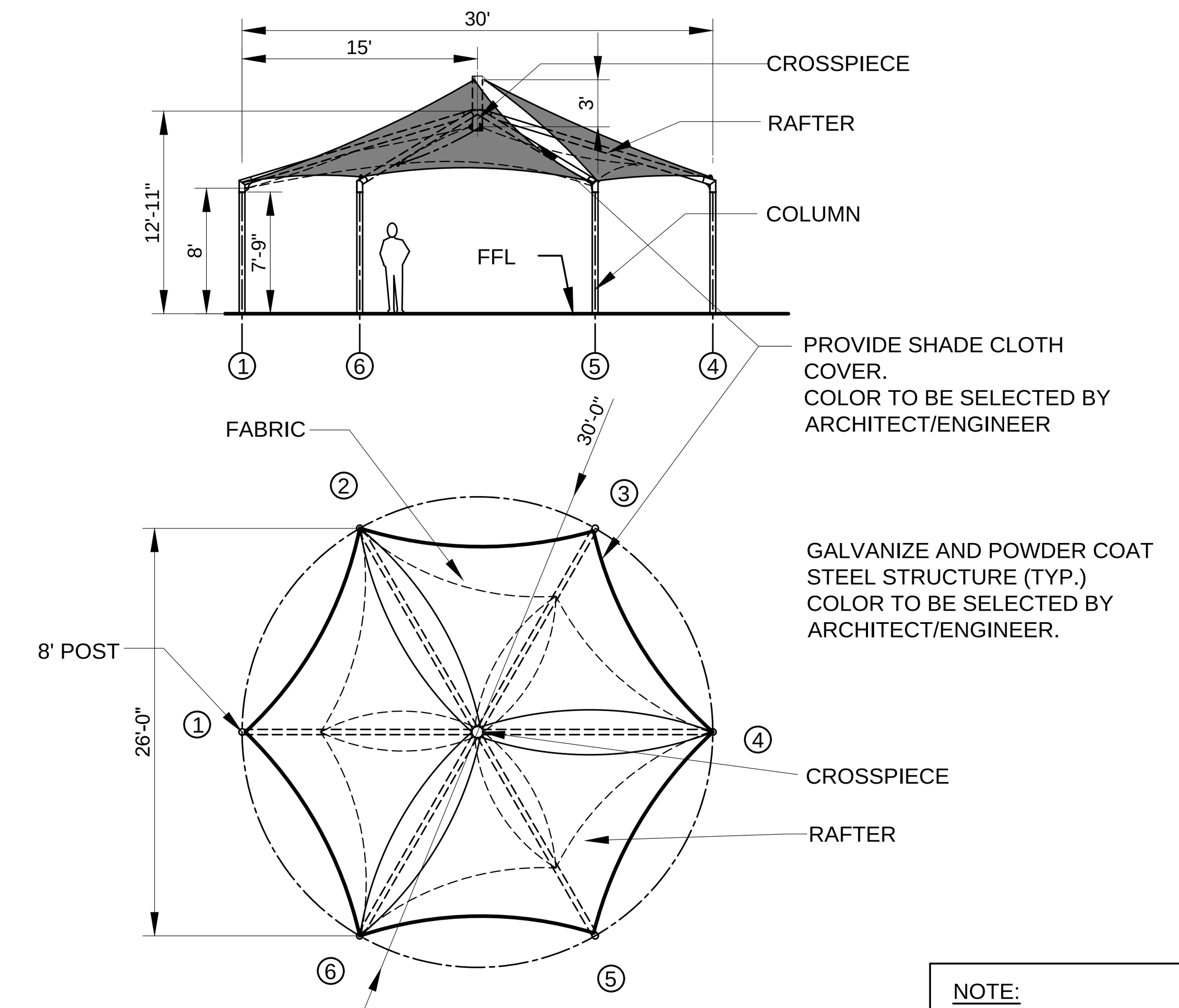
SCALE: N.T.S.



NOTE:
1. LEVELNESS OF POST IS CRUCIAL TO THE TWILIGHT STRUCTURE ERECTION.
2. ALL POLES SHALL BE GALVANIZED AND PAINTED.
3. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, CALCULATIONS, AND FOUNDATION DRAWINGS BY A LICENSED ENGINEER (MISSOURI) FOR REVIEW TO THE PROJECT ARCHITECT / ENGINEER.

2 COOLBRELLA EMBED DETAIL

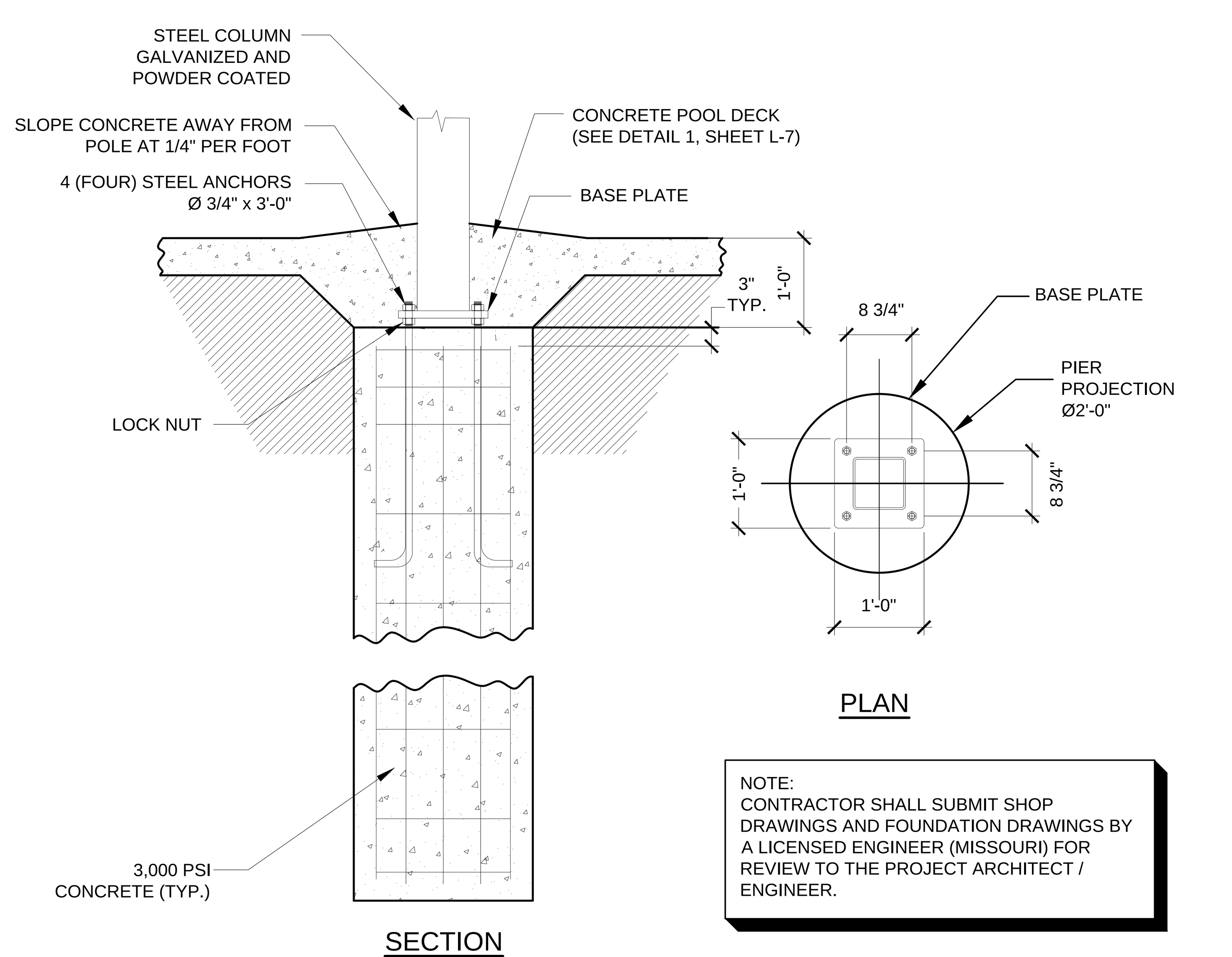
SCALE: N.T.S.



NOTE:
1. CONTRACTOR SHALL SUBMIT SHOP DRAWINGS, CALCULATIONS, AND FOUNDATION DRAWINGS BY A LICENSED ENGINEER (MISSOURI) FOR REVIEW TO THE PROJECT ARCHITECT / ENGINEER.
2. PROVIDED AND INSTALLED BY USA SHADE PHONE (800) 966-5005 OR APPROVED EQUAL.
3. CONTRACTOR TO COORDINATE WITH USA SHADE ON PEDESTALS AND FOOTINGS. SEE DETAIL 4, THIS SHEET.

3 MARINERS HEXAGON GROUP SHADE STRUCTURE (PROVIDE 1)

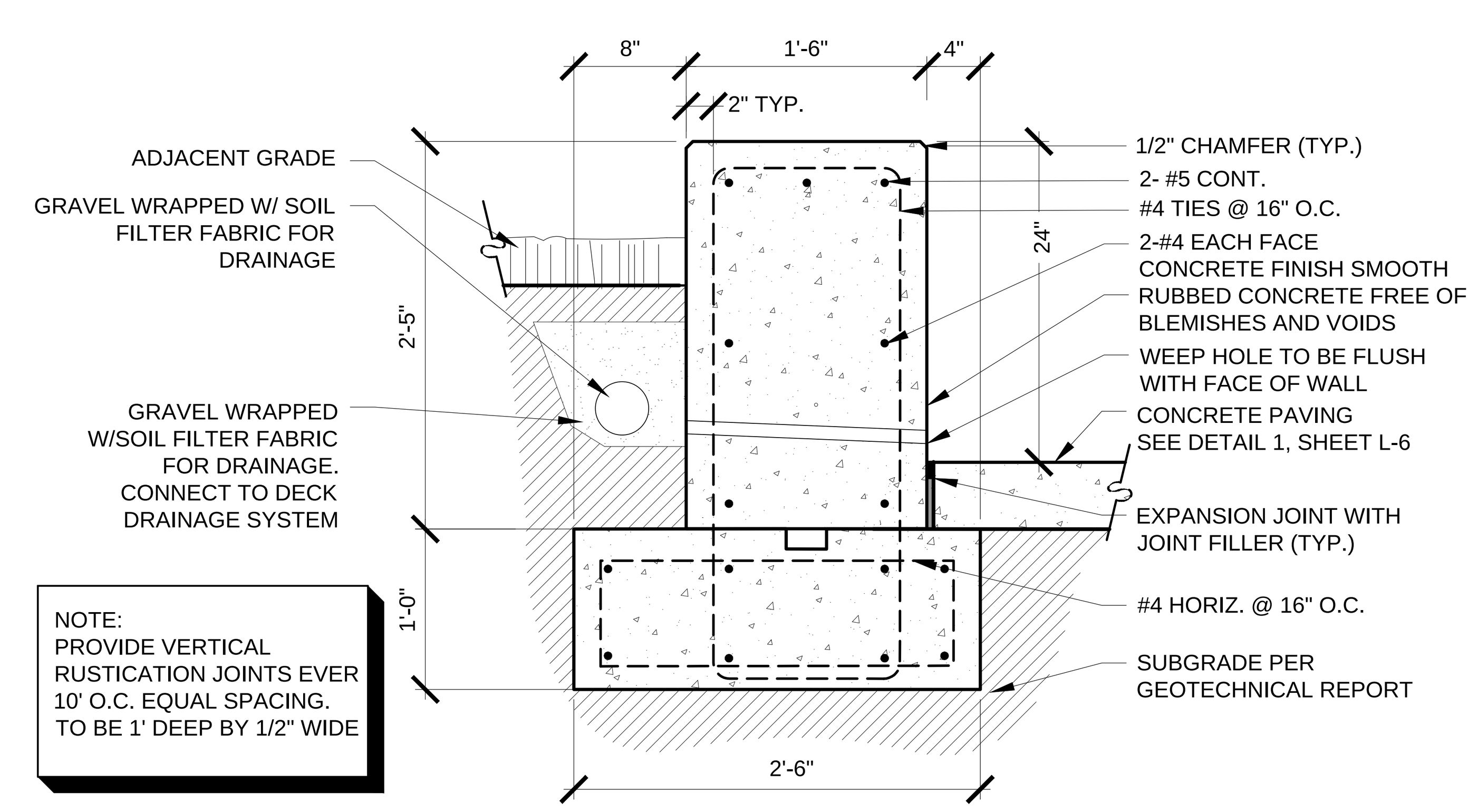
SCALE: 1" = 10'



NOTE:
CONTRACTOR SHALL SUBMIT SHOP DRAWINGS AND FOUNDATION DRAWINGS BY A LICENSED ENGINEER (MISSOURI) FOR REVIEW TO THE PROJECT ARCHITECT / ENGINEER.

4 SHADE STRUCTURE FOOTING (TYP.)

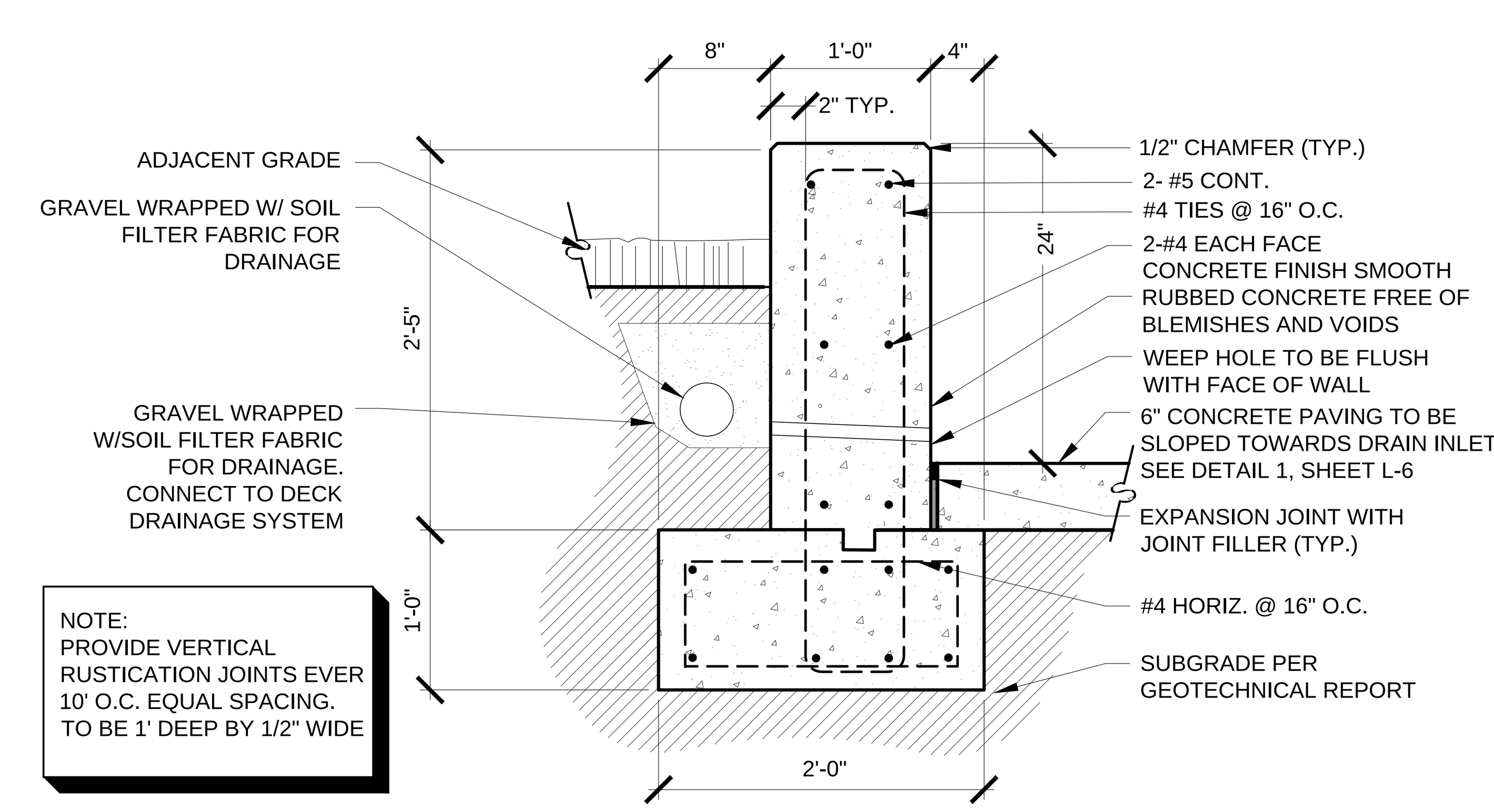
SCALE: N.T.S.



NOTE:
PROVIDE VERTICAL RUSTICATION JOINTS EVER 10' O.C. EQUAL SPACING. TO BE 1' DEEP BY 1/2" WIDE

5 CONCRETE RAISED PLANTER (PROVIDE ±110 LF)

SCALE: 1" = 1'-0"



NOTE:
PROVIDE VERTICAL RUSTICATION JOINTS EVER 10' O.C. EQUAL SPACING. TO BE 1' DEEP BY 1/2" WIDE

6 CONCRETE RETAINING WALL (PROVIDE ±125 LF)

SCALE: 1" = 1'-0"

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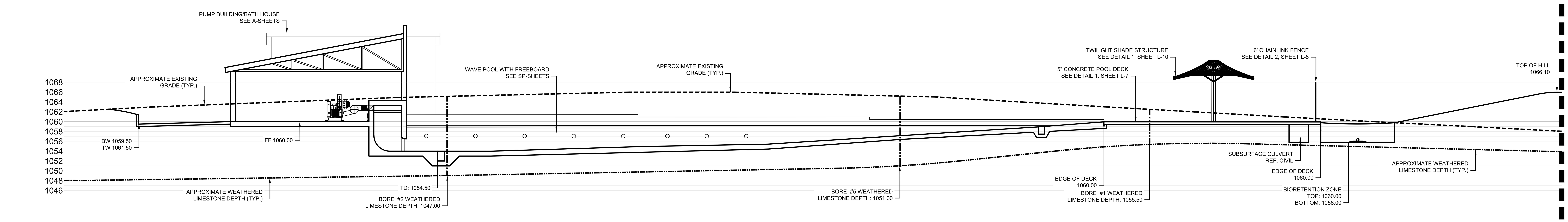
Kimley»Horn
P.L.A. MARK HATCHEL
L.A. No. 2011010334 Date APRIL 2019

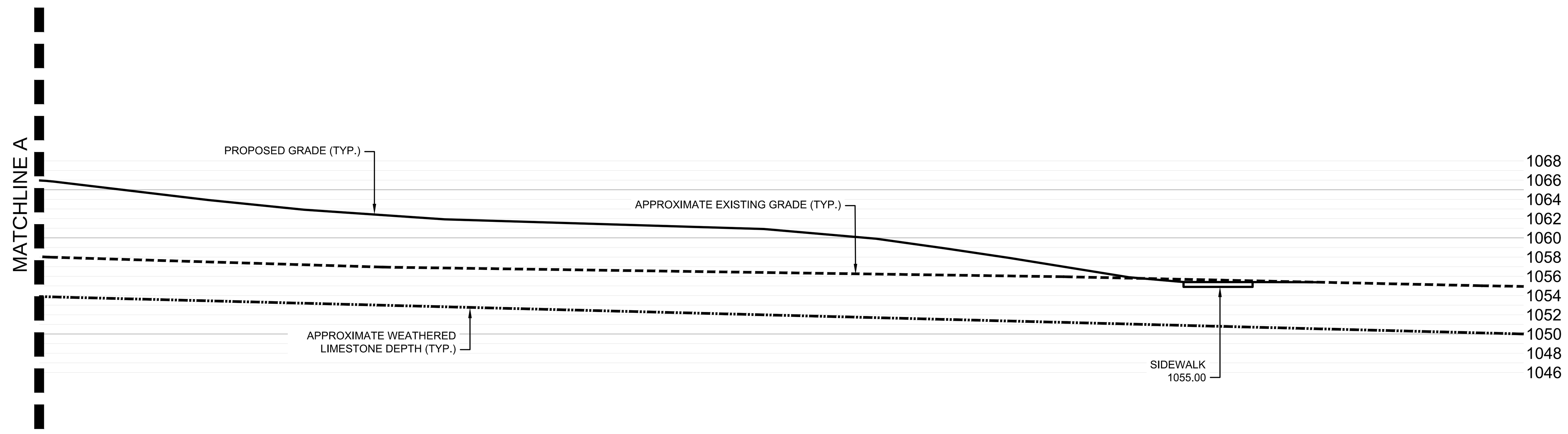
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

SITE DETAILS - 4

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-10





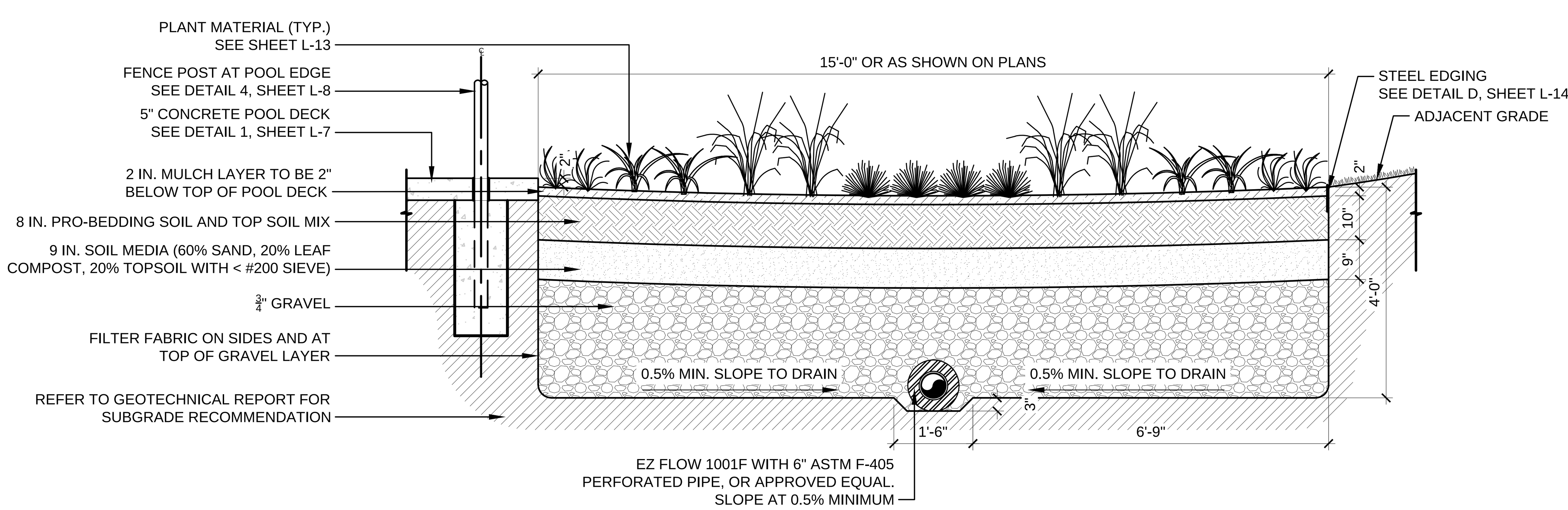
LEGEND

- - - - -	APPROXIMATE EXISTING GRADE
— - — - —	APPROXIMATE WEATHERED LIMESTONE
— · · — · · —	BORE LOCATION

NOTE:
1. REFER TO GEOTECHNICAL INVESTIGATION COMPLETED BY INTERTEK-PSI REPORT NO. 03381842, DATED DECEMBER 14, 2018
2. EXISTING GRADE AND WEATHERED LIMESTONE DEPTH ARE APPROXIMATE
3. ANY ROCK REMOVAL BY CONTRACTOR SHALL BE INCLUDED IN THE LUMP SUM CONTRACT

1 SITE SECTION

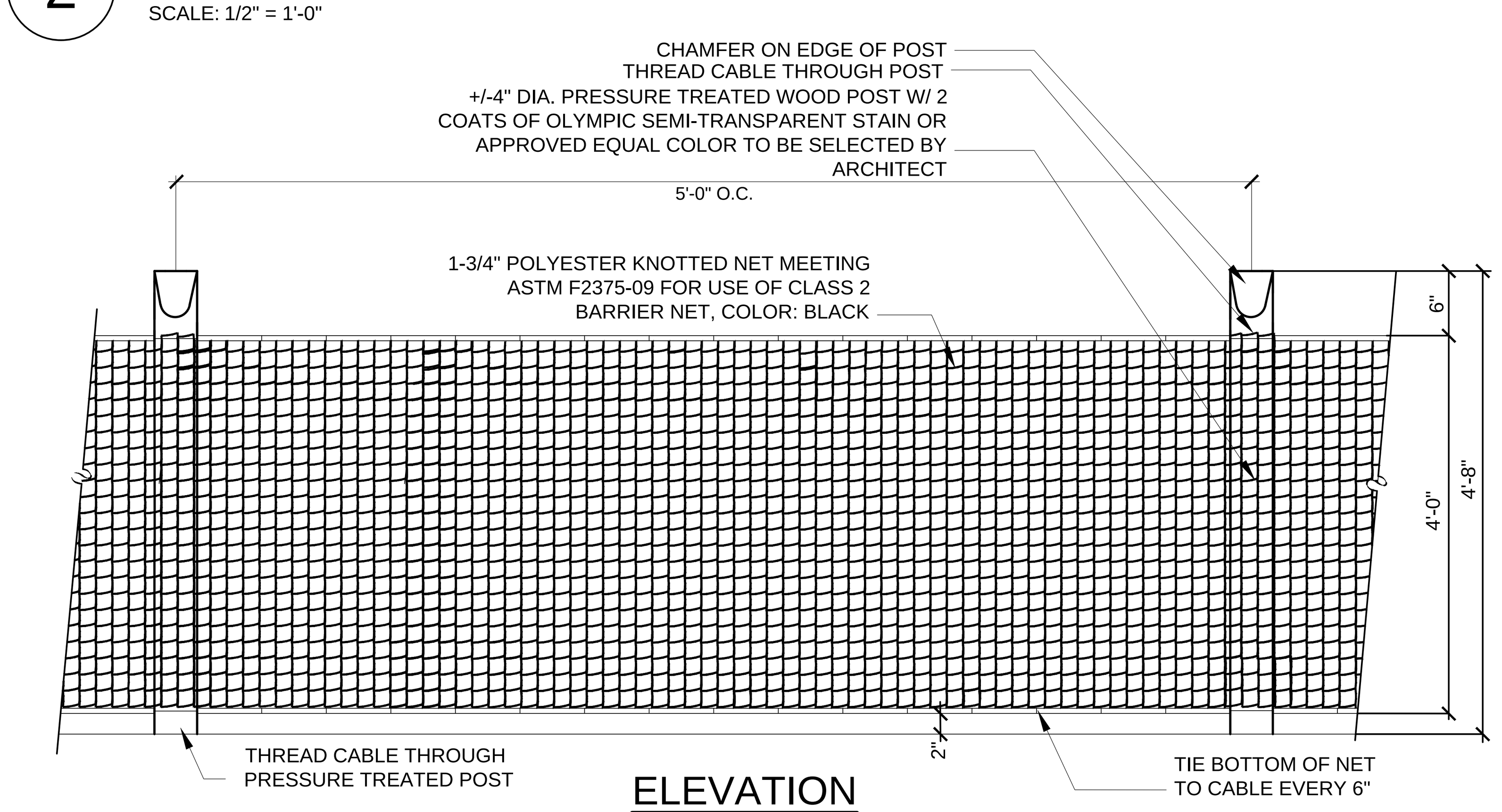
SCALE: 1" = 10'



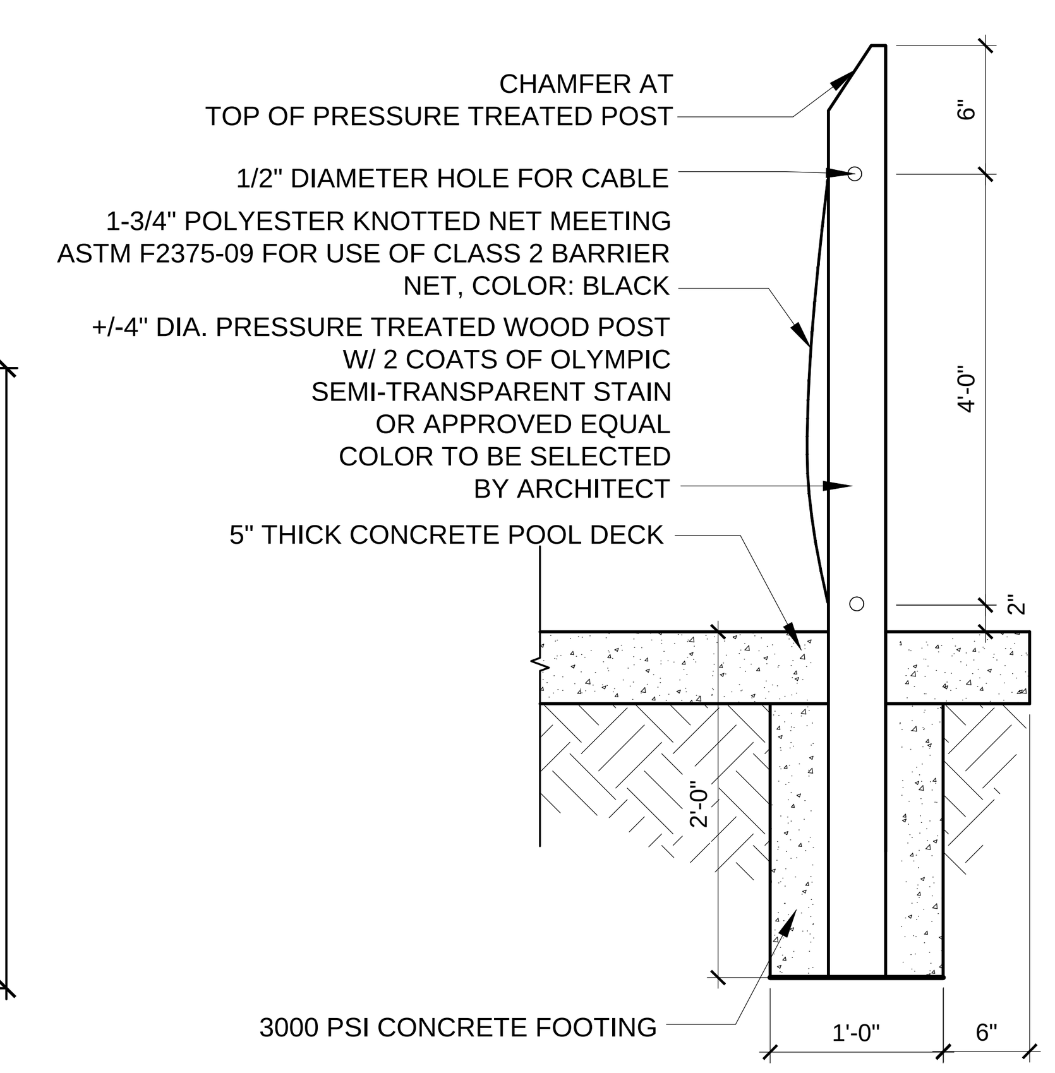
NOTE:
1. CONTRACTOR TO PROVIDE SAMPLE OF RETENTION AND MANUFACTURE SPEC FOR APPROVAL PRIOR TO INSTALLATION
2. NO DYED MULCH TO BE USED WITH BIORETENTION ZONE
3. CONTRACTOR TO REFERENCE SHEET L-5 FOR PERFORATED PIPE FLOW LINES AND LAYOUT.

2 BIORETENTION ZONE

SCALE: 1/2" = 1'-0"



ELEVATION



SECTION

NOTE:
1. NETTING TO BE 1-3/4" POLYESTER KNOTTED NET MEETING ASTM F2375-09 FOR USE OF CLASS 2 BARRIER NET, COLOR: BLACK.
2. NETTING TO BE INSTALLED IN PANELS NOT TO EXCEED THREE FENCE POSTS. OVERLAP PANELS AT POSTS TO ENSURE SECURITY
3. CONTACT KLOSE ASSOCIATES PHONE: (830) 708-5728, OR APPROVED EQUAL.
4. ALL POSTS SHALL BE PRESSURE TREATED

3 POST AND NET BARRIER (PROVIDE ±228 LF)

SCALE: N.T.S.

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MARK HATCHEL
2011015334 APRIL 2019

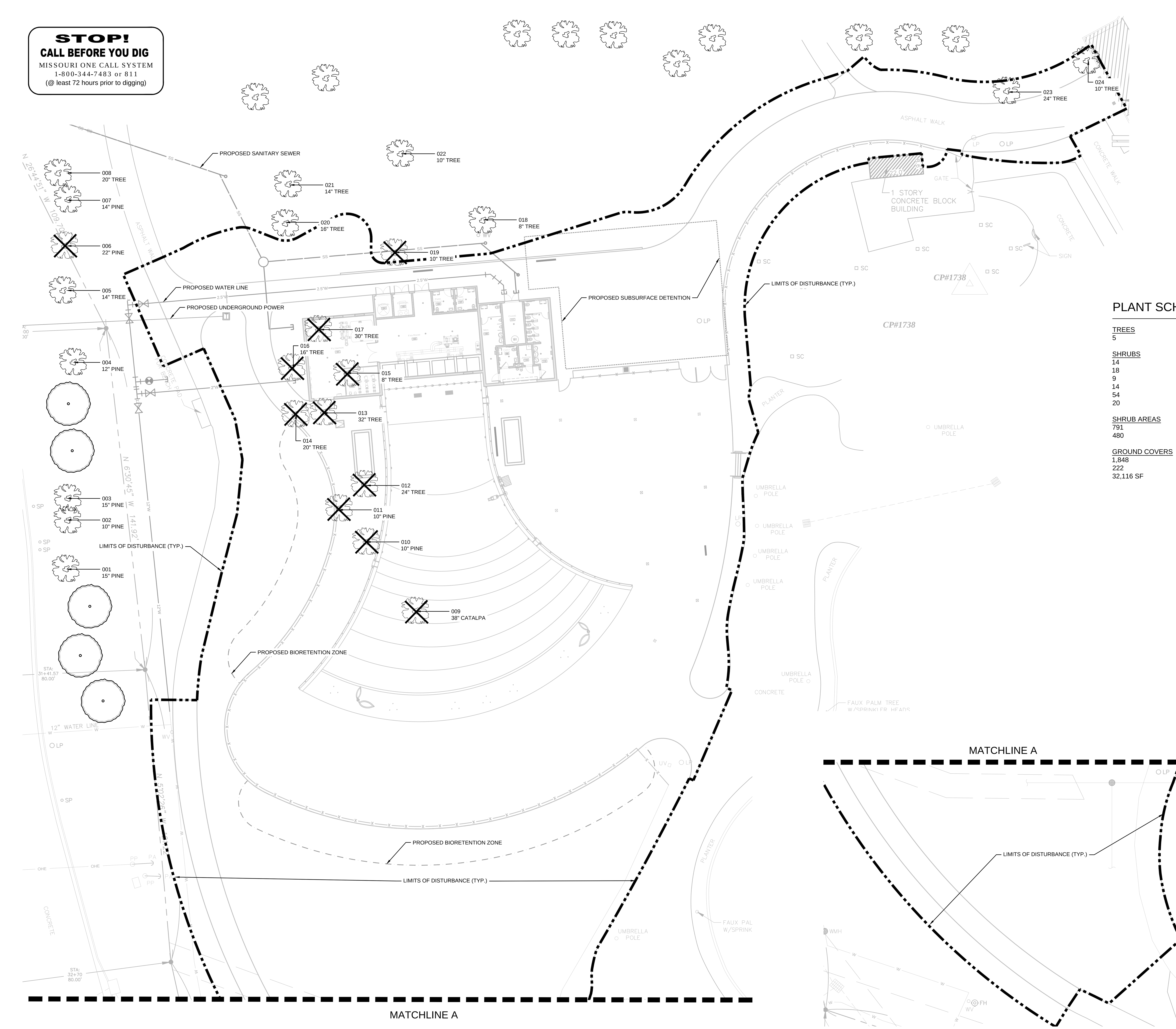
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

SITE DETAILS - 5

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-11

STOP!
CALL BEFORE YOU DIG
MISSOURI ONE CALL SYSTEM
1-800-344-7483 or 811
(@ least 72 hours prior to digging)



1 TREE CONSERVATION PLAN
SCALE: 1" = 20'

LEGEND

- EXISTING TREE TO REMAIN
- EXISTING TREE TO BE REMOVED
- LIMITS OF DISTURBANCE

PLANT SCHEDULE

TREES	BOTANICAL NAME	COMMON NAME
5	QUERCUS RUBRA	RED OAK

SHRUBS	BOTANICAL NAME	COMMON NAME
14	BUXUS X `GREEN VELVET`	BOXWOOD
18	BUDDLEJA X `PURPLE HAZE`	LO & BEHOLD PURPLE HAZEF BUTTERFLY BUSH
9	EUONYMUS ALATUS `COMPACTUS`	COMPACT BURNING BUSH
14	JUNIPERUS HORIZONTALIS	CREEPING JUNIPER
54	PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS
20	PHYSOCARPUS OPULIFOLIUS	NINEBARK

SHRUB AREAS	BOTANICAL NAME	COMMON NAME
791	AMSONIA ILLUSTRIS	OZARK BLUE STAR
480	MONARDA FISTULOSA	BERGAMOT

GROUND COVERS	BOTANICAL NAME	COMMON NAME
1,848	CAREX MUSKINGUMENSIS	PALM SEDGE
222	LIRIOPE MUSCARI `EMERALD GODDESS`	LIRIOPE
32,116 SF	FESTUCA ARUNDINACEA	TALL FESCUE

Tree No.	DBH in.	Species	Status
1	15	Pine	To Remain
2	10	Pine	To Remain
3	15	Pine	To Remain
4	12	Pine	To Remain
5	14	Tree	To Remain
6	22	Pine	To Be Removed
7	14	Pine	To Remain
8	20	Tree	To Remain
9	28	Catalpa	To Be Removed
10	10	Pine	To Be Removed
11	10	Pine	To Be Removed
12	24	Tree	To Be Removed
13	32	Tree	To Be Removed
14	20	Tree	To Be Removed
15	8	Tree	To Be Removed
16	16	Tree	To Be Removed
17	30	Tree	To Be Removed
18	8	Tree	To Remain
19	10	Tree	To Be Removed
20	16	Tree	To Remain
21	14	Tree	To Remain
22	10	Tree	To Remain
23	24	Tree	To Remain
24	10	Tree	To Remain

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L.A. No. 2011010334 Date APRIL 2019

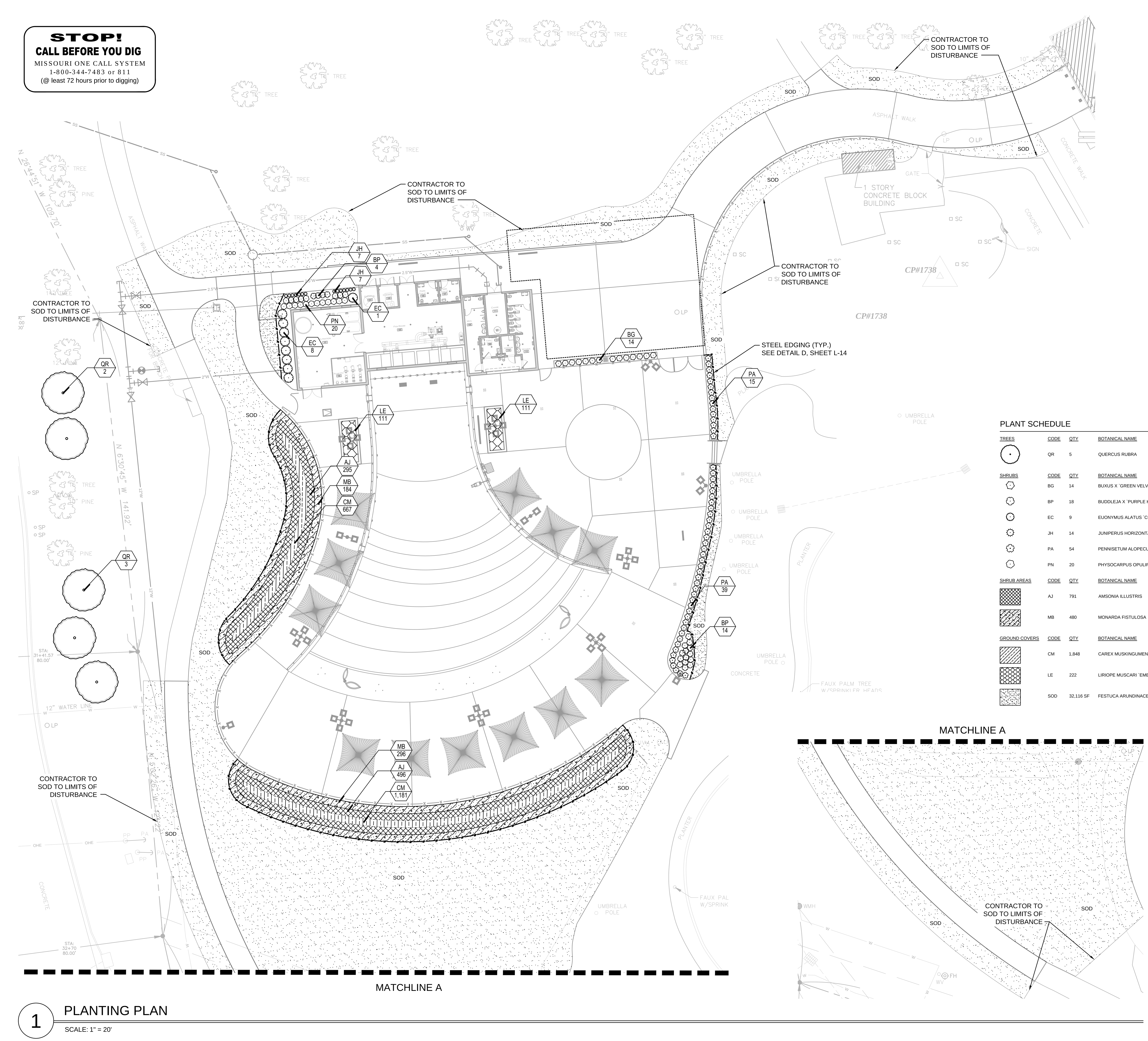
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

TREE CONSERVATION PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-12

File: K:\DAL_LALP\LAC_LALP\064538700_lees summit\Dwg\Sheet\L-12 TREE CONSERVATION PLAN.dwg [TREE CONSERVATION PLAN]
Xrefs: x24X36 xsite xsurvey xgrad xlandscape xbndy xexutil xutil xstorm Images:



NORTH

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City of Lee's Summit Landscape Requirements - Unified Development Odrinance		
Summit Waves Wave Pool Addition		
Tree Conservation Plan Sec. 8.740	**Required**	**Provided**
A tree conservation plan shall be submitted to the Department prior to any grading, bulldozing, or other removal of existing vegetation that may affect existing tree coverage. A preliminary plan may be submitted in certain circumstances, as provided below:	YES	YES
Street Frontage Sec. 8.790.A	**Required**	**Provided**
One tree shall be planted for each 30 feet of street frontage, public or private, within the landscaped setback abutting said street frontage. 350 LF / 30 LF = 12 Trees	12 Trees	7 Existing Trees 5 Proposed Trees
One shrub shall be provided for each 20 feet of street frontage, or portion thereof, within the landscaped setback abutting such frontage. 350 LF / 20 LF = 18 Shrubs	18 Shrubs	18 Shrubs**
Open Yard Area SEC. 8.790.B	**Required**	**Provided**
The minimum open yard area landscaping requirements shall be two shrubs per 5,000 square feet of total lot area 84,650 SF / 5,000 SF = 17 Shrubs x 2 = 34 Shrubs	34 Shrubs	219 Shrubs
Landscape Strips long Street Frontage Sec. 8.800	**Required**	**Provided**
Frontage landscape strips shall contain no structures, parking areas, patios, strom water detention facilities unless included in the landscape plan as an amenity.	YES	YES

*GROUNDCOVER SHALL BE UTILIZED ON ALL SLOPES IN EXCESS OF 3:1 SLOPES
** STREET FRONTAGE SHRUBS PLACED ELSEWHERE ON SITE DUE TO R.O.W. AND UTILITY EASEMENTS

PLANT SCHEDULE

TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	CONT	CALIPER	SIZE	REMARKS
	QR	5	QUERCUS RUBRA	RED OAK	B & B	3" CAL	8`-10` H X 4`-5` W	SINGLE STRAIGHT LEADER, FULL AND MATCHING
SHRUBS	**CODE**	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SPACING**	**SIZE**	**REMARKS**
	BG	14	BUXUS X `GREEN VELVET`	BOXWOOD	5 GAL	36" O.C.	24"H X 24"W	FULL AND MATCHING
	BP	18	BUDDLEJA X `PURPLE HAZE`	LO & BEHOLD PURPLE HAZEF BUTTERFLY BUSH	5 GAL	30" O.C.	24"H X 24"W	FULL AND MATCHING
	EC	9	EUONYMUS ALATUS `COMPACTUS`	COMPACT BURNING BUSH	5 GAL	48" O.C.	24" H X 24" W	FULL AND MATCHING
	JH	14	JUNIPERUS HORIZONTALIS	CREEPING JUNIPER	5 GAL	12" H X 18" W	24" O.C.	FULLL AND MATCHING
	PA	54	PENNISETUM ALOPECUROIDES	FOUNTAIN GRASS	5 GAL	24" O.C.	18" H X 18" W	FULL AND MATCHING
	PN	20	PHYSOCARPUS OPULIFOLIUS	NINEBARK	5 GAL	18" O.C.	18" H X 12" W	FULL AND MATCHING
SHRUB AREAS	**CODE**	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SPACING**	**SIZE**	**REMARKS**
	AJ	791	AMSONIA ILLUSTRIS	OZARK BLUE STAR	4"POT	6" H X 6" W		FULL AND MATCHING
	MB	480	MONARDA FISTULOSA	BERGAMOT	5 GAL	12" H X 12" W	24" O.C.	FULL AND MATCHING
GROUND COVERS	**CODE**	**QTY**	**BOTANICAL NAME**	**COMMON NAME**	**CONT**	**SIZE**	**SPACING**	**REMARKS**
	CM	1,848	CAREX MUSKINGUMENSIS	PALM SEDGE	4"POT	2"-3"	8" O.C.	FULL AND MATCHING
	LE	222	LIRIOPE MUSCARI `EMERALD GODDESS`	LIRIOPE	1 GAL	8" HT. X 8" W.	12" O.C.	FULL AND MATCHING
	SOD	32,116 SF	FESTUCA ARUNDINACEA	TALL FESCUE	SOD			TALL FESCUE SOD BLEND PER CITY REQUIREMENTS. SOD TO HAVE TIGHT, SAND ROLLED JOINTS AND BE FREE OF WEEDS.

1 PLANTING PLAN
SCALE: 1" = 20'

Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
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WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

95% REVIEW SET
FOR REVIEW ONLY
Not for construction or permit purposes.
Kimley»Horn
P.L.A. MARK HATCHEL
L.A. No. 2011010334 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

PLANTING PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-13

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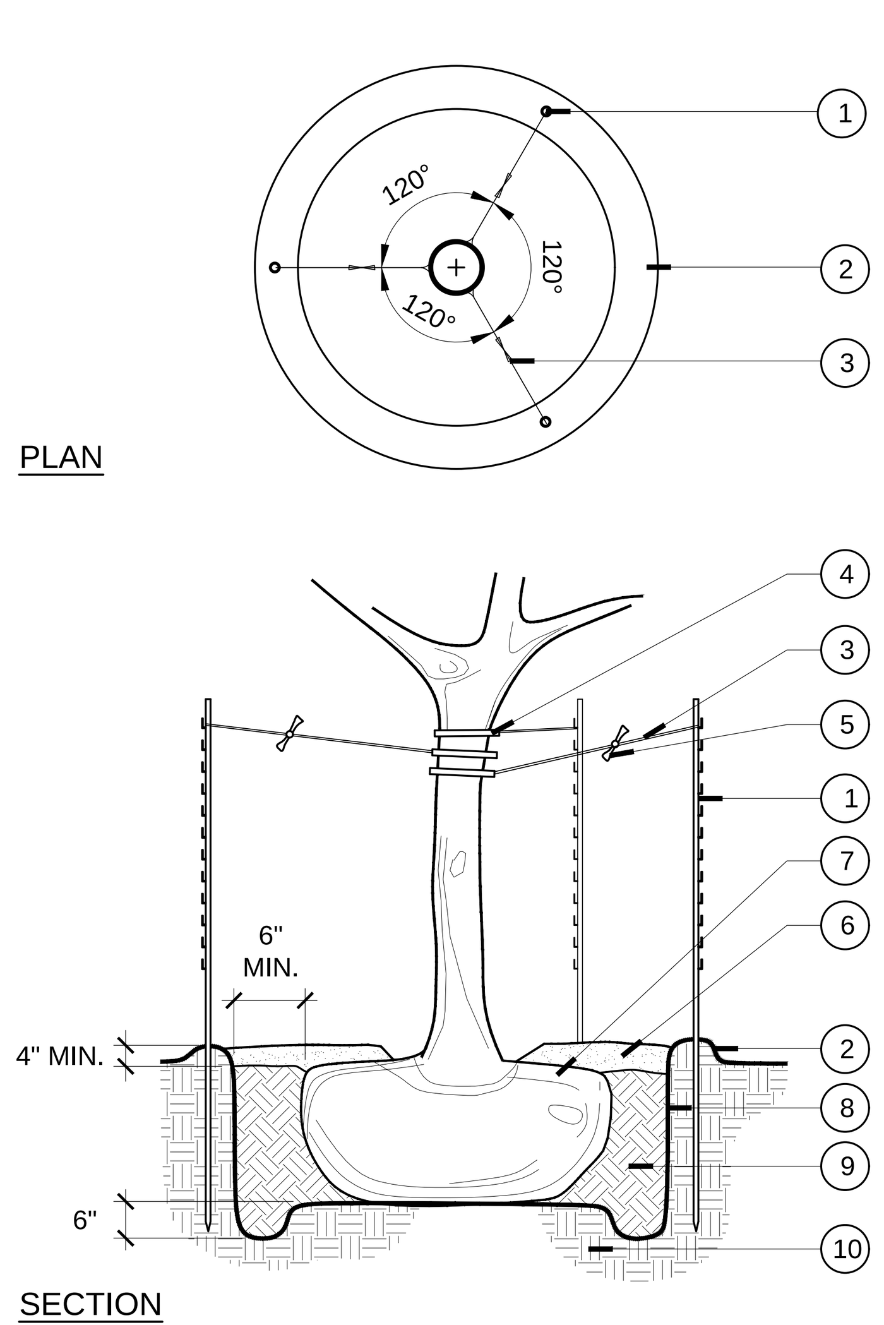
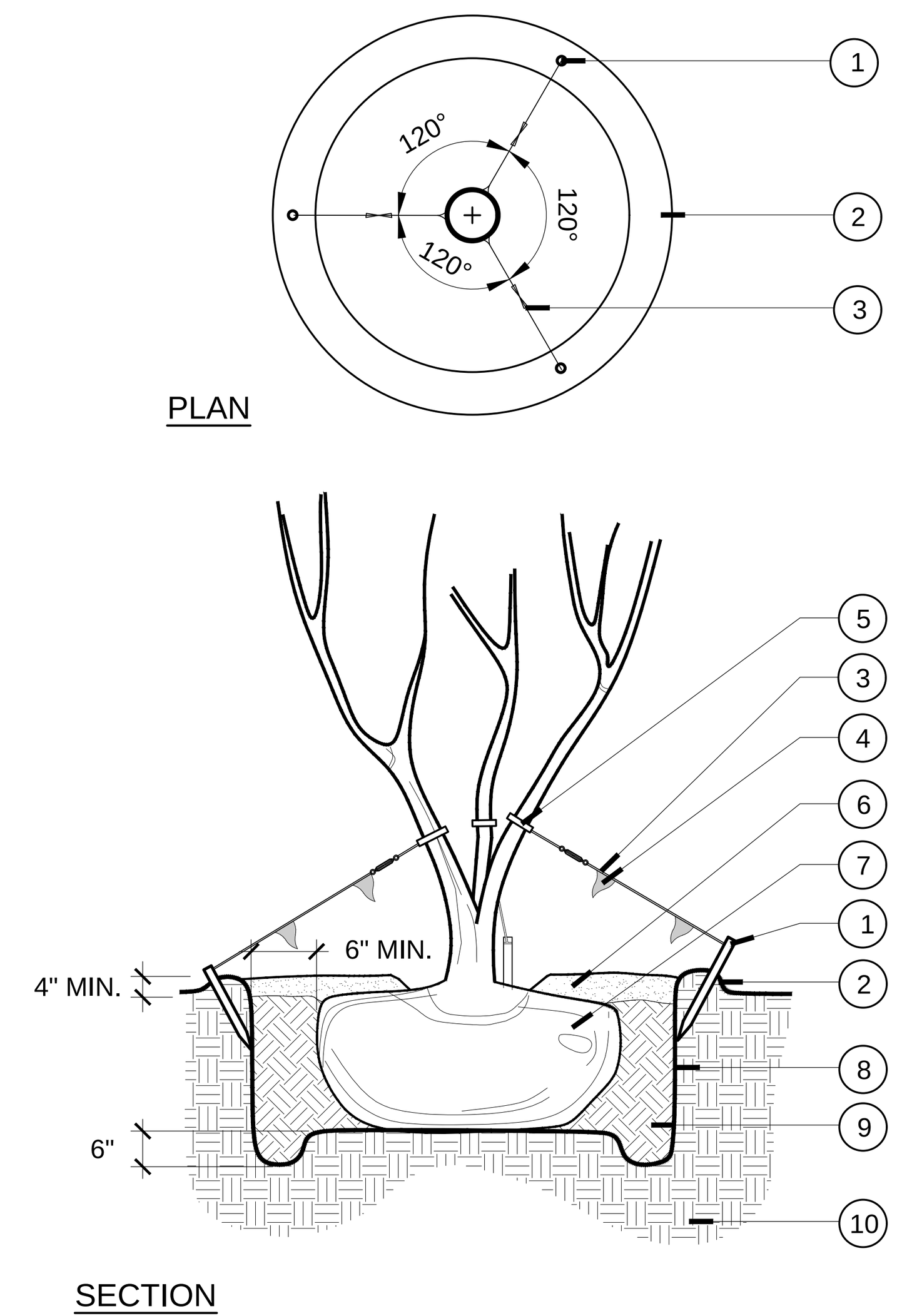
Xrefs: x24X36 xsite xsurvey xgrad xlandscape xstorm xutil Images:



1. 2"X2"X8' STEEL FENCE 'T' POST, 3 PER TREE, EQUALLY SPACED, MATERIAL PER NOTES AND/OR SPECIFICATIONS.
2. 4" EARTH SAUCER
3. GALVANIZED GUY WIRE; ADD TURNBUCKLES AS NECESSARY TO STABILIZE TREE.
4. RUBBER CHAFING GUARDS
5. WARNING FLAGS
6. 2" MULCH PER SPECIFICATIONS
7. ROOT BALL: REMOVE FROM CONTAINER. REMOVE ALL PLASTIC LINERS, AND OTHER SYNTHETIC MATERIALS FROM THE ENTIRE ROOTBALL.
8. PLANTING PIT EXCAVATED 12" LARGER (MIN.) THAN WIDTH OF ROOTBALL. PIT DEPTH AS NEEDED TO SET ROOTBALL COLLAR AT PROPOSED FINISHED GRADE. PLACE ROOTBALL ON SOLID SOIL AND NOT LOOSE BACKFILL.
9. PIT BACKFILL SOIL PER SPECIFICATIONS
10. UNDISTURBED EARTH

A TREE PLANTING

N.T.S.



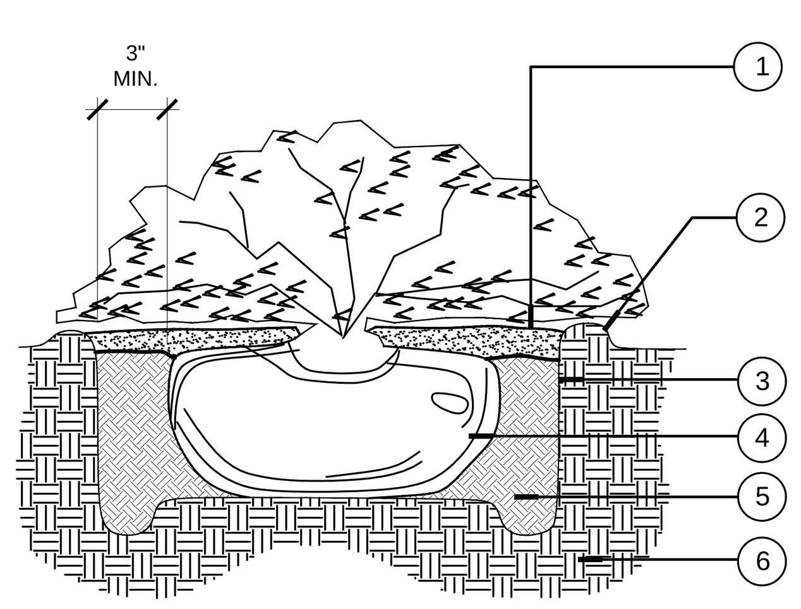
1. 2"X2"X24" WOOD STAKE, 3 PER TREE, MATERIAL PER NOTES AND/OR SPECIFICATIONS
2. 4" EARTH SAUCER
3. GALVANIZED GUY WIRE; ADD TURNBUCKLES AS NECESSARY TO STABILIZE TREE.
4. WARNING FLAGS
5. RUBBER CHAFING GUARDS
6. 4" MULCH PER SPECIFICATIONS
7. ROOT BALL: REMOVE BURLAP, BURLAP TIES, AND WIRE BASKET FROM TOP 1/3 OF ROOTBALL. REMOVE ALL NYLON STRINGS, PLASTIC LINERS, AND OTHER SYNTHETIC MATERIALS FROM THE ENTIRE ROOTBALL.
8. PLANTING PIT EXCAVATED 12" LARGER (MIN.) THAN WIDTH OF ROOTBALL. PIT DEPTH AS NEEDED TO SET ROOTBALL COLLAR AT PROPOSED FINISHED GRADE. PLACE ROOTBALL ON SOLID SOIL AND NOT LOOSE BACKFILL.
9. PIT BACKFILL SOIL PER SPECIFICATIONS
10. UNDISTURBED EARTH

E ORNAMENTAL TREE DETAIL

N.T.S.

PLANTING NOTES

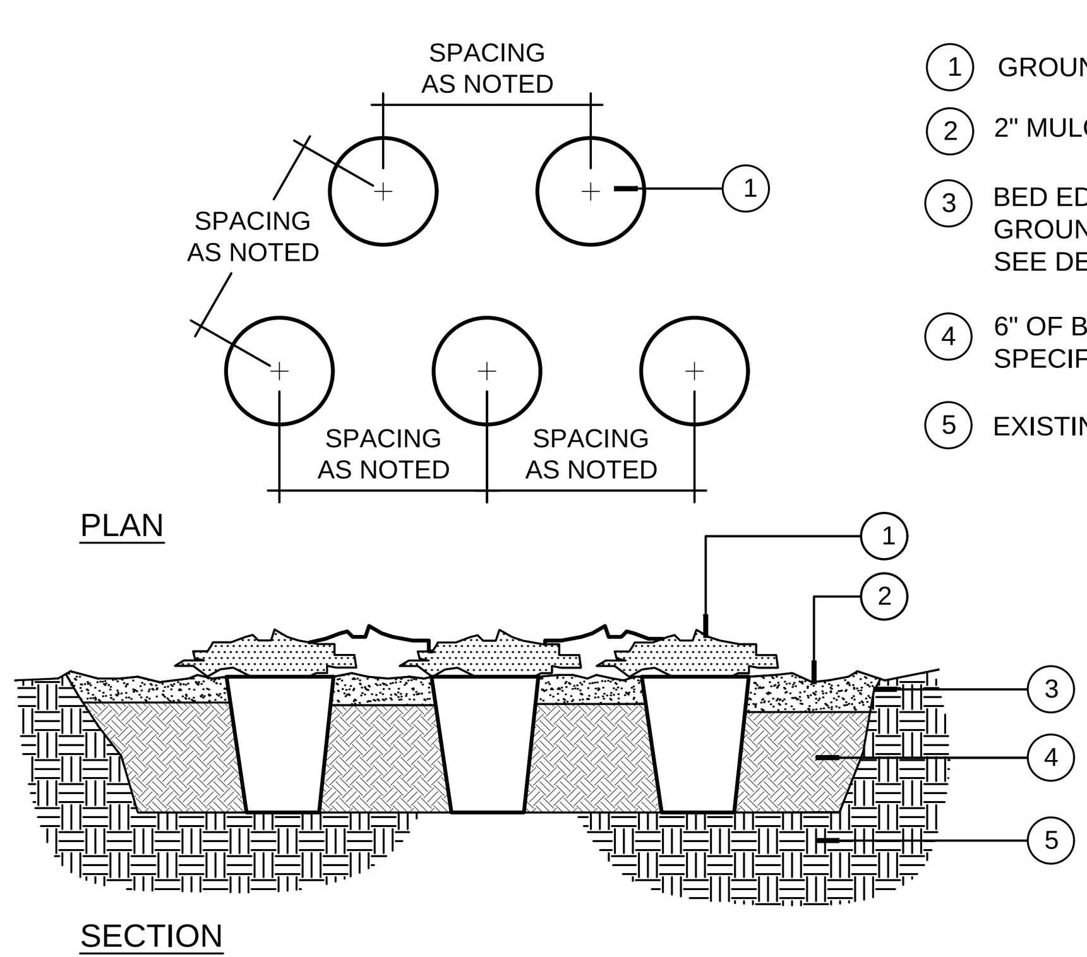
1. ALL PLANT MATERIAL SHALL BE INSTALLED ACCORDING TO SOUND NURSERY PRACTICES AND SHALL MEET ALL STANDARDS AS STATED IN THE LATEST EDITION OF "AMERICAN STANDARD FOR NURSERY STOCK" BY THE AMERICAN ASSOCIATION OF NURSERYMEN.
2. NO SUBSTITUTIONS IN PLANT MATERIALS SHALL BE MADE WITHOUT WRITTEN AUTHORIZATION FROM OWNER OR LANDSCAPE ARCHITECT. IN THE EVENT OF DISCREPANCIES BETWEEN THE DRAWING AND THE PLANT LIST, THE DRAWING SHALL PREVAIL.
3. LOCATE ALL UTILITIES PRIOR TO ANY DIGGING OPERATIONS. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL DAMAGES TO EXISTING UTILITIES INCURRED BY HIS WORK.
4. ALL LANDSCAPED AREAS SHALL BE FULLY IRRIGATED WITH AN AUTOMATIC IRRIGATION SYSTEM.
5. STAKING AND GUYING ALTERNATIVES: METHODS INDICATED IN DRAWING DETAILS ARE PREFERRED. CONTRACTOR MAY SUGGEST ALTERNATE METHODS, ASSUMING FULL RESPONSIBILITY FOR THEIR IMPLEMENTATION. CONTRACTOR SHALL REPLACE, PLANT, OR UPRIGHT ANY TREES BLOWN OVER OR DAMAGED DUE TO INADEQUATE STAKING AT NO ADDITIONAL COST TO THE OWNER.
6. PLANTS MASSED IN BEDS SHALL BE ARRANGED USING TRIANGULAR SPACING.
7. PROVIDE A STEEL EDGE OR SPADE EDGE BETWEEN ALL PLANTING BEDS AND LAWN AREAS AS CALLED FOR ON PLANS.
8. ALL PLANTING BEDS TO BE TOP DRESSED WITH A MINIMUM OF 2" SHREDDED CYPRESS BARK MULCH.
9. PROVIDE GRASS SEEDING OR LAY SOD FOR PROPOSED LAWN AREAS TO ALL EDGES OF PAVEMENT AND/ OR LIMITS OF DISTURBANCE OUTSIDE R.O.W. OR PROPOSED LANDSCAPE EASEMENT.
10. THE CONTRACTOR, SHALL BE RESPONSIBLE FOR THE MAINTENANCE OF ALL LANDSCAPING UNTIL FINAL ACCEPTANCE. ALL REQUIRED LANDSCAPING SHALL BE MAINTAINED IN A NEAT AND ORDERLY MANNER AT ALL TIMES. THE WORK SHALL INCLUDE, BUT NOT TO BE LIMITED TO, MOWING, EDGING, PRUNING, FERTILIZING, WATERING, WEEDING, AND OTHER SUCH ACTIVITIES COMMON TO THE MAINTENANCE OF LANDSCAPING. ALL PLANT MATERIALS SHALL BE MAINTAINED IN A HEALTHY AND GROWING CONDITION AS IS APPROPRIATE FOR THE SEASON OF THE YEAR. PLANT MATERIAL THAT DIES SHALL BE REPLACED WITH THE PLANT MATERIAL OF SIMILAR SIZE AND VARIETY.
11. CONTRACTOR SHALL WARRANTY PLANT MATERIAL TO REMAIN ALIVE AND HEALTHY FOR A PERIOD OF ONE YEAR AFTER FINAL ACCEPTANCE. WARRANTY SHALL NOT INCLUDE DAMAGE FOR LOSS OF PLANT MATERIAL DUE TO NATURAL CAUSES, ACTS OF VANDALISM OR NEGLIGENCE ON THE PART OF THE OWNER.
12. QUANTITIES ARE APPROXIMATE AND ARE PROVIDED ONLY FOR THE CONVENIENCE OF THE CONTRACTOR. CONTRACTOR IS RESPONSIBLE FOR VERIFYING QUANTITIES AND PROVIDING SUFFICIENT QUANTITIES OF MATERIAL FOR COVERAGE BASED ON THE AREAS TO BE COVERED AND PLANT SPACING CALLED FOR.
13. ALL DISTURBED AREAS ON SITE NOT CALLED TO BE SODDED, SHALL BE REESTABLISHED WITH SEED OR HYDROMULCH.



1. 2" MULCH PER SPECIFICATIONS
2. 3" HIGH EARTH SAUCER
3. PLANTING PIT: EXCAVATE 6" LARGER (MIN.) THAN WIDTH OF ROOTBALL, W/ PIT DEPTH AS NEEDED TO SET ROOTBALL @ PROPOSED FINISHED GRADE. PLACE ROOTBALL ON SOLID SOIL AND NOT LOOSE BACKFILL. SCARIFY SIDES OF PIT. PROVIDE CONTINUOUS PIT FOR MASSED BED PLANTINGS.
4. ROOT BALL: REMOVE FROM CONTAINER. GENTLY SCARIFY GIRDLED ROOTS AS NEEDED. REMOVE ALL TAGS & TWINE.
5. PIT BACKFILL W/ PREPARED SOIL BED MIX PER SPECIFICATIONS. PROVIDE CONTINUOUS SOIL BED MIX IN MASS PLANTINGS.
6. UNDISTURBED EARTH

B SHRUB PLANTING

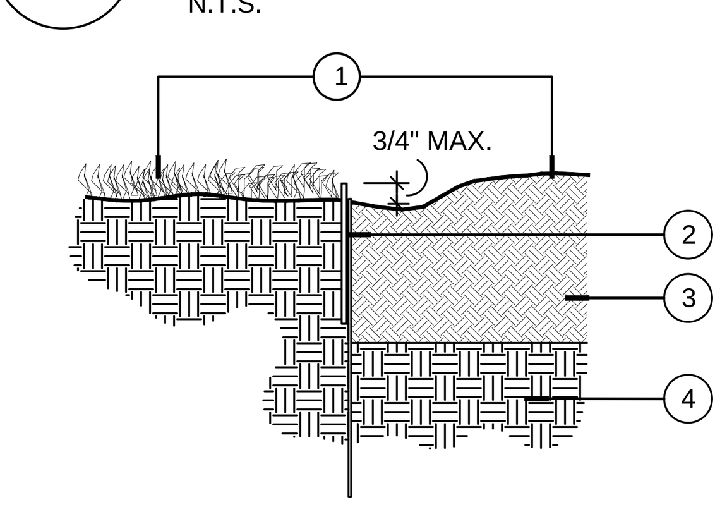
N.T.S.



1. GROUNDCOVER
2. 2" MULCH PER SPECIFICIATIONS.
3. BED EDGE WHERE GROUNDCOVER MEETS LAWN. SEE DETAIL D, THIS SHEET.
4. 6" OF BEDDING MIX PER SPECIFICATIONS.
5. EXISTING SUBGRADE

C GROUNDCOVER PLANTING

N.T.S.



1. DIFFERENT PLANTING TREATMENTS.
2. STEEL EDGING, PER SPECIFICATIONS
3. BED SOIL. REF: NOTES AND/OR SPECS FOR MIX. & DEPTH.
4. NATIVE SOIL

D STEEL EDGING (+/- 505 LF)

N.T.S.

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MISSOURI REGISTRATION NUMBER 001512

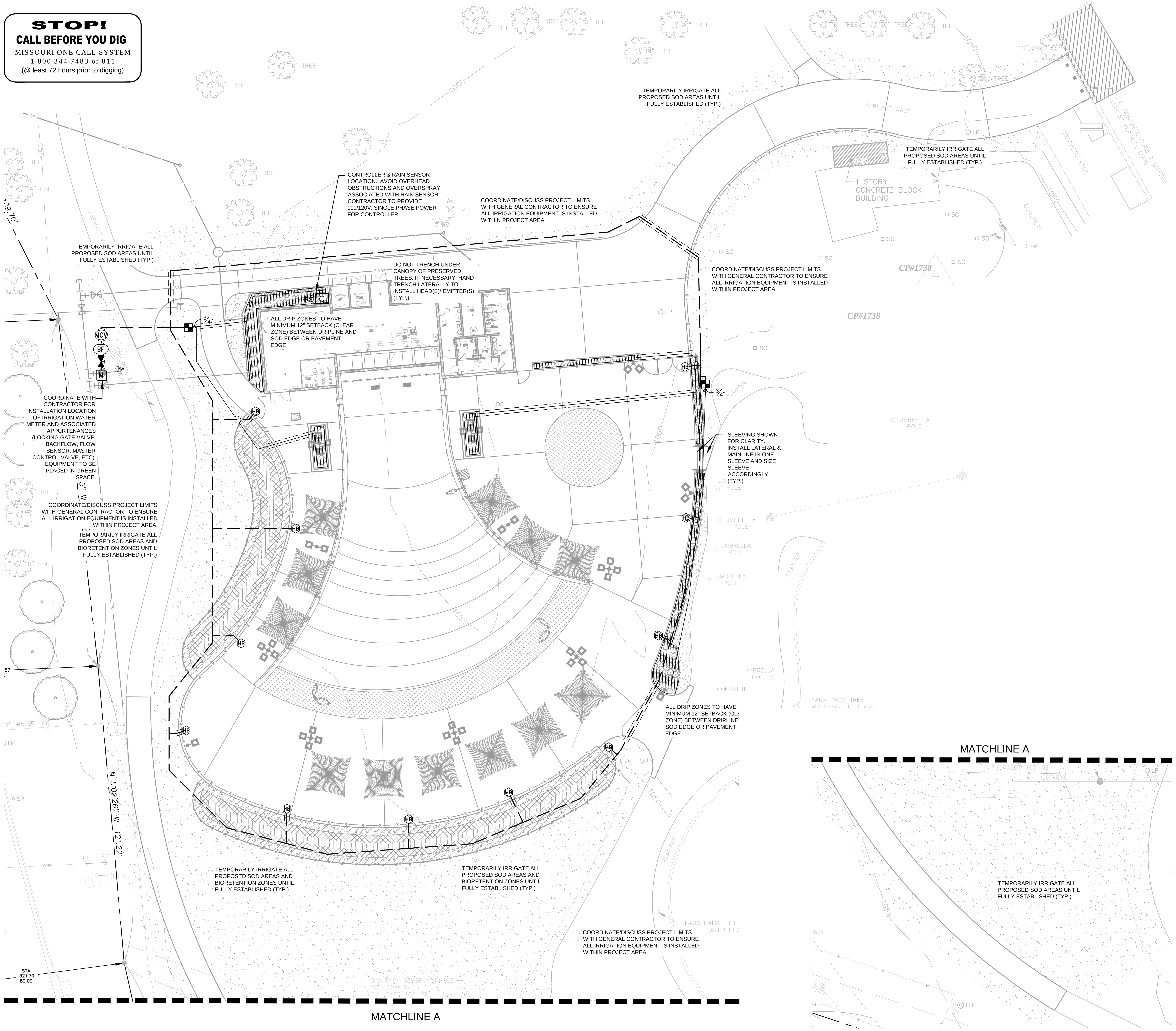
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

PLANTING DETAILS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-14

STOP!
CALL BEFORE YOU DIG
MISSOURI ONE CALL SYSTEM
1-800-344-7483 or 811
(@ least 72 hours prior to digging)



1 IRRIGATION PLAN

SCALE: 1" = 30'

IRRIGATION NOTES

1. IRRIGATION CONTRACTOR SHALL TEST EXISTING STATIC PRESSURE ON SITE PRIOR TO CONSTRUCTION. SHOULD EXISTING SITE PRESSURE BE BELOW 65 PSI, CONTRACTOR SHALL CONTACT THE IRRIGATION DESIGNER PRIOR TO COMMENCEMENT OF CONSTRUCTION.
2. COORDINATE IRRIGATION INSTALLATION WITH PLANTING PLAN AND SITE CONDITIONS TO PROVIDE COMPLETE COVERAGE WITH MINIMUM OVERSPRAY. THE IRRIGATION CONTRACTOR SHALL MAKE MINOR ADJUSTMENTS TO ENSURE PROPER COVERAGE AT NO ADDITIONAL COST TO THE OWNER.
3. THE IRRIGATION CONTRACTOR WILL SECURE ALL REQUIRED PERMITS AND PAY ALL ASSOCIATED FEES UNLESS OTHERWISE NOTED. ALL LOCAL CODES SHALL PREVAIL OVER ANY DISCREPANCIES HEREIN.
4. LATERAL PIPE SHALL BE INSTALLED AT A MINIMUM DEPTH OF 12 INCHES. MAINLINE PIPE AND WIRES SHALL BE INSTALLED AT A MINIMUM DEPTH OF 18 INCHES.
5. ELECTRICAL POWER SHALL BE PROVIDED WITHIN 5 FEET OF CONTROLLER LOCATION BY GENERAL CONTRACTOR. L.I.C. TO PROVIDE FINAL HARD WIRE TO CONTROLLER.
6. 24 VOLT VALVE WIRE SHALL BE A MINIMUM OF 16 GAUGE, U.L. APPROVED FOR DIRECT BURIAL, SINGLE CONDUCTOR "IRRIGATION WIRE". WIRE SPLICES SHALL BE ENCASED IN A WATERPROOF WIRE CONNECTOR UL APPROVED AND FILLED WITH SILICONE.
7. VALVE BOXES SHALL BE INSTALLED FLUSH WITH GRADE, WITH THREE INCHES OF CLEAN PEA GRAVEL LOCATED BELOW THE VALVE. USE 10" ROUND VALVE BOXES FOR ELECTRIC VALVES AND QUICK COUPLING VALVES UNLESS NOTED OTHERWISE. D.C.A. SHALL BE BOXED ACCORDING TO LOCAL CODES.
8. USE PVC SWING JOINT ASSEMBLIES TO CONNECT ALL SPRAY HEADS.
9. ALL ROTOR HEADS SHALL BE CONNECTED WITH A 12" MINIMUM LENGTH OF 1/2 FLEX PVC. THE FLEX PVC SHALL BE SOLVENT WELDED TO SCHEDULE 40 PVC FITTINGS WITH WELD ON *795 SOLVENT AND *P-70 PRIMER. PRIMER SHALL BE PURPLE IN COLOR.
10. CONTRACTOR IS TO CONTACT APPROPRIATE AUTHORITIES AND LOCATE ALL UTILITIES PRIOR TO CONSTRUCTION.
11. SLEEVES SHALL BE INSTALLED BY GENERAL CONTRACTOR. SLEEVE MATERIAL SHALL BE PVC, SCHD. 40. CONTRACTOR SHALL EXTEND SLEEVES ONE FOOT BEYOND EDGE OF ALL PAVEMENT.
12. LANDSCAPE CONTRACTOR SHALL BE REQUIRED TO SUPPLY OWNER AND OWNERS CONTRACTOR WITH ALL EQUIPMENT SPECIFICATIONS AND MAINTENANCE GUIDELINES.
13. DRIP LINE SHALL BE PLACED A MINIMUM OF 2" UNDER MULCH.
14. LICENSED IRRIGATION CONTRACTOR SHALL ADJUST SPRAY NOZZLES FOR "HEAD-TO-HEAD" COVERAGE AND ADJUST FOR MINIMUM OVERSPRAY ONTO PAVEMENT. NO OVERSPRAY IS PERMITTED ONTO STREETS OR SIDEWALKS
15. IRRIGATION CONTRACTOR SHALL SUPPLY AND CONSTRUCT IRRIGATION SYSTEM WITH ALL MATERIALS AND PER MANUFACTURER SPECIFICATIONS SHOWN ON THIS PLAN. IF CONTRACTOR PREFERS MATERIALS THAT DIFFER FROM THE THIS PLAN, THEY SHALL BE APPROVED BY THE IRRIGATION DESIGNER PRIOR TO CONSTRUCTION.

IRRIGATION SCHEDULE

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
	Rain Bird XCZ-100-PRB-COM Wide Flow Drip Control Kit for Commercial Applications. 1" Ball Valve with 1" PESB Valve and 1" Pressure Regulating 40psi Quick-Check Basket Filter. 0.3gpm to 20gpm.	2
	Area to Receive Dripline Netafim TLCV-06-18 Techline Pressure Compensating Landscape Dripline with Check Valve. 0.6 GPH emitters at 18" O.C. Dripline laterals spaced at 18" apart, with emitters offset for triangular pattern. 17mm.	730.7 l.f.

SYMBOL	MANUFACTURER/MODEL/DESCRIPTION	QTY
HB	Hose Bibb	11
	LOCKING GATE VALVE/ISOLATION VALVE	1
MCV	Rain Bird PEB 1-1/2" 1", 1-1/2", 2" Plastic Industrial Valves. Low Flow Operating Capability, Globe Configuration.	1
BF	Febco 850 1-1/2" Double Check Backflow prevention, 1/2" to 2"	1
C	Rain Bird ESP8LXME 8 Station Capable Commercial Controller. Mounted on a Plastic Wall Mount. Without flow sensor.	1
RS	Rain Bird WR2-RFC Wireless Rain and Freeze Sensor Combo, includes 1 receiver and 1 rain/freeze sensor transmitter.	1
M	Water Meter 1-1/2"	1
	Irrigation Lateral Line: PVC Class 200 SDR 21	462.5 l.f.
	Irrigation Mainline: PVC Class 200 SDR 21	1,043 l.f.
	Pipe Sleeve: PVC Schedule 40 TYPICAL PIPE SLEEVE FOR IRRIGATION PIPE. PIPE SLEEVE SIZE SHALL ALLOW FOR IRRIGATION PIPING AND THEIR RELATED COUPLINGS TO EASILY SLIDE THROUGH SLEEVING MATERIAL. EXTEND SLEEVES 18 INCHES BEYOND EDGES OF PAVING OR CONSTRUCTION.	291.6 l.f.

Valve Callout
Valve Number
Valve Flow
Valve Size

NOTE:
THIS IRRIGATION PLAN IS DESIGNED TO THE FOLLOWING STATS: 65 PSI AND 75 GPM. IF WATER PRESSURE DOES NOT MEET DESIGN SPECIFICATIONS A BOOSTER PUMP WILL BE REQUIRED AT COST OF CONTRACTOR. CONTACT LANDSCAPE ARCHITECT PRIOR TO INSTALLATION IF SYSTEM HAS +/- 5 PSI THAN DESIGN PRESSURE.

ABOVE QUANTITIES PROVIDED FOR CONVENIENCE ONLY. CONTRACTOR TO CONFIRM ALL QUANTITIES PRIOR TO BIDDING.
REFERENCE MAXIMUM LATERAL DRIPLINE CHART TO DETERMINE MINIMUM NUMBER OF POINTS OF CONNECTION PER DRIP LINE ZONE.
WHERE LAYOUT FLEXIBILITY EXISTS CENTER FEED LAYOUTS MUST BE USED. THIS ALLOWS FOR EVEN FLOW OF WATER THROUGH THE ZONE.

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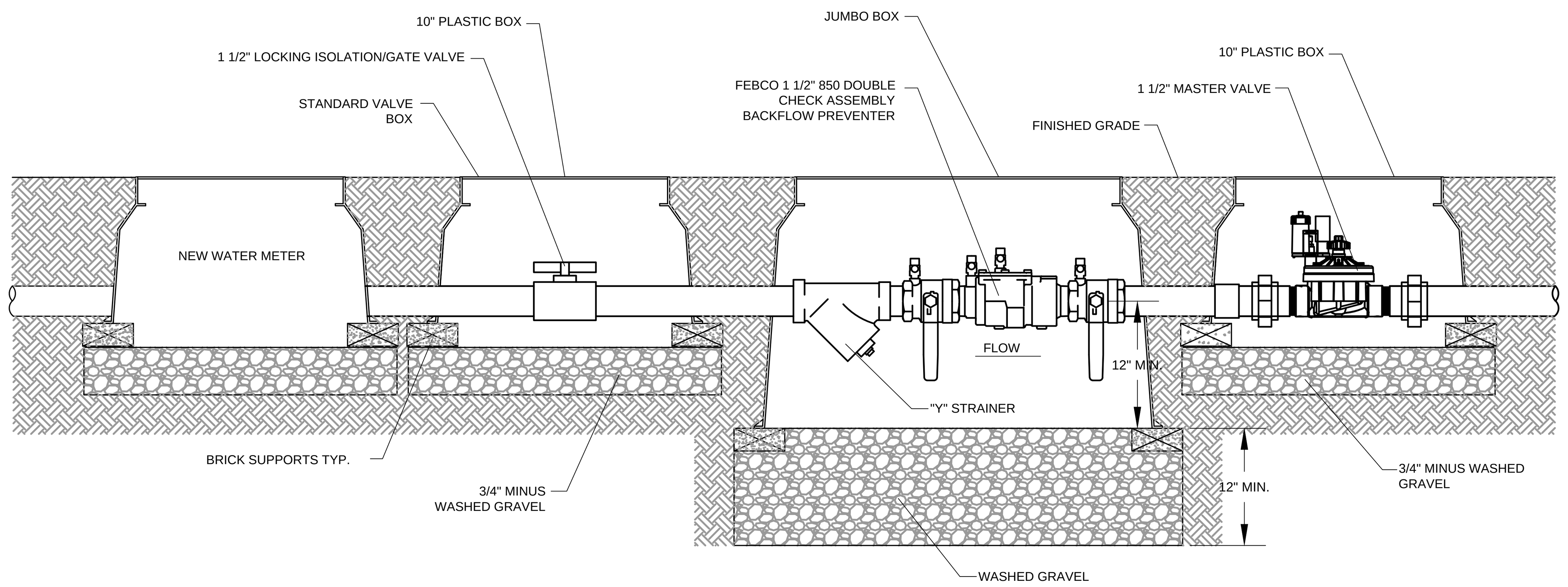
MARK HATCHEL
APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

IRRIGATION PLAN

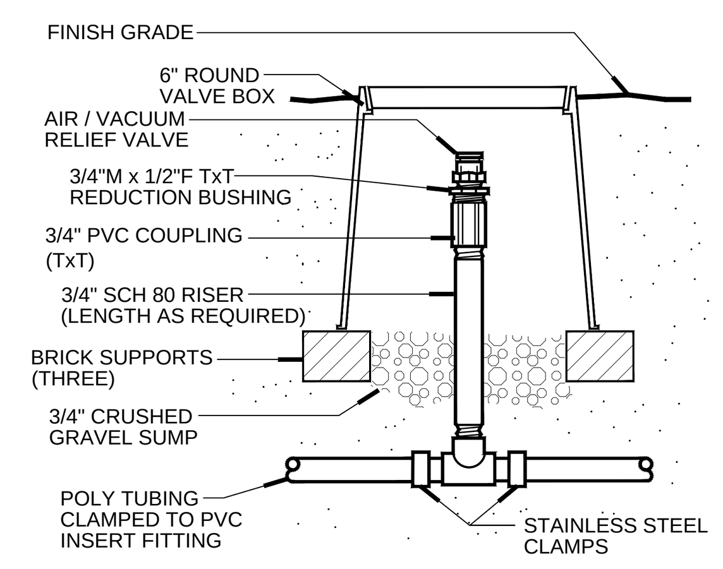
Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-15



DOUBLE CHECK ASSEMBLY BACKFLOW PREVENTER

N.T.S.



AIR/VACUUM RELIEF

(PLUMBED TO POLY) N.T.S.

GENERAL IRRIGATION SPECIFICATIONS AND NOTES

A. EXTENT:

INCLUDES FURNISHING ALL LABOR, MATERIALS AND EQUIPMENT FOR THE PROPER INSTALLATION OF THE IRRIGATION SYSTEM. THE WORK INCLUDES, BUT IS NOT LIMITED TO THE FOLLOWING: (1) TRENCHING AND BACKFILL, (2) AUTOMATICALLY CONTROLLED LOW VOLUME IRRIGATION SYSTEM, (3) TEST ALL SYSTEMS AND MAKE OPERATIVE, (4) "AS-BUILT" DRAWINGS.

B. GENERAL:

1. PERMITS AND FEES: OBTAIN ALL PERMITS AND PAY REQUIRED FEES TO ANY GOVERNMENTAL AGENCY HAVING JURISDICTION OVER THE WORK. INSPECTIONS REQUIRED BY LOCAL ORDINANCES DURING THE COURSE OF CONSTRUCTION SHALL BE ARRANGED AS REQUIRED. ON COMPLETION OF THE WORK, SATISFACTORY EVIDENCE SHALL BE FURNISHED TO THE OWNER'S CONSTRUCTION REPRESENTATIVE TO SHOW THAT ALL WORK HAS BEEN INSTALLED IN ACCORDANCE WITH THE MISSOURI BUILDING CODE - PLUMBING / APPENDIX 'F' AND CODE REQUIREMENTS.

2. APPROVAL: WHEREVER THE TERMS "APPROVE" OR "APPROVED" ARE USED IN THE SPECIFICATIONS, THEY SHALL MEAN THE APPROVAL OF THE OWNER'S CONSTRUCTION REPRESENTATIVE IN WRITING.

3. BEFORE ANY WORK IS STARTED, A CONFERENCE SHALL BE HELD BETWEEN THE CONTRACTOR AND THE OWNER'S CONSTRUCTION REPRESENTATIVE CONCERNING THE WORK UNDER THIS CONTRACT.

4. COORDINATION: COORDINATE AND COOPERATE WITH OTHER CONTRACTORS TO ENABLE THE WORK TO PROCEED AS RAPIDLY AND EFFICIENTLY AS POSSIBLE

5. INSPECTION OF SITE:

A. CONTRACTOR SHALL ACQUAINT HIMSELF WITH ALL SITE CONDITIONS. SUBMISSION OF HIS PROPOSAL SHALL BE CONSIDERED EVIDENCE THAT THE EXAMINATION HAS BEEN CONDUCTED. SHOULD UTILITIES NOT SHOWN ON THE PLANS BE FOUND DURING EXCAVATIONS, CONTRACTOR SHALL PROMPTLY NOTIFY THE OWNER'S CONSTRUCTION REPRESENTATIVE FOR INSTRUCTIONS AS TO FURTHER ACTION. FAILURE TO DO SO WILL MAKE CONTRACTOR LIABLE FOR ANY AND ALL DAMAGE THERETO ARISING FROM HIS OPERATIONS SUBSEQUENT TO DISCOVERY OF SUCH UTILITIES NOT SHOWN IN PLANS.

B. CONTRACTOR SHALL MAKE NECESSARY ADJUSTMENTS IN THE LAYOUT AS MAY BE REQUIRED TO CONNECT TO EXISTING STUBOUTS, SHOULD SUCH STUBS NOT BE LOCATED EXACTLY AS SHOWN, AND AS MAY BE REQUIRED TO WORK AROUND EXISTING WORK AT NO INCREASE IN COST TO THE OWNER'S CONSTRUCTION REPRESENTATIVE.

6. PROTECTION OF EXISTING PLANTS AND SITE CONDITIONS: THE CONTRACTOR SHALL TAKE NECESSARY PRECAUTIONS TO PROTECT SITE CONDITIONS TO REMAIN. SHOULD DAMAGE BE INCURRED, THE CONTRACTOR SHALL REPAIR THE DAMAGE TO ITS ORIGINAL CONDITION AT THE CONTRACTOR'S EXPENSE.

7. THE OWNER RESERVES THE RIGHT TO SUBSTITUTE, ADD, OR DELETE ANY MATERIAL OR WORK AS THE WORK PROGRESSES. ADJUSTMENTS TO THE CONTRACT PRICE SHALL BE NEGOTIATED IF DEEMED NECESSARY BY THE OWNER ON A PER DIEM BASIS.

8. THE OWNER RESERVES THE RIGHT TO REJECT MATERIAL OR WORK WHICH DOES NOT CONFORM TO THE CONTRACT DOCUMENTS. REJECTED WORK SHALL BE REMOVED OR CORRECTED AT THE EARLIEST TIME POSSIBLE.

9. WORK SCHEDULE: WITHIN 10 DAYS AFTER AWARD OF THE CONTRACT, THE CONTRACTOR SHALL SUBMIT TO THE OWNER A WORK SCHEDULE.

10. "AS-BUILT" IRRIGATION DRAWINGS: PREPARE AN "AS-BUILT" DRAWING ON A BLUEPRINT WHICH SHALL SHOW DEVIATIONS FROM THE BID DOCUMENTS MADE DURING CONSTRUCTION AFFECTING THE MAIN LINE PIPE, CONTROLLER LOCATIONS, REMOTE CONTROL VALVES AND QUICK COUPLING VALVES. THE DRAWINGS SHALL ALSO INDICATE AND SHOW APPROVED SUBSTITUTIONS OF SIZE, MATERIAL AND MANUFACTURERS NAME AND CATALOG NAME AND CATALOG NUMBER. THE DRAWINGS SHALL BE DELIVERED TO THE TENANT'S CONSTRUCTION REPRESENTATIVE BEFORE FINAL ACCEPTANCE OF WORK

11. FINAL ACCEPTANCE: FINAL ACCEPTANCE OF THE WORK MAY BE OBTAINED FROM THE OWNER'S CONSTRUCTION REPRESENTATIVE UPON THE SATISFACTORY COMPLETION OF ALL WORK.

12. GUARANTEE: ALL WORK SHALL BE GUARANTEED FOR ONE YEAR FROM DATE OF ACCEPTANCE AGAINST ALL DEFECTS IN MATERIAL, EQUIPMENT AND WORKMANSHIP. GUARANTEE SHALL ALSO COVER REPAIR OF DAMAGE TO ANY PART OF THE PREMISES RESULTING FROM LEAKS OR OTHER DEFECTS IN MATERIAL, EQUIPMENT AND WORKMANSHIP TO THE SATISFACTION OF THE TENANT'S CONSTRUCTION REPRESENTATIVE. REPAIRS, IF REQUIRED, SHALL BE DONE PROMPTLY AT NO COST TO THE OWNER.

13. A LAMINATED PLAN (8 1/2 X 11) SHOWING THE DIFFERENT IRRIGATION ZONES IN COLOR, PREPARED BY THE IRRIGATION CONTRACTOR, SHALL BE POSTED IN THE MECHANICAL ROOM.

C. MATERIALS:

1. GENERAL: ALL MATERIALS THROUGHOUT THE SYSTEM SHALL BE NEW AND IN PERFECT CONDITION.

2. PLASTIC PIPING: ALL MAIN LINES AND LATERAL LINES SHALL BE CLASS 200 POLYVINYL CHLORIDE (PVC) PIPE AND SHALL COMPLY WITH ONE OF THE FOLLOWING STANDARDS: ASTM D 1785, ASTM D-2241, AWWA C-900, OR AWWA C-905. SDR-PR PIPE SHALL HAVE A MINIMUM WALL THICKNESS AS REQUIRED BY SDR-26. PVC GASKETS FITTINGS SHALL CONFORMING TO ASTM D 3139. GASKETS SHALL CONFORM TO ASTM F 477. SOLVENT-WELD PVC FITTINGS SHALL MEET THE REQUIREMENTS OF SCHEDULE 40 AS SET FORTH IN ASTM D 2466. THREADED PVC PIPE FITTINGS SHALL MEET THE REQUIREMENTS OF SCHEDULE 40 AS SET FORTH IN ASTM D 2464. CONFORMING TO ASTM D-1784 AND D-2241

3. PLASTIC FITTINGS: ALL SOLVENT-WELD PVC FITTINGS SHALL MEET THE REQUIREMENTS OF SCHEDULE 40 AS SET FORTH IN ASTM D 2466. SCHEDULE 40 SOLVENT-WELD, POLYVINYL CHLORIDE (PVC) STANDARD WEIGHT AS MANUFACTURED BY SLOANE, LASCO, OR APPROVED EQUAL.

4. SOLVENT CEMENT: PVC CEMENT SHALL MEET ASTM D 2564 AND PVC CLEANER-TYPE SHALL MEET ASTM F 656.

5. SPRINKLER HEAD RISERS: SCHEDULE 40 PVC FOR RISERS. PIPE SHALL BE CUT WITH A STANDARD PIPE CUTTING TOOL WITH SHARP CUTTERS. REAM ONLY TO FULL DIAMETER OF PIPE AND CLEAN ALL ROUGH EDGES OR BURRS. CUT ALL THREADS ACCURATELY WITH SHARP DIES. NOT MORE THAN THREE(3) FULL THREADS SHALL SHOW BEYOND FITTINGS WHEN PIPE IS MADE UP. ASSEMBLIES SHALL BE AS DETAILED.

6. AUTOMATIC CONTROLLER: SEE LEGEND

7. REMOTE CONTROL VALVES: SEE LEGEND

8. CONTROL WIRING: 24 VOLT SOLID UL APPROVED FOR DIRECT BURIAL IN GROUND. MINIMUM WIRE SIZE: 16 GAUGE. ALL SPLICES SHALL BE MADE WITHIN VALVE BOX.

9. SLEEVES FOR CONTROL WIRING: UNDER ALL WALKS AND PAVED AREAS AND WHERE INDICATED ON DRAWINGS. MINIMUM PVC SCHEDULE 40 PLASTIC PIPE.

10. SPRINKLER HEADS/ DRIP LINE: SEE LEGEND

11. QUICK COUPLING VALVES: SHALL BE NOTED ON DRAWINGS.

D. WORKMANSHIP:

1. LAY OUT WORK AS ACCURATELY AS POSSIBLE TO THE DRAWINGS. THE DRAWINGS, THOUGH CAREFULLY DRAWN, ARE GENERALLY DIAGRAMMATIC TO THE EXTENT THAT SWING JOINTS, OFFSETS, AND ALL FITTINGS ARE NOT SHOWN.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR FULL AND COMPLETE COVERAGE OF ALL IRRIGATED AREAS AND SHALL MAKE ANY NECESSARY MINOR ADJUSTMENTS AT NO ADDITIONAL COST TO THE OWNER'S CONSTRUCTION REPRESENTATIVE.

3. ANY MAJOR REVISIONS TO THE IRRIGATION SYSTEM MUST BE SUBMITTED AND ANSWERED IN WRITTEN FORM, ALONG WITH ANY CHANGE IN CONTRACT PRICE.

E. INSTALLATION:

1. EXCAVATION AND TRENCHING:

A. PERFORM ALL EXCAVATIONS AS REQUIRED FOR THE INSTALLATION OF THE WORK INCLUDING UNDER THIS SECTION, INCLUDING SHORING OF EARTH BANKS TO PREVENT CAVE-INS. RESTORE ALL SURFACES, EXISTING UNDERGROUND INSTALLATIONS, ETC., DAMAGED OR CUT AS A RESULT OF THE EXCAVATIONS TO AND IN A MANNER APPROVED BY THE OWNER.

B. TRENCHES SHALL BE MADE WIDE ENOUGH TO ALLOW A MINIMUM OF 6 INCHES BETWEEN PARALLEL PIPE LINES. TRENCHES FOR PIPE LINES SHALL BE MADE OF SUFFICIENT DEPTHS TO PROVIDE THE MINIMUM COVER FROM FINISH GRADE AS FOLLOWS:

1) 24" MINIMUM BELOW BOTTOM PAVEMENT PER SLEEVING INSTALLATION DETAIL THIS SHEET
2) MINIMUM COVER OVER IRRIGATION LINES TO HEADS/ DRIPLINE EXCEPT VEHICLE TRAFFIC AREAS ARE AS FOLLOWS:

12" COVER OVER LATERALS
18" COVER OVER MAINLINE

C. MAINTAIN ALL WARNING SIGNS, SHORING, BARRICADES, FLARES AND RED LANTERNS AS REQUIRED BY THE SAFETY ORDERS OF THE DIVISION OF INDUSTRIAL SAFETY AND LOCAL ORDINANCES.

2. PIPE LINE ASSEMBLY:

A. INSTALL REMOTE CONTROL VALVES WHERE SHOWN AND GROUP TOGETHER WHERE PRACTICAL, PLACE NO CLOSER THAN 6 INCHES TO WALK EDGES, BUILDINGS AND WALLS.

B. PLASTIC PIPE AND FITTINGS SHALL BE SOLVENT WELDED USING SOLVENTS AND METHODS RECOMMENDED BY MANUFACTURER OF THE PIPE, EXCEPT WHERE SCREWED CONNECTIONS ARE REQUIRED. PIPE AND FITTINGS SHALL BE THOROUGHLY CLEANED OF DIRT, DUST AND MOISTURE BEFORE APPLYING SOLVENT WITH A NON-SYNTHETIC BRISTLE BRUSH.

C. PIPE MAY BE ASSEMBLED AND WELDED ON THE SURFACE. SNAKE PIPE FROM SIDE TO SIDE OF TRENCH BOTTOM TO ALLOW FOR EXPANSION AND CONTRACTION.

D. MAKE ALL CONNECTIONS BETWEEN PLASTIC PIPE AND METAL VALVES OR STEEL PIPE WITH THREADED FITTINGS USING PLASTIC MALE ADAPTERS.

3. SPRINKLER HEADS/ DRIPLINE:

A. INSTALL ALL SPRINKLERS/ DRIPLINE AS DETAILED ON DRAWINGS.
B. DO NOT SCALE PLANS FOR EXACT HEAD LOCATION.
C. PROVIDE A MINIMUM OF 4" BETWEEN SPRINKLERS/ DRIPLINE AND PAVEMENT/ BUILDINGS.

4. CLOSING OF PIPE AND FLUSHING LINES:

A. CAP OR PLUG ALL OPENINGS AS SOON AS LINES HAVE BEEN INSTALLED TO PREVENT THE ENTRANCE OF MATERIALS THAT WOULD OBSTRUCT THE PIPE. LEAVE IN PLACE UNTIL REMOVAL IS NECESSARY FOR COMPLETION OF INSTALLATION.

B. THOROUGHLY FLUSH OUT ALL WATER LINES BEFORE INSTALLING HEADS, DRIPLINE, VALVES AND OTHER HYDRANTS.

C. TEST IN ACCORDANCE WITH PARAGRAPH ON HYDROSTATIC TESTS.

D. UPON COMPLETION OF THE TESTING, THE CONTRACTOR SHALL COMPLETE ASSEMBLY AND ADJUST SPRINKLER HEADS FOR PROPER DISTRIBUTION.

5. INSPECTIONS:

A. SPRINKLER/ DRIPLINE LAYOUT AND SPACING INSPECTION: VERIFICATION THAT THE IRRIGATION DESIGN IS ACCURATELY INSTALLED IN THE FIELD. IT WILL ALSO PROVIDE FOR ALTERATION OR MODIFICATION OF THE SYSTEM TO MEET FIELD CONDITIONS. SPACING SHOULD BE WITHIN 5% OF THE DESIGN SPACING.

B. PIPE INSTALLATION DEPTH INSPECTION: ALL PIPES IN THE SYSTEM SHALL BE INSTALLED TO DEPTHS AS PREVIOUSLY DESCRIBED IN SECTION 'E' OF THESE SPECIFICATIONS.

C. OPEN TRENCH INSPECTION: THE TRENCH AND ALL JOINTS AND EVERY TRANSITION IN PIPE SIZE, WILL BE OPEN WHERE OPEN TRENCH INSPECTION IS REQUIRED.

D. INSPECTIONS WILL BE PERFORMED THROUGHOUT THE DURATION OF THE INSTALLATION. INSPECTION MAY BE MADE BY THE GOVERNING AGENCY/ OWNER TO ENSURE COMPLIANCE WITH DESIGN INTENT, SPECIFICATIONS, AND THE IRRIGATION CODES.

6. HYDROSTATIC TESTS:

A. REQUEST THE PRESENCE OF THE OWNER IN WRITING AT LEAST 48 HOURS IN ADVANCE OF TESTING.

B. TESTING TO BE ACCOMPLISHED AT THE EXPENSE OF THE CONTRACTOR AND IN THE PRESENCE OF THE OWNER.

C. CENTER LOAD PIPING WITH SMALL AMOUNT OF BACKFILL TO PREVENT ARCHING OR SLIPPING UNDER PRESSURE.

D. APPLYING A CONTINUOUS AND STATIC WATER PRESSURE OF 125 PSI WHEN WELDED PLASTIC JOINTS HAVE CURED AT LEAST 3 HOURS AND WITH THE RISERS CAPPED AS FOLLOWS:
1) MAIN LINES AND SUBMAINS TO BE TESTED FOR 2 HOURS.
2) NO PRESSURE LOSS IS ALLOWED FOR SOLVENT WELD MAINLINE/ PIPE.

E. FOR PVC AND O-RING GASKET PIPE THE ALLOWABLE LEAKAGE SHALL NOT EXCEED THE NUMBER OF GALLONS PER HOUR AS DETERMINED BY THE FOLLOWING FORMULA:

$$L = NPD^{1/2} / 1,850$$

IN WHICH: L=ALLOWABLE LEAKAGE, IN GALLONS PER HOUR
N=NUMBER OF JOINTS
D=PIPE DIAMETER IN INCHES
P=AVERAGE TEST PRESSURE IN PSI GAUGE

F. REPAIR LEAKS RESULTING FROM TESTS.

7. AUTOMATIC CONTROLLERS:

A. CONNECT REMOTE CONTROL VALVES TO CONTROLLER IN A CLOCKWISE SEQUENCE TO CORRESPOND WITH STATION SETTING BEGINNING WITH STATIONS 1, 2, 3, ETC.

8. AUTOMATIC CONTROL WIRING:

A. INSTALL CONTROL WIRING, SPRINKLER MAINS AND LATERALS IN COMMON TRENCHES WHEREVER POSSIBLE.

B. INSTALL CONTROL WIRES AT LEAST 18" BELOW FINISHED GRADE AND SNAKE WIRE SIDE TO SIDE IN TRENCH BELOW MAIN LINE. EXPANSION CURLS SHALL BE PROVIDED WITHIN THREE (3') FEET OF EACH WIRE CONNECTION TO SOLENOID AND AT LEAST EVERY THREE HUNDRED (300') FEET IN LENGTH. (EXPANSION CURLS ARE FORMED BY WRAPPING AT LEAST FIVE (5) TURNS OF WIRE AROUND A ROD OR PIPE 1" OR MORE IN DIAMETER, THEN WITHDRAWING THE ROD).

C. CONTROL WIRE SPLICES WILL BE ALLOWED ONLY RUNS OVER 1000 FT. CONNECTIONS SHALL BE IN VALVE BOX AND LOCATION TO BE SHOWN ON AS-BUILT PLANS.

D. ALL WIRING PASSING UNDER EXISTING OR FUTURE PAVING, CONSTRUCTION, ETC., SHALL BE ENCASED IN PLASTIC OR GALVANIZED STEEL CONDUIT EXTENDING AT LEAST 24" BEYOND EDGES OF PAVING OR CONSTRUCTION.

9. BACKFILL AND COMPACTING:

A. AFTER SYSTEM IS OPERATING AND REQUIRED TESTS AND INSPECTIONS HAVE BEEN MADE, BACKFILL EXCAVATIONS AND TRENCHES WITH CLEAN SOIL, FREE OF RUBBISH. INITIAL BACKFILL MATERIAL TO 6 INCHES ABOVE THE TOP OF PIPE SHALL BE FREE OF ROCKS OR STONES LARGER THAN ONE INCH IN DIAMETER FINAL BACKFILL MATERIAL SHALL BE FREE OF ROCKS OR STONES LARGER THAN 3 INCHES IN DIAMETER.

B. BACKFILL FOR ALL TRENCHES, REGARDLESS OF THE TYPE OF PIPE COVERED, SHALL BE COMPACTED TO MINIMUM 90% DENSITY.

C. COMPACT TRENCHES IN AREAS TO BE PLANTED BY THOROUGHLY FLOODING THE BACKFILL. JETTING PROCESS MAY BE USED IN THOSE AREAS.

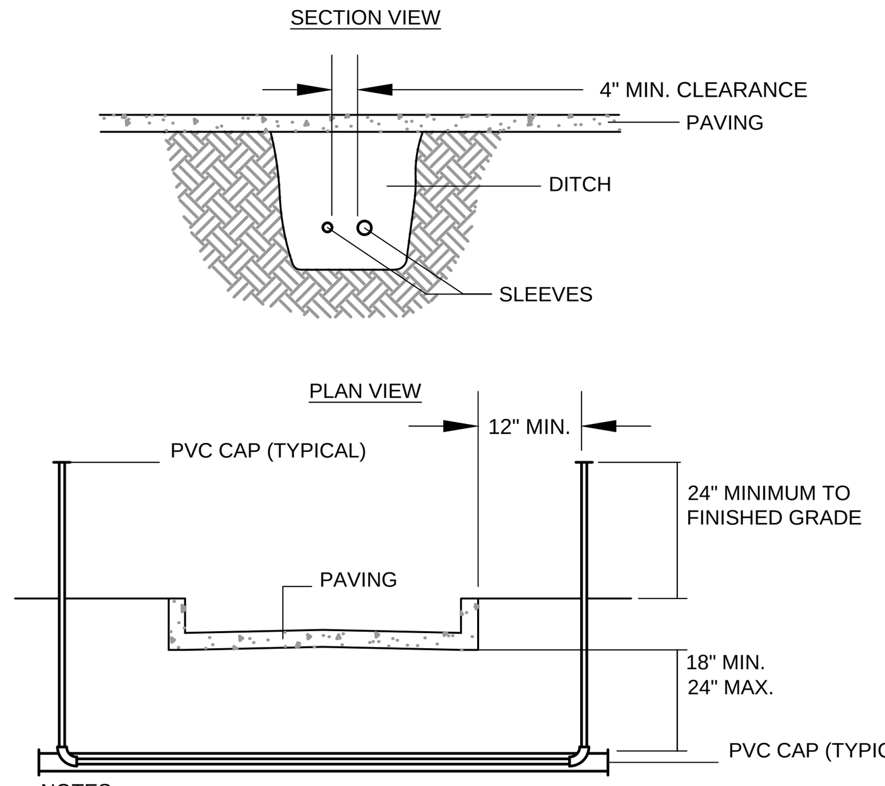
D. DRESS OFF ALL AREAS TO FINISH GRADES.

10. PROTECTIVE RADIUS OF EXISTING TREES:

A. AN AUGER IS TO BE USED TO TUNNEL UNDER EXISTING TREES IF IRRIGATION IS INSTALLED WITHIN THE PROTECTIVE RADIUS OF EXISTING TREES AND ONLY IF THERE IS NO OTHER OPTION OR TO DO SO CREATES AN UNREASONABLE HARDSHIP.

F. CLEAN-UP:

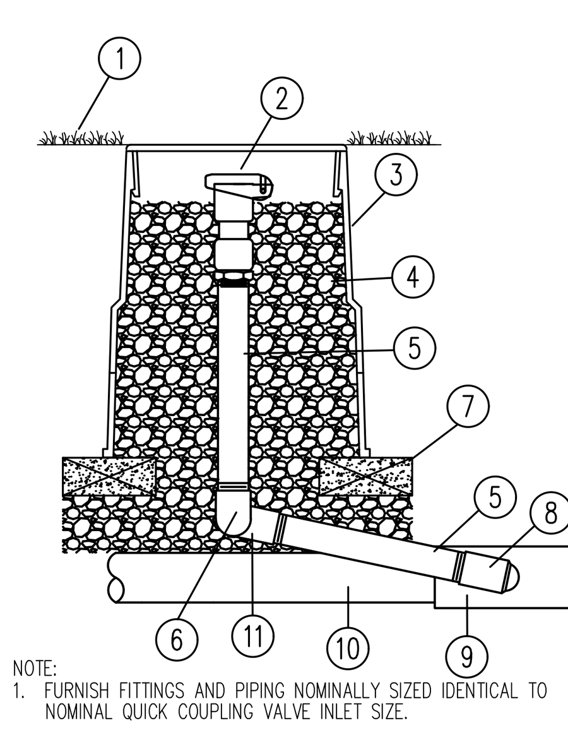
1. REMOVE FROM THE SITE ALL DEBRIS RESULTING FROM WORK OF THIS SECTION.



NOTES:
1. ALL IRRIGATION SLEEVES TO BE SCHEDULE 40 PVC.
2. ALL JOINTS TO BE SOLVENT WELDED AND WATERTIGHT.
3. WHERE THERE IS MORE THAN ONE SLEEVE. EXTEND THE SMALLER SLEEVE TO 24-INCHES MINIMUM ABOVE FINISHED GRADE.
4. MECHANICALLY TAMP TO 95° PROCTOR.

SLEEVE DETAIL

N.T.S.

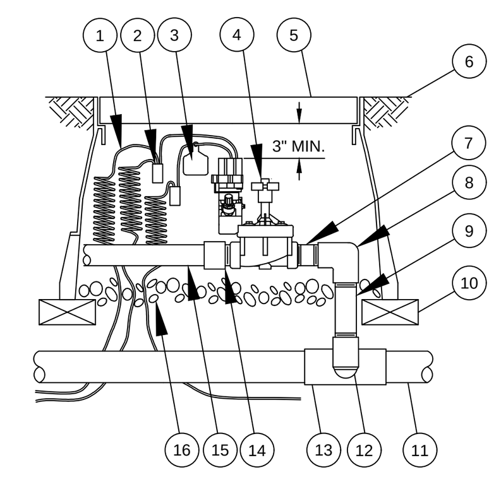


1. FINISH GRADE
2. QUICK-COUPLING VALVE ONE-PIECE BODY WITH 1 INCH INLET AND 1 1/4 INCH KEY OUTLET
3. VALVE BOX WITH COVER
4. 3/4" MINUS WASHED GRAVEL
5. PVC SCH 80 NIPPLE-1" (LENGTH AS REQUIRED)
6. PVC SCH 40 STREET ELL-1"
7. BRICK SUPPORTS (2)
8. PVC SCH 40 STREET ELL-1"
9. PVC SCH 40 TEE OR ELL X 1"
10. PVC MAINLINE PIPE
11. PVC SCH 40 ELL-1"

NOTE:
1. FURNISH FITTINGS AND PIPING NOMINALLY SIZED IDENTICAL TO NOMINAL QUICK COUPLING VALVE INLET SIZE.

HOSE BIBB

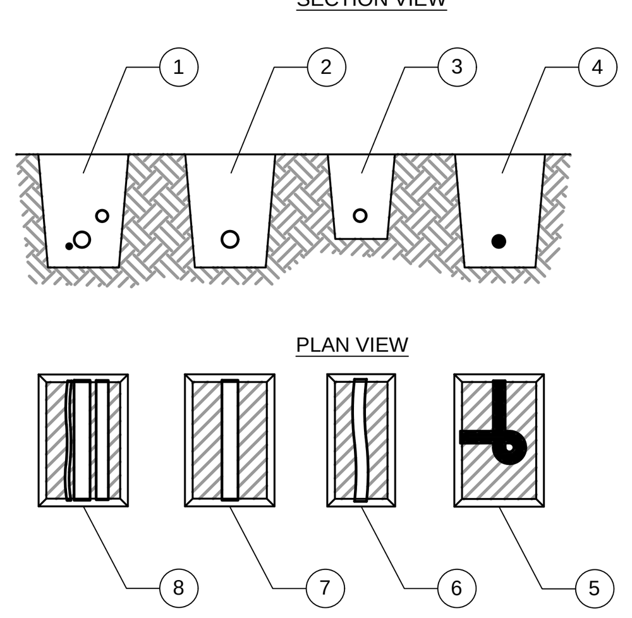
DETAIL - N.T.S.



1. 30-INCH LINEAR LENGTH OF WIRE, COILED
2. WATERPROOF CONNECTION RAIN BIRD SPLICE-1 (1 OF 2)
3. ID TAG: RAIN BIRD VID SERIES
4. REMOTE CONTROL VALVE: RAIN BIRD PESB-PRS-D WITH NP-HAN
5. VALVE BOX WITH COVER: RAIN BIRD VB-STD
6. FINISH GRADE/TOP OF MULCH
7. PVC SCH 80 NIPPLE (CLOSE)
8. PVC SCH 40 ELL
9. PVC SCH 80 NIPPLE (LENGTH AS REQUIRED)
10. BRICK (1 OF 4)
11. PVC MAINLINE PIPE
12. SCH 80 NIPPLE (2-INCH LENGTH, HIDDEN) AND SCH 40 ELL
13. PVC SCH 40 TEE OR ELL
14. PVC SCH 40 MALE ADAPTER
15. PVC LATERAL PIPE
16. 3.0-INCH MINIMUM DEPTH OF 3/4-INCH WASHED GRAVEL

PEB SERIES VALVE

DETAIL - N.T.S.

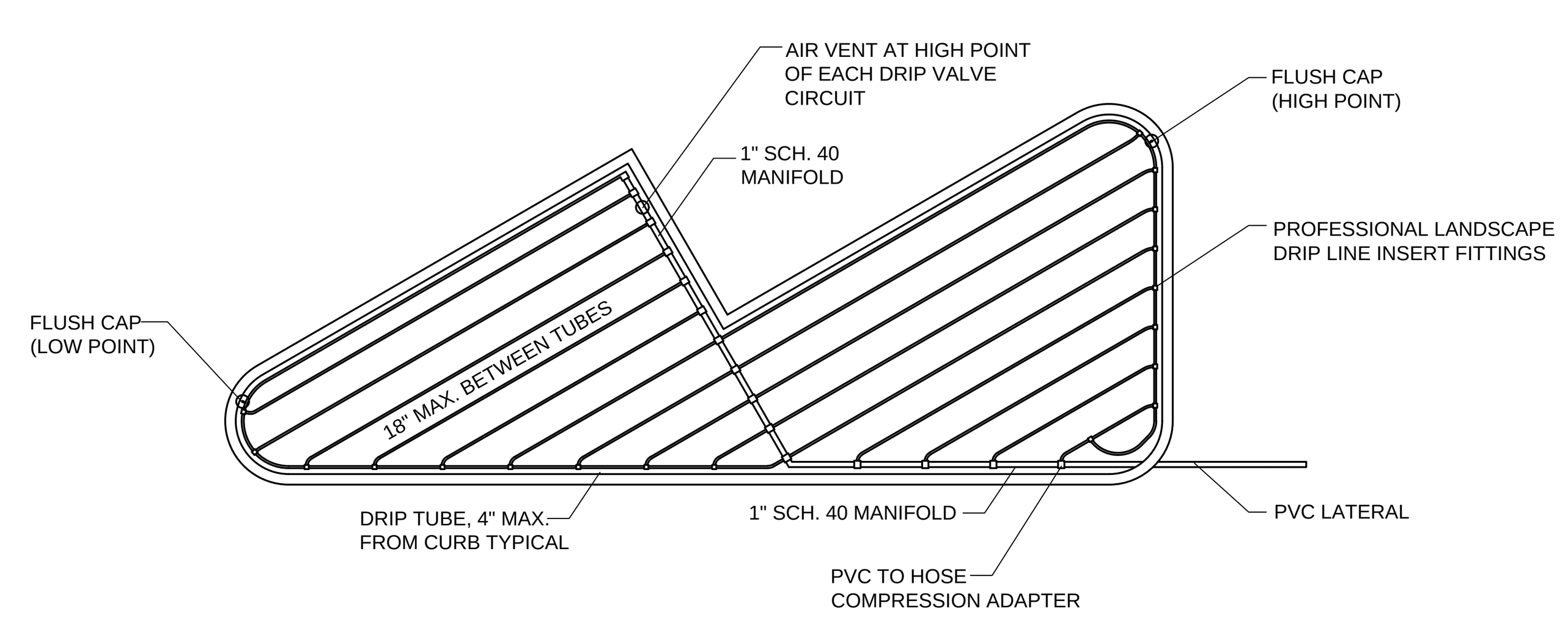


1. MAINLINE, LATERAL AND WIRING IN THE SAME TRENCH
2. MAINLINE PIPE
3. LATERAL PIPE
4. WIRING IN CONDUIT
5. TIE A 24-INCH LOOP IN ALL WIRING AT CHANGES OF DIRECTION OF 30° OR GREATER. UNTIE AFTER ALL CONNECTIONS HAVE BEEN MADE.
6. ALL SOLVENT WELD PLASTIC PIPING TO BE SNAKED IN TRENCH AS SHOWN.
7. ALL SOLVENT WELD PLASTIC PIPING TO BE RAN IN TRENCH AS SHOWN.
8. RUN WIRING BENEATH AND BESIDE MAINLINE. TAPE AND BUNDLE AT 10-FOOT INTERVALS.

NOTES:
1. SLEEVE BELOW ALL HARDSCAPE ELEMENTS WITH SCHD. 40 PVC TWICE THE DIAMETER OF THE PIPE OR WITH BUNDLE WITHIN.
2. FOR PIPE AND WIRE BURIAL DEPTHS SEE SPECIFICATIONS.

PIPE AND WIRE TRENCHING

N.T.S.



NOTE:
1. INSTALL FLUSH CAP/AIR VENTS AT HIGHEST AND LOWEST POINT.
2. STAKE DRIP HOSE AT EVERY 3RD EMITTER.
3. USE HUNTER INSERT FIITINGS FOR DRIP CONNECTIONS

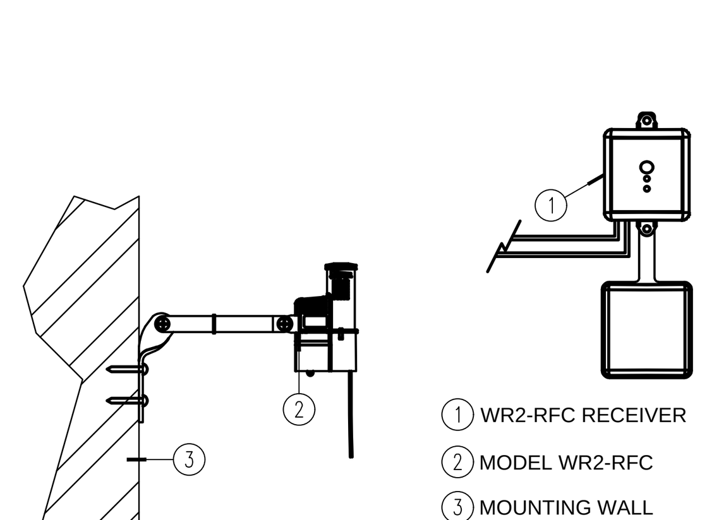
TYPICAL DRIP IRRIGATION INSTALLATION DETAIL

N.T.S.

PVC PIPE SIZE	SOLVENT WELD SCH. 40 FITTINGS	BELL AND GASKET FITTINGS	SOCKETED PIPE
1/2"	2"	--	2"
3/4"	2"	--	2"
1"	2 1/2"	--	2 1/2"
1 1/4"	3"	--	3"
1 1/2"	3"	3"	3"
2"	4"	4"	4"
2 1/2"	6"	6"	4"
3"	6"	6"	6"
4"	8"	8"	4"

SLEEVE SCHEDULE

N.T.S.

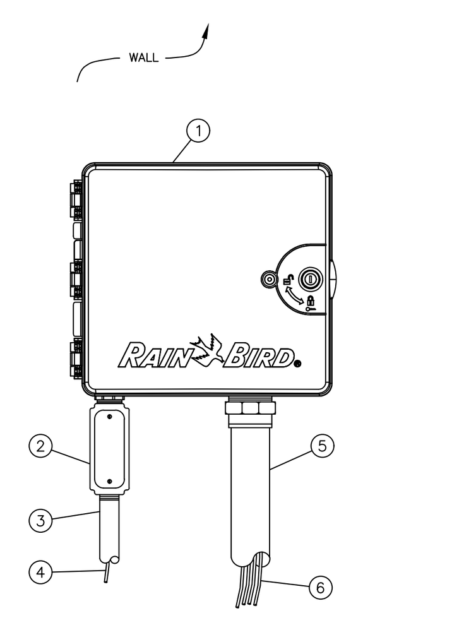


1. WR2-RFC RECEIVER
2. MODEL WR2-RFC
3. MOUNTING WALL

NOTE:
MOUNT SENSOR ON ANY SURFACE WHERE IT WILL BE EXPOSED TO UNOBSTRUCTED RAINFALL, BUT NOT IN PATH OF SPRINKLER SPRAY, NO MORE THAN 300' FROM RECEIVER UNIT. MOUNT RECIEVER UNIT NO FURTHER THAN 6' FROM CONTROLLER.

WIRELESS
RAIN SENSOR

DETAIL - N.T.S.

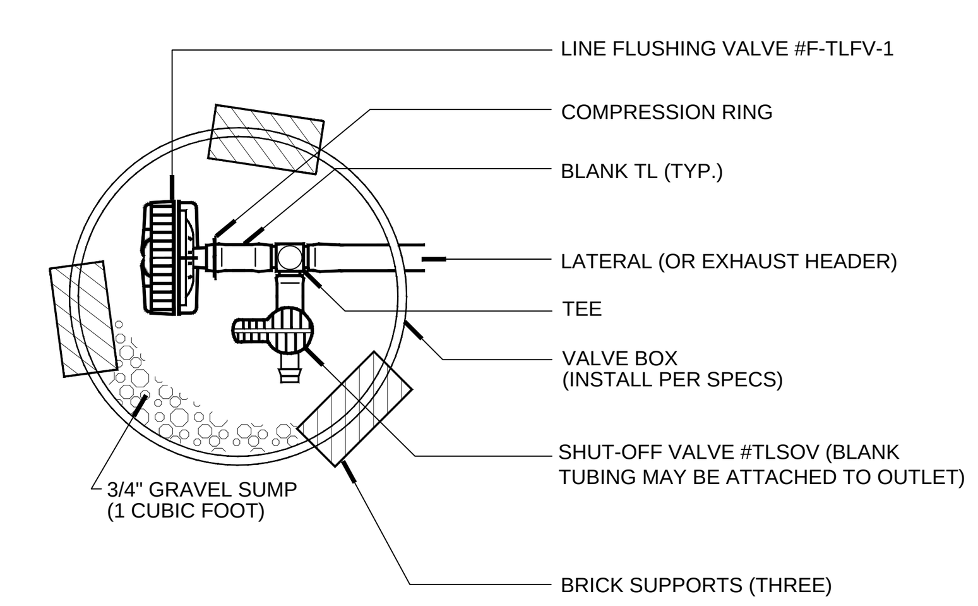


1. IRRIGATION CONTROLLER: RAIN BIRD ESP8-LXME CONTROLLER IN PLASTIC CABINET WITH WALL MOUNT. INSTALL CONTROLLER AND CABINET ON WALL PER MANUFACTURER'S RECOMMENDATIONS.
2. JUNCTION BOX
3. 1-INCH CONDUIT AND FITTINGS TO POWER SUPPLY
4. POWER SUPPLY WIRE
5. 2-INCH CONDUIT AND FITTINGS FOR STATION WIRES
6. WIRES TO REMOTE CONTROL VALVES

NOTES:
1. ESP-LXME CONTROLLER IS AVAILABLE IN 8- OR 12-STATION BASE MODELS. ADDITIONAL MODULES IN 4-, 8- AND 12-STATION VERSIONS MAY BE ADDED TO BRING THE CONTROLLER UP TO 48 STATIONS MAXIMUM.
2. FOR EASE OF INSTALLATION INTO A CONTROLLER WITH MORE THAN 24 STATIONS, INSTALL A JUNCTION BOX AT THE BASE OF CONTROLLER AND TRANSITION LARGER VALVE AND COMMON WIRES FROM FIELD TO 18 AWG MULTI CONDUCTOR WIRE TO BE USED IN CONTROLLER.
3. USE STEEL CONDUIT FOR ABOVE GRADE AND SCH 40 PVC CONDUIT FOR BELOW GRADE CONDITIONS.
4. PROVIDE PROPER GROUNDING COMPONENTS TO ACHIEVE GROUND RESISTANCE OF 10 OHMS OR LESS.

ESP8-LXME CONTROLLER

DETAIL - N.T.S.



LINE FLUSHING VALVE

W/ SHUT-OFF VALVE N.T.S.

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MISSOURI REGISTRATION NUMBER 001512

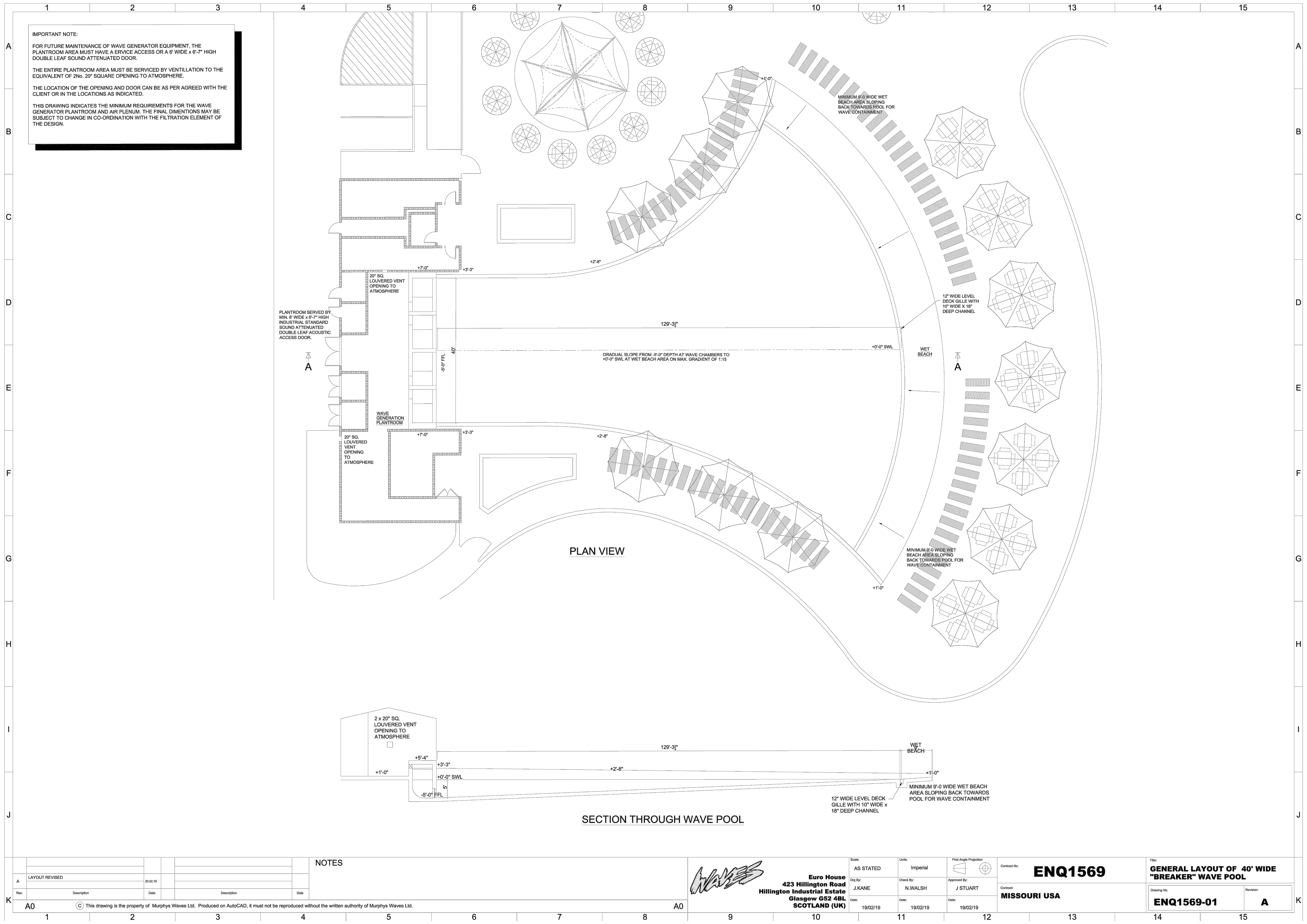
95% REVIEW SET
FOR REVIEW ONLY
Kimley»Horn
MARK HATCHEL
APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

IRRIGATION DETAIL AND SPECIFICATIONS

Scale: AS SHOWN
Designed by: ABP
Drawn by: KWS
Checked by: MCH
Date: 04/15/2019
Project No. 064538700

SHEET
L-16


IMPORTANT NOTE:
FOR FUTURE MAINTENANCE OF WAVE GENERATOR EQUIPMENT, THE PLANTROOM AREA MUST HAVE A ERVICE ACCESS OR A 6' WIDE x 6'-7" HIGH DOUBLE LEAF SOUND ATTENUATED DOOR.
THE ENTIRE PLANTROOM AREA MUST BE SERVICED BY VENTILLATION TO THE EQUIVALENT OF 2No. 20" SQUARE OPENING TO ATMOSPHERE.
THE LOCATION OF THE OPENING AND DOOR CAN BE AS PER AGREED WITH THE CLIENT OR IN THE LOCATIONS AS INDICATED.
THIS DRAWING INDICATES THE MINIMUM REQUIREMENTS FOR THE WAVE GENERATOR PLANTROOM AND AIR PLENUM. THE FINAL DIMENTIONS MAY BE SUBJECT TO CHANGE IN CO-ORDINATION WITH THE FILTRATION ELEMENT OF THE DESIGN.
PLAN VIEW
SECTION THROUGH WAVE POOL
12" WIDE LEVEL DECK GILLE WITH 10" WIDE x 18" DEEP CHANNEL
MINIMUM 9'-0 WIDE WET BEACH AREA SLOPING BACK TOWARDS POOL FOR WAVE CONTAINMENT
WET BEACH
129'-3"
NOTES
Euro House
423 Hillington Road
Hillington Industrial Estate
Glasgow G52 4BL
SCOTLAND (UK)
Scale: AS STATED
Units: Imperial
First Angle Projection
Drg By: J.KANE
Check By: N.WALSH
Approved By: J STUART
Date: 19/02/19
Contract No. ENQ1569
Contract: MISSOURI USA
Title: GENERAL LAYOUT OF 40' WIDE "BREAKER" WAVE POOL
Drawing No. ENQ1569-01
Revision: A
A0
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1 WAVES POOL

SCALE: N.T.S.

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MISSOURI REGISTRATION NUMBER 001512

FOR INFORMATION ONLY

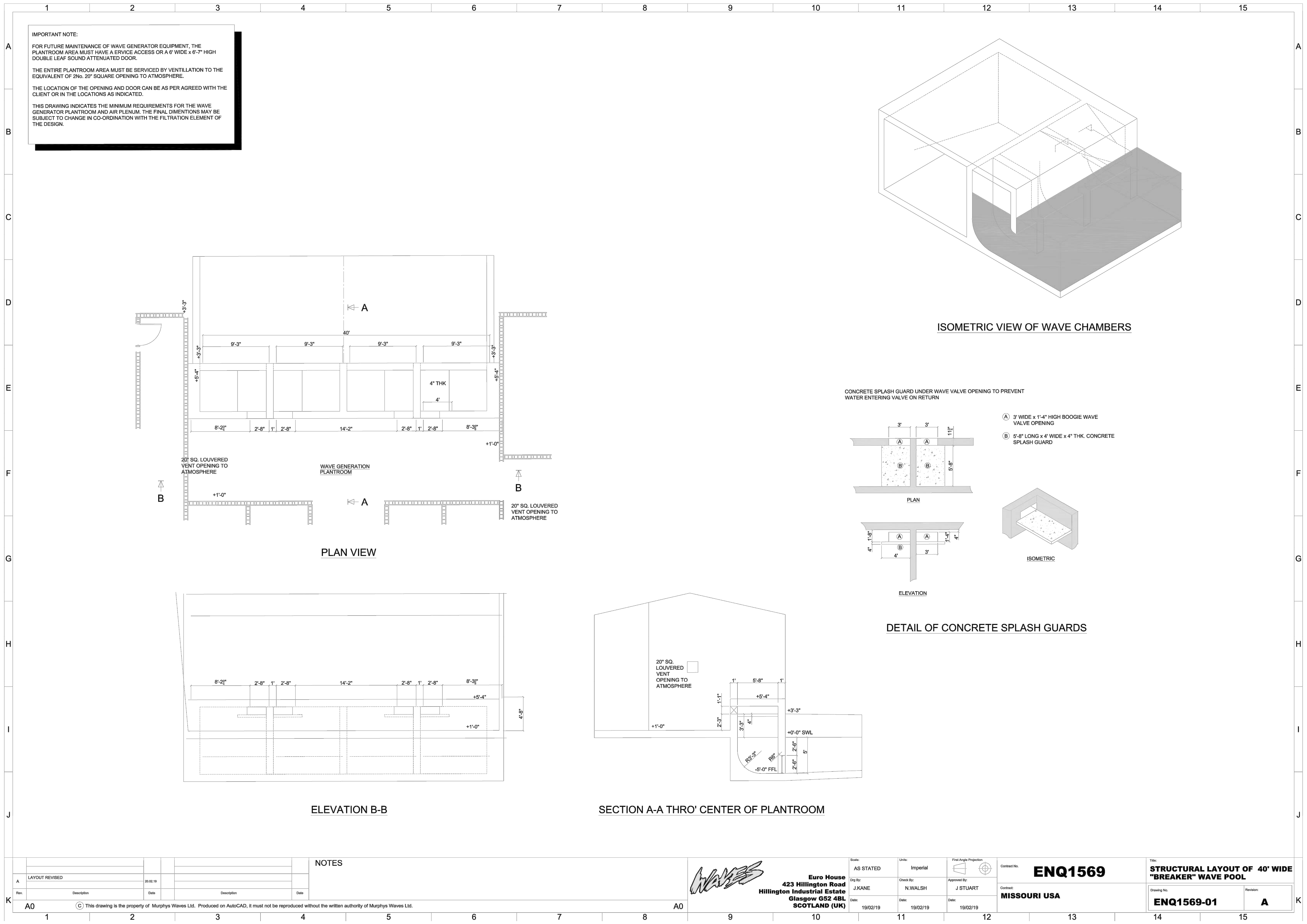
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVES EQUIPMENT 1

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET

L-17


IMPORTANT NOTE:
FOR FUTURE MAINTENANCE OF WAVE GENERATOR EQUIPMENT, THE PLANTROOM AREA MUST HAVE A ERVICE ACCESS OR A 6' WIDE x 6'-7" HIGH DOUBLE LEAF SOUND ATTENUATED DOOR.
THE ENTIRE PLANTROOM AREA MUST BE SERVICED BY VENTILLATION TO THE EQUIVALENT OF 2No. 20" SQUARE OPENING TO ATMOSPHERE.
THE LOCATION OF THE OPENING AND DOOR CAN BE AS PER AGREED WITH THE CLIENT OR IN THE LOCATIONS AS INDICATED.
THIS DRAWING INDICATES THE MINIMUM REQUIREMENTS FOR THE WAVE GENERATOR PLANTROOM AND AIR PLENUM. THE FINAL DIMENTIONS MAY BE SUBJECT TO CHANGE IN CO-ORDINATION WITH THE FILTRATION ELEMENT OF THE DESIGN.
ISOMETRIC VIEW OF WAVE CHAMBERS
PLAN VIEW
WAVE GENERATION PLANTROOM
20" SQ. LOUVERED VENT OPENING TO ATMOSPHERE
CONCRETE SPLASH GUARD UNDER WAVE VALVE OPENING TO PREVENT WATER ENTERING VALVE ON RETURN
A 3' WIDE x 1'-4" HIGH BOOGIE WAVE VALVE OPENING
B 5'-8" LONG x 4' WIDE x 4" THK. CONCRETE SPLASH GUARD
PLAN
ISOMETRIC
ELEVATION
DETAIL OF CONCRETE SPLASH GUARDS
ELEVATION B-B
SECTION A-A THRO' CENTER OF PLANTROOM
NOTES
Euro House
423 Hillington Road
Hillington Industrial Estate
Glasgow G52 4BL
SCOTLAND (UK)
AS STATED
Imperial
J.KANE
N.WALSH
J STUART
19/02/19
ENQ1569
MISSOURI USA
STRUCTURAL LAYOUT OF 40' WIDE "BREAKER" WAVE POOL
ENQ1569-01
A
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1 WAVES POOL

SCALE: N.T.S.

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MISSOURI REGISTRATION NUMBER 001512

FOR INFORMATION ONLY

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

WAVES EQUIPMENT 2

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET L-18

File: K:\DAL_LALP\LAC_LALP\064538700_lees summit\Dwg\Sheet\L-17_Murphy Pools.dwg [MURPHY POOLS1] 4/15/2019 11:21am
Xrefs: x24X36 Images:

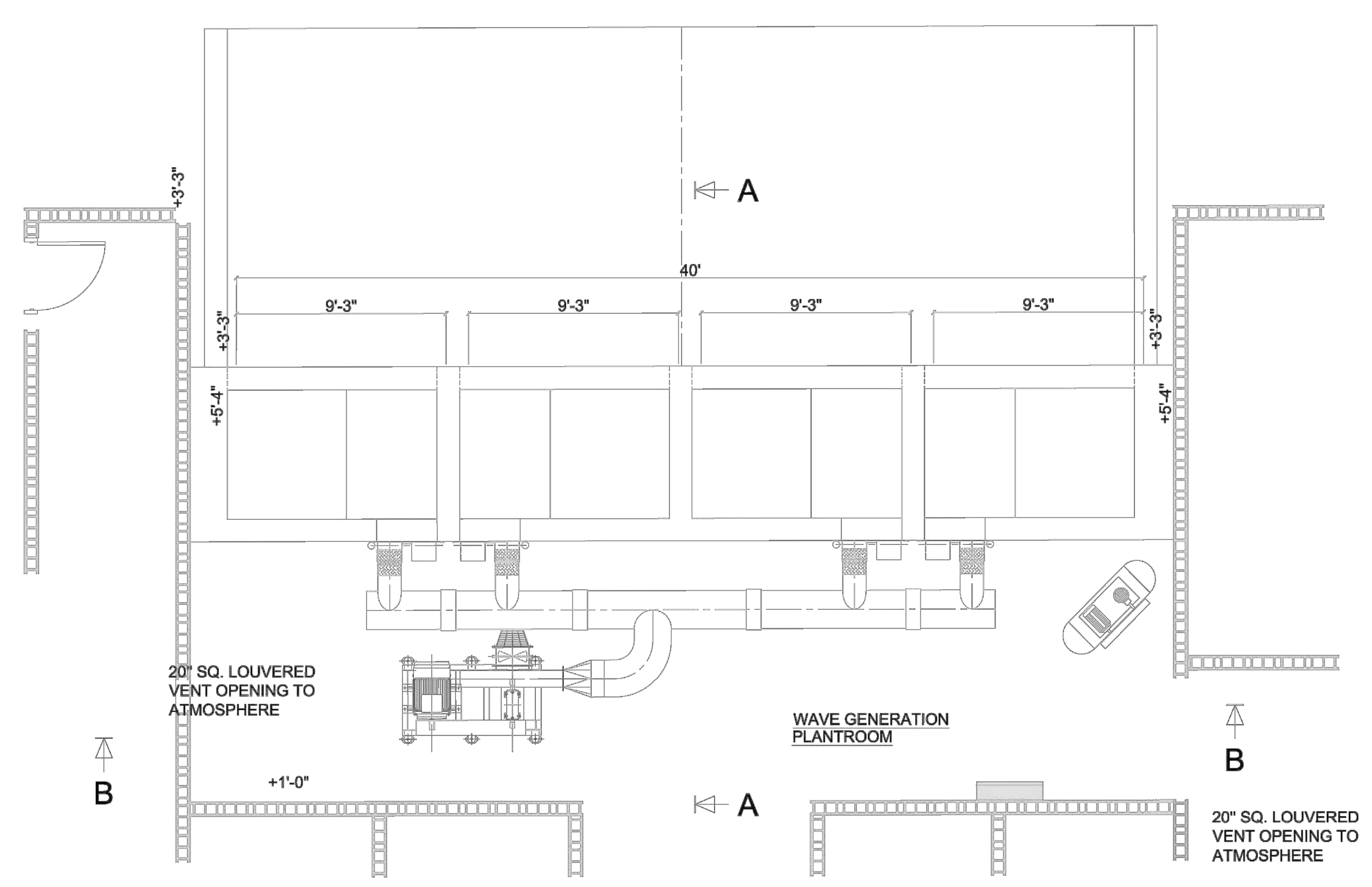
IMPORTANT NOTE:

FOR FUTURE MAINTENANCE OF WAVE GENERATOR EQUIPMENT, THE PLANTROOM AREA MUST HAVE A ERVICE ACCESS OR A 6' WIDE x 6'-7" HIGH DOUBLE LEAF SOUND ATTENUATED DOOR.

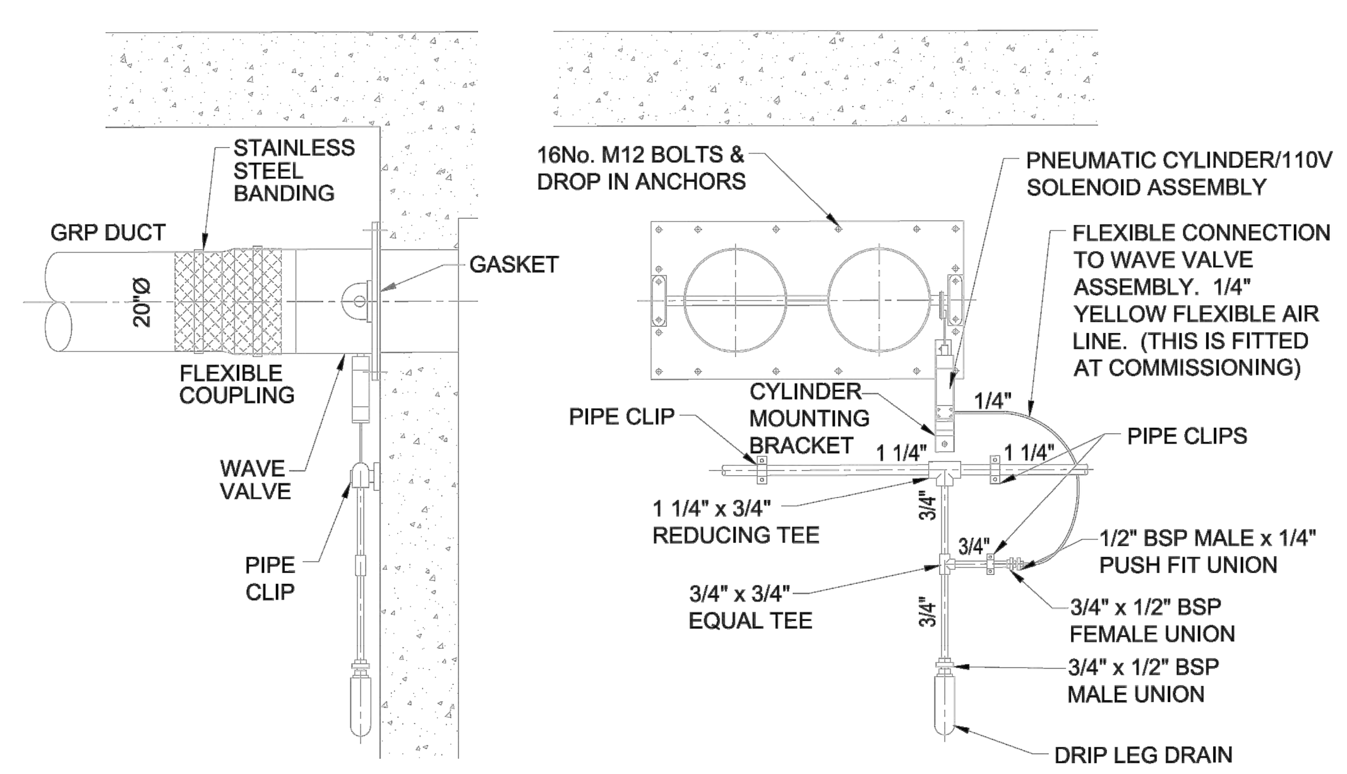
THE ENTIRE PLANTROOM AREA MUST BE SERVICED BY VENTILLATION TO THE EQUIVALENT OF 2No. 20" SQUARE OPENING TO ATMOSPHERE.

THE LOCATION OF THE OPENING AND DOOR CAN BE AS PER AGREED WITH THE CLIENT OR IN THE LOCATIONS AS INDICATED.

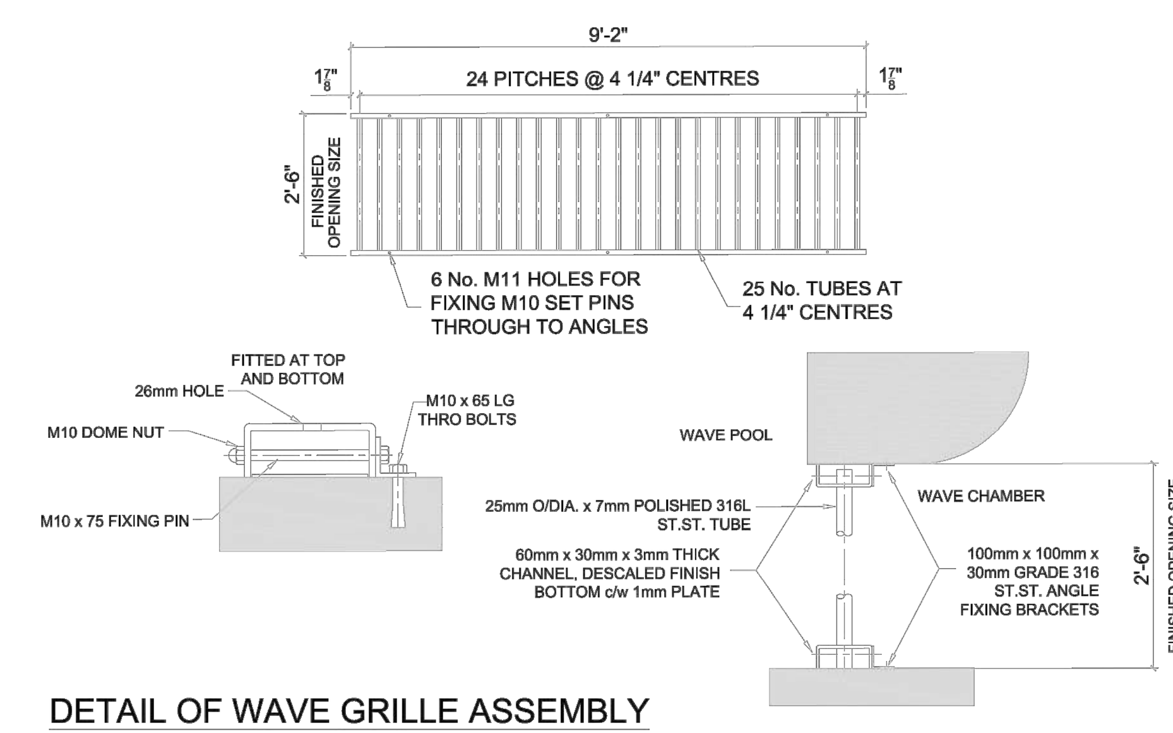
THIS DRAWING INDICATES THE MINIMUM REQUIREMENTS FOR THE WAVE GENERATOR PLANTROOM AND AIR PLENUM. THE FINAL DIMENTIONS MAY BE SUBJECT TO CHANGE IN CO-ORDINATION WITH THE FILTRATION ELEMENT OF THE DESIGN.



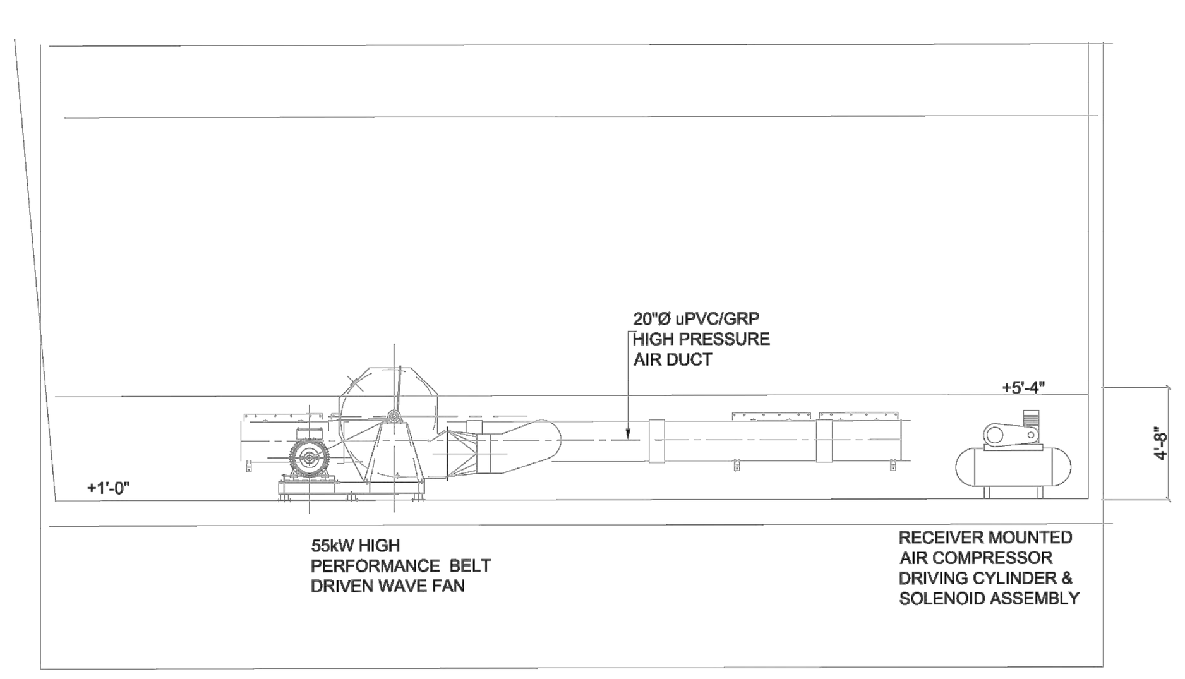
PLAN VIEW



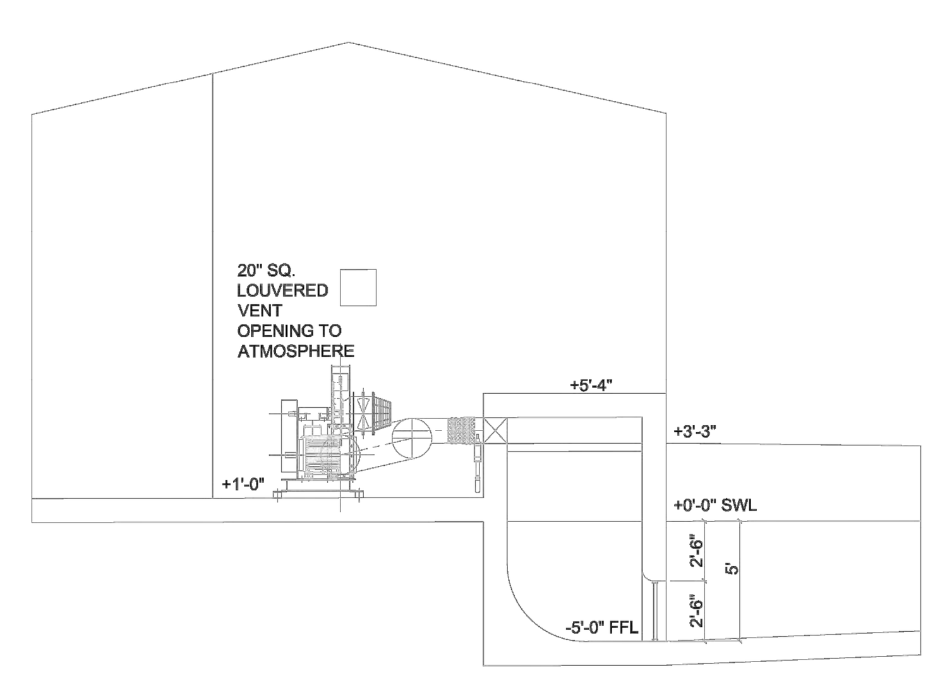
DETAIL OF WAVE VALVE ASSEMBLY



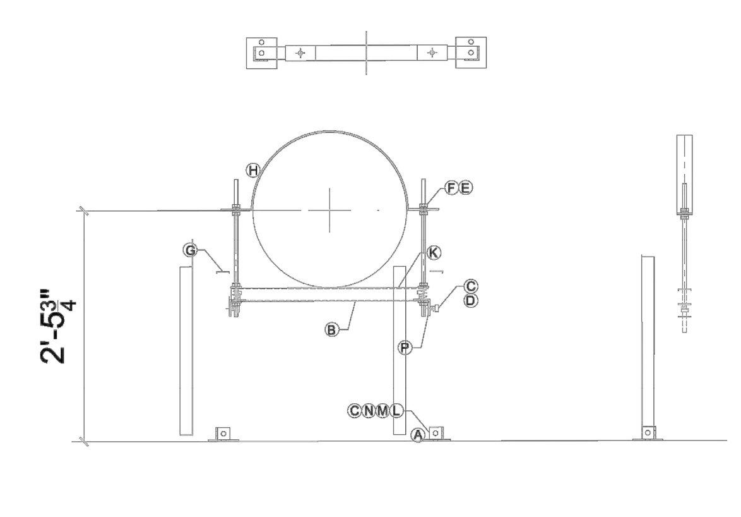
DETAIL OF WAVE GRILLE ASSEMBLY



ELEVATION ON PLANTROOM



SECTION THRO' CENTER OF PLANTROOM



DETAIL OF AIR DUCT ASSEMBLY

ITEMS PER SUPPORT LOCATION		
REF	DESCRIPTION	QTY.
A	CH10 SLOTTED CHANNEL 22" LONG	2
B	CH10 SLOTTED CHANNEL 26" LONG	1
C	M10 UNL CHANNEL SPRING NUT	6
D	M10 x 30 SET PIN	4
E	M12 HEX HEAD NUT	8
F	M12 SQUARE WASHER	8
G	CH10 uPVC BLACK END PROTECTION CAP	2
H	M12 SCREWED ROD 500mm LONG	2
J	325 I/D. DUCT SUPPORT BRACKET	1
K	M12 UNL CHANNEL SPRING NUT	2
L	B600 FLOOR PLATE ANGLE SUPPORT BRACKET	2
M	M10 NON DRILL ANCHORS	2
N	M10 x 50 SET PINS	2
P	A201 90 DEGREE ANGLE	2

NOTES

A LAYOUT REVISED

Euro House
423 Hillington Road
Hillington Industrial Estate
Glasgow G52 4BL
SCOTLAND (UK)

Scale: AS STATED | Units: Imperial | Drawn By: J.KANE | Checked By: N.WALSH | Approved By: J.STUART | Date: 19/02/19

Contract No.: ENQ1569

Contract: MISSOURI USA

Title: EQUIPMENT LAYOUT OF 40' WIDE "BREAKER" WAVE POOL

Drawing No.: ENQ1569-01 | Revision: A

1 WAVES POOL

SCALE: N.T.S.

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13455 Noel Road, Suite 700, Dallas, Texas 75240
PHONE: 214-420-5600 FAX: 214-420-5680
WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

FOR INFORMATION ONLY

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

WAVES EQUIPMENT 3

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

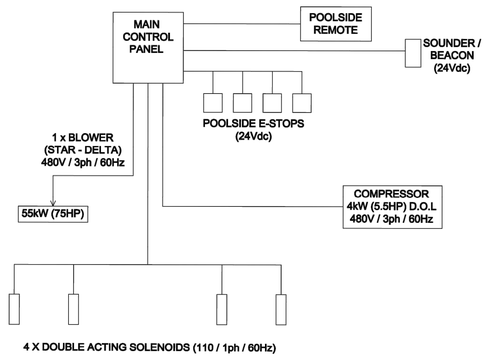
SHEET

L-19

ITEM	DESCRIPTION	REQUIREMENTS	LENGTH
A	55kW / 75HP FAN SET	16mm² SWA 2 x 4 CORE CLIPPED DIRECT ONTO PERFORATED CABLE TRAY. ALL CABLES GLANDS OFF EACH END.	40ft
A1	FAN MOTOR HEATER	1.5mm² SY CABLE 5 CORE CLIPPED DIRECT ONTO PERFORATE CABLE TRAY. ALL CABLES GLAND OFF EACH END.	40ft
A2	FAN MOTOR THERMISTOR	1.5mm² SY CABLE 5 CORE CLIPPED DIRECT ONTO PERFORATE CABLE TRAY. ALL CABLES GLAND OFF EACH END.	40ft
B	4kW / 5.5HP COMPRESSOR	4mm² SWA 1 x 4 WIRE CLIPPED DIRECT ONTO PERFORATED CABLE TRAY. GLANDS OFF EACH END.	10ft
C	WAVE VALVES (4off)	1mm² SINGLE WIRE x 4 RUN IN CONDUIT TO EACH WAVE VALVE	130ft
D	REMOTE CONTROL PANEL	1mm² SINGLE WIRE x 6 OR MIN. 6 MULTI CORE RUN IN CONDUIT	80ft
E	POOL SIDE EMERGENCY	1mm² SINGLE CABLE x 2 TO EACH E-STOP RUN IN CONDUIT.	250ft
F	SOUNDER / BEACON	1mm² SINGLE CABLE RUN IN CONDUIT.	80ft

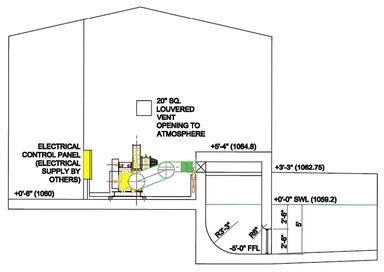
NOTES:

- GROUNDING REQUIREMENTS BY OTHERS TO COMPLY WITH LOCAL REGULATIONS.
- FINAL CABLES LENGTHS TO BE DETERMINED BY ELECTRICAL CONTRACTOR DEPENDING ON CHOSEN CABLE ROUTING.
- CHOSEN CABLE LENGTHS ARE ESTIMATED, ALL LENGTHS ARE DEPENDANT UPON FINAL EQUIPMENT POSITIONING.



WAVE MACHINE CONTROL SCHEMATIC

PLAN VIEW



SECTION A-A THRO' CENTER OF PLANTROOM

NOTES

SEE DRG ENQ1569-08 FOR STRUCTURAL DETAILS.

Euro House
423 Hillington Road
Hillington Industrial Estate
Glasgow G52 4BL
SCOTLAND (UK)

Scale:	AS STATED
Units:	Imperial
First Angle Projection:	
Drg By:	J.KANE
Check By:	N.WALSH
Approved By:	J STUART
Date:	03/04/19
Date:	03/04/19
Date:	03/04/19

Contract No. **ENQ1569**

Contract: **LEES SUMMIT**

Title: **CABLE SCHEDULE FOR 40' WIDE "BREAKER" WAVE POOL**

Drawing No. **ENQ1569-10**

Revision:

1 WAVES POOL

SCALE: N.T.S.

Kimley»Horn
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MISSOURI REGISTRATION NUMBER 001512

FOR INFORMATION ONLY

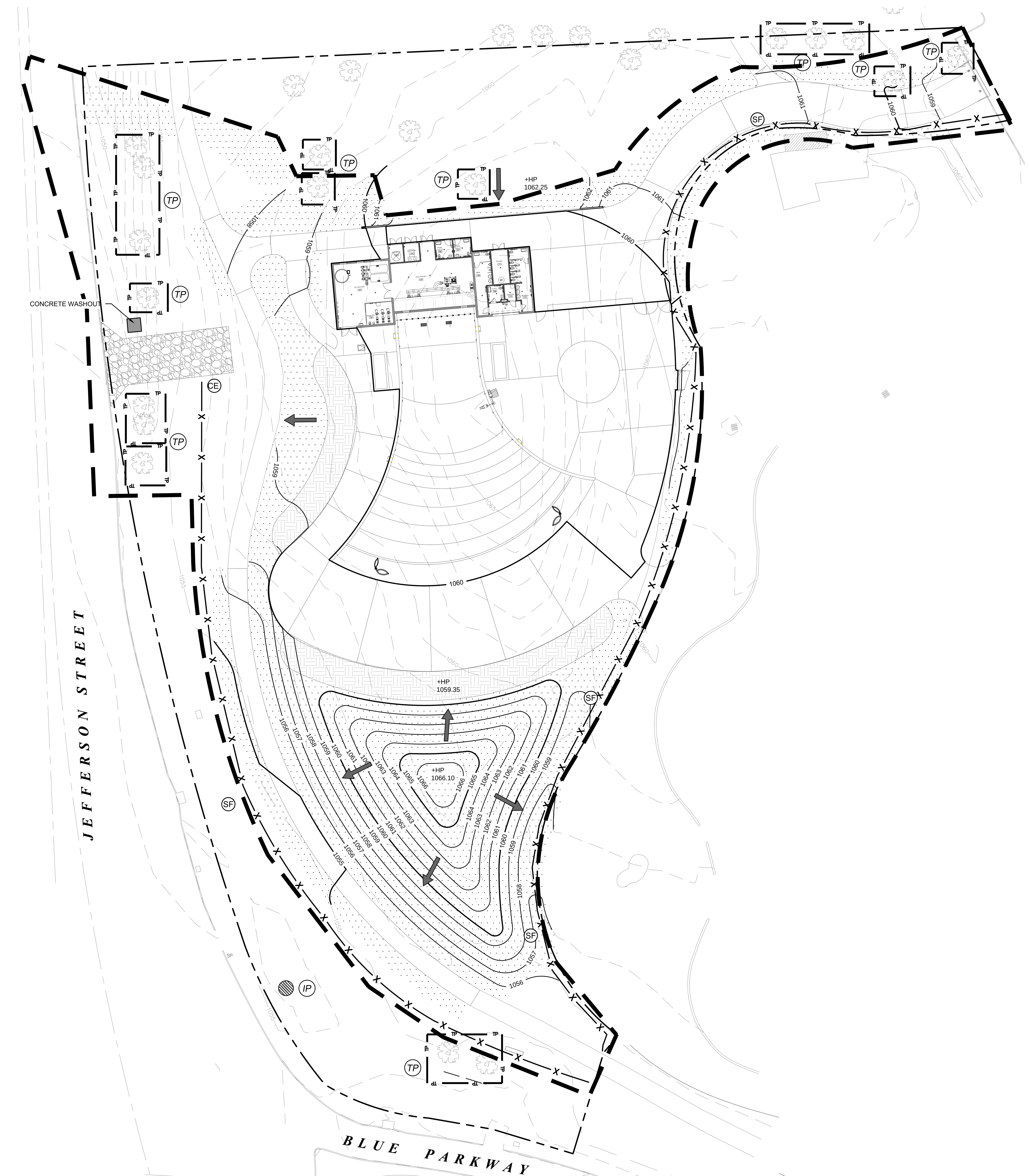
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVES EQUIPMENT 4

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	KWS
Checked by:	MCH
Date:	04/15/2019
Project No.	064538700

SHEET
L-20

STOP!
CALL BEFORE YOU DIG
MISSOURI ONE CALL SYSTEM
1-800-344-7483 or 811
(@ least 72 hours prior to digging)



NORTH

GRAPHIC SCALE IN FEET
0 15 30 60

LEGEND

- 1055 — PROPOSED CONTOUR
- 1055 — EXISTING CONTOUR
- LIMITS OF DISTURBED AREA
- CE — PROPOSED STABILIZED CONSTRUCTION ENTRANCE
- PROPOSED LANDSCAPE AREA
- PROPOSED BIOSWALE
- SF — FILTER BARRIER
- TP — TREE PROTECTION
- FLOW ARROW
- IP — INLET PROTECTION

SITE MAP-GENERAL NOTES

1. CONTRACTOR IS SOLELY RESPONSIBLE FOR SELECTION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL SWPPP CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
2. CONTRACTOR SHALL RECORD INSTALLATION, MAINTENANCE OR MODIFICATION, AND REMOVAL DATES FOR EACH BMP EMPLOYED (WHETHER CALLED OUT ON ORIGINAL SWPPP OR NOT) DIRECTLY ON THE SITE MAP.
3. DRAINAGE PATTERNS ARE SHOWN ON THIS PLAN BY PROPOSED AND EXISTING CONTOURS, FLOW ARROWS, AND SLOPES.
4. TEMPORARY AND PERMANENT STABILIZATION PRACTICES AND BMP'S SHALL BE INSTALLED AS PER THE STORM WATER POLLUTION PREVENTION PLAN. AS AN EXAMPLE, PERIMETER SILT FENCE SHALL BE INSTALLED BEFORE COMMENCEMENT OF ANY GRADING ACTIVITIES. OTHER BMP'S SHALL BE INSTALLED AS SOON AS PRACTICABLE AND SHALL BE MAINTAINED UNTIL FINAL SITE STABILIZATION IS ATTAINED. CONTRACTOR SHALL ALSO REFERENCE CIVIL AND LANDSCAPE PLANS SINCE PERMANENT STABILIZATION IS PROVIDED BY LANDSCAPING, THE BUILDING(S), AND SITE PAVING.
5. BMP'S HAVE BEEN LOCATED AS INDICATED ON THIS PLAN IN ACCORDANCE WITH GENERALLY ACCEPTED ENGINEERING PRACTICES IN ORDER TO MINIMIZE SEDIMENT TRANSFER. FOR EXAMPLE: SILT FENCES LOCATED AT TOE OF SLOPE AND INLET PROTECTION FOR INLETS RECEIVING SEDIMENT FROM SITE RUN-OFF.
6. SANITARY SEWER EFFLUENT IS DISPOSED OF VIA AN ON-SITE SEWER SYSTEM CONNECTED TO A MUNICIPAL SEWER SYSTEM.

EROSION CONTROL SCHEDULE AND SEQUENCING

A. NOTIFY ALL APPLICABLE AUTHORITIES AT LEAST 48 HOURS PRIOR TO BEGINNING ANY WORK; CALL THE 'MISSOURI ONE CALL CENTER' AT1-800-344-7482 FOR UTILITY LOCATIONS.
B. INSTALL TEMPORARY EROSION CONTROLS AND TREE PROTECTION FENCING PRIOR TO ANY CLEARING AND GRUBBING.
C. DEMOLISH AREAS INDICATED ON EXISTING CONDITIONS AND REMOVAL ITEMS SHEET. (IF APPLICABLE)
D. CLEAR AND GRUB AND STRIP TOPSOIL. STOCKPILE TOPSOIL FOR LATER USE.
E. CONSTRUCT TEMPORARY RETENTION/DETENTION POND. (IF APPLICABLE)
F. ROUGH GRADE SITE PER GRADING PLAN.
G. INSTALL STORM SEWER LINES AND APPURTENANCES.
H. INSTALL TEMPORARY EROSION/SEDIMENTATION Controls ON NEW STORM SEWER INLETS.
I. INSTALL WATER AND WASTE WATER LINES AND APPURTENANCES.
J. ENSURE THAT ALL UNDERGROUND UTILITY CROSSINGS ARE COMPLETED.
K. RAISE MANHOLE FRAMES AND COVERS TO TOP OF NATURAL GROUND.
L. CONSTRUCT PAVED AREAS, CURBS. ISLANDS AND INSTALL INLET EROSION PROTECTION.
M. COMPLETE RESTORATION OF SITE VEGETATION.
N. WRITE CONCURRENCE LETTER AND SCHEDULE FINAL INSPECTION WITH INSPECTOR.
O. REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROLS WHEN RESTORATION HAS BEEN ACCEPTED.
P. COMPLETE ANY NECESSARY FINAL DRESS UP OF AREAS DISTURBED BY ITEM “O”

TOTAL STATION LAYOUT

KIMLEY-HORN WILL PROVIDE AN AUTOCAD FILE OF THIS PLAN TO THE CONTRACTOR'S SURVEYOR TO USE FOR LAYOUT, VIA TOTAL STATION.

SITE MAP-SITE SPECIFIC NOTES

1. CONSTRUCTION ENTRANCE SHALL BE LOCATED SO AS TO PROVIDE THE LEAST AMOUNT OF DISTURBANCE TO THE FLOW OF TRAFFIC IN AND OUT OF THE SITE. ADDITIONALLY, CONSTRUCTION ENTRANCE SHALL BE LOCATED TO COINCIDE WITH THE PHASING OF THE PAVEMENT REPLACEMENT.
2. THE NATURE OF THIS SITE'S CONSTRUCTION CONSISTS OF:
   A. DEMOLITION
   B. PRELIMINARY GRADING
   C. UTILITY INSTALLATION
   D. PAVEMENT CONSTRUCTION
   E. FINAL GRADING AND STABILIZATION
3. CONTRACTOR TO REFERENCE GEOTECHNICAL REPORT PREPARED BY INTERTEK PSI (PROJECT NO. 03381842 DATED DECEMBER 14, 2018) FOR SOIL CONDITIONS.
4. ALL STORM WATER ON-SITE WILL SHEET FLOW INTO THE ON-SITE UNDERGROUND STORM DRAINAGE SYSTEM OR CONTINUE ALONG EXISTING DRAINAGE ROUTE
5. NO SEDIMENTATION BASINS HAVE BEEN PROVIDED ON THIS SITE BECAUSE THE AREA OF DISTURBANCE IS LESS THAN 10.0 ACRES.
6. POST CONSTRUCTION STORM WATER POLLUTION CONTROL MEASURES INCLUDE STABILIZATION BY PERMANENT PAVING, DRAINAGE SYSTEM STRUCTURE, OR LANDSCAPING.
7. VELOCITY DISSIPATION DEVICES (RIP-RAP) WILL NOT BE USED.
8. DISTURBED PORTIONS OF SITE MUST BE STABILIZED. STABILIZATION PRACTICES MUST BE INITIATED WITHIN 14 DAYS IN PORTIONS OF THE SITE WHERE CONSTRUCTION HAS BEEN EITHER TEMPORARILY OR PERMANENTLY CEASED, UNLESS EXCEPTED WITHIN THE NPDES PERMIT. CONTRACTOR SHALL REMOVE TEMPORARY EROSION CONTROL DEVICES UPON COMPLETION OF STABILIZATION OR PERMANENT DRAINAGE FACILITIES.
9. PER FIRM MAP NO. 29095C0417G EFFECTIVE 01-20-2017, THE SITE IS LOCATED WITHIN FEMA DESIGNATED "X" FLOODPLAIN.
10. CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP/SITE MAP TO INCLUDE BMP'S FOR ANY OFF-SITE MATERIAL WASTE, BORROW OR EQUIPMENT STORAGE AREAS.
11. CONTRACTOR SHALL INSPECT DISTURBED AREAS, MATERIAL STORAGE AREAS EXPOSED TO PRECIPITATION, STRUCTURAL CONTROL MEASURES, AND VEHICLE ENTRY AND EXIT AREAS AT LEAST ONCE EVERY 14 CALENDAR DAYS AND WITHIN 24 HOURS OF A STORM EVENT OF 0.5 INCHES OR GREATER.

Kimley»Horn
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PHONE: 214-420-5600 FAX: 214-420-5680
WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001612

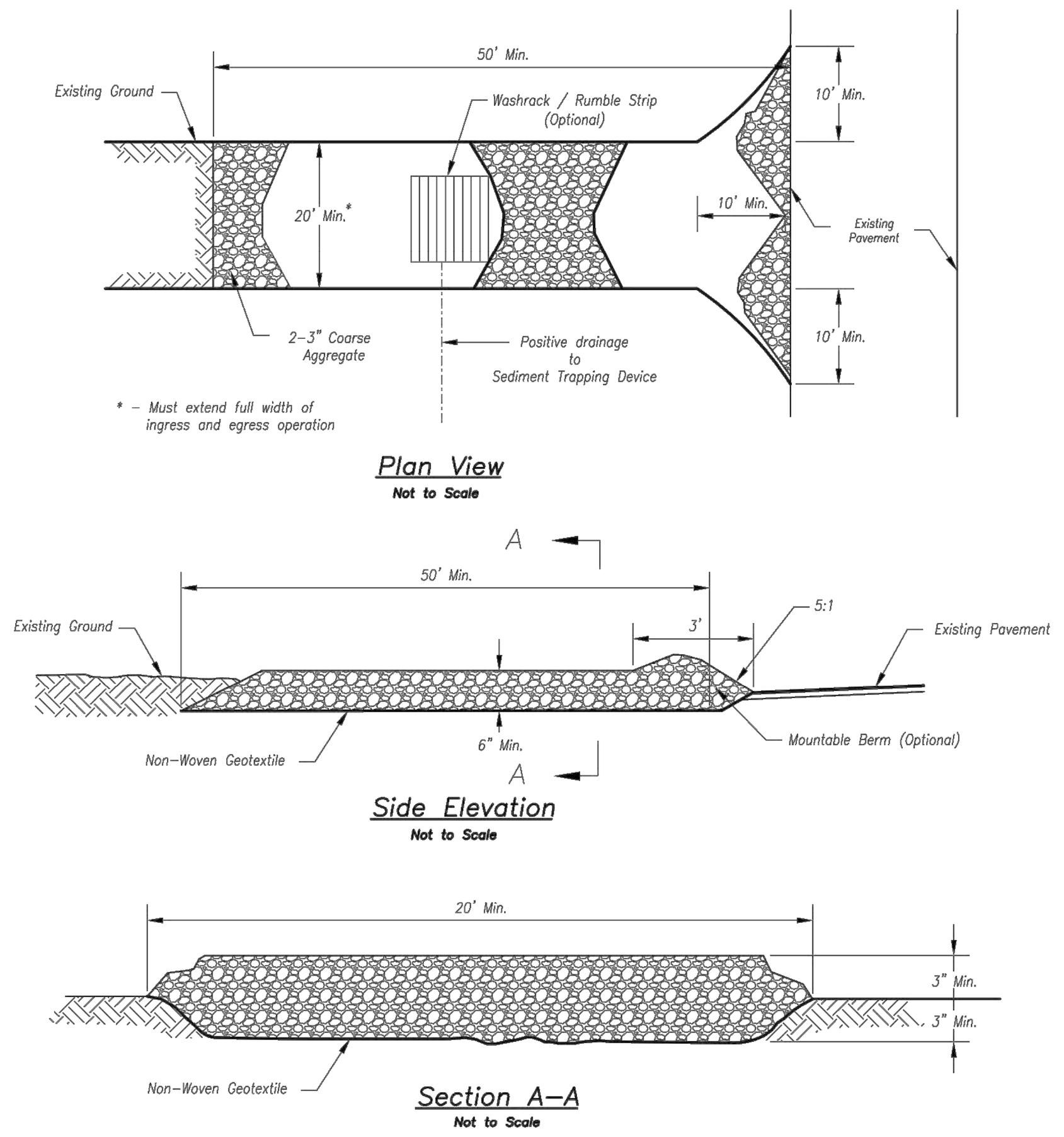
95% REVIEW SET
FOR REVIEW ONLY
Not for construction or permit purposes.
Kimley»Horn
Engineer KEVIN S. GASKEY
P.E. No. APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

EROSION CONTROL PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-1



Notes for Construction Entrance:

1. Avoid locating on steep slopes, at curves on public roads, or downhill of disturbed area.
2. Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.
3. If slope towards the public road exceeds 2%, construct a 6– to 8–inch high ridge with 3H:1V side slopes across the foundation approximately 15 feet from the edge of the public road to divert runoff from it.
4. Install pipe under the entrance if needed to maintain drainage ditches along public roads.
5. Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.
6. Divert all surface runoff and drainage from the entrance to a sediment control device.
7. If conditions warrant, place geotextile fabric on the graded foundation to improve stability.

Maintenance for Construction Entrance:

1. Reshape entrance as needed to maintain function and integrity of Installation. Top dress with clean aggregate as needed.

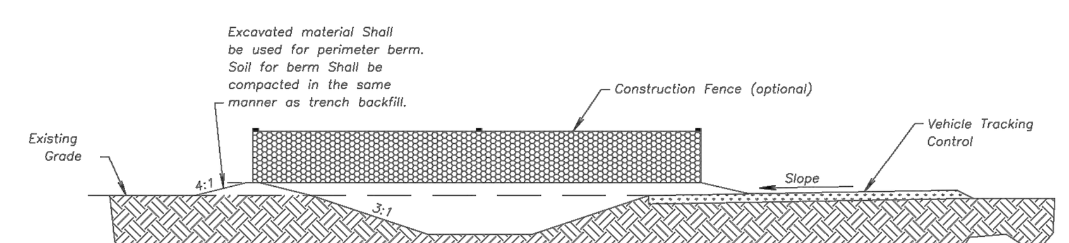
CONSTRUCTION ENTRANCE

Notes for Concrete Washout:

1. Concrete washout areas shall be installed prior to any concrete placement on site.
2. Concrete washout area shall include a flat subsurface pit sized relative to the amount of concrete to be placed on site. The slopes leading out of the subsurface pit shall be 3:1. The vehicle tracking pad shall be sloped towards the concrete washout area.
3. Vehicle tracking control is required at the access point to all concrete washout areas.
4. Signs shall be placed at the construction site entrance, washout area and elsewhere as necessary to clearly indicate the location(s) of the concrete washout area(s) to operators of concrete truck and pump rigs.
5. A one–piece impervious liner may be required along the bottom and sides of the subsurface pit in sandy or gravelly soils.

Maintenance for Concrete Washout:

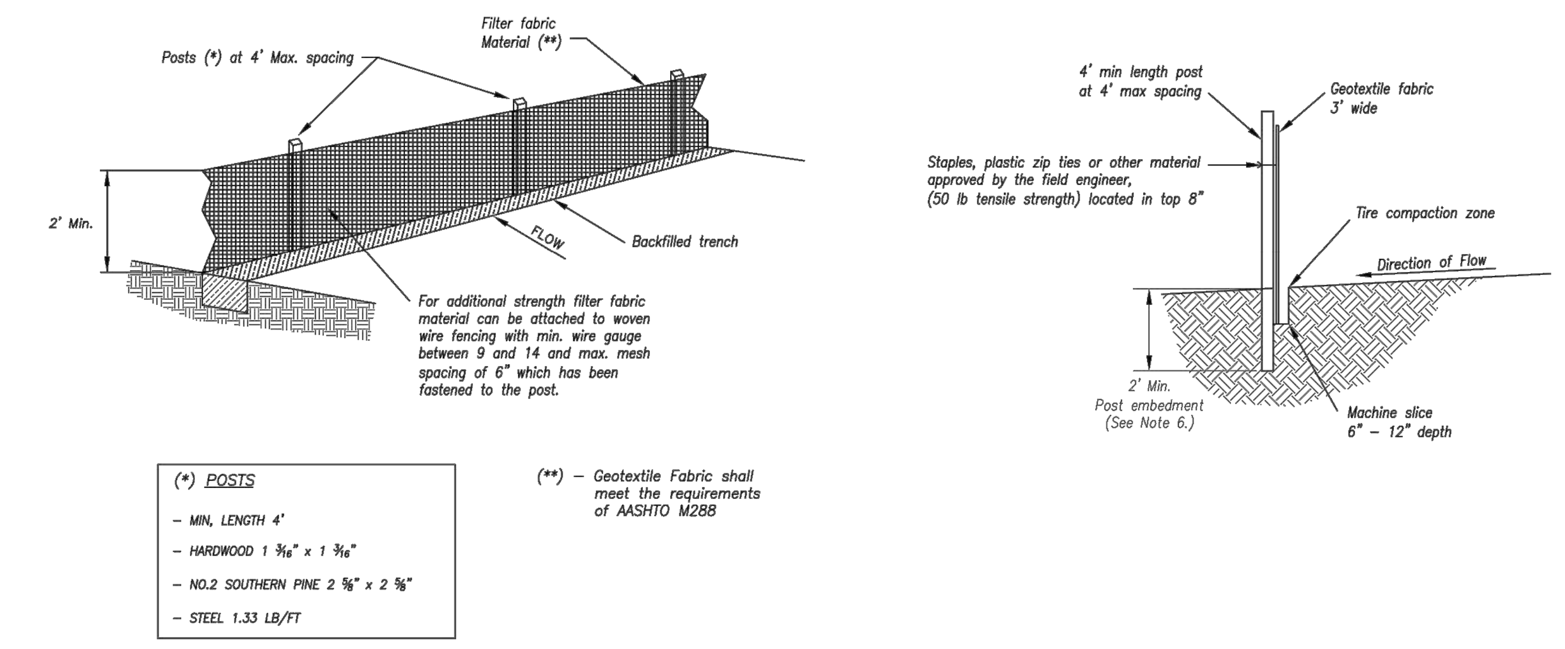
1. Concrete washout materials shall be removed once the materials have filled the washout to approximately 75% full.
2. Concrete washout areas shall be enlarged as necessary to maintain capacity for wasted concrete.
3. Concrete washout water, wasted pieces of concrete and all other debris in the subsurface pit shall be transported from the job site in a water–tight container and disposed of properly.
4. Concrete washout areas shall remain in place until all concrete for the project is placed.
5. When concrete washout areas are removed, excavations shall be filled with suitable compacted backfill and topsoil, any disturbed areas associated with the installation, maintenance, and/or removal of the concrete washout areas shall be stabilized.



CONCRETE WASHOUT

Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control; Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER
CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT
STANDARD DRAWING NUMBER ESC-01
ADOPTED: 10/24/2016



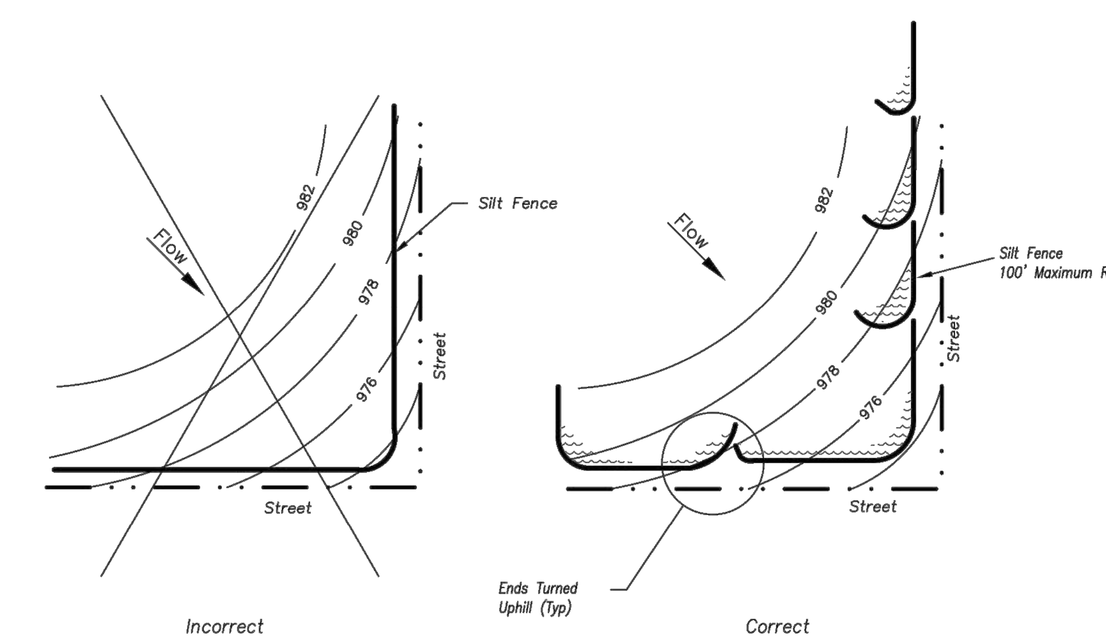
SILT FENCE DETAILS
Not to Scale

Notes:

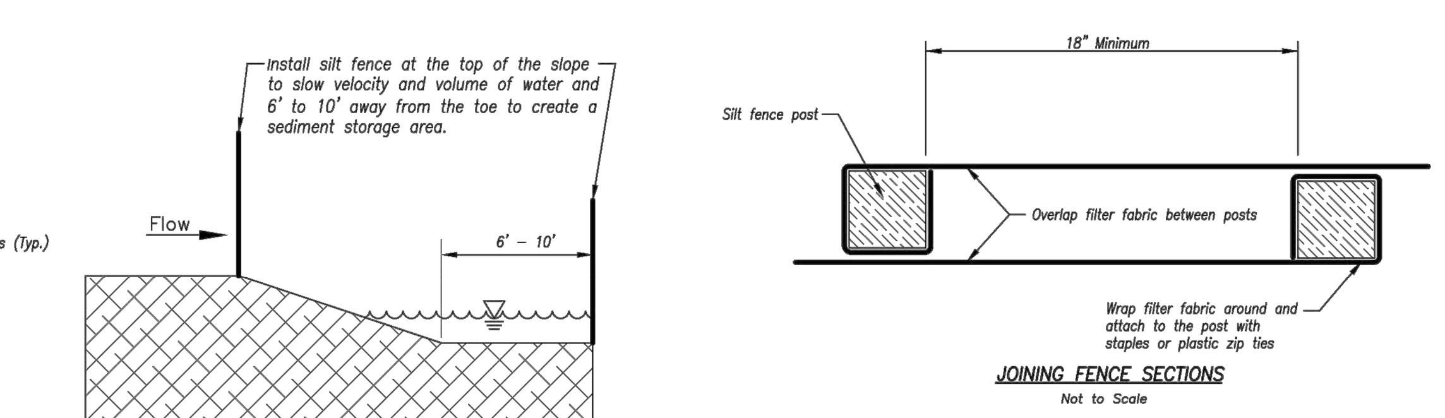
1. In order to contain water, the ends of the silt fence must be turned uphill (Figure A).
2. Long perimeter runs of silt fence must be limited to 100'. Runs should be broken up into several smaller segments to minimize water concentrations (Figure A).
3. Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.
4. Attach fabric to upstream side of post.
5. Install posts a minimum of 2' into the ground.
6. Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

1. Remove and dispose of sediment deposits when the deposit approaches ⅓ the height of silt fence.
2. Repair as necessary to maintain function and structure.



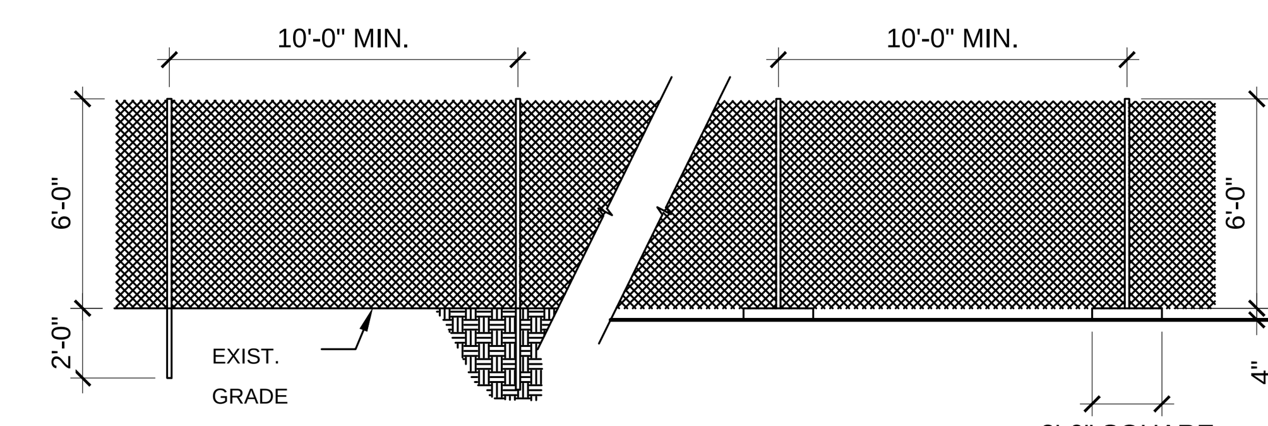
SILT FENCE LAYOUT
Not to Scale



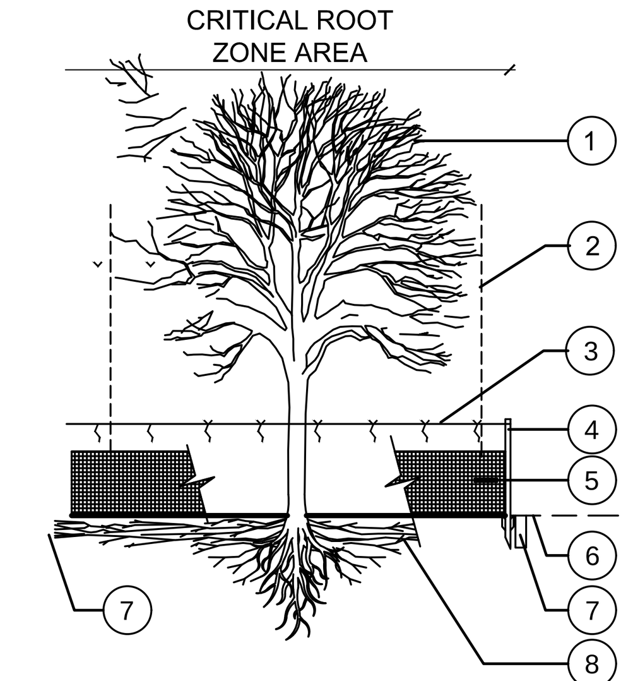
Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER
SILT FENCE
STANDARD DRAWING NUMBER ESC-03
ADOPTED: 10/24/2016

CHAIN LINK FENCE FABRIC IS TO BE 11 GAUGE HOT DIPPED ZINC COATED (GALVANIZED) IRON OR STEEL 8'-0" HIGH W/2 1/2" SQUARE DIAMOND. USE 8'-0" x 1 5/8" DIA. O.D. GALVANIZED IRON POSTS. CORNER AND GATE POSTS WILL BE 8'-0" x 2 3/4" DIA. O.D. ALL NON-MOVABLE FENCE POSTS TO BE SET IN A MIN. 2'-0" IN GROUND OR SET IN 4" THICK CONCRETE PAD 2'-0" SQUARE OR 2'-6" ROUND W/CORNER & GATE POSTS ADEQUATELY BRACED.



CONSTRUCTION FENCE
N.T.S.

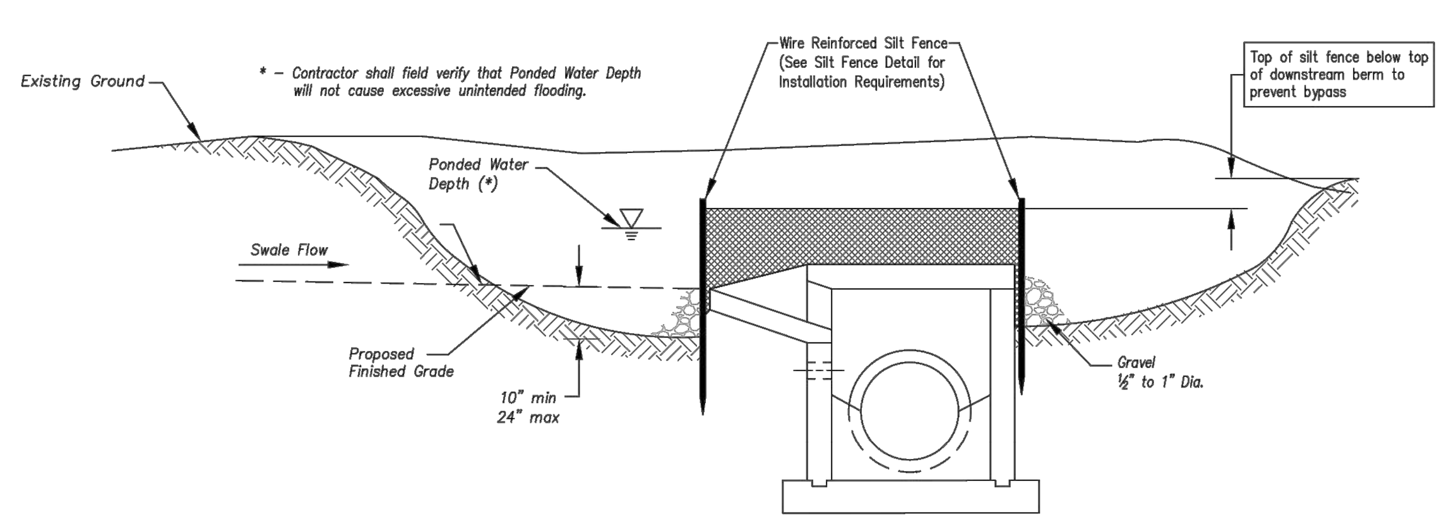


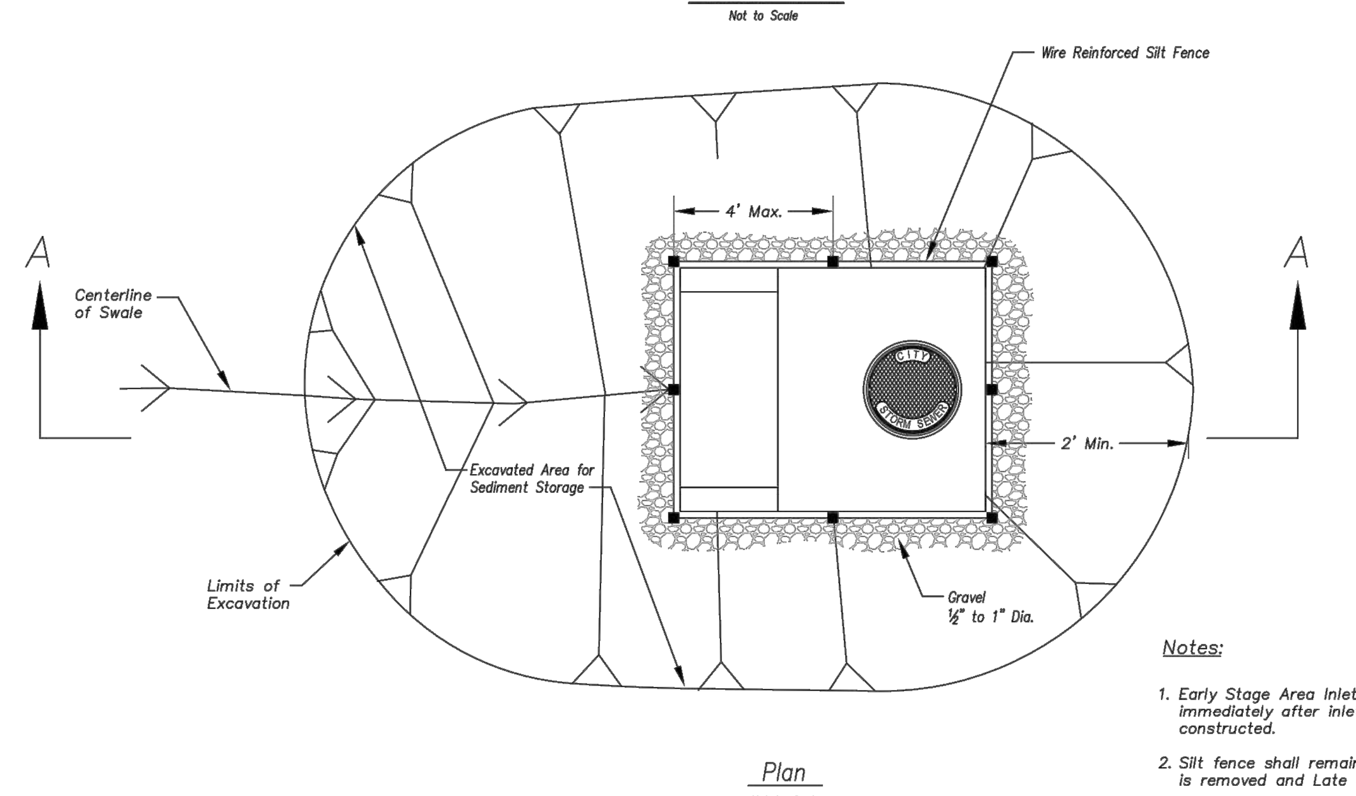
1. EXISTING TREE(S) TO REMAIN.
2. DRIPLINE OF EXISTING TREE (TYP)
3. CONTINUOUS NYLON TIE STRING TIED TO STAKE TOPS W/ 2' TUNDRA WEIGHT ORANGE STREAMERS @ 3' O.C.
4. 8' METAL T-STAKES: 8' O.C. MIN., DRIVEN 2' INTO GROUND AT (OR OUTSIDE) TREE DRIPLINE
5. 4' MIN. HEIGHT ORANGE PLASTIC FENCING INSTALLED PER MANF. RECOMMENDATIONS (TYP). SUPPLEMENT W/ SILT FENCE FABRIC @ PRUNING TRENCH AS REQ'D.
6. EXISTING GRADE TO BE DISTURBED.
7. ROOT PRUNING TRENCH 12" OUTSIDE FENCE - SEE NOTES.
8. EXISTING GRADE TO REMAIN.

NOTES:

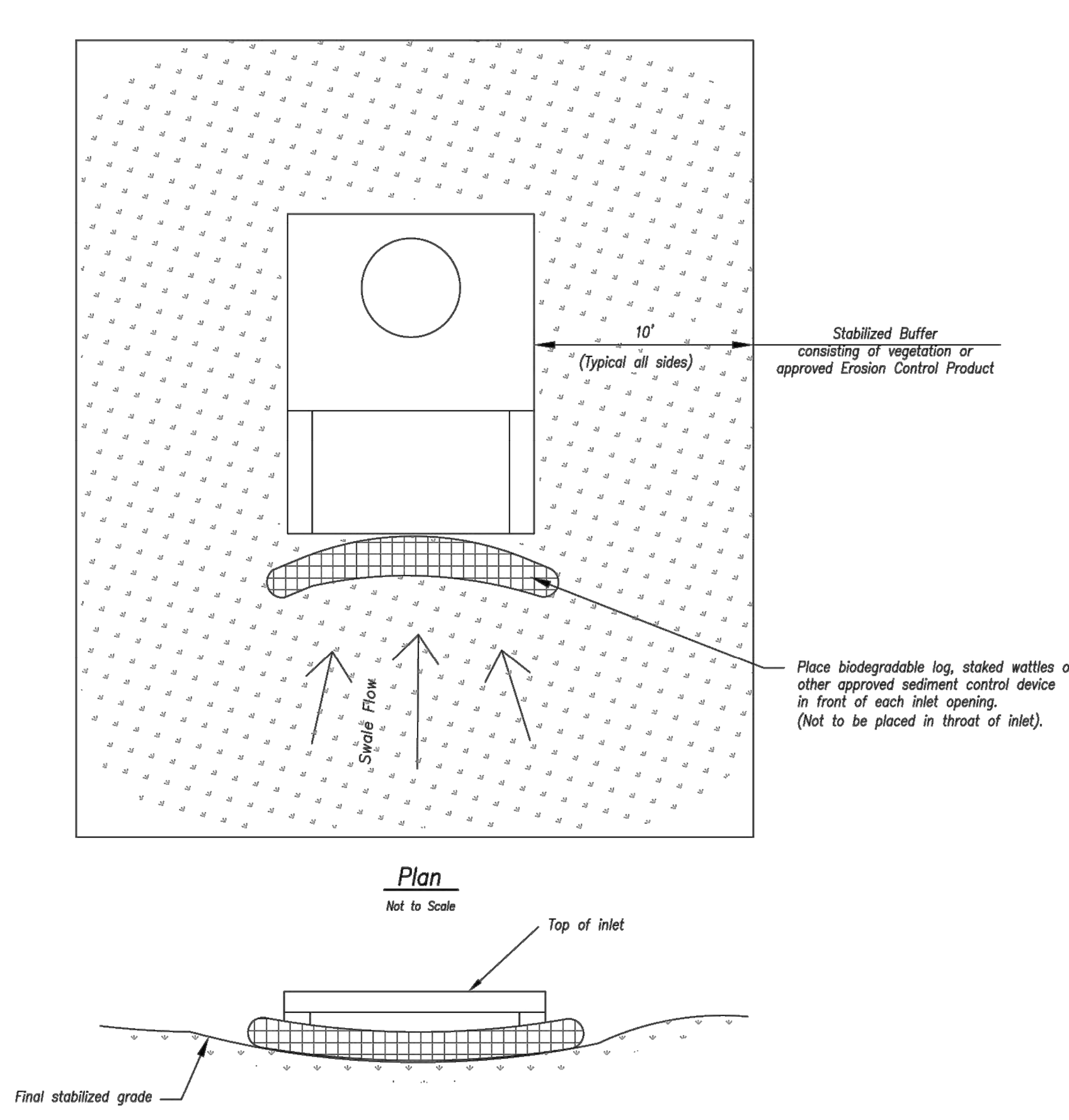
1. PERFORM ROOT PRUNING ON ALL EXISTING TREES TO REMAIN WHERE CONSTRUCTION ACTIVITY FALLS WITHIN DRIP LINE OF EXISTING TREES.
2. ROOT PRUNING METHOD: 2 MONTHS MIN. PRIOR TO EXCAVATION & CONSTRUCTION ACTIVITIES, HAND CUT ROOTS BY DIGGING A 18"-24" DEEP x 8" WIDE TRENCH ALONG THE OUTSIDE PERIMETER OF EXISTING TREE(S) ADJACENT TO CONSTRUCTION AREAS. MAXIMIZE PRUNING TRENCH DISTANCE FROM TRUNK TO THE FULLEST EXTENT POSSIBLE, W/ THE ROOT PRUNING LINE PLACED @ THE EDGE OF CONSTRUCTION LIMITS.

TREE PROTECTION DETAIL
N.T.S.





EARLY STAGE AREA INLET
(All open boxes and inlets not at final grade)



LATE STAGE AREA INLET
(Area inlets at final grade and existing inlets)

Notes:

1. Early Stage Area Inlet Sediment Barrier to be installed immediately after inlet or junction box is constructed.
2. Silt fence shall remain in place until excavated area is removed and Late Stage Area Inlet is being installed.
3. Backfill excavated area ONLY after final grading of the site. Stabilization of the site is to immediately follow.
4. Wire reinforced silt fence may be used in place of silt fence attached to wood frame.

Maintenance:

1. Remove deposited sediment from excavated storage areas when available storage has been reduced by 20%.
2. Remove deposited sediment from filter socks or similar when any accumulation of sediment is visible.
3. Repair or replace as necessary to maintain function and integrity of installation.

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER
AREA INLET AND JUNCTION BOX PROTECTION
STANDARD DRAWING NUMBER ESC-07
ADOPTED: 10/24/2016

VEGETATIVE STABILIZATION REQUIREMENTS

TEMPORARY SEEDING

ALL DISTURBED AREAS WHICH WILL BE LEFT DORMANT FOR GREATER THAN 14 DAYS SHALL BE SEEDED WITH FAST–GERMINATING TEMPORARY VEGETATION IMMEDIATELY FOLLOWING GRADING OPERATIONS. SELECTION OF THE SEED WILL DEPEND ON THE TIME OF YEAR IT IS APPLIED (SEE DESCRIPTIONS IN TABLE 2). REFERENCE LANDSCAPE PLAN FOR PERMANENT STABILIZATION REQUIREMENTS.

TABLE 2
*VEGETATION TABLE**

TEMPORARY SEEDING SPECIES	PLANTING RATE	PLANTING–DATES
CRIMSON CLOVER	7#/ACRE	8/15 – 11/30
MILLET, FOXTAIL	30#/ACRE	5/1 – 8/31
RYEGRASS, ANNUAL	30#/ACRE	8/15 – 9/30
SPRANGLETOP, GREEN	2.5#/ACRE	2/1 – 5/1
TALL FESCUE	7#–10#/1000 SF	9/1 – 10/15

*USE ONLY USDA CERTIFIED SEED.

SURFACE PREPARATION FOR TEMPORARY SEEDING

1. INSTALL EROSION STRUCTURES SUCH AS DIKES, DIVERSIONS, ETC. PRIOR TO SEEDING.
2. FURROW SLOPES STEEPER THAN 3:1 ON THE CONTOUR LINE BEFORE SEEDING.
3. ENSURE SEED BED IS PULVERIZED, LOOSE, AND UNIFORM.

APPLICATION

1. WHEN HYDROMULCHING IS USED, DO NOT MIX SEED AND FERTILIZER MORE THAN 30 MINUTES PRIOR TO APPLICATION.
2. APPLY SEED EVENLY USING PROPER EQUIPMENT AND WATER TO AID VEGETATION GROWTH.
3. EROSION CONTROL NETTING SHALL BE INSTALLED OVER FILL SLOPES WHICH HAVE BEEN BROUGHT TO FINAL GRADE AND HAVE BEEN SEEDED TO PROTECT AGAINST EROSION. MULCH (STRAW OR FIBER) SHALL BE USED ON RELATIVELY FLAT SLOPES.

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Kimley»Horn
Engineer: KEVIN S. GASKEY
P.E. No. 28441 Date: APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

EROSION CONTROL DETAILS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-2

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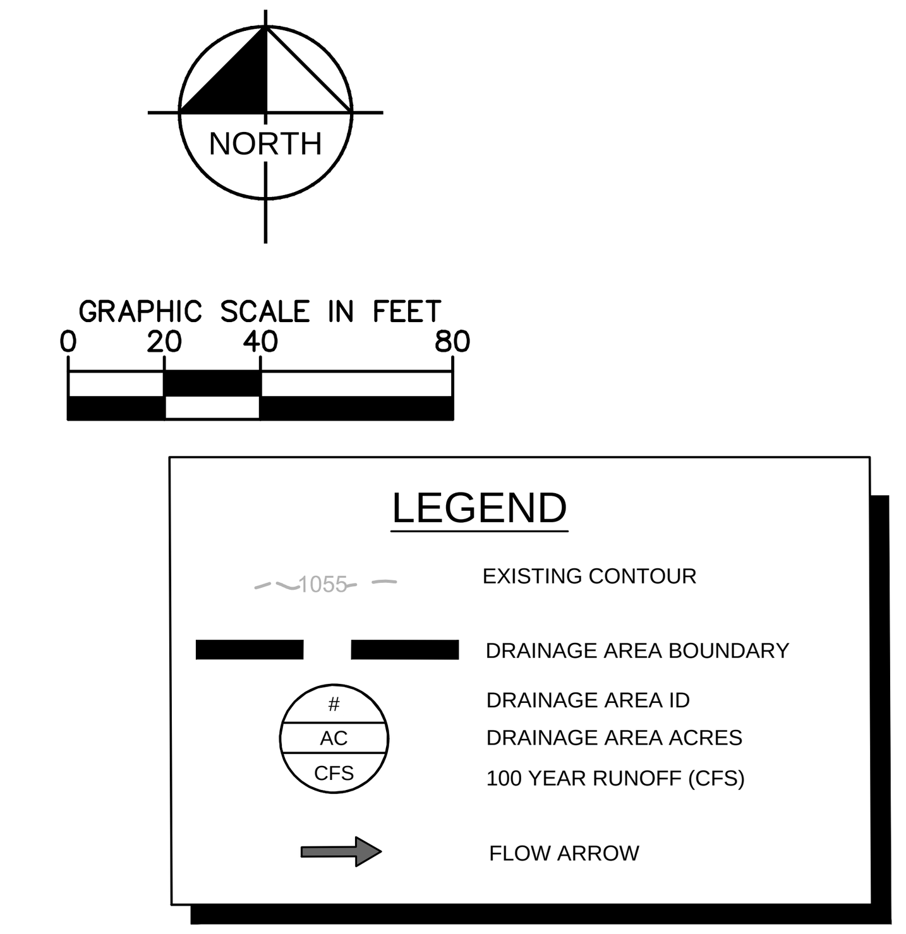
(@ least 72 hours prior to digging)



Existing Condition Hydrologic Parameters

DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A	1.17	0.00183	75.2	4.52	2.71	2.2	5.7	10.8
B	0.16	0.00025	75.5	4.22	2.53	0.3	0.8	1.5
C1	0.13	0.00020	77.7	7.64	4.58	0.2	0.6	1.1
C2	0.38	0.00059	75.3	5.91	3.54	0.7	1.7	3.2
D	1.42	0.00222	75.5	7.20	4.32	2.4	6.1	11.6

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Engineer KEVIN S. GASKEY
P.E. No. Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

EXISTING DRAINAGE AREA MAP

Scale: AS SHOWN
Designed by: ABP
Drawn by: ABO
Checked by: SEG
Date: 04/15/2019
Project No. 064538700

SHEET
C-3

Proposed Hydrologic Parameters								
DA	Area (ac)	Area (mi^2)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A1	0.86	0.00134	75.7	3.97	2.38	1.8	4.3	8.1
A2	0.07	0.00011	98.0	5.00	3.00	0.3	0.5	0.8
A3	0.24	0.00038	92.0	5.23	3.14	1.0	1.7	2.7
A4	0.23	0.00036	98.0	5.35	3.21	1.0	1.7	2.6
A5	0.32	0.00050	88.3	5.98	3.59	1.1	2.0	3.3
A6	0.11	0.00017	89.3	5.62	3.37	0.4	0.7	1.1
B	0.13	0.00020	75.8	4.09	2.45	0.3	0.6	1.2
C1	0.14	0.00022	87.7	7.49	4.49	0.4	0.8	1.3
C2	0.05	0.00008	83.6	5.00	3.00	0.2	0.3	0.5
D	0.88	0.00138	76.5	7.24	4.35	1.6	3.9	7.3
Pool	0.22	0.00034	98.0	5.19	3.11	1.0	1.6	2.4

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SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

PROPOSED DRAINAGE AREA MAP

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET

C-4

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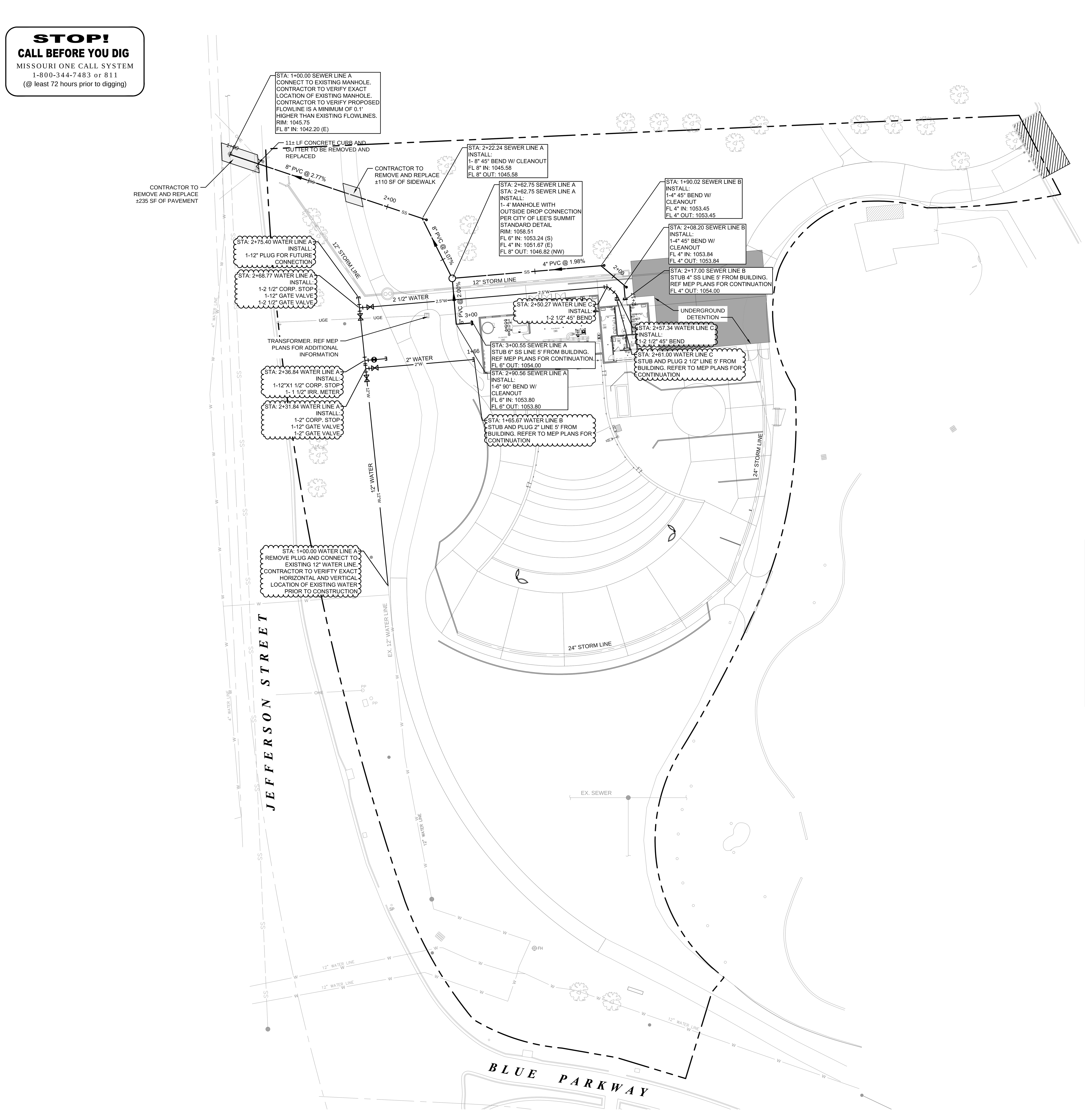

LEGEND

W	EXISTING WATER LINE
SAN	EXISTING SEWER LINE
⊗	EXISTING WATER VALVE
(S)	EXISTING SS MANHOLE
○	PROPOSED SS MANHOLE
	EXISTING FIRE HYDRANT
	PROPOSED STORM LINE
2" W	PROPOSED WATER LINE
	PROPOSED SS LINE
UGE	PROPOSED UGE LINE
⋈	PROPOSED GATE VALVE

NOTES:
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3. CONTRACTOR TO COORDINATE WITH MEP PLANS AT ALL UTILITY STUBOUTS.

4. CONTRACTOR TO ENSURE NO METERS OR VALVES ARE PLACED IN SIDEWALKS.

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7. ALL WATERLINES AND SANITARY SEWER LINES, AND WATERLINES AND STORM SEWER LINES SHOULD BE KEPT TEN FEET (10') APART WHEN PARALLEL OR 24" VERTICAL CLEARANCE WHEN CROSSING (OUTSIDE OF PIPE TO OUTSIDE OF PIPE). IF 24" OF VERTICAL CLEARANCE CAN NOT BE MAINTAINED, SANITARY SEWER LINE TO BE ENCASED IN CONCRETE FOR 20' CENTERED ON CROSSING.
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13. THE CONTRACTOR SHALL INCLUDE IN THE BID PRICE THE DAILY RECORD KEEPING OF THE AS-BUILT CONDITION OF ALL THE UNDERGROUND UTILITIES.

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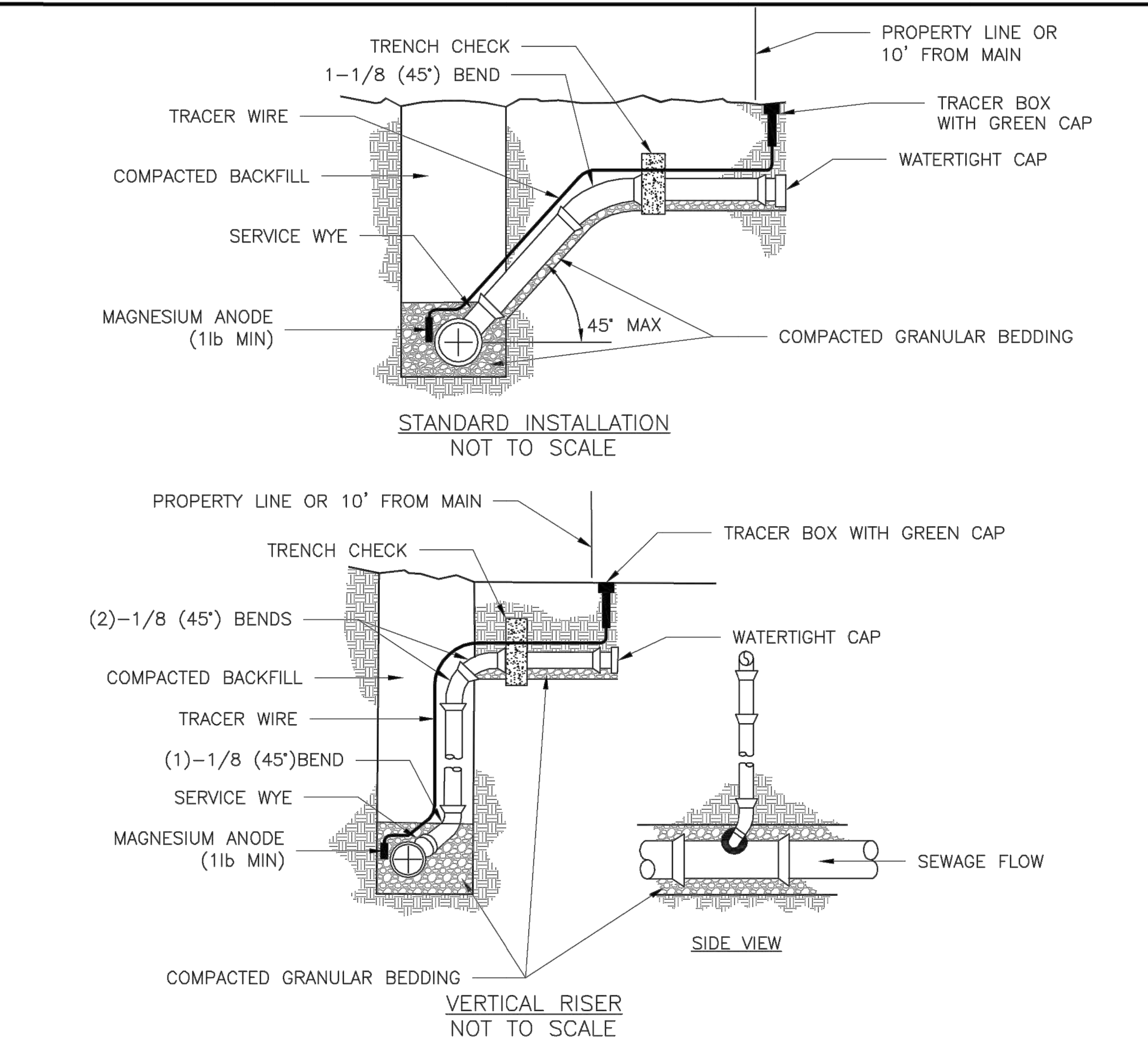
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

UTILITY PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-5



NOTES:

1. ALL SEWER STUBS SHALL BE CONSTRUCTED TO PROPERTY LINE OR 10' MINIMUM FROM THE MAIN. WHERE SIDEWALKS ARE PRESENT, CONTRACTOR SHALL EXTEND SERVICE LINE UNDER EXISTING SIDEWALK TO TWO FEET BEYOND.
2. ALL NEW CONSTRUCTION OFF SEWER STUBS SHALL BE TEMPORARILY MARKED WITH A MARKING STAKE, 36" ABOVE GROUND AND PAINTED GREEN.
3. IMPERVIOUS TRENCH CHECKS SHALL BE PLACED ON BUILDING SEWER STUBS (AT LEAST 5' AWAY FROM THE SANITARY SEWER MAIN).
4. TRENCH CHECKS ON THE BUILDING SEWER STUBS SHALL EXTEND 6" BELOW THE BOTTOM OF THE PIPE. LENGTH SHALL BE A MINIMUM OF 12". THE HEIGHT OF THE TRENCH CHECK SHALL EXTEND 12" ABOVE THE TOP OF THE PIPE. THE WIDTH OF THE TRENCH CHECK SHALL BE THE WIDTH OF THE TRENCH.
5. SEE SPECIFICATION SECTION 2100 FOR SEWER MAIN BEDDING AND BACKFILL.
6. #12 GAUGE GREEN INSULATED COPPER TRACER WIRE SHALL BE INSTALLED. TRACER WIRE TERMINAL BOXES SHALL BE INSTALLED DIRECTLY ABOVE THE SEWER SERVICE OR AS DETERMINED BY THE ENGINEER.
7. FOR SERVICES, TRACER WIRE SHALL RUN FROM THE WYE AND TERMINATE IN A FLUSH MOUNTED TRACER BOX WITH A GREEN CAST IRON LOCKABLE TOP. WIRE SHALL BE TAPED OR TIED TO THE PIPE AT 5' INTERVALS.
8. TRACER WIRE BOX SHALL BE INSTALLED WITHIN 1.0' OF PROPERTY LINE.
9. THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT CONNECTORS. WIRE NUTS SHALL NOT BE USED. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

LEE'S SUMMIT
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PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

BUILDING SEWER STUB AND RISER

Date: 04/17
Drawn By: MJF
Checked By: DL

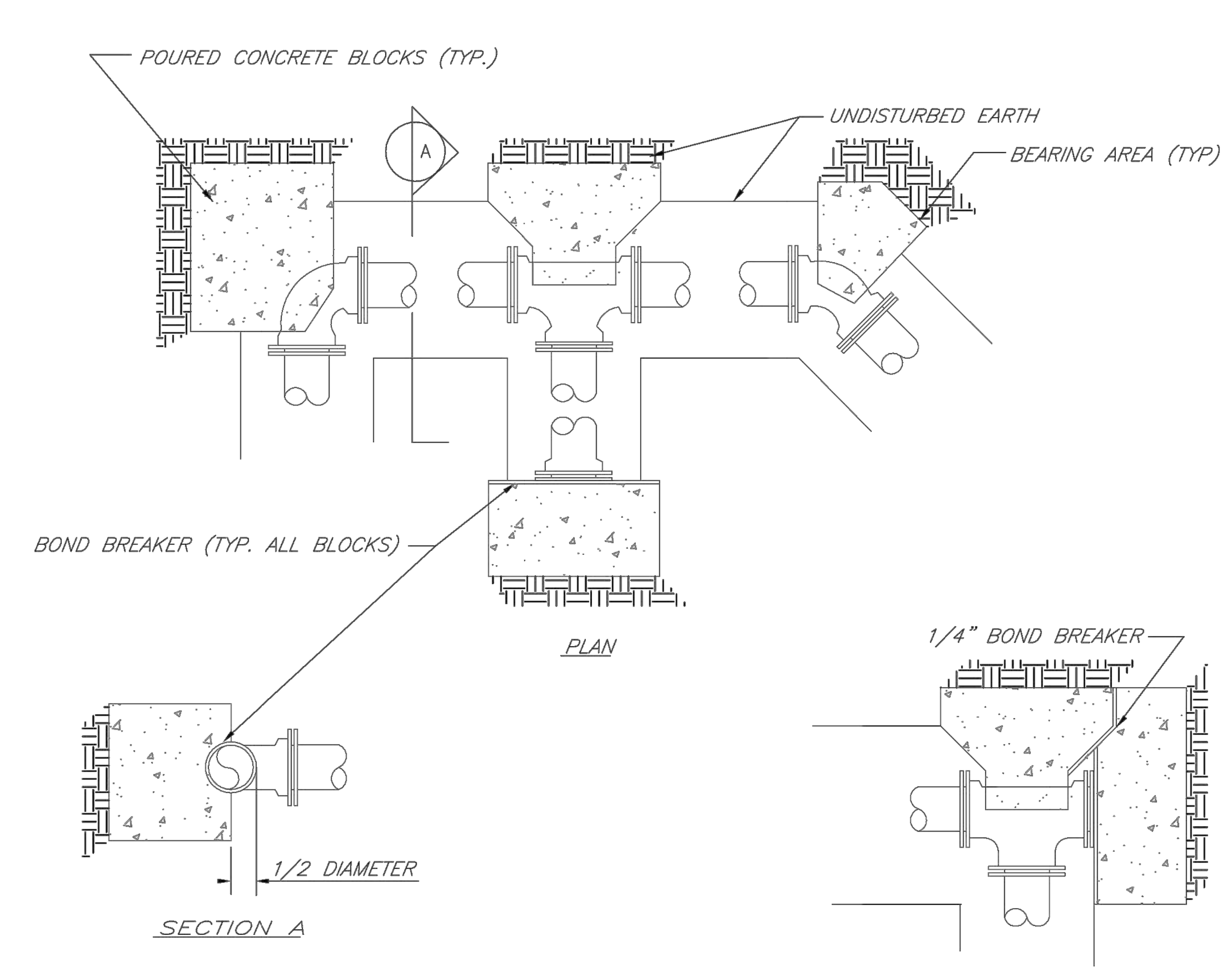
SAN-1

REQUIRED CONCRETE BEARING AREA (SQUARE FEET - SF)

NOM. DIA. (INCHES)	180 TEE, PLUG	90 BEND	45 BEND	22.5 BEND	11.25 BEND
6	4.7	6.7	4.0	4.0	4.0
8	8.4	11.8	6.4	4.0	4.0
10	13.1	18.5	10.0	5.1	4.0
12	18.8	26.7	14.4	7.4	4.0
14	25.7	36.3	19.6	10.0	5.0
16	33.5	47.4	25.6	13.1	6.6
18	42.4	REST. JT.	32.5	16.5	8.3
20	REST. JT.	REST. JT.	40.1	20.4	10.3
24	REST. JT.	REST. JT.	REST. JT.	29.4	14.8

NOTES:

1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
3. BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



LEE'S SUMMIT
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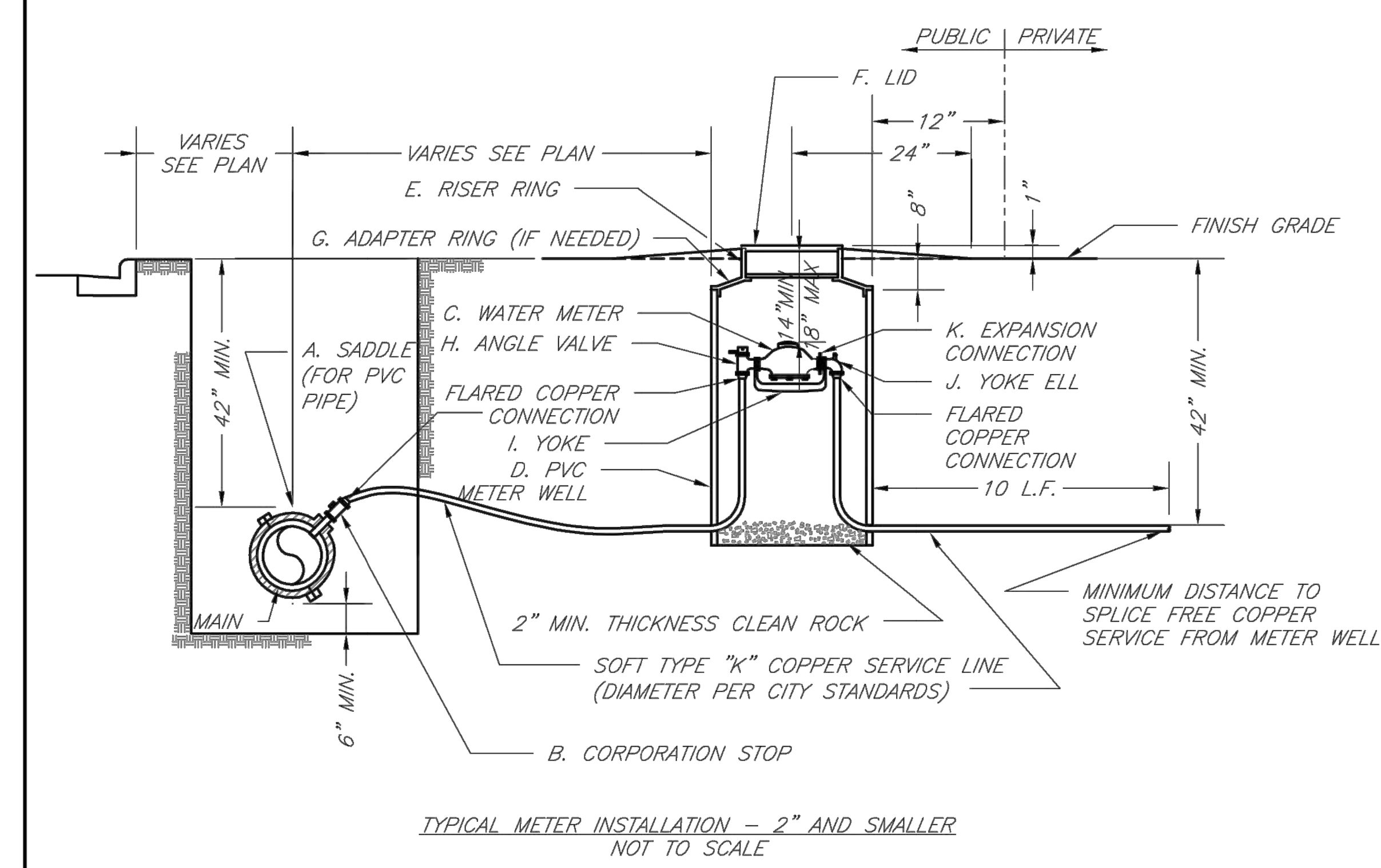
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

HORIZONTAL THRUST BLOCKS

Date: 02/13
Drawn By: JN
Checked By: DL
FILE: WAT-1
Rev: 1/14
Rev:



TYPICAL METER INSTALLATION - 2" AND SMALLER
NOT TO SCALE

NOTES:

1. METER INSTALLATION SHALL NOT BE LOCATED IN AREAS SUBJECT TO VEHICULAR TRAFFIC OR IN CONCRETE PAVEMENT WITHOUT CITY APPROVAL.
2. IF METER IS TO BE LOCATED OTHER THAN IN FRONT OF PROPERTY LINE, CITY APPROVAL SHALL BE OBTAINED.
3. CITY TO FURNISH ITEMS A-K.
4. NO OTHER EQUIPMENT SHALL BE INSTALLED IN THIS PIT.
5. 42" MINIMUM BURY DEPTH FOR ALL SERVICE LINES.
6. EXCAVATION FOR TAP TO EXPOSE 4 LINEAR FEET OF MAIN.
7. NO SPLICES ALLOWED BETWEEN METER AND MAIN.
8. SERVICE CONNECTION TAP AT APPROXIMATELY 45 DEGREES.
9 LID AND RISER RING SHALL BE SET SO THAT GROUND WATER WILL DRAIN AWAY FROM THE WELL.
10. CONTACT WATER UTILITIES, 816-969-1900, FOR REQUIREMENTS OF A METER LARGER THAN 2"

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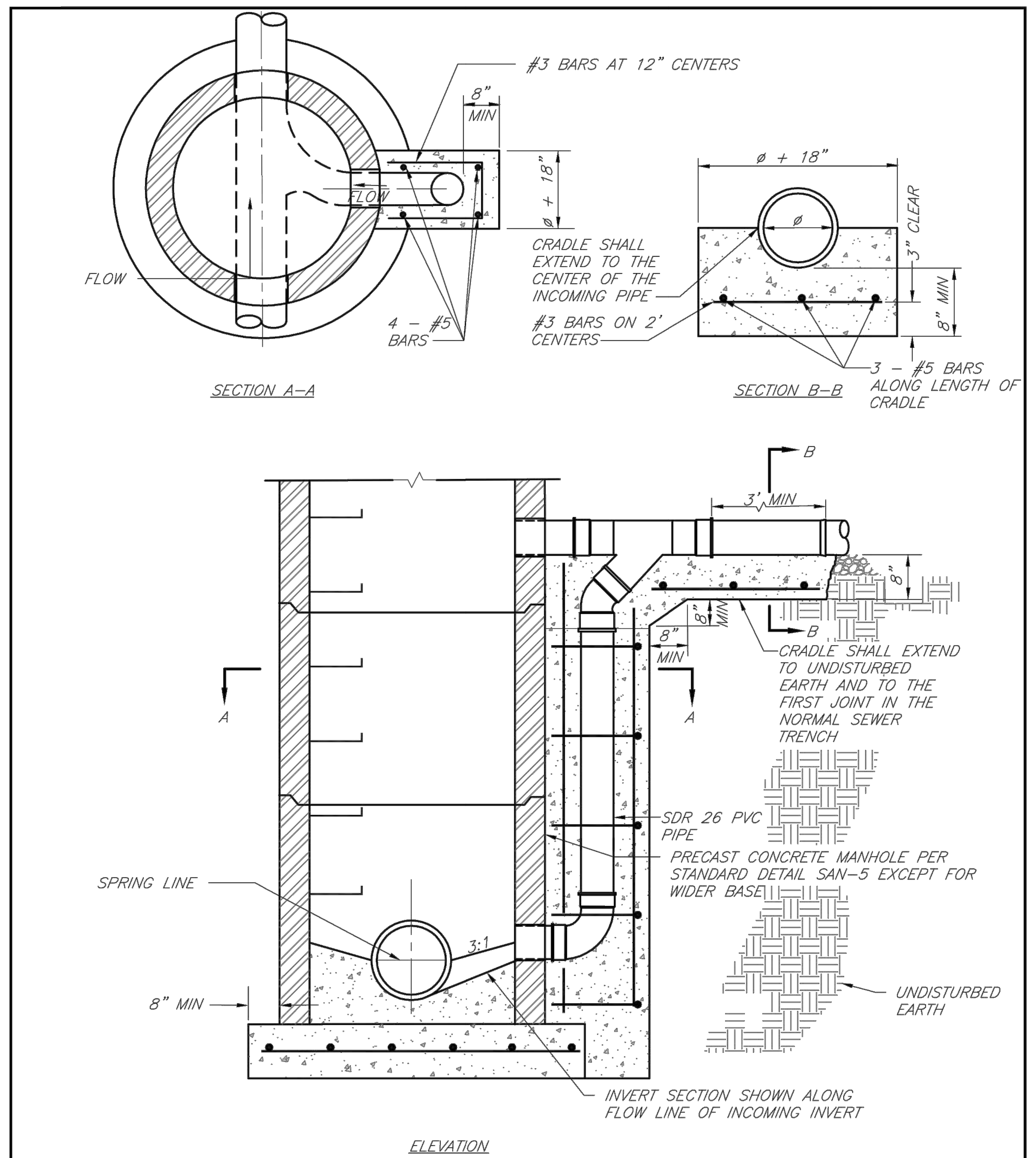
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

SERVICE CONNECTION/METER WELL

Date: 02/13
Drawn By: JN
Checked By: DL
FILE: WAT-11
Rev: 1/14
Rev:



NOTE:
REFER TO DRAWING SAN-2 FOR MANHOLE DETAILS NOT SHOWN.

LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

DROP SANITARY SEWER MANHOLE

Date: 02/13
Drawn By: JN
Checked By: DL
FILE: SAN-4
Rev: 1/14
Rev:

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SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

UTILITY DETAILS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-6

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Xrefs: 20190325x2436 Images:

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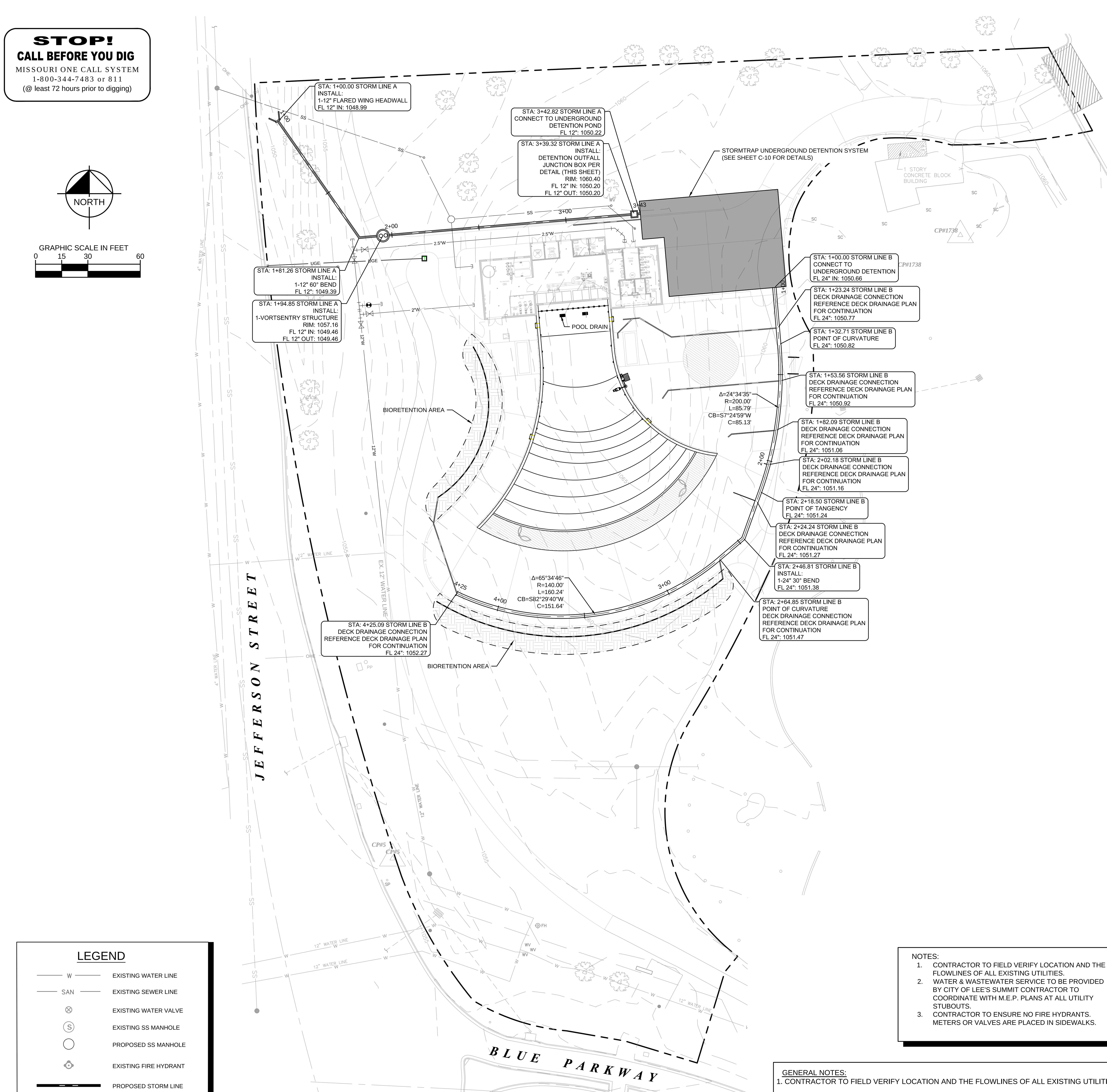
NORTH

GRAPHIC SCALE IN FEET
0 15 30 60



LEGEND

—W—	EXISTING WATER LINE
—SAN—	EXISTING SEWER LINE
⊗	EXISTING WATER VALVE
Ⓢ	EXISTING SS MANHOLE
○	PROPOSED SS MANHOLE
	EXISTING FIRE HYDRANT
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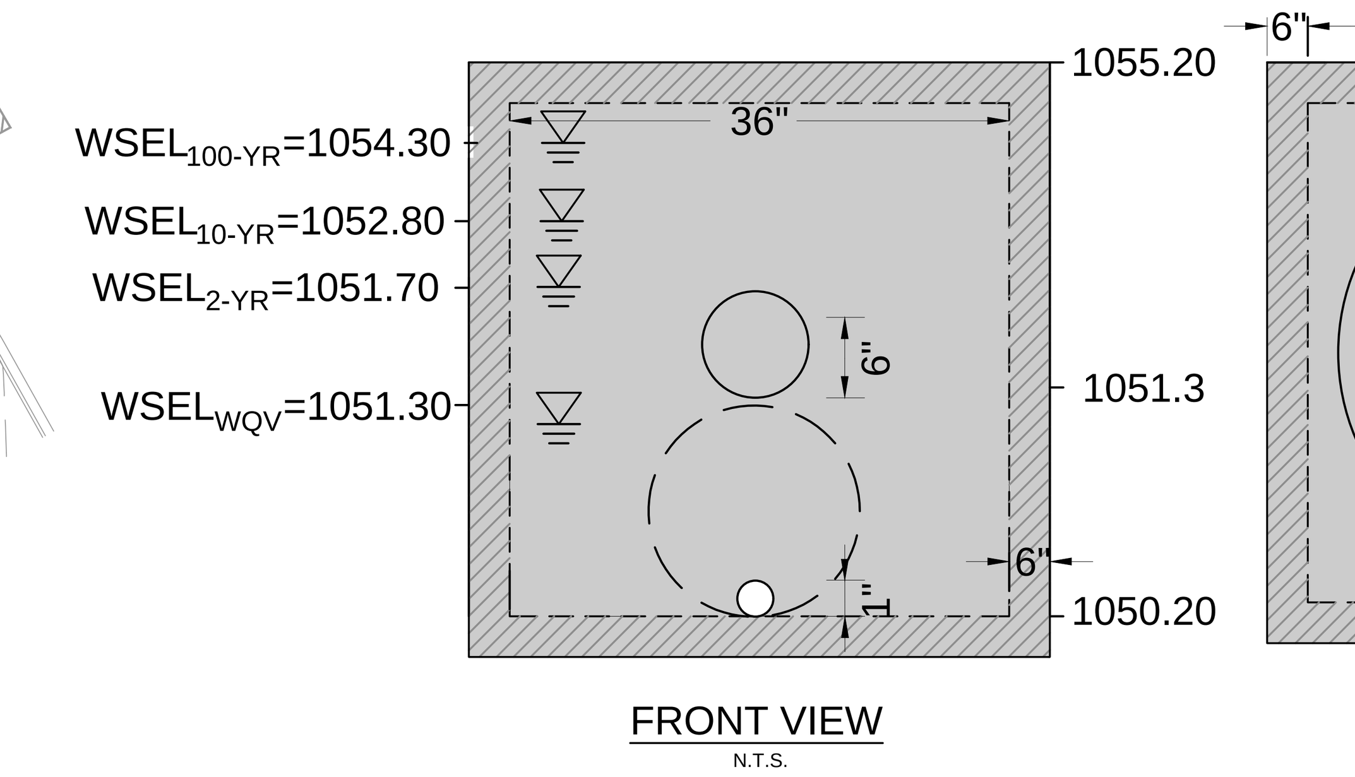
—2" W—	PROPOSED WATER LINE
	PROPOSED SS LINE
—UGE—	PROPOSED UGE LINE
⋈	PROPOSED GATE VALVE

DETENTION OUTFALL JUNCTION BOX DETAILS



WEIR CALCULATIONS:

$Q = C*L*H^{1.5}$
$C = 3.0$

ORIFICE CALCULATIONS:

$Q = C*A*(2*g*H)^{0.5}$
$C = 0.6$
$g = 32.2\ FT/S^2$

OPENING #1 (WQV)
D = 1 IN
$A = 0.01\ FT^2$
INVERT ELEVATION = 1050.20
H = WSEL - CENTROID

OPENING #2
D = 6 IN
$A = 0.20\ FT^2$
INVERT ELEVATION = 1051.55
H = WSEL - CENTROID

Outfall Structure Summary

Design Storm	Volume (ac-ft)	Elevation (ft)	Opening #1 Weir	Opening #1 Orifice	Opening #1 Actual	Opening #2 Weir	Opening #2 Orifice	Opening #2 Actual	Total Actual
WQV	0.11	1051.30	0.29	0.03	0.03	0.00	0.00	0.00	0.03
2-year	0.20	1051.70	0.46	0.03	0.03	0.38	0.37	0.37	0.40
10-year	0.30	1052.80	1.05	0.04	0.04	2.76	1.06	1.06	1.10
100-year	0.43	1054.30	2.08	0.05	0.05	7.79	1.57	1.57	1.62

Elevation Discharge Summary Table

Elevation	Opening #1 Weir	Opening #1 Orifice	Opening #1 Actual	Opening #2 Weir	Opening #2 Orifice	Opening #2 Actual	Total Actual
1050.2	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1051.2	0.25	0.03	0.03	0.00	0.00	0.00	0.03
1052.2	0.71	0.04	0.04	1.28	0.76	0.76	0.80
1053.2	1.30	0.05	0.05	3.93	1.21	1.21	1.26
1054.2	2.00	0.05	0.05	7.41	1.54	1.54	1.59
1054.72	2.40	0.06	0.06	9.49	1.68	1.68	1.74

Stage Storage Summary Table

Elevation (ft)	Area (ac)	Volume (ac-ft)
1050.20	0.10	0.00
1054.72	0.10	0.45

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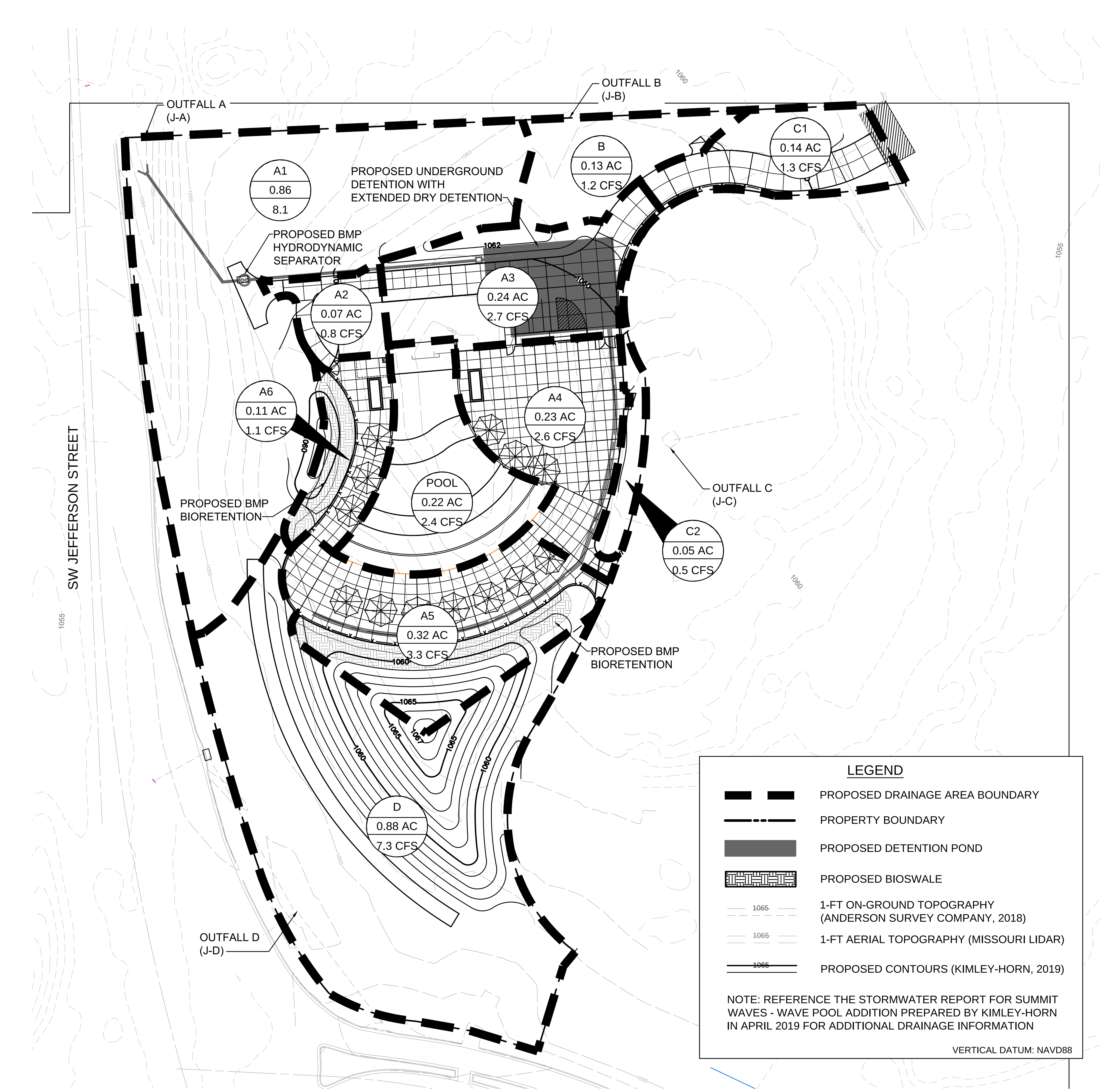
P.E. No. Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

DRAINAGE AND DETENTION POND PLAN

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-7



WATER QUALITY CALCULATIONS – PROPOSED CONDITIONS

Water Quality Calculations - Outfall A (Disturbed Area):

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	1.27	74	93.98
Pavement	0.01	98	0.98
		$CN_{PreWeighted}$ =	74.2

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.32	74	23.68
Pavement	0.97	98	95.06
		$CN_{PostWeighted}$ =	92.0

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	74.2
$CN_{PostWeighted}$ =	92.0
Difference =	17.9
LS Requried (Table 4.2)=	8

D. Proposed BMP Package

DA	Cover/BMP Description	Treatment Area	VR	VR*Area
A1 (Bypass, Disturbed)	None	0.10	0.00	0.00
A2 (Bypass)	None	0.07	0.00	0.00
A3	Extended Dry Detention + Hydrodynamic Seperator	0.24	8.00	1.92
A4	Extended Dry Detention + Hydrodynamic Seperator	0.23	8.00	1.84
A5	Bioretention, Extended Dry Detention, + Hydrodynamic	0.32	16.50	5.28
A6	Bioretention, Extended Dry Detention, + Hydrodynamic	0.11	16.50	1.82
Pool	Extended Dry Detention + Hydrodynamic Seperator	0.22	8.00	1.76
			Total =	12.62
			Weighted VR =	9.78
			Required VR =	8.00

E. Water Quality Volume

% Site Impervious	75%
Rv	0.73
WQV (in)	1.00
WQV (ac-ft)	0.11
Release Rate (hr)	40
Q_{WQV} (cfs)	0.03

Water Quality Calculations - Outfall D:

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	1.33	74	98.42
Pavement	0.09	98	8.82
		$CN_{PreWeighted}$ =	75.5

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.79	74	58.46
Pavement	0.10	98	9.8
		$CN_{PostWeighted}$ =	76.7

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	75.5
$CN_{PostWeighted}$ =	76.7
Difference =	1.2
LS Requried (Table 4.2)=	n/a

Water Quality Calculations - Outfall B:

A. Predevelopment CN

Land Use	Area	CN	CN*A
Grass	0.15	74	11.1
Pavement	0.01	98	0.98
		$CN_{PreWeighted}$ =	75.5

B. Postdevelopment CN

Land Use	Area	CN	CN*A
Grass	0.12	74	8.88
Pavement	0.01	98	0.98
		$CN_{PostWeighted}$ =	75.8

C. Level of Service (LS) Calculation

$CN_{PreWeighted}$ =	75.5
$CN_{PostWeighted}$ =	75.8
Difference =	0.3
LS Requried (Table 4.2)=	n/a

HYDROLOGIC CALCULATIONS – EXISTING CONDITIONS

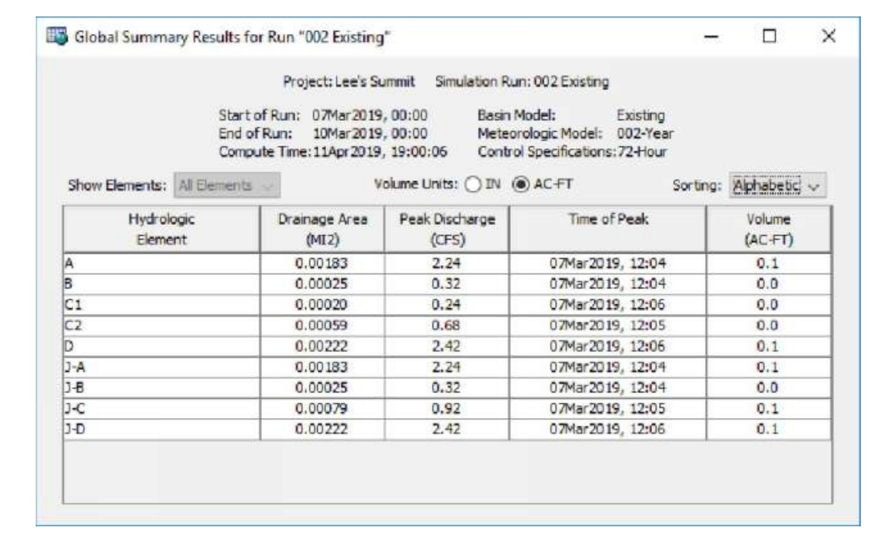
Existing Condition Hydrologic Parameters

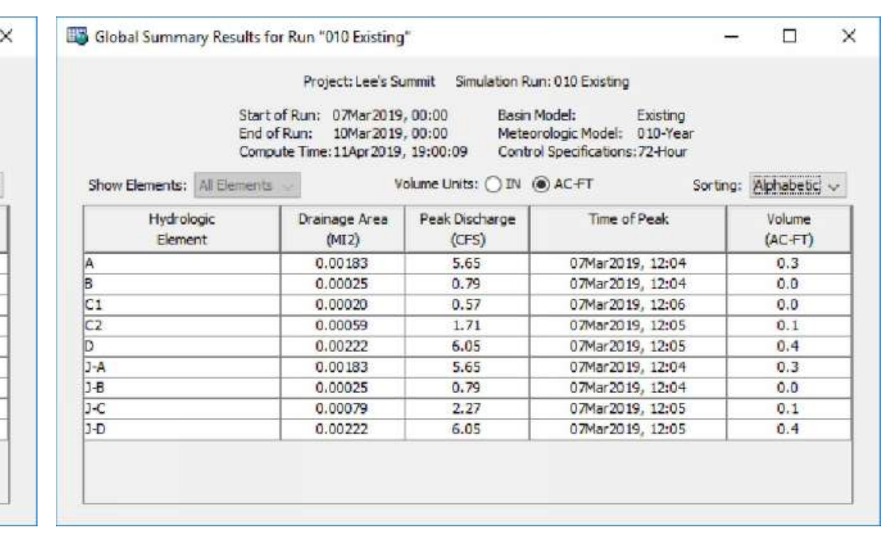
DA	Area (ac)	Area (mi²)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A	1.17	0.00183	75.2	4.52	2.71	2.2	5.7	10.8
B	0.16	0.00025	75.5	4.22	2.53	0.3	0.8	1.5
C1	0.13	0.00020	77.7	7.64	4.58	0.2	0.6	1.1
C2	0.38	0.00059	75.3	5.91	3.54	0.7	1.7	3.2
D	1.42	0.00222	75.5	7.20	4.32	2.4	6.1	11.6

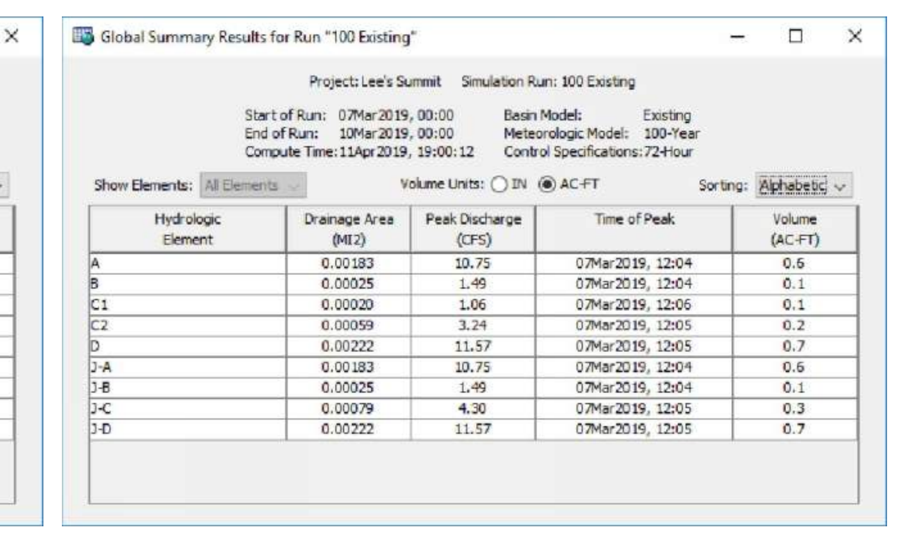
TIME OF CONCENTRATION & LAG TIME
EXISTING
TR-55 Methodology

SHEET FLOW: Tc = (0.007(nL)^0.8)/(P2^0.5)(s^0.4); 2-year/24-hr Rainfall Depth (in.) = 3.71
SHALLOW CONCENTRATED FLOW: Tc = L / 60*V
STORM SEWER FLOW: Assumed Velocity = 4 ft/s (swale)

Basin	Sheet Length (ft)	$Elev_1$	$Elev_2$	Slope (ft/ft)	Manning's "n"	T_{c1} (min)	Shallow Length (ft)	$Elev_2$	$Elev_3$	Slope (ft/ft)	Condition TR-55 Fig. 3-1	V_{avg} (ft/s)	T_{c2} (min)	Inlet Time (min)	Travel Length (ft)	Travel Velocity (ft/s)	Travel Time (min)	T_{c3} (min)	T_{cTOTAL} (min)	T_{lag} (min)
A	50	1066.0	1063.0	0.0600	0.150	3.4	137	1063.0	1052.0	0.080	Unpaved	4.57	0.5		156	4.0	0.7	0.7	4.5	2.7
B	50	1063.0	1061.0	0.0400	0.150	4.0	40	1061.0	1060.0	0.025	Unpaved	2.55	0.3						4.2	2.5
C1	50	1061.5	1061.0	0.0100	0.150	6.9	116	1061.0	1058.0	0.026	Unpaved	2.59	0.7						7.6	4.6
C2	50	1066.0	1065.0	0.0200	0.150	5.2	145	1065.0	1058.0	0.048	Unpaved	3.55	0.7						5.9	3.5
D	50	1066.0	1065.0	0.0200	0.150	5.2	342	1065.0	1054.0	0.032	Unpaved	2.89	2.0						7.2	4.3







HYDROLOGIC CALCULATIONS – PROPOSED CONDITIONS

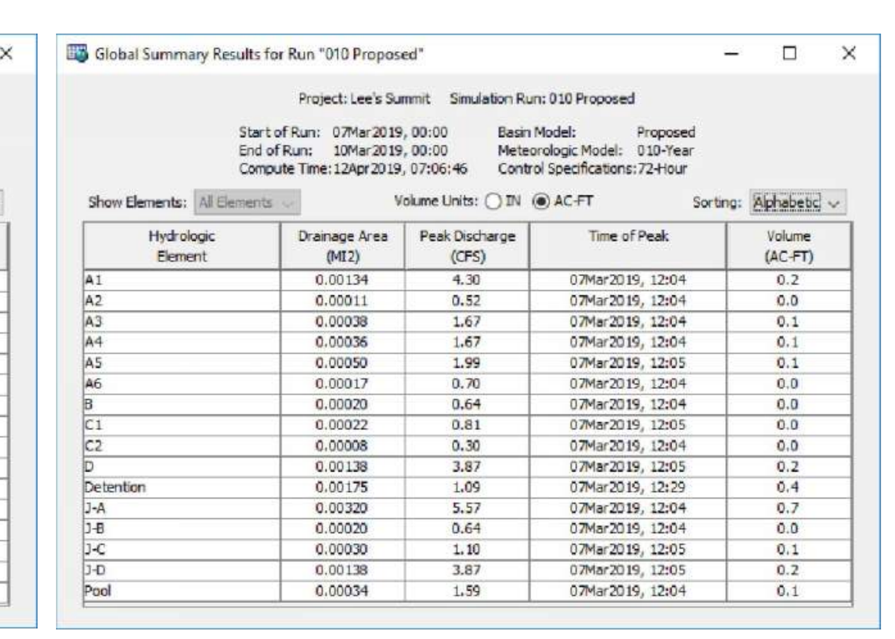
Proposed Hydrologic Parameters

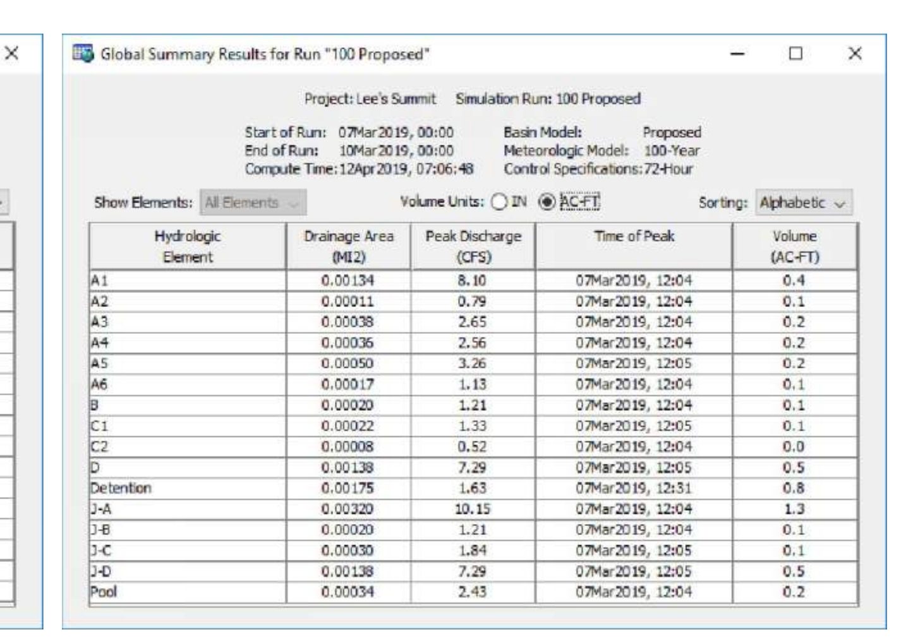
DA	Area (ac)	Area (mi²)	CN	TC	TC_{lag}	Q_{2yr} (cfs)	Q_{10yr} (cfs)	Q_{100yr} (cfs)
A1	0.86	0.00134	75.7	3.97	2.38	1.8	4.3	8.1
A2	0.07	0.00011	98.0	5.00	3.00	0.3	0.5	0.8
A3	0.24	0.00038	92.0	5.23	3.14	1.0	1.7	2.7
A4	0.23	0.00036	98.0	5.35	3.21	1.0	1.7	2.6
A5	0.32	0.00050	88.3	5.98	3.59	1.1	2.0	3.3
A6	0.11	0.00017	89.3	5.62	3.37	0.4	0.7	1.1
B	0.13	0.00020	75.8	4.09	2.45	0.3	0.6	1.2
C1	0.14	0.00022	87.7	7.49	4.49	0.4	0.8	1.3
C2	0.05	0.00008	83.6	5.00	3.00	0.2	0.3	0.5
D	0.88	0.00138	76.5	7.24	4.35	1.6	3.9	7.3
Pool	0.22	0.00034	98.0	5.19	3.11	1.0	1.6	2.4

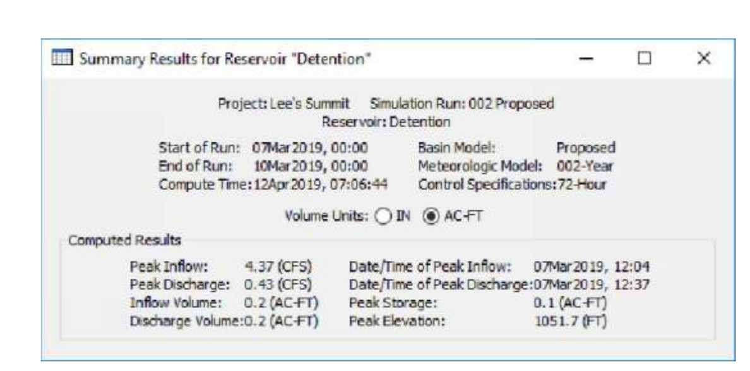
TIME OF CONCENTRATION & LAG TIME
PROPOSED
TR-55 Methodology

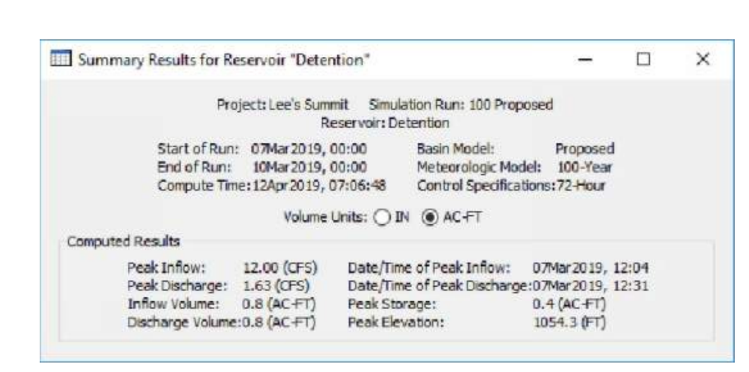
SHEET FLOW: Tc = (0.007(nL)^0.8)/(P2^0.5)(s^0.4); n = 0.24 (dense grass)
SHALLOW CONCENTRATED FLOW: Tc = L / 60*V
STORM SEWER FLOW: Assumed Velocity = 4 ft/s (swale); Assumed Velocity = 6 ft/s (storm sewer); Assumed Velocity = 3 ft/s (bioretention)

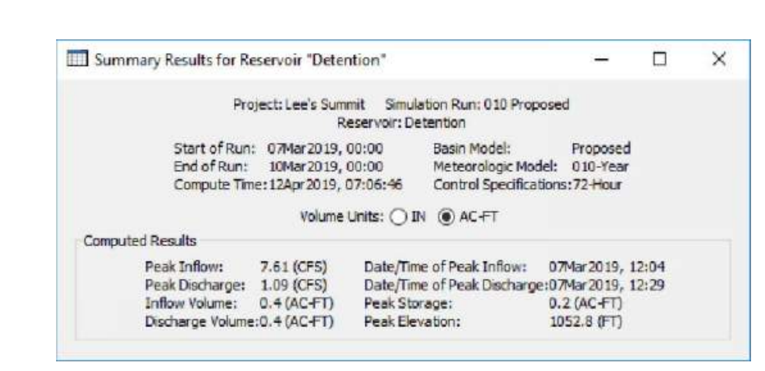
Basin	Sheet Length (ft)	$Elev_1$	$Elev_2$	Slope (ft/ft)	Manning's "n"	T_{c1} (min)	Shallow Length (ft)	$Elev_2$	$Elev_3$	Slope (ft/ft)	Condition TR-55 Fig. 3-1	V_{avg} (ft/s)	T_{c2} (min)	Inlet Time (min)	Travel Length (ft)	Travel Velocity (ft/s)	Travel Time (min)	T_{c3} (min)	T_{cTOTAL} (min)	T_{lag} (min)
A1	50	1059.5	1056.0	0.0700	0.150	3.2	44	1056.0	1052.0	0.091	Unpaved	4.86	0.2		156	4.0	0.7	0.7	4.0	2.4
A2														5.0					5.0	3.0
A3														5.0	81	6.0	0.2	5.2	5.2	3.1
A4														5.0	127	6.0	0.4	5.4	5.4	3.2
A5														5.0	176	3.0	1.0	6.0	6.0	3.6
A6														5.0	112	3.0	0.6	5.6	5.6	3.4
B	50	1062.5	1060.5	0.0400	0.150	4.0	20	1060.5	1060.0	0.025	Unpaved	2.55	0.1						4.1	2.5
C1	50	1061.5	1061.0	0.0100	0.150	6.9	116	1061.0	1058.0	0.026	Paved	3.27	0.6						7.5	4.5
C2														5.0					5.0	3.0
D	50	1059.0	1058.0	0.0200	0.150	5.2	248	1058.0	1054.0	0.016	Unpaved	2.05	2.0						7.2	4.3
Pool														5.0	67	6.0	0.2	5.2	5.2	3.1











Junction	2 YR			10 YR			100 YR		
	Existing	Proposed	Difference	Existing	Proposed	Difference	Existing	Proposed	Difference
J-A	2.24	2.10	-0.14	5.65	5.57	-0.08	10.75	10.15	-0.60
J-B	0.32	0.26	-0.06	0.79	0.64	-0.15	1.49	1.21	-0.28
J-C	0.92	0.57	-0.35	2.27	1.10	-1.17	4.30	1.84	-2.46
J-D	2.42	1.59	-0.83	6.05	3.87	-2.18	11.57	7.29	-4.28

Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
PHONE: 214-420-5600 FAX: 214-420-5680
WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

95% REVIEW SET
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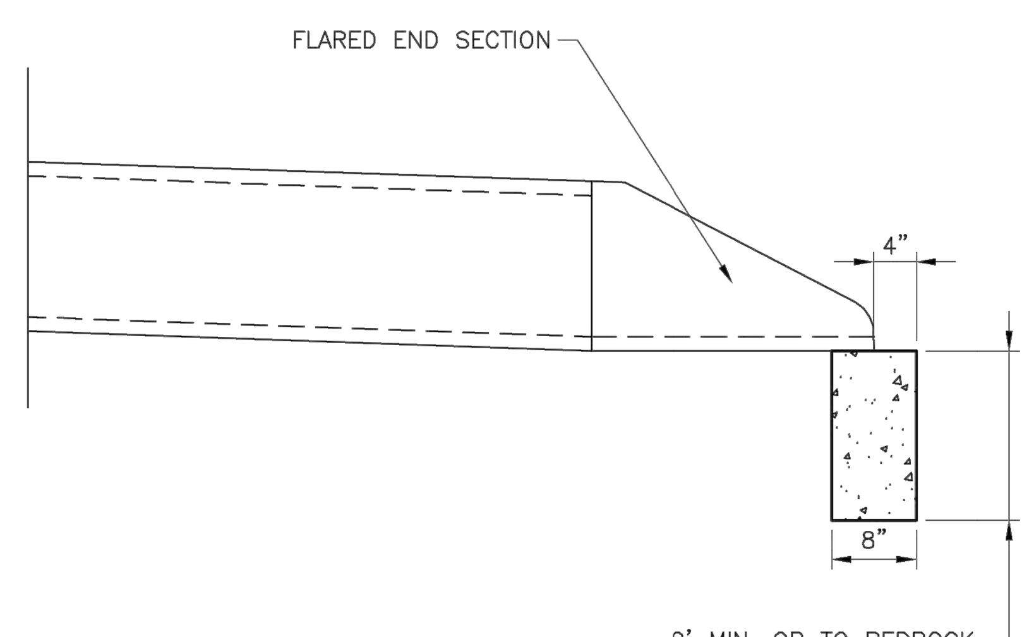
Kimley»Horn
Engineer KEVIN S. GASKEY
P.E. No. 28441 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

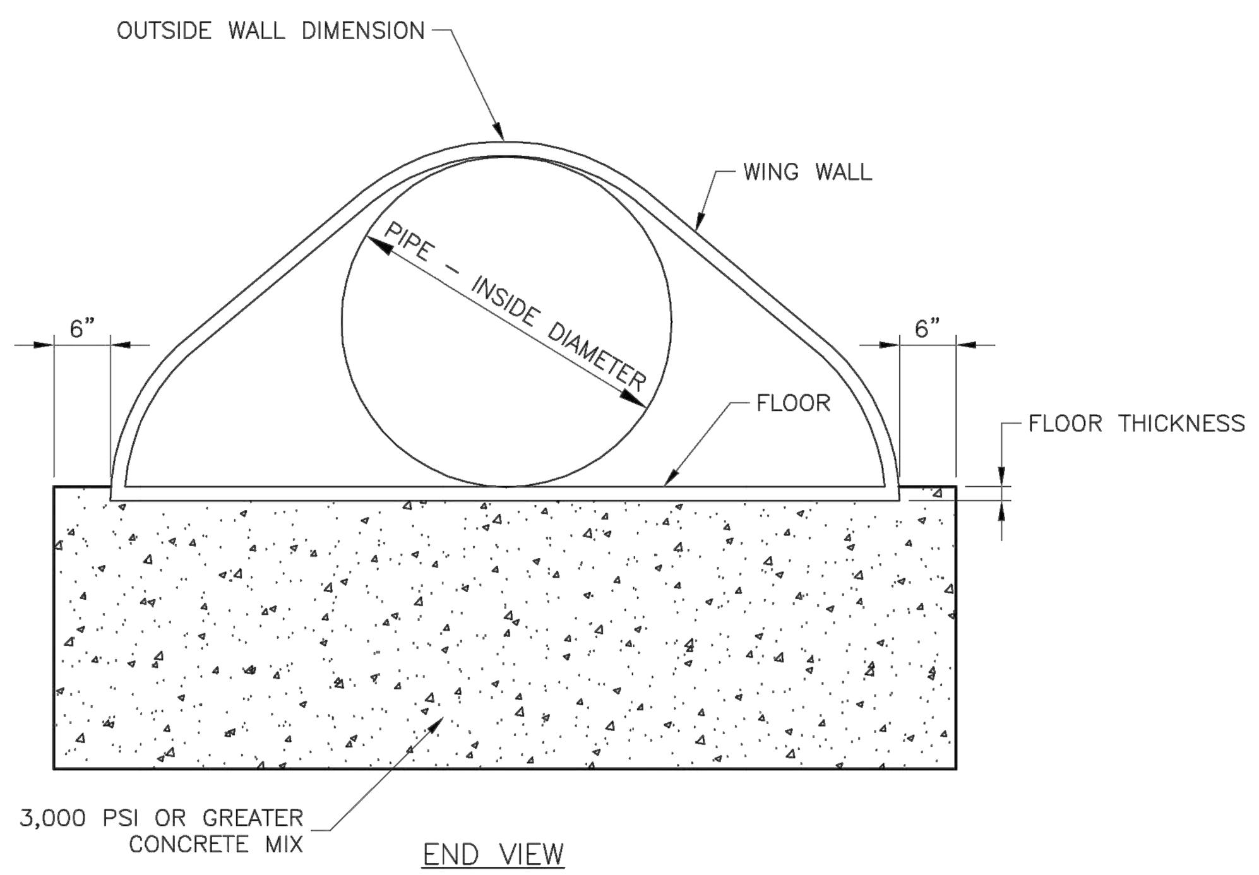
DRAINAGE CALCULATIONS

Scale: AS SHOWN
Designed by: ABP
Drawn by: ABO
Checked by: SEG
Date: 04/15/2019
Project No. 064538700

SHEET
C-8



PLAN VIEW
NOT TO SCALE



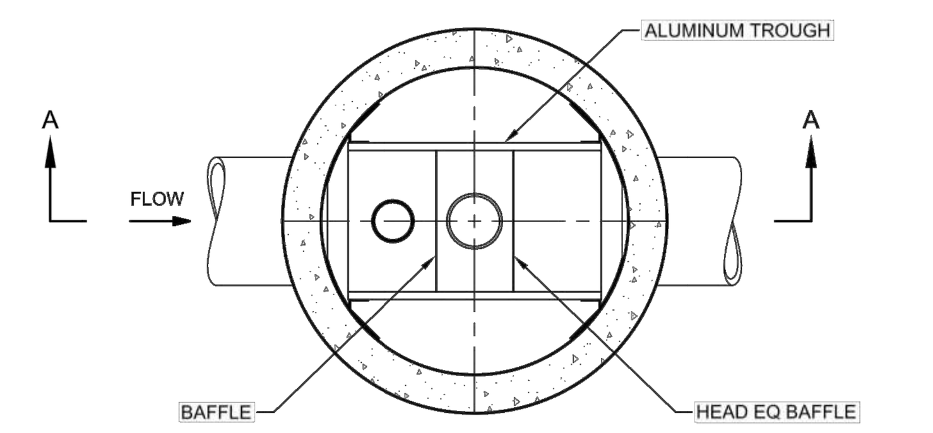
END VIEW
NOT TO SCALE

LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

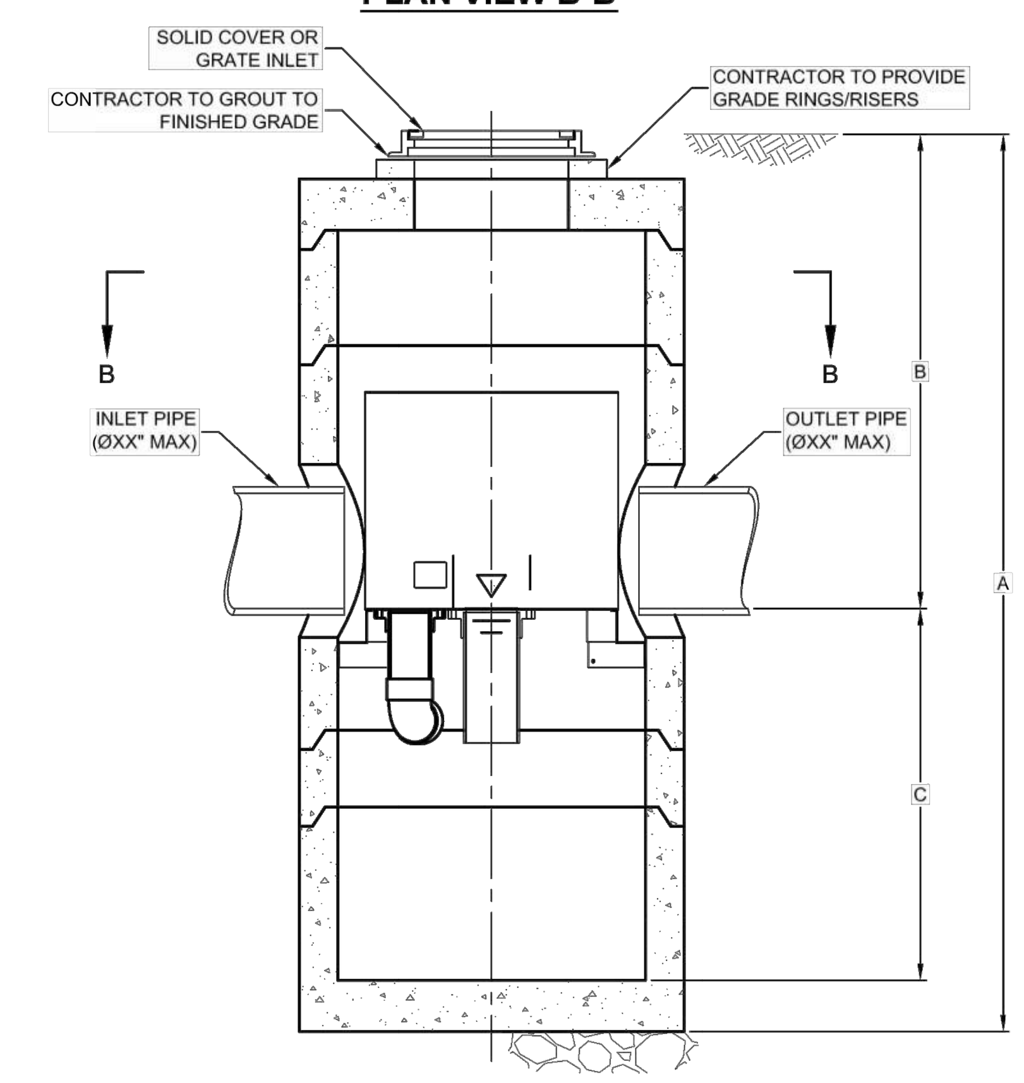
Date: 04/17
Drawn By: MJF
Checked By: DL

FLARED END SECTION SUPPORT DETAIL

STM-5



PLAN VIEW B-B



SECTION A-A

VortSentry

VORTSENTRY HS DESIGN NOTES

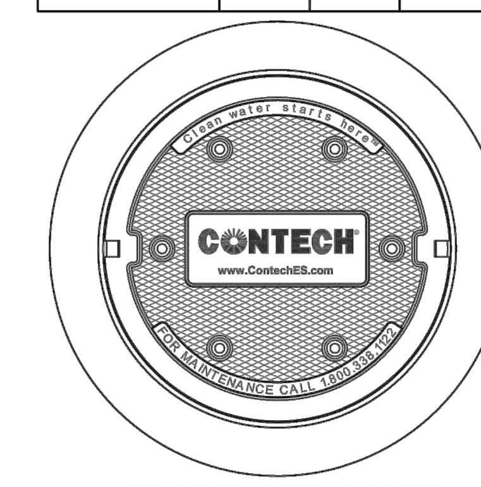
VSHS RATED TREATMENT CAPACITY IS SHOWN IN THE TABLE BELOW, OR PER LOCAL REGULATIONS. MAXIMUM HYDRAULIC INTERNAL BYPASS CAPACITY VARIES. CONTACT YOUR CONTECH REPRESENTATIVE FOR ADITIONAL INFORMATION.

THE STANDARD SOLID COVER CONFIGURATION IS SHOWN. ALTERNATE CONFIGURATIONS ARE AVAILABLE AND ARE LISTED BELOW.

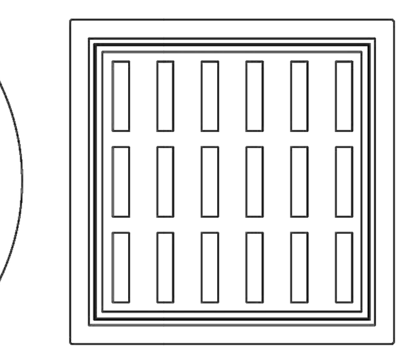
	CONFIGURATION OPTION DESCRIPTION
	GRATE INLET (NO INLET PIPE)
	GRATE INLET WITH INLET PIPE

VORTSENTRY HS GENERAL INFORMATION

Model	Manhole Diameter (ID)		Total Treatment Flow Rate		Typical Total Distance Rim to Outside Bottom A		Typical Distance Rim to Invert B		Typical Depth Below Invert (inside) C		Approximate Minimum Distance Rim to Invert		Maximum Pipe Diameter (ID)	
	FT	mm	CFS	L/S	FT	m	FT	m	FT	mm	FT	m	IN	mm
HS36	3	900	0.55	15.6	10.16	3.10	4.08	1.24	5.58	1702	3.00	0.91	18	450
HS48	4	1200	1.20	34.0	13.25	4.04	6.00	1.83	6.75	2057	4.00	1.22	24	600
HS60	5	1500	2.20	62.3	15.13	4.61	6.50	1.98	7.96	2426	4.82	1.47	30	750
HS72	6	1800	3.70	104.8	16.56	5.05	6.75	2.06	9.15	2788	5.59	1.70	36	900
HS84	7	2100	5.60	158.6	18.85	5.75	7.75	2.36	10.35	3156	5.00	1.52	42	1050
HS96	8	2400	8.10	229.4	20.87	6.36	8.50	2.59	11.54	3518	6.91	2.11	48	1200



FRAME AND COVER
(DIAMETER VARIES)
N.T.S.



FRAME AND GRATE
(24" SQUARE)
N.T.S.

SITE SPECIFIC DATA REQUIREMENTS

STRUCTURE ID			
WATER QUALITY FLOW RATE (CFS)			*
PEAK FLOW RATE (CFS)			*
RETURN PERIOD OF PEAK FLOW (YRS)			*
PIPE DATA:	I.E.	MATERIAL	DIAMETER
INLET PIPE 1	*	*	*
OUTLET PIPE	*	*	*
RIM ELEVATION			*
ANTI-FLOTATION BALLAST		WIDTH	HEIGHT
		*	*
NOTES/SPECIAL REQUIREMENTS:			

* PER ENGINEER OF RECORD

GENERAL NOTES
1. CONTECH TO PROVIDE ALL MATERIALS UNLESS NOTED OTHERWISE.
2. DIMENSIONS MARKED WITH ( ) ARE REFERENCE DIMENSIONS. ACTUAL DIMENSIONS MAY VARY.
3. FOR FABRICATION DRAWINGS WITH DETAILED STRUCTURE DIMENSIONS AND WEIGHT, PLEASE CONTACT YOUR CONTECH ENGINEERED SOLUTIONS LLC REPRESENTATIVE. www.ContechES.com
4. VORTSENTRY HS WATER QUALITY STRUCTURE SHALL BE IN ACCORDANCE WITH ALL DESIGN DATA AND INFORMATION CONTAINED IN THIS DRAWING.
5. STRUCTURE SHALL MEET AASHTO HS20 AND CASTINGS SHALL MEET AASHTO M306 LOAD RATING, ASSUMING GROUNDWATER ELEVATION AT, OR BELOW, THE OUTLET PIPE INVERT ELEVATION. ENGINEER OF RECORD TO CONFIRM ACTUAL GROUNDWATER ELEVATION.

INSTALLATION NOTES
1. ANY SUB-BASE, BACKFILL DEPTH, AND/OR ANTI-FLOTATION PROVISIONS ARE SITE-SPECIFIC DESIGN CONSIDERATIONS AND SHALL BE SPECIFIED BY ENGINEER OF RECORD.
2. CONTRACTOR TO PROVIDE EQUIPMENT WITH SUFFICIENT LIFTING AND REACH CAPACITY TO LIFT AND SET THE VORTSENTRY HS MANHOLE STRUCTURE (LIFTING CLUTCHES PROVIDED).
3. CONTRACTOR TO INSTALL JOINT SEALANT BETWEEN ALL STRUCTURE SECTIONS AND ASSEMBLE STRUCTURE.
4. CONTRACTOR TO PROVIDE, INSTALL, AND GROUT PIPES. MATCH PIPE INVERTS WITH ELEVATIONS SHOWN.
5. CONTRACTOR TO TAKE APPROPRIATE MEASURES TO ASSURE UNIT IS WATER TIGHT, HOLDING WATER TO FLOWLINE INVERT MINIMUM. IT IS SUGGESTED THAT ALL JOINTS BELOW PIPE INVERTS ARE GROUTED.

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

VORTSENTRY HS
STANDARD DETAIL

Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
PHONE: 214-420-5600 FAX: 214-420-5680
WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

95% REVIEW SET
FOR REVIEW ONLY
Not for construction or permit purposes.
Kimley»Horn
Engineer KEVIN S. GASKEY
P.E. No. 28441 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

CONSTRUCTION DETAILS

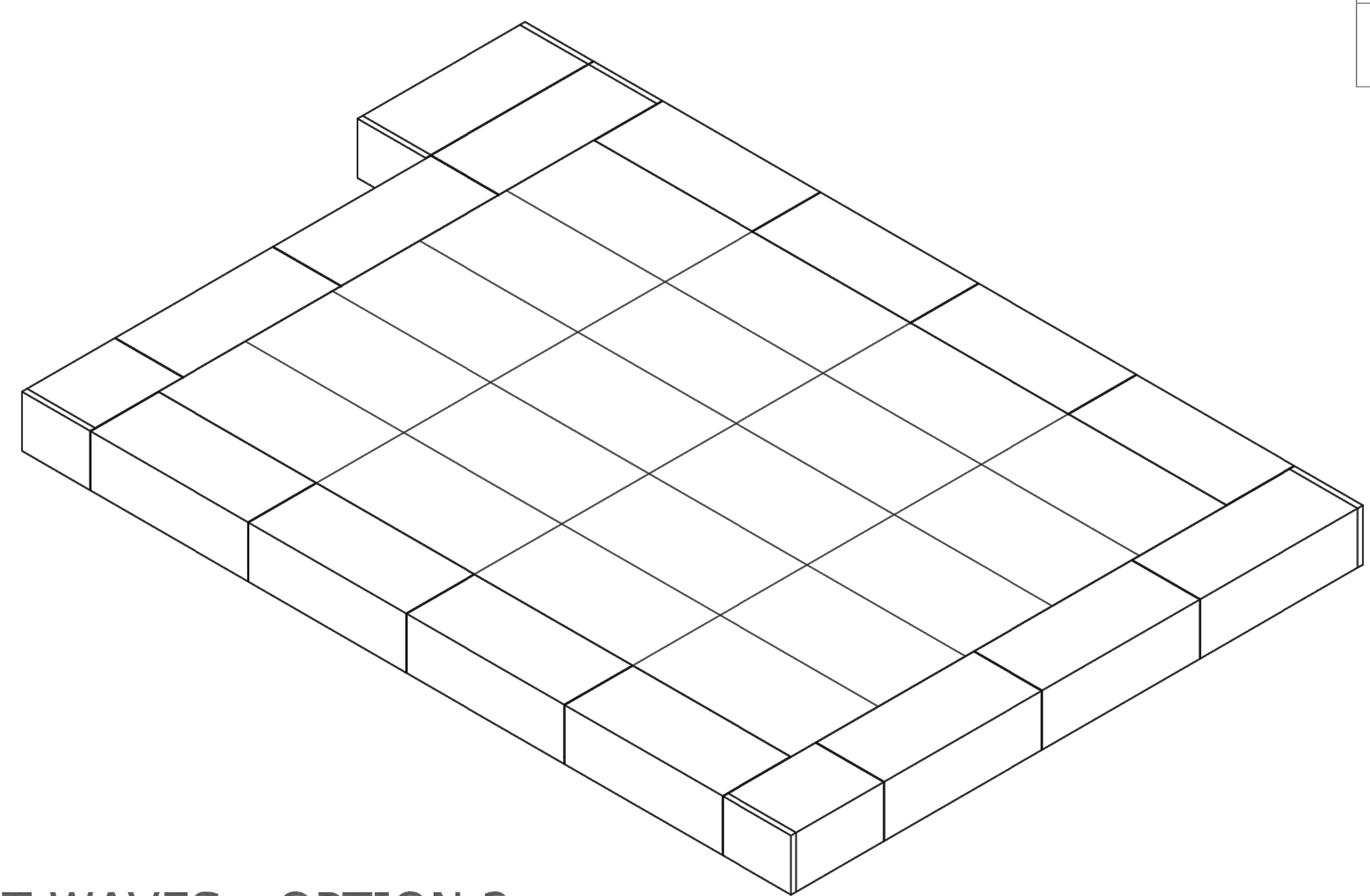
Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-9

File: K:\DAL_LALP\LAC_LALP\064538700_lees summit\Dwg\Sheet\Civils\C-CONSTRUCTION DETAILS.dwg [Layout1] 4/15/2019 5:33pm
Xrefs: 20190325x2436 Images:

StormTrap®

MODULAR CONCRETE STORMWATER MANAGEMENT



SUMMIT WAVES - OPTION 2
LEES SUMMIT, MO

SHEET INDEX

PAGE	DESCRIPTION
0.0	COVER SHEET
1.0	SINGLETRAP DESIGN CRITERIA
2.0	SINGLETRAP SYSTEM LAYOUT
2.1	SINGLETRAP FOUNDATION LAYOUT
3.0	SINGLETRAP INSTALLATION SPECIFICATIONS
3.1	SINGLETRAP INSTALLATION SPECIFICATIONS
4.0	SINGLETRAP BACKFILL SPECIFICATIONS
5.0	RECOMMENDED PIPE / ACCESS OPENING SPECIFICATIONS
6.0	SINGLETRAP MODULE TYPES

STORMTRAP CONTACT INFORMATION

STORM TRAP SUPPLIER: STORMTRAP
CONTACT NAME: DAVID MCRAE
CELL PHONE: 601-814-0730
SALES EMAIL: DMCRAE@STORMTRAP.COM

StormTrap®
PATENTS LISTED AT: [HTTP://STORMTRAP.COM/PATENT]
1287 WINDHAM PARKWAY
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347

ENGINEER INFORMATION:
KIMLEY-HORN & ASSOCIATES
13455 NOEL RD
TWO GALLERIA OFFICE
TOWER STE 700

PROJECT INFORMATION:
SUMMIT WAVES
OPTION 2
LEES SUMMIT, MO

CURRENT ISSUE DATE: 4/15/2019
ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	4/15/2019	PRELIMINARY	JH

SCALE: NTS
SHEET TITLE: COVER SHEET
SHEET NUMBER: 0.0

STRUCTURAL DESIGN LOADING CRITERIA

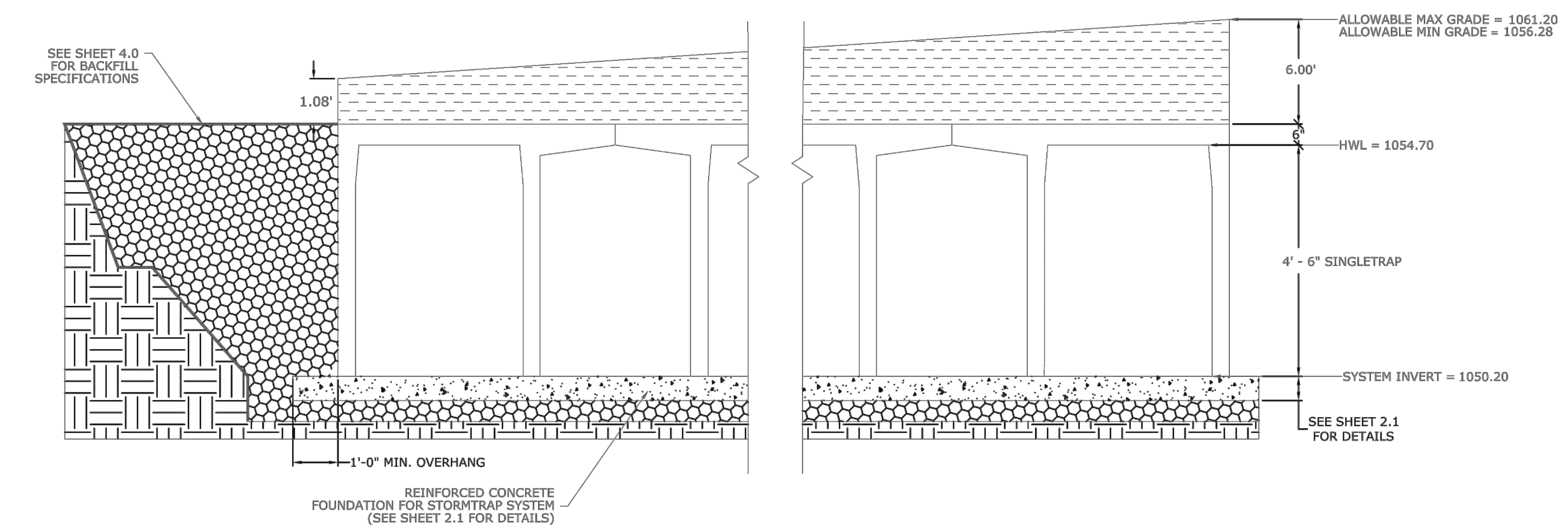
LIVE LOADING: AASHTO HS-20 HIGHWAY LOADING
GROUND WATER TABLE: BELOW INVERT OF SYSTEM
SOIL BEARING PRESSURE: 3000 PSF
SOIL DENSITY: 120 PCF
EQUIVALENT UNSATURATED LATERAL ACTIVE EARTH PRESSURE: 35 PSF / FT.
EQUIVALENT SATURATED LATERAL ACTIVE EARTH PRESSURE: 80 PSF/FT. (IF WATER TABLE PRESENT)
APPLICABLE CODES: ASTM C857, ACI-318
BACKFILL TYPE: SEE SHEET 4.0 FOR BACKFILL OPTIONS

STORMTRAP SYSTEM INFORMATION

WATER STORAGE PROV: 17,442.73 CUBIC FEET
UNIT HEADROOM: 4' - 6" SINGLETRAP
UNIT QUANTITY: 37 TOTAL PIECES

SITE SPECIFIC DESIGN CRITERIA

1. STORMTRAP UNITS SHALL BE MANUFACTURED AND INSTALLED ACCORDING TO SHOP DRAWINGS APPROVED BY THE INSTALLING CONTRACTOR AND ENGINEER OF RECORD. THE SHOP DRAWINGS SHALL INDICATE SIZE AND LOCATION OF ROOF OPENINGS AND INLET/ OUTLET PIPE TYPES, SIZES, INVERT ELEVATIONS AND SIZE OF OPENINGS.
2. COVER RANGE: MIN. 1.08' MAX. 6.00' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
3. ALL DIMENSIONS AND SOIL CONDITIONS, INCLUDING BUT NOT LIMITED TO GROUNDWATER AND SOIL BEARING CAPACITY ARE REQUIRED TO BE VERIFIED IN THE FIELD BY OTHERS PRIOR TO STORMTRAP INSTALLATION.
4. FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM . IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.
5. SYSTEM DESIGN MAY ALLOW FOR INCIDENTAL LEAKAGE AND WILL NOT BE SUBJECT TO LEAKAGE TESTING.



4' - 6" SINGLETRAP

SHEET TITLE: SINGLETRAP DESIGN CRITERIA
SHEET NUMBER: 1.0

BILL OF MATERIALS

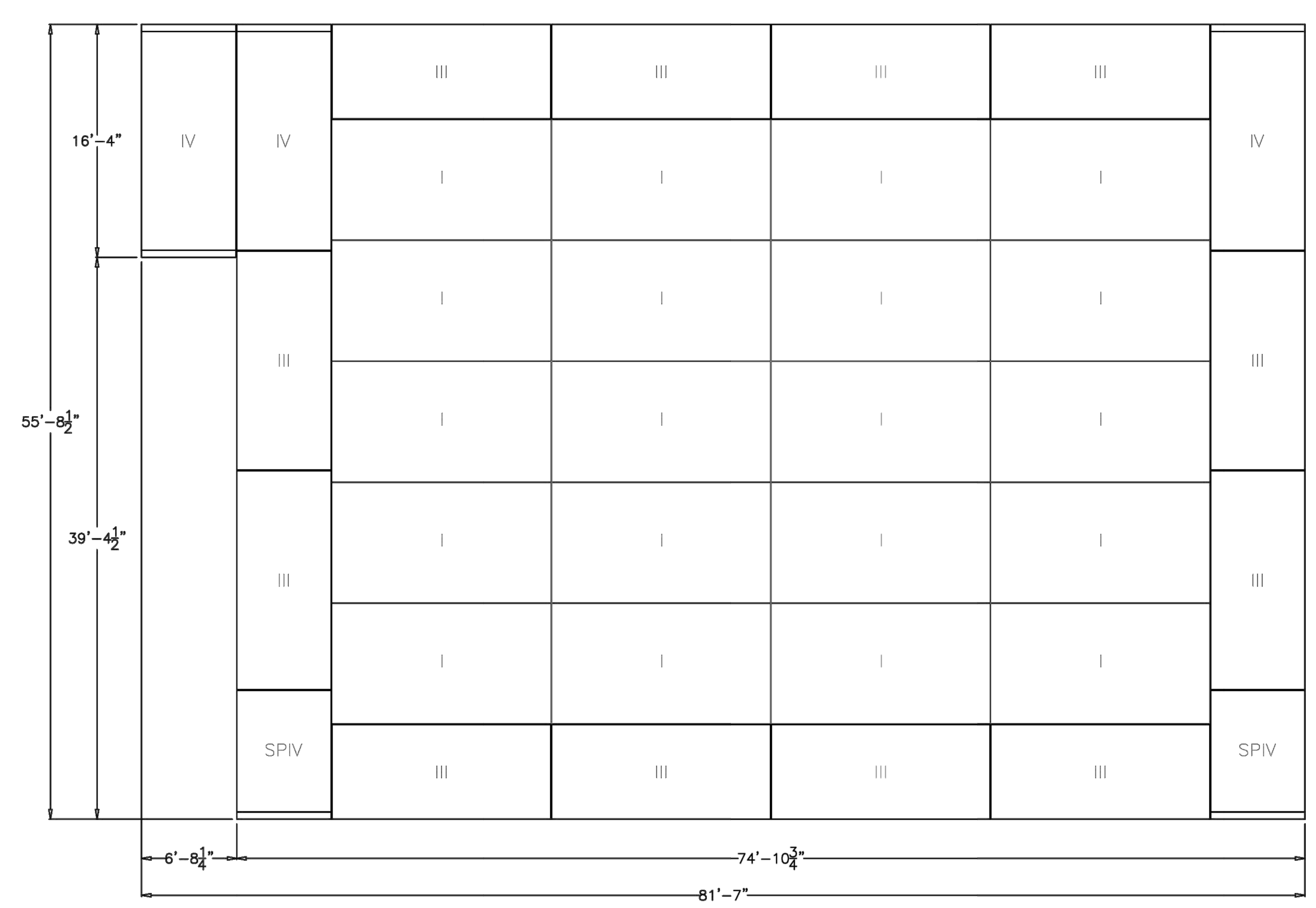
QTY.	UNIT TYPE	DESCRIPTION	WEIGHT
20	I	4' - 6" SINGLETRAP	15188
0	II	4' - 6" SINGLETRAP	17263
12	III	4' - 6" SINGLETRAP	14779
3	IV	4' - 6" SINGLETRAP	15817
0	VII	4' - 6" SINGLETRAP	14365
2	SPIV	4' - 6" SINGLETRAP	VARIES
6	PANEL	6" THICK PANELS	2485
7	JOINT WRAP	150' PER ROLL	
24	JOINT TAPE	14.5' PER ROLL	

LOADING DISCLAIMER:

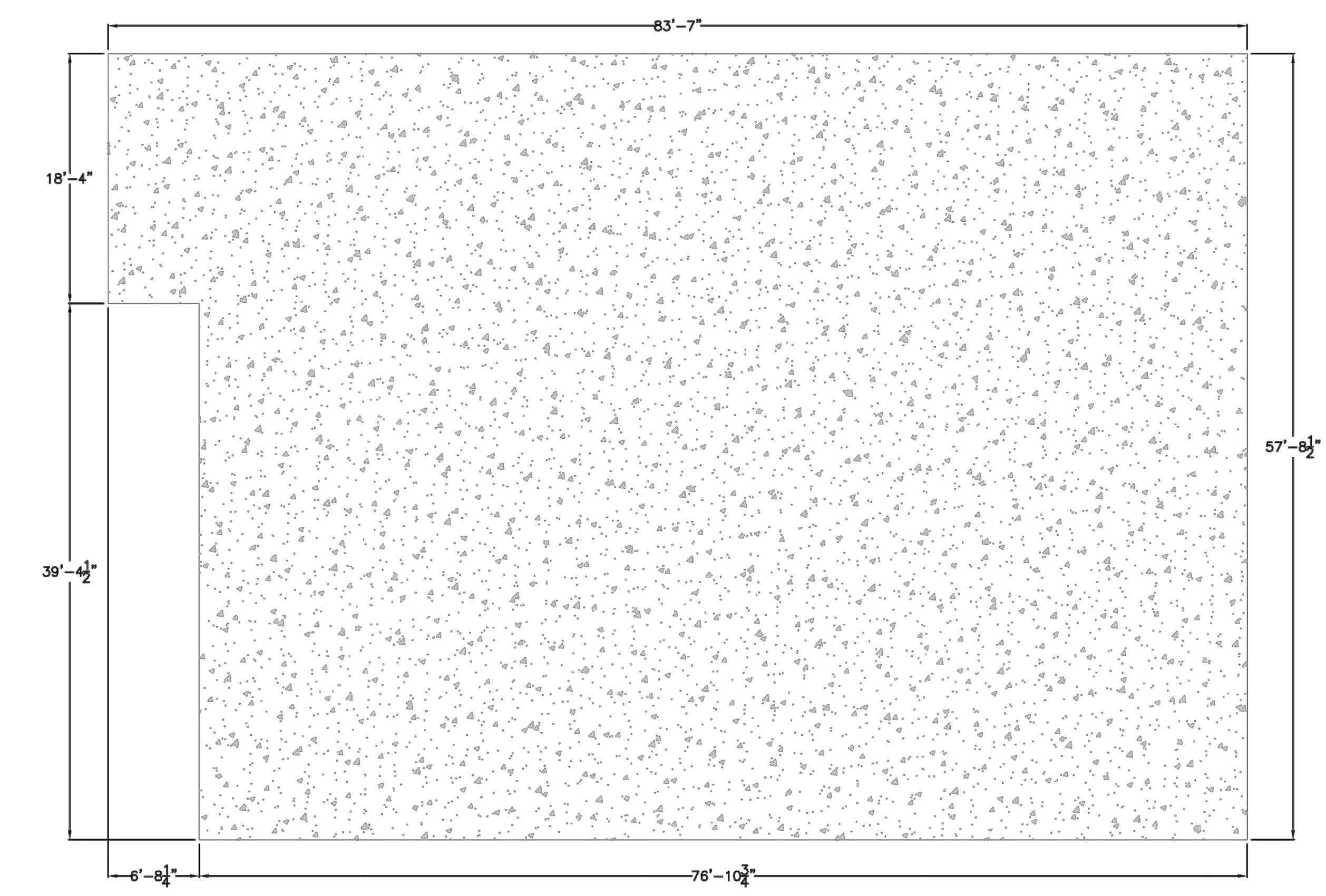
STORMTRAP IS NOT DESIGNED TO ACCEPT ANY ADDITIONAL LOADINGS FROM NEARBY STRUCTURES NEXT TO OR OVER THE TOP OF STORMTRAP. IF ADDITIONAL LOADING CONSIDERATIONS ARE REQUIRED FOR STRUCTURAL DESIGN OF STORMTRAP, PLEASE CONTACT STORMTRAP IMMEDIATELY.

DESIGN CRITERIA
ALLOWABLE MAX GRADE = 1061.20
ALLOWABLE MIN GRADE = 1056.28
INSIDE HEIGHT ELEVATION = 1054.70
SYSTEM INVERT = 1050.20

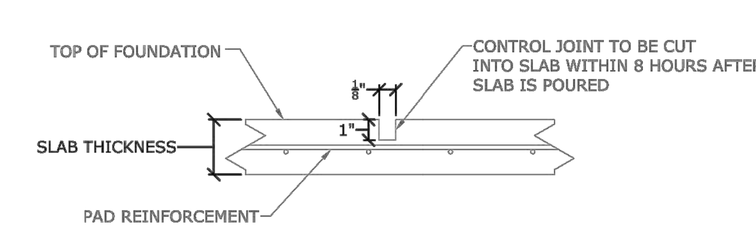
NOTES:
1. DIMENSIONING OF STORMTRAP SYSTEM SHOWN BELOW ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
2. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
3. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.
4. SP - INDICATES A MODULE WITH MODIFICATIONS.
5. P - INDICATES A MODULE WITH A PANEL ATTACHMENT.
6. CONTRACTORS RESPONSIBILITY TO ENSURE CONSISTENCY/ACCURACY TO FINAL ENGINEER OF RECORD PLAN SET.



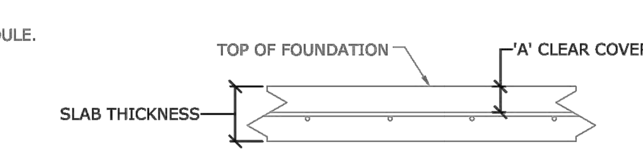
SHEET TITLE: SINGLETRAP SYSTEM LAYOUT
SHEET NUMBER: 2.0



NOTES:
1. CONCRETE STRENGTH @ 28 DAYS, 5%-8% ENTRAINED AIR, 4" MAX. SLUMP.
2. NET ALLOWABLE SOIL PRESSURE AS INDICATED ON SHEET 1.0.
3. SOIL CONDITIONS TO BE VERIFIED ON SITE BY OTHERS.
4. REBAR: ASTM A-615 GRADE 60. BLACK BAR.
5. DIMENSION OF FOUNDATION MUST HAVE 1'-0" OVERHANG BEYOND EXTERNAL FACE OF MODULE.
6. DIMENSION OF STORMTRAP SYSTEM ALLOW FOR A 3/4" GAP BETWEEN EACH MODULE.
7. ALL DIMENSIONS TO BE VERIFIED IN THE FIELD BY OTHERS.
8. THE CONTROL JOINTS SHALL BE BETWEEN (IF REQUIRED BY ENGINEER OF RECORD) 16'-0" TO 24'-0" MAX APART.
9. SEE SHEET 3.0 FOR INSTALLATION SPECIFICATIONS.



CONTROL JOINT DETAIL



STORMTRAP FOUNDATION DETAIL

MAXIMUM SYSTEM COVER	SLAB THICKNESS	CONCRETE STRENGTH	REINFORCEMENT (BOTH DIRECTIONS)	'A' CLEAR COVER
6" - 12"	0'-8"	4000 PSI	#4 @ 18" O.C.	3.5"
>1'-0" - 2'-0"	0'-8"	4000 PSI	#4 @ 16" O.C.	3.5"
>2'-0" - 3'-0"	0'-8"	4000 PSI	#4 @ 12" O.C.	3.5"
>3'-0" - 4'-0"	0'-8"	4000 PSI	#4 @ 12" O.C.	3.5"
>4'-0" - 5'-0"	0'-8"	4000 PSI	#5 @ 18" O.C.	3.375"
>5'-0" - 6'-0"	0'-8"	4000 PSI	#5 @ 16" O.C.	3.375"
>6'-0" - 7'-0"	0'-8"	4000 PSI	#5 @ 16" O.C.	3.375"
>7'-0" - 8'-0"	0'-9"	4000 PSI	#5 @ 12" O.C.	3.875"
>8'-0" - 9'-0"	0'-10"	4000 PSI	#5 @ 12" O.C.	4.375"
>9'-0" - 10'-0"	0'-10"	4500 PSI	#5 @ 12" O.C.	4.375"

SHEET TITLE: SINGLETRAP FOUNDATION LAYOUT
SHEET NUMBER: 2.1

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MISSOURI REGISTRATION NUMBER 001512

95% REVIEW SET
FOR REVIEW ONLY
Not for construction or permit purposes.
Kimley»Horn
KEVIN S. GASKEY

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

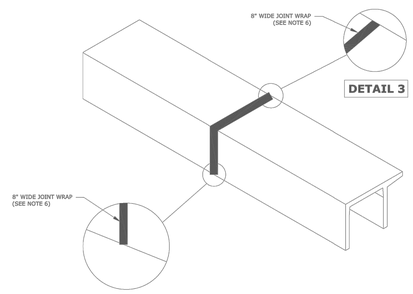
DETENTION DETAILS

Scale: AS SHOWN
Designed by: ABP
Drawn by: ABO
Checked by: SEG
Date: 04/15/2019
Project No. 064538700

SHEET
C-10

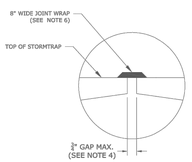
STORMTRAP INSTALLATION SPECIFICATIONS

1. STORMTRAP SHALL BE INSTALLED IN ACCORDANCE WITH ASTM C891, STANDARD FOR INSTALLATION OF UNDERGROUND PRECAST CONCRETE UTILITY STRUCTURES, THE FOLLOWING ADDITIONS AND/OR EXCEPTIONS SHALL APPLY:
2. IT IS THE RESPONSIBILITY OF THE INSTALLING CONTRACTOR TO ENSURE THAT PROPER/ADEQUATE EQUIPMENT IS USED TO SET/INSTALL THE MODULES.
3. STORMTRAP MODULES SHALL BE PLACED ON A LEVEL CONCRETE FOUNDATION (SEE SHEET 2.1) WITH A 1'-0" OVERHANG ON ALL SIDES THAT SHALL BE POURED IN PLACE BY INSTALLING CONTRACTOR. A QUALIFIED GEOTECHNICAL ENGINEER WILL BE EMPLOYED, BY OWNER, TO PROVIDE ASSISTANCE IN EVALUATING THE EXISTING SOIL CONDITIONS TO ENSURE THAT THE SOIL BEARING PRESSURE MEETS OR EXCEEDS THE STRUCTURAL DESIGN LOADING CRITERIA AS SPECIFIED ON SHEET 1.0.
4. THE STORMTRAP MODULES SHALL BE PLACED SUCH THAT THE MAXIMUM SPACE BETWEEN ADJACENT MODULES DOES NOT EXCEED ¾" (SEE DETAIL 2). IF THE SPACE EXCEEDS ¾", THE MODULES SHALL BE RESET WITH APPROPRIATE ADJUSTMENT MADE TO LINE AND GRADE TO BRING THE SPACE INTO SPECIFICATION.
5. THE PERIMETER HORIZONTAL JOINT BETWEEN THE STORMTRAP MODULES AND THE CONCRETE FOUNDATION SHALL BE SEALED TO THE FOUNDATION WITH PRE-FORMED MASTIC JOINT SEALER ACCORDING TO ASTM C891, 8.8 AND 8.12 (SEE DETAIL 1). THE MASTIC JOINT TAPE DOES NOT PROVIDE A WATERTIGHT SEAL.
6. ALL EXTERIOR JOINTS BETWEEN ADJACENT STORMTRAP MODULES SHALL BE SEALED WITH 8" WIDE PRE-FORMED, COLD-APPLIED, SELF-ADHERING ELASTOMERIC RESIN, BONDED TO A WOVEN , HIGHLY PUNCTURE RESISTANT POLYMER WRAP, CONFORMING TO ASTM C891 AND SHALL BE INTEGRATED WITH PRIMER SEALANT AS APPROVED BY STORMTRAP (SEE DETAILS 3 & 4). THE JOINT WRAP DOES NOT PROVIDE A WATERTIGHT SEAL. THE SOLE PURPOSE OF THE JOINT WRAP IS TO PROVIDE A SILT AND SOIL TIGHT SYSTEM. THE ADHESIVE EXTERIOR JOINT WRAP SHALL BE INSTALLED ACCORDING TO THE FOLLOWING INSTALLATION INSTRUCTIONS:
   - 6.1. USE A BRUSH OR WET CLOTH TO THOROUGHLY CLEAN THE OUTSIDE SURFACE AT THE POINT WHERE JOINT WRAP IS TO BE APPLIED.
   - 6.2. A RELEASE PAPER PROTECTS THE ADHESIVE SIDE OF THE JOINT WRAP. PLACE THE ADHESIVE TAPE (ADHESIVE SIDE DOWN) AROUND THE STRUCTURE, REMOVING THE RELEASE PAPER AS YOU GO. PRESS THE JOINT WRAP FIRMLY AGAINST THE STORMTRAP MODULE SURFACE WHEN APPLYING.
7. IF THE CONTRACTOR NEEDS TO CANCEL ANY SHIPMENTS, THEY MUST DO SO 48 HOURS PRIOR TO THEIR SCHEDULED ARRIVAL AT THE JOB SITE. IF CANCELED AFTER THAT TIME, PLEASE CONTACT THE PROJECT MANAGER.
8. IF THE STORMTRAP MODULE(S) IS DAMAGED IN ANY WAY PRIOR, DURING, OR AFTER INSTALL, STORMTRAP MUST BE CONTACTED IMMEDIATELY TO ASSESS THE DAMAGE AND DETERMINE WHETHER OR NOT THE MODULE(S) WILL NEED TO BE REPLACED. IF ANY MODULE ARRIVES AT THE JOBSITE DAMAGED DO NOT UNLOAD IT; CONTACT STORMTRAP IMMEDIATELY. ANY DAMAGE NOT REPORTED BEFORE THE TRUCK IS UNLOADED WILL BE THE CONTRACTOR'S RESPONSIBILITY.
9. STORMTRAP MODULES CANNOT BE ALTERED IN ANY WAY AFTER MANUFACTURING WITHOUT WRITTEN CONSENT FROM STORMTRAP.

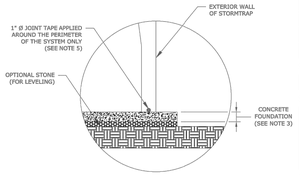


DETAIL 3

DETAIL 4



DETAIL 2



DETAIL 1

StormTrap®
PATENTS LISTED AT: [HTTP://STORMTRAP.COM/PATENT]

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ENGINEER INFORMATION:

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13455 NOEL RD
TWO GALLERIA OFFICE
TOWER STE 700

PROJECT INFORMATION:

SUMMIT WAVES

OPTION 2

LEES SUMMIT, MO

CURRENT ISSUE DATE: 4/15/2019

ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	4/15/2019	PRELIMINARY	JH

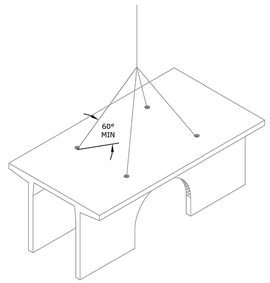
SCALE: NTS

SHEET TITLE: SINGLETRAP INSTALLATION SPECIFICATIONS

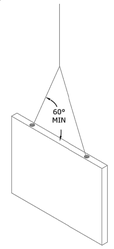
SHEET NUMBER: **3.0**

END PANEL ERECTION/INSTALLATION NOTES

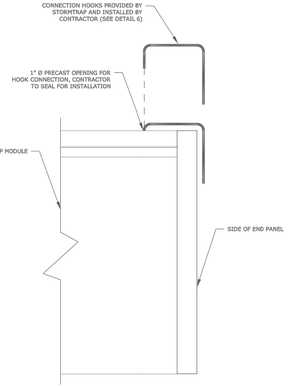
1. END PANELS WILL BE SUPPLIED TO CLOSE OFF OPEN ENDS OF ROWS.
2. PANELS SHALL BE INSTALLED IN A TILT UP FASHION DIRECTLY ADJACENT TO OPEN END OF MODULE (REFER TO SHEET 2.0 FOR END PANEL LOCATIONS).
3. CONNECTION HOOKS WILL BE SUPPLIED WITH END PANELS TO SECURELY CONNECT PANEL TO ADJACENT STORMTRAP MODULE (SEE PANEL CONNECTION ELEVATION VIEW).
4. ONCE CONNECTION HOOKS ARE ATTACHED, LIFTING CLUTCHES MAY BE REMOVED.
5. JOINT WRAP SHALL BE PLACED AROUND PERIMETER JOINT PANEL (SEE SHEET 3.0).



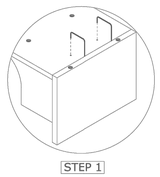
MODULE LIFTING DETAIL



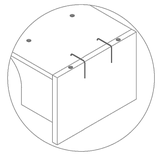
END PANEL LIFTING DETAIL



PANEL CONNECTION ELEVATION VIEW



STEP 1



STEP 2

DETAIL 6

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PROJECT INFORMATION:

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OPTION 2

LEES SUMMIT, MO

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SHEET TITLE: SINGLETRAP INSTALLATION SPECIFICATIONS

SHEET NUMBER: **3.1**

ZONE CHART		
ZONES	ZONE DESCRIPTIONS	REMARKS
ZONE 1	FOUNDATION AGGREGATE	#5 (2") STONE AGGREGATE (SEE NOTE 4 FOR DESCRIPTION)
ZONE 2	BACKFILL	UNIFIED SOILS CLASSIFICATION (GW, GP, SW, SP) - SEE BELOW FOR APPROVED BACKFILL OPTIONS
ZONE 3	FINAL COVER OVERTOP	MATERIALS NOT TO EXCEED 12in POF

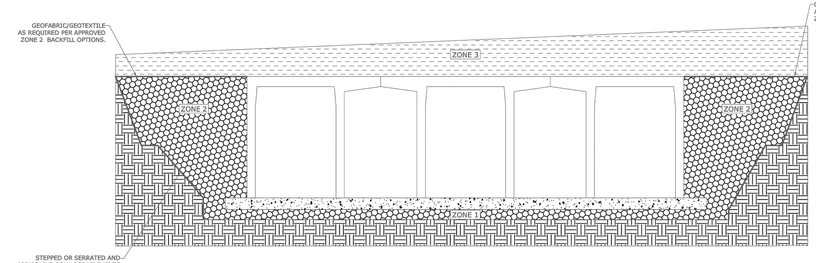
APPROVED ZONE 2 BACKFILL OPTIONS	
OPTION	REMARKS
2" STONE AGGREGATE	THE STONE AGGREGATE SHALL CONSIST OF WASHED, CLEAN AND FREE DRAINING ANGULAR MATERIAL. THE SIZE OF THIS MATERIAL SHALL HAVE 100% PASSING THE 1" SIEVE WITH 0% TO 5% PASSING THE #8 SIEVE. THIS MATERIAL SHALL BE SEPARATED FROM NATIVE MATERIAL USING GEOFABRIC AROUND THE PERIMETER OF THE BACKFILL (ASTM SIZE #57) AS DETERMINED BY THE GEOTECHNICAL ENGINEER.
SAND	IMPORTED PURE SAND IS PERMITTED TO BE USED AS BACKFILL IF IT IS CLEAN AND FREE DRAINING. THE SAND USED FOR BACKFILLING SHALL HAVE LESS THAN 40% PASSING #40 SIEVE AND LESS THAN 5% PASSING #200 SIEVE. THIS MATERIAL SHALL BE SEPARATED FROM NATIVE MATERIAL USING GEOFABRIC AROUND THE PERIMETER OF THE SAND BACKFILL.
CRUSHED CONCRETE AGGREGATE	CLEAN, FREE DRAINING CRUSHED CONCRETE AGGREGATE MATERIAL CAN BE USED AS BACKFILL FOR STORMTRAP'S MODULES. THE SIZE OF THIS MATERIAL SHALL HAVE 100% PASSING THE 1" SIEVE WITH 0% TO 5% PASSING THE #8 SIEVE. THIS MATERIAL SHALL BE SEPARATED FROM NATIVE MATERIAL USING GEOFABRIC AROUND THE PERIMETER OF THE BACKFILL.
ROAD PACK	STONE AGGREGATE 100% PASSING THE 1-1/2" SIEVE WITH LESS THAN 12% PASSING THE #200 SIEVE (ASTM SIZE #467). GEOFABRIC AS PER GEOTECHNICAL ENGINEER RECOMMENDATION.

FILL DEPTH	TRACK WIDTH	MAX VEHICLE WEIGHT (KIPS)	MAX GROUND PRESSURE
12"	13"	51.8	1690 psf
	18"	56.1	1219 psf
	24"	68.1	1111 psf
	30"	76.7	1000 psf
	36"	85.0	924 psf

NOTE:
TRACK LENGTH NOT TO EXCEED 15'-4".
ONLY TWO TRACKS PER VEHICLE.

STORMTRAP ZONE INSTALLATION SPECIFICATIONS/PROCEDURES

1. THE FILL PLACED AROUND THE STORMTRAP MODULES MUST DEPOSITED ON BOTH SIDES AT THE SAME TIME AND TO APPROXIMATELY THE SAME ELEVATION. AT NO TIME SHALL THE FILL BEHIND ONE SIDE WALL BE MORE THAN 2'-0" HIGHER THAN THE FILL ON THE OPPOSITE SIDE. BACKFILL SHALL EITHER BE COMPACTED AND/OR VIBRATED TO ENSURE THAT BACKFILL AGGREGATE/STONE MATERIAL IS WELL SEATED AND PROPERLY INTER LOCKED. CARE SHALL BE TAKEN TO PREVENT ANY WEDGING ACTION AGAINST THE STRUCTURE, AND ALL SLOPES WITHIN THE AREA TO BE BACKFILLED MUST BE STEPPED OR SERRATED TO PREVENT WEDGING ACTION. CARE SHALL ALSO BE TAKEN AS NOT TO DISRUPT THE JOINT WRAP FROM THE JOINT DURING THE BACKFILL PROCESS. BACKFILL MUST BE FREE-DRAINING MATERIAL. SEE ZONE 2 BACKFILL CHART ON THIS PAGE FOR APPROVED BACKFILL OPTIONS. IF NATIVE EARTH IS SUSCEPTIBLE TO MIGRATION, CONFIRM WITH GEOTECHNICAL ENGINEER AND PROVIDE PROTECTION AS REQUIRED (PROVIDED BY OTHERS).
2. DURING PLACEMENT OF MATERIAL OVERTOP THE SYSTEM, AT NO TIME SHALL MACHINERY BE USED OVERTOP THAT EXCEEDS THE DESIGN LIMITATIONS OF THE SYSTEM. WHEN PLACEMENT OF MATERIAL OVERTOP, MATERIAL SHALL BE PLACED SUCH THAT THE DIRECTION OF PLACEMENT IS PARALLEL WITH THE OVERALL LONGITUDINAL DIRECTION OF THE SYSTEM WHENEVER POSSIBLE.
3. THE FILL PLACED OVERTOP THE SYSTEM SHALL BE PLACED AT A MINIMUM OF 6" LIFTS. AT NO TIME SHALL MACHINERY OR VEHICLES GREATER THAN THE DESIGN HS-20 LOADING CRITERIA TRAVEL OVERTOP THE SYSTEM WITHOUT THE MINIMUM DESIGN COVERAGE. IF TRAVEL IS NECESSARY OVERTOP THE SYSTEM PRIOR TO ACHIEVING THE MINIMUM DESIGN COVER, IT MAY BE NECESSARY TO REDUCE THE ULTIMATE LOAD/BURDEN OF THE OPERATING MACHINERY SO AS TO NOT EXCEED THE DESIGN CAPACITY OF THE SYSTEM. IN SOME CASES, IN ORDER TO ACHIEVE REQUIRED COMPACTION, HAND COMPACTION MAY BE NECESSARY IN ORDER NOT TO EXCEED THE ALLOTTED DESIGN LOADING. SEE CHART FOR TRACKED VEHICLE WIDTH AND ALLOWABLE MAXIMUM PRESSURE PER TRACK.
4. STONE AGGREGATE FOUNDATION IN ZONE 1 IS RECOMMENDED FOR LEVELING PURPOSES ONLY (OPTIONAL).



BACKFILL DETAIL

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SUMMIT WAVES

OPTION 2

LEES SUMMIT, MO

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SCALE: NTS

SHEET TITLE: SINGLETRAP BACKFILL SPECIFICATIONS

SHEET NUMBER: **4.0**

RECOMMENDED ACCESS OPENING SPECIFICATION

1. A TYPICAL ACCESS OPENING FOR THE STORMTRAP SYSTEM ARE 2'-0" IN DIAMETER. ACCESS OPENINGS LARGER THAN 3'-0" IN DIAMETER NEED TO BE APPROVED BY STORMTRAP. ALL OPENINGS MUST BETAIN AT LEAST 1'-0" OF CLEARANCE FROM THE END OF THE STORMTRAP MODULE UNLESS NOTED OTHERWISE. ALL ACCESS OPENINGS TO BE LOCATED ON INSIDE LEG UNLESS OTHERWISE SPECIFIED.
2. PLASTIC COATED STEEL STEPS PRODUCED BY M.A. INDUSTRIES PART #PS3-PFC OR APPROVED EQUAL (SEE STEP DETAIL) ARE PROVIDED INSIDE ANY MODULE WHERE DEEMED NECESSARY. THE HIGHEST STEP IN THE MODULE IS TO BE PLACED A DISTANCE OF 1'-0" FROM THE INSIDE EDGE OF THE STORMTRAP MODULES. ALL ENSUING STEPS SHALL BE PLACED AT A DISTANCE BETWEEN 10" MIN AND 14" MAX BETWEEN THEM. STEPS MAY BE MOVED OR ALTERED TO AVOID OPENINGS OR OTHER IRREGULARITIES IN THE MODULE.
3. STORMTRAP LIFTING INSERTS MAY BE RELOCATED TO AVOID INTERFERENCE WITH ACCESS OPENINGS OR THE CENTER OF GRAVITY OF THE MODULE AS NEEDED.
4. STORMTRAP ACCESS OPENINGS MAY BE RELOCATED TO AVOID INTERFERENCE WITH INLET AND/OR OUTLET PIPE OPENINGS SO PLACEMENT OF STEPS IS ATTAINABLE.
5. ACCESS OPENINGS SHOULD BE LOCATED IN ORDER TO MEET THE APPROPRIATE MUNICIPAL REQUIREMENTS. STORMTRAP RECOMMENDS AT LEAST TWO ACCESS OPENINGS PER SYSTEM FOR ACCESS AND INSPECTION.
6. USE PRECAST ADJUSTING RINGS AS NEEDED TO MEET GRADE. STORMTRAP RECOMMENDS FOR COVER OVER 2' TO USE PRECAST BARREL OR CONE INSPECTIONS. (PROVIDED BY OTHERS)

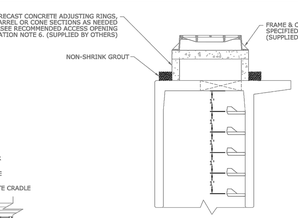
RECOMMENDED PIPE OPENING SPECIFICATION

1. MINIMUM EDGE DISTANCE FOR AN OPENING ON THE OUTSIDE WALL SHALL BE NO LESS THAN 1'-0".
2. MAXIMUM OPENING SIZE TO BE DETERMINED BY THE MODULE HEIGHT. PREFERRED OPENING SIZE Ø 36" OR LESS. ANY OPENING NEEDED THAT DOES NOT FIT THIS CRITERIA SHALL BE BROUGHT TO THE ATTENTION OF STORMTRAP FOR REVIEW.
3. CONNECTING PIPES SHALL BE INSTALLED WITH A 1'-0" CONCRETE COLLAR, AND AN AGGREGATE CRADLE FOR AT LEAST ONE PIPE LENGTH (SEE PIPE CONNECTION DETAIL). A STRUCTURAL GRADE CONCRETE OR HIGH STRENGTH, NON-SHRINK GROUT WITH A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 3000 PSI SHALL BE USED.
4. THE ANNULAR SPACE BETWEEN THE PIPE AND THE HOLE SHALL BE FILLED WITH HIGH STRENGTH NON-SHRINK GROUT.

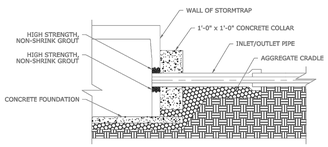
RECOMMENDED PIPE INSTALLATION INSTRUCTIONS

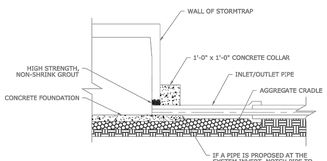
1. CLEAN AND LIGHTLY LUBRICATE ALL OF THE PIPE TO BE INSERTED INTO STORMTRAP.
2. IF PIPE IS CUT, CARE SHOULD BE TAKEN TO ALLOW NO SHARP EDGES. BEVEL AND LUBRICATE LEAD END OF PIPE.
3. ALIGN CENTER OF PIPE TO CORRECT ELEVATION AND INSERT INTO OPENING.

NOTE: ALL ANCILLARY PRODUCTS/SPECIFICATIONS RECOMMENDED AND SHOWN ON THIS SHEET ARE RECOMMENDATIONS ONLY AND SUBJECT TO CHANGE PER THE INSTALLING CONTRACTOR AND/OR PER LOCAL MUNICIPAL CODE/REQUIREMENTS.

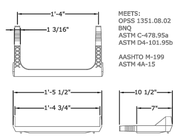


RISER / STAIR DETAIL





PIPE CONNECTION DETAIL



MEETS:
OPSS 1351.08.02
BNQ
ASTM C-478.95a
ASTM D4-101.95b

AASHTO M-199
ASTM 4A-15

STEP DETAIL

StormTrap®
PATENTS LISTED AT: [HTTP://STORMTRAP.COM/PATENT]

1287 WINDHAM PARKWAY
ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347

ENGINEER INFORMATION:

KIMLEY-HORN & ASSOCIATES
13455 NOEL RD
TWO GALLERIA OFFICE
TOWER STE 700

PROJECT INFORMATION:

SUMMIT WAVES

OPTION 2

LEES SUMMIT, MO

CURRENT ISSUE DATE: 4/15/2019

ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	4/15/2019	PRELIMINARY	JH

SCALE: NTS

SHEET TITLE: RECOMMENDED PIPE / ACCESS OPENING SPECIFICATIONS

SHEET NUMBER: **5.0**

Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
PHONE: (214) 369-2100 FAX: (214) 520-5880
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MISSOURI REGISTRATION NUMBER 001512

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Not for construction or permit purposes.
Kimley»Horn
Engineer: KEVIN S. GASSKEY
P.E. No. 28441 Date: APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

DETENTION DETAILS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-11

File: K:\OKL_LAD\OKL_LAD\064538700_Lees Summit\Sheets\C-CONSTRUCTION DETAILS.dwg | Layout1 (3) | 4/15/2019 8:34pm
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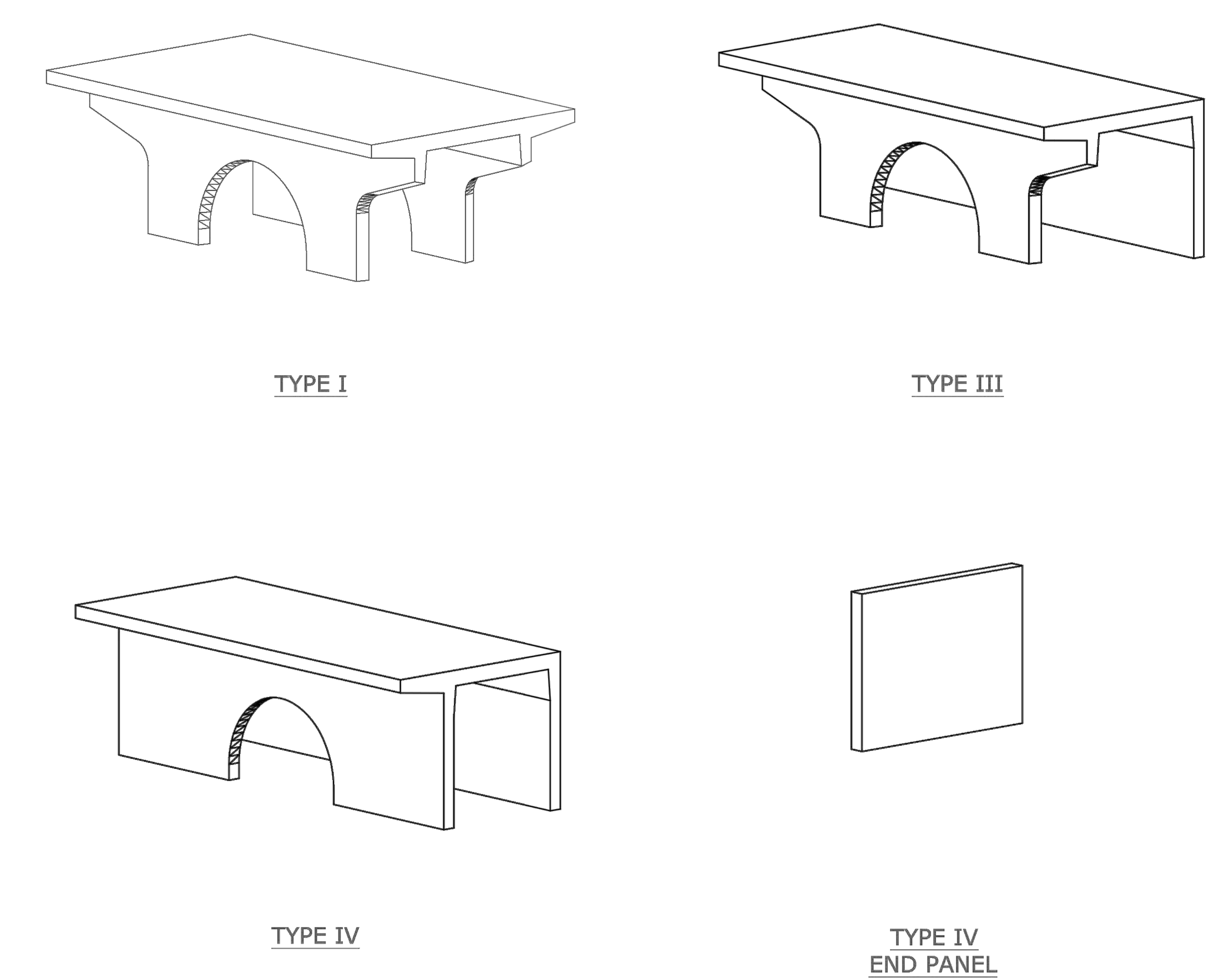
Images:



NOTES:
1. OPENING LOCATIONS AND SHAPES MAY VARY.
2. SP - INDICATES A MODULE WITH MODIFICATIONS.
3. P - INDICATES A MODULE WITH A PANEL ATTACHMENT.
4. POCKET WINDOW OPENINGS ARE OPTIONAL.

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ROMEOVILLE, IL 60446
P:815-941-4549 / F:331-318-5347

ENGINEER INFORMATION:
KIMLEY-HORN & ASSOCIATES
13455 NOEL RD
TWO GALLERIA OFFICE TOWER STE 700

PROJECT INFORMATION:
SUMMIT WAVES
OPTION 2
LEES SUMMIT, MO

CURRENT ISSUE DATE: 4/15/2019

ISSUED FOR: PRELIMINARY

REV.	DATE:	ISSUED FOR:	DWN BY:
1	4/15/2019	PRELIMINARY	JH

SCALE: NTS

SHEET TITLE: SINGLETRAP MODULE TYPES

SHEET NUMBER: 6.0

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Kimley»Horn
Engineer KEVIN S. GASKEY
P.E. No. 28441 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

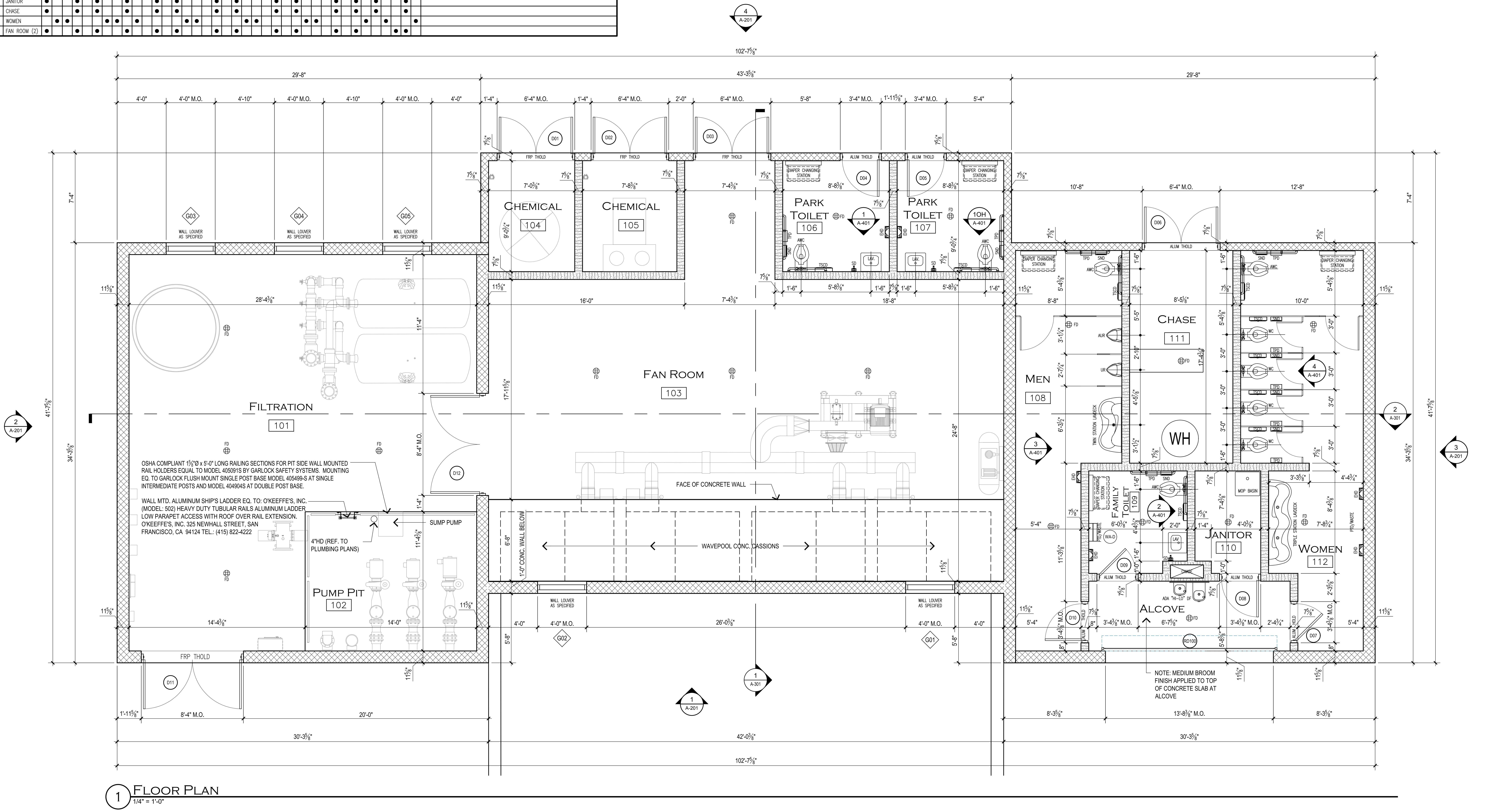
DETENTION DETAILS

Scale:	AS SHOWN
Designed by:	ABP
Drawn by:	ABO
Checked by:	SEG
Date:	04/15/2019
Project No.	064538700

SHEET
C-12

Room Finish Schedule

ROOM		FLOORING				BASE					NORTH WALL						SOUTH WALL						EAST WALL						WEST WALL						CEILING					
		MATL		FIN		MATL			HT		MATL			FIN			MATL			FIN			MATL			FIN			MATL			FIN			MATL			FIN		
NUMBER	NAME	SEALED CONCRETE	SEAMLESS BREATHABLE DECORATIVE QUARTZ	NON-SLIP (ADA COMPLIANT)	NON-SLIP MEDIUM BROOM FINISH	4X4 TILE COVE BASE	NONE	SEAMLESS BREATHABLE DECORATIVE QUARTZ (INTEGRAL W/ FLOORING)	4"	NA	CMU (CONCRETE BLOCK)	CONCRETE	CONCRETE BLOCK (CMU)	EPOXY PAINT	NONE	PAINT	CMU (CONCRETE BLOCK)	CONCRETE	CONCRETE BLOCK (CMU)	EPOXY PAINT	NONE	PAINT	CMU (CONCRETE BLOCK)	CONCRETE	CONCRETE BLOCK (CMU)	EPOXY PAINT	NONE	PAINT	CMU (CONCRETE BLOCK)	CONCRETE	CONCRETE BLOCK (CMU)	EPOXY PAINT	NONE	PAINT	1/2" TK. PLYWOOD (CAULK SEAMS)	1X6 TONGUE AND GROOVE W/ "V" ROUTE AT CENTER	EXPOSED STRUCTURE	NONE	STAIN/SEAL	REMARKS
101	FILTRATION	●			●		●			●			●		●				●		●				●		●				●		●				●	●		
102	PUMP PIT	●			●		●			●		●			●			●			●			●			●			●			●				●	●		
103	FAN ROOM	●			●		●			●			●		●				●		●				●		●				●		●				●	●		
104	CHEMICAL	●			●		●			●			●		●				●		●				●		●				●		●		●			●		
105	CHEMICAL	●			●		●			●			●		●				●		●				●		●				●		●		●			●		
106	PARK TOILET	●			●	●			●		●			●			●			●			●			●			●			●				●			●	
107	PARK TOILET	●			●	●			●		●			●			●			●			●			●			●			●				●			●	
108	MEN		●	●				●	●		●					●	●					●	●					●	●					●		●			●	
109	FAMILY TOILET		●	●				●	●		●					●	●					●	●					●	●					●		●			●	
110	JANITOR	●			●		●			●			●		●				●		●				●		●				●		●		●			●		
111	CHASE	●			●		●			●			●		●				●		●				●		●				●		●		●			●		
112	WOMEN		●	●				●	●		●					●	●					●	●					●	●					●		●			●	
114	FAN ROOM (2)	●			●		●			●			●		●				●		●				●		●				●		●				●	●		



1 FLOOR PLAN
1/4" = 1'-0"

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MISSOURI REGISTRATION NUMBER 001512

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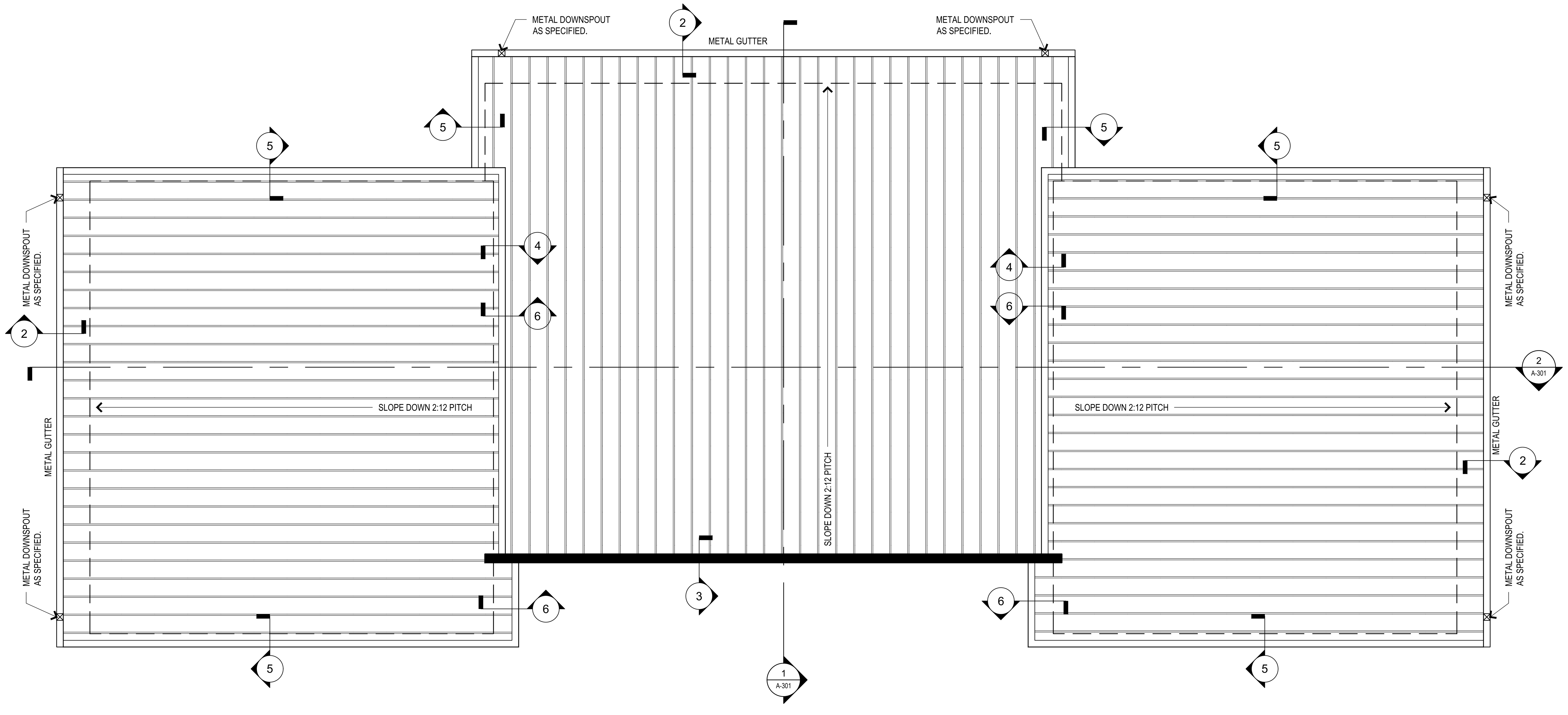
ARCHITECT: ANDREW SEAMANS
LICENSE NO: A-2016033876
DATE: APRIL 15, 2019

SUMMIT WAVES
WAVE POOL EXPANSION
LEE'S SUMMIT, MO

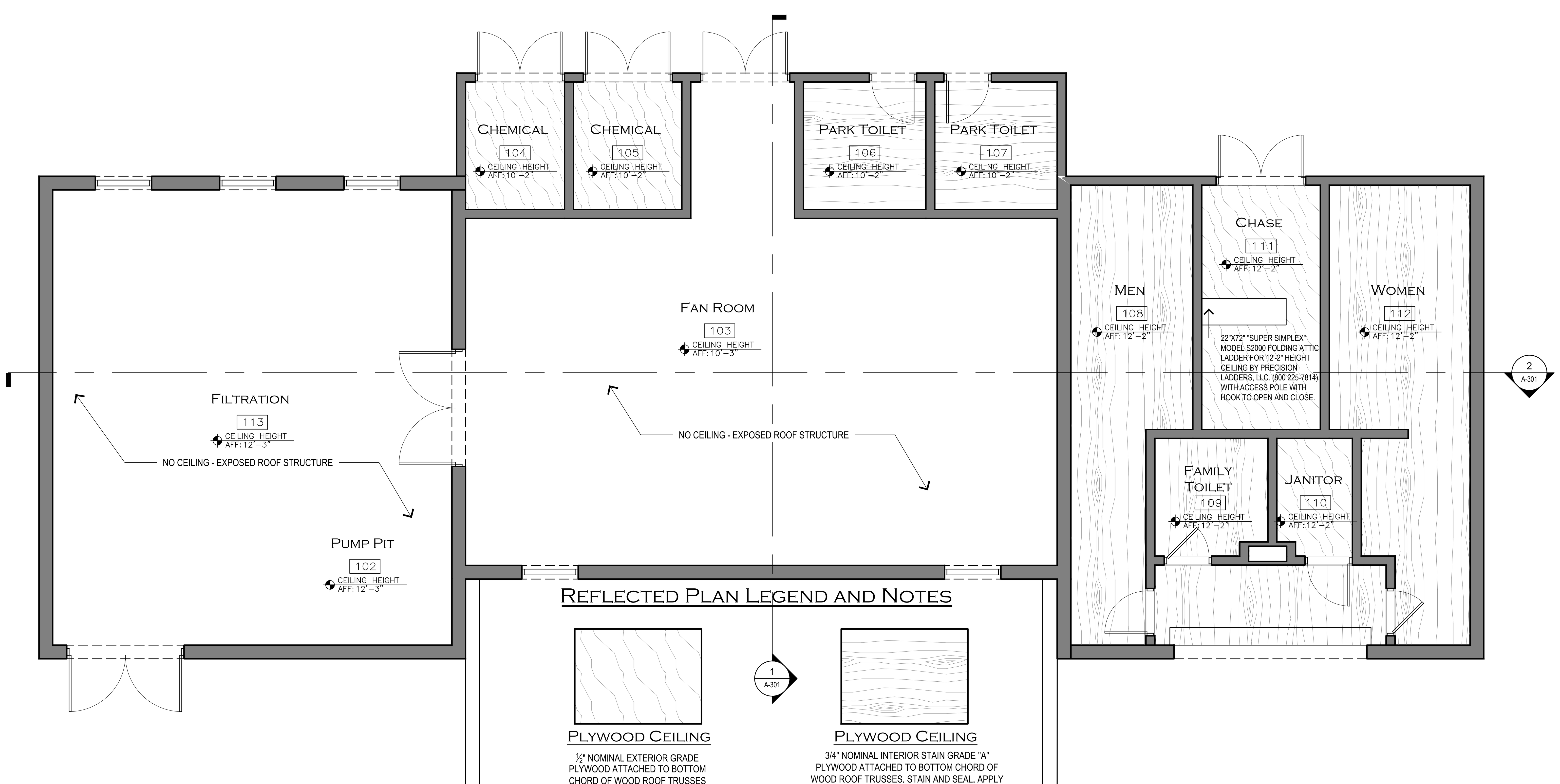
FLOOR PLAN

Scale: AS SHOWN
Designed by: DMK
Drawn by: DMK
Checked by: KCD
Date: 04/15/2019
Project No. 064538700

SHEET
A-101



1 Roof Plan
3/16" = 1'-0"

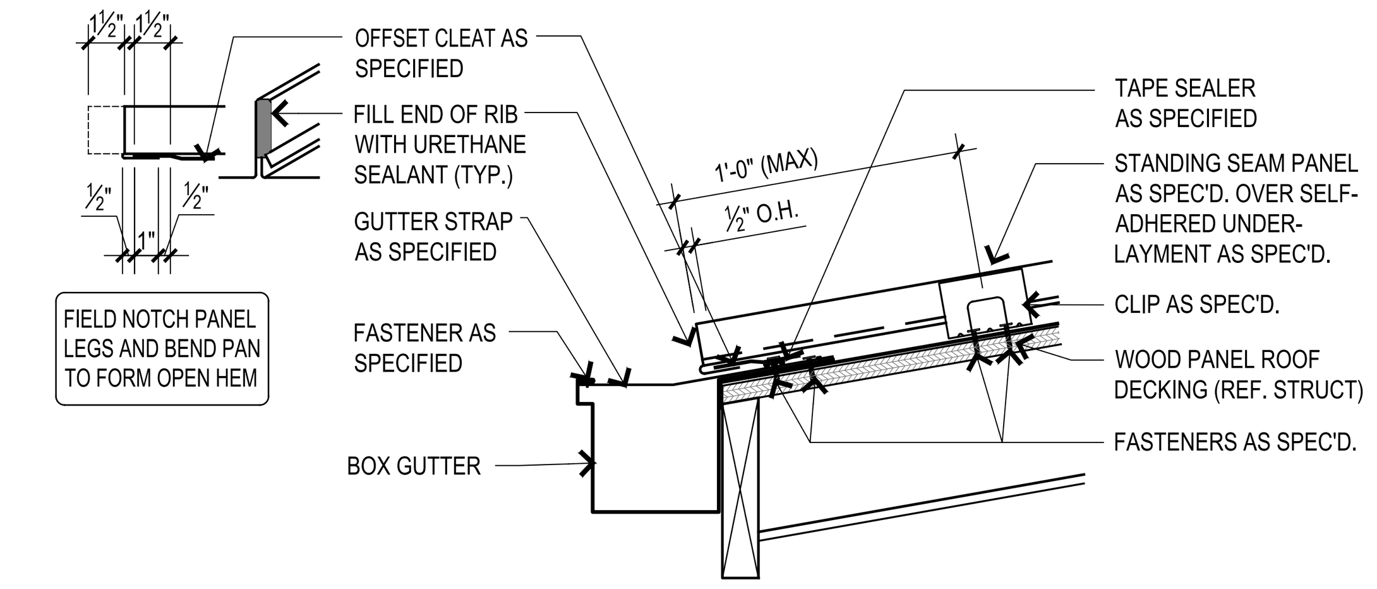


Reflected Plan Legend and Notes

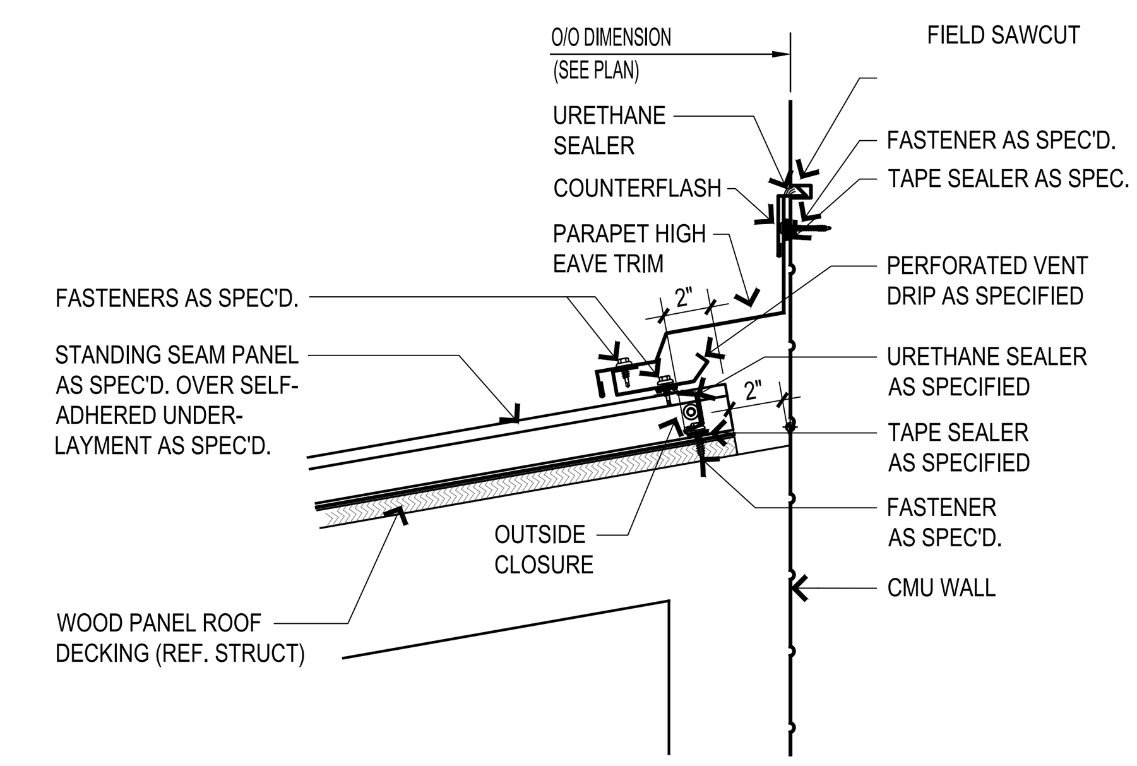
Plywood Ceiling
½" NOMINAL EXTERIOR GRADE PLYWOOD ATTACHED TO BOTTOM CHORD OF WOOD ROOF TRUSSES AT CHEMICAL ROOMS.

Plywood Ceiling
3/4" NOMINAL INTERIOR STAIN GRADE "A" PLYWOOD ATTACHED TO BOTTOM CHORD OF WOOD ROOF TRUSSES. STAIN AND SEAL. APPLY 1x2 WOOD TRIM OVER STAGGERED SEAMS.

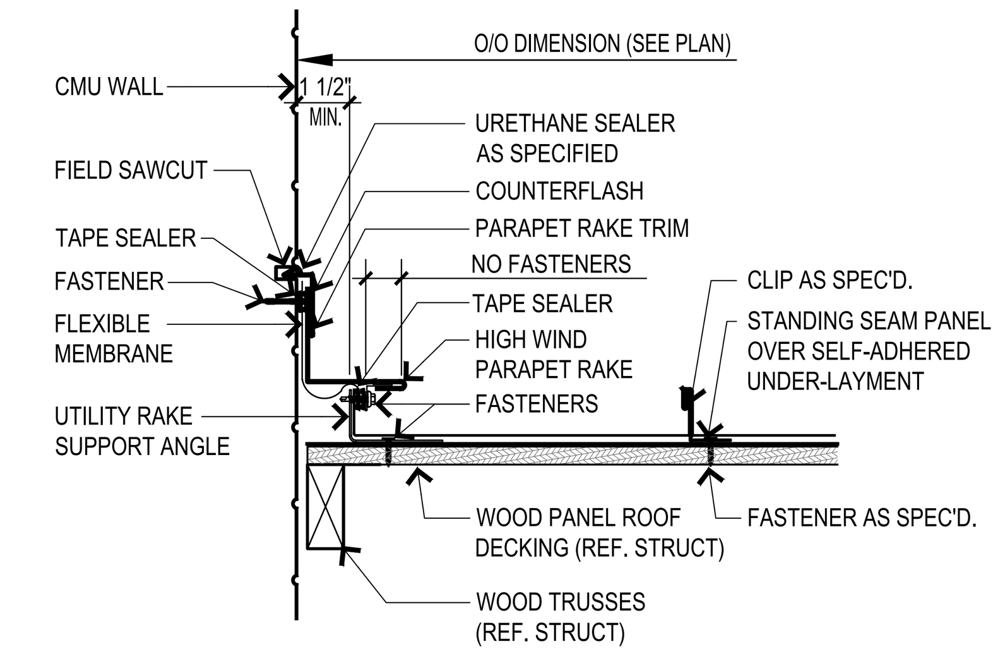
8 Reflected Ceiling Plan
3/16" = 1'-0"



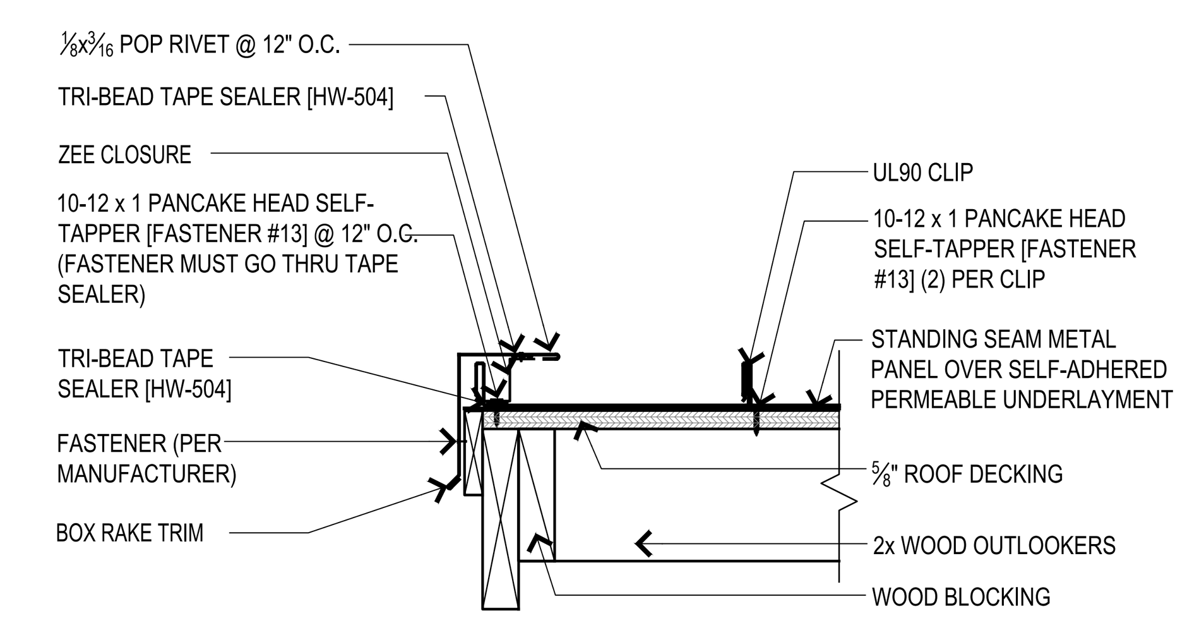
2 Detail - Roof Eave w/ Gutter
1 1/2" = 1'-0"



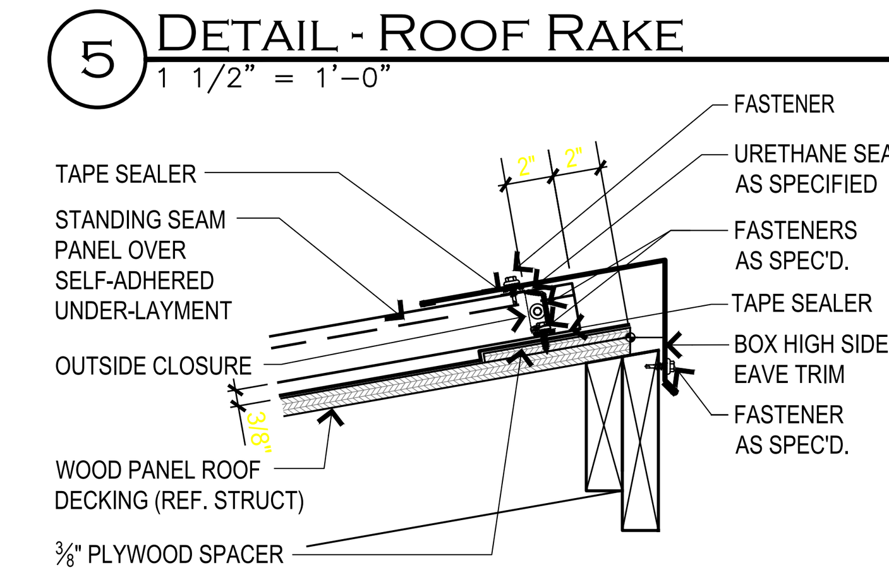
3 Detail - Roof High Eave
1 1/2" = 1'-0"



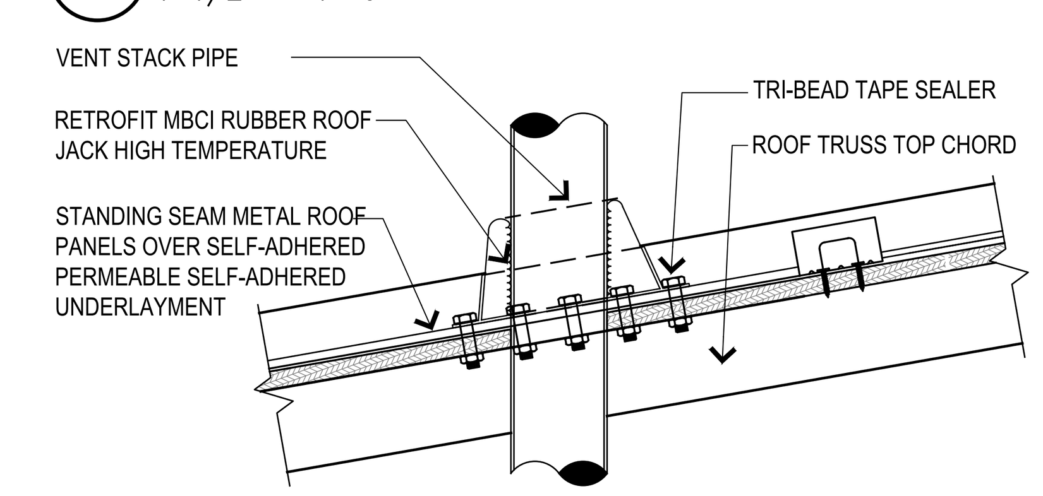
4 Detail - Roof Rake at Parapet
1 1/2" = 1'-0"



5 Detail - Roof Rake
1 1/2" = 1'-0"



6 Detail - Roof at High Eave
1 1/2" = 1'-0"



7 Detail - Rubber Roof Boot
1 1/2" = 1'-0"

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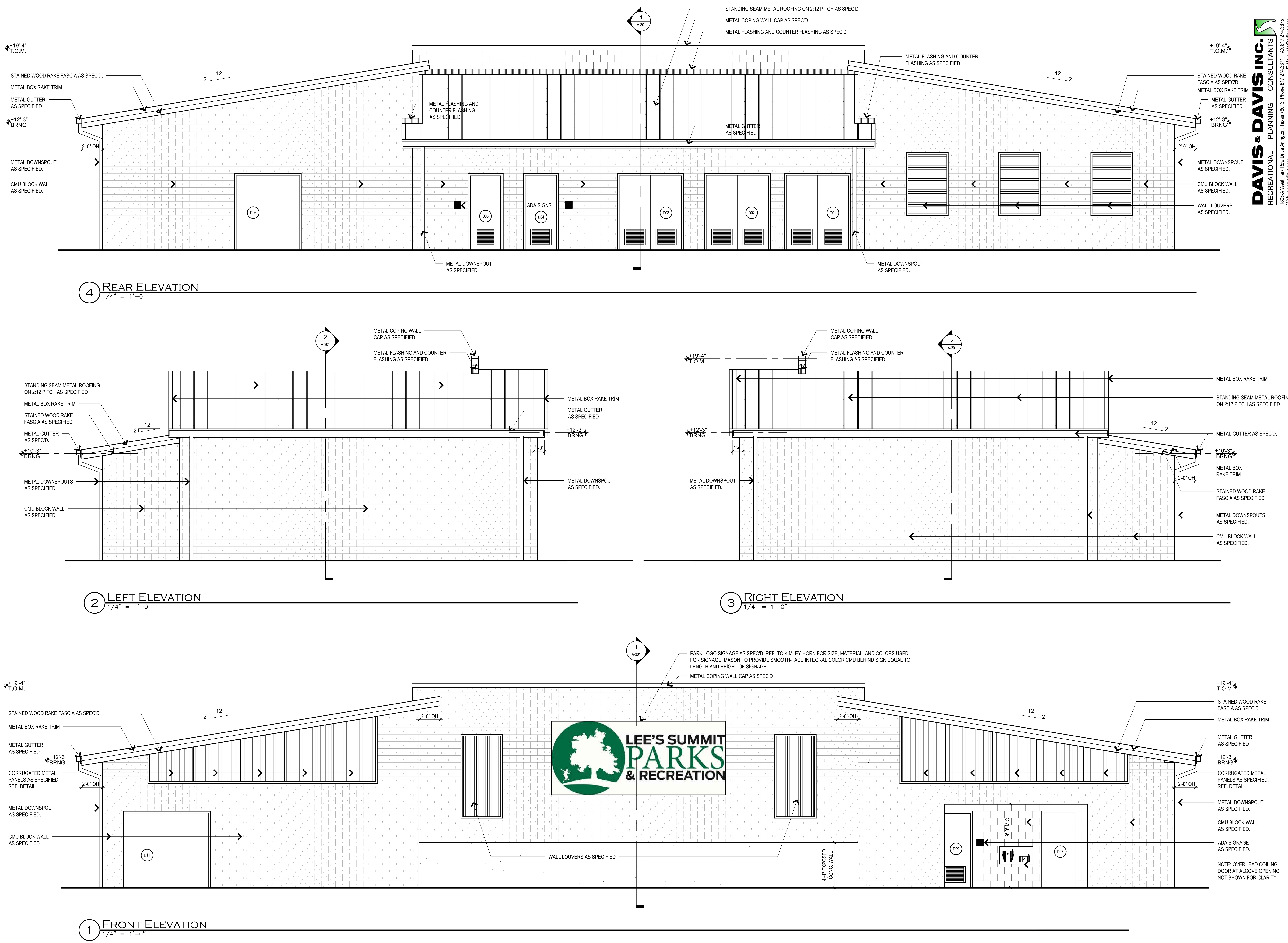
ARCHITECT: ANDREW SEAMANS
LICENSE NO: A-2016033876
DATE: APRIL 15, 2019

SUMMIT WAVES WAVE POOL EXPANSION LEE'S SUMMIT, MO

REFLECTED CEILING & ROOF PLANS

Scale:	AS SHOWN
Designed by:	DMK
Drawn by:	DMK
Checked by:	KCD
Date:	04/15/2019
Project No.	064538700

SHEET
A-102



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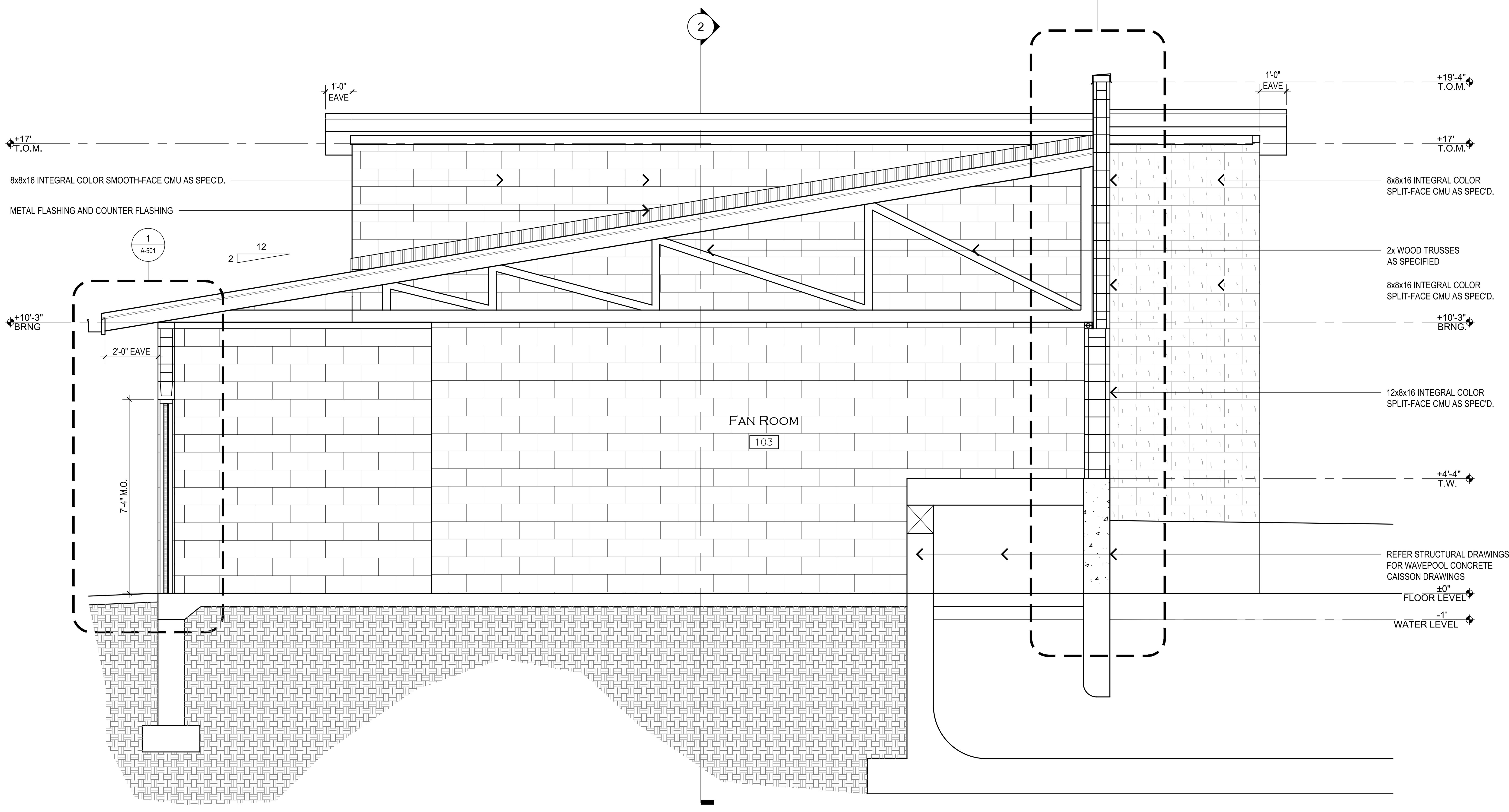
DATE: APRIL 15, 2019

SUMMIT WAVES WAVE POOL EXPANSION LEE'S SUMMIT, MO

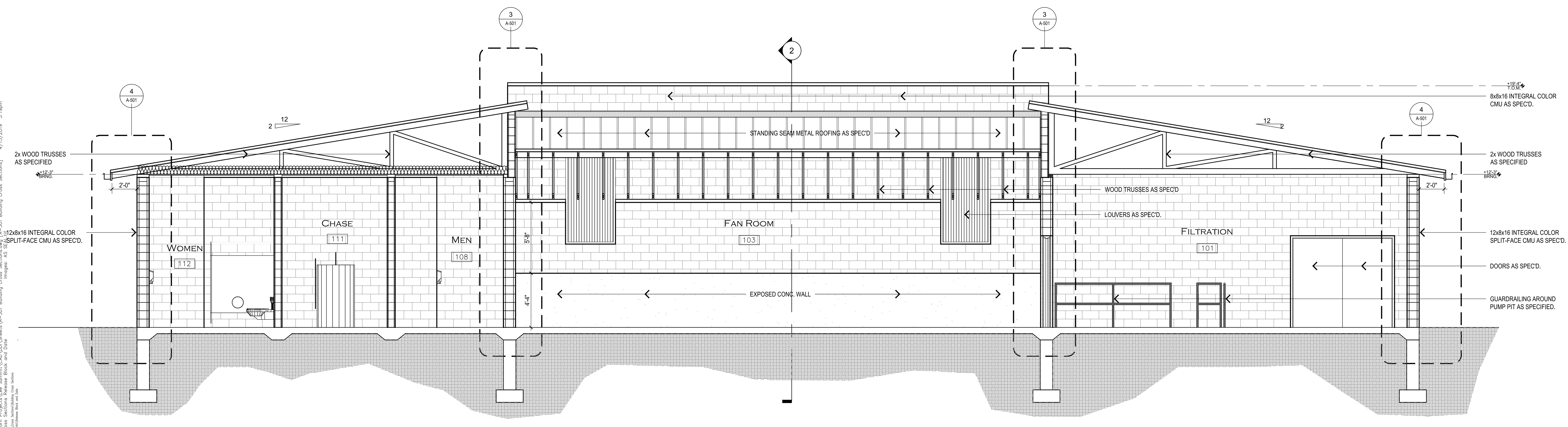
EXTERIOR ELEVATIONS

Scale:	AS SHOWN
Designed by:	DMK
Drawn by:	DMK
Checked by:	KCD
Date:	04/15/2019
Project No.	064538700

SHEET
A-201



1 BUILDING CROSS SECTION
3/8" = 1'-0"



2 BUILDING CROSS SECTION
1/4" = 1'-0"

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XREF FILES:

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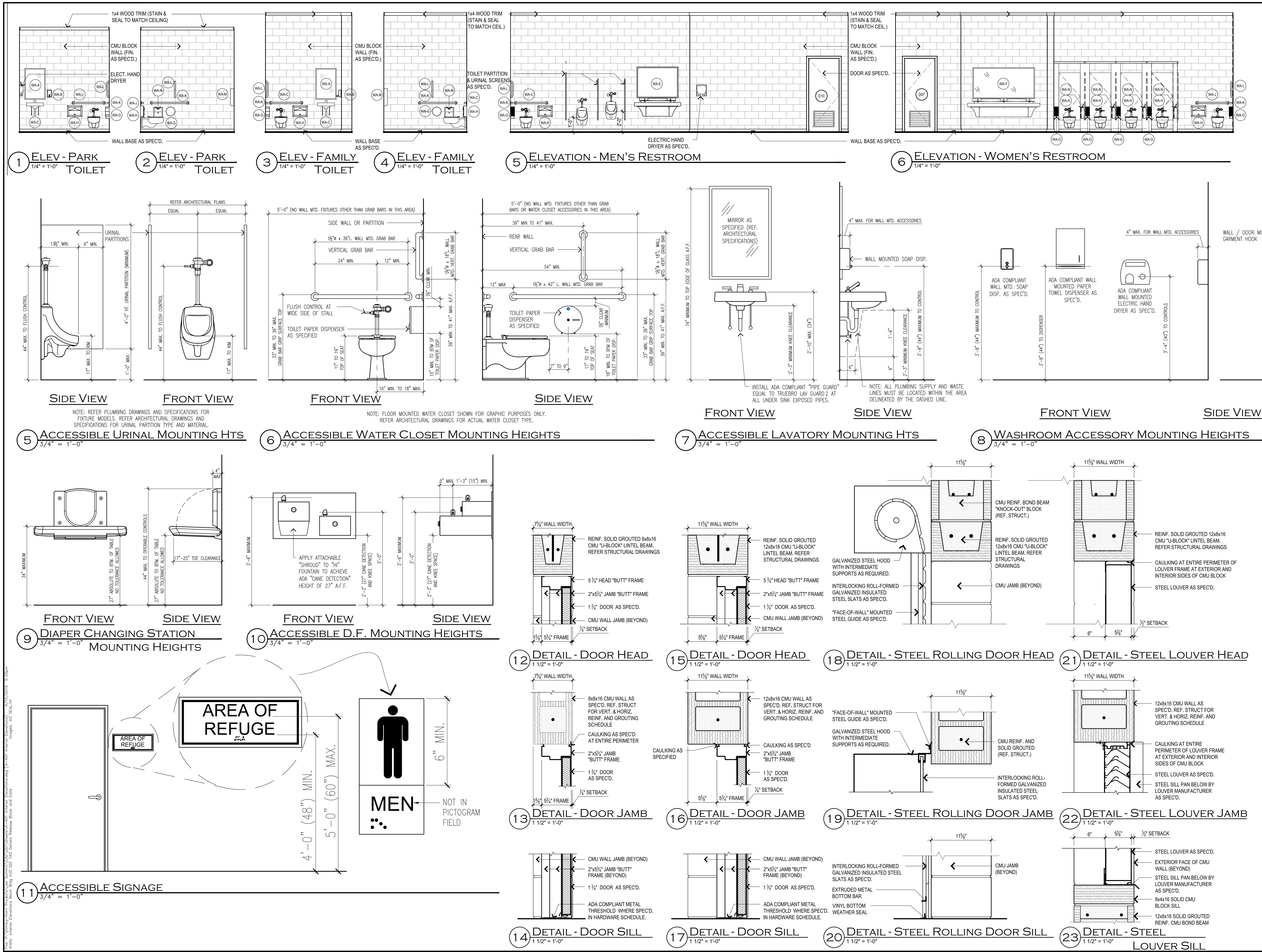
LICENSE NO.: A-2016033876
DATE: APRIL 15, 2019

SUMMIT WAVES
WAVE POOL EXPANSION
LEE'S SUMMIT, MO

BUILDING CROSS SECTIONS

Scale:	AS SHOWN
Designed by:	DMK
Drawn by:	DMK
Checked by:	KCD
Date:	04/15/2019
Project No.	064538700

SHEET
A-301



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MISSOURI REGISTRATION NUMBER 001512

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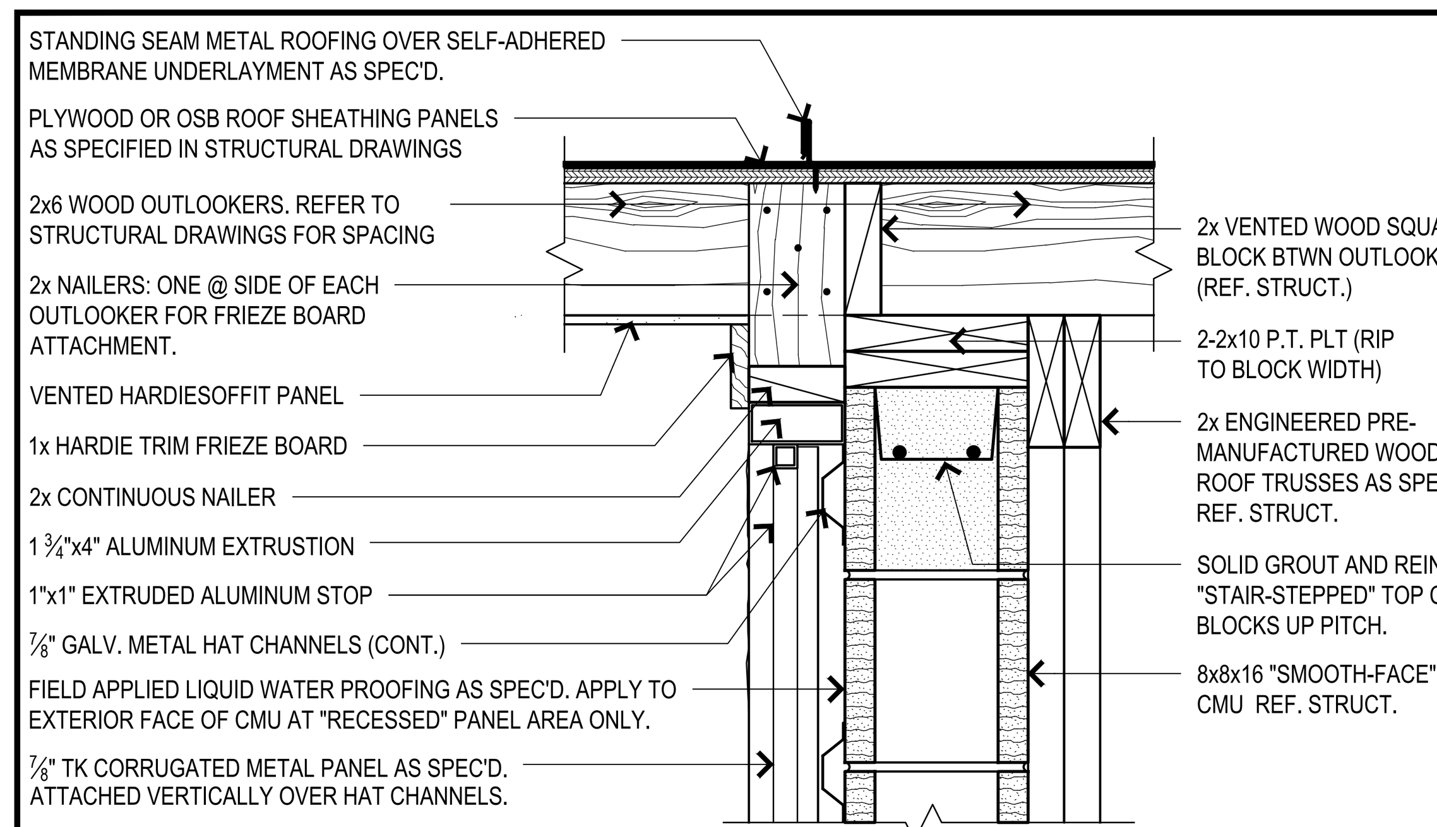
SUMMIT WAVES WAVE POOL EXPANSION LEE'S SUMMIT, MO

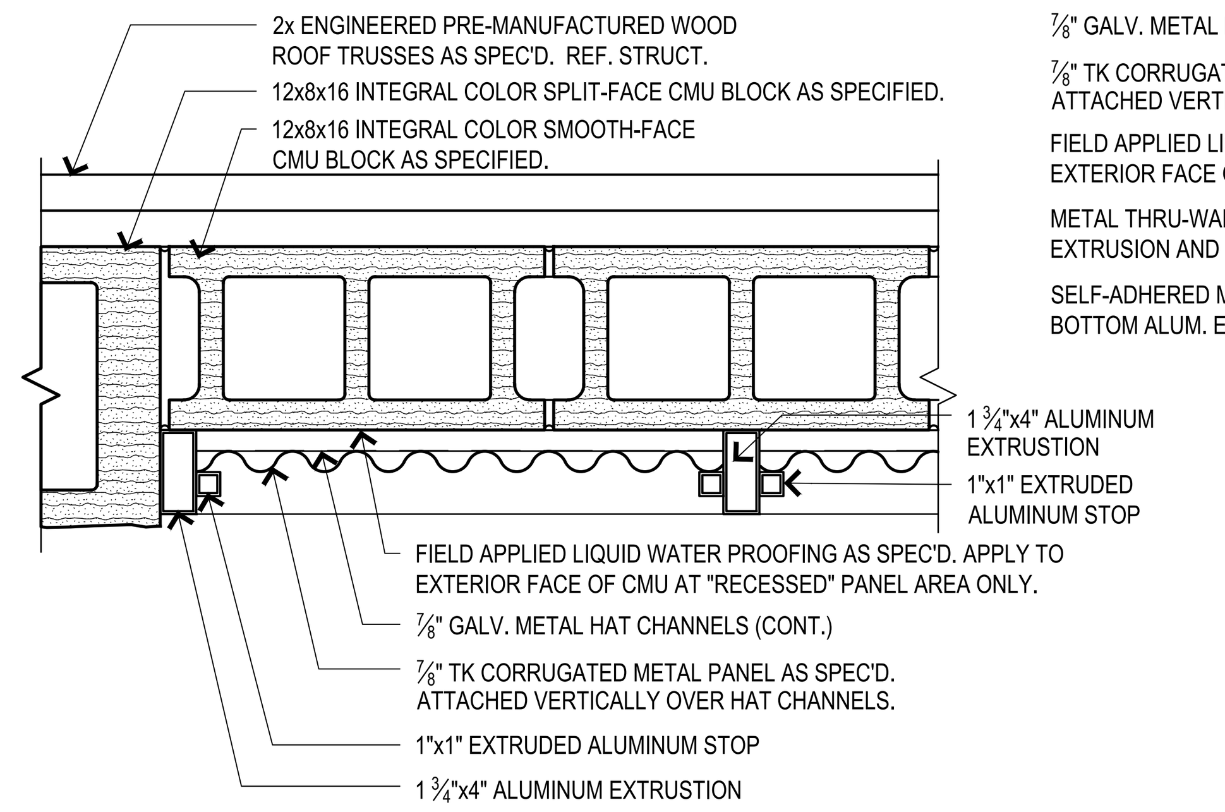
INTERIOR ELEVATIONS

Scale:	AS SHOWN
Designed by:	DMK
Drawn by:	DMK
Checked by:	KCD
Date:	04/15/2019
Project No.	064538700

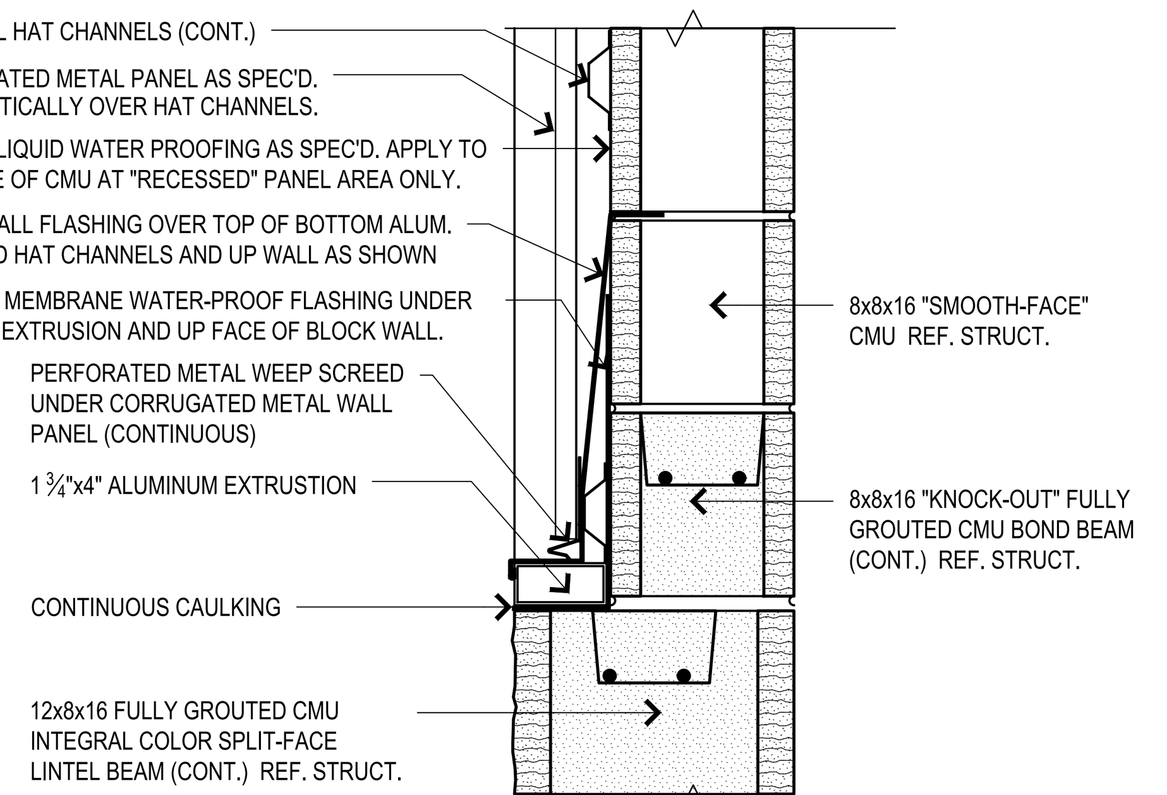
SHEET
A-401



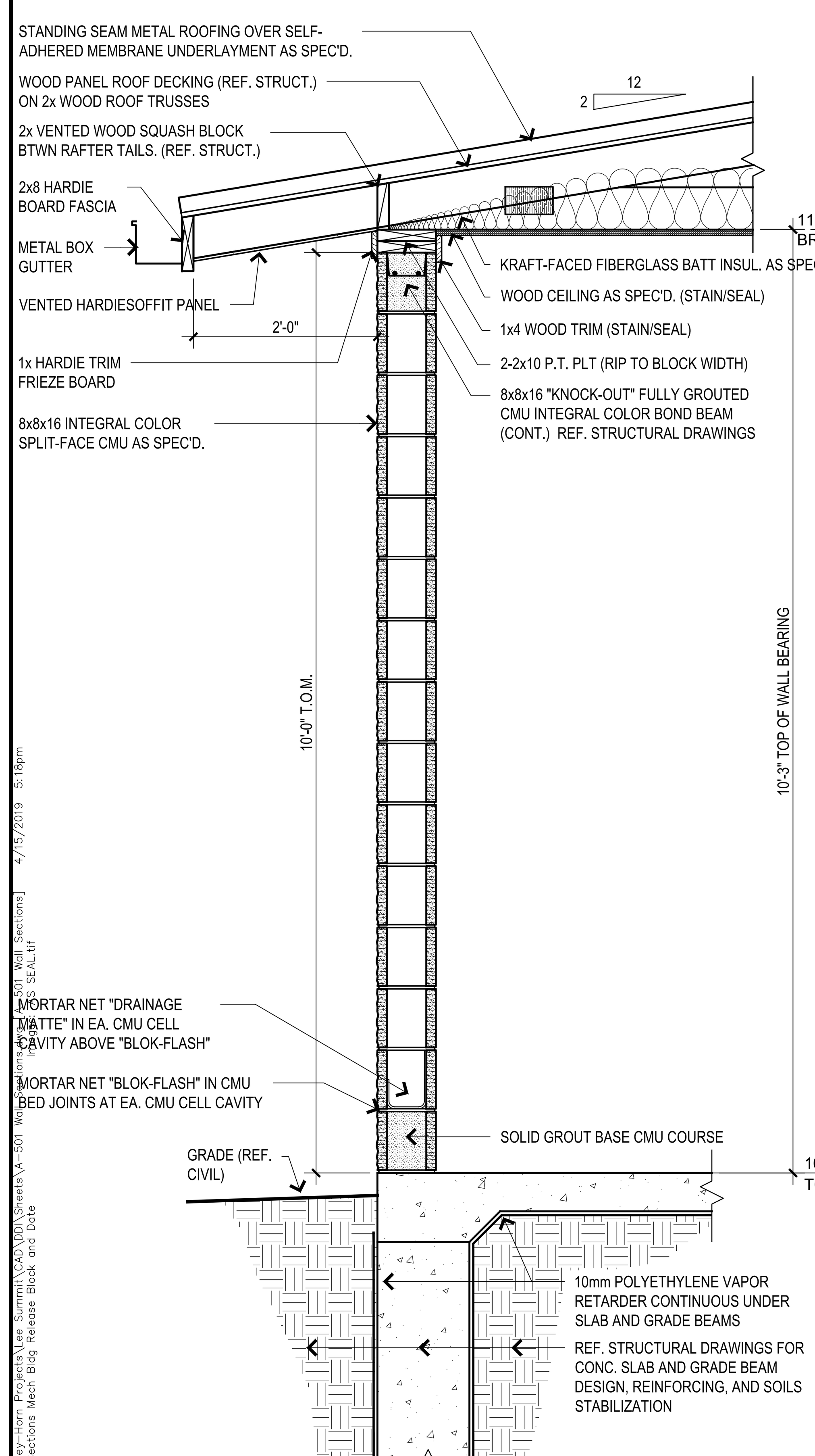
6 SECTION / DETAIL - TOP OF METAL PANEL AT WALL INSET
1 1/2" = 1'-0"



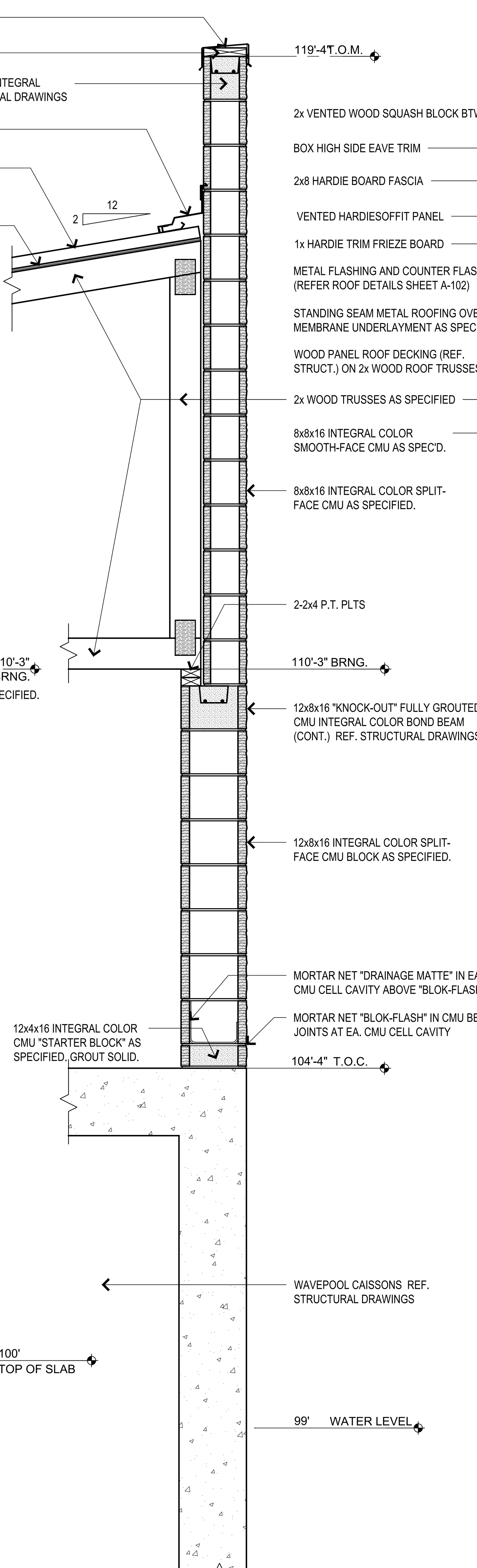
7 PLAN / DETAIL - METAL PANEL AT WALL INSET
1 1/2" = 1'-0"



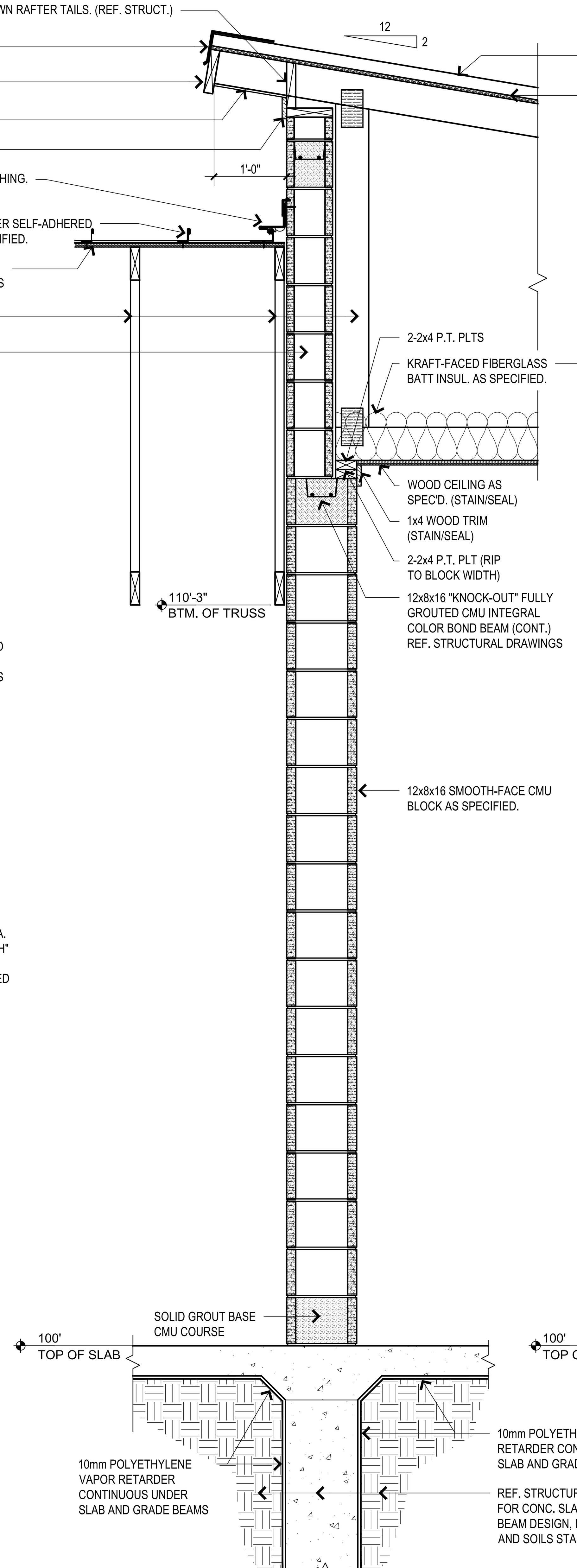
8 SECTION / DETAIL - BOTTOM OF METAL PANEL AT WALL INSET
1 1/2" = 1'-0"



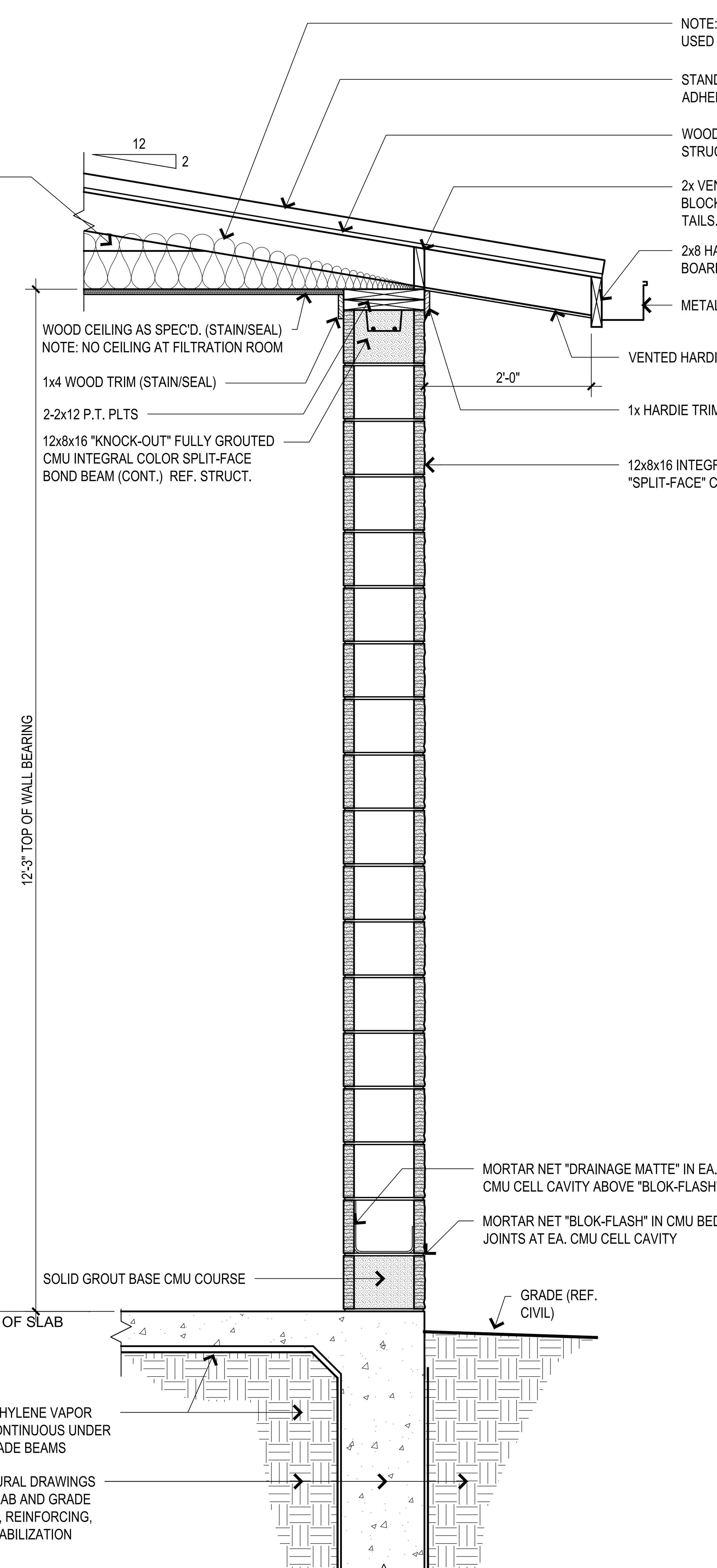
1 WALL SECTION
3/4" = 1'-0"



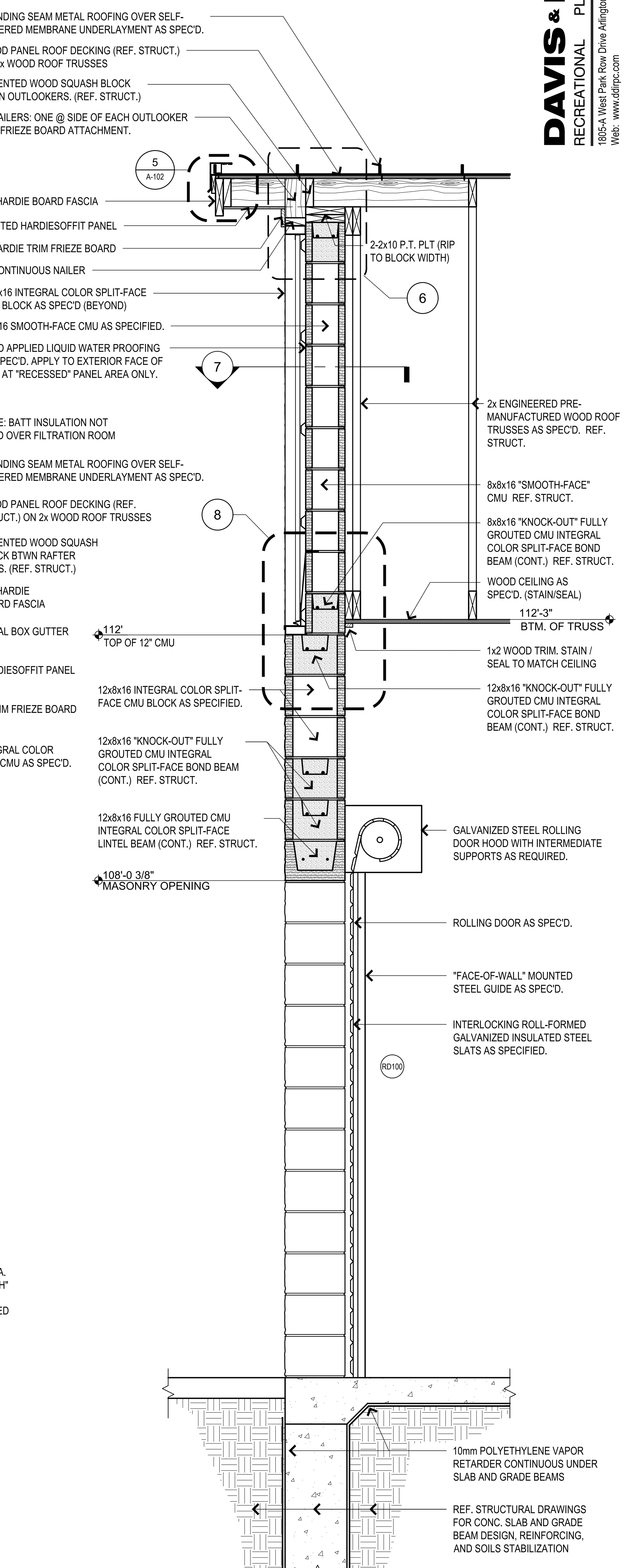
2 WALL SECTION
3/4" = 1'-0"



3 WALL SECTION
3/4" = 1'-0"



4 WALL SECTION
3/4" = 1'-0"



5 WALL SECTION
3/4" = 1'-0"

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LICENSE NO: A-2016033876
DATE: APRIL 15, 2019

SUMMIT WAVES WAVE POOL EXPANSION LEE'S SUMMIT, MO

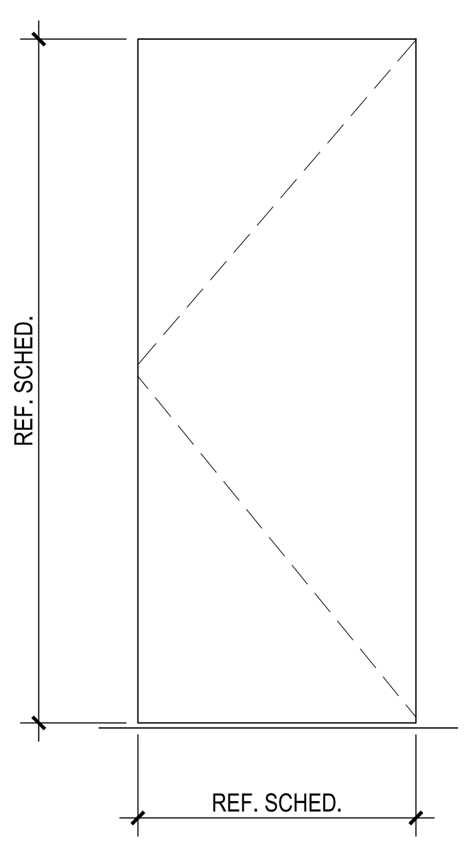
WALL SECTIONS

Scale:	AS SHOWN
Designed by:	DMK
Drawn by:	DMK
Checked by:	KCD
Date:	04/15/2019
Project No.	064538700

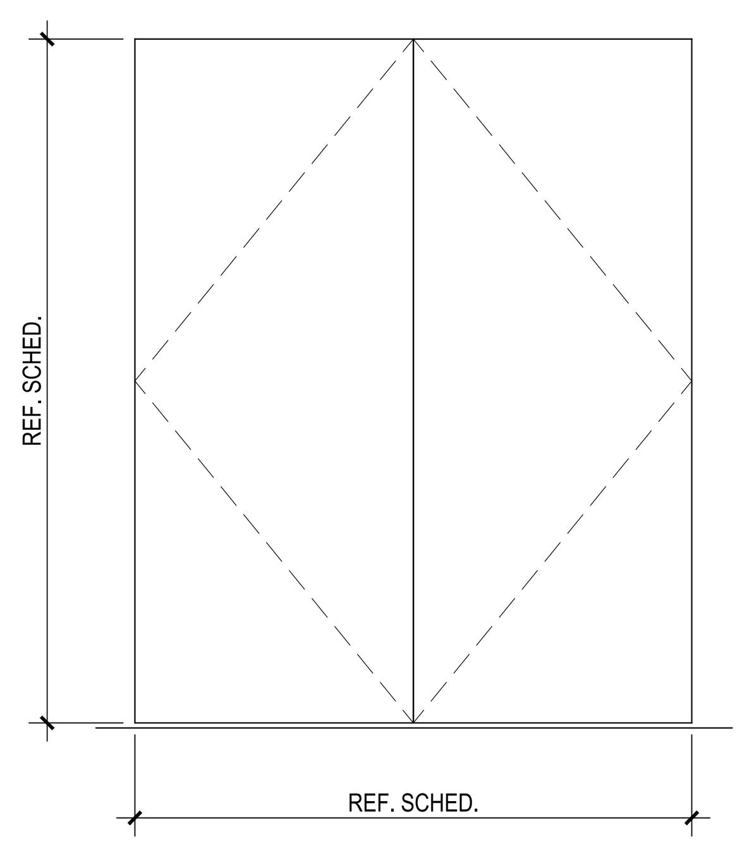
SHEET
A-501

Door and Frame Schedule

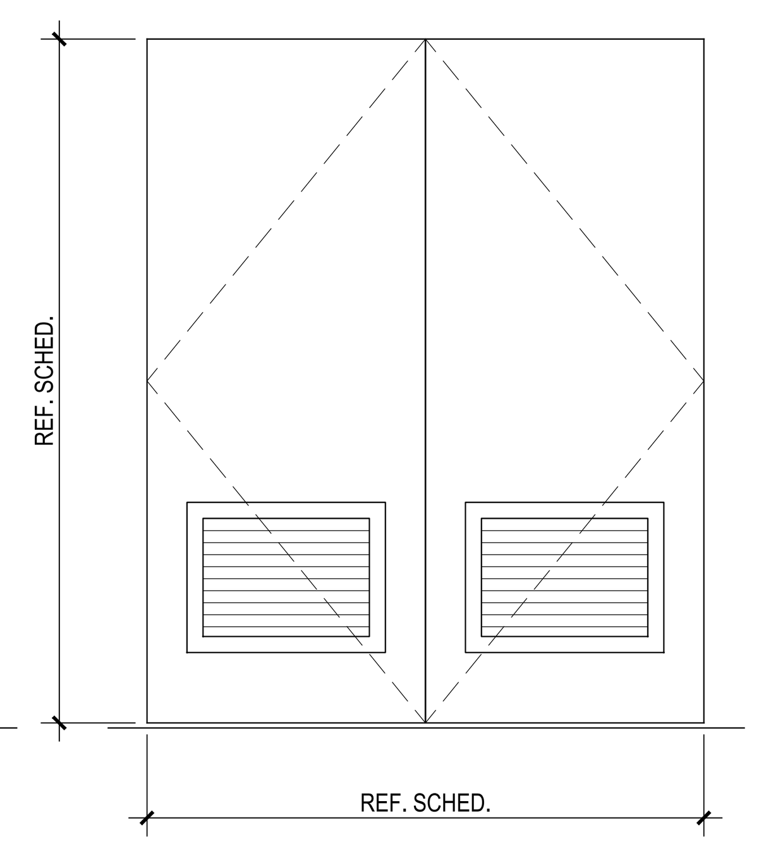
DOOR IDEN.		DOOR DIMENSIONS			DOOR DESIGN / MANUFACTURER					DOOR CONSTRUCTION						DOOR FINISH			DOOR FRAME													REMARKS
										CORE		FACING	LOUVER								FRAME CONSTRUCTION					FRAME SIZE			FRAME DETAILS			
																										FRAME WIDTH		FRAME DEPTH				
MARK	ELEV.	WxH	THK	LEAVES	TYPE	STYLE	OPERATION	DOOR SWING	MANUF.	TYPE	MAT'L	MATERIAL	WxH	MAT'L	RATING	EXT.	INT.	HARDWARE	ELEV.	MANUF.	TYPE	STYLE	MATERIAL	RATING	FINISH	JAMB	HEAD	FRAME DEPTH	HEAD	JAMB	SILL	
D01	C	PR 3'-0" x 7'-2"	1 3/4"	2	FRP	PAIR - LOUVERED (L)	SWINGING	RHRA	REF. SPECS.	FOAM	URETHANE	FIBERGLASS	24"X18"	FIBERGLASS	NA	PAINT	PAINT	HS#4	F-2	REF. SPECS.	FIBERGLASS BUTTED FRAME	FIBERGLASS DOUBLE RABBET	FIBERGLASS	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D02	C	PR 3'-0" x 7'-2"	1 3/4"	2	FRP	PAIR - LOUVERED (L)	SWINGING	RHRA	REF. SPECS.	FOAM	URETHANE	FIBERGLASS	24"X18"	FIBERGLASS	NA	PAINT	PAINT	HS#4	F-2	REF. SPECS.	FIBERGLASS BUTTED FRAME	FIBERGLASS DOUBLE RABBET	FIBERGLASS	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D03	C	PR 3'-0" x 7'-2"	1 3/4"	2	FRP	PAIR - LOUVERED (L)	SWINGING	RHRA	REF. SPECS.	FOAM	URETHANE	FIBERGLASS	24"X18"	FIBERGLASS	NA	PAINT	PAINT	HS#4	F-2	REF. SPECS.	FIBERGLASS BUTTED FRAME	FIBERGLASS DOUBLE RABBET	FIBERGLASS	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D04	D	3'-0" x 7'-2"	1 3/4"	1	HOLLOW METAL	LOUVERED (L)	SWINGING	LH	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	24"X18"	STEEL	NA	PAINT	PAINT	HS#2	F-1	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D05	D	3'-0" x 7'-2"	1 3/4"	1	HOLLOW METAL	LOUVERED (L)	SWINGING	RH	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	24"X18"	STEEL	NA	PAINT	PAINT	HS#2	F-1	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D06	B	PR 3'-0" x 7'-2"	1 3/4"	2	HOLLOW METAL	PAIR - FLUSH (F)	SWINGING	RHRA	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	NA	NA	NA	PAINT	PAINT	HS#4	F-2	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D07	D	3'-0" x 7'-2"	1 3/4"	1	HOLLOW METAL	LOUVERED (L)	SWINGING	RH	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	24"X18"	STEEL	NA	PAINT	PAINT	HS#3	F-1	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D08	A	3'-0" x 7'-2"	1 3/4"	1	HOLLOW METAL	FLUSH (F)	SWINGING	RHR	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	NA	NA	NA	PAINT	PAINT	HS#1	F-1	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D09	D	3'-0" x 7'-2"	1 3/4"	1	HOLLOW METAL	LOUVERED (L)	SWINGING	LH	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	24"X18"	STEEL	NA	PAINT	PAINT	HS#2	F-1	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D10	D	3'-0" x 7'-2"	1 3/4"	1	HOLLOW METAL	LOUVERED (L)	SWINGING	LH	REF. SPECS.	FOAM	URETHANE	18 GA. STEEL	24"X18"	STEEL	NA	PAINT	PAINT	HS#3	F-1	REF. SPECS.	HM BUTTED FRAME	WELDED DOUBLE RABBET	16 GA. STEEL	NA	PAINT	2"	2"	5 3/4"	12:A-401	13:A-401	14:A-401	
D11	B	PR 4'-0" x 7'-2"	1 3/4"	2	FRP	FLUSH (F)	SWINGING	RHRA	REF. SPECS.	FOAM	URETHANE	FIBERGLASS	NA	NA	NA	PAINT	PAINT	HS#4	F-2	REF. SPECS.	FIBERGLASS BUTTED FRAME	FIBERGLASS DOUBLE RABBET	FIBERGLASS	NA	PAINT	2"	2"	5 3/4"	15:A-401	16:A-401	17:A-401	
D12	B	PR 4'-0" x 7'-2"	1 3/4"	2	FRP	FLUSH (F)	SWINGING	RHRA	REF. SPECS.	FOAM	URETHANE	FIBERGLASS	NA	NA	NA	PAINT	PAINT	HS#5	F-2	REF. SPECS.	FIBERGLASS BUTTED FRAME	FIBERGLASS DOUBLE RABBET	FIBERGLASS	NA	PAINT	2"	2"	5 3/4"	15:A-401	16:A-401	17:A-401	



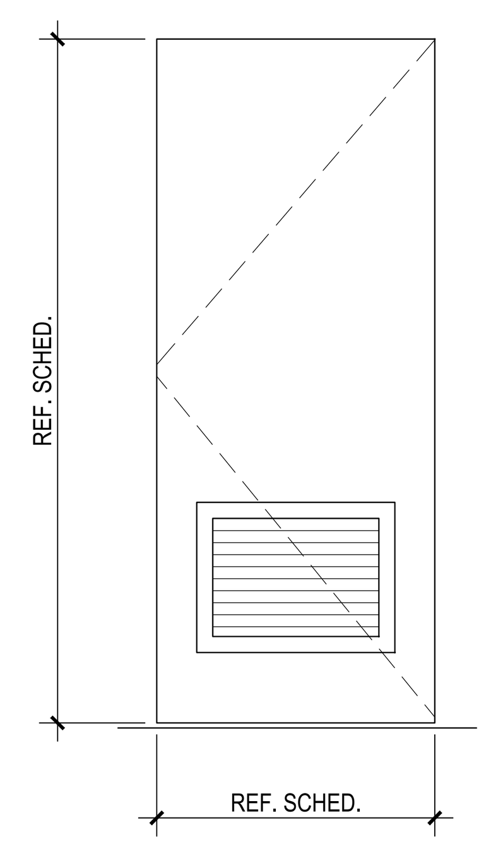
1 DOOR TYPE "A"
1/2" = 1'-0"



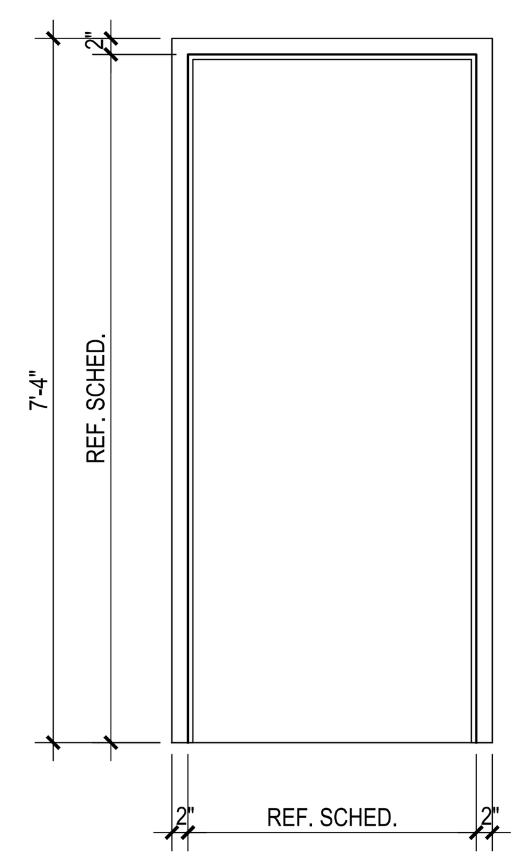
2 DOOR TYPE "B"
1/2" = 1'-0"



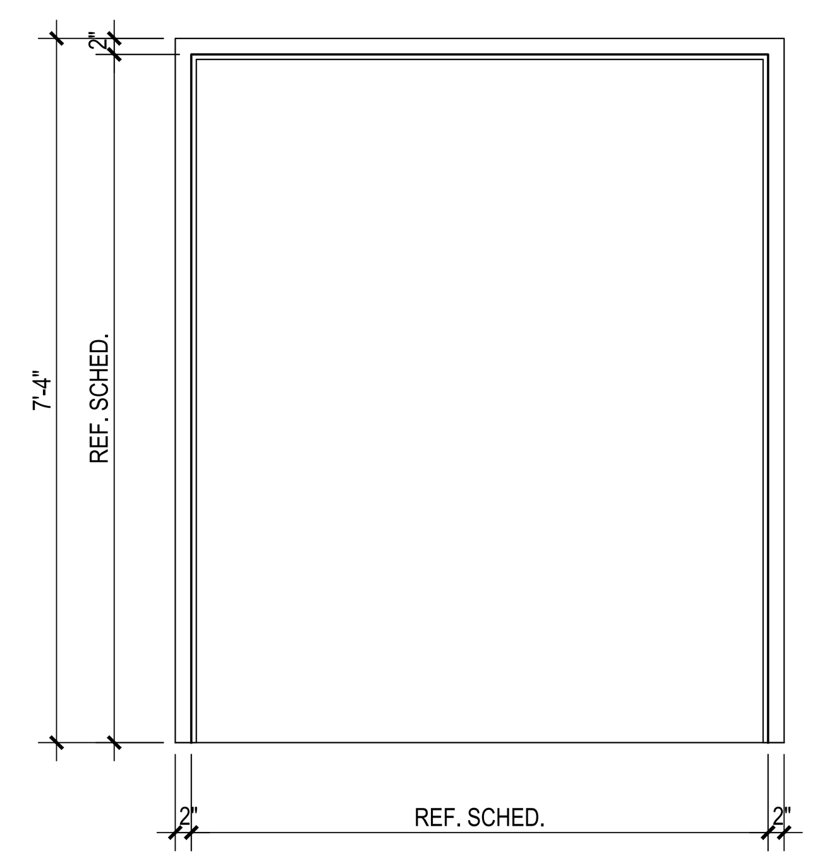
3 DOOR TYPE "C"
1/2" = 1'-0"



4 DOOR TYPE "D"
1/2" = 1'-0"



5 FRAME TYPE "F1"
1/2" = 1'-0"



6 FRAME TYPE "F2"
1/2" = 1'-0"

Door Hardware Schedule

HARDWARE SET #1 (HS#1)

QTY. DESCRIPTION

(3) "BUTT" HINGES, FULL MORTISE, STANDARD WEIGHT, 4½"x4½", BALL BEARING.

(1) KEYED LOCKSET, "STOREROOM" FUNCTION, ADA COMPLIANT LEVER HANDLE.

(1) SINGLE CYLINDER DEADLOCK.

(3) DOOR SILENCERS.

(1) ADA COMPLIANT ALUMINUM THRESHOLD.

(1) WEATHER STRIPPING PACKAGE

(1) DOOR SWEEP

(1) DRIP CAP AT DOOR HEAD

HARDWARE SET #2 (HS#2)

QTY. DESCRIPTION

(3) "BUTT" HINGES, FULL MORTISE, STANDARD WEIGHT, 4½"x4½", BALL BEARING.

(1) KEYED LOCKSET, "PRIVACY" FUNCTION, ADA COMPLIANT LEVER HANDLE.

(1) SINGLE CYLINDER DEADLOCK (CLASSROOM FUNCTION.)

(3) DOOR SILENCERS.

(1) ADA COMPLIANT ALUMINUM THRESHOLD.

(1) WEATHER STRIPPING PACKAGE

(1) DOOR SWEEP

(1) WALL MOUNTED CONCAVE DOOR BUMPER AT DOORS D04 AND D05.

(1) DRIP CAP AT DOOR HEAD

HARDWARE SET #3 (HS#3)

QTY. DESCRIPTION

(3) "BUTT" HINGES, FULL MORTISE, STANDARD WEIGHT, 4½"x4½", BALL BEARING.

(1) PULL HANDLE W/ PLATE

(1) PUSH PLATE

(1) SINGLE CYLINDER DEADLOCK (CLASSROOM FUNCTION.)

(1) SURFACE MOUNTED DOOR CLOSER WITH HOLD-OPEN FUNCTION, ADA COMPLIANT, INTERIOR SIDE MOUNTED.

(3) DOOR SILENCERS.

(1) ADA COMPLIANT ALUMINUM THRESHOLD.

(1) 8"x34" KICKPLATE

(1) WEATHER STRIPPING PACKAGE

(1) DOOR SWEEP

(1) DRIP CAP AT DOOR HEAD

HARDWARE SET #4 (HS#4)

QTY. DESCRIPTION

(6) "BUTT" HINGES, FULL MORTISE, STANDARD WEIGHT, 4½"x4½", BALL BEARING

(1) KEYED LOCKSET, "STOREROOM" FUNCTION, ADA COMPLIANT LEVER HANDLE.

(1) SINGLE CYLINDER DEADLOCK W/ THUMBTURN.

(6) DOOR SILENCERS.

(1) SURFACE MOUNTED FLUSH BOLT

(1) ADA COMPLIANT ALUMINUM THRESHOLD.

(2) DOOR SWEEPS

(1) WEATHERSTRIPPING PACKAGE

(2) DRIP CAP AT DOOR HEAD

(1) ASTRAGAL

HARDWARE SET #5 (HS#5)

QTY. DESCRIPTION

(6) "BUTT" HINGES, FULL MORTISE, STANDARD WEIGHT, 4½"x4½", BALL BEARING

(1) KEYED LOCKSET, "STOREROOM" FUNCTION, ADA COMPLIANT LEVER HANDLE.

(1) SINGLE CYLINDER DEADLOCK W/THUMBTURN.

(6) DOOR SILENCERS.

(1) SURFACE MOUNTED FLUSH BOLT

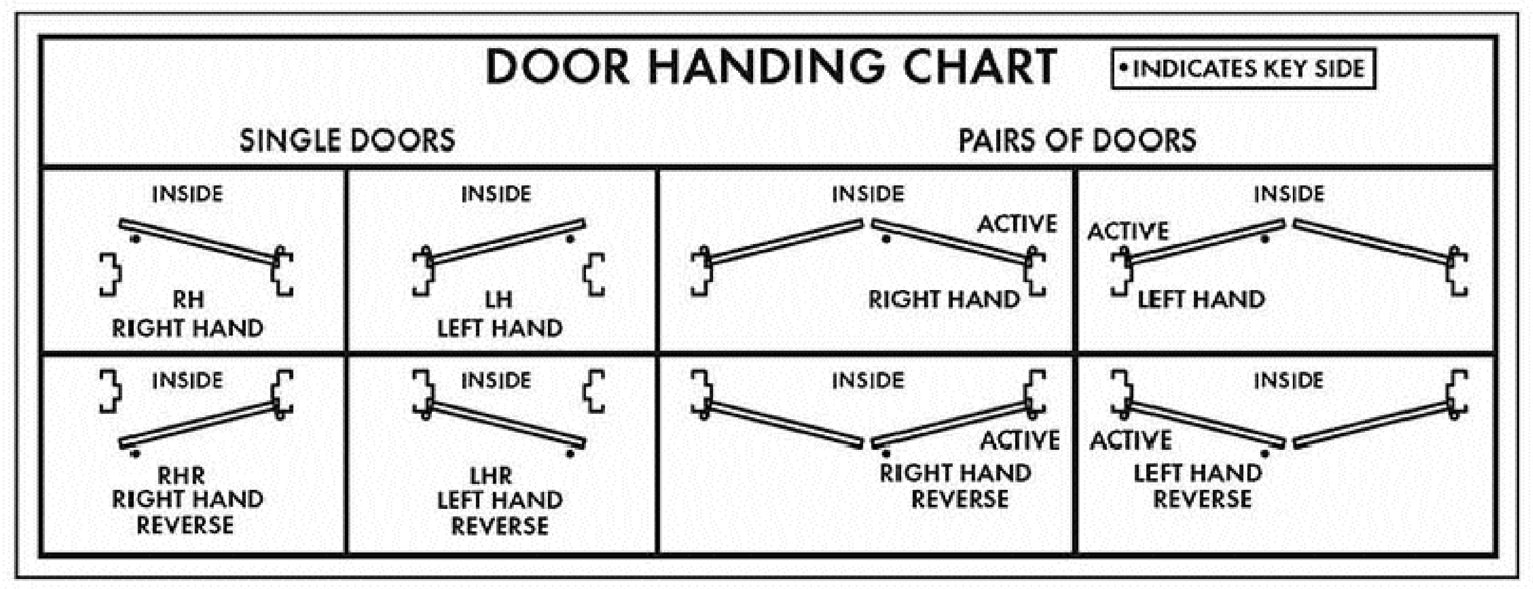
(1) ASTRAGAL

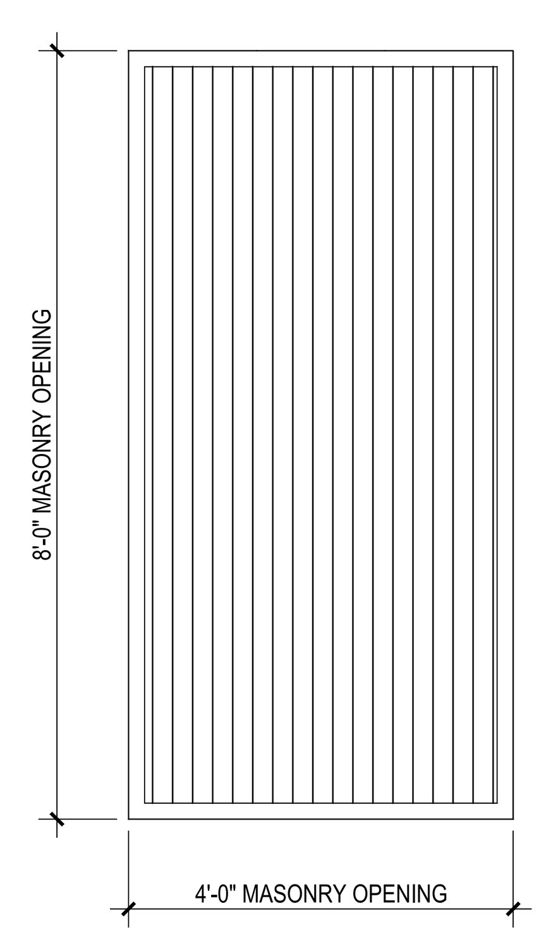
Rolling Door Schedule

DOOR NO.	WALL OPENING WxH	DOOR DESCRIPTION								DOOR TRACK / GUIDES DESCRIPTION								REMARKS
															DETAILS:			
		ELEV. TYPE	DOOR TYPE	MANUFACTURER	MODEL	MOUNTING	MATERIAL	FINISH	DOOR / FRAME RATING	TYPE	MATERIAL	FINISH	WIDTH	DEPTH	SILL	JAMB	HEAD	
			ROLLING	OVERHEAD DOOR CORP.	615 SERIES	FACE-OF-WALL	24 GA. C187 SLATS	GALV. & PAINTED	NA	ROLLED	STEEL	GALV. & PAINTED	REF. MANUF.	REF. MANUF.				
RD100	13'-8 3/8" x 8'-0"	--	●	●	●	●	●	●	●	●	●	●	●	●	--	--	--	--

Door Hardware Functions

Function & Diag.	Description	Outside Lever		Inside Lever	
ANSI No. Grade	Latch operated by	Locked by	Unlocked by	Locked by	Unlocked by
Single Keyed					
AB-Entry F109-Grade 2	• Rotating inside lever, OR • Rotating outside lever– only when inside push button is out, OR • Turning key in outside lever.	• Pushing inside button, OR • Pushing and turning the inside button. Turning the button keeps the outside lever locked until the button is turned back.	• Turning the key in the outside lever, (only when the button is not turned) OR • Rotating the inside lever (only when the button is not turned) OR • Closing the door (only when the button is not turned).	Cannot be locked	Always unlocked
D-Storeroom F86-Grade 2	• Turning key in the outside lever, OR • Rotating inside lever	Always locked	Cannot be unlocked	Cannot be locked	Always unlocked
L-Privacy F76-Grade 2	• Rotating inside lever, OR • Rotating outside lever– only when inside push button is out.	Pushing inside button	• Rotating the outside slotted button, OR • Rotating the inside lever, OR • Closing the door.	Cannot be locked	Always unlocked
N-Passage F75-Grade 2	• Rotating inside lever, OR • Rotating outside lever.	Cannot be locked	Always unlocked	Cannot be locked	Always unlocked
R-Classroom F84-Grade 2	• Rotating inside lever, OR • Turning key in outside lever when outside lever is locked, OR • Rotating outside lever when not locked by key.	Turning key in outside lever	Turning key in outside lever	Cannot be locked	Always unlocked
Y-Exit Grade 2	Rotating the inside lever	No outside lever-Blank rose	No outside lever- Blank rose	Cannot be locked	Always unlocked
1DT-Single Dummy Trim Grade 2	This is a single, surface-mounted lever for an inactive door or a non-latching door				





7 LOUVER TYPE "G01" AND "G02"
1/2" = 1'-0"

Washroom Accessory Schedule

PARK TOILET ROOM 106, 107; 109

MARK	QTY. DESCRIPTION
WA-A	(1) MIRROR - LAMINATED GLASS IN STAINLESS STEEL CHANNEL FRAME, 24" WIDE x 36" HEIGHT, SURFACE-MOUNTED OVER LAVATORY.
WA-B	(1) STAINLESS STEEL ADA COMPLIANT LIQUID SOAP DISPENSER MOUNTED ADJACENT TO LAVATORY - BY OWNER.
WA-C	(1) ADA COMPLIANT "PIPE GUARD" EQUIVILANT TO TRUEBRO LAV GUARD 2 AT ALL UNDER SINK EXPOSED PIPES.
WA-D	(1) SURFACE-MOUNTED STAINLESS STEEL COMBINATION PAPER TOWEL DISPENSER AND WASTE RECEPTICLE EQUIVILANT TO BOBRICK MODEL B-3949 OR AS SPECIFIED. MOUNT TO BE ADA COMPLIANT.
WA-E	(1) MIRROR - LAMINATED GLASS IN STAINLESS STEEL CHANNEL FRAME, 48" WIDE x 36" HEIGHT, SURFACE-MOUNTED OVER LAVATORY.
WA-F	(1) MIRROR - LAMINATED GLASS IN STAINLESS STEEL CHANNEL FRAME, 72" WIDE x 36" HEIGHT, SURFACE-MOUNTED OVER LAVATORY.
WA-G	(1) SURFACE-MOUNTED JUMBO ROLL ADA COMPLIANT TOILET PAPER DISPENSER AT SIDE OF WATER CLOSET. REFER DETAIL 2, SHEET A1-601.
WA-H	(1) SURFACE-MOUNTED STAINLESS STEEL TOILET SEAT COVER DISPENSER. MOUNT AT ADA COMPLIANT HEIGHT AND LOCATION.
WA-J	(1) STAINLESS STEEL PEENED GRIP GRAB BAR, 36" LONG AND MOUNTED HORIZONTALLY BEHIND ACCESSIBLE WATER CLOSET AS SHOWN IN DETAIL 2, SHEET A1-601.
WA-K	(1) STAINLESS STEEL PEENED GRIP GRAB BAR, 42" LONG AND MOUNTED HORIZONTALLY AT THE SIDE OF ACCESSIBLE WATER CLOSET AS SHOWN IN DETAIL 2, SHEET A1-601.
WA-L	(1) STAINLESS STEEL PEENED GRIP GRAB BAR, 18" LONG AND MOUNTED VERTICALLY AT THE SIDE OF ACCESSIBLE WATER CLOSET AS SHOWN IN DETAIL 2, SHEET A1-601.
WA-M	(1) SURFACE-MOUNTED "HORIZONTAL" DIAPER CHANGING STATION, 4" DEEP (MAXIMUM) x 35 3/16" W x 22¼" H, EQUIVILANT TO KOALA MODEL KB-200. COLOR TO BE SELECTED BY OWNER. LOCATE AS SHOWN ON FLOOR PLANS AND MOUNT SO THAT THE BOTTOM OF THE OPENED FOLDING "TABLE" IS 27" MAX. A.F.F.
WA-N	(1) SURFACE-MOUNTED STAINLES STEEL SANITARY NAPKIN DISPOSAL EQUIVILANT TO BOBRICK MODEL B-270. LOCATE AS SHOWN IN DRAWINGS AND MOUNT IN ACORDANCE WITH ADA REQUIREMENTS AT ACCESSIBLE TOILETS. MOUNT AT HEIGHTS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AT NON-ACCESSIBLE TOILET STALLS.

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WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512

SUMMIT WAVES
WAVE POOL EXPANSION
LEE'S SUMMIT, MO

SCHEDULES

Scale:	AS SHOWN
Designed by:	DMK
Drawn by:	DMK
Checked by:	KCD
Date:	04/15/2019
Project No.	064538700

SHEET
A-601

GENERAL NOTES

GENERAL

THE FOLLOWING GENERAL NOTES CONSTITUTE A MAJOR PART OF THE PLANS AND SPECIFICATIONS. STRICT COMPLIANCE WITH THESE NOTES IS ESSENTIAL TO THE PROPER CONSTRUCTION OF THE BUILDING.

1. THE DETAILS, DESIGNATED AS "TYPICAL DETAILS," APPLY GENERALLY TO THE DRAWINGS IN ALL AREAS WHERE CONDITIONS ARE SIMILAR TO THOSE DESCRIBED IN THE DETAILS.
2. SLEEVES AND BLOCKOUTS REQUIRED FOR PASSAGE OF DUCTWORK, PIPING, DRAINS, CONDUIT, ETC., AND ANCHORS REQUIRED FOR ANCHORING EQUIPMENT AND PIPING ARE NOT GENERALLY INDICATED ON THE STRUCTURAL DRAWINGS. THE CONTRACTOR SHALL DETERMINE SUCH REQUIREMENTS FROM OTHER SERIES DRAWINGS, SUBCONTRACTORS, AND SUPPLIERS AND SHALL COORDINATE THE LOCATIONS AND DETAILS FOR THESE ITEMS PRIOR TO FABRICATION OR CONSTRUCTION OF THE STRUCTURE. ANY CONFLICTS BETWEEN THESE ITEMS AND THE BUILDING STRUCTURE SHALL BE BROUGHT TO THE ATTENTION OF THE ARCHITECT FOR RESOLUTION.
3. VERIFY, OR ESTABLISH, LOCATIONS AND DIMENSIONS OF ALL FRAMED OPENINGS RELATED TO EQUIPMENT OR DUCTWORK, INCLUDING INSULATION, IF ANY. WHERE SUBSTANTIAL RELOCATION OR RECONFIGURATION IS REQUIRED, SUBMIT A DRAWING TO THE ARCHITECT FOR REVIEW.
4. MATERIALS OR PRODUCTS SUBMITTED FOR APPROVAL WHICH ARE NOT AS SPECIFIED IN THE DOCUMENTS SHALL BE ACCOMPANIED BY A CURRENT I.C.B.O. (INTERNATIONAL CONFERENCE OF BUILDING OFFICIALS) REPORT. MATERIALS OR PRODUCTS THAT DO NOT HAVE I.C.B.O. REPORTS INDICATING THE SUBSTITUTED MATERIAL OR PRODUCT TO BE EQUAL TO THAT SPECIFIED, WILL NOT BE CONSIDERED.
5. PLANS, SECTIONS AND DETAILS ARE NOT TO BE SCALED FOR DETERMINATION OF QUANTITIES, LENGTHS, OR FIT OF MATERIALS.
6. THE CONTRACTOR SHALL VERIFY JOB SITE CONDITIONS,, UNDERGROUND UTILITIES, ETC., THAT MAY CONFLICT WITH THE PROPOSED CONSTRUCTION.

EXISTING CONDITIONS

1. FIELD VERIFY ALL RELEVANT DIMENSIONS AND CONDITIONS AT EXISTING STRUCTURES PRIOR TO STARTING SHOP DRAWINGS AND THE CONSTRUCTION PROCESS IN THOSE AREAS.
2. EXISTING CONDITIONS WHICH REQUIRE MODIFICATIONS TO THE DESIGN OF THE PROPOSED CONSTRUCTION SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF THE ENGINEER.

SUBSTITUTIONS

1. ALL REQUESTS FOR SUBSTITUTIONS OF MATERIALS OR DETAILS SHOWN IN THE CONTRACT DOCUMENTS SHALL BE SUBMITTED FOR APPROVAL DURING THE BIDDING PERIOD. ONCE BIDS ARE ACCEPTED, PROPOSED SUBSTITUTIONS WILL BE CONSIDERED ONLY WHEN THEY ARE OFFICIALLY SUBMITTED WITH AN IDENTIFIED SAVINGS TO BE DEDUCTED FROM THE CONTRACT.

DESIGN LOADS

1. DEAD LOADS INCLUDE THE WEIGHT OF THE STRUCTURAL COMPONENTS, PERMANENT FIXTURES (CEILINGS, MECHANICAL EQUIPMENT, ETC.)------ 20 PSF
2. DESIGN LIVE LOADING IS AS FOLLOWS:
   - ROOF ---------- 20 PSF
   - WIND SPEED ---------- 130 MPH
   - UPLIFT LOAD ---------- 26.77 PSF
   - WIND LOAD 0'-15' ---------- 51.01 PSF
   - WIND LOAD 15'-20' ---------- 52.48 PSF
   - WIND LOAD 20'-25' ---------- 53.66 PSF
   - WIND LOAD 25'-30' ---------- 54.84 PSF
   - WIND LOAD 30'-40' ---------- 56.60 PSF
   - SEISMIC ZONE ---------- 0
3. MECHANICAL LOADS @ FILTRATION BLDG. ---------- RE: MECH

CODES AND DESIGN SPECIFICATIONS

1. IBC 2012
2. STRUCTURAL STEEL: "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS," THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.
3. STRUCTURAL CONCRETE: "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-LATEST EDITION)," THE AMERICAN CONCRETE INSTITUTE.
4. WHERE THERE IS A CONFLICT BETWEEN THE BUILDING CODE AND THE MATERIAL CODES, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

FOUNDATION DESIGN

1. FOUNDATION DESIGN IS BASED ON THE FOLLOWING CRITERIA:

SOIL REPORT BY:	INTERTEK PSI
DATE OF REPORT:	DECEMBER 14, 2018
REPORT NUMBER:	03381842
RECOMMENDED FOUNDATION TYPE:	FOOTINGS, SLAB-ON-GRADE
BEARING STRATA:	IMPROVED SUBGRADE
ALLOWABLE BEARING:	2000 PSF

2. TEMPLATES SHALL BE USED FOR PLACEMENT OF ANCHOR BOLTS AND/OR DOWELS TO CONCRETE COLUMNS, BEAMS, WALLS OR FOOTINGS.
3. CONTRACTOR SHALL REVIEW THE GEOTECHNICAL REPORT FOR ADDITIONAL INFORMATION.

CONCRETE REINFORCEMENT

1. REINFORCING STEEL SHALL BE NEW DOMESTIC DEFORMED BILLET STEEL, CONFORMING TO ASTM A 615, GRADE 60.
2. DETAIL REINFORCING BARS AND PROVIDE BAR SUPPORTS AND SPACERS IN ACCORDANCE WITH THE ACI DETAILING MANUAL.
3. ALL BAR SPLICES IN BEAMS AND SLABS, SHALL BE 33 BAR DIAMETERS, EXCEPT THAT SPLICES IN HORIZONTAL WALL BARS AND INTERMEDIATE BEAM BARS SHALL BE 45 BAR DIAMETERS.
4. PROVIDE CORNER BARS FOR EACH HORIZONTAL BAR AT THE INSIDE AND OUTSIDE FACES OF INTERSECTING BEAMS OR WALLS. REFER TO CORNER BAR TYPICAL DETAIL.
5. PROVIDE FOUNDATION DOWELS TO MATCH MASONRY WALL REINFORCEMENT. DOWELS SHALL EXTEND A MINIMUM OF 44 BAR DIAMETERS ABOVE AND BELOW TOP OF FOUNDATION.
6. REINFORCING CLEAR COVER:
   A. GRADEBEAMS: 1 1/2" TOP, 2" SIDES, 3" BOTTOM

STRENGTH OF MATERIALS

(1) CONCRETE: REFER TO CAST IN PLACE CONCRETE SECTION

(2) REINFORCING: ASTM A615 U.N.O.

#3 BARS:	GRADE 40
ALL OTHER:	GRADE 60

(3) STRUCTURAL STEEL:

STRUCTURAL STEEL SHAPES: AND PLATES: (NORMAL STRENGTH):	ASTM 36
ANCHOR BOLTS: THROUGH BOLTS:	ASTM A307

(4) WOOD FRAMING: NO. 2 SOUTHERN PINE (19% MAX. MOISTURE CONTENT). BASIC DESIGN VALUES:

MEMBER (THICK. x WIDTH)	MIN. BENDING STRESS Fb (PSI)	MIN. COMPRESSIVE STRESS Fc (PSI)	MIN. SHEAR STRESS Fv (PSI)	MIN. MODULUS OF ELASTICITY (PSI)
2"-4" x 2"-4"	1500	1650		
2"-4" x 5"-6"	1250	1600		
2"-4" x 8"	1200	1550	90	1,600,000
2"-4" x 10"	1050	1500		
2"-4" x 12"	975	1450		
5"x5" & LARGER	1100	625	95	1,400,000

WOOD FRAMING

1. ALL FRAMING MEMBERS SHALL BE NO. 2 SOUTHERN YELLOW PINE. DO NOT USE FINGER JOINTED STUDS.
2. USE COMMON WIRE NAILS, UNLESS NOTED OTHERWISE. ALL NAILS IN EXTERIOR WORK SHALL BE GALVANIZED OR OR NON-FERROUS METAL.

SLAB-ON-GRADE

1. THE SLAB-ON GRADE DESIGN IS BASED ON A SOILS REPORT #03381842 FROM TERRACON. DATED DECEMBER 14, 2018.
2. THE FLOOR SLAB SHALL BE FIVE INCH (5") THICK CONCRETE OVER IMPROVED SUBGRADE, AS SPECIFIED IN THE SOILS REPORT TO LIMIT THE POTENTIAL VERTICAL RISE (PVR) TO ONE (I) INCH. REFER TO THE GEOTECHNICAL REPORT FOR SUBGRADE SPECIFICATIONS.
3. REINFORCE SLAB WITH #4 @ 16" ON CENTER PLACED 2" FROM TOP OF SLAB.
4. A METAL CONSTRUCTION JOINT FORM MAY BE USED. REMOVE METAL FORMS BEFORE PLACING SECOND POUR.
5. PROVIDE A SIX (6) MILL VAPOR BARRIER OVER IMPROVED SUBGRADE.

* NOTE TO OWNER: SOME SLAB MOVEMENT MAY OCCUR FOR SLABS SUPPORTED ON GRADE CAUSING COSMETIC CRACKING IN THE SLAB AND NON-STRUCTURAL ELEMENTS. THE INDUSTRY STANDARD FOR ALLOWABLE POTENTIAL VERTICAL RISE (PVR) IS 1 INCH. IF THIS AMOUNT OF MOVEMENT IS UNACCEPTABLE TO THE OWNER, NOTIFY THE CORE GROUP FOR ALTERNATIVE SOLUTIONS.

CAST-IN-PLACE CONCRETE

1. ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE AMERICAN CONCRETE INSTITUTE CODE (ACI 318-99).
2. CONCRETE MIX SCHEDULE:

CLASS	STRENGTH PSI	AGG. TYPE	AGG. SIZE	SLUMP IN'S	USAGE
A	4000	HRC	1"	3-5	POOL SLAB
B	4000	HRC	3/4"	3-5	POOL WALLS (CAST-IN-PLACE)
C	4000	HRC	1/2"	1 1/2 - 3"	POOL WALLS (SHOTCRETE)
D	4000	HRC	1"	3-5	FOOTINGS, SLAB-ON-GRADE, WALLS

3. STRENGTH LISTED SHALL BE MINIMUM DESIGN STRENGTH AT TWENTY-EIGHT (28) DAYS AS SPECIFIED BY THE AMERICAN CONCRETE INSTITUTE (ACI 318).

   "HRC" REFERS TO HARDROCK CONCRETE HAVING AN AIR DRY UNIT WEIGHT OF APPROXIMATELY 145 PCF.
4. FIVE TO SEVEN PERCENT (5 -7%) AIR ENTRAINMENT SHALL BE ADDED TO CONCRETE MIXES FOR STRUCTURAL ELEMENTS PERMANENTLY EXPOSED TO WEATHER.
5. ADMIXTURES MAY BE INCLUDED IN ANY CLASS OF CONCRETE AT THE CONTRACTOR'S OPTION, TO IMPROVE WORKABILITY OR STRENGTH CHARACTERISTICS. LIMIT WATER-CEMENT RATIO TO .48 FOR ALL CAST-IN-PLACE POOL CONTAINMENT STRUCTURES. LIMIT WATER CEMENT RATIO TO .40 WHEN THE SHOTCRETE METHOD IS USED.
6. CALCIUM CHLORIDE SHALL NOT BE ADDED TO CONCRETE MIXTURES WITHOUT WRITTEN APPROVAL.
7. FORMED CONCRETE IS THE PREFERRED METHOD OF CONSTRUCTION FOR POOL WALLS. HOWEVER, THE WET-MIXED SHOTCRETE METHOD OF CONCRETE PLACEMENT CAN BE USED, PROVIDED THAT THE CONTRACTOR CAN DEMONSTRATE THE ABILITY TO PRODUCE EQUIVALENT CONSTRUCTION QUALITY COMPARED TO CAST-IN-PLACE FORMED CONCRETE.
8. ALL CONCRETE USED FOR THE SHOTCRETE METHOD SHALL BE READY-MIXED BY THE CONCRETE SUPPLIER AND DELIVERED TO THE SITE.
9. REFERENCE ACI 506.2 FOR SHOTCRETE TESTING PROCEDURES TO BE FOLLOWED IN PRECONSTRUCTION AND CONSTRUCTION. VERIFY THAT THE WATER ABSORPTION RATE IS EQUAL TO THAT OF THE CAST-IN-PLACE CONCRETE.
10. THE USE OF CURING COMPOUNDS SHOULD BE REVIEWED BY THE CONTRACTOR/MANUFACTURER, WHERE THE FINAL CONCRETE FINISH COAT WILL BE PAINT.
11. PROVIDE CONSTRUCTION JOINTS IN POOL AND LAZY RIVER WALLS THAT EXCEED 80'-0", OR AS NOTED ON PLAN.

PRE-FABRICATED WOOD TRUSSES

1. ALL TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE LOADS INDICATED ON PLAN AND IN THE GENERAL NOTES. INCLUDE ALL LOADS FROM ROOF TOP UNITS SHOWN ON PLAN.
2. TRUSS MANUFACTURER SHALL SUBMIT SHOP DRAWINGS AND DESIGN CALCULATIONS TO THE CORE GROUP FOR REVIEW.
3. TRUSS MANUFACTURER SHALL PROVIDE ALL NECESSARY BRIDGING.
4. ALL TRUSSES SHALL BE DESIGNED WITH THE FOLLOWING DEFLECTION CRITERIA:
   (A) ALLOWABLE LL DEFLECTION - L/360
   (B) ALLOWABLE TL DEFLECTION - L/240
5. ALL TRUSSES SHALL BE FASTENED TO SUPPORTING BEAMS WITH GAVANIZED METAL CONNECTORS AS INDICATED IN FRAMING DETAILS.
6. TRUSS PLATE CONNECTIONS HAVE NOT BEEN SHOWN. TRUSS MFR. TO DESIGN CONNECTION PLATES FOR REQUIRED LOADING. THESE PLATES SHOULD NOT EXCEED THE BOUNDARY EDGES OF THE CONNECTING MEMBERS FOR ARCH'L. REASONS. SUBMIT CONNECTION DETAILS TO ARCHITECT FOR REVIEW PRIOR TO FABRICATION.
7. ERECT WOOD TRUSS IN ACCORDANCE WITH TRUSS PLATE INSTITUTE (TPI) PUBLICATION "COMMENTARY AND RECOMMENDATIONS FOR HANDLING AND ERECTING WOOD TRUSSES" AND MFR'S. RECOMMENDATIONS. BRACE WOOD TRUSSES IN ACCORDANCE WITH TRUSS PLATE INSTITUTE (TPI) PUBLICATION "BRACING WOOD TRUSSES: COMMENTARY AND RECOMMENDATIONS" AND MFR'S. RECOMMENDATIONS. SUBMIT TRUSS DESIGN SHOP DWGS. FOR APPROVAL PRIOR TO FABRICATION. TRUSS DESIGN SHOP DWGS. TO BE SIGNED AND SEALED BY REGISTERED STRUCTURAL ENGINEER.

ROOF SHEATHING

1. ROOF DECK U.N.O.:
   USE 5/8" APA RATED EXTERIOR EXPOSURE ROOF DECKING THROUGHOUT. FACE GRAIN SHOULD BE PLACED PERPENDICULAR TO DIRECTION OF JOISTS AND SHOULD BE CONSTRUCTED WITH THREE (3) SPAN MIN. CONDITION. FIELD NAILING PROVISIONS FOR 10d NAILS ARE AS FOLLOWS:

BOUNDARY NAILING:	4" O.C.
INTERMEDIATE NAILING:	12" O.C.
OTHER EDGES:	4" O.C.
BLOCKING REQ'D.	

2. WALL SHEATHING U.N.O.:
   USE 5/8" APA RATED EXTERIOR SHEATHING THROUGHOUT. FACE GRAIN SHOULD BE PLACED PERPENDICULAR TO DIRECTION OF WALL STUDS AND SHOULD BE CONSRUCTED WITH THREE (3) SPAN MIN. CONDITION. FIELD NAILING PROVISIONS FO 10d NAILS ARE AS FOLLOWS:

BOUNDARY NAILING:	4" O.C.
INTERMEDIATE NAILING:	12" O.C.
OTHER EDGES:	4" O.C.
BLOCKING REQ'D.	SEE SCHED.

STRUCTURAL MASONRY

1 STRUCTURAL PROPERTIES: ASSUMED PRISM f'm = 1500 PSI - SEE ARCHITECTURAL SPECIFICATIONS FOR COLORS, TEXTURES AND SPECIAL REQUIREMENTS.

CONCRETE MASONRY UNITS: NORMAL WT ASTM C90 WITH A MINIMUM COMPRESSIVE STRENGTH ON THE NET AREA OF 3300 PSI.

MORTAR: ASTM C270 TYPE "S" WITH A MINIMUM COMPRESSIVE STRENGTH OF 1800 PSI.

COARSE GROUT: ASTM C476, 3/8" AGGREGATE WITH A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.

REINFORCING ASTM A615 GRADE 60

"Z" TIES: ASTM A82, 3/16" DIAMETER WIRE, GALVANIZED.

2 HORIZONTAL JOINT REINFORCING SHALL BE DUR-O-WALL TRUSS TYPE OR EQUAL AS FOLLOWS:

(A) 8" MASONRY WALL: 2 HOR. WIRES SPACED AT 16" O.C. VERTICALLY WITH CONTINUOUS DIAGONAL WIRES.

(B) PROVIDE SPECIAL "L" AND "T" SHAPED SECTIONS AT WALL INTERSECTIONS. LAP HORIZONTAL WIRES AT LEAST 12" AT SPLICES.

3 HORIZONTAL REINFORCING IN BOND BEAM SHALL BE LAPPED 30 BAR DIAMETERS AT SPLICES. STAGGER SPLICES IN ADJACENT BARS AT LEAST 4'-0".

4 THE FIRST CELL, IN EACH WYTHE, AT CORNERS, END OF WALLS, AND EACH SIDE OF OPENINGS SHALL BE GROUTED AND REINFORCED WITH ONE (1) #4 VERTICALLY (8" WALLS) AND (1) #5 VERTICALLY REFERENCE TYPICAL DETAIL FOR ADDITIONAL REINFORCEMENT REQUIREMENTS.

5 PROVIDE DOUBLE LINTEL BOND BEAMS, REINFORCED WITH 2-#4 CONTINUOUS EACH BEAM, AT ALL MANDOOR HEADER CONDITIONS. THE LINTEL SHALL EXTEND 8" EITHER SIDE OF OPENING.

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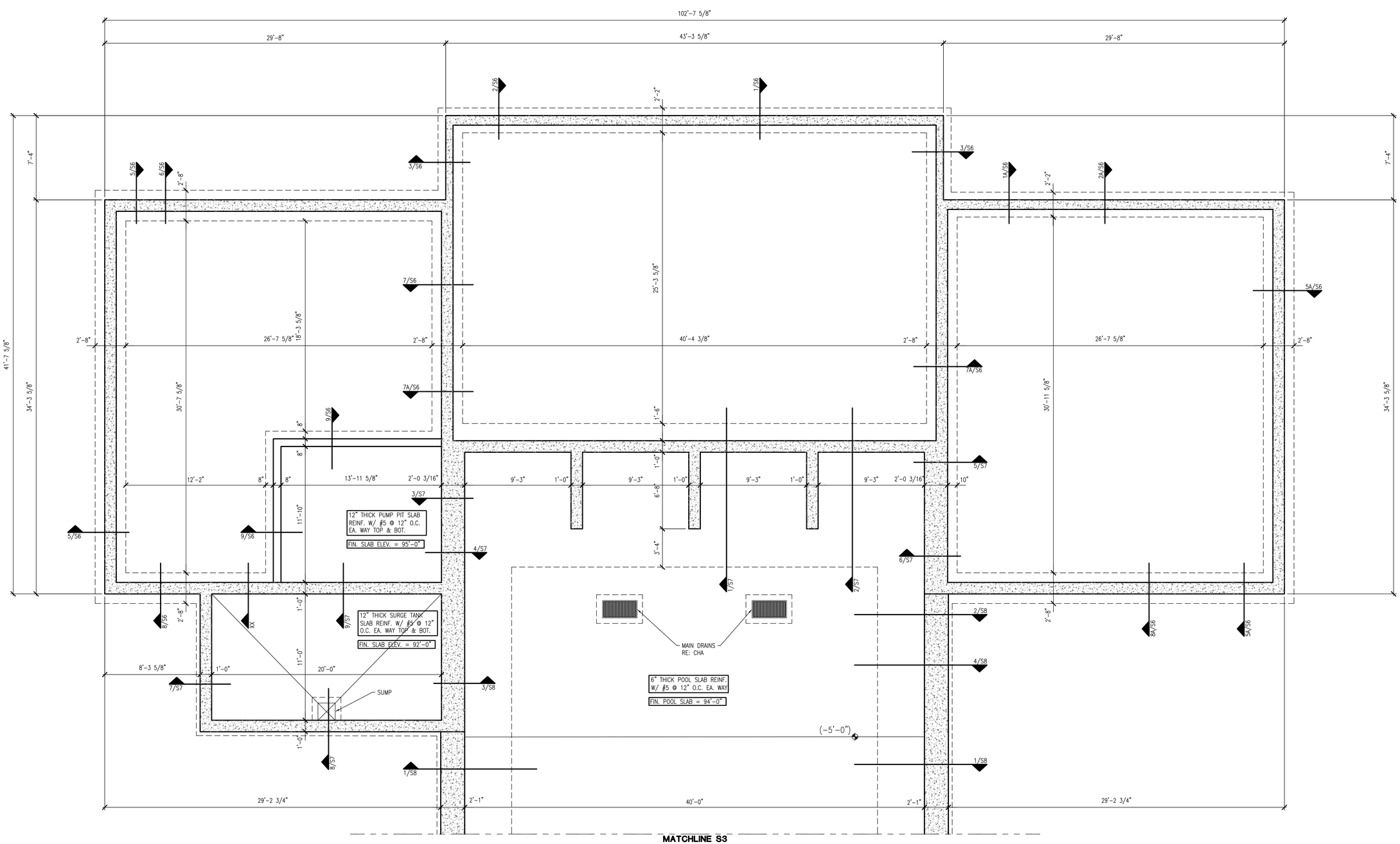
The Core Group
Structural Engineering
TRENT CRAUMB
P.E. No. 23864 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

GENERAL NOTES

Scale:	AS SHOWN
Designed by:	TC
Drawn by:	SS
Checked by:	TC
Date:	04/15/2019
Project No.	064538700

SHEET
S1



MATCHLINE S3

1 FOUNDATION PLAN

SCALE: 1/4" = 1'-0"

PLAN NOTES:

1. REFERENCE ELEVATION 100'-0" EQUALS ACTUAL FINISH SLAB ELEVATION DETERMINED BY CIVIL ENGINEER.
2. REFER TO ARCHITECTURAL AND MEP DRAWINGS FOR LOCATION OF FLOOR DRAINS. ALL FLOOR DRAINS ARE TO BE SET 1/8" LOWER THAN THE FINISH BUILDING SLAB ELEVATION AND HAVE 1% SLOPE RADIUS OF 12". ADJUST RADIUS AS PER FIELD CONDITIONS, BUT IN NO CASE EXCEED 2% SLOPE. BLEND FOR A SMOOTH TRANSITION AT TOP OF SLOPE AND TOP OF SLAB.
3. REFERENCE SHEET S5 FOR FOUNDATION DETAILS.
4. REFERENCE ARCHITECTURAL FOR CMU WALL THICKNESS.
5. ALL CMU WALLS NOT SUPPORTED BY GRADE BEAMS SHALL BE SUPPORTED BY A THICKENED SLAB. RE: 8/S5.
6. PROVIDE VERTICAL CONTROL JOINTS IN CMU WALLS @ 20'-0" O.C. MAXIMUM. AND BETWEEN INTERIOR AND EXTERIOR PERPENDICULAR WALLS.
7. SHADED AREAS DENOTES GRADE BEAMS.

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SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

FOUNDATION PLAN

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SHEET
S2

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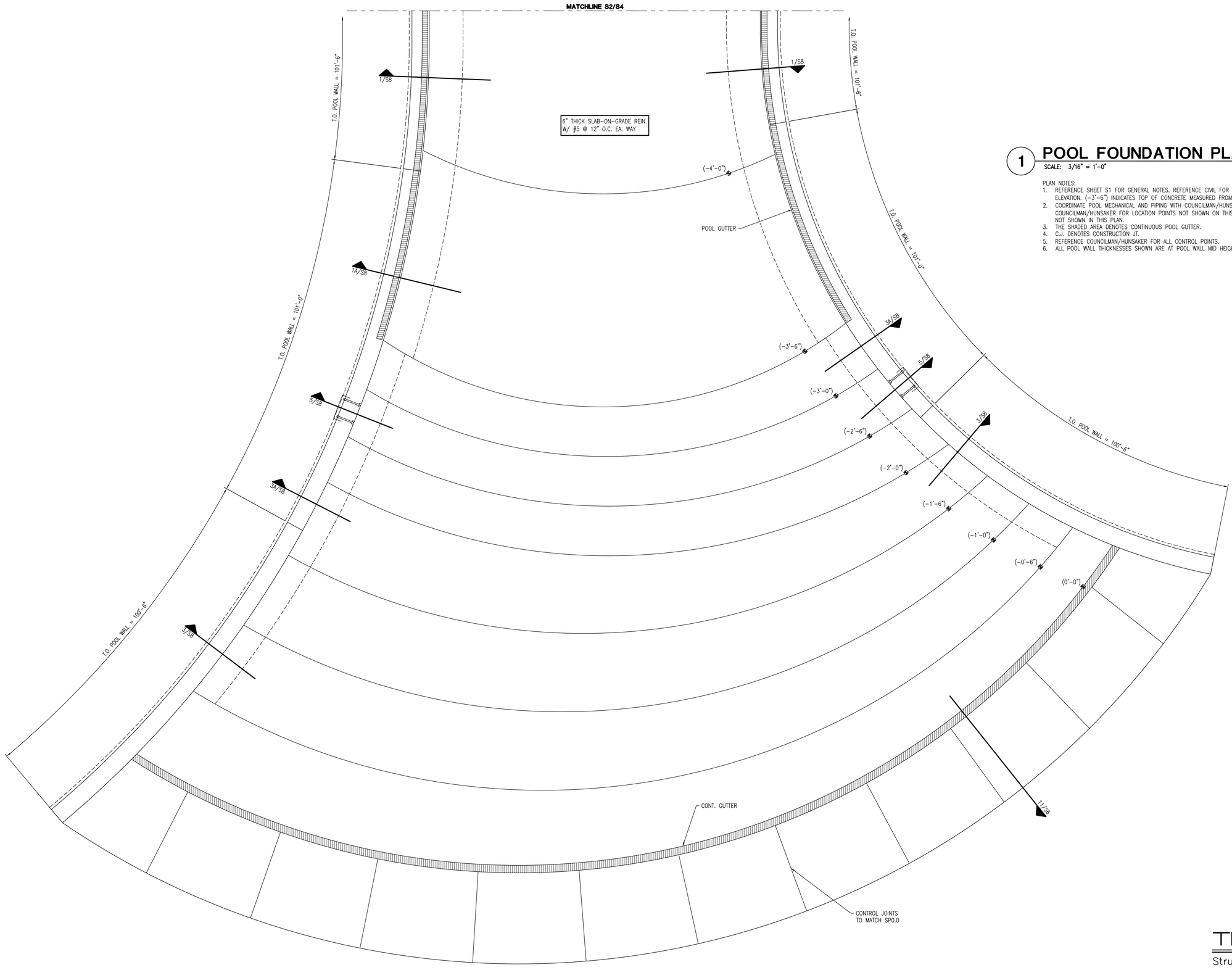

1 POOL FOUNDATION PLAN

SCALE: 3/16" = 1'-0"

PLAN NOTES:

1. REFERENCE SHEET S1 FOR GENERAL NOTES. REFERENCE CIVIL FOR POOL WATER ELEVATION. (–3'–6") INDICATES TOP OF CONCRETE MEASURED FROM WATER LEVEL.
2. COORDINATE POOL MECHANICAL AND PIPING WITH COUNCILMAN/HUNSAKER. REFERENCE COUNCILMAN/HUNSAKER FOR LOCATION POINTS NOT SHOWN ON THIS PLAN AND EQUIPMENT NOT SHOWN IN THIS PLAN.
3. THE SHADED AREA DENOTES CONTINUOUS POOL GUTTER.
4. C.J. DENOTES CONSTRUCTION JT.
5. REFERENCE COUNCILMAN/HUNSAKER FOR ALL CONTROL POINTS.
6. ALL POOL WALL THICKNESSES SHOWN ARE AT POOL WALL MID HEIGHT.

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P.E. No. 23864 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

FOUNDATION PLAN

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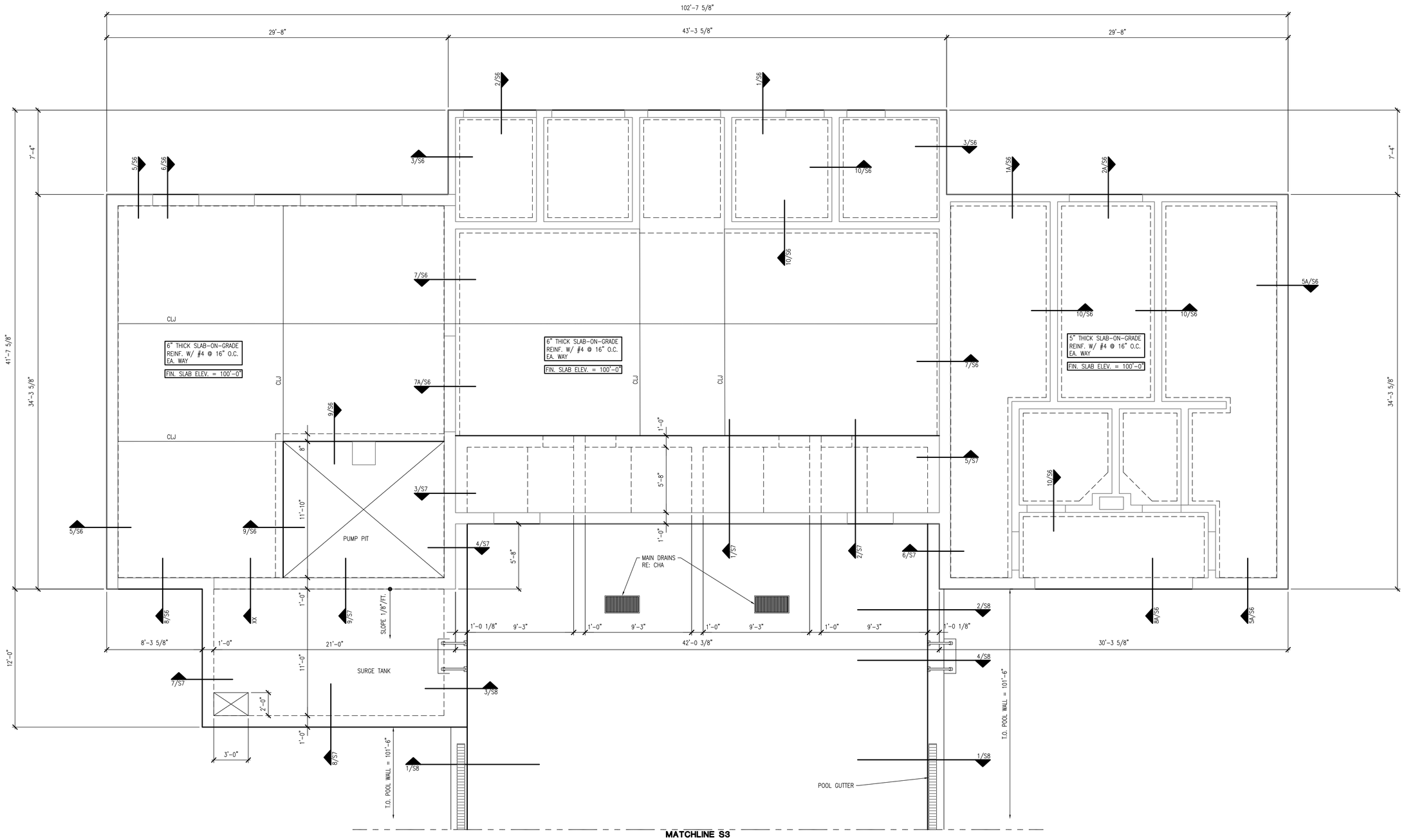
SHEET
S3



1 GROUND FLOOR PLAN

SCALE: 1/4" = 1'-0"

PLAN NOTES:

1. REFERENCE ELEVATION 100'-0" EQUALS ACTUAL FINISH SLAB ELEVATION AT GROUND FLOOR. WAVE POOL WATER LEVEL ELEV. IS 99'-0".
2. REFERENCE SHEET S5 & S6 FOR FOUNDATION DETAILS.
3. REFERENCE ARCHITECTURAL FOR CMU WALL THICKNESS.
4. SHADED AREAS DENOTES WALLS.

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P.E. No. 23994 Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

FOUNDATION PLAN

Scale:	AS SHOWN
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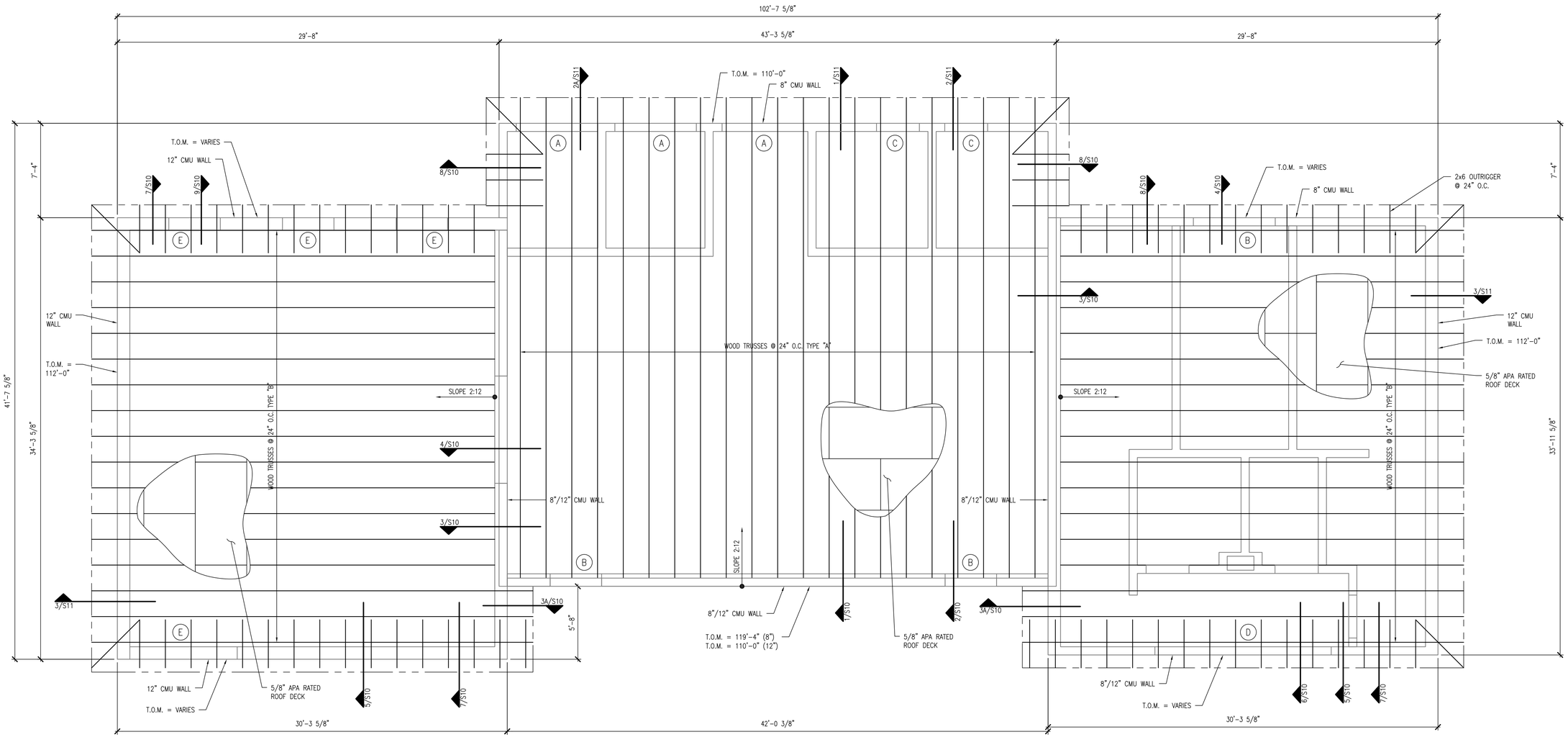
Project No.	064538700

SHEET
S4



1 ROOF FRAMING PLAN

SCALE: 1/4" = 1'-0"

PLAN NOTES:

1. REFERENCE ELEVATION 100'-0" EQUALS ACTUAL FINISH SLAB ELEVATION DETERMINED BY CIVIL ENGINEER.
2. REFERENCE SHEETS S6 & S7 FOR FRAMING DETAILS.
3. USE 5/8" APA RATED EXTERIOR EXPOSURE SHEATHING FOR ALL ROOF DECK OVER WOOD TRUSSES.
4. COORDINATE ALL ROOF OPENINGS WITH ARCHITECT AND MECHANICAL ENGINEER.
5. REFERENCE ARCHITECTURAL FOR ALL CMU WALL THICKNESS.
6. (A) DENOTES BOND BEAM TYPE.

BOND BEAM SCHEDULE		
MARK	# OF BOND BEAMS	REINFORCING
(A)	1-8"x8" U-BLOCK BM, 2-8"x8" KNOCK-OUT BMS	2-#4 HORIZ.
(B)	1-8"x8" U-BLOCK BM, 3-8"x8" KNOCK-OUT BMS	2-#4 HORIZ.
(C)	1-8"x8" U-BLOCK BM, 1-8"x8" KNOCK-OUT BM	2-#4 HORIZ.
(D)	1-12"x8" U-BLOCK BM, 5-12"x8" KNOCK-OUT BMS	4-#4 HORIZ.
(E)	1-12"x8" U-BLOCK BM, 1-12"x8" KNOCK-OUT BMS	4-#4 HORIZ.

NOTE:
1. EXTEND ALL BOND BEAM HEADER REINFORCING 1'-0" BEYOND OPENING.
2. GROUT ALL KNOCKOUT BLOCKS SOLID & REINFORCE AS NOTED.

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SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

ROOF FRAMING PLAN

Scale:	AS SHOWN
Designed by:	TC
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Date:	04/15/2019
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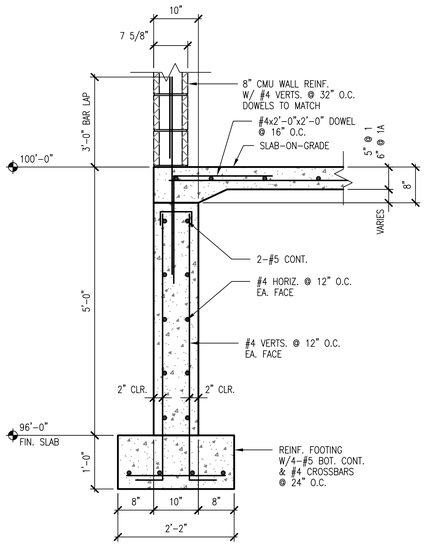
SHEET
S5



1A 1 **SECTION**
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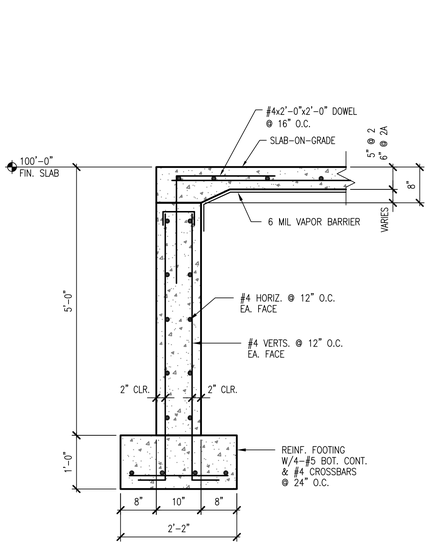

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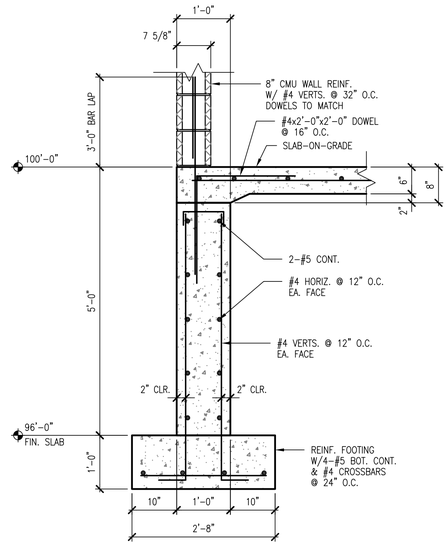

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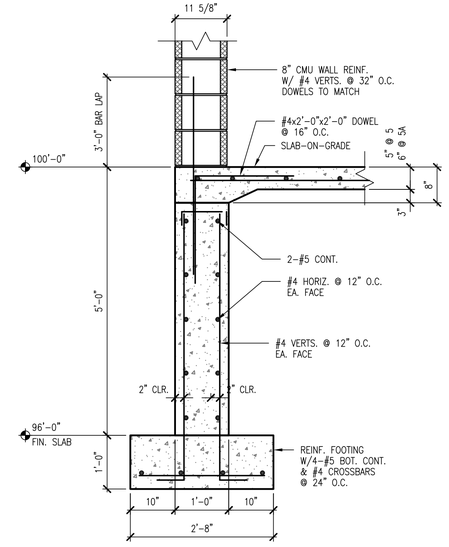

4 **SECTION**
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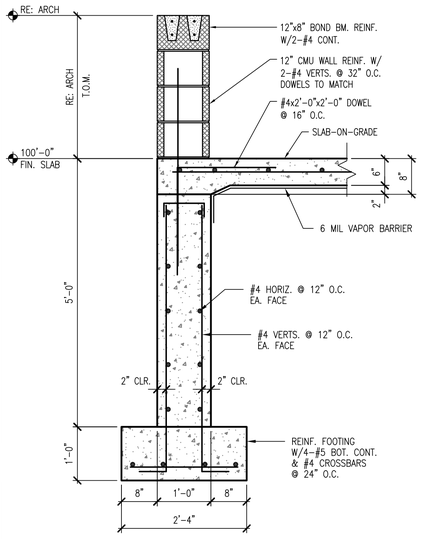
5A 5 **SECTION**
SCALE: 3/4" = 1'-0"



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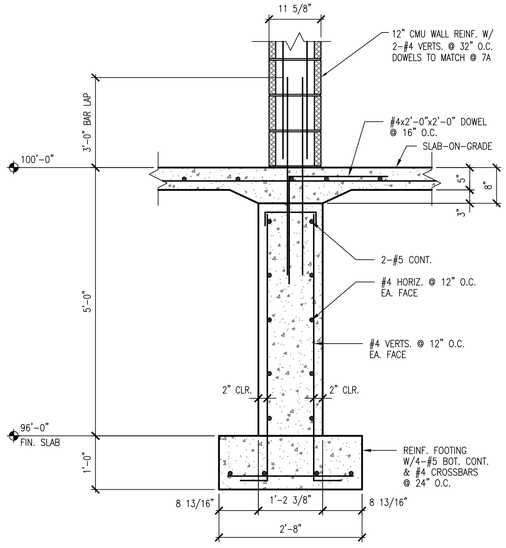

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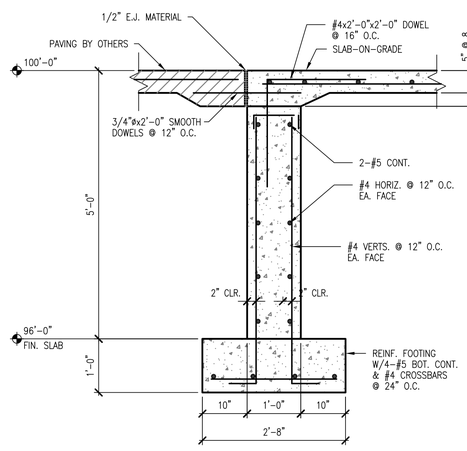

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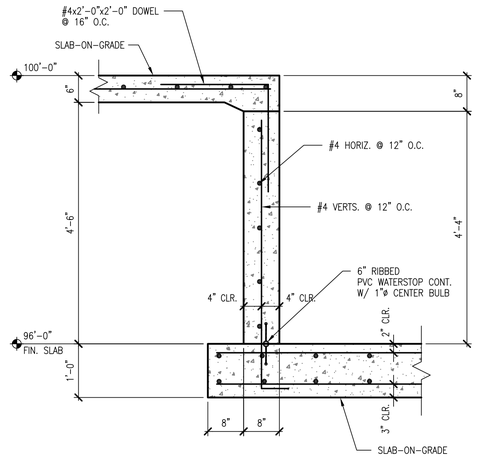

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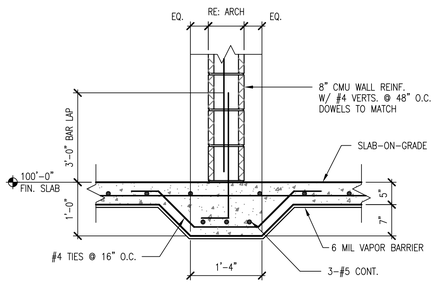

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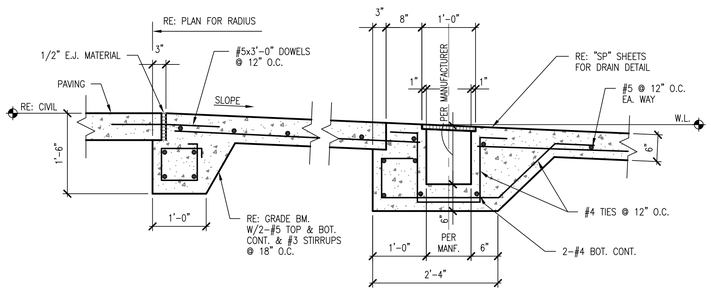

11 **SECTION**
SCALE: 3/4" = 1'-0"

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P.E. TRENT CRAUN
P.E. No. 23864 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

FOUNDATION DETAILS

Scale:	AS SHOWN
Designed by:	TC
Drawn by:	SS
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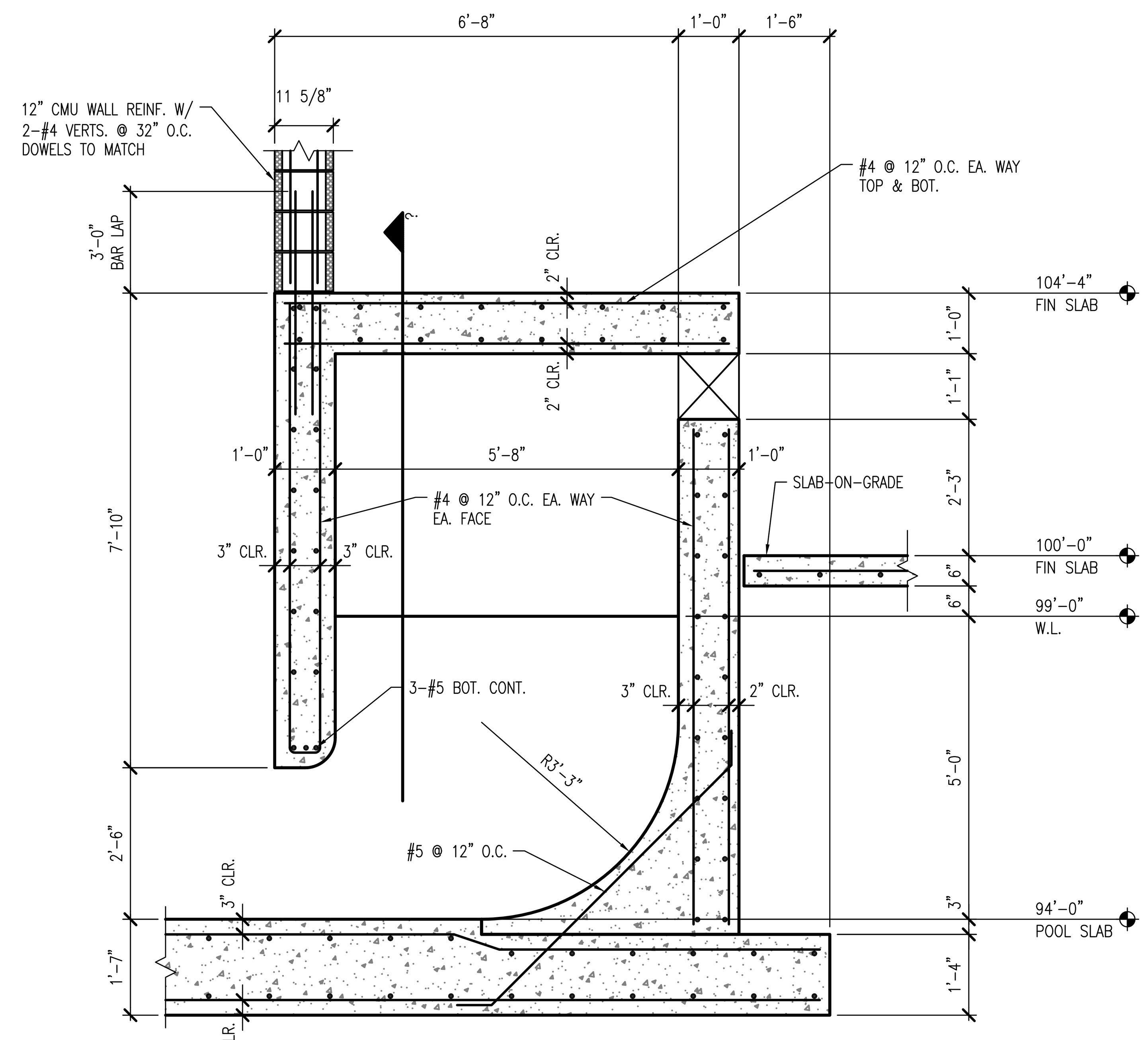
Date:	04/15/2019
Project No.	064538700

SHEET
S6



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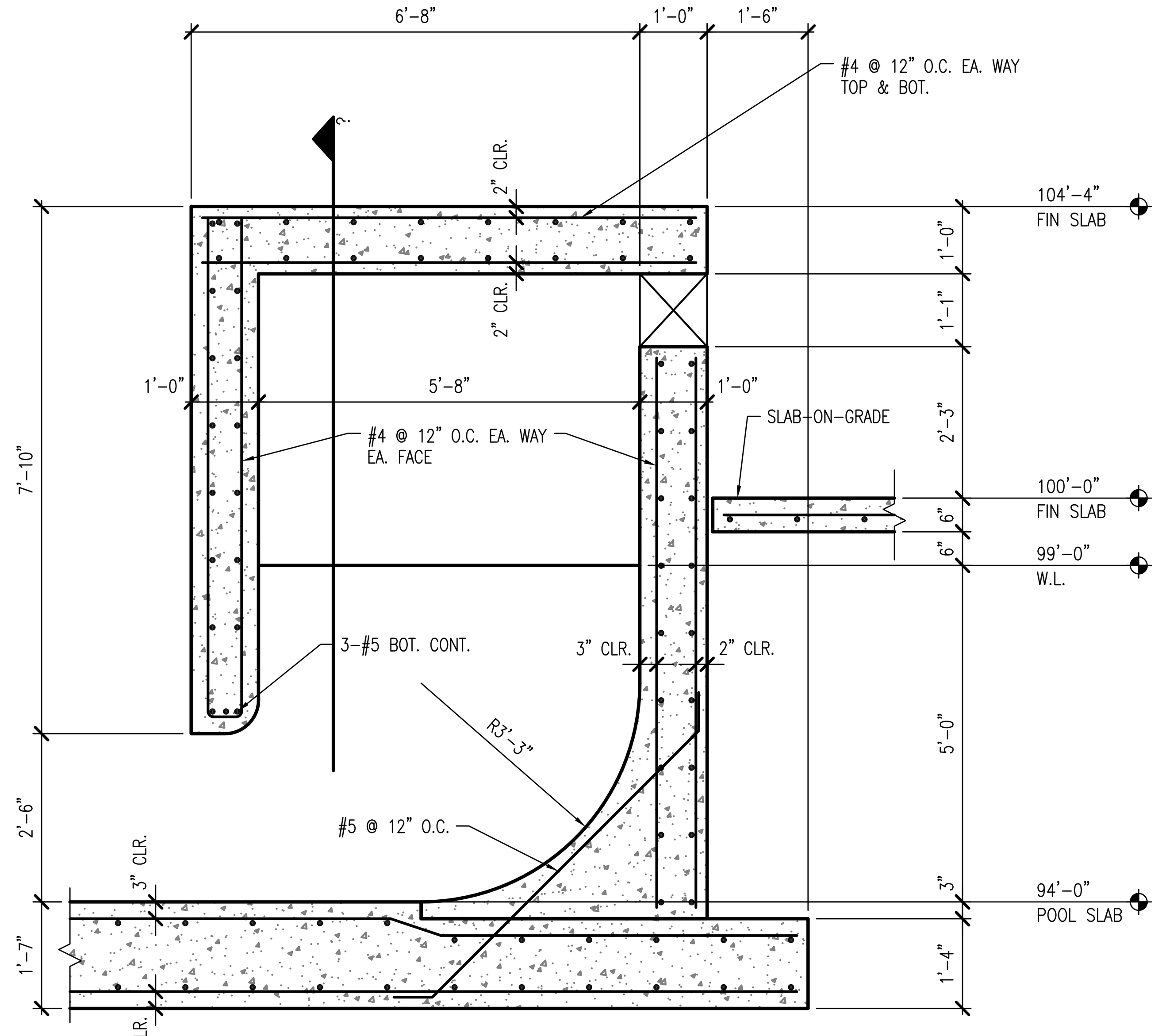

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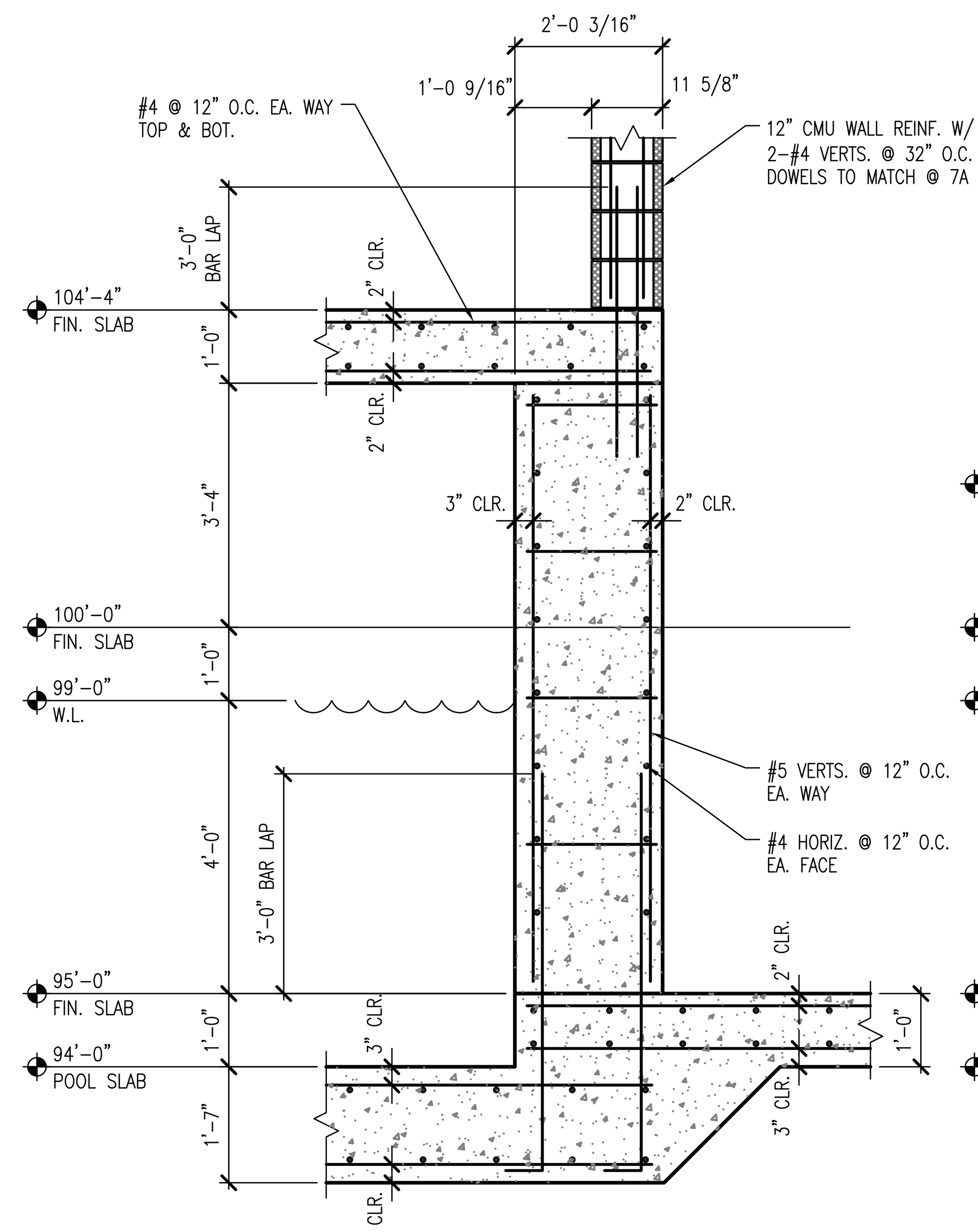

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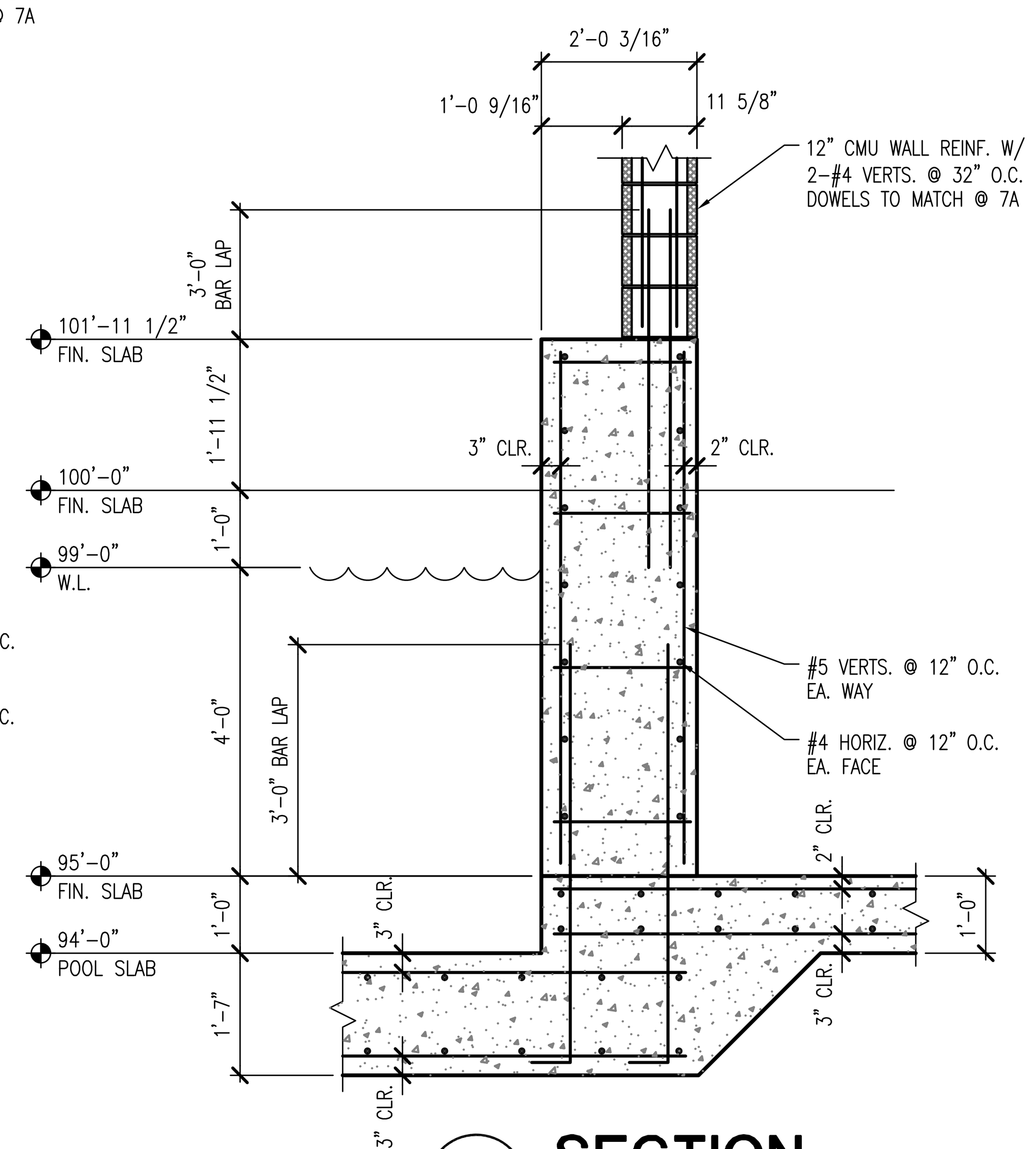

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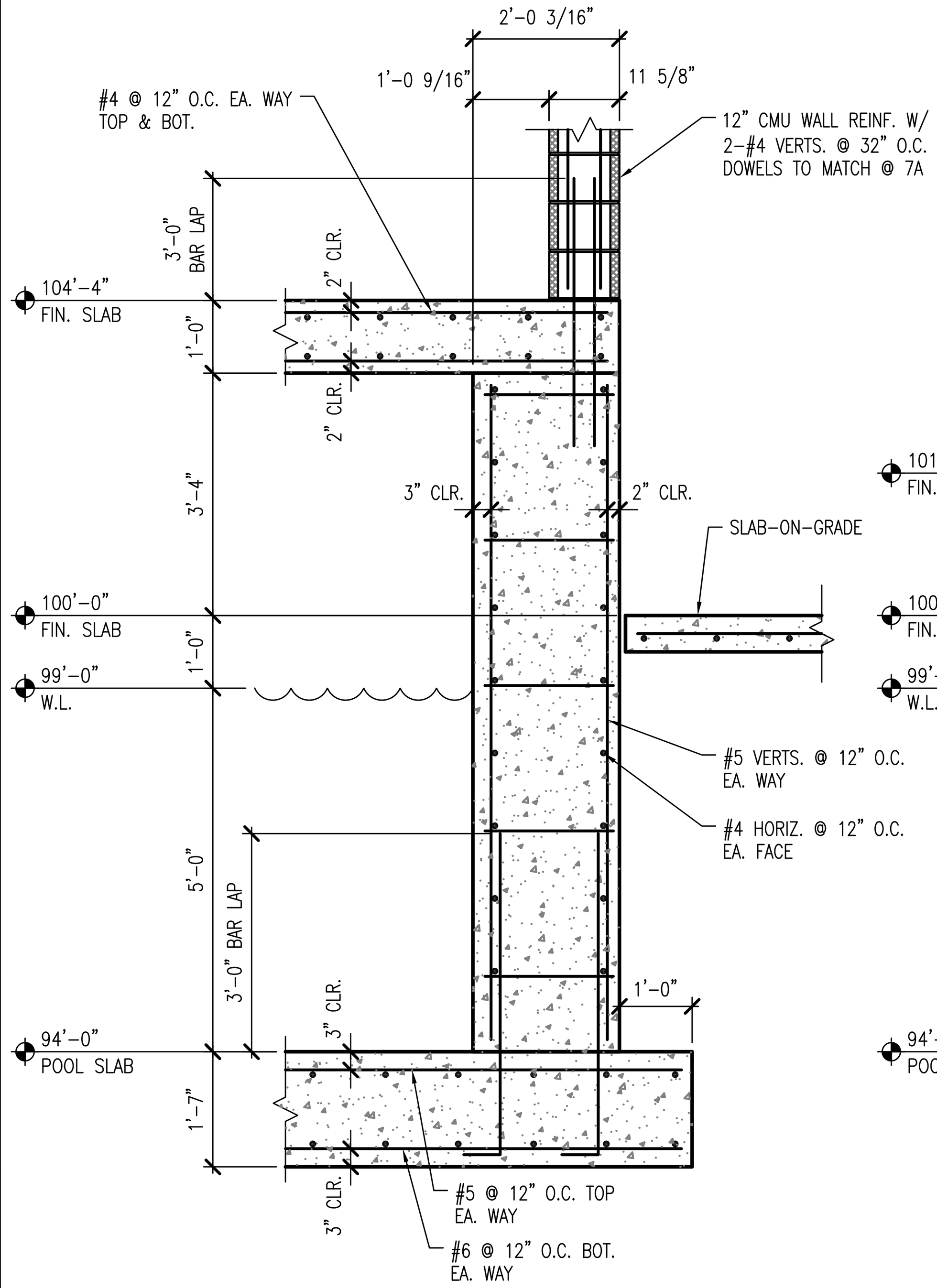

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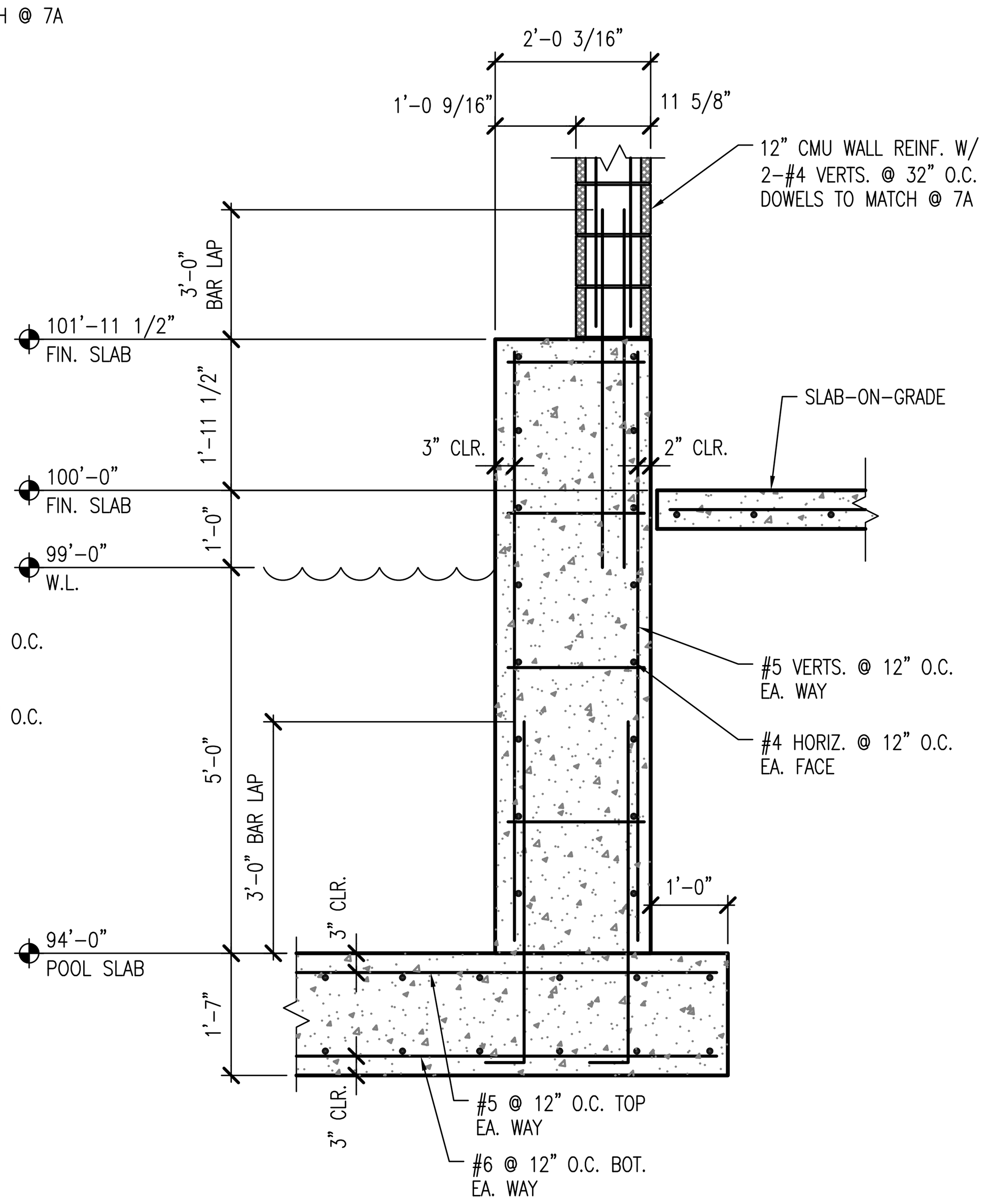

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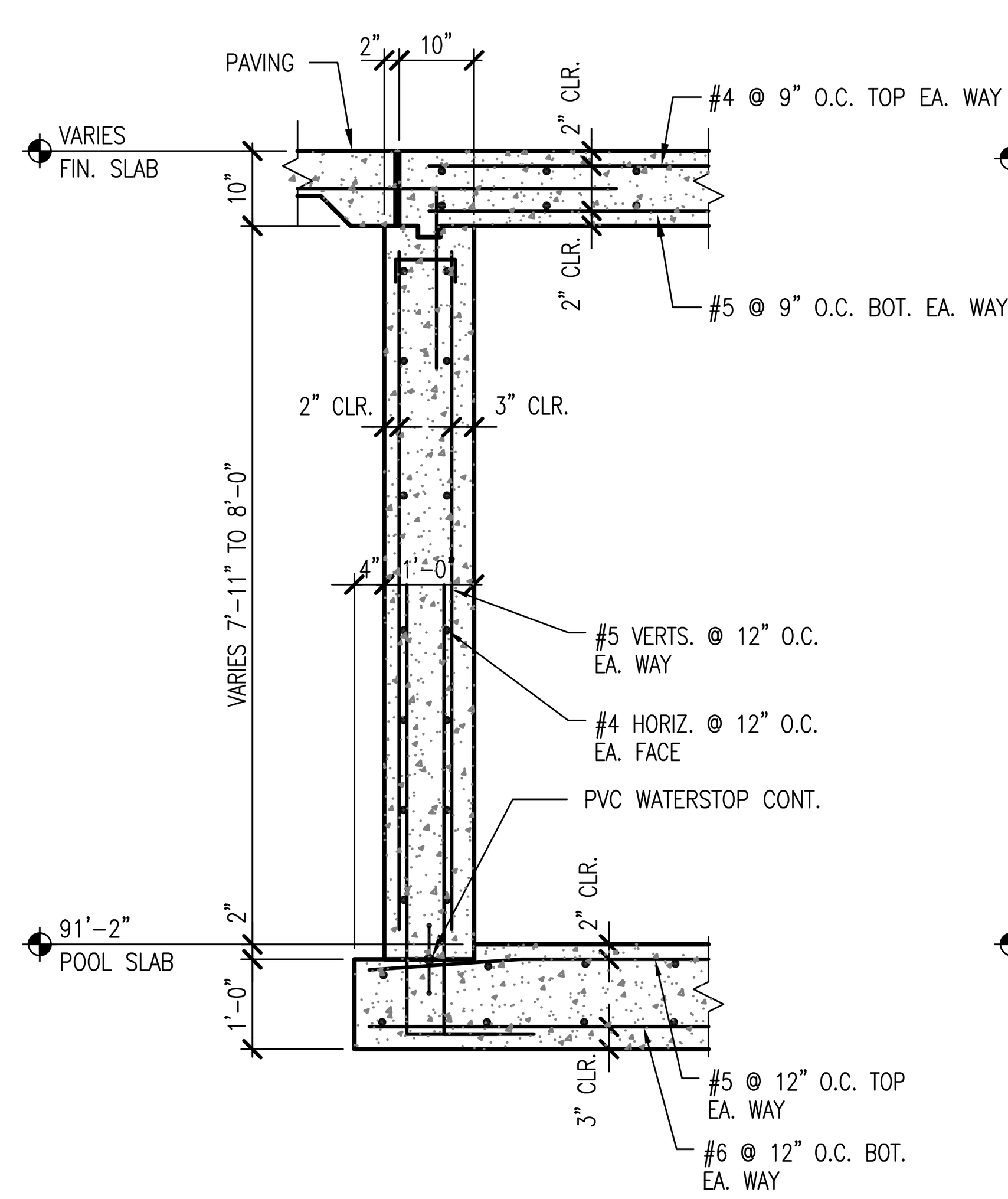

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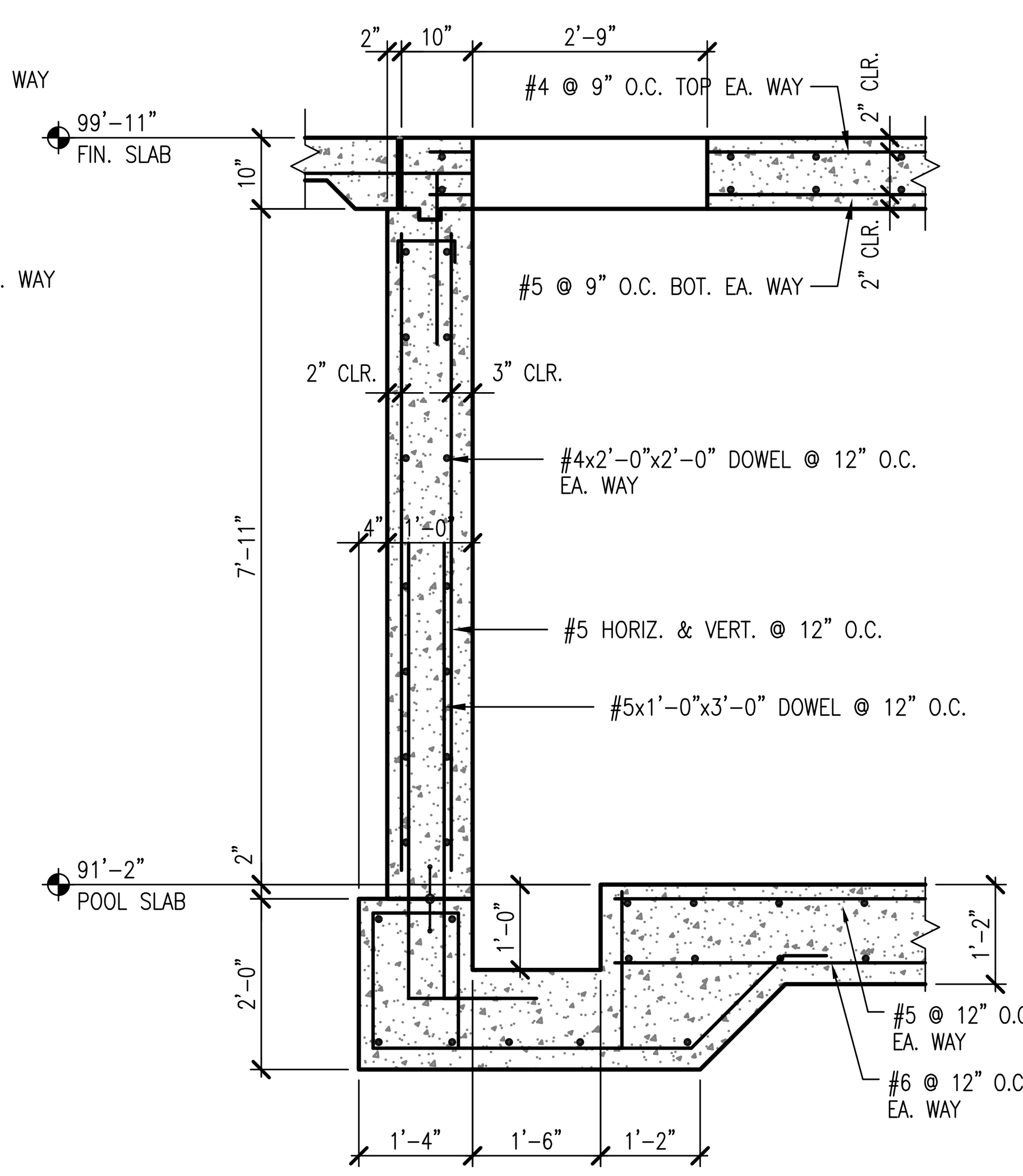

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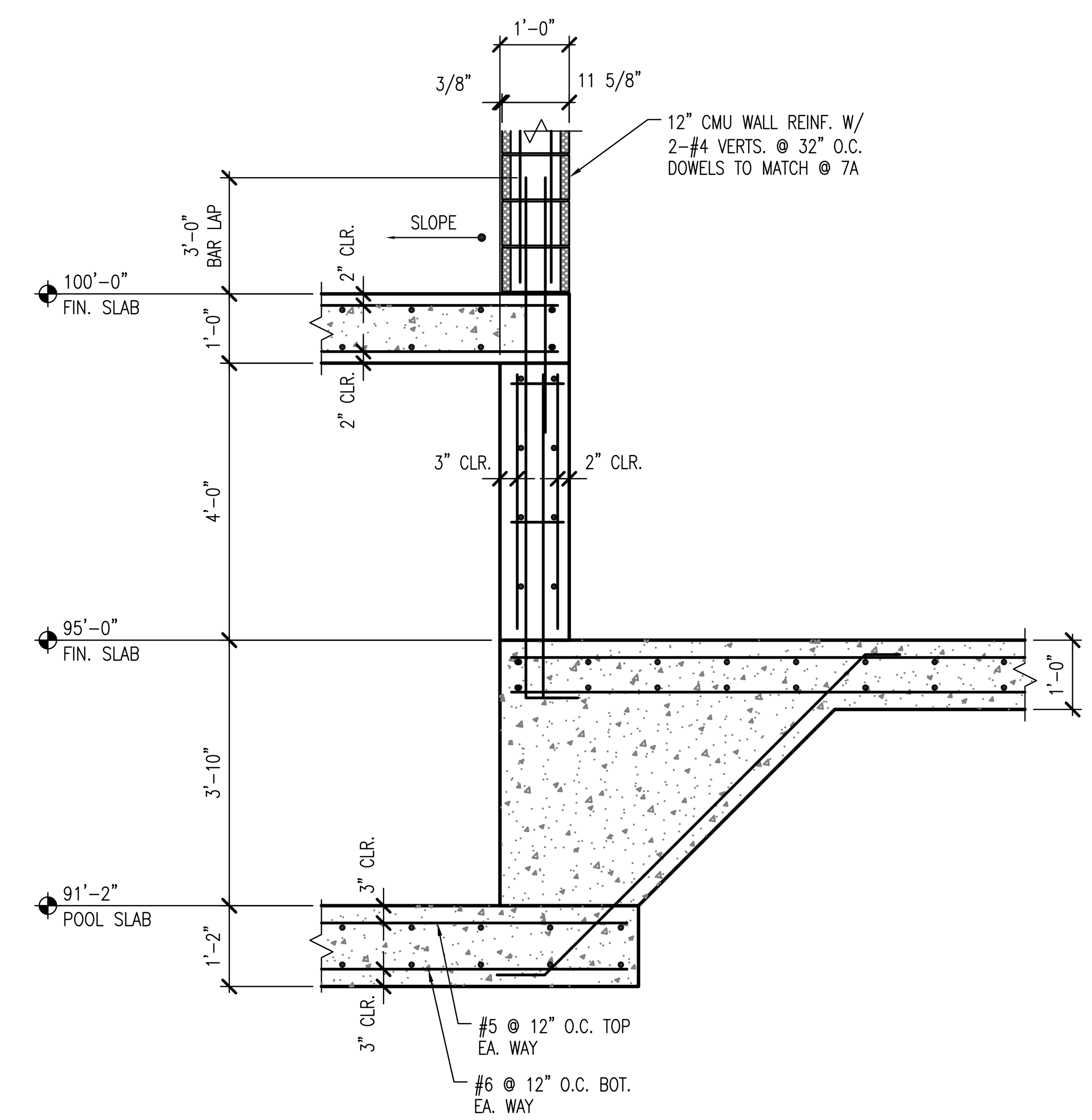

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MISSOURI REGISTRATION NUMBER 001512

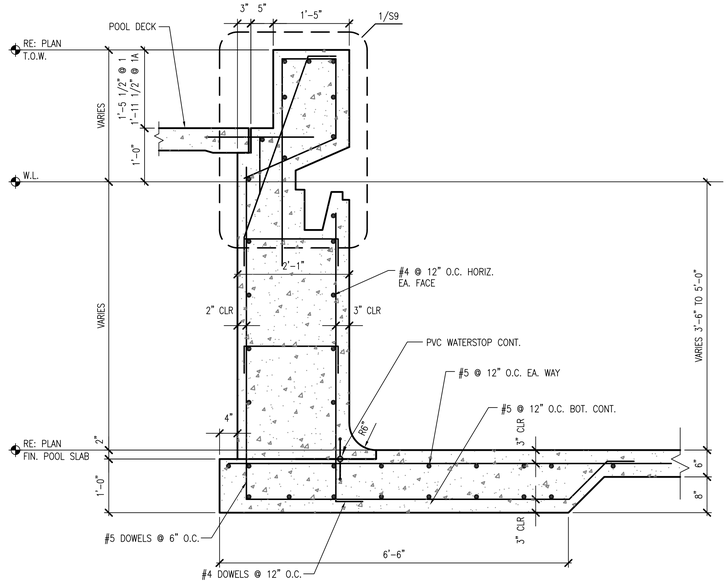
95% REVIEW SET
FOR REVIEW ONLY

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

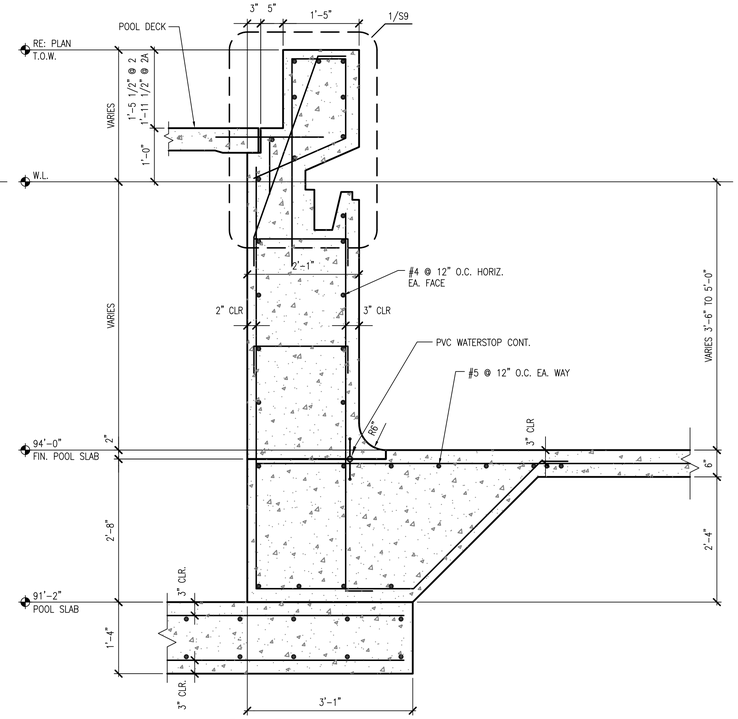
FOUNDATION DETAILS

Scale:	AS SHOWN
Designed by:	TC
Drawn by:	SS
Checked by:	TC
Date:	04/15/2019
Project No.	064538700

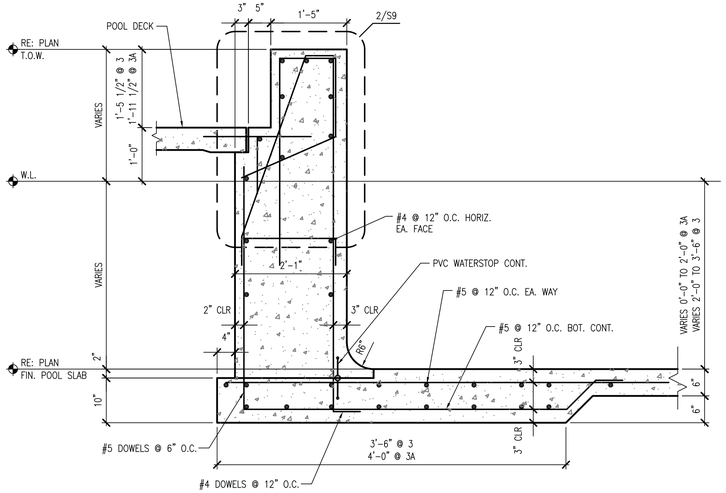
SHEET
S7



1A 1 **SECTION**
SCALE: 3/4" = 1'-0"



2A 2 **SECTION**
SCALE: 3/4" = 1'-0"



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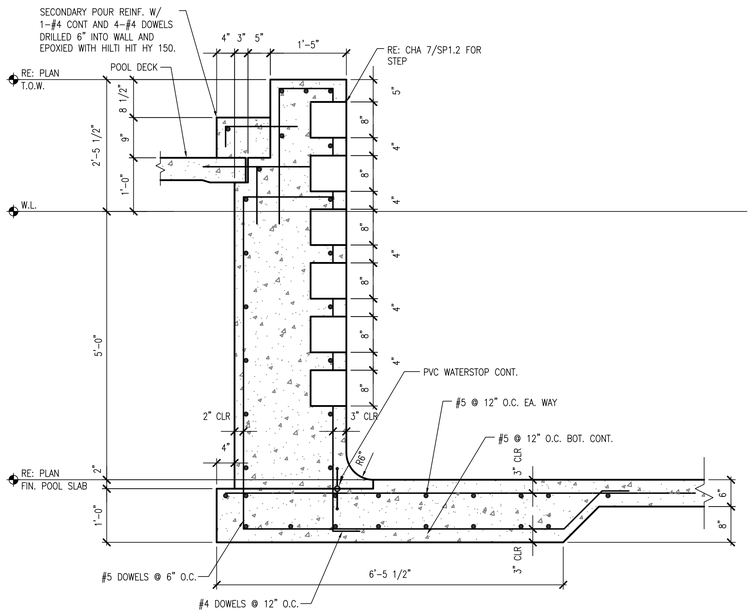
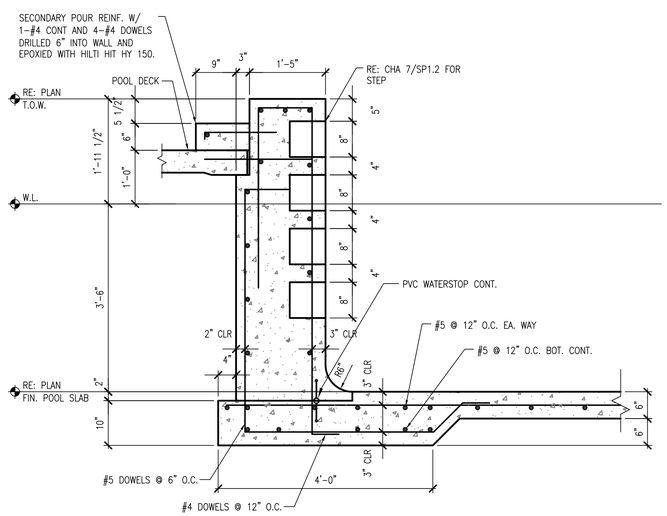


4 **SECTION**
SCALE: 3/4" = 1'-0"



5 **SECTION**
SCALE: 3/4" = 1'-0"

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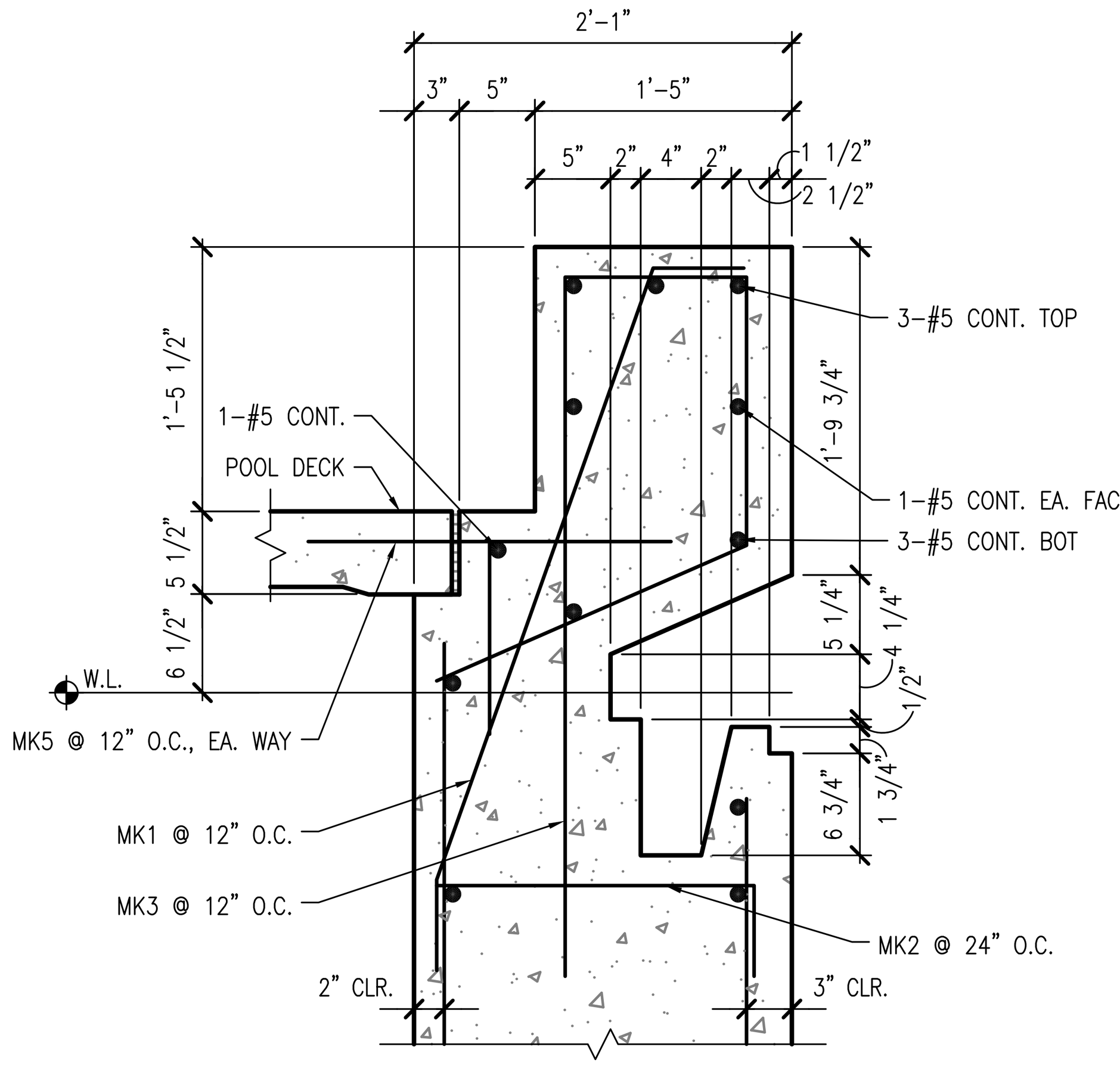
The Core Group
Structural Engineers
P.E. TRENT CRUZEN
P.E. No. 23864 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

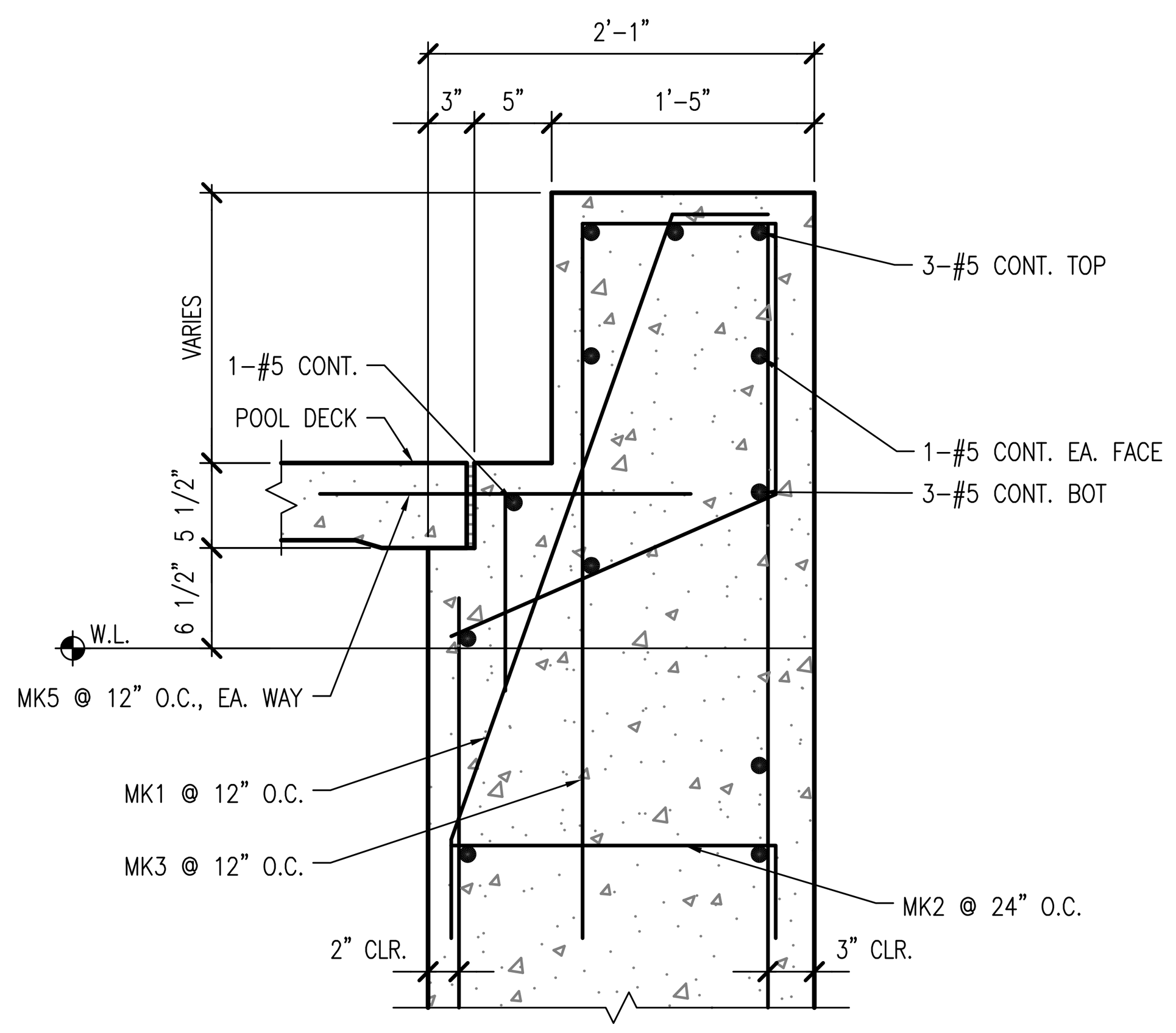
FOUNDATION DETAILS

Scale:	AS SHOWN
Designed by:	TC
Drawn by:	SS
Checked by:	TC
Date:	04/15/2019
Project No.	064538700

SHEET
S8



1 **TYPICAL DETAIL**
SCALE: 1" = 1'-0"



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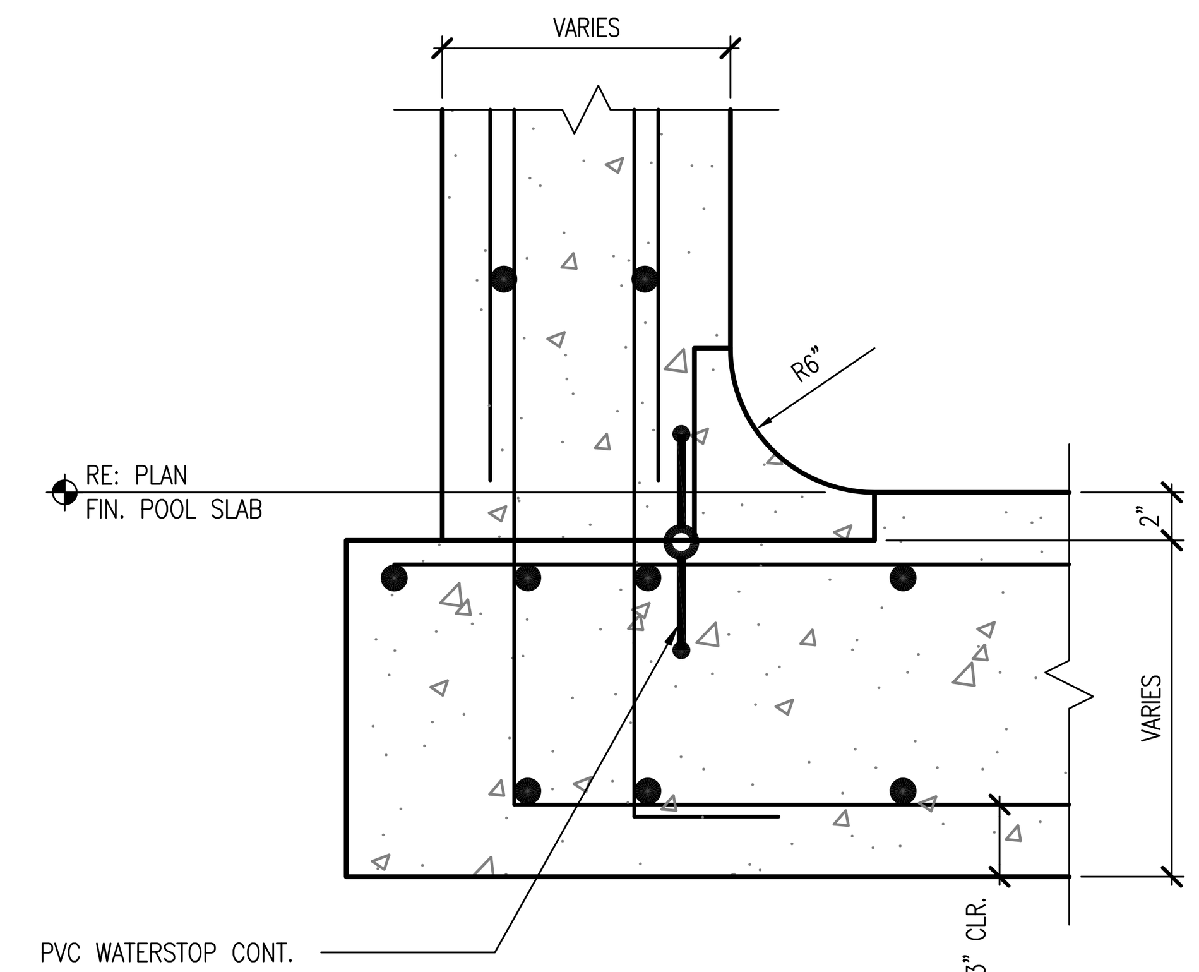
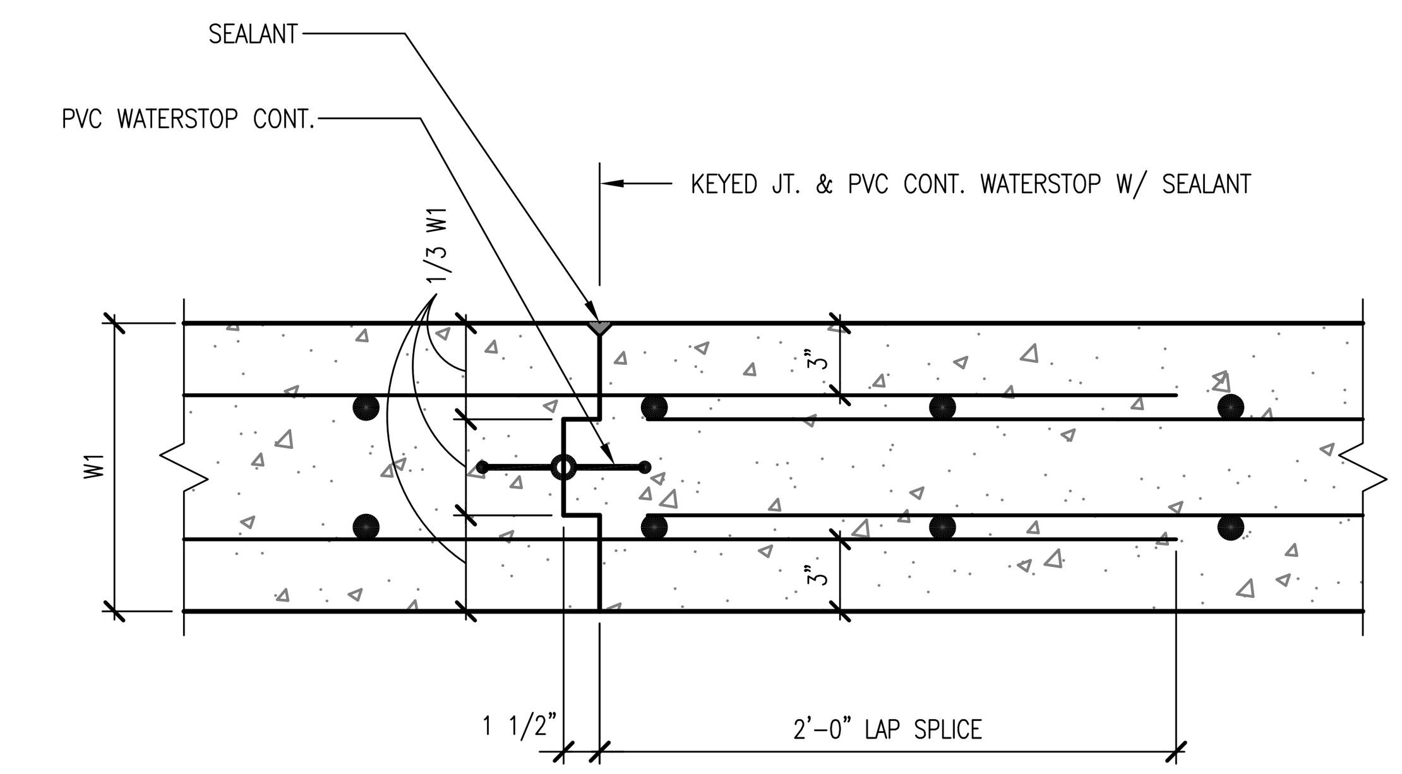
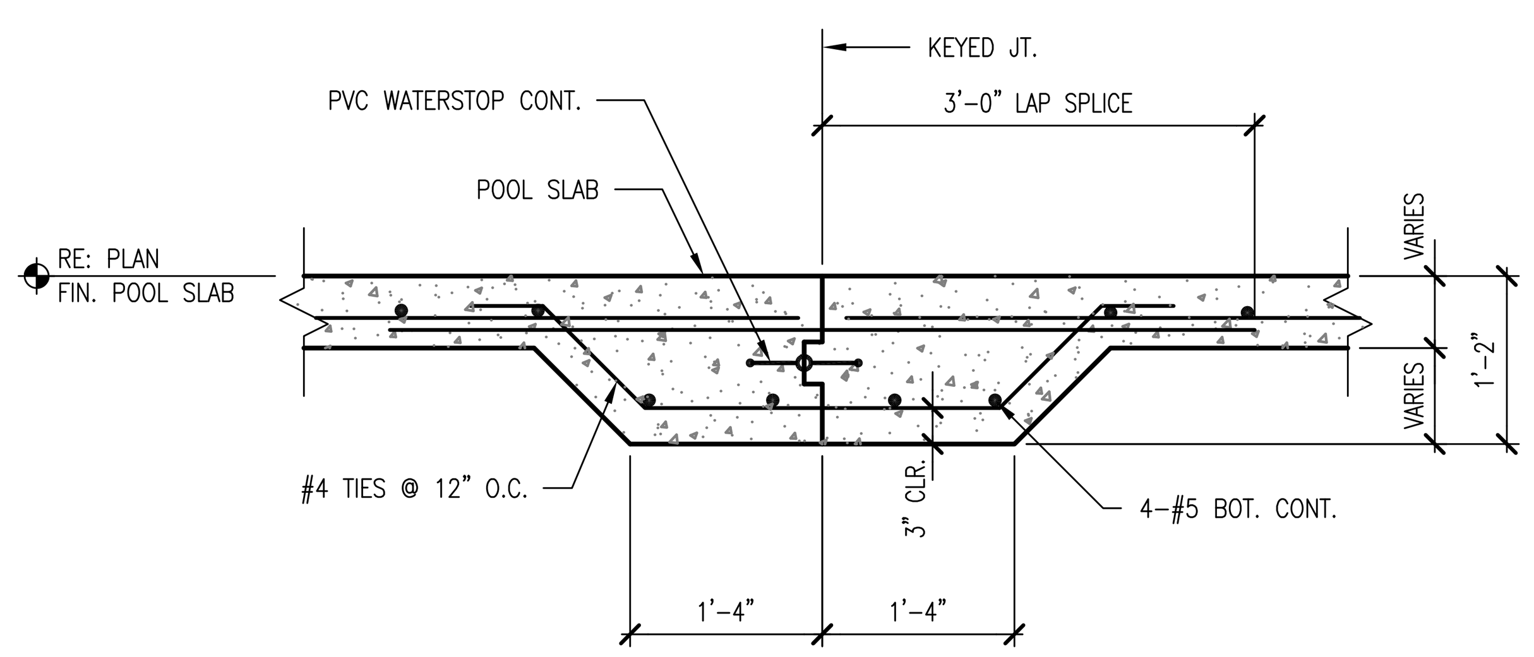


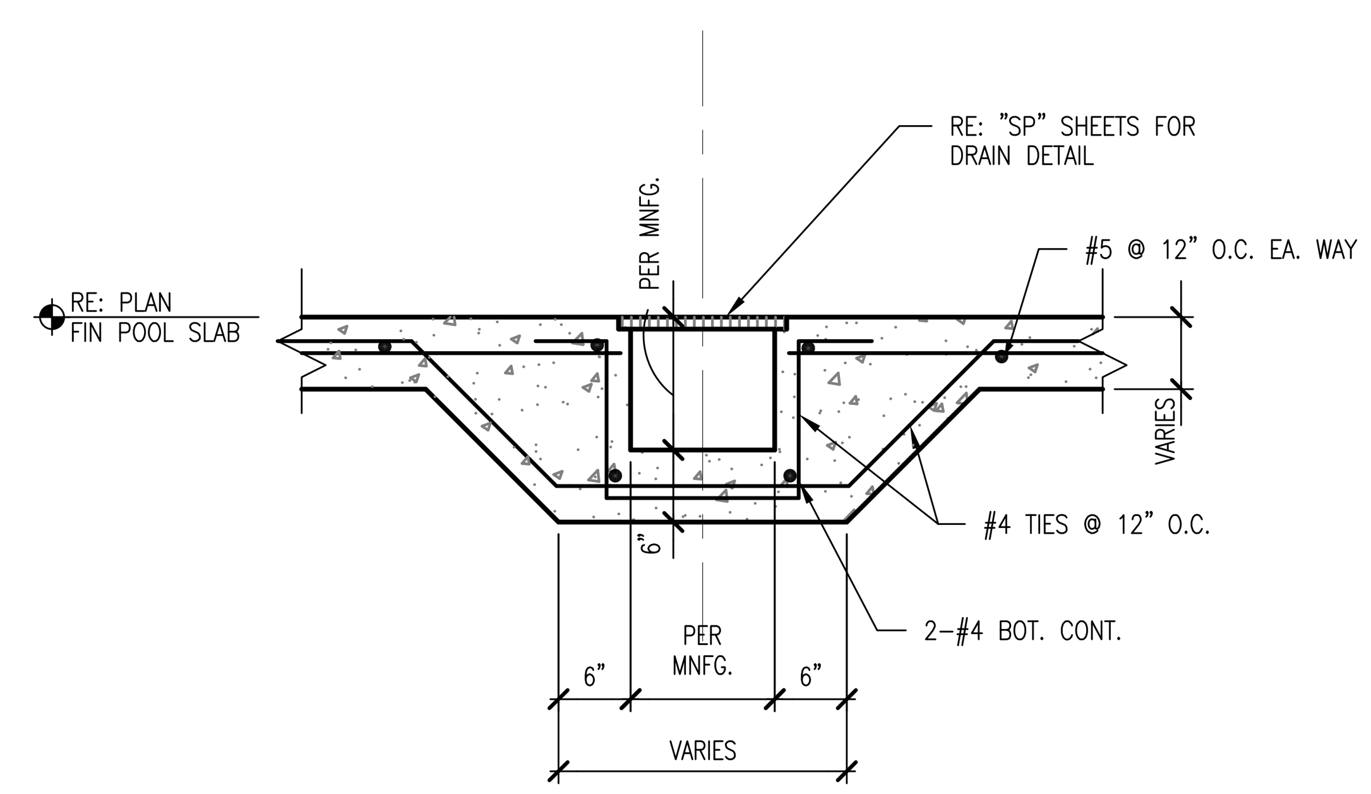
3 **TYPICAL DETAIL**
SCALE: 1 1/2" = 1'-0"



4 **WALL CONSTRUCTION JOINT**
SCALE: 1 1/2" = 1'-0"

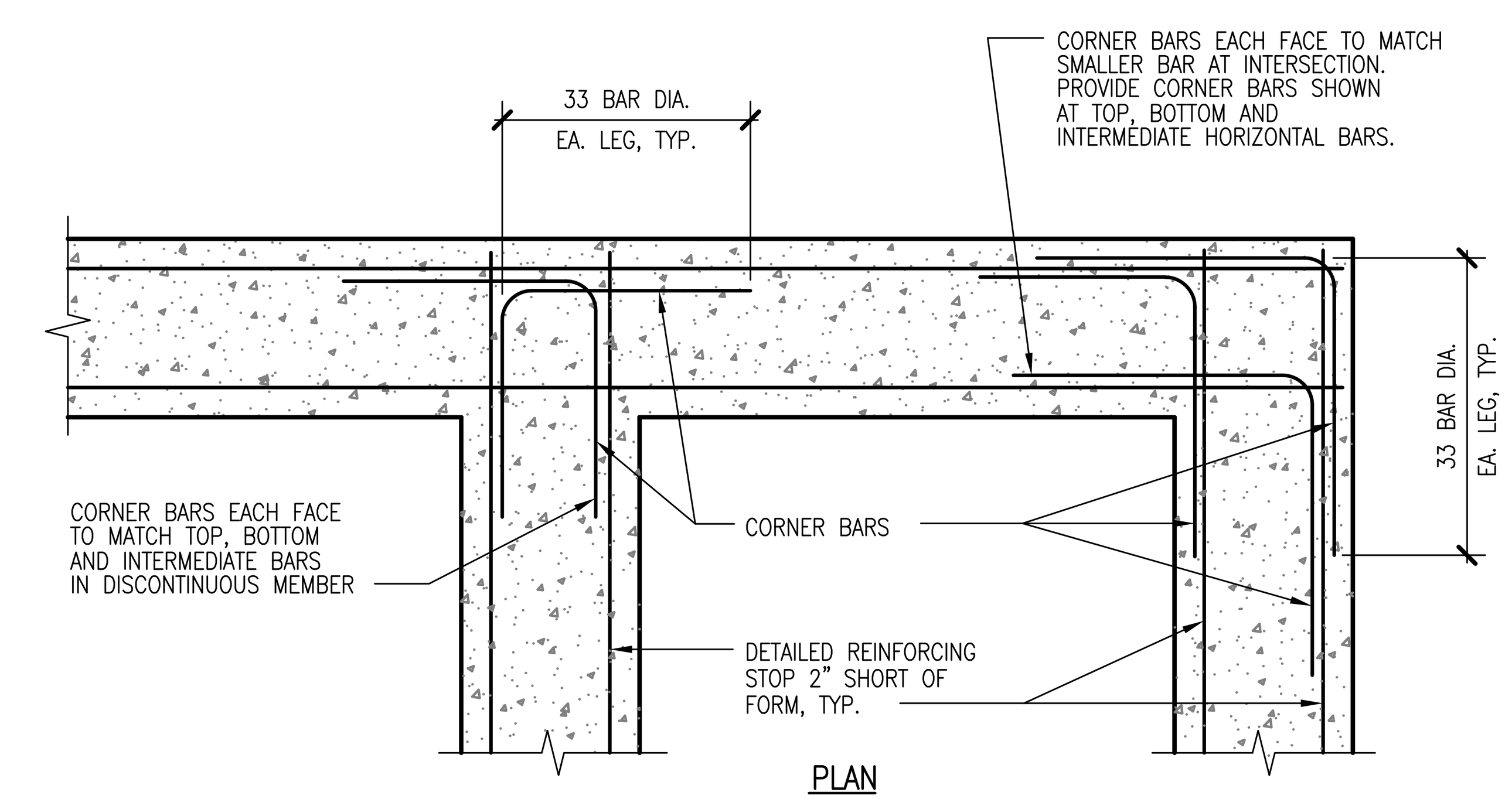


5 **POOL SLAB CONSTRUCTION JOINT**
SCALE: 3/4" = 1'-0"



NOTE: PROVIDE HYDROSTATIC RELIEF VALVES IN ALL MAIN DRAINS.

6 **SECTION AT MAIN DRAIN**
SCALE: 3/4" = 1'-0"



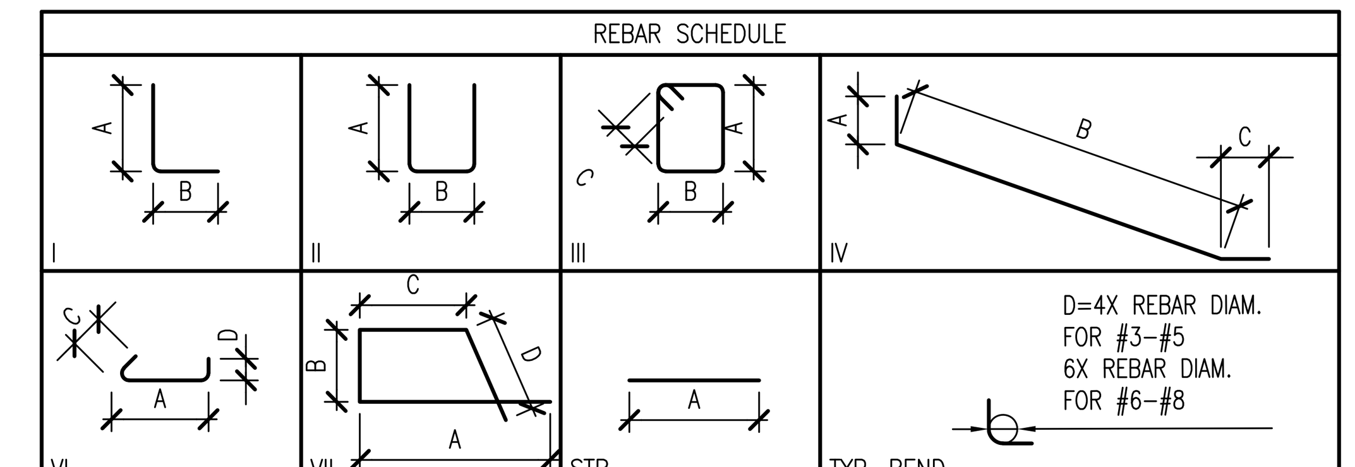
PLAN

NOTES
1. WHERE 90 DEGREE HOOKS ARE SCHEDULED OR DETAILED FOR TOP BARS, CORNER BARS MAY BE OMITTED.
2. MATCH SIZE, LOCATION AND NUMBER OF HORIZONTAL BEAM AND WALL BARS, EXCEPT THAT WHERE THERE ARE MORE THAN 2 TOP OR BOTTOM BARS, ONLY THE INSIDE AND OUTSIDE BARS MUST BE MATCHED.

CORNER BARS AT WALL OR GRADE BEAM INTERSECTION

8 **TYPICAL DETAIL**
N.T.S.

REBAR SCHEDULE



MARK / BAR NO.	TYPE	SIZE	A	B	C	D	E
MK1	IV	#4	6"	3'-7"	6"	–	–
MK2	VI	#3	1'-8"	–	3"	3"	–
MK3	VII	#4	3'-10"	1'-0"	1'-6"	1'-10"	–
MK4	I	#4	1'-5"	1'-5"	–	–	–
MK5	STR	3/4"ø SMOOTH	2'-0"	–	–	–	–

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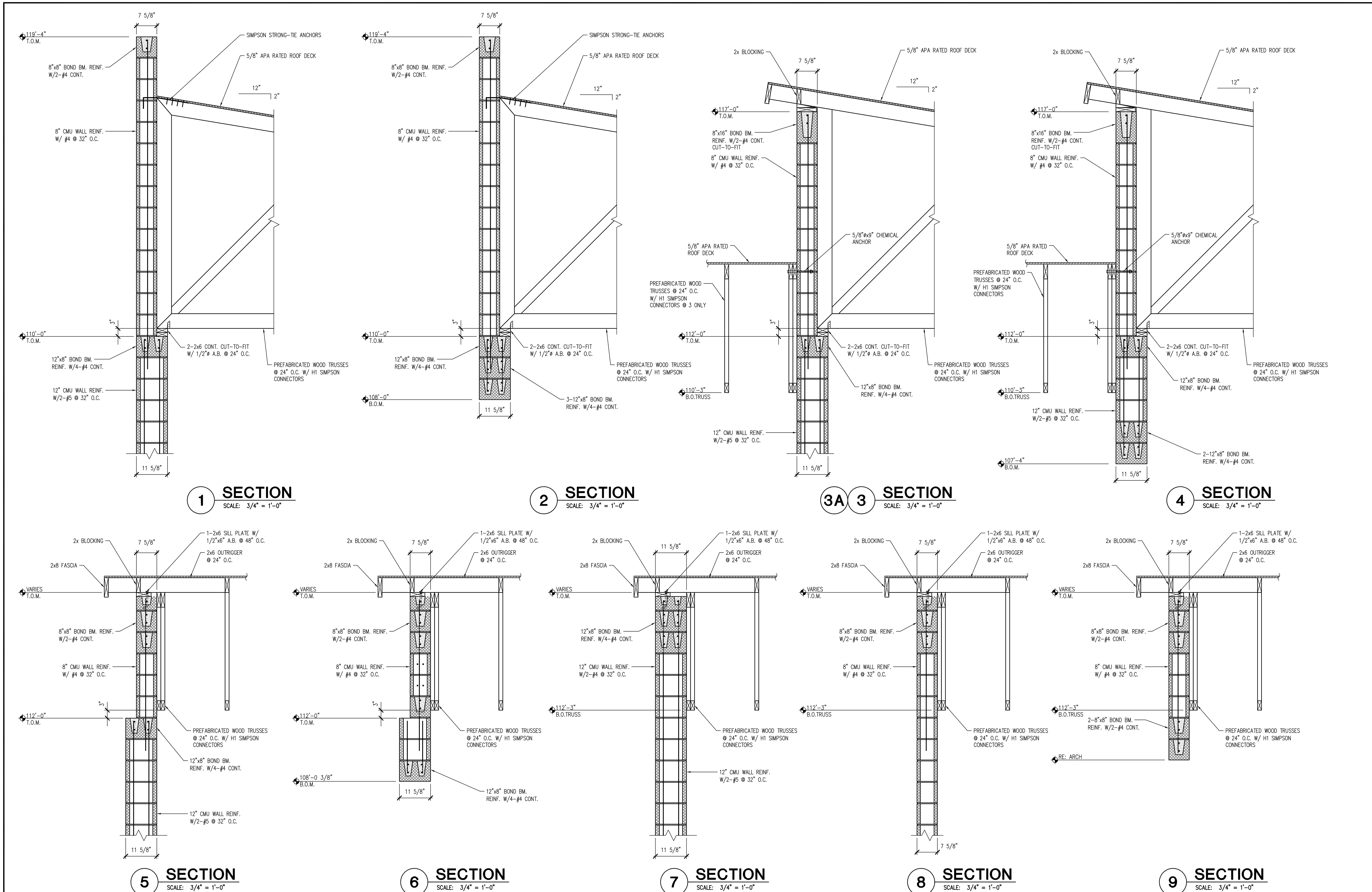
The Core Group
P.E. TRENT CRAIGIN
P.E. No. 25864 Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

FOUNDATION DETAILS

Scale:	AS SHOWN
Designed by:	TC
Drawn by:	SS
Checked by:	TC
Date:	04/15/2019
Project No.	064538700

SHEET
S9



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Structural Engineering

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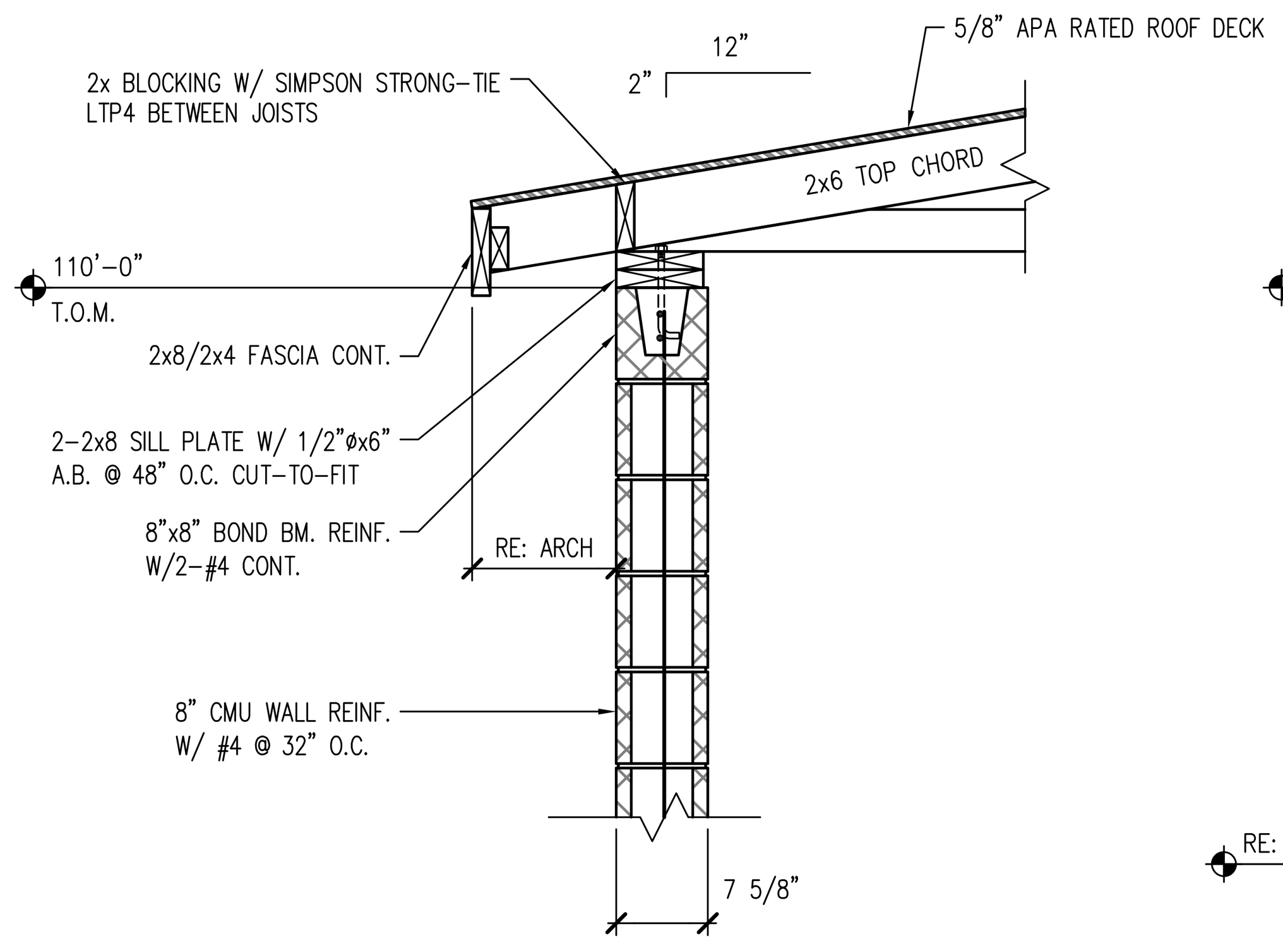
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

ROOF FRAMING DETAILS

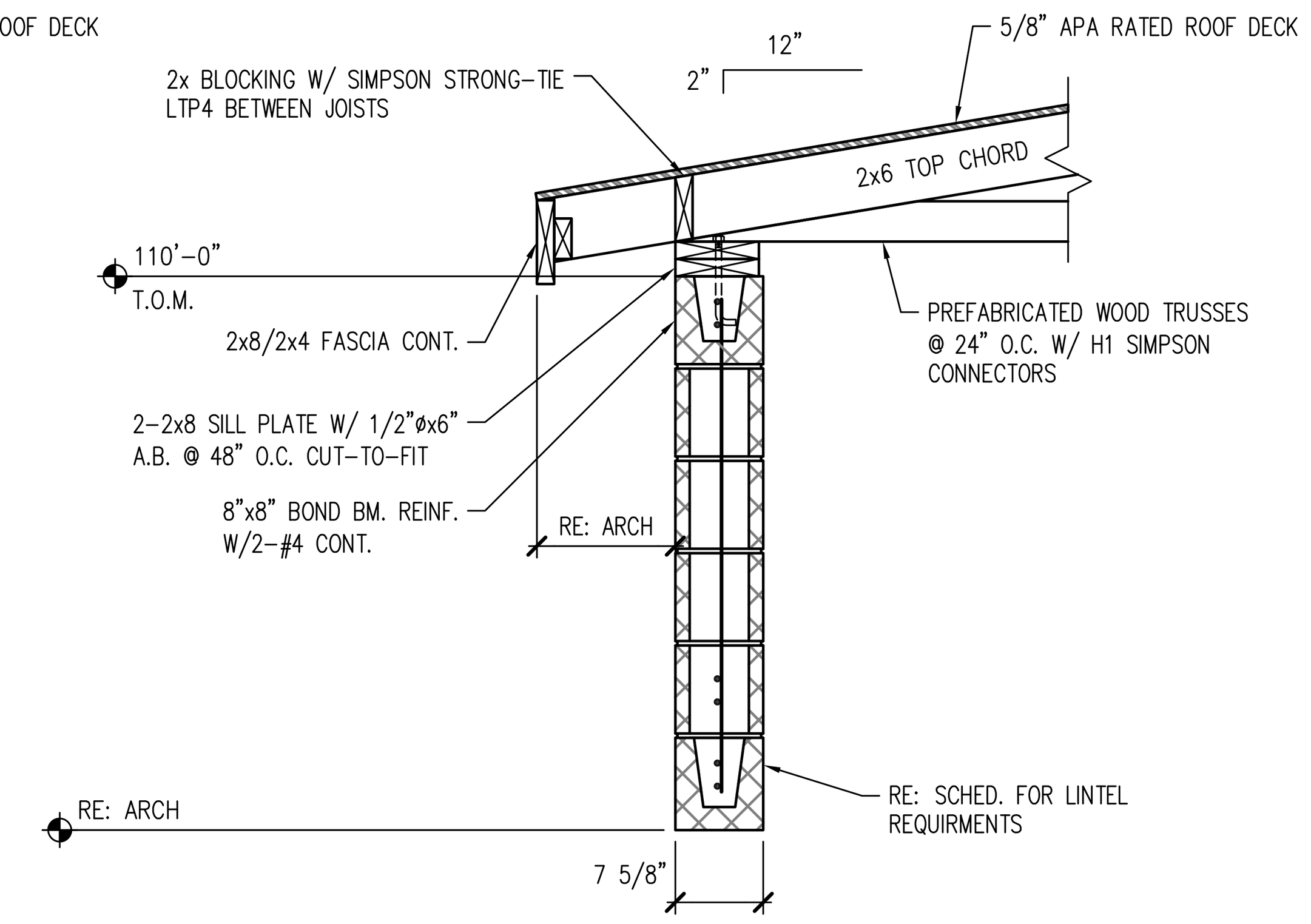
Scale:	AS SHOWN
Designed by:	TC
Drawn by:	SS
Checked by:	TC
Date:	04/15/2019
Project No.	064538700

SHEET

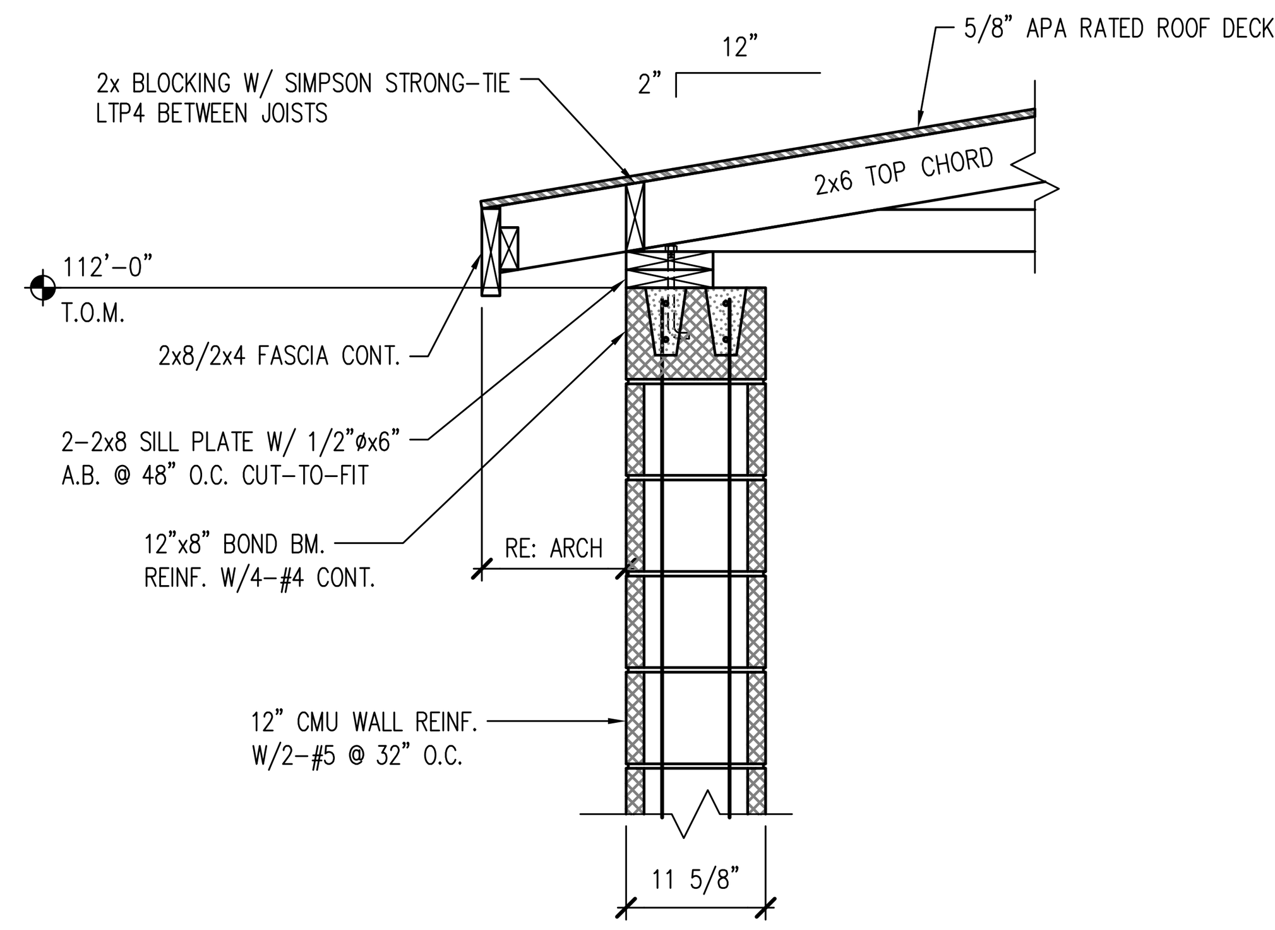
S10



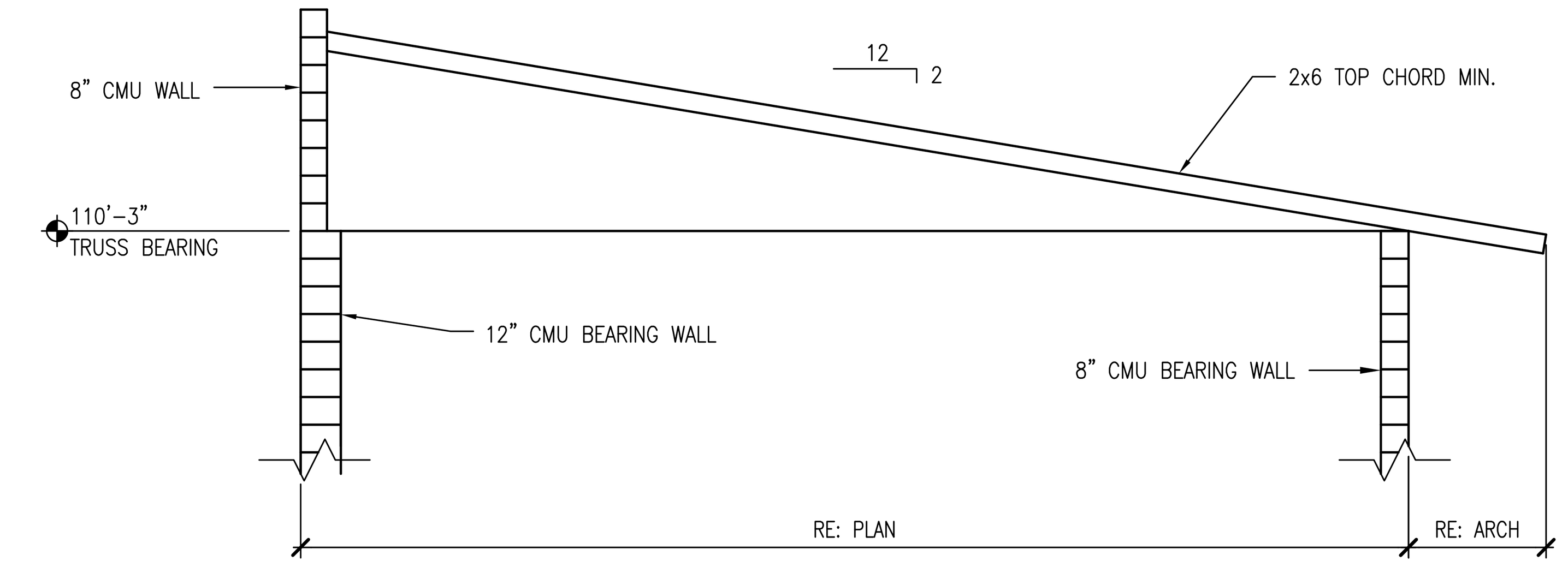
1 **SECTION**
SCALE: 3/4" = 1'-0"



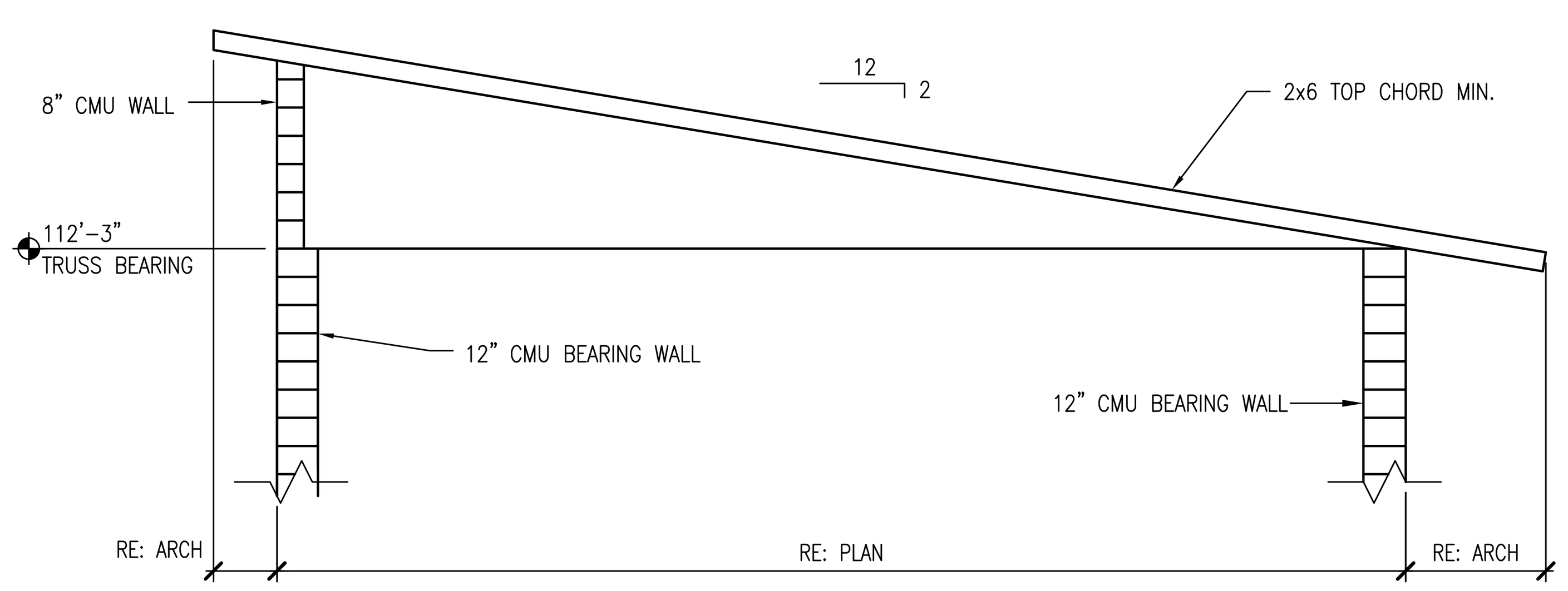
2A 2 **SECTION**
SCALE: 3/4" = 1'-0"



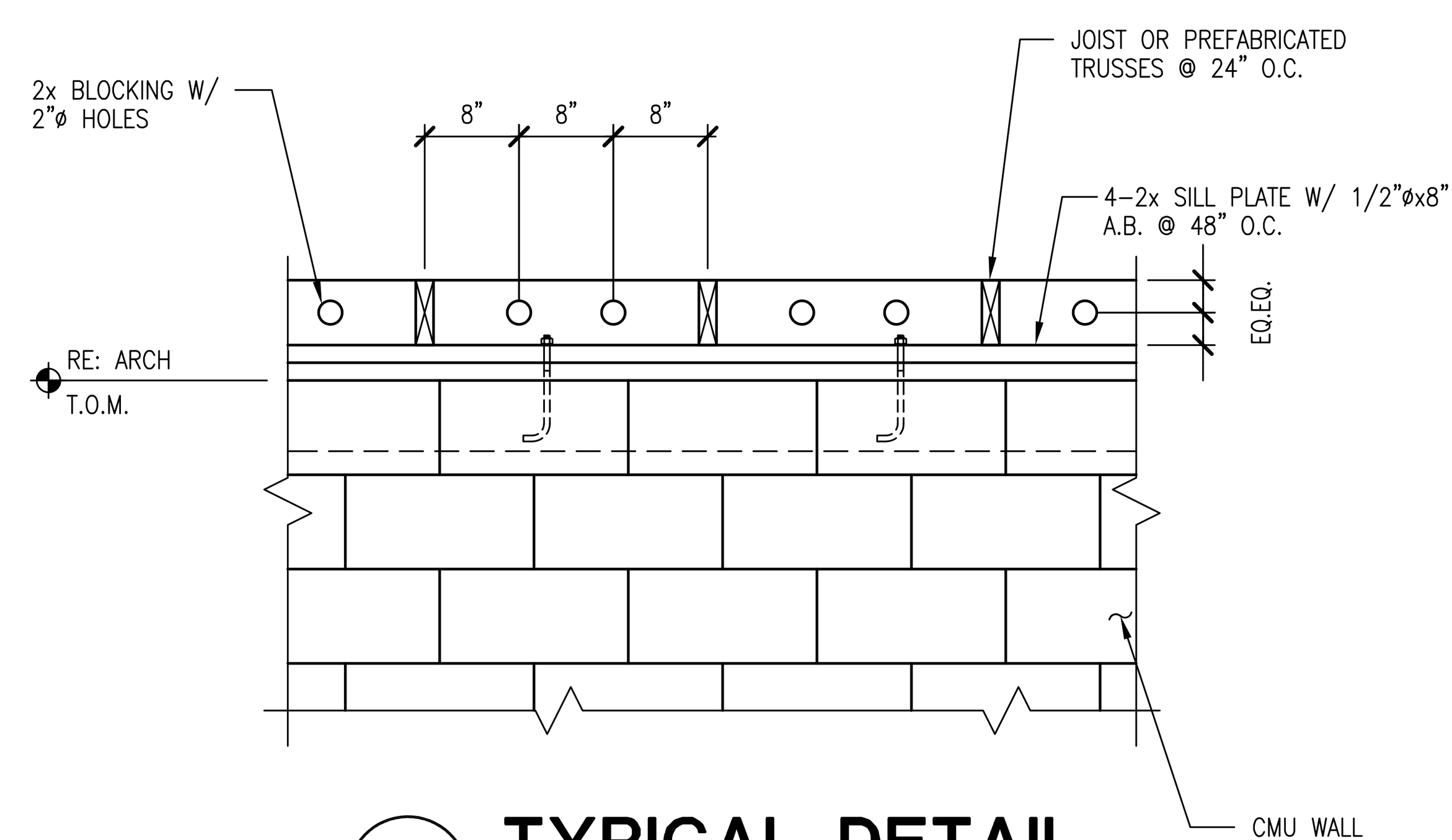
3 **SECTION**
SCALE: 3/4" = 1'-0"



4 **WOOD TRUSSES (TYPE "A")**
SCALE: 1/4" = 1'-0"



5 **WOOD TRUSSES (TYPE "B")**
SCALE: 1/4" = 1'-0"



6 **TYPICAL DETAIL**
SCALE: 3/4" = 1'-0"

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SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

ROOF FRAMING DETAILS

Scale:	AS SHOWN
Designed by:	TC
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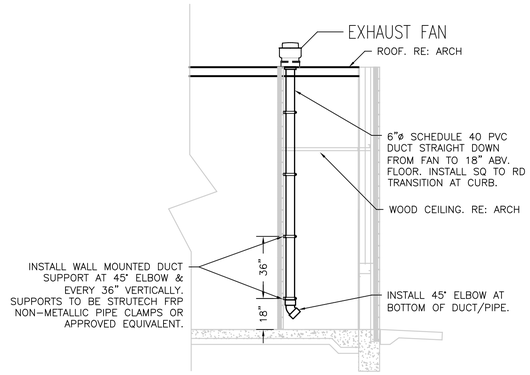
Checked by:	TC
Date:	04/15/2019
Project No.	064538700

SHEET
S11



2 CHEMICAL ROOM EXHAUST

SCALE: NOT TO SCALE

SPECIAL NOTES

1. MAINTAIN MINIMUM 10'-0" BETWEEN OUTDOOR AIR INTAKES AND EXHAUST OUTLETS AND PLUMBING VENTS.
2. ALL DUCTWORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE LATEST EDITION OF THE SMACNA DUCT CONSTRUCTION STANDARDS FOR LOW PRESSURE CLASSIFICATION. DUCT SHALL BE HUNG FROM THE STRUCTURE USING MINIMUM 1" WIDE 24 GA. GALV. STRAP OR AS SPECIFICALLY DEFINED BY SMACNA. RE: SHEET M-2 FOR ADDITIONAL NOTES. ALL SUPPLY DUCTWORK TO EXTERNALLY INSULATED WITH FIBERGLASS DUCT WRAP INSULATION WITH AN R VALUE NO LESS THAN R5. ALL DUCTWORK IS AIR SIZED.
3. NEW UNIT LOCATIONS ARE APPROXIMATE. CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATION TO CONFORM TO THE STRUCTURAL SUPPORT OF THE WALL, ROOF OR SLAB. COORDINATE LOCATION WITH OTHER CONTRACTORS.
4. GENERALLY, IT IS INTENDED FOR WALL PENETRATIONS TO BE MODULAR IN SIZE TO MATCH THE OPENING OF THE CMU.

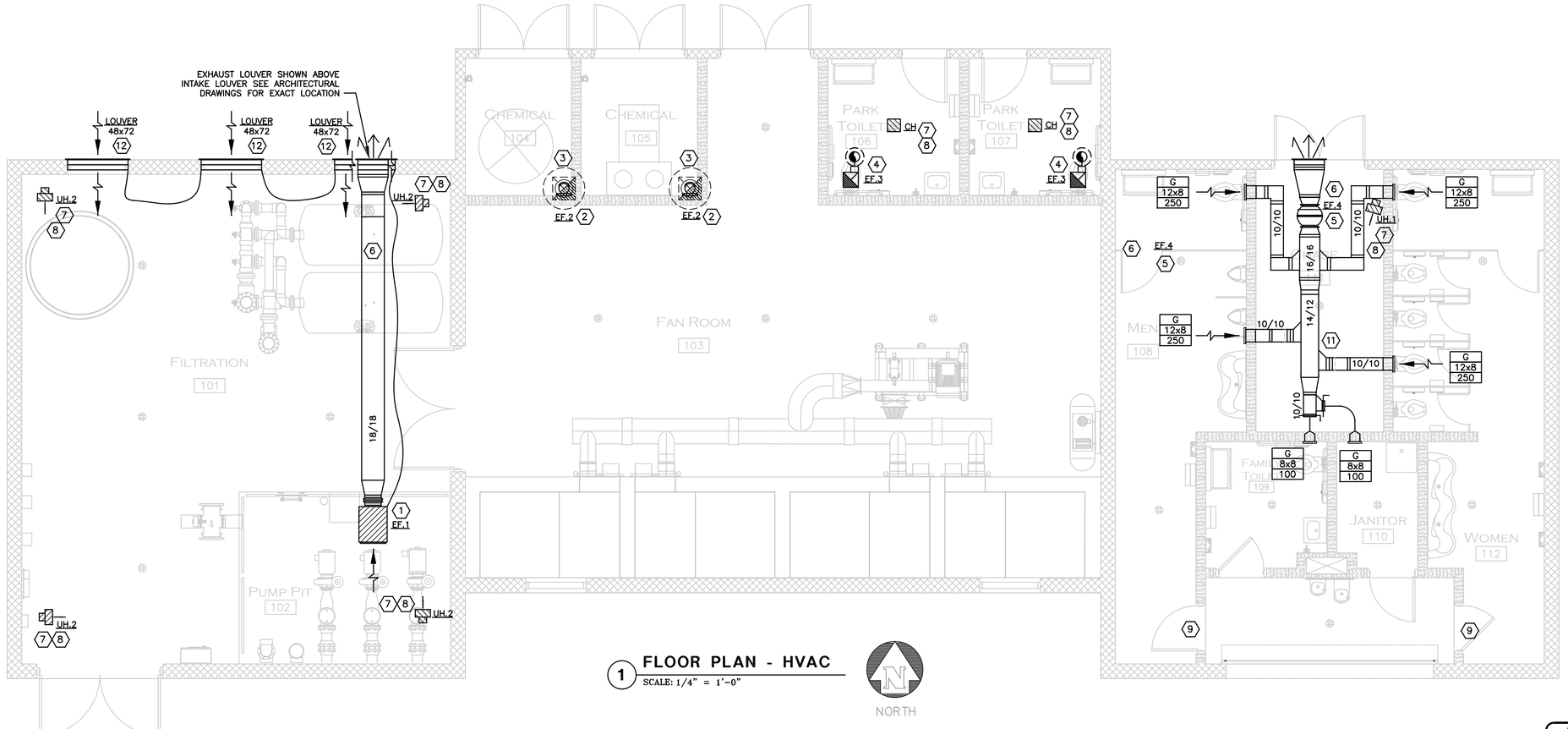
AIR DEVICE SYMBOL

XX	AIR DEVICE TYPE
XXXXX	NECK SIZE
XXX	CFM

REFER TO AIR DEVICE SCHEDULE ON SHEET M-2 FOR DESCRIPTION.

NOTES BY SYMBOL: "⬡"

1. EXHAUST FAN SUSPENDED FROM STRUCTURE RE: M-2 FOR SCHEDULE. PROVIDE DUCT TRANSITIONS FROM EXHAUST FAN TO ARCHITECTURAL LOUVER. COVER FAN INLET WITH 1/2" HARDWARE CLOTH.
2. ROOF MOUNTED EXHAUST FAN RE: M-2 FOR SCHEDULE. RE: ARCH FOR ELEVATION AND ROOF DETAILS.
3. 6"ø SCHEDULE 40 PVC DUCT STRAIGHT DOWN FROM FAN TO 18" ABOVE FLOOR. INSTALL SQUARE TO ROUND TRANSITION AT CURB. INSTALL 45° PVC ELBOW AT BOTTOM OF DUCT. INSTALL DUCT AS TIGHT TO CORNER AS POSSIBLE. INSTALL WALL MOUNTED DUCT SUPPORT AT 45° ELBOW AND AT EVERY 36" VERTICALLY. SUPPORTS TO BE STRUTECH FRP NON-METALLIC PIPE CLAMPS OR APPROVED EQUIVALENT.
4. CEILING MOUNTED EXHAUST FAN DUCTED TO ROOF CAP. RE: M-2 FOR SCHEDULE.
5. ATTIC MOUNTED EXHAUST FAN. INSTALL AS HIGH IN ATTIC AS POSSIBLE. RE: M-2 FOR SCHEDULE.
6. DUCT ROUTED IN ATTIC. REFER TO ARCHITECTURAL PLANS FOR WALL LOUVER. PROVIDE FULL SIZE TRANSITION TO LOUVER FROM EXHAUST DUCT. LOUVER TO EXHAUST ABOVE ADJACENT ROOF.
7. CEILING MOUNTED UNIT HEATER RE: M-2 FOR SCHEDULE.
8. ELECTRICAL CONNECTION TO HEATER PER MANUFACTURER'S RECOMMENDATIONS.
9. DOOR WILL BE LOCKED OPEN DURING OPERATION.
10. THERMOSTAT WITH REMOTE SENSOR.
11. FURNISH AND INSTALL BALANCING DAMPER IN ALL BRANCH DUCTS AND/OR AIR DEVICE RUN-OUTS.
12. 48"x72" WALL LOUVER EQUIVALENT TO RUSKIN #ELC-6375DXD WITH MOTORIZED DAMPER. INSTALL LOUVER IN WALL AND ALIGN WITH CMU COURSES. RE: ARCH FOR EXACT MOUNTING LOCATION AND COLOR SELECTION. PROVIDE 120V ACTUATOR INTERLOCKED WITH EXHAUST FANS AS SHOWN. ACTUATOR EQUIVALENT TO RUSKIN #RH-120-S (BELIMO ACCEPTABLE). VERIFY ACTUATOR TORQUE RATINGS FOR PROPER DAMPER OPERATION.



1 FLOOR PLAN - HVAC

SCALE: 1/4" = 1'-0"

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MISSOURI REGISTRATION NUMBER 2011512

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EA ENGINEERING ASSOCIATES
P.E. JIM D. DALLAS
Lic. No. E-19991/36332 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

FLOOR PLAN - HVAC

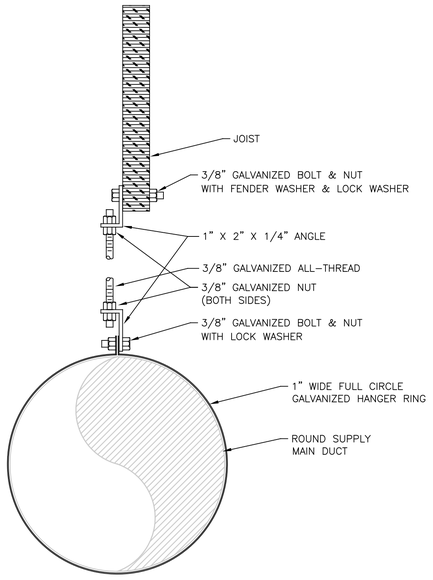
Scale:	AS SHOWN
Designed by:	E.A.
Drawn by:	KCW
Checked by:	JDD
Date:	04/15/2019
Project No.	064538700

SHEET
M-1

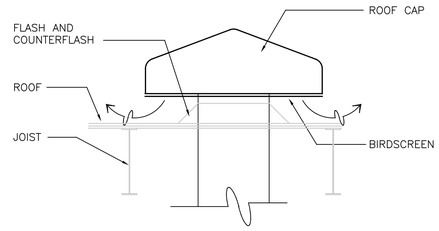
EA ENGINEERING ASSOCIATES
Ph: 325.365.3725 Fx: 325.365.5278
225 CR 288 Ballinger, TX 76821

HVAC GENERAL NOTES

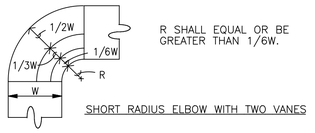
1. COMPLETED INSTALLATIONS SHALL CONFORM TO ALL APPLICABLE FEDERAL CODES, STATE AND LOCAL ORDINANCES AND THE SPECIFICATIONS. IF ANY CONFLICTS OCCUR, THE MOST STRINGENT SHALL APPLY.
2. PIPING AND DUCT LAYOUT IS ONLY SCHEMATIC, EXACT LOCATION OF PIPES AND DUCTS SHALL BE COORDINATED WITH BLDG. STRUCTURE, AND WORK OF OTHER CONTRACTORS PRIOR TO START OF ANY CONSTRUCTION OR DEMOLITION.
3. MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR ALL WARRANTIES ON THE EQUIPMENT INSTALLED BY THAT CONTRACTOR OR THEIR SUB-CONTRACTORS.
4. INSURE THE EXECUTION OF ALL WARRANTIES FOR EQUIPMENT AND INSTALLATION AS PRESCRIBED BY THE OWNER AND/OR ARCHITECT.
5. ALL DUCTS AND PIPES ABOVE CEILING AND TIGHT TO BOTTOM OF STRUCTURE UNLESS OTHERWISE NOTED.
6. ELEVATIONS, WHERE SHOWN, ARE CENTER OF PIPE AND BOTTOM OF DUCT UNLESS OTHERWISE NOTED.
7. NOTIFY GENERAL CONTRACTOR OF SIZE AND LOCATION OF ALL RECESSES AND OPENINGS REQUIRED FOR HVAC WORK.
8. LOCATE ALL TEMPERATURE, PRESSURE AND FLOW MEASURING DEVICES IN ACCESSIBLE LOCATIONS WITH STRAIGHT SECTION OF PIPE OR DUCT UP- OR DOWNSTREAM AS RECOMMENDED BY THE MANUFACTURER FOR ACCURACY.
9. LOCATE ALL MECHANICAL EQUIPMENT FOR UNOBSTRUCTED ACCESS TO UNIT ACCESS PANELS, CONTROLS AND VALVING.
10. LOCATE TEMPERATURE AND PRESSURE GAUGES FOR UNOBSTRUCTED ACCESS TO VIEWING.
11. LOCATE ROOM THERMOSTATS, HUMIDISTAT, AND TEMPERATURE AND HUMIDITY SENSORS 4'-0" (CENTERLINE) ABOVE FINISHED FLOOR. NOTIFY ARCHITECT WHERE DIMENSION CANNOT BE MAINTAINED OR WHERE THERE IS A QUESTION ON LOCATION.
12. REFER TO ARCHITECTURAL REFLECTED CEILING PLAN FOR EXACT LOCATION OF DIFFUSERS, GRILLES, ETC.
13. MAINTAIN MINIMUM 10'-0" BETWEEN OUTDOOR AIR INTAKES AND EXHAUST OUTLETS AND PLUMBING VENTS.
14. SUPPORT ALL STEEL PIPE AT INTERVALS OF NOT MORE THAN 10'-0", COPPER PIPE AT INTERVALS OF NOT MORE THAN 8'-0".
15. PROVIDE ALL CONTROLS AND CONTROLLERS, INCLUDING STARTERS AND CONTRACTORS, NECESSARY FOR A COMPLETE AND OPERATIONAL HVAC SYSTEM. INCLUDE ALL ELECTRICAL WORK NECESSARY TO COMPLY WITH THIS REQUIREMENT. COORDINATE WITH THE ELECTRICAL CONTRACTOR FOR POWER SOURCE CONNECTIONS.
16. BEFORE ORDERING ANY EQUIPMENT, THE CONTRACTOR SHALL COORDINATE THE VOLTAGE AND PHASE OF EACH PIECE OF EQUIPMENT WITH THE ELECTRICAL CONTRACTOR



1 ROUND DUCT HANGER DETAIL
SCALE: NOT TO SCALE

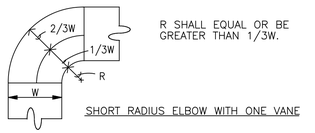


3 ROOF PENETRATION DETAIL
SCALE: NOT TO SCALE



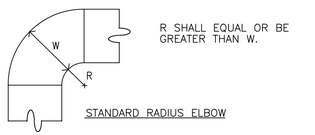
R SHALL EQUAL OR BE GREATER THAN 1/6W.

SHORT RADIUS ELBOW WITH TWO VANES



R SHALL EQUAL OR BE GREATER THAN 1/3W.

SHORT RADIUS ELBOW WITH ONE VANE



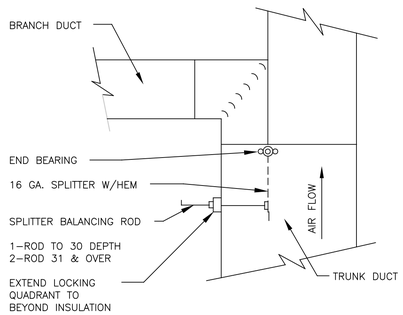
R SHALL EQUAL OR BE GREATER THAN W.

STANDARD RADIUS ELBOW

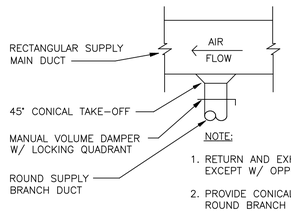
5 RADIUSED ELBOW DETAILS
SCALE: NOT TO SCALE

NOTES:

1. THE INTERIOR SURFACES OF ALL RADIUS ELBOWS SHALL BE MADE ROUND
2. ALL STANDARD RADIUS ELBOWS SHOWN ON PLANS MAY BE MADE SHORT RADIUS ELBOWS. ALL SHORT RADIUS ELBOWS SHALL HAVE VANES. VASE SHALL BE CONSTRICTED, SUPPORTED AND FASTENED AS RECOMMENDED BY SMACNA.



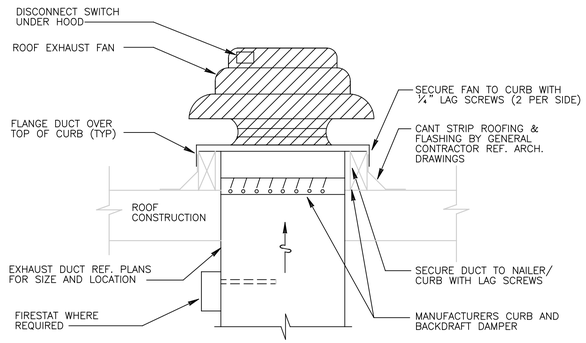
6 MAIN DUCT SPLIT DETAIL
SCALE: NOT TO SCALE



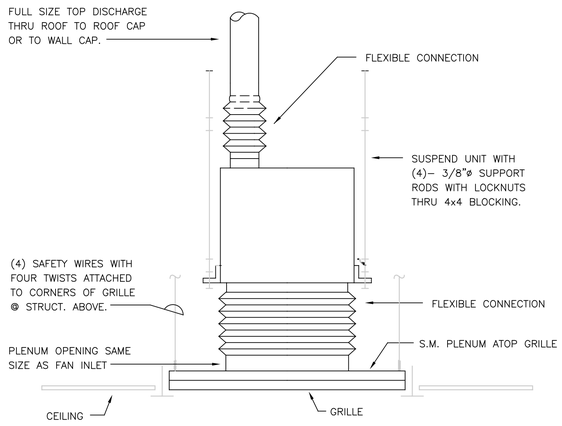
NOTE:

1. RETURN AND EXHAUST DUCTWORK SIMILAR EXCEPT W/ OPPOSITE AIR FLOW DIRECTION
2. PROVIDE CONICAL TAKEOFFS FOR ALL ROUND BRANCH DUCTS.

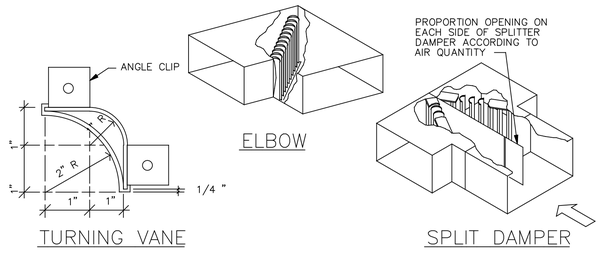
8 ROUND DUCT TAKEOFF DETAIL
SCALE: NOT TO SCALE



2 ROOF MOUNTED EXHAUST FAN
SCALE: NOT TO SCALE



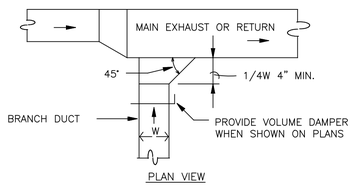
4 CEILING EXHAUST FAN DETAIL (IN-LINE SIMILAR)
SCALE: NOT TO SCALE



7 DUCT CONSTRUCTION DETAILS
SCALE: NOT TO SCALE

NOTES:

1. ALL RECTANGULAR ELBOWS SHALL HAVE TURNING VANES.
2. ALL RECTANGULAR SPLITS SHALL HAVE TURNING VANES IN BOTH ELBOWS.



9 EXHAUST/RETURN DUCT CONNECTION DETAIL
SCALE: NOT TO SCALE

DUCTING LEGEND

T	THERMOSTAT, HUMIDISTAT (OR SENSOR)		FIRE DAMPER
	SUPPLY DUCT		FIRE/SMOKE DAMPER
	RETURN DUCT		EXHAUST FAN
	RECT. DUCT VERTICAL		EXHAUST GRILLE
	ROUND DUCT/OR PIPE VERTICAL		RND. NECK DIFFUSER
	RECT. ELBOW W/TURNING VANES		RND. NECK RETURN GRILLE
	SPIN-IN FITTING W/ EXTRACTOR & BALANCE DAMPER		SIDEWALL SUPPLY OR RETURN GRILLE
	BRANCH Y FITTING W/BALANCE DAMPER		SUPPLY AIR FLOW
	SIZE CHANGE INDICATOR		RETURN AIR FLOW

AIR DEVICE SCHEDULE

TYPE	DESCRIPTION	FINISH	MODEL	MANUFACTURER
A	12X12 SUPPLY DIFFUSER, LOUVER FACE	WHITE	5SH	KRUEGER
B	6X6 SUPPLY DIFFUSER, LOUVER FACE	WHITE	5SH	KRUEGER
C	14X14 SUPPLY GRILLE, PERF FACE	WHITE	51190	KRUEGER
D	SUPPLY REGISTER, SURF. MOUNT, HORIZ. BARS W/ OBD	WHITE	5880H	KRUEGER
E	14X14 RET/EXH/SUPPLY GRILLE, PERF FACE	WHITE	51190	KRUEGER
F	8X8 RET/EXH GRILLE, PERF FACE	WHITE	51190	KRUEGER
G	RET/EXH GRILLE, HORIZ. BARS, SURFACE MTD.	WHITE	S580H	KRUEGER

NOTE:
1. NOT ALL TYPES ARE NECESSARILY USED
2. FRAME STYLE SHALL BE COMPATIBLE WITH CEILING TYPE
3. ALUMINUM CONSTRUCTION.
4. PROVIDE NECESSARY CLIPS, SUPPORTS AND SQUARE TO ROUND CONNECTIONS
5. PROVIDE RADIATION DAMPER AND BLANKET FOR RATED CEILING ASSEMBLIES
6. FINISH SHALL BE COORDINATED WITH THE ARCHITECT PRIOR TO ORDER

EXHAUST FAN SCHEDULE

DESIGNATION	EF.1	EF.2	EF.3	EF.4	
SERVES	PUMP HOUSE	CHEM STORAGE	RR'S 106, 107	108-110, 112	
CFM	1600	200	75	1200	
S.P. (IN. W.G.)	0.25	0.125	0.10	0.125	
POWER AS LABELED	0.22 BHP	87 WATTS	0.3A	1/4	
ELECTRICAL CHARACTERISTIC	120/1/60	120/1/60	120/1/60	120/1/60	
MODEL NUMBER	10DB	RE(C)-6	XB80	12CV17D	
MANUFACTURER	COOK	FANTECH	BROAN	COOK	
SONES	8.6	7.7	0.3	LOW	
ACCESSORIES	2,3,4,7,13,14	1,2,3,4,7,8,9	1,2,3,4,5,7,8	1,2,3,4,7,8	
CONTROLS	TIME CLOCK	TIME CLOCK	SWITCH	TIME CLOCK	

ACCESSORIES:
1. FACTORY DISCONNECT
2. BACKDRAFT DAMPER
3. INSECT SCREEN
4. DUCT TRANSITIONS
5. DIRECT DRIVE
6. INTEGRAL WALL FLASHING
7. RUBBER VIBRATION ISOLATORS
8. ALUMINUM CONSTRUCTION
9. FACTORY ROOF CURB
10. IN-LINE THERMOSTAT
11. CURB MOUNT ROOF CAP #611CM
12. PAINTED GALVANIZED
13. FLEXIBLE DUCT CONNECTOR
14. FACTORY UNIT MOUNTED DISCONNECT

ELECTRIC HEATER SCHEDULE

MARK	CFM	KW		ΔT (F°)	ELECTRICAL DATA AMPS	HP	RPM	VOLTS/PHASE/Hz	MODEL #	MANUF.	KEY NOTES
UH.1	350	2.2		27	11.0	1/100	850	208/1/60	MUH-03-21	QMARK	1-4
UH.2	350	5.0		-	6.0	1/100	-	480/3/60	MUH-05-41	QMARK	1-4
CH	300	2.0		51	8.3	1/100	-	208/1/60	CDF-548	QMARK	1,3,5

NOTES:
1. PROVIDE W/ UNIT MOUNTED THERMOSTAT.
2. PROVIDE W/ STRUCTURE MOUNTING BRACKET.
3. PROVIDE W/ FACTORY MOUNTED DISCONNECT.
4. MOUNT BOTTOM OF UNIT @ 9' AFF.
5. PROVIDE W/ CEILING MOUNTING ENCLOSURE.

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EA ENGINEERING ASSOCIATES
P.E. JIM D. DALLAS
Lic. E-19991/36332 Date APRIL 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

SCHEDULES & DETAILS - HVAC

Scale:	AS SHOWN
Designed by:	E.A.
Drawn by:	KCW
Checked by:	JDD
Date:	04/15/2019
Project No.	064538700

SHEET
M-2

EA ENGINEERING ASSOCIATES
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225 CR 288 Ballinger, TX 76821

LUMINAIRE SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER/MODEL #	VOLTAGE	WATTAGE	LAMPS	REMARKS
A	SURFACE MOUNTED VANDAL RESISTANT LED	NEW STAR *VIC4W-L2 40 IC-RWC-UN-WH	120/277	50	LEDS FURNISHED	
A1	SAME AS TYPE 'A' EXCEPT WITH EMERGENCY BATTERY PACK	NEW STAR *VIC4W-L2 40 IC-RWC-UN-WH-EL2	120/277	50	LEDS FURNISHED	
B	CHAIN HUNG WET LOCATION LISTED ENCLOSED LED	LITHONIA *FEM L48 4000LM IMAFL MD MVOLT GZ10 40K 80 CRI MHCH 36	120	42	LEDS FURNISHED	
B1	SAME AS TYPE 'J' EXCEPT WITH EMERGENCY BATTERY PACK	LITHONIA *FEM L48 4000LM IMAFL MD MVOLT GZ10 40K 80 CRI MHCH 36 B6L520	120	42	LEDS FURNISHED	
C	SURFACE MOUNTED LED STRIP	LITHONIA *ZLIN L48 3000LM F5T MVOLT 40K 80CRI	120/277	25	LEDS FURNISHED	
C1	SAME AS TYPE 'C' EXCEPT WITH EMERGENCY BATTERY PACK	LITHONIA *ZLIN L48 3000LM F5T MVOLT 40K 80CRI E7W	120/277	25	LEDS FURNISHED	
D	WALL MOUNTED VANDAL RESISTANT LED	ECLIPSE LIGHTING *L22-A-LED30-4K-EBU-BK	120	30	LEDS FURNISHED	
D1	SAME AS TYPE 'D' EXCEPT WITH EMERGENCY BATTERY PACK	ECLIPSE LIGHTING *L22-A-LED30-4K-EBU-BK-EL67	120	30	LEDS FURNISHED	
E	CEILING MOUNTED LED	ECLIPSE LIGHTING *L02-LED20-4K-EBU-BK-CM	120	20	LEDS FURNISHED	
E1	SAME AS TYPE 'E' EXCEPT WITH EMERGENCY BATTERY PACK	ECLIPSE LIGHTING *L02-LED20-4K-EBU-BK-CM-EL4W	120	20	LEDS FURNISHED	
SA	(1) POLE MOUNTED LED AREA LUMINAIRE ON 20'-0" ROUND TAPERED STEEL POLE	BEACON VIPER SERIES (1) *VPL-80L-180-4K7-4 UNV-BL POLE: VALMONT *DS2106S0A200D1PC-FP-BK-FBC-AB	277	181.3	LEDS FURNISHED	REFER I/E-6 FOR POLE BASE DETAIL. FIXTURE MOUNTING HEIGHT IS 20'-0"
SB	(2) POLE MOUNTED LED AREA LUMINAIRES @ 90° ON 20'-0" ROUND TAPERED STEEL POLE	BEACON VIPER SERIES (2) *VPL-80L-180-4K7-4 UNV-BL POLE: VALMONT *DS2106S0A200D2PC-FP-BK-FBC-AB	277	362.6	LEDS FURNISHED	REFER I/E-6 FOR POLE BASE DETAIL. FIXTURE MOUNTING HEIGHT IS 20'-0"
SC	(2) POLE MOUNTED LED AREA LUMINAIRES @ 180° ON 20'-0" ROUND TAPERED STEEL POLE	BEACON VIPER SERIES (2) *VPL-80L-180-4K7-4 UNV-BL POLE: VALMONT *DS2106S0A200D2PC-FP-BK-FBC-AB	277	362.6	LEDS FURNISHED	REFER I/E-6 FOR POLE BASE DETAIL. FIXTURE MOUNTING HEIGHT IS 20'-0"
SD	(4) POLE MOUNTED LED AREA LUMINAIRES ON 20'-0" ROUND TAPERED STEEL POLE	BEACON VIPER SERIES (4) *VPL-80L-180-4K7-4 UNV-BL POLE: VALMONT *DS2106S0A200D4PC-FP-BK-FBC-AB	277	725.2	LEDS FURNISHED	REFER I/E-6 FOR POLE BASE DETAIL. FIXTURE MOUNTING HEIGHT IS 20'-0"
SE	(4) POLE MOUNTED LED AREA LUMINAIRES ON 18'-0" ROUND TAPERED STEEL POLE	BEACON VIPER SERIES (4) *VPL-80L-180-4K7-4 UNV-BL POLE: VALMONT *DS2106S0A180D4PC-FP-BK-FBC-AB	277	725.2	LEDS FURNISHED	REFER I/E-6 FOR POLE BASE DETAIL. FIXTURE MOUNTING HEIGHT IS 20'-0"
X	UNIVERSAL MOUNT LED EMERGENCY EXIT SIGN	LITHONIA *LX W 3 R EL N	120/277	1.8	LEDS FURNISHED	

ELECTRICAL SYMBOL LEGEND

NOTE: NOT ALL SYMBOLS APPEAR ON ALL DRAWINGS

SYMBOL	DESCRIPTION	SYMBOL	DESCRIPTION
	2' x 4' Light Fixture		Flush In Wall Duplex Receptacle
	1' x 4' Light Fixture	GFCI	Flush In Wall Duplex Receptacle - Ground Fault Circuit Interrupt
	Ceiling Mounted Light Fixture	IG	Flush In Wall Duplex Receptacle - Isolated Ground
	Wall Mounted Light Fixture		Flush In Wall Duplex Receptacle Mounted Above Counter
	Ceiling Mounted Strip Light		Flush In Floor Duplex Receptacle
	Wall Mounted Strip Light		Flush In Wall Quadraplex Receptacle
WHOMM	Crosshatching Denotes Fixture On Emergency Circuit Or With Emergency Battery Pack		Flush In Wall Quadraplex Receptacle Mounted Above Counter
			Flush In Floor Quadraplex Receptacle
	Wall Mounted Dual Head Emergency Egress Light		Single Receptacle
	Wall Mounted Dual Head Emergency Egress Light Remote Head		Special Purpose Flush In Wall Receptacle (Verify NEMA Configuration with Owner)
	Surface Mounted Combination Exit Sign / Dual Head Emergency Egress Light		Flush In Wall Receptacle 220V. (Verify NEMA Configuration with Owner)
	Single Arm Pole Light		Plugmold Receptacle
	Double Arm Pole Light	J	Wall Mounted Junction Box
	Post Top Mounted Area Light	J	Ceiling Mounted Junction Box
$S6	Single Pole Switch (Lower Case Letter Denotes Switching Pattern)	J	Flush In Grade Junction Box
$S3	Three Way Switch	PB	Flush In Grade, Concrete Pull Box W/ Bolt Down Lid
$S4	Four Way Switch	S	Flush Mounted Ceiling Speaker Assembly w/ Back Box, Transformer And Ceiling Baffle (White)
$SD	Dimmer Switch		Weatherproof Outdoor Speaker
$SM	Motor Rated Switch		Plywood Telephone Backboard
$SK	Keyed Switch		Data Outlet (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
$SPL	Pilot Light Switch		Floor Mtd. Data Outlet (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
$VFC	Variable Speed Fan Control Switch		Telephone Outlet (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
$WP	Weatherproof Switch		Floor Mtd. Telephone Outlet (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
$OR	Manual Over-Ride Switch For Ceiling Mounted Occupancy Sensor	W	Telephone Outlet @ 54" AFF. (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
M	Wall Mounted Occupancy Sensor Light Switch Watt Stopper Model #WA-200	P	Public Telephone Outlet (Provide W/ 1" Conduit W/ Pull String To Point As Indicated On Plans)
M	Ceiling Mounted Dual Technology Occupancy Sensor Light Switch Watt Stopper Model #DT-355 Series		Combination Telephone/ Data Outlet (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
	Conduit In Ceiling Or Wall		Floor Mtd. Combination Telephone/Data Outlet (Provide W/ ¾" Conduit W/ Pull String To Above Accessible Ceiling)
	Conduit In Or Under Floor / Grade	*	Asterisk Denotes Tele/Data Device Mounted Above Counter
	Homerun To Panelboard In Ceiling Or Wall		Exit - Single Direction Indication - Ceiling Mounted
	Homerun To Panelboard In Or Under Floor / Grade		Exit - Bi-Directional Indication - Ceiling Mounted
	Wire Run Indicating Ground Wire, Phase And Neutral Conductors		Exit - Single Direction Indication - Wall Mounted
C C	CCTV Raceway, 1" Conduit Minimum W/ Pull String		Exit - Bi-Directional Indication - Wall Mounted
T T	Telephone Raceway, 1" Conduit Minimum W/ Pull String		Exit Directional Arrow - Single
OHE	Overhead Power Line		Exit Directional Arrow - Double
$Ø_{PP}$	Power Pole	S	Space Smoke Detector - Ceiling Mounted
	Combination Motor Starter / Disconnect Switch	D	Space Smoke Detector - Duct Mounted
	Non-Fused Disconnect Switch (NFS)	H	Space Heat Detector - Ceiling Mounted
	Fused Disconnect Switch (FDS)	P C	Photocell
	Variable Frequency Drive (VFD)	T C	Timeclock
T	Transformer	F	Fire Alarm Manual Pull Station
	Motor	F	Fire Alarm Horn Only
	Main Panel Or Distribution Panel	F 15cd	Fire Alarm Horn / Strobe (Number Denotes Strobe Intensity Measured In Candelas)
	Surface Mounted Branch Circuit Panel	S 15cd	Fire Alarm Strobe Only (Number Denotes Strobe Intensity Measured In Candelas)
	Flush Mounted Branch Circuit Panel	H	Horn
FACP	Fire Alarm Control Panel		Emergency Stop Push Button
FS	Fire Sprinkler System Flow Switch	WP	Denotes Weatherproof
TS	Fire Sprinkler System Tamper Switch		Television Outlet

SYMBOL NOTES:

1. ALL DEVICES, SWITCHES, OUTLETS, ETC. SHALL BE MOUNTED AT THE HEIGHTS ESTABLISHED IN THE AMERICANS WITH DISABILITIES ACT (ADA) AND ANY LOCAL CODES. IF ADA AND OTHER CODES HAVE CONFLICTING DATA, CONTRACTOR WILL DEFER TO THE MORE STRINGENT OF THE CODES.
2. ALL TELEPHONE, DATA, TELEVISION, SECURITY, POS AND JUNCTION BOXES SHALL BE INSTALLED WITH A ¾" CONDUIT WITH PULL STRING TO ABOVE ACCESSIBLE CEILING, UNLESS INDICATED OR NOTED OTHERWISE.

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MISSOURI REGISTRATION NUMBER 001512

95% REVIEW SET

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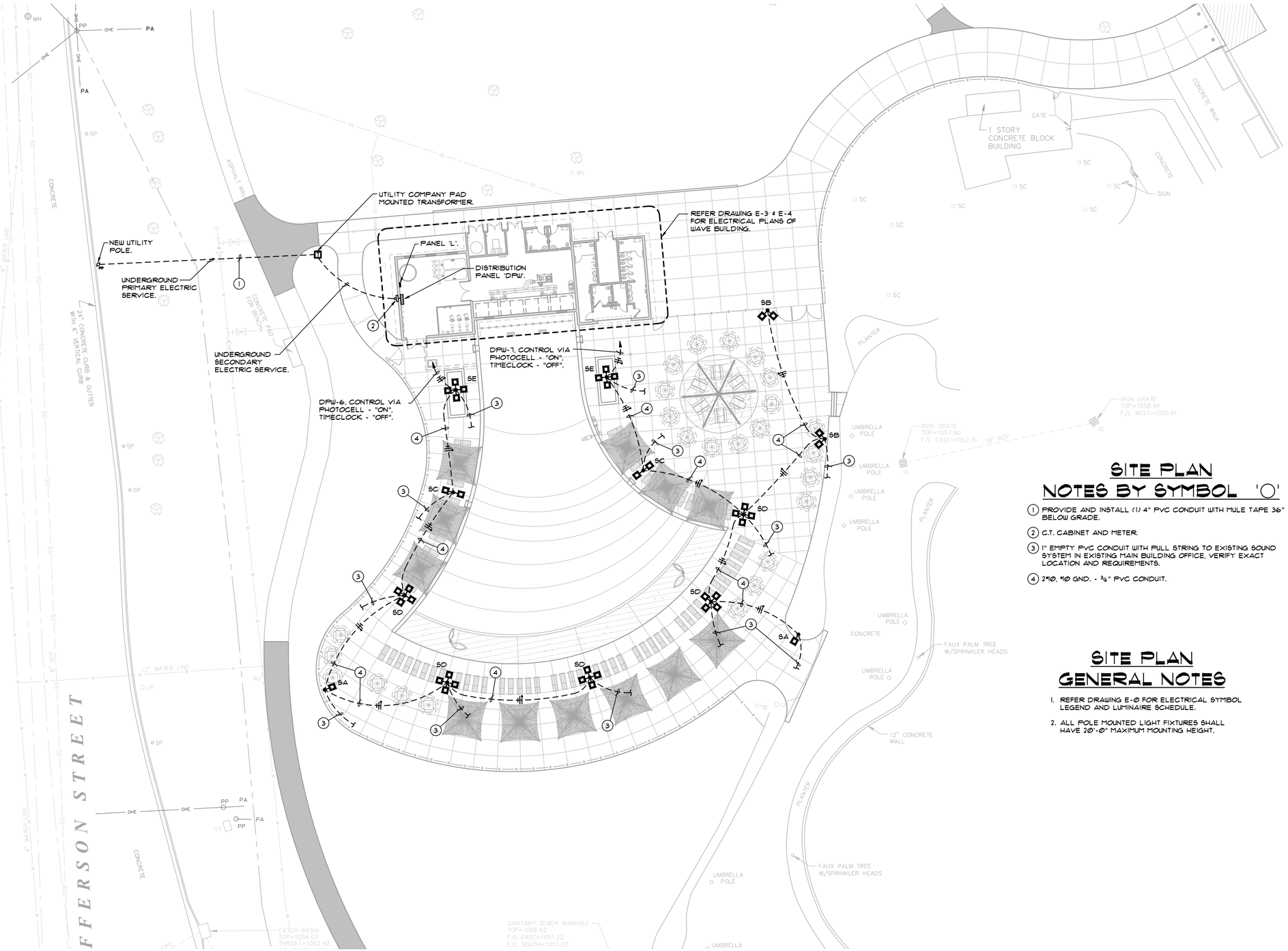
EA ENGINEERING ASSOCIATES
Engineer: JIM D. DALLAS, P.E.
P.E.# E-109913/3332 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

ELECTRICAL SYMBOL LEGEND
& LUMINAIRE SCHEDULE

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-0



SITE PLAN NOTES BY SYMBOL '○'

1. PROVIDE AND INSTALL (1) 4" PVC CONDUIT WITH MULE TAPE 36" BELOW GRADE.
2. C.T. CABINET AND METER.
3. 1" EMPTY PVC CONDUIT WITH PULL STRING TO EXISTING SOUND SYSTEM IN EXISTING MAIN BUILDING OFFICE, VERIFY EXACT LOCATION AND REQUIREMENTS.
4. 2#10, #10 GND. - ¾" PVC CONDUIT.

SITE PLAN GENERAL NOTES

1. REFER DRAWING E-0 FOR ELECTRICAL SYMBOL LEGEND AND LUMINAIRE SCHEDULE.
2. ALL POLE MOUNTED LIGHT FIXTURES SHALL HAVE 20'-0" MAXIMUM MOUNTING HEIGHT.

N

1 SITE PLAN - ELECTRICAL

SCALE: 1"=20'-0"

UTILITY CONTACTS

KCP&L

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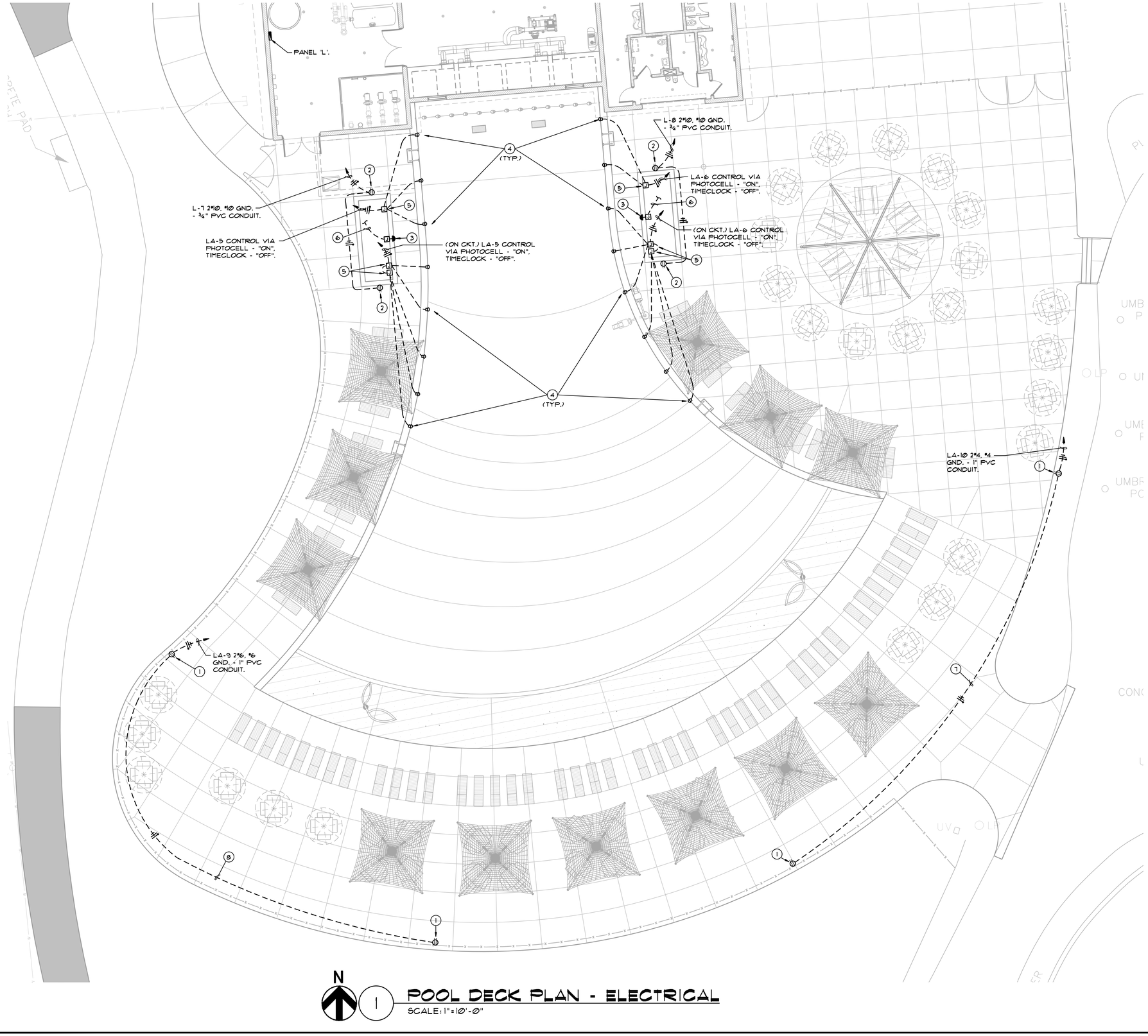
P.E. # E-109913/3332 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

SITE PLAN - ELECTRICAL

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-1



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POOL DECK PLAN - ELECTRICAL

SCALE: 1" = 10'-0"

POOL DECK PLAN NOTES BY SYMBOL '○'

1. PROVIDE AND INSTALL W.R. LISTED GFCI, 20A., 125V. DUPLEX RECEPTACLE MOUNTED IN GARD-N-POST PEDESTAL. REFER 2/E-6 FOR MOUNTING DETAIL.
2. PROVIDE AND INSTALL W.R. LISTED GFCI, 20A., 125V. DUPLEX RECEPTACLE WITH METAL 'IN USE' COVER EQUAL TO T4B *CKMUV SERIES.
3. PROVIDE AND INSTALL WEATHERPROOF EMERGENCY E-STOP PUSHBUTTON FURNISHED BY EQUIPMENT SUPPLIER, MOUNT TO 4" SQUARE POST. 'E-STOP' TO BE MOUNTED @ 48" A.F.G.
4. UNDERWATER LED POOL LIGHT FURNISHED BY POOL CONTRACTOR. REFER 'SP' DRAWINGS FOR ADDITIONAL INFORMATION AND INSTALLATION DETAILS.
5. WEATHERPROOF POOL LIGHT JUNCTION BOX SHALL BE EQUAL TO INTERMATIC *PJB SERIES. COORDINATE EXACT LOCATIONS WITH POOL CONTRACTOR. REFER 3/E-6 MOUNTING DETAIL.
6. 2#12, #12 GND. - ¾" PVC CONDUIT TO WAVE FAN CONTROLLER.
7. 2#4, #4 GND. - 1" PVC CONDUIT.
8. 2#6, #6 GND. - 1" PNC CONDUIT.

POOL DECK PLAN GENERAL NOTES

1. UNDERWATER POOL LIGHT, CORDS AND ASSOCIATED POOL LIGHT NICHES ARE FURNISHED BY THE POOL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE LOCATIONS AND CORD LENGTHS WITH POOL CONTRACTOR. REFER TO "SP" SERIES DRAWINGS FOR EXACT QUANTITIES, LOCATIONS AND MOUNTING DETAIL.
2. REFER DRAWING E-0 FOR ELECTRICAL SYMBOL LEGEND.

POOL AREA BONDING NOTE

1. PER N.E.C. ART. 680-26 AND ART. 250, BOND ALL METALLIC PARTS OF THE POOL INCLUDING ALL LADDERS, HAND RAILS, POOL REINFORCING STEEL, DECK REINFORCING STEEL, UNDERWATER LIGHT NICHES, DRAINS, GRATES, SKIMMERS, PUMPS, MOTORS, METAL JUNCTION BOXES, PLATFORM AND SLIDE SUPPORT STRUCTURES, METAL PIPING, ETC. REFER DRAWING 4/E-6 FOR TYPICAL POOL BONDING DETAIL.

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EA ENGINEERING ASSOCIATES
Engineer: JIM D. DALLAS, P.E.
P.E. # E-109913/8332 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

POOL DECK PLAN - ELECTRICAL

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-2

EA ENGINEERING ASSOCIATES
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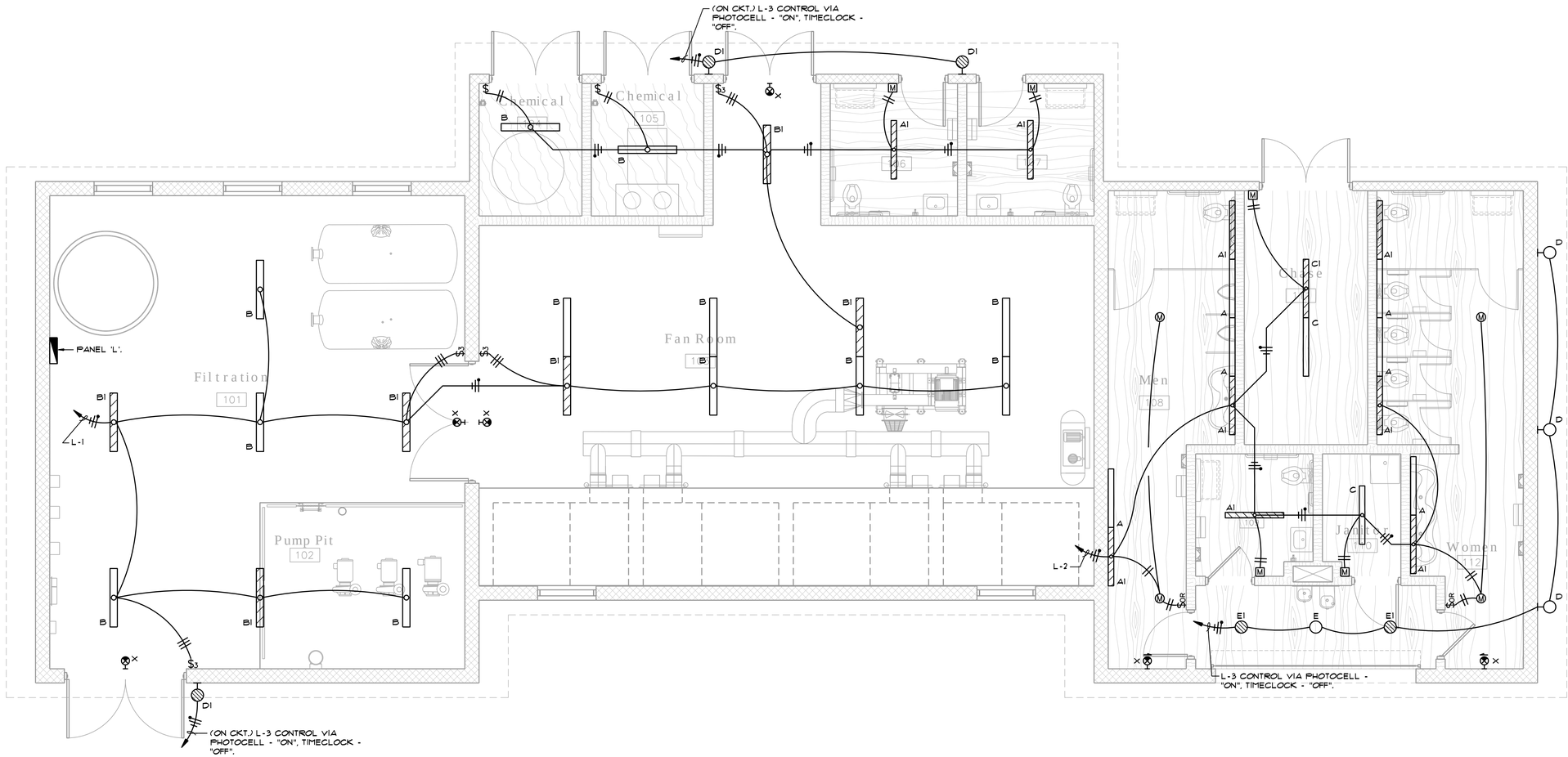

N

1 WAVE BUILDING PLAN - LIGHTING

SCALE: 1/4"=1'-0"

LIGHTING PLAN GENERAL NOTES

1. CONNECT ALL TYPE 'X' EMERGENCY EXIT SIGNS TO CIRCUIT L-4, CONNECT WITH 2#12, #12 GND. - ¾"C.
2. CONNECT ALL EMERGENCY BATTERY PACKS TO "LINE SIDE" OF FIXTURE CONTROL DEVICE FOR CONSTANT "HOT" TO BATTERY PACKS.
3. REFER DRAWING E-0 FOR ELECTRICAL SYMBOL LEGEND AND LUMINAIRE SCHEDULE.

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Engineer: JIM D. DALLAS, P.E.
P.E. # E-109913/3332 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE BUILDING PLAN - LIGHTING

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-3

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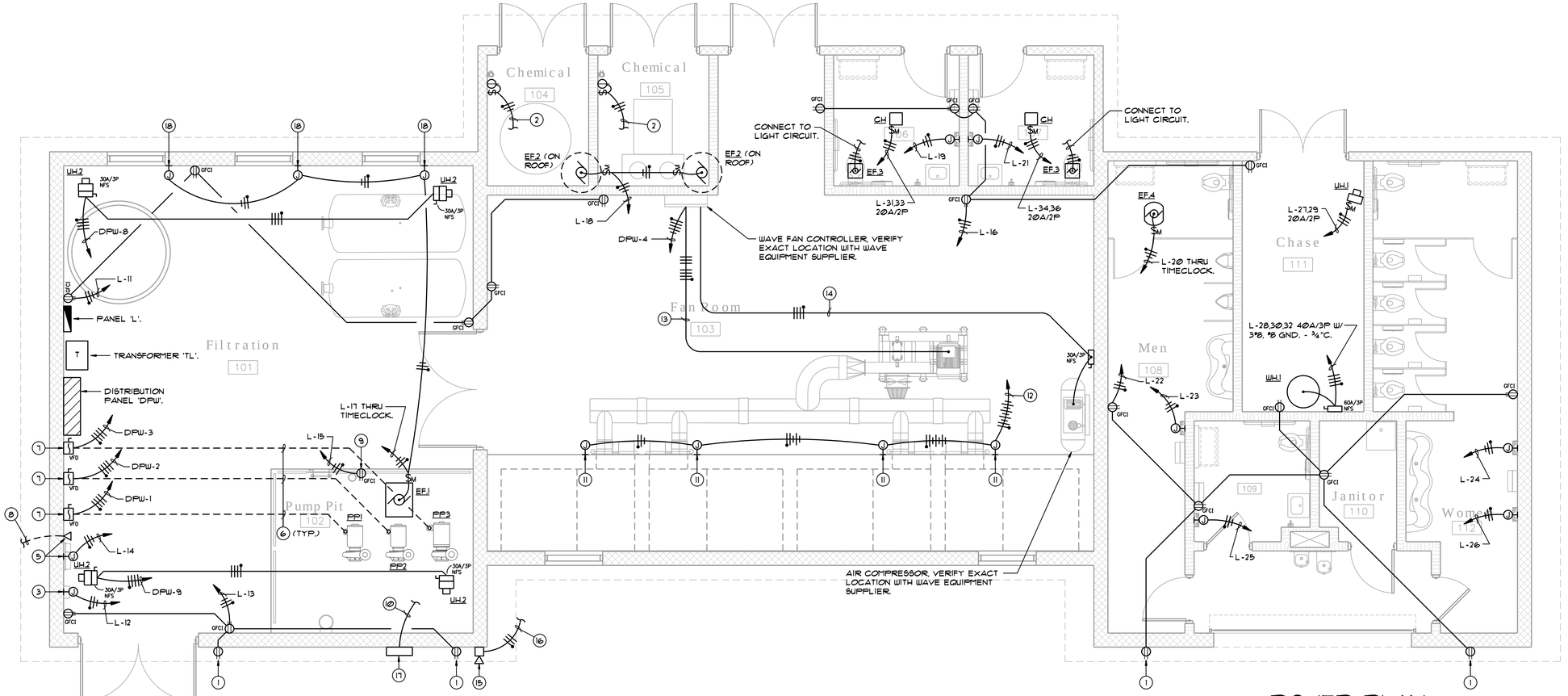

POWER PLAN GENERAL NOTES

1. REFER DISTRIBUTION PANEL 'DPW' SCHEDULE ON DRAWING E-5 FOR BREAKER, FEEDER AND CONDUIT SIZES NOT SHOWN.
2. PROVIDE NON-METALLIC DEVICE PLATES FOR CHEMICAL ROOMS #301 & #302.
3. ALL RECEPTACLES IN PUMP PIT AND FILTRATION AREA ARE TO HAVE METAL 'IN USE' COVER EQUAL TO T4B CKMUV SERIES.
4. REFER DRAWING E-0 FOR ELECTRICAL SYMBOL LEGEND.
5. REFER DRAWING E-5 FOR PANEL SCHEDULES.

N

1 WAVE BUILDING PLAN - POWER

SCALE: 1/4"=1'-0"

POWER PLAN NOTES BY SYMBOL '◯'

1. PROVIDE AND INSTALL WR. LISTED GFCI, 20A., 125V. DUPLEX RECEPTACLE WITH METAL 'IN USE' COVER EQUAL TO T4B *CKMUV SERIES.
2. 2#12, #12 GND. - 3/4"C. TO CHEMICAL CONTROLLER.
3. WATER LEVEL CONTROLLER.
4. MOUNT WEATHERPROOF J-BOXES AND WEATHERPROOF DATA OUTLETS AT 18" ABOVE CHEMICAL CONTROLLER. INTERLOCK CHEMICAL CONTROLLER WITH RECIRCULATION PUMP TO SUSPEND CHEMICAL FEEDING IN THE EVENT THE RECIRCULATION PUMP IS SHUT DOWN.
5. MOUNT J-BOXES AT 18" ABOVE CHEMICAL PUMPS, 2#12, #12 GND. - 3/4"C. TO CHEMICAL CONTROLLER.
6. ROUTE CONDUIT UNDERFLOOR FROM VFD TO PUMP. SURFACE MOUNTED CONDUIT ON PUMP PIT FLOOR NOT ALLOWED. REFER 5/E-6 FOR PUMP CONNECTION ROUTING DETAIL.
7. VARIABLE FREQUENCY DRIVE (VFD). VFD'S PROVIDED BY POOL CONTRACTOR AND INSTALLED BY ELECTRICAL CONTRACTOR. REFER TO 'SP' SERIES DRAWINGS FOR VFD SPECIFICATIONS.
8. 3/4" EMPTY PVC CONDUIT WITH PULL STRING TO EXISTING DATA/TELCOM IN EXISTING MAIN OFFICE. VERIFY EXACT LOCATION, ROUTING AND REQUIREMENTS.
9. PROVIDE AND INSTALL 20A., 125V., WR. LISTED, DUPLEX RECEPTACLE WITH METAL 'IN USE' COVER EQUAL TO T4B *CKMUV SERIES MOUNTED AT TOP OF PUMP PIT WALL FOR SUMP PUMP.
10. 14 #16GA. CONDUCTORS IN 3/4" CONDUIT TO WAVE FAN CONTROLLER.
11. WAVE FAN SOLENOID VALVES.
12. 8 #14, #14 GND. - 3/4"C. TO WAVE FAN CONTROLLER.
13. 6#1, #1 GND. - 2"C.
14. 3#12, #12 GND. - 3/4"C.
15. WAVE SYSTEM AUDIO / VISUAL ALARM, VERIFY MOUNTING HEIGHT.
16. 2#16, #16 GND. - 3/4"C. TO WAVE FAN CONTROLLER.
17. POOL SIDE REMOTE PANEL BY WAVE EQUIPMENT SUPPLIER, VERIFY EXACT LOCATION.
18. JUNCTION BOX FOR MOTORIZED DAMPER, INTERLOCK WITH EXHAUST FAN EF1.

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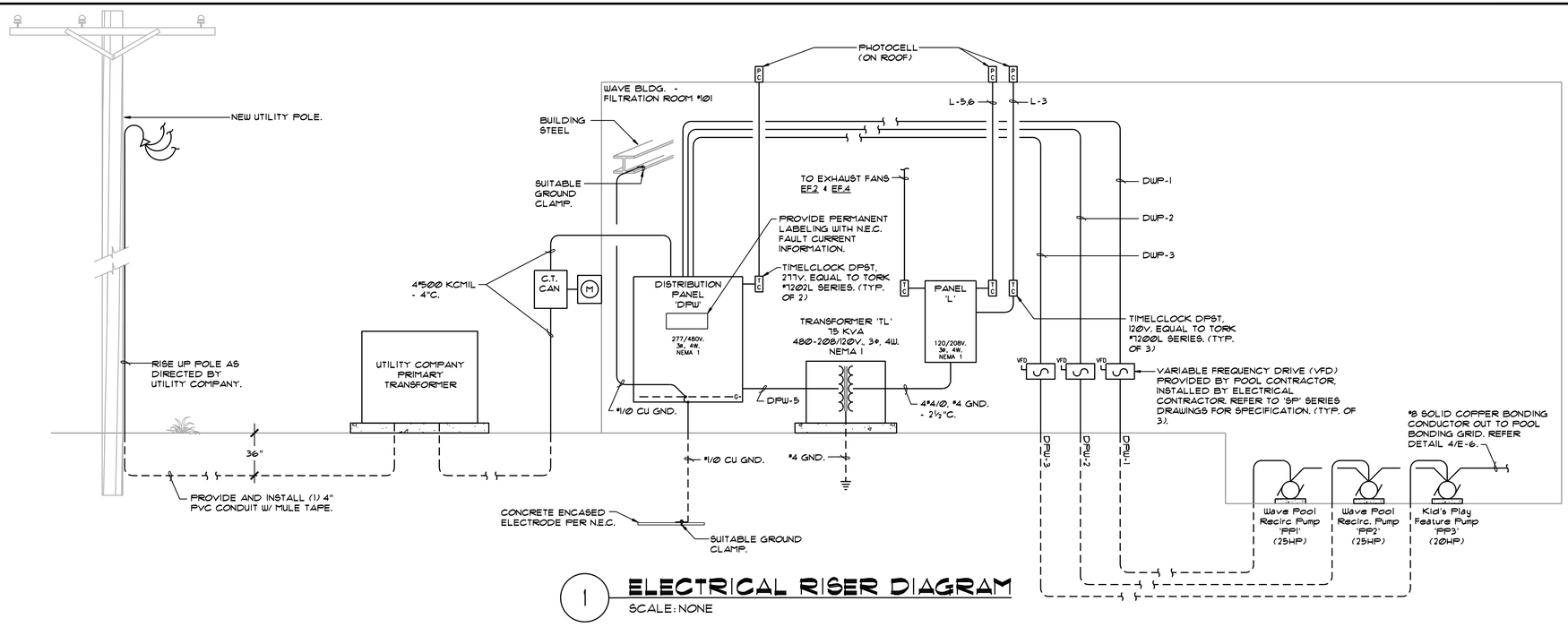
EA ENGINEERING ASSOCIATES
Engineer: JIM D. DALLAS, P.E.
P.E. # E-109913/8332 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE BUILDING PLAN - POWER

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-4



1 ELECTRICAL RISER DIAGRAM

SCALE: NONE

DISTRIBUTION PANEL 'DPW'

CIRCUIT	SERVES	BRANCH	TRIP	POLE	FEEDER	CONNECTED LOAD
DPW-1	Recirculation Pump 'PP1' (25HP)	70A.	70A.	3	3#8, #8 Gnd. - ¾"C.	28.3 KW
DPW-2	Recirculation Pump 'PP2' (25HP)	70A.	70A.	3	3#8, #8 Gnd. - ¾"C.	28.3 KW
DPW-3	Feature Pump 'PP3' (20HP)	50A.	50A.	3	3#8, #8 Gnd. - ¾"C.	22.4 KW
DPW-4	Wave Fan Controller	250A.	250A.	3	4#250 KCMIL, #4 Gnd. - 3"C.	74.8 KW
DPW-5	Transformer 'TL'	125A.	125A.	3	3#1, #6 Gnd. - 1½"C.	75.0 KW
DPW-6	Wave Pool "West" Lights	20A.	20A.	1	2#10, #10 Gnd. - ¾" PVC Conduit	3.5 KW
DPW-7	Wave Pool "East" Lights	20A.	20A.	1	2#10, #10 Gnd. - ¾" PVC Conduit	3.5 KW
DPW-8	(2) Unit Heaters UH.2	20A.	20A.	3	3#12, #12 Gnd. - ¾"C.	10.0 KW
DPW-9	(2) Unit Heaters UH.2	20A.	20A.	3	3#12, #12 Gnd. - ¾"C.	10.0 KW
DPW-10	Space	---	---	-	---	---
DPW-11	Space	---	---	-	---	---
DPW-12	Space	---	---	-	---	---
					TOTAL CONNECTED LOAD (KW)	255.8 KW
					TOTAL CONNECTED LOAD (AMPS)	308 Amps

PROJECT: Summit Waves - Wave Pool Addition, Lee's Summit, Missouri

SERVICE: 277/480V., 3Ph., 4W. **MAINS:** 400 Amp Fully Rated M.C.B. **MOUNTING:** Surface **PANEL LOCATION:** Wave Building - Filtration Room #101

SIZE: 400 Amps **A.I.C. RATING:** 35K **ENCLOSURE:** NEMA 1

PANEL 'L'

NOTES	DESCRIPTION	P - AMP	LOAD LIGHTING	LOAD POWER	PH / CKT #	LOAD POWER	LOAD LIGHTING	P - AMP	DESCRIPTION	NOTES
	Filtration / Fan Rm. Lights	1 - 20	856		1 A 2		725	1 - 20	Restroom Lights	
	Exterior Building Lights	1 - 20	240		3 B 4		20	1 - 20	Exit Signs	
1	West Pool Lights	1 - 20	560		5 C 6		560	1 - 20	East Pool Lights	1
	West Pool Deck Recepts.	1 - 20		1200	7 A 8	1200		1 - 20	East Pool Deck Recepts.	
	West Pool Deck Recepts.	1 - 20		1200	9 B 10	1200		1 - 20	East Pool Deck Recepts.	
	Filtration Receptacles	1 - 20		900	11 C 12	1200		1 - 20	Water Level Controller	
	Filtration Receptacles	1 - 20		900	13 A 14	1200		1 - 20	Chemical Controller	
	Sump Pump	1 - 20		720	15 B 16	900		1 - 20	Receptacles	
	Exhaust Fan EF.1	1 - 20		1176	17 C 18	400		1 - 20	(2) Exhaust Fans EF.2	
	Hand Dryer	1 - 20		1600	19 A 20	696		1 - 20	Exhaust Fan EF.4	
	Hand Dryer	1 - 20		1600	21 B 22	1080		1 - 20	Receptacles	
	Hand Dryer	1 - 20		1600	23 C 24	1600		1 - 20	Hand Dryer	
	Hand Dryer	1 - 20		1600	25 A 26	1600		1 - 20	Hand Dryer	
	Unit Heater UH.1	2 / 20		1100	27 B 28	3000		3 / 40	Water Heater WH	
				1100	29 C 30	3000				
	Ceiling Heater CH	2 / 20		1000	31 A 32	3000		2 / 20	Ceiling Heater CH	
	Space Only	1 - -	-----	-----	33 B 34	1000				
	Space Only	1 - -	-----	-----	35 C 36	1000		1 - -	Space Only	
	Space Only	1 - -	-----	-----	37 A 38	-----	-----	1 - -	Space Only	
	Space Only	1 - -	-----	-----	39 B 40	-----	-----	1 - -	Space Only	
	Space Only	1 - -	-----	-----	41 C 42	-----	-----	1 - -	Space Only	

LOAD SUMMARY	CONN. KW	N.E.C. DIV.	DIV. KW
LIGHTING	3.0	X 1.25	3.7
POWER	38.6	X 1.0	38.6
OTHER	0.0	X 1.0	0.0
TOTALS	41.5		42.3

POLES	42
SIZE	225 AMP
MAINS	225 AMP M.C.B.
VOLTS	120/208V., 3Φ, 4W
A.I.C.	10K
MOUNTING	Surface
ENCLOSURE	NEMA 1
PANEL AMPS	117
LOADS PER PHASE:	
PHASE A (KW)	15.4
PHASE B (KW)	13.5
PHASE C (KW)	12.6

PROJECT: Summit Waves - Wave Pool Addition, Lee's Summit, Missouri

PANEL LOCATION: Wave Building - Filtration Room #101

DATE: April 2019

NOTES:
1. Provide with 'GFCI' type circuit breaker.

FAULT CURRENT CALCULATIONS

PROJECT: Summit Waves - Wave Pool Addition

FAULT NO. : X1 - (Distribution Panel 'DPW')

SYSTEM Isca:

SYSTEM VOLTAGE: 277/480V., 3 Ph.

WIRE: #500 KCMIL CU — CONDUCTORS PER PHASE: 1

C-VALUE: 26,106 — DISTANCE: 50 L.F.

CONDUIT: PVC

MOTOR LOAD CONTRIBUTION: 740A. (400%)

CALCULATION

f = FACTOR — L = LENGTH

C = WIRE VALUE — V = VOLTS

M = MULTIPLIER — Isca = SHORT CIRCUIT AMPS AVAILABLE

$$f = \frac{1.732 \times 50 \times 23,530}{26,106 \times 480}$$

f = 0.1590

$$M = \frac{1}{1 + f}$$

M = 0.8628

Isca = 23,530 x 0.8628 = 20,302A.

MOTOR CONTRIBUTION = 740A.

TOTAL Isca @ X1 = 21,042A.

RISER DIAGRAM GENERAL NOTES

1. THE ROUTING OF CONDUCTORS AND LOCATION OF EQUIPMENT SHOWN ON THIS DRAWING IS FOR DIAGRAMMATIC PURPOSES ONLY.
2. REFER DISTRIBUTION PANEL 'DPW' SCHEDULE ON THIS DRAWING FOR BREAKER, FEEDER AND CONDUIT SIZES NOT SHOWN.

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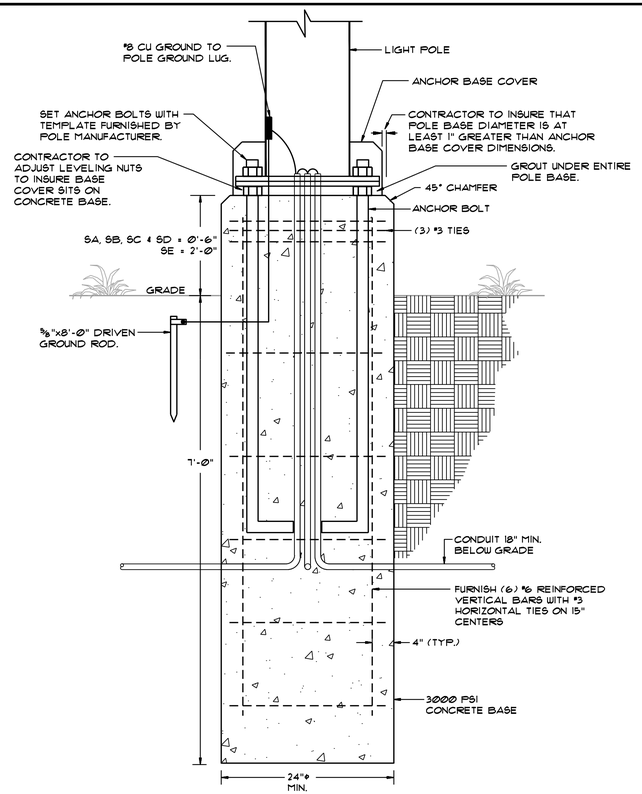
EA ENGINEERING ASSOCIATES
Engineer: JIM D. DALLAS, P.E.
P.E. # E-109913/3332 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

ELECTRICAL RISER DIAGRAM & PANEL SCHEDULES

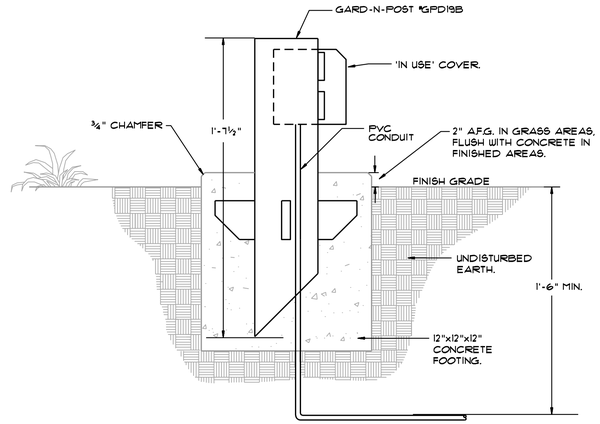
Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-5



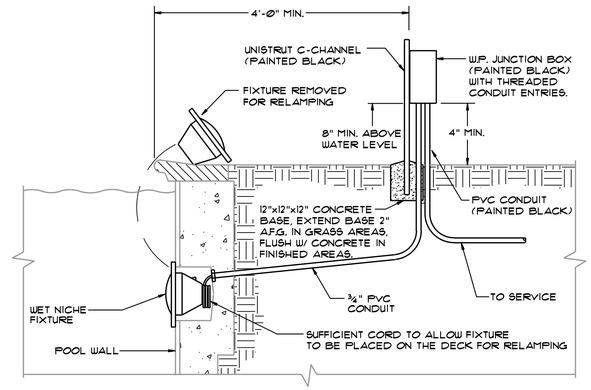
1 TYPICAL POLE BASE DETAIL

SCALE: NONE



2 GROUND MOUNTED DUPLEX RECEPTACLE DETAIL

SCALE: NONE

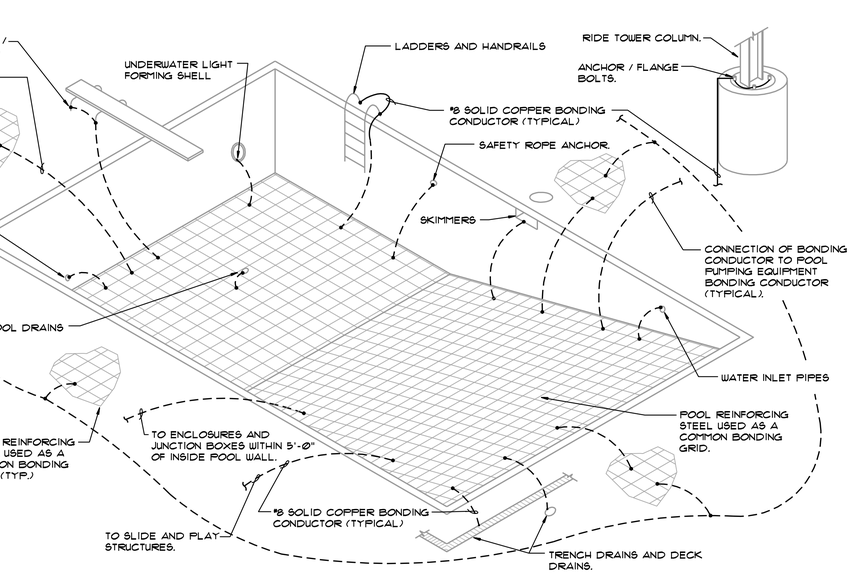


NOTE:

1. UNDERWATER POOL LIGHT ARE FURNISHED BY THE POOL CONTRACTOR AND INSTALLED BY THE ELECTRICAL CONTRACTOR. ASSOCIATED POOL LIGHT JUNCTION BOXES FURNISHED AND INSTALLED BY THE ELECTRICAL CONTRACTOR. COORDINATE CORD LENGTHS WITH POOL CONTRACTOR. REFER TO "SP" DRAWINGS FOR EXACT QUANTITIES AND LOCATIONS.
2. ALL DISTANCES SHOWN ARE BASED ON N.E.C. ART. 680.

3 POOL LIGHT JUNCTION BOX MOUNTING DETAIL

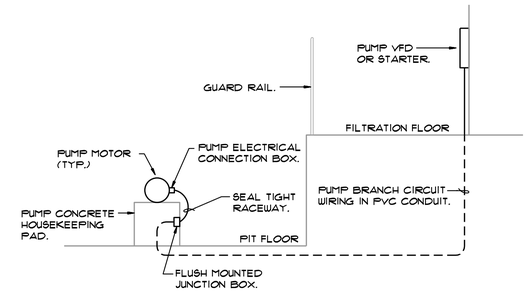
SCALE: NONE



NOTE:
CONTRACTOR SHALL SUBMIT LETTER AS PART OF CLOSE OUT DOCUMENTS TO OWNER CERTIFYING BONDING IS INSTALLED PER NEC ART. 680-26 AND ART. 250.

4 TYPICAL POOL BONDING DETAIL

SCALE: NONE



5 TYPICAL PUMP CONNECTION ROUTING DETAIL

SCALE: NONE

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Engineer: JIM D. DALLAS, P.E.
P.E. # E-109913833 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

ELECTRICAL DETAILS

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

SHEET
E-6

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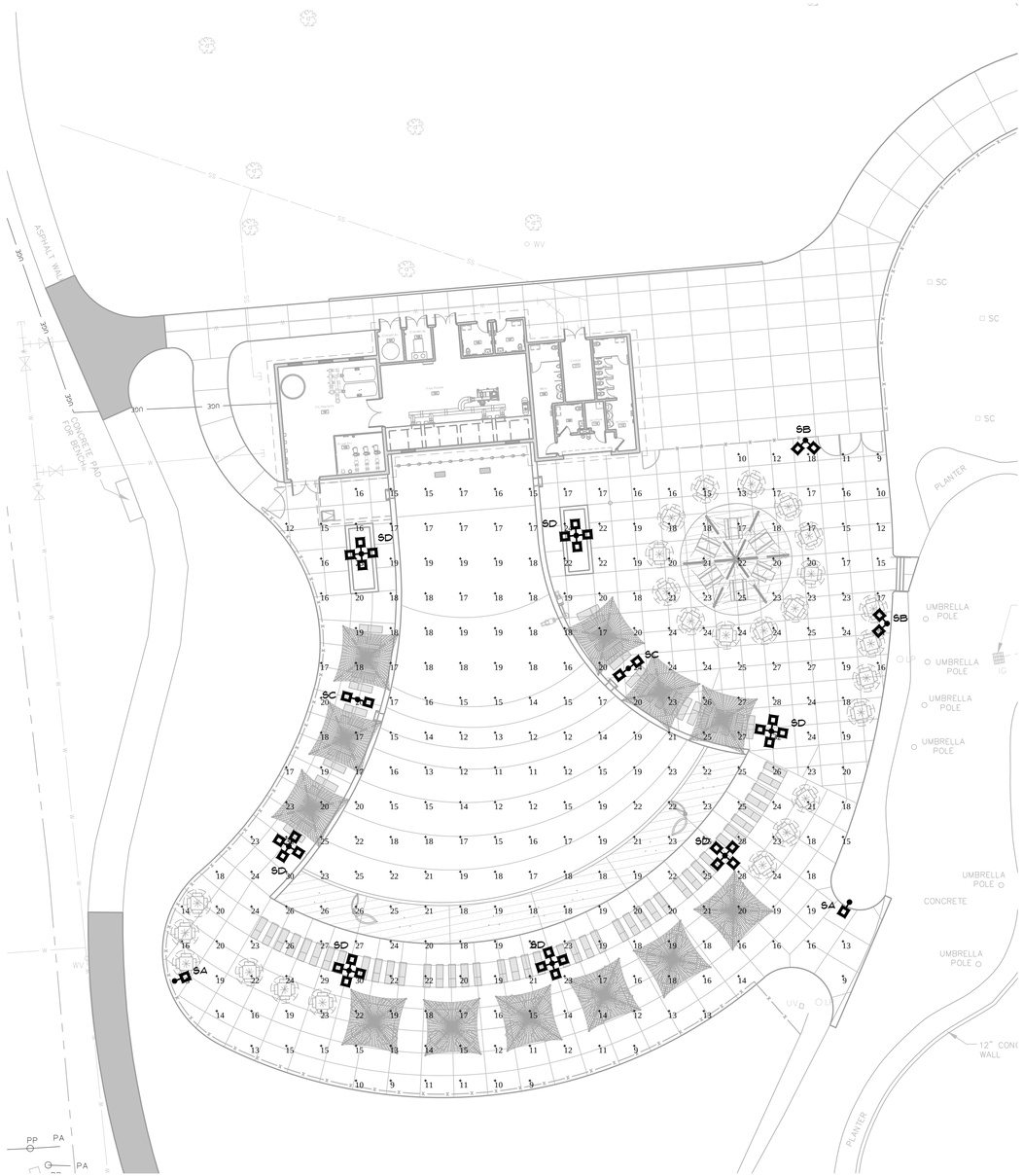

Luminaire Schedule									
Symbol	Label	Qty	Arrangement	Manufacturer & Part Number	LLF	Lum. Lumens	Lum. Watts	Total Watts	Filename
	SA	2	SINGLE	BEACON VP-L-80L-180-4K7-4 [SINGLE]	0.900	22167	181.3	362.6	VP-L-80L-180-4K7-4 (1).ies
	SB	2	2 @ 90 DEGREES	BEACON VP-L-80L-180-4K7-4 [2@90]	0.900	22167	181.3	725.2	VP-L-80L-180-4K7-4 (1).ies
	SC	2	BACK-BACK	BEACON VP-L-80L-180-4K7-4 [2@180]	0.900	22167	181.3	725.2	VP-L-80L-180-4K7-4 (1).ies
	SD	7	4 @ 90 DEGREES	BEACON VP-L-80L-180-4K7-4 [4@90]	0.900	22167	181.3	5076.4	VP-L-80L-180-4K7-4 (1).ies

Calculation Summary										
Label	CalcType	Units	PtSpcLr	PtSpcTb	Avg	Max	Min	Avg/Min	Max/Min	Description
CalcPts_1	Illuminance	Fc	10	10	18.67	32	9	2.07	3.56	Readings taken at 0'-0" AFF
Wave Pool	Illuminance	Fc			17.74	26	11	1.61	2.36	

N

1 WAVE POOL PHOTOMETRICS

SCALE: 1"=20'-0"

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Engineer: JIMMY DALLAS, P.E.
P.E. # E-109913833 Date: April 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL PHOTOMETRICS

Scale:	AS SHOWN
Designed by:	JW
Drawn by:	CAD
Checked by:	JW
Date:	04/15/2019
Project No.	064538700

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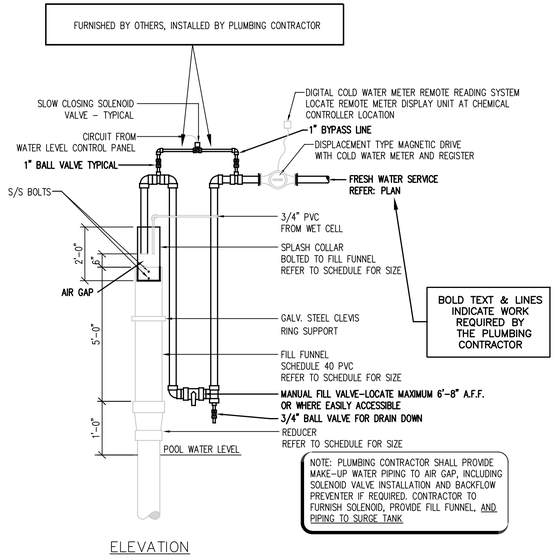
SHEET
E-7



2 DETAIL - POOL FILLER

SCALE: NOT TO SCALE

SPECIAL NOTE

1. REFER TO SPECIFICATION SECTION 15430 FOR DRAINAGE FIXTURES AND 15440 FOR PLUMBING FIXTURES.
2. FIXTURE MOUNTING HEIGHTS SHALL BE COMPLIANT WITH ALL FEDERAL AND STATE ACCESSIBILITY REQUIREMENTS.
3. REFER TO ARCHITECTURAL DRAWINGS AND SPECIFICATIONS FOR ELEVATIONS RELATIVE TO FIXTURE MOUNTING REQUIREMENTS.
4. UNLESS OTHERWISE SHOWN ON DWGS., THIS CONTR. SHALL BE RESPONSIBLE FOR SIZING DOMESTIC WATER PIPING IN CHASES, ETC. TO INDIVIDUAL FIXTURES. WHEN PIPING SERVES FLUSH VALVES, COLD WATER PIPE SHALL EXTEND FULL SIZE TO END OF PIPE CHASE RUN AND A SHOCK ABSORBER INSTALLED. ALL PIPE SHALL BE SIZED ACCORDING TO THE FIXTURE UNIT CRITERIA ESTABLISHED IN THE UNIFORM PLUMBING CODE.
5. MAINTAIN MINIMUM 10'–0" BETWEEN OUTDOOR AIR INTAKES AND EXHAUST OUTLETS AND PLUMBING VENTS.

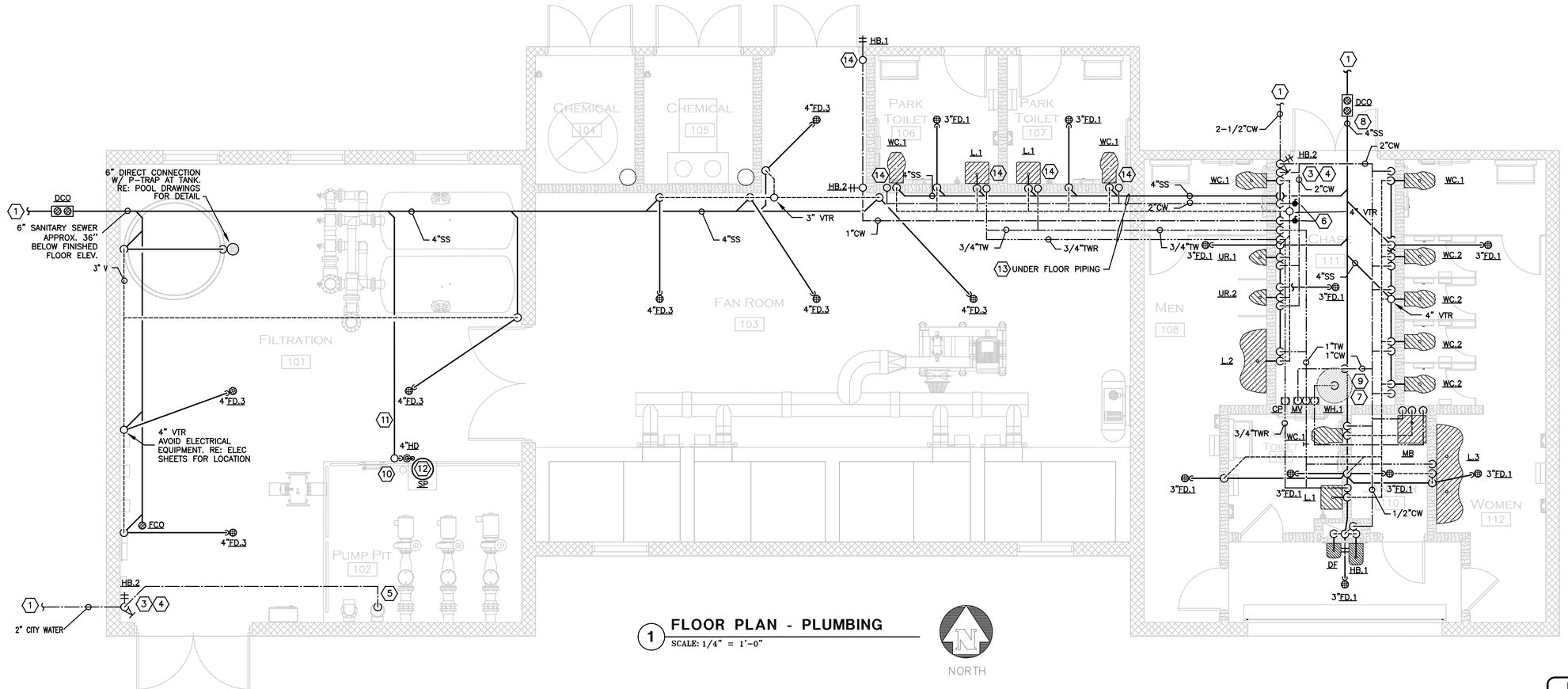
WSFU CALCULATIONS

FIXTURES PLAN MARK	DESCRIPTION	QUANTITY	WSFU LOADS COLD	HOT	TOTAL	TOTALS
WC.1&2	FLUSH VALVE WC	9	10.0	–	10.0	90.0
UR.1&2	FLUSH VALVE UR	2	5.0	–	5.0	10.0
L.1,2,3	LAVATORY	8	0.5	0.5	0.7	5.6
MB	MOP BASIN	1	1.0	1.0	1.4	1.4
DF	DRINKING FOUNTAIN	2	0.25	–	0.25	0.5
TOTAL WSFU						107.5

WSFU CALCULATIONS PER 2012 IPC TABLE
E103.3(2) LOAD VALVES ASSIGNED TO FIXTURES

NOTES BY SYMBOL: " ⬡ "

1. CONNECT TO SITE UTILITY SERVICE VERIFY REQUIREMENTS WITH LOCAL SERVICE PROVIDER.
2. THIS LINE WILL BE AT LEAST 12" BELOW FINISHED FLOOR. REFER TO ARCH. DOCUMENTS FOR ELEVATION.
3. INSTALL HOSE BIBB AT 12" ABOVE PUMP FLOOR.
4. PROVIDE VALVE IN RISER 24" ABOVE FLOOR PENETRATION.
5. REFER TO DETAIL THIS SHEET FOR FILL PIPING.
6. BRANCH LINE ISOLATION VALVES.
7. T&P DRAIN ROUTED TO FLOOR DRAIN. TERMINATE IN ACCORDANCE WITH LOCAL CODE.
8. THIS LINE WILL BE AT LEAST 12" BELOW FINISHED FLOOR. REFER TO ARCH. DOCUMENTS FOR ELEVATION. REFER TO POOL DRAWINGS FOR TANK DRAIN PIPING.
9. FLOOR MOUNTED WATER HEATER RE: P–2 FOR SCHEDULE AND WATER HEATER INSTALLATION DETAIL.
10. INSTALL PIPING TIGHT TO PUMP PIT WALL, BELOW FILTRATION FINISHED FLOOR ELEVATION.
11. THIS LINE WILL BE AT LEAST 12" BELOW FILTRATION FINISHED FLOOR. REFER TO ARCH. DOCUMENTS FOR ELEVATION. REFER TO POOL DRAWINGS FOR TANK DRAIN PIPING.
12. SUMP PUMP EQUIVALENT TO LITTLE GIANT #ES–60, 115 V, 10.3 AMPS, 98 GPM, 15' HD. 2" DISCHARGE INTO 4" HUB DRAIN.
13. ALL UNDER FLOOR SUPPLY PIPING TO BE BURIED AT A DEPTH BELOW THE FROST LINE.
14. PIPING UP FROM BELOW TO FIXTURE.



1 FLOOR PLAN - PLUMBING

SCALE: 1/4" = 1'–0"

NORTH

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P.E. JIM D. DALLAS
Lic. No. E–19991 Date APRIL 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

FLOOR PLAN - PLUMBING

Scale:	AS SHOWN
Designed by:	E.A.
Drawn by:	KCW
Checked by:	JDD
Date:	04/15/2019
Project No.	064538700

SHEET
P-1

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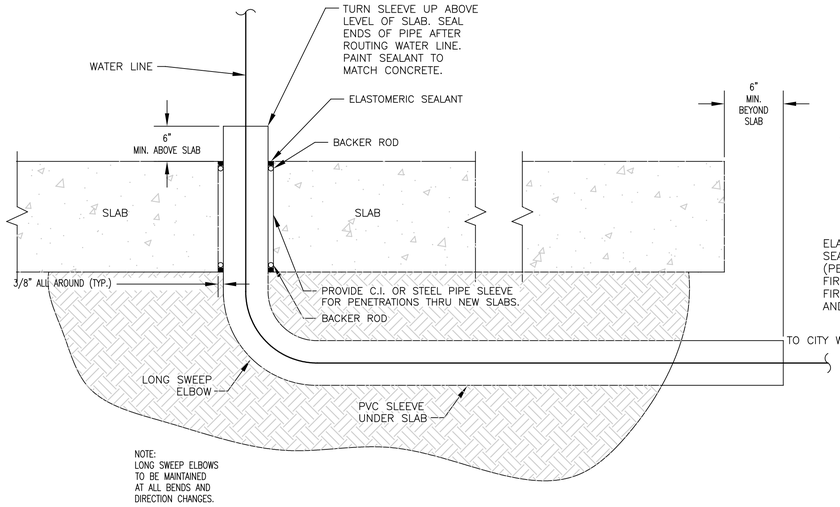
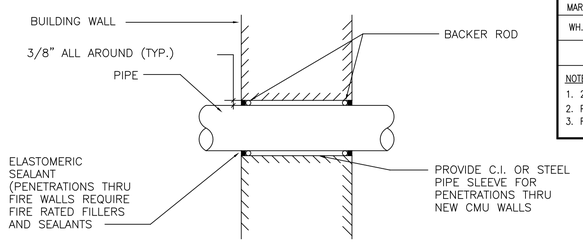


1 WATER LINE FLOOR PENETRATION DETAIL
SCALE: NOT TO SCALE



2 PIPE SLEEVE DETAIL
SCALE: NOT TO SCALE

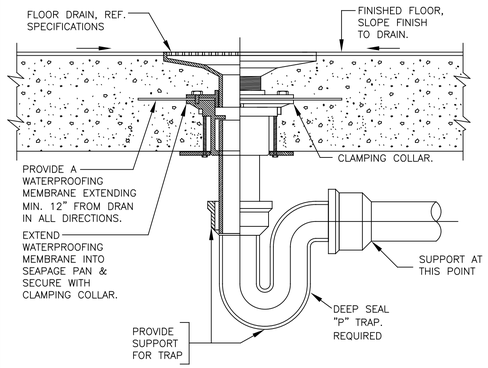
WATER HEATER SCHEDULE

MARK	DESCRIPTION	TYPE	INPUT KW	USABLE GAL	RECOVERY GPM @ 90°F RISE	MOUNTING	MANUFACTURER	NAME	MODEL NO.	NOTES
WH.1	WATER HEATER	ELEC	9	48	42	FLOOR	BRADFORD WHITE	COMMERCIAL	50A-9-3	1,2,3

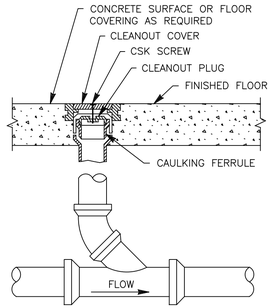
NOTES:
1. 208V/3ø/60Hz
2. PROVIDE A TOTAL OF (1) ONE UNIT.
3. FURNISH AND INSTALL RETURN WATER CIRCULATOR.

PLUMBING GENERAL NOTES

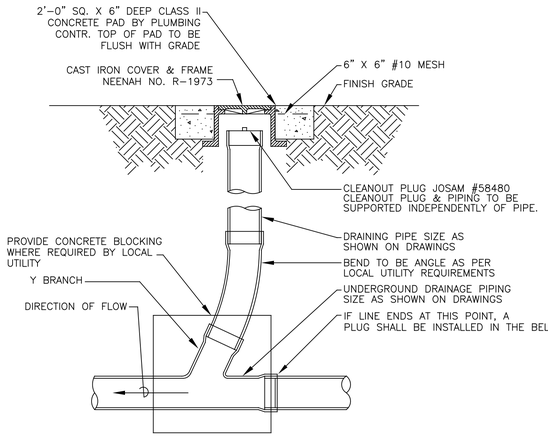
1. ALL PIPING SHOWN IS ABOVE CEILING OR TIGHT TO BOTTOM OF SUPPORT STRUCTURE WHERE STRUCTURE IS EXPOSED, UNLESS OTHERWISE NOTED.
2. SECURE AND VERIFY ALL MEASUREMENTS AND CONDITIONS AT JOB BEFORE PROCEEDING WITH FABRICATION OF WORK.
3. PROVIDE ALL ADDITIONAL STEEL, HANGER MATERIALS, RODS & CLAMPS AS REQUIRED FOR COORDINATION W/ WORK OF OTHER TRADES.
4. THE CONTRACTOR IS RESPONSIBLE FOR FIRESTOPPING AT ALL PENETRATIONS OF FIRE AND SMOKE RATED STRUCTURES, FLOORS AND PARTITIONS. REFER TO ARCHITECTURAL FLOOR PLANS FOR LOCATIONS OF ALL RATED STRUCTURES.
5. PIPING LAYOUT IS ONLY SCHEMATIC, EXACT LOCATION OF PIPES TO BE COORDINATED WITH BUILDING STRUCTURE AND WORK OF OTHER CONTRACTORS.
6. CONCEAL PIPING WHENEVER POSSIBLE UNLESS OTHERWISE NOTED.
7. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING PLUMBING IN AREA OF RENOVATION PRIOR TO BIDDING AND CONSTRUCTION.
8. RUN ALL PIPING LEVEL EXCEPT FOR THE SLOPES REQUIRED FOR DRAINAGE AND VENTING..
9. COORDINATE EXACT LOCATION OF FLOOR AND HUB DRAINS FOR KITCHEN EQUIPMENT WITH KITCHEN CONTRACTOR AND HUB DRAIN FOR CONDENSATE WITH ARCHITECT.
10. SUPPORT CAST IRON SAN. AND STORM PIPING NOT IN EARTH, ON 5'-0" CENTERS, ALL STEEL PIPING ON 10'-0" CENTERS, COPPER PIPING ON 8'-0" CENTERS.
11. WORK SHALL BE INSTALLED IN ACCORDANCE WITH THE LOCAL PLUMBING CODE.
12. PROVIDE CLEANOUTS AT BASE OF ALL STORM DOWNSPOUTS AND SAN STACKS.
13. PROVIDE CLEANOUTS AT NOT MORE THAN 50 FT. APART IN HORIZONTAL STORM & SAN. DRAINAGE LINES 4" SIZE OR LESS, AND NOT MORE THAN 100 FT. APART FOR LARGER PIPES.
14. PROVIDE CLEANOUTS AT EACH CHANGE OF DIRECTION GREATER THAN 45° IN THE BUILDING DRAIN (SANITARY PIPING BELOW FLOOR SLAB).
15. INSTALL TEST CLEANOUTS AT CONNECTIONS TO EXISTING SANITARY SYSTEMS.
16. ALL FIXTURES TO BE EQUIPPED. WITH STOP VALVES IN ACCESSIBLE LOCATION.
17. UNLESS OTHERWISE SHOWN ON DWGS., THIS CONTR. SHALL BE RESPONSIBLE FOR SIZING DOMESTIC WATER PIPING IN CHASES, ETC. TO INDIVIDUAL FIXTURES. WHEN PIPING SERVES FLUSH VALVES, COLD WATER PIPE SHALL EXTEND FULL SIZE TO END OF PIPE CHASE RUN AND A SHOCK ABSORBER INSTALLED. WHEN COLD WATER PIPE IS 2" OR AB. AND SERVES FLUSH VALVES, PIPE MAIN IN CHASE CAN ONLY BE REDUCED TO 1 1/2" SIZE. 1/2" HOT WATER PIPE SHALL SERVE UP TO FOUR (4) LAVS. OTHER PIPE SIZING CRITERIA SHALL BE AS OUTLINED IN "ASHRAE 1989 FUNDAMENTALS HANDBOOK".
18. NO LIQUID TRANSMISSION PLBG. UTILITY PIPING IS TO RUN AB. ELEC. SWITCHGEAR OR PANELS. MAKE ADJUSTMENTS NECESSARY TO REROUTE PIPING FOR ACTUAL INSTALLATION OF ELEC. EQUIP.
19. NO LIQUID TRANSMISSION PLBG. UTILITY PIPING IS TO RUN THRU OR AB. ELEC. UTILITY, TELE. EQUIP. OR ELEVATOR MACHINE RM'S. OR CLOSETS (INCLUDING ELEVATOR SHAFTS), EXCEPT FOR PIPING SERVING EQUIP. OR DEVICES FOR THAT SPECIFIC AREA. PROVIDE DRIP PANS BELOW ANY LIQUID TRANSMISSION PIPING THAT IS REQ'D. IN THESE AREAS.



3 FLOOR DRAIN DETAIL
SCALE: NOT TO SCALE



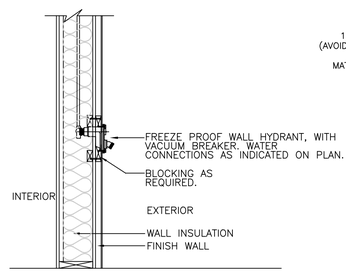
4 FLOOR CLEANOUT DETAIL
SCALE: NOT TO SCALE



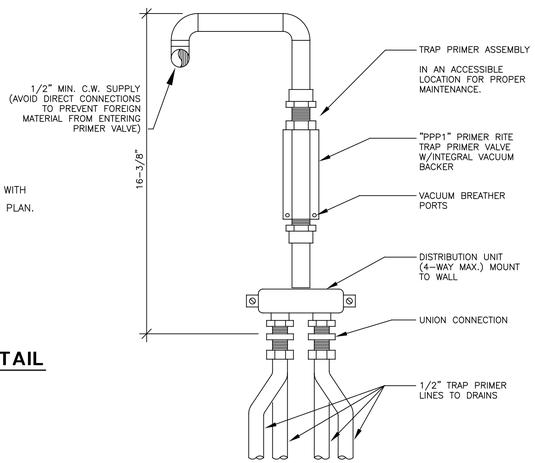
5 GRADE CLEANOUT DETAIL (DOUBLE SIMILAR)
SCALE: NOT TO SCALE

PIPING LEGEND

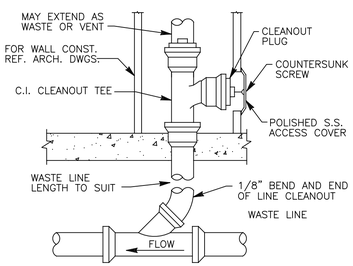
———	SOIL AND/OR WASTE PIPE (SS)
- - - - - - - -	VENT PIPE (V)
———	DOMESTIC COLD WATER SUPPLY (DCWS)
———	DOMESTIC HOT WATER SUPPLY (DHWS)
——D———	DRAIN LINE (D)
——G———	GAS LINE (G)
FD ⊕ C	FLOOR DRAIN WITH P-TRAP & TRAP PRIMER
HD ○ C	HUB DRAIN WITH P-TRAP
FCO ⊗	FLOOR CLEANOUT
WCO ⊢	WALL CLEANOUT
	VENT THRU ROOF (VTR)
	BALL VALVE
	GATE VALVE



6 HOSE BIB CONNECTION DETAIL

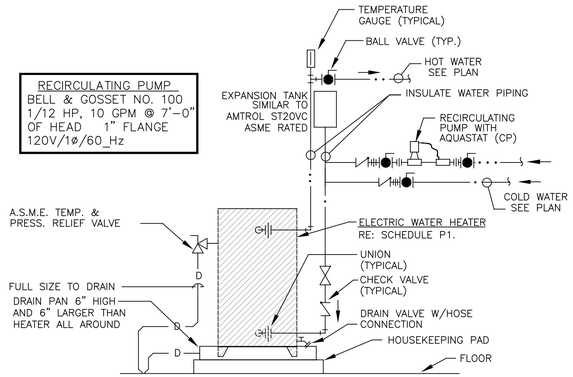


7 TRAP PRIMER VALVE DETAIL



8 WALL CLEANOUT DETAIL
SCALE: NOT TO SCALE

RECIRCULATING PUMP
BELL & GOSSET NO. 100
1/12 HP, 10 GPM @ 7'-0" OF HEAD 1" FLANGE
120V/1ø/60_Hz



9 ELECTRIC WATER HEATER DETAIL
SCALE: NOT TO SCALE

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EA ENGINEERING ASSOCIATES
P.E. JIM D. DALLAS
Lic. E-19991/36332 Date APRIL 2019

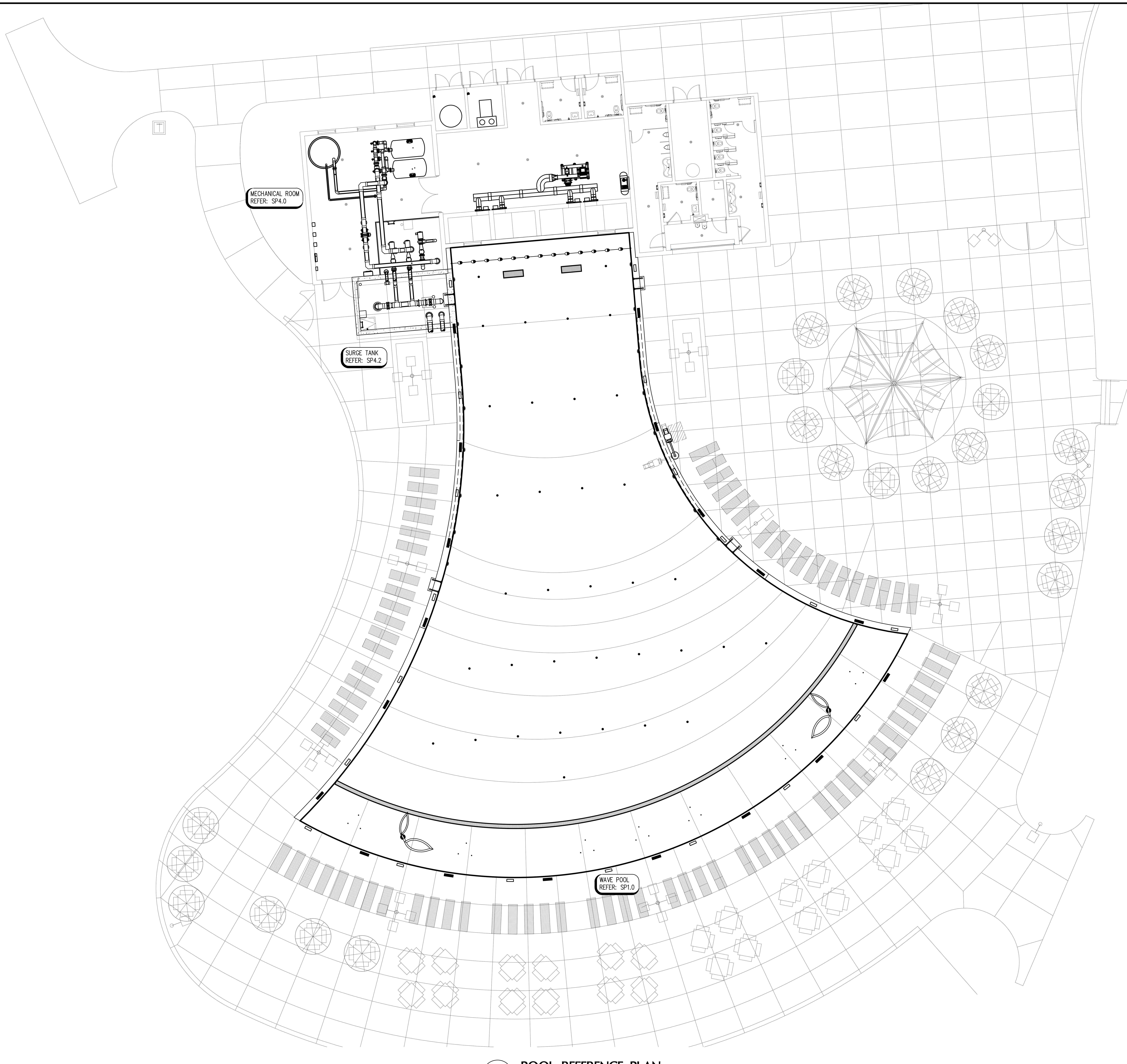
SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

SCHEDULES & DETAILS - PLUMBING

Scale:	AS SHOWN
Designed by:	E.A.
Drawn by:	KCW
Checked by:	JDD
Date:	04/15/2019
Project No.	064538700

SHEET
P-2

EA ENGINEERING ASSOCIATES
Ph: 325.365.3725 Fx: 325.365.5278
225 CR 288 Ballinger, TX 76821



1 SP0.0 **POOL REFERENCE PLAN**
3/32" = 1'-0"

DESIGN DATA

	UNITS	POOL
LENGTH	FT.	VARIES
WIDTH	FT.	VARIES
WATER SURFACE AREA	SQ. FT.	8,006
PERIMETER	FT.	407
VOLUME	GALLON	152,491
CIRCULATION SYSTEM & FILTERS		
POOL TURNOVER RATE	HOUR	1.59
RECIRCULATION RATE	GPM	1,600
FILTRATION RATE (MAX. DESIGN)	GPM/SQ. FT.	12.5
FILTER AREA REQUIRED	SQ. FT.	128
FILTRATION RATE (ACTUAL)	GPM/SQ. FT.	11.2
FILTRATION AREA (ACTUAL)	SQ. FT.	142.8
FILTER BACKWASH RATE	GPM/SQ. FT.	15
BACKWASH FLOW RATE (PER FILTER)	GPM	536
SURGE CAPACITY	GALLON	8,415
SEWER CAPACITY	GPM	350
DESIGN FILL RATE	GPM	106
DESIGN FILL TIME	HOUR	24
BATHER LOAD	PERSON	400

GENERAL POOL NOTES

1. ⯐ DENOTES WATER DEPTH FROM WATER LEVEL.
2. POOL INTERIOR FINISH SHALL BE HIGH-BUILD EPOXY POOL PAINT WITH CONTRASTING MARKINGS WHERE INDICATED. POOL BEAM ABOVE WATERLINE SHALL BE PROVIDED WITH A SCULPTED ROCKWORK FINISH. CERAMIC TILE SHALL BE INSTALLED FOR ALL DEPTH MARKINGS AND WARNING SIGNS.
3. ALL POOL FLOOR AREAS 18" AND SHALLOWER SHALL HAVE A SLIP RESISTANT FINISH.
4. TYPICAL POOL DIMENSIONS SHOWN ARE FROM INSIDE FINISHED POOL WALL.
5. REFER TO POOL STRUCTURAL DRAWINGS FOR ALL DIMENSIONS RELATING TO THE THICKNESS OF THE POOL SHELL.
6. THE JUNCTION BETWEEN THE SWIMMING POOL WALL AND THE FLOOR SHALL BE COVED WITH A MAXIMUM 6" RADIUS.
7. DEPTH MARKERS AND WARNING SIGNS ARE SHOWN IN APPROXIMATE LOCATIONS. DEPTH MARKERS AND WARNING SIGNS SHALL NOT EXCEED 25'-0" APART FROM EACH OTHER, AND SHALL BE PLACED AT EVEN FOOT INTERVALS PER LOCAL CODE.
8. ALL PROPRIETARY NAMES MENTIONED ARE TO DESIGNATE PERFORMANCE STANDARDS. EQUIVALENT PRODUCTS SHALL BE SUBMITTED FOR APPROVAL.
9. SLIP RESISTANT DECK FINISH REQUIRED. REFER TO ARCHITECT.
10. REFER TO L & P SHEETS FOR DECK DRAINS AND HOSE BIBBS.
11. ALL SURFACE WATER SHALL DRAIN AWAY FROM THE POOL.
12. REFER TO ELECTRICAL FOR GFI OUTLETS IN ON POOL DECK.
13. ELECTRICAL INSPECTOR SHALL APPROVE INSTALLATION OF BONDING GRID FOR POOL REINFORCING AND ALL POOL EMBEDS PRIOR TO PLACEMENT OF CONCRETE.
14. NO GROUND WATER SHALL BE ALLOWED TO RISE ABOVE ANY PORTION OF THE POOL BOTTOM DURING CONSTRUCTION.
15. ALL POOL REINFORCING STEEL, METAL FITTINGS, EQUIPMENT WITHIN 5'-0" OF POOL EDGE AND ANY METAL PARTS OF POOL EQUIPMENT IN CONTACT WITH POOL RECIRCULATION SYSTEM SHALL BE BONDED PER NEC 680. REFER: 3/SP4.5

DRAWING INDEX

SHEET	DESCRIPTION
SP0.0	POOL REFERENCE PLAN
SP1.0	WAVE POOL PLAN
SP1.1	WAVE POOL SECTIONS
SP1.2	WAVE POOL DETAILS
SP1.3	WAVE POOL DETAILS
SP2.0	WAVE POOL LOCATION POINT PLAN
SP3.0	WAVE POOL SUCTION PIPING PLAN
SP3.1	WAVE POOL RETURN PIPING PLAN
SP4.0	WAVE POOL MECHANICAL ROOM PLAN
SP4.1	WAVE POOL MECHANICAL ROOM SECTIONS
SP4.2	SURGE TANK PLAN & SECTIONS
SP4.3	MECHANICAL DETAILS
SP4.4	MECHANICAL DETAILS
SP4.5	MECHANICAL DETAILS
SP5.0	SYSTEMS SCHEMATIC

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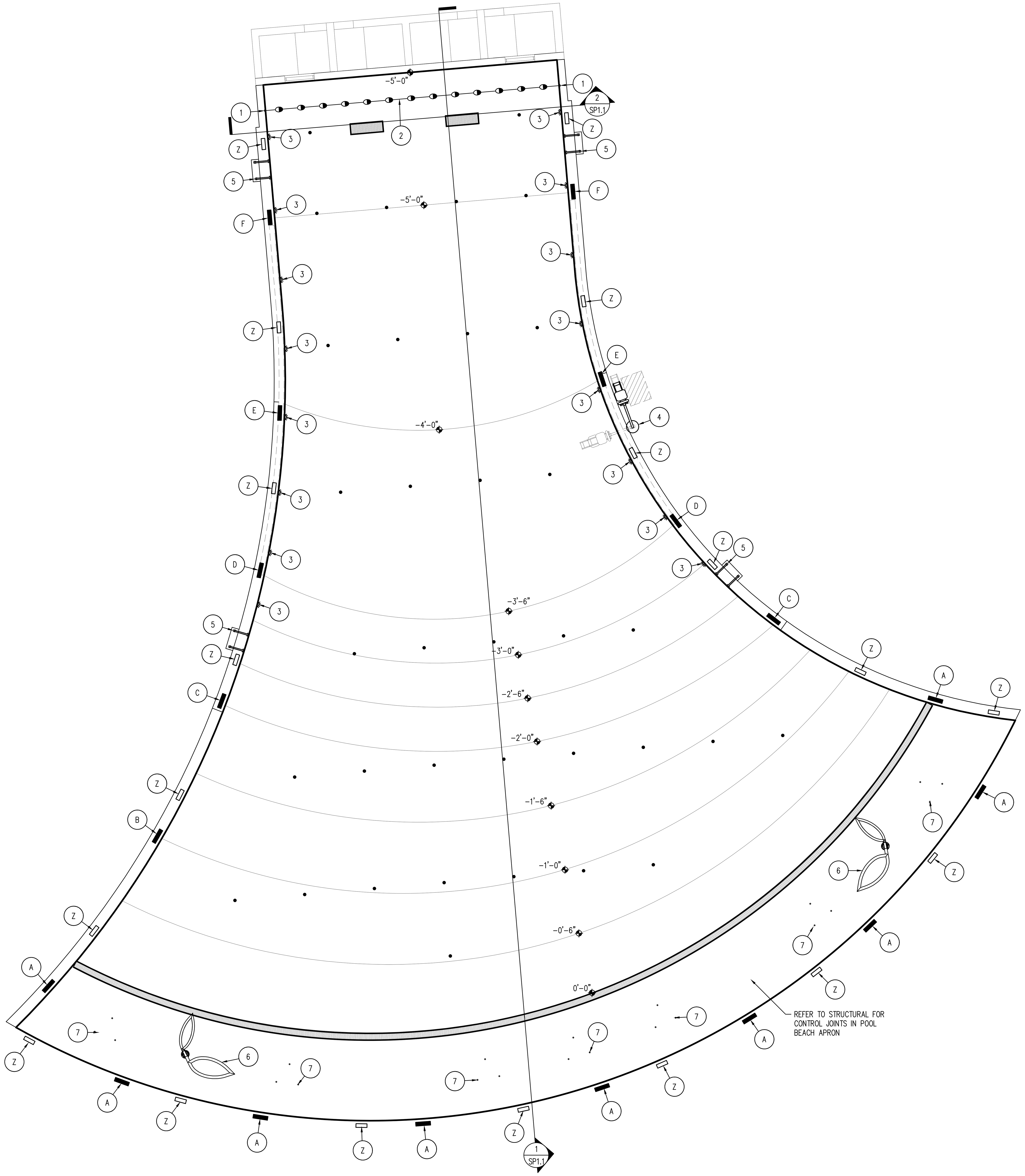
P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15,2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

POOL REFERENCE PLAN

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP0.0



1 SP1.0 **WAVE POOL PLAN**
1/8" = 1'-0"

DEPTH & WARNING SIGNAGE SCHEDULE

ID	SIGNAGE
A	0 FT 0 IN
B	1 FT 0 IN
C	2 FT 0 IN
D	3 FT 6 IN
E	4 FT 0 IN
F	5 FT 0 IN
Z	NO DIVING

POOL EQUIPMENT LEGEND

LEGEND	ID	ITEM
	1	SAFETY ROPE CUP ANCHOR REFER: 1/SP1.2
	2	SAFETY ROPE
	3	UNDERWATER LIGHT REFER: 4/SP1.2
	4	POOL LIFT AND ANCHOR REFER: 2/SP1.3
	5	GRAB RAILS AND RECESSED STEPS REFER: 8/SP1.2
	6	LEAF NO. 3 FEATURE REFER: 3/SP1.3
	7	BUBBLER FEATURE REFER: 9/SP1.2

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SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL PLAN

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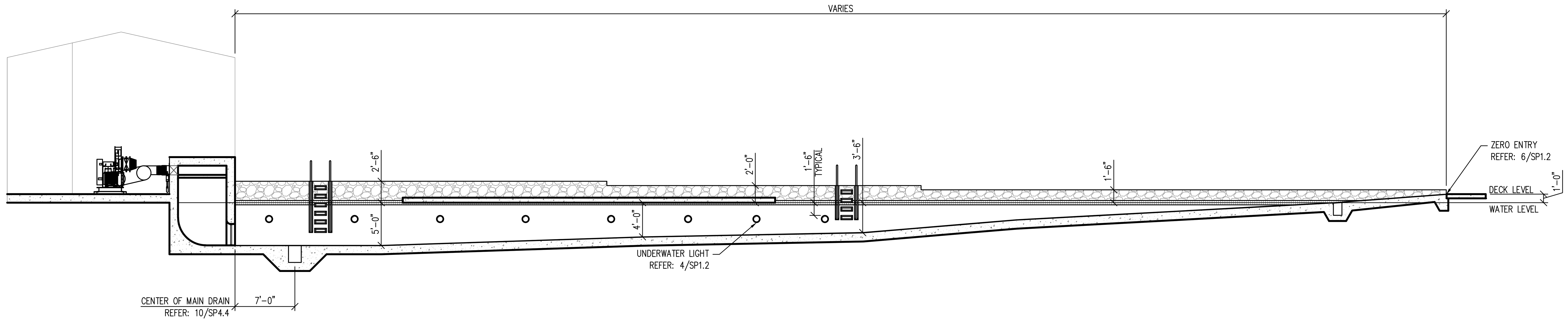
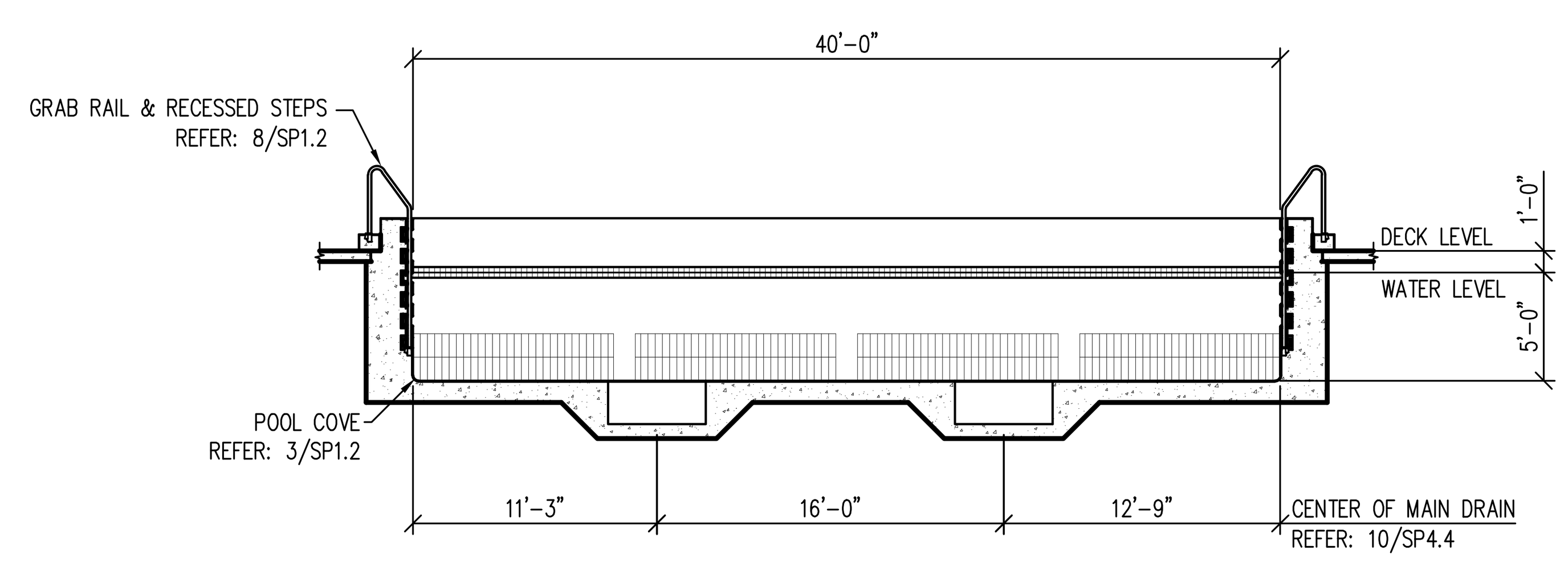
SHEET
SP1.0



1 SP1.1 WAVE POOL SECTION
1/8" = 1'-0"



2 SP1.1 WAVE POOL SECTION
1/8" = 1'-0"

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SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL SECTIONS

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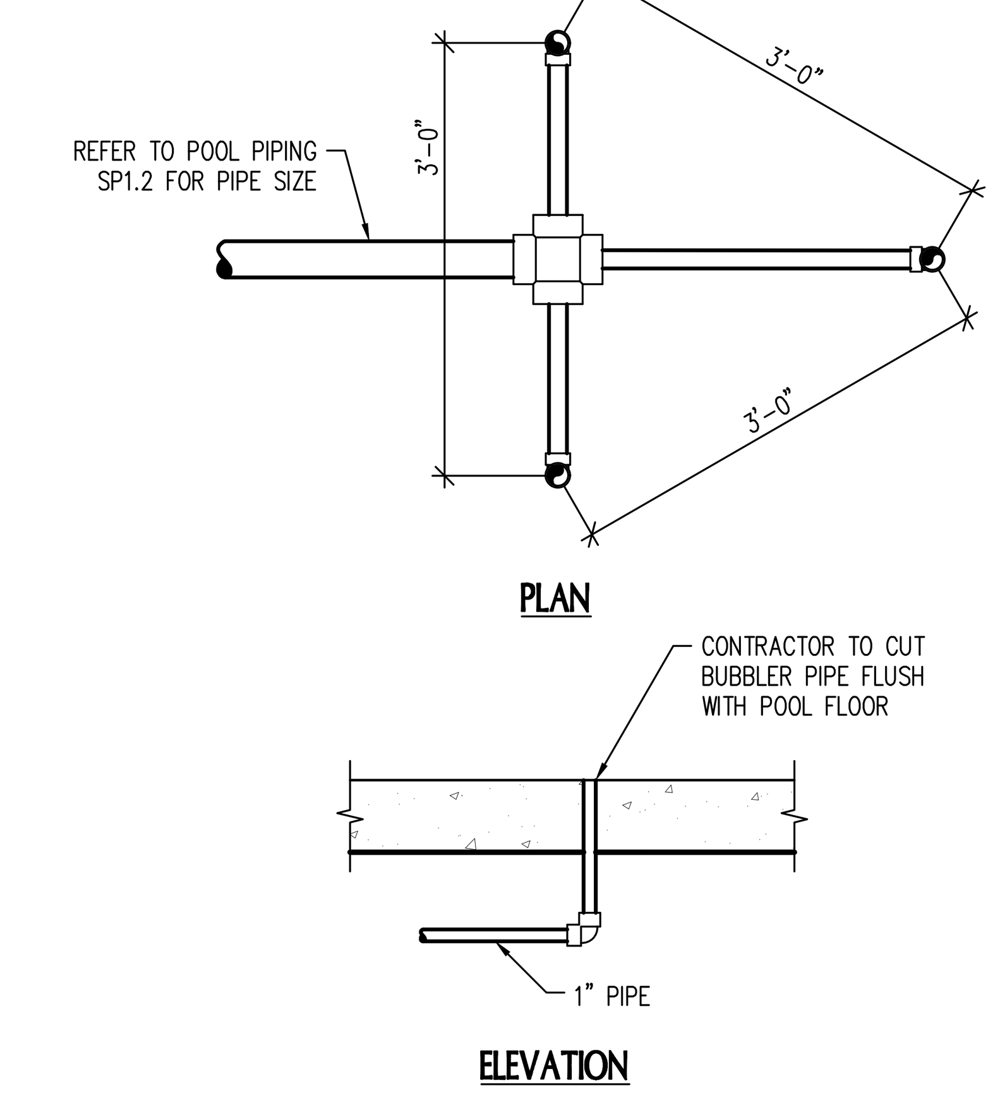
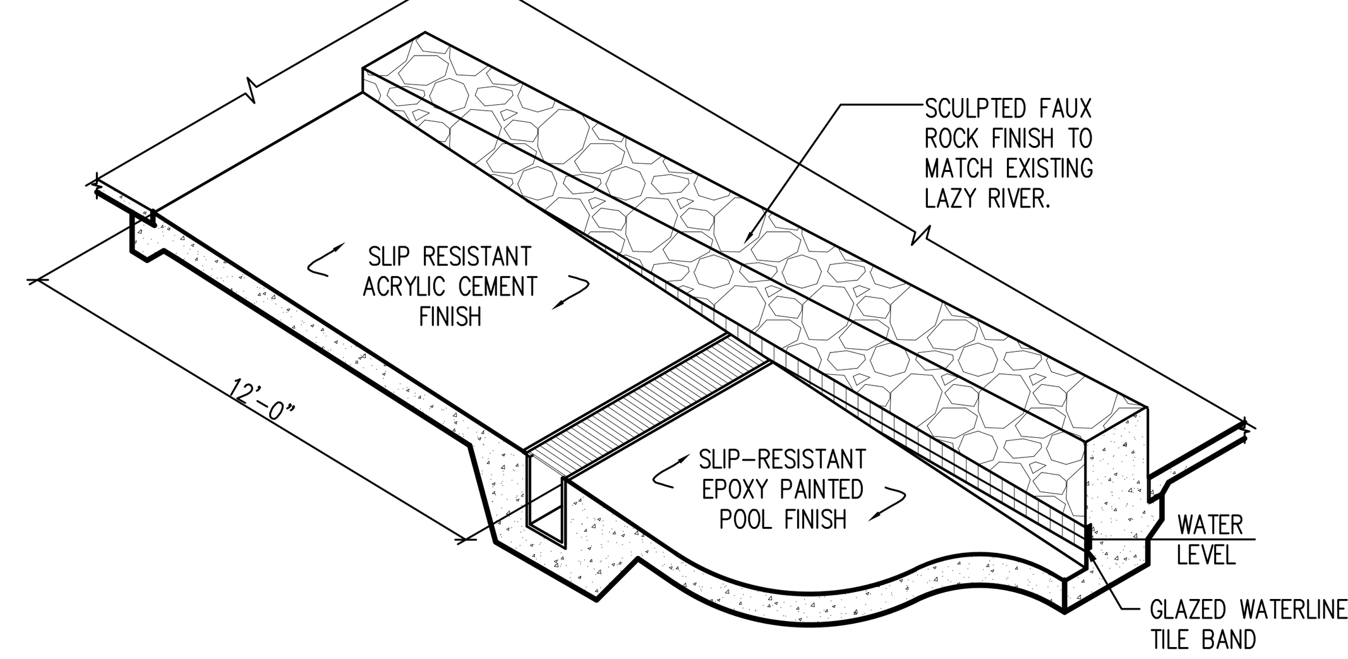
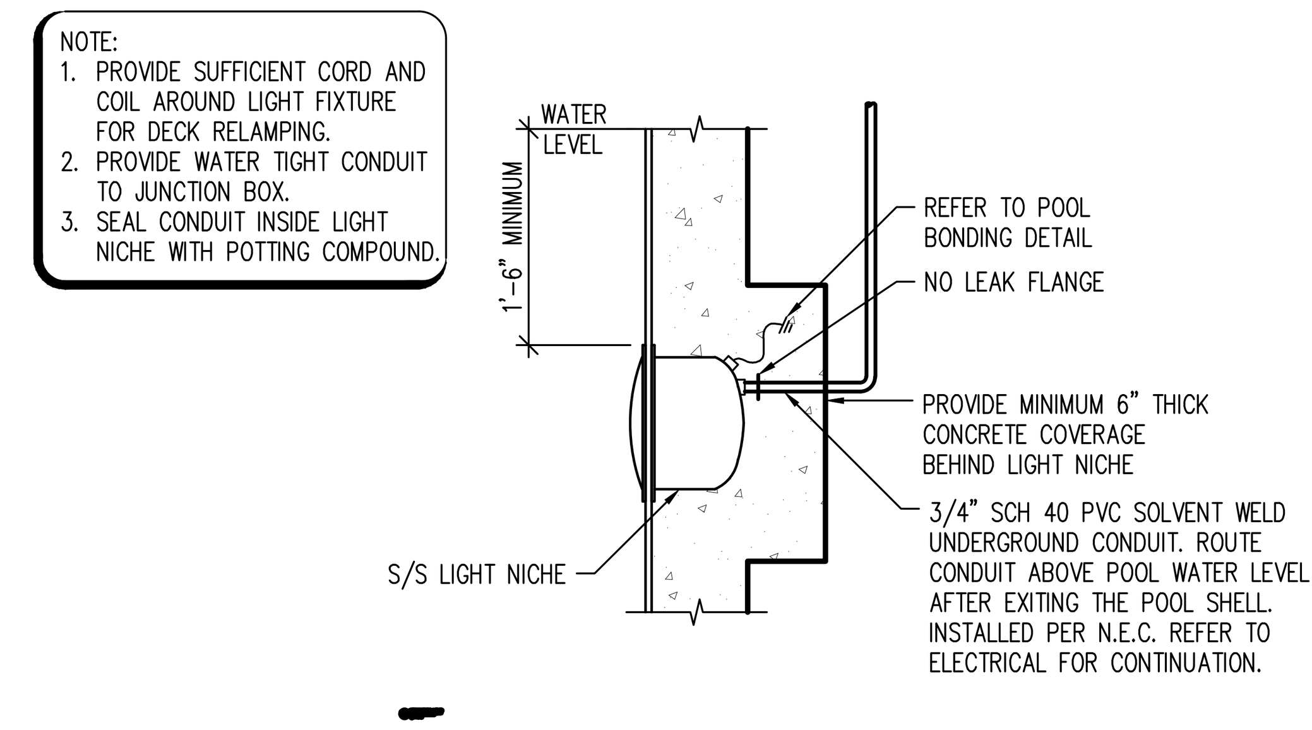
SHEET
SP1.1



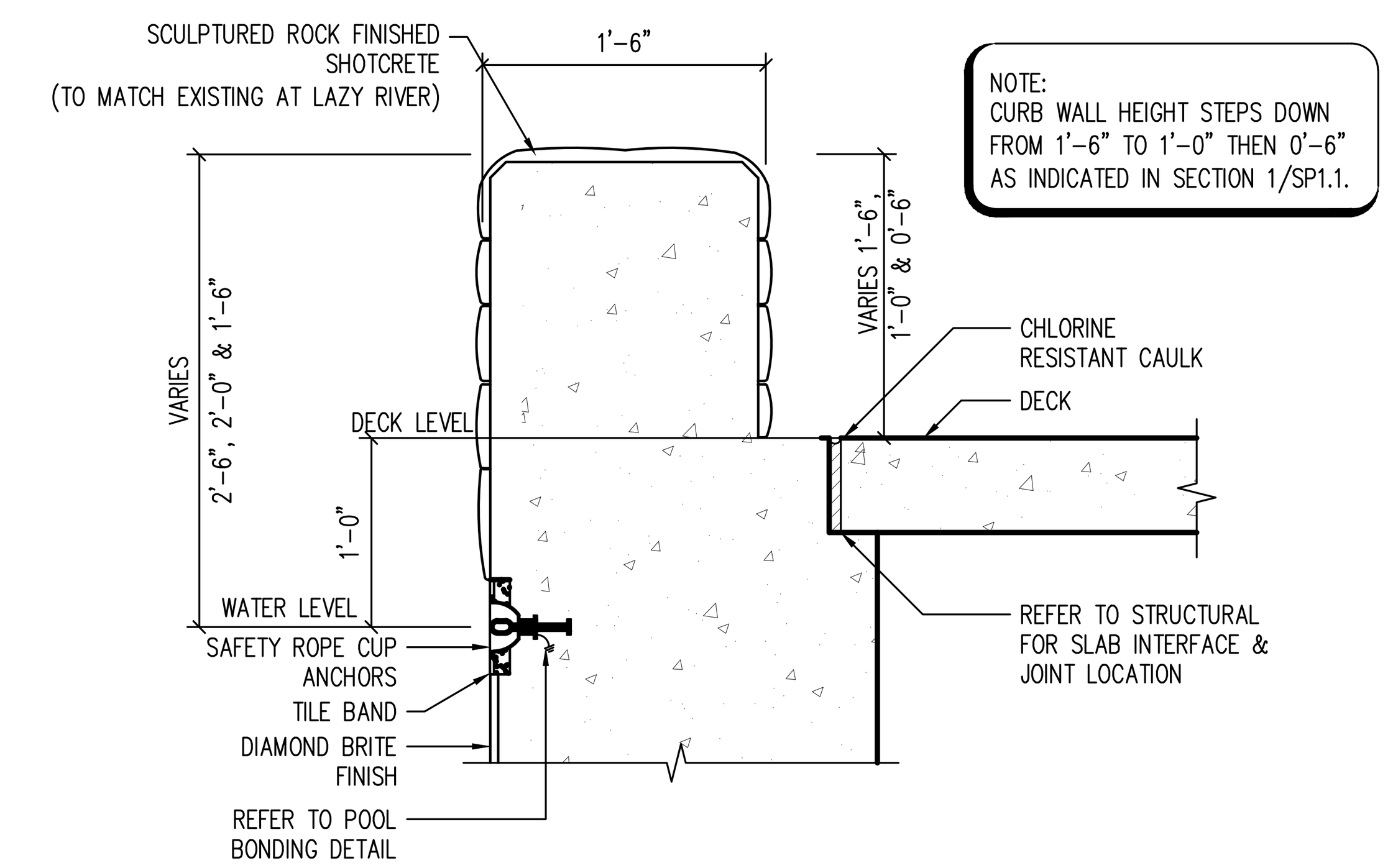
9 SP1.2 **BUBBLER FEATURE** 3/4" = 1'-0"



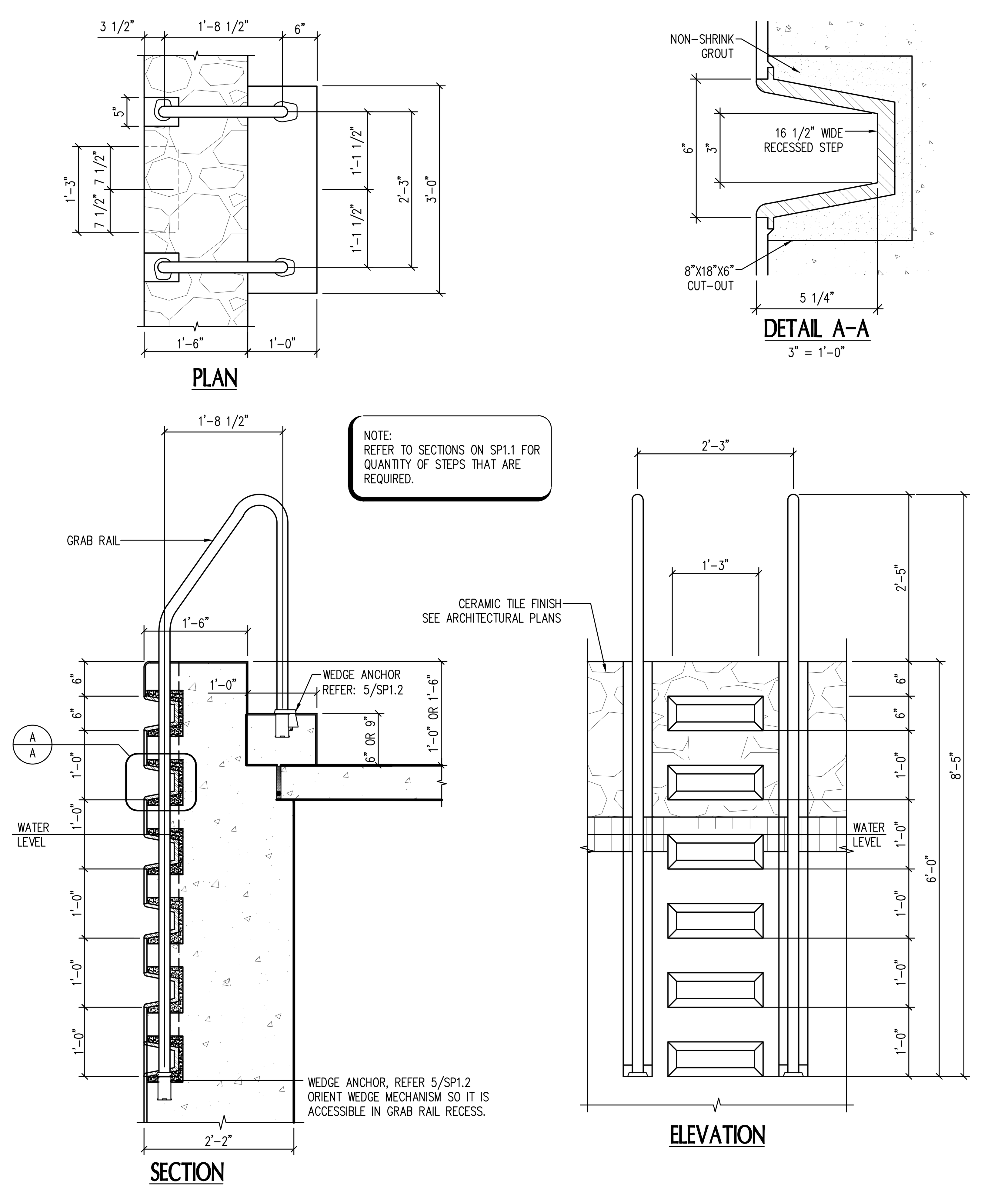
7 SP1.2 **ZERO ENTRY ISOMETRIC** 3/8" = 1'-0"



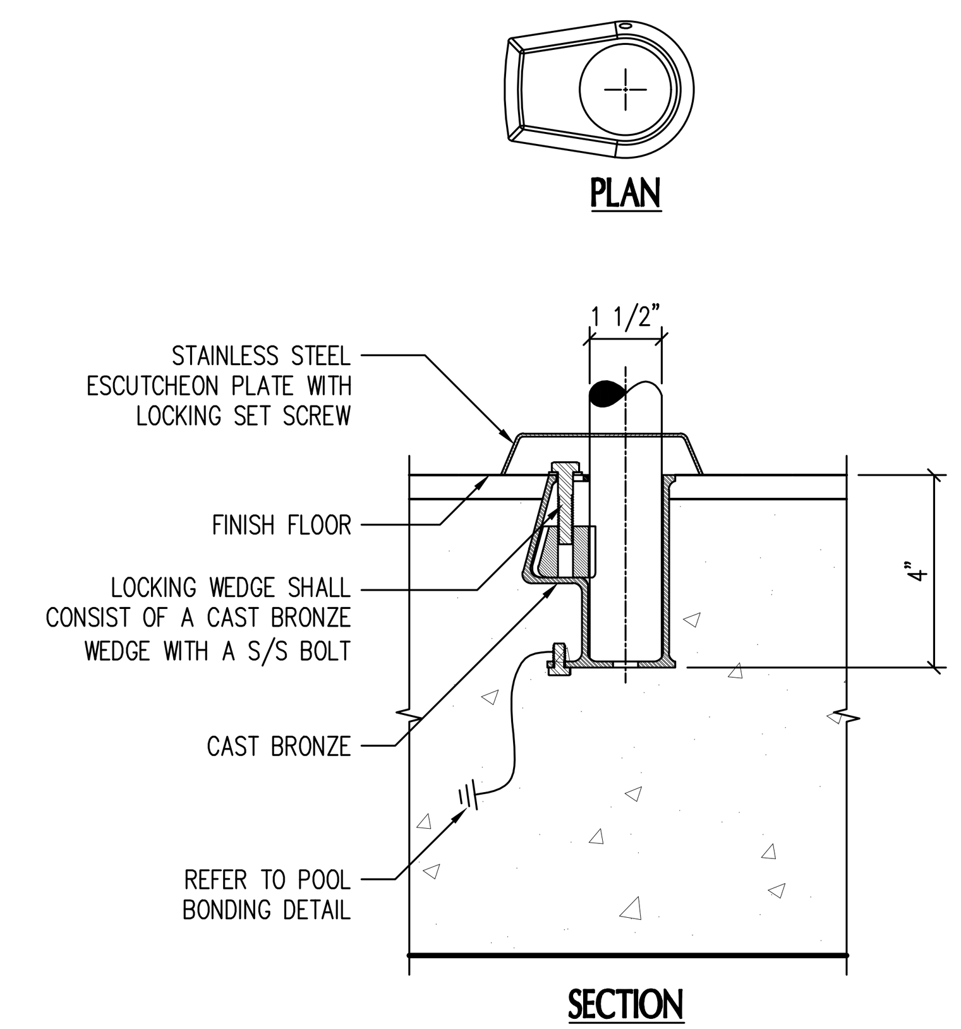
4 SP1.2 **UNDERWATER LIGHT** 3/4" = 1'-0"



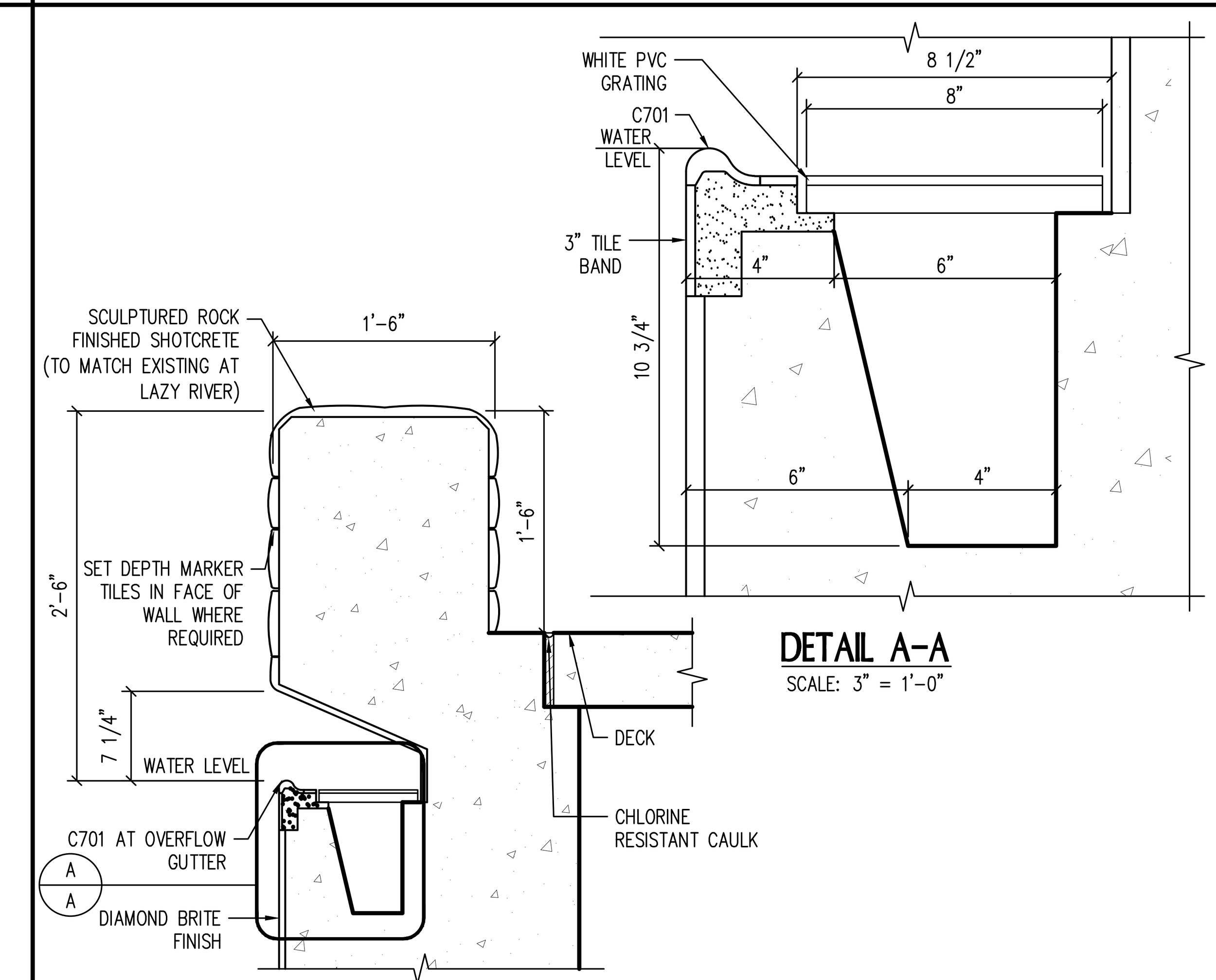
1 SP1.2 **WAVE POOL WALL SECTION** 1" = 1' -0"



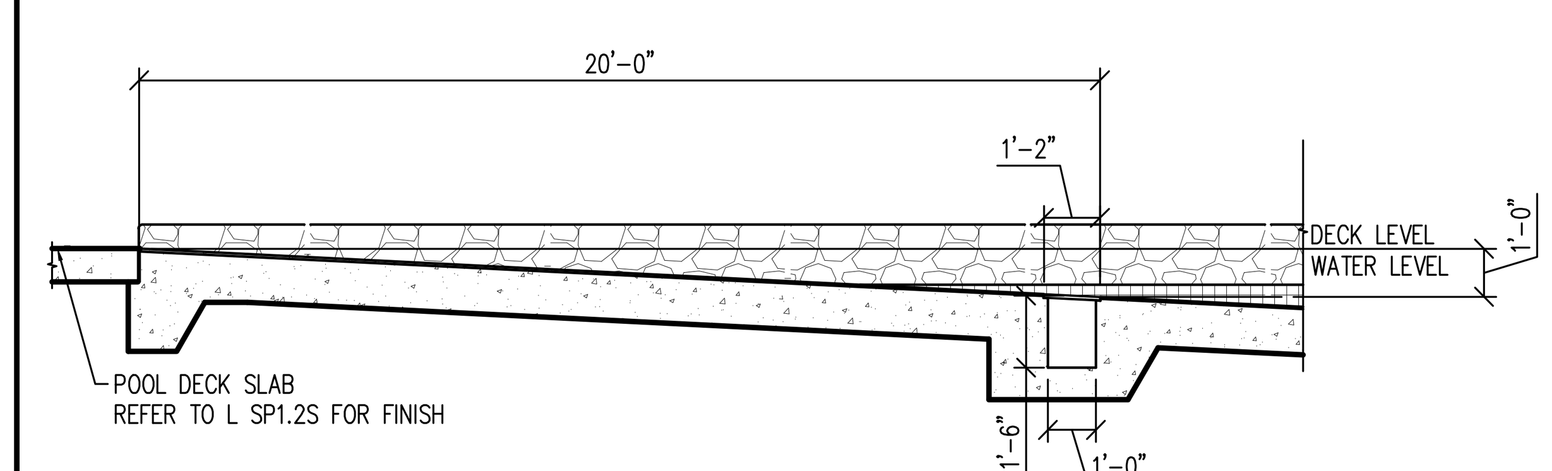
8 SP1.2 **GRAB RAILS & RECESSED STEPS** 3/4" = 1' -0"



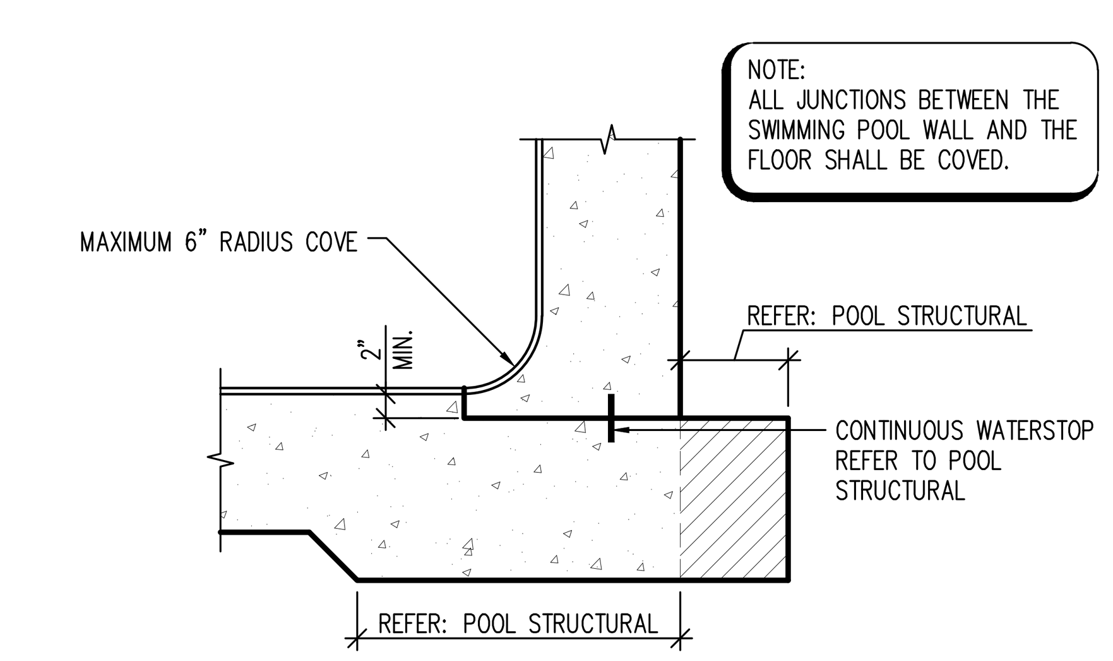
5 SP1.2 **WEDGE ANCHOR** 3" = 1'-0"



2 SP1.2 **WALL SECTION THROUGH GUTTER** 1" = 1' -0"



6 SP1.2 **ZERO ENTRY SECTION** 3/8" = 1'-0"



3 SP1.2 **SHOTCRETE COVE** 3/4" = 1'-0"

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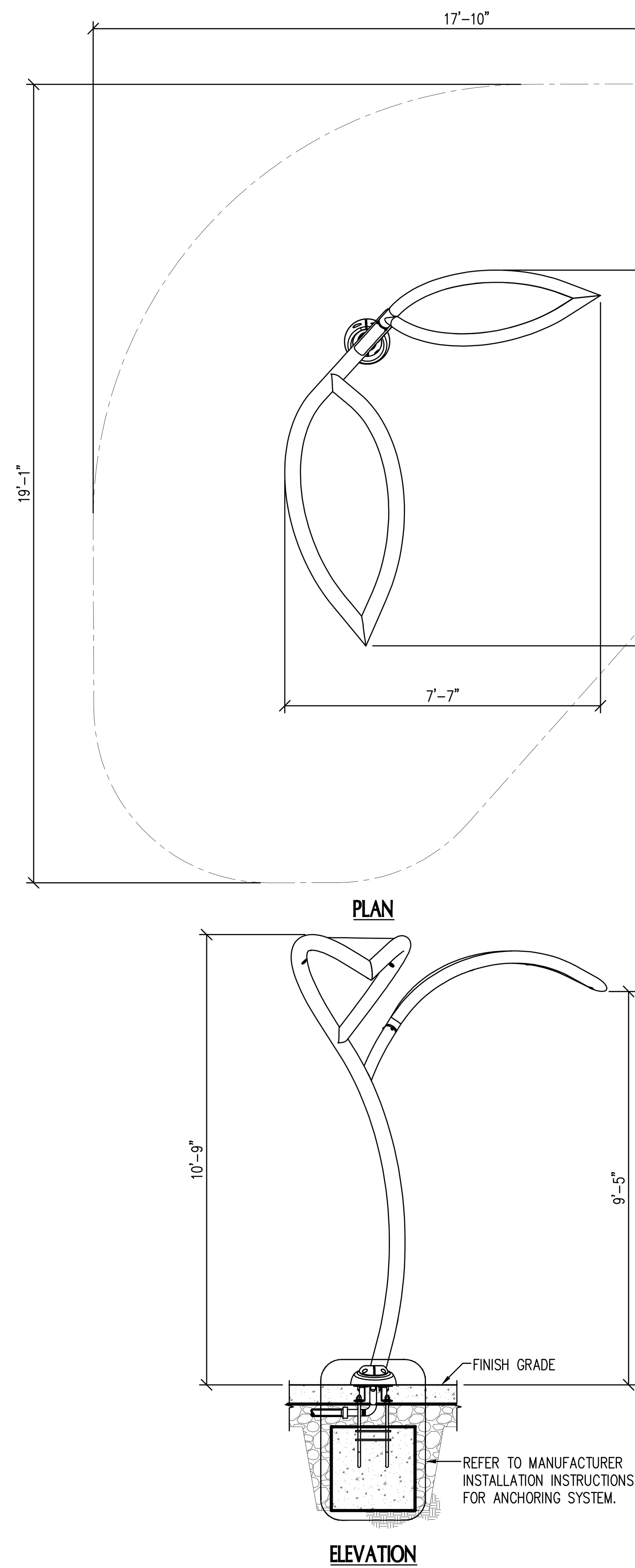
P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15,2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

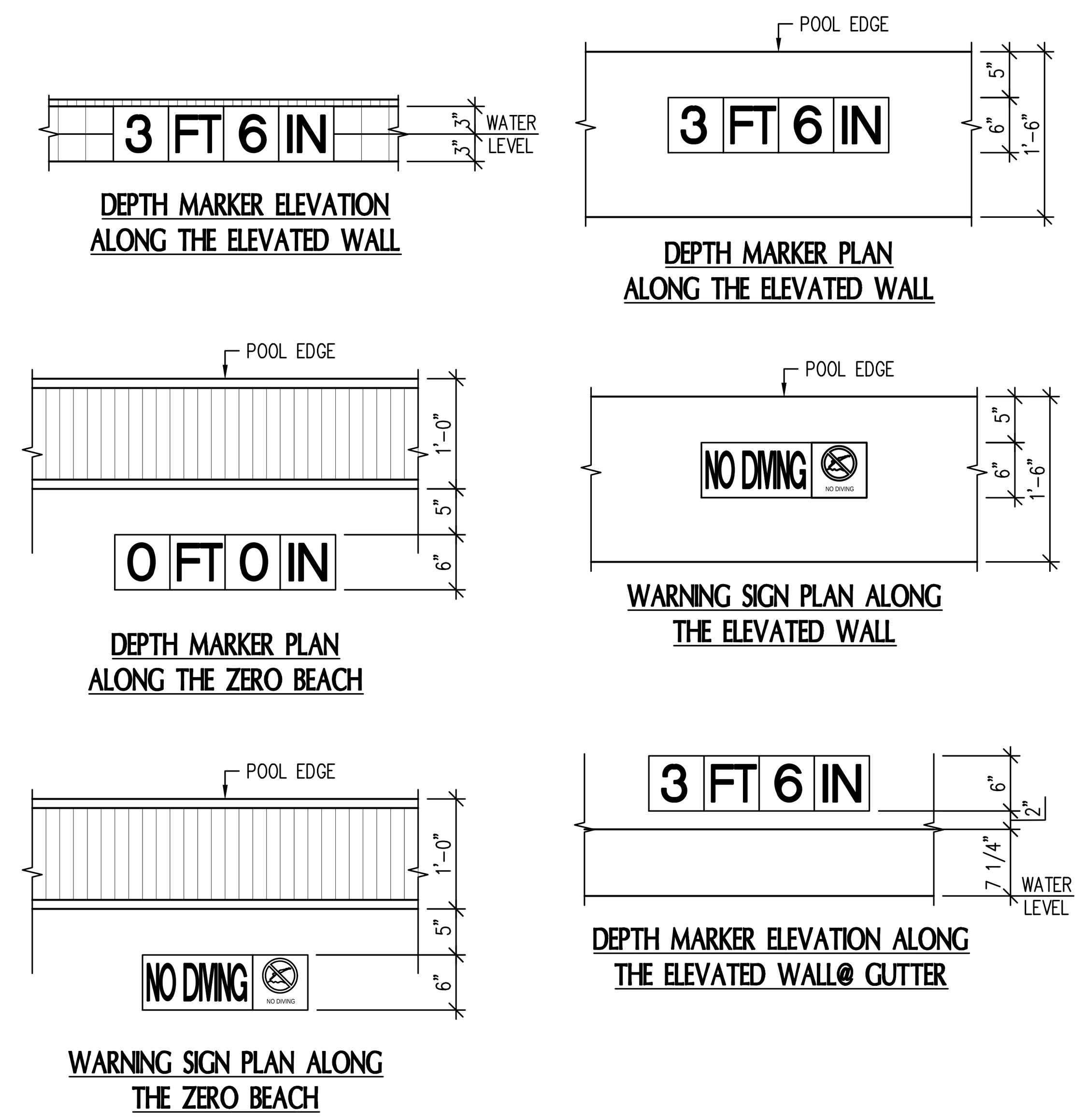
WAVE POOL DETAILS

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP1.2

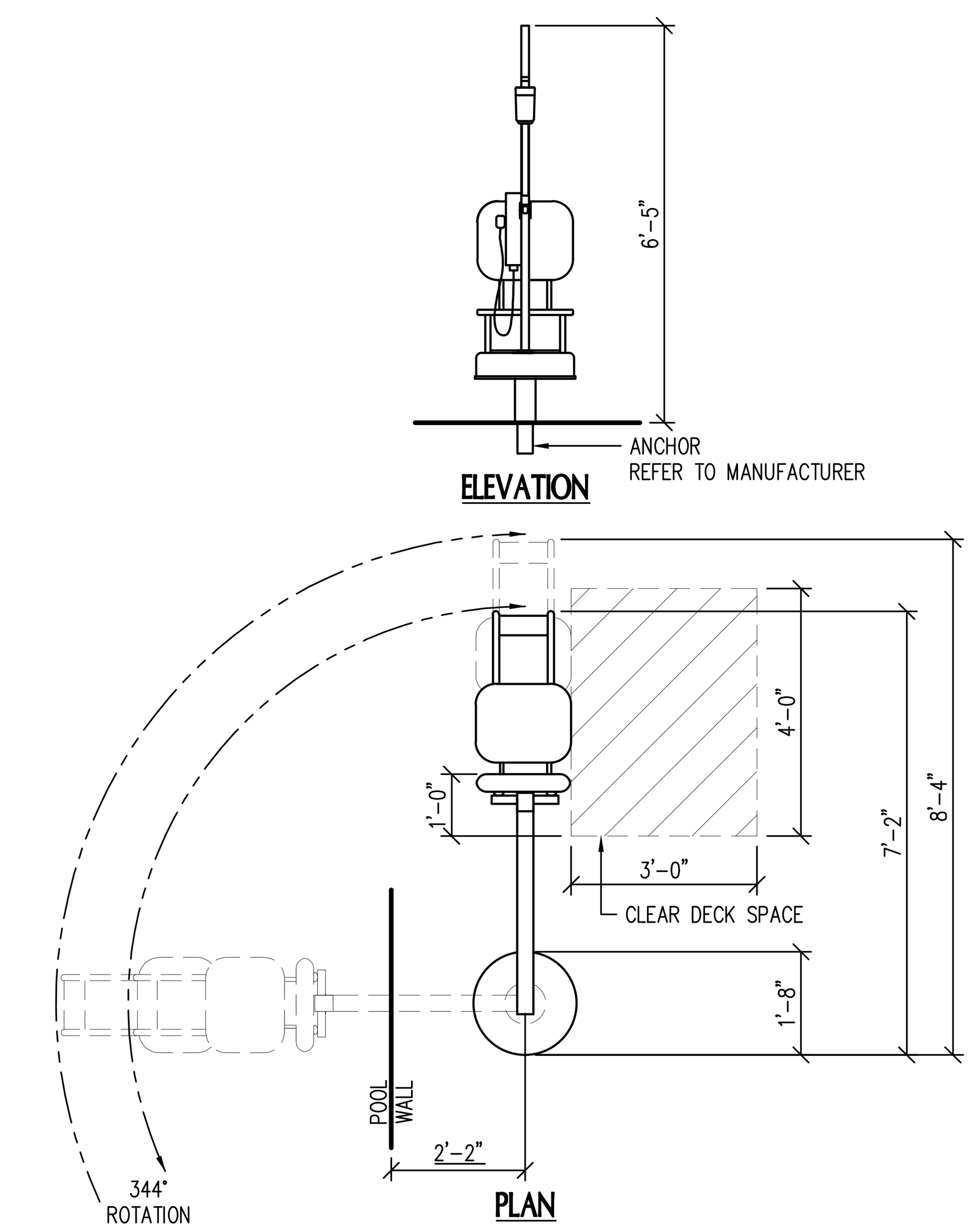


3 SP1.3 **LEAF NO 3 FEATURE**
3/8" = 1'-0"



NOTE:
1. DEPTH MARKERS AND WARNING SIGNS CREATED WITH 6"x6" SLIP RESISTANT CONTRASTING TILE LETTERS AND NUMBERS COLOR BY ARCHITECT.
2. WARNING SIGN CREATED WITH 6"x6" SLIP RESISTANT TILE WITH INTERNATIONAL NO DIVING SYMBOL.
3. WHERE MESSAGE TILES ARE ARE REQUIRED AT FAUX ROCK FINISH, TILES SHALL BE SET LEVEL/FLUSH IN SHOTCRETE ROCKWORK.
4. LOCATE ALL MARKING TILES SO THEY DO NOT CONFLICT WITH PAVING JOINTS.

1 SP1.3 **DEPTH MARKER AND WARNING SIGN**
3/4" = 1'-0"



2 SP1.3 **POOL LIFT**
3/8" = 1'-0"

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SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

WAVE POOL DETAILS

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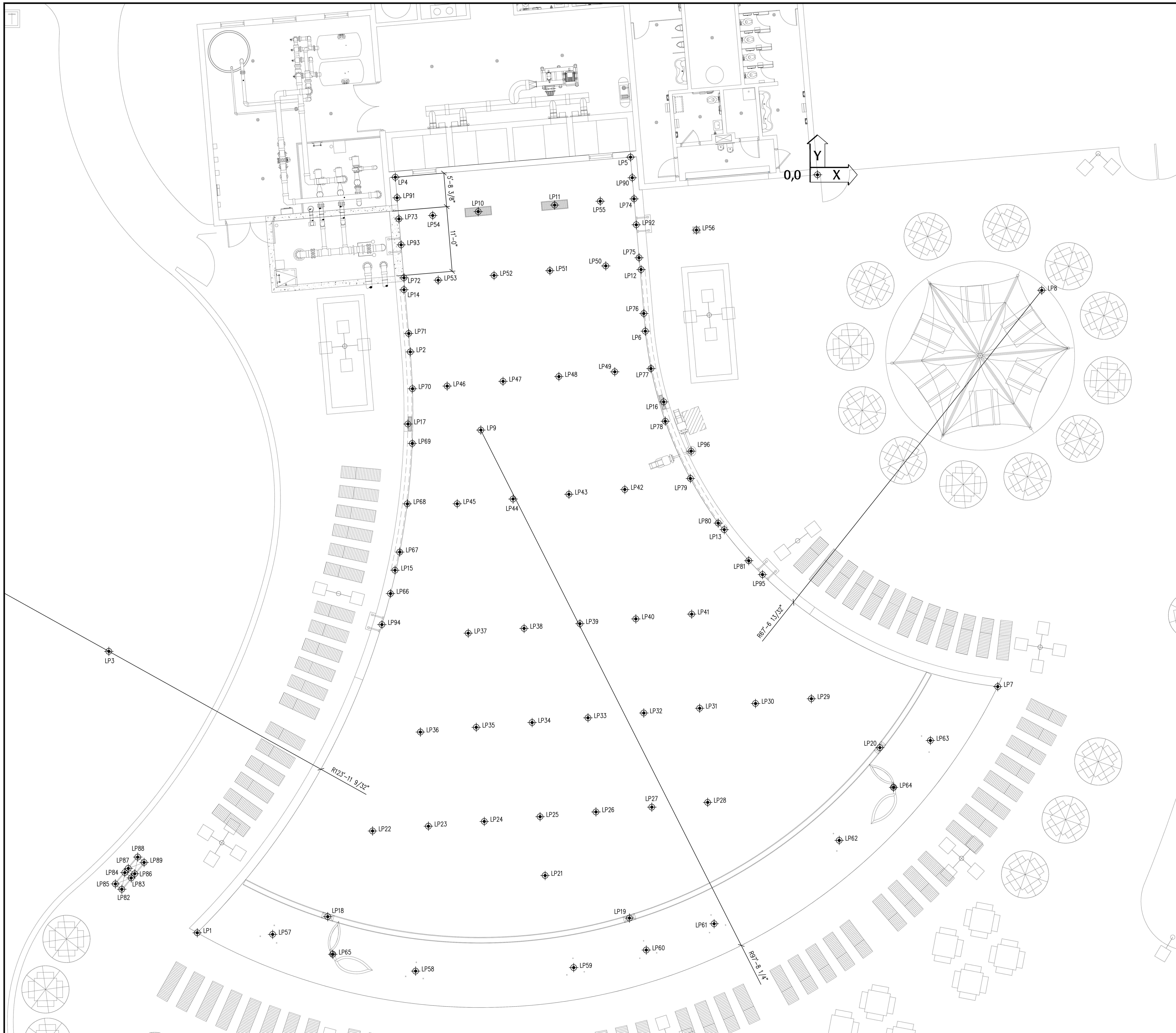
SHEET
SP1.3



LOCATION POINT SCHEDULE

LP#	X	Y	DESCRIPTION
1	-105'-1 1/4"	-128'-4 1/2"	ARC END POINT
2	-69'-0"	-30'-0"	ARC END POINT
3	-192'-6"	-40'-5 3/4"	ARC CENTER POINT
4	-71'-6 1/2"	-4 3/4"	CONSTRUCTION POINT
5	-31'-8 1/4"	2'-11 3/4"	CONSTRUCTION POINT
6	-29'-2"	-26'-6"	ARC END POINT
7	30'-6 1/2"	-86'-8 1/4"	ARC END POINT
8	38'-0"	-19'-6 3/4"	ARC CENTER POINT
9	-57'-0 1/2"	-43'-2 3/4"	ARC CENTER POINT
10	-57'-6"	-6'-2 3/4"	CENTER OF MAIN DRAIN
11	-44'-6 1/2"	-5'-1 1/2"	CENTER OF MAIN DRAIN
12	-29'-10 3/4"	-16'-0 1/2"	START OF GUTTER
13	-15'-9 1/2"	-60'-1 1/4"	END OF GUTTER
14	-70'-1"	-19'-5 1/2"	START OF GUTTER
15	-71'-7 1/4"	-66'-11 3/4"	END OF GUTTER
16	-26'-0 1/2"	-38'-5 1/2"	GUTTER DROPOUT BOX
17	-69'-4 3/4"	-42'-2 1/2"	GUTTER DROPOUT BOX
18	-83'-0"	-125'-7 3/4"	TRENCH DROPOUT BOX
19	-31'-10 1/2"	-125'-10 1/2"	TRENCH DROPOUT BOX
20	10'-7"	-97'-0 1/4"	TRENCH DROPOUT BOX
21	-46'-1 3/4"	-118'-8 1/4"	FLOOR INLET
22	-75'-4 3/4"	-111'-1 1/2"	FLOOR INLET
23	-65'-11 1/4"	-110'-4"	FLOOR INLET
24	-56'-5 3/4"	-109'-6 1/4"	FLOOR INLET
25	-47'-0"	-108'-8 1/2"	FLOOR INLET
26	-37'-6 1/2"	-107'-11"	FLOOR INLET
27	-28'-0 3/4"	-107'-1 1/4"	FLOOR INLET
28	-18'-7 1/4"	-106'-3 1/2"	FLOOR INLET
29	-1'-0 1/2"	-88'-8 3/4"	FLOOR INLET
30	-10'-6"	-89'-6 1/2"	FLOOR INLET
31	-19'-11 1/2"	-90'-4 1/4"	FLOOR INLET
32	-29'-5 1/4"	-91'-2"	FLOOR INLET
33	-38'-10 3/4"	-91'-11 1/2"	FLOOR INLET
34	-48'-4 1/4"	-92'-9 1/4"	FLOOR INLET
35	-57'-10"	-93'-7"	FLOOR INLET
36	-67'-3 1/2"	-94'-4 1/2"	FLOOR INLET
37	-59'-2 1/4"	-77'-7 1/2"	FLOOR INLET
38	-49'-8 3/4"	-76'-10"	FLOOR INLET
39	-40'-3"	-76'-0 1/4"	FLOOR INLET
40	-30'-9 1/2"	-75'-2 1/2"	FLOOR INLET
41	-21'-4"	-74'-5"	FLOOR INLET
42	-32'-8"	-53'-3 1/2"	FLOOR INLET
43	-42'-1 1/2"	-54'-1 1/4"	FLOOR INLET
44	-51'-7"	-54'-11"	FLOOR INLET
45	-61'-0 3/4"	-55'-8 1/2"	FLOOR INLET
46	-62'-9"	-35'-9 1/2"	FLOOR INLET
47	-53'-3 1/2"	-34'-11 3/4"	FLOOR INLET
48	-43'-9 3/4"	-34'-2"	FLOOR INLET
49	-34'-4 1/4"	-33'-4 1/2"	FLOOR INLET
50	-35'-10 1/2"	-15'-5 1/4"	FLOOR INLET
51	-45'-4 1/4"	-16'-2 3/4"	FLOOR INLET
52	-54'-9 3/4"	-17'-0 1/2"	FLOOR INLET
53	-64'-3 1/4"	-17'-10 1/4"	FLOOR INLET
54	-65'-2 1/2"	-6'-10 3/4"	FLOOR INLET
55	-36'-9 3/4"	-4'-5 3/4"	FLOOR INLET
56	-20'-6 1/4"	-9'-4 1/4"	SIGHT SUMP
57	-92'-4"	-128'-7 3/4"	BUBBLERS
58	-68'-1 1/4"	-134'-10 1/2"	BUBBLERS
59	-41'-3 3/4"	-134'-3 1/4"	BUBBLERS
60	-29'-0 1/4"	-131'-3 1/2"	BUBBLERS
61	-17'-6 1/4"	-126'-10 1/4"	BUBBLERS
62	3'-8 1/4"	-112'-8 3/4"	BUBBLERS
63	19'-1 1/2"	-95'-9 3/4"	BUBBLERS
64	12'-10 3/4"	-103'-9"	LEAF NO. 2 FEATURE
65	-82'-1 3/4"	-132'-0 1/4"	LEAF NO. 2 FEATURE
66	-72'-4 1/4"	-70'-11"	UNDERWATER LIGHT
67	-70'-9 1/2"	-63'-10 3/4"	UNDERWATER LIGHT
68	-69'-6"	-55'-8 3/4"	UNDERWATER LIGHT
69	-68'-8"	-45'-6"	UNDERWATER LIGHT
70	-68'-7 1/2"	-36'-2 3/4"	UNDERWATER LIGHT
71	-69'-3 1/4"	-26'-10 1/2"	UNDERWATER LIGHT
72	-70'-1"	-17'-5 1/4"	UNDERWATER LIGHT
73	-70'-11 1/4"	-7'-5 3/4"	UNDERWATER LIGHT
74	-31'-1"	-4'-1"	UNDERWATER LIGHT
75	-30'-2 3/4"	-14'-0 1/2"	UNDERWATER LIGHT
76	-29'-5 1/4"	-23'-5 3/4"	UNDERWATER LIGHT
77	-28'-2 1/2"	-32'-9 3/4"	UNDERWATER LIGHT
78	-25'-9 1/2"	-41'-9"	UNDERWATER LIGHT
79	-21'-6 1/4"	-51'-5 1/4"	UNDERWATER LIGHT
80	-16'-9 3/4"	-59'-0"	UNDERWATER LIGHT
81	-11'-7 3/4"	-65'-4 1/4"	UNDERWATER LIGHT
82	-117'-10 3/4"	-121'-0 1/4"	VALVE BOX
83	-116'-3 1/2"	-119'-1"	VALVE BOX
84	-117'-4 1/2"	-118'-2 1/4"	VALVE BOX
85	-118'-11 3/4"	-120'-1 1/4"	VALVE BOX
86	-115'-8 1/2"	-118'-4 1/2"	VALVE BOX
87	-116'-9 1/2"	-117'-5 3/4"	VALVE BOX
88	-115'-2 1/2"	-115'-6 3/4"	VALVE BOX
89	-114'-1 1/4"	-116'-5 1/2"	VALVE BOX
90	-31'-4 3/4"	-6"	SAFETY ROPE ANCHOR
91	-71'-3"	-3'-10 3/4"	SAFETY ROPE ANCHOR
92	-30'-8 1/2"	-8'-5 1/2"	GRAB RAIL
93	-70'-6 3/4"	-11'-10 1/4"	GRAB RAIL
94	-73'-9 3/4"	-76'-2 1/4"	GRAB RAIL
95	-9'-4"	-67'-8 1/2"	GRAB RAIL
96	-21'-5"	-46'-9 3/4"	POOL LIFT

1 / SP2.0 WAVE POOL LOCATION POINT PLAN
3/32" = 1'-0"

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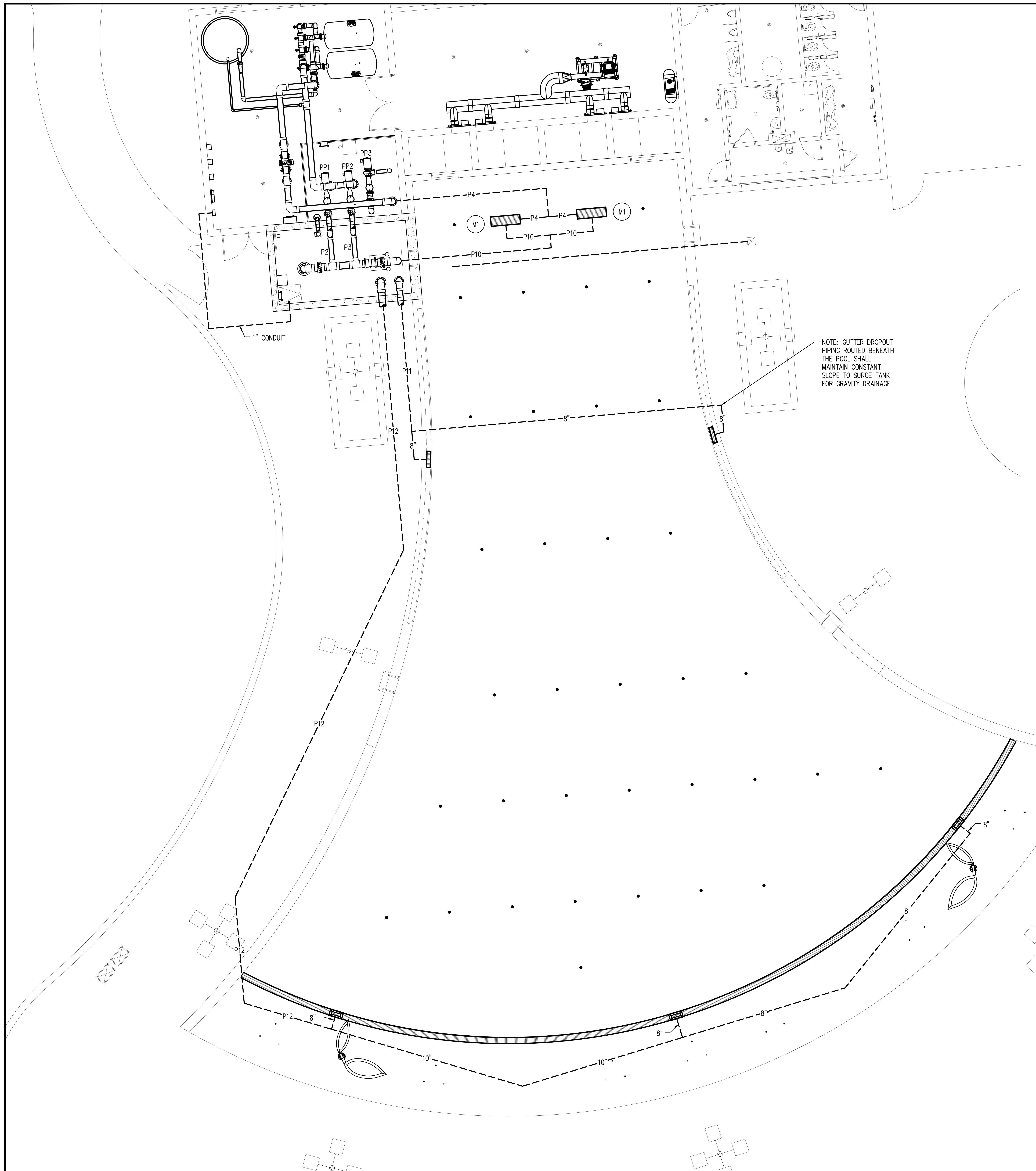
P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15,2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL LOCATION POINT PLAN

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP2.0



1
SP3.0
WAVE POOL SUCTION PIPING PLAN
1/8" = 1'-0"

PIPE SCHEDULE

ID	DESCRIPTION
P1	6" FROM FILL FUNNEL TO SURGE TANK
P2	8" FROM P10 TO PP1
P3	8" FROM P10 TO PP2
P4	8" FROM MAIN DRAINS TO PP3
P5	6" FROM PP3 TO VALVE BOXES
P6	10" FROM POOL FILTERS TO INLETS
P7	10" FROM PP1 & PP2 TO POOL FILTERS
P8	6" FROM POOL FILTERS TO BACKWASH CATCH BASIN
P9	3" FROM P7 TO BACKWASH CATCH BASIN
P10	12" FROM MAIN DRAINS TO P2 & P3
P11	10" FROM GUTTER DROPOUT BOXES TO SURGE TANK
P12	12" TRENCH DROPOUTS TO SURGE TANK
P13	2" FROM VALVE BOX TO LEAF FEATURE
P14	2" FROM VALVE BOX TO BUBBLERS
P15	2" FROM VALVE BOX TO BUBBLERS
P16	2" FROM VALVE BOX TO BUBBLERS

PIPING LEGEND

LEGEND	QTY.	ITEM
◉	35	FLOOR INLET REFER: 8/SP4.4
⊠	1	SIGHT SUMP REFER: 12/SP4.4
	2	GUTTER DROPOUT BOX REFER: 9/SP4.4
	2	MAIN DRAIN REFER: 10/SP4.4
	3	TRENCH DROPOUT REFER: 11/SP4.4
	2	VALVE BOX REFER: 4/SP4.5
– – – – –	N/A	BELOW GRADE PIPING

GENERAL PIPING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERATIONAL PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. PIPE SIZES INDICATED ARE NOMINAL, I.P.S.
3. UNLESS OTHERWISE NOTED, ALL OVERHEAD PIPING SHALL BE TIGHT TO UNDERSIDE OF STRUCTURE OR SLAB.
4. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).
5. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN THE EQUIPMENT OR PIPING ON THE EQUIPMENT SIDE OF THE VALVE IS REMOVED.
6. PROVIDE CHAIN WHEEL OPERATORS FOR ALL VALVES IN EQUIPMENT ROOMS MOUNTED GREATER THAN 7'–0" ABOVE FINISHED FLOOR; CHAIN SHALL EXTEND TO 7'–0" ABOVE FINISHED FLOOR LEVEL.
7. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.
8. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES AND SITE CONDITIONS. OFFSETS, EXPANSION LOOPS, OR TRANSITIONS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. ALL PIPING INDICATED SHALL BE CONSIDERED DIAGRAMMATIC.
10. ALL SWIMMING POOL PIPING ROUTED BELOW THE POOL SHELL SHALL BE SCHEDULE 80 PVC. REFER: 1/SP4.5
11. ALL UNDERGROUND OR EXPOSED SWIMMING POOL PIPING SHALL BE SCHEDULE 80 PVC, UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO PLANS AND SPECIFICATIONS FOR ANY SPECIFIC REQUIREMENTS REGARDING PLACEMENT AND BACKFILLING OF BELOW GRADE POOL PIPE.
12. ALL DIMENSIONS INDICATED FROM THE FINISH WALL SURFACE AND DO NOT ACCOUNT FOR ANY VARIATIONS IN EITHER GRADE OR SLOPE DISTANCES.
13. THE CHEMICAL SENSOR LINE SHALL BE A 3/4" TO 1" DIAMETER, SCHEDULE 80 PVC PIPE EXTENDED FROM THE WET CELL SENSOR TO ITS RESPECTIVE FILL FUNNEL AND THE BACKWASH CATCH BASIN OR PUMP SUCTION.
14. ALL FLOOR INLETS SHALL BE ADJUSTED TO ACHIEVE AN EVEN FLOW DISTRIBUTION THROUGHOUT SYSTEMS.
15. ALL PIPE TEES SHALL BE SIZED FOR LARGEST PIPE CONNECTION.
16. ALL GUTTER DROPOUT LINES SHALL SLOPE 1/8" PER FOOT MINIMUM
17. 55 PSI MINIMUM WATER PRESSURE FOR POOL LIFT. REFER TO PLUMBING.

POOL PIPING WINTERIZATION NOTES

1. ALL POOL PIPING SHALL HAVE THE CAPABILITY TO BE DRAINED FOR WINTERIZATION. (OUTDOOR POOLS ONLY)
2. ALL POOL SUCTION AND GRAVITY PIPING SHALL BE INSTALLED WITH A CONSTANT SLOPE TO THE MAIN DRAINS AND/OR SURGE TANK.
3. ALL POOL RETURN PIPING SHALL HAVE THE ABILITY TO COMPLETELY DRAIN TO THE 2" WINTERIZATION LINE AS SHOWN ON THE DRAWINGS.
4. BLOW OUT ALL PIPES BY MEANS OF AN AIR BLOWER AND A WINTERIZATION TAP. CAP ALL PIPES. FOR ADDED PROTECTION AGAINST FREEZING PIPES, THE PIPES CAN BE FILLED WITH ANTI–FREEZE. REFER: 10/SP4.5

PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	SIZE	GPM	TDH	HP	NPSHR	NOTES
PP1	WAVE POOL RECIRCULATION PUMP 1 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP2	WAVE POOL RECIRCULATION PUMP 2 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP3	WAVE POOL FEATURE PUMP REFER: 1/SP4.3	AURORA	340	6X6X9	810	55	15	7.68	1,2,3,4,5

NOTE:
1. THE MANUFACTURER INDICATED IS BASIS OF DESIGN. PUMP MANUFACTURERS: ITT MARLOW, GRISWOLD, PACO OR AURORA SHALL BE CONSIDERED EQUAL PROVIDED THEY MEET SPECIFICATIONS AS INDICATED IN BID DOCUMENTS.
2. PROVIDE WITH 460 VOLT, 3 PHASE, 60HZ, 1750 RPM MOTOR.
3. PROVIDE WITH CHECK VALVE.
4. PROVIDE VARIABLE FREQUENCY DRIVE.
5. PROVIDE REMOTE PUMP START.

MAIN DRAIN SCHEDULE

ID	DESCRIPTION	SIZE	QTY	DESIGN FLOW (GPM)	DESIGN VELOCITY (FPS)	MODEL	MANUFACTURER	NOTES
M1	WAVE POOL MAIN DRAINS	18X54	2	2,280	0.71	MLD–FG–1854	NEPTUNE BENSON	1,2,3,4,5,6

NOTE:
1. MAIN DRAIN GRATING SHALL BE MANUFACTURED BY NEPTUNE BENSON/LAWSON.
2. MAXIMUM FACE VELOCITY SHALL NOT EXCEED 1.5 FEET PER SECOND.
3. OPEN AREA IS BASED ON MANUFACTURER'S DATA.
4. THE INSTALLED LIFE OF THE MAIN DRAIN COVER SHALL BE 10 YEARS.
5. ALL MAIN DRAINS SHALL BE INSTALLED IN THE POOL FLOOR. WALL SUMPS WILL NOT BE PERMITTED.
6. FASTEN MAIN DRAIN COVER TO EMBEDDED PVC FRAME/POOL FLOOR WITH S/S TAMPER PROOF FASTENERS AT A SPACING NO GREATER THAN 24" O.C. REFER TO FRAME AND GRATE MANUFACTURER'S INSTALLATION INSTRUCTIONS.

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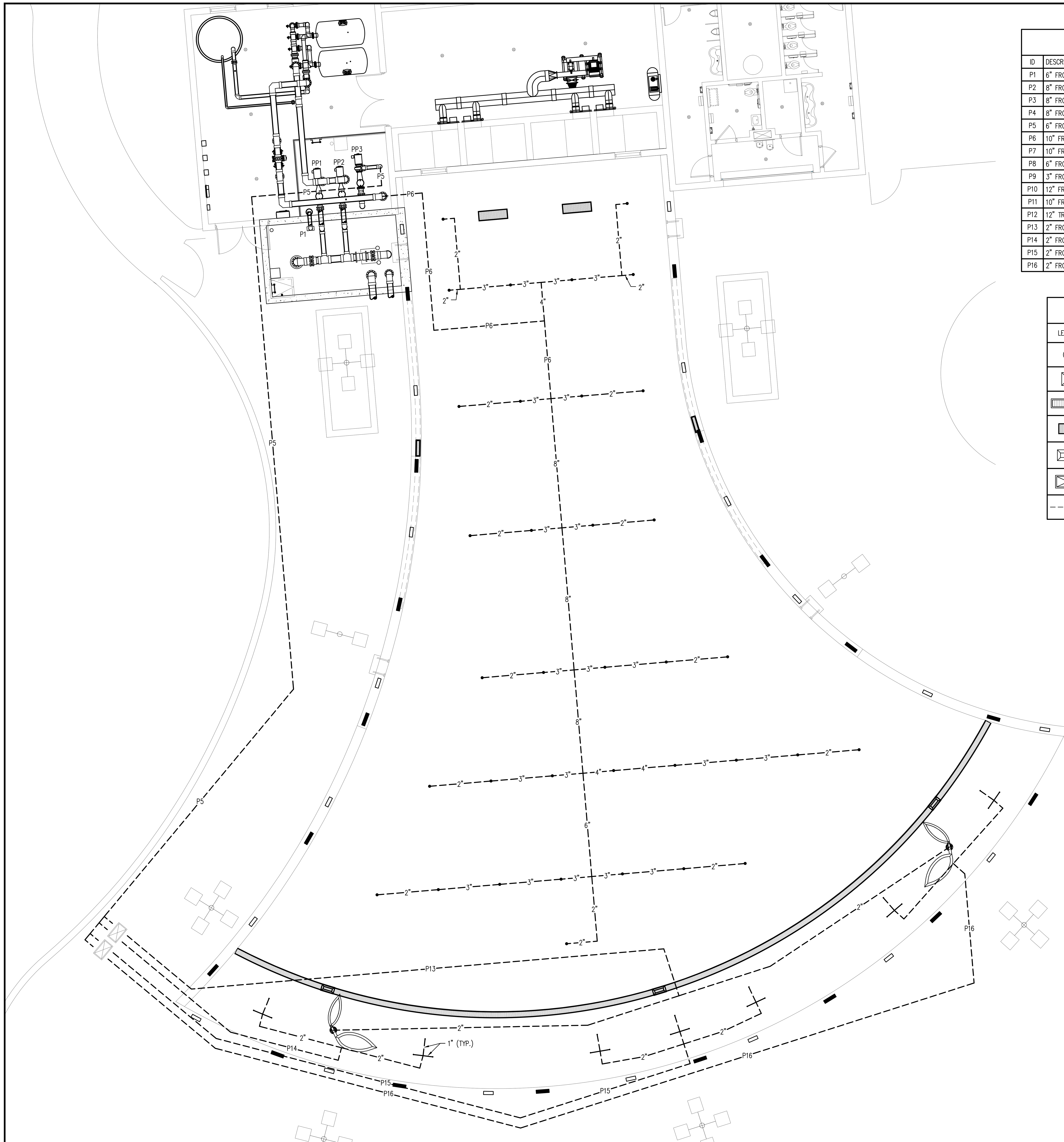
P.E. DARREN BEVARD
LI.NO.: E–2008002132 DATE: APRIL 15,2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

WAVE POOL SUCTION PIPING PLAN

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP3.0



1
SP3.1
WAVE POOL RETURN PIPING PLAN
1/8" = 1'-0"

PIPE SCHEDULE

ID	DESCRIPTION
P1	6" FROM FILL FUNNEL TO SURGE TANK
P2	8" FROM P10 TO PP1
P3	8" FROM P10 TO PP2
P4	8" FROM MAIN DRAINS TO PP3
P5	6" FROM PP3 TO VALVE BOXES
P6	10" FROM POOL FILTERS TO INLETS
P7	10" FROM PP1 & PP2 TO POOL FILTERS
P8	6" FROM POOL FILTERS TO BACKWASH CATCH BASIN
P9	3" FROM P7 TO BACKWASH CATCH BASIN
P10	12" FROM MAIN DRAINS TO P2 & P3
P11	10" FROM GUTTER DROPOUT BOXES TO SURGE TANK
P12	12" TRENCH DROPOUTS TO SURGE TANK
P13	2" FROM VALVE BOX TO LEAF FEATURE
P14	2" FROM VALVE BOX TO BUBBLERS
P15	2" FROM VALVE BOX TO BUBBLERS
P16	2" FROM VALVE BOX TO BUBBLERS

PIPING LEGEND

LEGEND	QTY.	ITEM
(floor inlet symbol)	35	FLOOR INLET REFER: 8/SP4.4
(sight sump symbol)	1	SIGHT SUMP REFER: 12/SP4.4
(gutter dropout box symbol)	2	GUTTER DROPOUT BOX REFER: 9/SP4.4
(main drain symbol)	2	MAIN DRAIN REFER: 10/SP4.4
(trench dropout symbol)	3	TRENCH DROPOUT REFER: 11/SP4.4
(valve box symbol)	2	VALVE BOX REFER: 4/SP4.5
– – – – –	N/A	BELOW GRADE PIPING

GENERAL PIPING NOTES

1. PROVIDE ALL MATERIALS AND EQUIPMENT AND PERFORM ALL LABOR REQUIRED TO INSTALL COMPLETE AND OPERATIONAL PIPING SYSTEMS AS INDICATED ON THE DRAWINGS, AS SPECIFIED AND AS REQUIRED BY CODE.
2. PIPE SIZES INDICATED ARE NOMINAL, I.P.S.
3. UNLESS OTHERWISE NOTED, ALL OVERHEAD PIPING SHALL BE TIGHT TO UNDERSIDE OF STRUCTURE OR SLAB.
4. ALL BALANCING VALVES AND BUTTERFLY VALVES SHALL BE PROVIDED WITH POSITION INDICATORS AND MAXIMUM ADJUSTABLE STOPS (MEMORY STOPS).
5. ALL VALVES SHALL BE INSTALLED SO THAT THE VALVE REMAINS IN SERVICE WHEN THE EQUIPMENT OR PIPING ON THE EQUIPMENT SIDE OF THE VALVE IS REMOVED.
6. PROVIDE CHAIN WHEEL OPERATORS FOR ALL VALVES IN EQUIPMENT ROOMS MOUNTED GREATER THAN 7'–0" ABOVE FINISHED FLOOR; CHAIN SHALL EXTEND TO 7'–0" ABOVE FINISHED FLOOR LEVEL.
7. INSTALL ALL PIPING WITHOUT FORCING OR SPRINGING.
8. ALL PIPING WORK SHALL BE COORDINATED WITH ALL TRADES AND SITE CONDITIONS. OFFSETS, EXPANSION LOOPS, OR TRANSITIONS IN PIPING AROUND OBSTRUCTIONS SHALL BE PROVIDED AT NO ADDITIONAL COST TO THE OWNER.
9. ALL PIPING INDICATED SHALL BE CONSIDERED DIAGRAMMATIC.
10. ALL SWIMMING POOL PIPING ROUTED BELOW THE POOL SHELL SHALL BE SCHEDULE 80 PVC. REFER: 1/SP4.5
11. ALL UNDERGROUND OR EXPOSED SWIMMING POOL PIPING SHALL BE SCHEDULE 80 PVC, UNLESS OTHERWISE NOTED. CONTRACTOR SHALL REFER TO PLANS AND SPECIFICATIONS FOR ANY SPECIFIC REQUIREMENTS REGARDING PLACEMENT AND BACKFILLING OF BELOW GRADE POOL PIPE.
12. ALL DIMENSIONS INDICATED FROM THE FINISH WALL SURFACE AND DO NOT ACCOUNT FOR ANY VARIATIONS IN EITHER GRADE OR SLOPE DISTANCES.
13. THE CHEMICAL SENSOR LINE SHALL BE A 3/4" TO 1" DIAMETER, SCHEDULE 80 PVC PIPE EXTENDED FROM THE WET CELL SENSOR TO ITS RESPECTIVE FILL FUNNEL AND THE BACKWASH CATCH BASIN OR PUMP SUCTION.
14. ALL FLOOR INLETS SHALL BE ADJUSTED TO ACHIEVE AN EVEN FLOW DISTRIBUTION THROUGHOUT SYSTEMS.
15. ALL PIPE TEES SHALL BE SIZED FOR LARGEST PIPE CONNECTION.
16. ALL GUTTER DROPOUT LINES SHALL SLOPE 1/8" PER FOOT MINIMUM
17. 55 PSI MINIMUM WATER PRESSURE FOR POOL LIFT. REFER TO PLUMBING.

POOL PIPING WINTERIZATION NOTES

1. ALL POOL PIPING SHALL HAVE THE CAPABILITY TO BE DRAINED FOR WINTERIZATION. (OUTDOOR POOLS ONLY)
2. ALL POOL SUCTION AND GRAVITY PIPING SHALL BE INSTALLED WITH A CONSTANT SLOPE TO THE MAIN DRAINS AND/OR SURGE TANK.
3. ALL POOL RETURN PIPING SHALL HAVE THE ABILITY TO COMPLETELY DRAIN TO THE 2" WINTERIZATION LINE AS SHOWN ON THE DRAWINGS.
4. BLOW OUT ALL PIPES BY MEANS OF AN AIR BLOWER AND A WINTERIZATION TAP. CAP ALL PIPES. FOR ADDED PROTECTION AGAINST FREEZING PIPES, THE PIPES CAN BE FILLED WITH ANTI–FREEZE. REFER: 10/SP4.5

PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	SIZE	GPM	TDH	HP	NPSHR	NOTES
PP1	WAVE POOL RECIRCULATION PUMP 1 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP2	WAVE POOL RECIRCULATION PUMP 2 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP3	WAVE POOL FEATURE PUMP REFER: 1/SP4.3	AURORA	340	6X6X9	810	55	15	7.68	1,2,3,4,5

NOTE:
1. THE MANUFACTURER INDICATED IS BASIS OF DESIGN. PUMP MANUFACTURERS: ITT MARLOW, GRISWOLD, PACO OR AURORA SHALL BE CONSIDERED EQUAL PROVIDED THEY MEET SPECIFICATIONS AS INDICATED IN BID DOCUMENTS.
2. PROVIDE WITH 460 VOLT, 3 PHASE, 60HZ, 1750 RPM MOTOR.
3. PROVIDE WITH CHECK VALVE.
4. PROVIDE VARIABLE FREQUENCY DRIVE.
5. PROVIDE REMOTE PUMP START.

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P.E. DARREN BEVARD
LI.NO.:E-2008002132 DATE:APRIL 15,2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL RETURN
PIPING PLAN

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP3.1

EQUIPMENT SCHEDULE

ID	ITEM
1	FILTER SYSTEM
2	CHEMICAL CONTROLLER REFER: 2/SP4.3
3	CHLORINATION TANK REFER: 6/SP4.3
4	ACID TANK REFER: 3/SP4.3
5	FILL FUNNEL REFER: 10/SP4.3
6	WATER LEVEL CONTROLLER REFER: 2/SP4.5
7	VARIABLE FREQUENCY DRIVE
8	FLOW METER SENSOR REFER: 12/SP4.3
9	IMPACT FLOW METER REFER: 1/SP4.4
10	UV TREATMENT SYSTEM & CONTROLLER REFER: 7/SP4.3 (FUTURE INSTALLATION)
11	WAVE GENERATION EQUIPMENT REFER:
12	BACKWASH POLY TANK REFER:

PIPE SCHEDULE

ID	DESCRIPTION
P1	6" FROM FILL FUNNEL TO SURGE TANK
P2	8" FROM P10 TO PP1
P3	8" FROM P10 TO PP2
P4	8" FROM MAIN DRAINS TO PP3
P5	6" FROM PP3 TO VALVE BOXES
P6	10" FROM POOL FILTERS TO INLETS
P7	10" FROM PP1 & PP2 TO POOL FILTERS
P8	6" FROM POOL FILTERS TO BACKWASH CATCH BASIN
P9	3" FROM P7 TO BACKWASH CATCH BASIN
P10	12" FROM MAIN DRAINS TO P2 & P3
P11	10" FROM GUTTER DROPOUT BOXES TO SURGE TANK
P12	12" TRENCH DROPOUTS TO SURGE TANK
P13	2" FROM VALVE BOX TO LEAF FEATURE
P14	2" FROM VALVE BOX TO BUBBLERS
P15	2" FROM VALVE BOX TO BUBBLERS
P16	2" FROM VALVE BOX TO BUBBLERS

GENERAL POOL MECHANICAL ROOM NOTES

1. POOL PUMPS, STRAINERS, SHALL BE INSTALLED ON HOUSEKEEPING PADS UNLESS NOTED OTHERWISE.
2. EQUIPMENT ROOM FLOOR AND PUMP PIT FLOOR SHALL SLOPE 1/4" TO 1/2" PER FOOT TO FLOOR DRAINS OR SUMP PIT. REFER TO PLUMBING.
3. PROVIDE HOSE BIBBS FOR HOUSE CLEANING PURPOSES. REFER TO PLUMBING DRAWINGS.
4. THE INSIDE SURFACES OF THE BACKWASH CATCH BASIN SHALL BE WATERPROOFED. REFER TO SPECIFICATION.
5. VENTILATION OF POOL MECHANICAL ROOM AND CHEMICAL STORAGE AREAS PER LOCAL, STATE AND INTERNATIONAL MECHANICAL CODE MINIMUM. REFER TO MECHANICAL.
6. THE FOLLOWING INFORMATION SHALL BE LAMINATED AND POSTED IN THE POOL MECHANICAL ROOM: BACKWASH PROCEDURE, POOL FILLING & DRAINING, VALVE REFERENCE CHART, POOL MECHANICAL ROOM PLAN, POOL PIPING SCHEMATICS & POOL SYSTEMS SCHEMATICS.
7. REFER TO MECHANICAL FOR HVAC SYSTEMS DESIGN.
8. REFER TO ARCHITECTURAL DRAWINGS FOR LADDER RUNGS, SAFETY CHAIN, & REMOVABLE RAILING AT PUMP PIT.

PIPING

1. MINIMUM 7'-0" CLEARANCE BENEATH ALL OVERHEAD PIPING.
2. PROVIDE AND SUPPORT OVERHEAD AND VERTICAL PIPING PER SPECIFICATION REQUIREMENTS.
3. LABEL AND IDENTIFY ALL PIPING IN COMPLIANCE WITH THE SPECIFICATIONS.
4. ALL FLOW METERS SHALL BE SIZED TO MATCH THE PIPE ON WHICH IT IS INSTALLED. PROVIDE PRESSURE GAUGES ON INFLUENT AND EFFLUENT SIDE OF EACH FILTRATION SYSTEM AND A FULL LINE SIZE FLOW METER ON FILTER RETURN.
5. THE BACKWASH PIPING SHALL TERMINATE NO CLOSER THAN 6" ABOVE THE FLOOD RIM OF THE BACKWASH CATCH BASIN OR TWICE THE PIPE DIAMETER, WHICHEVER IS GREATER.
6. HYDROSTATICALLY TEST ALL PIPING AT 50 PSI FOR TWO HOURS AND MAINTAIN A PRESSURE OF 20 PSI IN ALL PIPING THROUGHOUT CONSTRUCTION. SECURE ALL FIXTURES PER SPECIFICATION REQUIREMENTS BEFORE HYDROSTATIC TEST.
7. REFER TO DETAILS 2-7 ON DRAWING SP4.4 FOR INSTALLATION OF PIPE SUPPORTS.

FILTERS

1. ALL FILTER SUPPORTS SHALL BE SEISMICALLY RATED FOR THE SEISMIC ZONE IN WHICH IT IS INSTALLED IN ACCORDANCE WITH LOCAL AND/ OR STATE REQUIREMENTS.
2. FILTER MANUFACTURER SHALL CERTIFY FILTER MEDIA.
3. VALVES SHALL BE PROVIDED TO BACKWASH EACH FILTER VESSEL INDEPENDENTLY.
4. FILTER TANK ASSEMBLIES SHALL BEAR THE NATIONAL SANITATION FOUNDATION SEAL OF APPROVAL FOR A MAXIMUM FLOW RATE OF 20 GPM PER SQUARE FOOT OF FILTER MEDIA.
5. THE BACKWASH THROTTLING VALVE(S) HANDLE SHALL BE REMOVED AND TURNED OVER TO THE OWNER ONCE THE BACKWASH FLOW RATE(S) HAVE BEEN TESTED, ADJUSTED AND BALANCED.
6. PROVIDE 1" DIAMETER, SCHEDULE 80 PIPE FROM THE AUTOMATIC AIR VENT ON EACH FILTER VESSEL TO THE NEAREST FLOOR DRAIN OR BACKWASH CATCH BASIN. THE VENT PIPE SHALL BE SLOPED TO THE DRAIN.
7. VESSEL SHALL BE BACKWASHED AT NO LESS THAN 15.0 GPM/SF.
8. PROVIDE MILLED ANGULAR SHAPED PARTICLES OF SILICA QUARTZ FOR FILTER MEDIA. PARTICLE SIZE SHALL BE BETWEEN 0.45MM AND 0.55MM AND HAVE A MAXIMUM UNIFORMITY COEFFICIENT OF 1.53. (CA)

CHEMICAL TREATMENT

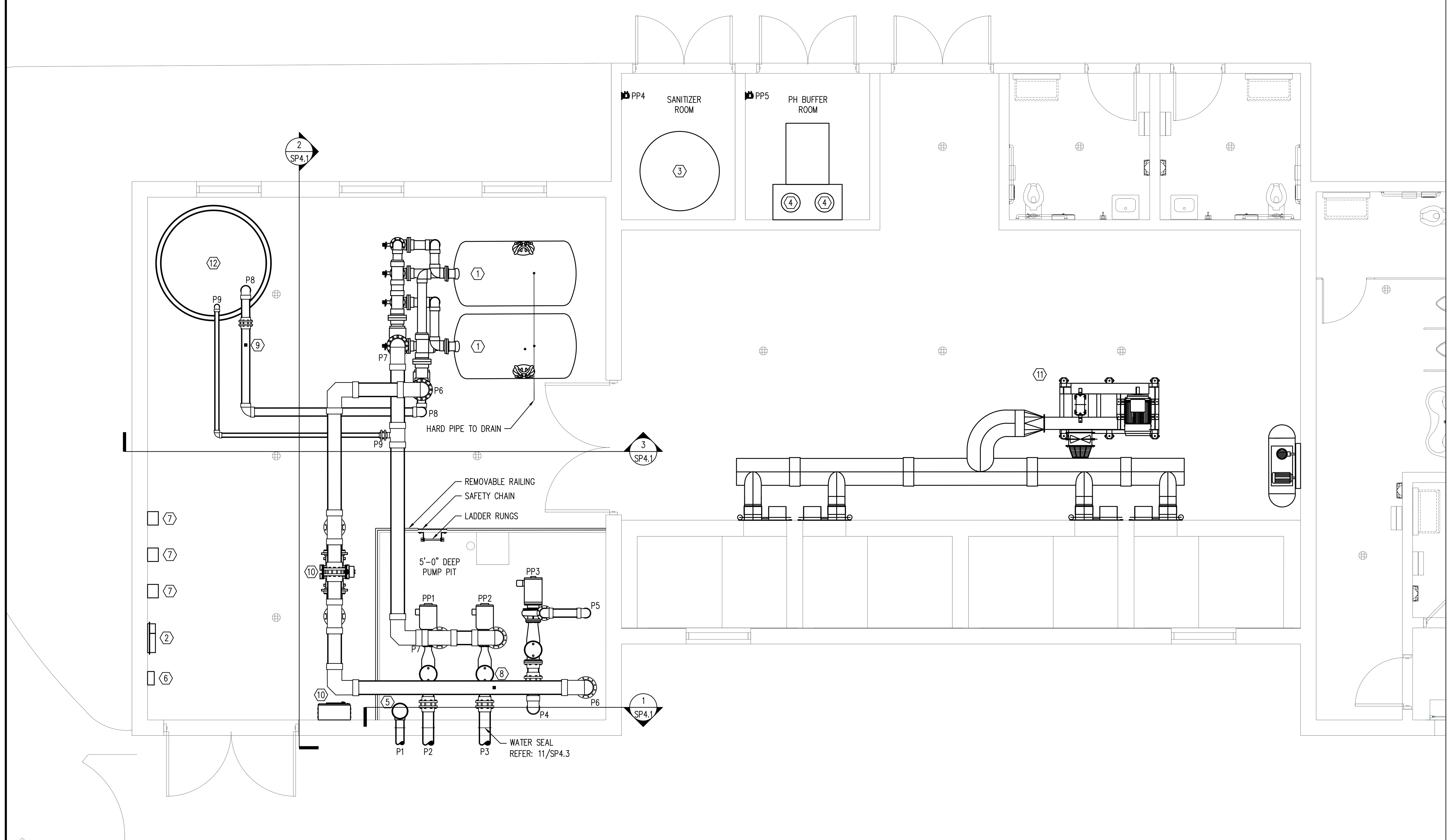
1. CHEMICAL FEED REQUIREMENTS – REFER TO THE POOL SYSTEMS SCHEMATIC(S) ON SP5.0.
2. INTERLOCK POOL CIRCULATION PUMP(S) WITH ITS CORRESPONDING WATER CHEMISTRY CONTROLLER, CHEMICAL FEED PUMP(S).
3. PROVIDE SIGNAGE ON CHEMICAL ROOM DOORS IN COMPLIANCE WITH THE STATE FIRE CODE. REFER 9/SP4.3.
4. SECURE CHEMICAL METERING PUMP FEED LINES TO WALL AND/OR OVERHEAD WITH CLIPS OR DEVICES THAT DO NOT CRIMP, DISTORT OR ALLOW HIGH AND LOW AREAS IN TUBING RUNS. PROVIDE CHECK VALVE AND SHUT-OFF VALVE BEFORE LINES ENTER POOL RETURN PIPING.
5. WATER CHEMISTRY CONTROLLERS SHALL CONTROL THE SANITIZING SYSTEM AND PH CONTROL SYSTEM AND SHUT THEM DOWN UPON LOSS OF SAMPLE STREAM FLOW.
6. THE CHEMICAL CONTROL SYSTEM BYPASS LINE SHALL SAMPLE WATER AFTER THE FILTERS.
7. VERIFY REMOTE ACCESS CAPABILITY TO ALL CHEMICAL CONTROLLERS. REFER TO ELECTRICAL.
8. LOCATE CHEMICAL INJECTION POINT AFTER THE FLOW METER SENSOR AND AT MAXIMUM HEIGHT OF 7'-0" ABOVE FINISHED FLOOR. REFER: 8/SP4.3

PUMPS

1. PROVIDE INFLUENT AND EFFLUENT GAUGES FOR EACH PUMP. PRESSURE GAUGES HAVE A RANGE OF 0-60 PSI. COMPOUND GAUGES HAVE A RANGE OF 0-30 HG / 0-60 PSI.

ELECTRICAL

1. GFCI'S PROVIDED AT OUTLETS. REFER TO ELECTRICAL.
2. POOL EQUIPMENT ROOM AND CHEMICAL STORAGE AREAS SHALL BE PROVIDED WITH ARTIFICIAL LIGHTING SUFFICIENT TO ILLUMINATE ALL EQUIPMENT AND SUPPLIES. REFER TO ELECTRICAL.
3. CONDUIT SHALL BE ROUTED OVERHEAD OR BELOW GRADE.



1 SP4.0 WAVE POOL MECHANICAL ROOM PLAN
1/4" = 1'-0"

PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	SIZE	GPM	TDH	HP	NPSHR	NOTES
PP1	WAVE POOL RECIRCULATION PUMP 1 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP2	WAVE POOL RECIRCULATION PUMP 2 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP3	WAVE POOL FEATURE PUMP REFER: 1/SP4.3	AURORA	340	6X6X9	810	55	15	7.68	1,2,3,4,5

NOTE:
1. THE MANUFACTURER INDICATED IS BASIS OF DESIGN. PUMP MANUFACTURERS: ITT MARLOW, GRISWOLD, PACO OR AURORA SHALL BE CONSIDERED EQUAL PROVIDED THEY MEET SPECIFICATIONS AS INDICATED IN BID DOCUMENTS.
2. PROVIDE WITH 460 VOLT, 3 PHASE, 60HZ, 1750 RPM MOTOR.
3. PROVIDE WITH CHECK VALVE.
4. PROVIDE VARIABLE FREQUENCY DRIVE.
5. PROVIDE REMOTE PUMP START.

CHEMICAL FEED PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	TUBE #	NOTES
PP4	CHLORINATION FEED PUMP REFER: 6/SP4.3	STENNER	85M5	5	1,2,3
PP5	ACID FEED PUMP REFER: 3/SP4.3	STENNER	45M5	3	1,2,3

NOTE:
1. THE MANUFACTURER INDICATED IS BASIS OF DESIGN. ALTERNATE MANUFACTURER: LMI OR APPROVED EQUAL.
2. PROVIDE WITH 120 VOLT, SINGLE PHASE, ADJUSTABLE FEED.
3. INTERLOCK WITH POOL RECIRCULATION PUMP.

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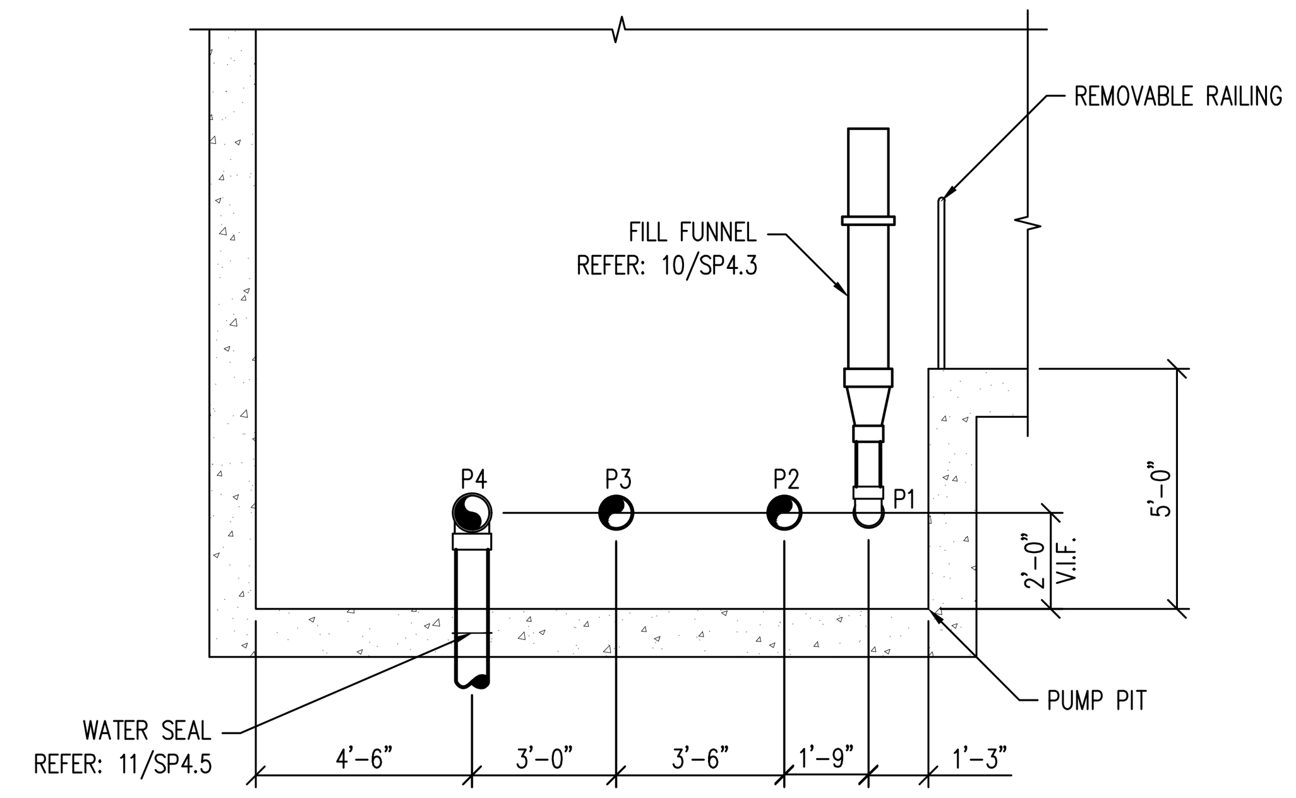
P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15,2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL MECHAINCAL ROOM PLAN

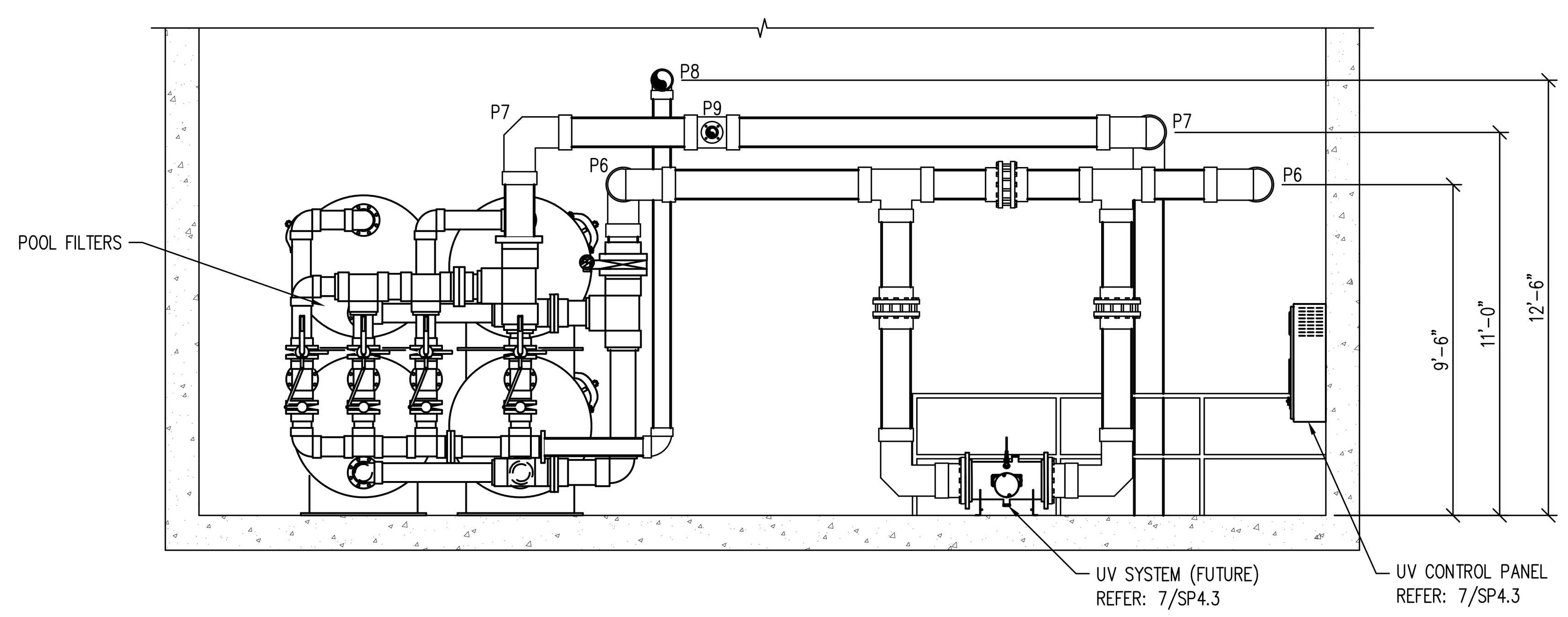
Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP4.0



1 SP4.1 **WAVE POOL MECHANICAL ROOM SECTION**

1/4" = 1'-0"



2 SP4.1 **WAVE POOL MECHANICAL ROOM SECTION**

1/4" = 1'-0"

PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	SIZE	GPM	TDH	HP	NPSHR	NOTES
PP1	WAVE POOL RECIRCULATION PUMP 1 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP2	WAVE POOL RECIRCULATION PUMP 2 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP3	WAVE POOL FEATURE PUMP REFER: 1/SP4.3	AURORA	340	6X6X9	810	55	15	7.68	1,2,3,4,5

NOTE:
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2. PROVIDE WITH 460 VOLT, 3 PHASE, 60HZ, 1750 RPM MOTOR.
3. PROVIDE WITH CHECK VALVE.
4. PROVIDE VARIABLE FREQUENCY DRIVE.
5. PROVIDE REMOTE PUMP START.

PIPE SCHEDULE

ID	DESCRIPTION
P1	6" FROM FILL FUNNEL TO SURGE TANK
P2	8" FROM P10 TO PP1
P3	8" FROM P10 TO PP2
P4	8" FROM MAIN DRAINS TO PP3
P5	6" FROM PP3 TO VALVE BOXES
P6	10" FROM POOL FILTERS TO INLETS
P7	10" FROM PP1 & PP2 TO POOL FILTERS
P8	6" FROM POOL FILTERS TO BACKWASH CATCH BASIN
P9	3" FROM P7 TO BACKWASH CATCH BASIN
P10	12" FROM MAIN DRAINS TO P2 & P3
P11	10" FROM GUTTER DROPOUT BOXES TO SURGE TANK
P12	12" TRENCH DROPOUTS TO SURGE TANK
P13	2" FROM VALVE BOX TO LEAF FEATURE
P14	2" FROM VALVE BOX TO BUBBLERS
P15	2" FROM VALVE BOX TO BUBBLERS
P16	2" FROM VALVE BOX TO BUBBLERS

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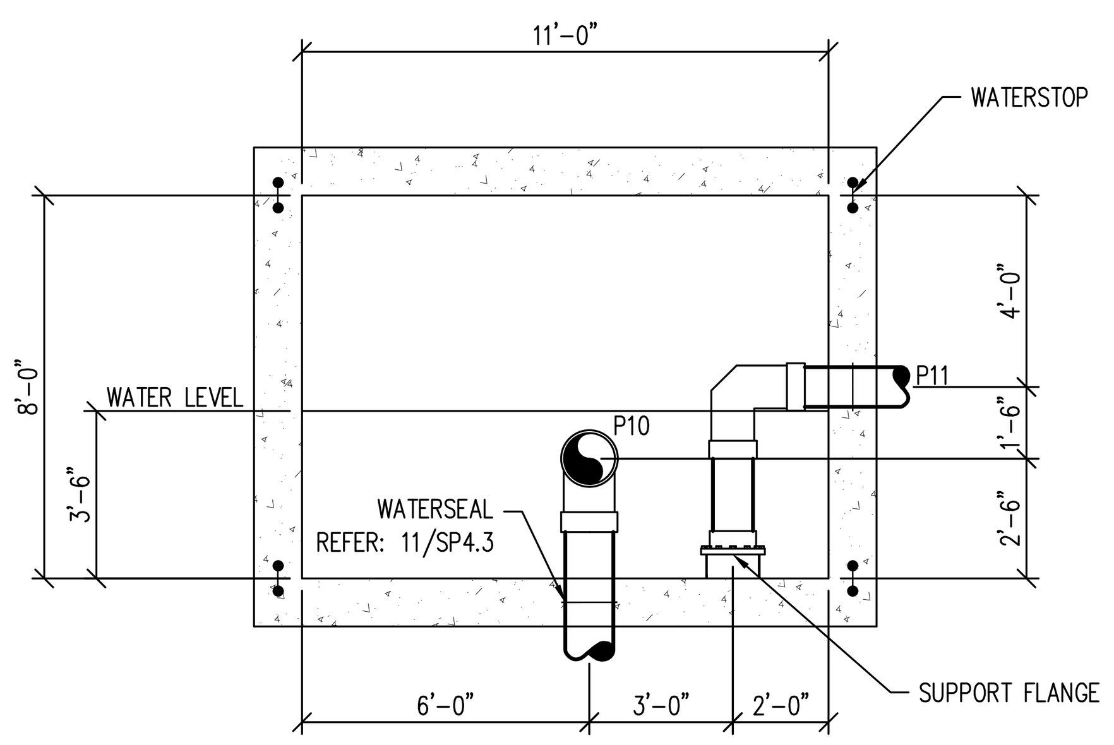
SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

WAVE POOL MECHAINCAL ROOM SECTIONS

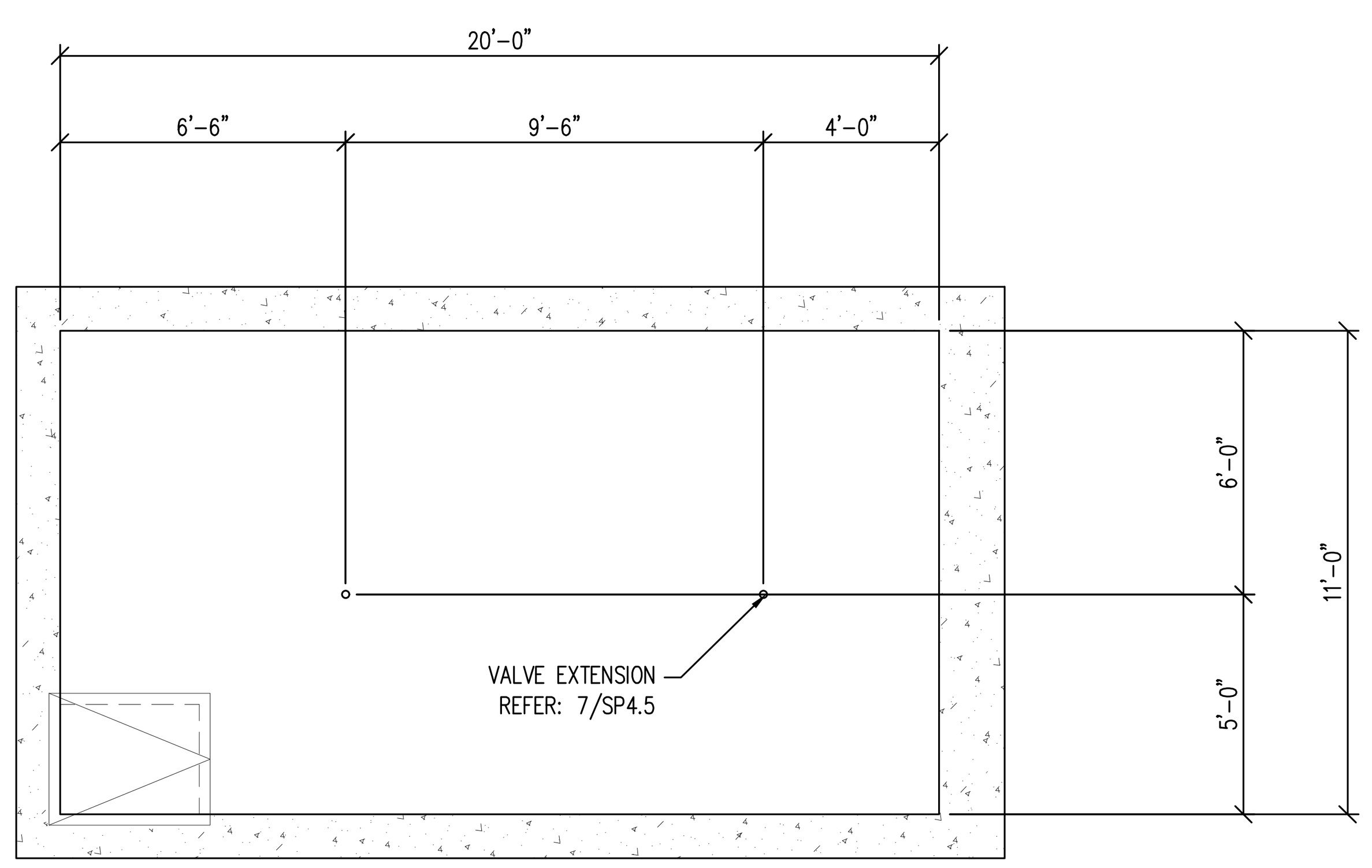
Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET

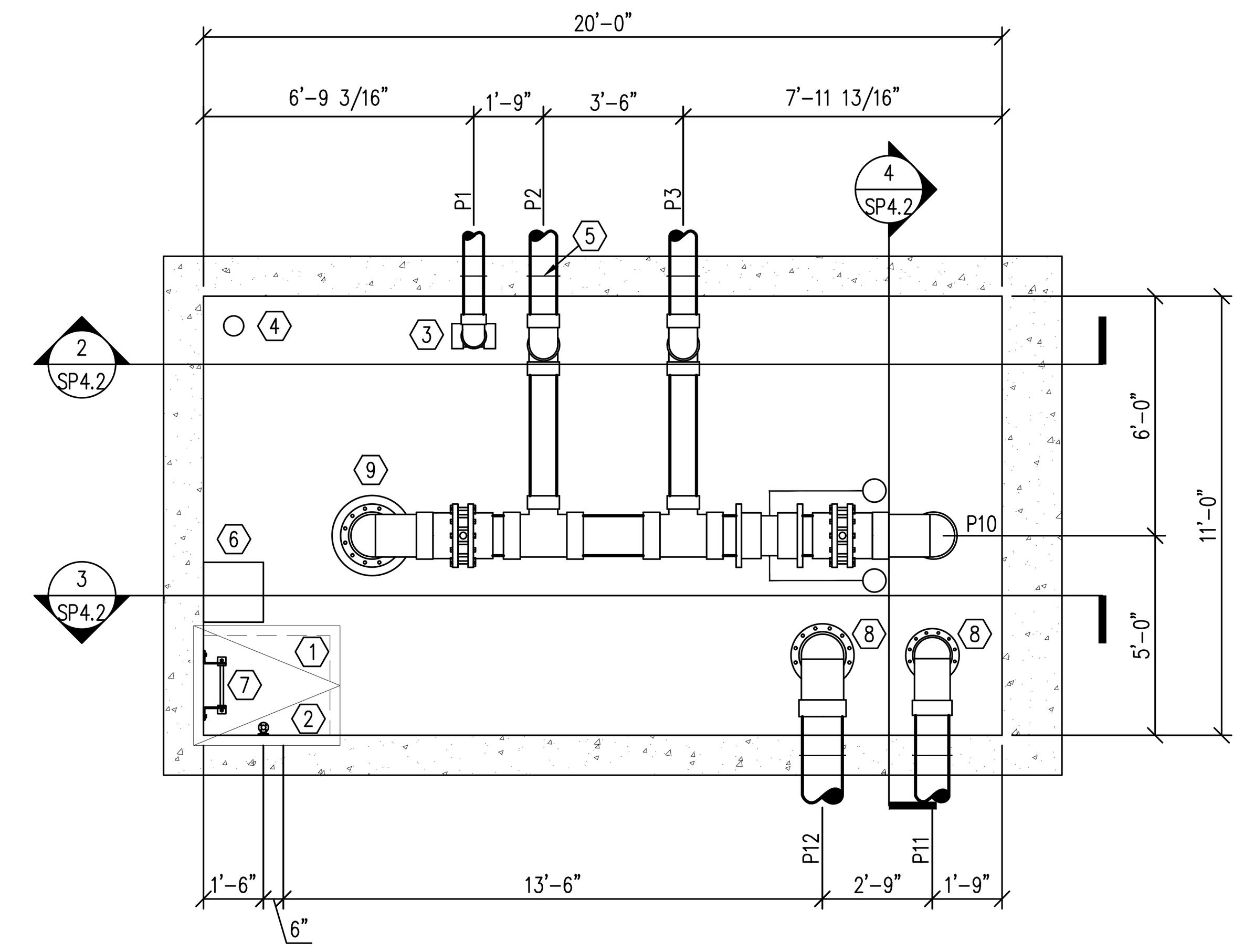
SP4.1



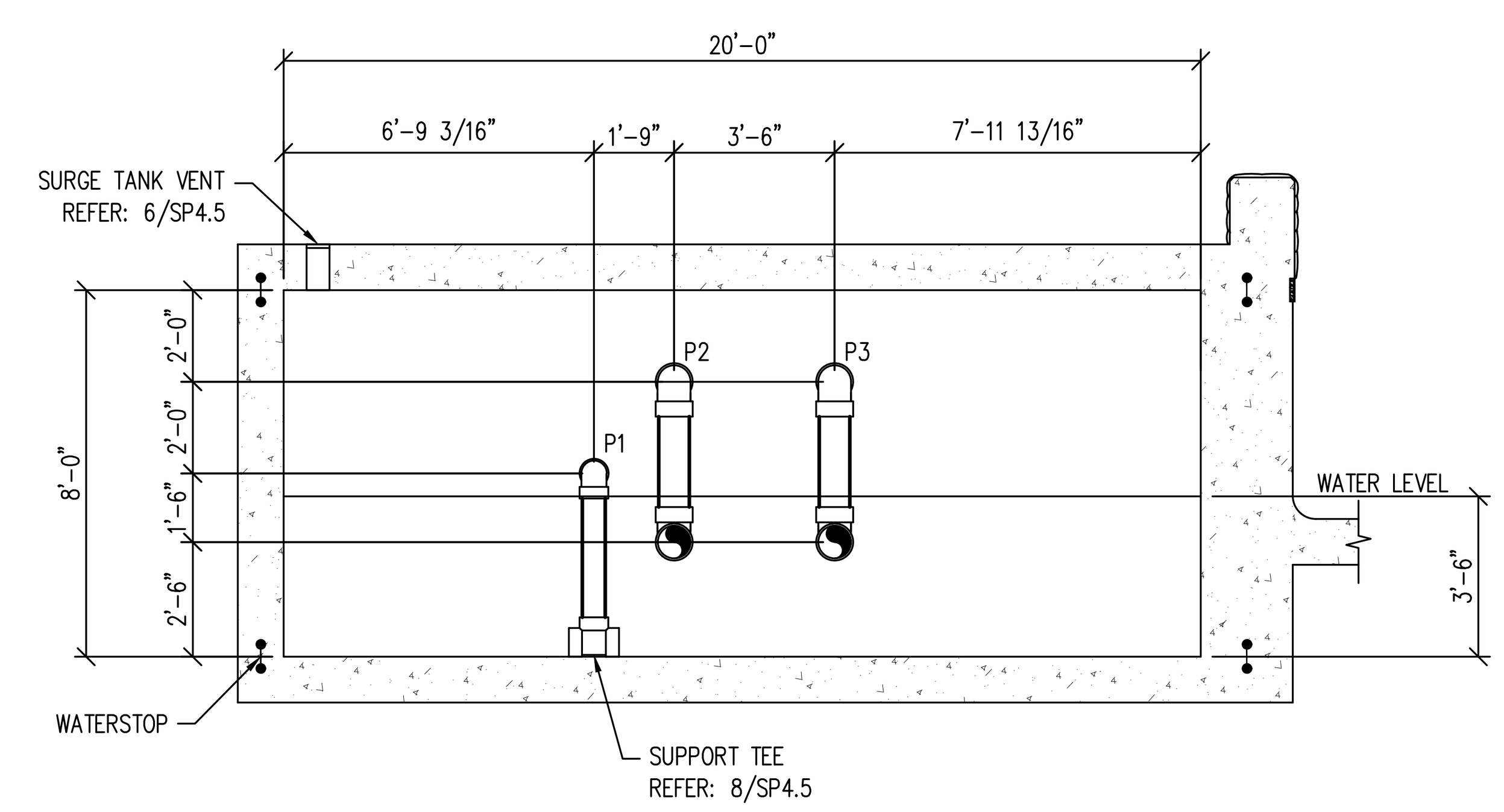
4 SP4.2 **SURGE TANK SECTION**
1/4" = 1'-0"



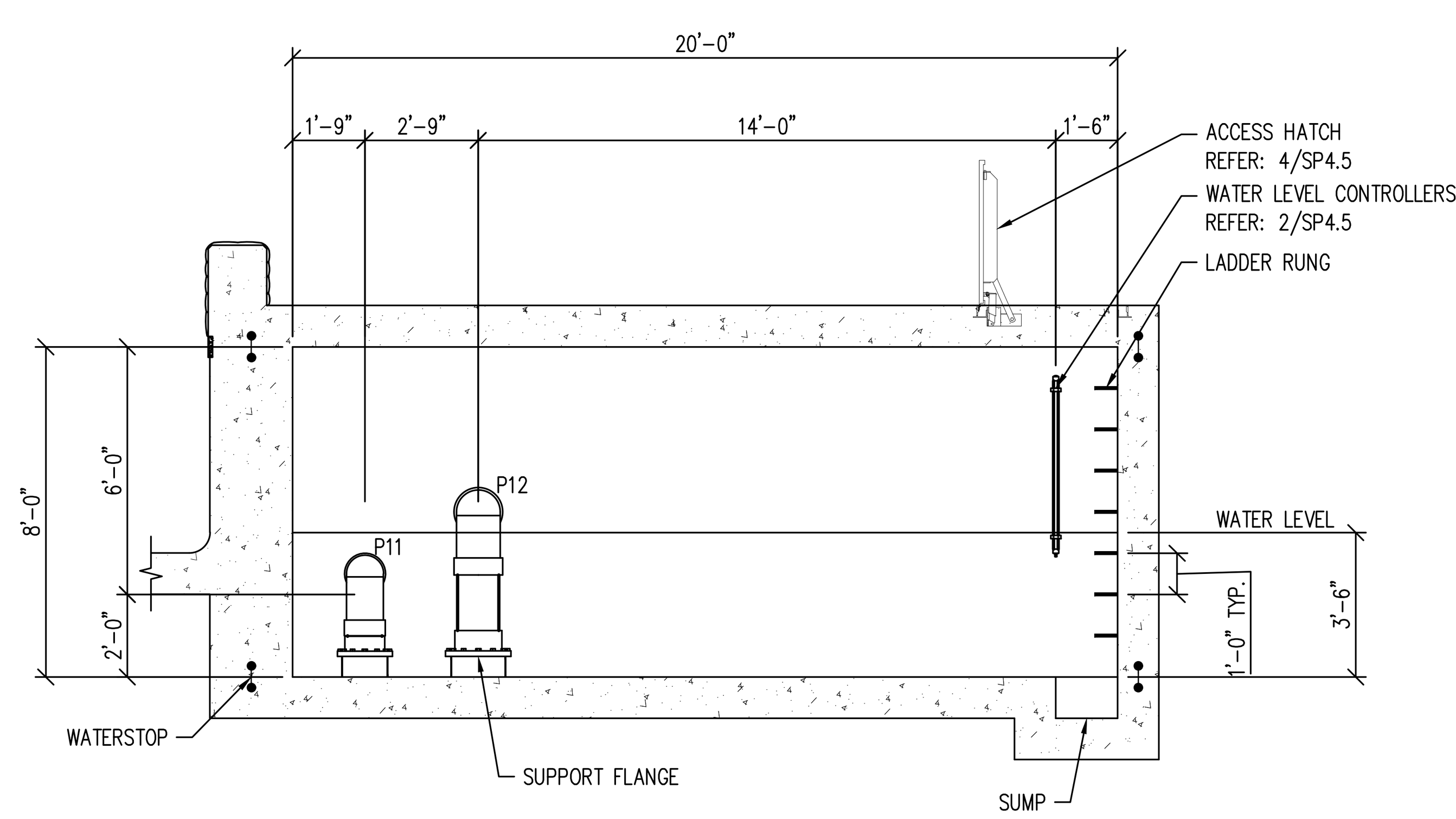
5 SP4.2 **VALVE EXTENSION PENETRATION PLAN**
1/4" = 1'-0"



1 SP4.2 **SURGE TANK PLAN**
1/4" = 1'-0"



2 SP4.2 **SURGE TANK SECTION**
1/4" = 1'-0"



3 SP4.2 **SURGE TANK SECTION**
1/4" = 1'-0"

SURGE TANK NOTES

1. A WATERPROOFING COATING SHALL BE PROVIDED TO ALL INTERIOR SURFACES OF SURGE TANK INCLUDING LID.
2. PROVIDE WATER TIGHT PIPE PENETRATIONS AND INTERFACES WITHIN THE SURGE TANK.
3. REFER TO POOL OR BUILDING STRUCTURAL DRAWINGS FOR SURGE TANK STRUCTURAL SHELL DESIGN.
4. SLEEVES IN SLAB OVER SURGE TANK FOR VALVE EXTENSIONS POSITIONED DIRECTLY ABOVE SURGE TANK VALVES BELOW SHALL BE COORDINATED.
5. DRILL 1" DIAMETER HOLE ON TOP OF ELBOW. TYPICAL ALL GUTTER DROPOUT LINES.
6. LADDER RUNGS SHALL BE PROVIDED.
7. REFER TO POOL OR BUILDING STRUCTURAL DRAWINGS FOR WATER STOPS.
8. PVC ANTI-VORTEX PLATE SHALL BE MINIMUM 2.5 TIMES CONNECTING PIPE DIAMETER UP TO 24" AND 4" A.F.F.
9. SUPPORT FLANGE WITH FOUR (4) LEGS EQUAL TO NOMINAL PIPE DIAMETER, BUT NOT LESS THAN 6" A.F.F.
10. PROVIDE 18"x18"x12" DEEP SUMP LOCATED NEAR ACCESS HATCH.

PUMP SCHEDULE

ID	DESCRIPTION	MANUFACTURER	MODEL	SIZE	GPM	TDH	HP	NPSHR	NOTES
PP1	WAVE POOL RECIRCULATION PUMP 1 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP2	WAVE POOL RECIRCULATION PUMP 2 REFER: 1/SP4.3	AURORA	340	6X6X9	800	75	25	7.94	1,2,3,4
PP3	WAVE POOL FEATURE PUMP REFER: 1/SP4.3	AURORA	340	6X6X9	810	55	15	7.68	1,2,3,4,5

NOTE:
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2. PROVIDE WITH 460 VOLT, 3 PHASE, 60HZ, 1750 RPM MOTOR.
3. PROVIDE WITH CHECK VALVE.
4. PROVIDE VARIABLE FREQUENCY DRIVE.
5. PROVIDE REMOTE PUMP START.

PIPE SCHEDULE

ID	DESCRIPTION
P1	6" FROM FILL FUNNEL TO SURGE TANK
P2	8" FROM P10 TO PP1
P3	8" FROM P10 TO PP2
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P12	12" TRENCH DROPOUTS TO SURGE TANK
P13	2" FROM VALVE BOX TO LEAF FEATURE
P14	2" FROM VALVE BOX TO BUBBLERS
P15	2" FROM VALVE BOX TO BUBBLERS
P16	2" FROM VALVE BOX TO BUBBLERS

EQUIPMENT SCHEDULE

ID	ITEM
1	ACCESS HATCH REFER: 5/SP4.5
2	WATER LEVEL CONTROLLER(S) REFER: 2/SP4.5
3	SUPPORT TEE REFER: 8/SP4.5
4	SURGE TANK VENT REFER: 6/SP4.5
5	WATER SEAL REFER: 11/SP4.5
6	SUMP
7	LADDER RUNGS
8	SUPPORT FLANGE
9	ANTI-VORTEX PLATE

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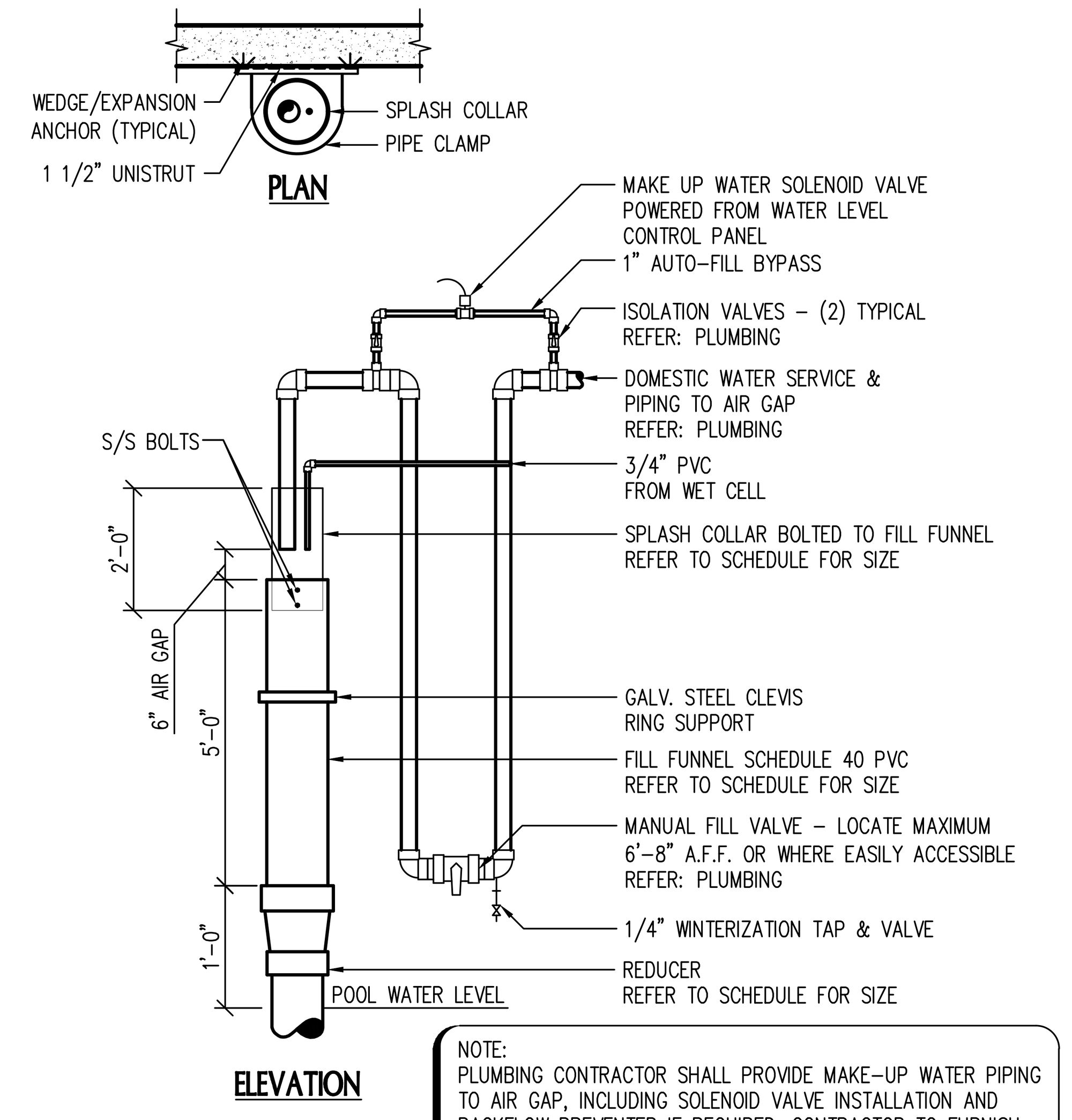
P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15,2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

SURGE TANK PLAN & SECTIONS

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP4.2

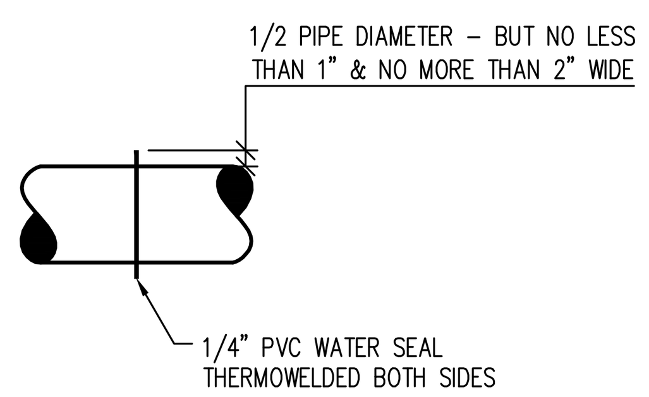


NOTE:
PLUMBING CONTRACTOR SHALL PROVIDE MAKE-UP WATER PIPING TO AIR GAP, INCLUDING SOLENOID VALVE INSTALLATION AND BACKFLOW PREVENTER IF REQUIRED. CONTRACTOR TO FURNISH SOLENOID, PROVIDE FILL FUNNEL, AND PIPING TO SURGE TANK

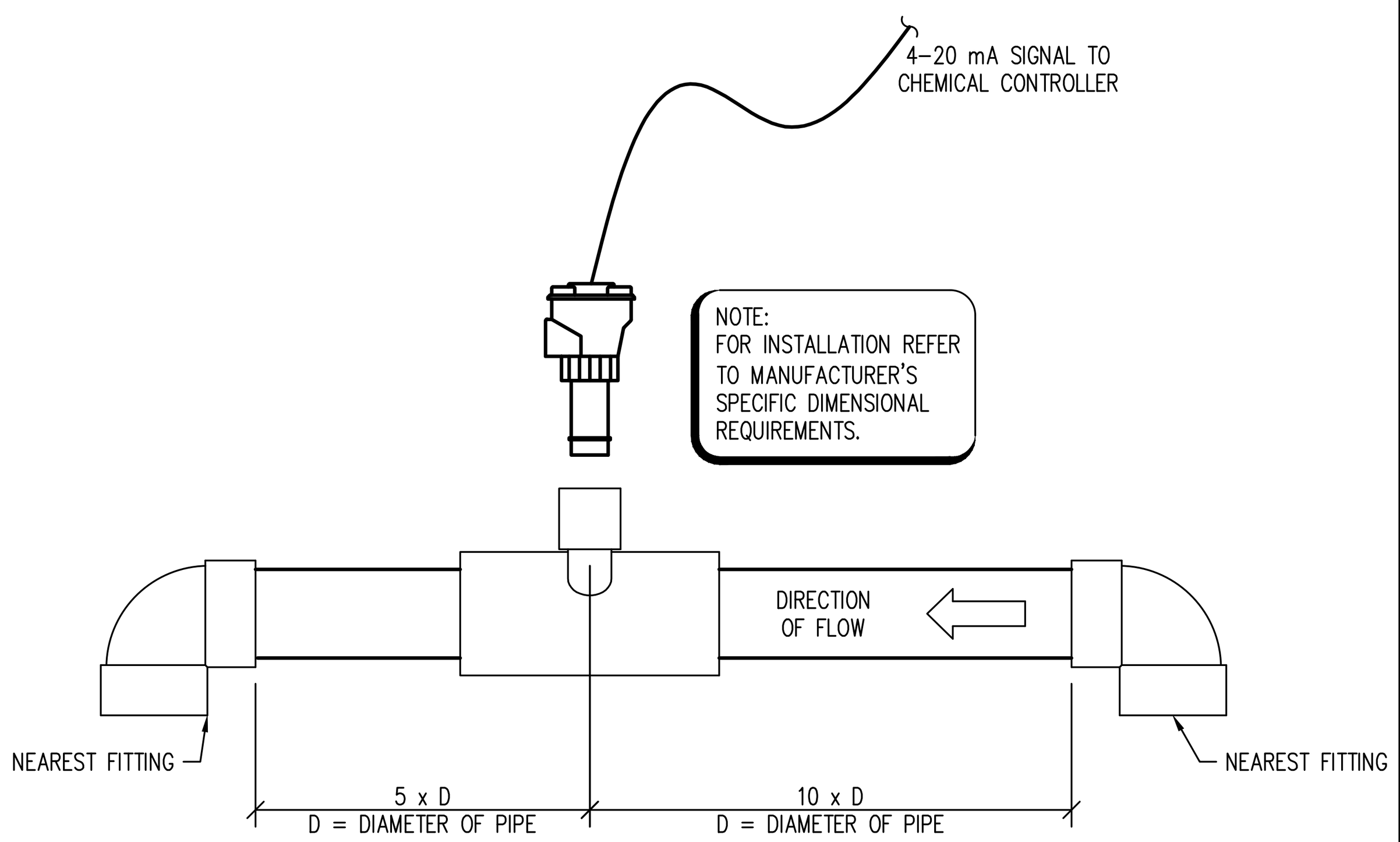
FILL FUNNEL SCHEDULE

POOL	FRESH WATER SUPPLY GPM (MIN.)	FILL FUNNEL SIZE	REDUCER SIZE	SPLASH COLLAR SIZE	FILL LINE SIZE TO POOL
WAVE POOL	100	10"	10X6	8"	6"

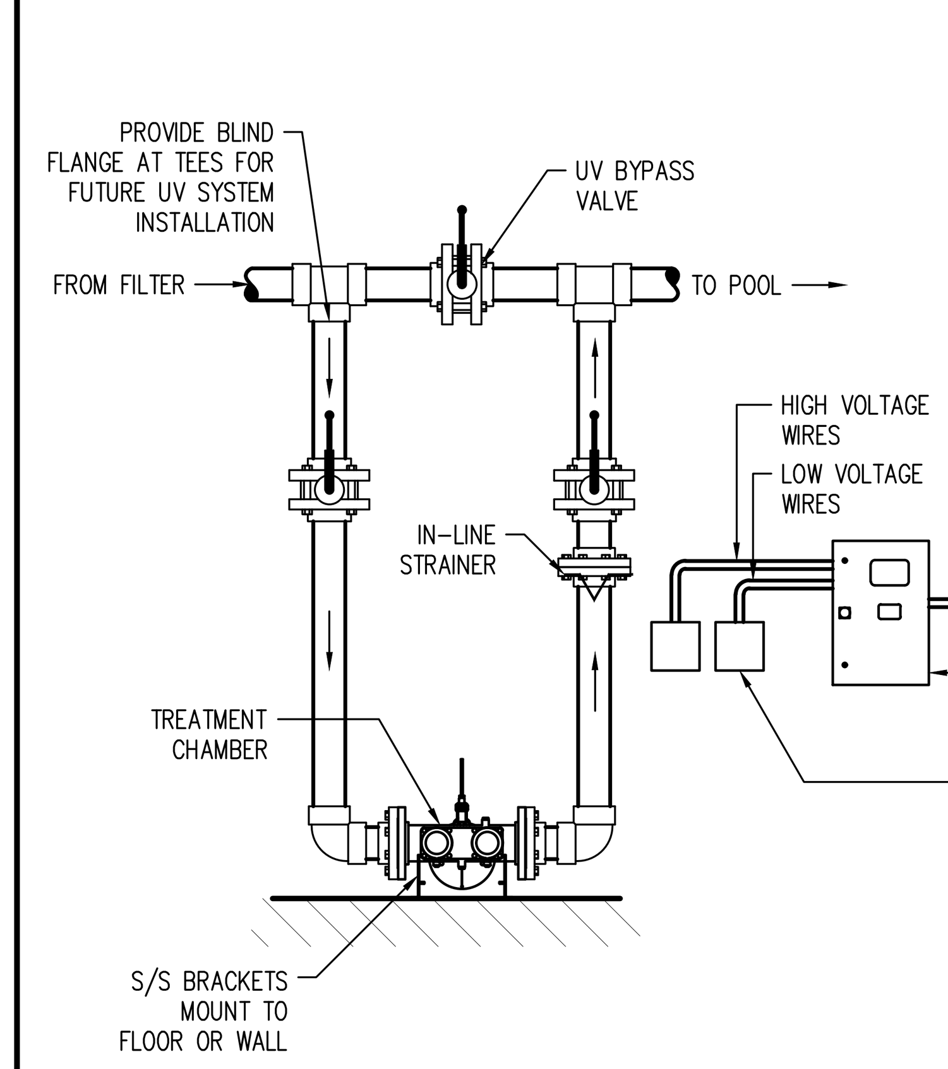
10 FILL FUNNEL
SP4.3 3/8" = 1'-0"



11 WATER SEAL
SP4.3 1" = 1'-0"

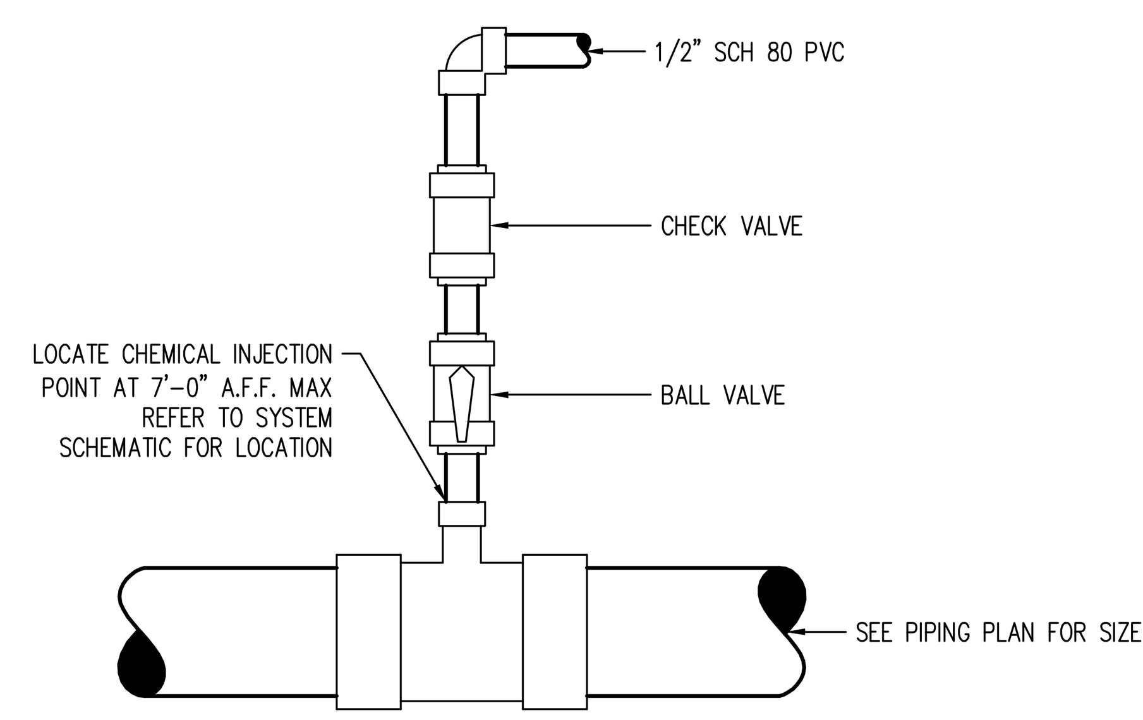


12 FLOW METER SENSOR
SP4.3 3/4" = 1'-0"

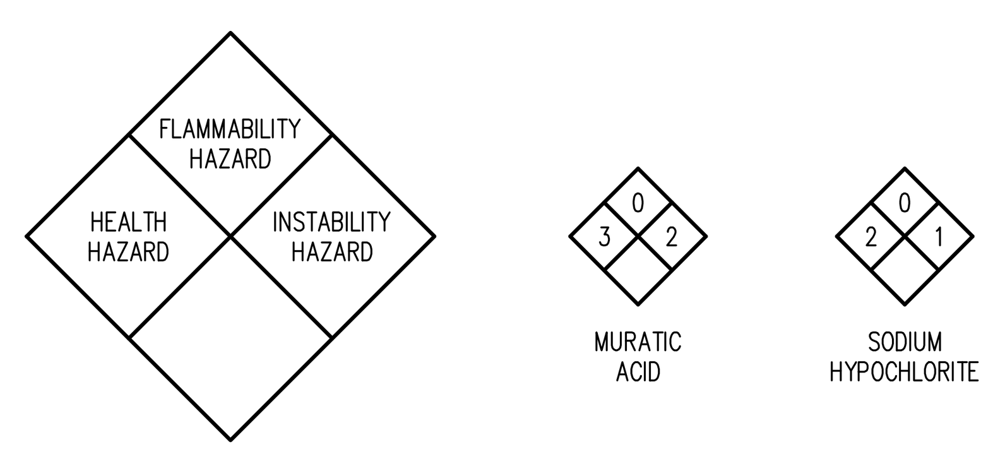


NOTE:
1. UV TREATMENT SYSTEM SHALL BE FUTURE INSTALLATION, NOT INCLUDED IN BASE BID.
2. ALL PIPING IN UV BYPASS LOOP SHALL BE SCHEDULE 80 PIPING.
3. INFLUENT & EFFLUENT FLOW VARIABLE ON CHAMBER ORIENTATION.
4. REFER TO POOL PIPING & MECHANICAL ROOM DRAWINGS FOR POOL RECIRCULATION PIPE SIZES.
5. REFER TO MANUFACTURER FOR POWER CONNECTIONS FROM CHAMBER TO CONTROL CABINET.
6. PROVIDE CLEARANCE PER MANUFACTURER RECOMMENDATION TO REMOVE UV LAMPS.

7 UV TREATMENT SYSTEM (FUTURE)
SP4.3 1/2" = 1'-0"



8 CHEMICAL TAP AND VALVE
SP4.3 1" = 1'-0"

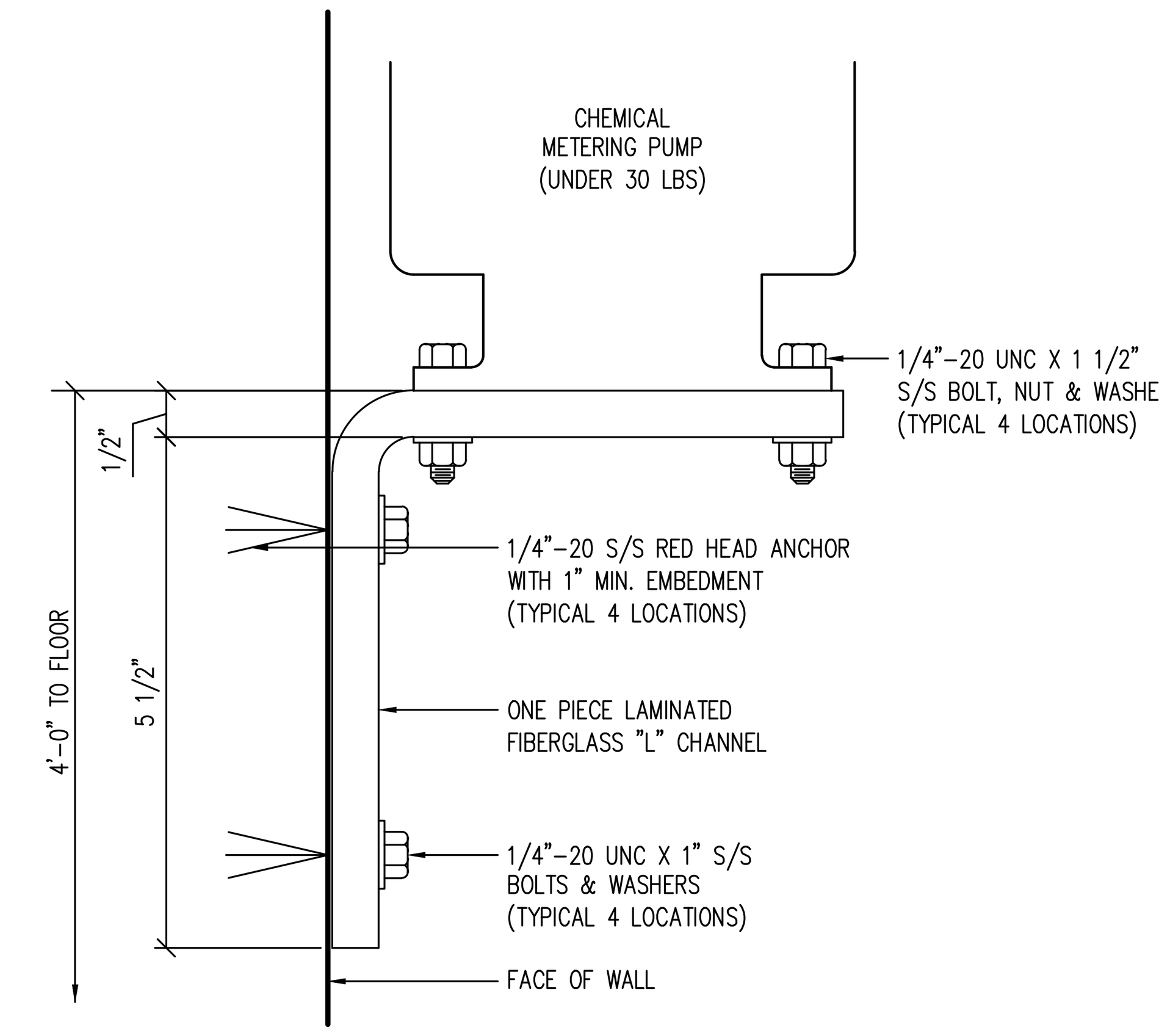


RATING EXPLANATION GUIDE

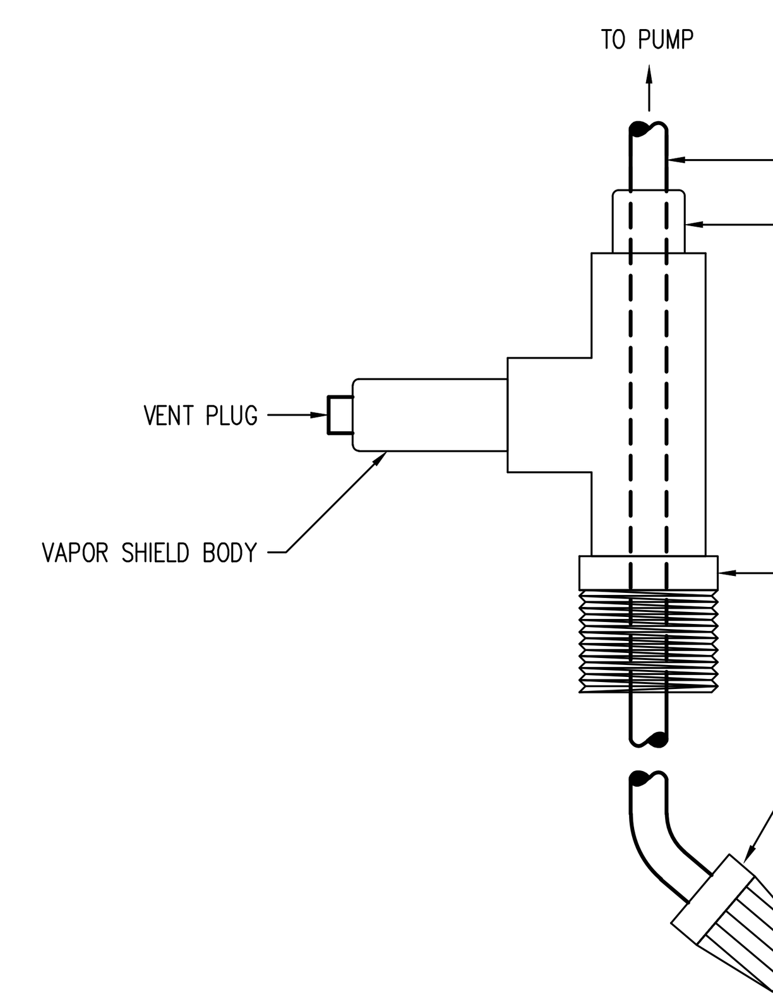
RATING	HEALTH HAZARD	FLAMMABILITY HAZARD	INSTABILITY HAZARD
4	CAN BE LETHAL	BELOW 73 DEGREES F	MAY EXPLODE AT NORMAL TEMPERATURES & PRESSURES
3	CAN CAUSE SERIOUS OR PERMANENT INJURY	ABOVE 73 DEGREES, BELOW 100 DEGREES F	MAY EXPLODE AT HIGH TEMPERATURE OR SHOCK
2	CAN CAUSE TEMPORARY INCAPACITATION OR RESIDUAL INJURY	ABOVE 100 DEGREES F, BELOW 200 DEGREES F	VIOLENT CHEMICAL CHANGE AT HIGH TEMPERATURES OR PRESSURES
1	CAN CAUSE SIGNIFICANT IRRITATION	ABOVE 200 DEGREES F	NORMALLY STABLE. HIGH TEMPERATURES MAKE UNSTABLE
0	NO HAZARD	WILL NOT BURN	STABLE

CONFIRM SIGNAGE WITH LOCAL FIRE MARSHAL AND/OR BUILDING CODES PRIOR TO INSTALLATION.

9 HAZARD SIGNAGE
SP4.3 NTS

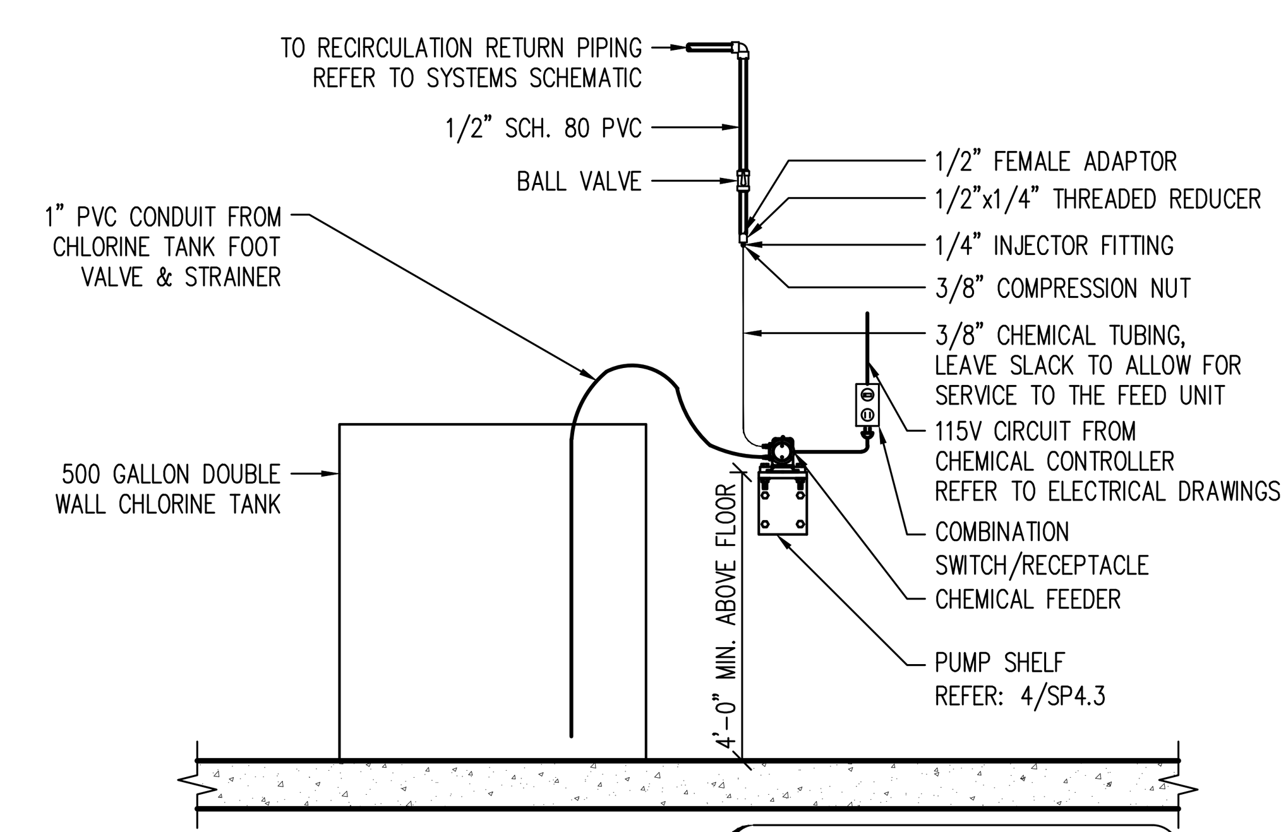


4 CHEMICAL PUMP SHELF
SP4.3 6" = 1'-0"



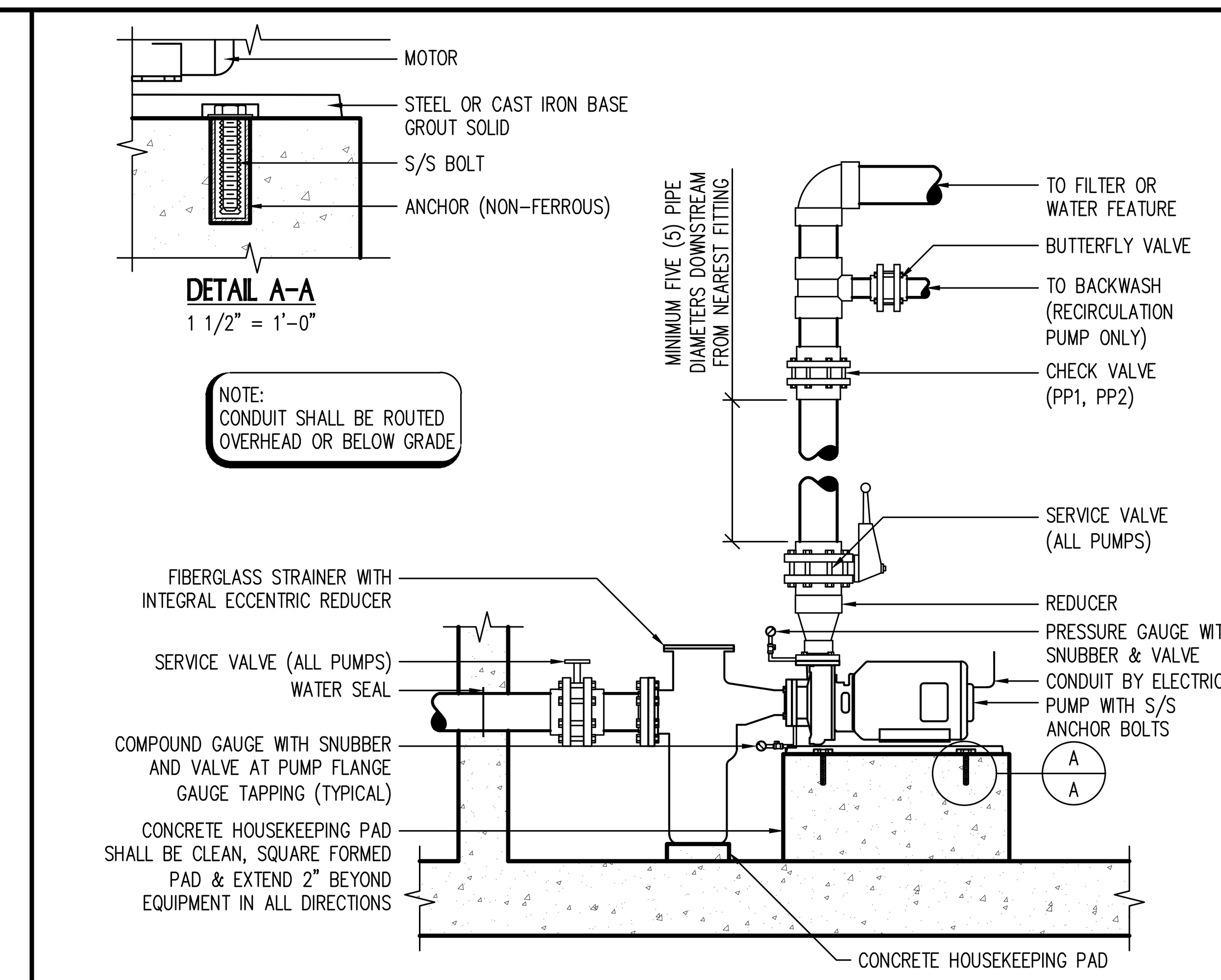
NOTE:
WITH ALL TANK CONFIGURATIONS, INCLUDING BULK TANKS, VAPOR SHIELD SHALL BE CONFIGURED TO ENSURE CONTAINMENT OF ALL VAPORS.

5 ACID VENT PIPING
SP4.3 6" = 1'-0"



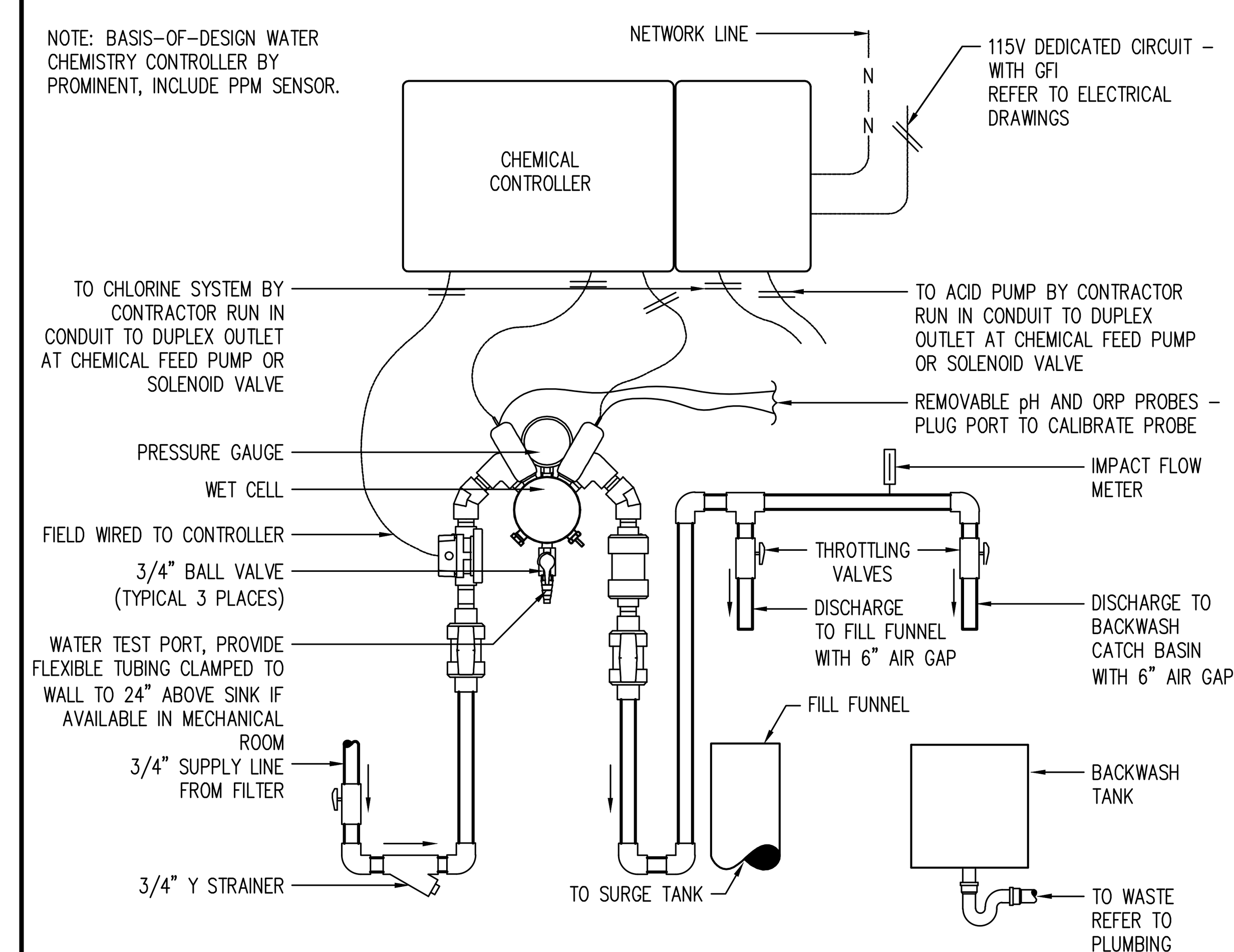
NOTE:
ALL PIPE & FITTINGS ARE NON-METALLIC WITH S/S FASTENERS

6 CHLORINATION SYSTEM
SP4.3 1" = 1'-0"

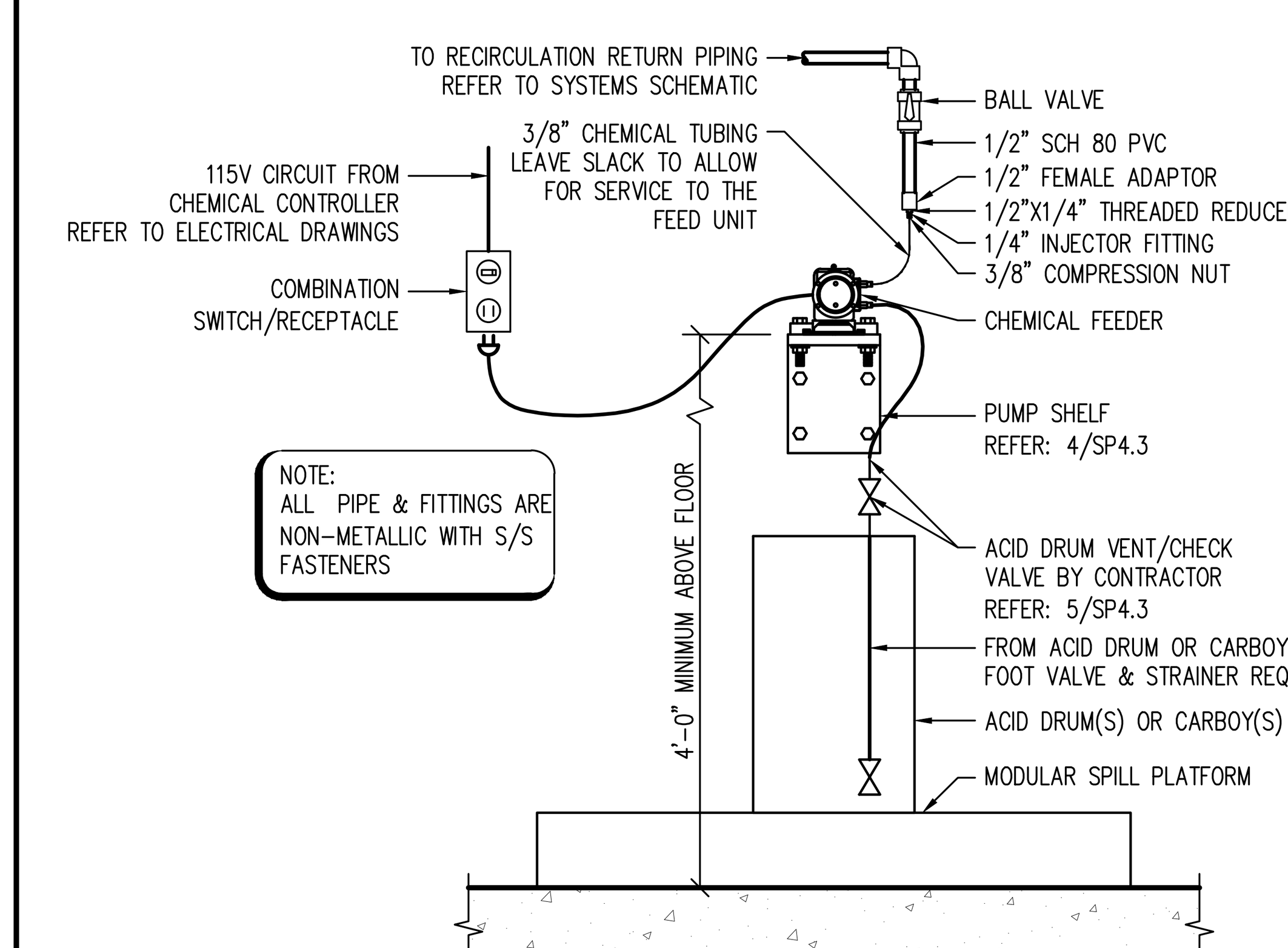


1 TYPICAL PUMP DETAIL
SP4.3 1/2" = 1'-0"

NOTE: BASIS-OF-DESIGN WATER CHEMISTRY CONTROLLER BY PROMINENT, INCLUDE PPM SENSOR.



2 CHEMICAL CONTROLLER
SP4.3 NTS



NOTE:
ALL PIPE & FITTINGS ARE NON-METALLIC WITH S/S FASTENERS

3 ACID SYSTEM
SP4.3 3/4" = 1'-0"

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P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15, 2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

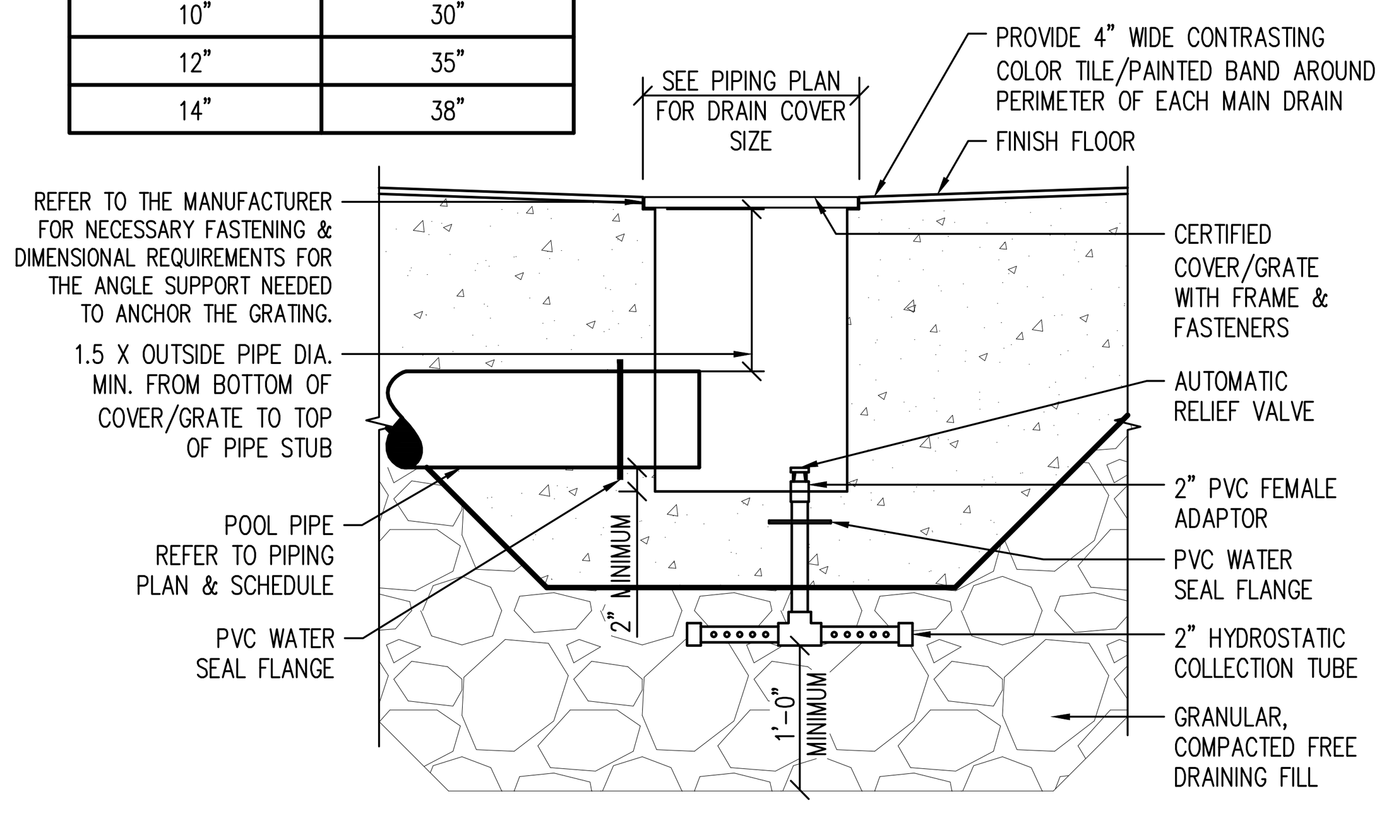
MECHANICAL DETAILS

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP4.3

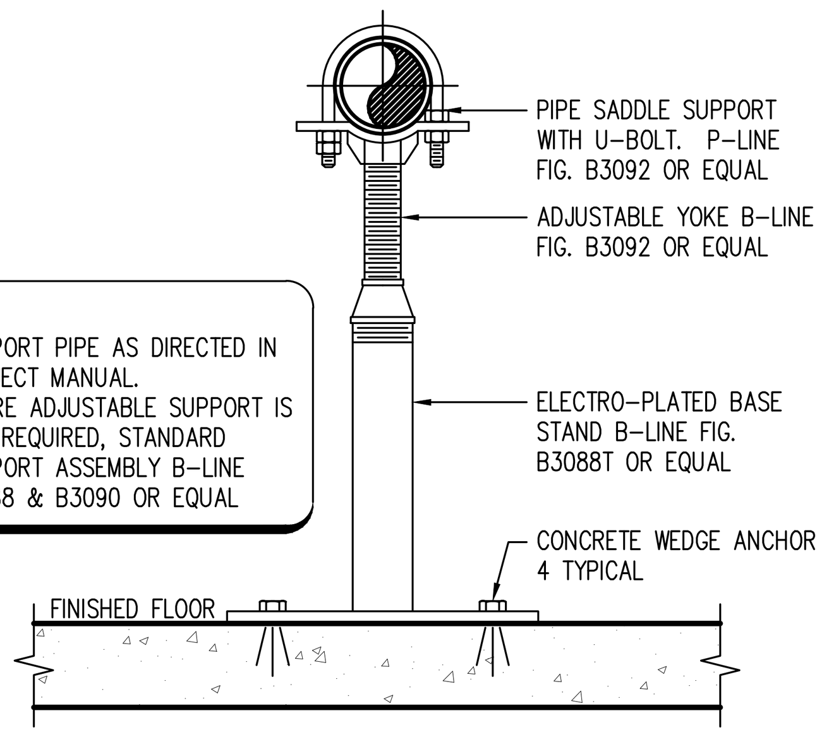
DRAIN DEPTH SCHEDULE	
STUB SIZE (NPS)	MINIMUM DEPTH
3" AND UNDER	12"
4"	14.25"
6"	19.5"
8"	24.5"
10"	30"
12"	35"
14"	38"

NOTE:
1. ALL MAIN DRAINS SHALL BE CONSTRUCTED TO COMPLY WITH THE VIRGINIA GRAEME BAKER ACT & ASME ANSI/APSP-16-2011.
2. MAIN DRAINS MAY USE MULTIPLE VGB COMPLIANT GRATES SECURELY FASTENED PER MANUFACTURER RECOMMENDATIONS.
3. MAIN DRAIN SUMP DEPTH MAY NEED TO EXTEND LOWER TO ALLOW FOR WINTERIZATION. CONTRACTOR SHALL CONFIRM DEPTH PRIOR TO INSTALLATION.

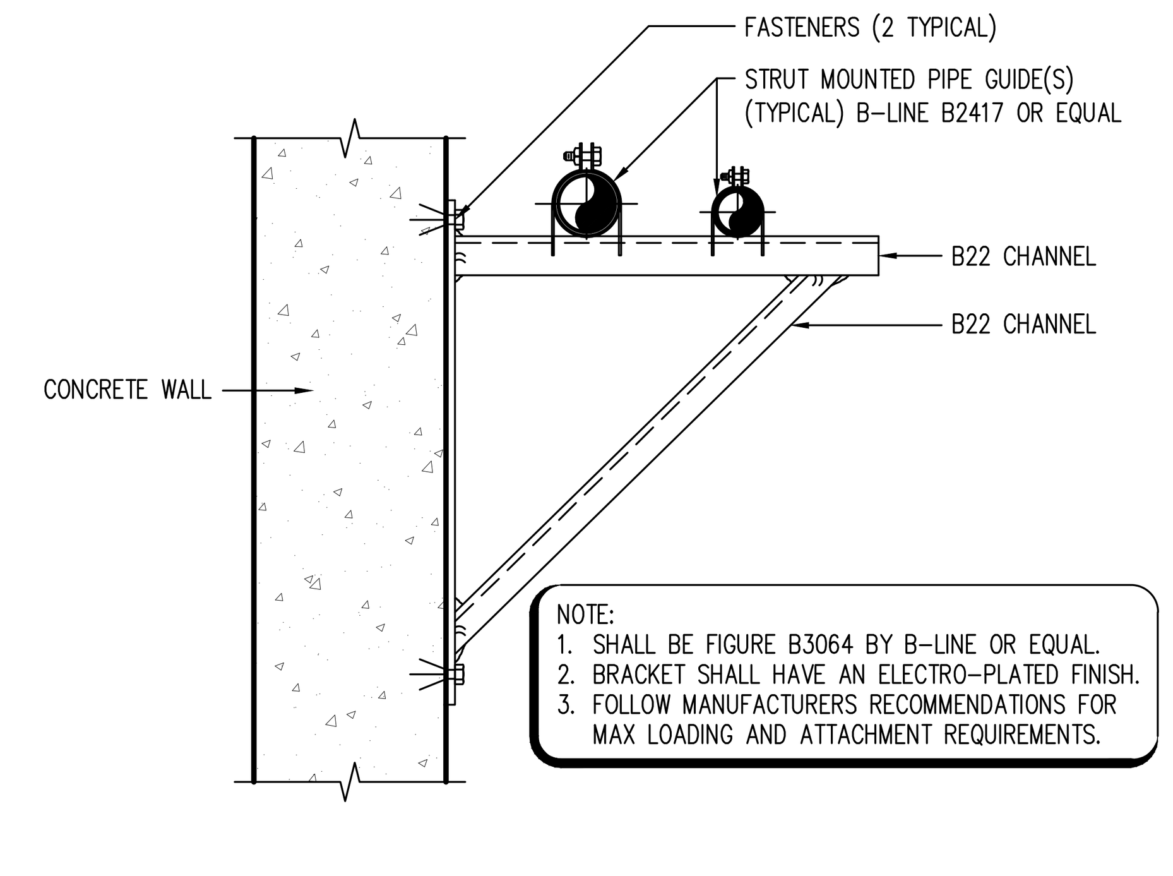


10 / SP4.4 **MAIN DRAIN**
3/4" = 1'-0"

NOTE:
1. SUPPORT PIPE AS DIRECTED IN PROJECT MANUAL.
2. WHERE ADJUSTABLE SUPPORT IS NOT REQUIRED, STANDARD SUPPORT ASSEMBLY B-LINE B3088 & B3090 OR EQUAL

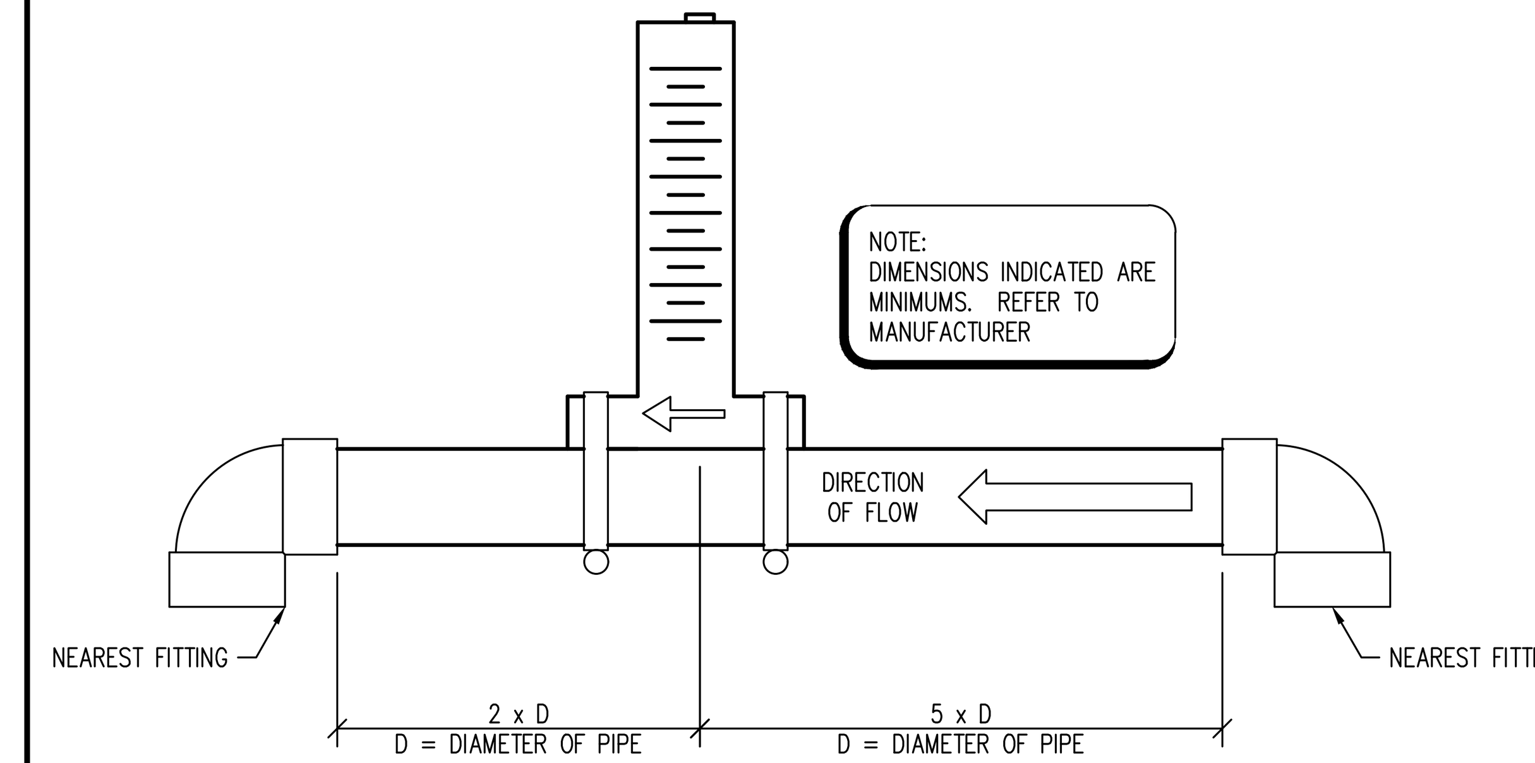


7 / SP4.4 **FLOOR MOUNTED PIPE SUPPORT**
3" = 1'-0"

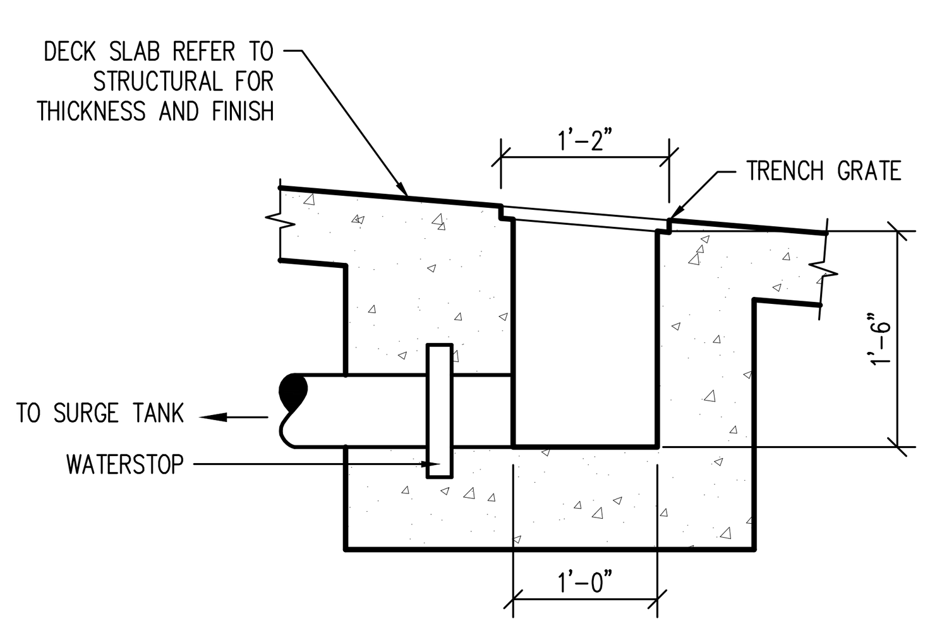


NOTE:
1. SHALL BE FIGURE B3064 BY B-LINE OR EQUAL.
2. BRACKET SHALL HAVE AN ELECTRO-PLATED FINISH.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.

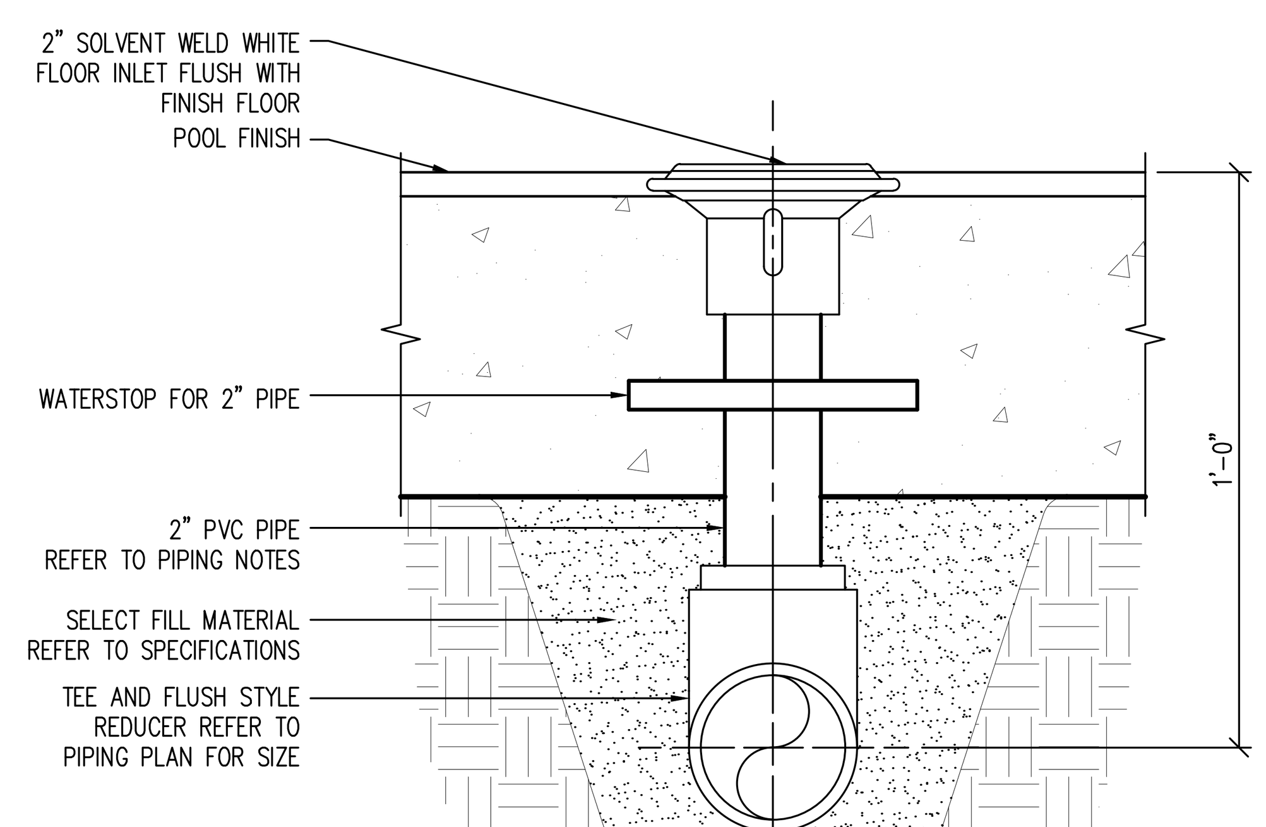
4 / SP4.4 **ADJUSTABLE STRUT BRACKET**
3" = 1'-0"



1 / SP4.4 **IMPACT FLOW METER**
3/4" = 1'-0"

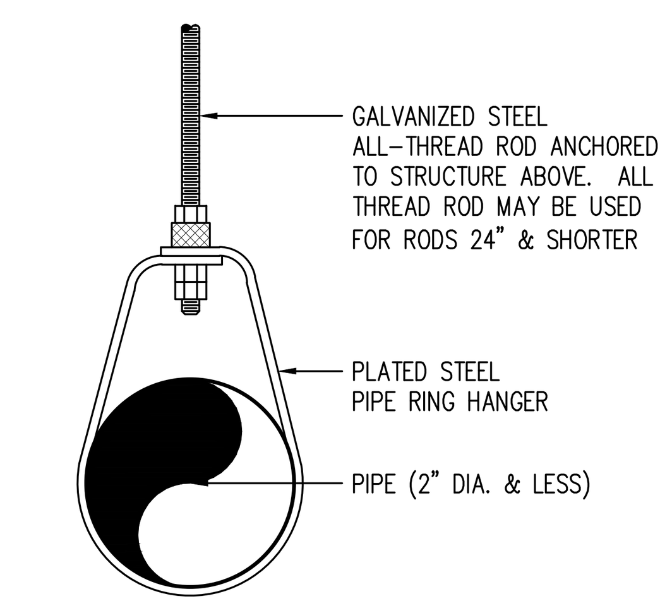


11 / SP4.4 **TRENCH DROPOUT**
3/4" = 1'-0"



NOTE:
CAP PIPE & HYDROSTATICALLY TEST PER SPECIFICATIONS BEFORE CONCEALMENT

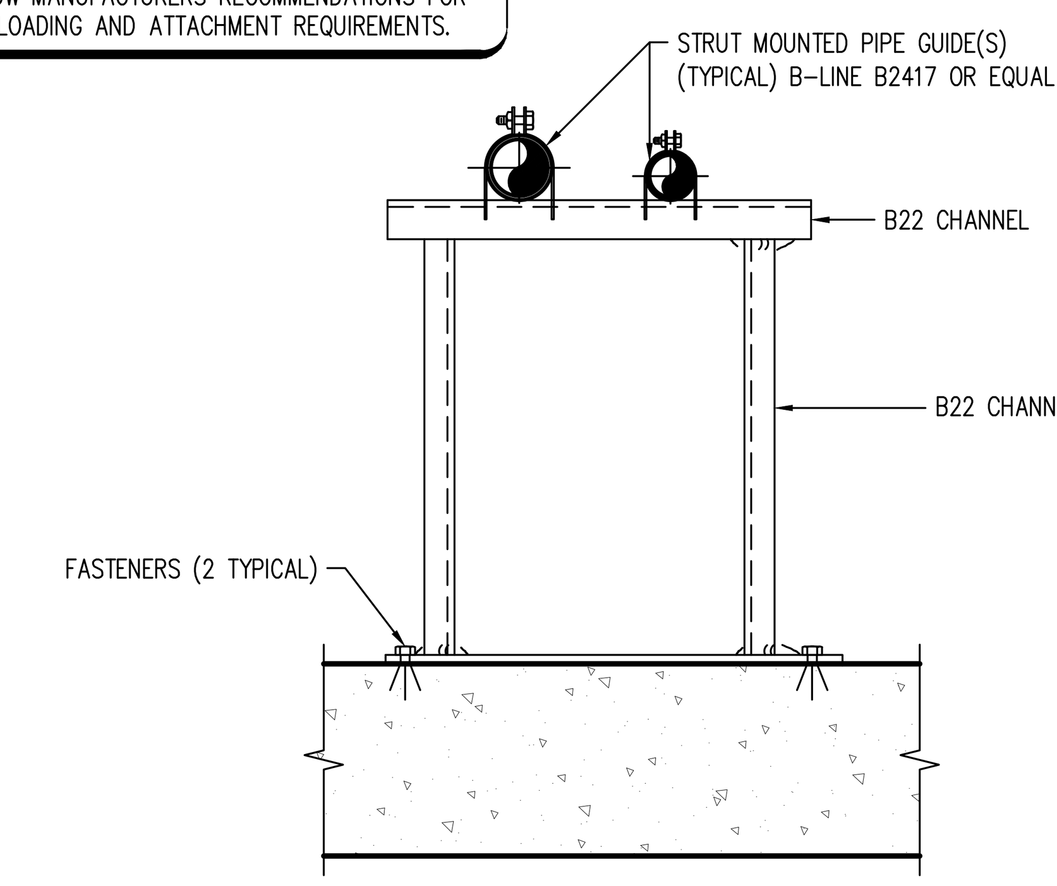
8 / SP4.4 **FLOOR INLET**
3" = 1'-0"



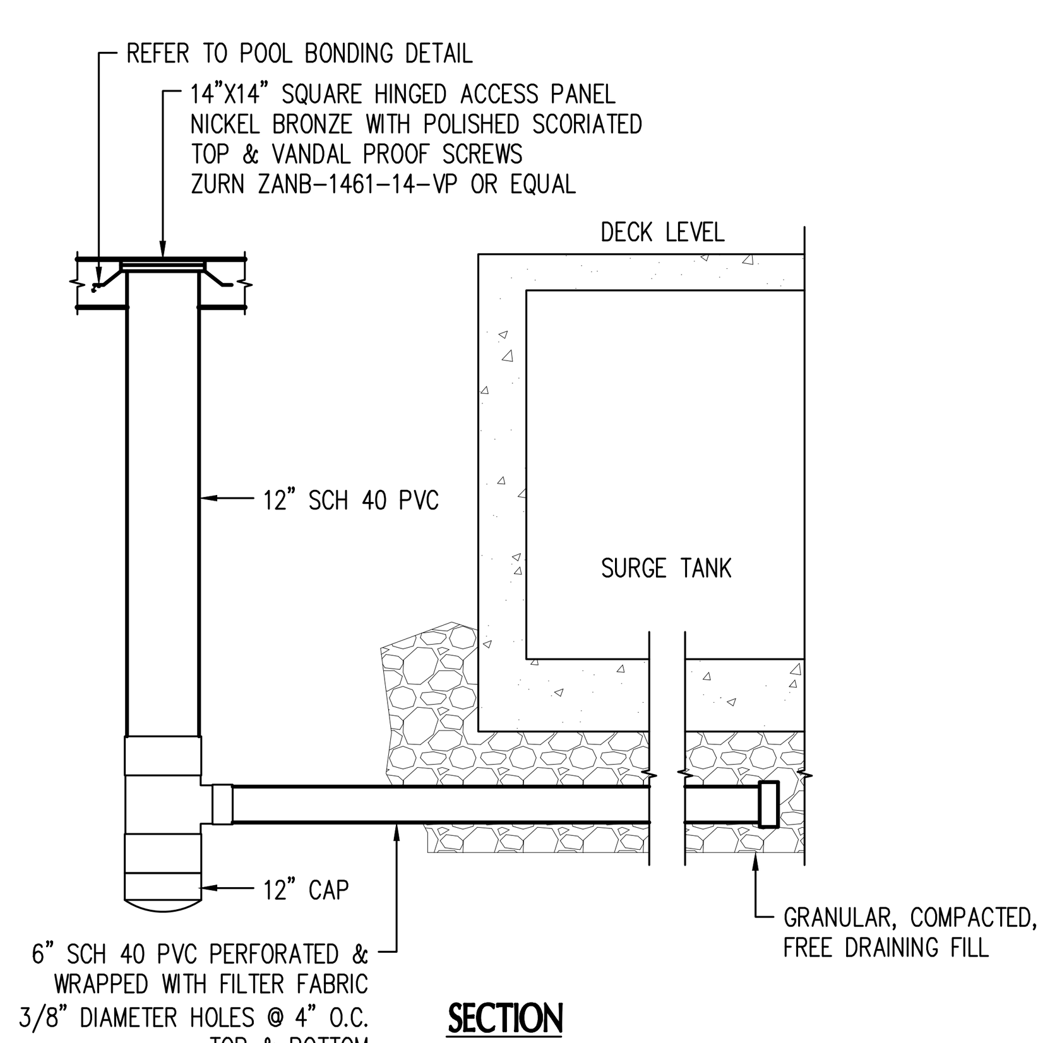
NOTE:
BASIS OF DESIGN: COOPER B-LINE. ALTERNATE MANUFACTURER GRINELL OR APPROVED EQUAL.

5 / SP4.4 **SWIVEL RING PIPE HANGER**
1 1/2" = 1'-0"

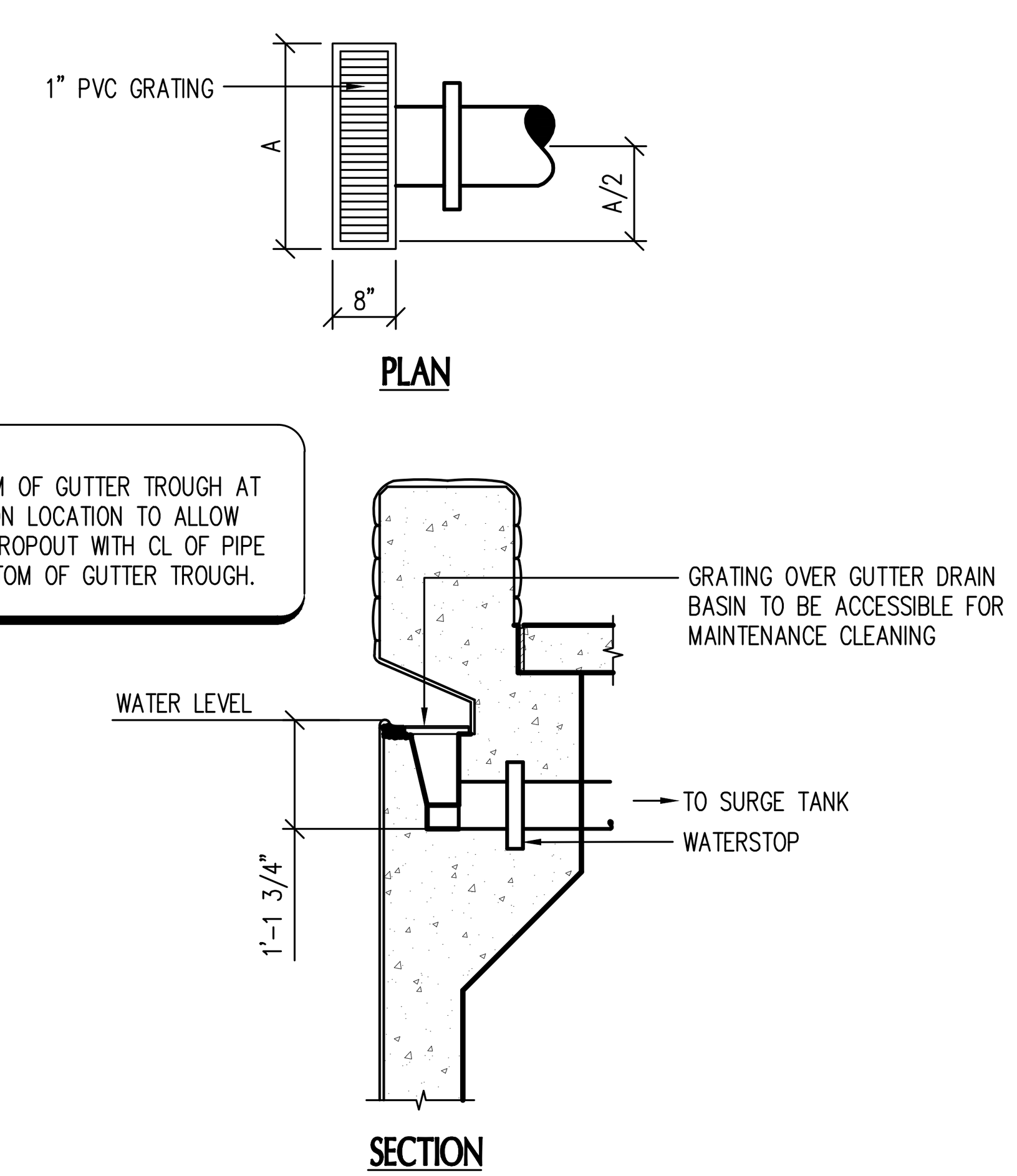
NOTE:
1. SHALL BE FIGURE B3064 BY B-LINE OR EQUAL.
2. BRACKET SHALL HAVE AN ELECTRO-PLATED FINISH.
3. FOLLOW MANUFACTURERS RECOMMENDATIONS FOR MAX LOADING AND ATTACHMENT REQUIREMENTS.



2 / SP4.4 **ADJUSTABLE STRUT FLOOR MOUNTED**
3" = 1'-0"

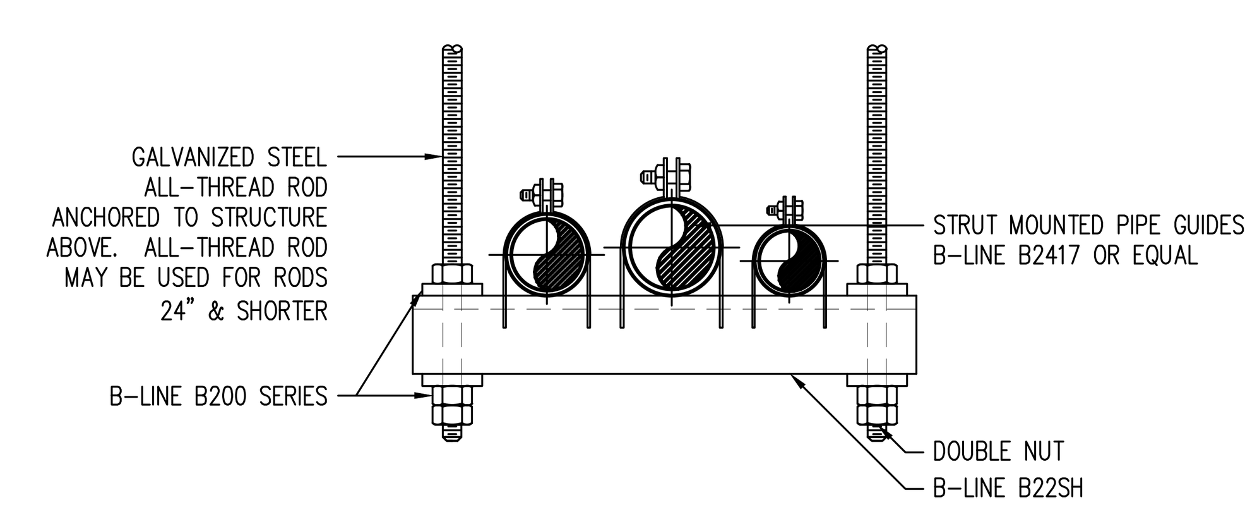


12 / SP4.4 **SIGHT SUMP**
3/8" = 1'-0"



NOTE:
DEPRESS BOTTOM OF GUTTER TROUGH AT PIPE PENETRATION LOCATION TO ALLOW FULL FLOW AT DROPOUT WITH CL OF PIPE LEVEL WITH BOTTOM OF GUTTER TROUGH.

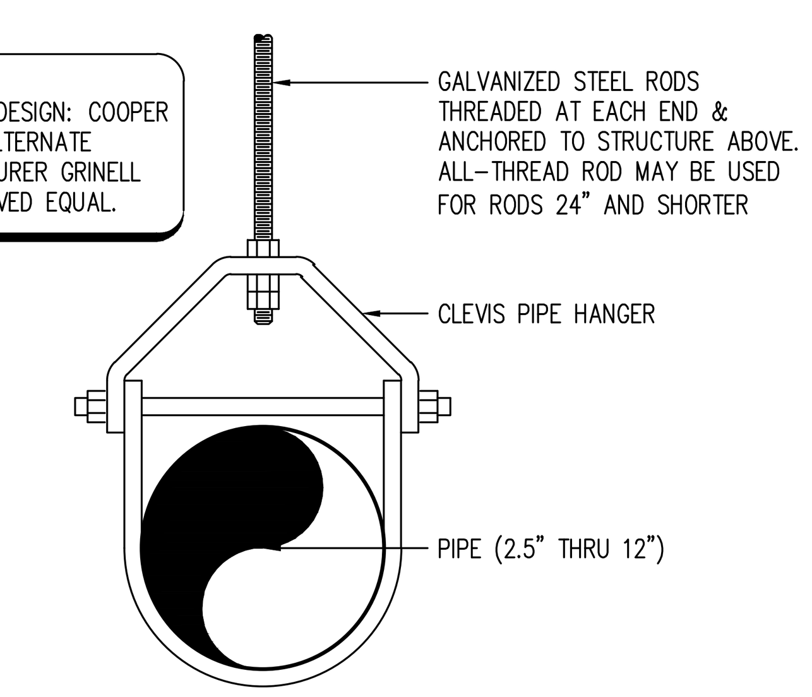
9 / SP4.4 **GUTTER DROPOUT BOX**
1/2" = 1'-0"



NOTE:
1. COOPER B-LINE (BASIS OF DESIGN) ALTERNATE MANUFACTURERS UNISTRUT OR PRE APPROVED EQUAL.
2. REFER TO THE PROJECT MANUAL FOR FINISH REQUIREMENT.
3. CONTRACTOR SHALL FOLLOW ALL RECOMMENDATIONS FROM MANUFACTURER.

6 / SP4.4 **TRAPEZE HANGER**
3" = 1'-0"

NOTE:
BASIS OF DESIGN: COOPER B-LINE. ALTERNATE MANUFACTURER GRINELL OR APPROVED EQUAL.



3 / SP4.4 **CLEVIS PIPE HANGER**
1 1/2" = 1'-0"

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AQUATICS FOR LIFE
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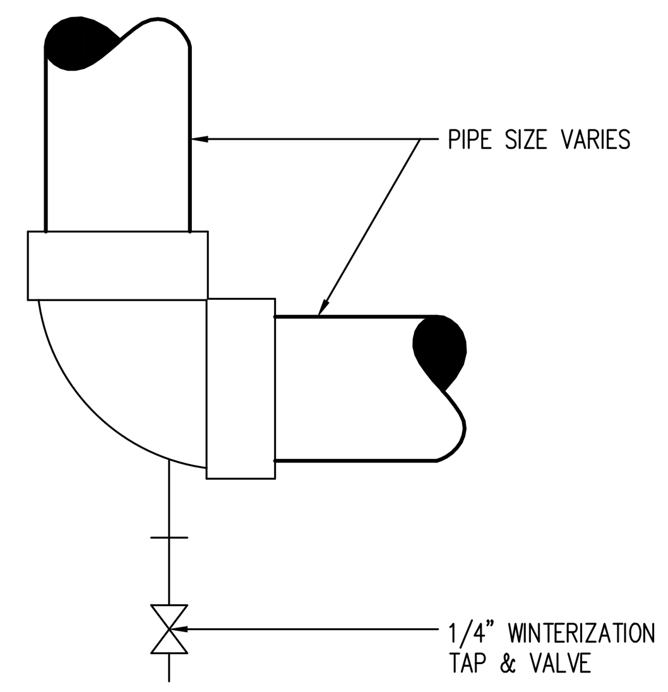
P.E. DARREN BEVARD
LI.NO.: E-2008002132 DATE: APRIL 15,2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

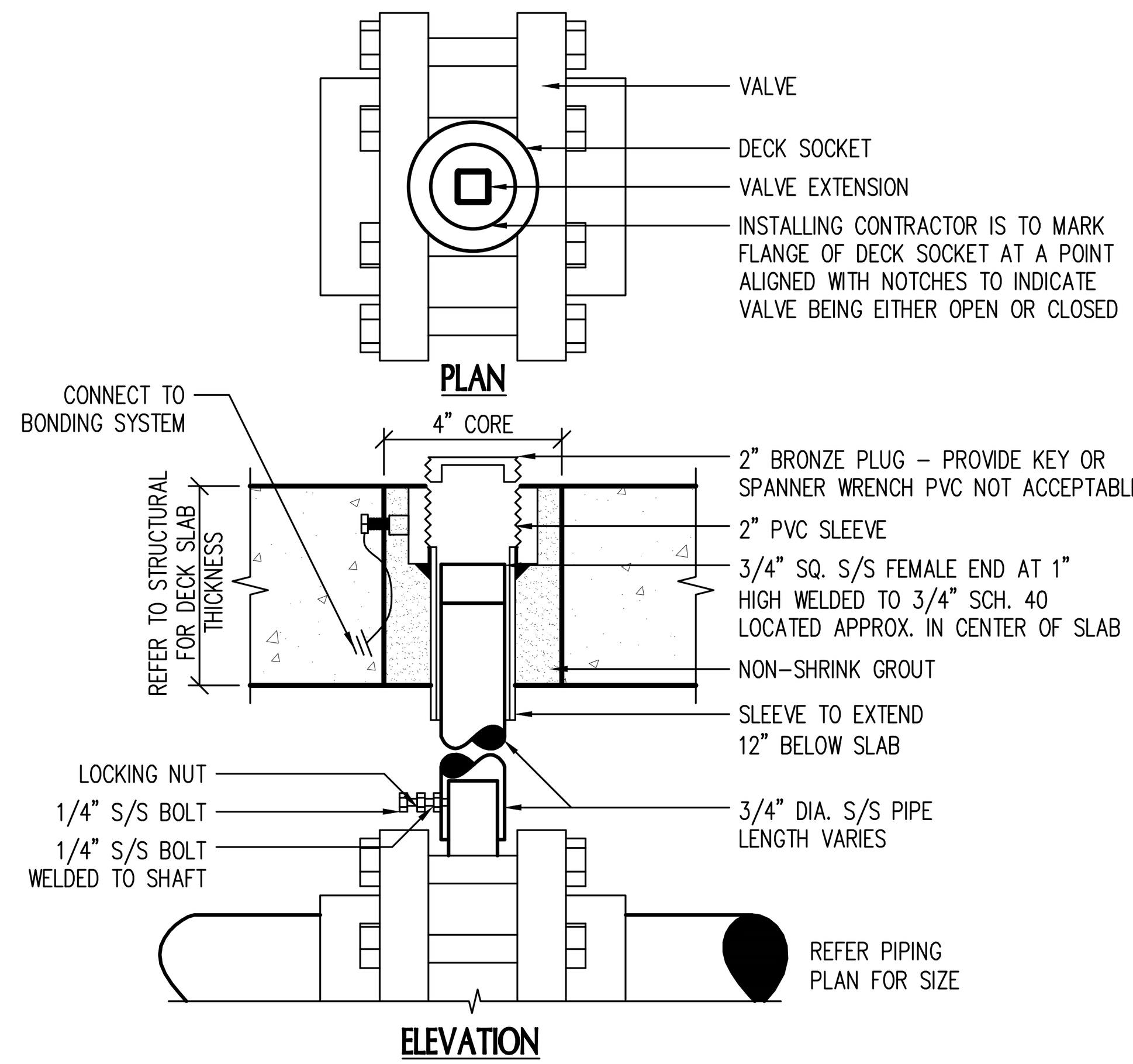
MECHANICAL DETAILS

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP4.4

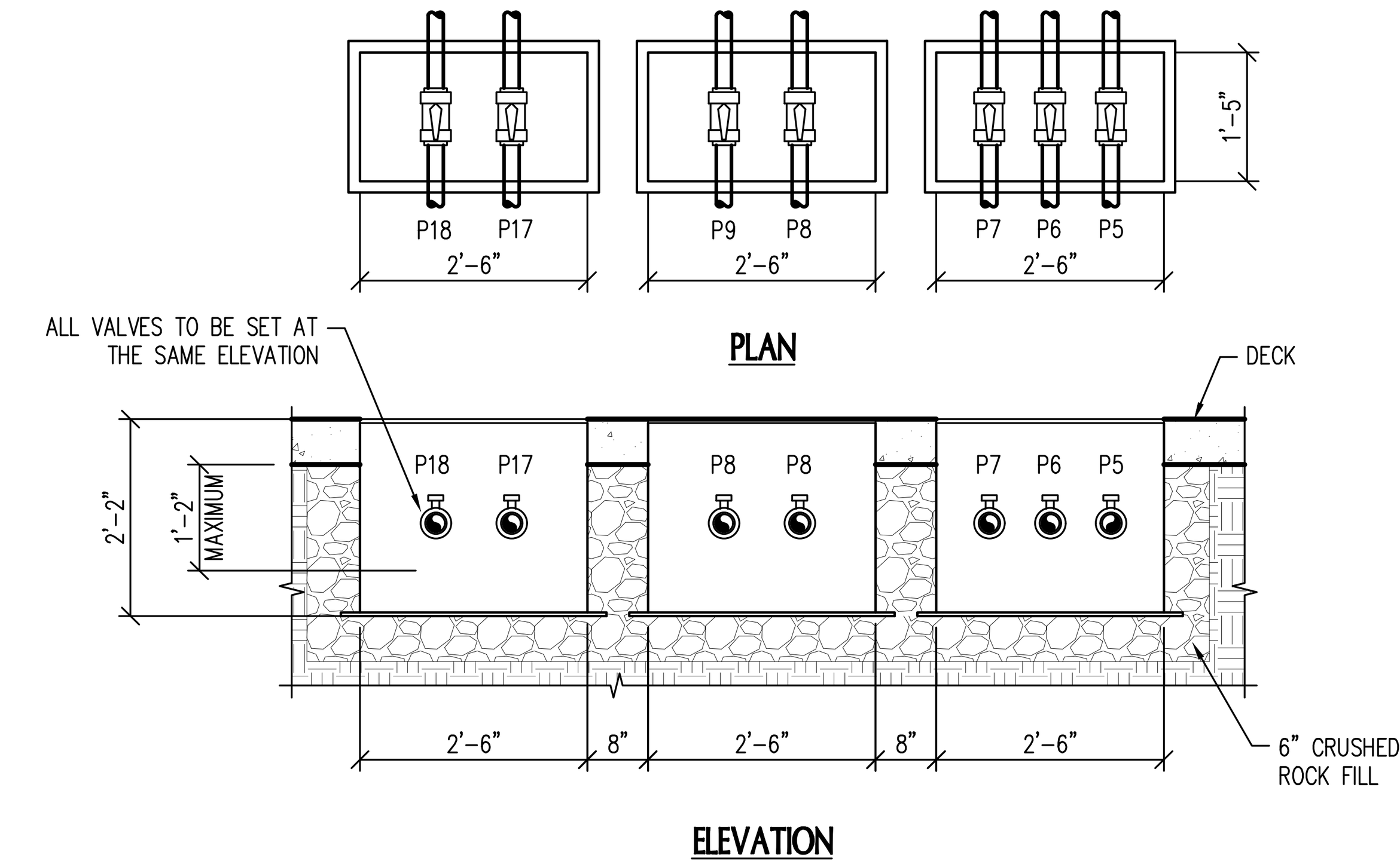


10 WINTERIZATION TAP AND VALVE
SP4.5 1 1/2" = 1'-0"

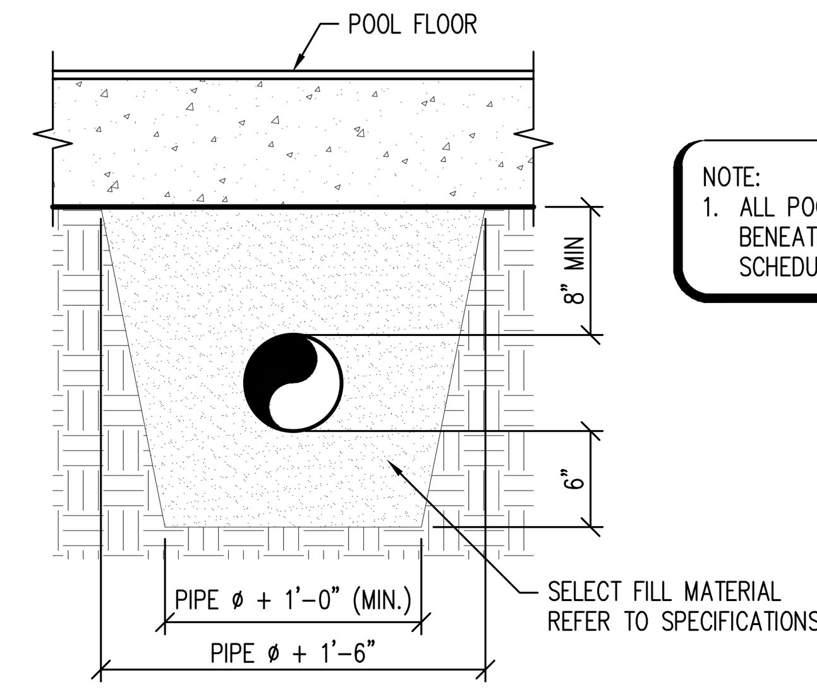


7 VALVE EXTENSION
SP4.5 3" = 1'-0"

NOTE:
1. REFER TO PIPE SCHEDULE FOR PIPE SIZES.
2. CONTRACTOR TO CONFIRM THAT ALL VALVES ARE ACCESSIBLE WITHIN BOX.
3. REFER TO SPECIFICATION FOR TYPE/STYLE OF VALVE OPERATOR REQUIRED.
4. REFER TO SPECIFICATION FOR STYLE OF QUAZITE ENCLOSURE.

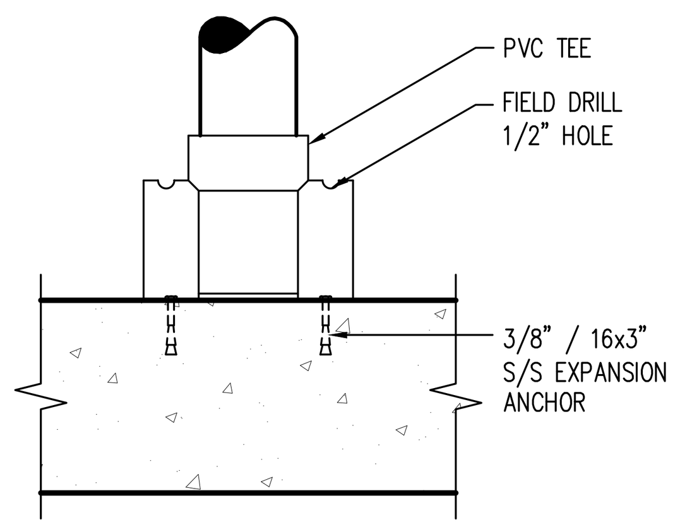


4 VALVE BOX
SP4.5 1/2" = 1'-0"



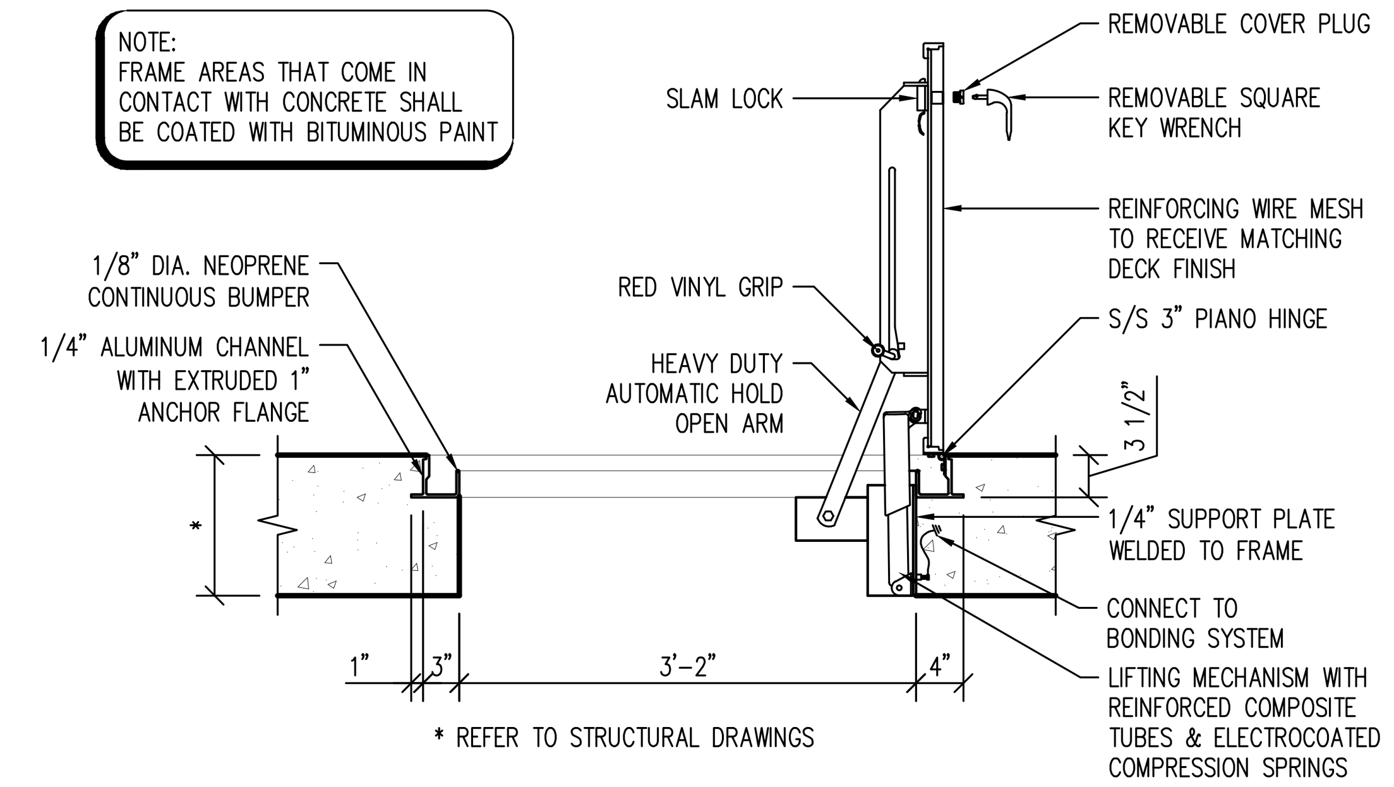
NOTE:
1. ALL POOL PIPING NOT LOCATED BENEATH THE POOL FLOOR SHALL BE SCHEDULE 80 PVC.

1 CONCRETE ENCASED PIPE
SP4.5 1" = 1'-0"

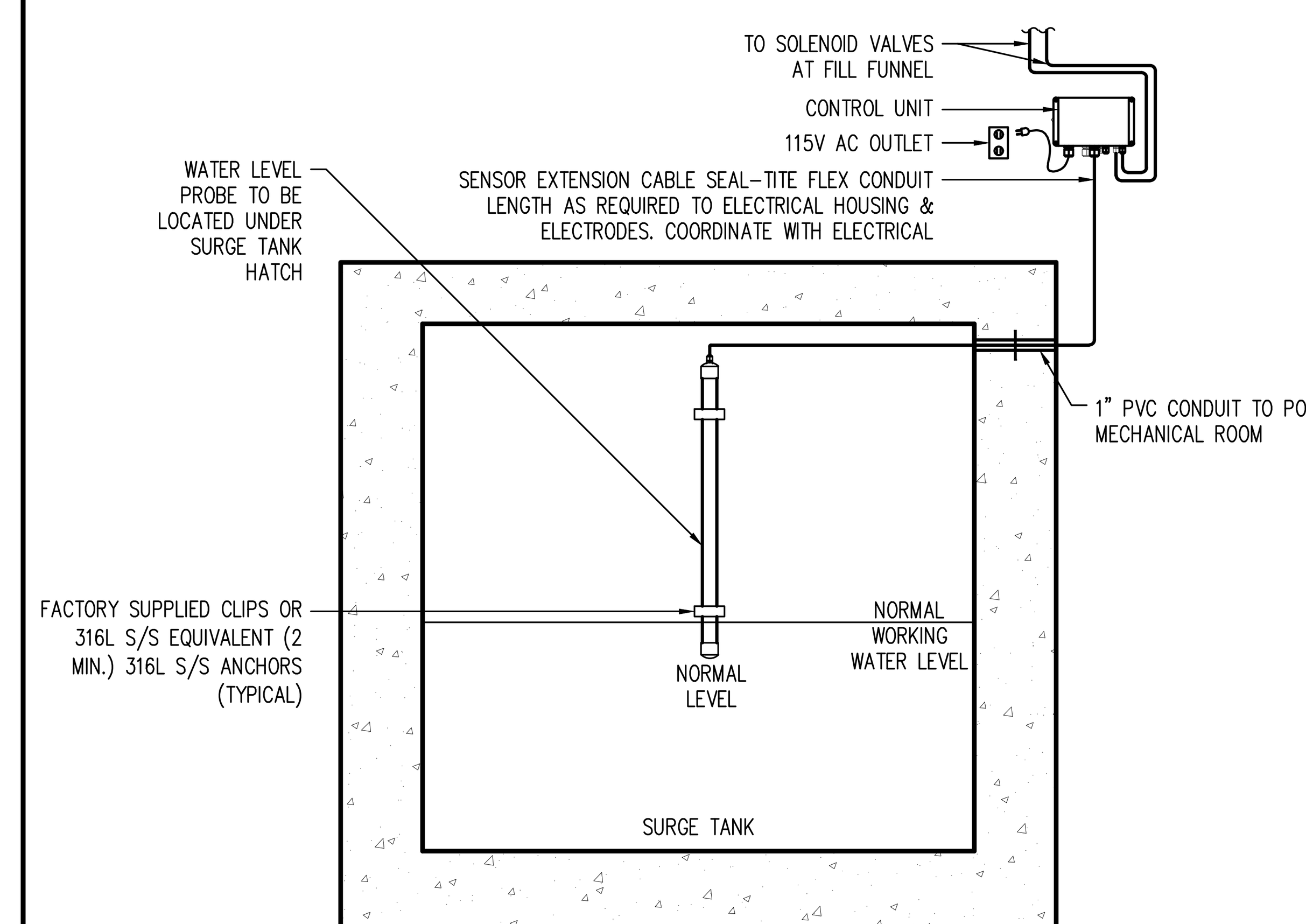


8 SUPPORT TEE
SP4.5 1" = 1'-0"

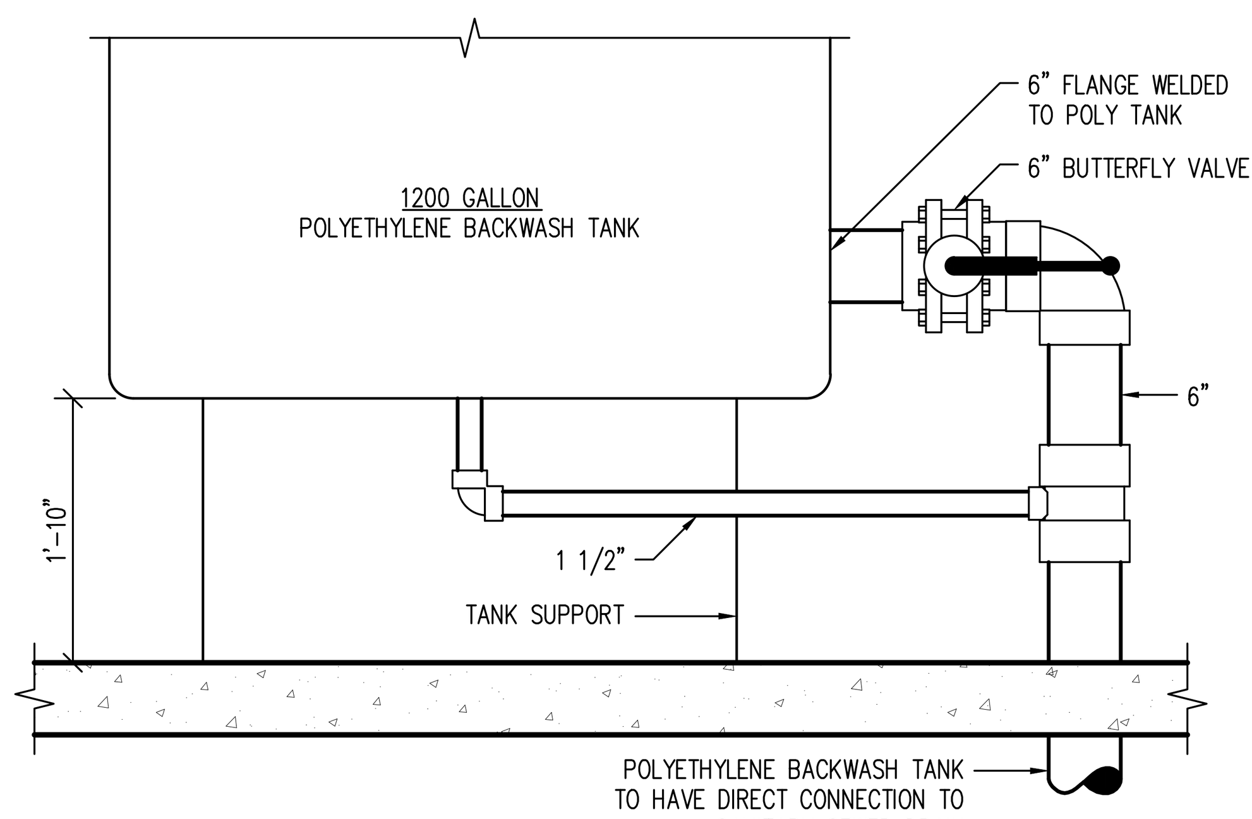
NOTE:
FRAME AREAS THAT COME IN CONTACT WITH CONCRETE SHALL BE COATED WITH BITUMINOUS PAINT



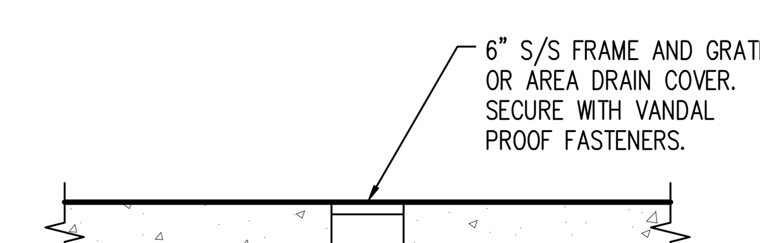
5 SURGE TANK ACCESS HATCH
SP4.5 3/4" = 1'-0"



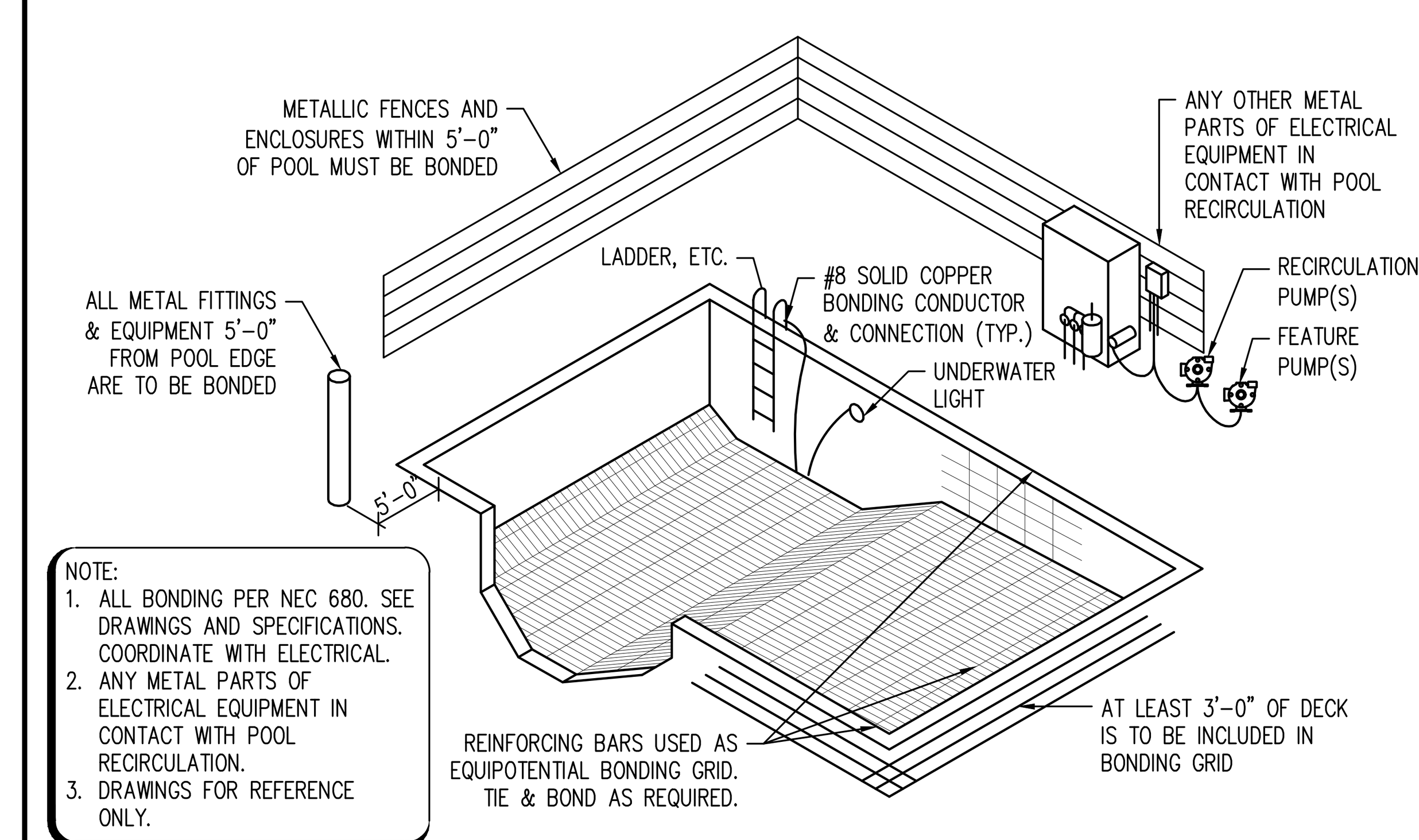
2 WATER LEVEL CONTROLLER
SP4.5 3/4" = 1'-0"



9 BACKWASH TANK
SP4.5 3/4" = 1'-0"



6 SURGE TANK VENT
SP4.5 3/4" = 1'-0"



NOTE:
1. ALL BONDING PER NEC 680. SEE DRAWINGS AND SPECIFICATIONS. COORDINATE WITH ELECTRICAL.
2. ANY METAL PARTS OF ELECTRICAL EQUIPMENT IN CONTACT WITH POOL RECIRCULATION.
3. DRAWINGS FOR REFERENCE ONLY.

3 TYPICAL POOL BONDING DETAIL
SP4.5 NTS

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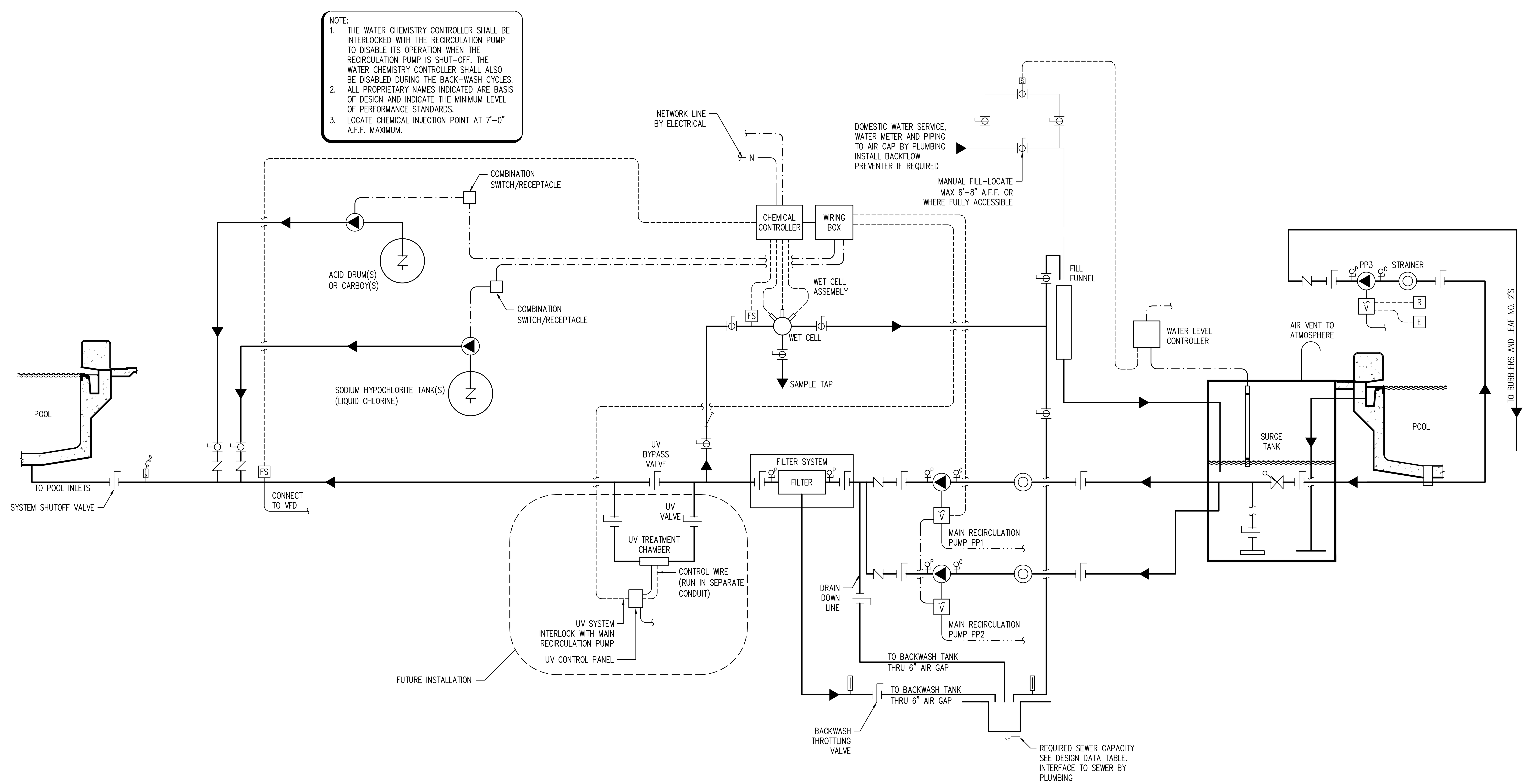
P.E. DARREN BEVARD
LI.NO.:E-2008002132 DATE:APRIL 15,2019

SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

MECHANICAL DETAILS

Scale:	AS SHOWN
Designed by:	DTB
Drawn by:	DRO
Checked by:	NRK
Date:	04/15/2019
Project No.	064538700

SHEET
SP4.5



SCHEMATIC LEGEND

LEGEND	ITEM
	FLOW DIRECTION
	BUTTERFLY VALVE
	BALL VALVE
	GATE VALVE
	MODULATING FLOAT VALVE
PRV-1	PRESSURE REDUCING VALVE
S	SOLENOID VALVE
	SWING GATE CHECK VALVE
	THREE WAY VALVE
	DUCK BILLED VALVE
	PUMP
	HAIR AND LINT STRAINER
	"Y" STRAINER
F	FLOW METER
FI	FLOW INTERLOCK
FS	FLOW SENSOR
	IMPACT FLOW METER
	VENTURI FLOW METER
W	WATER METER
AV	AUTOMATIC AIR VENT
MV	MANUAL AIR VENT
P	PRESSURE GAUGE AND COCK
C	COMPOUND GAUGE AND COCK
	DIGITAL TEMP SENSOR
	THERMOMETER
G	GEAR
A	PNEUMATIC ACTUATOR
S	SOLENOID
	POWER CORD
	FLOW CONTROL VALVE
V	VARIABLE FREQUENCY DRIVE
R	REMOTE START/STOP
E	EMERGENCY STOP
	LOW VOLTAGE CONTROL
	WATER LINE
	1 PHASE POWER
	3 PHASE POWER
	VENT LINE
	CO_2 LINE
N	NETWORK LINE

1 / SP5.0 **POOL SYSTEMS SCHEAMTIC**

NTS

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SUMMIT WAVES WAVE POOL ADDITION LEE'S SUMMIT, MO

POOL SYSTEMS SCHEMATIC

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SHEET
SP5.0

Appendix B:

Digital Files