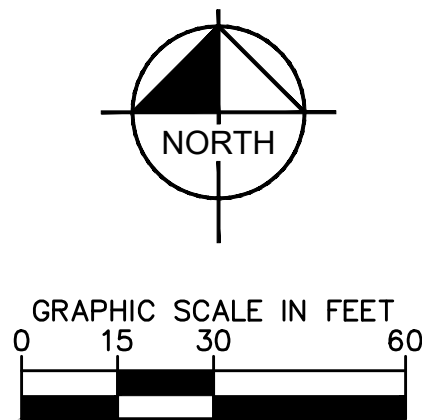
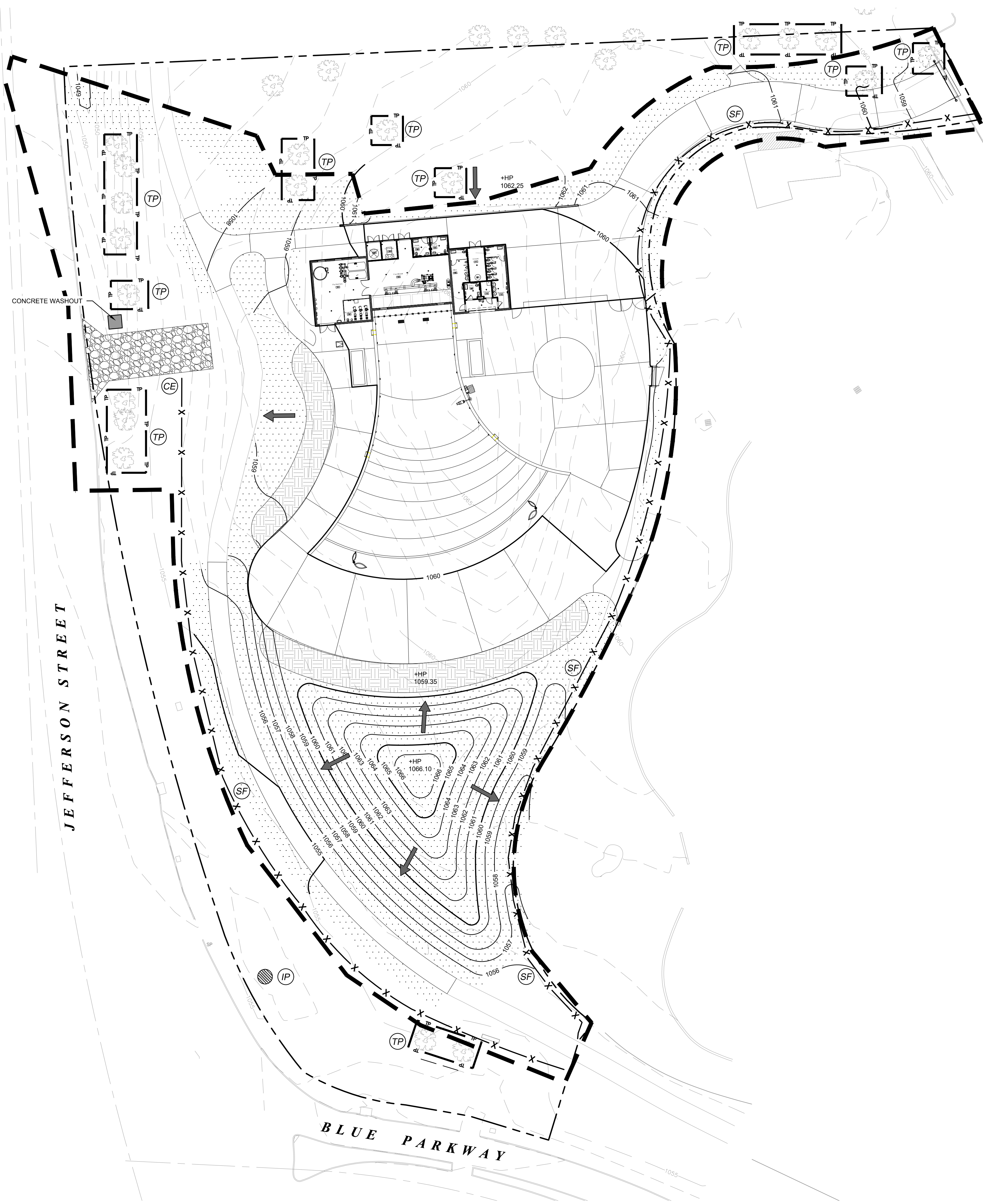


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(@ least 72 hours prior to digging)



| LEGEND | |
|--------|---|
| | 1055 PROPOSED CONTOUR |
| | EXISTING CONTOUR |
| | LIMITS OF DISTURBED AREA |
| | PROPOSED STABILIZED CONSTRUCTION ENTRANCE |
| | PROPOSED LANDSCAPE AREA |
| | PROPOSED BIOSWALE |
| | FILTER BARRIER |
| | TREE PROTECTION |
| | FLOW ARROW |
| | INLET PROTECTION |

SITE MAP-GENERAL NOTES

- CONTRACTOR IS SOLELY RESPONSIBLE FOR SELECTION, IMPLEMENTATION, MAINTENANCE, AND EFFECTIVENESS OF ALL SWPPP CONTROLS - CONTROLS SHOWN ON THIS SITE MAP ARE SUGGESTED CONTROLS ONLY.
- 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.
- DRAINAGE PATTERNS ARE SHOWN ON THIS PLAN BY PROPOSED AND EXISTING CONTOURS, FLOW ARROWS, AND SLOPES.
- 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.
- 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.
- SANITARY SEWER EFFLUENT IS DISPOSED OF VIA AN ON-SITE SEWER SYSTEM CONNECTED TO A MUNICIPAL SEWER SYSTEM.

EROSION CONTROL SCHEDULE AND SEQUENCING

- NOTIFY ALL APPLICABLE AUTHORITIES AT LEAST 48 HOURS PRIOR TO BEGINNING ANY WORK; CALL THE MISSOURI ONE CALL CENTER AT 1-800-344-7482 FOR UTILITY LOCATIONS.
- INSTALL TEMPORARY EROSION CONTROLS AND TREE PROTECTION FENCING PRIOR TO ANY CLEARING AND GRUBBING.
- DEMOLISH AREAS INDICATED ON EXISTING CONDITIONS AND REMOVAL ITEMS SHEET. (IF APPLICABLE)
- CLEAR AND GRUB AND STRIP TOPSOIL. STOCKPILE TOPSOIL FOR LATER USE.
- CONSTRUCT TEMPORARY RETENTION/DETENTION POND. (IF APPLICABLE)
- ROUGH GRADE SITE PER GRADING PLAN.
- INSTALL STORM SEWER LINES AND APPURTENANCES.
- INSTALL TEMPORARY EROSION/SEDIMENTATION CONTROLS ON NEW STORM SEWER INLETS.
- INSTALL WATER AND WASTE WATER LINES AND APPURTENANCES.
- ENSURE THAT ALL UNDERGROUND UTILITY CROSSINGS ARE COMPLETED.
- RAISE MANHOLE FRAMES AND COVERS TO TOP OF NATURAL GROUND.
- CONSTRUCT PAVED AREAS, CURBS, ISLANDS AND INSTALL INLET EROSION PROTECTION.
- COMPLETE RESTORATION OF SITE VEGETATION.
- WRITE CONCURRENCE LETTER AND SCHEDULE FINAL INSPECTION WITH INSPECTOR.
- REMOVE AND DISPOSE OF TEMPORARY EROSION CONTROLS WHEN RESTORATION HAS BEEN ACCEPTED.
- 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

- 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.
- THE NATURE OF THIS SITE'S CONSTRUCTION CONSISTS OF:
 - DEMOLITION
 - PRELIMINARY GRADING
 - UTILITY INSTALLATION
 - PAVEMENT CONSTRUCTION
 - FINAL GRADING AND STABILIZATION
- CONTRACTOR TO REFERENCE GEOTECHNICAL REPORT PREPARED BY INTERTEK PSI (PROJECT NO. 03381842 DATED DECEMBER 14, 2018) FOR SOIL CONDITIONS.
- ALL STORM WATER ON-SITE WILL SHEET FLOW INTO THE ON-SITE UNDERGROUND STORM DRAINAGE SYSTEM OR CONTINUE ALONG EXISTING DRAINAGE ROUTE
- NO SEDIMENTATION BASINS HAVE BEEN PROVIDED ON THIS SITE BECAUSE THE AREA OF DISTURBANCE IS LESS THAN 10.0 ACRES.
- POST CONSTRUCTION STORM WATER POLLUTION CONTROL MEASURES INCLUDE STABILIZATION BY PERMANENT PAVING, DRAINAGE SYSTEM STRUCTURE, OR LANDSCAPING.
- VELOCITY DISSIPATION DEVICES (RIP-RAP) WILL NOT BE USED.
- 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.
- PER FIRM MAP NO. 29095C04176 EFFECTIVE 01-20-2017, THE SITE IS LOCATED WITHIN FEMA DESIGNATED "X" FLOODPLAIN.
- CONTRACTOR IS RESPONSIBLE FOR MODIFYING THE SWPPP/SITE MAP TO INCLUDE BMP'S FOR ANY OFF-SITE MATERIAL WASTE, BORROW OR EQUIPMENT STORAGE AREAS.
- 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.

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MISSOURI REGISTRATION NUMBER 001512
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Kimley»Horn
Engineer KEVIN S. GASKNEY
P.E. No. 28441 Date MAY 2019

**SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO**

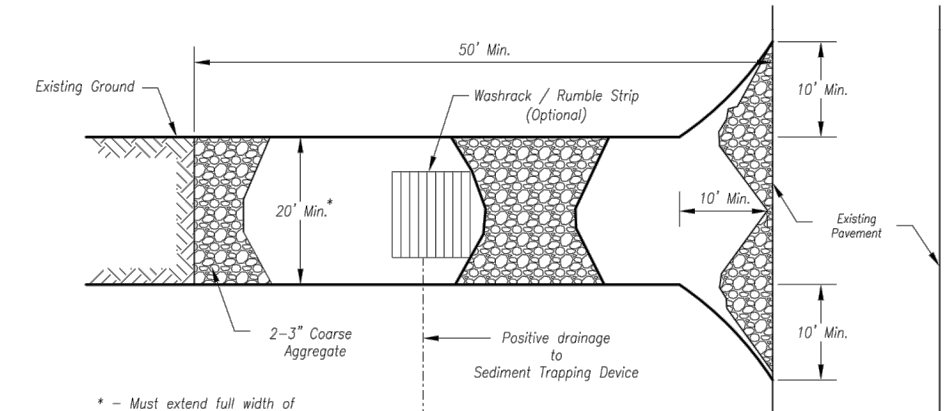
EROSION CONTROL PLAN

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

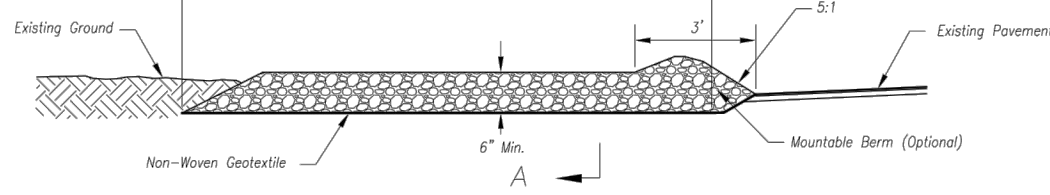
SHEET

C-1

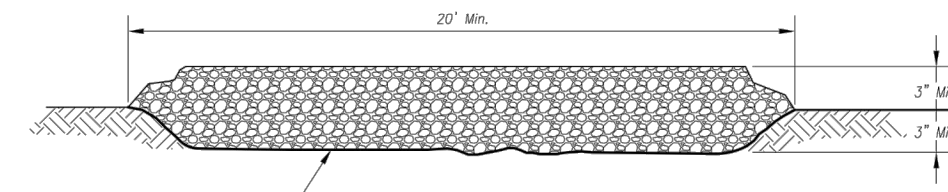
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Plan View
Not to Scale



Side Elevation
Not to Scale



Section A-A
Not to Scale

Notes for Construction Entrance:

1. Avoid loading on steep slopes, at curves on public roads, or down-drift 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 3%, construct a 6- to 8-inch high ridge with 36-IV 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 dimension 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

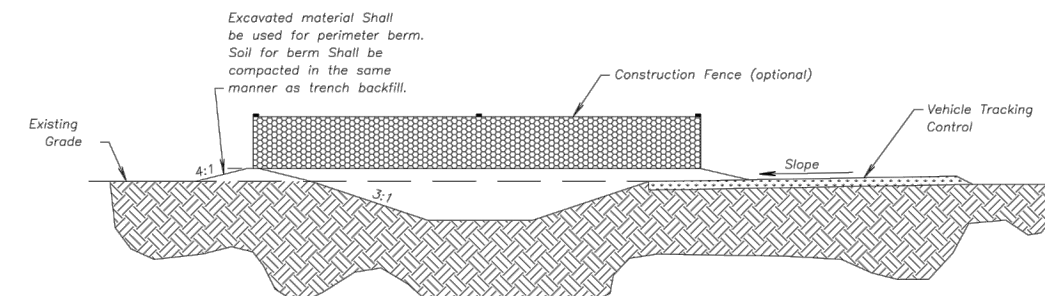
Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control, Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

Notes for Concrete Washout:

1. Concrete washout areas shall be installed prior to any concrete placement on site.
2. Concrete washout areas 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 post shall be placed 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.

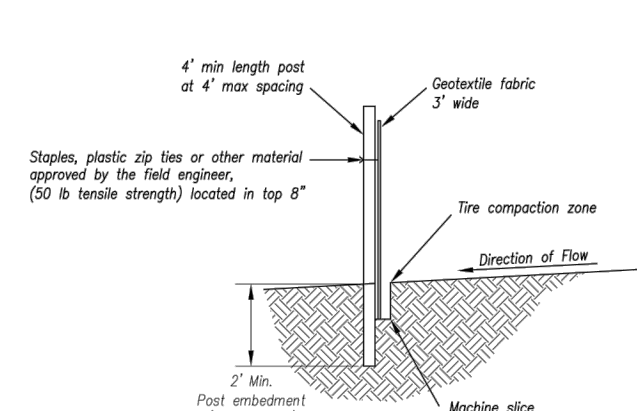
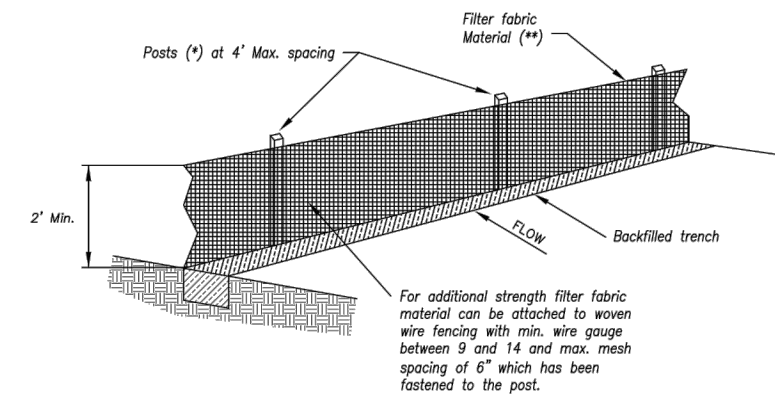
Maintenance for Concrete Washout:

1. Concrete washout materials shall be removed once the materials have filled the washout in approximately 728 ft.
2. Concrete washout areas shall be enlarged as necessary to maintain capacity for wasted concrete.
3. Concrete washout areas shall be enlarged as necessary to maintain capacity for wasted concrete.
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 topped, any disturbed area considered with the installation, maintenance, and/or removal of the concrete washout areas shall be stabilized.



CONCRETE WASHOUT

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

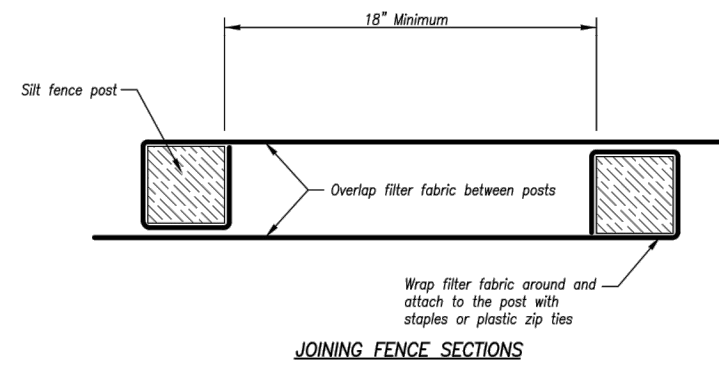


Notes:

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. Tranching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

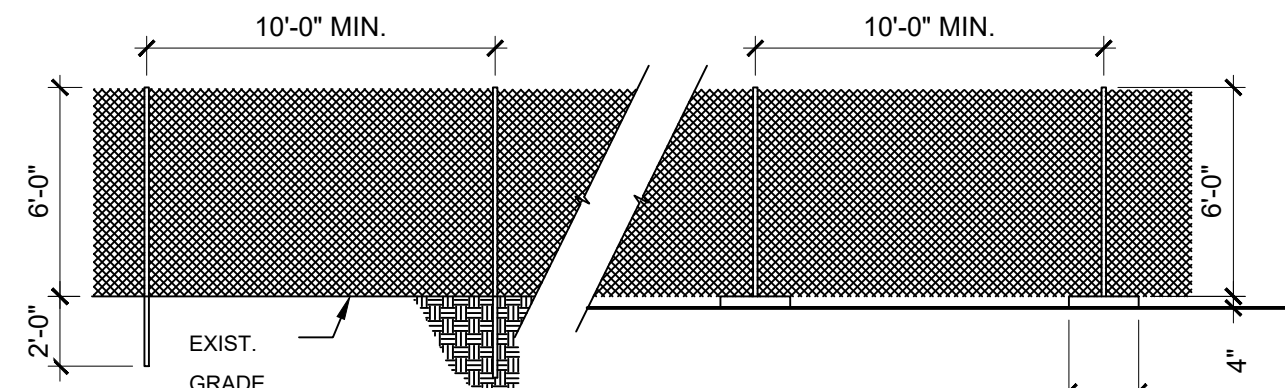
1. Remove and dispose of sediment deposits when the deposit approaches 1/2 the height of silt fence.
2. Repair as necessary to maintain function and structure.



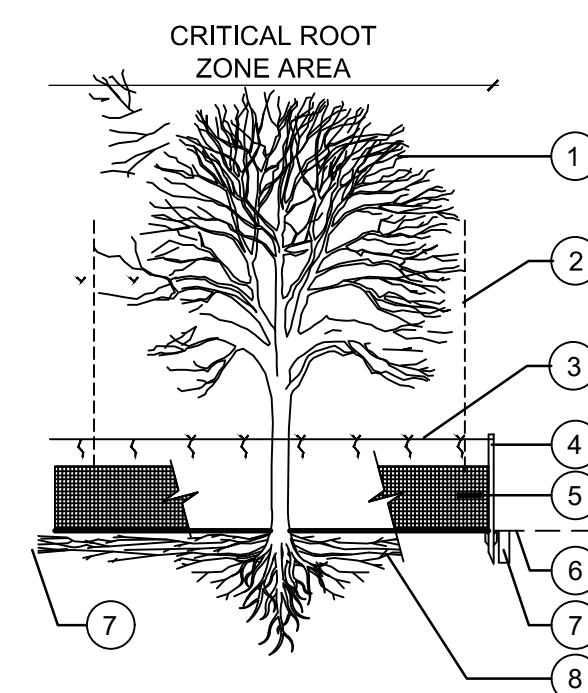
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| AMERICAN PUBLIC WORKS ASSOCIATION | |
| KANSAS CITY METRO CHAPTER | |
| SILT FENCE | STANDARD DRAWING NUMBER ESC-03 ADOPTED: 10/24/2016 |

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

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.

VEGETATIVE STABILIZATION REQUIREMENTS

TEMPORARY SEEDING

ALL DISTURBED AREAS WHICH WILL BE LEFT DORMANT FOR GREATER THAN 14 DAYS SHALL BE SEED 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 |

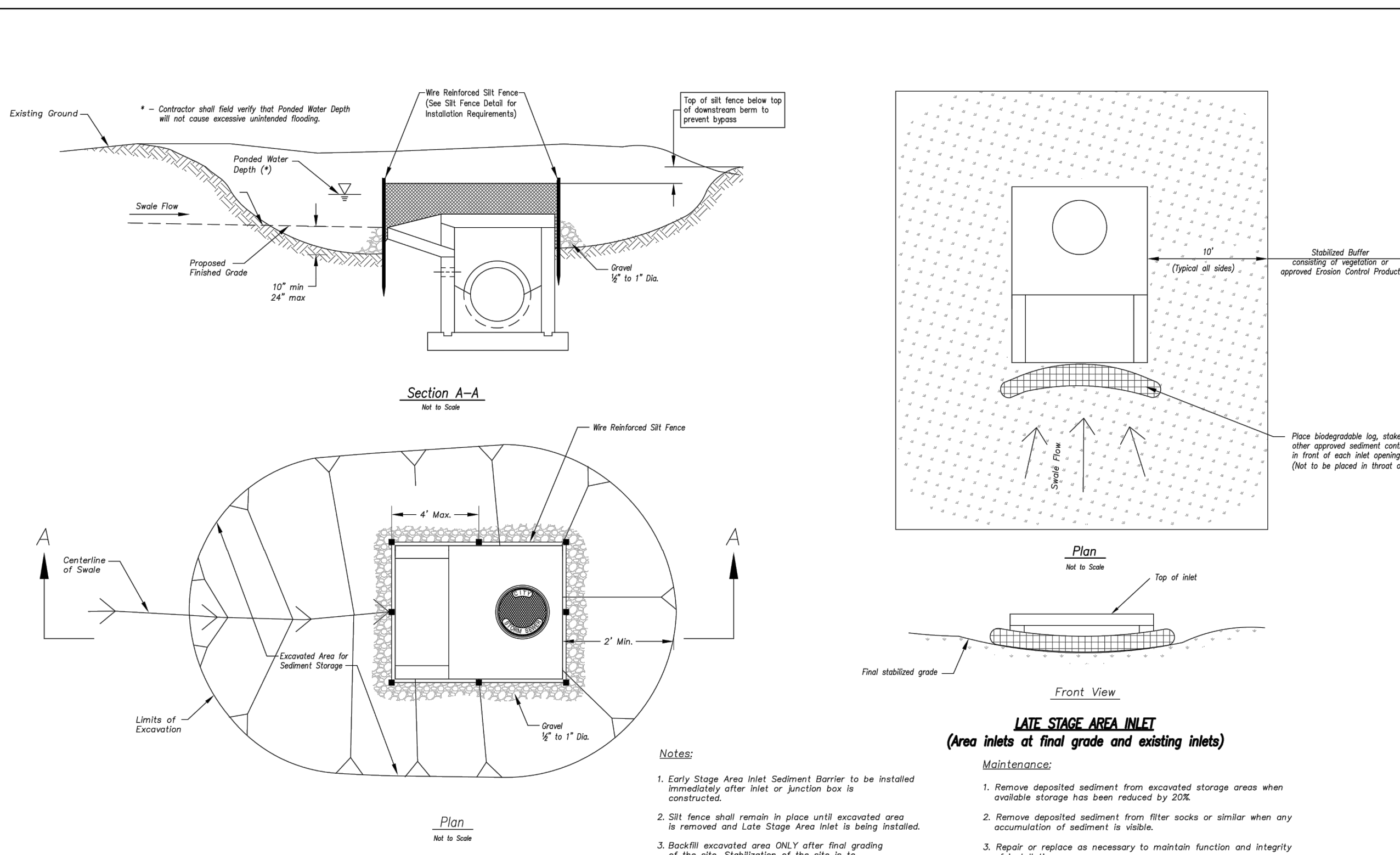
*USE ONLY USDA CERTIFIED SEED.

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 SEED TO PROTECT AGAINST EROSION. MULCH (STRAW OR FIBER) SHALL BE USED ON RELATIVELY FLAT SLOPES.



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

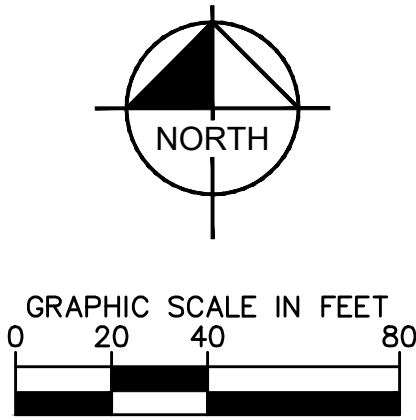
Maintenance:

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.

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

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

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LEGEND

- EXISTING CONTOUR
- DRAINAGE AREA BOUNDARY
- DRAINAGE AREA ID
- DRAINAGE AREA ACRES
- 100 YEAR RUNOFF (CFS)
- FLOW ARROW

| Existing Condition Hydrologic Parameters | | | | | | | | | | |
|---|-----|----|-----------|-------------------------|------|----------|------------------------|------------------------|-------------------------|--------------------------|
| Outfall | POI | DA | Area (ac) | Area (mi ²) | CN | TC (min) | T _{lag} (min) | 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 |

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Kimley»Horn
Engineer KEVIN S. GARNER
P.E. No. 28441 Date MAY 2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

EXISTING DRAINAGE AREA MAP

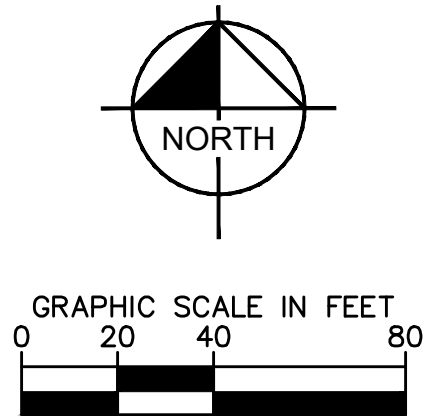
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Drawn by: ABO
Checked by: SEG
Date: MAY 2019
Project No. 064538700

SHEET

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STOP!
CALL BEFORE YOU DIG
MISSOURI ONE CALL SYSTEM
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(@ least 72 hours prior to digging)



LEGEND

- 1055 PROPOSED CONTOUR
- 1055 EXISTING CONTOUR
- DRAINAGE AREA BOUNDARY
- FLOW ARROW
- DRAINAGE AREA ID
DRAINAGE AREA ACRES
100 YEAR RUNOFF (CFS)
- PROPOSED DETENTION POND
- PROPOSED BIOSWALE

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



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SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

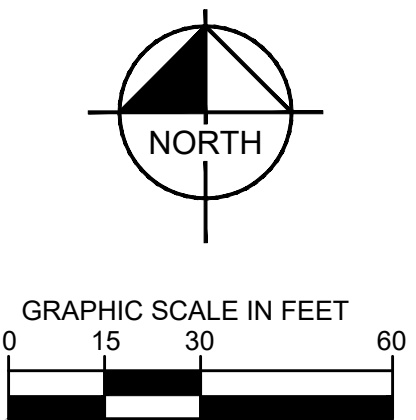
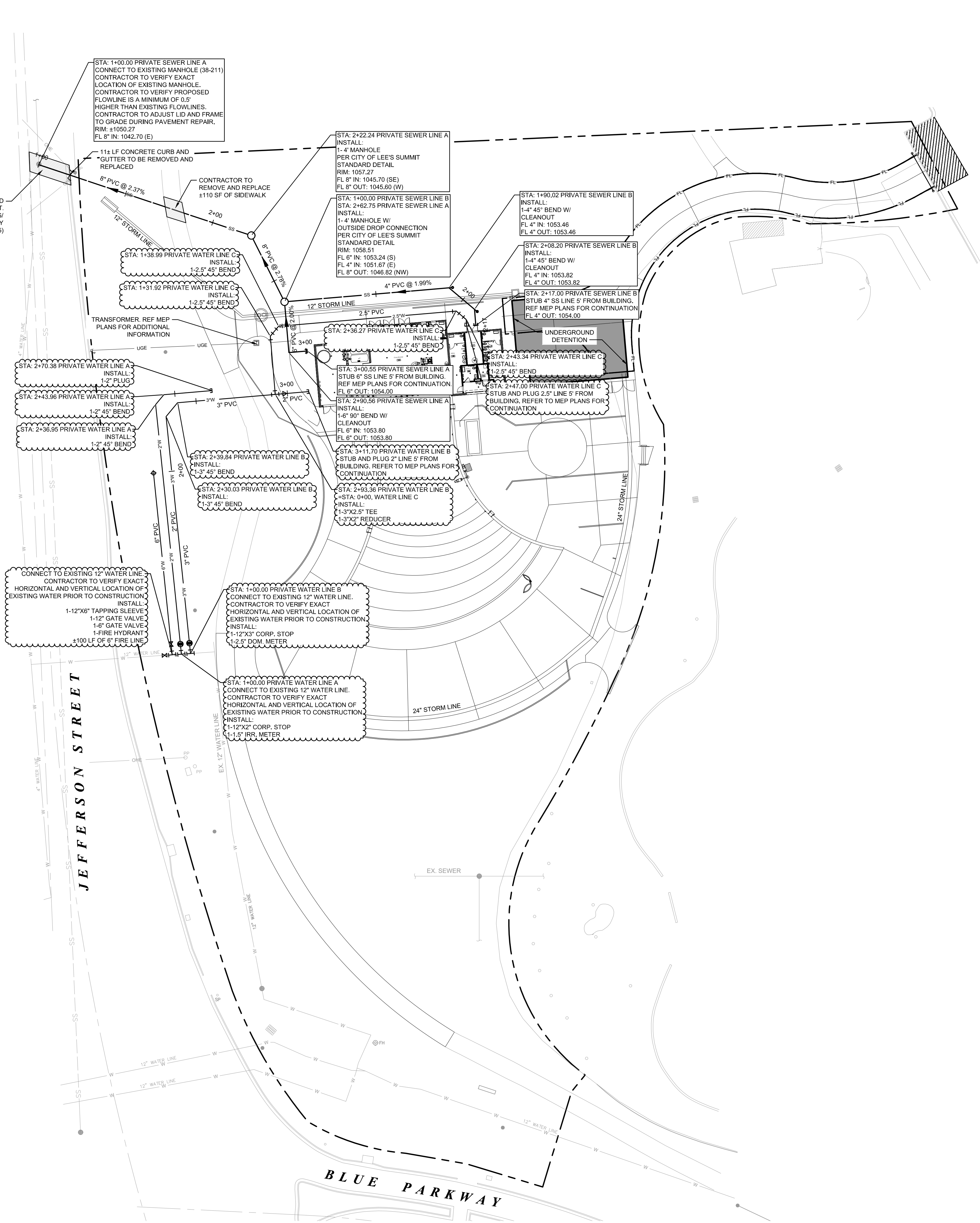
PROPOSED DRAINAGE AREA MAP

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

SHEET
C-4

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



| LEGEND | |
|----------|-----------------------|
| — W — | EXISTING WATER LINE |
| — SAN — | EXISTING SEWER LINE |
| ⊗ | EXISTING WATER VALVE |
| ⊙ | EXISTING SS MANHOLE |
| ○ | PROPOSED SS MANHOLE |
| ⊕ | EXISTING FIRE HYDRANT |
| — SS — | PROPOSED STORM LINE |
| — 2" W — | PROPOSED WATER LINE |
| — 12" — | PROPOSED SS LINE |
| — UGE — | PROPOSED UGE LINE |
| ⋈ | PROPOSED GATE VALVE |

- NOTES:
- CONTRACTOR TO FIELD VERIFY LOCATION AND THE FLOWLINES OF ALL EXISTING UTILITIES.
 - WATER & WASTEWATER SERVICE TO BE PROVIDED BY CITY OF LEE'S SUMMIT. CONTRACTOR TO COORDINATE WITH M.E.P. PLANS AT ALL UTILITY STUBOUTS.
 - CONTRACTOR TO ENSURE NO FIRE HYDRANTS, METERS OR VALVES ARE PLACED IN SIDEWALKS.

- GENERAL NOTES:
- CONTRACTOR TO FIELD VERIFY LOCATION AND THE FLOWLINES OF ALL EXISTING UTILITIES.
 - WATER AND WASTEWATER SERVICE TO BE PROVIDED BY THE CITY.
 - CONTRACTOR TO COORDINATE WITH MEP PLANS AT ALL UTILITY STUBOUTS.
 - CONTRACTOR TO ENSURE NO METERS OR VALVES ARE PLACED IN SIDEWALKS.
 - CONTRACTOR TO REFERENCE GEOTECHNICAL REPORT PREPARED BY INTERTEK PSI (PSI PROJECT NO. 03381842 DATED DECEMBER 14, 2018 FOR UTILITY TRENCH RECOMMENDATIONS).

- SITE UTILITY NOTES:
- THE LOCATION AND / OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES, AND WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CONTACT THE APPROPRIATE UTILITY COMPANIES AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF EXISTING UTILITIES ON SITE OR IN RIGHT-OF-WAY.
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MISSOURI REGISTRATION NUMBER 001512
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Kimley»Horn
Engineer KEVIN S. GASKY
P.E. No. 2841 Date MAY 2019

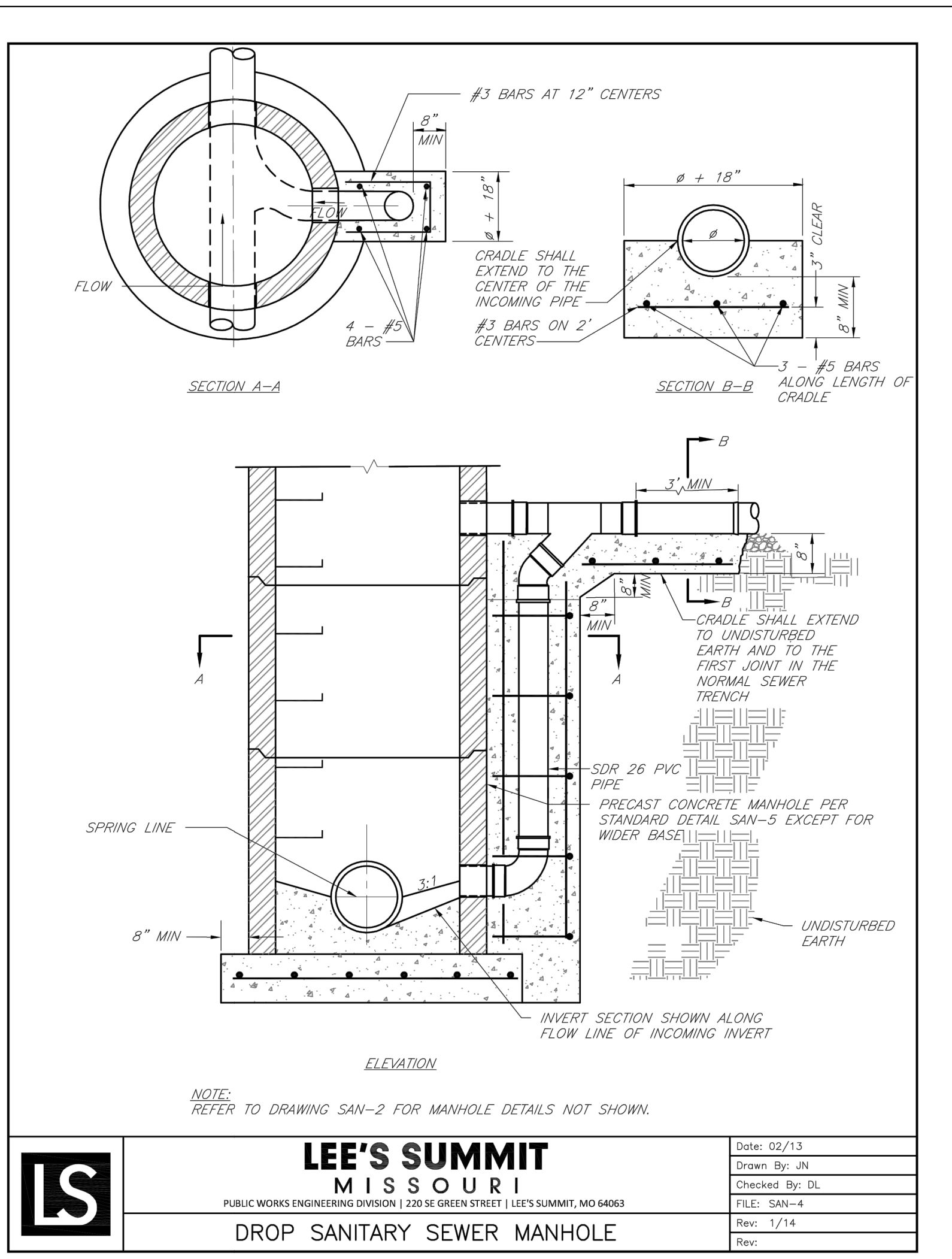
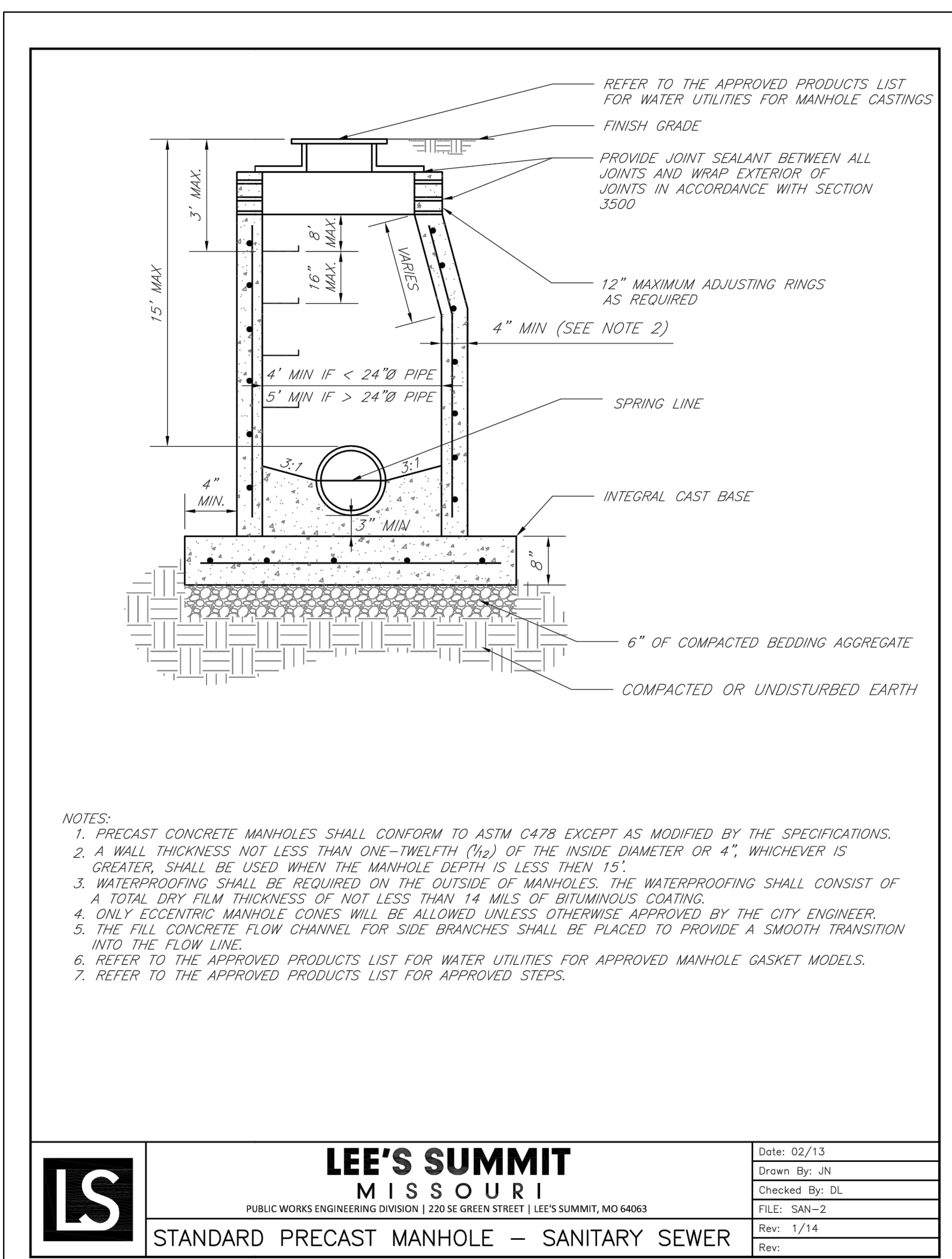
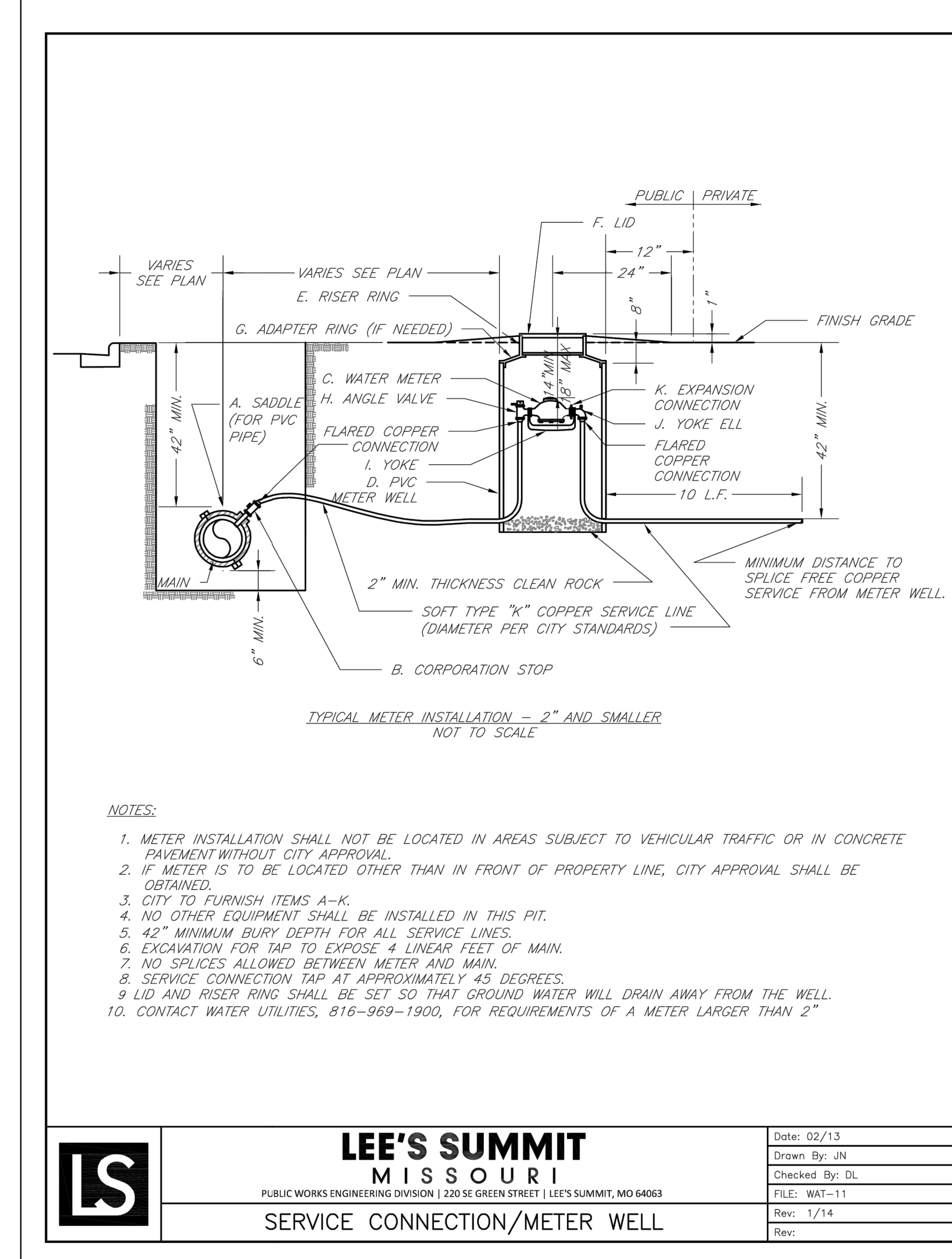
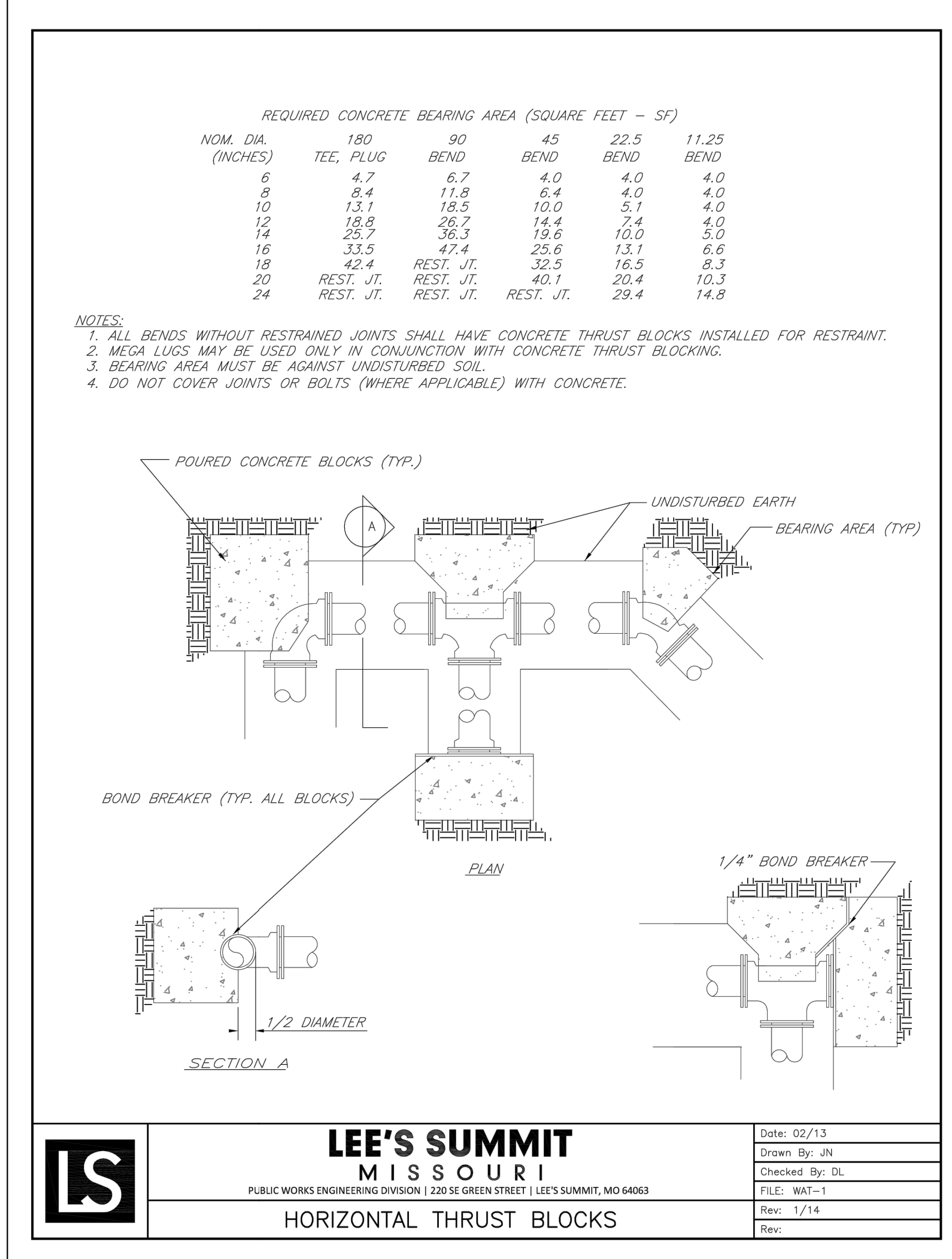
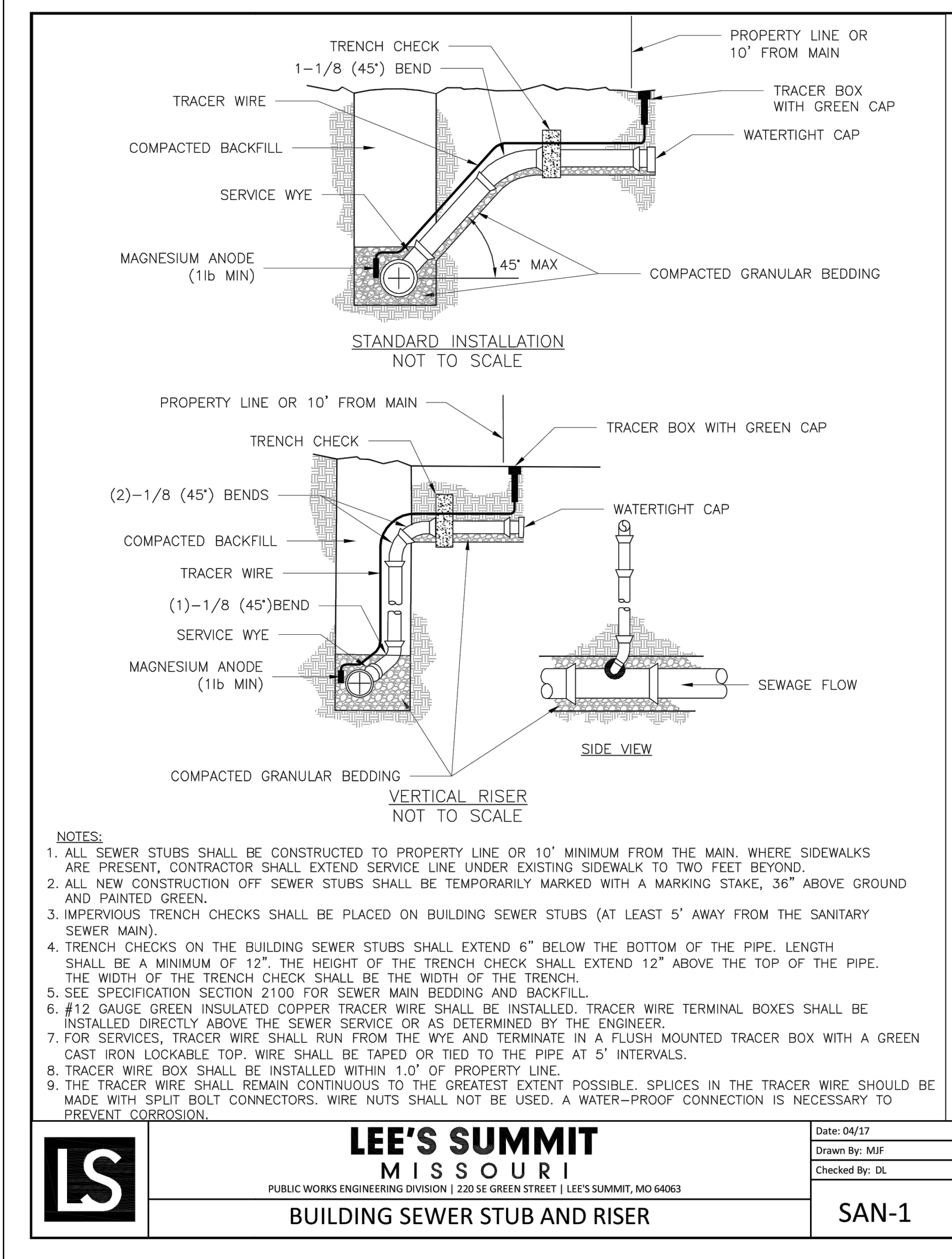
**SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO**

UTILITY PLAN

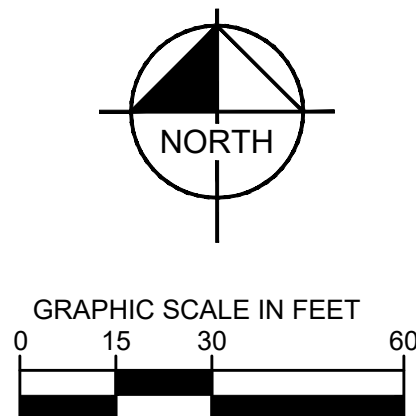
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|--------------|-----------|
| Scale: | AS SHOWN |
| Designed by: | ABP |
| Drawn by: | ABO |
| Checked by: | SEG |
| Date: | MAY 2019 |
| Project No. | 064538700 |

SHEET
C-5

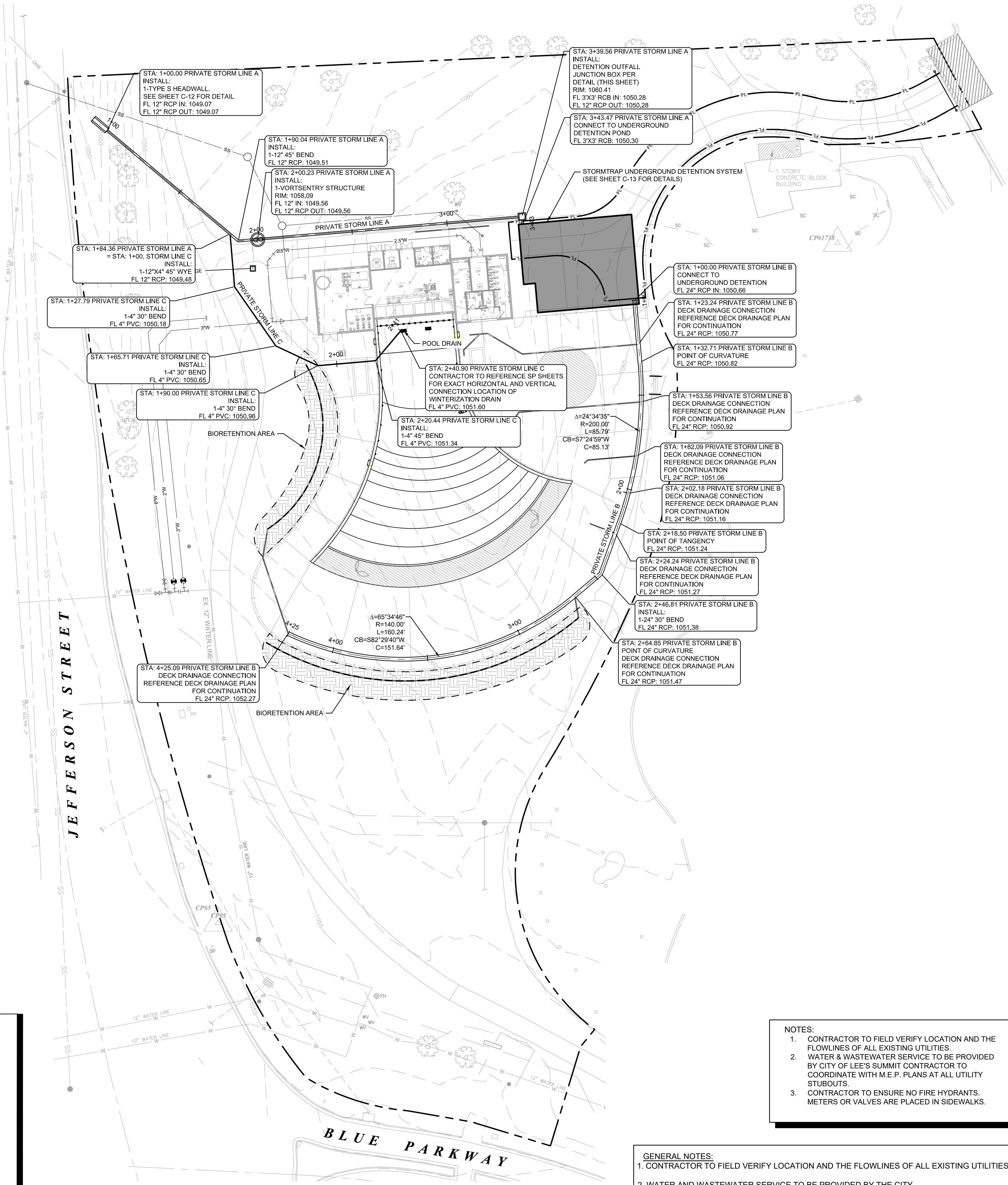
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Xrefs: xrefs storm sewer.dwg 201905252456 with xrefs xrefs storm sewer.dwg



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



| LEGEND | |
|----------|-----------------------|
| — W — | EXISTING WATER LINE |
| — SAN — | EXISTING SEWER LINE |
| ⊗ | EXISTING WATER VALVE |
| ⊙ | EXISTING SS MANHOLE |
| ○ | PROPOSED SS MANHOLE |
| ⊕ | EXISTING FIRE HYDRANT |
| — S — | PROPOSED STORM LINE |
| — 2" W — | PROPOSED WATER LINE |
| — S — | PROPOSED SS LINE |
| — UGE — | PROPOSED UGE LINE |
| ⊗ | PROPOSED GATE VALVE |



GENERAL NOTES:

- CONTRACTOR TO FIELD VERIFY LOCATION AND THE FLOWLINES OF ALL EXISTING UTILITIES.
- WATER AND WASTEWATER SERVICE TO BE PROVIDED BY THE CITY.
- CONTRACTOR TO COORDINATE WITH MEP PLANS AT ALL UTILITY STUBOUTS.
- CONTRACTOR TO ENSURE NO METERS OR VALVES ARE PLACED IN SIDEWALKS.
- CONTRACTOR TO REFERENCE GEOTECHNICAL REPORT PREPARED BY INTERTEK PSI (PSI PROJECT NO. 03381842 DATED DECEMBER 14, 2018 FOR UTILITY TRENCH RECOMMENDATIONS.

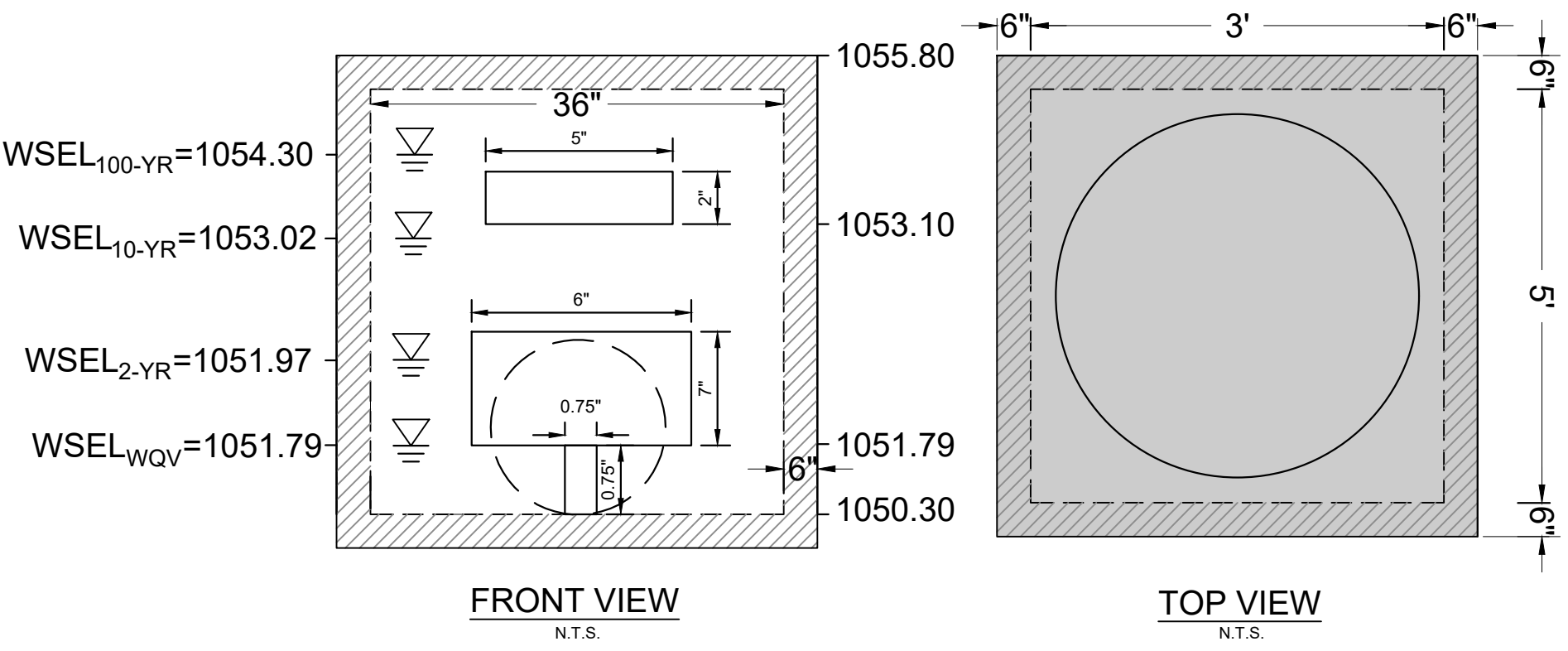
NOTES:

- CONTRACTOR TO FIELD VERIFY LOCATION AND THE FLOWLINES OF ALL EXISTING UTILITIES.
- WATER & WASTEWATER SERVICE TO BE PROVIDED BY CITY OF LEE'S SUMMIT CONTRACTOR TO COORDINATE WITH M.E.P. PLANS AT ALL UTILITY STUBOUTS.
- CONTRACTOR TO ENSURE NO FIRE HYDRANTS, METERS OR VALVES ARE PLACED IN SIDEWALKS.

SITE UTILITY NOTES:

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DETENTION OUTFALL JUNCTION BOX DETAILS



WEIR CALCULATIONS:

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

ORIFICE CALCULATIONS:

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

| OPENING #1 (WQV) | OPENING #2 | OPENING #3 |
|----------------------------|----------------------------|----------------------------|
| H = 0.75 IN | H = 7.0 IN | H = 2.0 IN |
| L = 0.75 IN | L = 6.0 IN | D = 5.0 IN |
| A = 0.004 FT ² | A = 0.29 FT ² | A = 0.07 FT ² |
| INVERT ELEVATION = 1050.30 | INVERT ELEVATION = 1051.79 | INVERT ELEVATION = 1053.10 |
| HEAD = WSEL - CENTROID | HEAD = WSEL - CENTROID | HEAD = WSEL - CENTROID |

| Outfall Structure Summary | | | | | | | | | | | | |
|---------------------------|----------------|----------------|------------|---------|--------|------------|---------|--------|------------|---------|--------|-------|
| Design Storm | Volume (ac-ft) | Elevation (ft) | Opening #1 | | | Opening #2 | | | Opening #3 | | | Total |
| | | | Weir | Orifice | Actual | Weir | Orifice | Actual | Weir | Orifice | Actual | |
| WQV | 0.08 | 1051.79 | 0.34 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 | |
| 2-year | 0.10 | 1051.97 | 0.40 | 0.02 | 0.02 | 0.12 | 0.00 | 0.12 | 0.00 | 0.00 | 0.14 | |
| 10-year | 0.16 | 1053.02 | 0.84 | 0.03 | 0.03 | 2.06 | 1.36 | 1.36 | 0.00 | 0.00 | 1.39 | |
| 100-year | 0.24 | 1054.30 | 1.50 | 0.04 | 0.04 | 5.98 | 2.09 | 2.09 | 1.64 | 0.35 | 2.48 | |

| Elevation Discharge Summary Table | | | | | | | | | |
|-----------------------------------|------------|---------|--------|------------|---------|--------|------------|---------|--------|
| Elevation | Opening #1 | | | Opening #2 | | | Opening #3 | | |
| | Weir | Orifice | Actual | Weir | Orifice | Actual | Weir | Orifice | Actual |
| 1050.3 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 |
| 1051.3 | 0.19 | 0.02 | 0.02 | 0.00 | 0.00 | 0.00 | 0.00 | 0.00 | 0.02 |
| 1052.3 | 0.53 | 0.03 | 0.03 | 0.55 | 0.66 | 0.55 | 0.00 | 0.00 | 0.58 |
| 1053.3 | 0.97 | 0.03 | 0.03 | 2.80 | 1.55 | 1.55 | 0.11 | 0.11 | 1.70 |
| 1054.3 | 1.50 | 0.04 | 0.04 | 5.98 | 2.09 | 2.09 | 1.64 | 0.35 | 2.48 |
| 1054.80 | 1.79 | 0.04 | 0.04 | 7.85 | 2.32 | 2.32 | 2.77 | 0.43 | 2.78 |

| Stage Storage Summary Table | | |
|-----------------------------|-----------|----------------|
| Elevation (ft) | Area (ac) | Volume (ac-ft) |
| 1050.30 | 0.06 | 0.00 |
| 1054.80 | 0.06 | 0.25 |

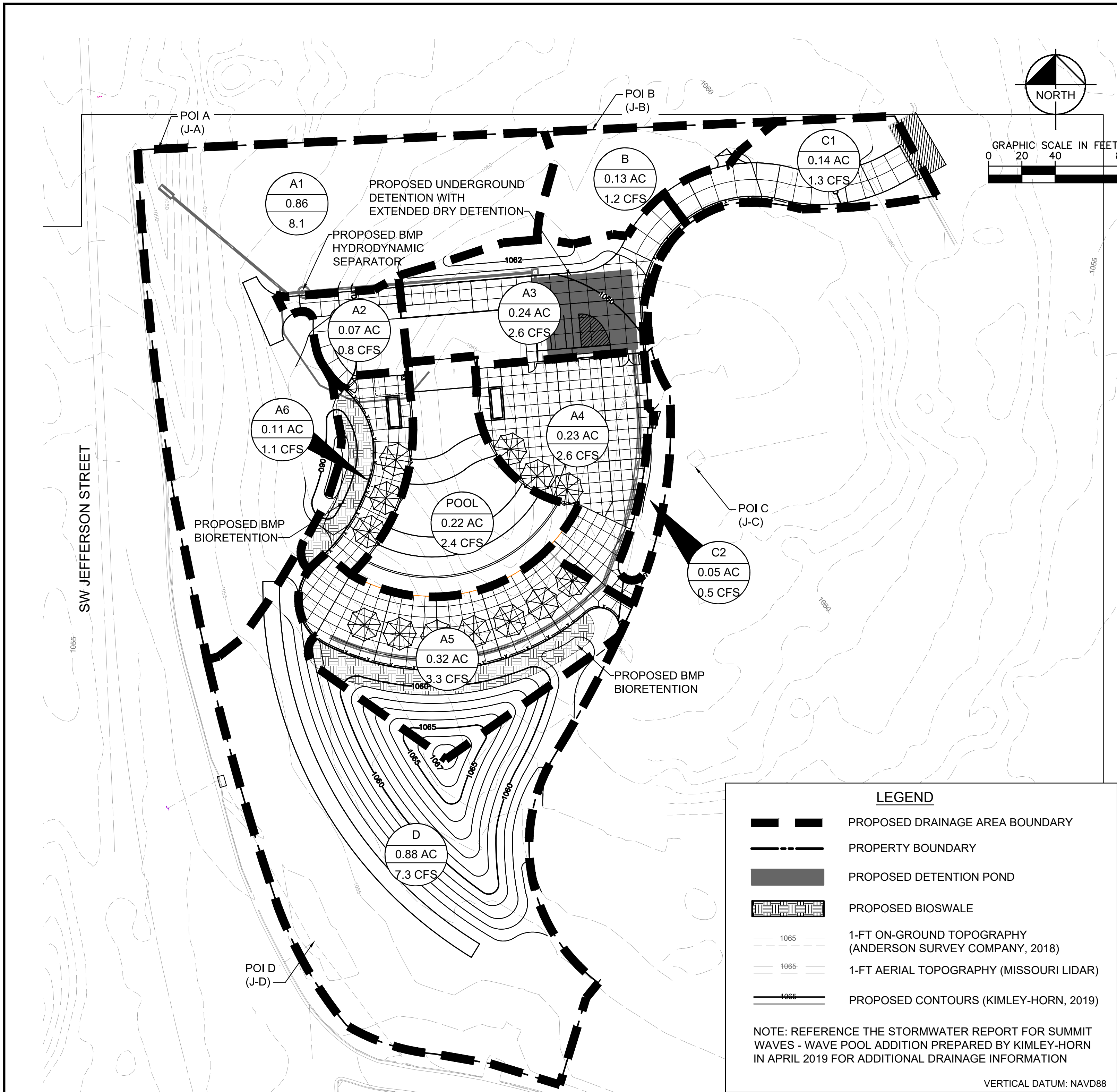
Kimley»Horn
13455 Noel Road, Suite 700, Dallas, Texas 75240
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WWW.KIMLEY-HORN.COM
MISSOURI REGISTRATION NUMBER 001512
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Kimley»Horn
Engineer KEVIN S. GARNER
P.E. No. 28441 Date MAY 2019

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: | MAY 2019 |
| Project No. | 064538700 |
| SHEET | |
| C-8 | |



LEGEND

- PROPOSED DRAINAGE AREA BOUNDARY
- PROPERTY BOUNDARY
- PROPOSED DETENTION POND
- PROPOSED BIOSWALE
- 1-FT ON-GROUND TOPOGRAPHY (ANDERSON SURVEY COMPANY, 2018)
- 1-FT AERIAL TOPOGRAPHY (MISSOURI LIDAR)
- PROPOSED CONTOURS (KIMLEY-HORN, 2019)

NOTE: REFERENCE THE STORMWATER REPORT FOR SUMMIT WAVES - WAVE POOL ADDITION PREPARED BY KIMLEY-HORN IN APRIL 2019 FOR ADDITIONAL DRAINAGE INFORMATION

VERTICAL DATUM: NAVD88

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 | 0.75 | 98 | 73.5 |
| CN _{PostWeighted} = 90.8 | | | |
| C. Level of Service (LS) Calculation | | | |
| CN _{PreWeighted} = 74.2 | | | |
| CN _{PostWeighted} = 90.8 | | | |
| Difference = 16.6 | | | |
| LS Required (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 Separator | 0.24 | 8.00 | 1.92 |
| A4 | Extended Dry Detention + Hydrodynamic Separator | 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 |
| | | Total = | 10.86 | |
| | | Weighted VR = | 10.14 | |
| | | Required VR = | 8.00 | |

| E. Water Quality Volume | | | |
|-------------------------|------|--|--|
| % Site Impervious | 70% | | |
| Rv | 0.68 | | |
| WQV (in) | 0.93 | | |
| WQV (ac-ft) | 0.08 | | |
| 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 | 0.80 | 74 | 59.2 |
| Pavement | 0.09 | 98 | 8.82 |
| CN _{PostWeighted} = 76.4 | | | |
| C. Level of Service (LS) Calculation | | | |
| CN _{PreWeighted} = 75.5 | | | |
| CN _{PostWeighted} = 76.4 | | | |
| Difference = 0.9 | | | |
| LS Required (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 Required (Table 4.2) = n/a | | | |

HYDROLOGIC CALCULATIONS – EXISTING CONDITIONS

| Existing Condition Hydrologic Parameters | | | | | | | | | |
|--|----|-----------|-------------------------|------|----------|------------------------|------------------------|-------------------------|--------------------------|
| POI | DA | Area (ac) | Area (mi ²) | CN | TC (min) | T _{lag} (min) | Q _{2yr} (cfs) | Q _{10yr} (cfs) | Q _{100yr} (cfs) |
| A | A | 1.17 | 0.00183 | 75.2 | 4.52 | 2.71 | 2.2 | 5.7 | 10.8 |
| B | B | 0.16 | 0.00025 | 75.5 | 4.22 | 2.53 | 0.3 | 0.8 | 1.5 |
| 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 |
| D | 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 | | | | | | | | | |
|---|-------------|-------------------|-------------------|---------------|---------------|-------------------------|-----------------------------------|------------------|--------------------|
| T _c = (0.007(L ^{0.58} S ^{-0.19}) / (P ^{0.22} S ^{0.5}) ^{0.4}) 2-year 24-hr Rainfall Depth (in.) = 3.71 | | | | | | | | | |
| Basin | Length (ft) | Elev ₁ | Elev ₂ | Slope (ft/ft) | Manning's "n" | T _{c1} (min) | SHALLOW CONCENTRATED FLOW | | |
| | | | | | | | T _c = L / 60-V | | |
| | | | | | | | Storm Sewer Flow | | |
| | | | | | | | Assumed Velocity = 4 ft/s (swale) | | |
| Basin | Length (ft) | Elev ₁ | Elev ₂ | Slope (ft/ft) | Condition | V _{avg} (ft/s) | T _{c2} (min) | Inlet Time (min) | Travel Length (ft) |
| A | 50 | 1065.0 | 1063.0 | 0.0400 | Unpaved | 4.57 | 0.5 | | 156 |
| B | 50 | 1061.5 | 1061.0 | 0.0100 | Unpaved | 2.59 | 0.7 | | 4.0 |
| C1 | 50 | 1065.0 | 1065.0 | 0.0200 | Unpaved | 3.55 | 0.7 | | 0.7 |
| C2 | 50 | 1066.0 | 1065.0 | 0.0200 | Unpaved | 2.89 | 2.0 | | 4.5 |
| D | 50 | 1066.0 | 1065.0 | 0.0200 | Unpaved | 2.89 | 2.0 | | 7.2 |

Project: Lee's Summit - Simulation Run: 002 Existing

Start of Run: 07Mar2019, 00:00 End of Run: 07Mar2019, 00:00
Base Model: Existing Meteorologic Model: 002 Year
Compute Time: 22Mar2019, 09:28:43 Control Specifications: 72-hour

| Hydrologic Element | Drainage Area (ac) | Peak Discharge (cfs) | Time of Peak (hr) | Volume (ac-ft) |
|--------------------|--------------------|----------------------|-------------------|----------------|
| D | 0.00222 | 2.4 | 07Mar2019, 12:04 | 0.14 |
| A1 | 0.00025 | 0.3 | 07Mar2019, 12:04 | 0.02 |
| A2 | 0.00025 | 0.3 | 07Mar2019, 12:04 | 0.02 |
| A3 | 0.00038 | 0.9 | 07Mar2019, 12:04 | 0.06 |
| A4 | 0.00038 | 0.9 | 07Mar2019, 12:04 | 0.06 |
| A5 | 0.00059 | 2.3 | 07Mar2019, 12:04 | 0.15 |
| A6 | 0.00025 | 0.3 | 07Mar2019, 12:04 | 0.02 |
| B | 0.00025 | 0.3 | 07Mar2019, 12:04 | 0.02 |
| C1 | 0.00020 | 0.2 | 07Mar2019, 12:04 | 0.01 |
| C2 | 0.00059 | 1.6 | 07Mar2019, 12:04 | 0.11 |
| D | 0.00222 | 2.4 | 07Mar2019, 12:04 | 0.14 |

Project: Lee's Summit - Simulation Run: 010 Existing

Start of Run: 07Mar2019, 00:00 End of Run: 07Mar2019, 00:00
Base Model: Existing Meteorologic Model: 010 Year
Compute Time: 22Mar2019, 09:48:17 Control Specifications: 72-hour

| Hydrologic Element | Drainage Area (ac) | Peak Discharge (cfs) | Time of Peak (hr) | Volume (ac-ft) |
|--------------------|--------------------|----------------------|-------------------|----------------|
| D | 0.00222 | 6.1 | 07Mar2019, 12:05 | 0.36 |
| A1 | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| A2 | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| A3 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.06 |
| A4 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.06 |
| A5 | 0.00059 | 2.3 | 07Mar2019, 12:05 | 0.15 |
| A6 | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| B | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| C1 | 0.00020 | 0.2 | 07Mar2019, 12:05 | 0.01 |
| C2 | 0.00059 | 1.6 | 07Mar2019, 12:05 | 0.11 |
| D | 0.00222 | 6.1 | 07Mar2019, 12:05 | 0.36 |

Project: Lee's Summit - Simulation Run: 100 Existing

Start of Run: 07Mar2019, 00:00 End of Run: 07Mar2019, 00:00
Base Model: Existing Meteorologic Model: 100 Year
Compute Time: 22Mar2019, 09:48:17 Control Specifications: 72-hour

| Hydrologic Element | Drainage Area (ac) | Peak Discharge (cfs) | Time of Peak (hr) | Volume (ac-ft) |
|--------------------|--------------------|----------------------|-------------------|----------------|
| D | 0.00222 | 11.6 | 07Mar2019, 12:05 | 0.74 |
| A1 | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| A2 | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| A3 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.06 |
| A4 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.06 |
| A5 | 0.00059 | 2.3 | 07Mar2019, 12:05 | 0.15 |
| A6 | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| B | 0.00025 | 0.3 | 07Mar2019, 12:05 | 0.02 |
| C1 | 0.00020 | 0.2 | 07Mar2019, 12:05 | 0.01 |
| C2 | 0.00059 | 1.6 | 07Mar2019, 12:05 | 0.11 |
| D | 0.00222 | 11.6 | 07Mar2019, 12:05 | 0.74 |

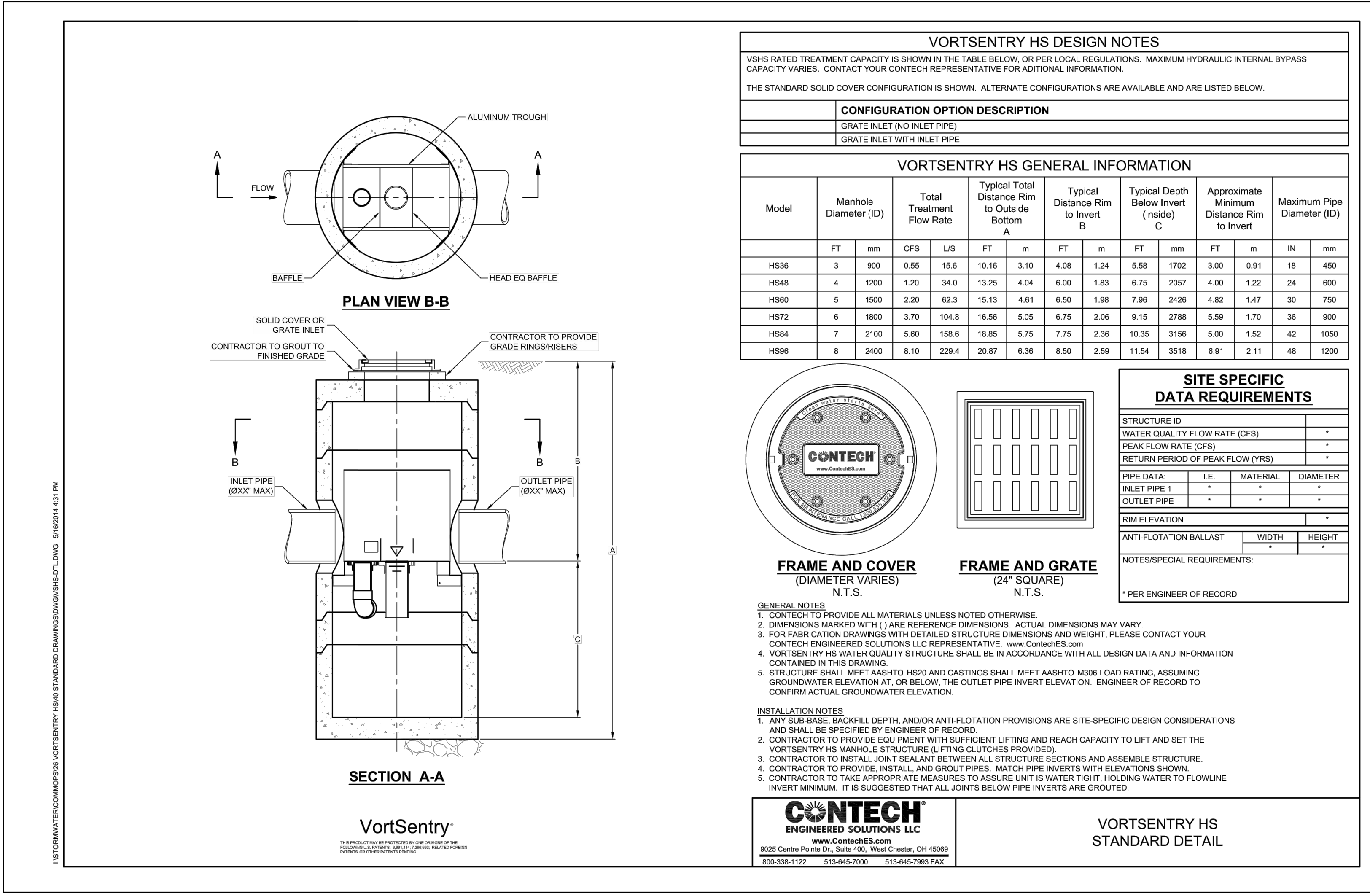
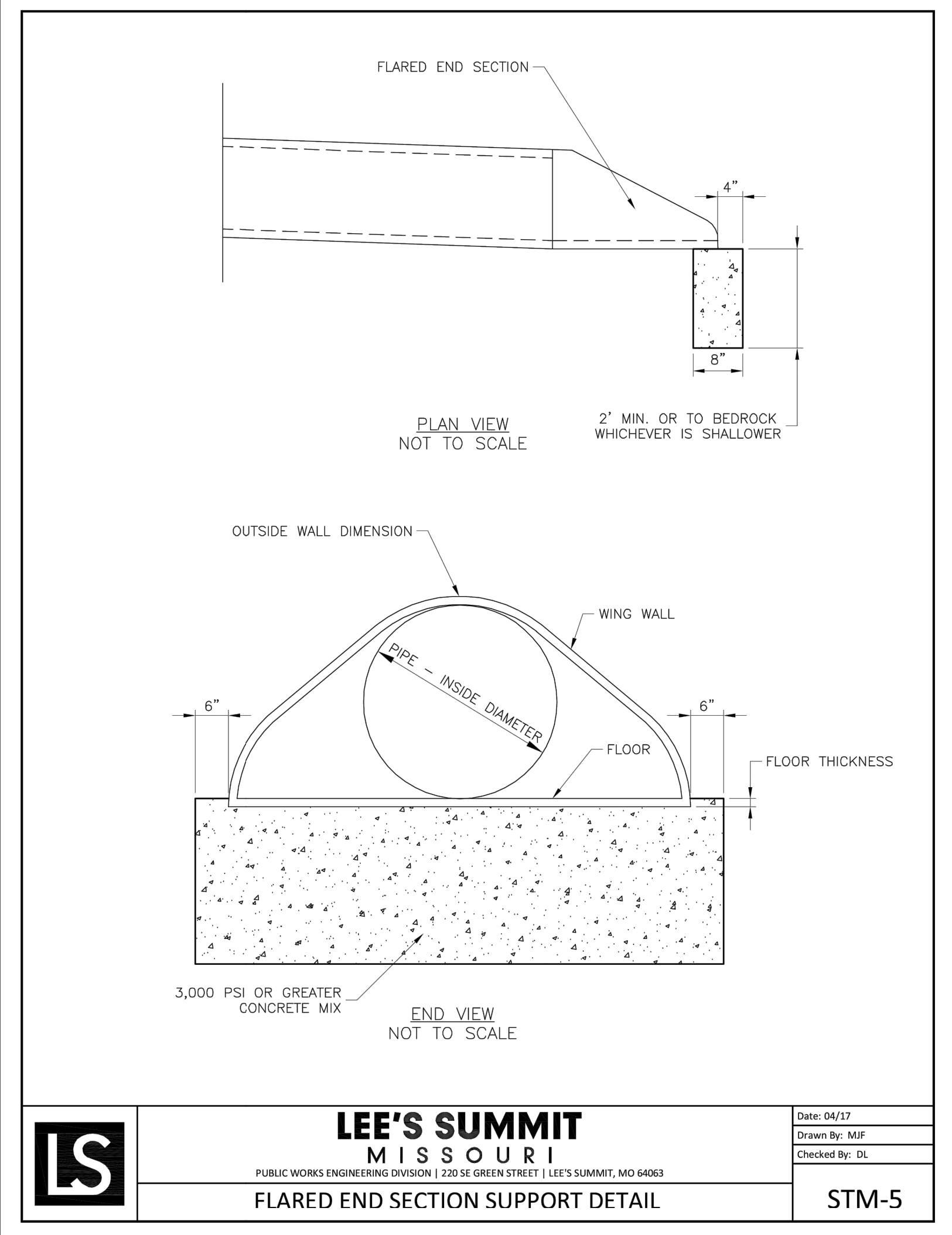
HYDROLOGIC CALCULATIONS – PROPOSED CONDITIONS

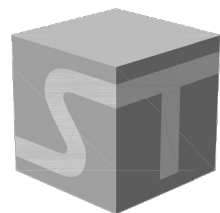
| Proposed Condition Hydrologic Parameters | | | | | | | | | |
|--|------|-----------|-------------------------|------|----------|------------------------|------------------------|-------------------------|--------------------------|
| POI | DA | Area (ac) | Area (mi ²) | CN | TC (min) | T _{lag} (min) | Q _{2yr} (cfs) | Q _{10yr} (cfs) | Q _{100yr} (cfs) |
| 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 |
| B | B | 0.13 | 0.00020 | 75.8 | 4.09 | 2.45 | 0.3 | 0.6 | 1.2 |
| 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 |
| D | 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

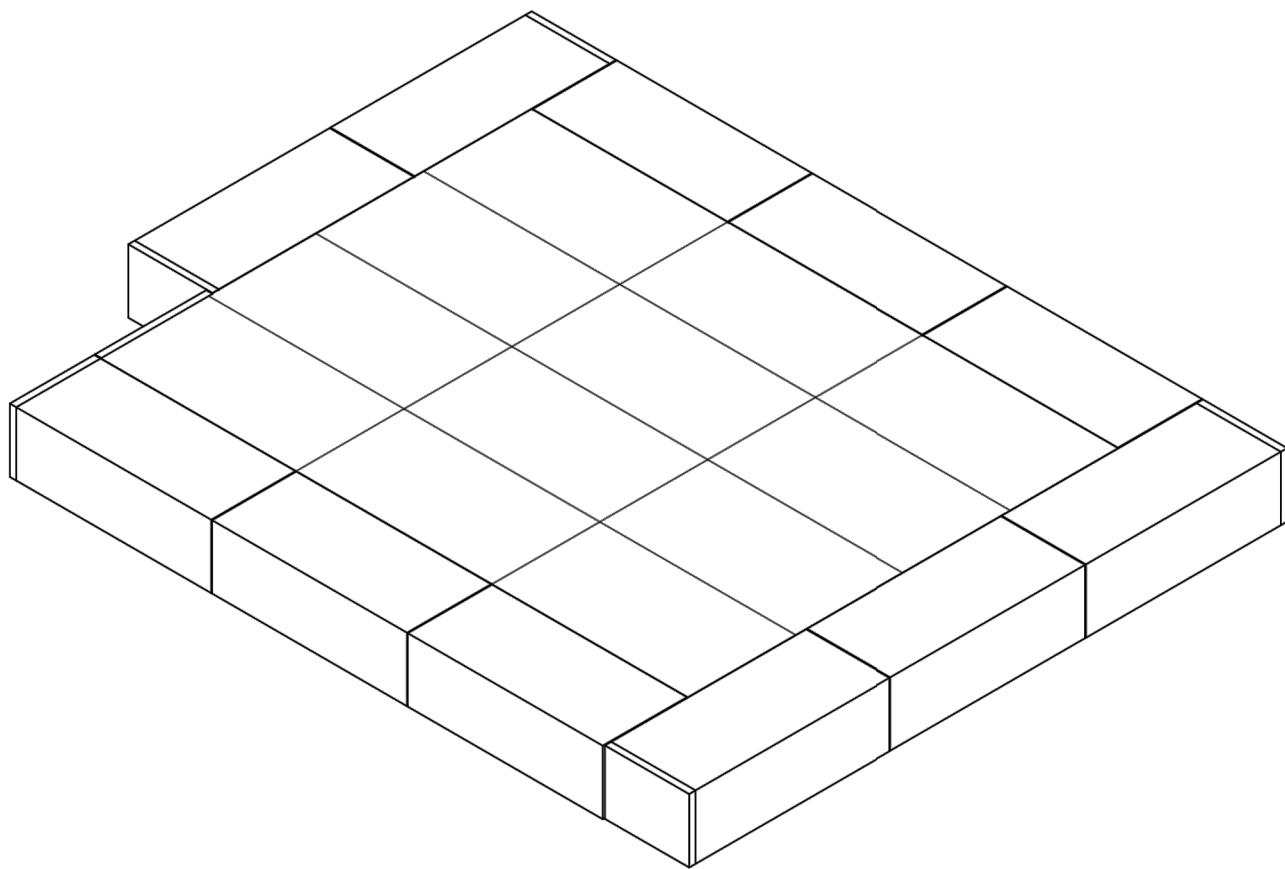
| SHEET FLOW | | | | | | | | | |
|---|-------------|-------------------|-------------------|---------------|---------------|-------------------------|--|------------------|--------------------|
| T _c = (0.007(L ^{0.58} S ^{-0.19}) / (P ^{0.22} S ^{0.5}) ^{0.4}) n = 0.24 (dense grass) | | | | | | | | | |
| Basin | Length (ft) | Elev ₁ | Elev ₂ | Slope (ft/ft) | Manning's "n" | T _{c1} (min) | SHALLOW CONCENTRATED FLOW | | |
| | | | | | | | T _c = 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 | Length (ft) | Elev ₁ | Elev ₂ | Slope (ft/ft) | Condition | V _{avg} (ft/s) | T _{c2} (min) | Inlet Time (min) | Travel Length (ft) |
| A1 | 50 | 1059.5 | 1058.0 | 0.0700 | Unpaved | 4.88 | 0.2 | | 156 |
| A2 | | | | | | | | 5.0 | 81 |
| A3 | | | | | | | | 5.0 | 127 |
| A4 | | | | | | | | 5.0 | 176 |
| A5 | | | | | | | | 5.0 | 112 |
| A6 | | | | | | | | | |
| B | 50 | 1062.5 | 1060.5 | 0.0400 | Unpaved | 2.55 | 0.1 | | 4.1 |
| C1 | 50 | 1061.5 | 1061.0 | 0.0100 | Unpaved | 3.27 | 0.6 | | 7.5 |
| C2 | | | | | | | | 5.0 | 5.0 |
| D | 50 | 1059.0 | 1058.0 | 0.0200 | Unpaved | 2.05 | 2.0 | | 7.2 |
| Pool | | | | | | | | 5.0 | 67 |

| Project: Lee's Summit | | | Simulation Run: 002 Proposed | | |
|-----------------------------------|--------------------|---------------------------------|------------------------------|----------------|------------|
| Start of Run: 07Mar2019, 00:00 | | Base Model: Proposed | | | |
| End of Run: 07Mar2019, 00:00 | | Meteorologic Model: 002 Year | | | |
| Compute Time: 22Mar2019, 09:28:43 | | Control Specifications: 72-hour | | | |
| Draw Elements | # of Elements | Value Units | # of E-Cells | Sorting | Hydrologic |
| Hydrologic Element | Drainage Area (ac) | Peak Discharge (CFS) | Time of Peak | Volume (ac-ft) | |
| A1 | 0.00038 | 1.1 | 07Mar2019, 12:05 | 0.06 | |
| A2 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.05 | |
| A3 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.05 | |
| A4 | 0.00038 | 0.9 | 07Mar2019, 12:05 | 0.05 | |
| A5 | 0.00050 | 2.3 | 07Mar2019, 12:05 | 0.14 | |
| A6 | 0.00017 | 0.4 | 07Mar2019, 12:05 | 0.02 | |
| Detention | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-1 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-2 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-3 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-4 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-5 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-6 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-7 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-8 | 0.00141 | 0.3 | 07Mar2019, 12:29 | 0.09 | |
| D-9 | 0.0014 | | | | |





StormTrap®
MODULAR CONCRETE
STORMWATER MANAGEMENT



SUMMIT WAVES - OPTION 2
LEES SUMMIT, MO

| SHEET INDEX | |
|-------------|--|
| PAGE | DESCRIPTION |
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| 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

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

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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:

5/7/2019

ISSUED FOR:

PRELIMINARY

REV. DATE: ISSUED FOR: DWN BY:

1 5/7/2019 PRELIMINARY JPH

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.: 10,979.88 CUBIC FEET
UNIT HEADROOM: 4' - 6" SINGLETRAP
UNIT QUANTITY: 23 TOTAL PIECES

SITE SPECIFIC DESIGN CRITERIA

- 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.
- COVER RANGE: MIN. 1.08' MAX. 6.00' CONSULT STORMTRAP FOR ADDITIONAL COVER OPTIONS.
- 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.
- FOR STRUCTURAL CALCULATIONS THE GROUND WATER TABLE IS ASSUMED TO BE BELOW INVERT OF SYSTEM. IF WATER TABLE IS DIFFERENT THAN ASSUMED, CONTACT STORMTRAP.
- SYSTEM DESIGN MAY ALLOW FOR INCIDENTAL LEAKAGE AND WILL NOT BE SUBJECT TO LEAKAGE TESTING.

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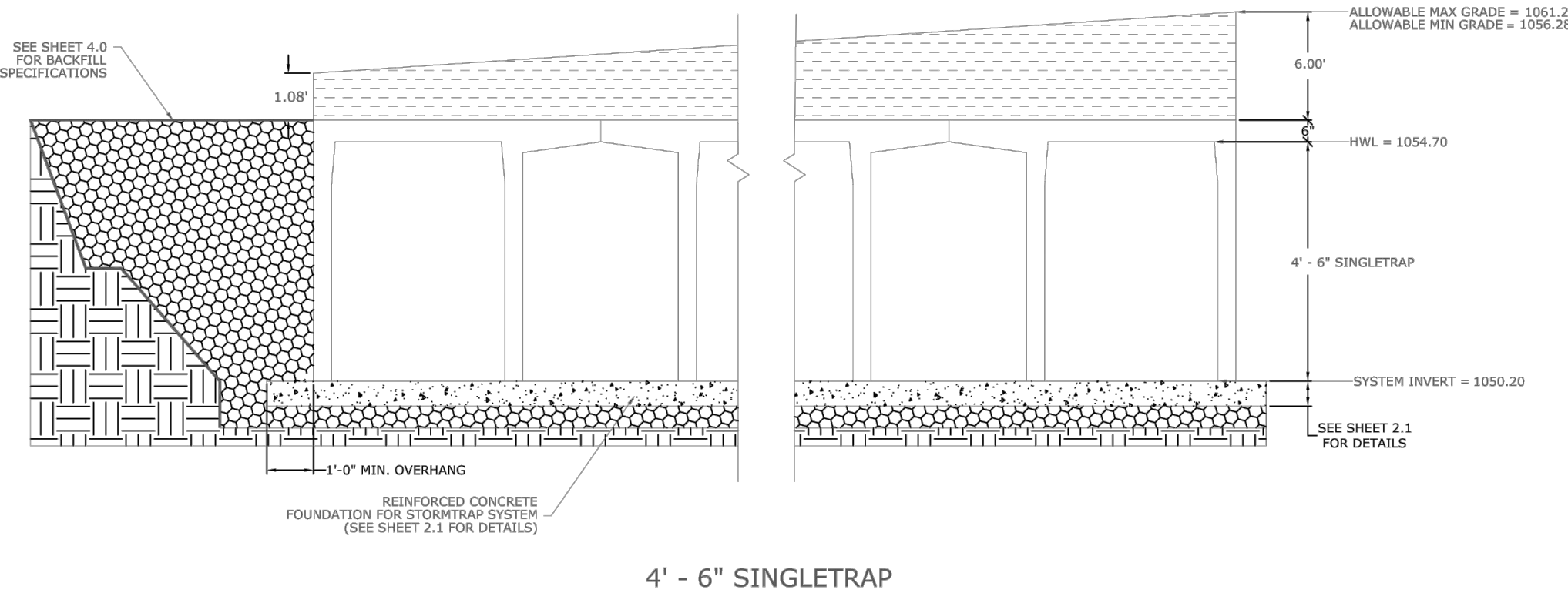
NTS

SHEET TITLE:

SINGLETRAP DESIGN CRITERIA

SHEET NUMBER:

1.0



| BILL OF MATERIALS | | | |
|-------------------|------------|--------------------|--------|
| QTY. | UNIT TYPE | DESCRIPTION | WEIGHT |
| 11 | I | 4' - 6" SINGLETRAP | 15188 |
| 1 | II | 4' - 6" SINGLETRAP | 17263 |
| 6 | III | 4' - 6" SINGLETRAP | 14779 |
| 5 | IV | 4' - 6" SINGLETRAP | 15817 |
| 0 | VII | 4' - 6" SINGLETRAP | 14365 |
| 0 | SPIV | 4' - 6" SINGLETRAP | VARIES |
| 6 | PANEL | 6" THICK PANELS | VARIES |
| 5 | JOINT WRAP | 150' PER ROLL | |
| 16 | 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 = 1051.20
ALLOWABLE MIN GRADE = 1055.28
INSIDE HEIGHT ELEVATION = 1054.70
SYSTEM INVERT = 1050.20

NOTES:

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

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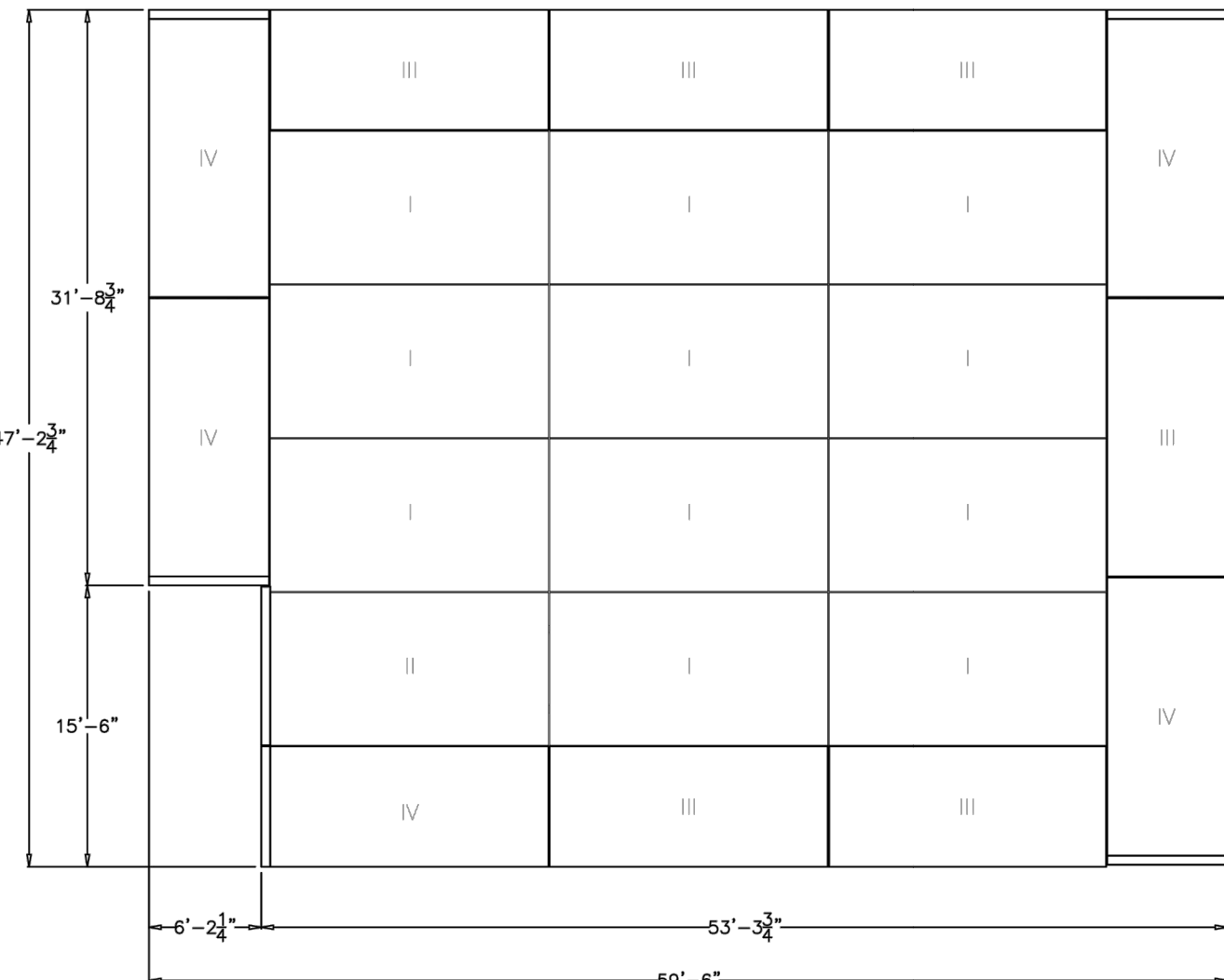
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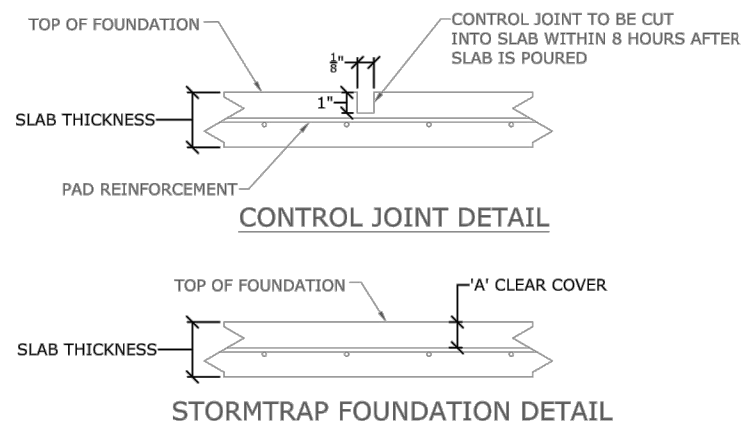
SINGLETRAP SYSTEM LAYOUT

SHEET NUMBER:

2.0



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



| MAXIMUM SYSTEM COVER | SLAB THICKNESS | CONCRETE STRENGTH | REINFORCEMENT (BOTH DIRECTIONS) | 'A' CLEAR COVER |
|----------------------|----------------|-------------------|---------------------------------|-----------------|
| 0'-8" | 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" |

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ASSOCIATES
13455 NOEL RD
TWO GALLERIA OFFICE
TOWER STE 700

PROJECT INFORMATION:

SUMMIT WAVES

OPTION 2

LEES SUMMIT, MO

CURRENT ISSUE DATE:

5/7/2019

ISSUED FOR:

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REV. DATE: ISSUED FOR: DWN BY:

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1 4/15/2019 PRELIMINARY JH

SCALE:

NTS

SHEET TITLE:

SINGLETRAP FOUNDATION LAYOUT

SHEET NUMBER:

2.1

Kimley»Horn
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MISSOURI REGISTRATION NUMBER 001512
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Kimley»Horn
Figure: KEVIN D. GABRY
File No. 2841 Date: 5/24/2019

SUMMIT WAVES
WAVE POOL ADDITION
LEE'S SUMMIT, MO

DETENTION DETAILS

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

SHEET
C-13

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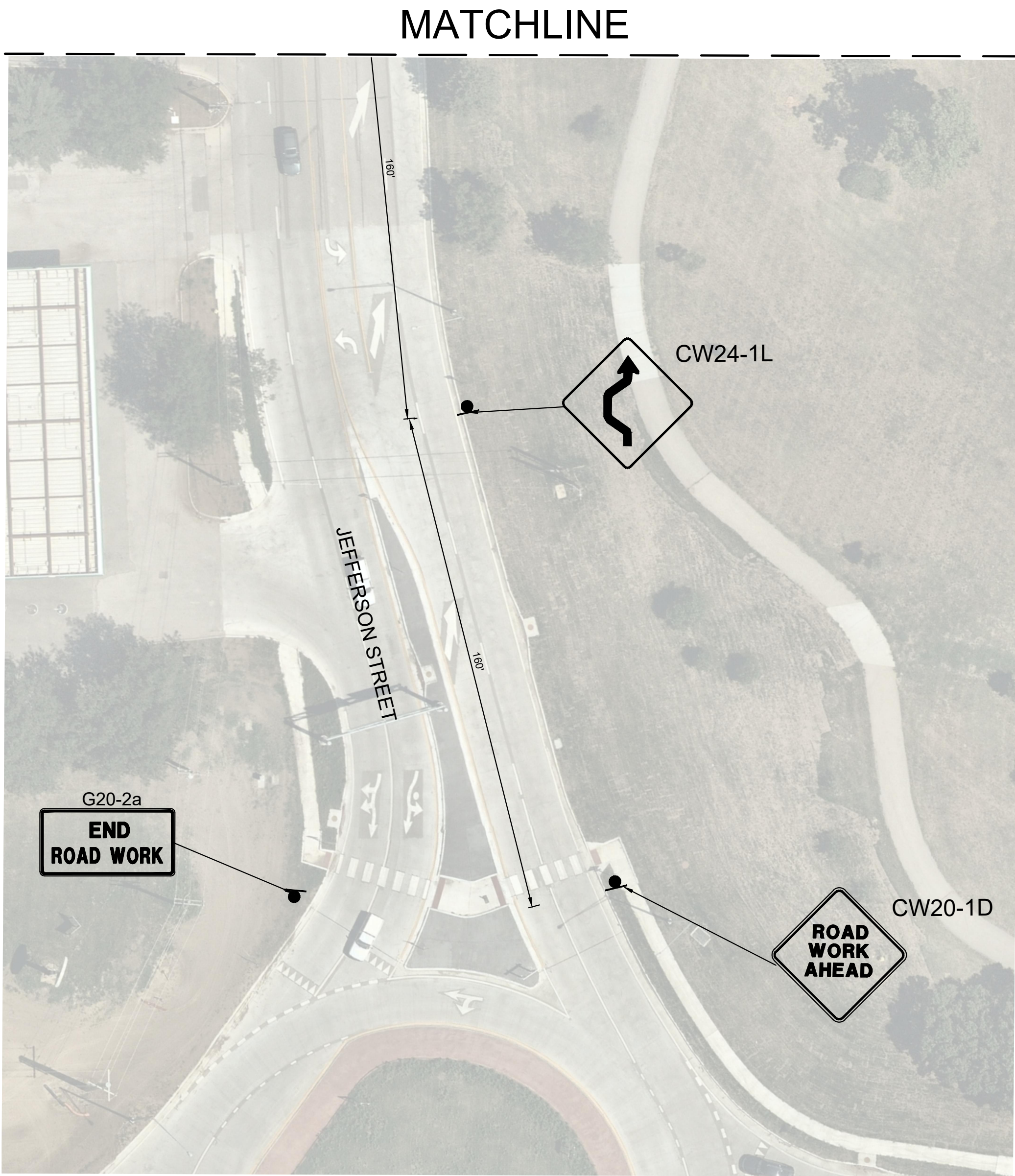
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| 1 | 4/15/2019 | PRELIMINARY | JH |

SCALE:
NTS

SHEET TITLE:
SINGLETRAP
MODULE TYPES

SHEET NUMBER:
6.0



8. WHEN THE TCP IS NOT IN EFFECT, ALL CHANNELIZING DEVICES SHALL BE REMOVED FROM THE TRAVEL LANES AND ALL SIGNS SHALL BE COVERED OR TURNED AWAY FROM THE DIRECTION OF TRAFFIC. THE TRAVEL LANE SURFACES SHALL BE RESTORED WITH STEEL PLATES OR TEMPORARY PAVEMENT. WHERE A SAW CUT OR PAVEMENT REMOVAL RESULTS IN MORE THAN A 2" DROP-OFF ADJACENT TO AN ACTIVE TRAVEL LANE, THE EDGE SHALL BE MARKED WITH VERTICAL PANELS OR CHANNELIZATION DRUMS AT 25' SPACING, AND WARNING SIGN CW 8-9a "SHOULDER DROP-OFF" SHALL BE POSTED 240' IN ADVANCE OF THE DROP-OFF CONDITION.

