**SECTION 6-47-31** 

Scale 1" = 2000'

### UTILITIES

WATER & SANITARY SEWER City of Lee's Summit Water Utilities 220 SE Green St Lee's Summit, MO Phone:816.969.1900

**ELECTRICITY** Kansas City Power and Light Phone: 816.471.5275

Missouri Gas Energy

PO Box 219255 Kansas City, Missouri 64141 Phone: 816.756.5252

described;

**TELEPHONE** AT&T Phone: 800.288.2020

Time Warner Cable Phone: 816.222.5952

CABLE TV Phone: 816.795.1100

Know what's below.

Call before you dig.

Time Warner Cable Phone: 816.358.8833

being more particularly described as follows; Commencing at the Northeast Corner of said Lot 3, HEARNE'S ADDITION, thence North 87°37'18" West, along the north line of said Lot 3, and also being along the south line of Lot 1, BENTON HEIGHTS, a subdivision of land in the City of Lee's Summit, Jackson County, Missouri, a distance of 150.00 feet to the

Northwest Corner of the East 150 feet of said Lot 3 and being the True Point of Beginning of land being

All that part of Lots 1, 2, 3, 22, and 23, HEARNE'S ADDITION, a subdivision of land in the City of Lee's

Summit, Jackson County, Missouri, together with all of vacated Orchard Street lying adjacent to said lots,

thence continuing North 87°37'18" West, along said north line of lot 3, and along the north line of said Lots 2 and 1, of said HEARNE'S ADDITION, a distance of 362.30 feet to the Northwest Corner of said Lot 1, said point being on the easterly right-of-way line of the Union Pacific Railroad, as now exists;

thence southeasterly along the westerly line of said Lot 1 and said Lot 23, HEARNE'S ADDITION, and being along the easterly right-of-way line of said railroad, on a curve to the left, said curve having an initial tangent bearing of South 19°41'03" East, a chord which bears South 25°03'20" East, a radius of 2,814.79 feet, a chord distance of 527.00 feet, an arc length of 527.77 feet to a point 8 feet due north of and adjacent to the south line of said Lot 23;

thence South 87°40'20" East, along a line 8 feet due north of and adjacent to and parallel with the south line of said Lot 23 and said Lot 22, HEARNE'S ADDITION, a distance of 119.63 feet to the Southwest Corner of the North 80 feet of the South 88 feet of the East 150 feet of said Lot 22;

thence North 02°25'04" East, along the west line of the East 150 feet of said Lot 22, a distance of 80.00 feet to the Northwest Corner of the South 88 feet of the East 150 feet of said Lot 22;

thence South 87°40'20" East, 88 feet due north of and adjacent to and parallel with the south line of said Lot 22, a distance of 150.07 feet (measured) 150 feet (deed) to the Northeast Corner of the South 88 feet of said Lot 22;

thence North 02°20'22" East, along the east line of said Lots 22 and 3, HEARNE'S ADDITION, and also

being along the westerly right-of-way line of Olive Street, as now exists, a distance of 317.50 feet to the Southeast Corner of the North 70 feet of said Lot 3; thence North 87°37'18" West, along a line 70 feet due south of and adjacent to and parallel with the

north line of said Lot 3, a distance of 150.00 feet to the Southwest Corner of the North 70 feet of the East 150 feet of said Lot 3; thence North 02°20'22" East, along the west line of the East 150 feet of said Lot 3, a distance of 70.00

feet to the place of beginning; Containing 164,714.19 square feet or 3.781 acres, more or less.

### BENCHMARK:

1.0 mi NW along the Missouri Pacific Railroad from the station at Lee's Summit, at the crossing of Sheer Road, 86 ft southeast of the center line of Sheer Road, 36 ft northeast of the northwest rail, 28.4 ft southeast of a telephone pole, 697 ft southwest of a fence, 1.8 ft west of a witness post, set in the top of a concrete post which projects 0.3 ft above the ground. Elev: 994.87

1.3 mi N along the Missouri Pacific Railroad from the station at Lee's Summit, Jackson County, at semaphore 2611, on the top of the concrete base, and 10 ft east of the track. A chiseled square. Elev: 971.80

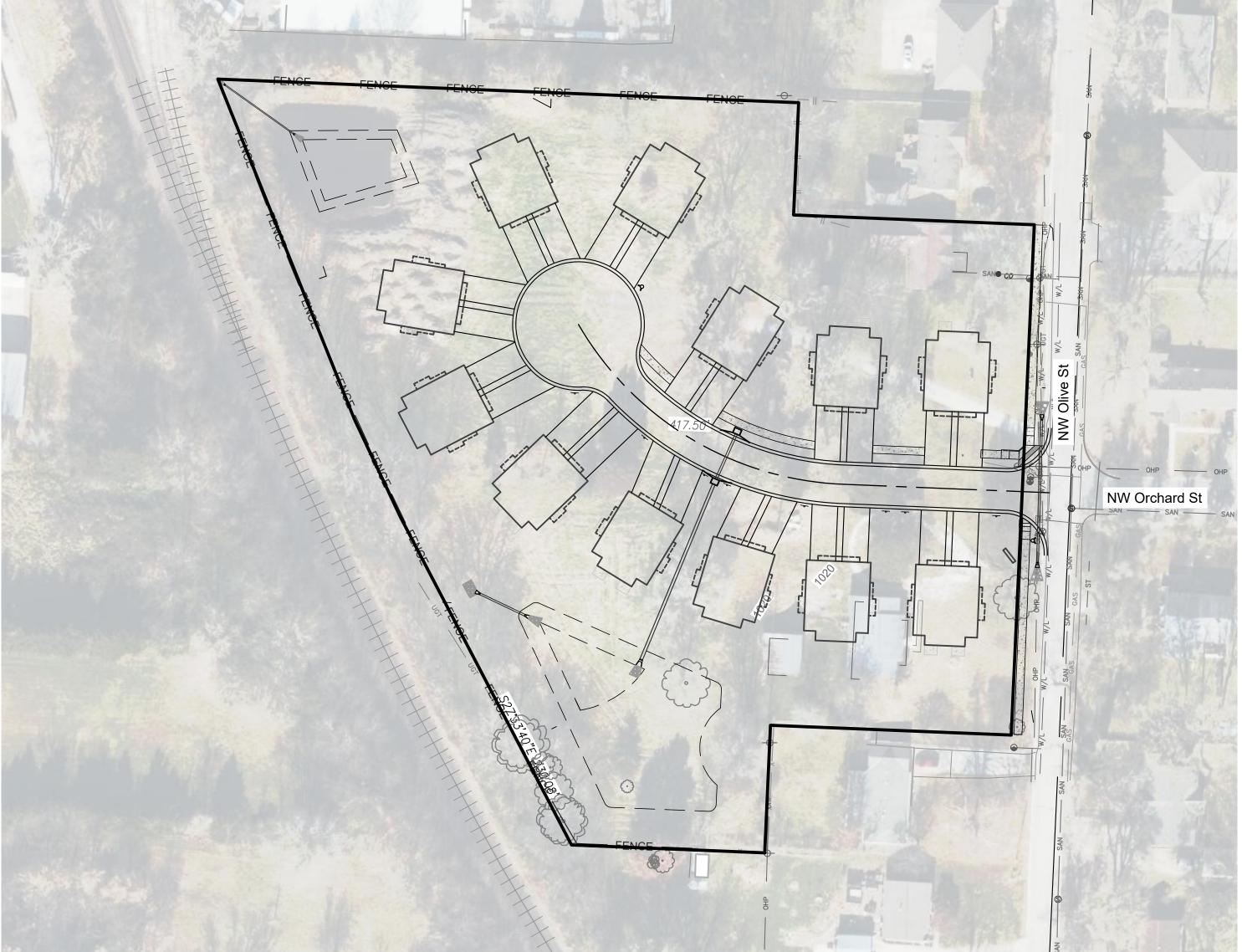
There is no visible evident, this date, of abandoned oil or gas wells located within the property boundary, as identified in "Environmental Impact Study of Abandoned Oil and Gas Wells in Lee's Summit, Missouri." (Figure B-4, pg. 91)

### Flood Plain Note

We have reviewed the F.E.M.A. Flood Insurance Rate Map Number 29095C0417G, revised January 20, 2017, this tract graphically lies in OTHER AREAS, ZONE X, defined as areas determined to be outside the 0.2% annual chance floodplain.

# Final Development Plans For Sequoia Residential

Lee's Summit, Jackson County, Missouri Total Project Area: 3.78 Acres (164,565.80 SF)



Proposed Right-of-Way

Proposed Property Line

Proposed Lot Line

**Proposed Easement** 

Proposed Sidewalk

Proposed Curb & Gutter

**Proposed Storm Sewer** 

Proposed Fire Hydrant

Proposed Waterline

—— ss —— Proposed Sanitary Sewer

Proposed Storm Structure

**Proposed Sanitary Manhole** 

**Proposed Contour Major** 

Proposed Contour Minor

Future Curb & Gutter

LEGEND

--- WATER ----

Existing Section Line

**Existing Lot Line** 

Existing Right-of-Way Line

Existing Easement Line

Existing Curb & Gutter

Existing Sidewalk

**Existing Waterline** 

**Existing Gas Main** 

**Existing Storm Sewer** 

**Existing Storm Structure** 

**Existing Sanitary Sewer** 

**Existing Contour Major** 

**Existing Contour Minor** 

**Proposed Asphaltic Pavement** 

**Existing Sanitary Manhole** 



**Sheet List Table** Sheet Number Sheet Title C01 Title Sheet C02 General Layout C03 **Existing Conditions & Demolition Plan** C04 Site Dimension Plan C05 Grading Plan Site Utility Plan C06 C07 Drainage Map & Calculations C08 Storm Plan and Profile C09 Pond Plan C10 Pond Plan - 2 C11 **Erosion Control Phase I** C12 **Erosion Control Phase II** C13 **Erostion Control Phase III** C14 Standard Details C15 Standard Details C16 **Standard Details** C17 **Standard Details** C18 **Standard Details** C19 **Standard Details** C20 **Standard Details** C21 **Standard Details** L01 Landscape Plan L02 Separate Schedules 1 L03 Separate Schedules 2 L04 Landscape Notes & Details L05 Planting Specifications

L06

L07

**APPLICATION/OWNER: Dick Burton Orchard Park Development LLC** 8 SW AA Highway Kingsville, MO 64061 daburton@mail.com

Lawn Specifications

Irrigation Specifications

**CIVIL ENGINEER** Mick Slutter, P.E. 1815 McGee St, #200 Kansas City, MO 64116 mslutter@ric-consult.com

LANDSCAPE ARCHITECT: Andy Gabbert, PLA 5015 NW Canal St, #100 Riverside, MO 64150 agabbert@ric-consult.com

# **GENERAL NOTES**

- 1. All construction shall follow the City of Lee's Summit Design and Construction Manual as adopted by Ordinance 5813. Where discrepancies exist between the Final Development Plan and the Design and Construction Manual, the Design and Construction Manual shall govern.
- 2. The contractor will be responsible for securing all bonds, and insurance required by the contract documents, City of Lee's Summit, Mo., and all other governing agencies (including local, county, state, and federal authorities) having jurisdiction over the work proposed by these construction documents.
- The cost for all bonds, and insurance shall be the contractor's responsibility and shall be included in the bid for the work. 3. All existing utilities indicated on the drawings are according to the best information available to the engineer; however, all utilities actually existing may not be shown. The contractor shall be responsible for contacting all utility companies for an exact field location of each utility prior to any construction. All
- utilities, shown and un-shown, damaged through the negligence of the contractor shall be repaired or replaced by the contractor at his/her expense. 4. The contractor will be responsible for all damages to existing utilities, pavement, fences, structures, and other features not designated for removal. The contractor shall repair all damages at his/her expense.

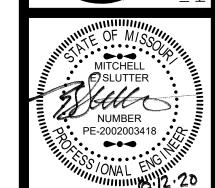
5. The demolition of existing pavement, curbs, structures, and all other features necessary to construct the proposed improvements, shall be performed by the

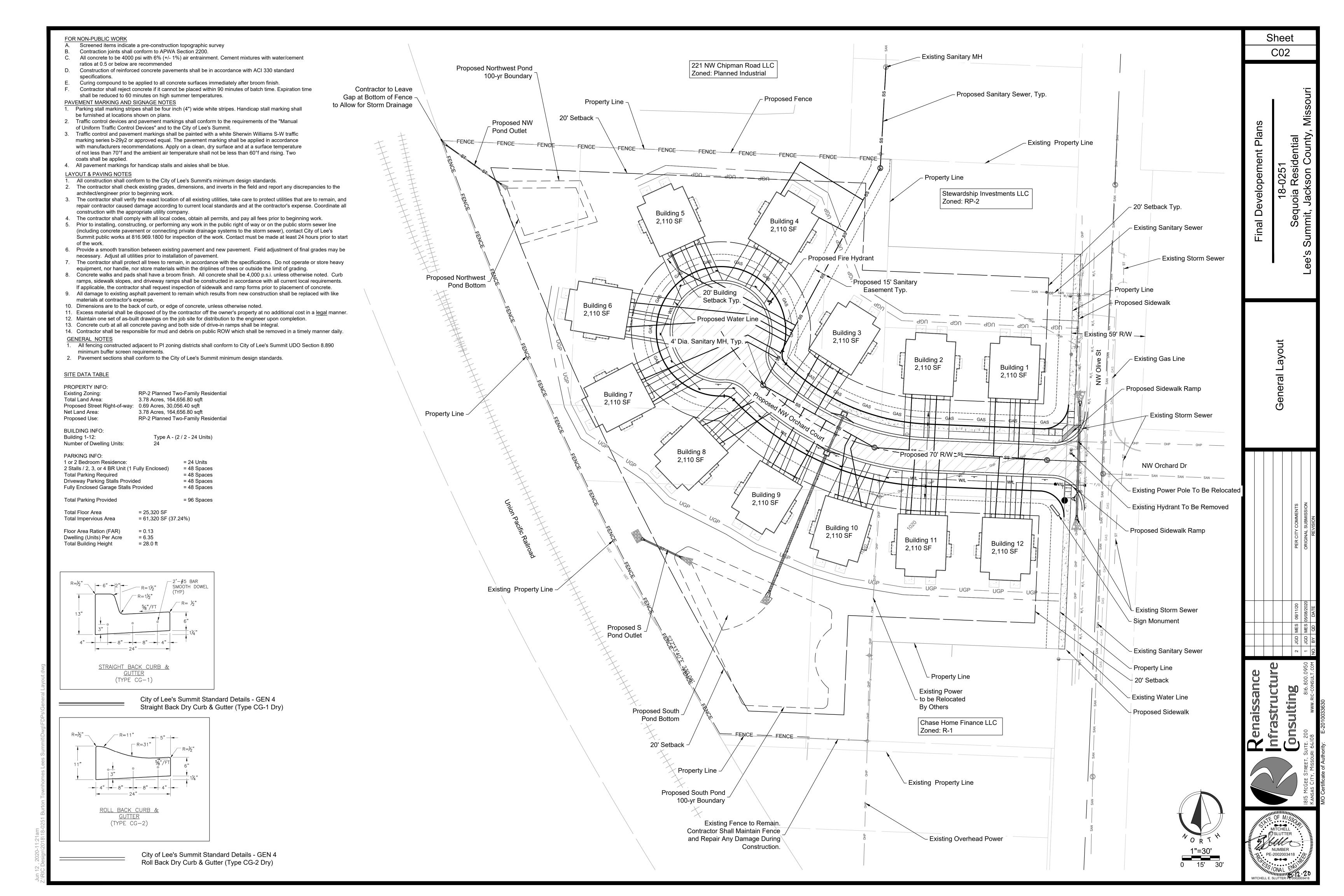
- contractor. All waste material removed during construction shall be disposed off the project site. The contractor shall be responsible for all permits for hauling and disposing of waste material. The disposal of waste material shall be in accordance with all local, state, and federal regulations. 6. By use of these construction documents the contractor hereby agrees that he shall be solely responsible for the safety of the construction workers and the
- public. The contractor agrees to hold the engineer and owner harmless for any and all injuries, claims, losses, or damages related to the project. 7. The contractor will be responsible for providing all signage, barricades, lighting, etc., as required for temporary traffic control during the construction of this project. Maintenance of the temporary traffic control devices will be the contractor's responsibility. All traffic control in conduction with construction in the
- right-of-way shall be in conformance with the City Traffic Control Requirements. Contractor shall furnish evidence that his/her insurance meets the requirements of the City of Lee's Summit, Missouri Municipal Code.
- Prior to installing, constructing, or performing any work on the public storm sewer line (including connecting private drainage systems to the storm sewer), contact Lee Summit Inspections. 10. Connections to the public storm sewers between structures will not be permitted.
- 11. Contractor shall verify and accept existing topography shown herein. Contractor shall notify Engineer if any discrepancies are found prior to any earthwork
- 12. Planning and Codes Administration will require a retaining wall design by a registered engineer in the State of Missouri.
- 13. Geogrid, footings, or other elements of the retaining wall(s) cannot encroach into the right of way or public easements.
- 14. A Knox Box shall be provided for Each Building.
- 15. All building and life safety issues shall comply with the 2012 International Fire Code and local amendments as adopted by the City of Lee's Summit.
- 16. All proposed signs must comply with the sign requirements as outlined in the City of Lee's Summit Unified Development Ordinance Article 9 SIGNS.

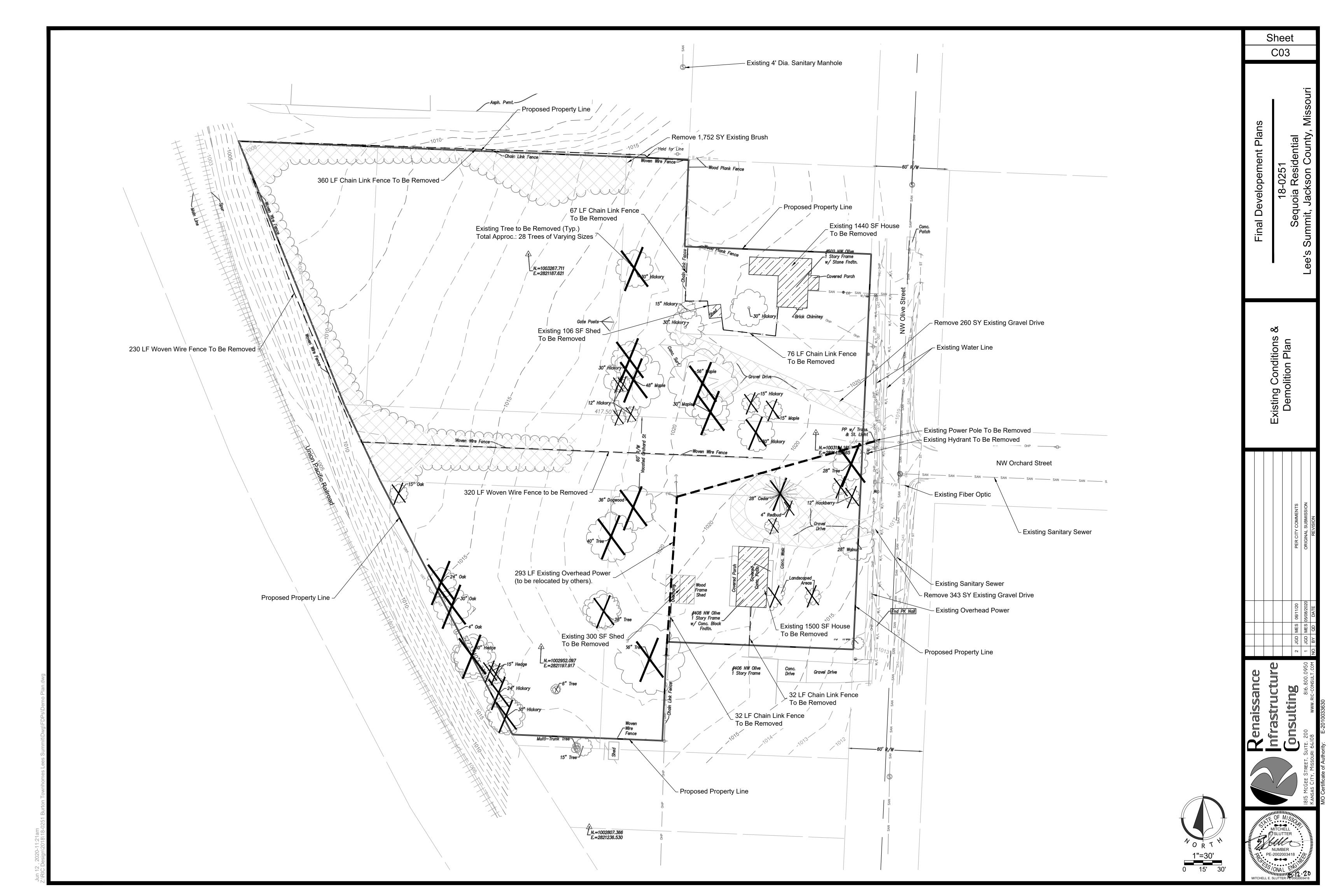
Sheet C01

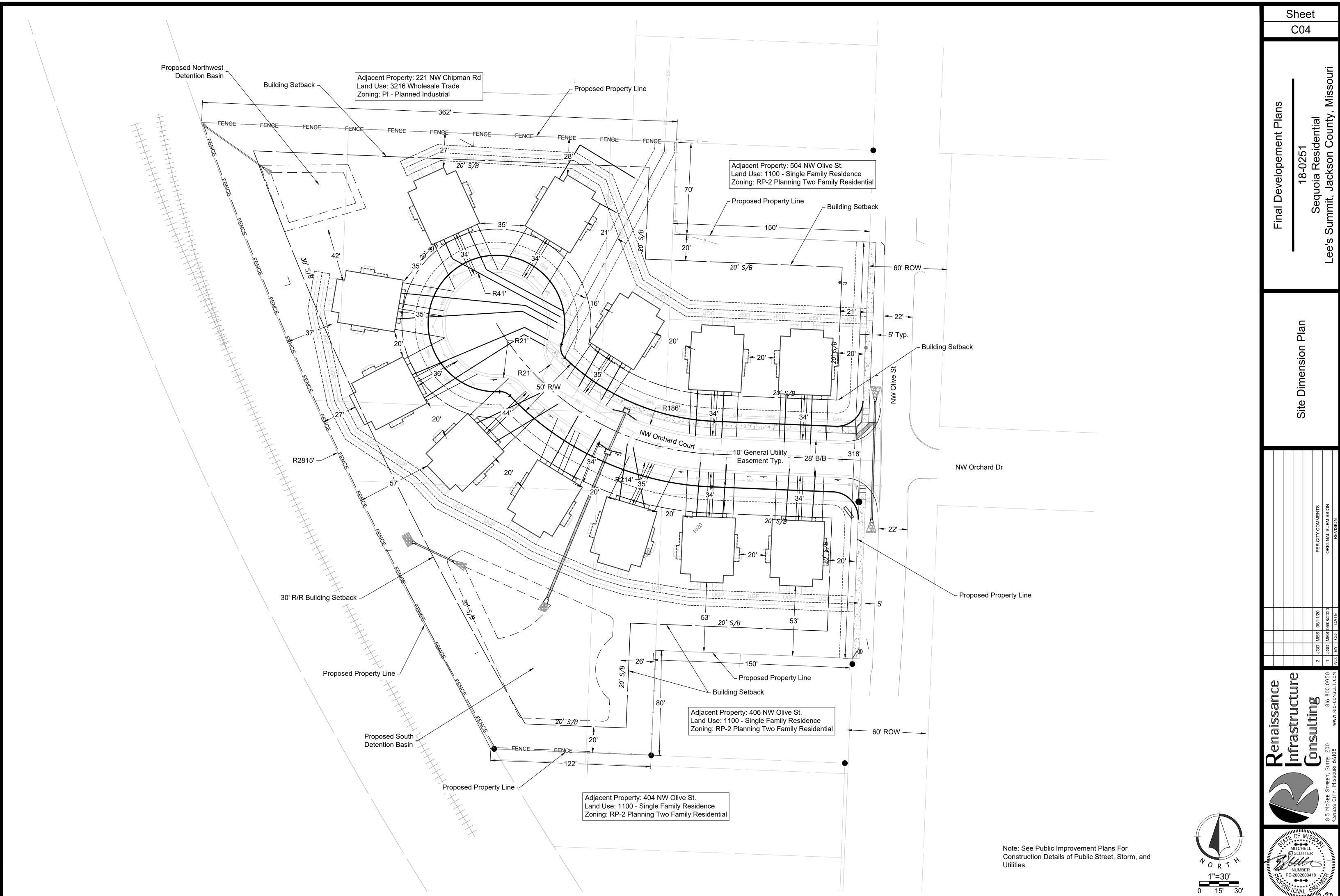
enaissance



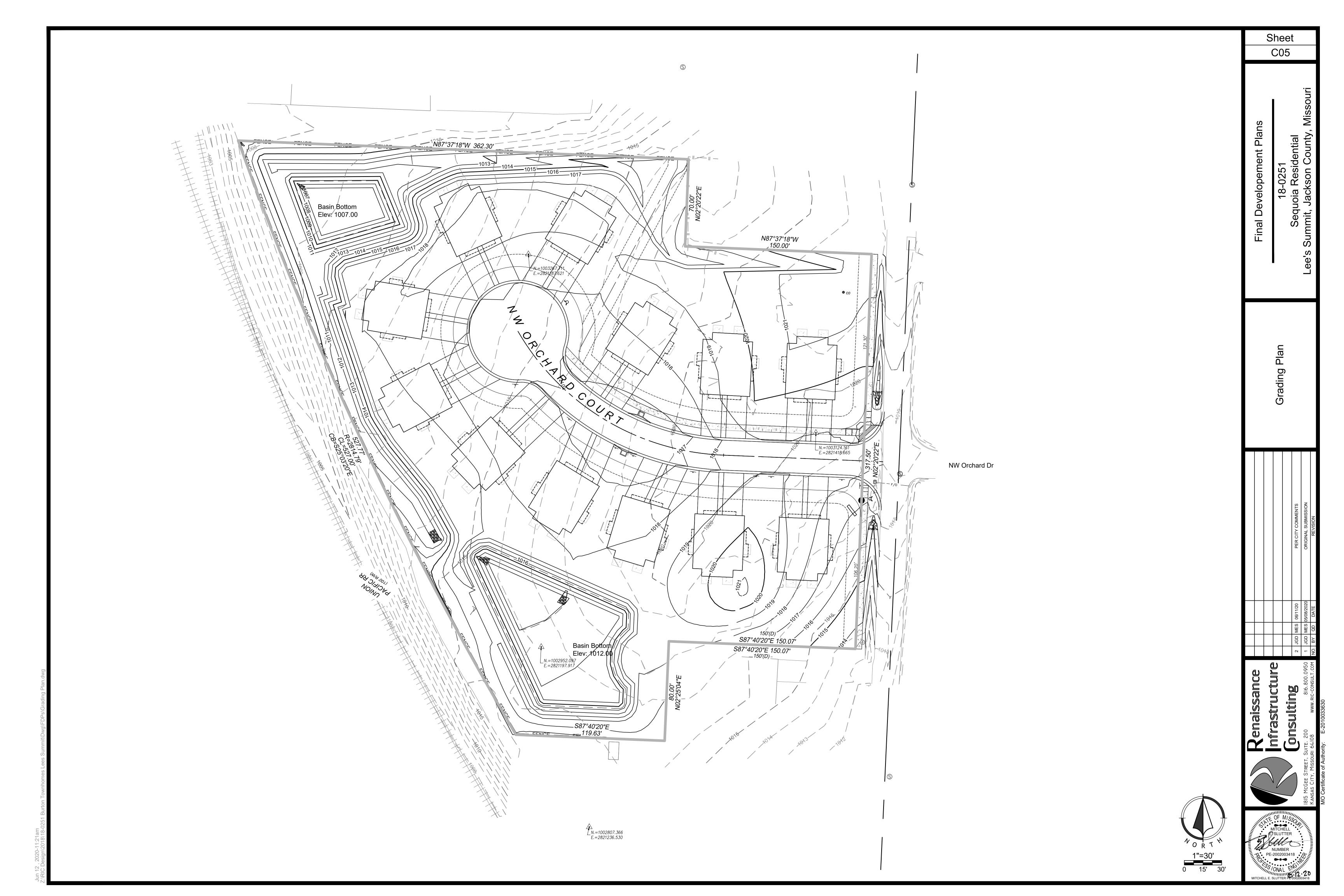


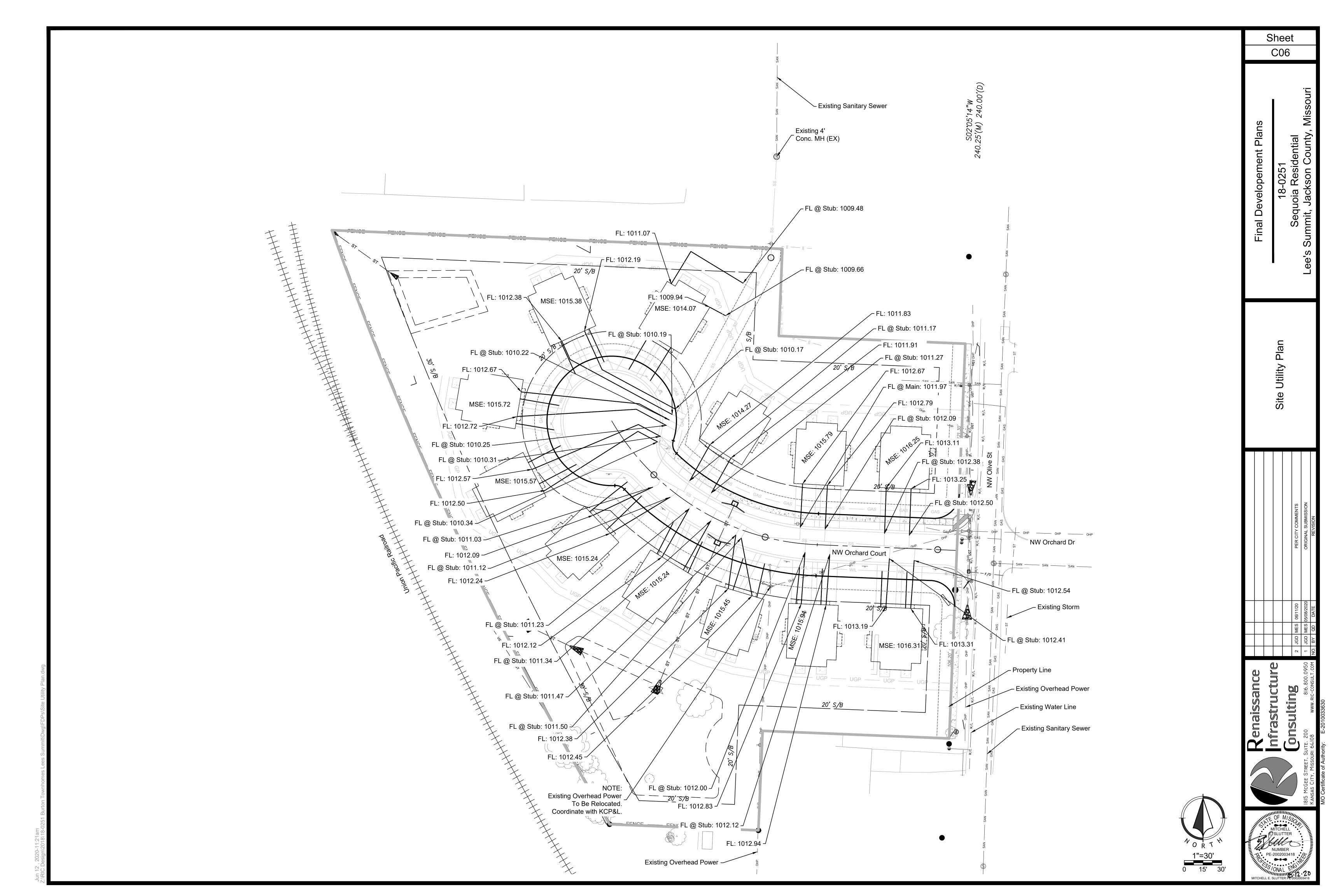














| Note: Drainage calculations are for reference only. See Public Plans for more detail. |
|---|

|      | Overland Flow System Flow |       |       |        |       |         |           | Pipe Design |        |        |       |         |         |           |           |      | Structure Design |       |       |          |        |           |       |        |          |           |          |          |        |            |           |            |           |           |           |           |           |              |           |
|------|---------------------------|-------|-------|--------|-------|---------|-----------|-------------|--------|--------|-------|---------|---------|-----------|-----------|------|------------------|-------|-------|----------|--------|-----------|-------|--------|----------|-----------|----------|----------|--------|------------|-----------|------------|-----------|-----------|-----------|-----------|-----------|--------------|-----------|
|      |                           | Trib. | "C"   | Design | "K"   | Time of | Intensity | Trib        | Bypass | Total  | Total | Total   | Time of | Intensity | System    | U/S  | D/S              | Pipe  | Pipe  | Pipe     | Pipe   | Mannings  | Pipe  | Design | Pipe     | Full Flow | Design   | Depth of | Flow   | U/S        | U/S       | D/S        | D/S       | U/S Depth | D/S Depth | Headwater | Headwater | Inlet/Outlet | Top       |
| Line | Point                     | Area  | Value | Storm  | Value | Conc.   | i         | Runoff      | flow   | Runoff | Area  | (K*A*C) | Conc.   | i         | Discharge | Node | Node             | Type  | Shape | Diameter | Length | "n" value | Slope | Flow   | Capacity | Velocity  | Flow     | Flow     | Time   | Invert El. | Crown El. | Invert El. | Crown El. | of Cover  | of Cover  | Inlet     | Outlet    | Control      | Elevation |
|      |                           | (Ac.) |       |        |       | (min.)  | (in./hr.) | (cfs)       | (cfs)  | (cfs)  | (Ac.) |         | (min.)  | (in./hr.) | (cfs)     |      |                  |       |       | (in.)    | (ft.)  |           | (%)   | (cfs)  | (cfs)    | (fps)     | Velocity | (in.)    | (min.) |            |           |            |           | (ft.)     | (ft.)     | Elev.     | Elev.     |              |           |
|      |                           |       |       |        |       |         |           |             |        |        |       |         |         |           |           |      |                  |       |       |          |        |           |       |        |          |           | (fps)    |          |        |            |           |            |           |           |           | (EGL)     | (EGL)     |              |           |
|      |                           |       |       |        |       |         |           |             |        |        |       |         |         |           |           |      |                  |       |       |          |        |           |       |        |          |           |          |          |        |            |           |            |           |           |           |           |           |              |           |
|      |                           |       |       |        |       |         |           |             |        |        |       |         |         |           |           |      |                  |       |       |          |        |           |       |        |          |           |          |          |        |            |           |            |           |           |           |           |           |              |           |
| ۸    | A-2                       | 0.760 | 0.66  | 25     | 1.1   | 5.00    | 7.35      | 4.06        | 0.00   | 4.06   | 0.760 | 0.55    | 5.00    | 7.35      | 4.06      | ۸.2  | ٨                | RCP   | Round | 15       | 3/1 37 | 0.013     | 0.52  | 4.06   | 4.66     | 3 70      | 4.27     | 10.8     | 0.13   | 1013.05    | 1014.30   | 1012.87    | 1014.12   | 2.34      | -2.51     | 1014.05   | 1014.05   | 1            | 1016.64   |
| A    | A-Z                       | 0.700 | 0.00  | 100    | 1.25  | 3.00    | 10.32     | 6.47        | 1.82   | 8.29   | 0.700 | 0.63    | 5.00    | 10.32     | 6.47      | A-2  | A                | NOP   | Round | 13       | 34.31  | 0.013     | 0.32  | 6.47   | 4.00     | 3.19      | 3.79     | 15.0     | 0.15   | 1013.03    | 1014.50   | 1012.07    | 1014.12   | 2.54      | -2.51     | 1014.03   | 1014.03   | •            | 1010.04   |
| ^    | Λ 1                       | 0.000 | 0.00  | 25     | 1.1   | 5.00    | 7.35      | 3.63        | 0.00   | 3.63   | 4.440 | 1.05    | E 00    | 7.35      | 7.69      | Λ.4  | 0                | LIDDE | Dayma | 40       | 124.52 | 0.04      | 0.50  | 7.69   | 0.00     | E 10      | 6.02     | 12.1     | 0.34   | 1012.62    | 1011 12   | 4040.00    | 4042 E0   | 2.54      | -1.50     | 1013.72   | 1013.57   |              | 1010 00   |
| A    | A-1                       | 0.680 | 0.66  | 100    | 1.25  | 3.00    | 10.32     | 5.79        | 2.66   | 8.45   | 1.440 | 1.19    | 5.00    | 10.32     | 12.26     | A-1  | U                | HDPE  | Round | 18       | 124.52 | 0.01      | 0.50  | 12.26  | 9.60     | 5.43      | 5.43     | 18.0     | 0.38   | 1012.62    | 1014.12   | 1012.00    | 1013.50   | 2.51      | -1.50     | 1013.72   | 1013.57   | 1            | 1016.63   |
|      |                           |       |       |        |       |         |           |             | 1      |        |       |         |         |           |           |      |                  |       |       |          |        |           |       |        |          |           |          |          |        |            |           |            |           |           |           |           |           |              |           |
| Α    | Α                         |       |       |        |       | -       |           |             |        |        | 1     |         |         |           |           |      |                  |       |       |          |        |           |       |        |          |           |          |          |        | =          |           |            |           |           |           |           |           |              | 1013.50   |

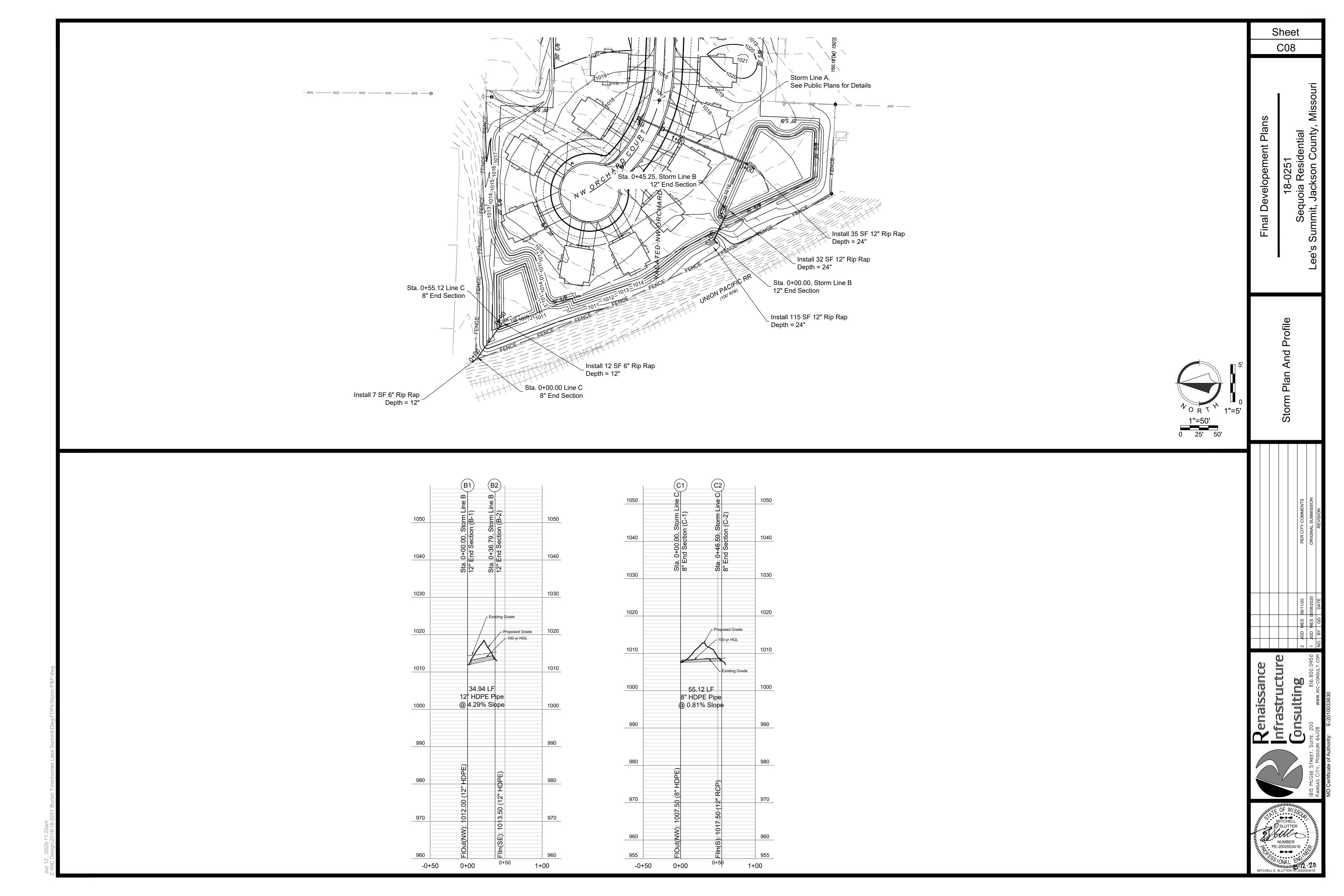


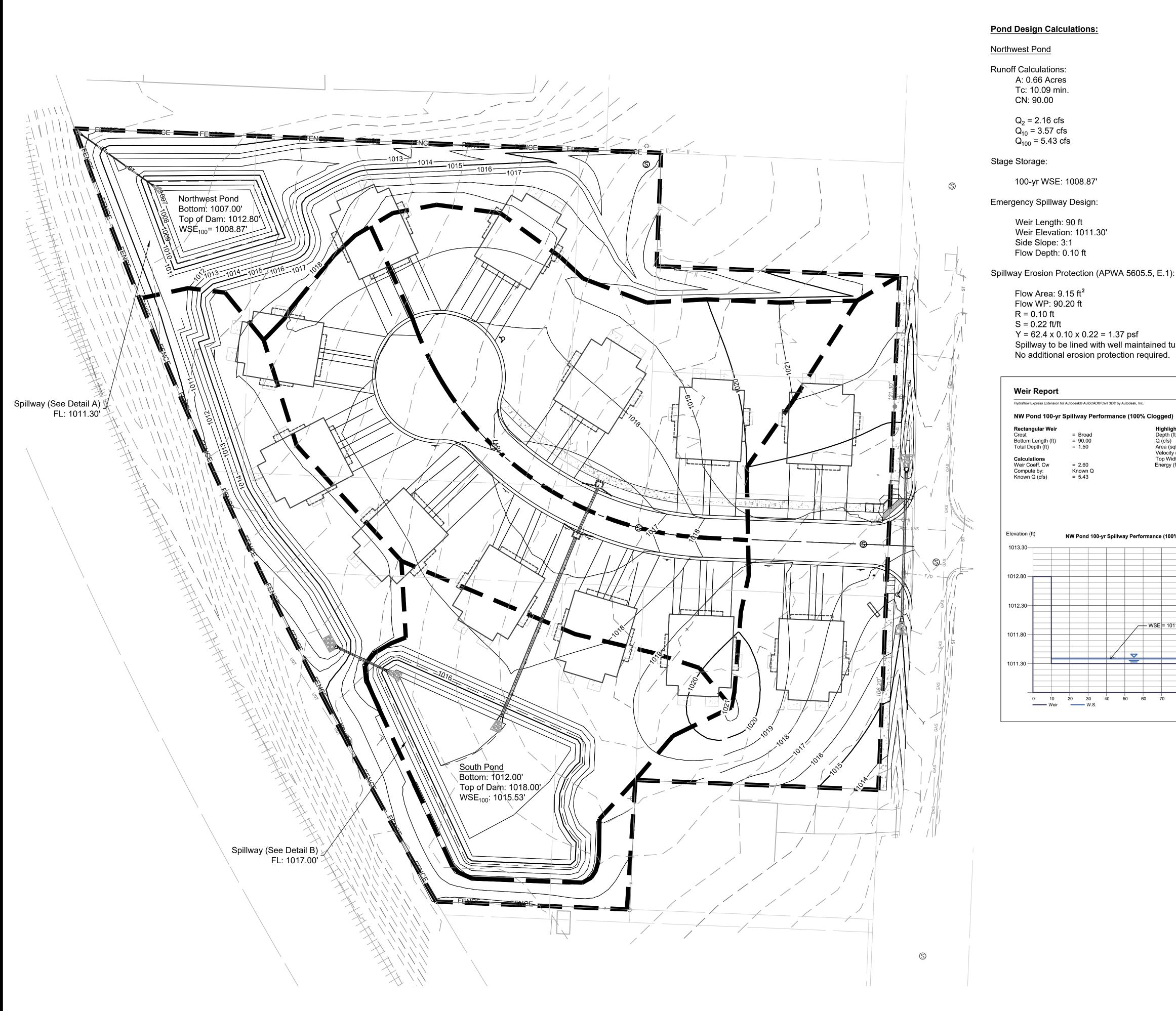


Sheet

C07

Final Developement Plans





## **Pond Design Calculations:**

### Northwest Pond

# Runoff Calculations:

A: 0.66 Acres Tc: 10.09 min. CN: 90.00

 $Q_2 = 2.16 \text{ cfs}$  $Q_{10} = 3.57 \text{ cfs}$  $Q_{100} = 5.43 \text{ cfs}$ 

100-yr WSE: 1008.87'

### Emergency Spillway Design:

Weir Length: 90 ft Weir Elevation: 1011.30' Side Slope: 3:1

Flow Depth: 0.10 ft

### Spillway Erosion Protection (APWA 5605.5, E.1):

Flow Area: 9.15 ft<sup>2</sup> Flow WP: 90.20 ft

R = 0.10 ft

S = 0.22 ft/ft

 $Y = 62.4 \times 0.10 \times 0.22 = 1.37 \text{ psf}$ 

= 2.60

Known Q = 5.43

Spillway to be lined with well maintained turf grass.

Highlighted
Depth (ft)
Q (cfs)
Area (sqft)
Velocity (ft/s)
Top Width (ft)

NW Pond 100-yr Spillway Performance (100% Clogged)

= 0.08 = 5.430 = 7.31 = 0.74 = 90.00 = 0.09

No additional erosion protection required.

## **Pond Design Calculations:**

### South Pond

# Runoff Calculations:

A: 1.98 Acres Tc: 10.62 min. CN: 90.00

 $Q_2 = 6.45 \text{ cfs}$  $Q_{10} = 10.67 \text{ cfs}$  $Q_{100} = 16.21 \text{ cfs}$ 

# Stage Storage:

100-yr WSE: 1015.53'

# Emergency Spillway Design:

Weir Length: 50 ft Weir Elevation: 1017.00' Side Slope: 3:1 Flow Depth: 0.25 ft

Spillway Erosion Protection (APWA 5605.5, E.1):

Flow Area: 11.38 ft<sup>2</sup> Flow WP: 50.46 ft R = 0.23 ft

S = 0.065 ft/ft

 $Y = 62.4 \times 0.23 \times 0.065 = 0.93 \text{ psf}$ 

Spillway to be lined with well maintained turf grass. No additional erosion protection required.

| irsday, Apr 30 2020                    | Hydraflow Express Extension fo  | or Autodesk® AutoCAD® Civil 3D® by                           | Autodesk, Inc.   | Thursday, Apr 30 2020                                       |  |  |
|--|---|--|--|---|--|--|
|  | S Pond 100-yr Sp  | oillway Performance  | (100% Clogged)   |   |  |  |
| 0.08<br>5.430<br>7.31<br>0.74<br>90.00 | Rectangular Weir Crest Bottom Length (ft) Total Depth (ft)  Calculations Weir Coeff. Cw Compute by: Known Q (cfs) | = Broad<br>= 50.00<br>= 1.50<br>= 2.60<br>Known Q<br>= 16.21 | Highlighted Depth (ft) Q (cfs) Area (sqft) Velocity (ft/s) Top Width (ft) Energy | = 0.25<br>= 16.21<br>= 12.47<br>= 1.30<br>= 50.00<br>= 0.28 |  |  |
|  |   |  |  |   |  |  |
| Depth (ft)                             | Elevation (ft)  | S Pond 100-yr Spillwa  | ry Performance (100% Clogged)  | Depth   |  |  |
| Depth (ft)                             | Elevation (ft)  | S Pond 100-yr Spillwa  | y Performance (100% Clogged)   | Depth 2.00  |  |  |
|  | Elevation (ft)  | S Pond 100-yr Spillwa  | y Performance (100% Clogged)   | ·   |  |  |
| 2.00                                   |   | S Pond 100-yr Spillwa  | y Performance (100% Clogged)  WSE = 1017/23                                      | 2.00  |  |  |



Length (ft)



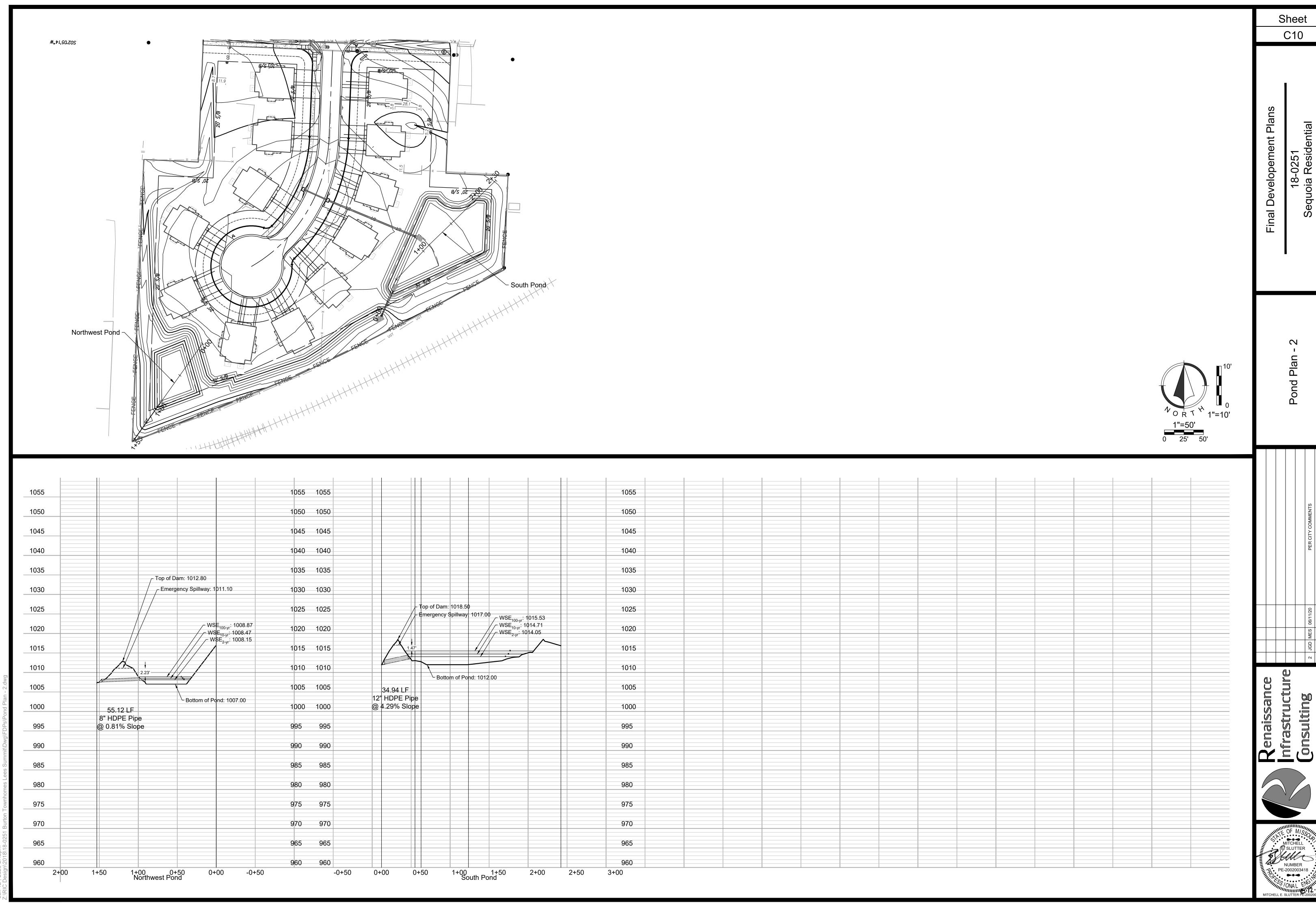
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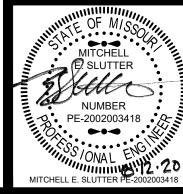
C09

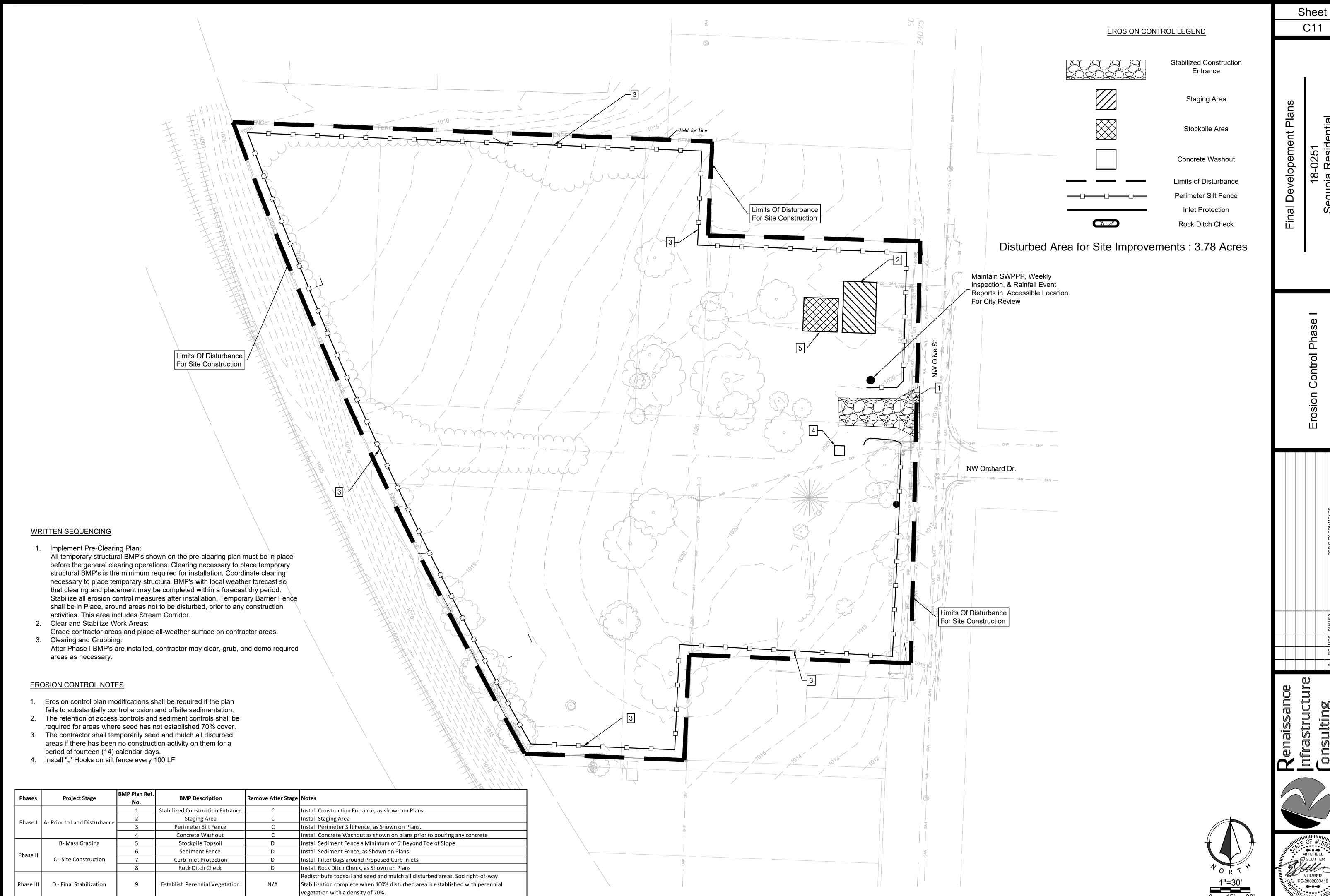
Developement Plans

Final

18-0251 Sequoia Residential nmit, Jackson County,

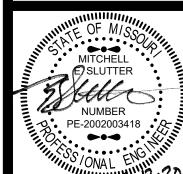


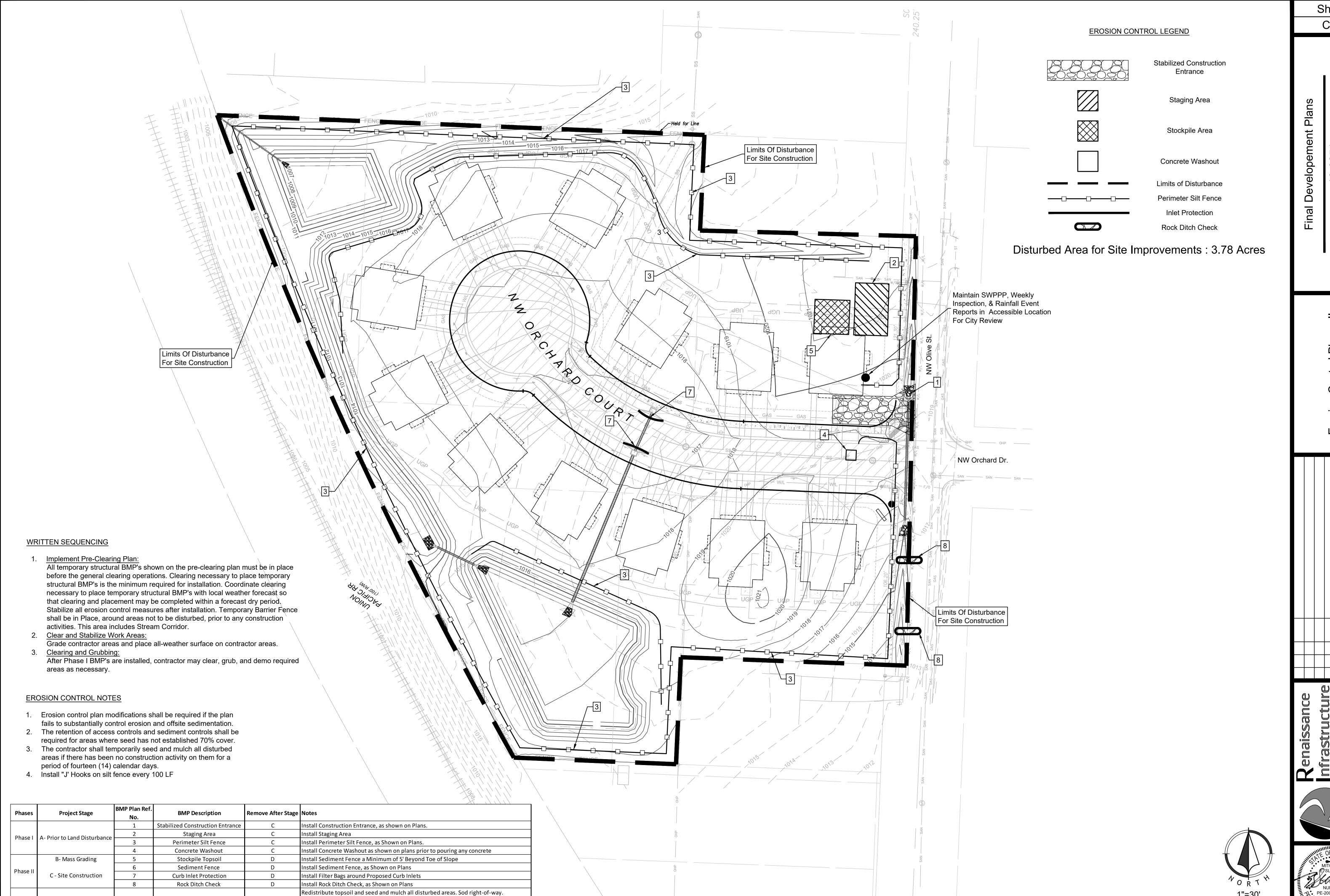












D - Final Stabilization

Phase III

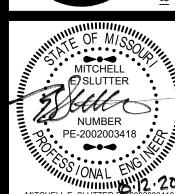
Establish Perennial Vegetation

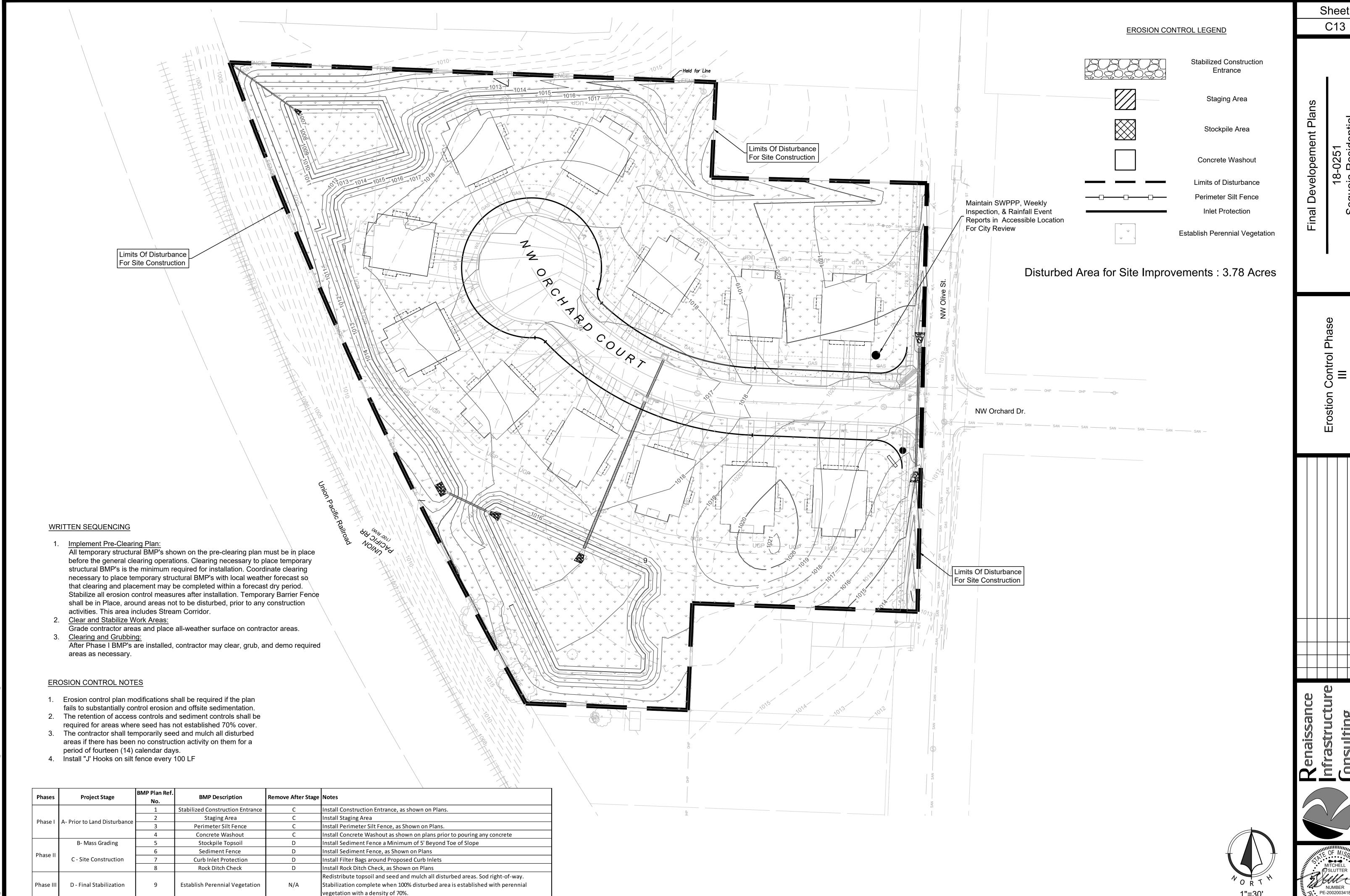
Stabilization complete when 100% disturbed area is established with perennial

Sheet

C12



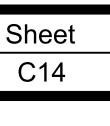




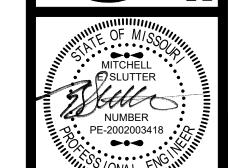
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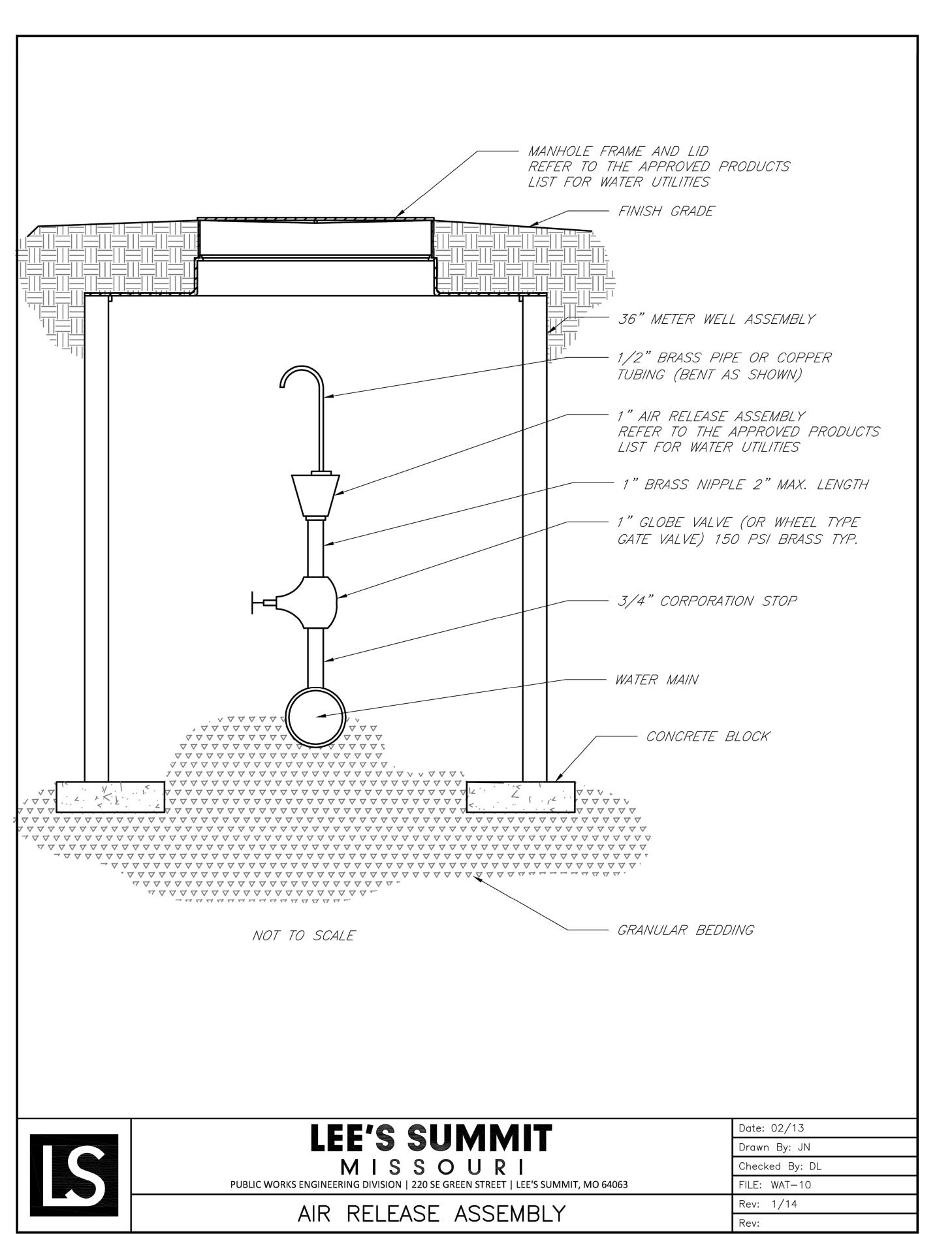


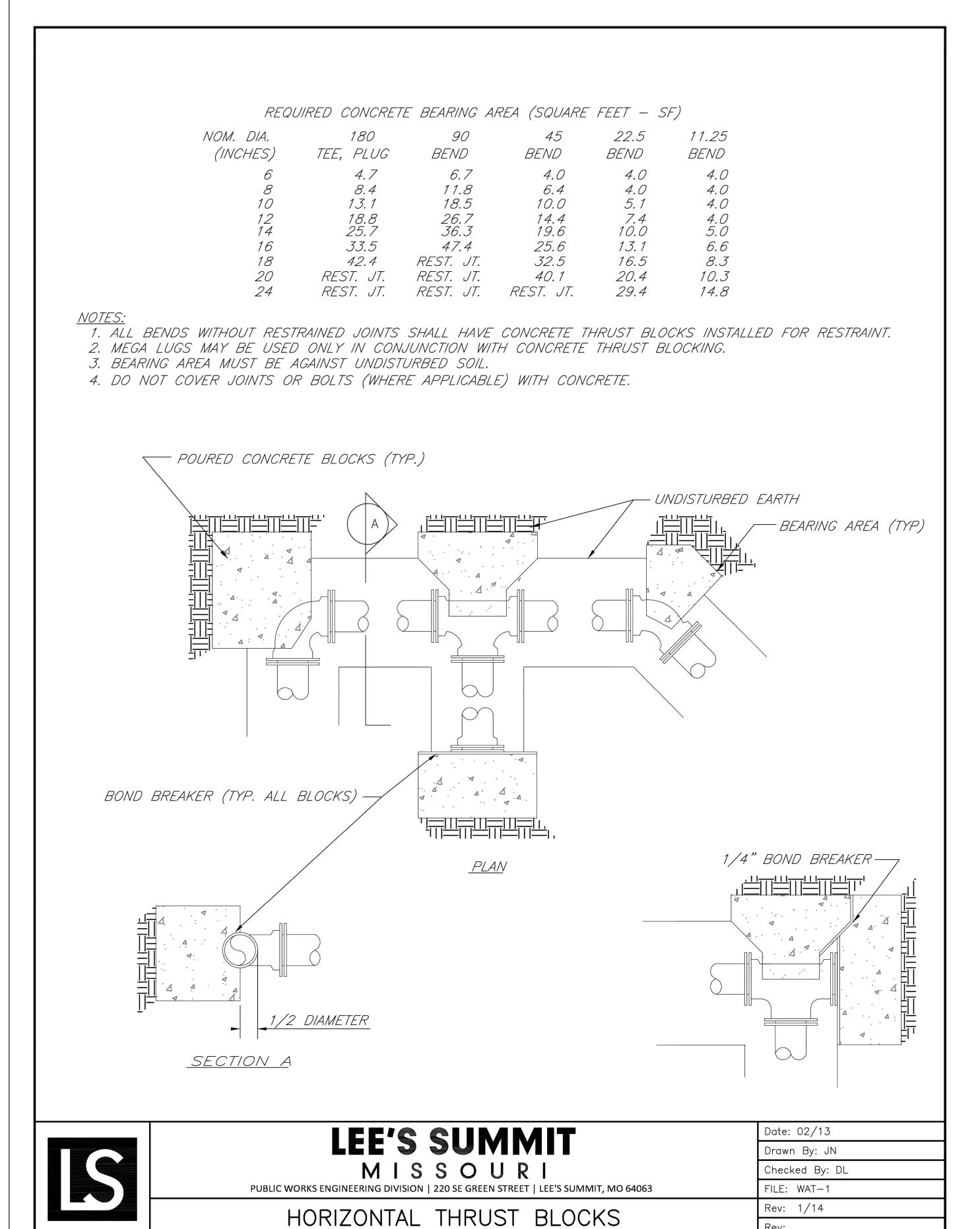






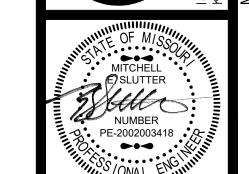


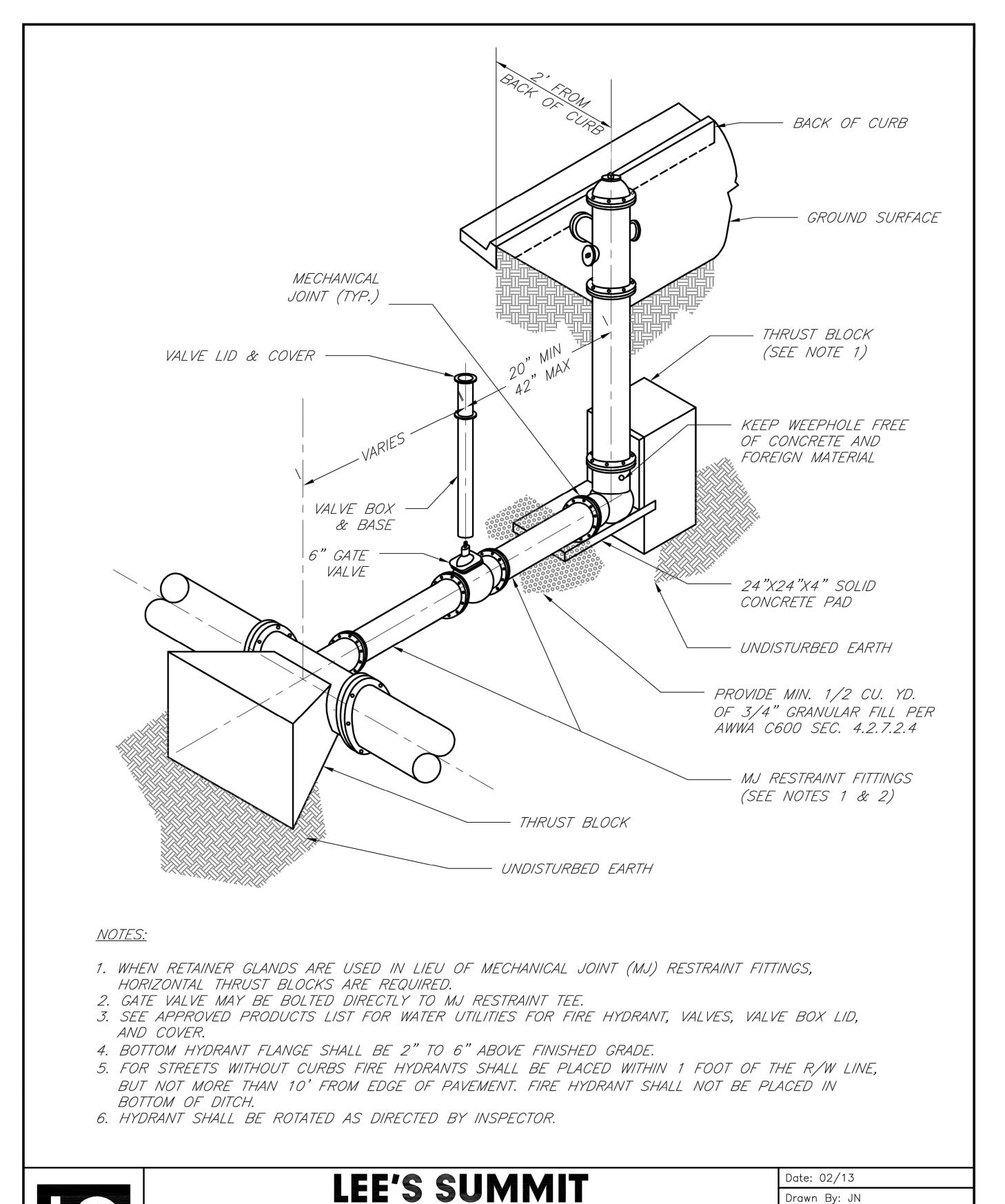






Rev: 1/14





MISSOURI

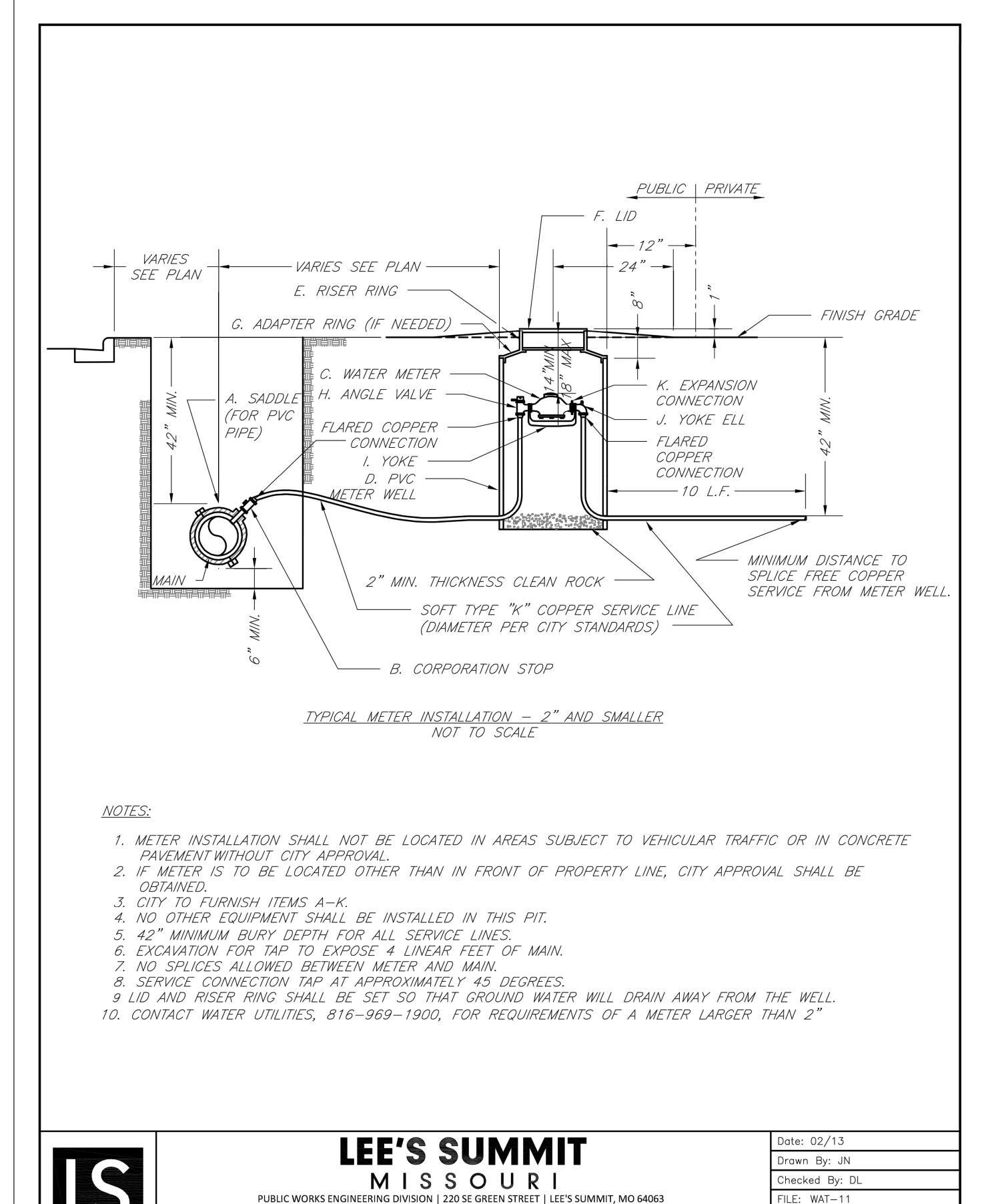
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

HYDRANT INSTALLATION - STRAIGHT SET

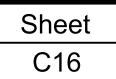
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Rev: 1/14



SERVICE CONNECTION/METER WELL





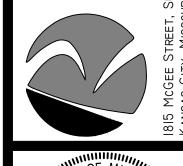
Date: 02/13

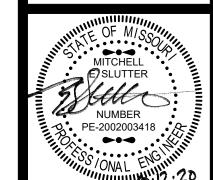
Drawn By: JN

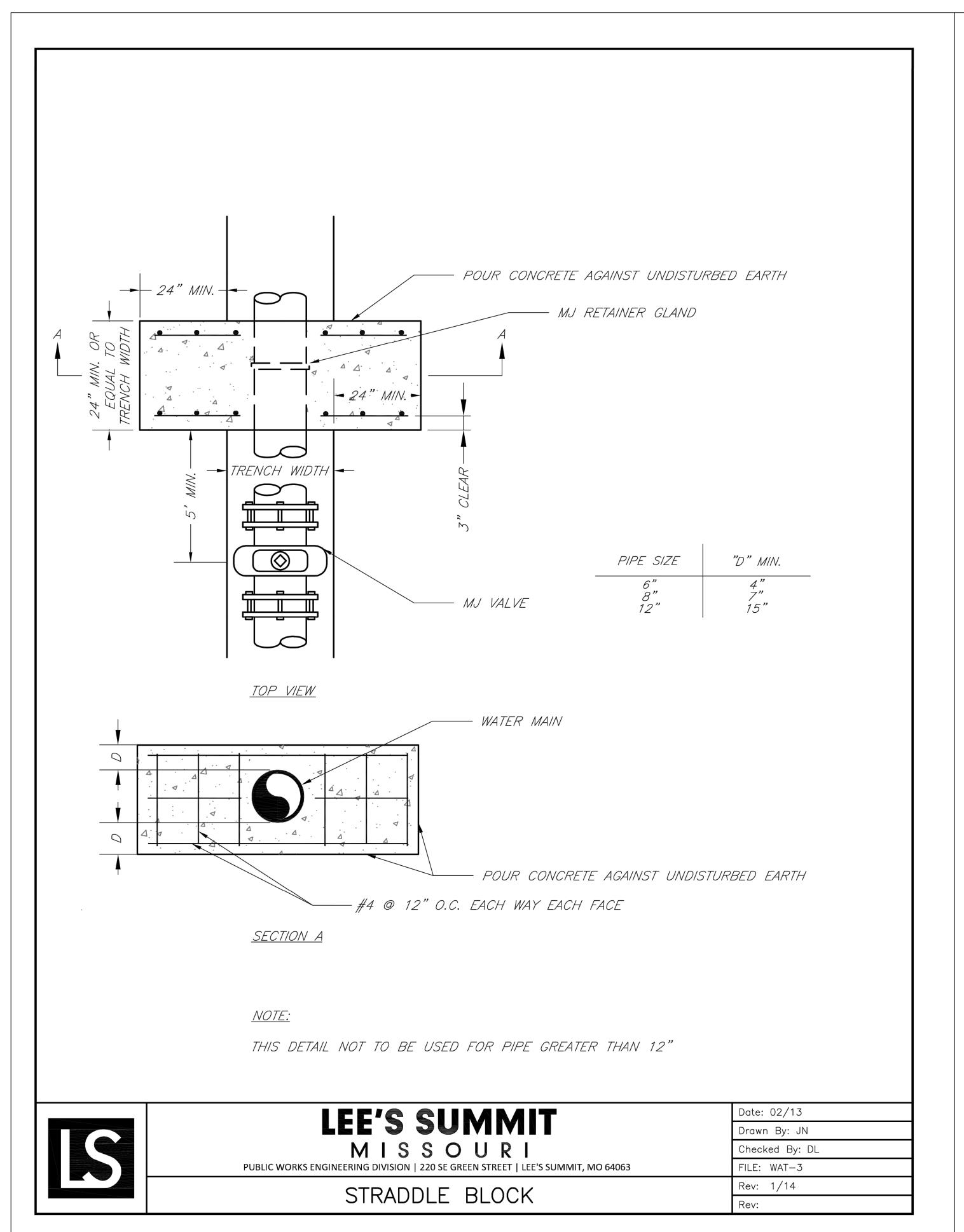
Checked By: DL

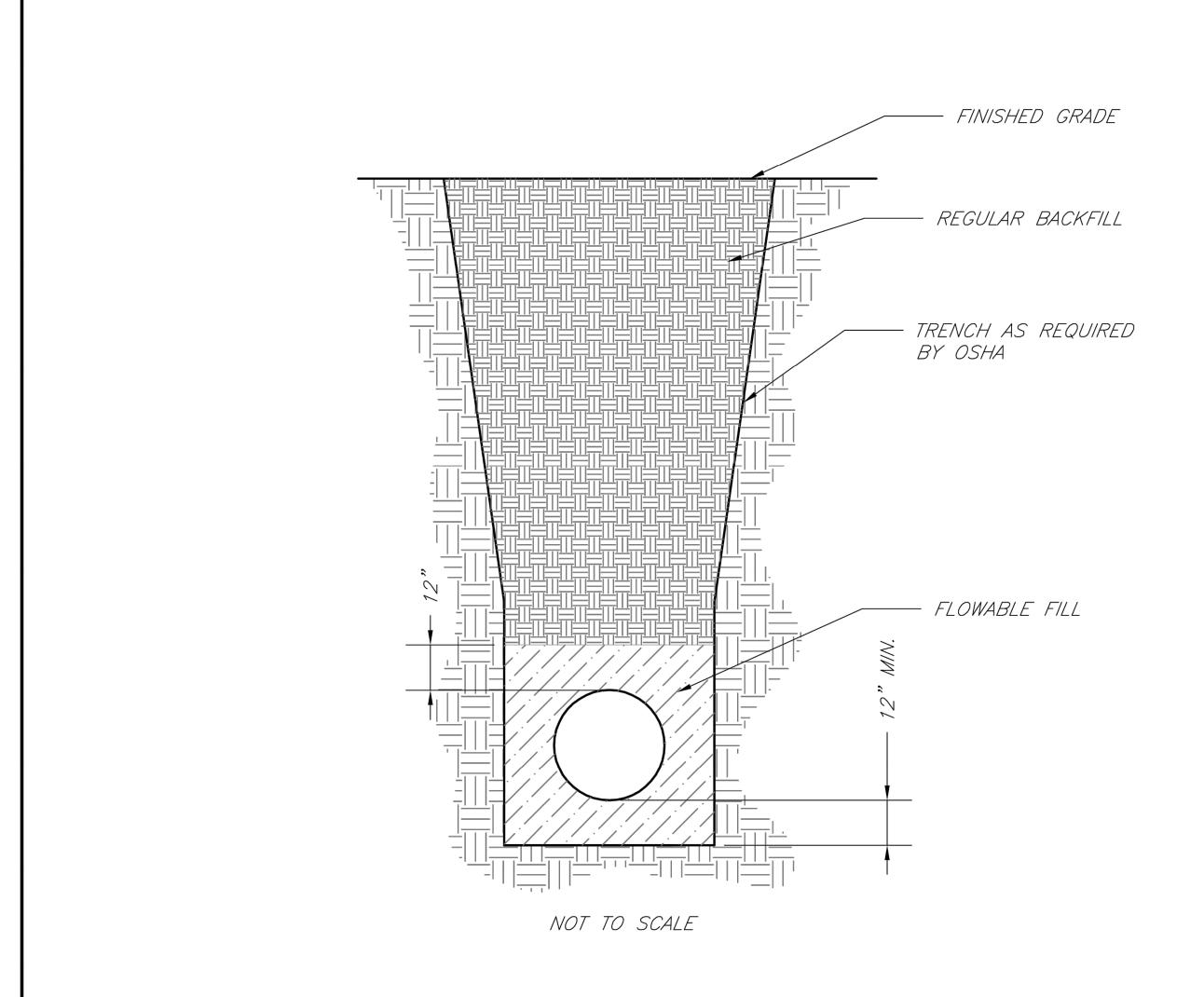
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Rev: 1/14









<u>NOTES:</u>

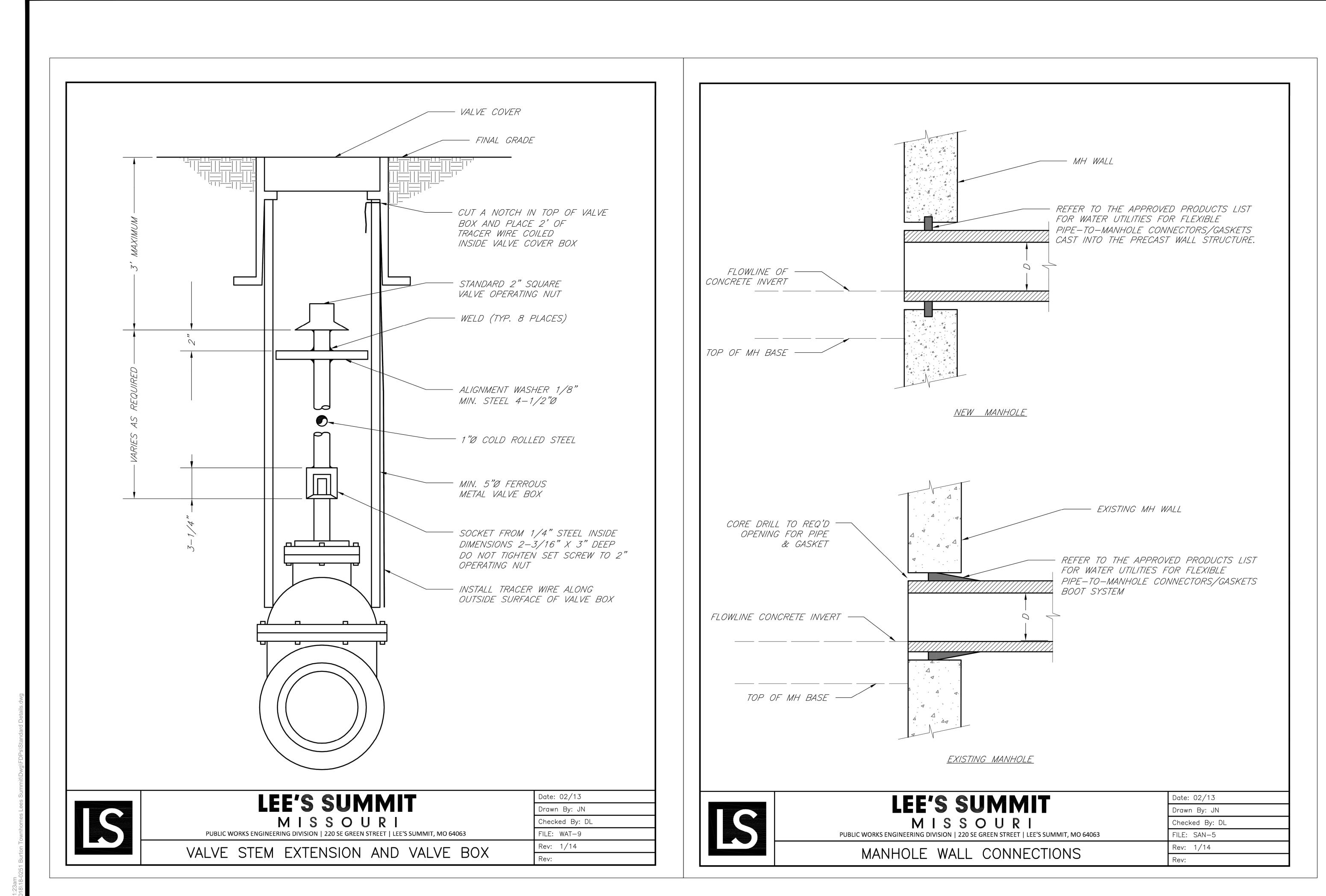
- 1. FLOWABLE FILL SHALL MEET THE REQUIREMENTS OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION
- 2. REGULAR BACKFILL ABOVE THE TRENCH CHECK SHALL BE FREE OF DEBRIS, ORGANIC MATTER, AND STONES > 6" IN ANY DIMENSION.
- 3. TOP OF FLOWABLE BACKFILL SHALL EXTEND 12" ABOVE THE TOP OF THE PIPE.
- 4. LENGTH OF TRENCH CHECK SHALL BE A MINIMUM OF 12".

| C |  |
|---|--|
|   |  |
|   |  |

LEE'S SUMMIT MISSOURI

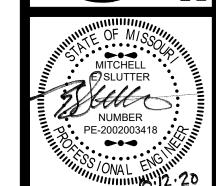
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

TRENCH CHECK

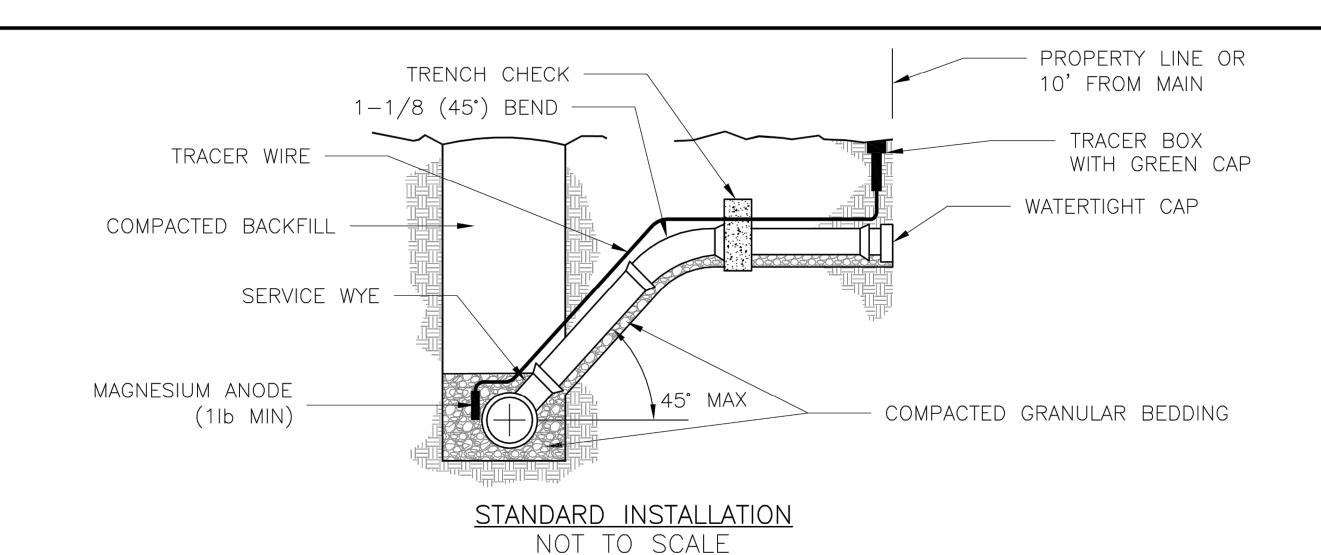


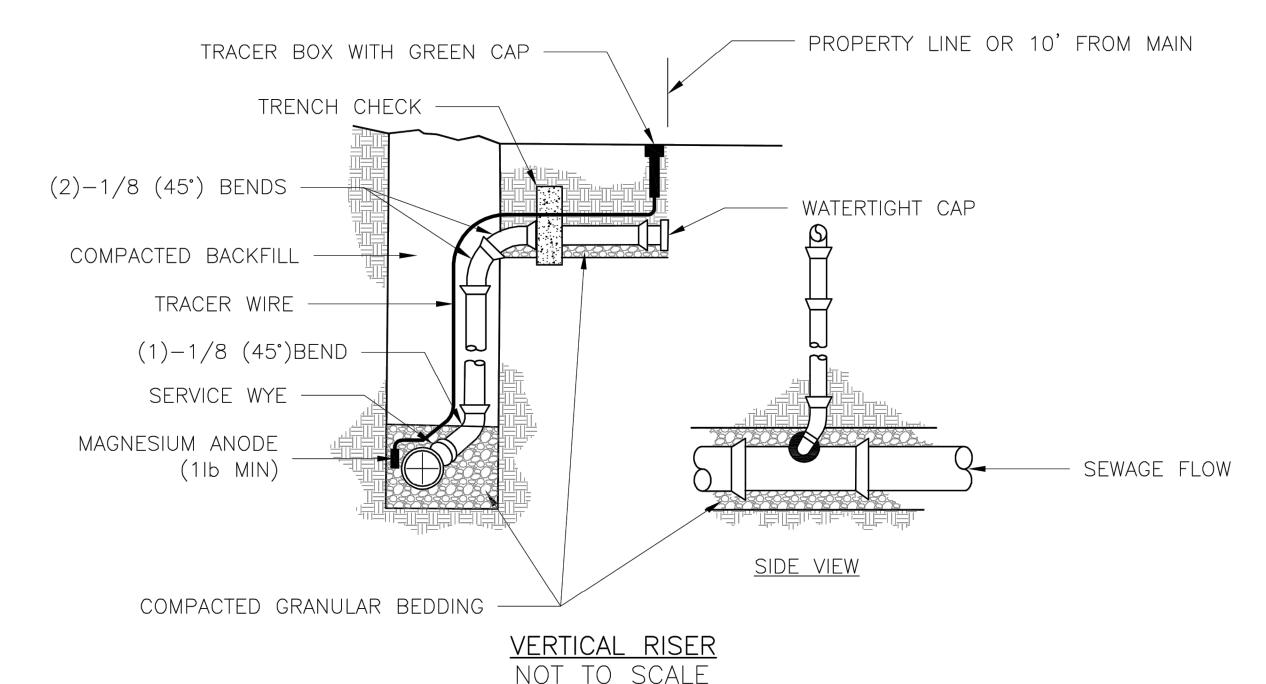
Sheet C17











# 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. IMPERVIOUS TRENCH CHECKS SHALL BE PLACED ON BUILDING SEWER STUBS (AT LEAST 5' AWAY FROM THE SANITARY SEWER MAIN).
- 3. 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.
- 4. SEE SPECIFICATION SECTION 2100 FOR SEWER MAIN BEDDING AND BACKFILL
- 5. #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.
- 6. 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.
- 7. TRACER WIRE BOX SHALL BE INSTALLED WITHIN 1.0' OF PROPERTY LINE.
- 8. 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 Date: 12/13 Drawn By: SC MISSOURI Checked By: DL PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063 FILE: SAN-1

BUILDING SEWER STUB AND RISER

Rev: 10/15 Rev: 12/15

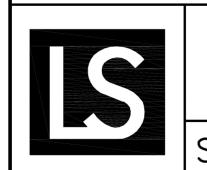
# NOTES:

- 1. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY THE SPECIFICATIONS.
- 2. A WALL THICKNESS NOT LESS THAN ONE-TWELFTH ( $^{1}\!/_{12}$ ) OF THE INSIDE DIAMETER OR 4", WHICHEVER IS GREATER, SHALL BE USED WHEN THE MANHOLE DEPTH IS LESS THEN 15'.

' MIN IF < 24"0 PIPE

' MIN IF > 24"0 PIPE

- 3. WATERPROOFING SHALL BE REQUIRED ON THE OUTSIDE OF MANHOLES. THE WATERPROOFING SHALL CONSIST OF A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 14 MILS OF BITUMINOUS COATING.
- 4. ONLY ECCENTRIC MANHOLE CONES WILL BE ALLOWED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER. 5. THE FILL CONCRETE FLOW CHANNEL FOR SIDE BRANCHES SHALL BE PLACED TO PROVIDE A SMOOTH TRANSITION INTO THE FLOW LINE.
- 6. REFER TO THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR APPROVED MANHOLE GASKET MODELS. 7. REFER TO THE APPROVED PRODUCTS LIST FOR APPROVED STEPS.



# LEE'S SUMMIT MISSOURI

STANDARD PRECAST MANHOLE - SANITARY SEWER

Date: 02/13 Drawn By: JN Checked By: DL FILE: SAN-2 Rev: 1/14

REFER TO THE APPROVED PRODUCTS LIST

PROVIDE JOINT SEALANT BETWEEN ALL

JOINTS IN ACCORDANCE WITH SECTION

JOINTS AND WRAP EXTERIOR OF

12" MAXIMUM ADJUSTING RINGS

FINISH GRADE

AS REQUIRED

SPRING LINE

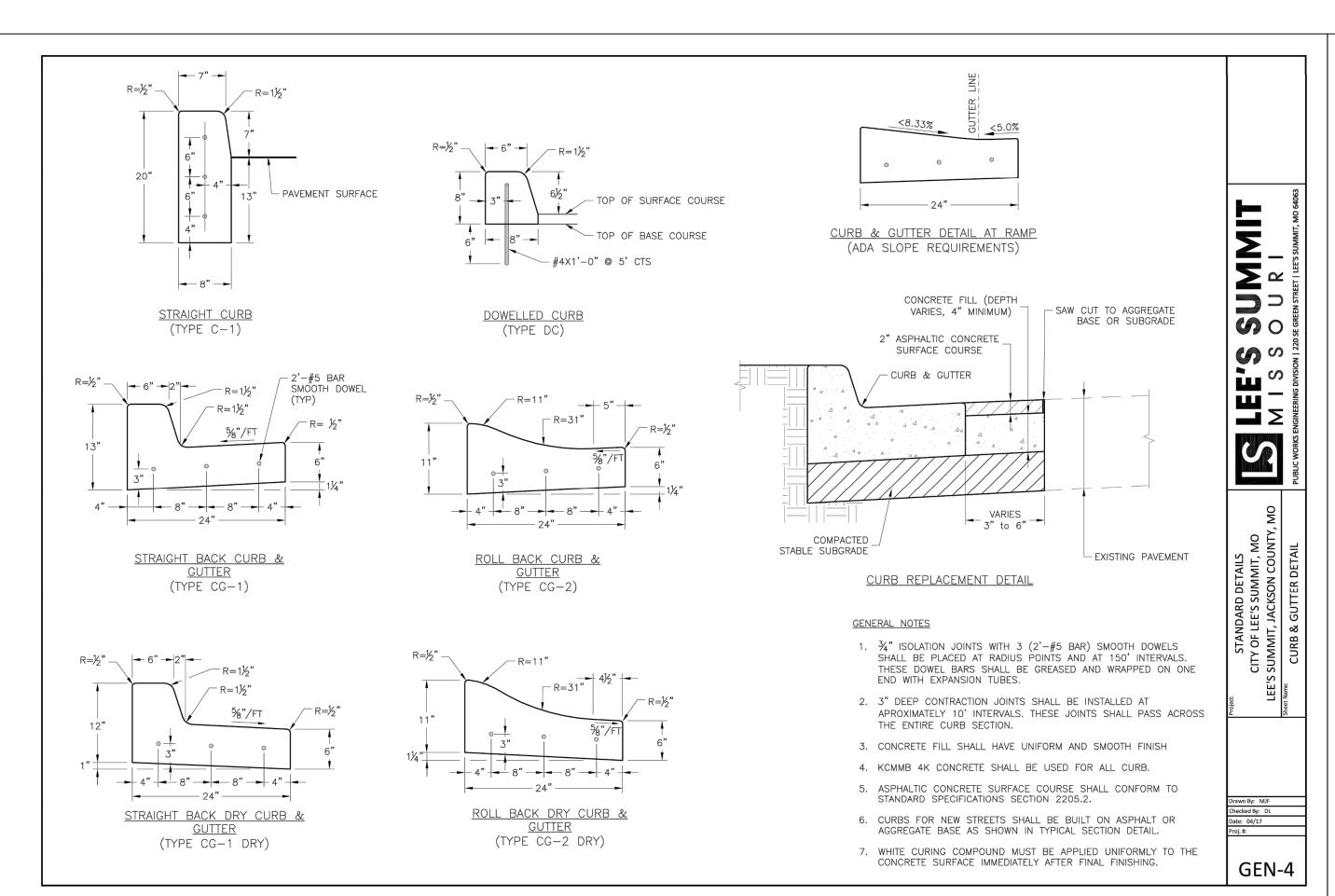
INTEGRAL CAST BASE

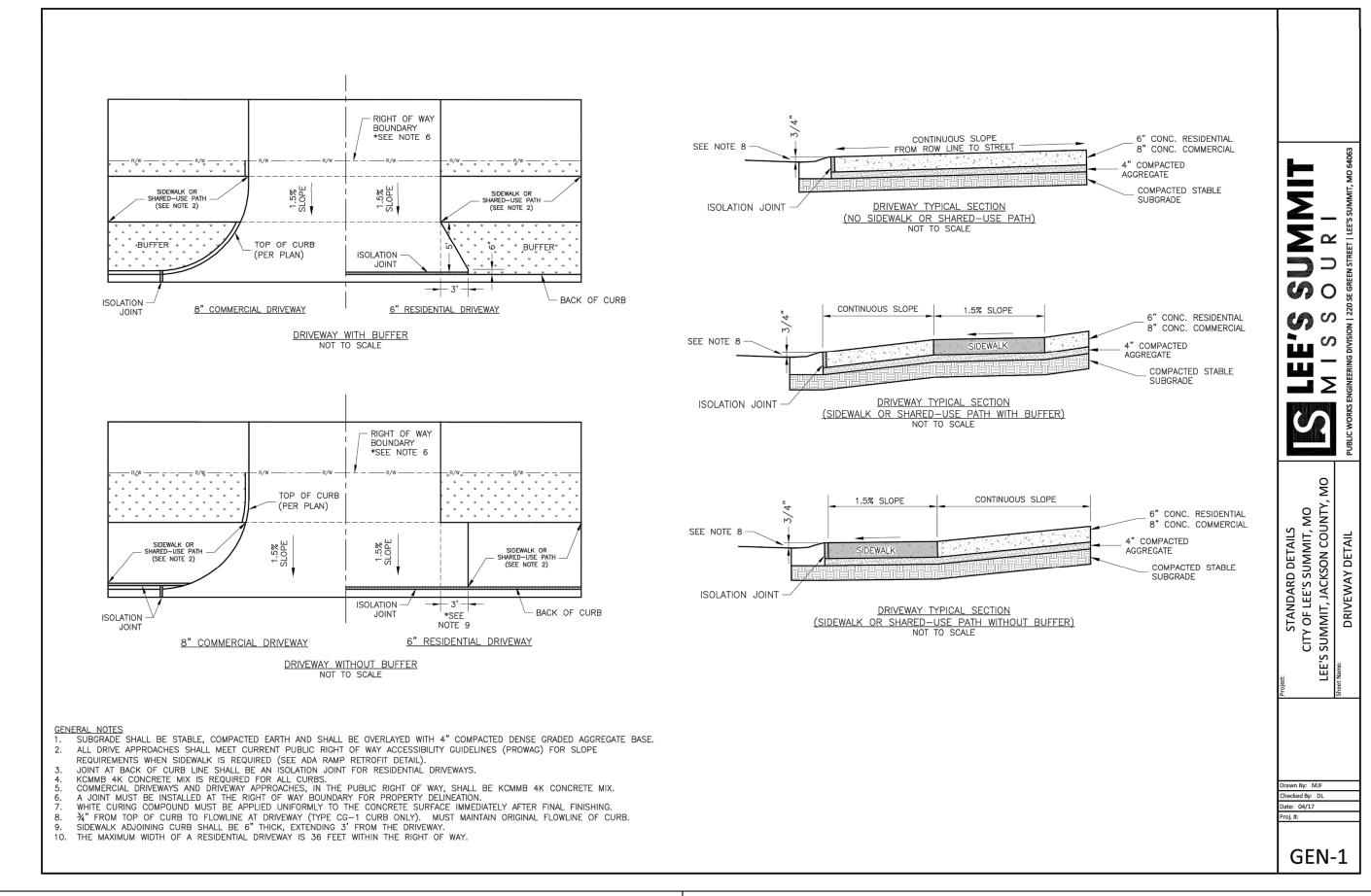
4" MIN (SEE NOTE 2)

FOR WATER UTILITIES FOR MANHOLE CASTINGS

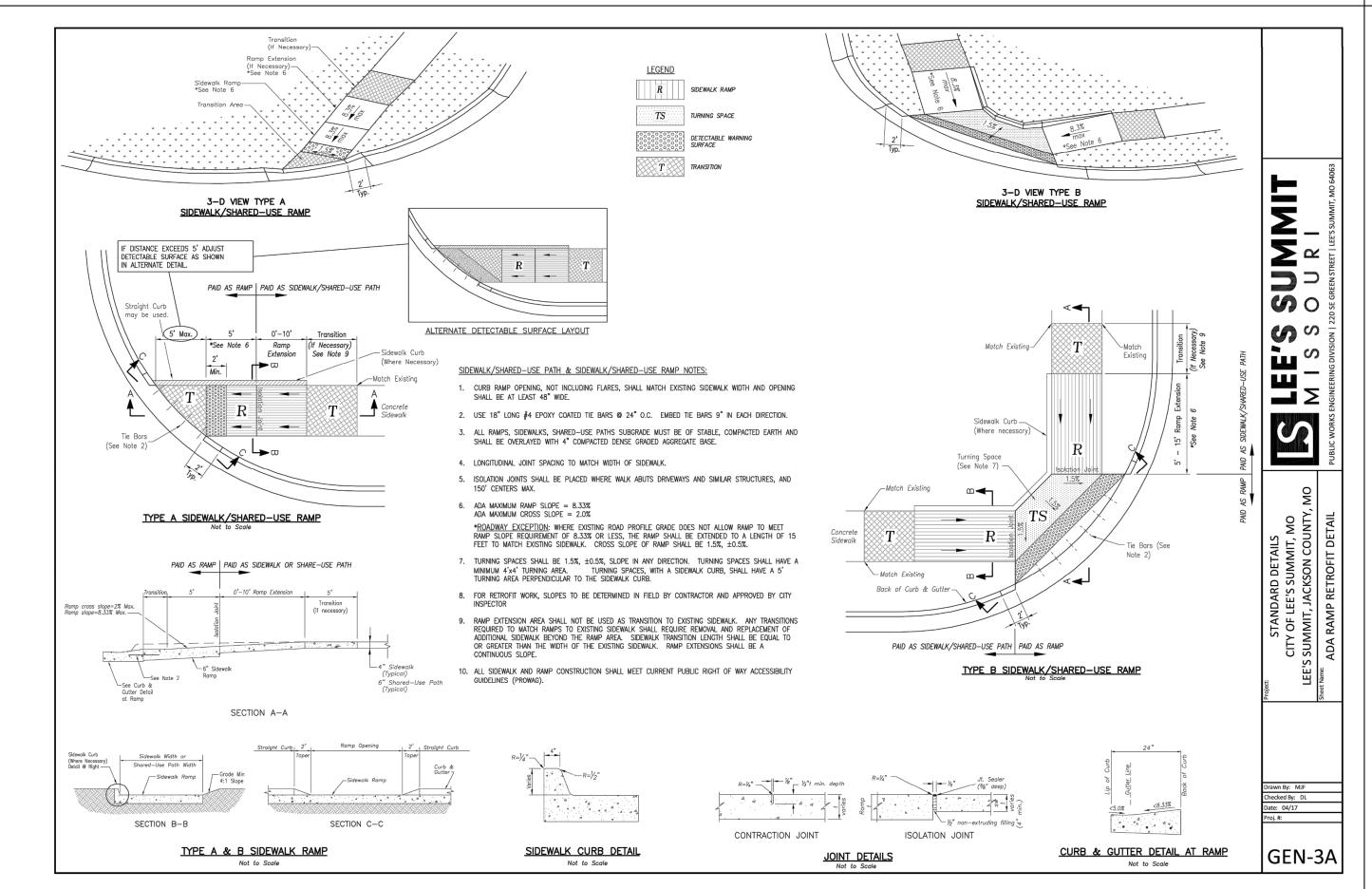
6" OF COMPACTED BEDDING AGGREGATE

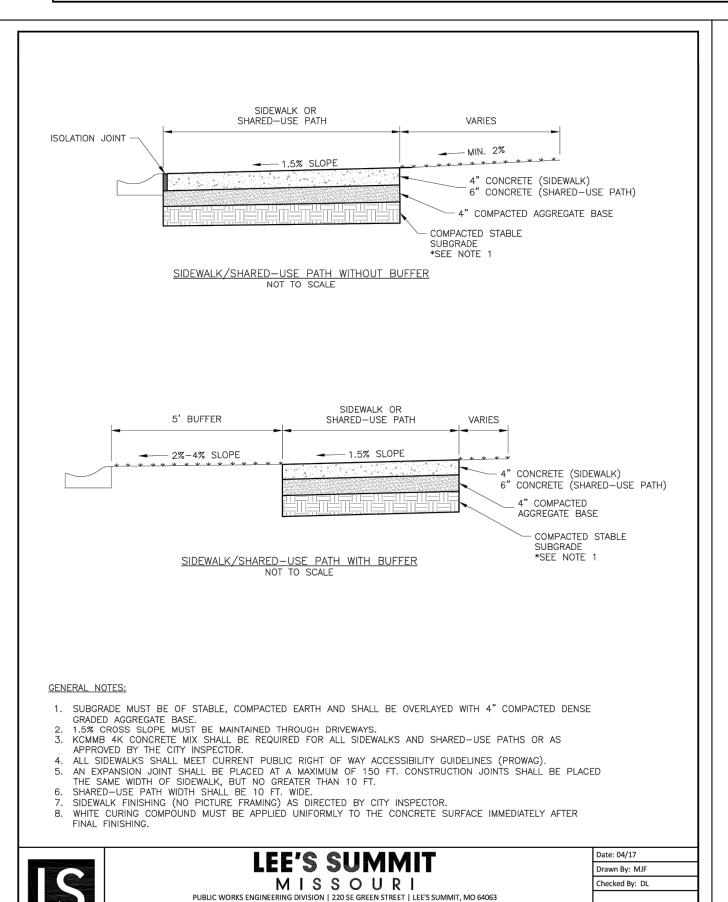
COMPACTED OR UNDISTURBED EARTH



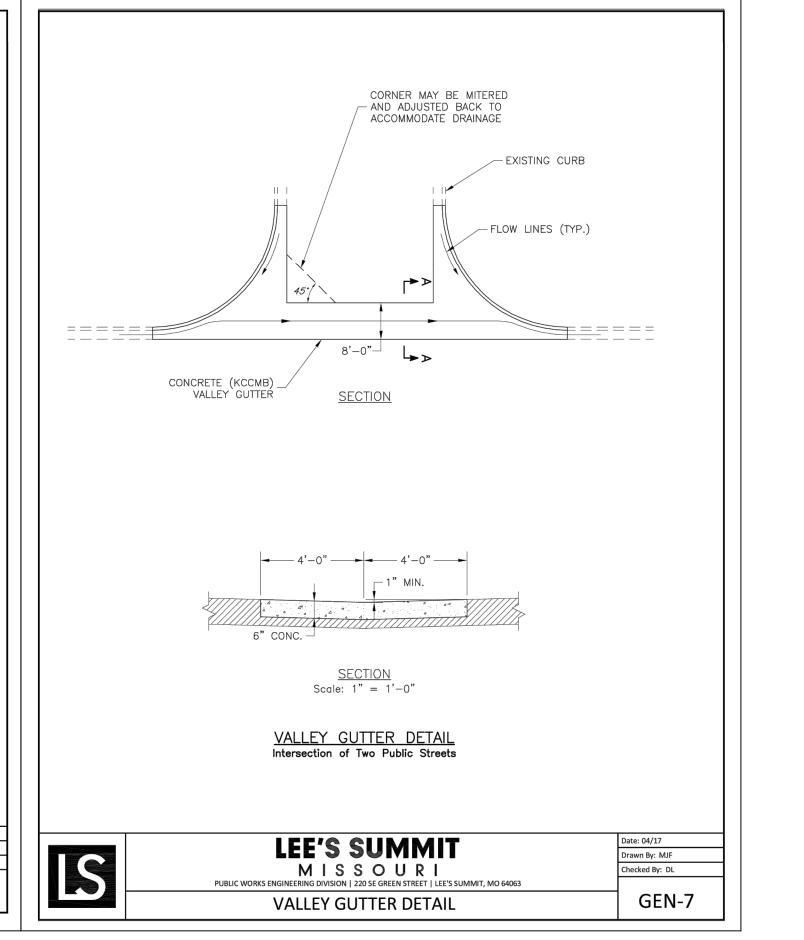


GEN-2



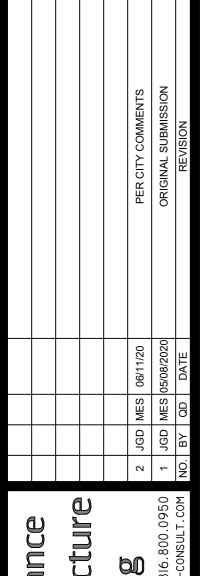


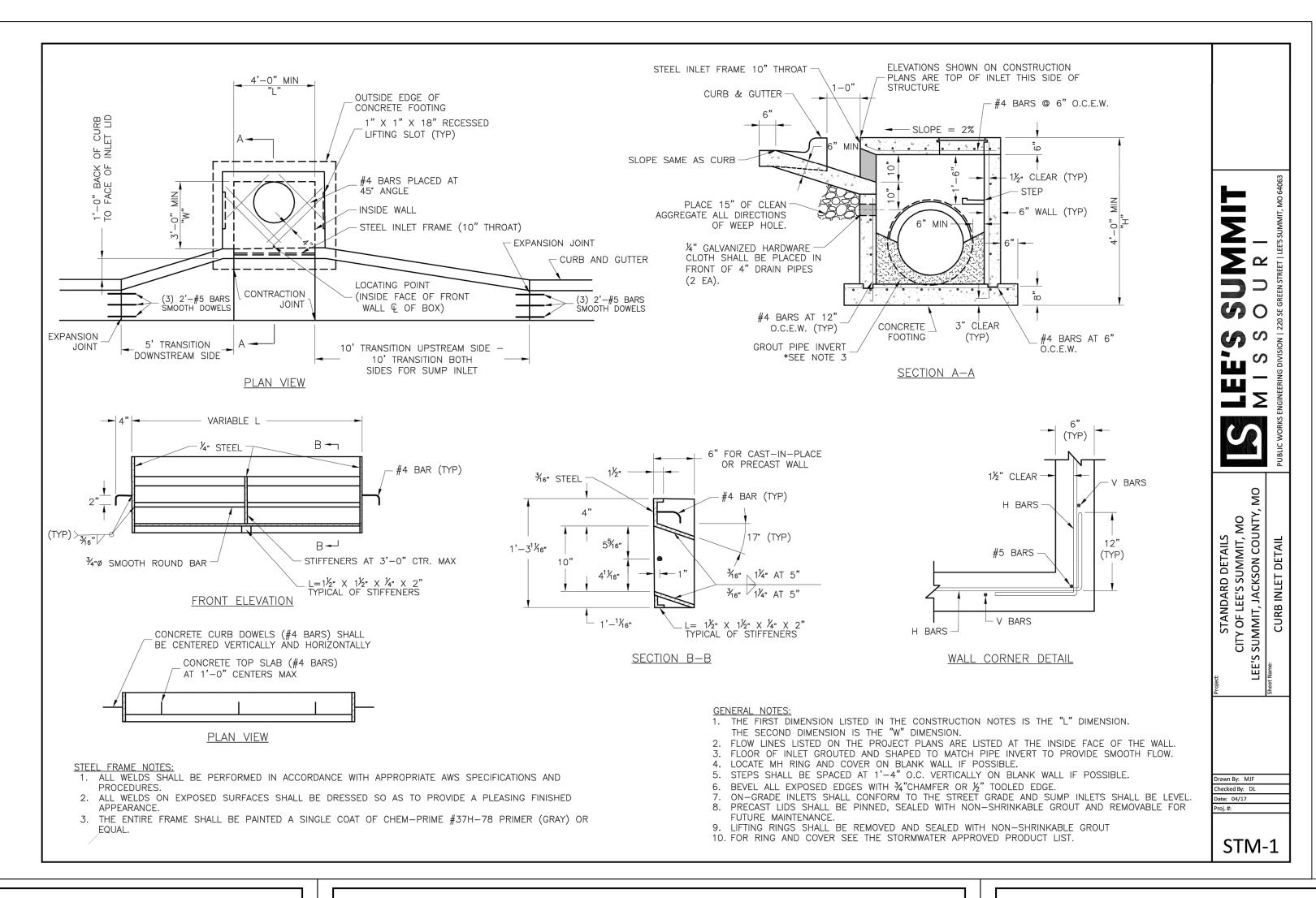
SIDEWALK/SHARED-USE PATH DETAIL

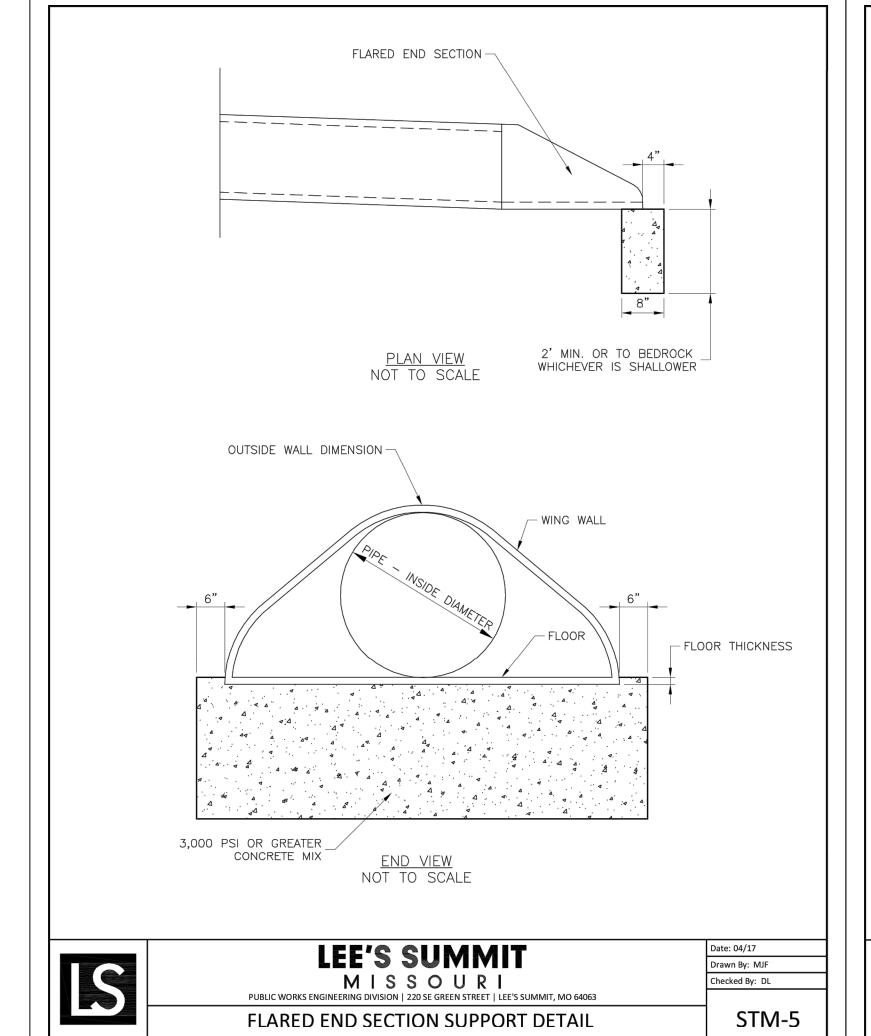


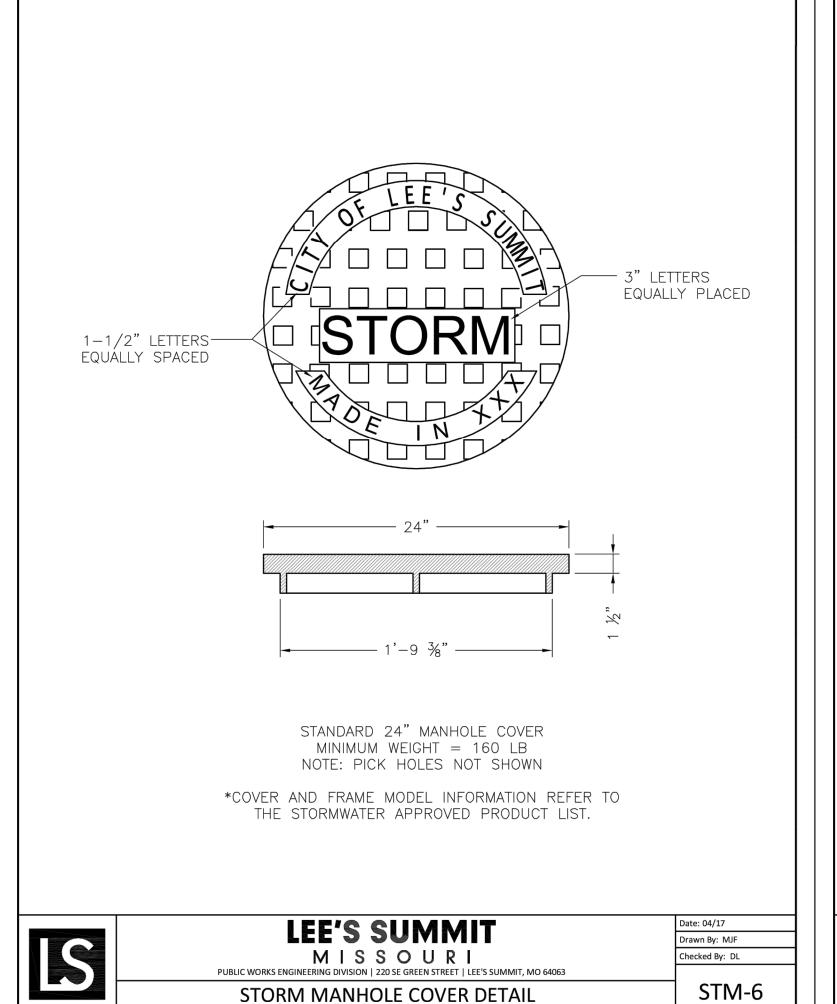


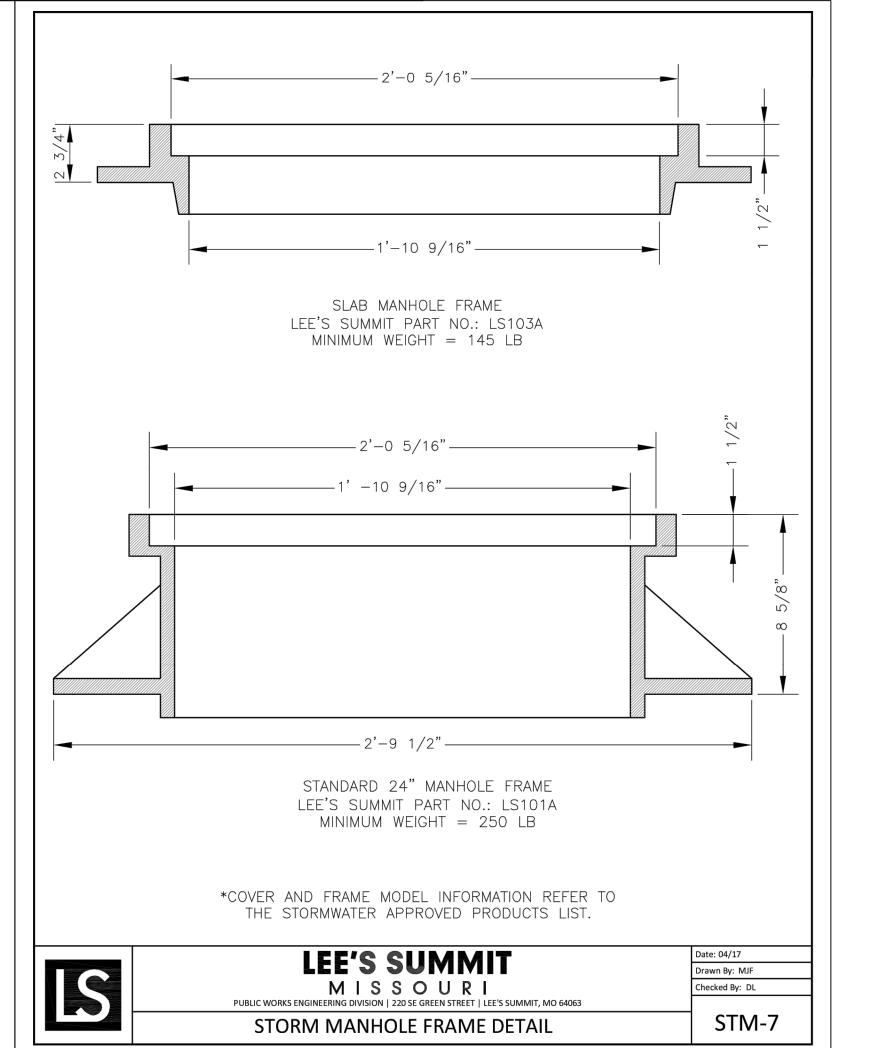
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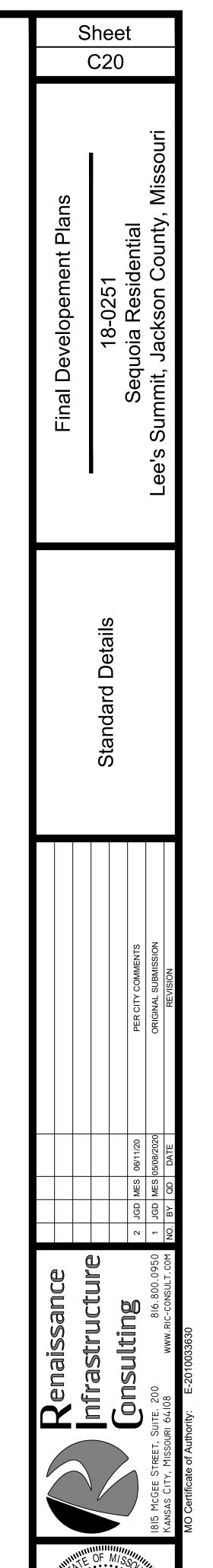




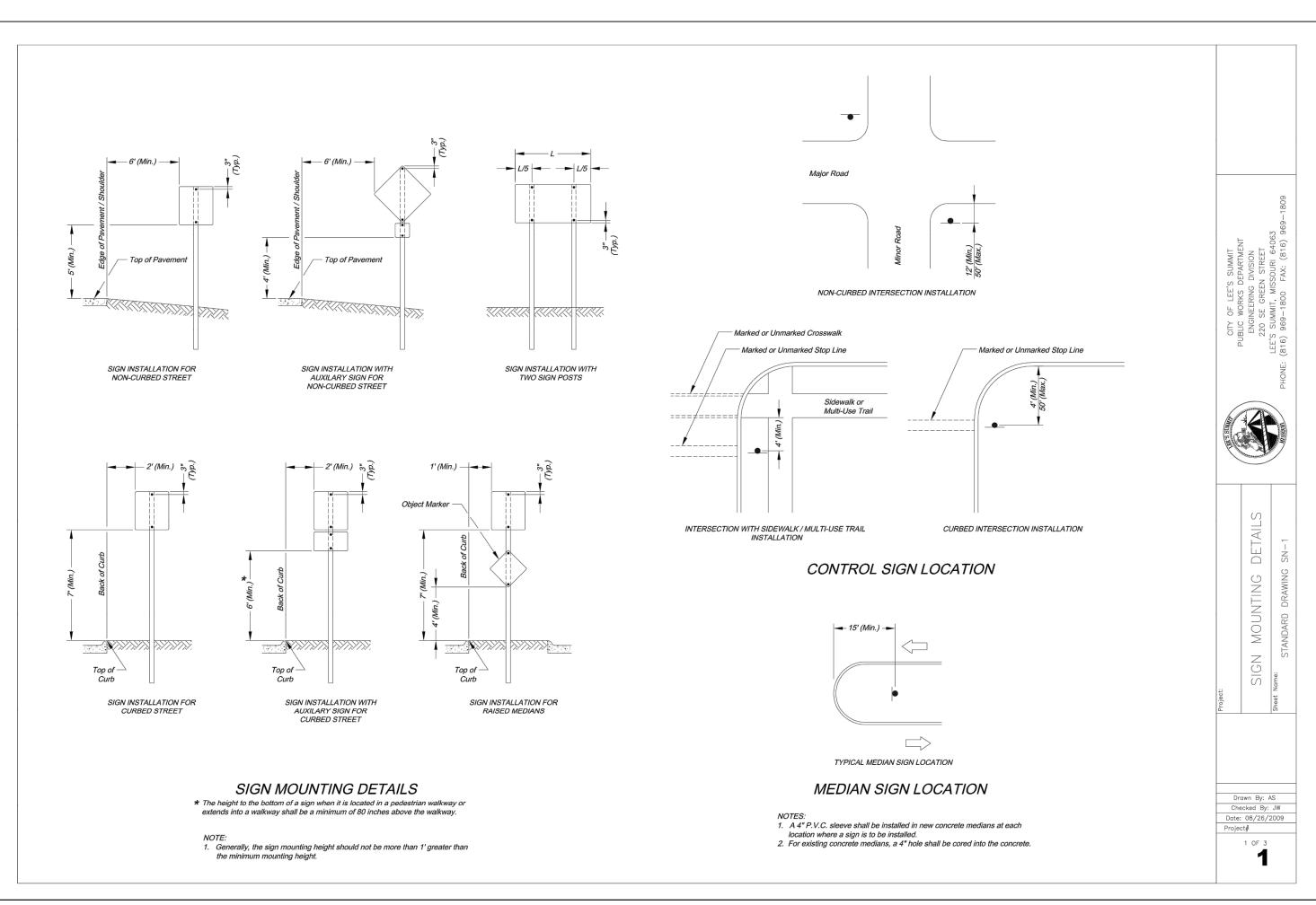


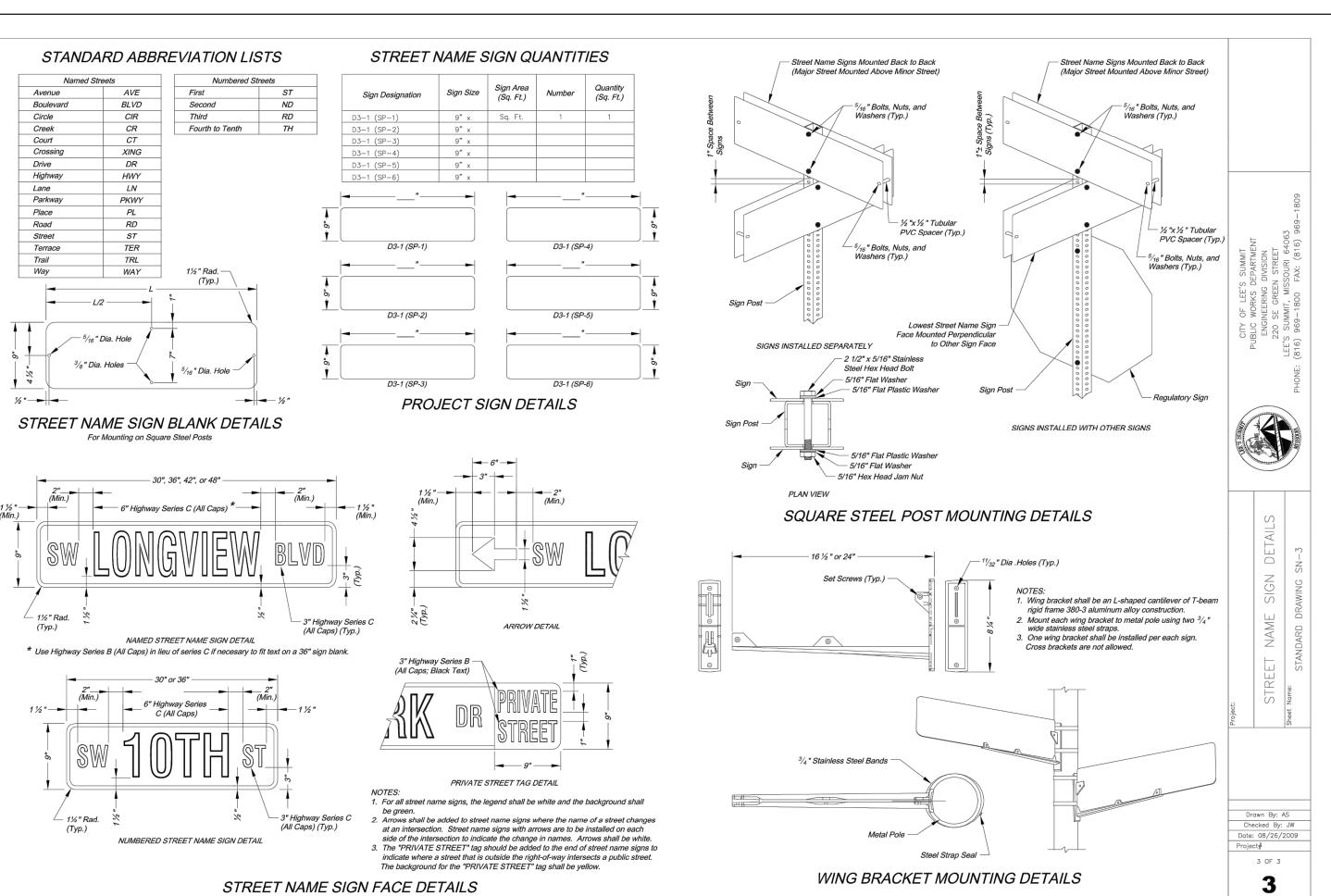


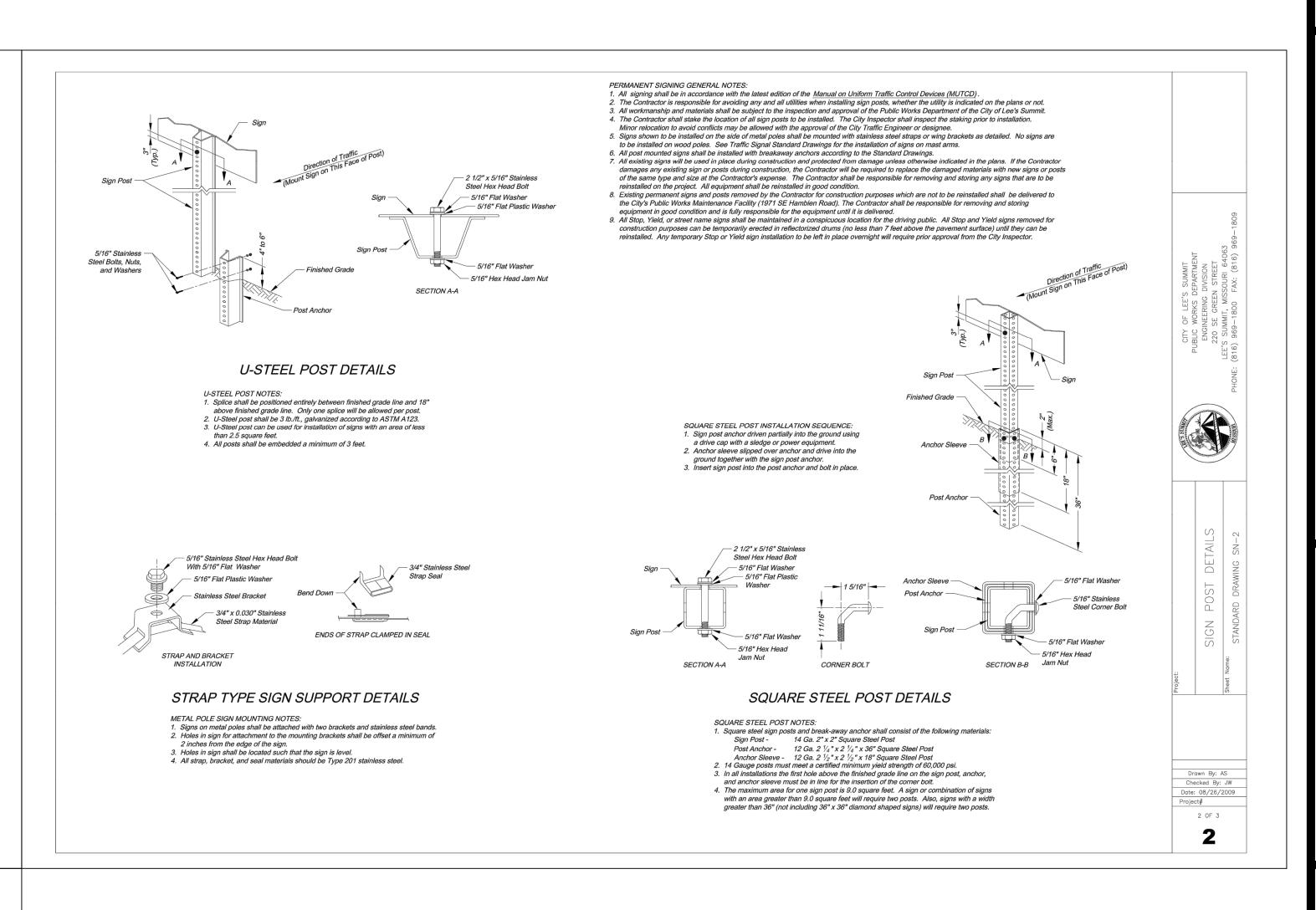




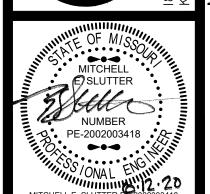
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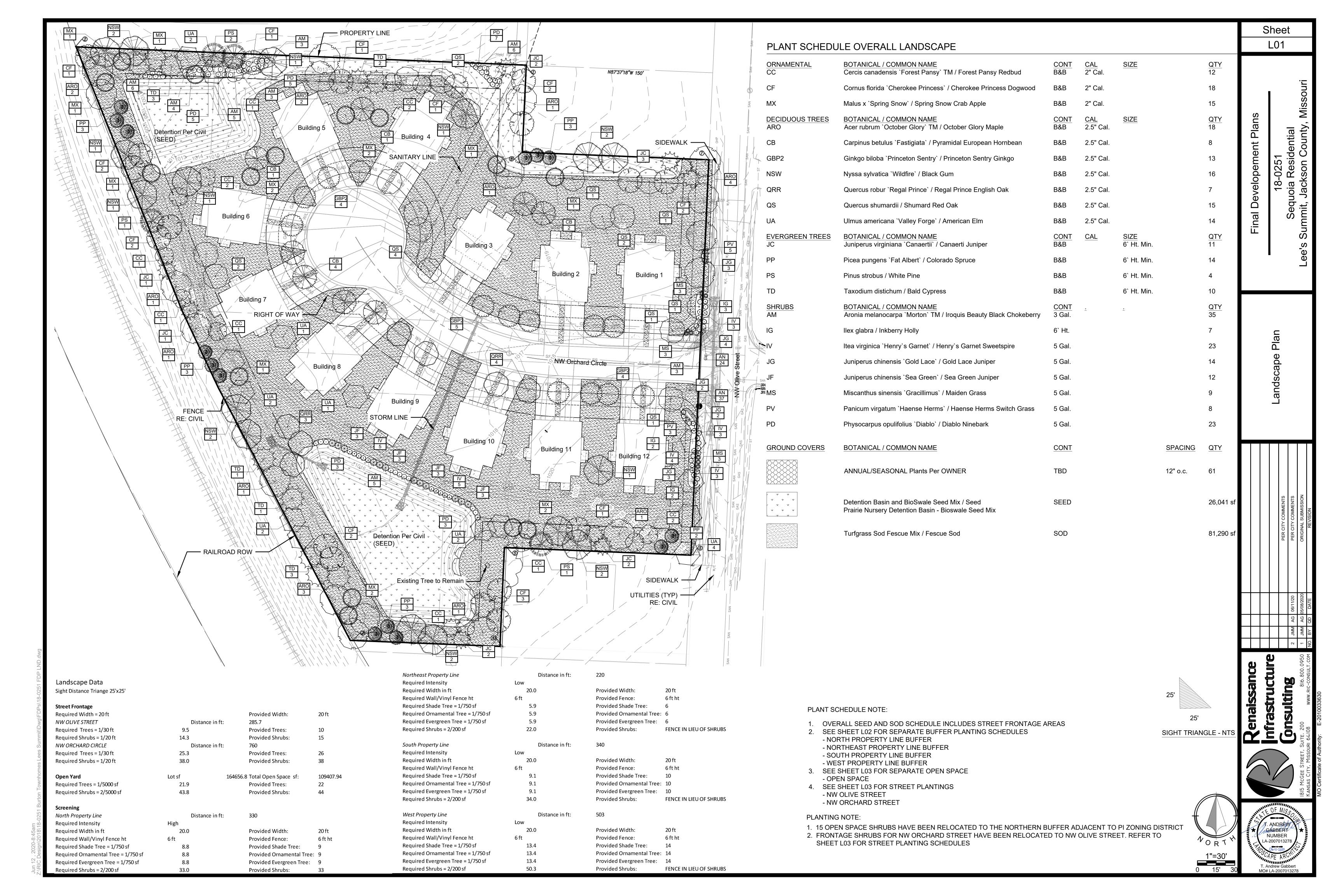




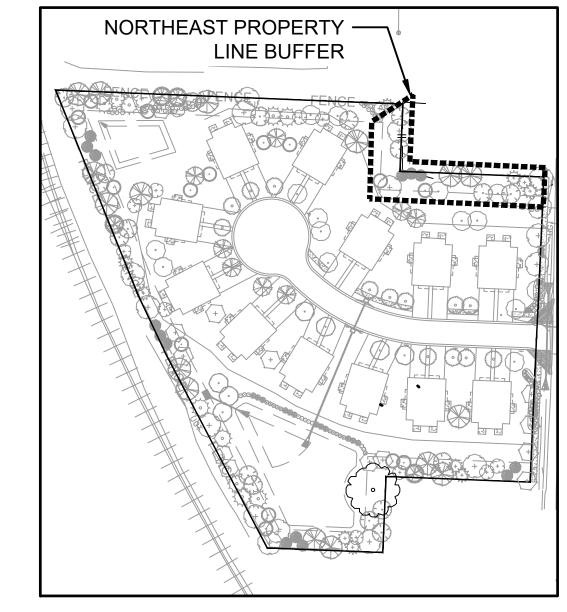


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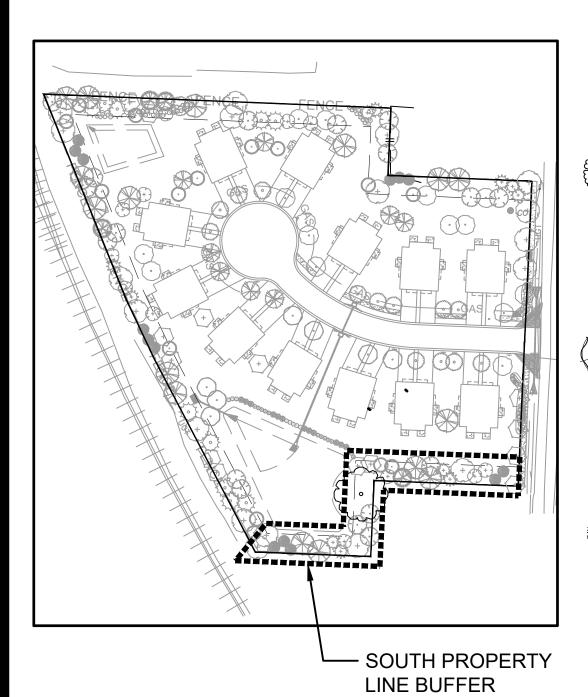




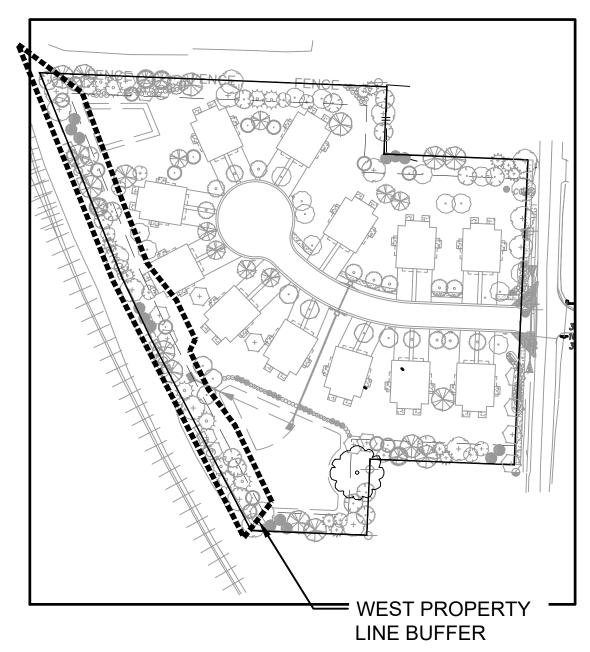
| PLANT SCHEDU                           | JLE NORTH PROPERTY LINE BUFFER                                   |        |           |             |            |
|--|--|--------|-----------|-------------|------------|
| ORNAMENTAL                             | BOTANICAL / COMMON NAME  | CONT   | CAL       | SIZE        | QTY        |
| +                                      | Cercis canadensis `Forest Pansy` TM / Forest Pansy Redbud        | B&B    | 2" Cal.   |             | 3          |
|  | Cornus florida `Cherokee Princess` / Cherokee Princess Dogwood   | B&B    | 2" Cal.   |             | 4          |
| 40000000000000000000000000000000000000 | Malus x `Spring Snow` / Spring Snow Crab Apple                   | B&B    | 2" Cal.   |             | 2          |
| DECIDUOUS TREES                        | BOTANICAL / COMMON NAME  | CONT   | CAL       | SIZE        | QTY        |
| 4 + &                                  | Acer rubrum `October Glory` TM / October Glory Maple             | B&B    | 2.5" Cal. |             | 2          |
|  | Nyssa sylvatica `Wildfire` / Black Gum                           | B&B    | 2.5" Cal. |             | 3          |
|  | Quercus shumardii / Shumard Red Oak                              | B&B    | 2.5" Cal. |             | 2          |
| +                                      | Ulmus americana `Valley Forge` / American Elm                    | B&B    | 2.5" Cal. |             | 2          |
| EVERGREEN TREES                        | BOTANICAL / COMMON NAME  | CONT   | CAL       | SIZE        | QTY        |
|  | Juniperus virginiana `Canaertii` / Canaerti Juniper              | B&B    |           | 6` Ht. Min. | 2          |
|  | Pinus strobus / White Pine                                       | B&B    |           | 6` Ht. Min. | 2          |
|  | Taxodium distichum / Bald Cypress                                | B&B    |           | 6` Ht. Min. | 5          |
| SHRUBS                                 | BOTANICAL / COMMON NAME  | CONT   | ÷         | ÷           | <u>QTY</u> |
| $\odot$                                | Aronia melanocarpa `Morton` TM / Iroquis Beauty Black Chokeberry | 3 Gal. |           |             | 22         |
| $\odot$                                | Physocarpus opulifolius `Diablo` / Diablo Ninebark               | 5 Gal. |           |             | 17         |



| PLANT SCHEDU                           | JLE NORTHEAST PROPERTY LINE BUFFER                             |      |           |             |            |
|--|--|------|-----------|-------------|------------|
| ORNAMENTAL                             | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | <u>QTY</u> |
|  | Cornus florida `Cherokee Princess` / Cherokee Princess Dogwood | B&B  | 2" Cal.   |             | 4          |
| 00000000000000000000000000000000000000 | Malus x `Spring Snow` / Spring Snow Crab Apple                 | B&B  | 2" Cal.   |             | 2          |
| DECIDUOUS TREES                        | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | <u>QTY</u> |
| + +                                    | Acer rubrum `October Glory` TM / October Glory Maple           |      | 2.5" Cal. |             | 2          |
|  | Nyssa sylvatica `Wildfire` / Black Gum                         |      | 2.5" Cal. |             | 2          |
|  | Quercus shumardii / Shumard Red Oak                            | B&B  | 2.5" Cal. |             | 2          |
| EVERGREEN TREES                        | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | QTY        |
| 2 + C                                  | Juniperus virginiana `Canaertii` / Canaerti Juniper            | B&B  |           | 6` Ht. Min. | 3          |
|  | Picea pungens `Fat Albert` / Colorado Spruce                   | B&B  |           | 6` Ht. Min. | 3          |
|  |  |      |           |             |            |



|         | PLANT SCHEDU                            | ILE SOUTH PROPERTY LINE BUFFER                                 |      |           |             |            |
|---------|---|--|------|-----------|-------------|------------|
|         | ORNAMENTAL                              | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | QTY        |
| -0(     | +                                       | Cercis canadensis `Forest Pansy` TM / Forest Pansy Redbud      | В&В  | 2" Cal.   |             | 4          |
| 5       |   | Cornus florida `Cherokee Princess` / Cherokee Princess Dogwood | В&В  | 2" Cal.   |             | 4          |
| ٠٠      | 00000000000000000000000000000000000000  | Malus x `Spring Snow` / Spring Snow Crab Apple                 | В&В  | 2" Cal.   |             | 2          |
|         | DECIDUOUS TREES                         | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | <u>QTY</u> |
| سير     | +                                       | Acer rubrum `October Glory` TM / October Glory Maple           | В&В  | 2.5" Cal. |             | 4          |
|         |   | Nyssa sylvatica `Wildfire` / Black Gum                         | B&B  | 2.5" Cal. |             | 4          |
|         | +                                       | Ulmus americana `Valley Forge` / American Elm                  | В&В  | 2.5" Cal. |             | 2          |
|         | EVERGREEN TREES                         | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | <u>QTY</u> |
|         | 3 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + 4 + | Juniperus virginiana `Canaertii` / Canaerti Juniper            | В&В  |           | 6` Ht. Min. | 4          |
|         |   | Picea pungens `Fat Albert` / Colorado Spruce                   | B&B  |           | 6` Ht. Min. | 5          |
| *44(J)) |   | Pinus strobus / White Pine                                     | В&В  |           | 6` Ht. Min. | 1          |



| PLANT SCHEDU                           | JLE WEST PROPERTY LINE BUFFER                                  |      |           |             |            |
|--|--|------|-----------|-------------|------------|
| ORNAMENTAL                             | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | QTY        |
| +                                      | Cercis canadensis `Forest Pansy` TM / Forest Pansy Redbud      | B&B  | 2" Cal.   |             | 3          |
|  | Cornus florida `Cherokee Princess` / Cherokee Princess Dogwood | B&B  | 2" Cal.   |             | 6          |
| 00000000000000000000000000000000000000 | Malus x `Spring Snow` / Spring Snow Crab Apple                 | B&B  | 2" Cal.   |             | 5          |
| DECIDUOUS TREES                        | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | <u>QTY</u> |
| + +                                    | Acer rubrum `October Glory` TM / October Glory Maple           | B&B  | 2.5" Cal. |             | 6          |
|  | Nyssa sylvatica `Wildfire` / Black Gum                         | B&B  | 2.5" Cal. |             | 4          |
| +                                      | Ulmus americana `Valley Forge` / American Elm                  | B&B  | 2.5" Cal. |             | 4          |
| EVERGREEN TREES                        | BOTANICAL / COMMON NAME  | CONT | CAL       | SIZE        | QTY        |
| 3+ 4<br>3+ 4                           | Juniperus virginiana `Canaertii` / Canaerti Juniper            | B&B  |           | 6` Ht. Min. | 2          |
|  | Picea pungens `Fat Albert` / Colorado Spruce                   | B&B  |           | 6` Ht. Min. | 6          |
|  | Pinus strobus / White Pine                                     | B&B  |           | 6` Ht. Min. | 1          |
| \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ \\ | Taxodium distichum / Bald Cypress                              | B&B  |           | 6` Ht. Min. | 5          |

PLANT SCHEDULE NOTE:

1. SEE SHEET L01 FOR OVERALL LANDSCAPE PLAN AND SCHEDULE 2. SEE SHEET L01 FOR SEED AND SOD SCHEDULE

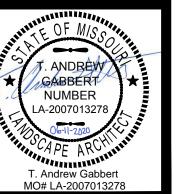
3. SEE SHEET L03 FOR SEPARATE OPEN SPACE SCHEDULE 4. SEE SHEET L03 FOR SEPARATE NW ORCHARD STREET SCHEDULE

5. SEE SHEET L03 FOR SEPARATE NW OLIVE STREET SCHEDULE



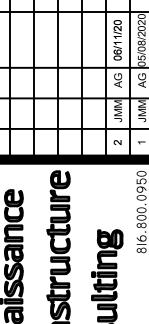
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L03

2

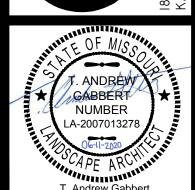


Renaissance Infrastructure Consulting







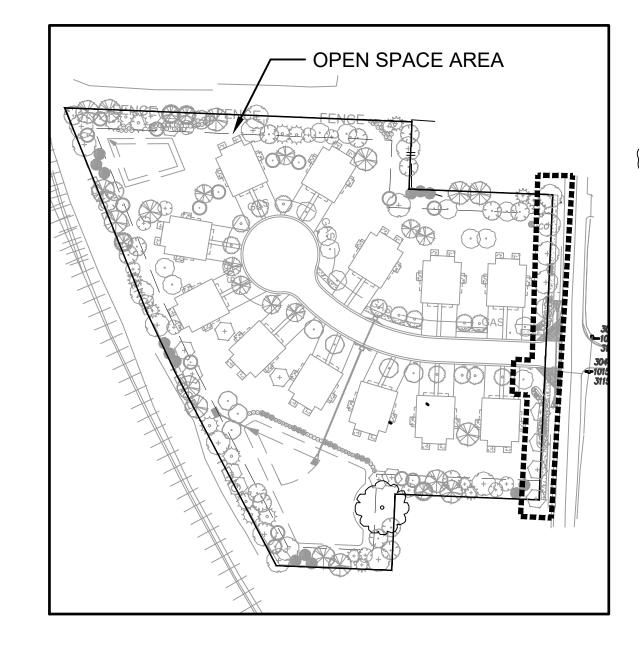


PLANT SCHEDULE NW ORCHARD STREET FRONTAGE

— NW ORCHARD

STREET TREES





| PLANT SCHEDULE NW OLIVE STREET FRONTAGE  |  |        |           |     |  |  |  |  |  |
|--|--|--------|-----------|-----|--|--|--|--|--|
| DECIDUOUS TREES  | BOTANICAL / COMMON NAME  | CONT   | CAL       | QTY |  |  |  |  |  |
| + +  | Acer rubrum `October Glory` TM / October Glory Maple             | B&B    | 2.5" Cal. | 4   |  |  |  |  |  |
|  | Quercus shumardii / Shumard Red Oak                              | B&B    | 2.5" Cal. | 2   |  |  |  |  |  |
| +  | Ulmus americana `Valley Forge` / American Elm                    | B&B    | 2.5" Cal. | 4   |  |  |  |  |  |
| SHRUBS   | BOTANICAL / COMMON NAME  | CONT   | ÷         | QTY |  |  |  |  |  |
| $\odot$  | Aronia melanocarpa `Morton` TM / Iroquis Beauty Black Chokeberry | 3 Gal. |           | 3   |  |  |  |  |  |
| $\odot$  | llex glabra / Inkberry Holly                                     | 6` Ht. |           | 7   |  |  |  |  |  |
| +  | Itea virginica `Henry`s Garnet` / Henry`s Garnet Sweetspire      | 5 Gal. |           | 13  |  |  |  |  |  |
| Č)   | Juniperus chinensis `Gold Lace` / Gold Lace Juniper              | 5 Gal. |           | 14  |  |  |  |  |  |
| Service Control of the Control of th | Miscanthus sinensis `Gracillimus` / Maiden Grass                 | 5 Gal. |           | 9   |  |  |  |  |  |
| *  | Panicum virgatum `Haense Herms` / Haense Herms Switch Grass      | 5 Gal. |           | 8   |  |  |  |  |  |
|  |  |        |           |     |  |  |  |  |  |

|                    | PLANT SCHEDU                           | JLE OPEN SPACE   |        |           |            |
|--------------------|--|--|--------|-----------|------------|
| OPEN SPACE AREA    | ORNAMENTAL                             | BOTANICAL / COMMON NAME  | CONT   | CAL       | QTY        |
| FENCE              | +                                      | Cercis canadensis `Forest Pansy` TM / Forest Pansy Redbud        | B&B    | 2" Cal.   | 2          |
|                    | 00000000000000000000000000000000000000 | Malus x `Spring Snow` / Spring Snow Crab Apple                   | B&B    | 2" Cal.   | 4          |
|                    | DECIDUOUS TREES                        | BOTANICAL / COMMON NAME  | CONT   | CAL       | <u>QTY</u> |
|                    |  | Carpinus betulus `Fastigiata` / Pyramidal European Hornbean      | B&B    | 2.5" Cal. | 4          |
|                    |  | Nyssa sylvatica `Wildfire` / Black Gum                           | B&B    | 2.5" Cal. | 3          |
|                    |  | Quercus robur `Regal Prince` / Regal Prince English Oak          | B&B    | 2.5" Cal. | 3          |
| 304<br>1010<br>311 |  | Quercus shumardii / Shumard Red Oak                              | B&B    | 2.5" Cal. | 4          |
|                    | +                                      | Ulmus americana `Valley Forge` / American Elm                    | B&B    | 2.5" Cal. | 2          |
|                    | <u>SHRUBS</u>                          | BOTANICAL / COMMON NAME  | CONT   | ÷         | <u>QTY</u> |
|                    | $\odot$                                | Aronia melanocarpa `Morton` TM / Iroquis Beauty Black Chokeberry | 3 Gal. |           | 5          |
|                    | +                                      | Itea virginica `Henry`s Garnet` / Henry`s Garnet Sweetspire      | 5 Gal. |           | 10         |
|                    | ₩                                      | Juniperus chinensis `Sea Green` / Sea Green Juniper              | 5 Gal. |           | 12         |
|                    | $\odot$                                | Physocarpus opulifolius `Diablo` / Diablo Ninebark               | 5 Gal. |           | 6          |

PLANT SCHEDULE NOTE:

- 1. SEE SHEET L01 FOR OVERALL LANDSCAPE PLAN AND SCHEDULE
- 2. SEE SHEET L01 FOR SEED AND SOD SCHEDULE
- 3. SEE SHEET L02 FOR SEPARATE BUFFER SCHEDULES
  4. SHRUBS FOR NW ORCHARD STREET HAVE BEEN RELOCATED TO NW OLIVE STREET.

### LANDSCAPE NOTES

- 1. LOCATE UTILITIES PRIOR TO COMMENCING LANDSCAPE OPERATIONS. ALL TREES SHALL BE FIELD POSITIONED AS TO AVOID CONFLICTS WITH EXISTING AND PROPOSED UTILITIES. NOTIFY LANDSCAPE ARCHITECT OF ANY CONFLICTS OR OBSTRUCTIONS.
- 2. CONTRACTOR SHALL STAKE ALL PLANTING AREAS IN THE FIELD PRIOR TO PLANTING FOR APPROVAL OF THE OWNER OR THEIR REPRESENTATIVE.
- 3. CONTRACTOR SHALL VERIFY ALL PLANT QUANTITIES PRIOR TO PLANTING. ANY DISCREPANCIES WITH THE PLAN SHALL BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT. THE PLAN QUANTITIES SHALL SUPERCEDE SCHEDULED QUANTITIES.
- 4. ALL PLANT MATERIAL SHALL BE SPECIMEN QUALITY AND SHALL COMPLY WITH RECOMMENDATIONS AND REQUIREMENTS OF ANSI Z60.1 THE 'AMERICAN STANDARD FOR NURSERY STOCK'.
- 5. ALL PLANTING BEDS & NATIVE GRASS STANDS SHALL BE EDGED AS SHOWN IN PLAN.
- 6. PREPARE PLANTING BEDS AND INCORPORATE AMENDMENTS ACCORDING TO PLANS.
- 7. SHREDDED HARDWOOD MULCH, PER SPECIFICATIONS SHALL BE USED AS A THREE INCH (3") TOP DRESSING IN ALL PLANTING BEDS AND AROUND ALL TREES. SINGLE TREES AND SHRUBS SHALL BE MULCHED TO THE OUTSIDE EDGE OF THE SAUCER OR LANDSCAPE ISLAND.
- 8. ALL TREES SHALL BE STAKED PER DETAIL.
- 9. ALL PLANT MATERIAL SHALL BE INSTALLED TO ALLOW A ONE FOOT (1') CLEARANCE BETWEEN PLANT AND ADJACENT PAVEMENT.
- 10. THE LANDSCAPE CONTRACTOR SHALL NOT COMMENCE WORK UNTIL THE SITE IS FREE OF DEBRIS CAUSED BY ON-GOING CONSTRUCTION OPERATIONS. REMOVAL OF DEBRIS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR. LANDSCAPE WORK SHALL NOT BEGIN UNTIL THE LANDSCAPE ARCHITECT AND OWNER HAVE GIVEN WRITTEN APPROVAL FOR SUCH. THERE SHALL BE NO DELAYS DUE TO LACK OF COORDINATION FOR THIS ACTIVITY.
- 11. THE LANDSCAPE ARCHITECT AND OWNER SHALL APPROVE GRADES AND CONDITION OF SITE PRIOR TO SODDING/SEEDING OPERATIONS.
- 12. ALL AREAS DISTURBED DURING CONSTRUCTION AND NOT DESIGNATED FOR OTHER PLANTINGS OR HARDSCAPE SHALL BE SODDED WITH TURF TYPE FESCUE.
- 13. LIMITS OF IRRIGATION SHALL BE DETERMINED BY OWNER. TURF AREAS SHALL BE IRRIGATED BY SPRAY OR ROTOR. PLANT BEDS SHALL BE IRRIGATED BY DRIP IRRIGATION. IRRIGATION SYSTEM SHALL INCLUDE AUTOMATIC RAIN-SENSOR DEVICE. IRRIGATION SHOP DRAWINGS SHALL BE PROVIDED BY THE CONTRACTOR FOR APPROVAL PRIOR TO CONSTRUCTION.

SHRUB PLANTING PER DETAIL; THIS SHEET - MULCH PER SHRUB PLANTING DETAILS **DETENTION/BIOSWALE AREA;** REPAIR IF DISTURBED LAWN AREA: RE: **SPECIFICATIONS** V-CUT NATURAL EDGING **SCARIFY PIT** WITH MULCH BACKFILL V-CUT NATURAL EDGING **BOTTOM** WITH MULCH BACKFILL (MIN. 6") CONTAINER **SECTION** Clustered Boxes Free Standing 1. PROVIDE V-CUT NATURAL EDGE AT BOTH FENCE EDGE AND TURF/NATIVE SEED EDGE FOR

EDGE PER PLANS.

Small Box UTILITY BOXES SHALL BE CLUSTERED AS MUCH AS POSSIBLE

TYPICAL UTILITY BOX SCREENING DETAILS - NTS

1. CONTRACTOR SHALL LOCATE AND MARK ALL PLANTBED LOCATIONS PRIOR TO

2. TRANSITION TO MULCH CONTAINMENT DETAIL AT ALL LOCATIONS ADJACENT

3. CONTRACTOR TO VERIFY ALL UTILITY LOCATIONS PRIOR TO TRENCHING OR

- LIMIT OF PLANT BED

AS SHOWN IN PLAN

V-CUT NATURAL EDGE DETAIL - NTS

- HARDWOOD MULCH

AS SPECIFIED

– LANDSCAPING; RE:

PLAN & DETAILS

V-CUT NATURAL EDGING

WITH MULCH BACKFILL

TO CURBS & SIDEWALKS. RE: DETAIL, THIS SHEET.

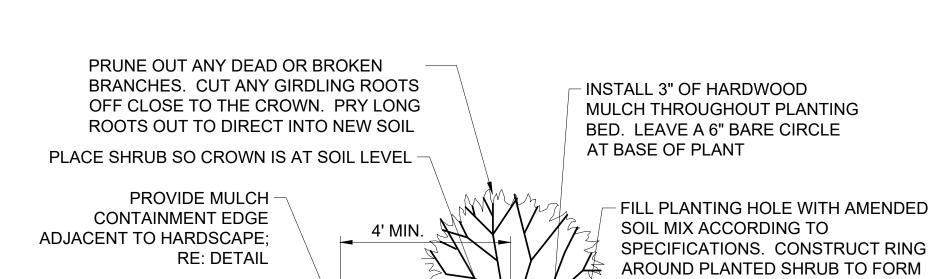
**VARIES** 

LAWN AREA; RE:

SPECIFICATIONS

LANDSCAPE INSTALLATION.

EXCAVATING FOR FINAL APPROVAL BY OWNER OR LANDSCAPE ARCHITECT.



ALL PLANT BEDS ADJACENT TO FENCE. ALL OTHER PLANT BEDS SHALL V-CUT NATURAL

PLANT BED W/ V-CUT NATURAL EDGE - NTS

SAUCER CURB, WHERE APPLICABLE: -MAINTAIN A MINIMUM OF 4' TO CENTER OF ROOTBALL FROM BACK OF CURB **SCARIFY PIT** BOTTOM (MIN. 6") 2 x CONTAINER

NOTES:

REFER TO SPECIFICATIONS FOR TOPSOIL BACKFILL MIX.

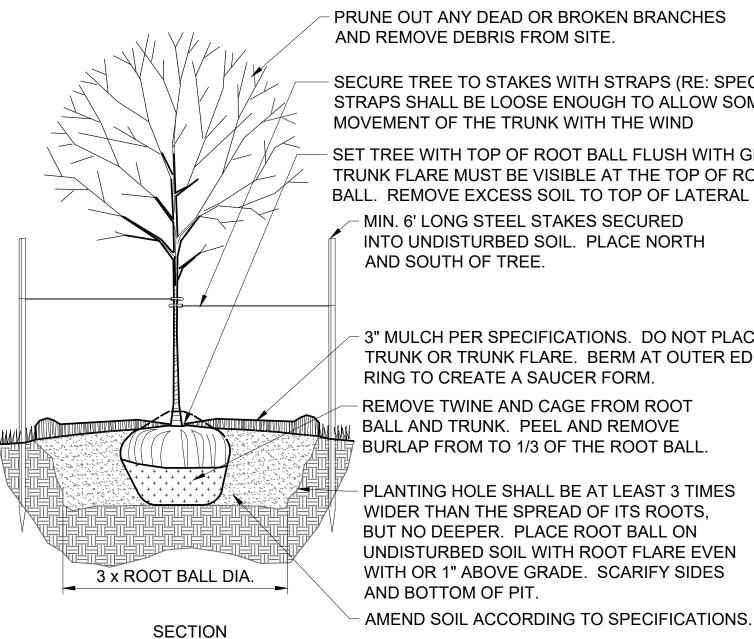
2. CONTRACTOR TO WATER THOROUGHLY AFTER PLANTING 3. INSTALLATION TO BE IN ACCORDANCE WITH PLANTING SPECIFICATIONS

4. WHERE ADJACENT TO CURB, MAINTAIN THE MINIMUM OFFSET SHOWN. FOR SHRUBS LARGER THAN 4' MATURE DIAMETER, PROVIDE A GREATER OFFSET EQUAL TO 1/2 OF THE MATURE DIAMETER MINIMUM.

SHRUB PLANTING DETAIL - NTS

### NOTES:

- 1. TREES THAT DO NOT MEET THE SIZE REQUIREMENT WILL BE REJECTED
- 2. TREES SHALL BE INSPECTED BY OWNERS REPRESENTATIVE PRIOR TO INSTALLATION.



SECURE TREE TO STAKES WITH STRAPS (RE: SPECS). STRAPS SHALL BE LOOSE ENOUGH TO ALLOW SOME MOVEMENT OF THE TRUNK WITH THE WIND

SET TREE WITH TOP OF ROOT BALL FLUSH WITH GRADE. TRUNK FLARE MUST BE VISIBLE AT THE TOP OF ROOT BALL. REMOVE EXCESS SOIL TO TOP OF LATERAL ROOTS.

MIN. 6' LONG STEEL STAKES SECURED INTO UNDISTURBED SOIL. PLACE NORTH AND SOUTH OF TREE.

- 3" MULCH PER SPECIFICATIONS. DO NOT PLACE ON TRUNK OR TRUNK FLARE. BERM AT OUTER EDGES OF RING TO CREATE A SAUCER FORM.

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cape Notes Details

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T. ANDREW

GABBERT

NUMBER

LA-2007013278

T. Andrew Gabber

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REMOVE TWINE AND CAGE FROM ROOT BALL AND TRUNK. PEEL AND REMOVE BURLAP FROM TO 1/3 OF THE ROOT BALL.

PLANTING HOLE SHALL BE AT LEAST 3 TIMES WIDER THAN THE SPREAD OF ITS ROOTS. BUT NO DEEPER. PLACE ROOT BALL ON UNDISTURBED SOIL WITH ROOT FLARE EVEN WITH OR 1" ABOVE GRADE. SCARIFY SIDES AND BOTTOM OF PIT.

3 x ROOT BALL DIA.

PRUNE ANY BROKEN TWIGS AND BRANCHES AND REMOVE DEBRIS FROM SITE

SECURE TREE TO (3) STAKES WITH STRAPS. STAPS SHALL BE LOOS ENOUGH TO ALLOW SOME MOVEMENT OF THE TRUNK WITH THE WIND.

MIN. 6' LONG STAKE SECURED INTO UNDISTURBED SOIL.

FIRST LATERAL ROOTS SHALL BE AT EXISTING GRADE. REMOVE ANY SOIL IN THE ROOT BALL ABOVE THE ROOT FLARE.

REMOVE TWINE AND CAGE FROM ROOT BALL AND TRUNK. PEEL AND REMOVE BURLAP FROM TOP \( \frac{1}{3} \) OF ROOT BALL

3" MULCH PER SPECIFICATIONS PLANTING HOLE SHALL BE AT LEAST 3 TIMES WIDER THAN THE SPREAD OF ITS ROOTS, BUT NO DEEPER. PLACE ROOT BALL ON UNDISTURBED SOIL WITH ROOT FLARE EVEN WITH OR 1" ABOVE GRADE. SCARIFY SIDES AND BOTTOM OF PIT.

AMEND SOIL ACCORDING TO SPECIFICATIONS.

DECIDUOUS TREE PLANTING DETAIL - NTS

EVERGREEN TREE PLANTING DETAIL - NTS

PART 1 - GENERAL

- 1.01 SUMMARY: A. This Section includes the following:
- 1. Furnishing trees, shrubs & plants. 2. Preparation of planting pits and beds, including excavation, backfilling, and disposal of surplus and unsuitable
- 3. Planting of plants (trees, shrubs, groundcovers, vines & perennials), including fertilizing, mulching, trimming, guying, and wrapping.
- 4. Maintenance of plants
- .02 REFERENCE: B. Applicable Standards:
- 1. American National Standards Institute (ANSI):
- a. Z60.1 Nursery Stock.

### .03 SUBMITTALS:

- A. General: Upon completion of the installation, deliver to Landscape Architect the following in accordance with the Conditions of the Contract and Division I Specification Sections. B. Include, but not limited to, the following:
- 1. Product Certification: Certificate of inspection as may be required by governing authorities. For standard products, submit manufacturer's certified analysis. For other materials, submit analysis by a recognized laboratory made in
- accordance with methods established by Association of Official Agricultural Chemists, wherever applicable. 2. Manufacturers Literature: Submit three (3) copies of fertilizer manufacturer's literature along with schedule of maintenance program spanning the life of the guarantee and three (3) copies of a recommended post guarantee
- maintenance program.
- 3. Label data substantiating that trees and shrubs comply with specified requirements. 4. Materials List: Within 15 days after award of contract, and before any materials are delivered to the job site, submit to Landscape Architect a complete list of all plants including the sizes ordered and the type of equipment to be used
- 5. As-Built Drawings: During course of installation, carefully record in red line on a print of the planting drawings all changes made to the planting system layout during installations; approved by the Landscape architect.
- 6. Planting Schedule: Proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of Substantial Completion. Once accepted, revise dates only as approved in writing, after documentation of
- 7. Maintenance Instructions: Typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period(s).
- D. Product Data: Submit product data, supplier sources and small sample of the following:
- 1. Shredded Hardwood Mulch 2. Fertilizer Planting Tablets
- 3. Steel Edging
- 4. Filter Fabric
- 5. Herbicide and Pre-emergent
- 6. Imported Topsoil & Analysis 7. Decorative Gravel
- .04 QUALITY ASSURANCE:

- A. Installers Qualifications: Engage a single firm specializing in landscape work with a minimum of 5 years experience who has completed landscaping work similar in material, design, and extent to that indicated for this project and with a record of successful landscape establishment.
- 1. Installers Field Supervision: Require installers to maintain an experienced full-time Supervisor on the project site during times that landscaping is in progress. 3. Source Quality Control.
- 1. General: ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
- 2. Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability to
- Landscape Architect, together with proposal for use of equivalent material. 3. Topsoil: ASTM 5268, pH range 5.5 to 7. Free of stones 1-inch or larger in any dimension and other extraneous
- materials harmful to plant growth. All topsoil used in planting operations shall meet standards as defined in this 3.1. Before delivery of topsoil, furnish Landscape Architect with written statement giving location of properties
- from which the topsoil is to be obtained, names and addresses of owners, depth to be stripped and crops grown during the past 2 years. 4. Plant Material: Provide plant material of quantity, size, genus, species, and variety shown and scheduled for
- landscape work and complying with recommendations and requirements of (ANSI Z60.1-1986) "American Standard for Nursery Stock" for number one grade nursery stock as adopted by the American Association of Nurserymen. Provide healthy, vigorous stock, grown in recognized nursery in accordance with good horticultural practice and free of disease, insects, eggs, larvae, and defects such as knots, sun-scald, injuries, abrasions, and disfigurement.
- a. Measurements: Measure trees and shrubs according to ANSI Z60.1 with branches and trunks or canes in their normal position. Do not prune to obtain required sizes. Take caliper measurements 6 inches above ground for trees up to 4-inch caliper size. Measure main body of tree or shrub for height and spread; do no measure branches or roots tip-to-tip.
- b. Plants shall be true to species and variety and shall conform to measurements specified in the plant schedule. Larger plants may be used if approved by the landscape architect, however, if approved shall not increase the
- 5. Label at least one tree and one shrub of each variety with a securely attached waterproof tag bearing legible
- designation of botanical and common name. Inspection: The Subcontractor shall notify the Landscape Architect of the location of plant materials to be used and
- allow the Landscape Architect the opportunity to inspect them either at the place of growth or at the site before planting, for compliance with requirements for genus, species, variety, size, and quality. The Owner retains the right to further inspect trees and shrubs for size and condition of root balls and root systems, insects, injuries and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from the project site.
- C.1. Landscape Contractor shall provide a minimum of 72 hours prior notice of readiness for landscape material inspection.
- D. Preinstallation Conference: Subcontractor to conduct conference at Project Site prior to installation.
- A. In addition to normal progress observations, schedule, and conduct the following formal observations to verify compliance with the specifications, giving the Landscape Architect at least 24 hours prior notice of readiness for observation.
- B. Plant Material: The Landscape Architect shall observe the plant material at site before planting for compliance with requirements for genus, species, variety, size, and quality.
- 1. If the Subcontractor requests, the Landscape Architect may observe plant materials at place of growth or storage. 2. The Subcontractor shall notify the Landscape Architect 72 hours in advance of when plant material is to be delivered and shall furnish an itemized listing of the actual quantities and size of plant materials to be observed at
- the point of delivery. 3. Landscape Architect retains the right to further observe plant material for size and conditions of balls and root systems, insects, injuries, and latent defects, and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected plants immediately from project site and replace at the Subcontractor's expense
- with approved materials. 4. Landscape Architect further retains the right for:
- a. Observation of labels and the condition of all items delivered to the site.
- b. Observation of any repairs or replacements necessary.
- c. Observe the staking for all trees and shrubs prior to planting. d. Observation of bed preparation prior to planting of trees and shrubs.
- e. Observation of plant material at end of plant warranty period.
- DELIVERY, STORAGE, AND HANDLING:
- A. Provide freshly dug trees and shrubs. Do not prune prior to delivery. Provide adequate protection of root systems and balls from drying winds and sun. Do not bend or bind-tie trees or shrubs in such a manner as to damage bark, break branches, or destroy natural shape. Provide protective covering during delivery. Do not drop balled and burlapped
- 3. Packaged Material: Deliver packaged materials to the site in their original container with all labels showing weight, analysis, and name of manufacturer intact and legible. Use all means necessary to protect all materials from deterioration before and during deliver, and while stored on site. Protect the installed work and materials of all other
- . Deliver plant material after preparations for planting have been completed, and plant immediately. If planting is delayed more than 6 hours after delivery, set trees and shrubs in shade, protect from weather and mechanical damage,
- and keep roots moist as follows:
- 1. Heel-in bare root stock. Soak roots in water for 2 hours if dried out. Set balled stock on ground and cover ball with soil, peat moss, sawdust or other acceptable material.
- 3. Do not remove container-grown stock from containers until planting time. 4. Periodically water root systems of trees and shrubs stored on site using a fine mist spray. Water as often as
- necessary to maintain root systems in a moist condition. Replacements: In the event of damage or rejection, immediately make all repairs and replacements necessary to the approval of the Landscape Architect and at no additional cost to the Owner.
- 1.07 JOB CONDITIONS:
- A. Utilities: determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand excavate, as required. Maintain grade stakes set by others until removal is mutually agreed upon by parties
- 3. Excavation: When conditions detrimental to plant growth are encountered, such as pebble fill, adverse drainage conditions, or obstructions, notify Landscape Architect before planting.

- C. Sequencing an Scheduling:
- 1. Planting Time: Proceed with, and complete landscape work as rapidly as portions of site become available, working within seasonal limitations for each kind of landscape work required.
- 2. All planting shall be performed during favorable weather conditions. The planting operations shall not be performed during times of extreme drought, when ground is frozen, or during times of other unfavorable climatic conditions unless otherwise approved by the Landscape Architect. The Subcontractor assumes full and complete
- responsibility for all such plantings and operations. 3. Dig, ball and burlap deciduous plants only when dormant (before March 15 and after October 15). Such plants may be planted at any time during the same year, subject to the other requirements of the specification.
- 4. Recommended dates for tree and shrub planting shall be March 15 May 31 and September 15 October 31st or as approved by the Landscape Architect. D. Plant trees and shrubs after final grades are established and prior to planting of lawns, unless otherwise acceptable to the
- Landscape Architect. If planting of trees and shrubs occur after lawn Work, protect lawn areas and promptly repair damage to lawns resulting from planting operations E. Correlate planting with specified maintenance periods to provide maintenance from date of Substantial Completion.

F. Coordination: All planting work shall be coordinated with all other work included in this contract and with work being

### 1.08 PROJECT WARRANTY:

done by others.

- A. General Warranty: Warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Subcontractor under requirements of the Contract Documents.
- B. Special Warranty: Warrant the following living planting materials for a period of one (1) year after date of Substantial Completion, against defects including death and unsatisfactory growth, except for defects resulting from lack of adequate maintenance, neglect, or abuse by the Owner, abnormal weather conditions unusual for warranty period, or incidents that are beyond the Subcontractor's control.
- Trees 2. Shrubs/Grasses/Vines
- 3. Perennials
- C. Immediately prior to plant warranty observation, the Subcontractor will be responsible for the removal of all staking material on site.
- D. Replacement Plants: The Subontractor shall replace once, without cost to Owner, and as soon as weather conditions permit, and within a specified planting period, all dead plants and all plants not in a vigorous, thriving condition as determined by the Landscape Architect during and at the end of the warranty period. The plants shall be free of dead or dying branches and branch tips, and shall bear foliage of a normal density, size, and color.
- E. Replacements shall closely match adjacent specimens of the same species. Replacements shall be subject to all requirements stated in the Specifications.
- F. The Subcontractor shall make all necessary repairs to other site and project features due to plant replacements. Such repairs shall be done at no cost to the Owner.
- G. Materials and Operations: All replacements shall be plants of the same kind and size specified in the plant schedule. They shall be furnished and planted as specified. The cost shall be borne by the Subcontractor. After Substantial Completion replacements resulting from the removal, loss, or damage due to occupancy of the project site by others, vandalism, or acts or neglect on the part of others, or physical damage by animals, may be approved and paid for by the

### PART 2 - PRODUCTS

### 2.01 GENERAL:

- A. Provide nursery-grown trees and shrubs, grown in a recognized nursery in accordance with good horticultural practice, with healthy root systems developed by transplanting or root pruning. Provide only healthy, vigorous stock grown under climatic conditions similar to conditions in the locality of the Project and free of disease, insects, eggs, larva, and defects such as knots, sun scald, injuries, abrasions, or disfigurement.
- B. Provide trees and shrubs of the sizes indicated in planting list and in accordance with dimensional requirements of ANSI Z60.1 for kind and size of trees and shrubs required. Trees and shrubs of larger size than indicated may be used if acceptable to Landscape Architect.
- C. Label each tree and shrub with a securely attached waterproof tag bearing legible designation of botanical and common
- D. Nomenclature: Scientific and common names used for plants are generally in conformity with "Standardized Plant
- Names." The names of varieties are generally in conformity with the names accepted in nursery trade.
- E. Plant material size and measurements shall conform to the "American Standard for Nursery Stock", ANSI Z60.1-1986. F. Digging, wrapping, and shipping:
- 1. Plants shall be dug up and prepared for shipment in a manner that will not cause damage to the branches, shape and future development of the plants after replanting. All plant material being transferred more than two miles shall be covered.

### 2.02 <u>TREES</u>:

- A. Trees shall not be pruned before delivery. Trees, which have a damaged or crooked leader or multiple leaders, unless otherwise specified, will be rejected. Trees with abrasion of bark, sunscalds, disfiguring knots, or fresh cuts of limbs over 1 inch in diameter which have not completely calloused will be rejected.
- 1. Plants shall be measured when branches are in a normal position. If a range of size is given, no plants shall be less than the minimum size and not less than 50% of the plants shall be as large as the upper half of the range specified. The measurements specified are the minimum size acceptable and are the measurements after pruning where pruning is required. Plants that meet the measurements specified, but do not possess a normal balance between
- height and spread will be rejected. 2. Plants shall be true to species and variety and shall conform to measurements specified in the Plant Schedule except that plants larger than specified may be used if approved by the Landscape Architect. Use of such plants shall not increase the contract price. If larger plants are approved, the ball of earth shall be increased in proportion to the size of the plant according to ANSI Z60.1-1986.
- B. Balled and Burlapped Plants:
- 1. All plants designated "B&B" in the Plant Schedule shall be adequately balled with firm natural balls of earth of a diameter and depth no less than that specified in ANSI 60.1-1986. Balls shall be firmly wrapped with burlap. All plants which are 2" in caliper or over shall be drum laced. No balled plants shall be planted if the ball is cracked or broken either before or during the process of planting.
- 2. Container grown plants will be acceptable in lieu of balled and burlapped deciduous plants subject to specified limitations of ANSI Z60.1 for container stock.
- C. Protection against drying: 1. Root balls shall be adequately protected at all times from sun and from drying winds. All balled and burlapped plants which cannot be planted immediately upon delivery shall be set on the ground and well protected with soil or
- other acceptable material. Plants shall not remain unplanted for longer than 3 days after delivery. D. Where shade trees are required, provide single stem trees with straight trunk and intact leader, free of branches to a point about 50% of their height for the size and kind of trees required.
- E. Where small trees of upright or spreading type are required, provide trees with single stem, branched or pruned naturally according to species and type:
- 1. Where indicated as "multi-stem," provide trees with three canes starting from the ground. F. Except as otherwise specified or indicated, provide bare root trees. Where indicated as "B&B," provide balled and
- 1. Container-grown trees will be acceptable in lieu of balled and burlapped deciduous trees, subject to the specified limitations for container stock.

### 2.03 SHRUBS & GRASSES:

- A. Provide shrubs of height and size indicated or specified.
- B. Provide with not less than the minimum number of canes required by ANSI Z60.1 for the type and height of shrub
- C. Except as otherwise specified or indicated, provide container grown shrubs.

# 2.04 CONTAINER PLANTS

A. Provide plants in containers as sized or specified.

D. Fertilizer applications shall be provided as follows:

- B. Plants shall show a vigorous root system, visible when container is removed.
- C. Root system shall not show excess signs of overgrowth.
- D. Plants shall appear healthy, with no broken limbs. Leaves shall appear full with no apparent sun or wind scald.

- A. Soil Mix: ASTM D 5268, pH range of 5.5 to 7, 4 percent organic material minimum, free of stones 1/2 inch or larger in any dimension, subsoil, clay lumps, roots, brush, weeds, weed seed, and other extraneous or toxic materials harmful to plant growth. Contents of the soil should contain no more than 15% Silt and 15% clay. Soil should also contain no less than 40% sand. Mix shall contain maximum soluble salts of 500 PPM.
- B. Soil Source: Reuse surface soil stockpiled on the site where available. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

### 2.06 SOIL AMENDMENTS:

- A. Spaghnum Peat Moss: Peat moss shall be Canadian Sphagnum Peat Moss, which is a light brown, fluffy material. Do
- not use hypnum, Michigan, or reed sedge peats. B. Commercial Fertilizer: Fertilizer shall be of the grade, type and form specified below and shall comply with the rules of the local governing authority and the following requirements:
- 1. The grade of fertilizer will be identified according to the percentage of nitrogen (N), percent available phosphoric acid (P2O5) and percent water soluble potassium (K2O), in that order and approval will be based on that identification.
- 3. Fertilizer shall be furnished in dry form. 4. Fertilizer may be either homogenized or natural organic with at least 25 percent of the total nitrogen in a slow-release form.
- 5. Deliver fertilizer in original, unopened and undamaged containers showing weight, analysis and name of manufacturer. Store in manner to prevent wetting and deterioration.

2. Fertilizer shall be of a type that can be uniformly distributed either by hand or application equipment.

- 1. For trees and shrubs: Fertilizer shall be Agriform 20-10-5 Planting Tablets or approved equal, and shall be
- incorporated according to the manufacturer's directions and at the following rates: a. Trees: Use 1 21-gram tablet for each 1/2-inch of trunk diameter for each foot of height or spread. Insert 21-gram
- b. Shrubs: Use 1 to 2 tablets for each 1 foot of height or spread of shrubs and large perennial grasses.

### 2.07 MISCELLANEOUS MATERIALS:

- A. Steel Edging: Commercial steel edging fabricated in sections with loops pressed from or welded to face to receive stakes. Edging to be Col-Met Steel Landscape Edging (or approved equal), Collier Metal Specialties, Inc., Atlanta, GA., 1-800-829-8225; 1/8" thick x 4" wide x 10' lengths, hot rolled low carbon steel (ASTM-A-36, ASTM-A-283, ASTM-A-569), treated with rust preventative and factory finished, (submit sample). Provide minimum 12" integral anchor stakes.
- B. Shredded hardwood mulch: Double ground aged brown hardwood mulch.
- C. Tree Wrap: Material used in wrapping tree trunks shall be waterproof crepe paper or burlap strips as made and sold for this purpose and shall not be less than 4" or more than 8" wide having qualities to resist insect infestation. Twine for tying shall be a lightly tarred medium or coarse sisal yarn or approved equal.
- D. Pre-Emergent Herbicide. Provide pre-emergent herbicide Pre M 60 DG (granular). The Landscape Architect will consider an "equivalent" of the brand name specified. Provide the Landscape Architect with a complete description, literature, test reports, etc. on the proposed "equivalent". The burden of proof regarding the "equivalent" is upon the Subcontractor. The Landscape Architect will accept the pre-emergent herbicide based on brand name and visual inspection for condition.
- E. Tree Stakes and Guys: 1. All trees shall be staked with a minimum of 2 metal "T" posts. Stakes shall be approximately 2" wide and 6-6.5 feet long. Stakes are to be driven a minimum of 2 feet into undisturbed stable earth.
- 2. Tree Ties: An acceptable tree tie is one that is easily adjustable, strong in all weather, and is easily attached and removed. Hose and wire are not acceptable for staked trees. Provide the following or approved equal: a. "Cinch Ties"
- b. "Adj.-A-Tye". Heavy weight only, a plastic chain twist tie, OR "Plastic Binder Tye", tie with tapered beads that
- c. Other tree tying materials may be accepted upon submitting a sample, product information, and plant tying methods to the Landscape Architect for approval.
- F. Water: Upon request of the Subcontractor, the Owner may approve the use of water from existing hydrants or working irrigation system for this work. The Owner may pay for the cost of the water. The Subcontractor shall provide all needed hose, sprinkler heads and other appurtenances. If the Subcontractor provides his own water, it shall not contain material injurious to plant growth.
- G. Anti-Erosion Mulch: Provide clean, dry straw of winter wheat, rye, oats, or barley.
- H. Anti-Desiccant: Emulsion type, film-forming agent designed to permit transpiration, but retard excessive loss of moisture from plants. Deliver in manufacturer's fully identified containers and mix in accordance with manufacturer's instructions
- I. Biostimulant: The Subcontractor shall utilize an organic, biological fungi for soil prep. The material shall be granular and applied per manufacturer's recommendation. Myke Mycorrhizae or approved equal.
- J. All other materials, not specifically described but required for a complete and proper installation or construction, shall be as selected by the Subcontractor subject to the approval of the Landscape Architect.

### PART 3 - EXECUTION

# 3.01 SURFACE CONDITIONS

- 1. Prior to all landscape installation, carefully inspect the installed work of all other trades and verify that all such work
- is complete to the point where this installation may properly commence. Weeds that have emerged or persisted shall be removed or eradicated.
- 3. Verify that planting may be completed in accordance with the original design and the referenced standards. B. Discrepancies:
- 1. In the event of discrepancy, immediately notify the Landscape Architect. 2. Do not proceed with installation in areas of discrepancy until all such discrepancies have been fully resolved.

### 3.02 PREPARATION FOR PLANTING OF TREES, SHRUBS AND PLANT BEDS:

- 1. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to
- 2. Loosen subgrade of planting areas to a minimum of 8 inches.
- 3. Mix soil amendments and fertilizers with topsoil at rates indicated. Delay mixing fertilizer if planting does not follow placing of planting soil within two (2) days.
- 4. Grade planting areas to a smooth, uniform surface place with loose, uniformly fine texture. Roll, rake and remove ridges/depressions to meet finish grades.
- 5. Schedule of Plantings Soil Mixture Requirements

a. For planting beds, provide not less than the following quantities of specified materials:

- (1) Loose peat humus by volume: 1part (2) Well-rotted composted manure by volume: 1 part
- (3) Topsoil (as defined in this specification): 2 parts (4) Fertilizer: Incorporate 3 lbs/100sf
- b. For backfill for trees provide specified materials in not less than the following quantities:
- (1) Loose peat humus by volume: 1 part (2) Well-rotted cow manure by volume: 1 part
- (3) Topsoil (as defined in this specification): 3 parts
- (4) Place Agriform tablet (or approved equal) in bottom of tree pit.
- B. Unless directed by the Landscape Architect, the indication of a plant on the Planting Plan is to be interpreted as including the prepping the landscape bed, digging of a hole, furnishing of a plant of the specified size, the work of planting, wrapping and other activities where called for.
- C. Planting Coordination: 1. Consult the Plant Schedule for type and size of plants.
- 2. The Subcontractor shall be responsible for selection and tagging at nurseries stocking the specified materials. 3. Subcontractor shall inform the Landscape Architect three (3) days in advance of when planting will commence, and of anticipated delivery date of material and will furnish an itemized listing of actual quantities of plant materials to be delivered. Failure to notify the Landscape Architect in advance, in order to arrange proper scheduling, may result
- in loss of time or removal of any plant or plants not installed as specified or directed. D. Plant Location Staking:
- 1. The Subcontractor shall stake on the ground the beginning and ending points of all straight rows of plant materials. Rows will be parallel to adjacent walks, walls, or curbs.
- 2. The Subcontractor will stake locations of each plant in all random arrangements of plant materials (with the exception of groundcovers, and annual and perennial flowers) or may set the plants in their intended location, according to the arrangements shown on the plans. 3. The Landscape Architect will observe all plant locations. The Subcontractor shall not begin excavating plant pits
- until plant locations have been approved. 4. In case underground obstruction or utilities are encountered, locations shall be changed under the direction of the

### Landscape Architect without extra charge to the Owner. 3.03 EXCAVATION FOR TREES AND SHRUBS

- A. Holes for trees and shrubs shall be per the detail. Thoroughly spade slice the walls and the floor of all planting pits. B. Testing Plant Materials Holes: If stone, underground construction work, tree roots, poor drainage or obstructions are encountered in the excavation of plant pits, alternate locations may be selected by the Landscape Architect. Where
- locations cannot be changed as determined by the Landscape Architect, submit cost required to remove the obstructions to a depth of not less than 6 inches below the required pit depth. C. Excavate pits, beds, and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage. Loosen hard subsoil in bottom of excavation:
- 1. For bare-root trees and shrubs, make excavations as detailed.
- 2. For balled and burlapped trees and shrubs, make excavations as detailed. 3. For container grown stock, excavate as specified for balled and burlapped stock, adjusted to size of container width
- 4. Obstructions: If rock, underground construction, or other obstructions are encountered in excavation for planting of trees or shrubs, notify Landscape Architect. New locations may be selected by Landscape Architect, or Change Order may be issued to direct removal of obstructions to depth of not less than 6 inches below required planting

### 3.04 TREE & SHRUB PLANTING

A. Before mixing, clean topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful or toxic to

1. Set balled and burlapped stock on layer of compacted planting soil mixture, plumb and in center of pit or trench with

top of ball at same elevation as adjacent finished landscape grades. Remove burlap from sides and tops of balls, but

do not remove from under balls. When set, place additional backfill around base and sides of ball, and work each

layer to settle backfill to eliminate voids and air pockets. When excavation is approximately two-thirds full, water

- B. Mix soil amendments and fertilizers with topsoil. Delay mixing of fertilizer if planting will not follow placing of planting soil within a few days.
- C. For pit- or trench-type backfill, mix planting soil prior to backfilling and stockpile at site. D. Setting and Backfilling:
- thoroughly before placing remainder of backfill. Repeat watering until no more is absorbed. Water again after placing final layer of backfill. 2. Set container grown stock as specified for balled and burlapped stock, except cut cans on two sides. Carefully remove containers so as not to damage root balls.
- 3. Move or set large specimen trees with crane or other recognized tree moving equipment.

- 4. Plant Pits
- a. Around the perimeter of the plant pit, build a watering saucer 4 inches above the crown of the plant and shape and slope the surface away from the top of the saucer, approximately 18 inches wide down to existing grade.
- b. Treat entire plant pit or bed with Treflan in accordance with manufacturer's recommendations. 6. Mulching: Apply the specified mulch to a depth as shown on plans, evenly spread over the entire area of each soil
- basin or plant bed area. 7. Apply antidesiccant using power spray to provide an adequate film over trunks, branches, stems, and twigs for foliage. If deciduous trees or shrubs are moved in full-leaf, spray with antidesiccant at nursery before moving and
- again 2 weeks after planting. 8. Prune, thin out, and shape trees and shrubs in accordance with standard horticultural practice. Prune shrubs to retain
- natural character and accomplish their use in the landscape design. Required shrub sizes indicated or specified are
- 9. Remove and replace excessively pruned or misformed stock resulting from improper pruning.
- 10. Paint cuts over 13 mm (1/2 inch) in size with standard tree paint or compound, covering all exposed, living tissue. Use paint which is waterproof, antiseptic, adhesive, elastic, and free of kerosene, coal tar, creosote, and other
- substances harmful to plants. Do not use shellac. 11. Guy and stake trees immediately after planting and as indicated.
- 12. Wrap tree trunks of 50-mm (2-inch) caliper and larger. Start at ground and cover trunk to height of first branches and securely attach. Inspect tree trunks for injury, improper pruning, and insect infestation. Take corrective measures required before wrapping.

# 3.05 PERENNIALS/ANNUAL PLANTING:

- A. Prepare soil as stated in section 3.02
- B. Set out and space plants in triangular spacing as shown in plan
- C. Dig holes large enough to allow for spreading of roots D. Work soil around roots to eliminate air pockets
- E. Water thoroughly after planting F. Apply shredded hardwood mulch over the entire area of each plant bed location using caution to not cover, bend, break

### or smother newly installed plants. 3.06 INSTALLATION OF MISCELLANEOUS MATERIALS

- A. Shredded Hardwood Mulch: 1. Apply shredded hardwood mulch over the entire area of each soil basin, on all exposed soil surfaces within the
- perimeter of groupings or rows of trees or shrubs.
- 2. The Subcontractor shall determine his own quantities based on the area, the work and site investigations.
- 3. Provide a minimum depth per plans for all trees and shrubs. B. Edging: Install specified edging at the locations indicated on the plans.
- 1. Trenched Edge shall be dug to 8" Depth and 8" Width 2. Backfill Trenched Edge with shredded hardwood mulch to grade.

## 3. Steel Edging per manufacture's recommendations.

- 3.07 MAINTENANCE: A. Begin maintenance immediately after planting. Maintenance shall continue until time of Substantial Completion, but in
- no case for less than a period of 90 days after Substantial Completion. B. Maintain trees and shrubs by pruning, watering, cultivating, mulching, and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and guy supports and reset trees and shrubs to proper grades or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free from disease and insects. Plants shall be inspected at least once per week by the Subcontractor and needed maintenance
- C. Remove and replace trees and shrubs found to be dying, dead, or in unhealthy condition during the warranty period. Make replacements during the growth season following end of warranty period. Replace trees and shrubs which are in doubtful condition at end of warranty period.

### 3.08 CLEAN-UP AND PROTECTION

- A. During landscape work, keep pavements clean and work area in an orderly condition. Properly dispose of all resultant dirt, debris, and other waste material.
- B. Protect landscape work and materials from damage due to landscape operations, operations by other subcontractors and trades, and trespassers. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged landscape work as directed by the Landscape Architect at no additional cost, unless damage is the result of
- C. Disposal of Surplus and Waste Materials: Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of it off the Owner's property. 3.09 OBSERVATION AND ACCEPTANCE
- A. When landscape work is completed, including maintenance, Landscape Architect will, upon request, make an observation to determine acceptability. 1. Landscape work may be observed for acceptance in portions as agreeable to Landscape Architect, provided each portion of work offered for observation is complete, including maintenance.

B. When observed landscape work does not comply with requirements, replace rejected work and continue specified

maintenance until approved by Landscape Architect and found to be acceptable. Remove rejected plants and materials promptly from project site. C. Trees, shrubs, groundcover, and all other specified plants are to be inspected to certify that all plants have been installed according to plans and are acceptable. Upon satisfactory completion of all replacements and repairs requested, Landscape Architect shall certify granting of Substantial Completion. The warranty will begin on the date of Substantial Completion. Subcontractor to continue maintenance of all plants for 90 days following Substantial Completion. Final Acceptance will be granted after all maintenance periods have ended. At end of twelve (12) month warranty period, Landscape Architect will inspect plants upon written request by Subontractor. Any plant that is dead,

Owner. The Subcontractor will not be responsible for vandalism or theft.

or not in satisfactory health as determined by the Landscape Architect will be replaced by the Subs at no cost to the

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B. Native Seed: Delilver packaged materials in containers showing weight, analysis and name of manufacturer. Protect materials from 2.6 FERTILIZER (Turfgrass only, do not fertilize Native Seed areas)

A. Planting Season: Install sod during normal planting seasons for type of lawn work required. Correlate planting with specified maintenance periods to provide required maintenance from date of Substantial Completion. B. Native Seed Planting Season: Spring Planting Season: April 1st - June 1st; Dormant Planting Season: December 15th - March 31st.

Planting at any other time will require the use of a cover crop to be approved by Owner or Landscape Architect.

C. Weather Limitations: Proceed with work only when existing and forecast weather conditions are suitable for work.

A. Lawns/turf areas: Begin maintenance of turfgrass immediately after each area is planted and continue until acceptable establishment but for no less than the following periods:

1. Sodded Lawns: 90 days after date of Substantial Completion. 2. Seeded Lawns: 90 days after date of Substantial Completion

3. Native Grass Areas: 12 Months after date of Substantial Completion.

B. Maintain and establish lawns by watering, fertilizing, weeding, mowing, trimming, replanting and other operations per this Specification

C. Watering- Subcontractor shall be responsible of watering the sod as required by this Specification. Subcontractor may use irrigation system to accomplish watering. Subcontractor shall be responsible for coordinating with irrigation contractor for scheduling of irrigation system to provide required water needs.

D. Post-fertilization: Apply fertilizer to lawn after first mowing and when grass is dry.

PART 2 -PRODUCTS

2.1 TOPSOIL

A. Standard Topsoil: ASTM 5268, pH range 5.5 to 7. Free of stones 1 inch or larger in any dimension, and other extraneous materials

B. Compost Soil Blend: As located in plan, areas denoted as Compost Soil Blend shall be provided as 50% Standard Topsoil or Native Topsoil and 50% Compost for a depth of 12". pH range shall be 5.5 to 7.

1. Topsoil Source: Reuse surface soil stockpiled on the site where available. Verify suitability of surface soil to produce topsoil meeting requirements and amend when necessary. Supplement with imported topsoil when quantities are insufficient. Imported topsoil shall meet the requirements of this specification for composition. Clean all topsoil of roots, plants, sods, stones, clay lumps, and other extraneous materials harmful to plant growth.

2. Compost Soil Blend shall have a minimum infiltration rate between 0.25" to 0.5" per hour.

2.2 LIMITED SOIL AMENDMENTS

A. Herbicides: EPA registered and approved, of type recommended by manufacturer and approved by the Landscape Architect.

B. Compost: Well-composted, stable and weed-free organic matter, pH range of 5.5-8; moisture content 35-55 percent by weight; 100 percent passing through 3/4-inch sieve; soluble salt content less than 4 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings.

2.3 SOD

C. Water: Potable.

A. Sod: Certified turfgrass sod complying with ASPA specifications for machine-cut thickness, size, strength, moisture content, and mowed height, and free of weeds and undesirable native grasses. Provide viable sod of uniform density, color, and texture of the following turfgrass species, strongly rooted, and capable of vigorous growth and development when planted.

1. Species: Provide sod of grass species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on the following Schedule. The seed used will be of gold tag quality.

2. If gold tag is not available then seed must be of the highest quality blue tag certified available.

3. Landscape Architect has final approval, no exceptions.

4. All Turf-Type Fescues shall have a minimum 70% average endophyte level.

5. Sodded lawn areas to have a blend of 90% Turf-Type Tall Fescue and 10% Kentucky Bluegrass or approved equal.

B. Provide sod in uniform thickness of 16 mm (5/8-inch), plus or minus 6 mm (1/4-inch), measured at time of cutting and excluding top growth and thatch. Strips shall be of supplier's standard size of uniform length and width with maximum 5% allowable deviation in either length or width. Broken or torn pads, or pads with uneven ends are not acceptable.

C. Sod pads shall be capable of supporting their own weight and retaining size and shape when pad is suspended vertically from a firm

D. Handle sod with care to prevent loss of native soil from roots.

2.4 GRASS SEED:

A. Provide fresh, clean, new crop seed complying with tolerance for purity and germination established by Official Seed Analysts of North America and as required below.

B. Be labeled according to the U.S. Department of Agriculture Federal Seed Act and shall be furnished in containers with tags showing seed mixture, purity, germination, weed content, name of seller, and date on which seed was tested.

C. Seed Mix: 10% Bluegrass & 90% Turf-Type Tall Fescue, composed of an equal mix of three or four compatible species of bluegrass

1. Fescue Varieties, or approved equal

Apache, Arid, Austin, Bonanza, Carefree, Cheiftan, Cimmaron, Cochise, Falcon, Guardian, Houndog, Jaguar II, Maverick II, Mustang, Olympic, Phoenix, Rebel II, Rebel 3D, Safari, Shenandoah, Thoroughbred, Titan, Tribute, Vegas

and one or two species of fescue. The mixture shall not include any varieties of the slower growing "Dwarf" fescue types.

2. Bluegrass Varieties, or approved equal Asset, Kenblue, Midnight, Nassau, Ruby II, Troy

3. Moldy seed or seed that has been damaged in storage shall not be used.

4. Engineer shall have final approval of all seed blends and mixtures.

D. Cover Crop: As approved by Landscape Architect, Contractor shall submit mix for approval 2.5 NATIVE GRASSES (When Required by Plan)

A. Fresh, clean, dry, pure-live seed complying with Kansas Department of Agriculture laws for purity, germination, and noxious weed

1. Seed Components: Provide seed of grass and forb species and varieties, proportions by weight, and minimum percentages of purity, germination, and maximum percentage of weed seed as indicated on Schedules at the end of this Section. Seed lots, unblended, shall be provided to horticulturist in original unopened containers for agro-histological determination and re-testing. The Master label shall be produced by the horticulturist, and shall be sealed according to the appropriate laws and regulations

2. All seed must be tested by a registered seed technologist per AOSA methods and meet all requirements established by the Department of Agriculture. The contractor will provide documentation with the seed shipment for the following information;

a. State of Origin

b. Year of Harvest c. Genus species Identification

d. Seed Lot # e. Packaged Quantity

f. Identification of Seed Supplier g. Supplier Certification Number

h. State of Supplier Registration i. Percent PLS Per Seed Lot i. Percent Germination

k. Percent Hard Seed 1. Percent Foreign Matter

m. Percent Weed Seed n. Identification of Noxious Weed Seed o. Date of Seed Testing

p. Identification of Seed Testing Company 3. All native seed shall be primed for improved germination.

4. Landscape Architect has final approval, no exceptions.

5. Seed Source: Shall be submitted to Landscape Architect for approval B. Detention Basin Seed Mix: 9.44 lbs / Acre

Detention Basin Seed Mix by Prairie Moon Nursery (or Approved Equal). Ph. 866-427-8156

C. Native Seed Cover Crop

1. The use of a Cover Crop to help with the establishment of Native Grasses shall be approved by the Landscape Architect prior to use. Contractor shall submit Cover Crop seed mixes prior to installation.

D. Commercial fertilizer of neutral character, with some elements derived from organic sources, containing not less than 4 lbs. of actual nitrogen per 1,000 square feet of lawn area. Provide nitrogen in form that will be available to the lawn under the following products or approved equal. During the maintenance period the following fertilizers shall be used or approved equal:

1. Starter Fertilizer: Dyna Green Starter 12-20-06 with Fertil Blend. Total nitrogen: 7.83% ammoniacal, 4.17% urea; Phosphate Ammonium phosphate 20%; Potash MOP: 6%; Iron: 1%; SGN 200

2. Spring Fertilizer Dyna Green Long Lasting 22-0-8 with 50% UMAXX, 1,757% Viper & Fertil Blend. Total nitrogen: 22% urea with slowly available nitrogen from 50% UMAXX®; Potash MOP: 8%; Iron: 1%; SGN 200. Apply March to June.

3. Fall Fertilizer: Dyna Green Winterizer 18-0-9 with 1.434% Surge & Fertil Blend. Total nitrogen: 18% urea; Potash MOP: 8%; Iron: 1%; SGN 200. Apply September to October.

B. Deliver to site in labeled bags or containers.

2.7 MYCORRHIZAL INOCULANT

A. The Subcontractor shall utilize an organic, mycorrhizal inoculant for soil prep. The material shall be granular and applied per manufacturer's recommendation. M-Roots w/ Mycorrhiza or approved equal. For exact finish, insert names of coating manufacturers 3.8 PROTECTION: and products.

2.8 STRAW MAT

A. Provide a biodegradable single net, two sided organic straw mat with functional longevity of 10-12 months by Greenfix Amerca, 3.9 MAINTENANCE (SEED & SOD):

Product WS072 Double Net Straw or Approved Equal.

B. Utilize Straw Mat within Native Seed areas on slopes greater than 4:1.

3.1 EXAMINATION

A. Examine areas to receive lawns for compliance with requirements and for conditions affecting performance of work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities, trees, shrubs, and plantings from damage caused by planting

B. Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways

3.3 SOIL PREPARATION A. Dispose of any growth, rocks, or other obstructions which might interfere with tilling, seeding, sodding, or later maintenance

operations. Remove stones over 38 mm (1\_1/2 inches) in any dimension and sticks, roots, rubbish, and other extraneous matter.

B. Thoroughly loosen and pulverize topsoil to a depth of at least 100 mm (4 inches) for all standard turfgrass areas. Areas denoted as "Compost Soil Blend", shall be loosened and amended to a depth of 12 inches

C. Grade lawn areas to a smooth, even surface with loose, uniformly fine texture. Roll and rake, remove ridges and fill depressions to meet finish grades. Limit fine grading to areas which can be planted within immediate future. D. Moisten prepared lawn areas before planting if soil is dry. Water thoroughly and allow surface to dry off before planting of lawns.

Do not create a muddy soil condition. E. Restore prepared areas to specified condition if eroded or otherwise disturbed after fine grading and prior to planting.

F. Spread top soil mixture to depth required to meet thickness, grades, and elevations indicated after light rolling and natural settlement. G. Allow for sod thickness in areas to be sodded

1. Remove and dispose of existing grass, vegetation, and turf. Do not turn over into soil being prepared for lawns. 2. Till surface soil to a depth of at least 6 inches. Apply required soil amendments and initial fertilizers and mix thoroughly into

top 4 inches of soil. Trim high areas and fill in depressions. Till soil to a homogenous mixture of fine texture.

grading, or stripping operations, prepare soil for lawn planting as follows:

3. Clean surface soil of roots, plants, sod, stones, clay lumps, and other extraneous materials harmful to plant growth. 4. Remove waste material, including grass, vegetation, and turf, and legally dispose of it off the Owner's property

3.4 SEEDING NEW LAWNS:

B. Sow seed with a Brillion type seeding machine or where applicable and restricted by steep slopes or other areas not accessible to the seeding machine, broadcast or drop seed methods may be used. Do not broadcast or drop seed when wind velocity exceeds 5 mph. Evenly distribute seed by sowing equal quantities in 2 directions at right angles to each other, and 3 directions in high maintenance areas, as directed by the Engineer.

C. Sow not less than rate of 4 pounds per 1,000 square feet.

D. Rake seed lightly into top 1/8\_inch of soil, roll lightly, and water with fine spray.

A. Do not use wet seed or seed which is moldy or otherwise damaged in transit or storage.

E. Rake seed lightly into top 1/8 inch of topsoil, roll lightly, and water with fine spray.

F. Protect seeded slopes exceeding 1:6 against erosion with erosion-control blankets installed and stapled according to manufacturer's recommendations G. Protect seeded areas with slopes less than 1:6 against erosion by spreading mulch as specified after completion of seeding operations.

Spread uniformly to form a continuous blanket over seeded areas. Spread by hand, blower, or other suitable equipment.

H. Protect seeded areas against hot, dry weather or drying winds by applying peat mulch within 24 hours after completion of seeding operations. Soak and scatter uniformly to a depth of 3/16 inch thick and roll to a smooth surface.

I. Seasonal Limitations:

1. Perform seeding only during the following seasons:

a. Fall Seeding: September 15th to October 1st. b. Spring Seeding: March 15th to May 15th

c. Recommend seeding when temperatures ranging from 50 degrees Fahrenheit to 70 degrees Fahrenheit for a minimum 6 week period.

J. Methods of Application:

1. Dry Seeding: Spreader or seeding machine.

the soil will not be required.

2. Hydroseeding: Mix seed, fertilizer and pulverized mulch with water and constantly agitate. Do not add seed to water more than 4 hours before application:

a. On slopes of 2 horizontal to 1 vertical or flatter, apply seed separately from fertilizer. Cover seed with soil to an average depth of 13 mm (1/2 inch) by raking or other approved methods. b. On slopes steeper than 2 horizontal to 1 vertical, seed and fertilizer may be applied in a single operation. Incorporation into

3.5 SODDING NEW LAWNS

A. Do not place sod during a drought or during the period from June 15 to September 15, except as authorized by the Landscape

B. Lay sod within 24 hours from time of stripping. Do not lay dormant sod or if ground is frozen.

C. Sod shall be moist at the time it is placed.

D. Lay sod strips along contour lines, by hand, commencing at the base of the area to be sodded and working upward:

1. Carefully lay sod to produce tight joints. Butt ends and sides of sod strips; do not overlap.

2. Stagger transverse joints of sod strips.

3. Work from boards to avoid damage to subgrade or sod.

4. Tamp or roll lightly to ensure contact with subgrade. Work sifted soil into minor cracks between pieces of sod, removing excess to avoid smothering adjacent grass.

E. Water sod with fine spray immediately after planting. During first week, water daily or more frequently as necessary to maintain moist soil to depth of 100 mm (4 inches).

3.6 RECONDITIONING LAWNS:

A. Recondition lawn areas damaged by construction operations, including storage of materials or equipment and movement of vehicles. Also recondition lawn areas where settlement or washouts occur or where minor regrading is required. Recondition other existing lawn areas where indicated.

B. Provide fertilizer, sod, and soil amendments as specified for new lawns and as required to provide satisfactorily reconditioned lawn. Provide new planting soil as required to fill low spots and meet new finish grades.

C. Cultivate bare and compacted areas thoroughly to provide a good, deep planting bed.

D. Remove diseased or unsatisfactory lawn areas; do not bury into soil. Remove topsoil containing foreign materials resulting from Subcontractor's operations including oil drippings, stone, gravel, and other construction materials. Replace with new topsoil.

E. Where substantial lawn remains (but is thin), mow, rake, aerate if compacted, fill low spots, remove humps and cultivate soil. fertilize, and seed. Remove weeds before seeding or, if extensive, apply selective chemical weed killers as required. Apply a seed-bed mulch, if required, to maintain moist condition.

F. Water newly planted areas and keep moist until new grass is established.

3.7 SEEDING COVER CROP & NATIVE GRASSES:

A. Sow seeds using seed drill (Truax-type) that accurately meters the seed types and mixes all seeds uniformly during seeding. It should have, at the minimum, two seed boxes to separate fine seeds from large/fluffy seeds. This seed drill should also be equipped with disc furrow openers and a no-till trash plow assembly, which will compact the soil directly over the drill rows. The maximum row spacing for drill seeding should be 8 inches. Fine seeds shall be dropped onto the ground from the fine seed box, while large/fluffy seed should be placed to obtain final planting depth of 1/4-1/2". The path of the drill seeding shall be done at a right angle to that of the drainage patterns.

1. Do not use wet seed or seed that is moldy or otherwise damaged in transit or storage.

B. Protect all native grass areas on slopes 4:1 and greater using straw mat erosion control blanket installed and stapled according to manufacturer's recommendations

A. Erect barricades and warning signs as required to protect newly planted areas from traffic. Maintain barricades throughout maintenance period until lawn is established.

A. Mow grass to a height of 3 inches as soon as there is enough top growth to cut with mower. Remove no more than 30% of grass leaf growth in initial or subsequent mowings. Do not delay mowing until grass blades bend over and become matted.

B. Remove weeds by pulling or chemical treatment.

C. Perform maintenance throughout the 90 day maintenance period.

1. Thoroughly water daily for a period of 15 days after placing and to a minimum of 1-inch per week thereafter.

2. Maintain sod in good live condition. Replace any sod not in good growing condition with fresh live sod. 3. Water thoroughly whenever sod evidences excessive drying.

E. Seeded Areas:

1. Thoroughly water seeded areas daily to keep seeds moist until germination. After seeds have germinated, continue watering daily until the first mowing. Watering shall be in amounts enough to wet seeds and surrounding soil, but not cause erosion or disposition of seeds.

F. Apply second fertilizer application after first mowing and when grass is dry. Use fertilizer which will provide not less than 1 lbs of actual nitrogen per 1,000 square feet of lawn area.

2. Repair any portion of the seeded surface which becomes gullied or otherwise damaged. Reseed as required.

3.10 MAINTENANCE (NATIVE GRASSES) (When Required by Plan) A. Begin maintenance of native grass areas immediately after each area is planted and continue until established and accepted, but for not less than the following periods:

B. Native grass: 12 MONTHS after date of Substantial Completion

1. The Installer shall be responsible for the proper care until verification that all plant materials are present in the density and health to ensure self-maintenance.

2. Maintain and establish native grasses by mowing, weeding, trimming, replanting, and other operations as stated below. Re-grade

erosion rills, replant bare or eroded areas, and re-mulch to produce a uniform prairie H. Preparation of Unchanged Grades: Where lawns are to be planted in areas that have not been altered or disturbed by excavation, 3.11 ACCEPTANCE OF LAWNS:

> A. When lawn Work is Substantially Complete, including maintenance, Landscape Architect and Owner will, upon request, make an inspection to determine acceptability

> 1. Lawn Work may be inspected for acceptance in parts agreeable to Owner, provided Work offered for inspection is complete, including maintenance.

B. Replant rejected work and continue specified maintenance until re-inspected by Landscape Architect and Owner and found to be

C. Sodded lawns will be acceptable provided requirements, including maintenance, have been complied with and healthy, well-rooted, even-colored, viable lawn is established free of weeds, open joints, bare areas, and surface irregularities.

D. Native Grass Stands (When Required by Plan)

1. An acceptable native grass stand will contain no less than 5 healthy mature or developing plants per square foot with a population distribution per 10,000 square feet representative of ratios in the original blend. The result of maintenance shall be that weeds are being controlled through competition with the desired plants, and that mowed bio-mass is not accumulating in such a manner to be detrimental to existing plant materials as determined by the Landscape Architect.

2. An acceptable native grass stand shall control erosion through root mass development. The occurrence of rills and gullies shall be unacceptable.

3.11 CLEANUP:

A. Promptly remove soil and debris created by lawn Work from paved areas. Clean wheels of vehicles prior to leaving Site to avoid tracking soil onto surfacing of roads, walks, or other paved areas.

END OF SECTION 329200

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a. Shape: Box and cover, with open bottom and openings for piping; designed for installing flush with grade. Include size as required for valves and service

b. Sidewall: PE, ABS or FRP

c. Cover Material: PE, ABS or FRP, Green in color

4. Drainage Backfill: Cleaned gravel or crushed stone, graded from 3/4"-inch minimum to 1 inch maximum.

2.06 SPECIALTY VALVES:

A. Quick-Couplers: Factory-fabricated, brass, two-piece assembly. Include coupler water-seal valve; removable upper body with spring-loaded or weighted, locking rubber-covered cap; hose swivel with ASME B1.20.7, 3/4-11.5NH threads for garden hose on outlet; and operating key.

1. Locking-Top Option: Vandal-resistant, single-lug locking feature. Include two matching keys.

2. Manufacturers:

a. 33DLRC by Rain Bird Sprinkler Mfg. Corp. b. 075-SLVC by The Toro Company

c. Approved equal.

2.07 CONTROLLER

A. Existing controller may be used if space and functions allow. Irrigation contractor shall verify the existing controller for location, space and scheduling requirements prior to shop drawing approval

B. If required, Controller shall be provided meeting the following requirements.

1. Shall include a base unit with expansions slots to accommodate zones required for working system.

2. Shall be capable of operating two 24 VAC solenoid valves per zone plus a mater valve.

3. Shall operate on 120VAC +/- 10% at 60Hz

4. Shall be capable of providing watering cycles by day of week, odd, even and cyclic.

5. Shall have a display capable of displaying each zones schedule start days and watering windows in the same screen with active watering schedule notification

6. Shall have 12-hour AM/PM or 24 hour clock with a midnight day change over 7. Shall have 365 day calendar backed up against power interruptions by an internal lithium battery that will maintain date

and time for 10 years. Shall provide notification of lost power. 8. Shall be capable of communicating with the existing on-site weather sensor that measure site temperature and rainfall.

9. Controller shall have programmable rain shut off threshold

10. Shall be capable in running off time based program or ET based programming

11. The controller shall be EPA WaterSense labeled

12. Shall offer manual watering of all zones 13. Controller shall be capable of being located in the same location as the existing location.

a. Rainbird

b. Approved Equal

2.08 CONTROL WIRE (REMOTE VALVE TO CONTROLLER)

A. General: UL 493, Type UF, single conductor, with solid-copper conductor and PE insulation; suitable for direct burial

1. Low-Voltage, Branch-Circuit Cables: No. 14 AWG minimum, between controllers and automatic control valves; color coded per the following

a. Common Wire - White

b. Control Wire - Red

c. Spare Common Wire - Green d. Spare Control Wire - Blue

2. Splicing Materials: Manufacturer's packaged kit consisting of insulating, spring-type connector or crimped joint and epoxy resin moisture seal; suitable for direct burial

3. Each wire path shall be grounded using a Rain Bird MSP-1 surge protector, or approved equal

4. All connectors shall be 3M DBR connectors only

2.09 RAIN/TEMPERTURE SENSOR

A. Automatic rain shutoff sensor shall be capable of sensing precipitation/temperature and interrupting irrigation during rain and low temperature events.

B. All sensors shall be capable of interfacing with approved controller.

C. Contractor shall field locate for optimum performance. Location shall be approved prior to installation.

2.10 MISCELLANEOUS SPRINKLER EQUIPMENT:

A. Valve Identification Tags: Pre-printed plastic tags with minimum text height of 1 inch, capable of being attached to valve stem or valve wire within valve box.

B. Gravel: Clean washed gravel 3/4" nominal diameter.

2.11 POINT OF CONNECTION

A. Irrigation Contractor shall be responsible for providing all point of connection taps, back flow devices, valves, vaults &

B. Irrigation Contractor shall show in the provided shop drawings the point of connection for approval.

C. Irrigation Contractor shall provide a Master Valve for the proposed irrigation system.

PART 3 - EXECUTION 3.01 GENERAL:

A. Install piping and wiring in sleeves under sidewalks, roadways, and parking lots.

1. Install piping sleeves by boring or jacking under existing paving if possible. No open cutting of pavement shall be

2. Irrigation Contractor shall coordinate sleeve locations under new construction during early construction stages to avoid boring where possible; Refer to Sheet LS200 for sleeve locations.

B. Provide minimum cover over top of underground piping according to the following:

1. Irrigation Main Piping: Minimum depth of 18 inches below finished grade to top of pipe.

2. Circuit (Lateral) Piping: Minimum depth of 12 inches below finished grade to top of pipe.

3. Sleeves: 18 inches Minimum.

3.02 PREPARATION:

A. Set stakes to identify locations proposed irrigation system. Obtain owners approval before excavation. Locate all utilities

B. Route piping to avoid conflicts with other work

C. Unless otherwise installed, bore for sleeves under existing pavement as indicated on plans. Employ equipment and methods

designed for horizontal boring. 1. Sleeves shall be installed prior to pavement installation. All additional costs for boring sleeves shown in the plan shall be

the responsibility of the contractor.

3.03 TRENCHING

A. Trench and backfill with subsoil excavated on-site. Fill material shall be free of lumps larger than 3-inches, rocks larger than 2-inches and debris. Topsoil shall be placed as noted on the plans.

B. Trench shall accommodate grade changes

C. Maintain trenches free of debris, material or obstructions that may damage pipe. 3.04 PIPING APPLICATIONS:

A. Install components having pressure rating equal to or greater than system operating pressure.

3.05 PIPING INSTALLATION:

A. Location and Arrangement: To be determined by shop drawing approval. Drawings shall indicate irrigation type to be installed.

B. Install piping free of sags and bends.

C. Install groups of pipes parallel to each other spaced to permit valve servicing.

D. Install fittings for changes in direction and branch connections.

E. Install dielectric fittings to connect piping of dissimilar metals.

F. Install underground thermoplastic piping according to ASTM D2774.

G. Lay piping on solid subbase, uniformly sloped without humps or depressions.

H. Install PVC piping in dry weather when temperature is above 40°F (5°C). Allow joints to cure at least 24 hours at

temperatures above  $40^{\circ}F$  ( $5^{\circ}C$ ) before testing unless otherwise recommended by manufacturer. 3.06 JOINT CONSTRUCTION: A. Construct solvent-weld joints per ASTM D2855 and Butt Heat Fusion (HDPE Piping) per ASTM D3261 & ASTM D2657

B. Construct mechanical joints per manufacturer's recommendations: 1. Provide adequate joint restraint at all mechanical joints through thrust blocking or mechanical restraints.

3.07 VALVE INSTALLATION:

A. Underground Gate Valves: Install in round valve box with top flush with grade.

B. Control Valves/Master Valves: Install in rectangular control-valve box.

C. Quick Couple Valves: Install in round valve box.

3.08 OUTLET INSTALLATION:

A. Drip line Installation: Install drip lines per manufacturer's recommendations in areas shown on the plans and the approved shop drawings. Flush all lines prior to installation of drip lines.

B. Rotary/Spray Head Installation: Install rotary/spray heads per manufacturer's recommendations in areas shown on the plans and approved shop drawings. Heads shall be installed flush with finish grade. Flush all lines prior to installation of irrigation heads.

3.09 AUTOMATIC-CONTROL SYSTEM INSTALLATION:

A. Install control wire in same trench as irrigation piping as approved with shop drawings. Provide conductors of size not

smaller than recommended by controller manufacturer. Install wire in separate sleeve under paved areas if irrigation piping is installed in sleeve.

B. Connect to Controller and accessories per manufacturers recommendations

3.10 CONNECTIONS:

A. Make all electrical connections in conformance with local code requirements. Provide waterproof connectors for all underground electrical connections.

B. Tighten electrical connectors and terminals according to manufacturer's published torque-tightening values. If manufacturer's torque values are not indicated, use those specified in UL 486A and UL 486B.

3.11 LABELING AND IDENTIFYING

A. Provide valve tags at each remote control valve as shown on the approved shop drawings.

B. Install Warning Stakes per detail

3.12 FIELD QUALITY CONTROL:

A. Perform the following field tests and inspections and prepare test reports: 1. Hydrostatic Test: After installation and prior to backfillling, utilize quick-couple valves to charge mainline with

pressurized air to 100 psi. System will be able to maintain pressure with no more than 5 psi loss in one hour.

a. Owner's representative must be in attendance during test.

required to re-test with representative in attendance.

b. Provide a minimum of 48 hours notice prior to scheduled test. c. Hydrostatic test results obtained without Owner's representative present will be rejected and Contractor will be

2. Operational Test: After electrical circuitry has been energized, operate controllers and automatic control valves to confirm proper system operation.

3. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

B. Remove and replace defective units and retest as specified above until all requirements are met.

3.13 STARTUP SERVICE:

A. Verify that controller is installed and connected according to the Owners direction. B. Verify that electrical wiring installation complies with manufacturer's submittal and installation requirements.

C. Complete startup checks according to manufacturer's written instructions.

3.14 ADJUSTING:

A. Adjust settings of controller and provide initial watering schedule per Owner's requirements.

B. Adjust automatic control valves to provide flow rate of rated operating pressure required for each sprinkler circuit.

3.15 CLEANING: A. Flush dirt and debris from piping before installing sprinklers and other devices.

3.16 DEMONSTRATION: A. Schedule a complete demonstration and system walk-through with the Owner's representative. Final Payment will not be made until all items noted during demonstration and walk-through have been made by Irrigation Contractor and verified by

1. Irrigation Contractor, Owner and Landscape Architect shall each certify that the system performs as designed and there are no unacceptable areas of overspray on adjacent pavements, buildings or other site elements or fixtures.

3.17 MAINTENANCE

A. Irrigation Contractor shall maintain and coordinate system for plant establishment throughout 90 day maintenance period. At end of maintenance period, contractor shall set system for standard operation based on zone requirements. Any continued plant establishment or over watering necessary for continued plant establishment shall be given to the owner as a written

B. Provide one complete spring start-up and a fall shutdown by installer, at no extra cost to Owner. The Contractor shall provide this schedule at the end of the maintenance period.

3.18 WARRANTY:

A. Irrigation Contractor shall warranty irrigation system for a minimum of 12 months starting from the date of Substantial Completion. Warranty shall be for all installed equipment and workmanship of installation.

B. Irrigation Contractor shall be responsible for all system leaks due to quality of installation.

3.19 DOCUMENTATION:

A. Provide a complete operations and maintenance manual to the Owner in a three-ring binder with the following items, separated by tabbed dividers for clear organization.

1. Provide a label on the spine of the binder clearly stating "IRRIGATION SYSTEM OPERATION AND MAINTENANCE".

2. Table of Contents.

3. Cut-sheets or manufacturer's data for all installed equipment including:

a. Remote Control Valves. b. Quick Couple Valves.

c. Controller.

4. Operations Data from manufacturers documenting diagnostic, repair and replacement procedures for all items "a" through "c" identified above

5. Complete description of spring start-up operations including:

a. Valve inspection.

b. Controller programming guidelines for spring, summer and fall watering schedules.

c. Controller battery replacement (As Required). d. Rain Sensor Battery replacement (As Required)

B. Provide an as-built drawing at the same size and scale as the design drawings with the following information clearly shown:

1. Location of all sleeves with coordinates.

2. Location of mainline and lateral pipe runs with sizes clearly indicated with coordinates. 3. Location of all valves with coordinates.

4. Location of controller and rain sensor (As Required)

5. Utilize standard industry symbols and notations for all equipment.

C. Provide a copy of the Maintenance/Operations Manual and As-Built Drawing to the owner for review and approval. 1. Contractor shall make all revisions noted and required by the owner.

2. Contractor is required to demonstrate completion of all revisions, which may include providing a revised copy for additional review at the discretion of the owner.

D. Maintenance/Operations Manual and As-Built Drawing shall be completed and turned over to the owner before Final Payment will be made to the Irrigation Contractor.

END OF SECTION 328400

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T. ANDREW GABBERT NUMBER LA-2007013278

.09 COORDINATION:

PART 2 - PRODUCTS

2.01 MANUFACTURERS:

permitted under the following conditions and then only after arranging to provide temporary water service according to

1. Notify Owner and/or General Contractor no fewer than two days in advance of proposed interruption of water service.

B. If Existing irrigation system is present. Contractor shall be responsible for tapping into existing system, capping off existing

A. Coordinate timing of installation, location and installation of all sleeves under sidewalks or drives. Owner shall not be

E. Irrigation Contractor to attend on-site meeting at both project kick-off and prior to installation after approved shop drawings.

Manufacturers: Subject to compliance with requirements, provide products by one of the manufacturers specified. All

A. In other Part 2 articles where titles below introduce lists, the following requirements apply to product selection:

2. Disruption of services shall be by owner's written permission only.

responsible for boring due to lack of coordination of this requirement.

B. Coordinate power requirements and connection of controller as required.

C. Coordinate existing water supply requirements.

D. Coordinate with landscape installation

system where needed and verifying condition of existing system.