

**Stormwater / BMP Facility Maintenance Plan**  
**Stoney Creek Development to include all phases of development**

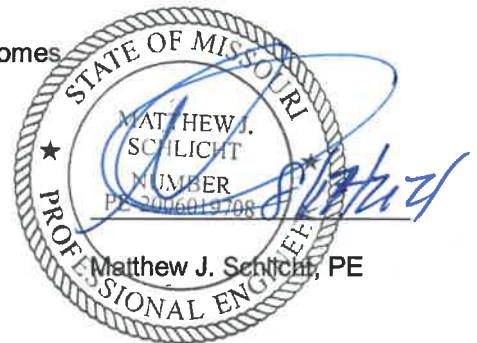
**Lee's Summit, MO**

**PREPARED BY:**



**PREPARED BY:**

Clayton Properties Group, d.b.a. Summit Homes



Revision

| Date | Comment | By |
|------|---------|----|
|      |         |    |
|      |         |    |
|      |         |    |

# Table of Contents

- Purpose
- Project Location
- Description of BMP / Basin Facilities
- Maintenance of BMP / Basin Facilities
- Inspection of BMP / Basin Facilities
- Repair of BMP / Basin Facilities
- Modification
  - Areas of BMP / Basin Facilities
  - Ownership
- Appendix
  - A – Final Plats of Site
  - B – As-built of Constructed BMP / Basin Facilities
  - C – Inspection Form
  - D – Ownership Form

## PURPOSE

Stormwater Best Management Practices (BMPs) are implemented in this development to meet stormwater discharge water-quality standards of the City of Lee's Summit, Missouri. Permanent BMPs are provided via this development. In order for physical stormwater BMPs to be effective, proper maintenance is essential. Maintenance includes both routinely scheduled activities, as well as non-routine repairs that may be required after large storms, or because of other unforeseen conditions. Maintenance of site specific BMPs is the responsibility of the property owner and a requirement of approval for this development. The property owner, heirs and assigns shall maintain appropriate funds to provide all maintenance required up to and including replacement of said facilities at end of their useful life. The property owners shall require implementation of this manual for all BMPs transferred with land ownership transfer to subsequent property owners, heirs and assigns.

## Project Location

The site is generally located south of MO-150 Highway, west of Ward Road, east of Pryor Road and north of County Line Road. The project has been developed in numerous phases starting around 2001 with phases recorded as Parkwood at Stoney Creek and Stoney Creek Estates. The "green" hatched areas below are areas within the development that contain a detention facility, BMP facility, Stream Buffer Area or Floodplain. These areas require a certain amount of maintenance to ensure the design or protection of these areas is maintained.

The site drains southeasterly into an unnamed tributary of Raintree Lake and ultimately into Middle Big Creek.



### ***Types of Stormwater Best Management Practices***

There are many different measures which can provide stormwater BMPs. The below list are the ones utilized within this development.

- Stormwater dry detention basin
  - Basin was design to control release various storm frequency storm events, which was accomplished by various orifice sizes located within the outlet structure
  - Basin bottom is design with a minimum 2% slope to direct water toward the outlet structure.

### **MAINTENANCE OF STORMWATER MANAGEMENT FACILITIES**

Stormwater management facilities need to be maintained to function properly. This section will discuss how to properly maintain the facilities within this development.

Stormwater Detention Basins are located within

Tract J, The Reserve at Stoney Creek 1<sup>st</sup> Plat  
Tract K, The Reserve at Stoney Creek 2<sup>nd</sup> Plat  
Tract L, The Reserve at Stoney Creek 3<sup>rd</sup> Plat  
Tract P, Manor at Stoney Creek 2<sup>nd</sup> Plat

Appendix A is the Final Plats of the developed basins

Appendix B is the as-built basin plans that were installed

### ***Extended Dry Detention Basin***

Extended dry detention basins provide detention for the water quality volume with a 40-hour release rate, along with detention for up to the 100-year storm event. These basins are typically simple in design, which helps make them relatively easy and inexpensive to maintain.

Generally the basin is design to be completely drained within 40 hours following a storm event equal to or greater than the 2 year event.

The basins within this development are planted with standard grass and have a minimum 2% slope, which maintenance requirements were discussed as shown in Table 1, focusing on the maintenance for the overall detention basin and not focused on the vegetation.



**Table 1. Maintenance of Extended Dry Detention Basin**

| Required Action            | Maintenance Objective                                                                                                                                                                         | Frequency of Action                                                                                                                                                                                               |
|----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Debris and Litter Removal  | Removal of debris and litter from the basin area to minimize outlet clogging and improve aesthetics                                                                                           | Periodically and after large rain events                                                                                                                                                                          |
| Repairing Erosion          | If erosional channels occur due to lack of vegetation and large rainfall events, the area shall be re-graded to fill in the channels and new vegetation shall be established per Section 2.1. | Periodically, as occurs after large rain events                                                                                                                                                                   |
| Inspection of Outlet       | To ensure the outlet box for the basin is function properly                                                                                                                                   | Yearly in the springtime and periodically until winter                                                                                                                                                            |
| Inspection of the Spillway | To ensure spillway is stable and functioning correctly                                                                                                                                        | Yearly in the springtime and periodically until winter                                                                                                                                                            |
| Removal of Sediment        | To ensure the basin has enough volume to handle rainfall events and function as designed                                                                                                      | Rare once the area draining to the basin is fully developed and vegetation established. Should occur if owner notices large amounts of silt in the bottom that is preventing the basin from draining/functioning. |

Maintenance for the basin shall be minimal to the owner, however if unforeseen events happen, the owner shall restore the basin, per the Detention Basin As-built sheets, Appendix B.

### ***Inspection of Facilities***

The above sections mentioned maintenance and frequency for each action. When an inspection of the facilities is performed, the form found in Appendix C, shall be filled out and included in this report for record keeping. It is recommended that owner walks around the facility areas yearly to check conditions and make sure no major concerns are occurring. If they see something of concern, they should reach out to a licensed professional for a deeper inspection of the issues and guidance on repairs required.

### ***Repairs to Facilities***

Many maintenance items can be done by the owner, however if larger repairs are needed the owner shall seek out a qualified contractor. Items that may require a contractor to perform are:

- Removal of sediment build up.
  - If there is undeveloped land, in proximity of the basin, sediment may be placed there with proper erosion control measure and seeding shall occur.
  - If the surrounding area is fully developed, then sediment shall be hauled off site to a proper disposal location.
- Repairs to the concrete outlet structure, spillway, or outlet pipe.
- Major erosional channels occurring on the sides slopes of the basin.

## **CHANGES TO THE CURRENT PLAN**

This section will discuss the process if changes are desired to the current Stormwater Management Facility-Best Management Practices Operation and Maintenance Plan.

### ***Ownership Change***

In the event of ownership change of the land which BMPs are located on, the following steps should be performed.

1. Current owner shall have all BMPs inspected and reviewed to be fully functioning, per this plan. If deficiencies are found both parties shall discuss and agree upon a plan to address deficiencies.
2. City shall be notified via writing of the ownership change within 30 days.
3. Appendix D shall be updated with the new owner information.

### ***Additional Land Added to the Development***

If additional land is added into the development, this document shall be updated to include any stormwater management facilities located within the additional area. A revision date shall be provided for the document along with a copy provided to the City of Lee's Summit, Missouri for review.

### ***Changes to How Maintenance is Performed***

If the owner has desire to change the recommended maintenance mentioned in this document, they shall prepare an update to this document and present it to Development Services with the City of Lee's Summit, Missouri to review. The City may require a licensed professional to update the recommendations.

# Appendix A

## Final Plats of

The Reserve at Stoney Creek 1<sup>st</sup> Plat

The Reserve at Stoney Creek 2<sup>nd</sup> Plat

The Reserve at Stoney Creek 3<sup>rd</sup> Plat

Manor at Stoney Creek 2<sup>nd</sup> Plat



## Final Plat

Section 36, Township 4/, Range 32  
Lee's Summit, Jackson County, Missouri



## EASEMENTS

VEGETATION 8

MASTER DRG

TRACT K IS CO  
THIS AREA TO

NOTARY C

I HAVE HEARD

NUMBER 2005

77°46'18" W. E.

|      |  |
|------|--|
| DATE |  |
|      |  |
|      |  |
|      |  |
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# Appendix B

As-built Basin Plans for

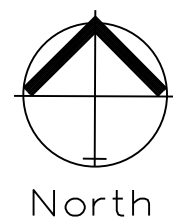
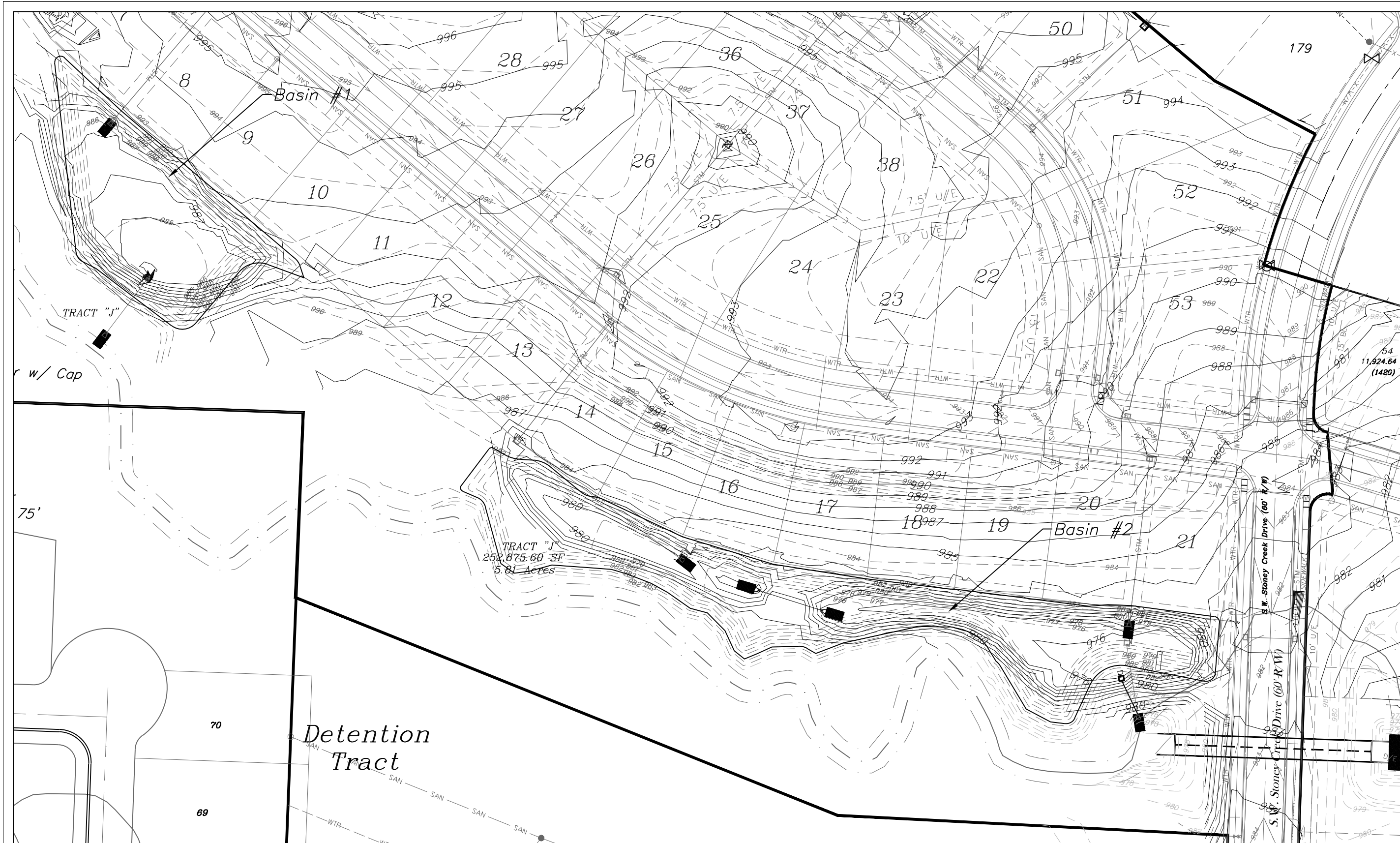
Tract J, The Reserve at Stoney Creek 1<sup>st</sup> Plat

Tract K, The Reserve at Stoney Creek 2<sup>nd</sup> Plat

Tract L, The Reserve at Stoney Creek 3<sup>rd</sup> Plat

Tract P, Manor at Stoney Creek 2<sup>nd</sup> Plat

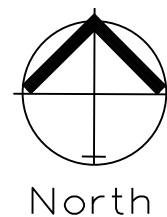
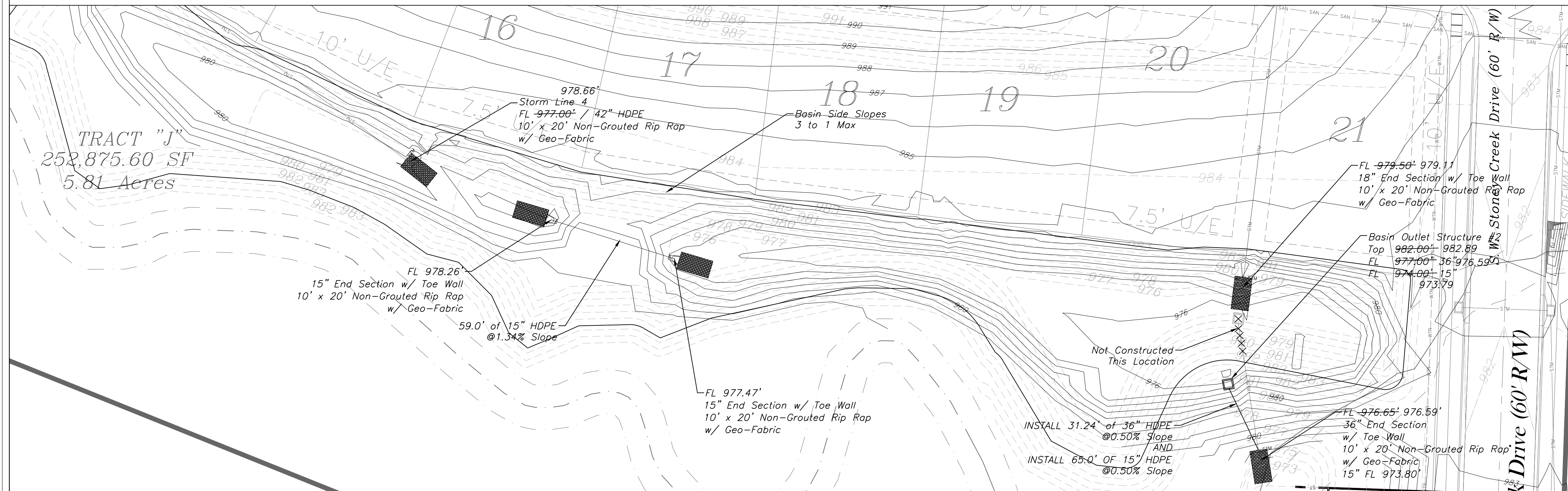




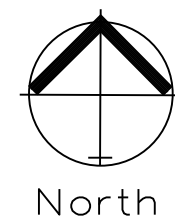
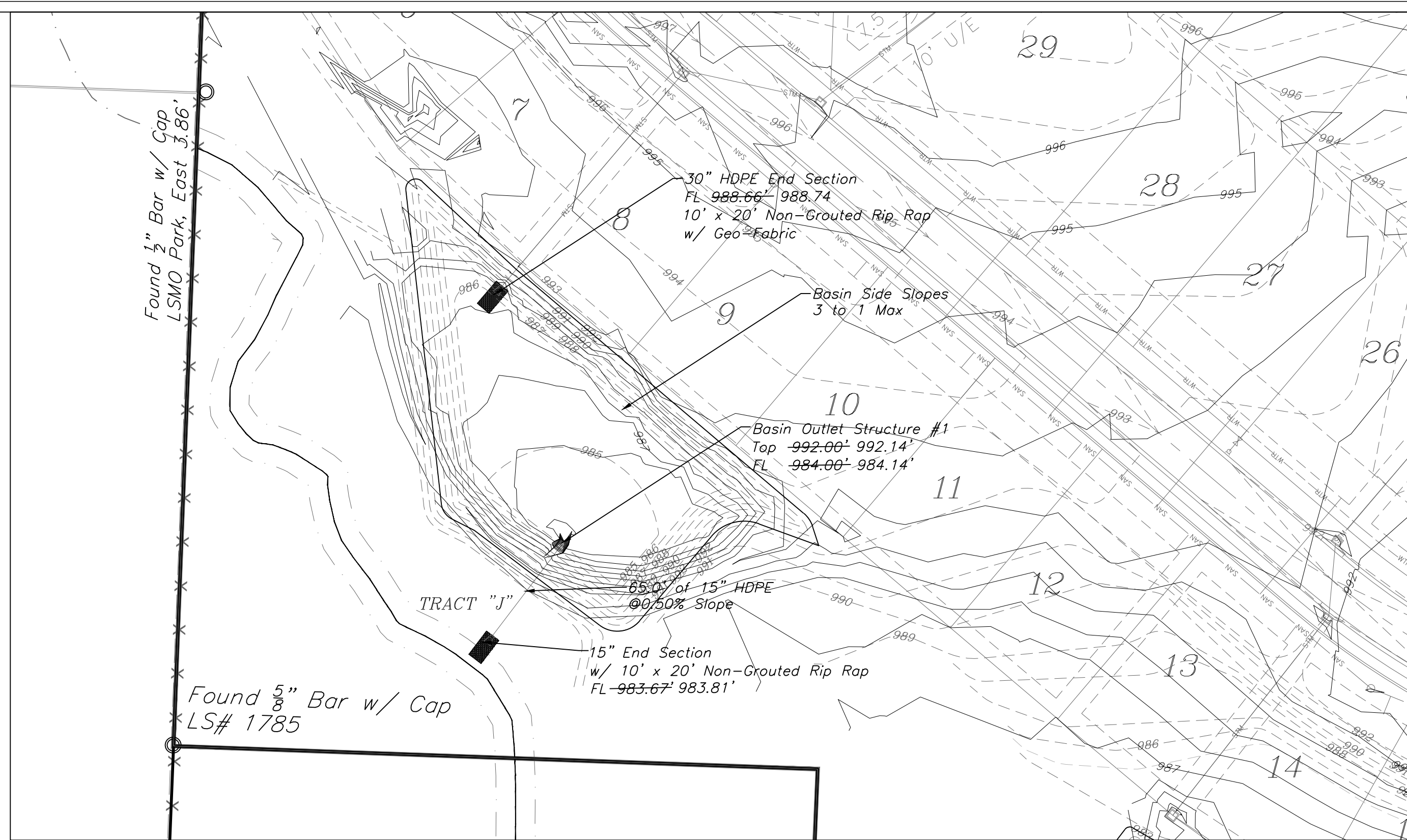
BMP/DETENTION PLAN  
SCALE: 1" = 80'

**NOTE:**

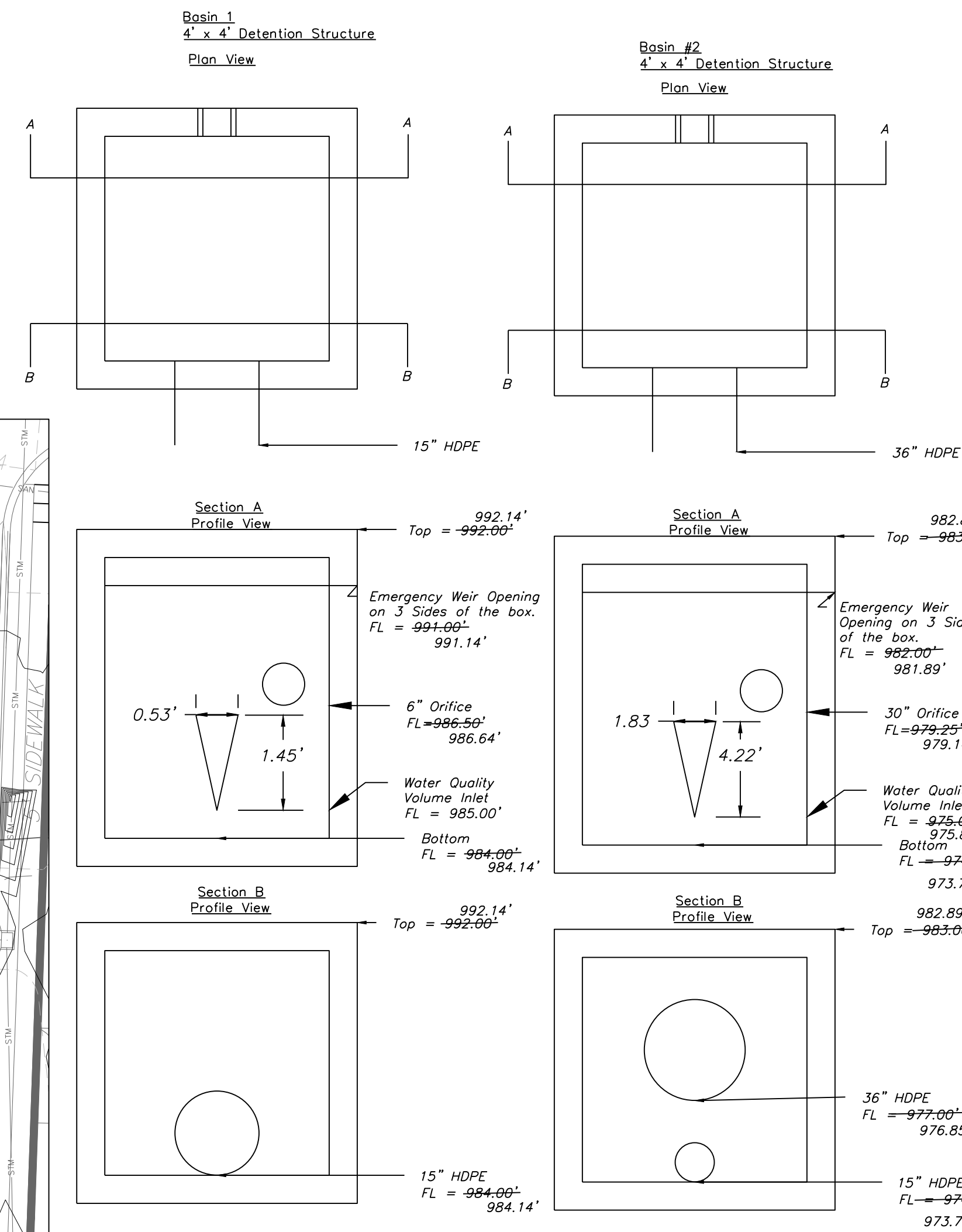
DETENTION IS A PRIVATE FEATURE TO BE MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION, INCLUDING THE OUTLET PIPE AND ASSOCIATED RIP RAP.



BASIN 2  
SCALE: 1" = 30'



BASIN #1  
SCALE: 1" = 50'

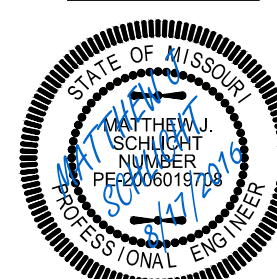


Professional Registration  
Missouri  
Engineering 2005002188-D  
Surveying 2005003182-D  
Kansas  
Engineering E-1685  
Surveying LS-218  
Oklahoma  
Engineering 6254  
Nebraska  
Engineering CA2821

The Reserve at Stoney Creek - 1st Plat  
Lee's Summit, Jackson County, Missouri

Project:  
PARK/0000 7TH  
Issue Date:  
July 2016

BMP/DETENTION PLAN  
Construction Plans for:  
The Reserve at Stoney Creek - 1st Plat  
Lee's Summit, Jackson County, Missouri

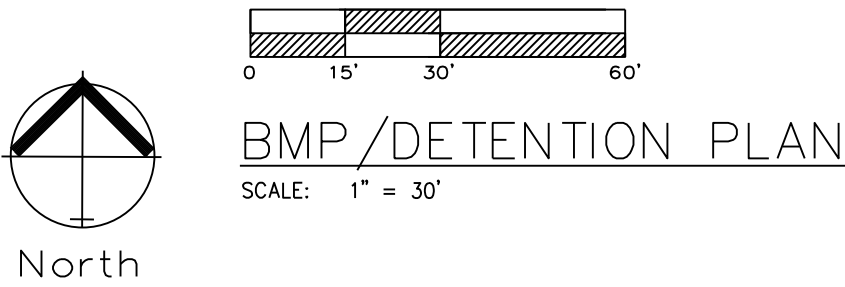


Matthew J. Schlicht  
MO, PE 2006019708  
KS PE 19071  
OK PE 25226

**REVISIONS**

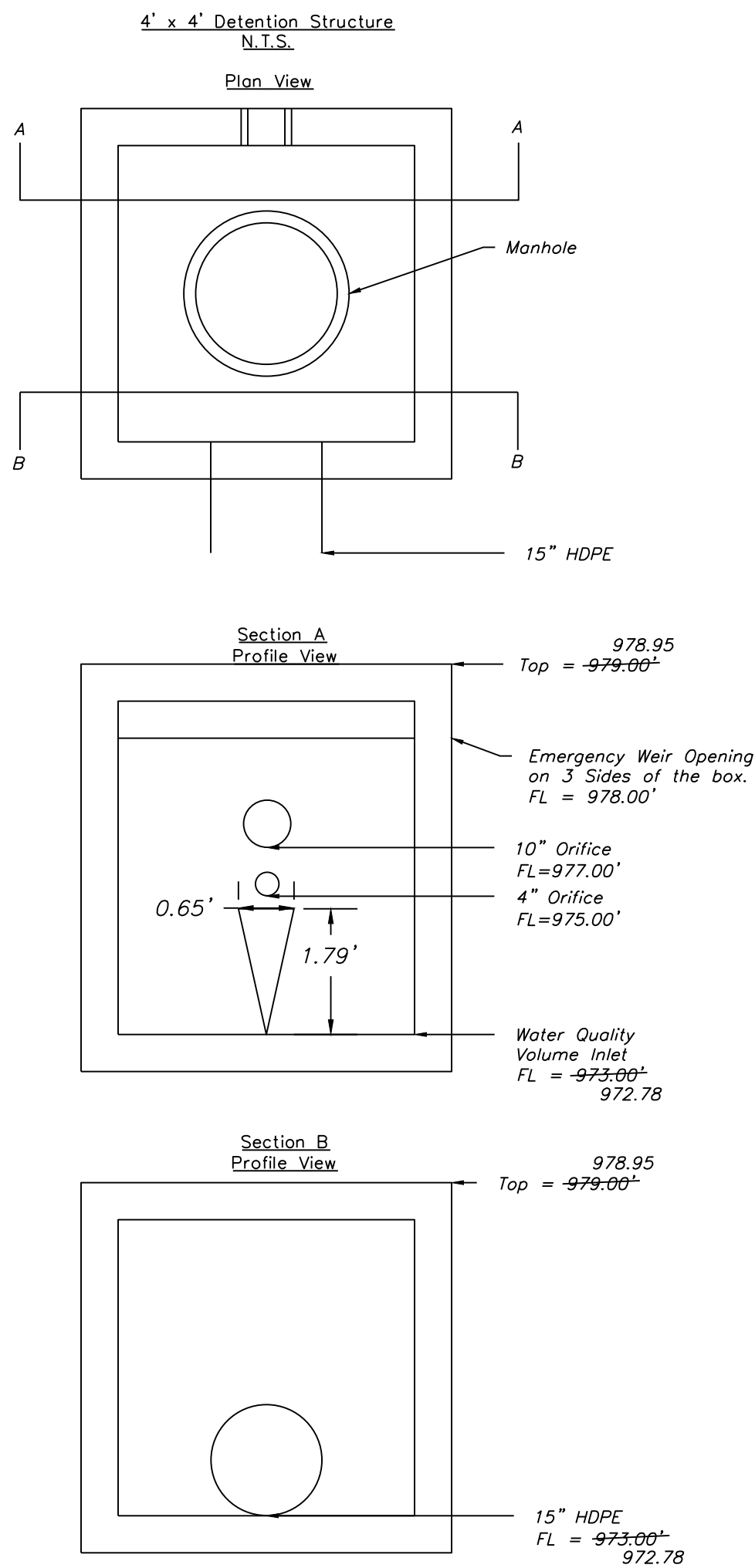
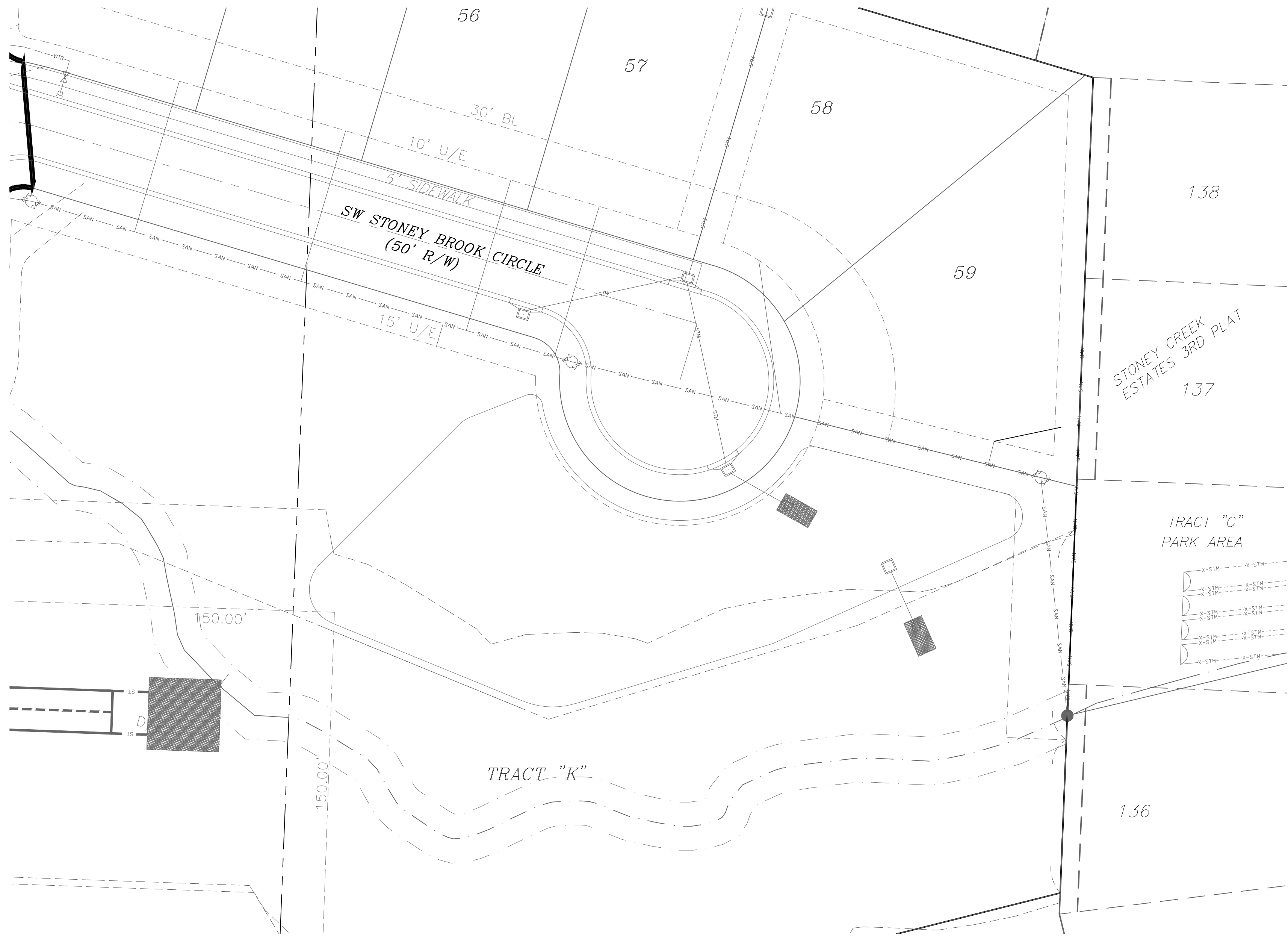
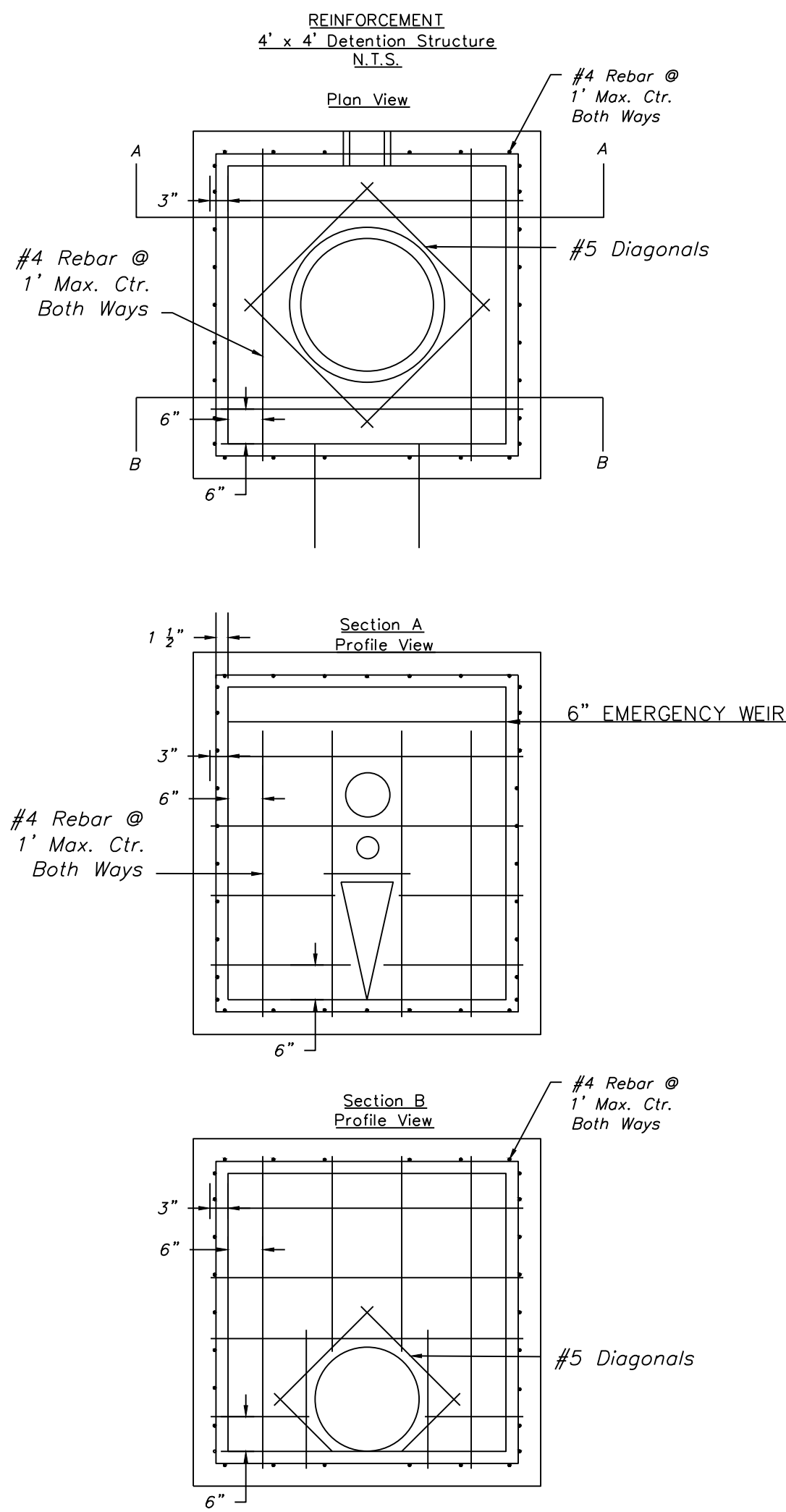
7/29/16 - As Built  
8/17/16 - As Built





NOTE:

DETENTION IS A PRIVATE FEATURE TO BE MAINTAINED BY THE PROPERTY OWNER'S ASSOCIATION, INCLUDING THE OUTLET PIPE AND ASSOCIATED RIP RAP.



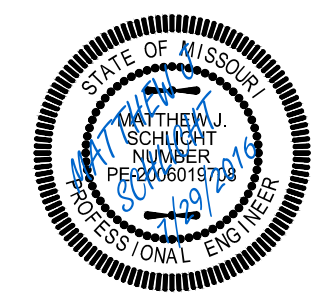
"AS-BUILT"

900.10  
906.00 Indicates data replaced with "As-Built" information. All other data is as designed and has not been field verified.

The Reserve at Stoney Creek - 2nd Plat  
Lee's Summit, Jackson County, Missouri

Project: RESERVE  
AT STONEY  
CREEK 2ND PLAT  
Issue Date:  
August 2014

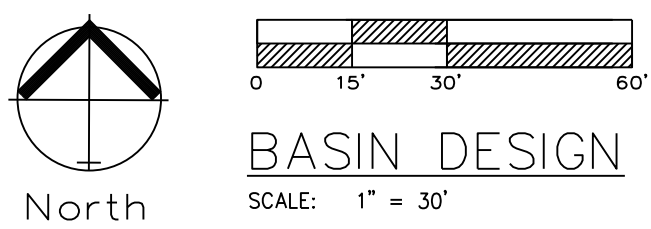
BMP/DETENTION PLAN  
Construction Plans for:  
The Reserve at Stoney Creek - 2nd Plat  
Lee's Summit, Jackson County, Missouri



Matthew J. Schlicht  
MO PE 2006019708  
KS PE 19071  
OK PE 25226

| REVISIONS          |
|--------------------|
| REV. 10/07/15      |
| REV. 10/21/15      |
| 7/12/16 - As Built |
| 7/29/16 - As Built |



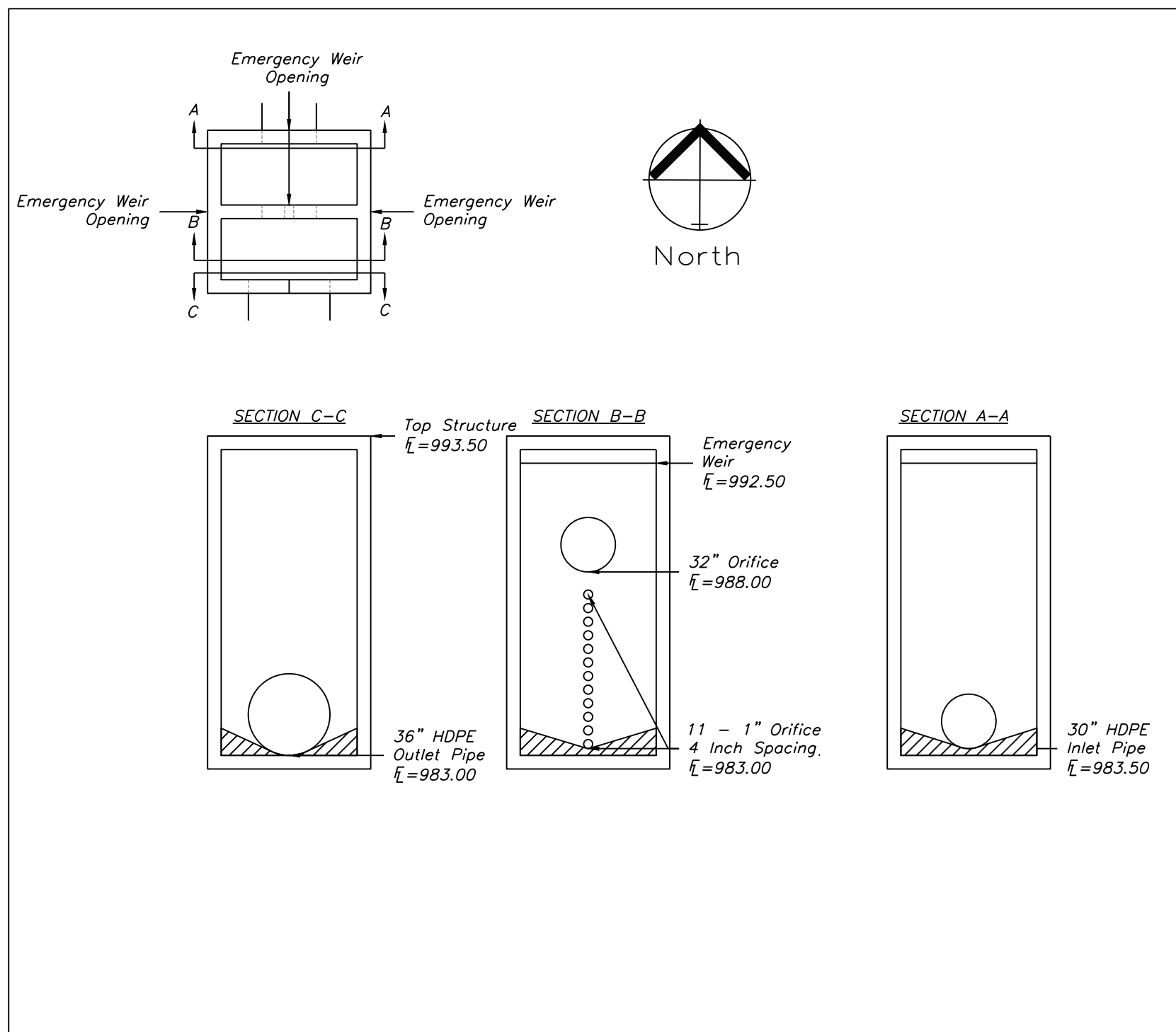


BASIN DESIGN

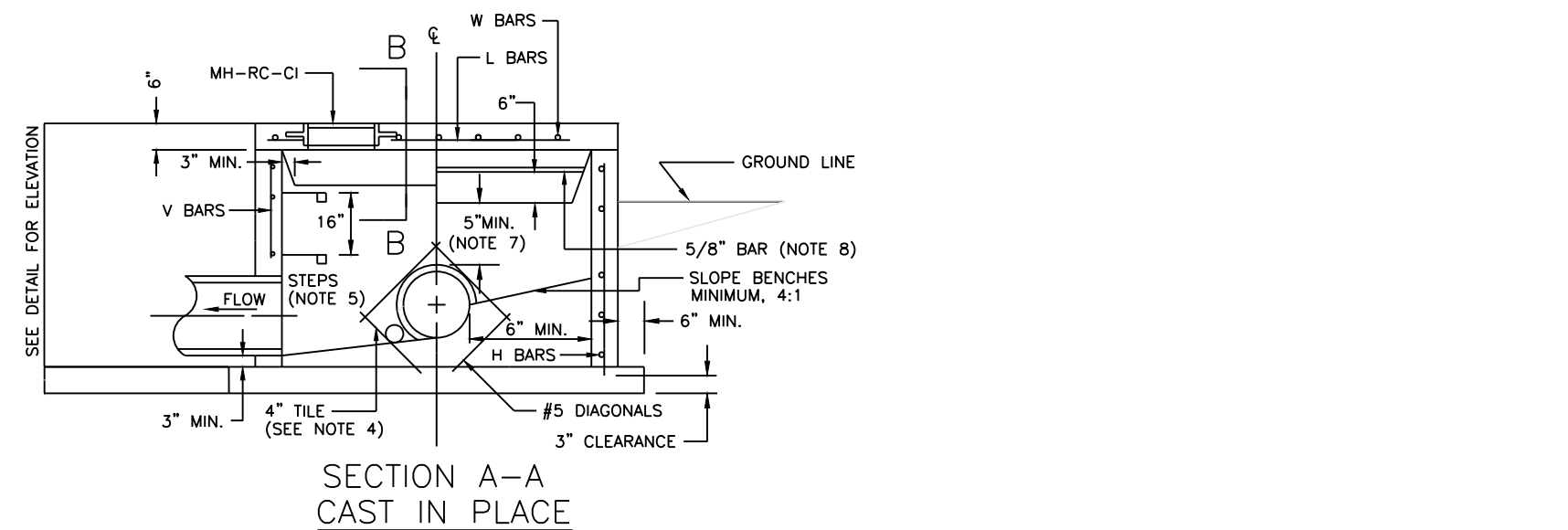
SCALE: 1" = 30'

DETENTION OUTLET STRUCTURE

SCALE: 1" = 5'



PHASE 3  
THE RESERVE AT  
STONEY CREEK  
AREA 403,605.09

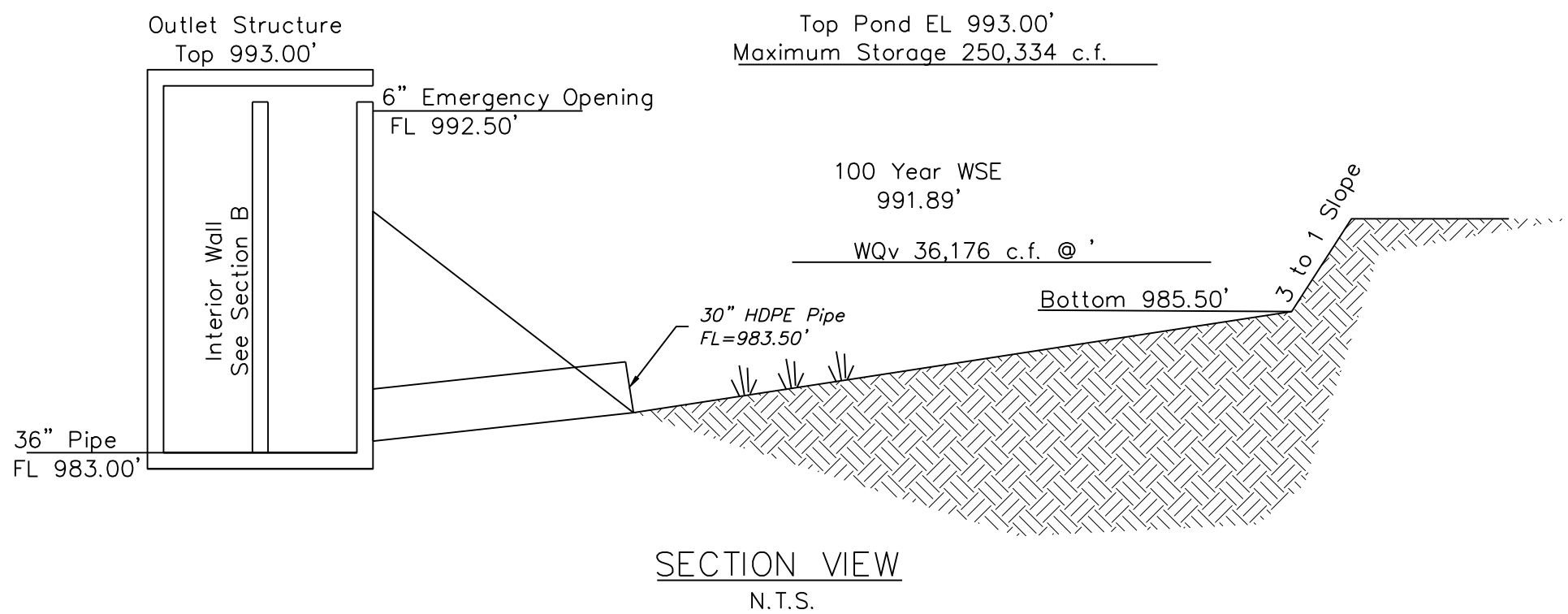
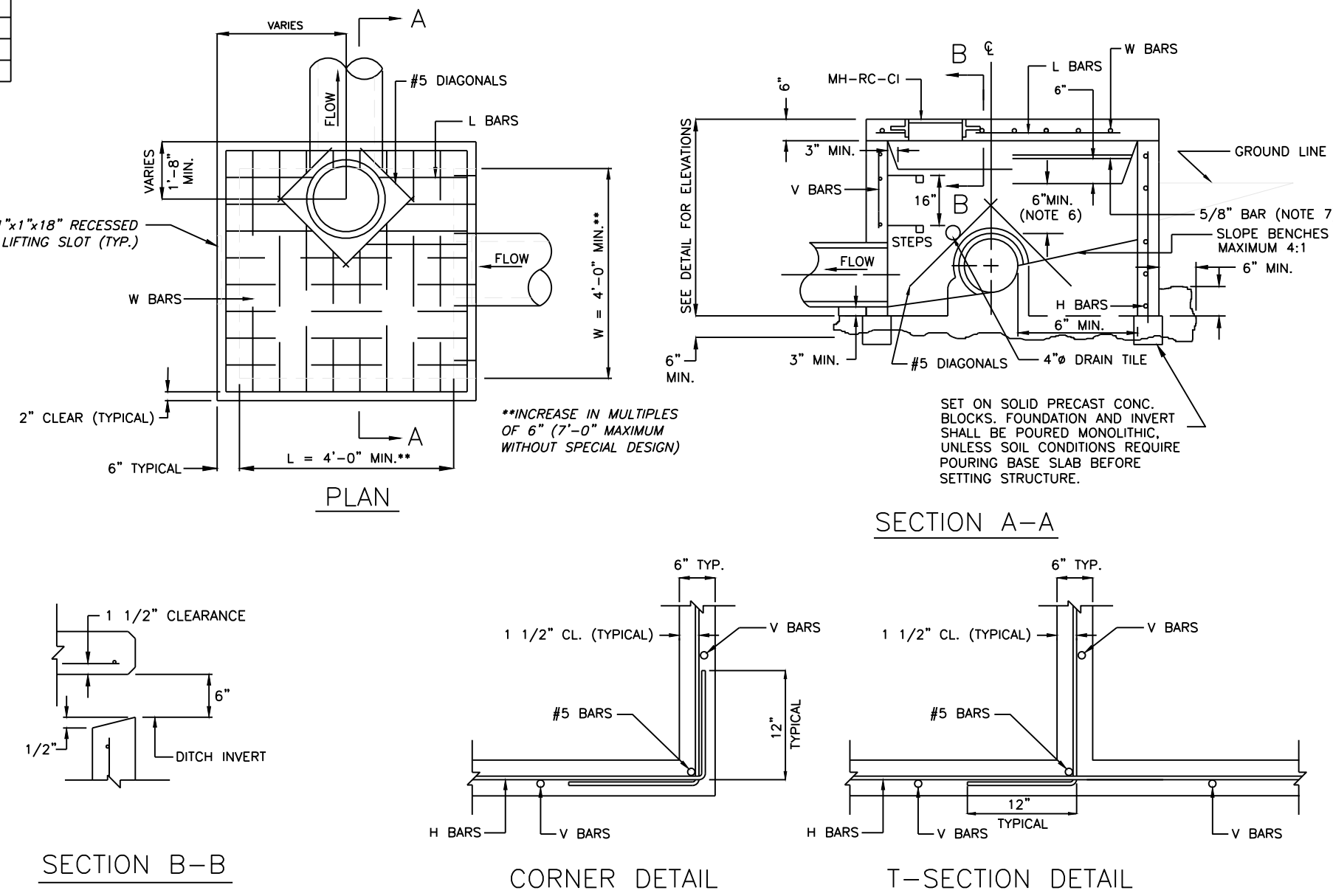


REINFORCING

| BAR | SIZE | SPACING (IN.) |
|-----|------|---------------|
| H   | 4    | 12            |
| V   | 4    | 12            |
| L   | 5    | 6             |
| W   | 5    | 6             |

GENERAL NOTES:

1. Locate ring and cover over outlet.
2. All work and materials shall conform to APWA Sect. 2600.
3. Use 3/4" chamfer strip on all exposed concrete corners.
4. Steps required @ 16" O.C. when depth from top of casting to invert exceeds 4 feet.
5. Boxouts will not be allowed to project through the corners of the structure.
6. The minimum reinforcing shall be 1 H-bar over a cast-in place pipe and 2 H-bars over a precast boxout.
7. Limit opening height to 6" with No. 5 galvanized bars extending to corner rebars.
9. Show field inlet orientation on plans plus number and size of opening.
10. O.R. = one half outside pipe diameter (O.D.).
11. 4" Ø field tile or precast hole shall be located at entering pipe and in the front face sump points. These tiles or openings shall be capped with 1/4" galvanized wire mesh on the outside of the inlet and clear the invert and base concrete.
12. Location of the Manhole shall be located along the Northeast side of the structure.



Professional Registration  
Missouri  
Engineering 2005002188-D  
Surveying 200500819-D  
Kansas  
Engineering E-1695  
Surveying LS-219  
Oklahoma  
Engineering 6254  
Nebraska  
Engineering CA2821

The Reserve at Stoney Creek - 3rd Plat  
Lee's Summit, Jackson County, Missouri

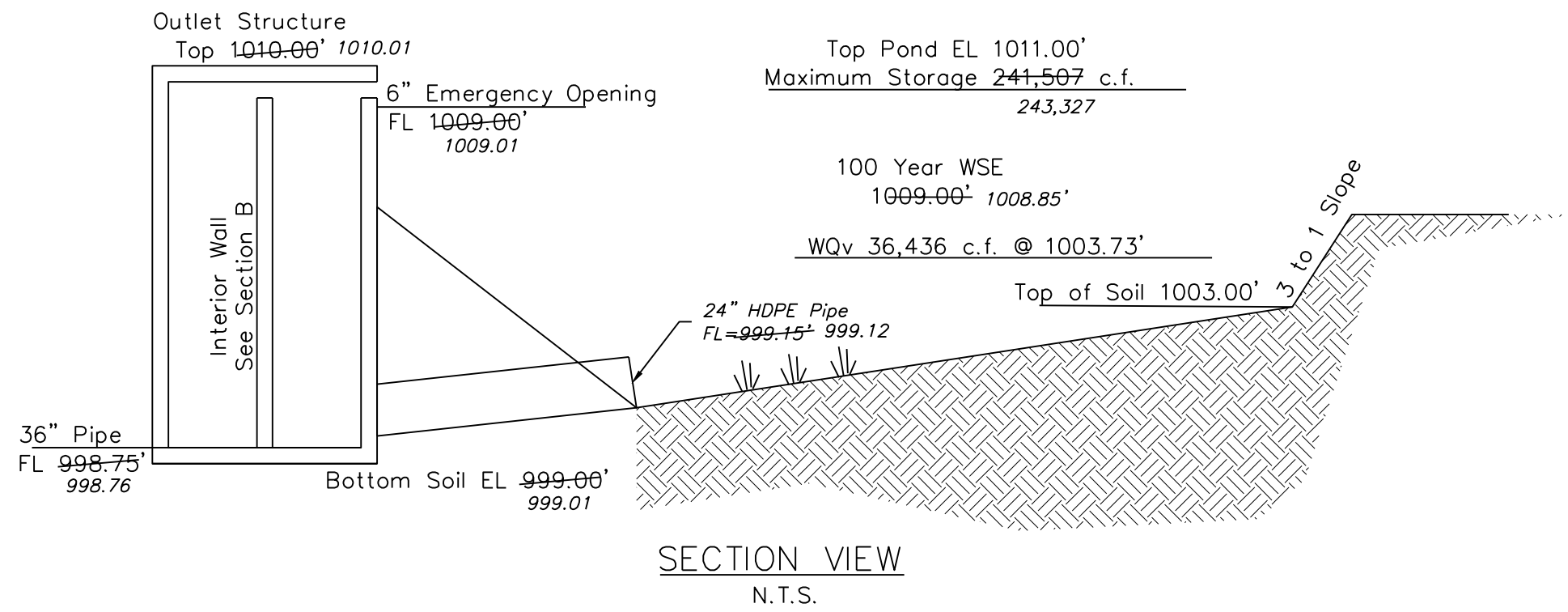
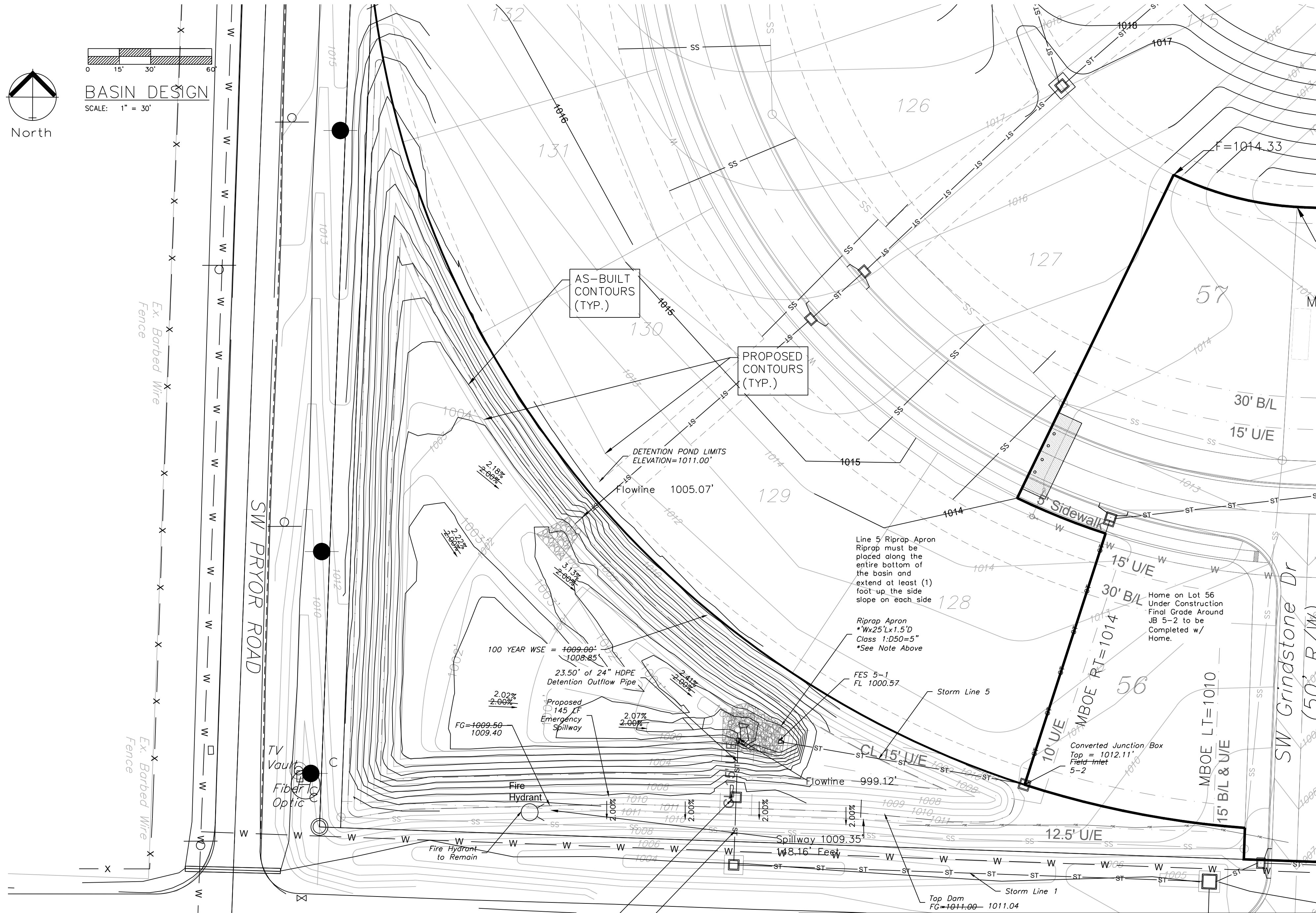
Project: THE RESERVE  
AT STONEY CREEK 3RD PLAT  
Drawn By: J. Schlicht  
Date: July 18, 2017

DETENTION BASIN / BMP PLAN  
Construction Plans for:  
The Reserve at Stoney Creek - 3rd Plat  
Lee's Summit, Jackson County, Missouri

Matthew J. Schlicht  
MO PE 2006019708  
KS PE 19071  
OK PE 255226

REVISIONS  
9/24/19 - As-Built

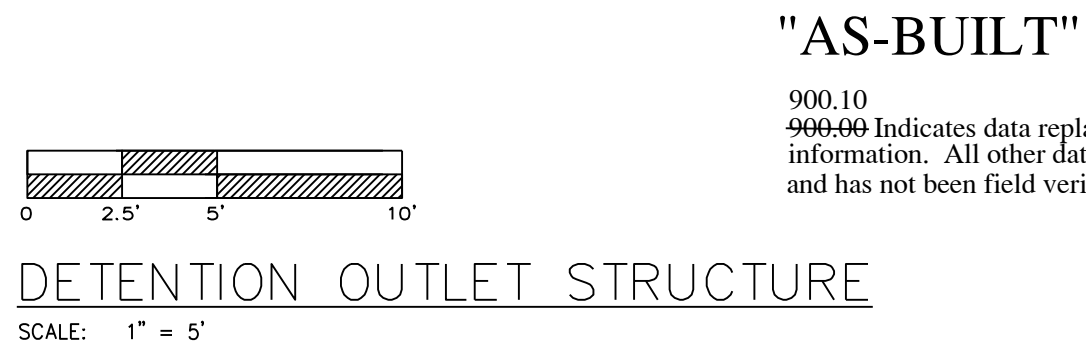
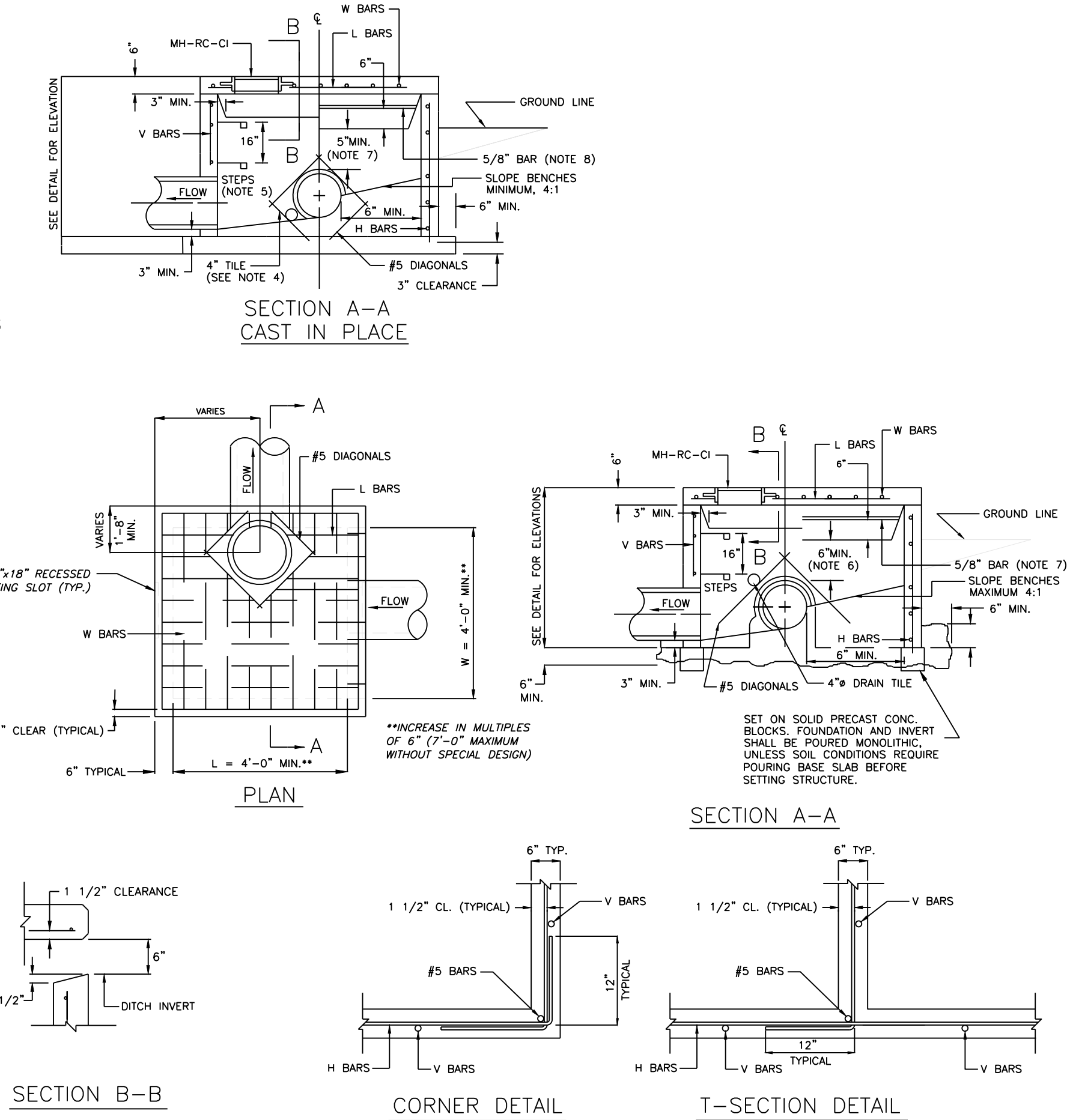




#### GENERAL NOTES:

1. Locate ring and cover over outlet.
2. All work and materials shall conform to APWA Sect. 2600.
3. Use 3/4\"
4. Steps required @ 16\"
5. Boxouts will not be allowed to project through the corners of the structure.
6. The minimum reinforcing shall be 1 H-bar over a cast-in place pipe and 2 H-bars over a precast boxout.
7. Limit opening height to 6\"
9. Show field inlet orientation on plans plus number and size of opening.
10. O.R. = one half outside pipe diameter (O.D.).
11. 4\"
12. Location of the Manhole shall be located along the Northeast side of the structure.

| BARS | SIZE | SPACING (IN.) |
|------|------|---------------|
| H    | 4    | 12            |
| V    | 4    | 12            |
| L    | 5    | 6             |
| W    | 5    | 6             |





# Appendix C

Stormwater BMP Basin Inspection Form



# STORMWATER BMP INSPECTION REPORT FORM

Location of BMP: \_\_\_\_\_

BMP Type: \_\_\_\_\_

Date of Inspection: \_\_\_\_\_

Inspected by: \_\_\_\_\_

| Maintenance Item                         | Features |    |     | Comments |
|------------------------------------------|----------|----|-----|----------|
|                                          | Yes      | No | N/A |          |
| Functioning to avoid complaints          |          |    |     |          |
| Aesthetically maintained                 |          |    |     |          |
| Free of trash and debris                 |          |    |     |          |
| Good vegetation cover                    |          |    |     |          |
| Free of invasive species                 |          |    |     |          |
| Evidence of erosion                      |          |    |     |          |
| Bottom of basin clear of excess sediment |          |    |     |          |
| Outlet structure in working condition    |          |    |     |          |
| Spillway in working condition            |          |    |     |          |
|                                          |          |    |     |          |
|                                          |          |    |     |          |
|                                          |          |    |     |          |
|                                          |          |    |     |          |
|                                          |          |    |     |          |

Action to be taken: \_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_

# Appendix D

Ownership Forms



### OWNERSHIP INFORMATION

Ownership information shall be updated in the event the property owner where the stormwater BMP's are located changes. Below is contact information for the property owner, shall they need to be contacted regarding the stormwater BMPs.

| Stormwater BMP Property Ownership |                                                        |
|-----------------------------------|--------------------------------------------------------|
| Property Owner                    | Clayton Properties Group, dba Summit Homes             |
| Contact Person                    | Travis Ruf                                             |
| Address                           | 120 SE 30 <sup>th</sup> Street, Lee's Summit, MO 64082 |
| Phone Number                      | 816.246.6700                                           |
| Email Address                     | development@summithomeskc.com                          |
|                                   |                                                        |

| Stormwater BMP Property Change of Ownership |  |
|---------------------------------------------|--|
| Property Owner                              |  |
| Contact Person                              |  |
| Address                                     |  |
| Phone Number                                |  |
| Email Address                               |  |
|                                             |  |

| Stormwater BMP Property Change of Ownership |  |
|---------------------------------------------|--|
| Property Owner                              |  |
| Contact Person                              |  |
| Address                                     |  |
| Phone Number                                |  |
| Email Address                               |  |
|                                             |  |

| Stormwater BMP Property Change of Ownership |  |
|---------------------------------------------|--|
| Property Owner                              |  |
| Contact Person                              |  |
| Address                                     |  |
| Phone Number                                |  |
| Email Address                               |  |
|                                             |  |