

## LOCATION MAP



ESTIMATED QUANTITIES - MAIN B			
Item	Description	Quantity	Unit
NRCS 326	Clearing & Snagging	LUMP	N/A
NRCS 606	10" Pipe, perforated (ODOT 707.33)	1270	Lineal Feet
NRCS 606	10" Pipe, non-perforated (ODOT 707.33)	200	Lineal Feet
NRCS 606	8" Pipe, perforated (ODOT 707.33)	740	Lineal Feet
NRCS 606	8" Pipe, non-perforated (ODOT 707.33)	500	Lineal Feet
NRCS 606	Tile Main Breathers	6	Each
NRCS 608	Surface Drain - Swale	2663	Lineal Feet
ODOT 202	Tile Destruction in Place	1200	Lineal Feet
ODOT 202	Fence Removal for Reuse	150	Lineal Feet
ODOT 611	10" Pipe, (707.33), non-perforated, Type B Installation, Gravel Drive	20	Lineal Feet
ODOT 611	18" Private Drive Culvert (See P. 3 of 7 for details)	1	Each
ODOT 611	15" Private Drive Culvert (See P. 3 of 7 for details)	1	Each
ODOT 659	Seeding & Mulching	3000	Square Yards

## DETAILS & NOTES

### GENERAL CONSTRUCTION NOTES

1. The construction right-of-way for this project will be 75' right and left of the project centerline unless otherwise marked by the Construction Inspector. Certain items of work may require an extended right-of-way in order to properly complete them. This work should not be done without prior consent of the construction inspector., and any consent given will be specific to a particular item of work. Additional right-of-way for construction access may be identified and approved by the construction inspector as deemed necessary at the completion of the project. All areas disturbed by the construction activities which are outside of the critical path including but not limited to area used for staging, stockpiling of materials, and access will be cleaned and returned to its pre-construction state at the sole responsibility of the contractor as per the requirements of ODOT CMS 104.04.

2. The contractor will be responsible for ensuring that all relevant OSHA regulations are met prior to beginning any construction activities.

3. Temporary easements for construction access may be identified and approved by the construction inspector as deemed necessary for the completion of the project. Any access easement not connected to the work limits of the project will be returned to its pre-construction state at the sole responsibility of the contractor.

4. All ground disturbed by excavation shall be returned to its pre-construction vegetative state and grade unless otherwise directed by the plans and/or the construction inspector.

5. Spoil from excavation of the surface drain (NRCS #608) and open channel (NRCS #582) construction shall be exported from the site at the expense of the contractor. Payment for spoil and debris disposal will be considered as included in payment for NRCS #608 and NRCS #582 items. The contractor is free to negotiate with landowners to dispose of spoil and debris materials on-site provided that any disposal site is outside of the work limits for this project. Delaware County will not be considered party to any such agreements made between the contractor and landowners.

6. Unless otherwise noted on these plans or instructed by the construction inspector, debris from clearing and snagging within the typical cross sections is to be disposed of off-site by the contractor unless permission to place brush and logs adjacent to the construction right-of-way is granted by the landowner. Payment for hauling and disposal shall be considered part of payment for NRCS #326-Clearing and Snagging. For the purposes of on-site disposal, a log will be defined as "a section of a tree (the main trunk of the tree) at least 8 feet long, not containing a fork, sufficiently straight and sound enough to yield at least an 8-foot board. Anything not considered a log by the above definition will be considered brush."

7. Pipe quantities listed on the Plan and Profile views represent cumulative quantities for both perforated and non-perforated pipe. The quantity table shall be the reference for the specific amounts of perforated and non-perforated pipe. The applicable specification and the instructions of the construction inspector will govern the placement of each type of pipe. All linear quantities of pipe shall be considered to be inclusive of all necessary elbows, couplers, and other fittings unless otherwise stated by these plans and/or the bid documents.

8. All lateral tile cut by the installation of the new tile shall be reconnected to the new tile at the point where they are cut or collected with a submain (size to be determined) and outlet into the new tile at the next downstream breather as specified by the construction inspector and per the requirements of NRCS #606-Subsurface Drain. Any connections made to any tile included in the Drainage Maintenance Program after completion of the project will require the approval of the Drainage Maintenance Department.

9. Seeding and Mulching will be done as per the specifications of ODOT #659 with the following stipulations/exceptions:

- Seed mixture to be used will be Class-Type #1.
- Soil testing will not be required.
- Liming will not be required.
- Compost will not be required.
- The use of straw mulch will be acceptable for the entire project.
- Watering will not be required.
- Mulch anchoring will not be required except where specified.

10. Linear alignments of all surface and subsurface features may be modified to fit site specific conditions at the discretion of the construction inspector.

11. The contractor shall contact the Delaware County Engineer's Office a minimum of seven (7) working days prior to beginning any work within the road right-of-way. It will be the sole responsibility of the contractor to secure any permits necessary for work within the road right-of-way.

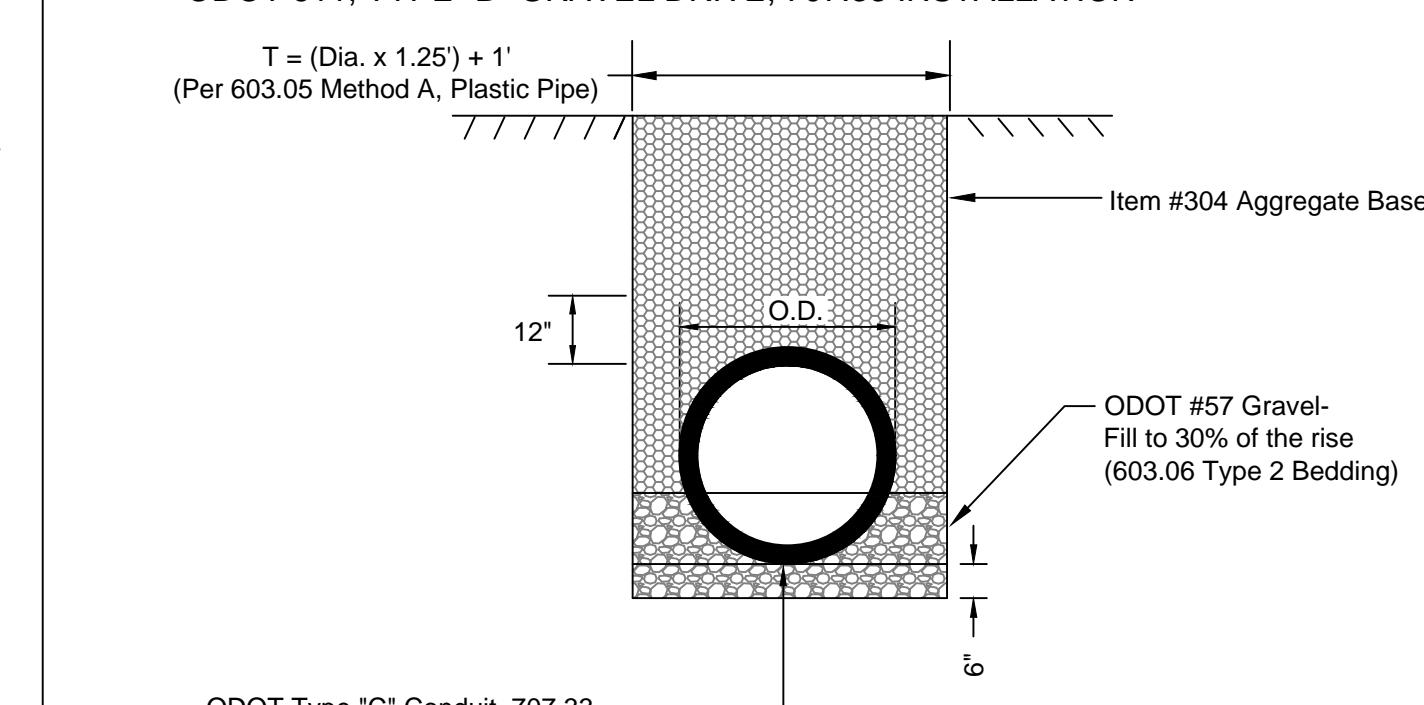
12. All trees to be saved will be marked prior to the start of construction by the construction inspector. Markings will be done in the manner requested by the contractor. Unless specifically designated as "Save" or "Do not disturb" in the plans or by the construction inspector, remove all trees and stumps within the cross section under the lump sum bid for NRCS Item #326-Clearing and Snagging. Trees marked to be saved shall be protected with protective cover such as filter fabric or other suitable material. Replacement of any tree damaged or removed that was otherwise marked to be saved will be the responsibility of the contractor.

13. Scale bars as shown on the Plan Views shall be considered to be accurate for surveyed features including, but not necessarily limited to, project centerline, tile lines, and benchmark locations. Property lines, drive centerlines, building footprints, and road centerlines as shown on the Plan Views were derived from other sources and are shown for general reference only and should not be used to scale the location of any constructed feature.

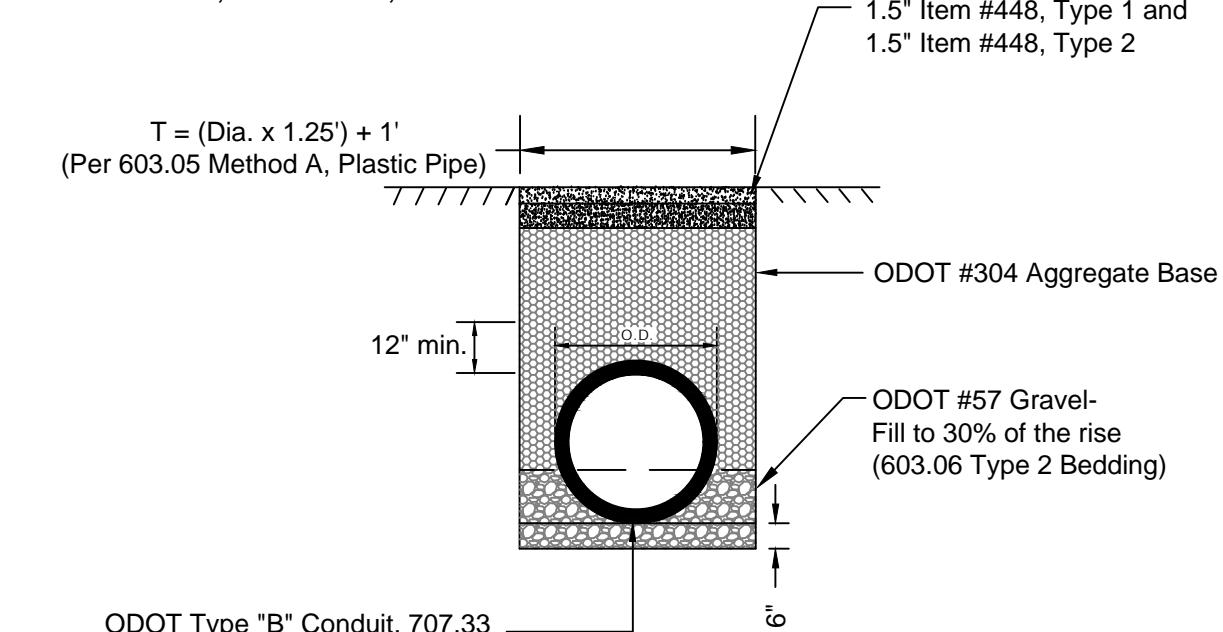
14. Excavation will/may be required to verify design elevations including, but not limited to, existing subsurface drain invert. These excavations will be considered incidental to the overall construction of the project per ODOT CMS 105.02.

### SUBSURFACE DRAIN (NRCS #606)

#### STONE DRIVE, SINGLE PIPE ODOT 611, TYPE "B" GRAVEL DRIVE, 707.33 INSTALLATION

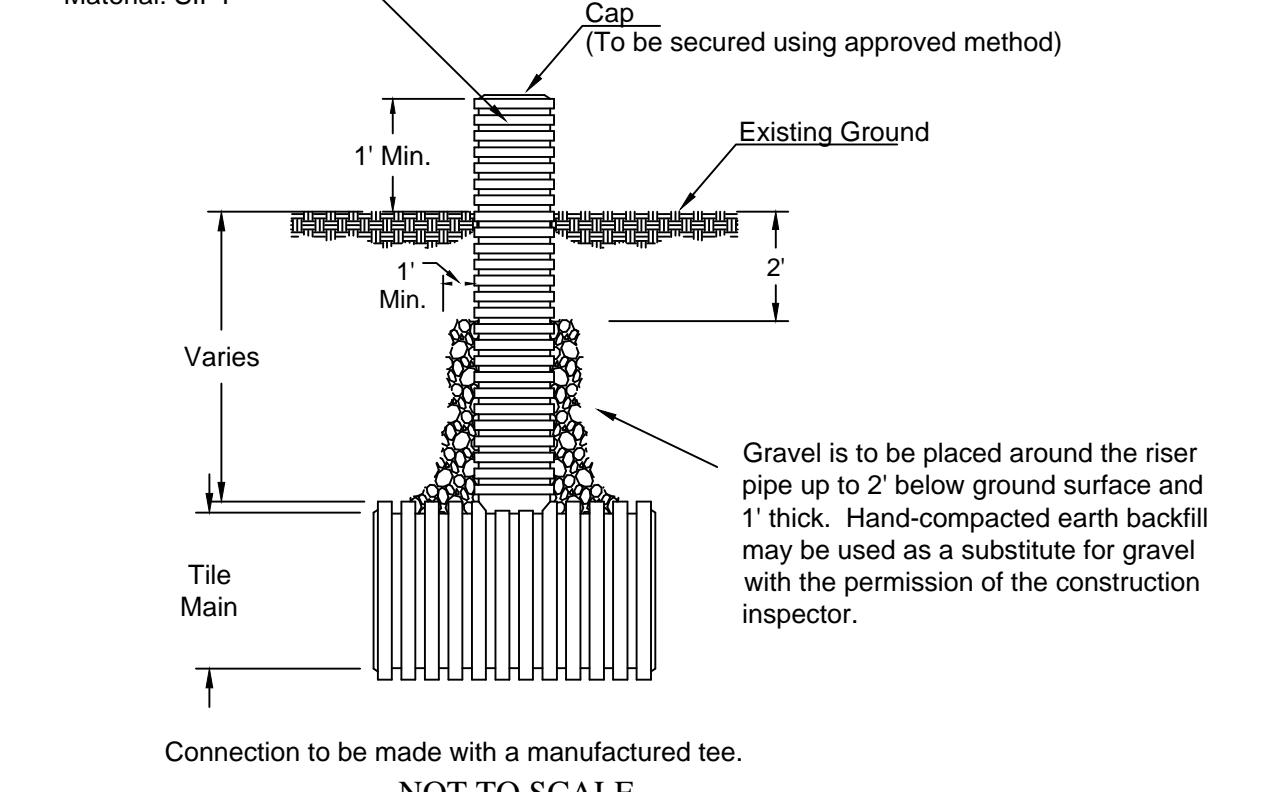


#### DRIVE CUT INSTALLATION DETAIL ODOT 611, TYPE "B", 707.33 INSTALLATION



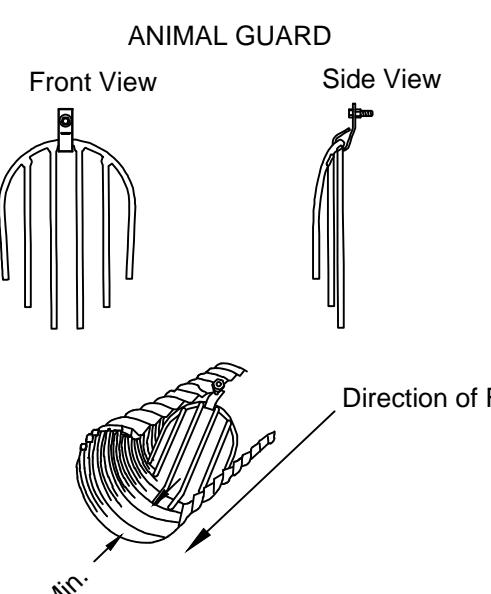
### INSPECTION WELL DETAIL

Pipe Dia.: Match Main (12" I.D. Min.)  
Material: SIPT



Tool #98  
DRAINAGE IMPROVEMENT PROJECT  
ENGINEERING DRAWINGS

2  
7

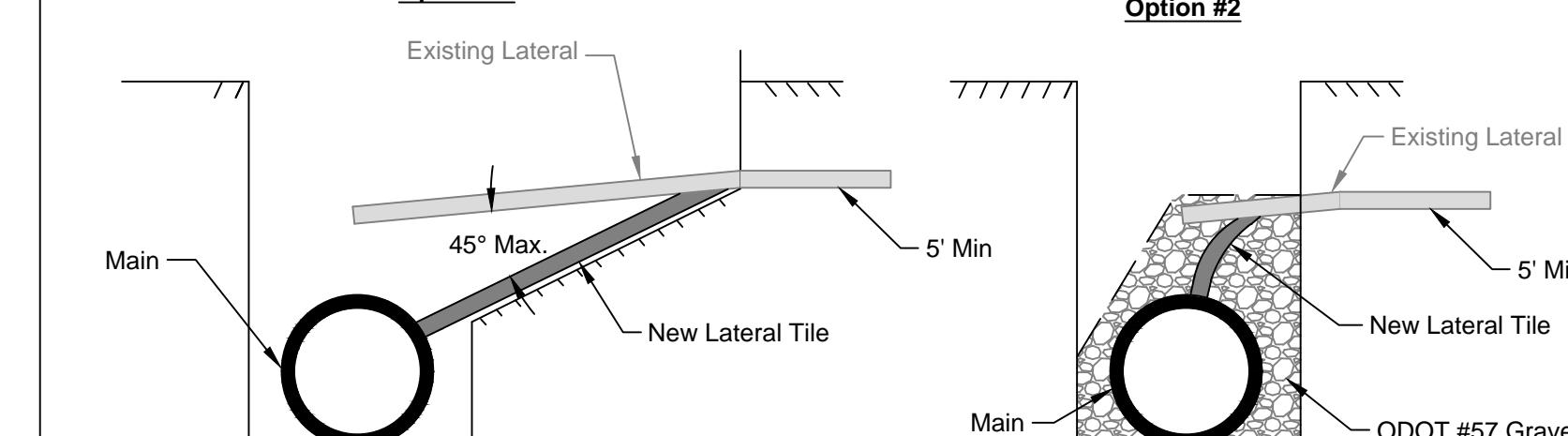


### TYPICAL SUBSURFACE DRAIN LATERAL CONNECTION DETAILS (NRCS #606)

NOT TO SCALE

#### LATERALS WITH NO EXISTING SURFACE OUTLET

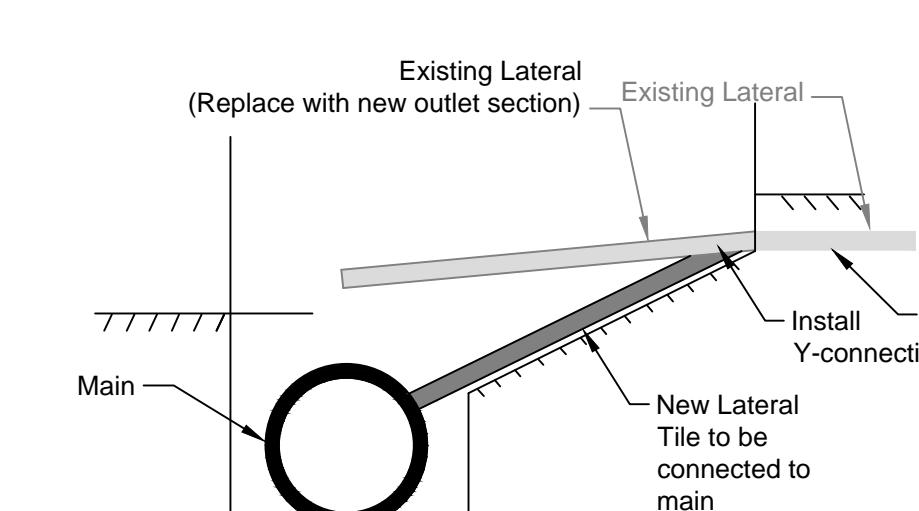
Option #1



Option #2

#### LATERALS WITH EXISTING SURFACE OUTLET

Existing Lateral



**NOTES**

- All tile shall be placed according to the Typical Subsurface Drain Installation Detail and the requirements of NRCS Specification #606.

- Removal of residual lateral tile regardless of size and/or material shall be considered part of the payment for this item.

- All connections shall be done using manufactured connectors.

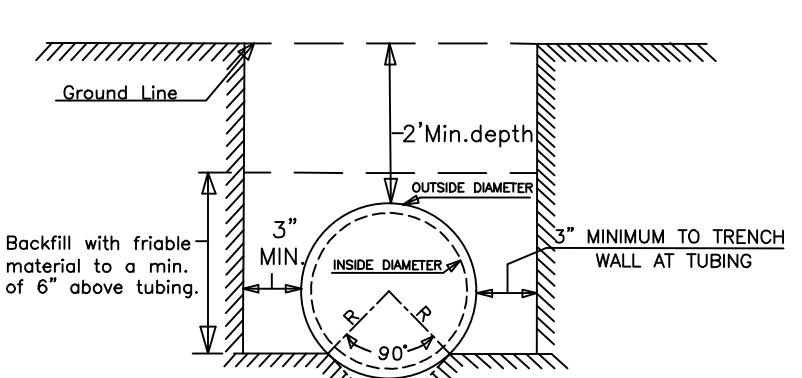
- Any quantity of gravel used to make connections utilizing Option #2 shall be considered part of the payment for this item. Determining the quantity of gravel needed for making connections using this option shall be the sole responsibility of the contractor. Cleanup of gravel stockpile areas shall be as per the requirements of ODOT CMS 104.04.

- The contractor shall note on a dedicated copy of the plans, as provided by the construction inspector, the station, size, material, and connection option used to make all lateral connections.

- Lateral types regarding having or not having a surface outlet will be marked by the construction inspector.

**Note:**  
Tile Main Breather shall have 20 evenly spaced 1 inch perforations per foot in the riser section. The surrounding ground will be graded to drain to the structure as per the instructions of the Construction Supervisor.

### NRCS 606 PIPE INSTALLATION DETAIL



### SURFACE DRAIN (NRCS #608)

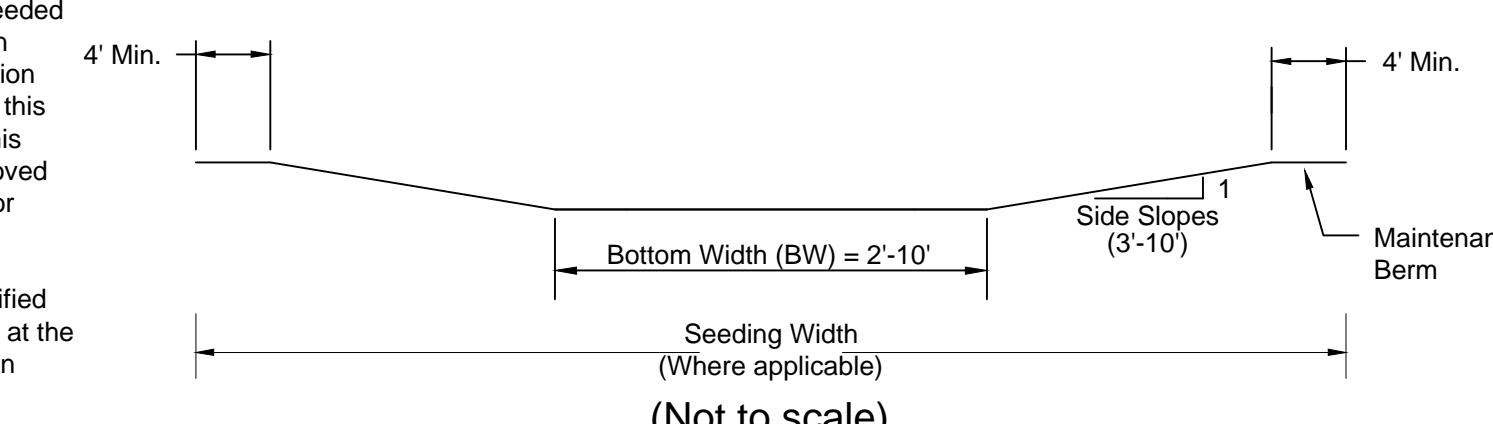
#### NOTES:

1. Where specified on the plans, the surface drain is to be seeded as stated in the construction notes and ODOT Specification #659. Any modifications to this seed mixture as stated in this Specification must be approved by the construction inspector prior to seed application.

2. Side slopes may be modified to fit site specific conditions at the discretion of the construction inspector.

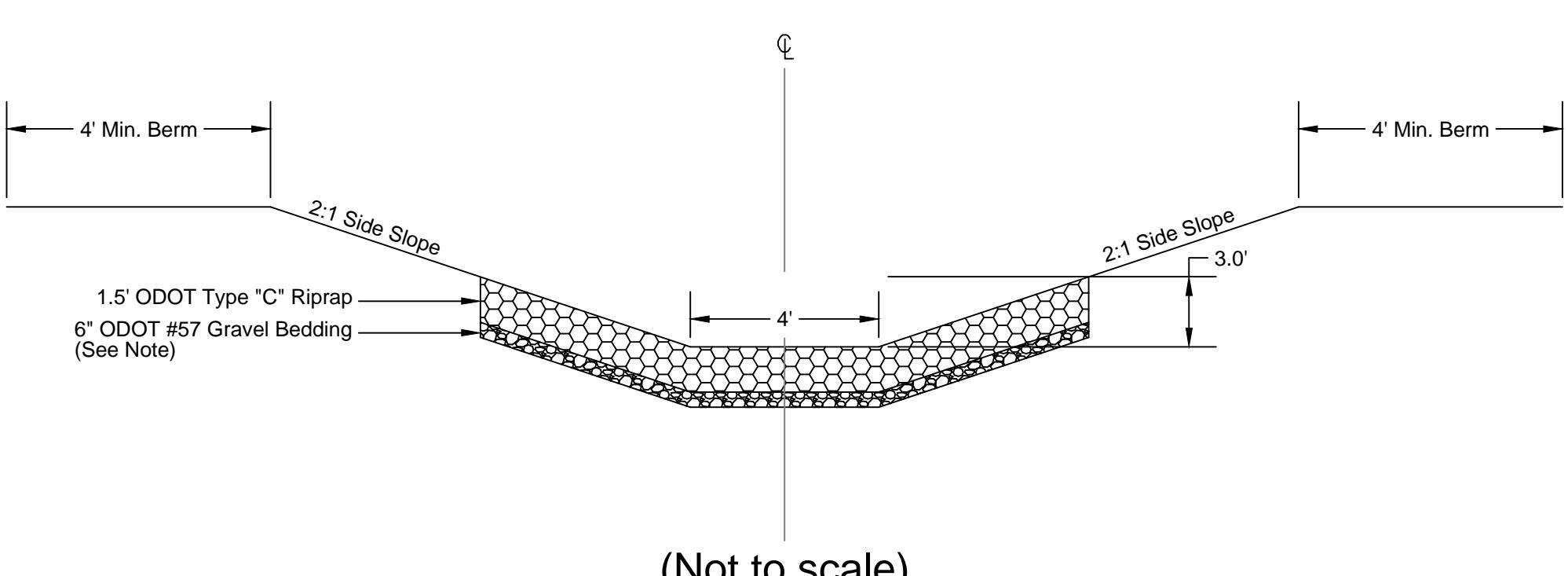
3. All spoil from within the typical surface drain cross section shall be disposed of according to the specifications of NRCS #608 - Surface Drainage Main.

### TYPICAL SURFACE DRAIN SWALE CROSS SECTION



### LINED WATERWAY (NRCS #486)

### TYPICAL ROCK LINED CHANNEL CROSS SECTION STA 124+25 - STA 124+97



**NOTES:**

- Side Slopes and Berms to be seeded as stated in the construction notes and ODOT Specification #659. Any modifications to this seed mixture as stated in the Specification must be approved by the construction inspector prior to seed application.

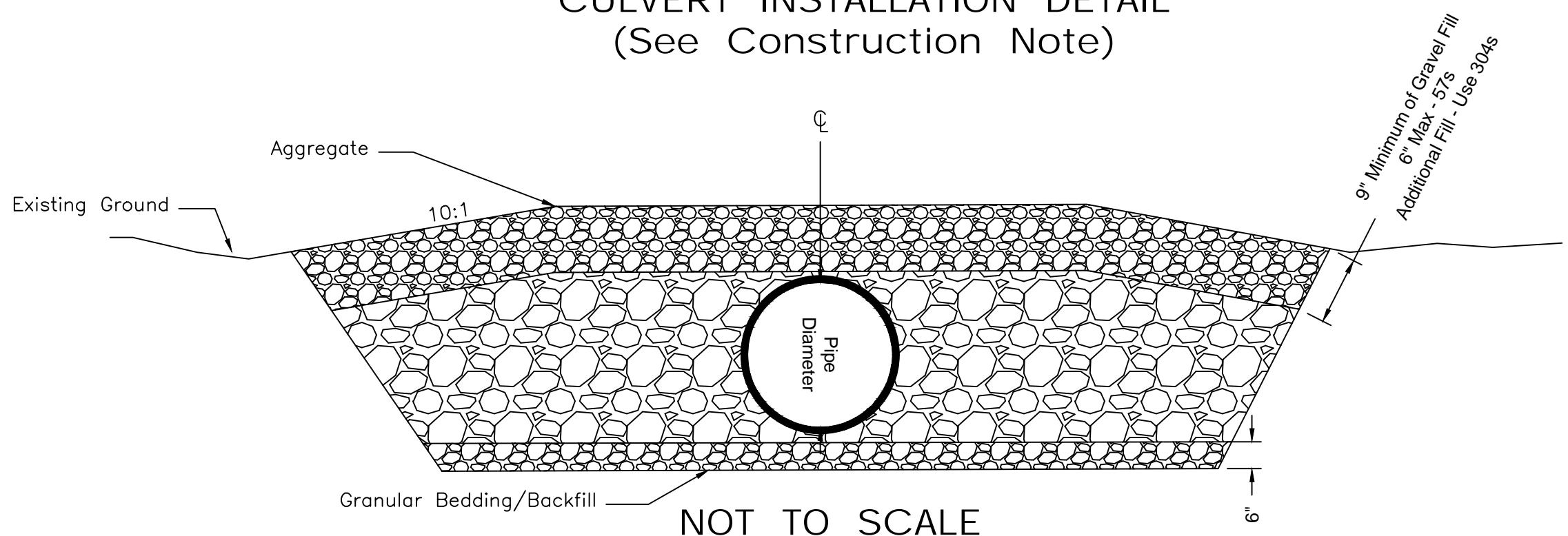
- Side slopes above rock may be modified to fit site specific conditions at the discretion of the construction inspector.

- Placement of Geotextile fabric may be used as a substitute for the ODOT #57 gravel bedding at the discretion of the contractor. If Geotextile fabric is used, it must comply with the specifications of NRCS #561 - Heavy Use Area Protection (P. 4, Paragraph 3). Copies of this Specification are available upon request.

- Excavation necessary above the upper limit of rock placement to blend the 4:1 side slope to existing ground will be considered part of the per linear foot payment for this item.

## CULVERT DETAIL

### CULVERT INSTALLATION DETAIL (See Construction Note)



### CONSTRUCTION NOTE

#### Materials

1. Conduit - corrugated HDPE plastic smooth lined pipe (double-wall) conforming to ODOT CMS 707.33.
2. Granular bedding and backfill - coarse aggregate meeting AASHTO/ODOT #57 or #67 size or crushed limestone aggregate meeting ODOT Item 304 or 411.

#### Excavation

The existing culvert shall be removed in its entirety, and included in this item for payment. The trench for the proposed culvert shall be excavated to a minimum width of 2 feet greater than the outside span of the culvert. The trench shall be excavated a minimum of 6 inches below the proposed elevation of the bottom of the culvert.

#### Bedding

Bedding for the culvert shall be 6 inches of granular material, and shall extend to the limits of the trench.

#### Laying Culvert

Except where otherwise directed by the Engineer for special conditions, the culvert shall be laid starting at the outlet end. For multiple barrel culverts, the minimum distance between the outside of adjacent barrels shall be 24".

#### Joining Culvert Sections

The method of joining culvert sections shall be such that the ends are fully entered and the inner surfaces are reasonably flush and even. Bands or gasket joints shall be used according to manufacturer's recommendations. Conduit shall be inspected before any backfill is placed. Any sections found to be out of alignment, unduly settled, or damaged shall be taken up and relaid or replaced.

#### Backfilling

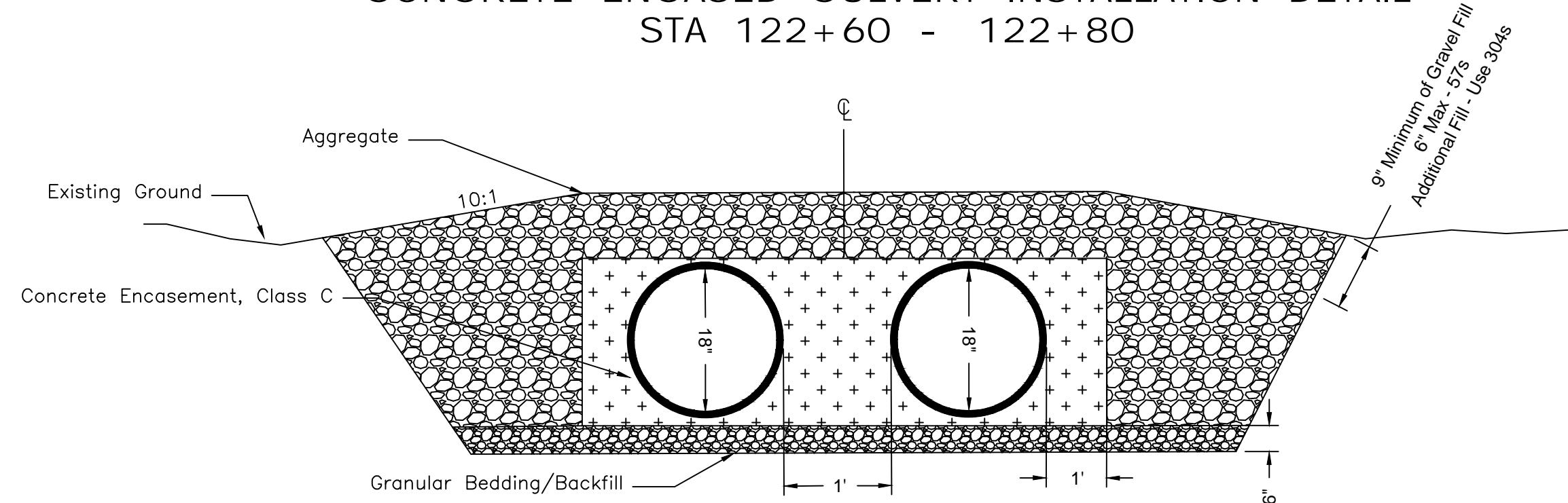
Granular backfill shall be placed in lifts not to exceed 8 inches up the sides of the culvert. Backfill shall be carefully compacted under the haunches of the pipe using mechanical compactors, spud bars or any other means approved by the Engineer.

When using #57 or #67 granular backfill, the material shall be compacted to approximately 85% of the original thickness. When using stabilized crushed aggregate, water shall be added as necessary to maintain optimum moisture content. Compaction shall be done by mechanical tampers, jumping-jacks, hand tools, or any other means approved by the Engineer, and shall be considered sufficient when 98-100 percent of AASHTO T 99 (Standard Proctor) has been achieved or the Engineer approves the backfill.

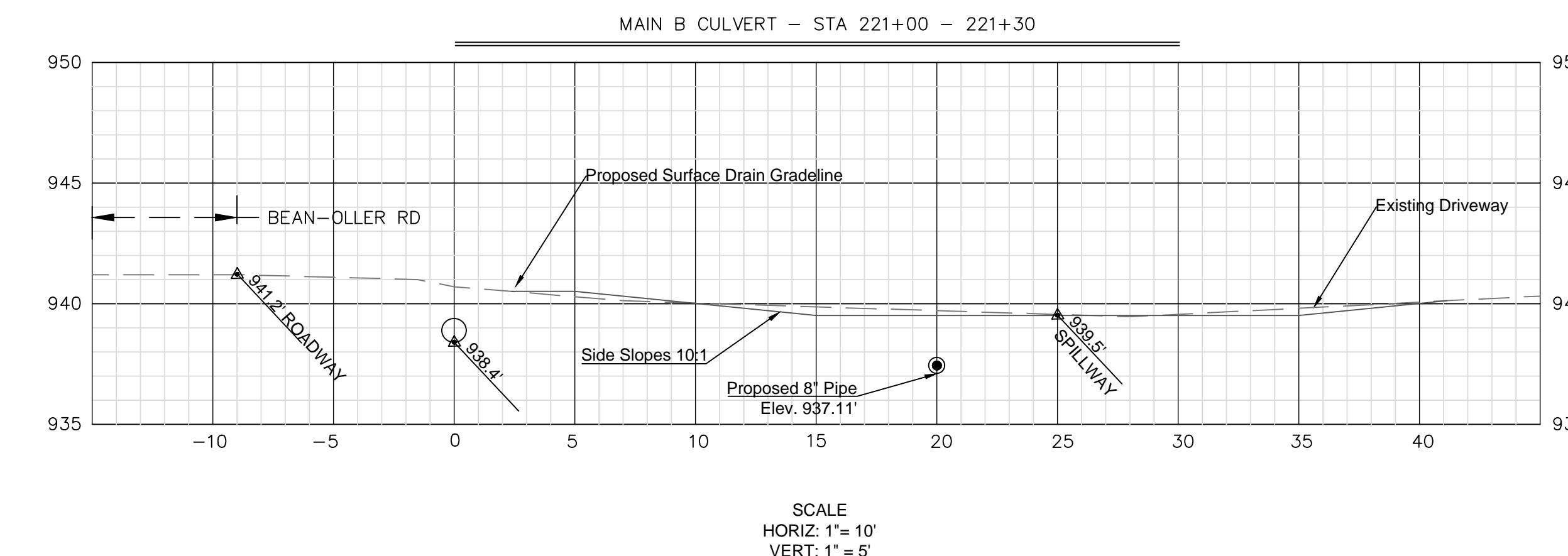
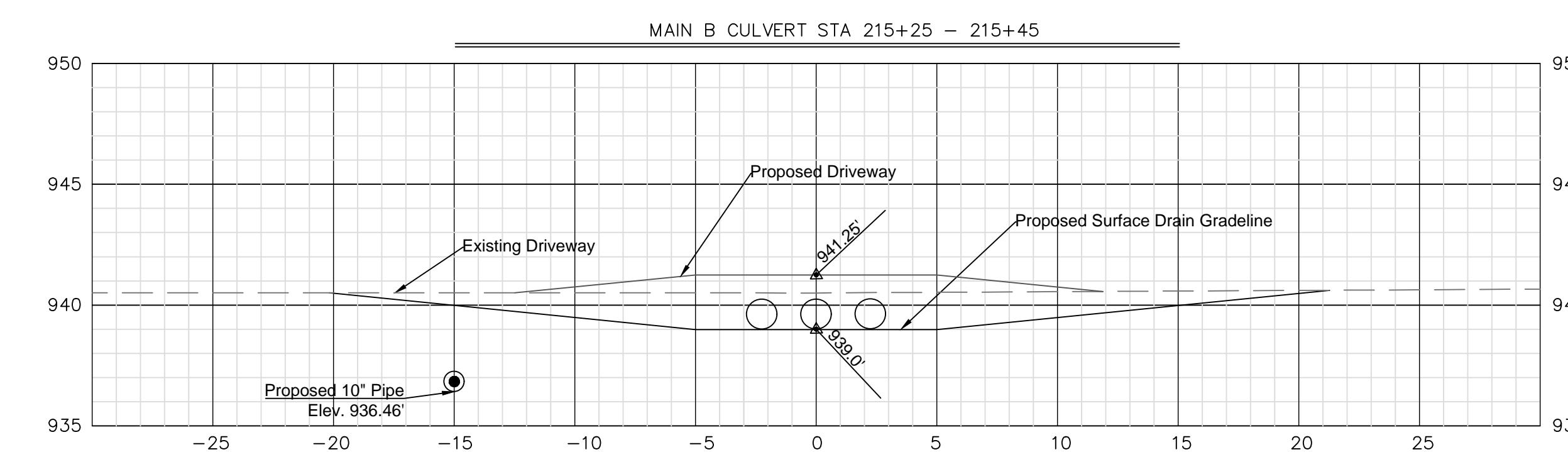
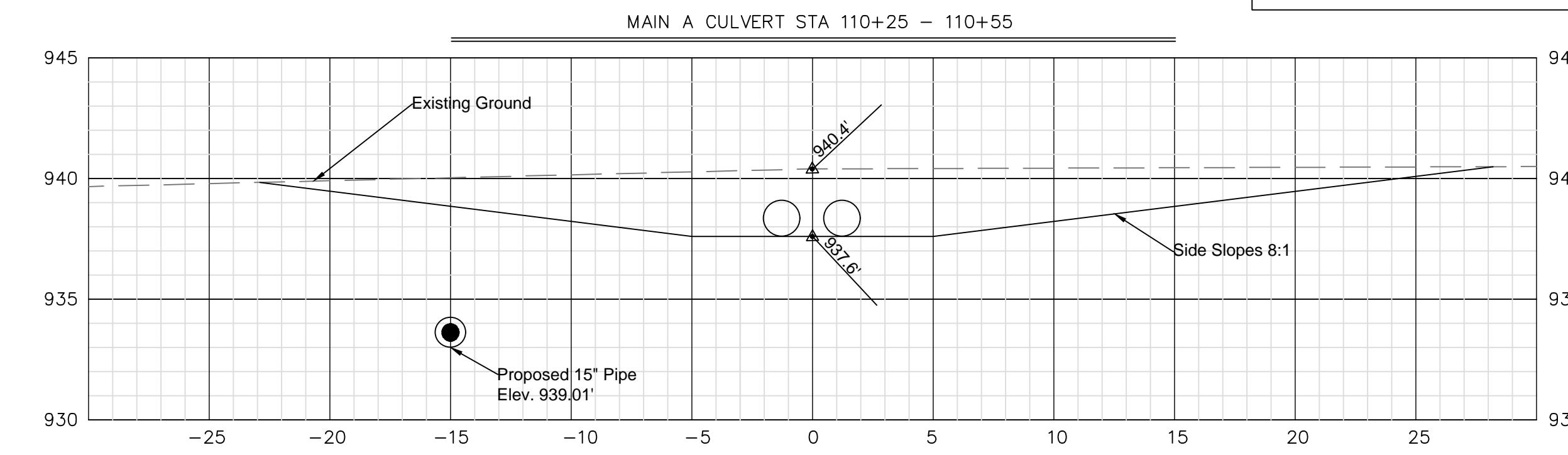
Culvert Design Table

STA Entrance	STA Exit	Entrance Inv.	Exit Inv.	Size	Qty	Material	Length
110+25	110+55	937.60'	937.57'	18"	2	ODOT 707.33	30'
215+25	215+45	939.00'	938.98'	15"	3	ODOT 707.33	20'
221+00	221+30	938.40	938.37'	18"	1	ODOT 707.33	30'

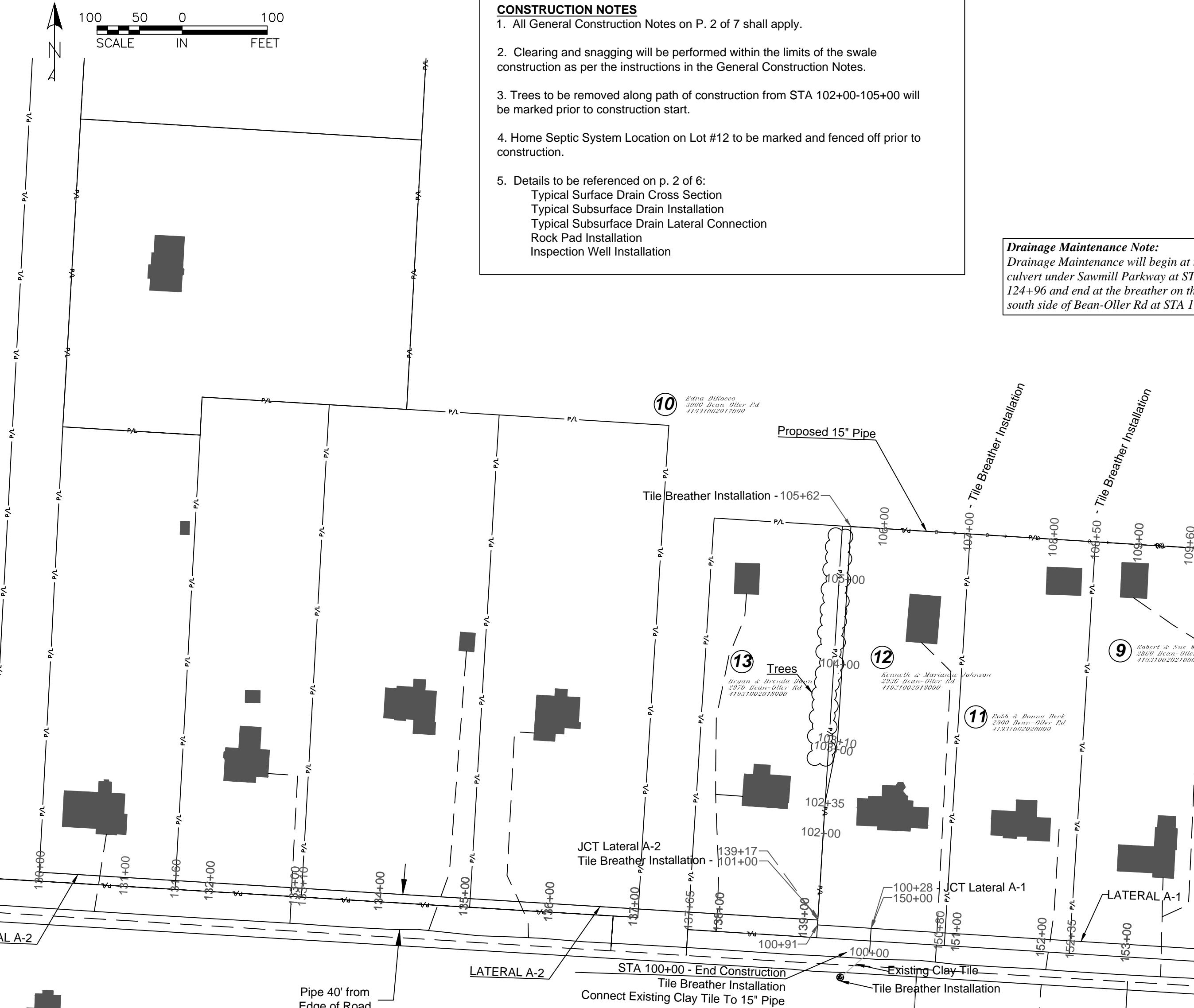
### CONCRETE ENCASED CULVERT INSTALLATION DETAIL STA 122+60 - 122+80



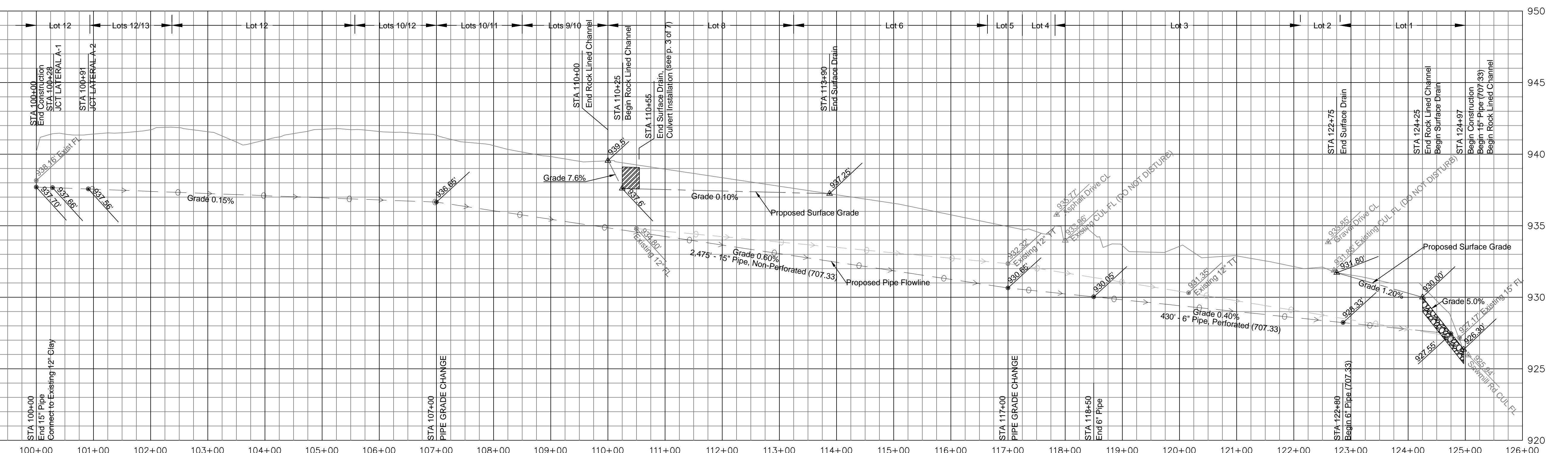
NOT TO SCALE



## MAIN A PLAN VIEW



MAIN A PROFILE



# **Toot #98**

## **DRAINAGE IMPROVEMENT PROJECT**

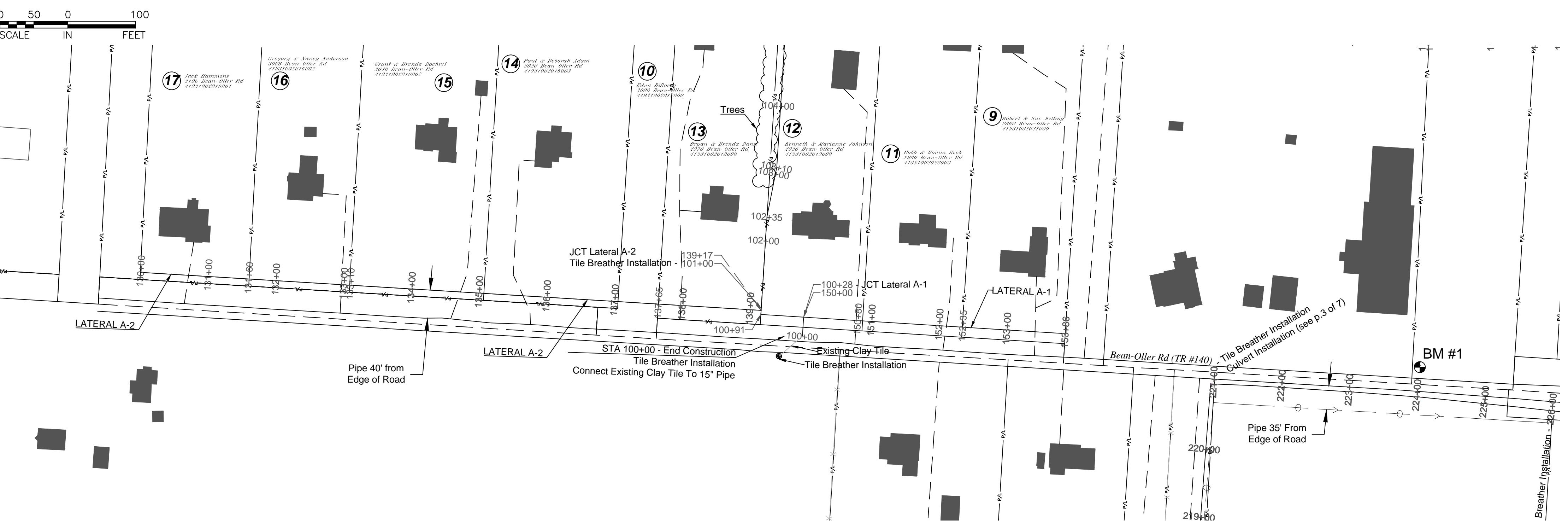
## **ENGINEERING DRAWINGS**

NCHMARK DESCRIPTIONS:  
#1 - BRASS TABLET SET IN CONCRETE AND  
AMPED "97-162", LOCATED ON BEAN-OLLER  
0.8 MILES WEST OF LIBERTY ROAD AND 11'  
RTH OF EDGE OF PAVEMENT OF  
AN-OLLER ROAD

ELEVATION - 939.97'

ESTIMATED QUANTITIES - TOOT #98 MAIN A			
<u>Item</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>
RCS 326	Clearing & Snagging	LUMP	N/A
RCS 468	Rock Lined Channel	97	Lineal Feet
RCS 606	15" Pipe, non-perforated (ODOT 707.33)	2475	Lineal Feet
RCS 606	6" Pipe, perforated (ODOT 707.33)	430	Lineal Feet
RCS 606	Tile Main Breathers	14	Each
RCS 608	Surface Drain - Swale	540	Lineal Feet
DOT 202	Tile Destruction in Place	1200	Lineal Feet
DOT 611	15" Pipe (707.33), non-perforated, Type B Installation (Gravel Drive)	40	Lineal Feet
DOT 611	6" Pipe (707.33), perforated, Type B Installation (Gravel Drive)	20	Lineal Feet
DOT 611	15" Pipe (707.33), non-perforated, Type B Installation (Paved Drive)	20	Lineal Feet
DOT 611	18" Private Drive Culvert (See P. 3 of 7 for detail)	1	Each
DOT 659	Seeding & Mulching	6200	Square Yards

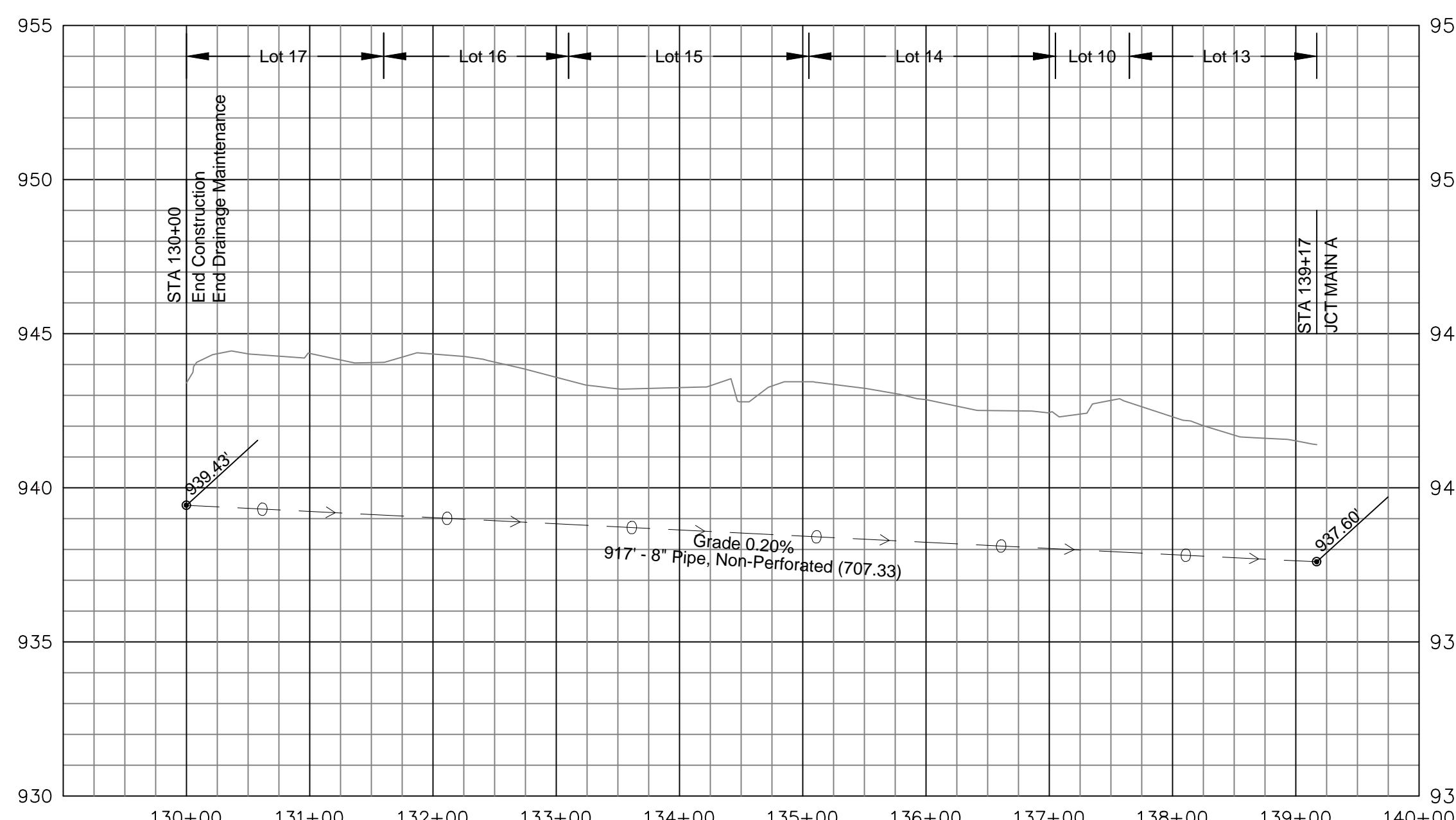
## A-1 & A-2 PLAN VIEW



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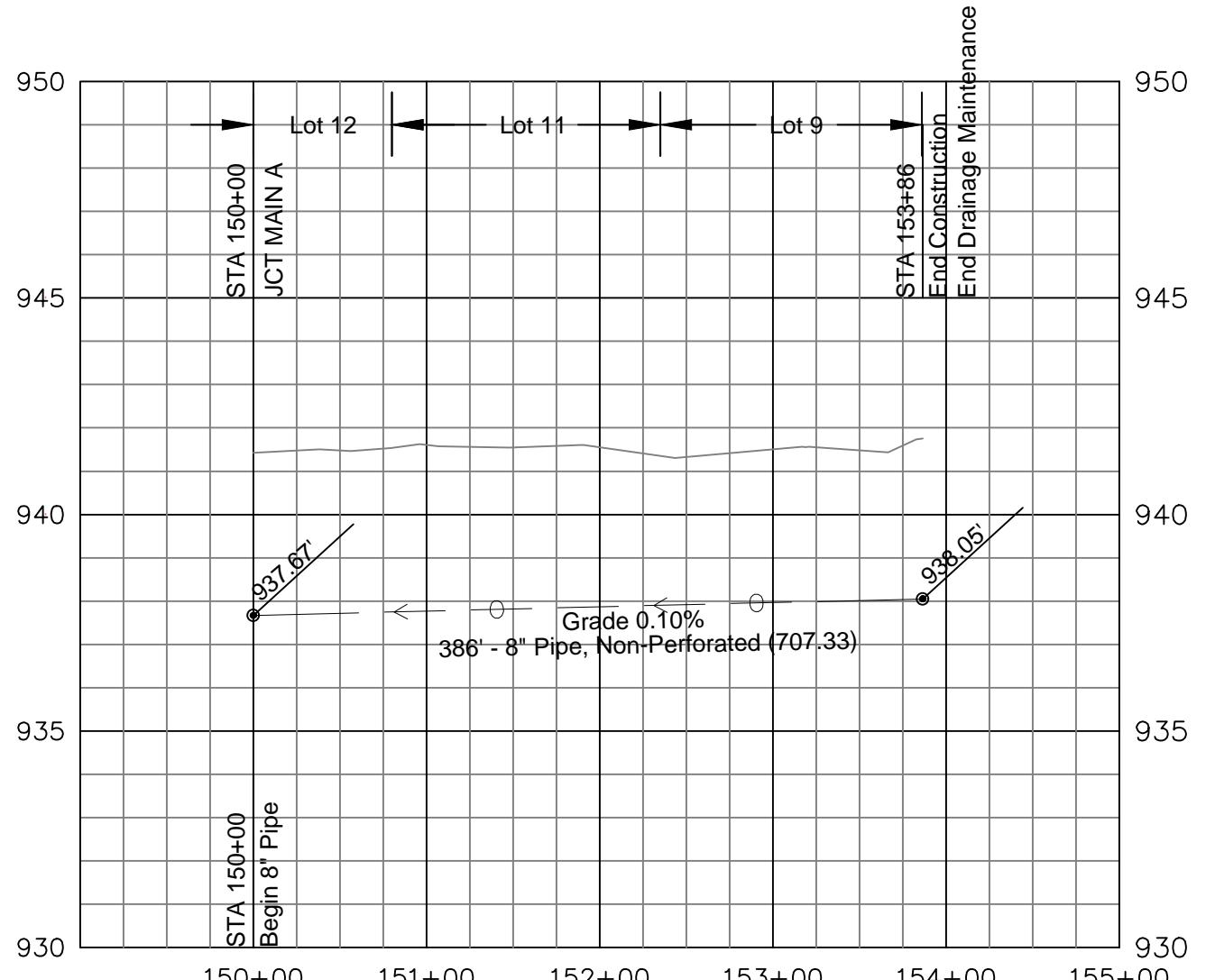
## *A-2 PROFILE*

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A-1 PROFILE



# **Toot #98**

## **DRAINAGE IMPROVEMENT PROJECT**

## **ENGINEERING DRAWINGS**

5  
7

CHMARK DESCRIPTIONS:  
#1 - BRASS TABLET SET IN CONCRETE AND  
IMPED "97-162", LOCATED ON BEAN-OLLER  
0.8 MILES WEST OF LIBERTY ROAD AND 11'  
NORTH OF EDGE OF PAVEMENT OF  
N-OLLER ROAD

VATION - 939.97'

#### INTRODUCTION NOTES

- General Construction Notes on P. 2 of 7 shall apply.

to be referenced on p. 2 of 7:

  - General Subsurface Drain Installation
  - General Subsurface Drain Lateral Connection
  - Excavation Well Installation

Material is to be exported from the site per General Construction Note #5. Material spoil export shall be considered as incidental to payment for NRCS #602 and #608.

## LEGEND

Existing SSD	
Proposed Mains	
Surface Drain	
Property Line	
Residence	
Pad	
Downway	
Benchmark	

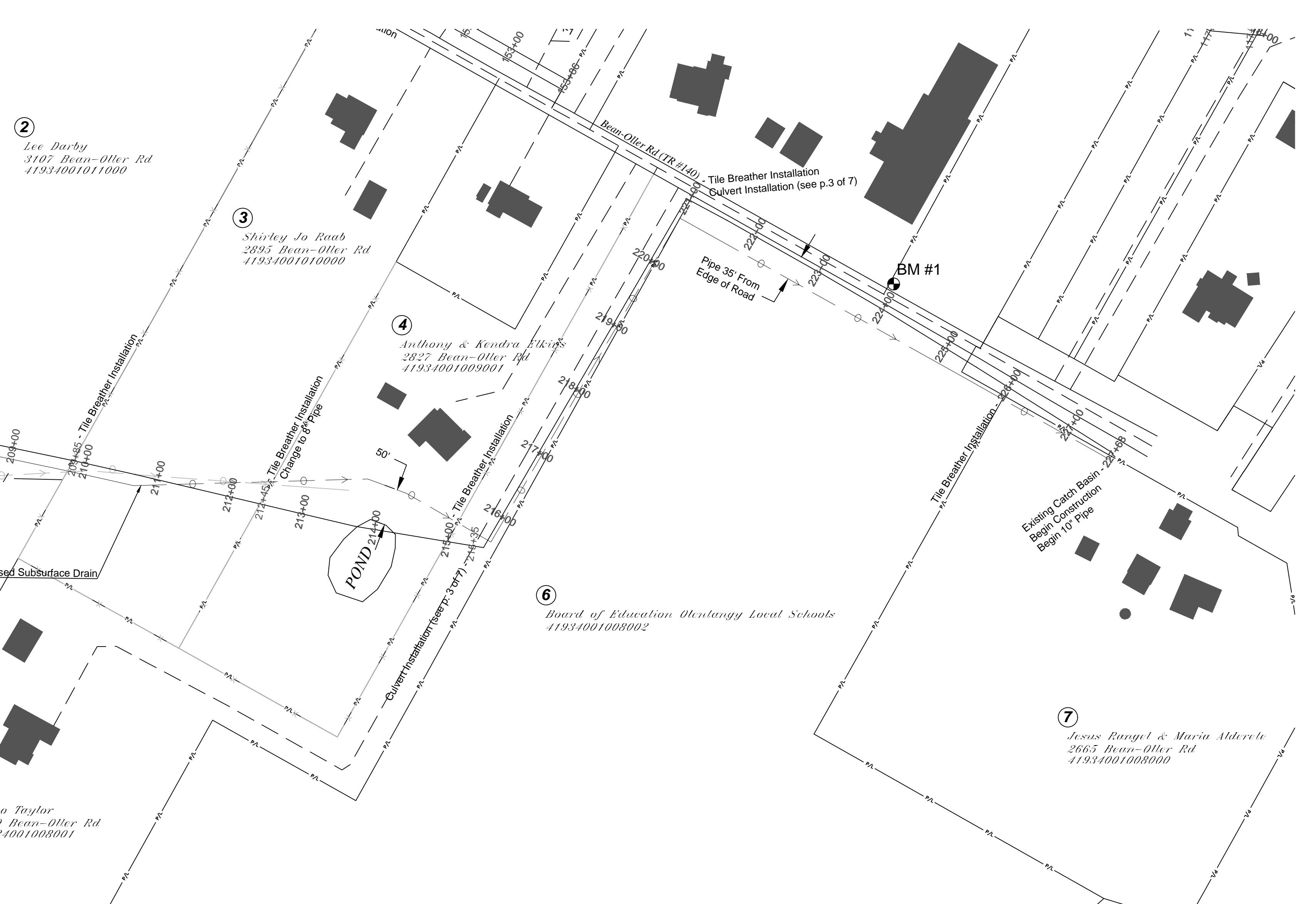
ESTIMATED QUANTITIES - TOOT #98 LATERAL A-1			
Item	Description	Quantity	Unit
NRCS 606	8" Pipe, non-perforated (ODOT 707.33)	326	Lineal Feet
NRCS 606	Tile Main Breathers	3	Each
ODOT 611	8" Pipe (707.33), non-perforated, Type B Installation, Paved Drive	40	Lineal Feet
ODOT 611	8" Pipe (707.33), non-perforated, Type B Installation, Gravel Drive	20	Lineal Feet
ODOT 659	Seeding & Mulching	550	Square Yards

ESTIMATED QUANTITIES - TOOT #98 LATERAL A-2			
<u>Item</u>	<u>Description</u>	<u>Quantity</u>	<u>Unit</u>
NRCS 606	8" Pipe, non-perforated (ODOT 707.33)	817	Lineal Feet
NRCS 606	Tile Main Breathers	7	Each
ODOT 452	Non-Reinforced Concrete Pavement Driveway Repair (including removal and disposal of existing pavement section)	LUMP	N/A
ODOT 611	8" Pipe (707.33), non-perforated, Type B Installation, Gravel Drive	20	Lineal Feet
ODOT 611	8" Pipe (707.33), non-perforated, Type B Installation, Paved Drive	80	Lineal Feet
ODOT 659	Seeding & Mulching	910	Square Yards

## MAIN B PLAN VIEW

SCALE IN FEET  
100 50 0 100

Item	Description	Quantity	Unit
NRCS 326	Clearing & Snagging	LUMP	N/A
NRCS 606	10" Pipe, perforated (ODOT 707.33)	1270	Lineal Feet
NRCS 606	10" Pipe, non-perforated (ODOT 707.33)	200	Lineal Feet
NRCS 606	8" Pipe, perforated (ODOT 707.33)	740	Lineal Feet
NRCS 606	8" Pipe, non-perforated (ODOT 707.33)	500	Lineal Feet
NRCS 606	Tile Main Breathers	6	Each
NRCS 608	Surface Drain - Swale	2663	Lineal Feet
ODOT 202	Tile Destruction in Place	1200	Lineal Feet
ODOT 202	Fence Removal for Reuse	150	Lineal Feet
ODOT 611	10" Pipe, (707.33), non-perforated, Type B Installation, Gravel Drive	20	Lineal Feet
ODOT 611	18" Private Drive Culvert (See P. 3 of 7 for details)	1	Each
ODOT 611	15" Private Drive Culvert (See P. 3 of 7 for details)	1	Each
ODOT 659	Seeding & Mulching	3000	Square Yards



## Toot #98 DRAINAGE IMPROVEMENT PROJECT ENGINEERING DRAWINGS

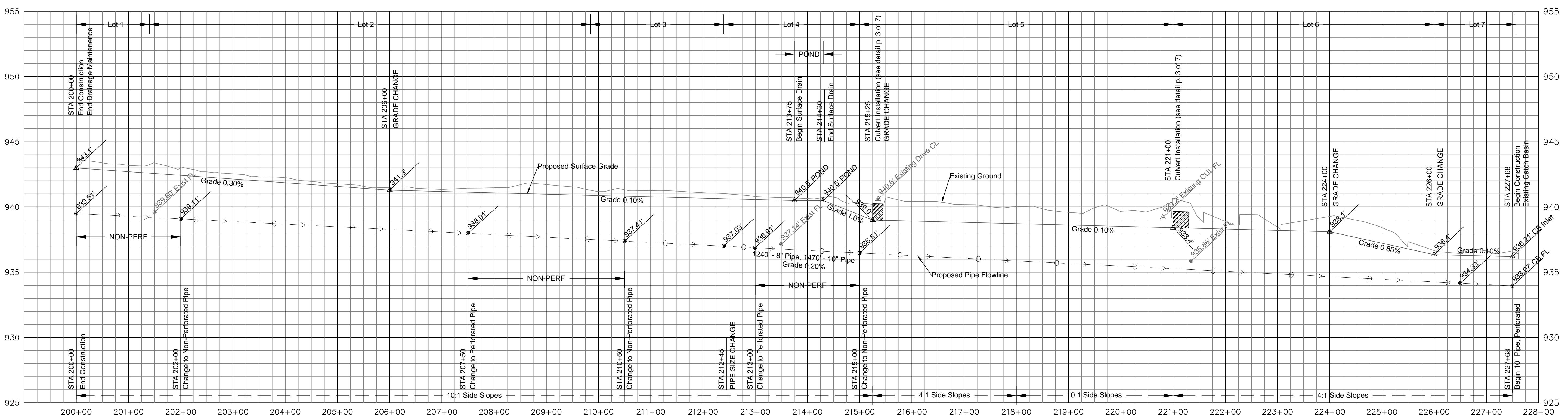
6  
7

BENCHMARK DESCRIPTIONS:  
BM #1 - BRASS TABLET SET IN CONCRETE AND STAMPED "97-162" LOCATED ON BEAN-OLLER RD 0.8 MILES WEST OF LIBERTY ROAD AND 11' NORTH OF EDGE OF PAVEMENT OF BEAN-OLLER ROAD  
ELEVATION - 939.97'

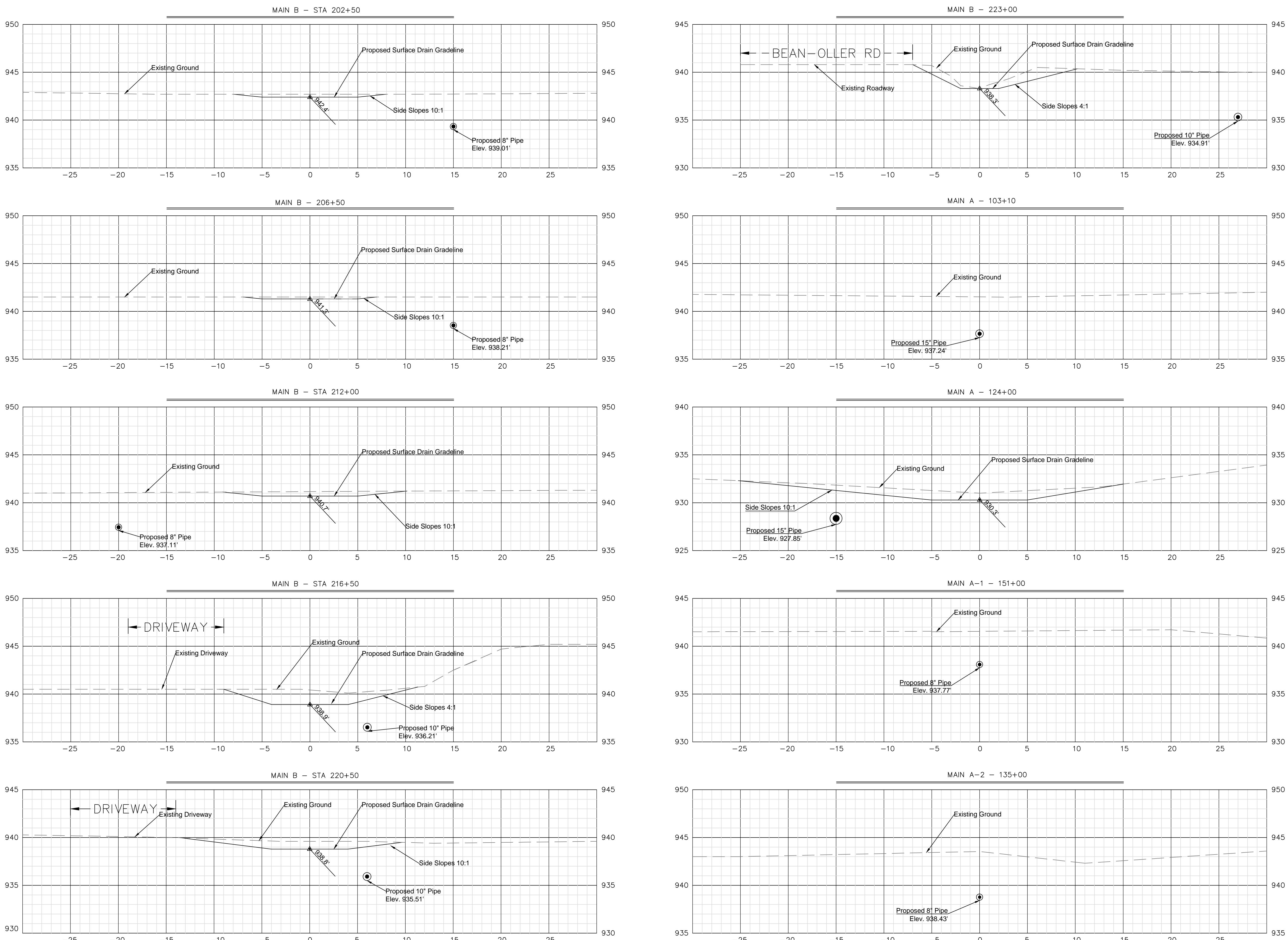
- CONSTRUCTION NOTES**
- All General Construction Notes on P. 2 of 6 shall apply.
  - Clearing and snagging will be performed within the limits of the channel and swale construction as per the instructions in the General Construction Notes.
  - Tile removal reaches will be marked by the Construction Inspector.
  - Fence removal and reuse at STA 209+85, 212+45, and 215+00 will be marked by the Construction Inspector.
  - Details to be referenced on p. 2 of 10:
    - Typical Surface Drain Cross Section
    - Typical Subsurface Drain Installation
    - Typical Subsurface Drain Lateral Connection
    - Inspection Well Installation
  - All spoil is to be exported from the site per General Construction Note #5. Payment for spoil export shall be considered as incidental to payment for NRCS Items #582 and #608.
  - Lot #4's HSTS is located behind pond. Septic Distribution line from house to HSTS to be located prior to construction to verify pipe elevation.

LEGEND	
Existing SSD	—>—>
Proposed Mains	—○—>
Surface Drain	— — —
Property Line	—p—
Fence	—x—
Road	—  —
Driveway	- - -
Benchmark	●

## MAIN B PROFILE



CROSS-SECTIONS

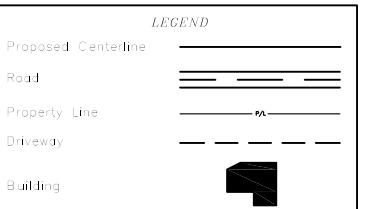


WORK LIMITS & ACCESS EASEMENTS - TOOT #98

TOOT #98  
DRAINAGE IMPROVEMENT PROJECT  
ENGINEERING DRAWINGS

7A  
7

125 62.5 0 125  
SCALE IN FEET



**NOTE:** All areas disturbed within the construction and maintenance easement area shall be returned to their pre-construction condition at the expense of the contractor. Payment for any remediation will be considered incidental to the listed items of work. The contractor shall take extra care to ensure the minimal disruption of any access easement and shall perform any necessary remediation work at the earliest possible convenience.

