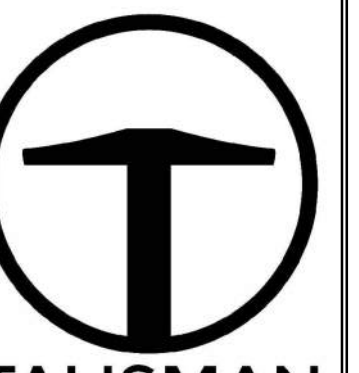


# BOBCAT RIDGE

## SITE CONSTRUCTION DRAWINGS

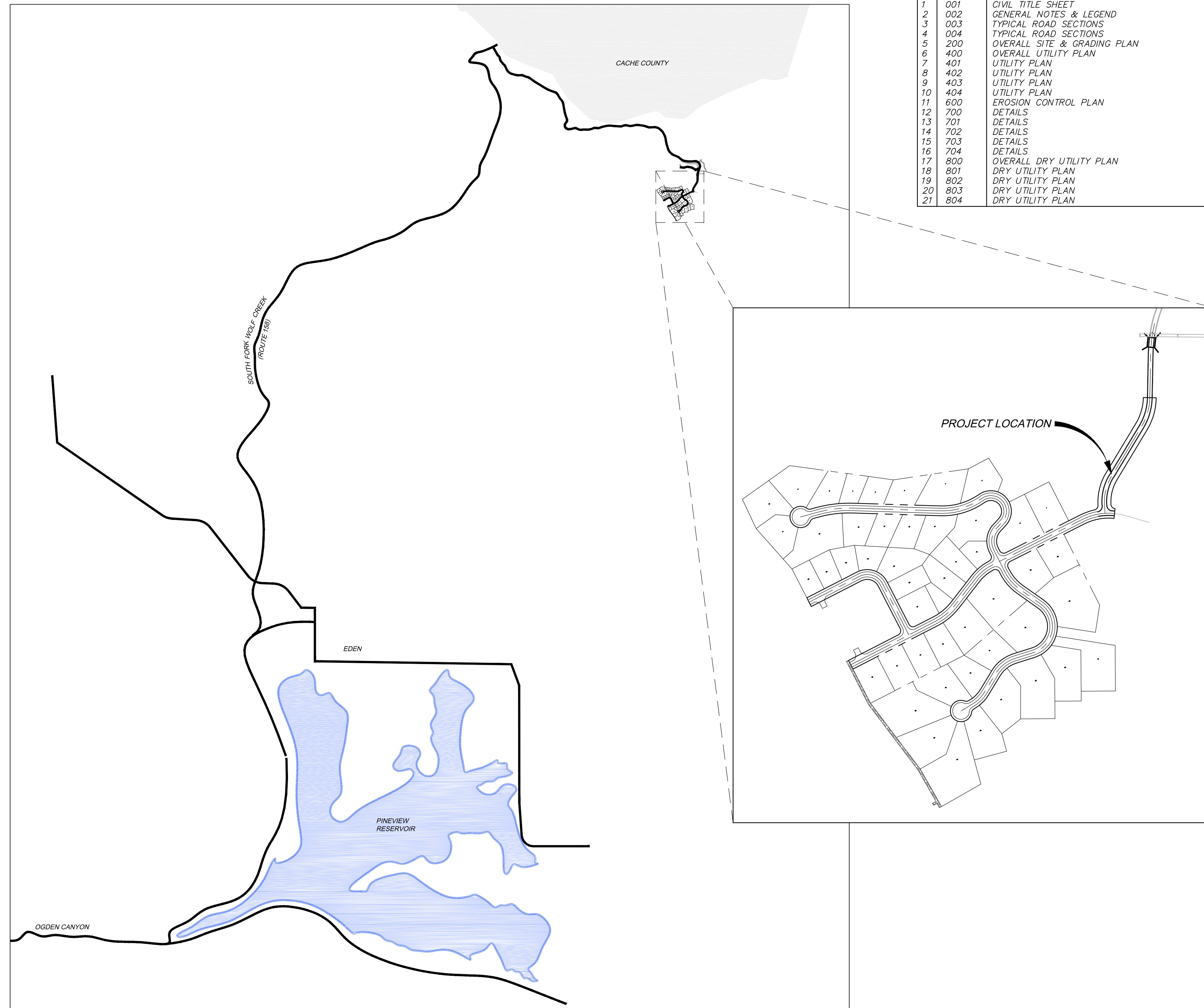
Located in Sec 08 T7N R2E  
Weber County, Utah



**TALISMAN**  
CIVIL CONSULTANTS  
6217 SOUTH STATE STREET  
SUITE 200  
MURRAY, UT 84107  
801.743.1300

**SHEET INDEX:**

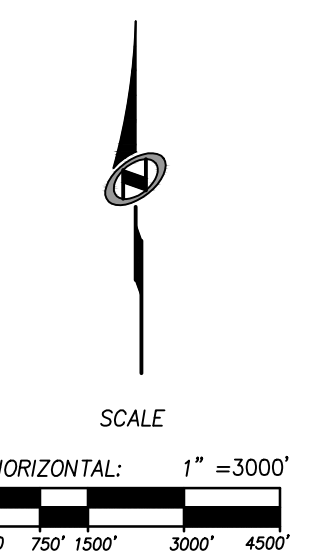
| SHEET NO. | SHEET DESCRIPTION               |
|-----------|---------------------------------|
| 1         | 001 CIVIL TITLE SHEET           |
| 2         | 002 GENERAL NOTES & LEGEND      |
| 3         | 003 TYPICAL ROAD SECTIONS       |
| 4         | 004 TYPICAL ROAD SECTIONS       |
| 5         | 200 OVERALL SITE & GRADING PLAN |
| 6         | 400 OVERALL UTILITY PLAN        |
| 7         | 401 UTILITY PLAN                |
| 8         | 402 UTILITY PLAN                |
| 9         | 403 UTILITY PLAN                |
| 10        | 404 UTILITY PLAN                |
| 11        | 600 EROSION CONTROL PLAN        |
| 12        | 700 DETAILS                     |
| 13        | 701 DETAILS                     |
| 14        | 702 DETAILS                     |
| 15        | 703 DETAILS                     |
| 16        | 704 DETAILS                     |
| 17        | 800 OVERALL DRY UTILITY PLAN    |
| 18        | 801 DRY UTILITY PLAN            |
| 19        | 802 DRY UTILITY PLAN            |
| 20        | 803 DRY UTILITY PLAN            |
| 21        | 804 DRY UTILITY PLAN            |



BOBCAT RIDGE  
CIVIL TITLE SHEET

DATE SUBMITTED: 07.18.2018

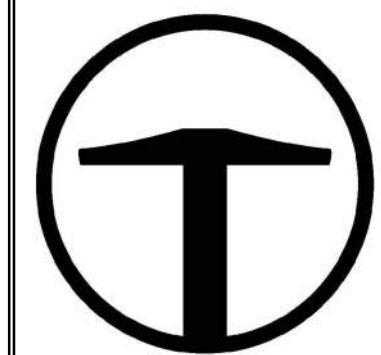
TCC JOB NUMBER: 18.200.22



SHEET NUMBER  
**001**  
1 OF 21



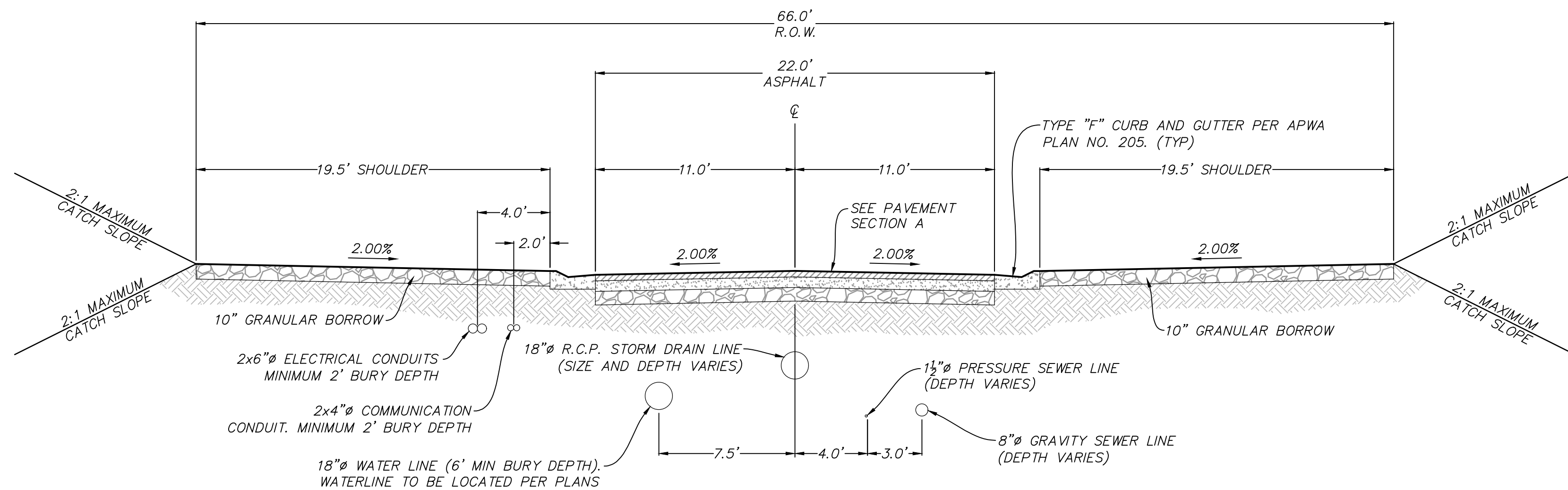




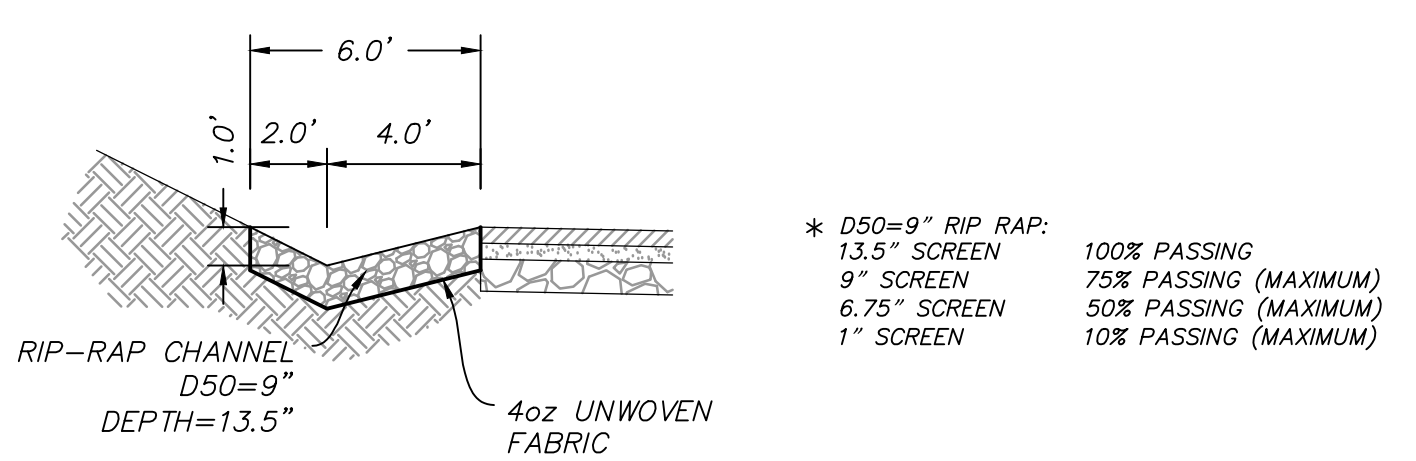
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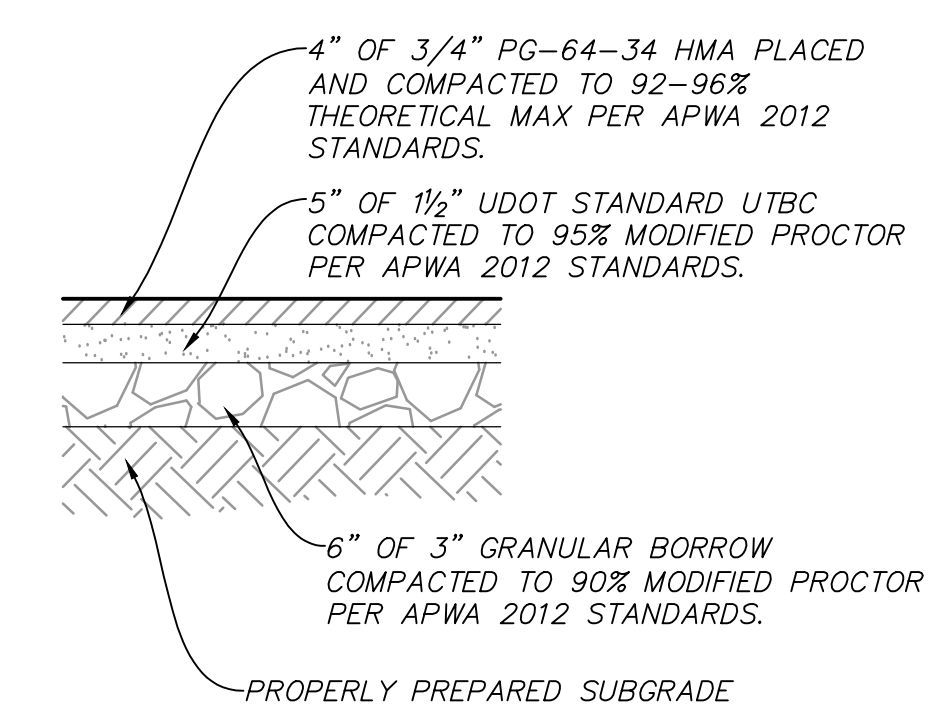
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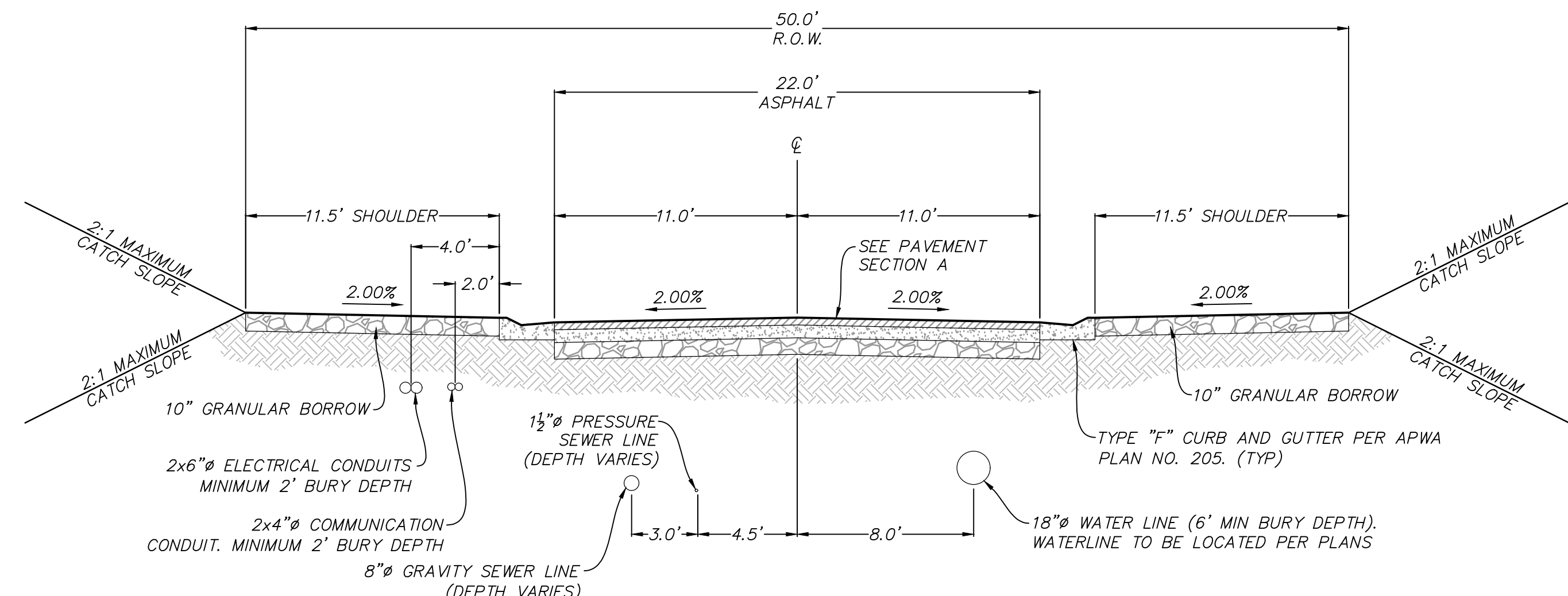
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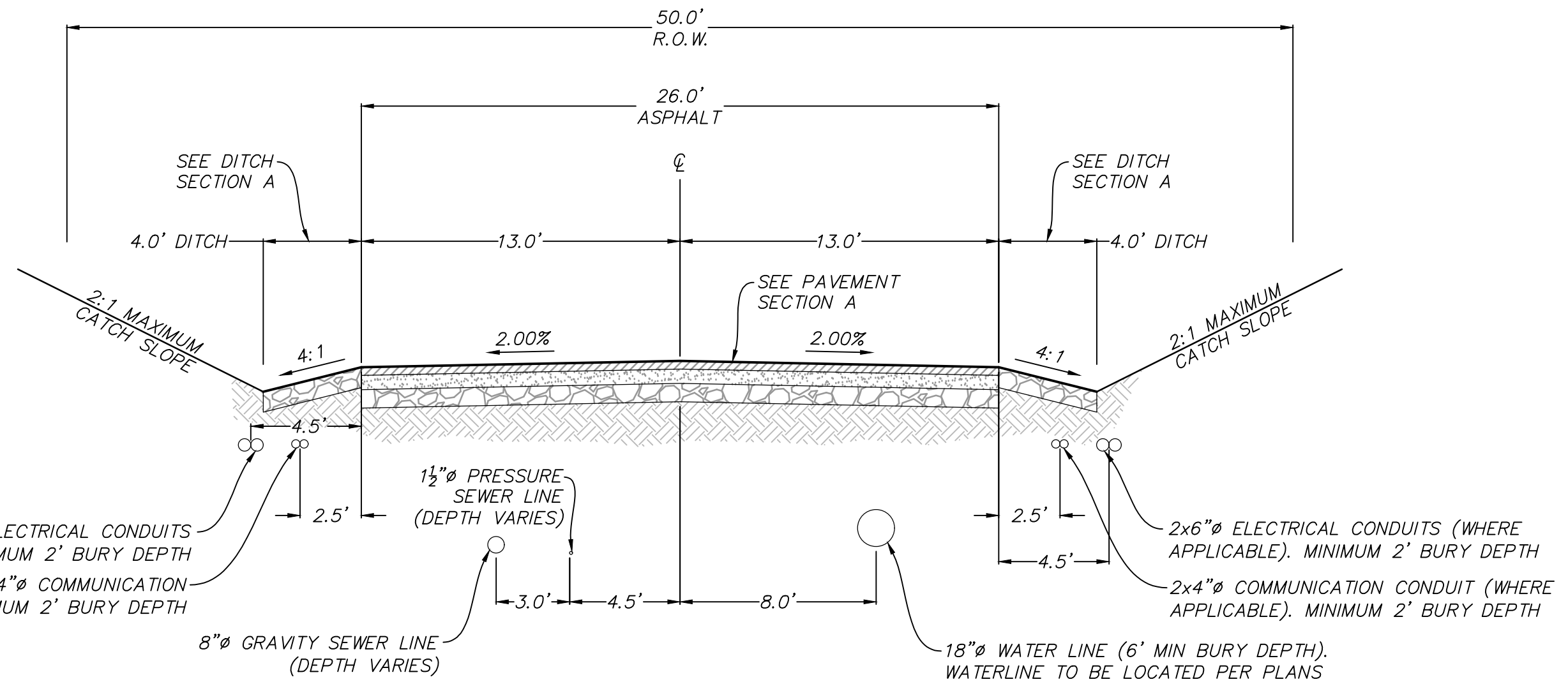
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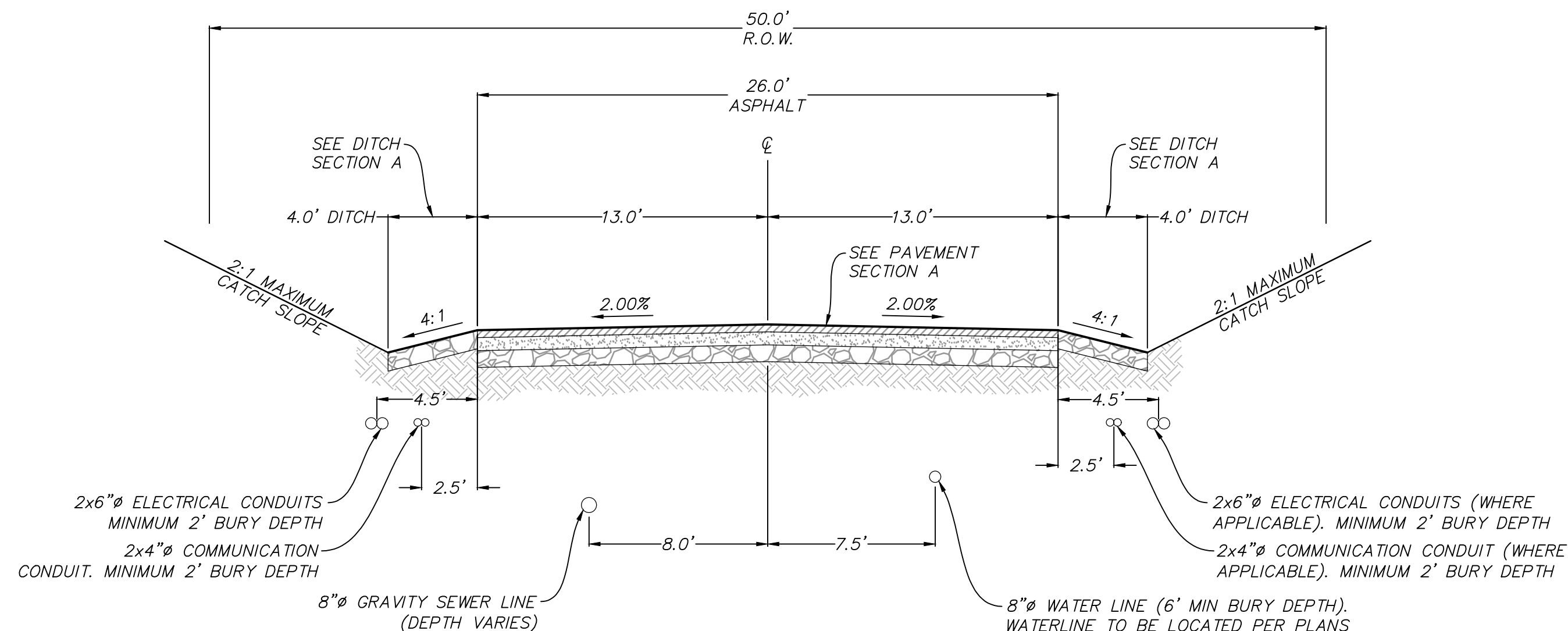
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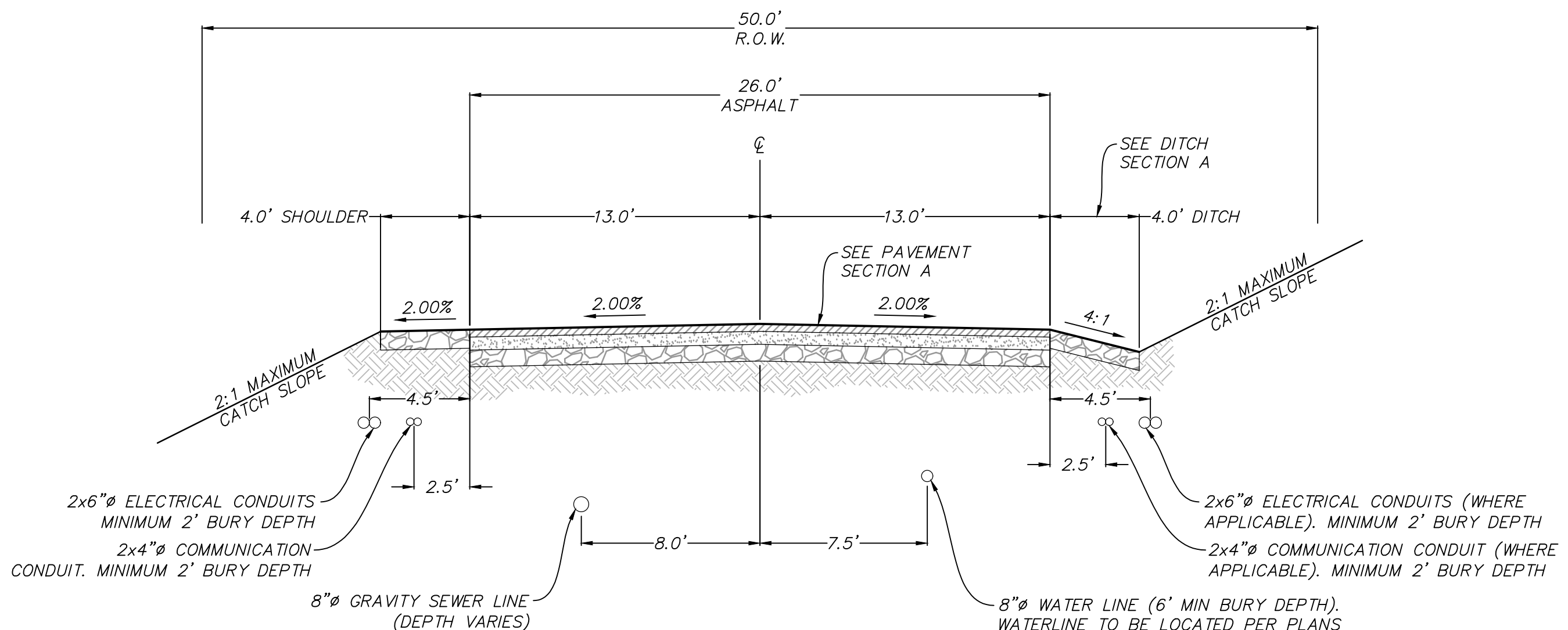
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STA: 10+00 – 11+25.85



**TYPICAL SECTION: WHITE PINE DRIVE**  
STA: 11+25.85 – 15+94.92  
STA: 16+90.22 – 24.83.71



**TYPICAL SECTION: MEADOW DRIVE**  
STA: 10+48 – 14+40.81



**TYPICAL SECTION: MEADOW DRIVE**  
STA: 14+40.81 – 20+52.30

**BOBCAT RIDGE**  
TYPICAL ROAD SECTIONS

DATE SUBMITTED: 07.18.2018

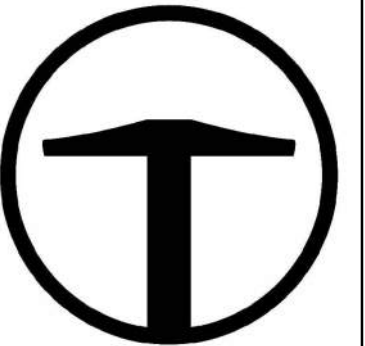
TCC JOB NUMBER: 18.200.22

SHEET NUMBER  
**003**

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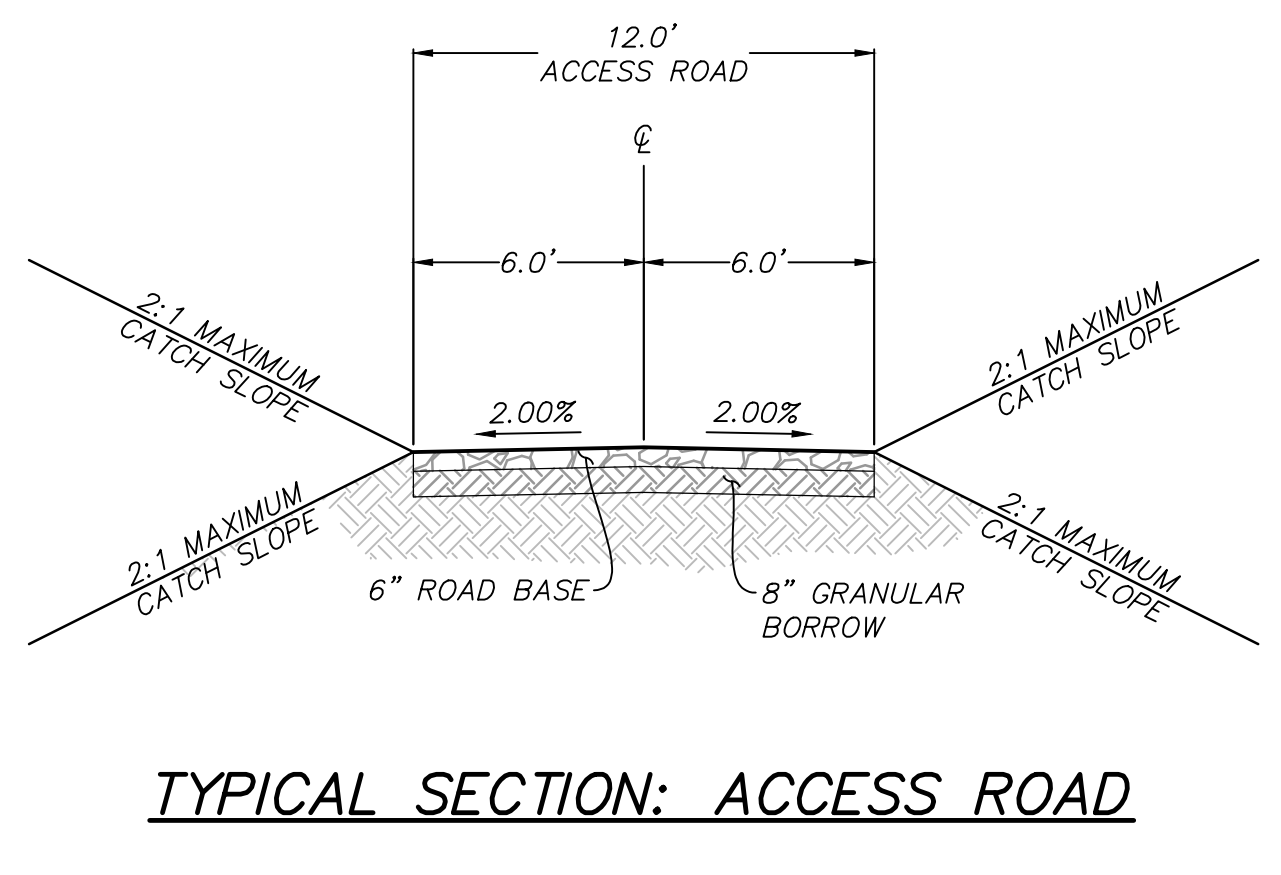
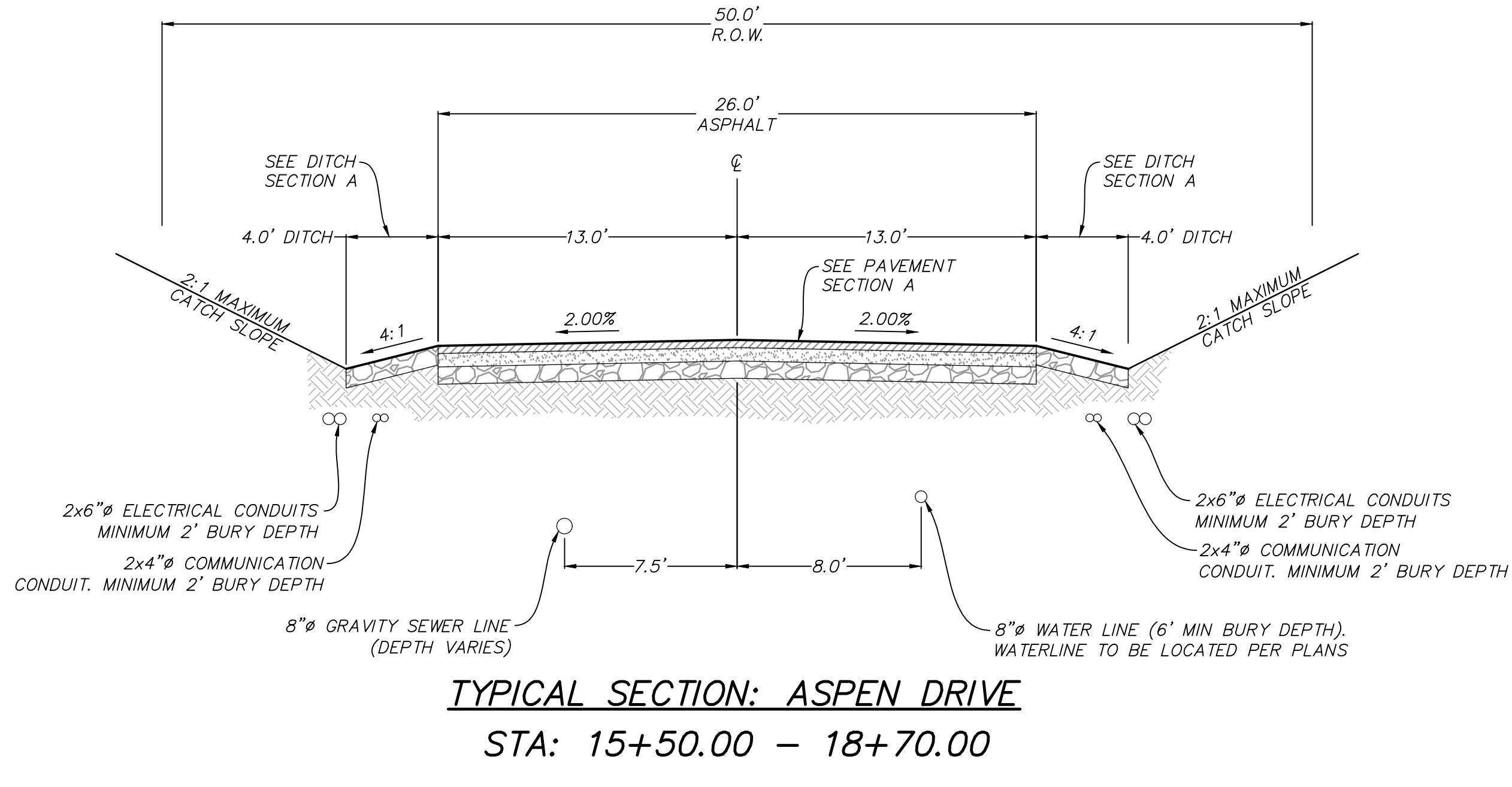
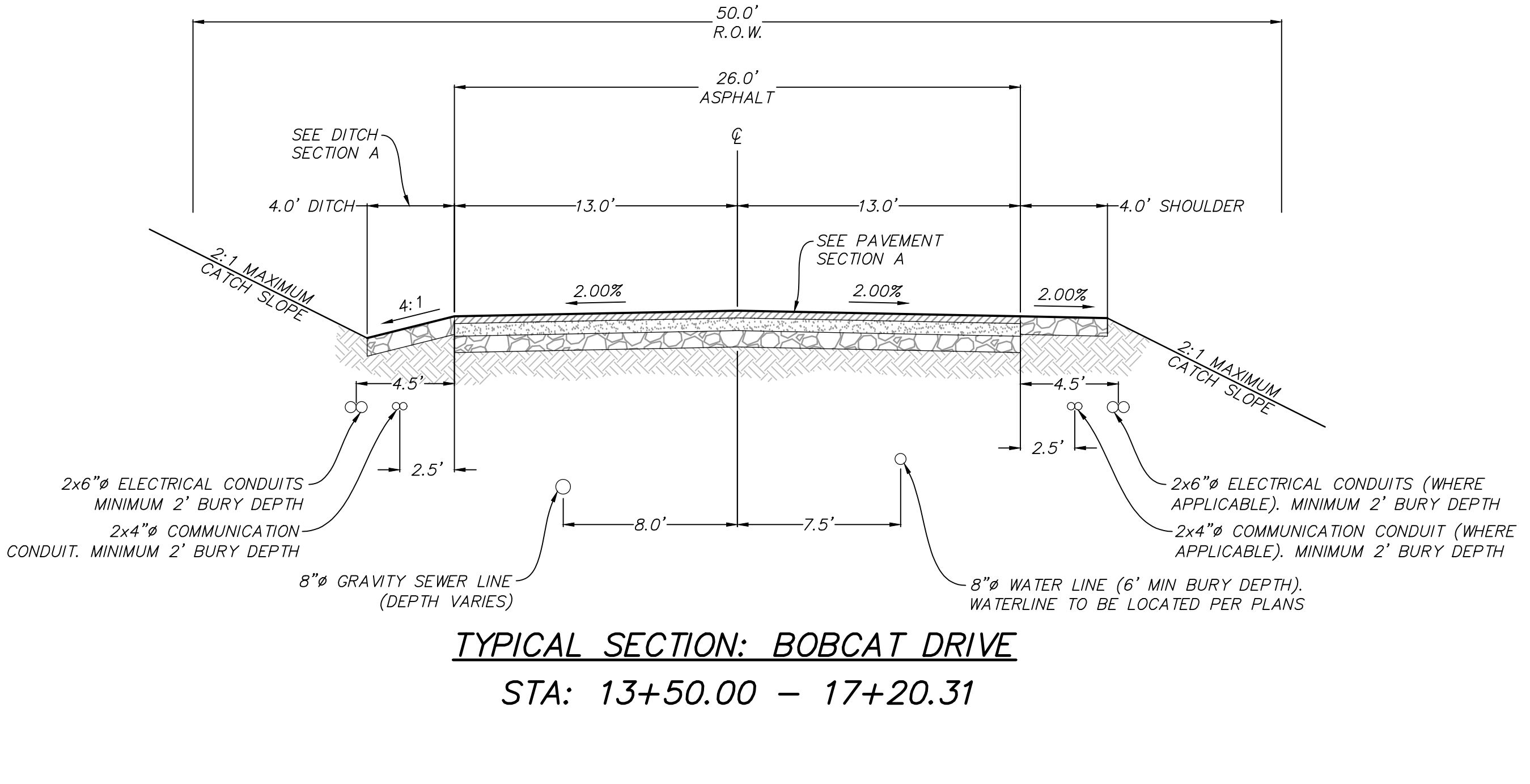
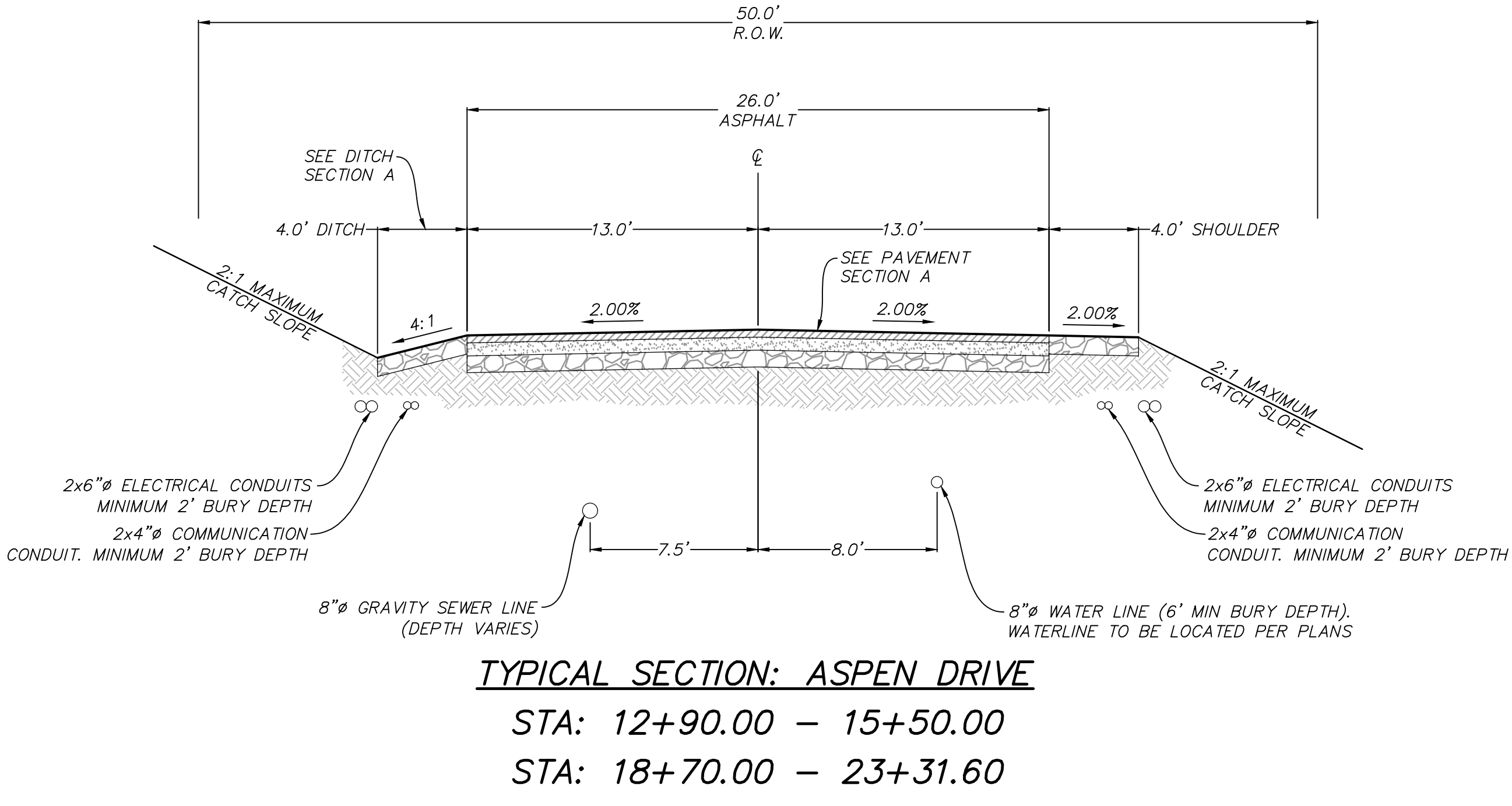
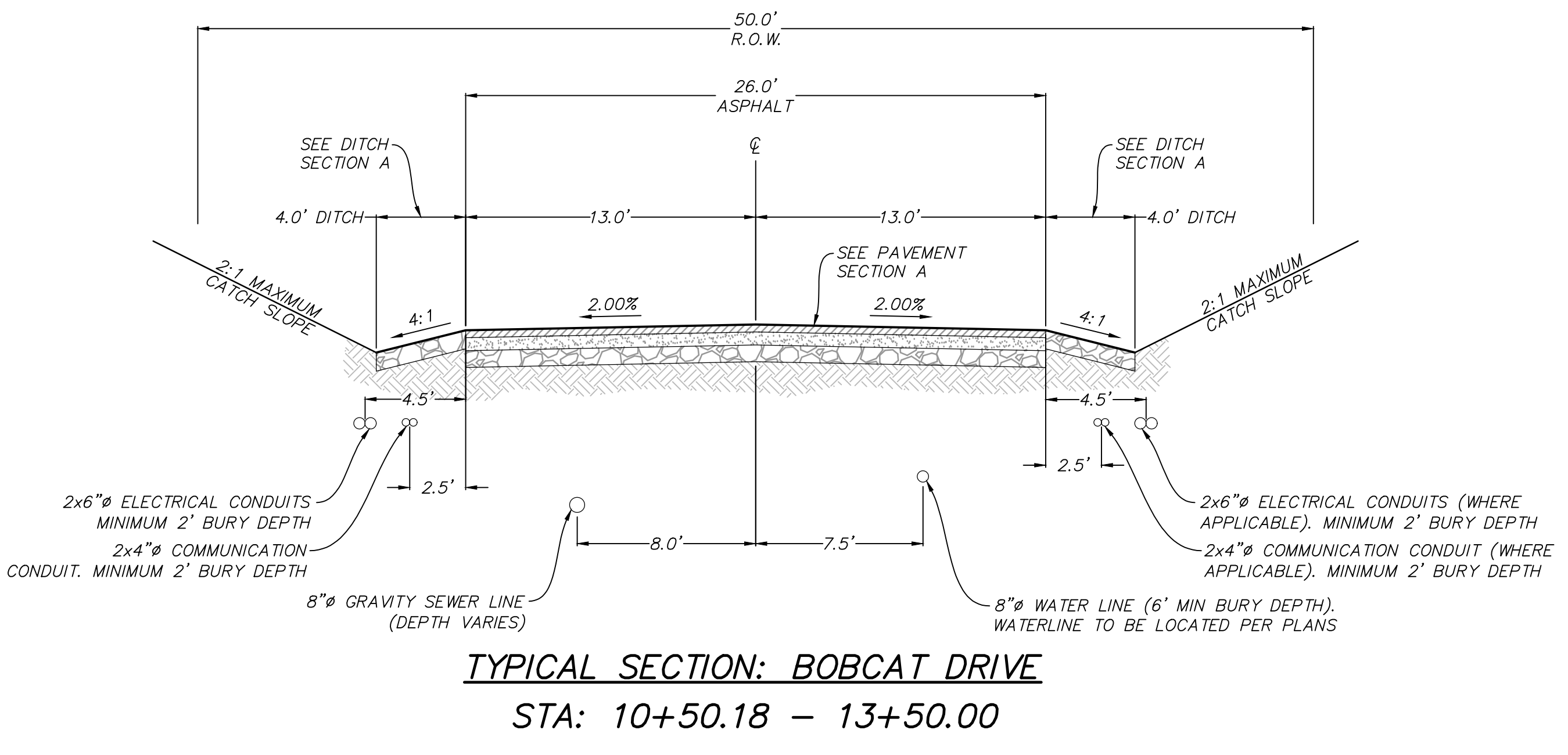
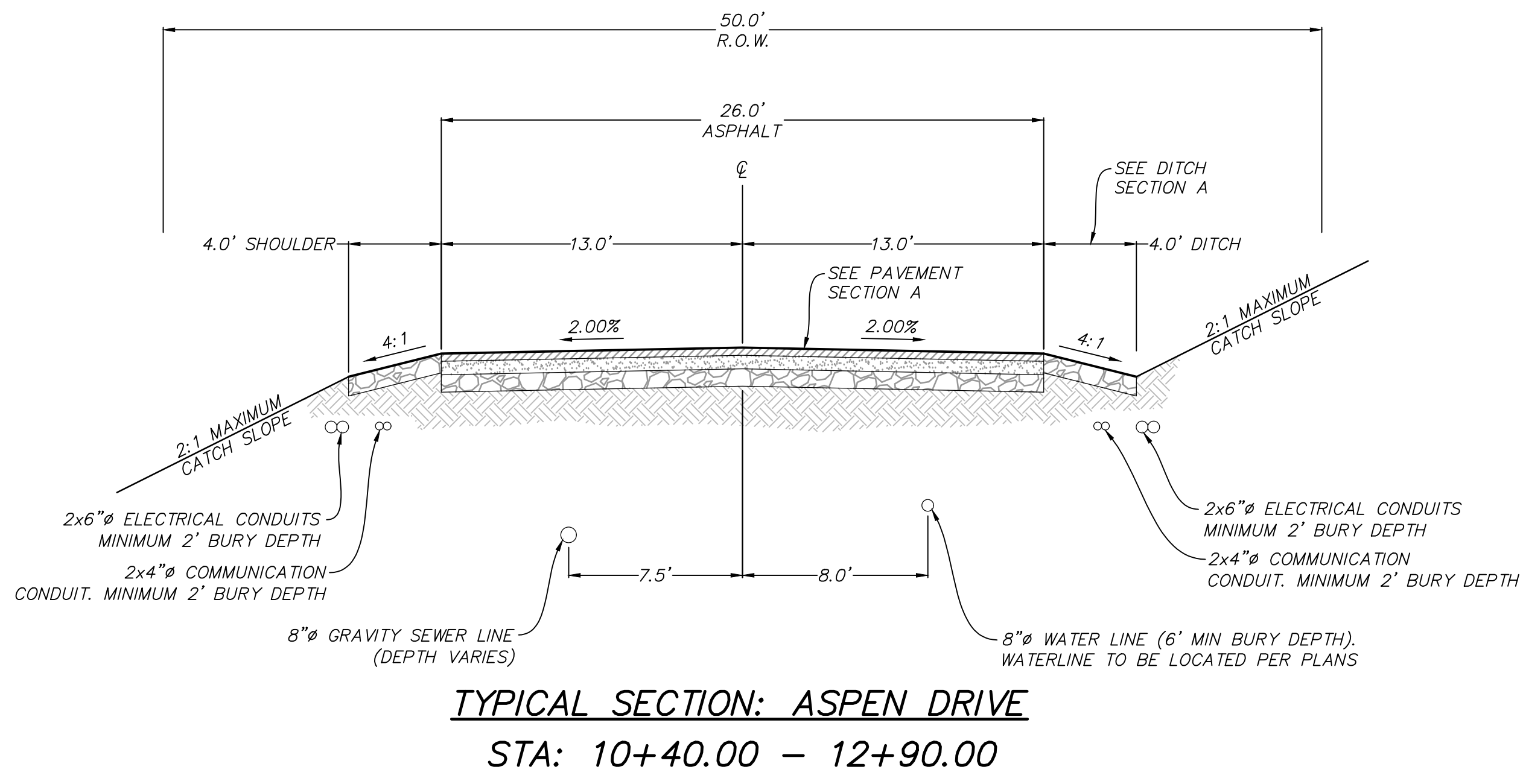
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**BOBCAT RIDGE**  
TYPICAL ROAD SECTIONS  
DATE SUBMITTED: 07.18.2018  
TCC JOB NUMBER: 18.200.22

DATE: 7/18/2018 1:43 PM

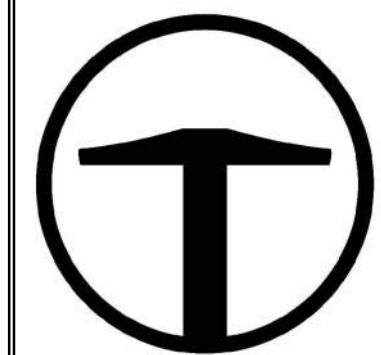
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SHEET NUMBER  
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4 OF 21

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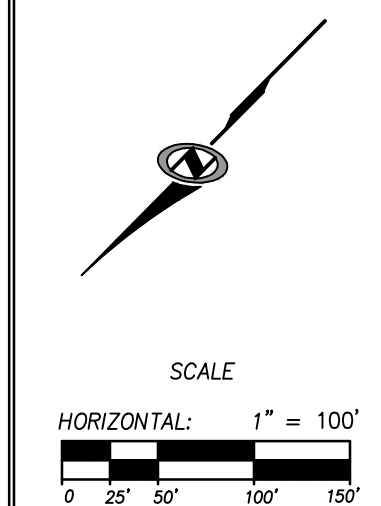
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**BOBCAT RIDGE**  
**OVERALL SITE & GRADING PLAN**

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18-200.22

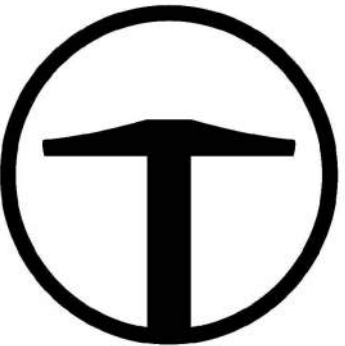
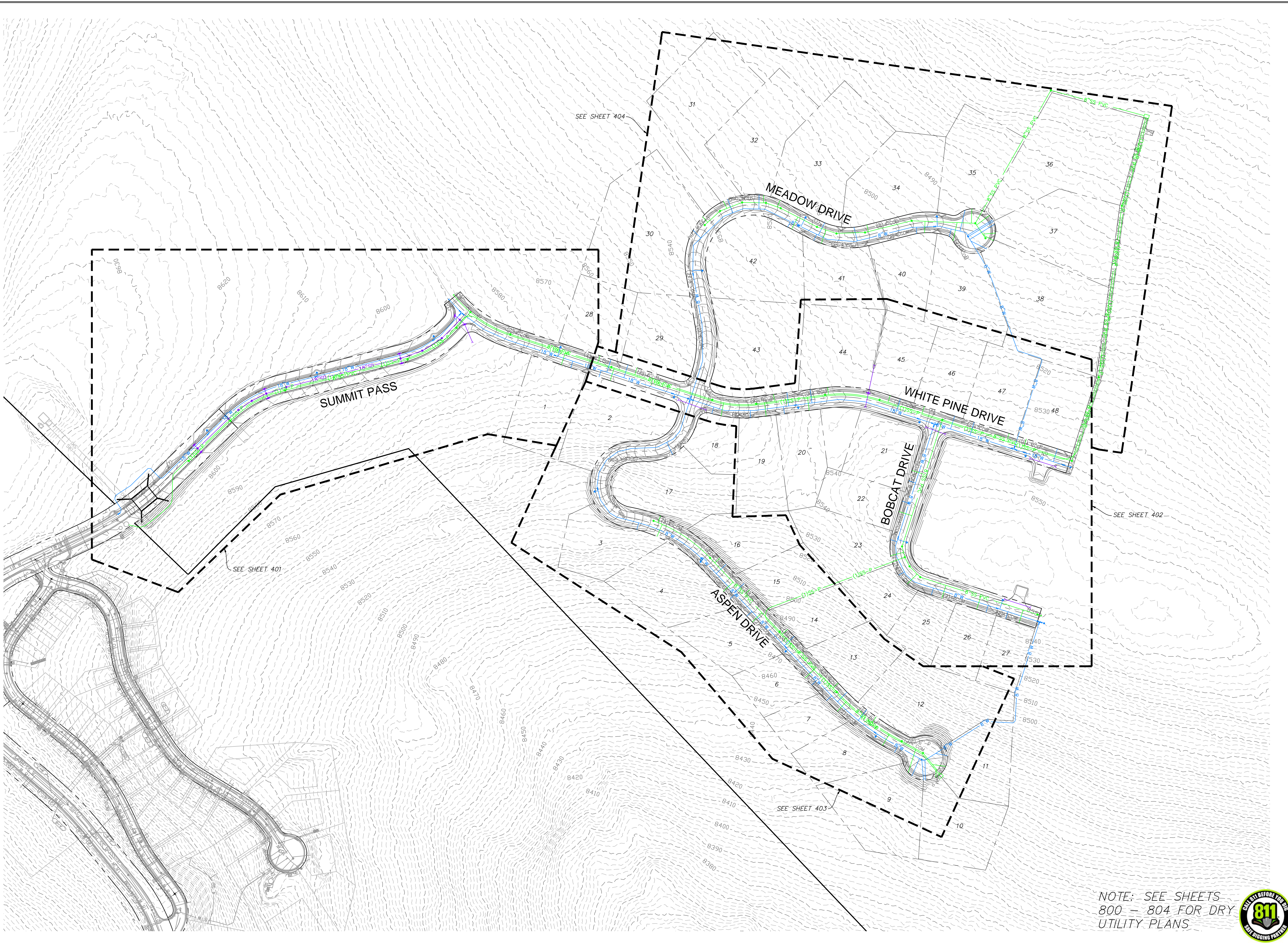


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**200**  
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DATE: 7/18/2018 1:50 PM

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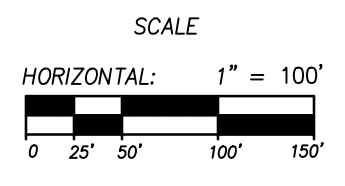
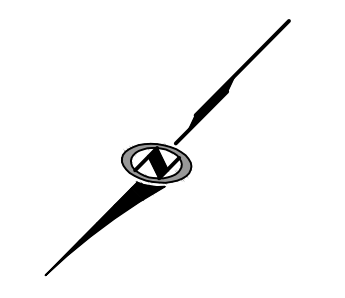
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 SUITE 200  
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**BOBCAT RIDGE**  
**OVERALL UTILITY PLAN**

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18-200-22



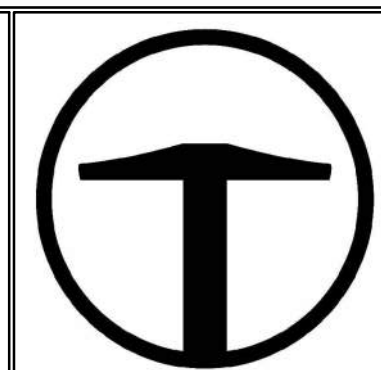
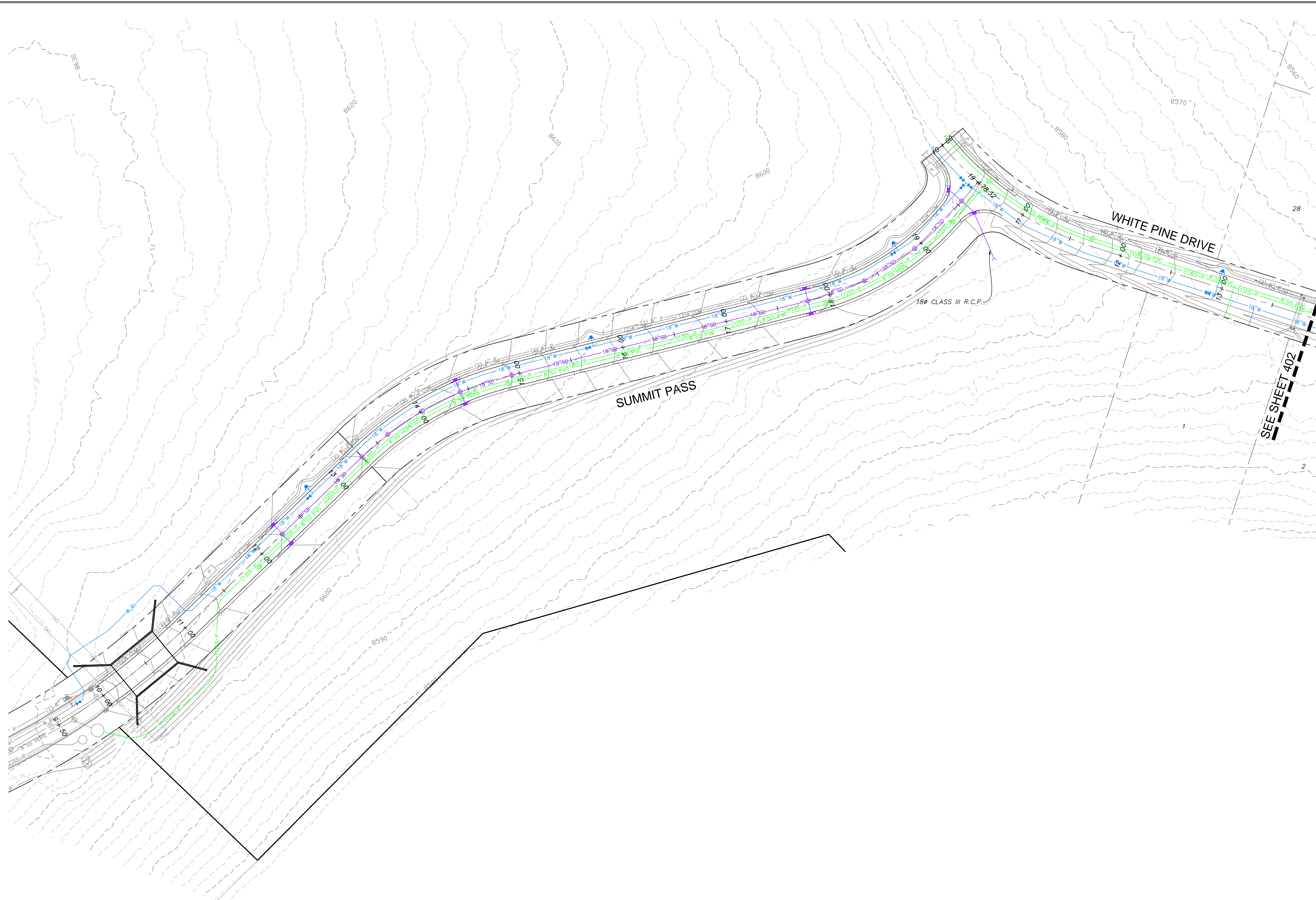
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 6 OF 21

NOTE: SEE SHEETS  
 800 - 804 FOR DRY  
 UTILITY PLANS



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**BOBCAT RIDGE**  
 UTILITY PLAN

TCC JOB NUMBER: 18.200.22      DATE SUBMITTED: 07.18.2018

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 0 10' 20' 40' 60'

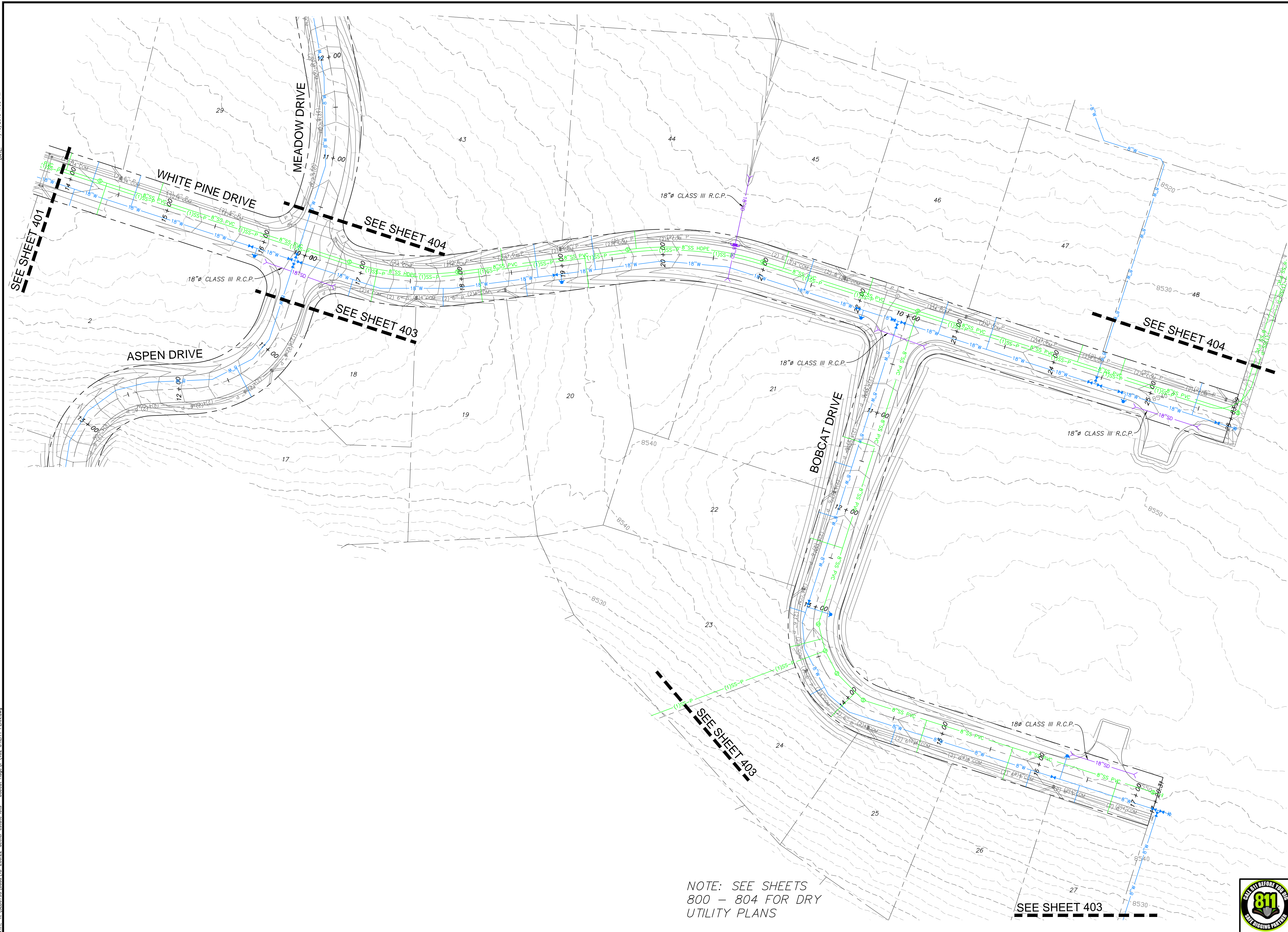
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NOTE: SEE SHEETS  
 800 - 804 FOR DRY  
 UTILITY PLANS

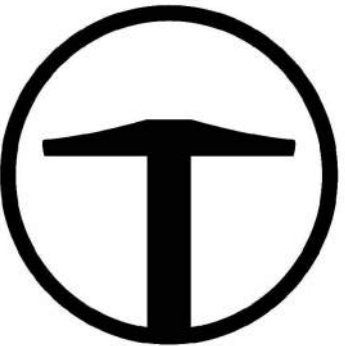


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NOTE: SEE SHEETS  
800 - 804 FOR DRY  
UTILITY PLANS

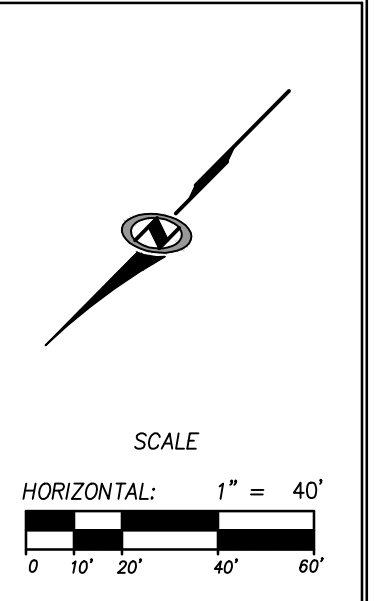
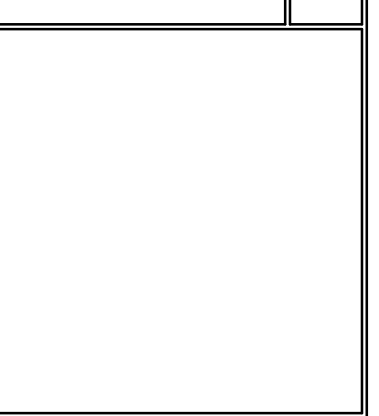


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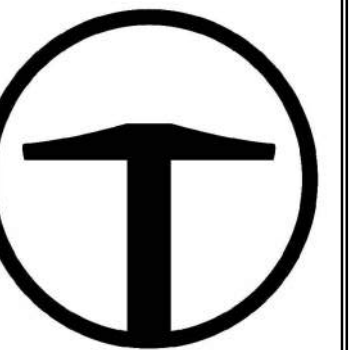
**BOBCAT RIDGE**  
UTILITY PLAN

TCC JOB NUMBER: 18-200-22      DATE SUBMITTED: 07.18.2018



SHEET NUMBER  
**402**  
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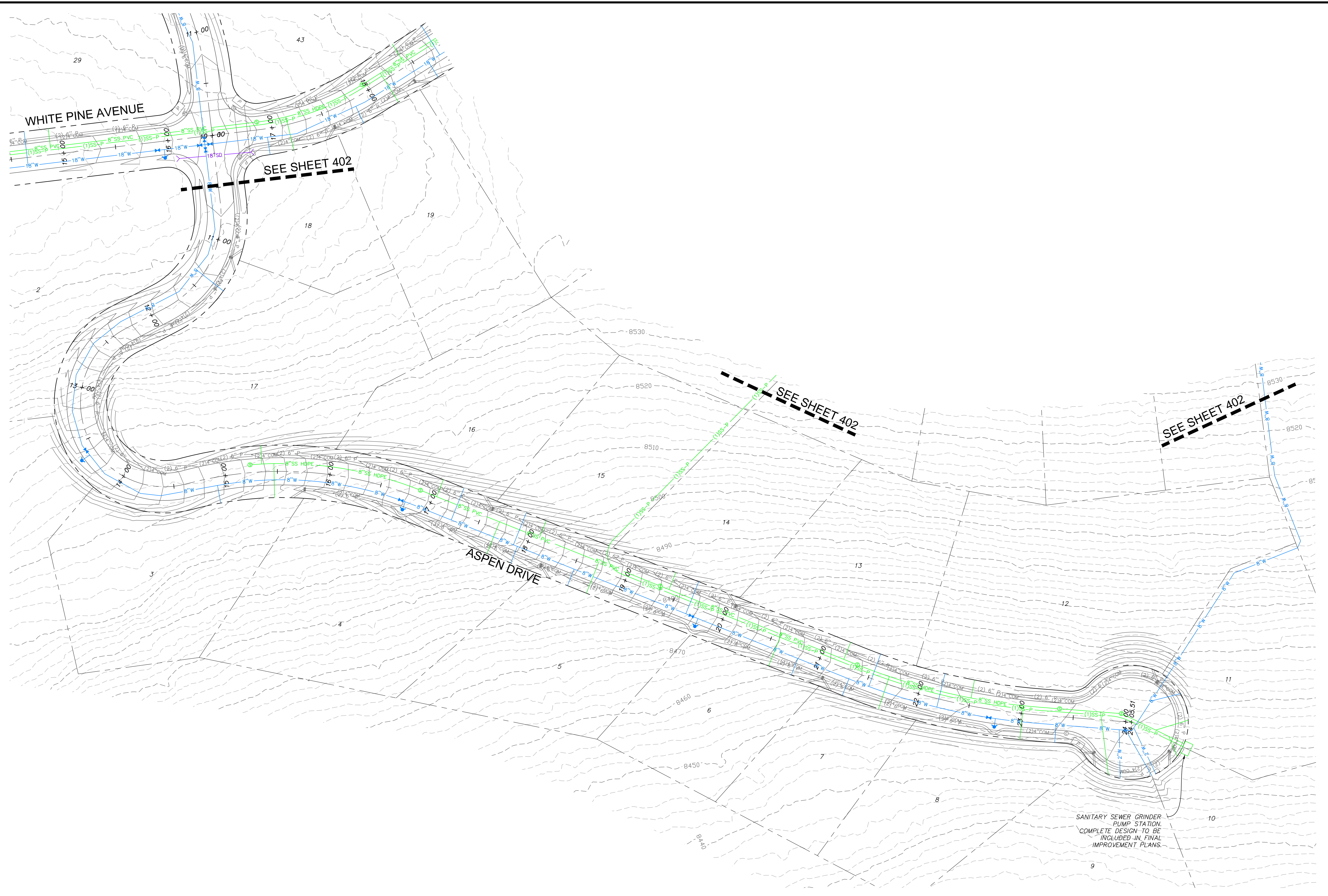
**BOBCAT RIDGE**  
 UTILITY PLAN

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18.200.22

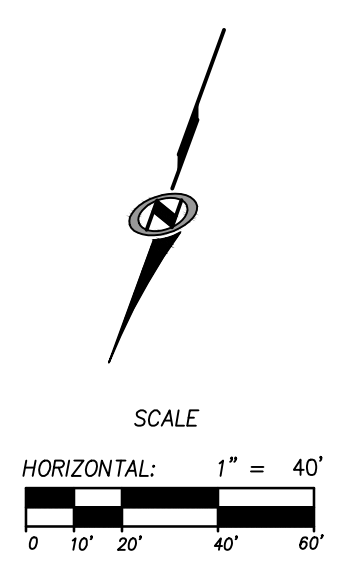
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SANITARY SEWER GRINDER  
 PUMP STATION.  
 COMPLETE DESIGN TO BE  
 INCLUDED IN FINAL  
 IMPROVEMENT PLANS.

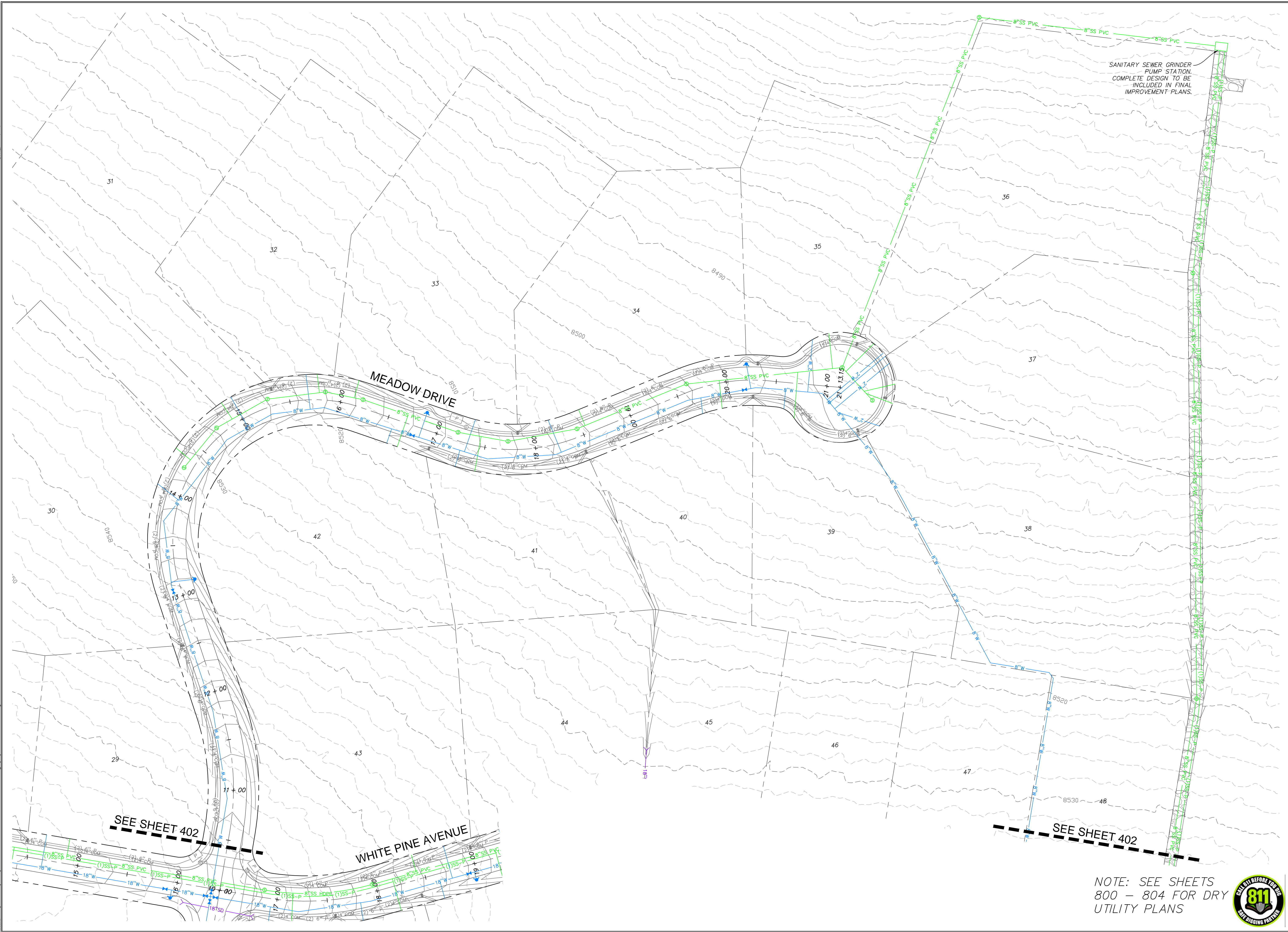
NOTE: SEE SHEETS  
 800 - 804 FOR DRY  
 UTILITY PLANS



SHEET NUMBER  
**403**  
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DATE: 7/18/2018 2:06 PM

PATH: m:\S\60793\Coord\18-200-22-entire\_estate\_plats - bobcat ridge\UP\404 UTILITY PLAN.dwg



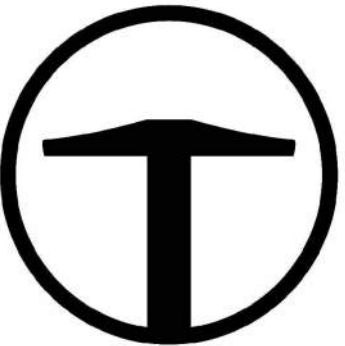
SANITARY SEWER GRINDER  
PUMP STATION.  
COMPLETE DESIGN TO BE  
INCLUDED IN FINAL  
IMPROVEMENT PLANS.

SEE SHEET 402

WHITE PINE AVENUE

SEE SHEET 402

NOTE: SEE SHEETS  
800 - 804 FOR DRY  
UTILITY PLANS



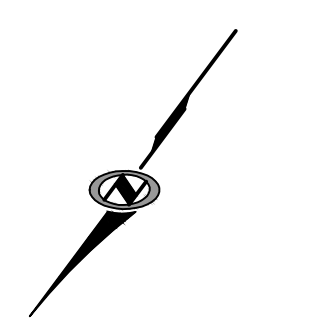
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MURRAY, UT 84107  
801.743.1300

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# BOBCAT RIDGE UTILITY PLAN

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18-200-22

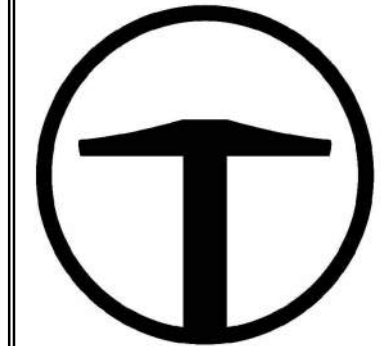


SCALE  
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0 10' 20' 40' 60'

SHEET NUMBER  
**404**  
10 OF 21

DATE: 7/18/2018 2:07 PM

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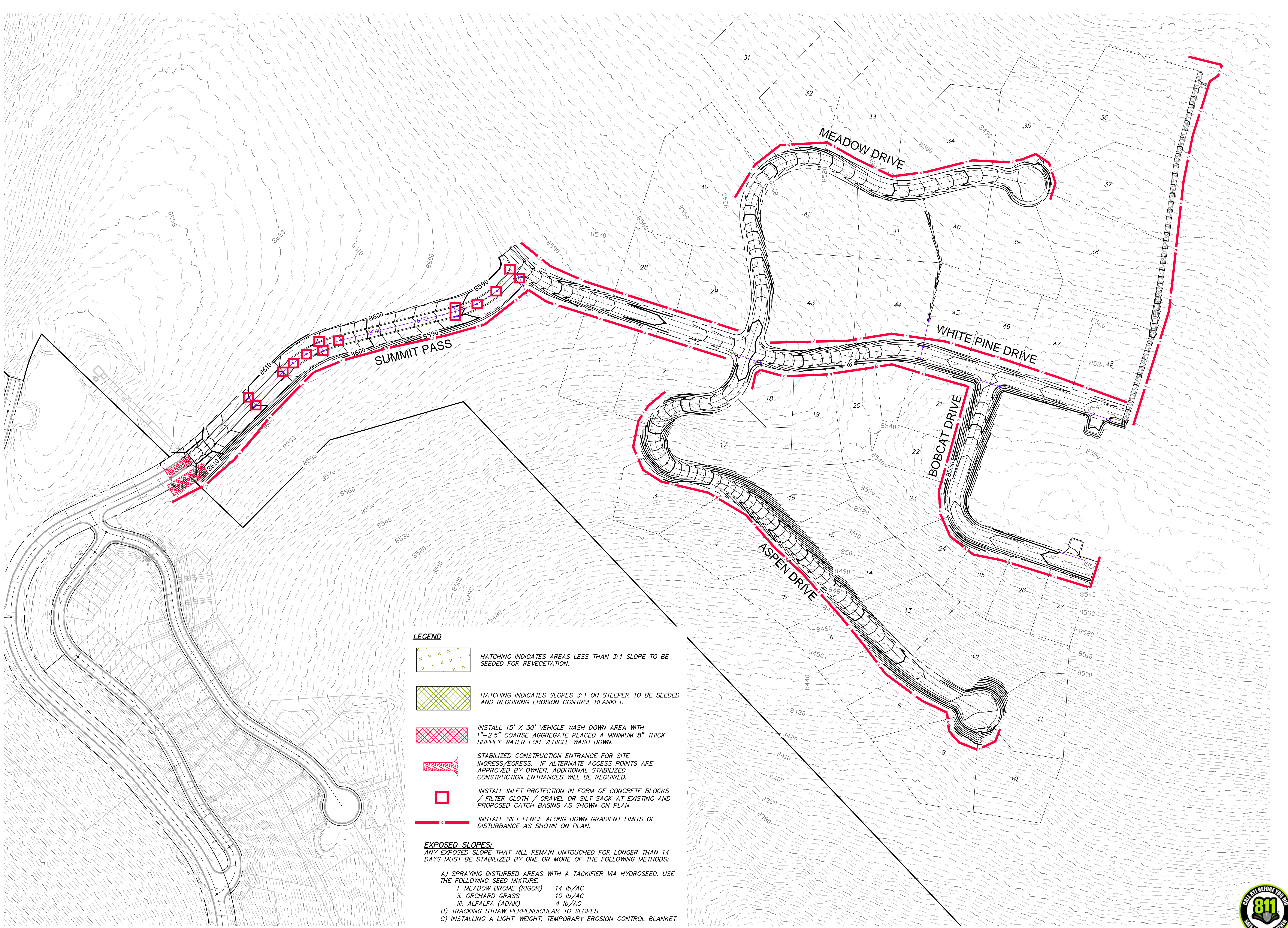
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**BOBCAT RIDGE**  
EROSION CONTROL PLAN

TCC JOB NUMBER: 18-200-22      DATE SUBMITTED: 07.18.2018

SCALE  
HORIZONTAL: 1" = 100'

SHEET NUMBER  
**600**  
11 OF 21



**LEGEND**

- HATCHING INDICATES AREAS LESS THAN 3:1 SLOPE TO BE SEEDED FOR REVEGETATION.
- HATCHING INDICATES SLOPES 3:1 OR STEEPER TO BE SEEDED AND REQUIRING EROSION CONTROL BLANKET.
- INSTALL 15' X 30' VEHICLE WASH DOWN AREA WITH 1"-2.5" COARSE AGGREGATE PLACED A MINIMUM 8" THICK. SUPPLY WATER FOR VEHICLE WASH DOWN.
- STABILIZED CONSTRUCTION ENTRANCE FOR SITE INGRESS/EGRESS. IF ALTERNATE ACCESS POINTS ARE APPROVED BY OWNER, ADDITIONAL STABILIZED CONSTRUCTION ENTRANCES WILL BE REQUIRED.
- INSTALL INLET PROTECTION IN FORM OF CONCRETE BLOCKS / FILTER CLOTH / GRAVEL OR SILT SACK AT EXISTING AND PROPOSED CATCH BASINS AS SHOWN ON PLAN.
- INSTALL SILT FENCE ALONG DOWN GRADIENT LIMITS OF DISTURBANCE AS SHOWN ON PLAN.

**EXPOSED SLOPES:**  
ANY EXPOSED SLOPE THAT WILL REMAIN UNTOUCHED FOR LONGER THAN 14 DAYS MUST BE STABILIZED BY ONE OR MORE OF THE FOLLOWING METHODS:

A) SPRAYING DISTURBED AREAS WITH A TACKIFIER VIA HYDROSEED. USE THE FOLLOWING SEED MIXTURE.

|                         |          |
|-------------------------|----------|
| i. MEADOW BROME (RIGOR) | 14 lb/AC |
| ii. ORCHARD GRASS       | 10 lb/AC |
| iii. ALFALFA (ADAK)     | 4 lb/AC  |

B) TRACKING STRAW PERPENDICULAR TO SLOPES  
C) INSTALLING A LIGHT-WEIGHT, TEMPORARY EROSION CONTROL BLANKET



Precast manhole

- GENERAL**
  - The drawing shows typical pipe connections. Refer to construction drawings for connection locations or refer to field location of existing piping when engineering pipe connection to the manhole.
  - Manhole size.
    - Diameter is 4-feet: For pipe under 12" diameter.
    - Diameter is 5-feet: For pipe 12" and larger, or when 3 or more drain pipes intersect the manhole.
  - Wall thickness:
    - Precast reinforced concrete walls 4 3/4" minimum.
    - Cast-in-place concrete to be 8 inches thick minimum.
- PRODUCTS**
  - Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
  - Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
  - Concrete: Class 4000, APWA Section 03 30 04.
  - Riser and Reducing Riser: ASTM C 478.
  - Joint Sealant: Rubber based, compressible.
  - Grout: 2 parts sand to 1 part cement mortar, ASTM C 1329.
  - Stabilization-Separation Geotextile: Moderate or high at CONTRACTOR's choice, APWA Section 31 05 19.
- EXECUTION**
  - Foundation Stabilization: Get ENGINEER's permission to use a sewer rock or a sewer rock in a geotextile wrap to stabilize an unstable foundation.
  - Base Course Placement: APWA Section 32 11 23. Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
  - Invert cover. During construction, place invert covers over the top of pipe in manholes that currently convey sewerage. See Plan 412.
  - Concrete Deck or Reducing Riser: When depth of manhole from pipe invert to finish grade exceeds 7 feet, use an ASTM C 478 reducing riser.
  - Pipe Connections: Grout around all pipe openings.
  - Pipe Seal: Install rubber-based pipe seals on all plastic pipes when connecting plastic pipes to manholes. Hold water-stop in place with stainless steel bands.
  - Joints: Place flexible sealant in all riser joints. Finish with grout.
  - Adjustment: If the required manhole adjustment is more than 1'-0", remove the cone and grade rings and adjust the manhole elevation with the appropriate manhole section, the cone section, and the grade rings or plastic form to make frame and lid match finish grade.
  - Finish: Provide smooth and neat finishes on interior of cones, shafts, and rings. Imperfect moldings or honeycombs will not be accepted.
  - Backfill: Provide backfill against the manhole shaft. Pea gravel and recycled RAP aggregate is NOT ALLOWED. Water jetting is NOT allowed. Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a standard proctor density, APWA Section 31 23 26.

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Trench backfill

- GENERAL**
  - The drawing applies to backfilling the trench above the pipe zone.
- PRODUCTS**
  - Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 3-inches.
  - Flowable Fill: Target is 60 psi in 28 days with 90 psi maximum in 28 days, APWA Section 31 05 15. It must flow easily requiring no vibration for consolidation.
- EXECUTION**
  - Trench Backfill:
    - DO NOT USE sewer rock, pea gravel, or recycled RAP aggregate as trench backfill.
    - Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a standard proctor density, APWA Section 31 23 26.
    - Water jetting is NOT allowed.
    - Submission of quality control compaction test result data developed for haunching areas may be requested by ENGINEER at any time. Provide results of tests immediately upon request.
  - Flowable Fill: When required, place controlled low strength material in the trench, APWA Section 31 05 15. Cure the fill before placing surface restorations.
  - Surface Restoration:
    - Landscape Surface: Rake to match existing grade. Replace vegetation to match pre-construction conditions. Follow APWA Section 32 92 00 (turf or grass) or APWA Section 32 93 13 (ground cover) requirements.
    - Paved Surface: Do not install asphalt or concrete surfacing until trench compaction is acceptable to ENGINEER. Follow APWA Section 33 05 25 (asphalt surfacing), or APWA Section 33 05 25 (concrete surfacing).

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Pipe zone backfill

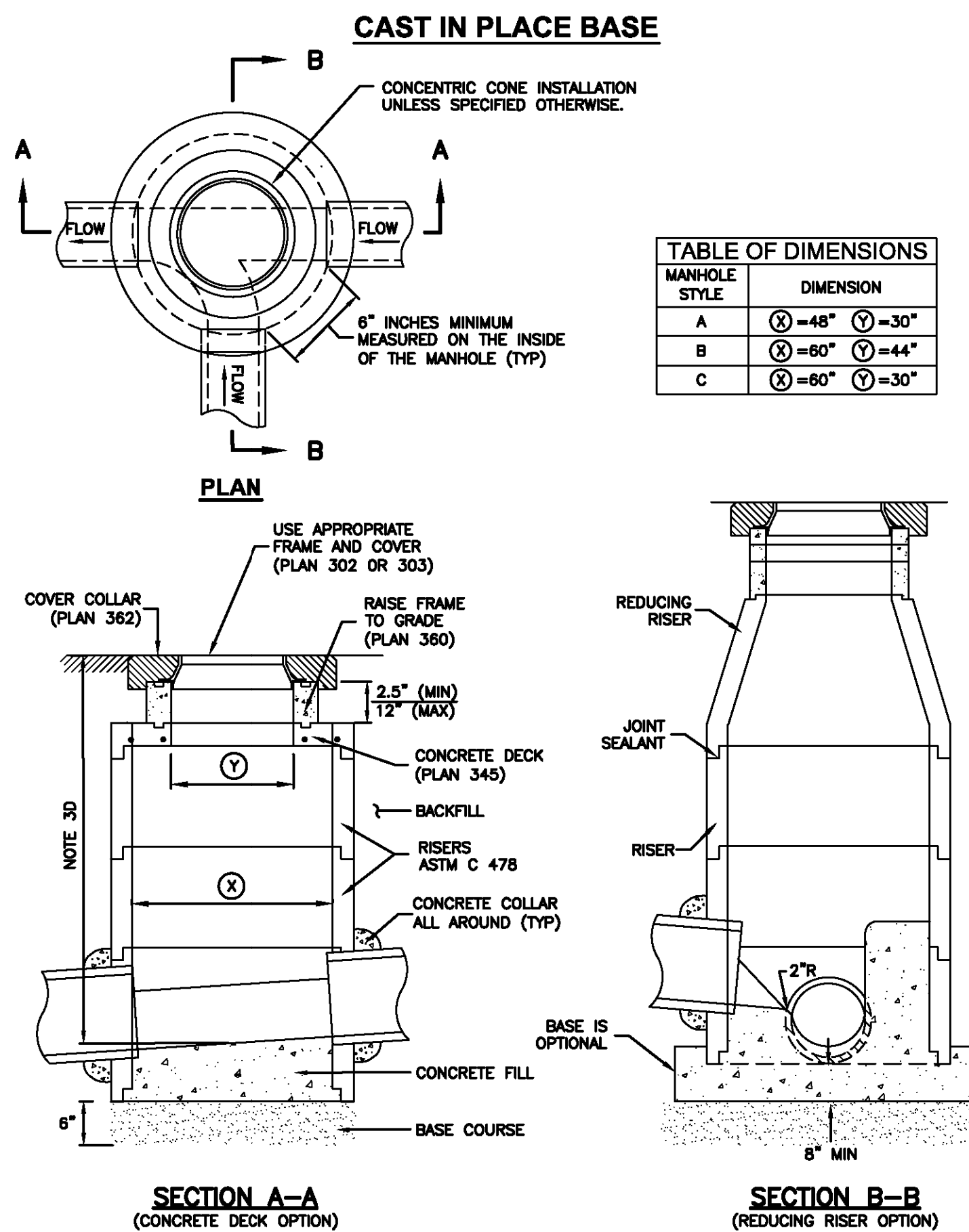
- GENERAL**
  - Install the pipe in the center of the trench or no closer than 6-inches from the wall of the pipe to the wall of the trench.
- PRODUCTS**
  - Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
  - Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
  - Concrete: APWA Section 03 30 04.
  - Flowable Fill: Target is 60 psi in 28 days with 90 psi maximum in 28 days, APWA Section 31 05 15. It must flow easily requiring no vibration for consolidation.
  - Stabilization-Separation Geotextile: Moderate or high at CONTRACTOR's choice, APWA Section 31 05 19.
- EXECUTION**
  - Excavate the Pipe Zone: Width is measured at the pipe spring line and includes any necessary sheathing. Provide width recommended by pipe manufacturer. Follow manufacturer's recommendations when using trench boxes.
  - Foundation Stabilization: Get ENGINEER's permission before installing common fill. Vibrate to stabilize. Installation of stabilization-separation geotextile will be required to separate backfill material and native subgrade materials if common fill cannot provide a working surface or prevent soils migration.
  - Base Course:
    - Furnish untreated base course material unless specified otherwise by pipe manufacturer.
    - Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
    - When using concrete, provide at least Class 2,000 per APWA Section 03 30 04.
  - Pipe Zone: DO NOT USE sewer rock, pea gravel, or recycled RAP aggregate in the pipe zone. Water jetting is NOT allowed.
    - Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26 unless pipe manufacturer requires more stringent installation.
    - Submission of quality control compaction test result data developed for the haunch zone may be requested by ENGINEER at any time. CONTRACTOR is to provide results of tests immediately upon request.
  - Flowable Fill (when required and if allowed by pipe manufacturer):
    - Place the controlled low strength material, APWA Section 31 05 15.
    - Prevent pipe flotation by installing in lifts and providing pipe restraints as required by pipe manufacturer.
    - Reset pipe to line and grade if pipe "floats" out of position.

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Sanitary sewer manhole

- GENERAL**
  - The drawing shows typical pipe connections. Refer to construction drawings for connection locations or refer to field location of existing piping when engineering pipe connection to the manhole.
  - Manhole size.
    - Diameter is 4 feet: For sewers under 12" diameter.
    - Diameter is 5 feet: For sewers 12" and larger, or when 3 or more pipes intersect the manhole.
- PRODUCTS**
  - Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
  - Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
  - Concrete: Class 4000, APWA Section 03 30 04.
  - Riser and Reducing Riser: ASTM C 478.
  - Reinforcement: Deformed, 60 ksi yield grade steel, ASTM A 615.
  - Grout: 2 parts sand to 1 part cement mortar, ASTM C 1329.
  - Stabilization-Separation Geotextile: Moderate or high at CONTRACTOR's choice, APWA Section 31 05 19.
- EXECUTION**
  - Foundation Stabilization: Get ENGINEER's permission to use a sewer rock or a granular backfill borrow in a geotextile wrap to stabilize an unstable foundation.
  - Base Course Placement: APWA Section 32 11 23. Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
  - Invert Cover. During construction, place invert covers over the top of pipe in manholes that currently convey sewerage. See Plan 412.
  - Pipe Connections: Grout around all pipe openings.
  - Pipe Seal: Install rubber-based pipe seals on all plastic pipes when connecting plastic pipes to manholes. Hold water-stop in place with stainless steel bands.
  - Joints: Place flexible gasket-type sealant in all riser joints. Finish with grout.
  - Adjustment: If the required manhole adjustment is more than 1'-0", remove the cone and grade rings and adjust the manhole elevation with the appropriate manhole section, the cone section, and the grade rings or plastic form to make frame and lid match finish grade.
  - Finish: Provide smooth and neat finishes on interior of cones, shafts, and rings. Imperfect moldings or honeycombs will not be accepted.
  - Backfill: Provide backfill against the manhole shaft. Pea gravel and recycled RAP aggregate is NOT ALLOWED. Water jetting is NOT allowed. Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a standard proctor density, APWA Section 31 23 26.

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Precast manhole

Plan 341

November 2010

187

Sheet 1 of 2

January 2011

Trench backfill

Plan 381

January 2011

Pipe zone backfill

Plan 382

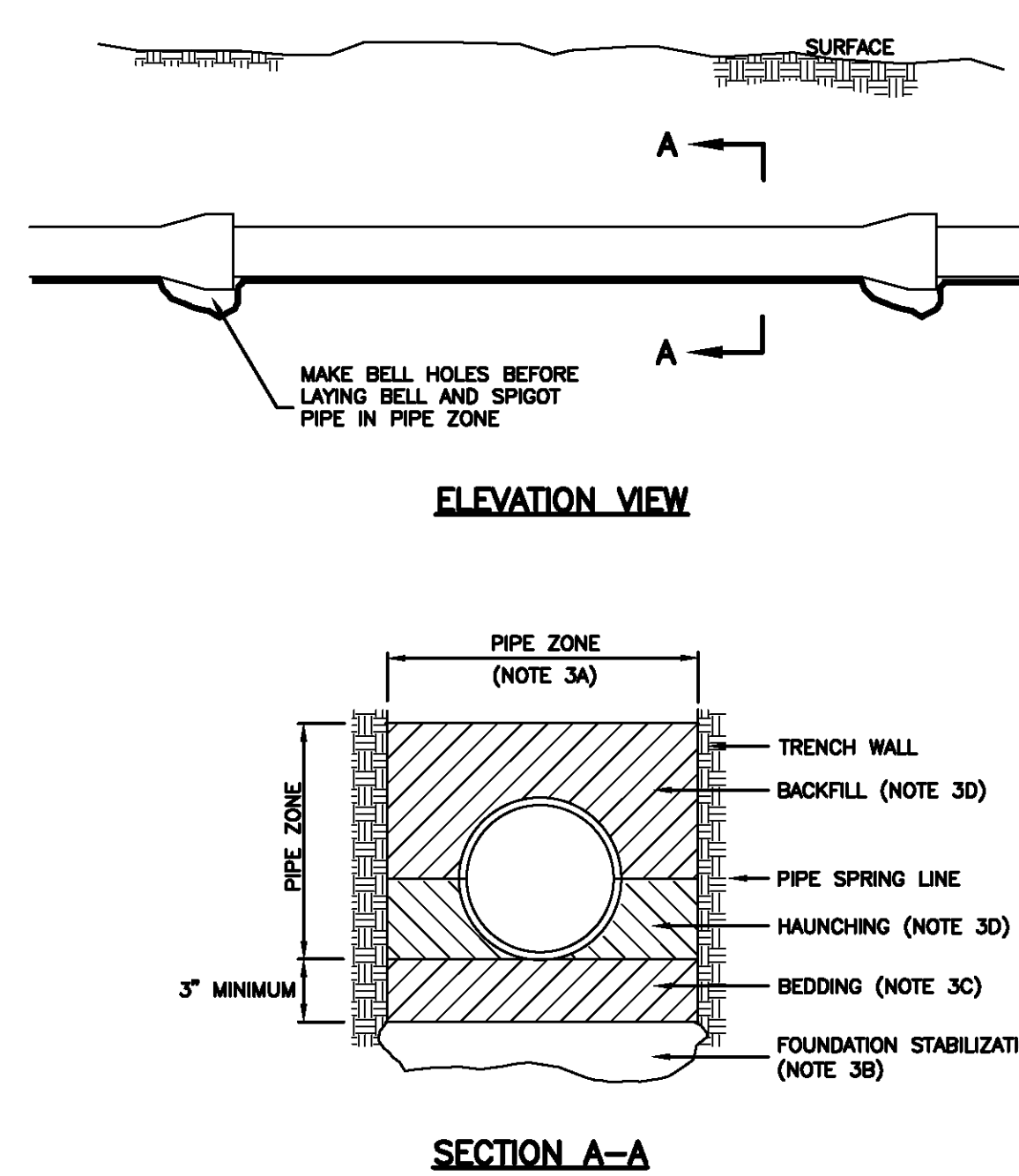
205

April 2011

Sanitary sewer manhole

Plan 411

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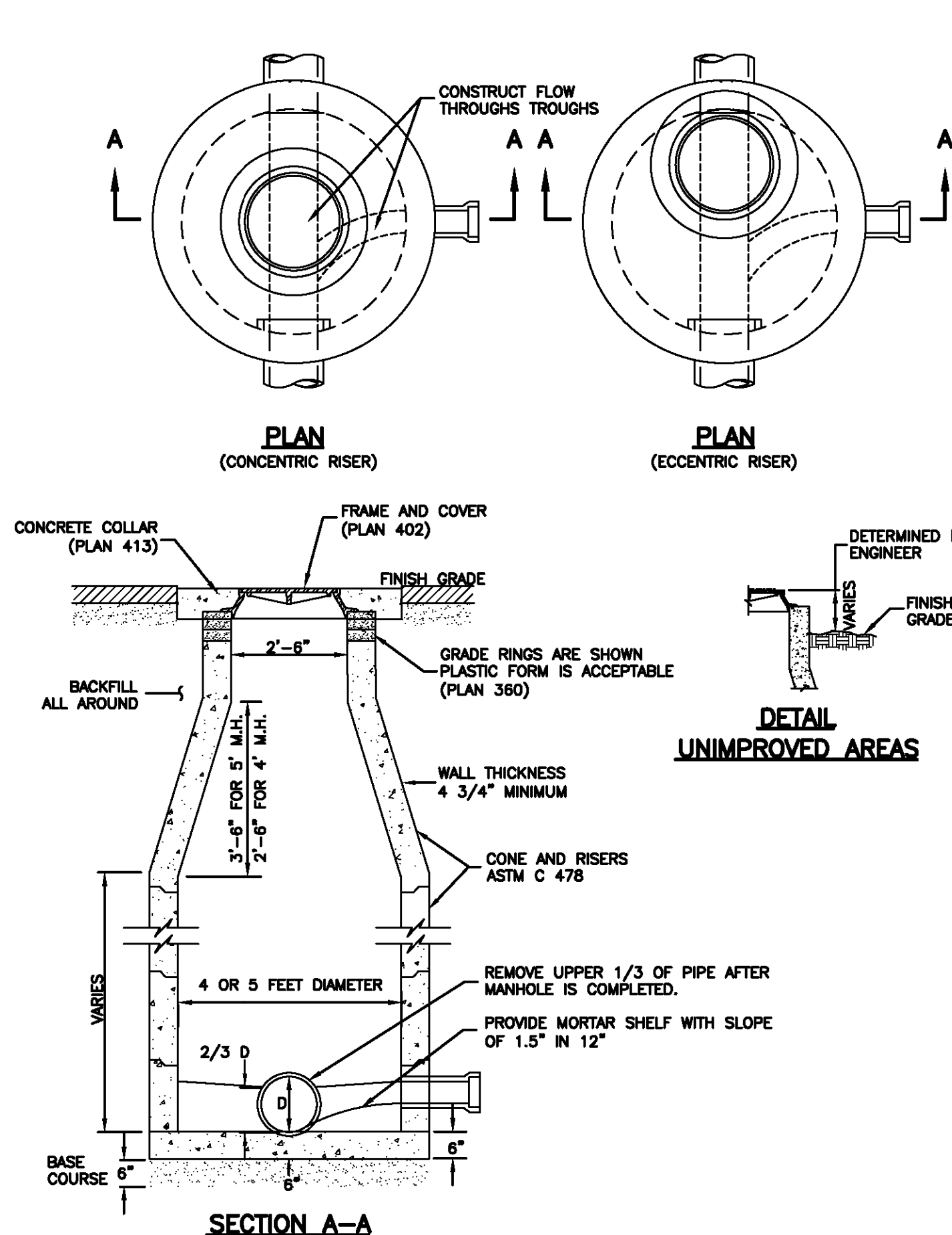
**INSTALLATION**

CONCRETE PIPE: FOLLOW ASTM C 1479  
 \*STANDARD PRACTICE FOR INSTALLATION OF PRECAST CONCRETE SEWER, STORM DRAIN, AND CULVERT PIPE USING STANDARD INSTALLATIONS.

PVC AND HDPE PIPE: FOLLOW ASTM D 2321  
 \*STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY-FLOW APPLICATIONS\*

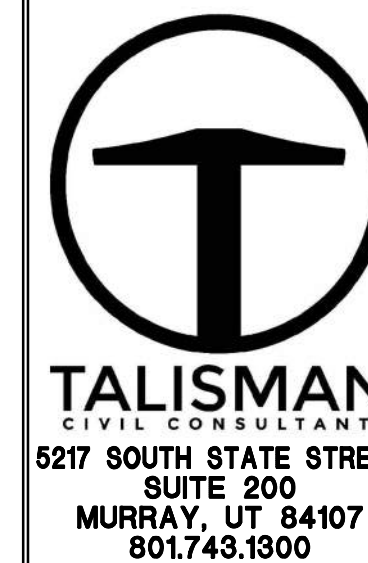
CORRUGATED METAL PIPE: FOLLOW ASTM A 798  
 \*STANDARD PRACTICE FOR INSTALLING FACTORY-WARE CORRUGATED STEEL PIPE FOR SEWERS AND OTHER APPLICATIONS.

VITRIFIED CLAY PIPE: FOLLOW ASTM C 12.  
 \*TOWARD RECOMMENDED PRACTICE FOR INSTALLING VITRIFIED CLAY PIPE LINES.



April 2011

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BOBCAT RIDGE DETAILS

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18.200.22

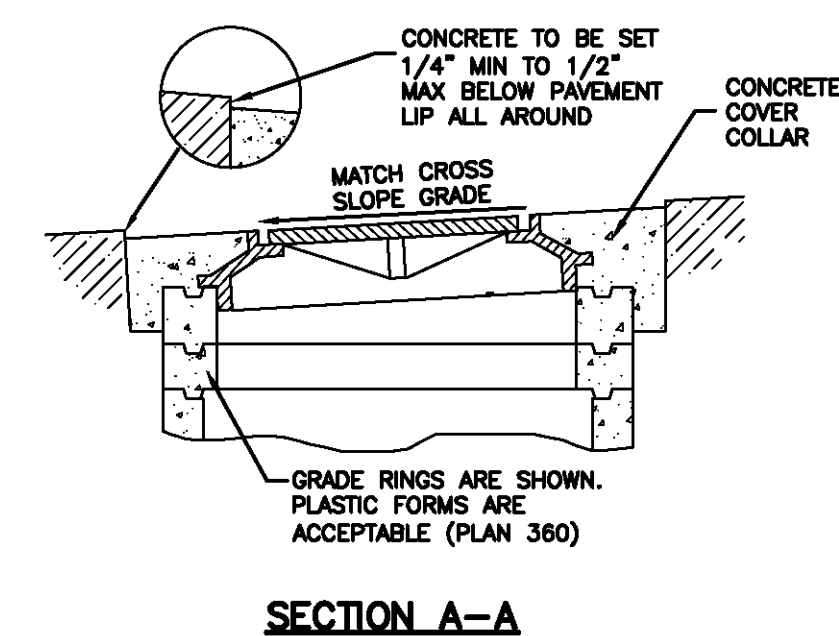
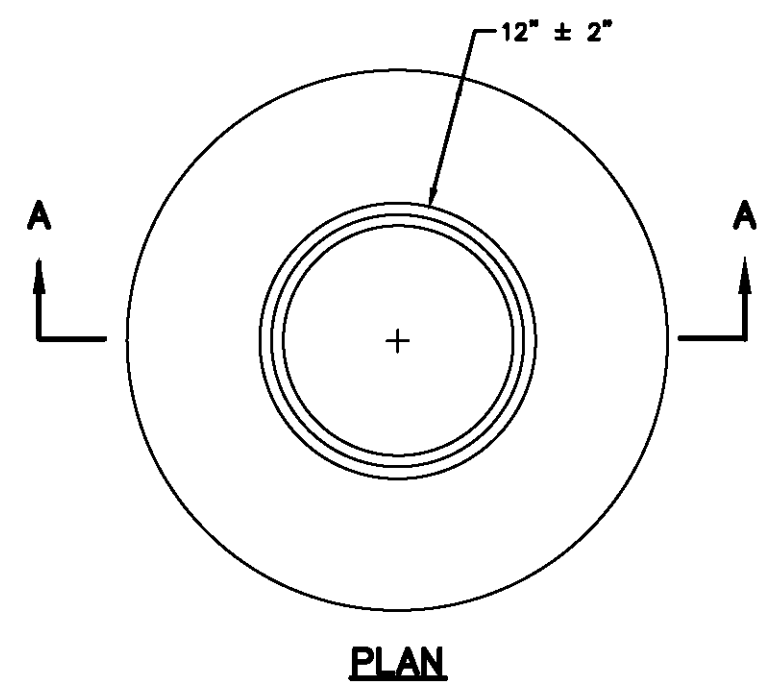


SHEET NUMBER 700

12 OF 21

Cover collar for sanitary sewer manhole

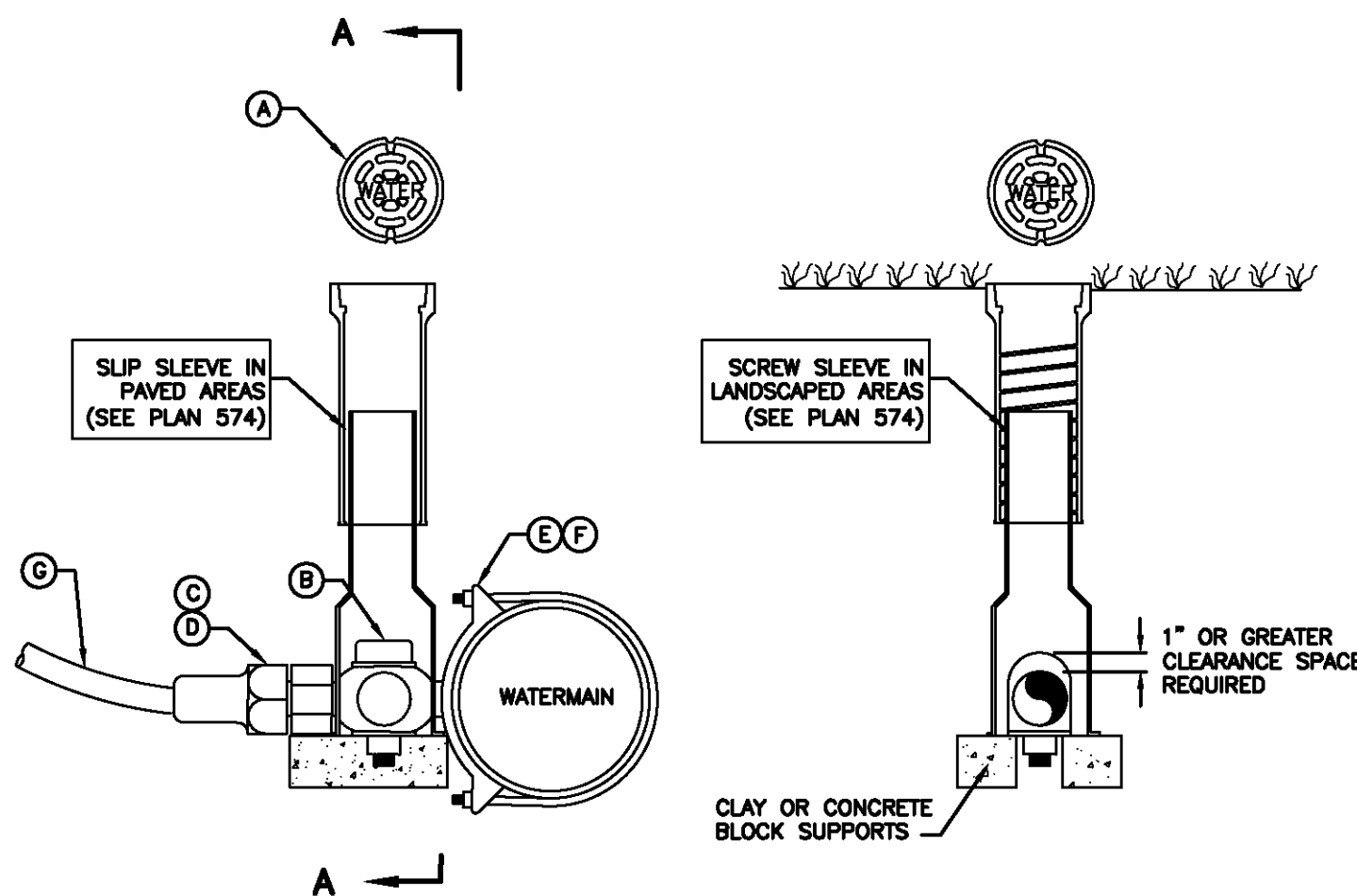
- GENERAL**  
A. In a pavement surface, the concrete will support the frame under traffic loadings.
- PRODUCTS**  
A. Concrete: Class 4000, APWA Section 03 30 04.  
B. Concrete Curing Agent: Type ID Class A (clear with fugitive dye), membrane forming compound, APWA Section 03 39 00.
- EXECUTION**  
A. Pavement Preparation: Provide a neat vertical and concentric joint between concrete and existing asphalt concrete surfaces. Clean edges of all dirt, oil, and loose debris.  
B. Concrete Placement: Fill the annular space around the frame and cover casting with concrete. Apply a broom finish. Apply a curing agent.



| LEGEND |   |                                    |                   |
|--------|---|------------------------------------|-------------------|
| No.    | * | ITEM                               | DESCRIPTION       |
| (A)    |   | VALVE BOX WITH LID                 | 2 PIECE CAST IRON |
| (B)    |   | CORPORATION STOP                   | BRASS             |
| (C)    |   | COPPER ADAPTER                     |                   |
| (D)    |   | FLARE OR PACK JOINT COPPER ADAPTER |                   |
| (E)    |   | SERVICE SADDLE CLAMP               | D.I., A.C., C.I.  |
| (F)    |   | SERVICE SADDLE CLAMP               | P.V.C.            |
| (G)    |   | COPPER PIPE (SERVICE LINE)         | TYPE K (SOFT)     |

1 1/2" and 2" Service taps

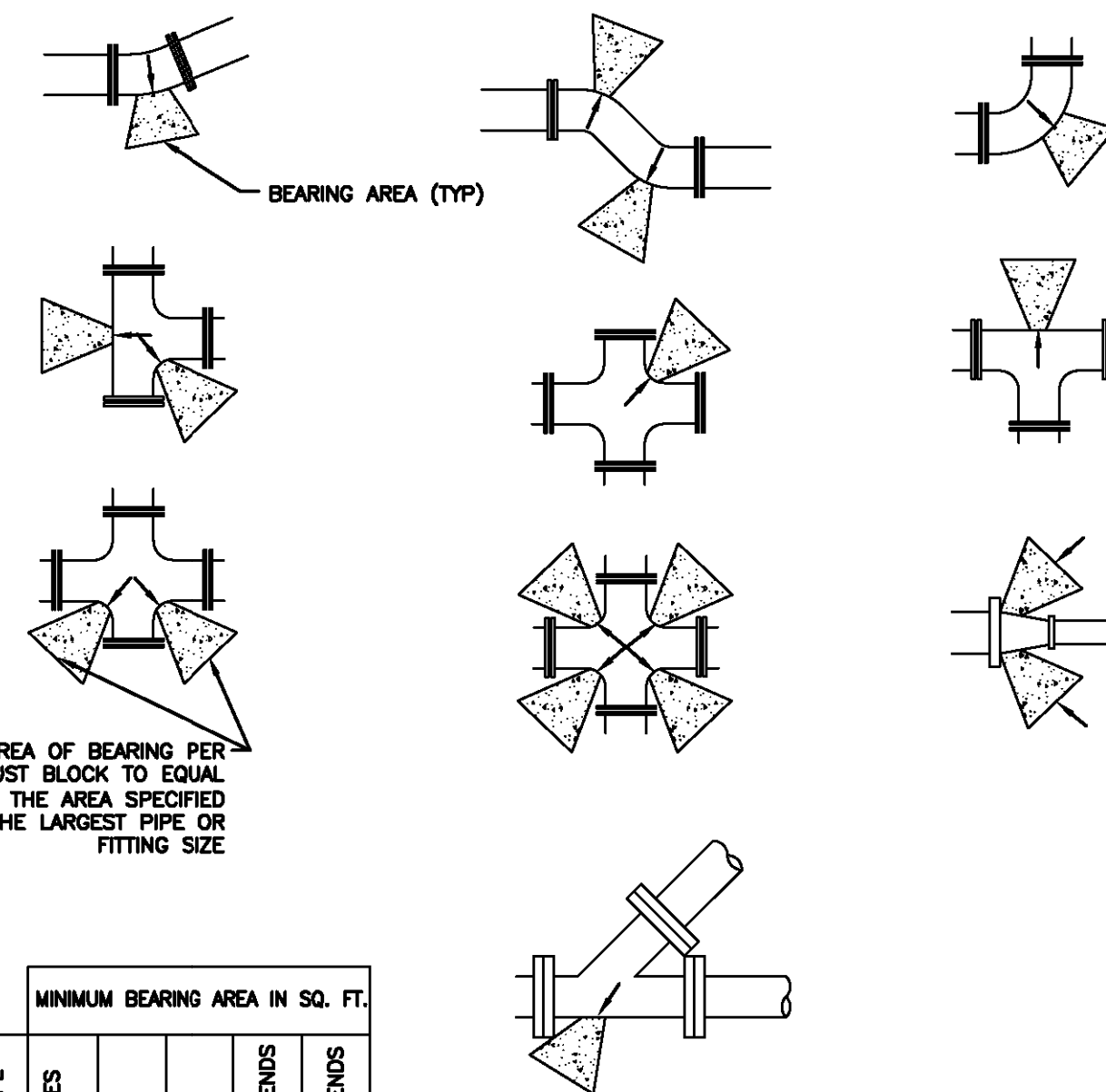
- GENERAL**  
A. Before backfilling around taps, secure inspection of installation by ENGINEER.
- PRODUCTS**  
A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.  
B. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.  
C. Tape: Teflon tape is required on all taps.
- EXECUTION**  
A. Tapping: Place taps a minimum of 36-inches apart. Use a tapping tool that is sized corresponding to the size of the service line to be installed. No taps within 36-inches of end of pipe.  
B. PVC or AC Pipe: A service saddle clamp is required on all PVC and AC pipe taps unless specified otherwise.  
C. Backfill: Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.  
D. Blocks: Clay brick or concrete block required under valve box to assure a 1" or greater space between the box and the corporation stop and pipe assembly.



| MINIMUM BEARING AREA IN SQ. FT. |                        |           |           |               |               |
|---------------------------------|------------------------|-----------|-----------|---------------|---------------|
| SIZE OF PIPE                    | TEES, VALVES DEAD ENDS | 90° BENDS | 45° BENDS | 22 1/2° BENDS | 11 1/4° BENDS |
| 4"                              | 2                      | 3         | 2         | 2             | 2             |
| 6"                              | 4                      | 5.5       | 3         | 1.5           | 1             |
| 8"                              | 6.5                    | 9.5       | 5         | 2.75          | 1.5           |
| 12"                             | 14                     | 20        | 11        | 5.5           | 3             |
| 14"                             | 19                     | 26.5      | 14.5      | 7.5           | 4             |
| 16"                             | 24                     | 34        | 18.5      | 9.5           | 6             |
| 20"                             | 27                     | 52        | 28.5      | 14.5          | 16            |
| 24"                             | 53                     | 74        | 41        | 21            | 53            |
| 30"                             | 81                     | 114       | 62        | 32            | 16            |

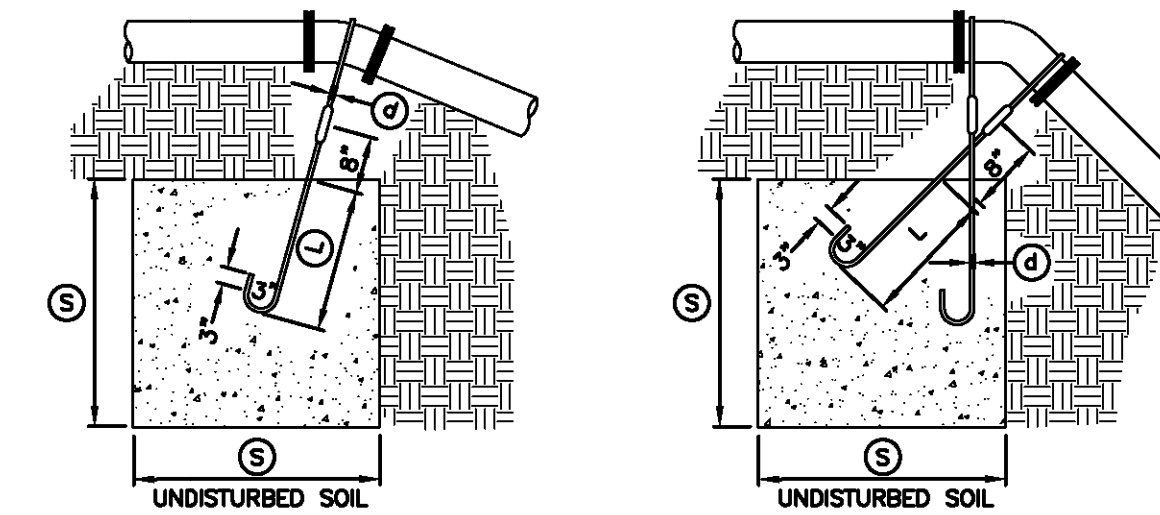
Direct bearing thrust block

- GENERAL**  
A. Thrust design for pipe sizes or configurations not shown require special design.  
B. Bearing areas, volumes, and special thrust blocking details shown on Drawings take precedence over this plan.  
C. Restraint sizing is based upon a maximum operating pressure of 150 psi and a test pressure of 200 psi, and a minimum soil bearing strength of 2,000 psf. Operating pressures in excess of 150 psi or soils with less than 2,000 pound bearing strength will require special design.  
D. Before backfilling around thrust block, secure inspection of installation by ENGINEER.
- PRODUCTS**  
A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.  
B. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.  
C. Thrust Blocks: Concrete Class 4000, APWA Section 03 30 04.  
D. Grease: Non-oxide poly-FM.
- EXECUTION**  
A. Pour concrete against undisturbed soil.  
B. Pipe Joints: Do not cover with concrete. Leave completely accessible.  
C. Grease: Apply grease to all buried metal surfaces. Wrap with polyethylene sheet and tape wrap.  
D. Locking restraint devices may be used in conjunction with concrete thrust blocking (at discretion of ENGINEER).  
E. Base Course and Backfill Placement: Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.



Tie-down thrust restraints

- GENERAL**  
A. Thrust design for pipe sizes or configurations not shown require special design.  
B. Bearing areas, volumes, and special thrust blocking details shown on Drawings take precedence over this plan.  
C. Restraint sizing is based upon a maximum operating pressure of 150 psi and a test pressure of 200 psi, and a minimum soil bearing strength of 2,000 psf. Operating pressures in excess of 150 psi or soils with less than 2,000 pound bearing strength will require special design.  
D. Before backfilling around thrust block, secure inspection of installation by ENGINEER.
- PRODUCTS**  
A. Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.  
B. Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.  
C. Concrete: Class 4,000 minimum, APWA Section 03 30 04.  
D. Reinforcement: Deformed, steel, ASTM A 615. Give bars an epoxy coating at least 15 mils thick. Minimum stress yield strength of steel tie-down bars is 70,000 ksi.  
E. Grease: Non-oxide poly-FM.
- EXECUTION**  
A. Pour concrete against undisturbed soil. Concrete must be allowed to cure in thrust restraints for 5 days before pressurizing water lines or have additional approved thrust restraints installed before pressurizing the water line.  
B. Pipe Joints: Do not cover with concrete. Leave completely accessible.  
C. Grease: Apply grease to all buried metal surfaces. Wrap with polyethylene sheet and tape wrap.  
D. Locking restraint devices may be used in conjunction with concrete thrust blocking (at discretion of ENGINEER).  
E. Base Course and Backfill Placement: Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.



TYPE A RESTRAINT  
FOR 11 1/4° - 22 1/2° VERTICAL BENDS

| TABLE OF DIMENSIONS               |                          |                                 |                      |  |                              |
|-----------------------------------|--------------------------|---------------------------------|----------------------|--|------------------------------|
| PIPE SIZE NOMINAL DIAMETER - INCH | VERTICAL BEND IN DEGREES | CONCRETE BLOCKING IN CUBIC FEET | SIDE OF CURVE - FEET | DIAMETER OF SHANK OR REBAR RODS - INCH | DEPTH OF ROD CONCRETE - FEET |
| 4"                                | 11 1/4°                  | 8                               | 2.0                  | 5/8"                                   | 1.5                          |
|                                   | 22 1/2°                  | 15.6                            | 2.5                  | 5/8"                                   | 2.0                          |
| 6"                                | 11 1/4°                  | 15.6                            | 2.5                  | 5/8"                                   | 2.0                          |
|                                   | 22 1/2°                  | 34.3                            | 3.25                 | 5/8"                                   | 2.0                          |
| 8"                                | 11 1/4°                  | 27                              | 3.0                  | 5/8"                                   | 2.0                          |
|                                   | 22 1/2°                  | 64                              | 4.0                  | 5/8"                                   | 2.0                          |
| 12"                               | 11 1/4°                  | 64                              | 4.0                  | 5/8"                                   | 2.0                          |
|                                   | 22 1/2°                  | 125                             | 5.0                  | 3/4"                                   | 3.0                          |
| 16"                               | 11 1/4°                  | 107                             | 4.25                 | 7/8"                                   | 3.0                          |
|                                   | 22 1/2°                  | 216                             | 6.0                  | 7/8"                                   | 3.0                          |
| 20"                               | 11 1/4°                  | 138                             | 5.17                 | 1"                                     | 3.5                          |
|                                   | 22 1/2°                  | 334                             | 6.94                 | 1"                                     | 4.0                          |
| 24"                               | 11 1/4°                  | 240                             | 6.22                 | 1"                                     | 4.0                          |
|                                   | 22 1/2°                  | 476                             | 7.81                 | 1"                                     | 4.0                          |
| 30"                               | 11 1/4°                  | 369                             | 7.17                 | 1"                                     | 4.0                          |
|                                   | 22 1/2°                  | 733                             | 9.02                 | 1"                                     | 4.0                          |

TYPE B RESTRAINT  
FOR 45° VERTICAL BENDS

| TABLE OF DIMENSIONS               |                          |                                 |                      |  |                              |
|-----------------------------------|--------------------------|---------------------------------|----------------------|--|------------------------------|
| PIPE SIZE NOMINAL DIAMETER - INCH | VERTICAL BEND IN DEGREES | CONCRETE BLOCKING IN CUBIC FEET | SIDE OF CURVE - FEET | DIAMETER OF SHANK OR REBAR RODS - INCH | DEPTH OF ROD CONCRETE - FEET |
| 4"                                | 45°                      | 1                               | 3.0                  | 5/8"                                   | 2.0                          |
| 6"                                |                          | 2.37                            | 4.0                  | 5/8"                                   | 2.5                          |
| 8"                                |                          | 3.97                            | 4.75                 | 5/8"                                   | 3.0                          |
| 12"                               |                          | 9.04                            | 6.25                 | 5/8"                                   | 4.0                          |
| 16"                               |                          | 17.24                           | 7.75                 | 3/4"                                   | 4.0                          |
| 20"                               |                          | 26.52                           | 9.21                 | 3/4"                                   | 4.0                          |
| 24"                               |                          | 37.82                           | 10.07                | 3/4"                                   | 4.0                          |
| 30"                               |                          | 58.26                           | 11.63                | 3/4"                                   | 4.0                          |

Cover collar for sanitary sewer manhole

Plan 413

September 2001

217

1 1/2" and 2" Service taps

Plan 552

August 2001

265

Direct bearing thrust block

Plan 561

August 2010

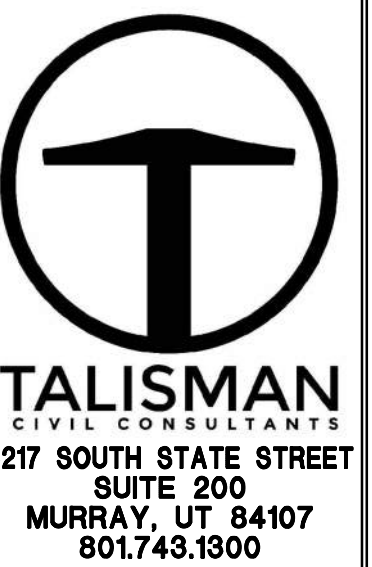
267

Tie-down thrust restraints

Plan 562

April 1997

269



BOBCAT RIDGE  
DETAILS

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18-200.22

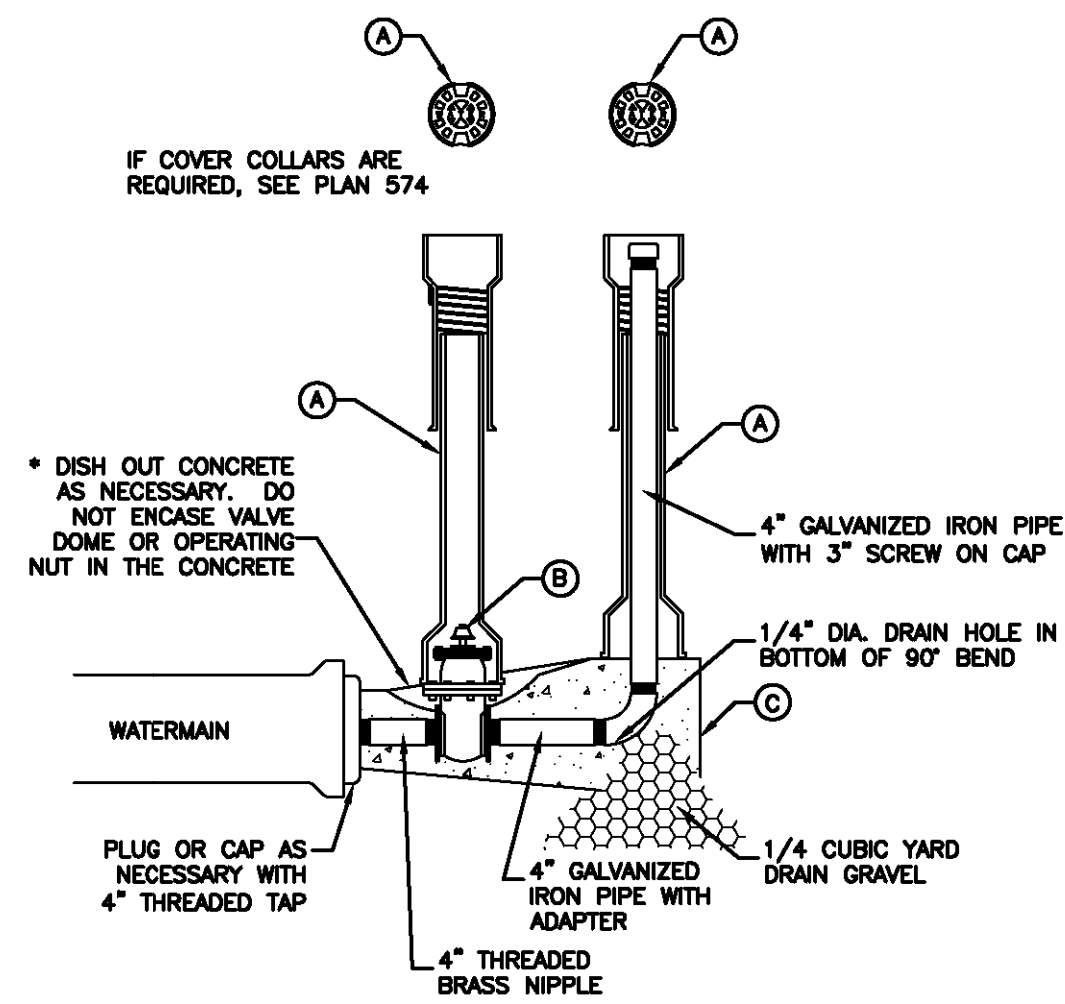


701

13 OF 21

4" washout valve

- GENERAL**
  - Before backfilling, secure inspection of installation by ENGINEER.
  - Water mains 12-inches and larger will require a special washout assembly design.
- PRODUCTS**
  - Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
  - Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
  - Concrete: Class 4000, APWA Section 03 30 04.
- EXECUTION**
  - Pour concrete against undisturbed soil.
  - Apply tape wrap to the exterior of all galvanized pipe per AWWA C209.
  - Place plastic sheet at least 6 mils thick over drain gravel to prevent silting.
  - After installation of washout valve assembly, verify the washout valve riser drains to gravel.
  - Backfill and Base Course Placement: Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater of a modified proctor density, APWA Section 31 23 26.

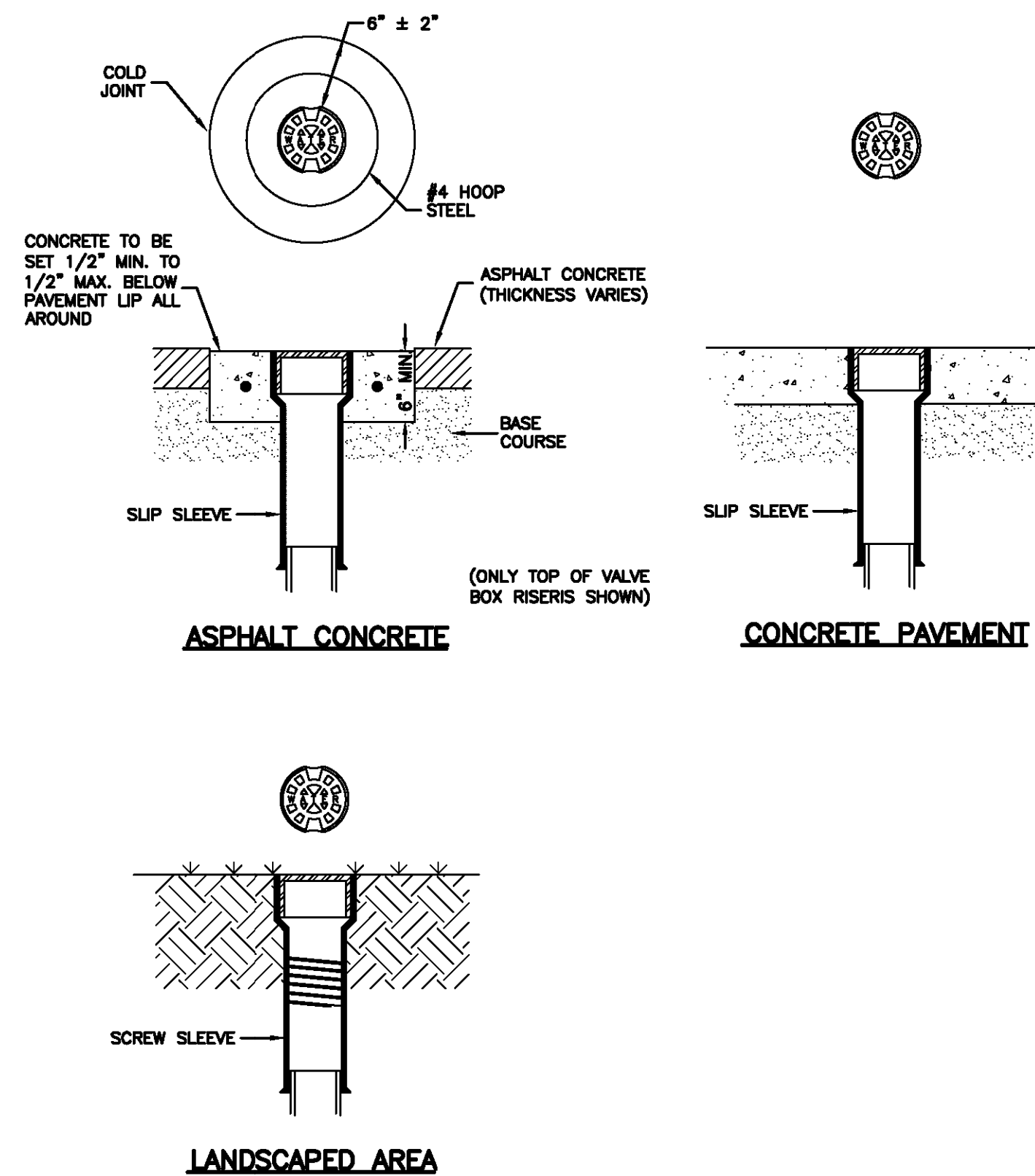


| LEGEND |                               |                       |
|--------|-------------------------------|-----------------------|
| No.    | ITEM                          | DESCRIPTION           |
| (A)    | VALVE BOX WITH LID            | 2 PIECE CAST IRON     |
| (B)    | 4" GATE VALVE WITH SCREW ENDS | 2" x 2" OPERATING NUT |
| (C)    | CONCRETE THRUST BLOCK         | PLAN 561              |

4" Washout valve  
271

Cover collar for water valve box

- GENERAL**
  - In a pavement surface, fill an annular space around a frame and cover casting with concrete. The concrete will support the casting under traffic loadings.
- PRODUCTS**
  - Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
  - Concrete: Class 4000, APWA Section 03 30 04.
  - Concrete Curing Agent: Type ID Class A (clear with fugitive dye), membrane forming compound, APWA Section 03 39 00.
- EXECUTION**
  - Base Course: Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
  - Pavement Preparation: Provide a neat vertical and concentric joint between concrete collar and existing asphalt concrete surface. Clean edges of all dirt, oil, and loose debris.

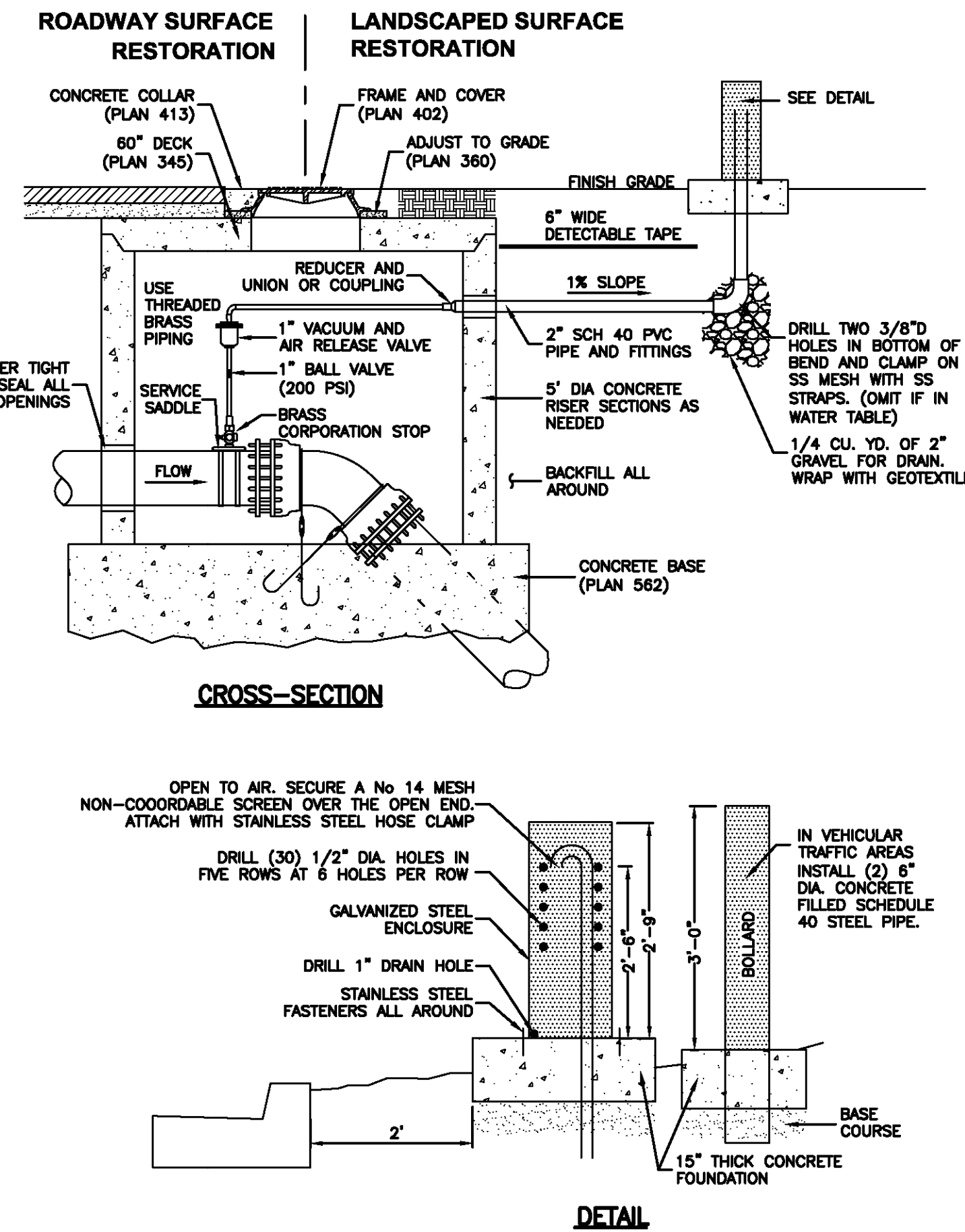


Plan 571

Cover collar for water valve box  
277

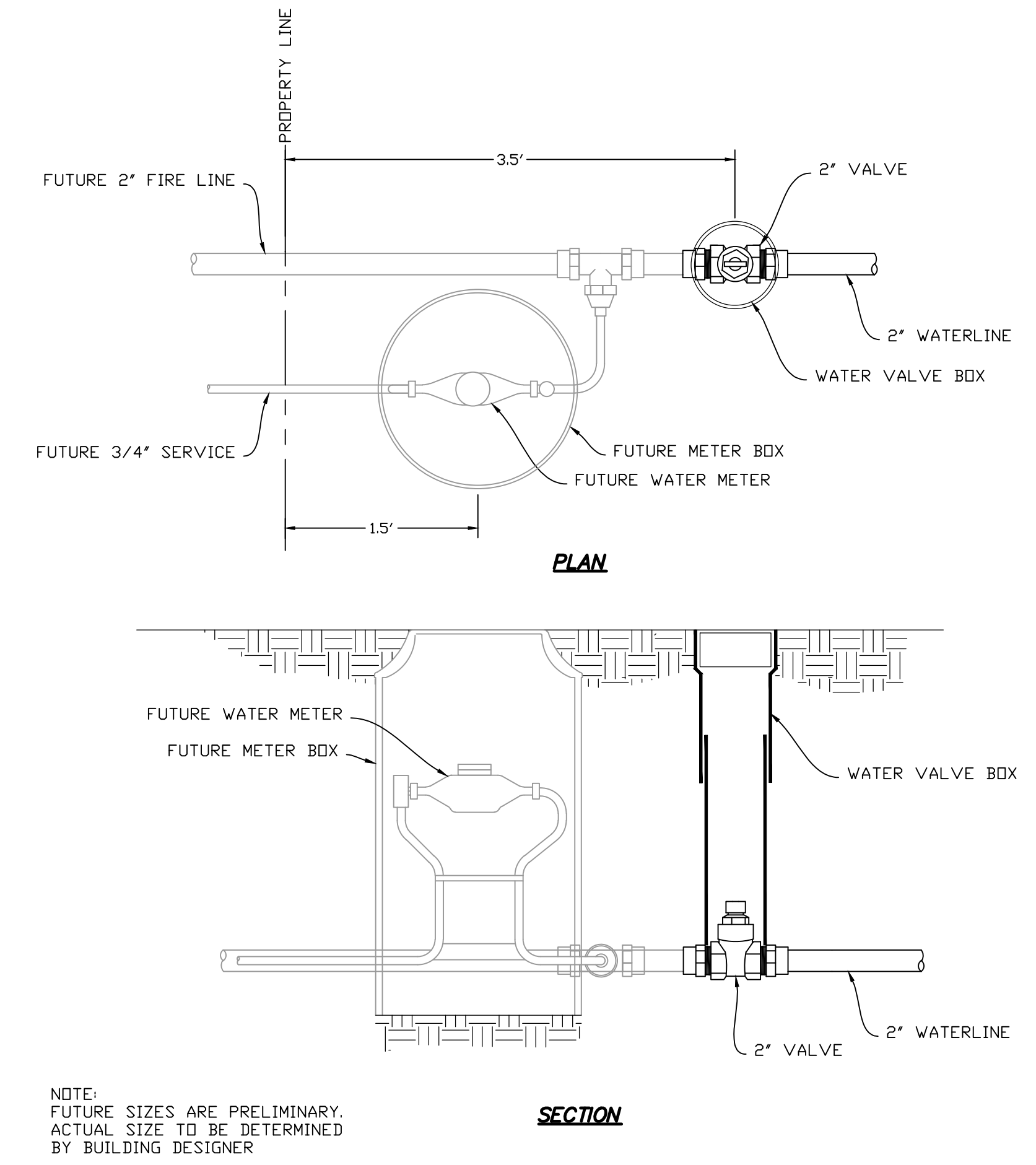
Air release assembly

- GENERAL**
  - This drawing detail is applicable to water main piping less than 16-inches diameter.
  - PCCP, steel, MLAC and other water main pipe materials will require special detail or design drawings. Submit the design and detail drawings and materials to the ENGINEER for review before installation.
  - Installation in areas of high ground water or potential for water entering the vent pipe will require a special design to be provided by the ENGINEER.
  - Before backfilling around the assembly, secure inspection of installation by ENGINEER.
- PRODUCTS**
  - Base Course: Untreated base course, APWA Section 32 11 23. Do not use gravel as a base course without ENGINEER's permission.
  - Drain Gravel: Sewer rock, ASTM size no. 3 (2" to 1") or equal, APWA Section 31 05 13.
  - Backfill: Common fill, APWA Section 31 05 13. Maximum particle size 2-inches.
  - Concrete: Class 4000, APWA Section 03 30 04.
  - Manhole: Riser, ASTM C 478.
  - Reinforcement: Deformed steel, ASTM A 615. Give bars an epoxy coating at least 15 mils thick. Minimum stress yield strength of steel tie-down bars is 70,000 ksi.
  - Small Fittings: Brass. Do not use galvanized materials.
  - PVC Pipe and Fittings: Schedule 40, APWA Section 33 05 07.
  - Water Tight Wall Seal: Waterproof, compressible.
- EXECUTION**
  - Base Course and Backfill Placement: Maximum lift thickness is 8-inches before compaction. Compaction is 95 percent or greater relative to a modified proctor density, APWA Section 31 23 26.
  - Apply tape wrap to the exterior of all buried steel pipe per AWWA C209.
  - Concrete Placement: APWA Section 03 30 10. Provide 1/2-inch radius edges. Apply a broom finish. Apply a curing agent.
  - Service saddle is required on all PVC and AC pipe taps unless specified otherwise. Ductile iron and cast iron pipe may be direct tapped.
  - Seal manhole joints water-tight and ground flush with interior wall.
  - Follow applicable AWWA and NSF standards when connecting piping.
  - If diameter of air relief valve is greater than 2-inches, provide piping to match its diameter from water main connection to open to air.

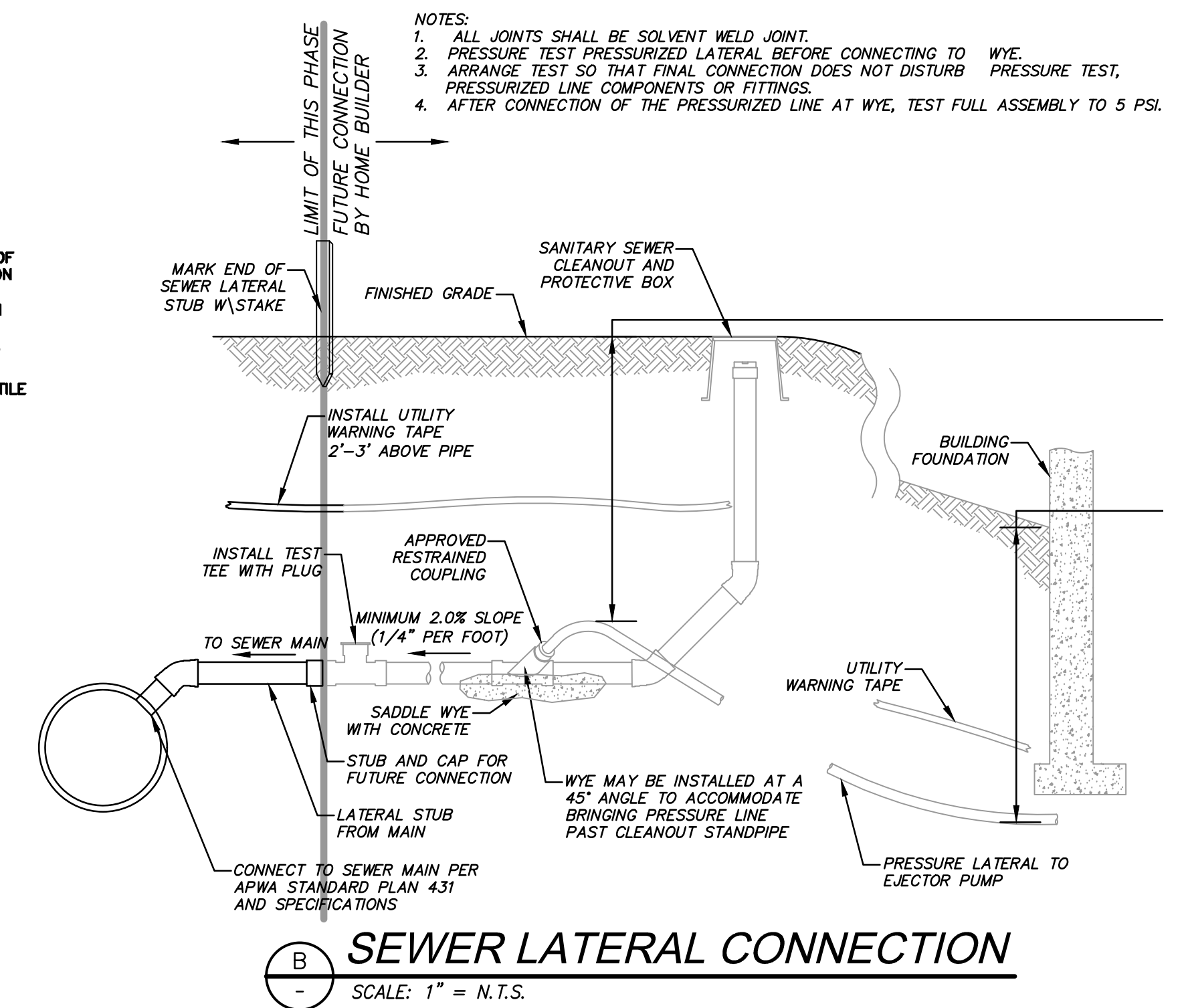


Plan 574

Air release assembly  
279



WATER LATERAL DETAIL  
NO SCALE



SEWER LATERAL CONNECTION  
SCALE: 1" = N.T.S.

Plan 575

| NO. | DATE | BY | REVISIONS |
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|     |      |    |           |
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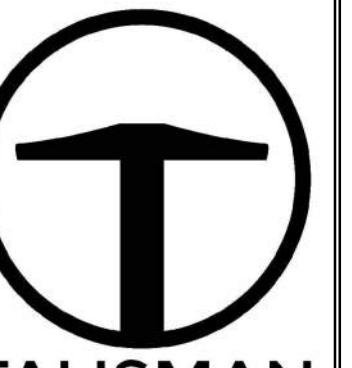
DATE SUBMITTED: 07.18.2018

BOBCAT RIDGE  
DETAILS

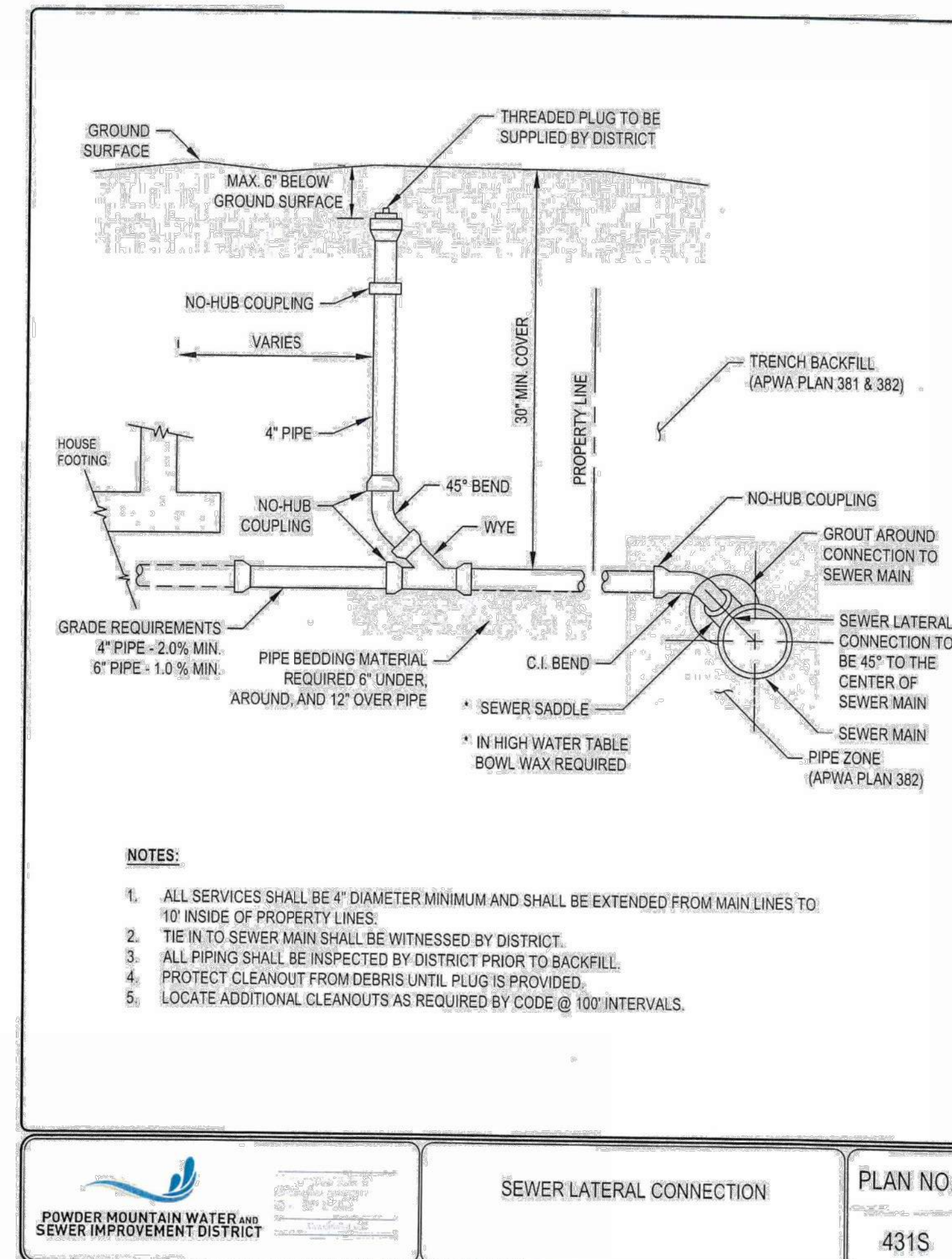
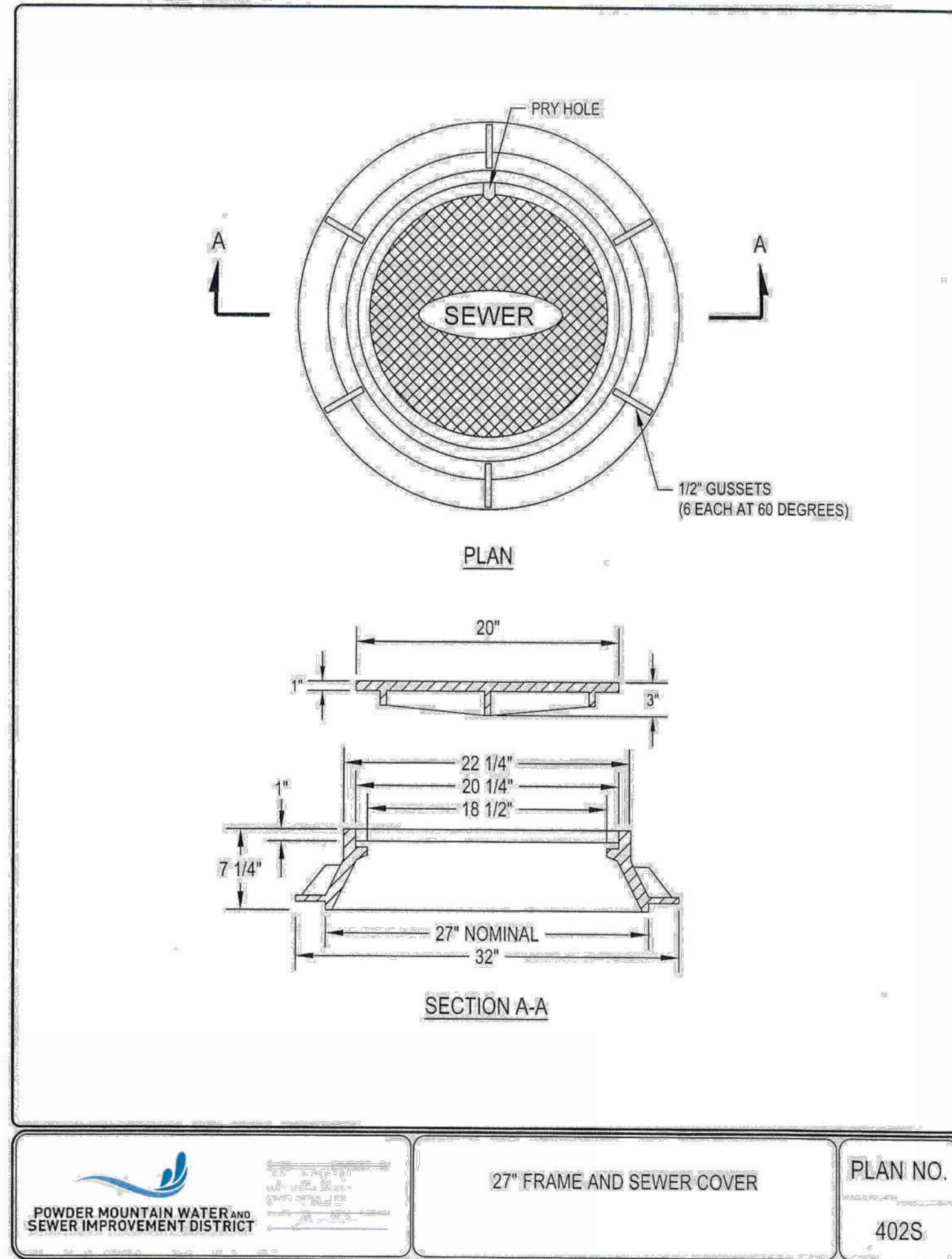
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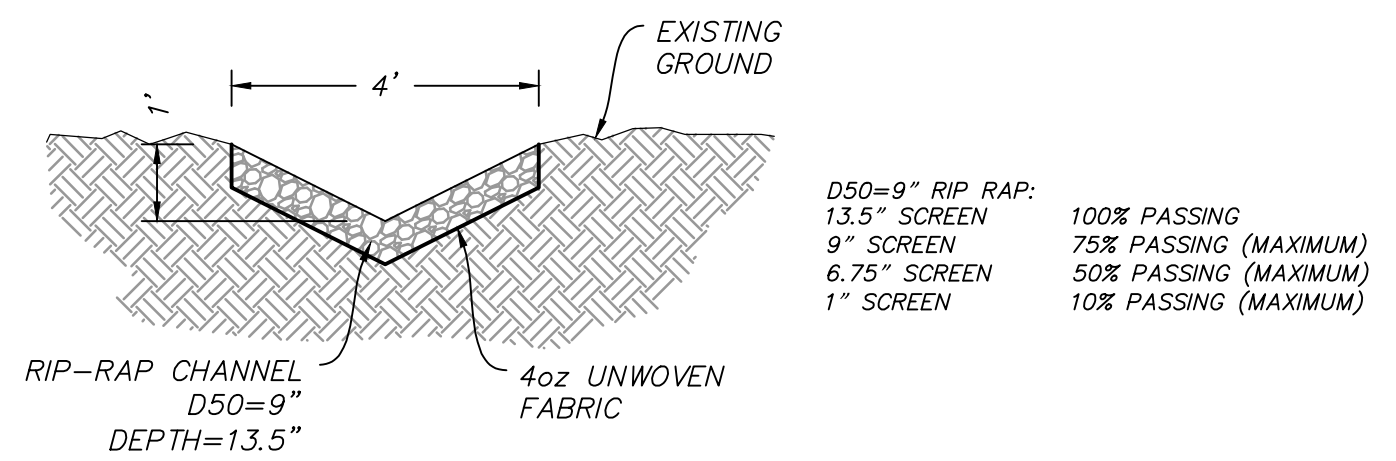
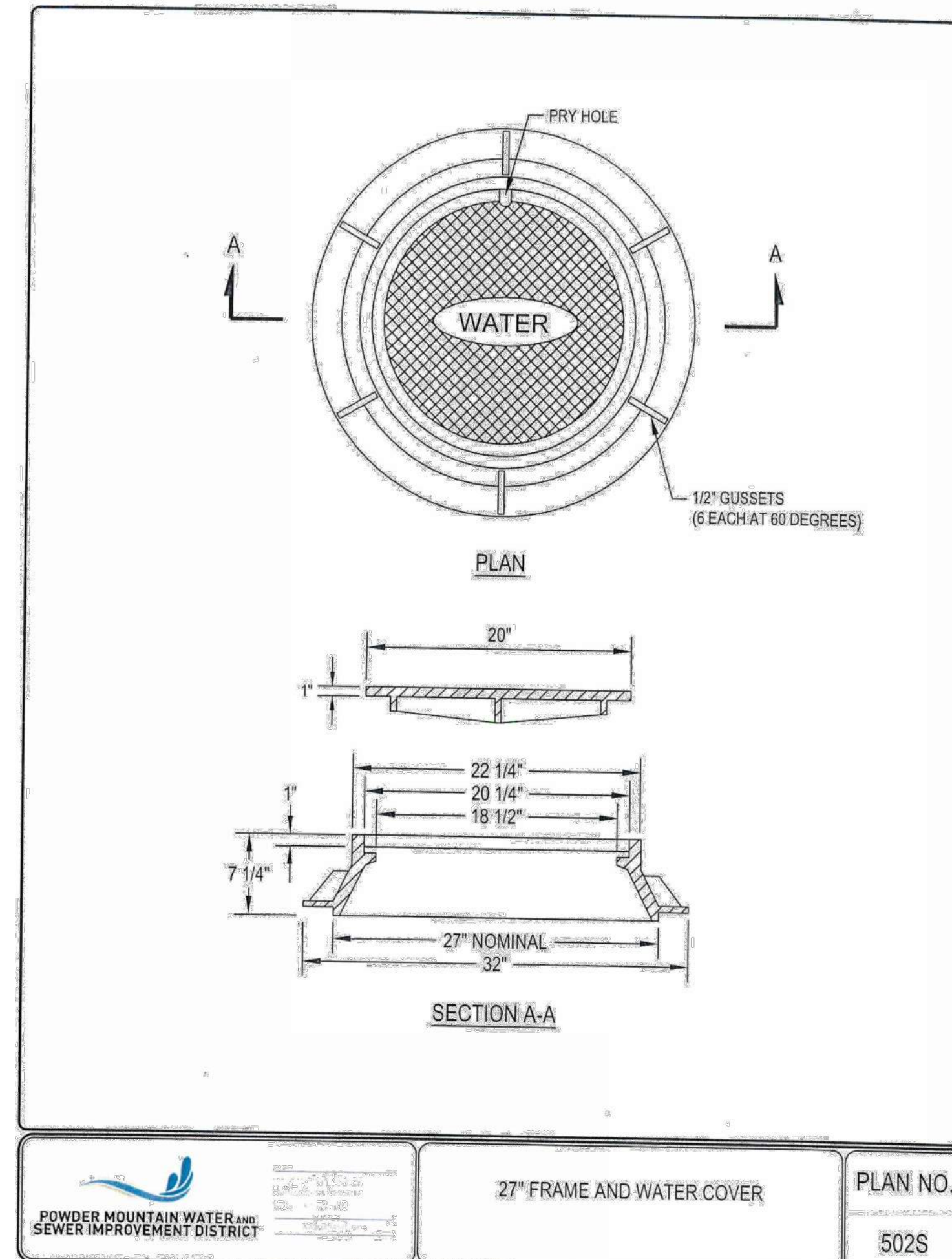
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- NOTES:**
1. ALL SERVICES SHALL BE 4\"/>



**DRAINAGE SWALE DETAIL**  
SCALE: 1" = N.T.S.

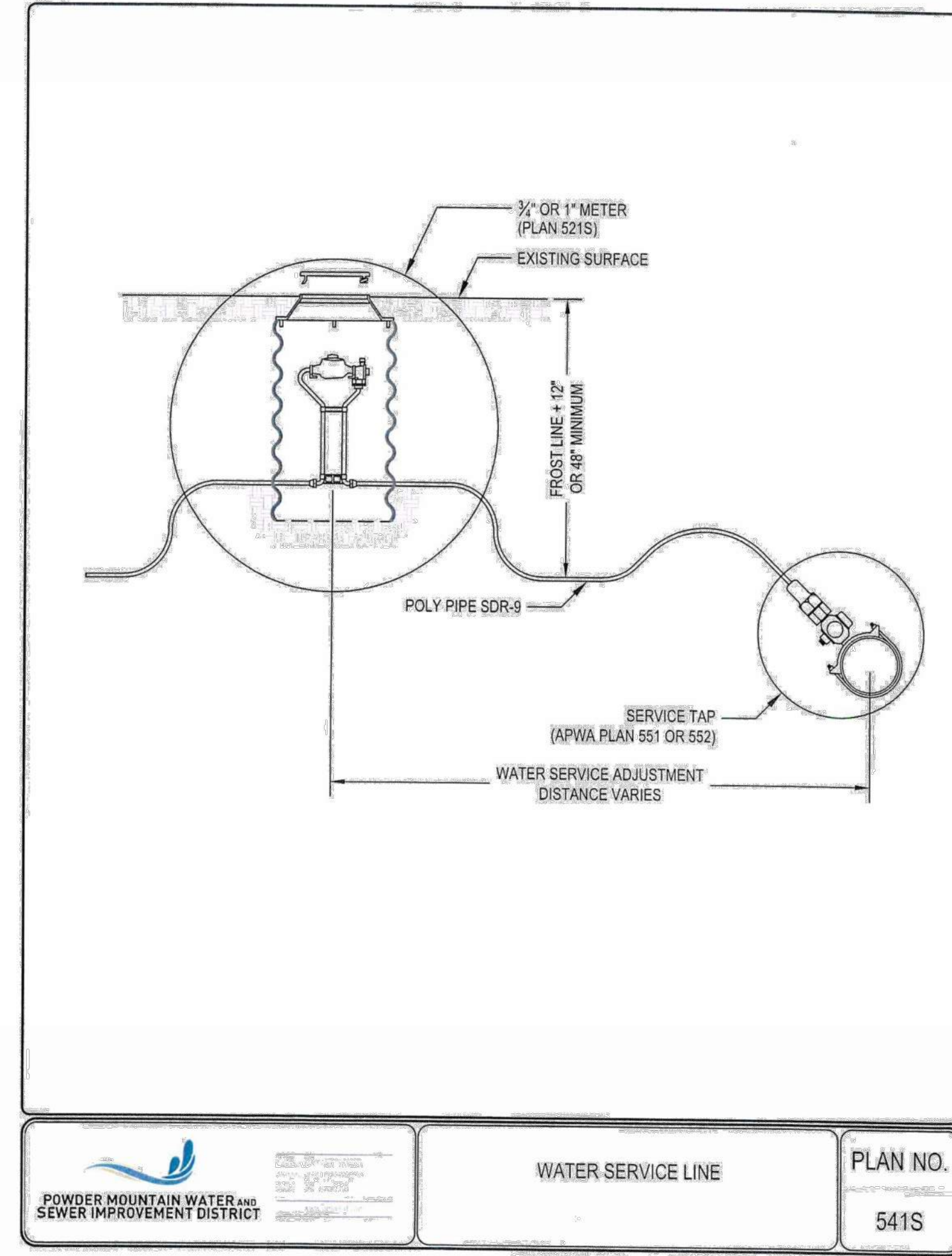
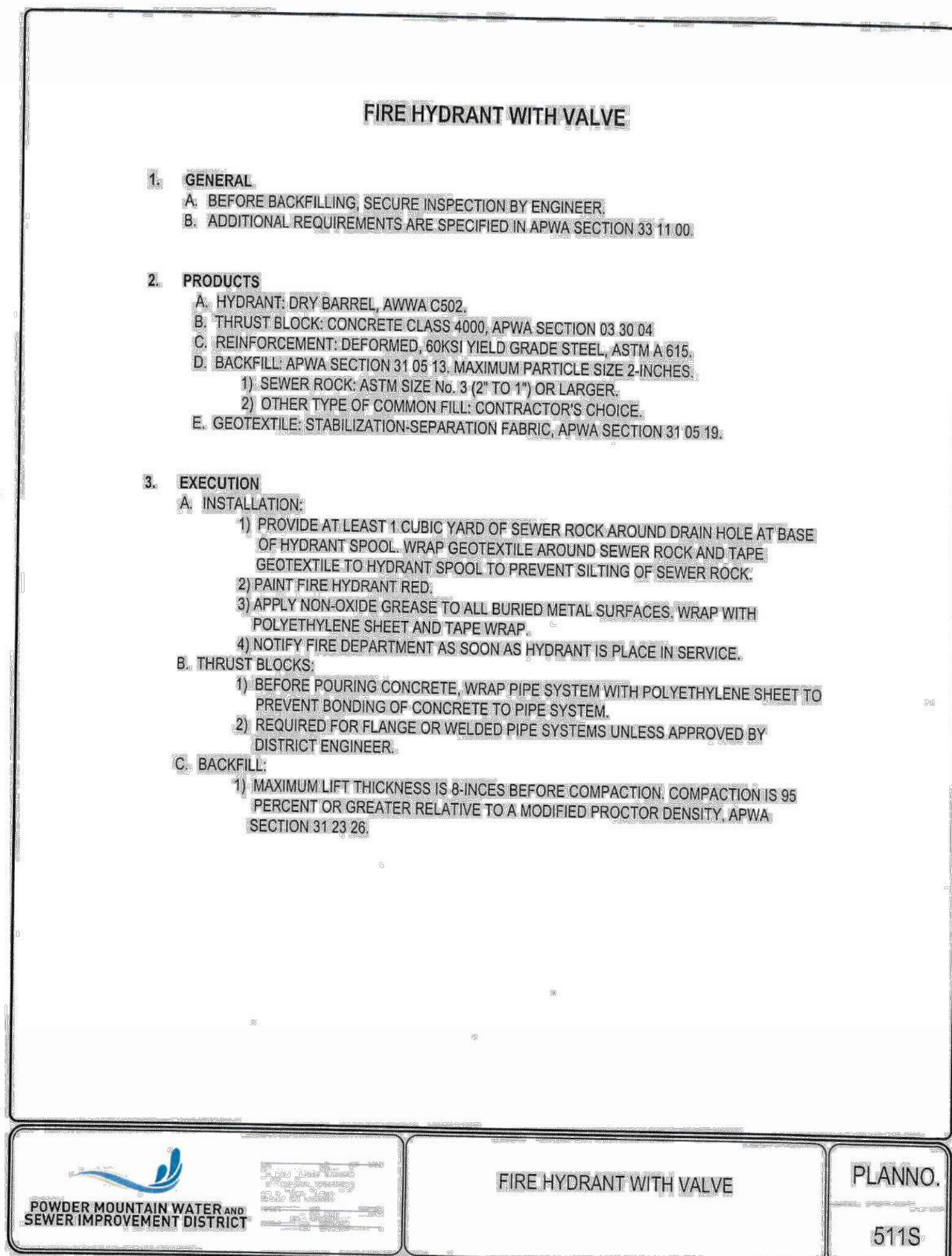
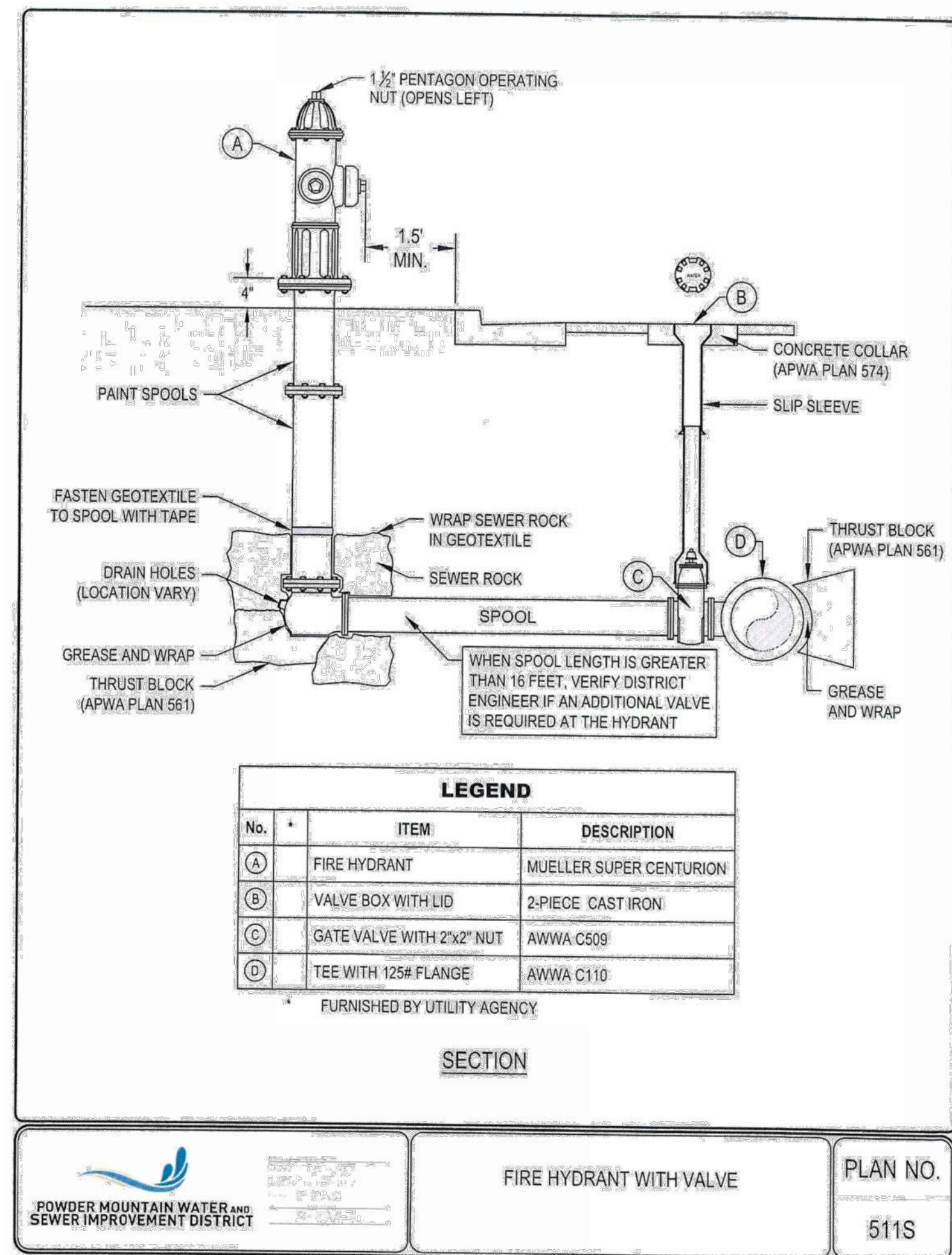
BOBCAT RIDGE DETAILS

DATE SUBMITTED: 07.18.2018

TCC JOB NUMBER: 18-200-22



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**BOBCAT RIDGE**  
DETAILS

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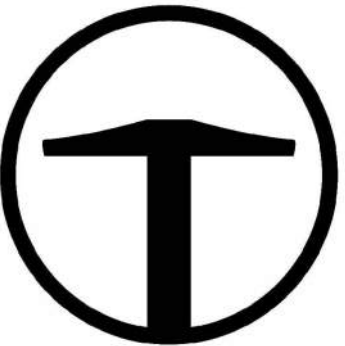
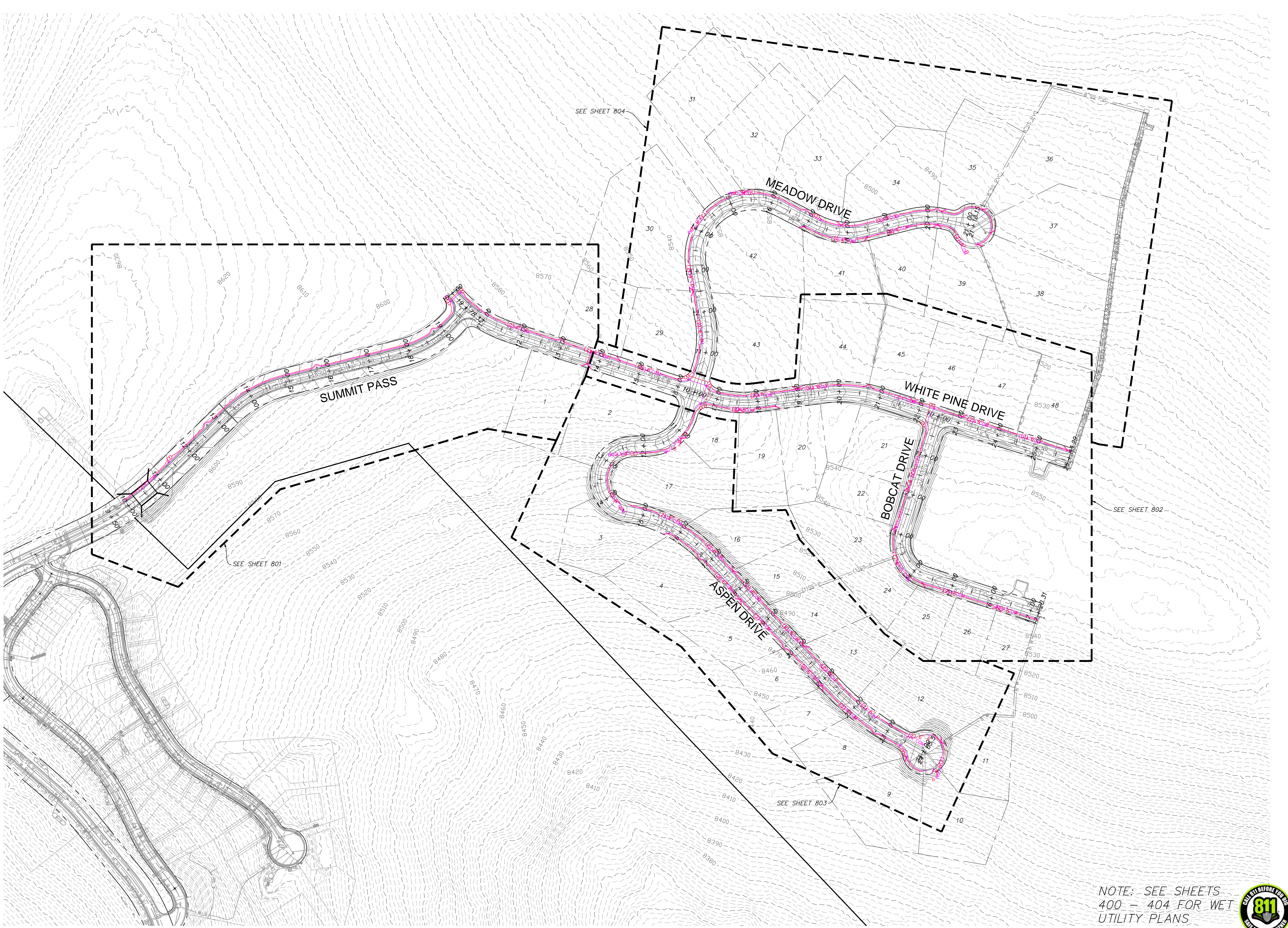
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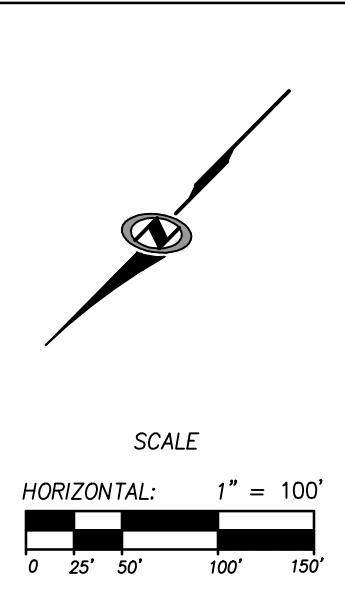


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**BOBCAT RIDGE**  
 OVERALL DRY UTILITY PLAN

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NOTE: SEE SHEETS  
 400 - 404 FOR WET  
 UTILITY PLANS



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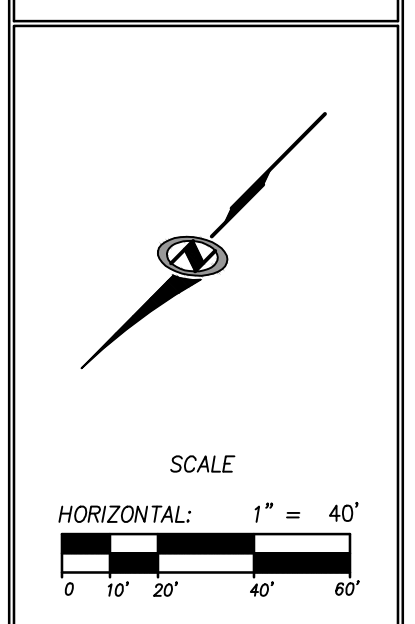
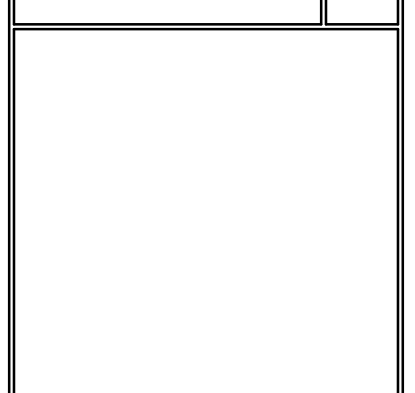
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**BOBCAT RIDGE**  
**DRY UTILITY PLAN**

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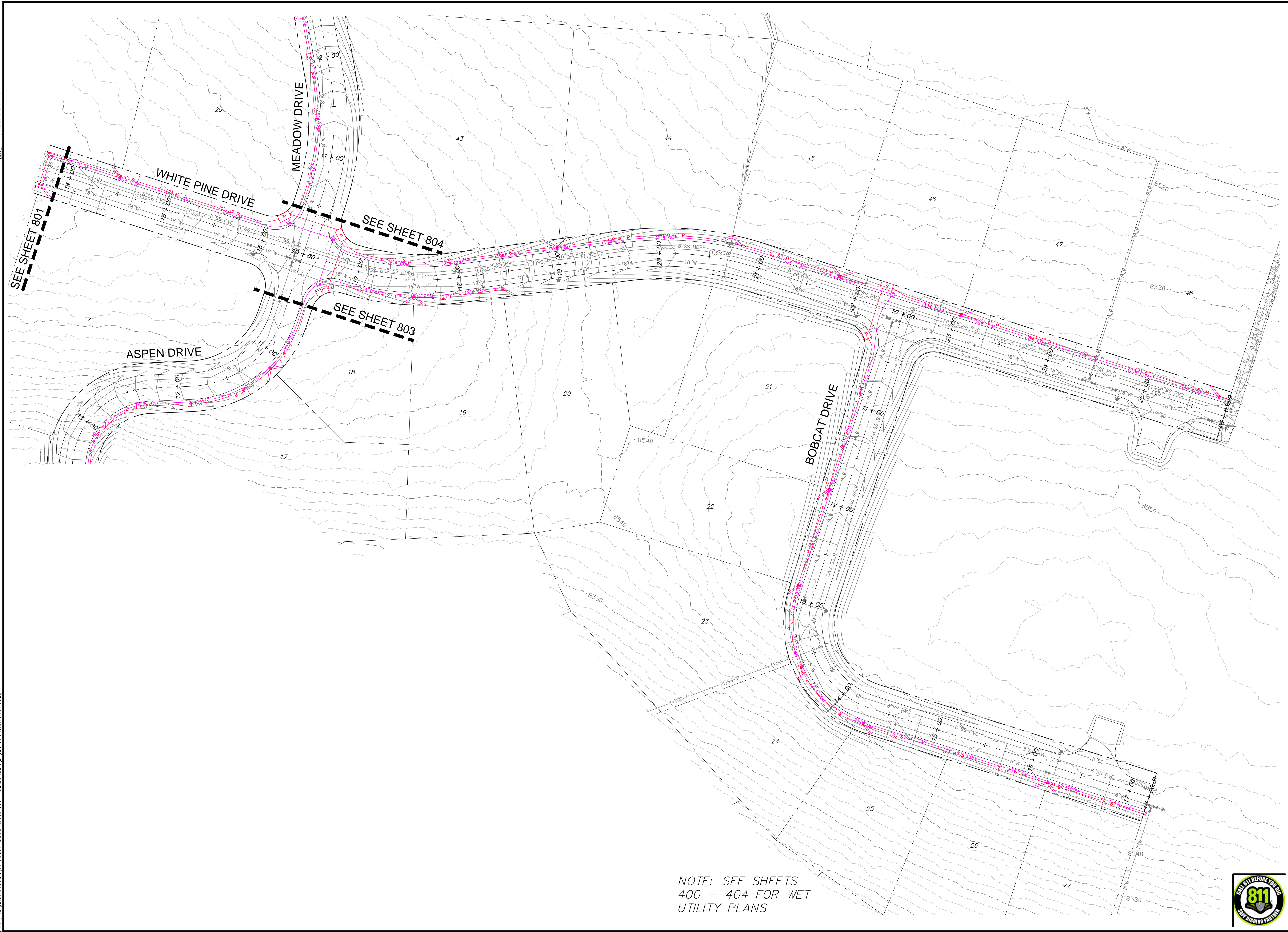


NOTE: SEE SHEETS  
400 - 404 FOR WET  
UTILITY PLANS

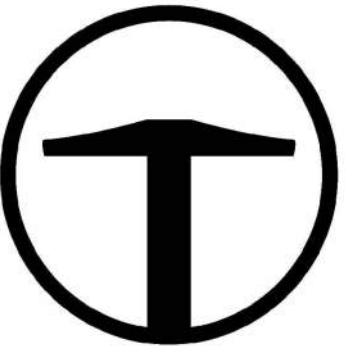


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NOTE: SEE SHEETS  
400 - 404 FOR WET  
UTILITY PLANS

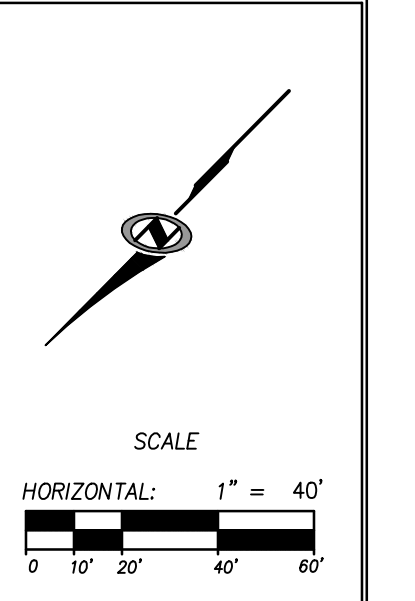
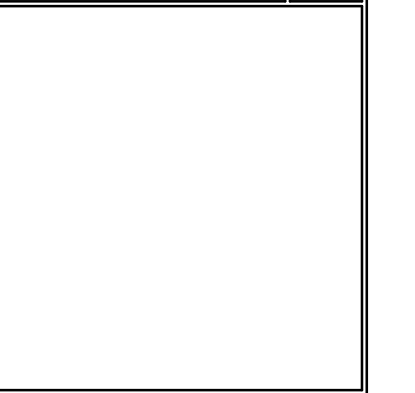


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**BOBCAT RIDGE**  
DRY UTILITY PLAN

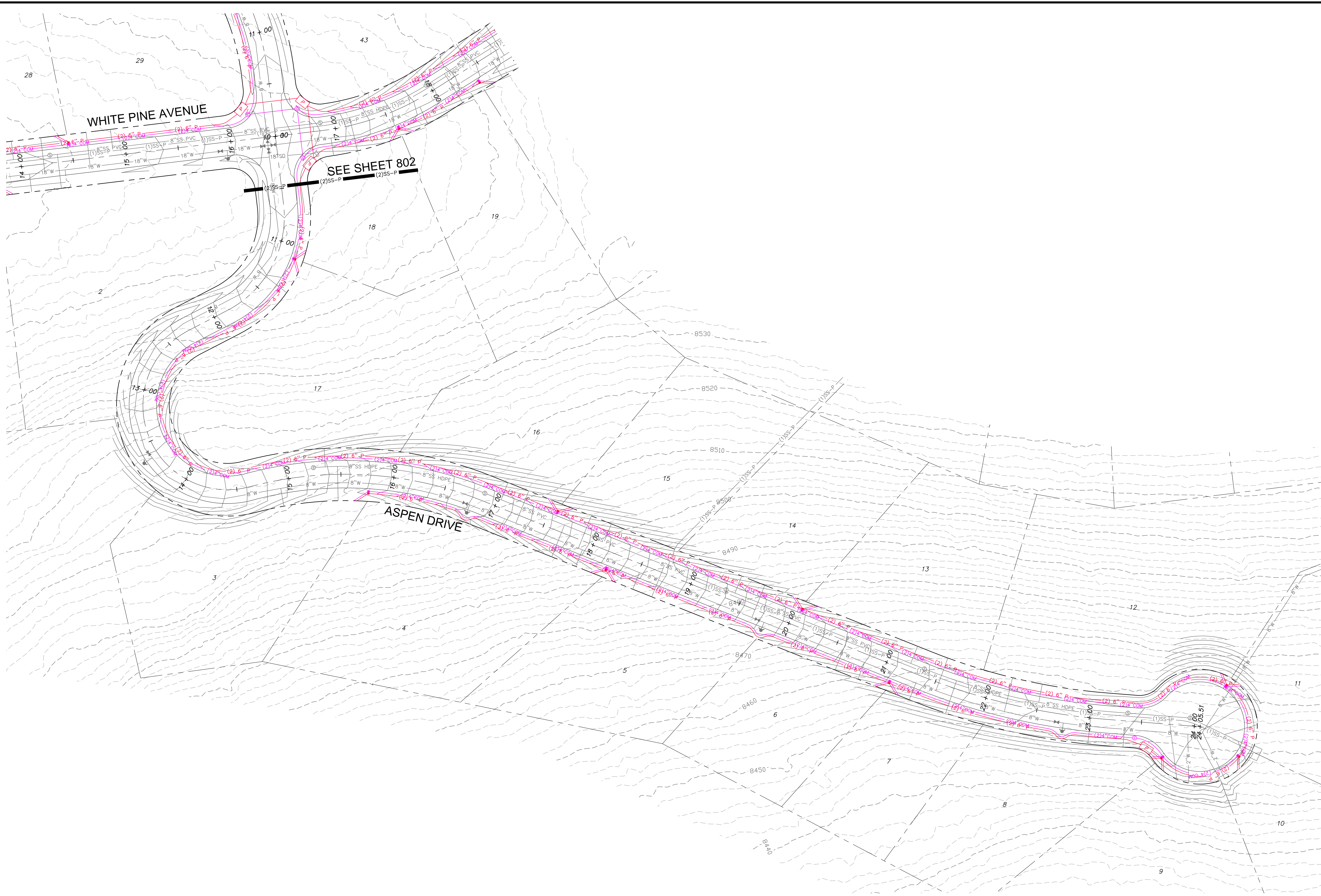
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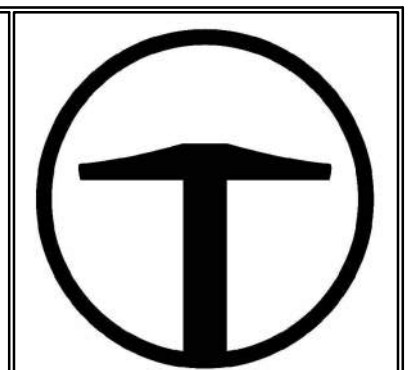
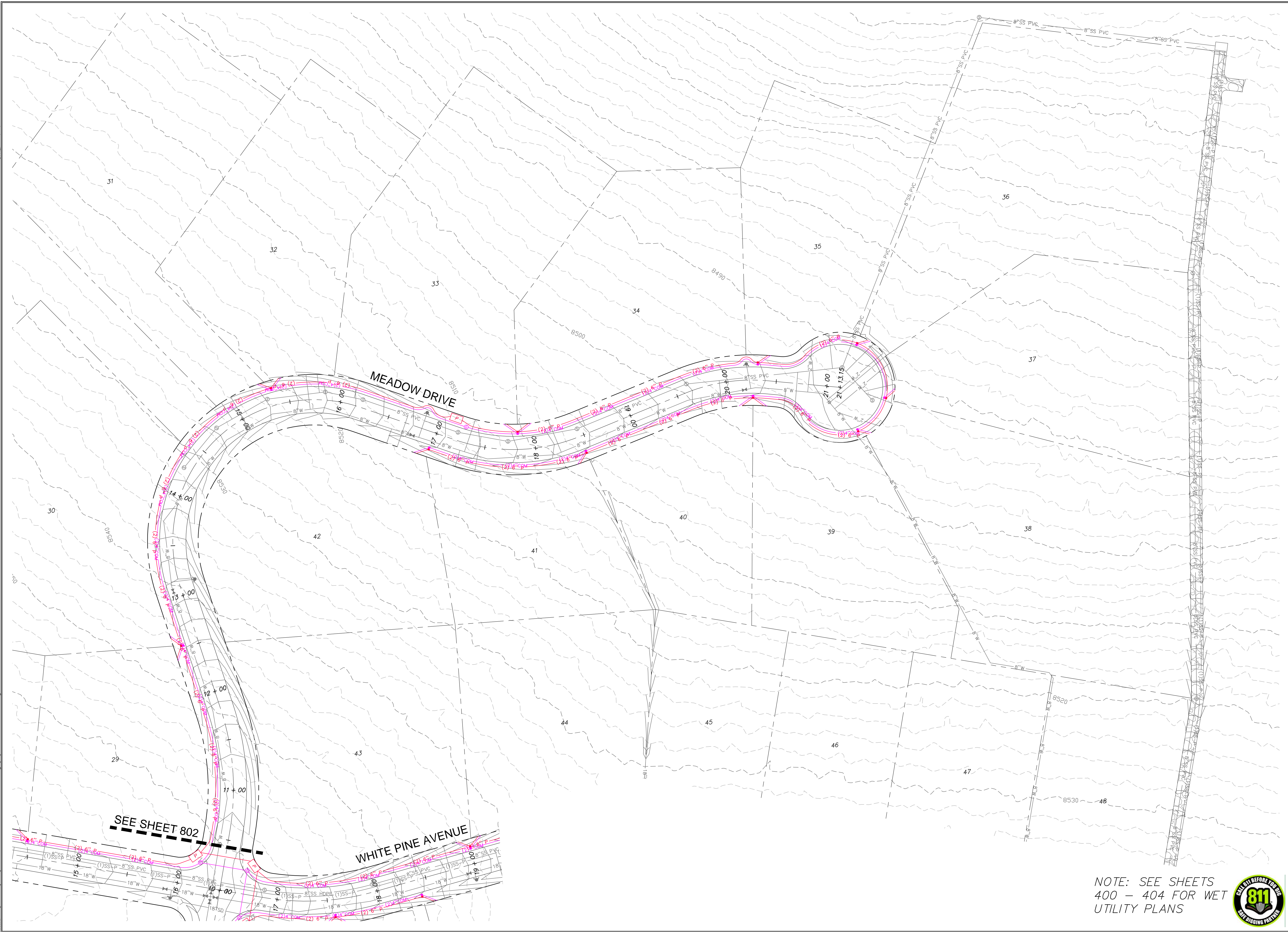
**NOTE: SEE SHEETS 400 - 404 FOR WET UTILITY PLANS**



SHEET NUMBER  
**803**  
20 OF 21

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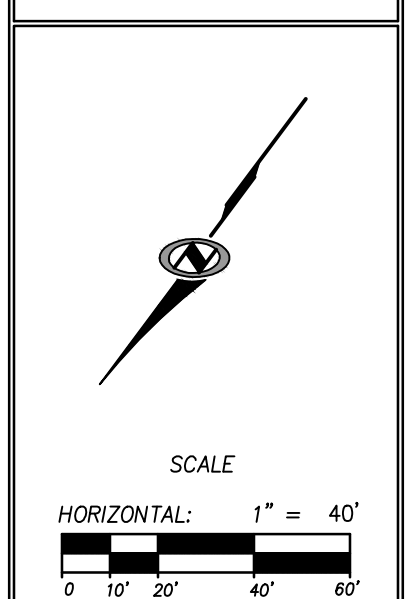
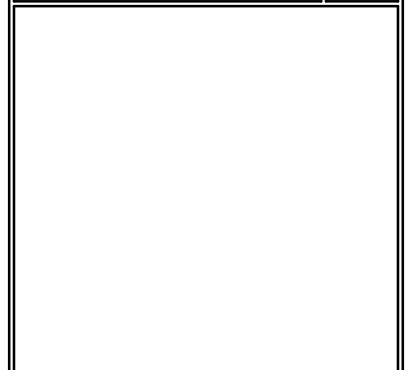


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**BOBCAT RIDGE**  
 DRY UTILITY PLAN

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SHEET NUMBER  
**804**  
 21 OF 21

NOTE: SEE SHEETS  
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