

# COLE COUNTY, MISSOURI

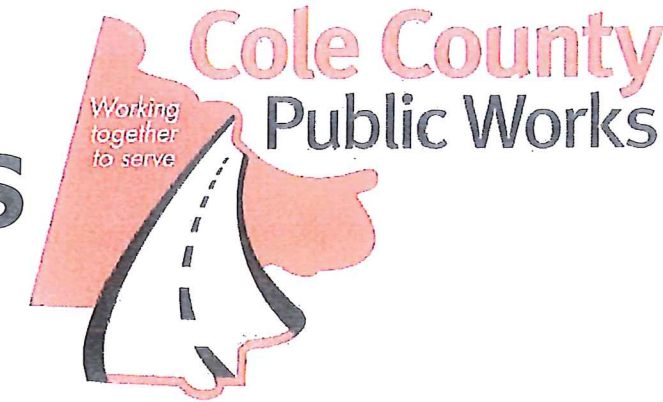
## SOUTH BROOKS DRIVE

# STORMWATER IMPROVEMENTS

COLE COUNTY PROJECT NO. 2017-203-0 & 2018-202-0

SECTION 18 - TOWNSHIP 44 - RANGE 12  
& SECTION 13 - TOWNSHIP 44 - RANGE 13

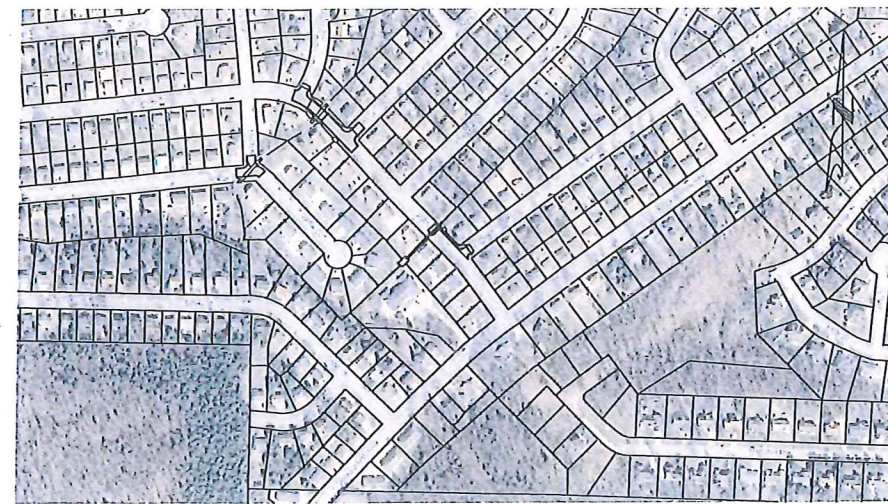
## MARCH 2019



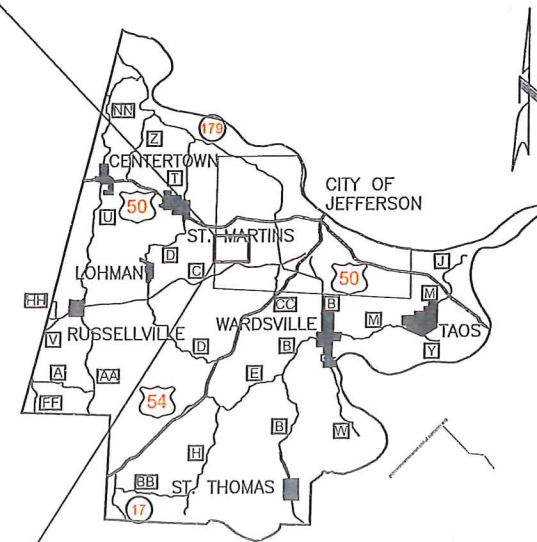
| Sheet Index Table |                                     |
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### LEGEND

- |        |                                  |   |                         |
|--------|----------------------------------|---|-------------------------|
| ⊙      | BILLBOARD                        | ⊠ | ROOF DRAIN              |
| ⊕      | BORE HOLE or DRILL HOLE          | ⊠ | CURB INLET              |
| ⊕      | LANDSCAPE BOULDER                | ○ | SANITARY MANHOLE        |
| ⊕      | WELL                             | ○ | CLEANOUT                |
| ⊕      | FLAG POLE                        | ⊕ | YARD HYDRANT            |
| ⊕      | SATELLITE DISH                   | ⊕ | WATER SPRINKLER         |
| ⊕      | POST                             | ○ | WATER MANHOLE           |
| ⊕      | MAILBOX                          | ⊕ | WATER METER             |
| ⊕      | TWO POLE SIGN                    | ⊕ | WATER VALVE             |
| ⊕      | ONE POLE SIGN                    | ⊕ | FIRE HYDRANT            |
| ⊕      | PARKING METER                    | ⊕ | LIGHT                   |
| ⊕      | STOP SIGN                        | ⊕ | FLOOD LIGHT             |
| ⊕      | GAS REGULATOR                    | ⊕ | LUMINARY (STREET LIGHT) |
| ⊕      | GAS RISER                        | ○ | MANHOLE COVER           |
| ⊕      | GAS TEST STATION                 | ⊕ | MISCELLANEOUS TOPO ITEM |
| ⊕      | GAS METER                        | ⊕ | FINISH FLOOR            |
| ⊕      | GAS VALVE                        | ⊕ | MIN. OPENING ELEV.      |
| ⊕      | UTILITY POLE                     | ⊕ | STUMP                   |
| ⊕      | GUY POLE                         | ⊕ | SHRUB                   |
| ⊕      | GUY ANCHOR                       | ⊕ | DECIDUOUS TREE          |
| ⊕      | TELEPHONE PEDESTAL               | ⊕ | EVERGREEN SHRUB         |
| ⊕      | TELEPHONE MANHOLE                | ⊕ | EVERGREEN TREE          |
| ⊕      | CABLE TV PEDESTAL                |   |                         |
| ⊕      | ELECTRIC MANHOLE                 |   |                         |
| ⊕      | ELECTRIC METER                   |   |                         |
| ⊕      | TRANSFORMER/ELECTRIC PAD         |   |                         |
| ⊕      | AIR CONDITIONER                  |   |                         |
| ⊕      | HAND HOLE                        |   |                         |
| ⊕      | TRAFFIC SIGNAL                   |   |                         |
| ⊕      | TRAFFIC SIGNAL BOX               |   |                         |
| ⊕      | SIGNAL MANHOLE                   |   |                         |
| ⊕      | STORM MANHOLE                    |   |                         |
| ⊕      | AREA INLET                       |   |                         |
| —OHE—  | OVERHEAD ELECTRIC                |   |                         |
| —UGT—  | UNDERGROUND TELEPHONE            |   |                         |
| —UGCT— | UNDERGROUND CABLE AND TELEVISION |   |                         |
| —G—    | GAS LINE                         |   |                         |
| —SAN—  | SANITARY SEWER LINE              |   |                         |
| —W—    | WATER LINE                       |   |                         |



Project Location Map



### UTILITY CONTACTS

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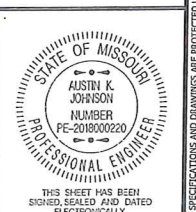
**Bartlett & West**  
1715 COUTERMORE DRIVE, SUITE 100, JEFFERSON CITY, MO 65109-4000  
MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING  
www.bartlettwest.com

**TITLE SHEET**  
SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
PROJECT NO. 2017-203-0 & 2018-202-0  
COLE COUNTY, MISSOURI

APPROVED BY  
COLE COUNTY, MISSOURI

*Eric Landwehr*  
ERIC LANDWEHR, P.E., COUNTY ENGINEER

3/5/19  
DATE



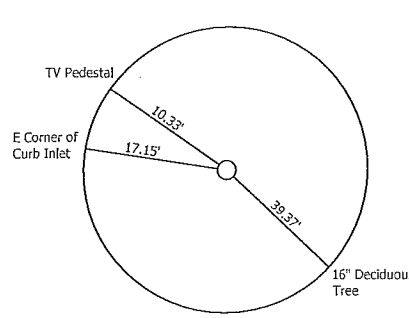
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| DRAWN BY:    | TAA           |
| APPROVED BY: | AKJ           |
| DESIGN PROJ: | 15937.110/111 |
| DATE:        | MARCH 2019    |
| DRAWING NO:  | 1             |
| SHEET NO:    | 1 of 20       |

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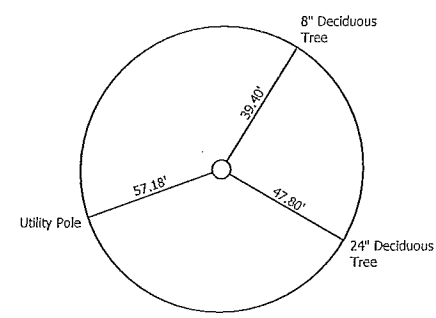
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**GENERAL NOTES:**

- A. FOR DETAILS, INCLUDING BUT NOT LIMITED TO, CURB, DRIVEWAYS, INLETS, END SECTIONS, TRENCHING, SANITARY SEWERS, MANHOLES AND CLEAN OUTS, REFER TO CITY OF JEFFERSON STANDARD DETAILS.
- B. VERIFYING THE LOCATIONS OF THE UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ANY DAMAGE TO EXISTING OR PROPOSED FACILITIES, STRUCTURES OR UTILITIES SHALL BE REPAIRED OR REPLACED AT THE CONTRACTOR'S EXPENSE. NOTIFY MISSOURI ONE CALL FOR LOCATION OF THE UTILITIES AT LEAST 5 DAYS PRIOR TO CONSTRUCTION. UTILITY COORDINATION SHALL NOT BE A REASON FOR DELAY OR ADDITIONAL COST FOR THE PROJECT.
- C. THE CONTRACTOR SHALL IMMEDIATELY REPAIR ALL DAMAGE TO PROPERTY OUTSIDE LIMITS OF CONSTRUCTION AT THE CONTRACTOR'S EXPENSE.
- D. REPORT ANY DISCREPANCIES FOUND WITH REGARD TO EXISTING CONDITIONS OR PROPOSED DESIGN IMMEDIATELY TO THE ENGINEER.
- E. DO NOT WILLFULLY PROCEED WITH CONSTRUCTION AS DESIGNED WHERE DISCREPANCIES EXIST. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL REVISIONS TO THE WORK WHEN NO NOTICE WAS GIVEN TO THE ENGINEER.
- F. THE GENERAL CONTRACTOR SHALL COORDINATE OTHER SITE RELATED OPERATIONS PERFORMED BY OTHER CONTRACTORS OR UTILITY COMPANIES TO ACCOMPLISH THE WORK.
- G. ALL WORK SHALL BE IN COMPLIANCE WITH ALL LOCAL, STATE AND FEDERAL CODES AND ORDINANCES.
- H. LEAVE AREAS OF DEMOLITION IN A NEAT AND SAFE CONDITION AT THE END OF EACH WORK DAY. CONTRACTOR SHALL BARRICADE AREAS OF DEMOLITION AS NECESSARY TO PROTECT THE GENERAL PUBLIC. MAINTAIN SAFE PUBLIC ACCESS TO RESIDENCES.
- I. LEGALLY DISPOSE OF ALL DEMOLITION ITEMS OFF SITE UNLESS NOTED TO RETURN ITEMS TO THE CITY.
- J. ALL REMOVALS ADJACENT TO EXISTING PAVEMENT TO REMAIN SHALL BE ISOLATED BY SAWCUTS. SAWCUTS SHALL BE A MINIMUM OF THE PAVEMENT THICKNESS.
- K. ALL UTILITIES NOT MARKED FOR REMOVAL SHALL REMAIN IN PLACE.
- L. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION.
- M. ANY EXISTING TRAFFIC SIGNS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL SHALL BE COVERED OR REMOVED, NO DIRECT PAY.
- N. CONTRACTOR SHALL STORE AND PROTECT ANY SIGNS THAT MUST BE REMOVED. ANY DAMAGED SIGNS SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE PROJECT.
- O. LOCATION OF TRAFFIC CONTROL DEVICES ARE SUBJECT TO CHANGE AS APPROVED BY ENGINEER.
- P. PLACEMENT AND USE OF TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES SHALL BE IN ACCORDANCE WITH THE CURRENT VERSION OF THE MUTCD.
- Q. CONTRACTOR SHOULD REMAIN BEYOND ROAD SHOULDER OR CURB LINE TO NOT INTERRUPT TRAFFIC WHENEVER POSSIBLE.
- R. LOCAL ACCESS FOR PROPERTY OWNERS SHALL BE MAINTAINED AT ALL TIMES. THIS CAN BE ACCOMPLISHED THROUGH THE USE OF TEMPORARY PAVEMENT, GRAVEL SURFACE OR ANY OTHER MEANS APPROVED BY THE ENGINEER.
- S. ALL PAVEMENT REMOVAL ADJACENT TO PAVEMENT REMAINING IN PLACE SHALL BE ISOLATED BY FULL DEPTH SAW CUTS PRIOR TO REMOVAL. ANY DAMAGE BEYOND THE INTENDED REMOVAL LIMITS SHALL BE REPLACED OR REPAIRED BY THE CONTRACTOR AT NO DIRECT PAY.



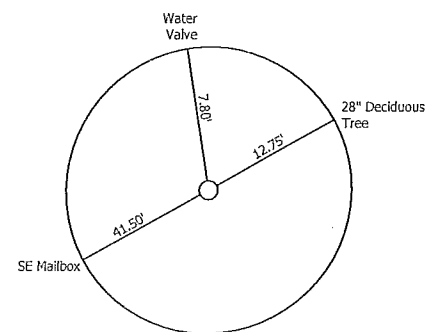
**CONTROL POINT 101**



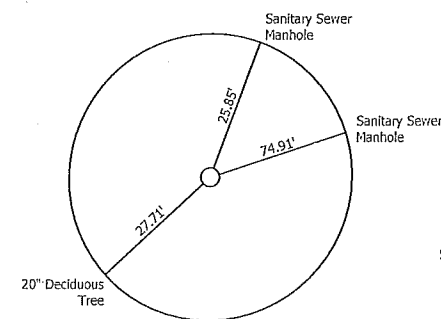
**CONTROL POINT 102**

| SURVEY BENCHMARKS |             |            |             |           |
|-------------------|-------------|------------|-------------|-----------|
| POINT NO.         | DESCRIPTION | NORTHING   | EASTING     | ELEVATION |
| 101               | 5/8 ROD     | 992633.721 | 1699922.183 | 732.05    |
| 102               | 5/8 ROD     | 992400.917 | 1699637.555 | 723.04    |

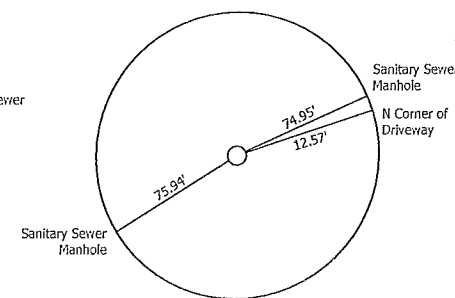
HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM OF 1983 (CENTRAL ZONE)  
 VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)



**CONTROL POINT 4000**



**CONTROL POINT 4001**



**CONTROL POINT 4002**

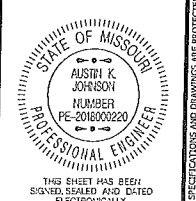
| SURVEY BENCHMARKS |                      |            |             |           |
|-------------------|----------------------|------------|-------------|-----------|
| POINT NO.         | DESCRIPTION          | NORTHING   | EASTING     | ELEVATION |
| 4000              | 1/2" IRON BAR W/ CAP | 992932.086 | 1699617.342 | 730.23    |
| 4001              | 1/2" IRON BAR W/ CAP | 993071.019 | 1699536.451 | 725.79    |
| 4002              | 1/2" IRON BAR W/ CAP | 992882.862 | 1699363.210 | 722.04    |

HORIZONTAL DATUM: MISSOURI STATE PLANE COORDINATE SYSTEM OF 1983 (CENTRAL ZONE)  
 VERTICAL DATUM: NORTH AMERICAN VERTICAL DATUM OF 1988 (NAVD88)

**Bartlett & West**

1710 COUNTRIDGE DRIVE, SUITE 160-JEFFERSON CITY, MO 64501-4008  
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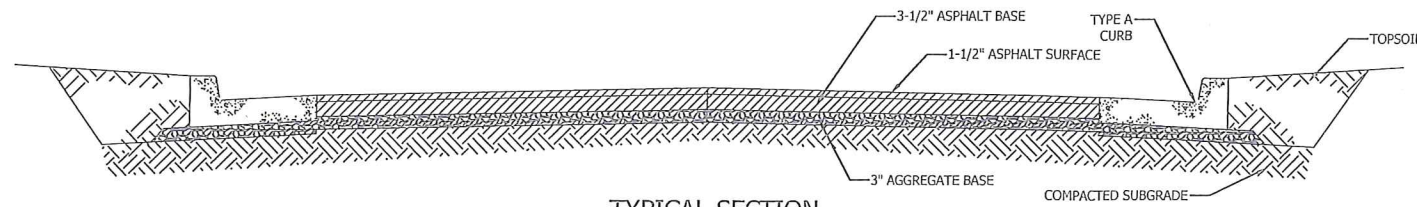
**GENERAL NOTES AND PROJECT CONTROL**  
 SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI



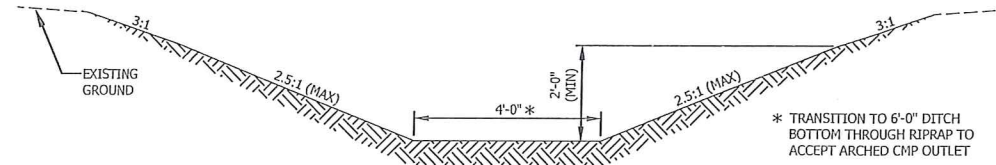
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 APPROVED BY: AKJ  
 DESIGN PROJ: 15937.110/111  
 DATE: MARCH 2019  
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 SHEET NO: 2 of 20

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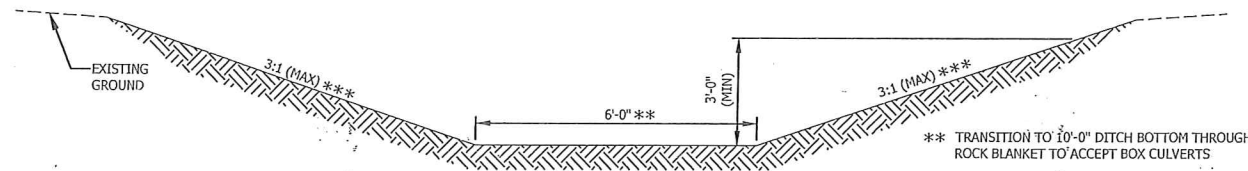
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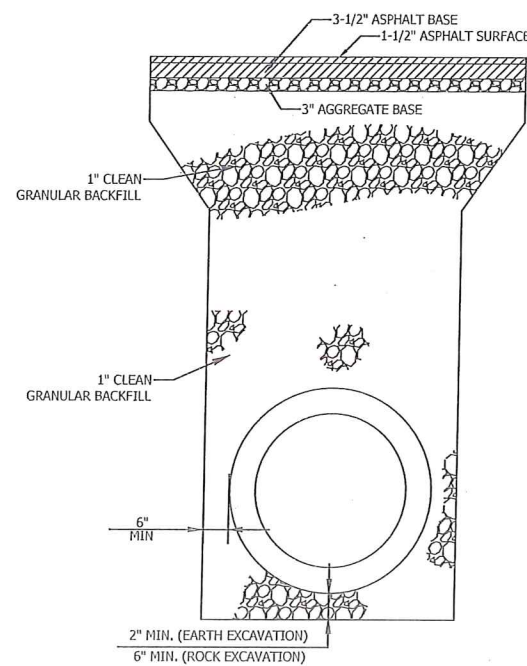
TYPICAL SECTION  
FULL DEPTH REPLACEMENT



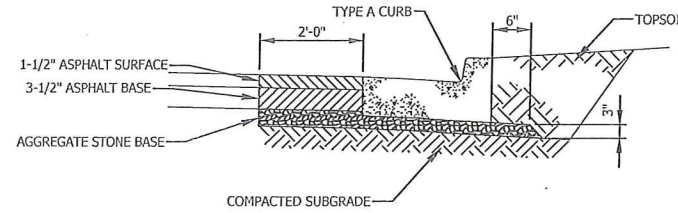
PHASE 1 TYPICAL DITCH SECTION



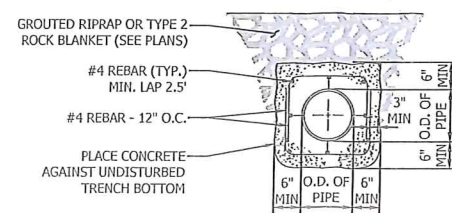
PHASE 2 TYPICAL DITCH SECTION



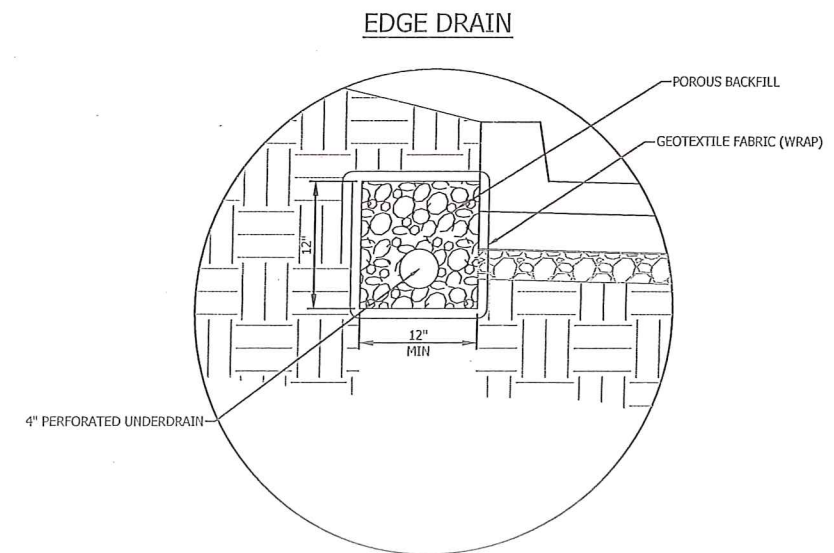
TRENCH DETAIL FOR ROAD CROSSING



TYPICAL CURB REPLACEMENT DETAIL



CONCRETE ENCASEMENT



ESTIMATED QUANTITIES

| Item No.  | Description  | Quantity | Unit |
|-----------|--|----------|------|
| 202-20.10 | Removal of Improvements  | 1        | LS   |
| 203-99.01 | Earthwork  | 1        | LS   |
| 208-31.00 | Class 3 Excavation in Rock                                     | 100      | CY   |
| 304-99.05 | 3" Aggregate Stone Base  | 2,580    | SY   |
| 401-99.05 | Bituminous Pavement - 3.5" Base                                | 2,580    | SY   |
| 401-99.07 | Bituminous Pavement - 1.5" Surface                             | 2,580    | SY   |
| 605-99.03 | Underdrain   | 325      | LF   |
| 608-60.04 | Concrete Sidewalk, 4 in.                                       | 10       | SY   |
| 603-99.26 | Concrete Encasement  | 40       | LF   |
| 608-99.05 | 6" PCC Residential Concrete Drive                              | 191      | SY   |
| 608-99.15 | 6" PCC Residential Concrete Drive Approach                     | 77       | SY   |
| 608-99.03 | Type A Curb and Gutter   | 2,014    | LF   |
| 609-99.07 | Grouted Type 2 Riprap (24" Thick)                              | 51.9     | CY   |
| 611-30.99 | Type 2 Rock Blanket (24" Thick)                                | 252.7    | CY   |
| 616-99.01 | Construction Signage/Traffic Control                           | 1        | LS   |
| 618-10.00 | Mobilization   | 1        | LS   |
| 703-40.41 | Class B-1 Concrete (Culverts)                                  | 192      | CY   |
| 705-10.30 | Reinforcing Steel (Culverts)                                   | 43,300   | LB   |
| 725-99.03 | 15" (16") Optional Pipe  | 284      | LF   |
| 725-99.04 | 18" (24") Optional Pipe  | 134      | LF   |
| 725-20.10 | Corrugated Polymer-Coated Steel Pipe-Arch Type B-10A (66"x51") | 169      | LF   |
| 726-13.15 | 15" Class III Reinforced Concrete Pipe Culvert                 | 42       | LF   |
| 726-13.18 | 18" Class III Reinforced Concrete Pipe Culvert                 | 55       | LF   |
| 731-99.01 | Type A Concrete Curb Inlet 4' x 3'                             | 8        | EA   |
| 731-99.03 | Type A Concrete Curb Inlet 4' x 5'                             | 2        | EA   |
| 731-99.04 | Type A Concrete Curb Inlet 5' x 3'                             | 2        | EA   |
| 731-99.04 | Type A Concrete Curb Inlet 5' x 4'                             | 1        | EA   |
| 731-99.02 | Type A Concrete Curb Inlet 6' x 4'                             | 2        | EA   |
| 731-99.05 | Type C Concrete Curb Inlet 4' x 4'                             | 2        | EA   |
| 805-99.01 | Seeding, Fertilizing and Mulch                                 | 1        | LS   |
| 806-10.19 | Silt Fence   | 125      | LF   |
| 806-10.25 | Inlet Check  | 17       | EA   |
| 806-99.02 | Rock Ditch Checks (9")   | 14       | EA   |

| ESTIMATED EARTHWORK & REMOVALS |           |
|--------------------------------|-----------|
| CUT                            | 1495 C.Y. |
| FILL                           | 112 C.Y.  |
| CLASS 4 EXCAVATION             | 512 C.Y.  |

NOTE:  
EARTHWORK QUANTITIES INCLUDE EXISTING PAVEMENT REMOVALS

**Bartlett & West**  
 1778 SOUTHBRIDGE DRIVE, SUITE 100, JEFFERSON CITY, MO 64108-4800  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000407 - ENGINEER  
 www.bartlettwest.com

**TYPICAL DETAILS AND QUANTITIES**  
 SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS, PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI

STATE OF MISSOURI  
 AUSTIN K. JOHNSON  
 NUMBER  
 PE-2018000220  
 PROFESSIONAL ENGINEER

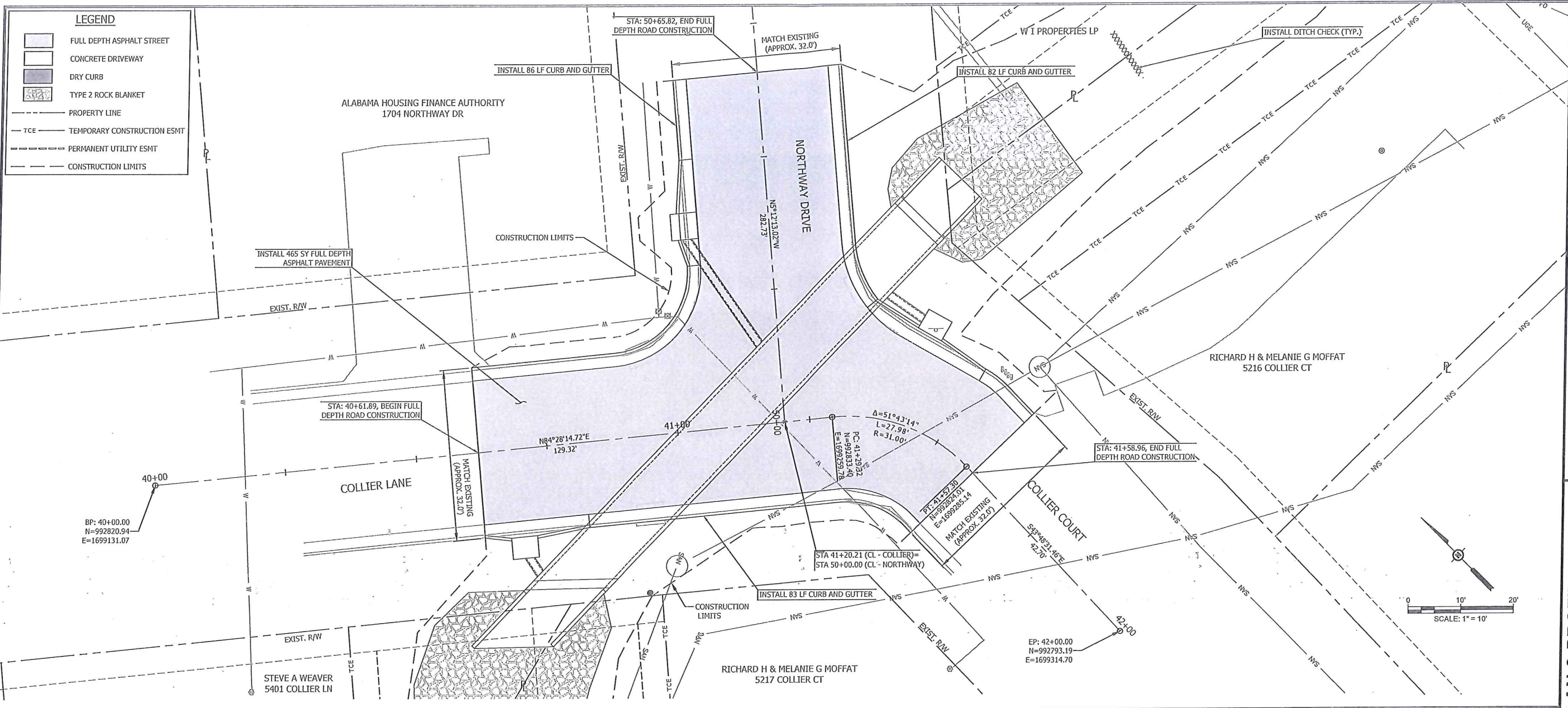
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 APPROVED BY: AKJ  
 DESIGN PROJ: 15937.110/111  
 DATE: MARCH 2019  
 DRAWING NO: 3  
 SHEET NO: 3 of 20

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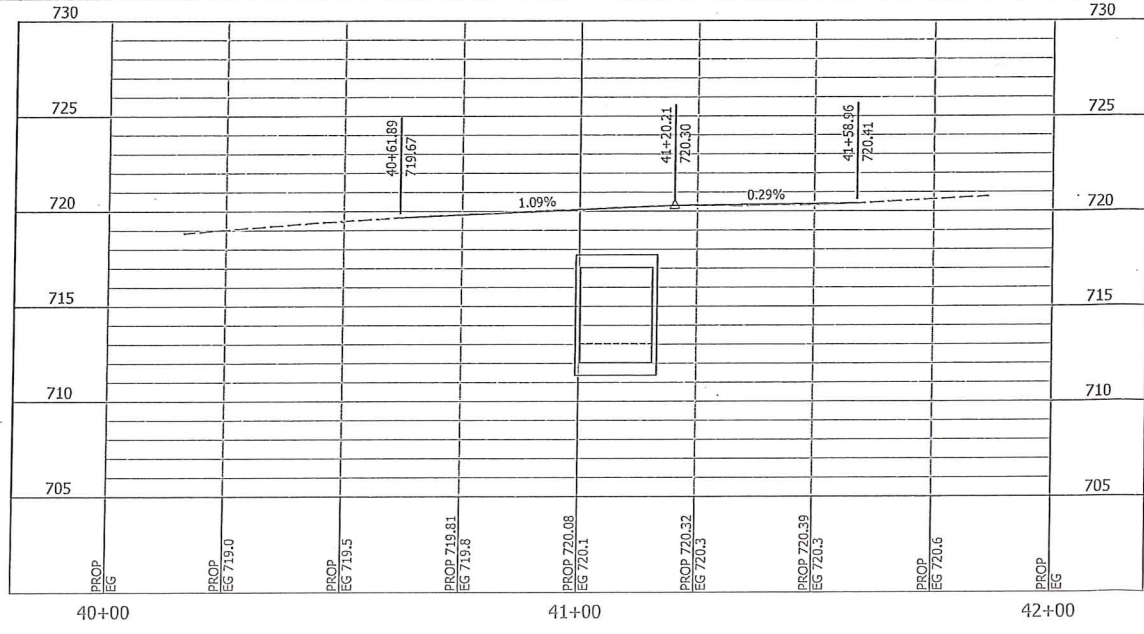
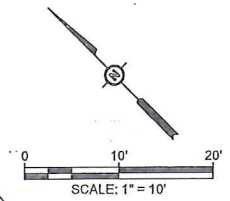




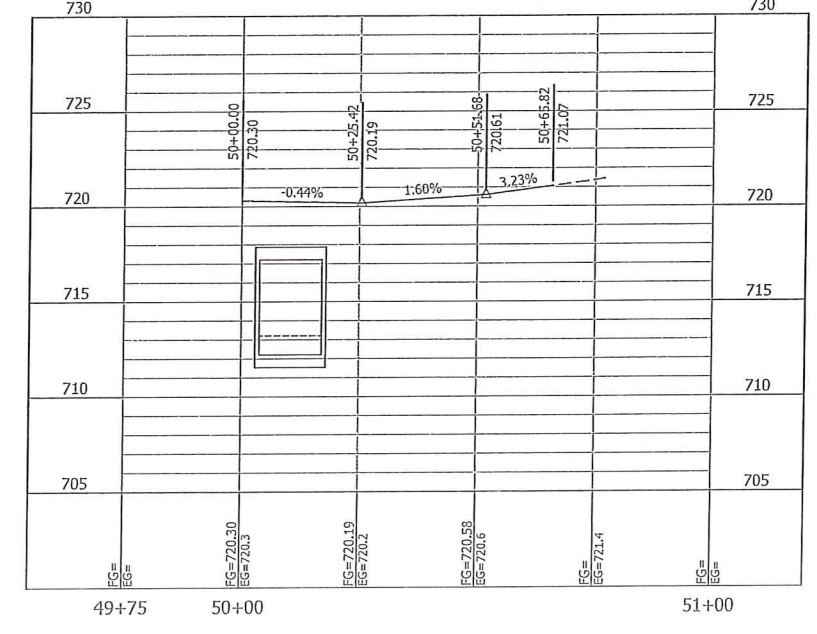


**LEGEND**

- FULL DEPTH ASPHALT STREET
- CONCRETE DRIVEWAY
- DRY CURB
- TYPE 2 ROCK BLANKET
- PROPERTY LINE
- TCE - TEMPORARY CONSTRUCTION ESMT
- PERMANENT UTILITY ESMT
- CONSTRUCTION LIMITS



COLLIER LANE/COLLIER COURT



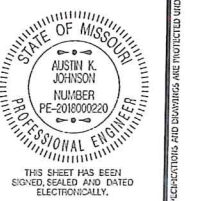
NORTHWAY DRIVE

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 Last edit on: Mar 5, 2019 by: DCFB1439

**Bartlett & West**

1719 SOUTHBRIDGE DRIVE, SUITE 100-1000 JEFFERSON CITY, MO 65109-4600  
 PHONE 672.434.7451  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 005194-0000-0000  
 MISSOURI REGISTERED PROFESSIONAL ENGINEER

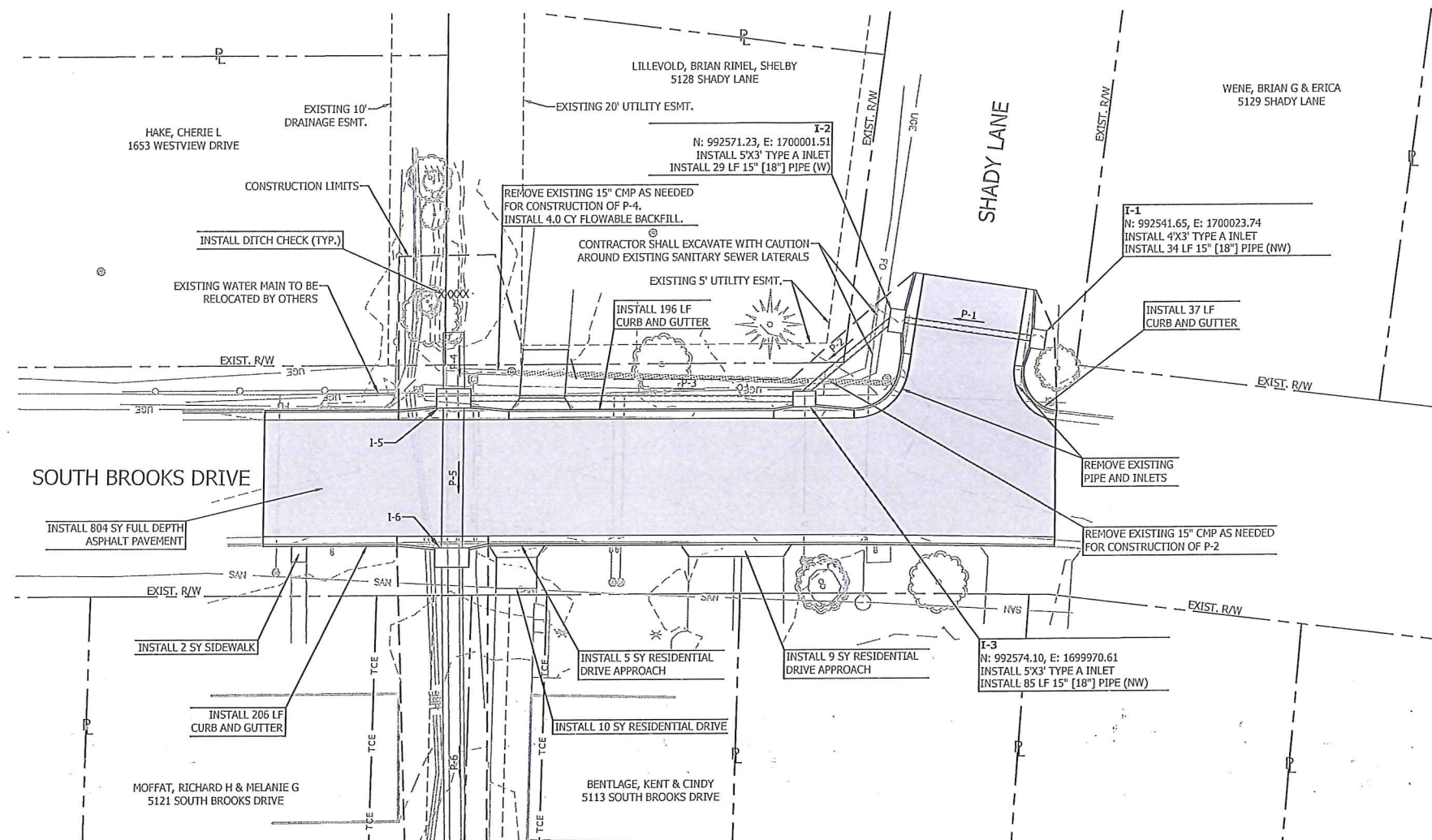
**ROAD PLAN & PROFILE  
 COLLIER LANE/COLLIER COURT  
 STA. 40+00 TO 42+00  
 SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI**



SEALED DATE: 3/05/2019  
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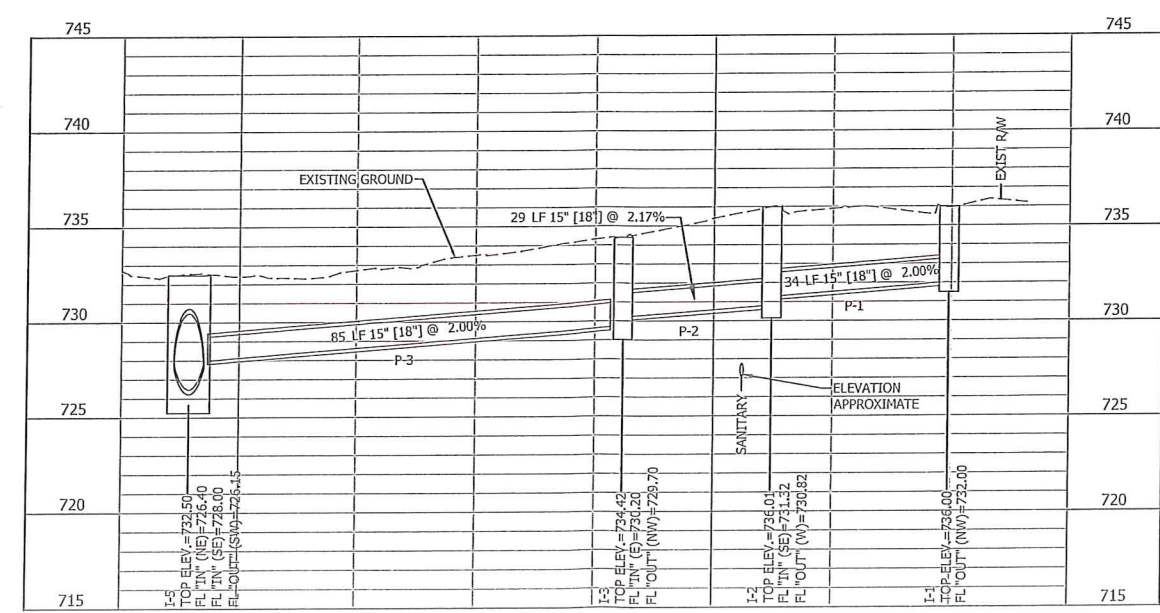




**LEGEND**

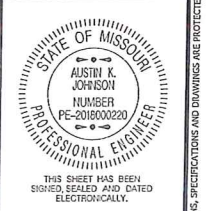
- FULL DEPTH ASPHALT STREET
- CONCRETE DRIVEWAY
- FLOWABLE FILL
- PROPERTY LINE
- TCE — TEMPORARY CONSTRUCTION ESMT
- PERMANENT UTILITY ESMT
- CONSTRUCTION LIMITS

- NOTE:**
1. OPTIONAL PIPE SIZES LISTED AS SMOOTH PIPE SIZE [CORRUGATED PIPE SIZE]. SEE JOB SPECIAL PROVISIONS FOR ALLOWABLE PIPE MATERIALS.
  2. CONTRACTOR SHALL CUT AND REMOVE ALL ABANDONED WATERLINES IN CONFLICT WITH THE PROPOSED STORM SEWER OR COORDINATE REMOVAL WITH PSD #1.



Drawing Name: C:\projects\2019\15937\15937-110-C-STORM SEWER IMP-110.dwg Layout Name: Storm PIP - Broke P12 Plotted by: DCF01439 Plotted on: 3/5/2019 3:00:56 PM  
 Last edit on: 3/5/2019 2:05 PM by: DCF01439

**STORM SEWER PLAN AND PROFILE**  
**SOUTH BROOKS DRIVE - PHASE 1**  
 SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI



|              |               |
|--------------|---------------|
| SEAL DATE:   | 3/05/2019     |
| DESIGNED BY: | DCF           |
| DRAWN BY:    | DCF           |
| APPROVED BY: | AKJ           |
| DESIGN PROJ: | 15937.110/111 |
| DATE:        | MARCH 2019    |
| DRAWING NO:  | 10            |
| SHEET NO:    | 10 of 20      |

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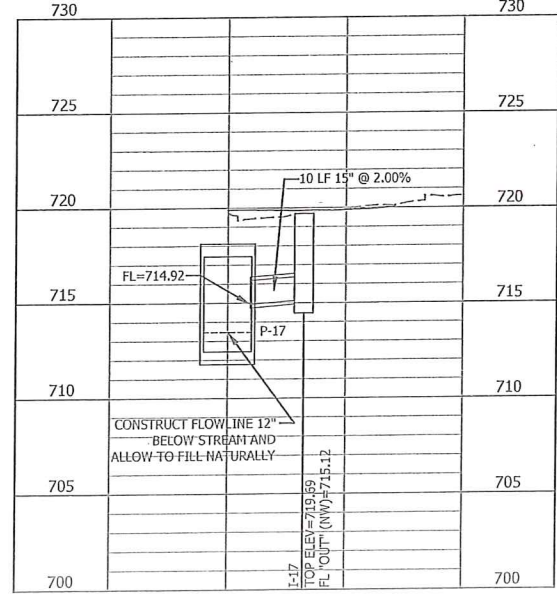
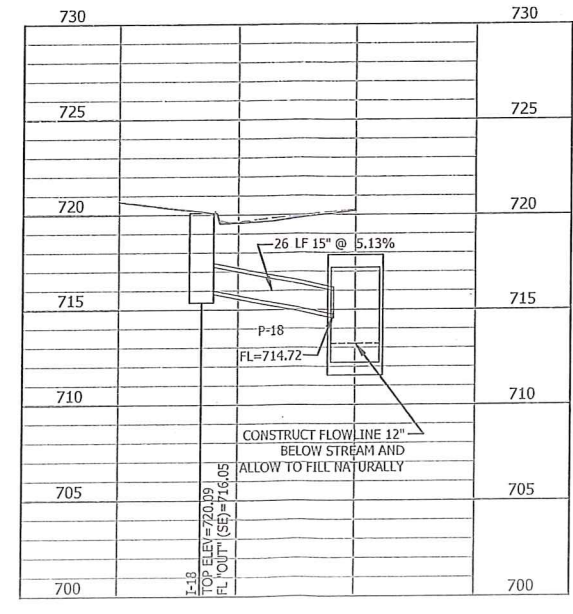
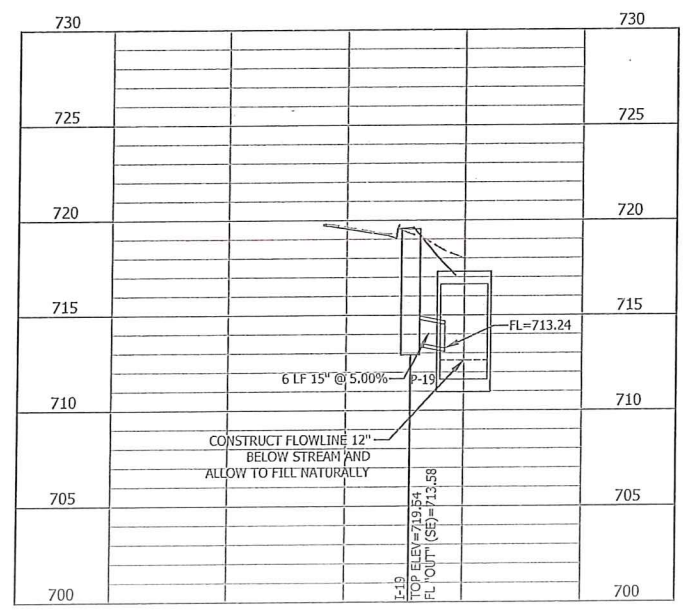
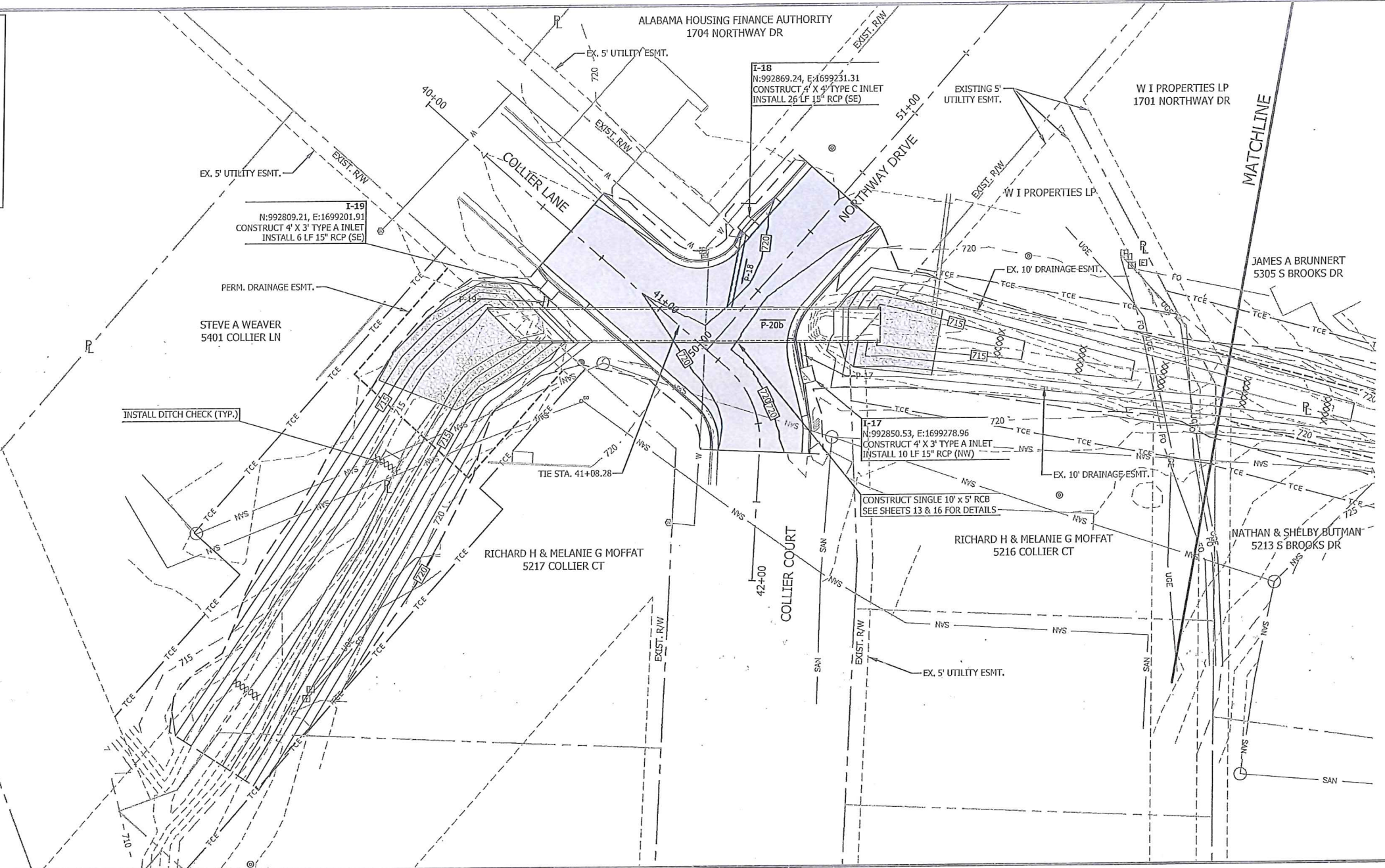
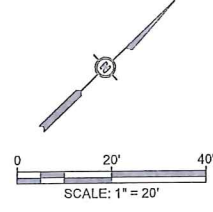
**Bartlett & West**

1719 SOUTHWIND DRIVE, SUITE 100 - JEFFERSON CITY, MO 65102-4000  
 PHONE 874.682.3101  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000477 - ENGINEERING  
 WWW.BARTLETTWEST.COM

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**LEGEND**

- FULL DEPTH ASPHALT STREET
- CONCRETE DRIVEWAY
- DRY CURB
- TYPE 2 ROCK BLANKET
- PROPERTY LINE
- TCE TEMPORARY CONSTRUCTION ESMT
- PERMANENT UTILITY ESMT
- CONSTRUCTION LIMITS



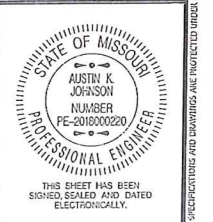
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**Bartlett & West**

1719 SOUTHRIDGE DRIVE, SUITE 100-SPRINGFIELD, MO 65704-4000  
 PHONE: (417) 881-1111 FAX: (417) 881-1112  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000403000000000000  
 WWW.BARTLETTANDWEST.COM

**STORM SEWER PLAN AND PROFILE  
 COLLIER COURT - PHASE 2**

SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI



THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

|              |               |
|--------------|---------------|
| SEALED DATE: | 3/05/2019     |
| DESIGNED BY: | DCF           |
| DRAWN BY:    | DCF           |
| APPROVED BY: | AJK           |
| DESIGN PROJ: | 15937.110/111 |
| DATE:        | MARCH 2019    |
| DRAWING NO:  | 11            |
| SHEET NO:    | 11 of 20      |

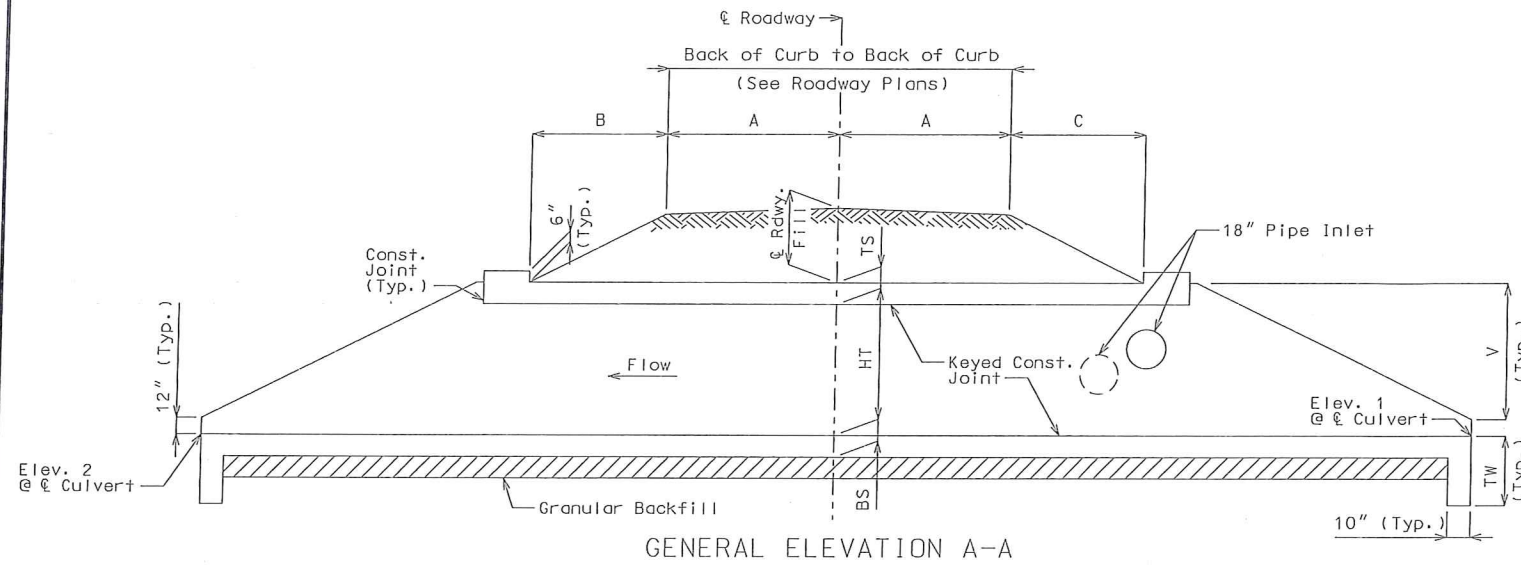
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10' x 5' CONCRETE BOX CULVERT



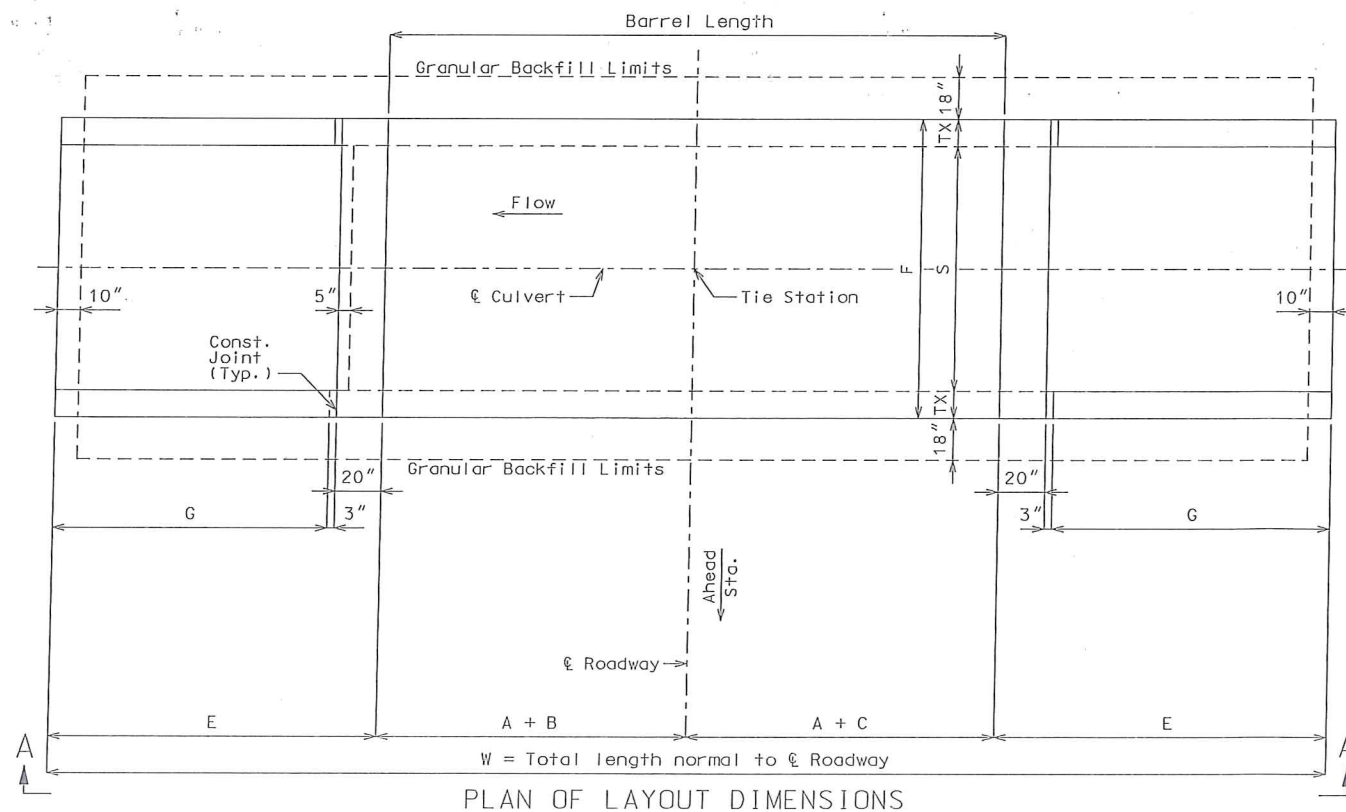
GENERAL ELEVATION A-A

Construction joint key not shown for clarity, see standard plans for details.

If unsuitable material is encountered, excavation of unsuitable material and furnishing and placing of granular backfill shall be in accordance with Sec 206.

For layout and dimensions of reinforcement, see standard plans.

For details of pipe inlets not shown, refer to Std 703.60.



PLAN OF LAYOUT DIMENSIONS

| Var. | Equation | Dim.   | Var. | Equation                 | Dim.    |
|------|----------|--------|------|--------------------------|---------|
| S    | ---      | 10'-0" | C    | ---                      | 8'-6"   |
| HT   | ---      | 5'-0"  | E    | G + 23"                  | 11'-11" |
| TS   | ---      | 12"    | F    | S + 2TX                  | 11'-4"  |
| BS   | ---      | 10"    | G    | 2V                       | 10'-0"  |
| TX   | ---      | 8"     | V    | HT + TS - 12"            | 5'-0"   |
| A    | ---      | 17'-6" | W    | 2A + B + C + 2E          | 84'-10" |
| B    | ---      | 17'-6" | TW   | Max{3'-4" or (BS + 12")} | 3'-4"   |

|                               |
|-------------------------------|
| Upstream (Elev. 1) = 718.61   |
| Downstream (Elev. 2) = 717.76 |
| Pr. Gr. at Tie Sta. = 726.60  |

|                             |
|-----------------------------|
| E Rdwy at E Culvert = 2'-4" |
| Design (All units) = 2'-0"  |

|                                      |          | Final  |
|--------------------------------------|----------|--------|
| Removal of Bridges (Culvert)         | lump sum | 1      |
| Class B-1 Concrete (Culverts-Bridge) | cu. yard | 78.6   |
| Reinforcing Steel (Culverts-Bridge)  | pound    | 17,690 |

General Notes:

Design Specifications:  
2010 AASHTO LRFD Bridge Design Specifications and 2010 Interim Revisions

Design Loading:  
Vehicular = HL-93 Minus Lane Load, Earth = 120 lb/cf  
Equivalent Fluid Pressure = 30 lb/cf (min.), 60 lb/cf (max.)

Design Unit Stresses:  
Class B-1 Concrete (Box Culvert) f'c = 4,000 psi  
Reinforcing Steel (Grade 60) fy = 60,000 psi

Miscellaneous:  
When alternate precast concrete box sections are used, the minimum distance from inside face of headwalls to precast sections measured along the shortest wall shall be 3 feet. Reinforcement and dimensions for wings and headwalls shall be in accordance with Missouri Standard Plans.

Channel bottom shall be graded within the right-of-way for transition of channel bed to culvert openings. Channel banks shall be tapered to match culvert openings.

| Station | Offset    | Dia. | F.L. Elev. |
|---------|-----------|------|------------|
| 5+77.35 | 22.79' RT | 18"  | 720.67     |
| 5+87.89 | 18.25' RT | 18"  | 719.91     |

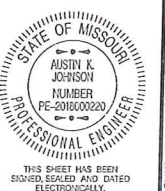
CULVERT: SOUTH BROOKS DRIVE OVER DITCH  
TIE STA. 5+81.79

Note: This drawing is not to scale. Follow dimensions.

|             |                            |
|-------------|----------------------------|
| STD. 703.10 | DESIGNED BY: TSK           |
| STD. 703.16 | DRAWN BY: TSK              |
| STD. 703.17 | APPROVED BY: AKJ           |
| STD. 703.37 | DESIGN PROJ: 15937.110/111 |
| STD. 703.60 | SCALE: N/A                 |
| STD. 706.35 | DATE: MARCH 2019           |
|             | DRAWING NO: 15             |
|             | SHEET NO: 15 of 20         |

**Bartlett & West**

CULVERT GEOMETRY  
SOUTH BROOKS DRIVE STA. 5+81.79



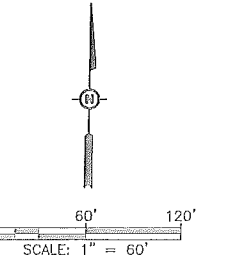
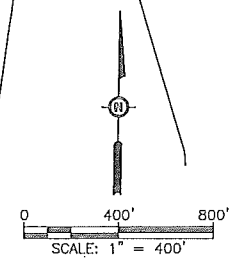
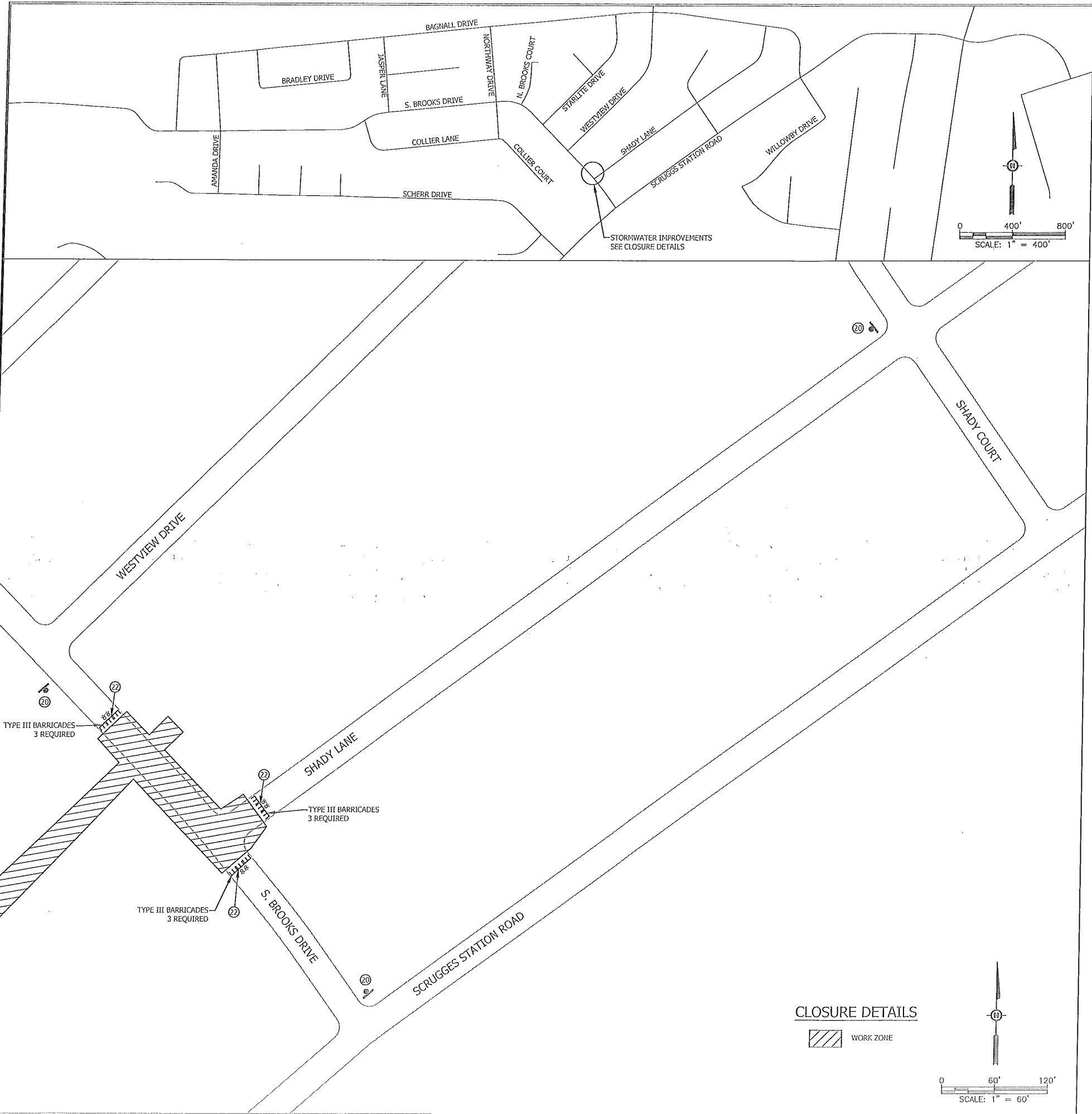
THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY.

SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
PROJECT NO. 2017-203-0 & 2018-202-0  
COLE COUNTY, MISSOURI

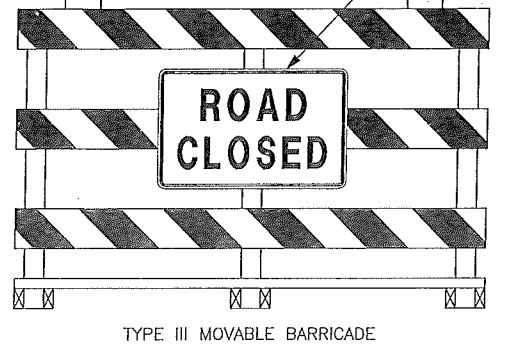
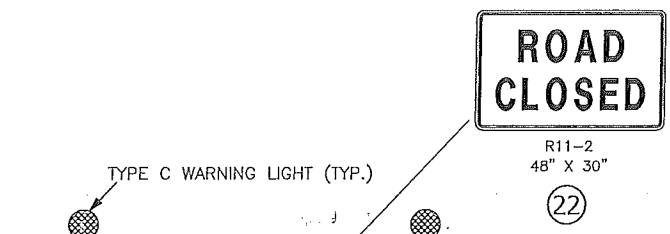
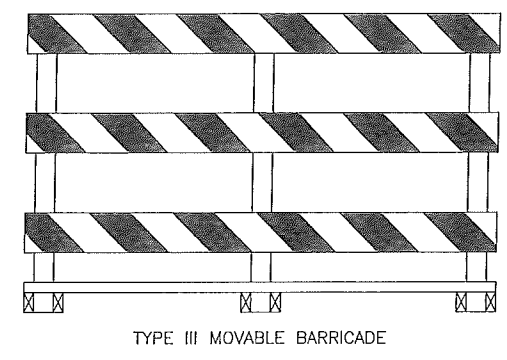
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**CLOSURE DETAILS**  
 WORK ZONE



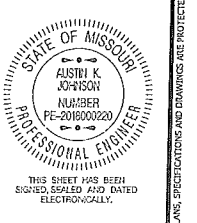
**TRAFFIC CONTROL LEGEND**  
 SIGN (SINGLE SIDED)  
 BARRICADE  
 TYPE C WARNING LIGHT

**NOTES:**  
 MAXIMUM CLOSURE LENGTH SHALL BE LIMITED TO ONE WEEK.  
 ACCESS TO DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES.  
 CONTRACTOR SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR THE TRAFFIC CONTROL OF THIS PROJECT.  
 COVER ALL CONFLICTING SIGNS.  
 USE A MINIMUM SIGN SPACING OF 500' OR AS DIRECTED BY THE ENGINEER.  
 SEE STANDARDS NO. 616.10 AND 903.03 OF THE MISSOURI STANDARD PLANS FOR DETAILS NOT SHOWN.

| NO. | DATE | DESCRIPTION |
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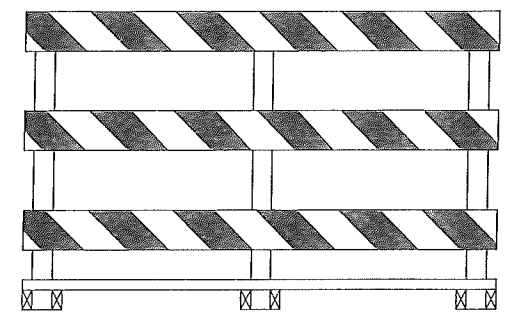
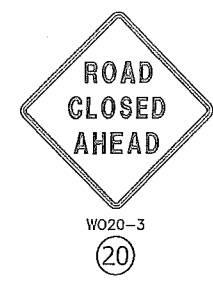
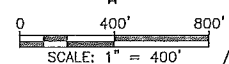
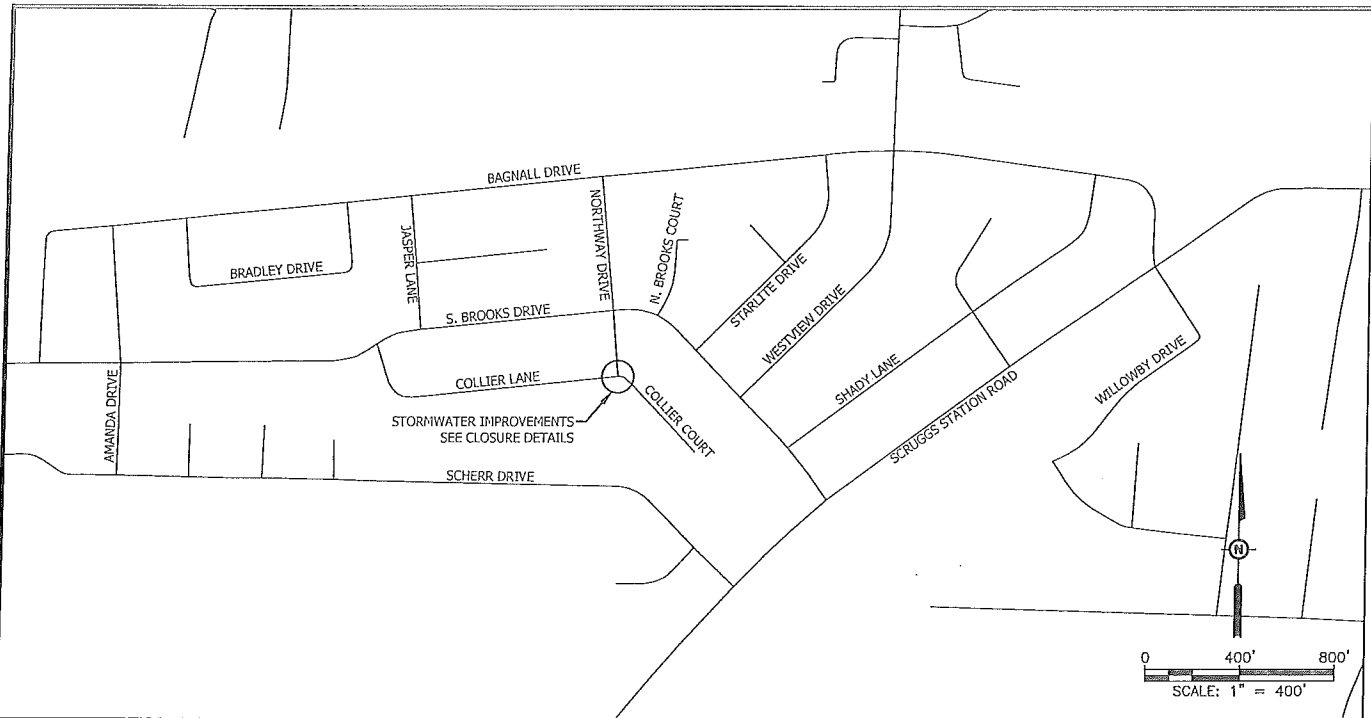
**Bartlett & West**  
 4719 SOUTHWIND DR. SUITE 100-1000  
 INDEPENDENCE, MO 64626-4000  
 PHONE: 816.772.5243  
 FACSIMILE: 816.772.5243  
 MISSOURI REGISTERED PROFESSIONAL ENGINEERS  
 LICENSE NO. 009107 - ENGINEERING  
 WWW.BARTLETTWEST.COM

**TRAFFIC CONTROL DETAILS  
 PHASE 1 - SOUTH BROOKS  
 & SHADY LANE**  
 SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI

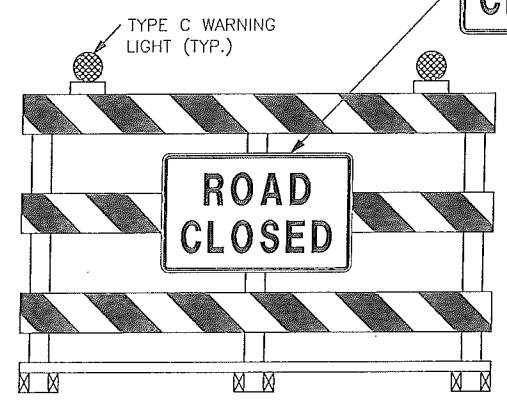


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| SEALED DATE: | 3/05/2019     |
| DESIGNED BY: | DCF           |
| DRAWN BY:    | PAS           |
| APPROVED BY: | AKJ           |
| DESIGN PROJ: | 15937.110/111 |
| DATE:        | MARCH 2019    |
| DRAWING NO:  | 18            |
| SHEET NO:    | 18 of 20      |

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 Plot Date: 3/17/2019 11:38 PM by: DCF01439



TYPE III MOVABLE BARRICADE



TYPE III MOVABLE BARRICADE

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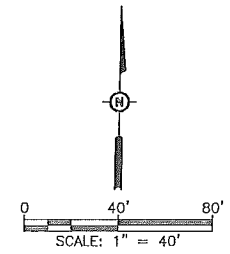
JASPER LANE

S. BROOKS DRIVE

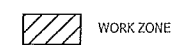
NORTHWAY DRIVE

**TRAFFIC CONTROL LEGEND**

- SIGN (SINGLE SIDED)
- BARRICADE
- TYPE C WARNING LIGHT

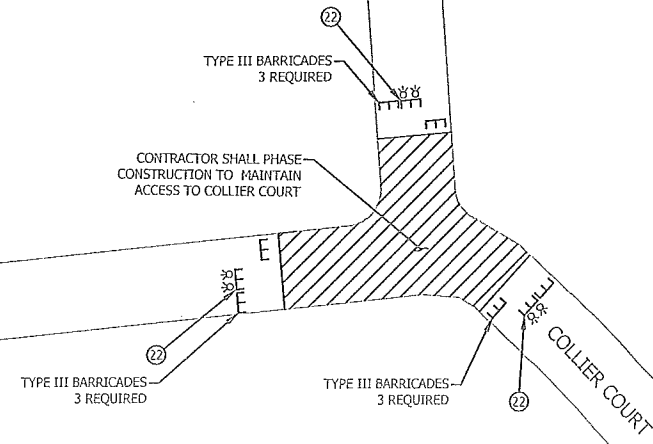


**CLOSURE DETAILS**



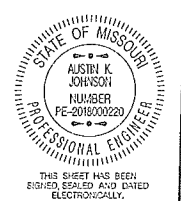
**NOTES:**

- ACCESS TO DRIVEWAYS MUST BE MAINTAINED AT ALL TIMES.
- CONTRACTOR SHALL COMPLY WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD) FOR THE TRAFFIC CONTROL OF THIS PROJECT.
- COVER ALL CONFLICTING SIGNS.
- USE A MINIMUM SIGN SPACING OF 500' OR AS DIRECTED BY THE ENGINEER.
- SEE STANDARDS NO. 616.10 AND 903.03 OF THE MISSOURI STANDARD PLANS FOR DETAILS NOT SHOWN.



**TRAFFIC CONTROL DETAILS  
PHASE 2 - COLLIER LANE**

**SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT**  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI

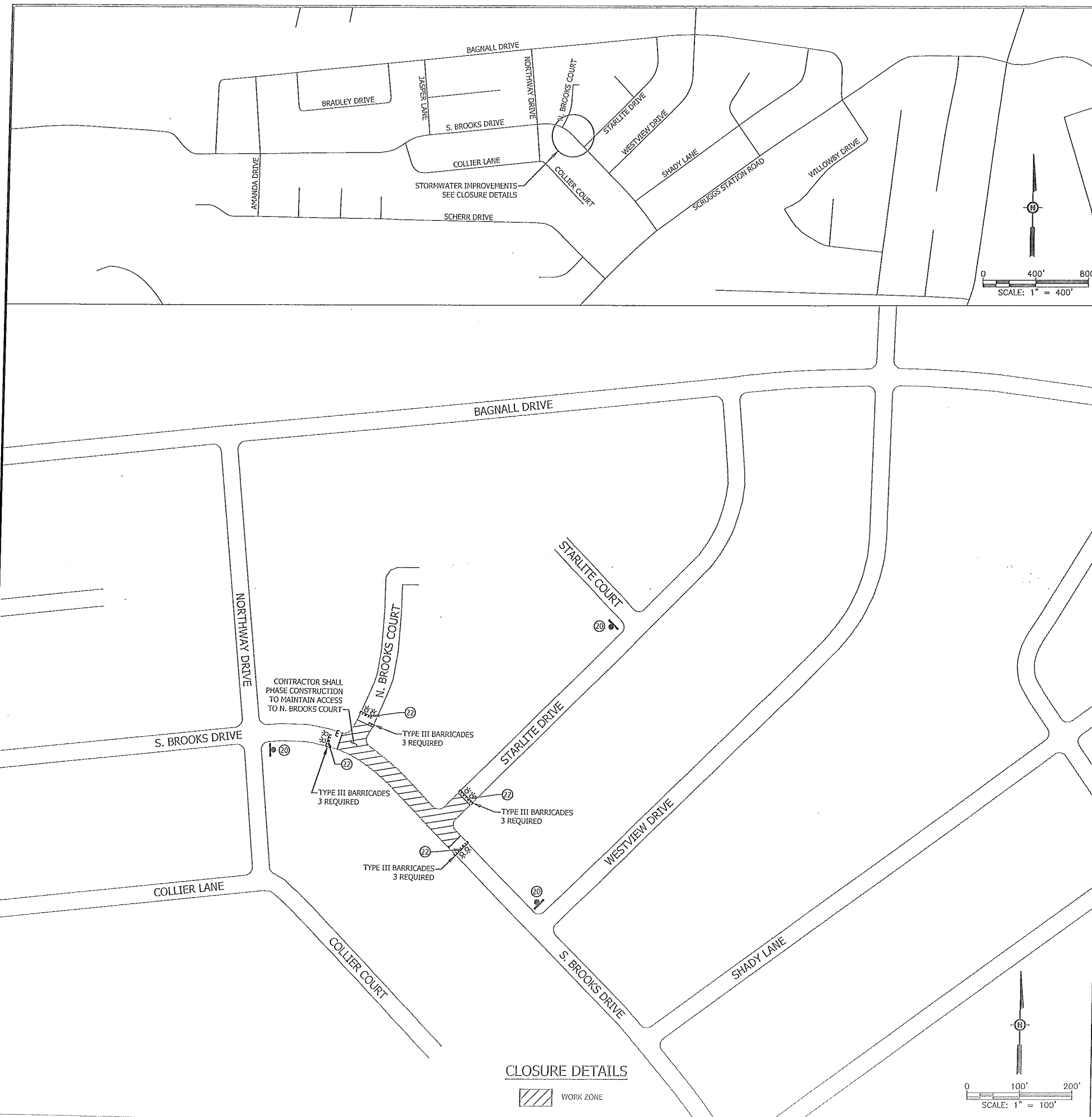


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| DESIGNED BY: | DCF           |
| DRAWN BY:    | PAB           |
| APPROVED BY: | AKJ           |
| DESIGN PROJ: | 15937.110/111 |
| DATE:        | MARCH 2019    |
| DRAWING NO:  | 19            |
| SHEET NO:    | 19 of 20      |

**Bartlett & West**

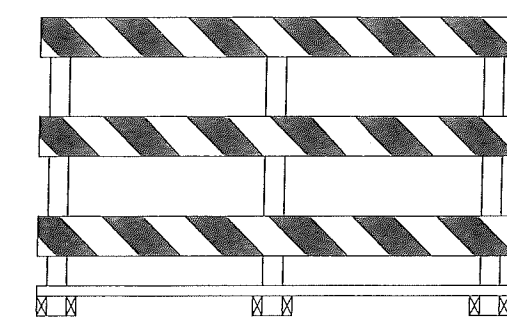
4770 COLLETT DRIVE, SUITE 100, JEFFERSON CITY, MO 64501-0000  
 MISSOURI CERTIFICATE OF AGENCY NO. 000167 - ENGINEERING  
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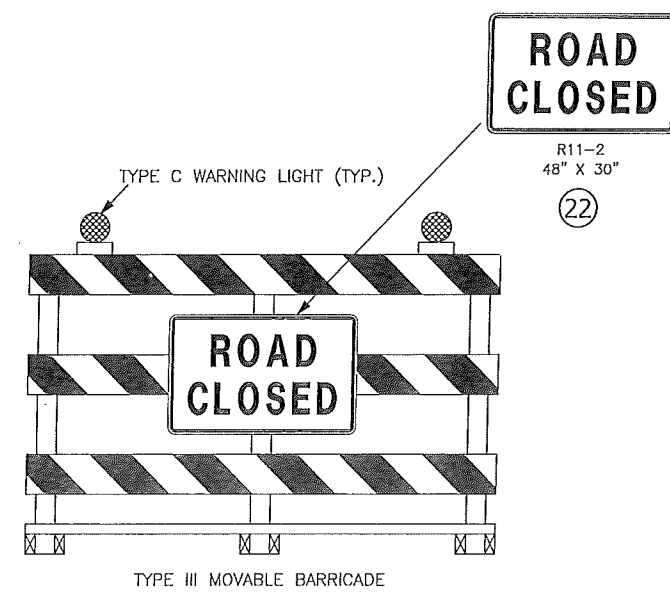


**CLOSURE DETAILS**

WORK ZONE



TYPE III MOVABLE BARRICADE



TYPE III MOVABLE BARRICADE

**TRAFFIC CONTROL LEGEND**

- SIGN (SINGLE SIDED)
- BARRICADE
- TYPE C WARNING LIGHT

**NOTES:**

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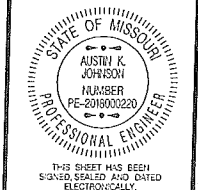
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**Bartlett & West**

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 PHONE: 636.224.2183  
 MISSOURI REGISTRATION NO. 000107 - ENGINEERING  
 www.bartlettwest.com

**TRAFFIC CONTROL DETAILS  
 PHASE 2 - SOUTH BROOKS DRIVE**

SOUTH BROOKS DRIVE STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2017-203-0 & 2018-202-0  
 COLE COUNTY, MISSOURI



|              |               |
|--------------|---------------|
| SEALED DATE: | 3/05/2019     |
| DESIGNED BY: | DCF           |
| DRAWN BY:    | PAB           |
| APPROVED BY: | AKJ           |
| DESIGN PROJ: | 15937.110/111 |
| DATE:        | MARCH 2019    |
| DRAWINGS NO: | 20            |
| SHEET NO:    | 20 of 20      |

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