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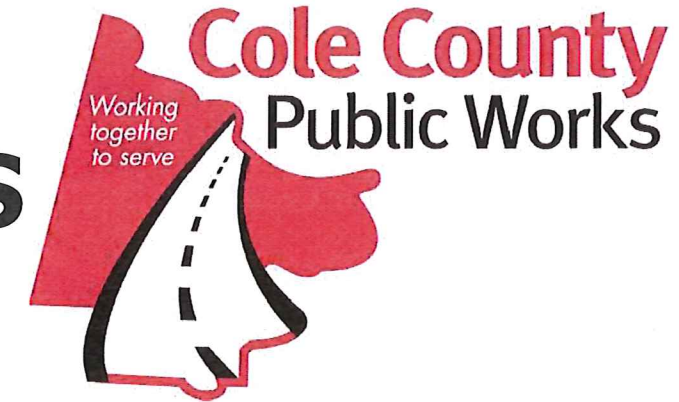
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# COLE COUNTY, MISSOURI MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS

COLE COUNTY PROJECT NO. 2016-201-0

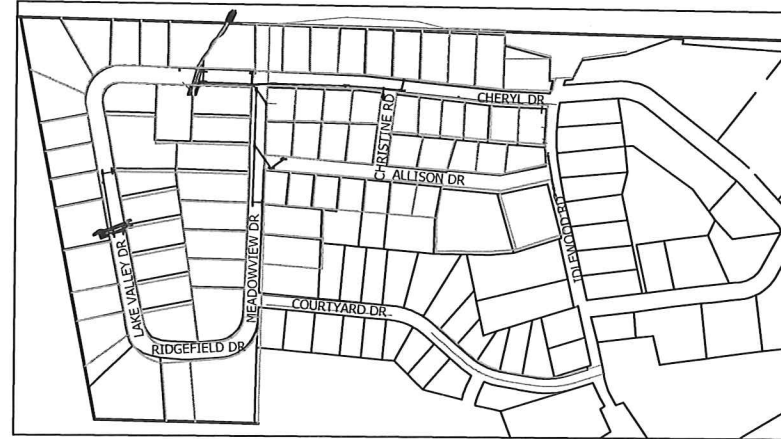
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FEBRUARY 2018

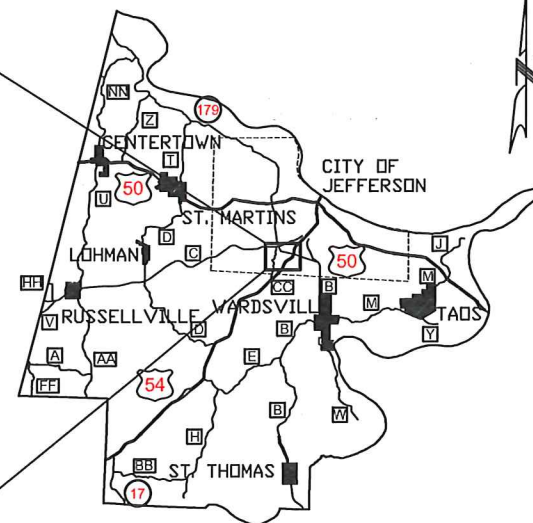
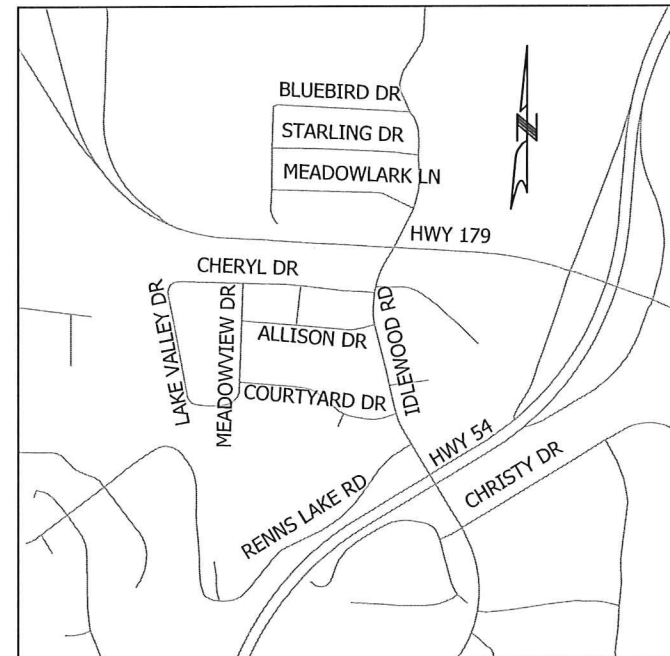


**LEGEND**

- |   |                                   |
|---|-----------------------------------|
| ⊕ 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                      | <b>SURVEY MONUMENTATION</b>       |
| ⊕ ELECTRIC METER                        | ⊕ BENCHMARK                       |
| ⊕ TRANSFORMER/ELECTRIC PAD              | ⊕ TEMPORARY BENCHMARK             |
| ⊕ AIR CONDITIONER                       | ⊕ R/W MARKER                      |
| ⊕ HAND HOLE                             | ○ FOUND SURVEY MONUMENT           |
| ⊕ TRAFFIC SIGNAL                        | ⊕ SET SURVEY MONUMENT             |
| ⊕ TRAFFIC SIGNAL BOX                    | ⊕ SET SURVEY MONUMENT IN CONCRETE |
| ○ SIGNAL MANHOLE                        | ⊕ CALCULATED SURVEY POINT         |
| ○ STORM MANHOLE                         | ⊕ CHISELED CROSS FOUND            |
| ⊕ AREA INLET                            | ⊕ CHISELED CROSS SET              |
| —OHE— OVERHEAD ELECTRIC                 |                                   |
| —UT— UNDERGROUND TELEPHONE              |                                   |
| —UC&T— UNDERGROUND CABLE AND TELEVISION |                                   |
| —G— GAS LINE                            |                                   |
| —SAN— SANITARY SEWER LINE               |                                   |
| —W— WATER LINE                          |                                   |



Project Location Map



**UTILITY CONTACTS**

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APPROVED BY

COLE COUNTY, MISSOURI

*Eric Landwehr*

COLE COUNTY PUBLIC WORKS:  
ERIC LANDWEHR, P.E., COUNTY ENGINEER

2/2/18

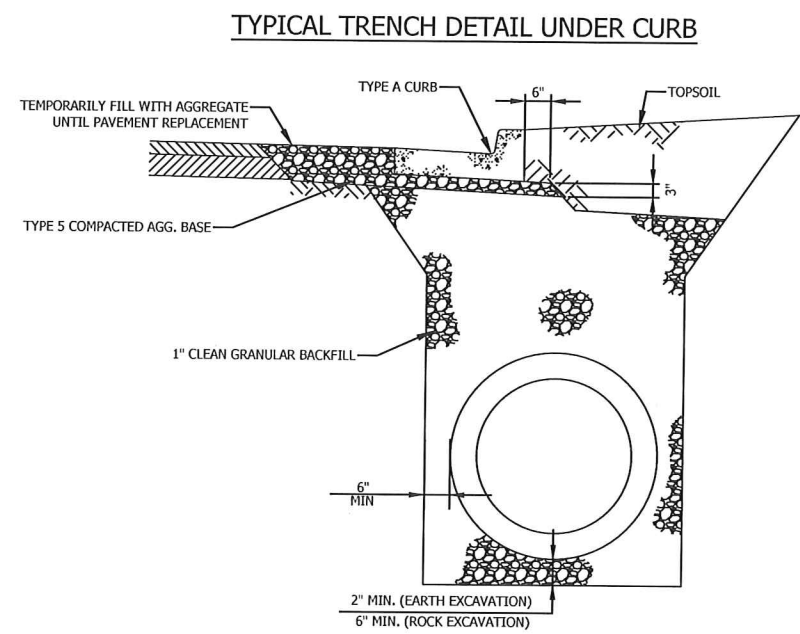
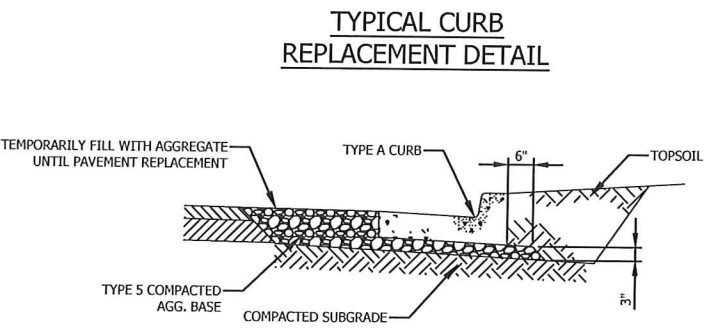
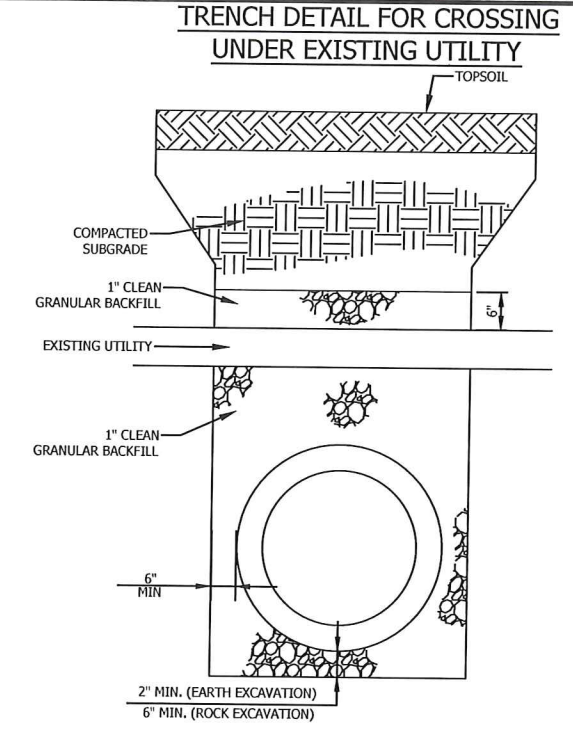
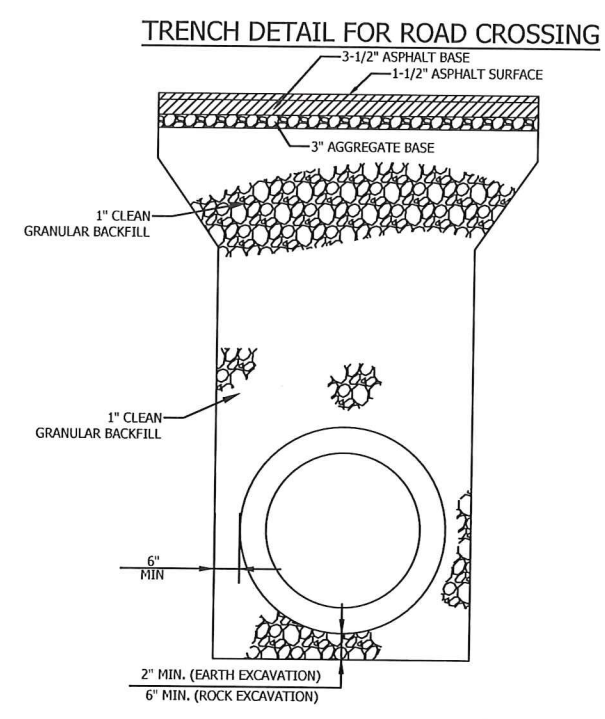
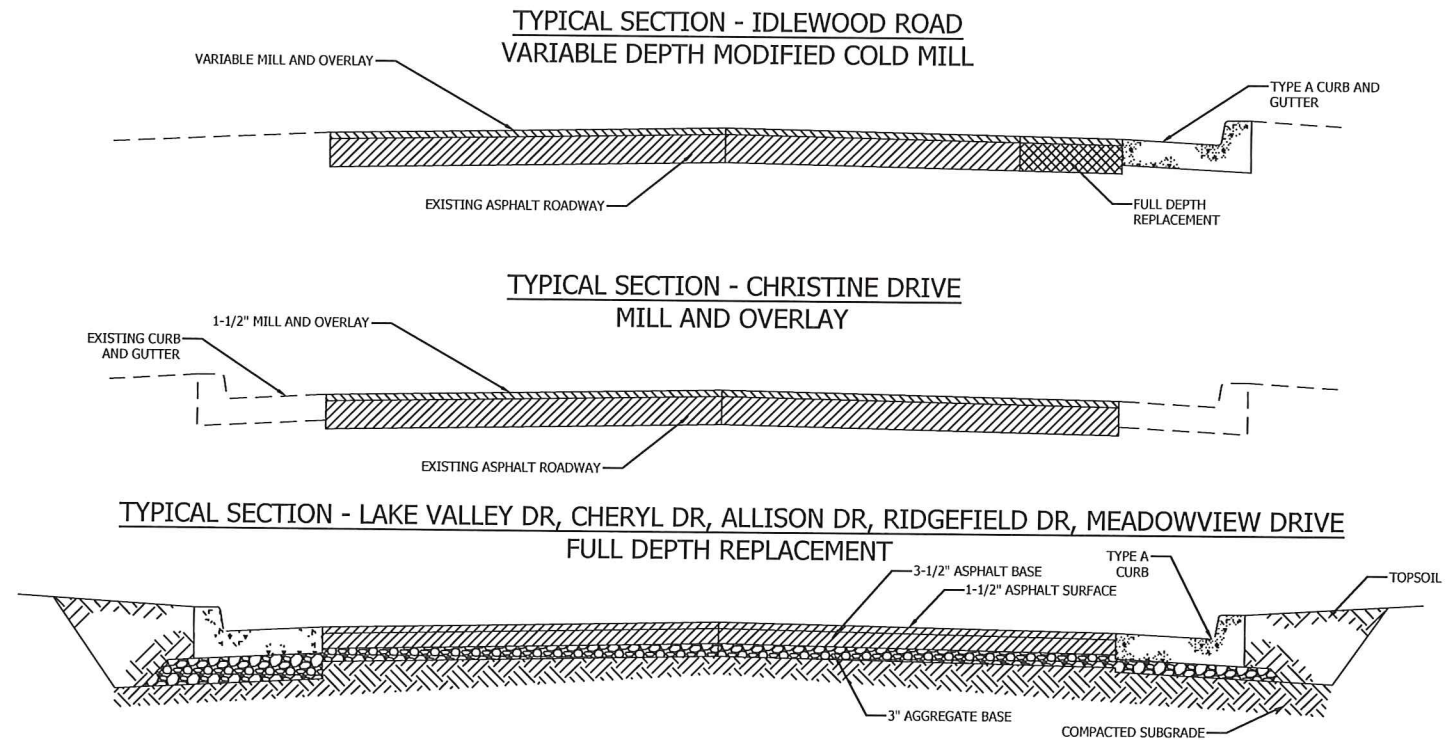
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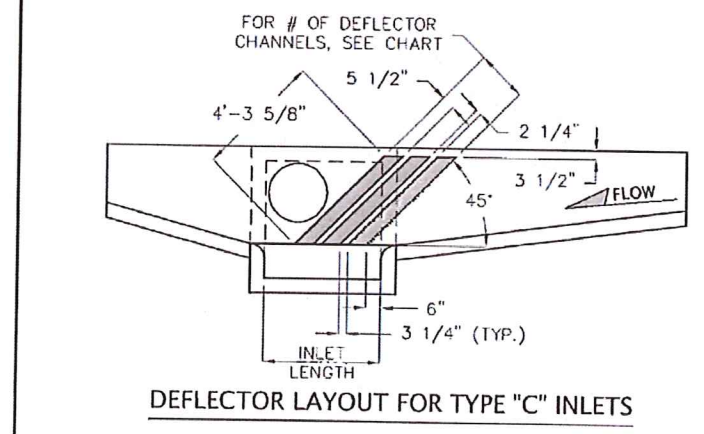
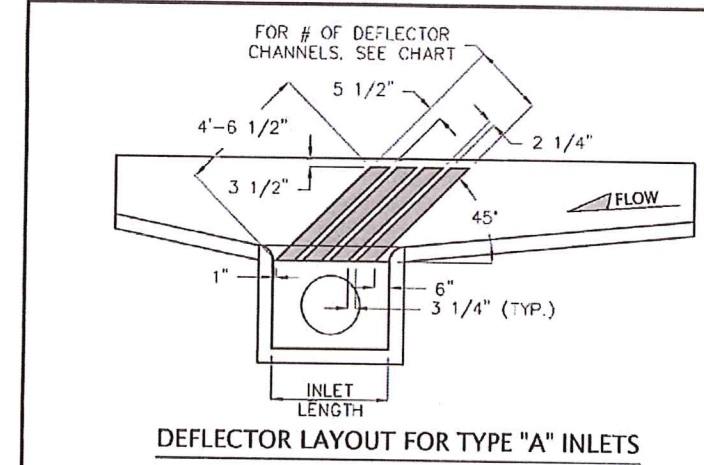
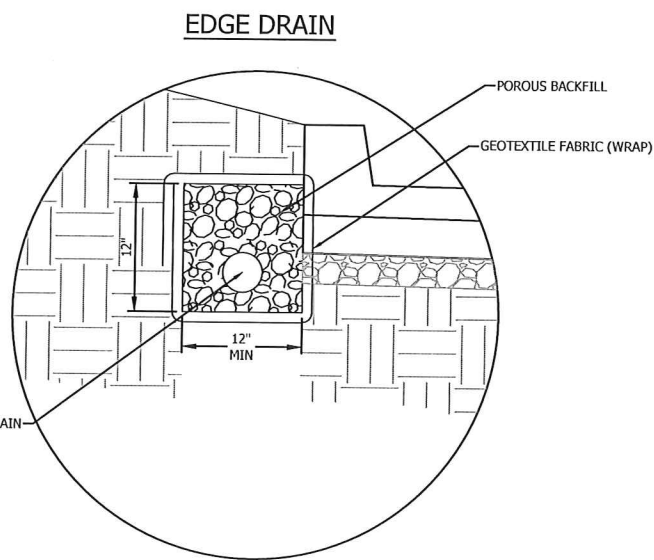
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PROJECT NO. 2016-201-0  
COLE COUNTY, MISSOURI



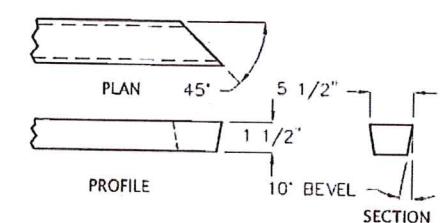
SEALED DATE:	02-02-2018
DESIGNED BY:	AKJ
DRAWN BY:	RAM
APPROVED BY:	TCK
DESIGN PROJ.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	1 of 44



NOTE: PIPE SHOWN UNDER CURB, AS FOR TYPE C INLETS. SEE JEFFERSON CITY STANDARD DRAWINGS FOR TRENCH DETAILS FOR PIPES NOT UNDER CURB OR PAVEMENT.



INLET LENGTH	# OF DEFLECTOR CHANNELS	
	TYPE "A" INLET	TYPE "C" INLET
4'	4	3
6'	6	5
8'	8	7



NO.	DATE	REVISION AND DESCRIPTION

CHECKED BY	DATE	DEFLECTOR DETAILS FOR TYPE "A" & "C" INLETS	STANDARD DETAILS

	SHEET NUMBER <b>2 OF 2</b> SECTION <b>41.02</b>
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**DETAILS**

MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
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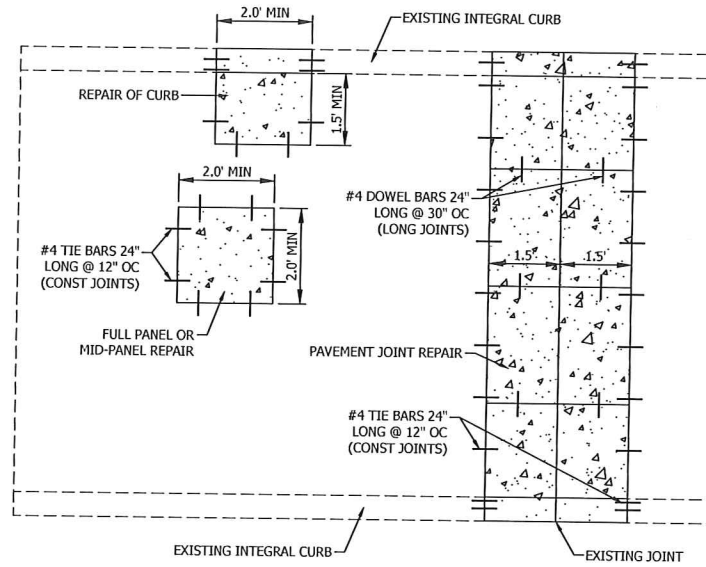
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**Bartlett & West**  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 068  
 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65106-4000  
 TEL: 573-634-7804 FAX: 573-634-7804  
 WWW.BARTLETTWEST.COM

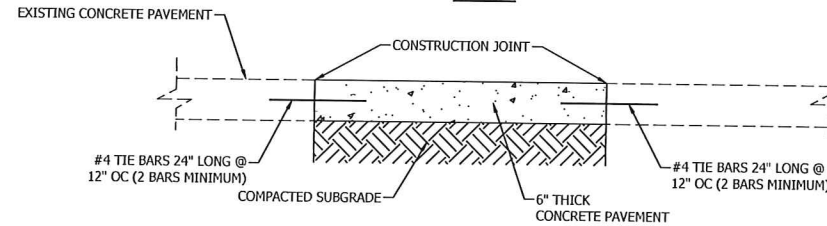
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**GENERAL NOTES:**

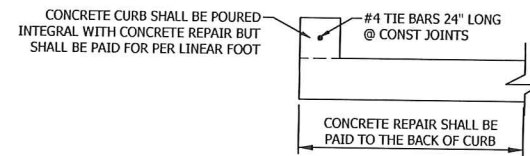
- A. FOR DETAILS, INCLUDING BUT NOT LIMITED TO, CURB, DRIVEWAYS, INLETS, END SECTIONS, TRENCHING, SANITARY SEWERS, MANHOLES AND CLEAN OUTS, REFER TO CITY OF JEFFERSON STANDARD DETAILS.
- B. VERIFYING THE LOCATIONS OF THE UNDERGROUND UTILITIES, SHOWN OR NOT SHOWN, SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. 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 EXISTING SIGNS AND POSTS SHALL BE RE-INSTALLED BY THE CONTRACTOR, AS DIRECTED BY THE ENGINEER, UNLESS OTHERWISE NOTED.
- M. THE CONTRACTOR SHALL ACHIEVE A STABILIZED SUBGRADE PRIOR TO CONSTRUCTION OF THE ROADWAY. PAYMENT FOR THIS WORK SHALL BE CONSIDERED COMPLETELY COVERED BY THE PAY ITEMS "EARTHWORK". THE CONDITION OF THE EXISTING MATERIAL AND METHOD OF ACHIEVING A STABLE BASE WILL NOT BE GROUNDS FOR ADDITIONAL PAYMENT.
- N. ALL TEMPORARY TRAFFIC CONTROL DEVICES SHALL BE INSTALLED PRIOR TO ANY CONSTRUCTION.
- O. ANY EXISTING TRAFFIC SIGNS THAT CONFLICT WITH TEMPORARY TRAFFIC CONTROL SHALL BE COVERED OR REMOVED, NO DIRECT PAY.
- P. 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.
- Q. LOCATION OF TRAFFIC CONTROL DEVICES ARE SUBJECT TO CHANGE AS APPROVED BY ENGINEER.
- R. PLACEMENT AND USE OF TEMPORARY TRAFFIC CONTROL SIGNS AND DEVICES SHALL BE IN ACCORDANCE WITH THE CURRENT VERSION OF THE MUTCD.
- S. CONTRACTOR SHOULD REMAIN BEYOND ROAD SHOULDER OR CURB LINE TO NOT INTERRUPT TRAFFIC WHENEVER POSSIBLE.
- T. 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.



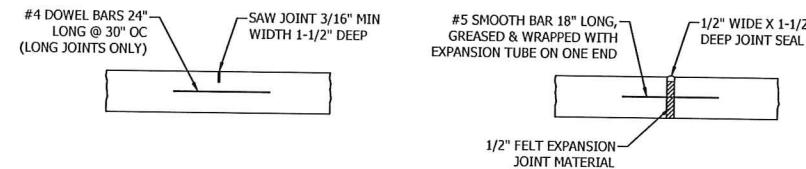
**PLAN**



**PAVEMENT REPAIR SECTION**



**CURB PAY LIMITS**



**CONTROL JOINT**

**EXPANSION JOINT**

**NOTES:**

1. THE UNIT PRICE FOR PAVEMENT REPLACEMENT SHALL INCLUDE ALL SAW CUTS, REMOVALS, SUBGRADE PREPARATION, TIE-BARS, DOWELS, CONCRETE PAVEMENT, SAW JOINTS AND JOINT SEAL.
2. JOINTS SHALL BE LOCATED PER CITY OF JEFFERSON STANDARD DRAWING 20.03
  - A) TRANSVERSE CONTROL JOINTS SHALL BE SAWS, NO DOWEL BARS REQUIRED
  - B) LONGITUDINAL CONTROL JOINTS SHALL BE SAWS AND REINFORCED WITH 24" LONG #4 DOWEL BARS @ 30" OC
  - C) ALL CONSTRUCTION JOINTS SHALL BE TIED WITH 24" LONG #4 BARS @ 12" OC
  - D) ALL NEW JOINTS SHALL MATCH EXISTING JOINT SPACING
  - E) ALL JOINTS SHALL BE SEALED

**PAVEMENT REPAIR DETAILS**

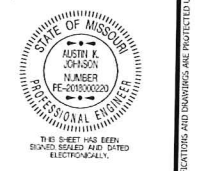
Item No.	Description	Total Quantity	Unit
<b>Base Bid</b>			
201-99.01	Clearing and Grubbing	1	LS
202-20.10	Removal of Improvements	1	LS
203-99.01	Earthwork	1	LS
206-31.00	Class 3 Excavation in Rock	107	CY
206-99.03	Waterline Excavation	1,290	LF
207-99.09	Linear Grading for Stream	1.8	STA
210-99.06	Geotextile Fabric for Stabilized Subgrade	3,558	SY
210-99.07	Stabilized Subgrade	1,779	CY
304-99.05	3" Aggregate Stone Base	16,765	SY
401-99.04	Variable Depth Asphalt Mill	466	SY
401-99.05	1.5" Asphalt Mill	906	SY
401-99.06	Bituminous Pavement - 3.5" Base	14,406	SY
401-99.07	Bituminous Pavement - 1.5" Surface	16,537	SY
401-99.08	Concrete Pavement (6")	2,830	SY
413-60.00	PCCP Joint/Crack Seal	10,152	LF
603-99.22	Thrust Block	3	EA
603-99.23	6" SDR 35 PVC Pipe	184	LF
603-99.24	8" Ductile Iron Force Main	195	LF
603-99.28	4" Dia. Manhole	3	EA
605-99.03	Underdrain	1,229	LF
605-99.23	Yard Drain	35	LF
607-10.11A	Chain-Link Fence (48 in.)	78	LF
608.60.04	Concrete Sidewalk, 4 in.	23	SY
608-99.06	6" PCC Residential Concrete Drive	1,830	SY
608-99.15	6" PCC Residential Concrete Drive Approach	655	SY
609-99.03	Type A Curb and Gutter	8,460	LF
609-99.23	Integral Curb	1,273	LF
611-30.99	Type 2 Rock Blanket (24" thick)	184	CY
616-99.01	Construction Signage/Traffic Control	1	LS
618-10.00	Mobilization	1	LS
703-20.09	Class B Concrete (Retaining Walls)	7	CY
703-40.41	Class B-1 Concrete (Culverts)	248.8	CY
706-10.30	Reinforcing Steel (Culverts)	56,160	LB
706-10.40	Reinforcing Steel (Retaining Wall)	1,400	LB
726-13.15	15" Class III Reinforced Concrete Pipe Culvert	1,642	LF
726-13.18	18" Class III Reinforced Concrete Pipe Culvert	21	LF
726-13.30	30" Class III Reinforced Concrete Pipe Culvert	184	LF
731-00.48	Precast Concrete Manhole - 48 in.	1	EA
731-00.72	Precast Concrete Manhole - 72 in.	1	EA
731-99.01	Type A Concrete Curb Inlet 4' x 3'	4	EA
731-99.02	Type A Concrete Curb Inlet 4' x 4'	1	EA
731-99.06	Type C Concrete Curb Inlet 4' x 4'	12	EA
731-99.07	Type C Concrete Curb Inlet 6' x 4'	2	EA
731-99.08	Type C Concrete Curb Inlet 6' x 5'	1	EA
731-99.09	Area Inlet 3' x 3'	1	EA
732-99.01	15" RCP End Section	1	EA
805-99.01	Seeding, Fertilizing and Mulch	1.1	AC
806-10.17	Temporary Seeding and Mulching	1.1	AC
806-10.19	Silt Fence	791	LF
806-10.25	Inlet Check	28	EA
806-99.05	Turf Reinforcement Mat	14	SY
<b>Add Alternate A</b>			
622-30.10	Diamond Grinding (Concrete Pavement)	2,042	SY

**QUANTITY NOTES:**

1. QUANTITIES FOR DRIVEWAY APPROACH AND DRIVEWAYS INCLUDE ALL DRIVES IN THE SUBDIVISION ADJACENT TO STREET PAVEMENT REPLACEMENT WHETHER SHOWN FOR REPLACEMENT OR NOT.

**GENERAL NOTES, DETAILS AND QUANTITIES**

MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
PROJECT NO. 2016-201-0  
COLE COUNTY, MISSOURI



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APPROVED BY:	TCK
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SHEET NO:	3 of 44

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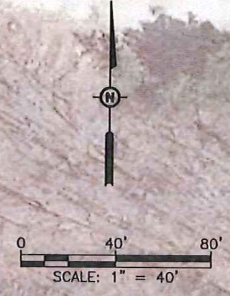


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**LEGEND**

- PROPERTY LINE
- PERMANENT RIGHT-OF-WAY
- PERMANENT DRAINAGE ESMT.
- PERMANENT SANITARY ESMT.
- TEMPORARY CONSTRUCTION ESMT.



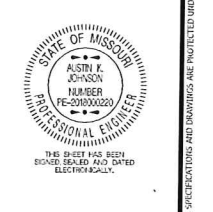
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**Bartlett & West**

1719 SOUTHBRIDGE DR., SUITE 100, JEFFERSON CITY, MO 65109-4000  
 TEL: 636-633-8800 FAX: 636-633-8801  
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 www.bartlettwest.com

**EASEMENTS AND REMOVALS**

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 COLE COUNTY, MISSOURI

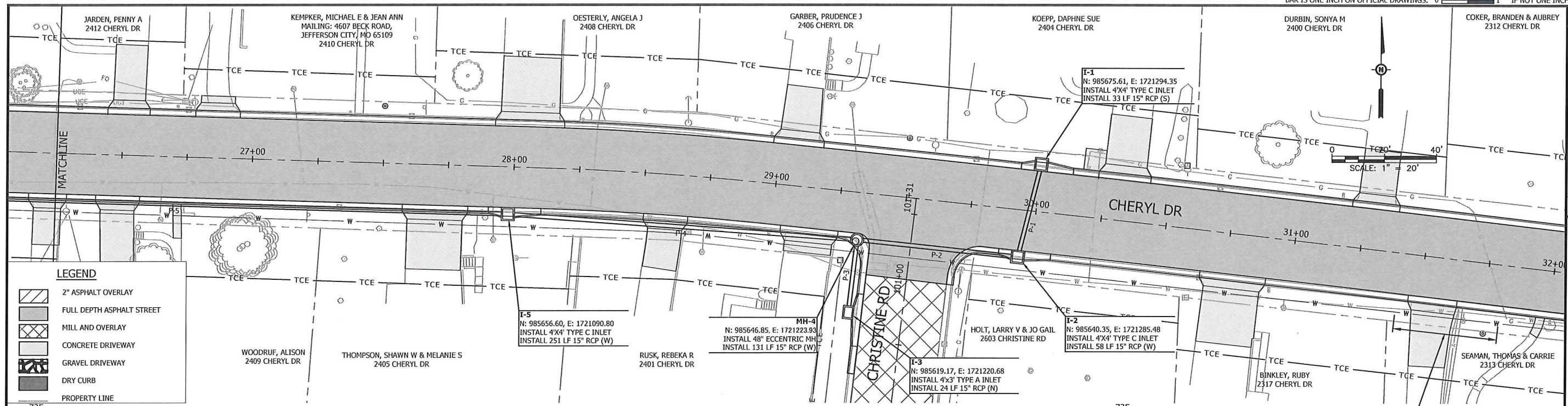


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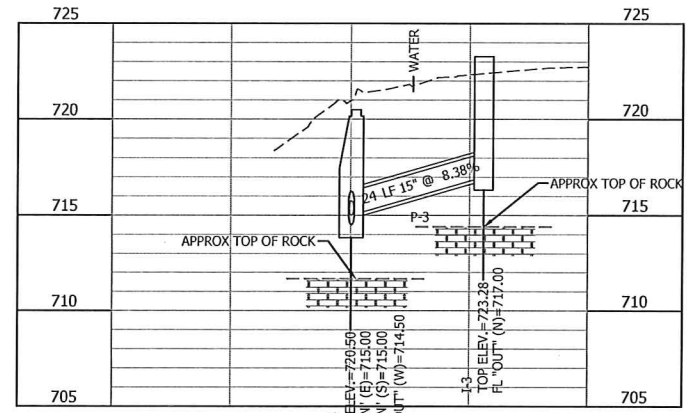
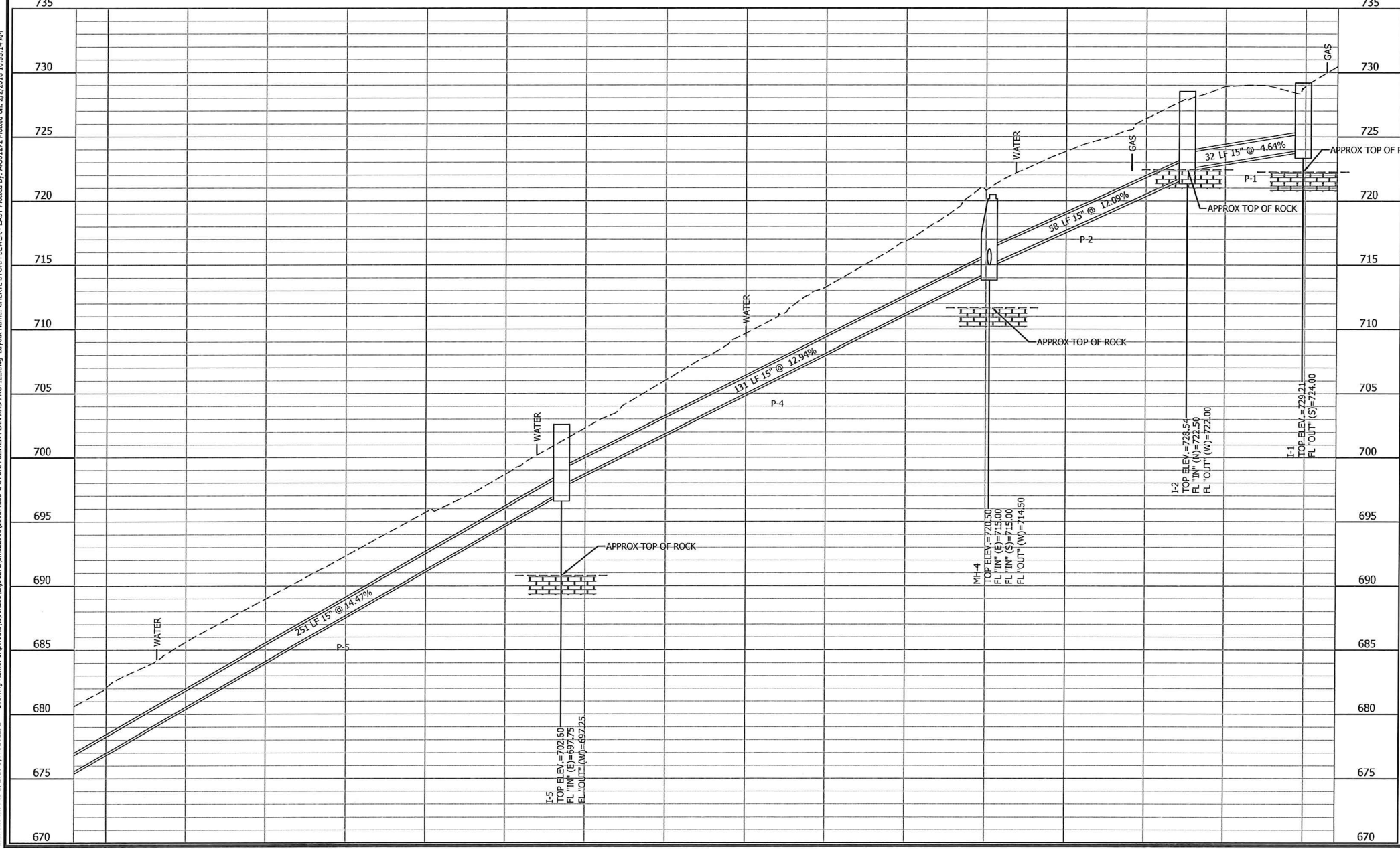


**LEGEND**

- 2" ASPHALT OVERLAY
- FULL DEPTH ASPHALT STREET
- MILL AND OVERLAY
- CONCRETE DRIVEWAY
- GRAVEL DRIVEWAY
- DRY CURB
- PROPERTY LINE

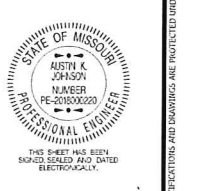
RELOCATED WATERLINE WILL BE BORED UNDER EXISTING RETAINING WALL BY OTHERS. 40 LF OF EXCAVATION HAS BEEN EXCLUDED FROM THE ASSOCIATED BID ITEM.

**NOTE:**  
INLET DEFLECTORS SHALL BE USED ON ALL INLETS WHERE ADJACENT STREET GRADE EXCEEDS 5.0%. SEE SHEET 2 FOR DETAILS.



**Bartlett & West**  
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**CHERYL DRIVE  
STORM SEWER PLAN AND PROFILE**  
MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
PROJECT NO. 2016-201-0  
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APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	8 of 44

Last edit on: Feb 1, 2018 by: AKJ1272 Drawing Name: c:\jordan\topo\akj1272\15937.600-C-STORM SEWER PLAN AND PROFILE.dwg Layout Name: CHERYL STORM SEWER - EAST Plotted on: 2/2/2018 10:53:14 AM

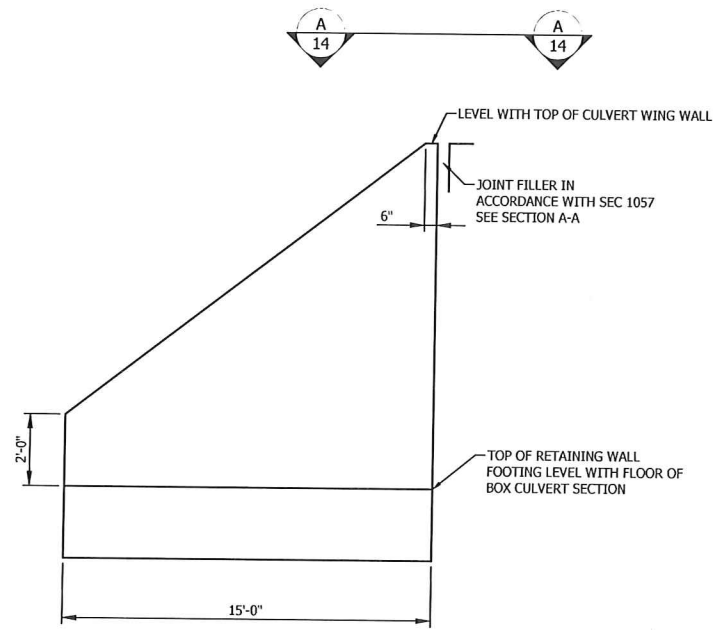




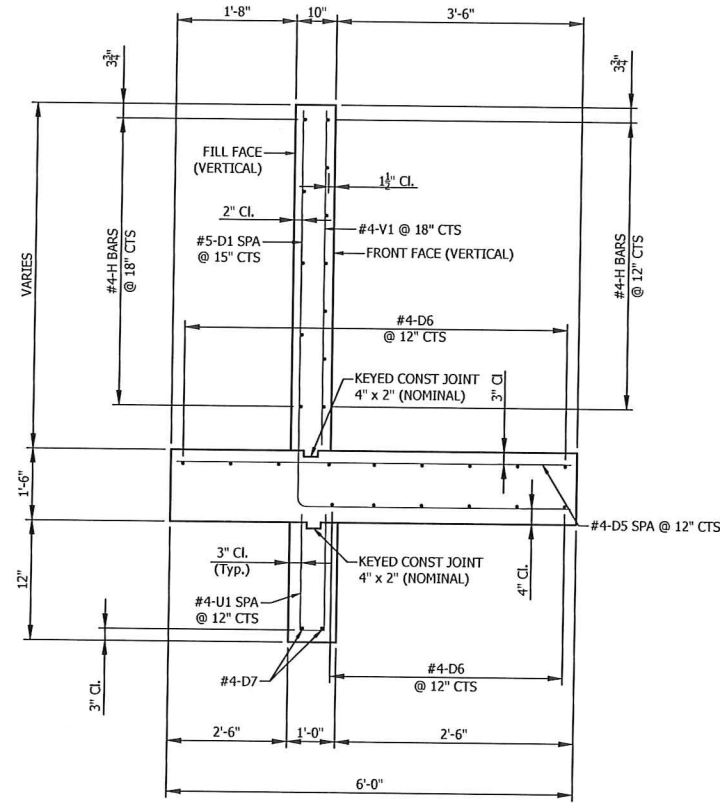




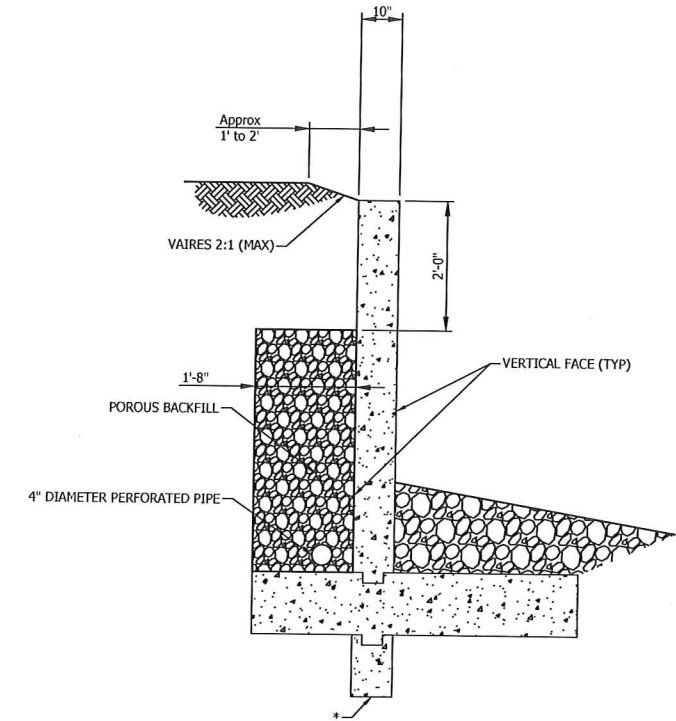




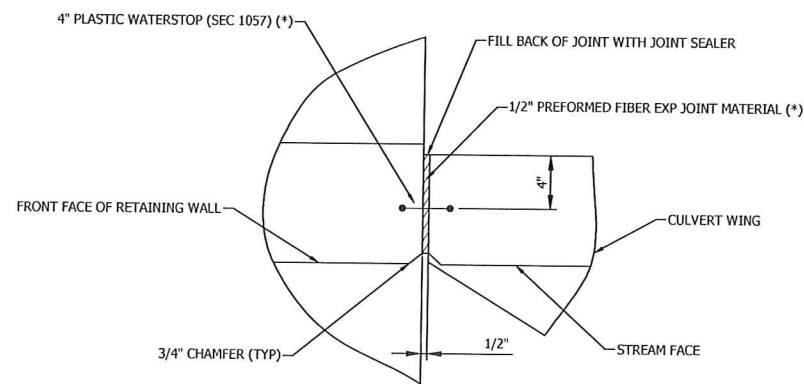
1 PLAN  
14 NOT TO SCALE



2 SECTION  
14 NOT TO SCALE



3 RETAINING WALL TYPICAL SECTION  
14 NOT TO SCALE



DETAIL "B"

4 SECTION A-A SECTION SHOWN FOR  
14 FLARED CULVERT WINGWALL, STRAIGHT WINGWALL SIMILAR  
NOT TO SCALE

DESIGN SPECIFICATIONS:  
2002 - AASHTO 17TH EDITION  
LOAD FACTOR DESIGN  
SEISMIC PERFORMANCE CATEGORY A  
DESIGN LOADING:  
EARTH 120 #/CU FT  
 $\phi = 27^\circ$   
LIVE LOAD SURCHARGE  
DESIGN UNIT STRESSES:  
CLASS B CONCRETE (RETAINING WALLS) FC = 3,000 PSI  
REINFORCING STEEL (GRADE 60) FY = 60,000 PSI

NOTES:

- COST OF MATERIAL, COMPLETE-IN-PLACE, WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR CLASS B CONCRETE (RETAINING WALLS) AND REINFORCING STEEL (CULVERTS).
- THERE WILL BE NO DIRECT PAY FOR ITEMS SUCH AS THE PVC WATERSTOP, UNDERDRAIN AND POROUS BACKFILL.
- COST OF ANY REQUIRED EXCAVATION IN ROCK WILL BE CONSIDERED COMPLETELY COVERED BY THE CONTRACT UNIT PRICE FOR OTHER ITEMS.
- FRONT FACE OF THE PROPOSED RETAINING WALL SHALL BE BUILT FLUSH WITH THE STREAM FACE OF THE PROPOSED CULVERT.
- \* IF ROCK ENCOUNTERED CONSISTENTLY AT OR ABOVE ELEVATION OF BOTTOM OF WALL FOOTING THE SHEAR KEY CAN BE OMITTED.

LAKE VALLEY RCB  
RETAINING WALL DETAILS

MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
PROJECT NO. 2016-201-0  
COLE COUNTY, MISSOURI

**Bartlett & West**

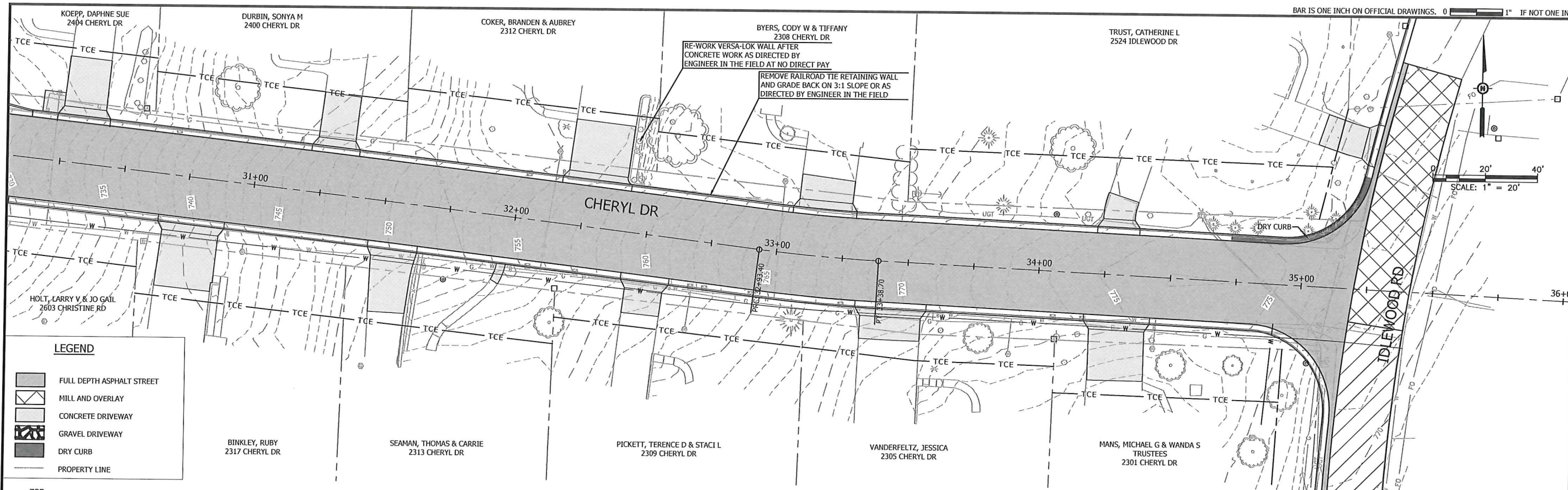
1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000  
MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING  
WWW.BARTLETTANDWEST.COM



SEALED DATE:	02-02-2018
DESIGNED BY:	AKJ
DRAWN BY:	MKA
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	14 of 44

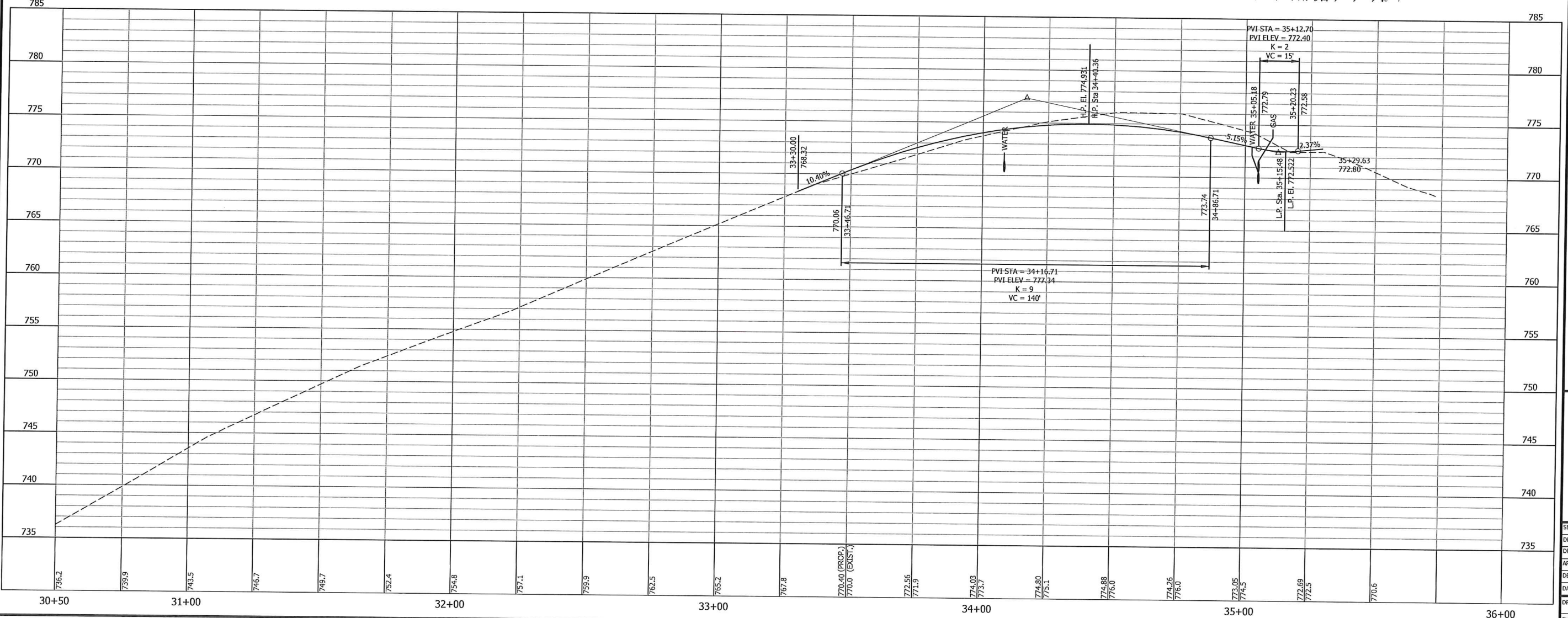






**LEGEND**

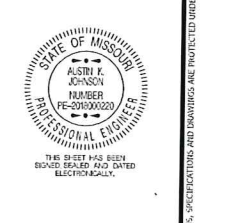
- FULL DEPTH ASPHALT STREET
- MILL AND OVERLAY
- CONCRETE DRIVEWAY
- GRAVEL DRIVEWAY
- DRY CURB
- PROPERTY LINE



NO.	DATE	DESCRIPTION

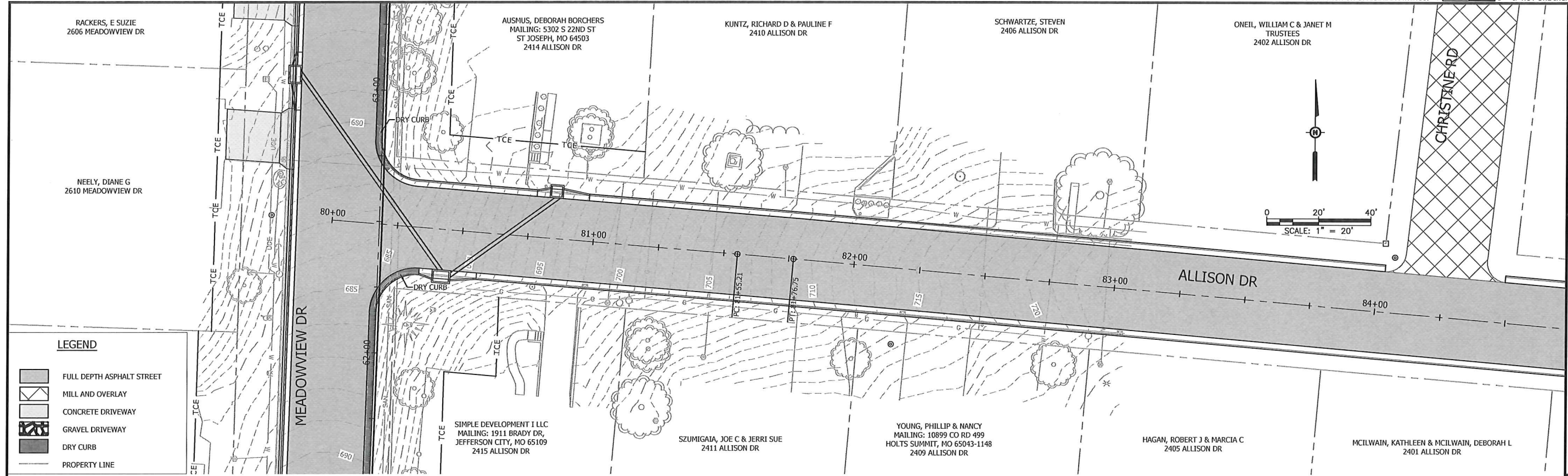
**Bartlett & West**  
 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109.4000  
 PHONE: 572.634.7181 • FAX: 572.634.7304  
 MISSOURI CERTIFICATE OF ADOPTIVE # 06818 • WWW.BARTLETTWEST.COM

**CHERYL DRIVE  
 PLAN AND PROFILE  
 STA 30+50 - 35+50  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI**



SEALED DATE:	02-02-2018
DESIGNED BY:	AKJ
DRAWN BY:	RAM
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	17 of 44

Date: 02-02-2018 10:56:28 AM  
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 Layout Name: CHERYL\_STA\_27+50 - 35+50  
 Plotted By: AKJ1272  
 Plotted On: 2/2/2018 10:56:28 AM

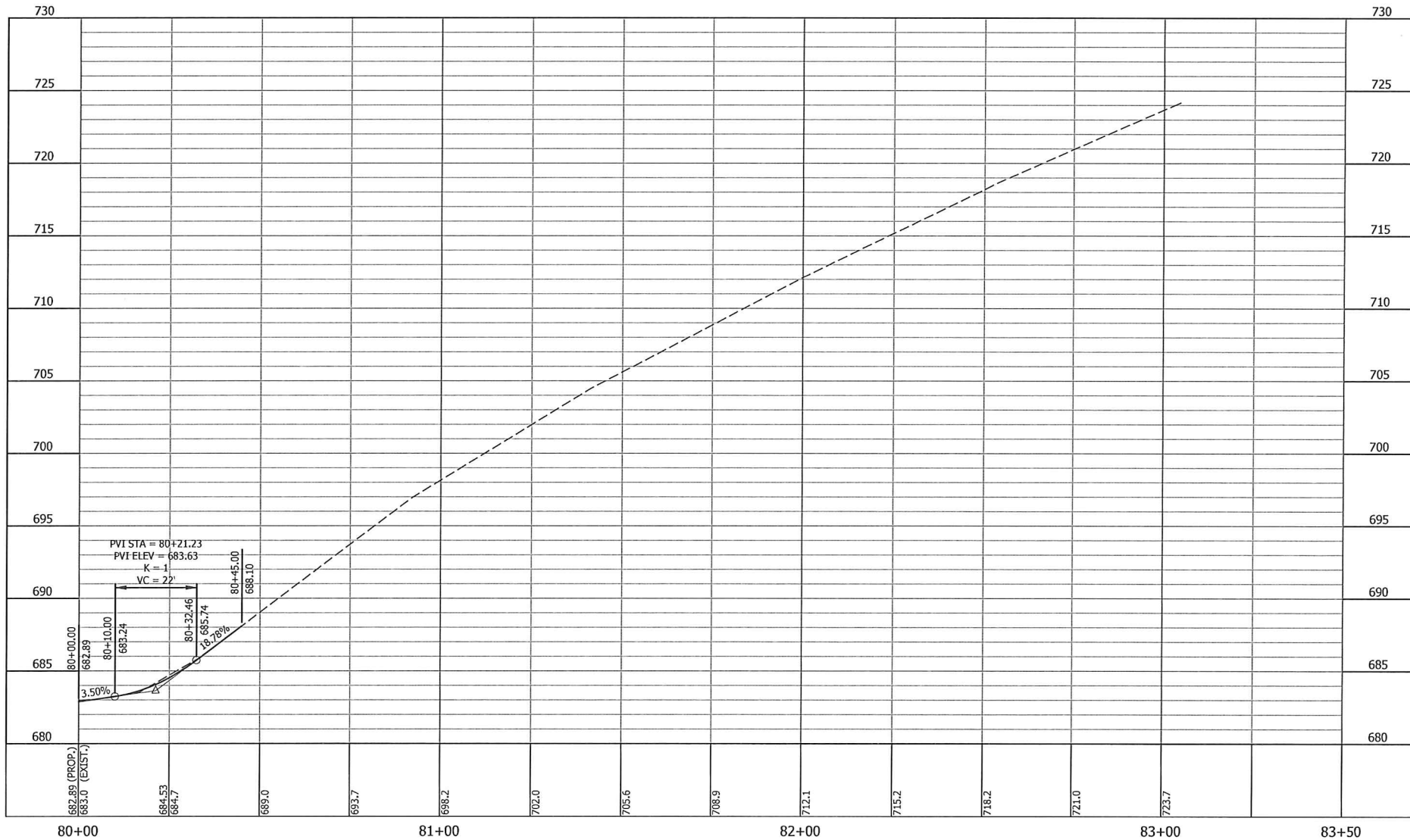


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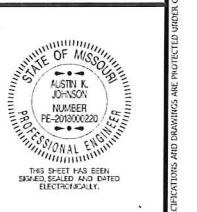
	FULL DEPTH ASPHALT STREET
	MILL AND OVERLAY
	CONCRETE DRIVEWAY
	GRAVEL DRIVEWAY
	DRY CURB
	PROPERTY LINE

NO.	DATE	DESCRIPTION

**Bartlett & West**  
 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000  
 PHONE 572.624.3181 - FAX 572.624.7904  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - WWW.BARTLETTWEST.COM

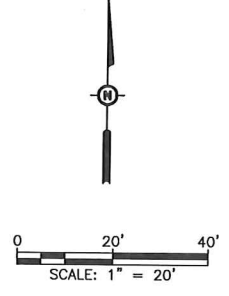
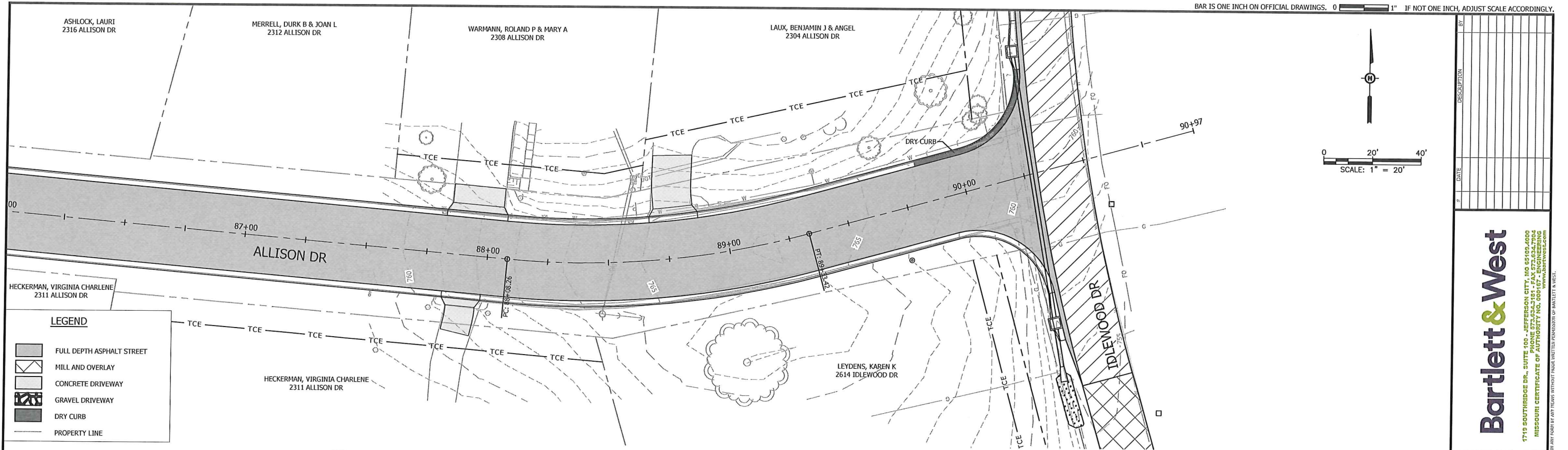


**ALLISON DRIVE  
 PLAN AND PROFILE  
 STA 80+00 - 83+50**  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI



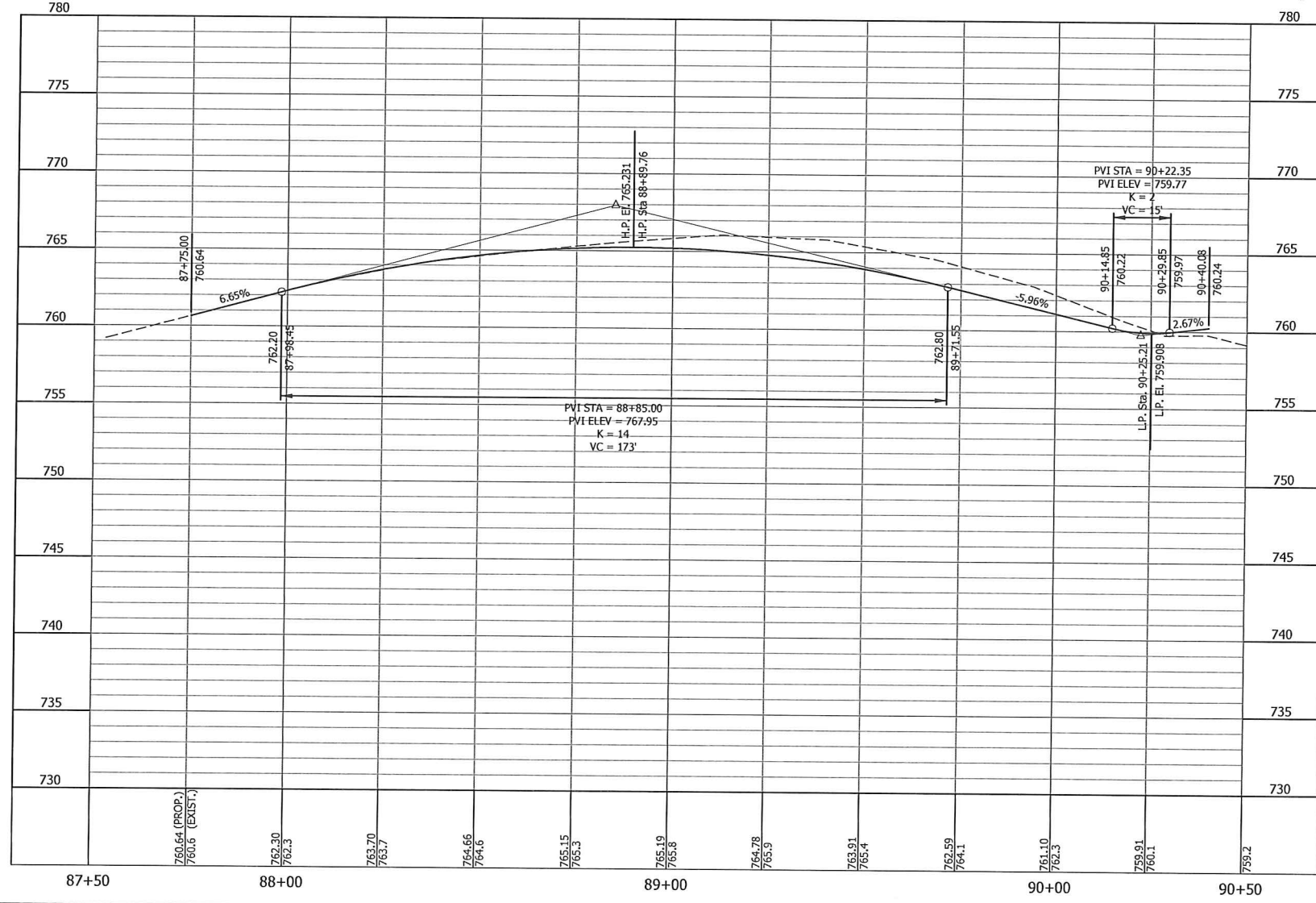
SEAL DATE: 02-02-2018

DESIGNED BY:	AKJ
DRAWN BY:	RAM
APPROVED BY:	TCK
DESIGN PROJ.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	18 of 44



**LEGEND**

- FULL DEPTH ASPHALT STREET
- MILL AND OVERLAY
- CONCRETE DRIVEWAY
- GRAVEL DRIVEWAY
- DRY CURB
- PROPERTY LINE

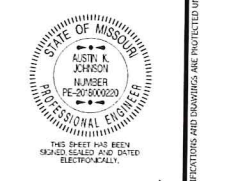


Last edit on: Jan 22, 2018 by: AKJ1272 Drawing Name: c:\p\dwg\topolad01\011272.dwg Layout Name: ALLISON STA. 87+50 - 90+50 Plotted By: AKJ1272 Plotted on: 2/2/2018 10:56:48 AM

NO.	DATE	DESCRIPTION

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 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000  
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**ALLISON DRIVE  
 PLAN AND PROFILE  
 STA 87+50 - 90+50**  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI



SEAL DATE: 02-02-2018

DESIGNED BY: AKJ

DRAWN BY: RAM

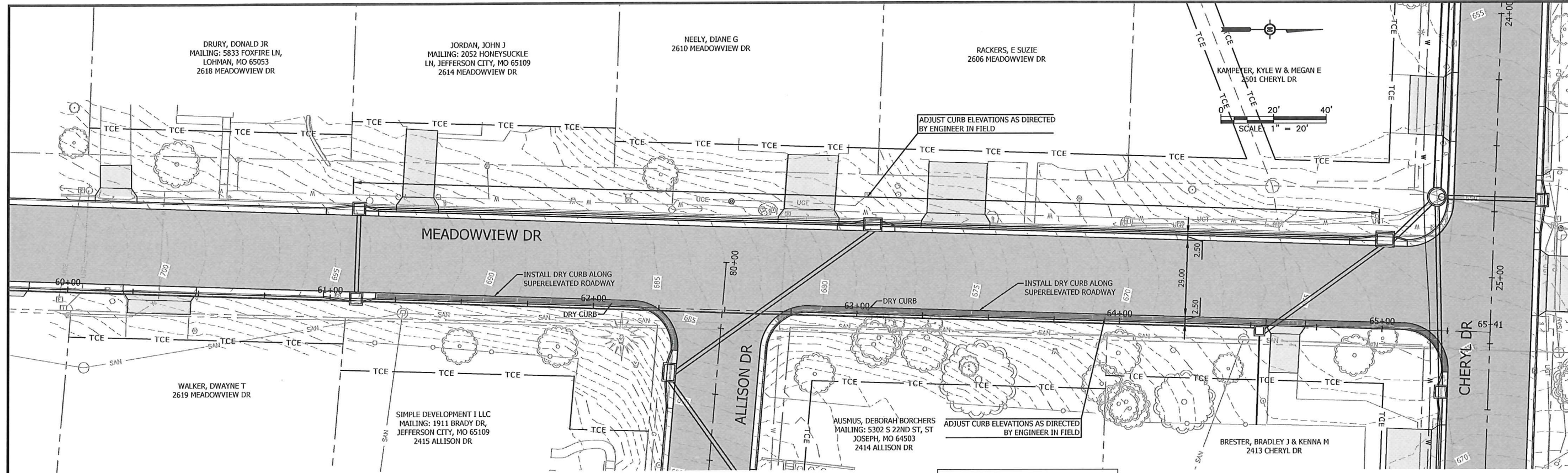
APPROVED BY: TCK

DESIGN PROJ: 15937.600

DATE: FEBRUARY 2018

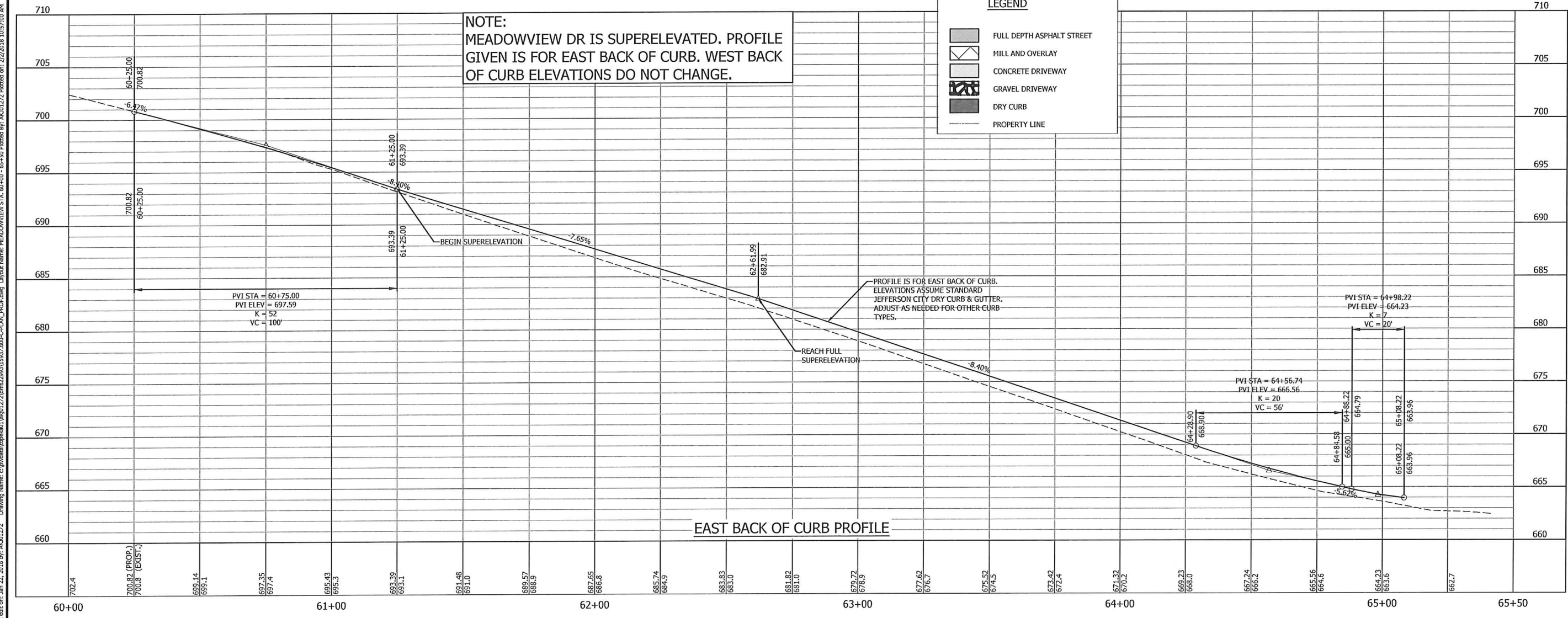
DRAWING NO:

SHEET NO: 19 of 44



NO.	DATE	DESCRIPTION

**Bartlett & West**  
 1719 SOUTHBRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65104-4800  
 PHONE 573.634.3181 - FAX 573.634.7904  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - SURVEYING



**MEADOWVIEW DRIVE  
 EAST BACK OF CURB PLAN AND PROFILE  
 STA 60+00 - 65+50**

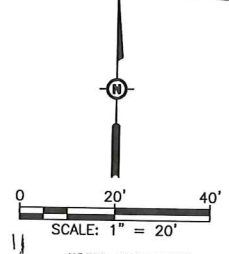
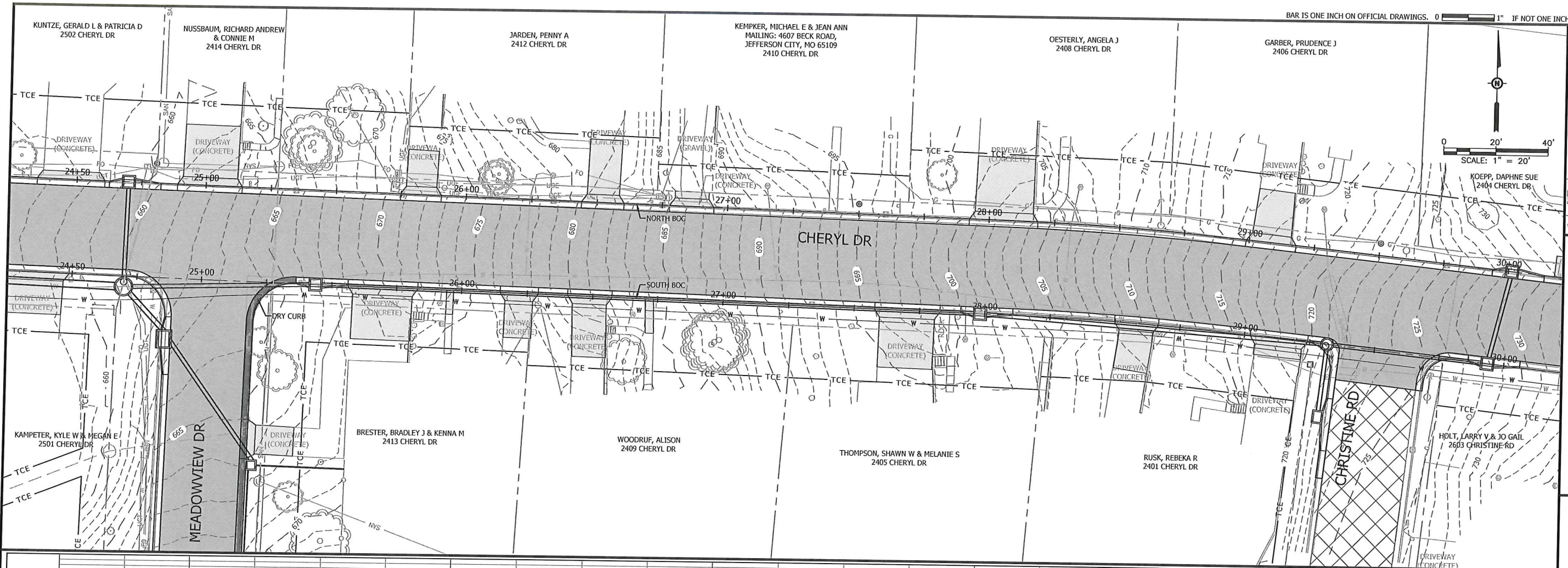
MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI

STATE OF MISSOURI  
 MISSOURI PROFESSIONAL ENGINEERS AND SURVEYORS  
 AUSTIN K. JOHNSON  
 LICENSE NO. PE-201630020  
 FEBRUARY 2018

THIS SHEET HAS BEEN  
 SEALED, SIGNED AND DATED  
 ELECTRONICALLY.

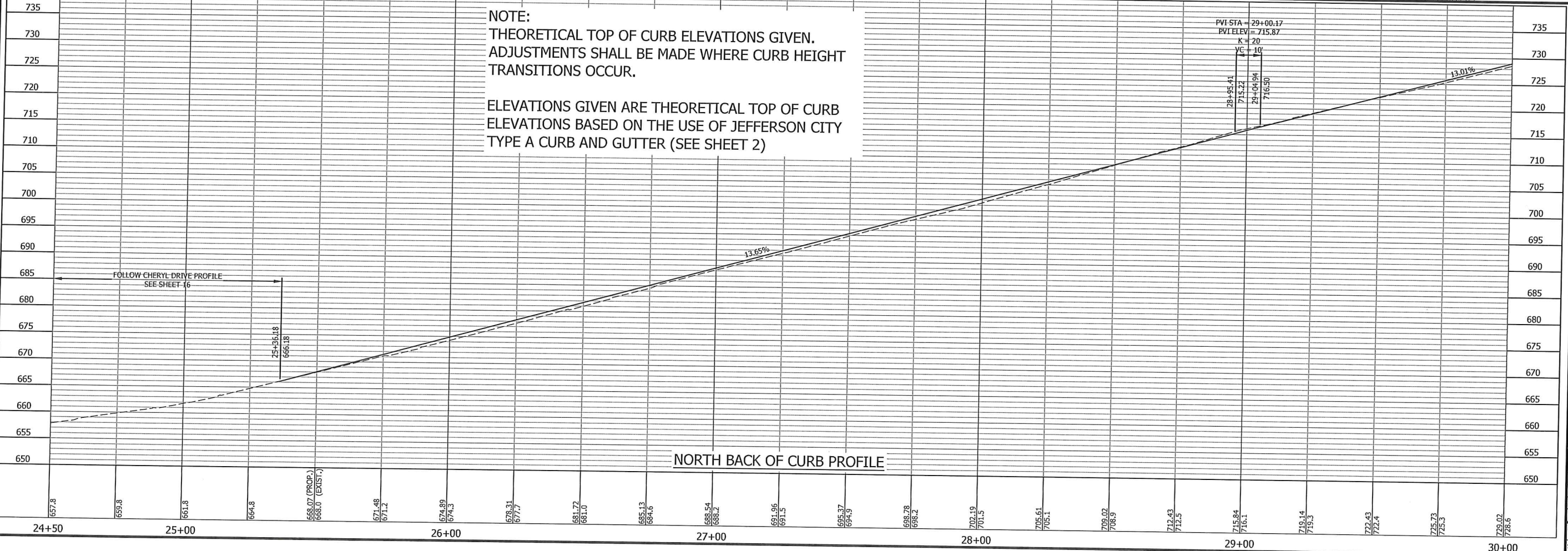
SEALED DATE: 02-02-2018  
 DESIGNED BY: AKJ  
 DRAWN BY: RAM  
 APPROVED BY: TCK  
 DESIGN PROJ: 15937.600  
 DATE: FEBRUARY 2018  
 DRAWING NO:  
 SHEET NO: 20 of 44

Last edit: 02-Jan-22, 2018 by: AKJ01272 Drawing Name: MEADOWVIEW STA. 60+00 - 65+50 Plotted By: AKJ01272 Plotted on: 2/2/2018 10:57:00 AM



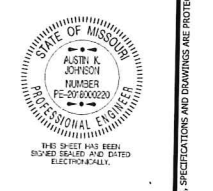
NO.	DATE	DESCRIPTION

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 Last edit on: 2/1/2018 9:55 AM by: AC01272



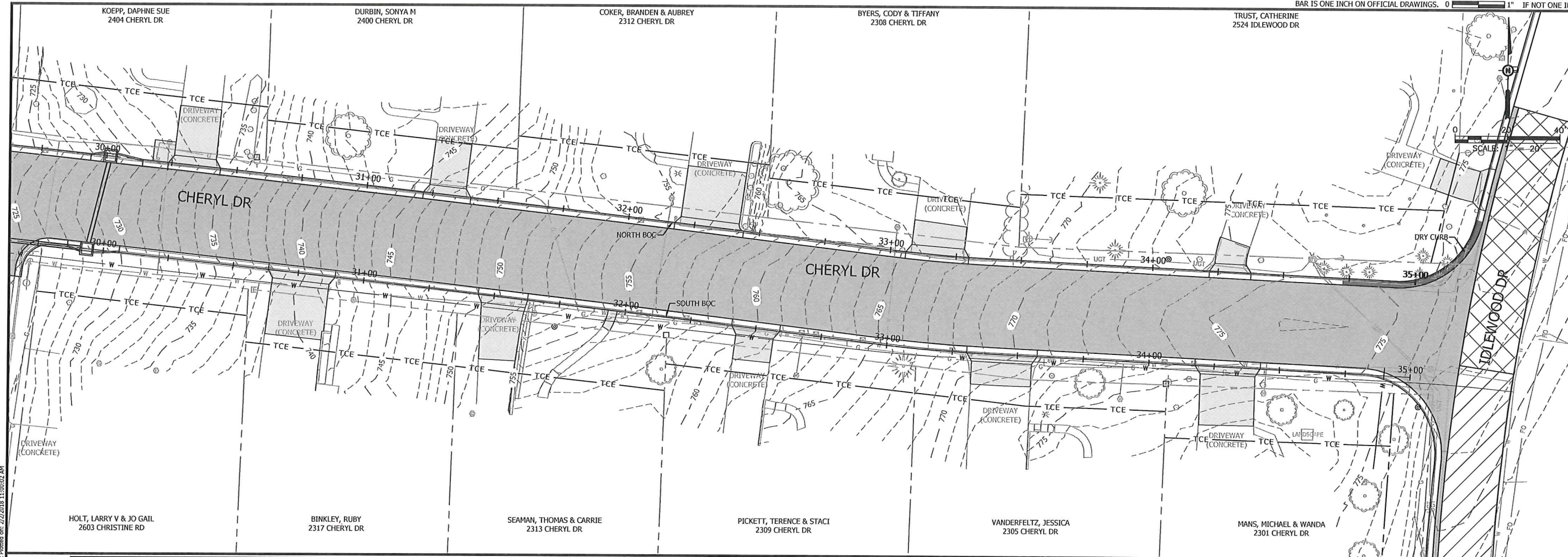
**Bartlett & West**  
 JEFFERSON CITY, MO  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000107 - SURVEYING  
 www.bartlettwest.com

**CHERYL DRIVE**  
**NORTH BACK OF CURB PLAN & PROFILE**  
**STA 24+50 - 30+00**  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI

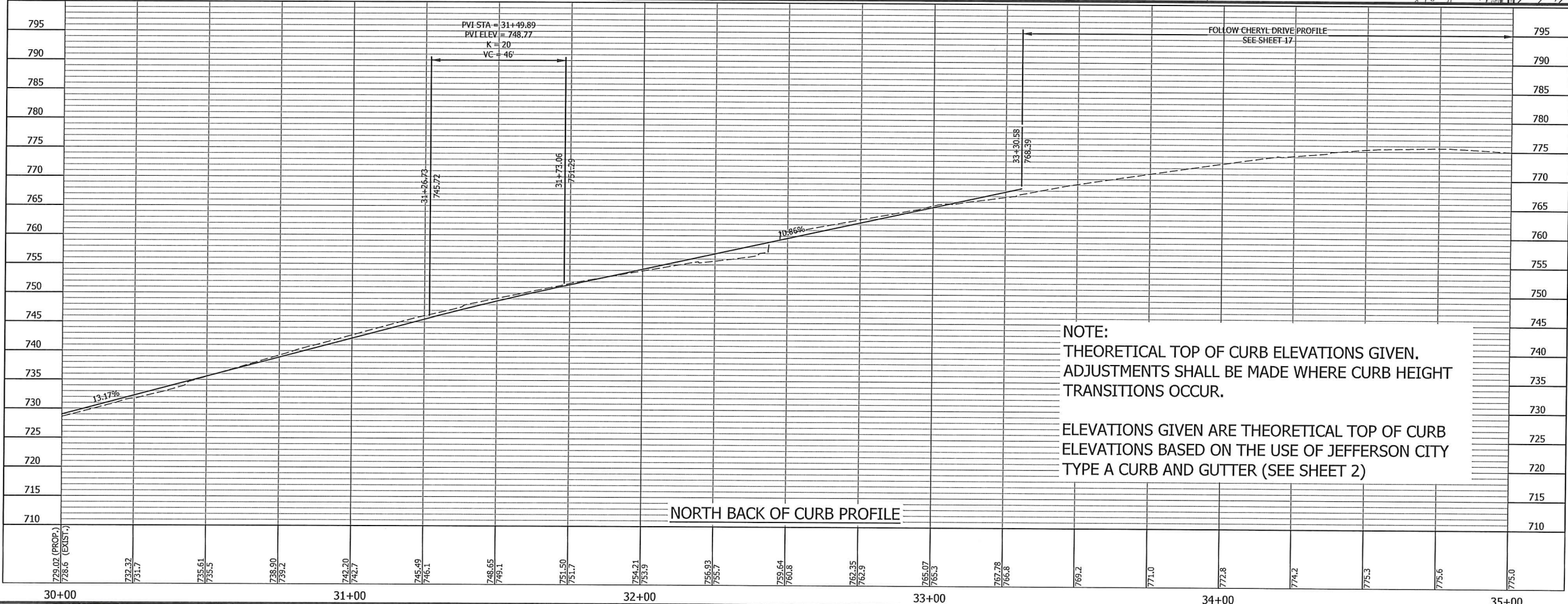


SEALED DATE:	02-02-2018
DESIGNED BY:	MKA
DRAWN BY:	MKA
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	21 of 44

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Use call out: 2/1/2018 9:35 AM by: AK01272  
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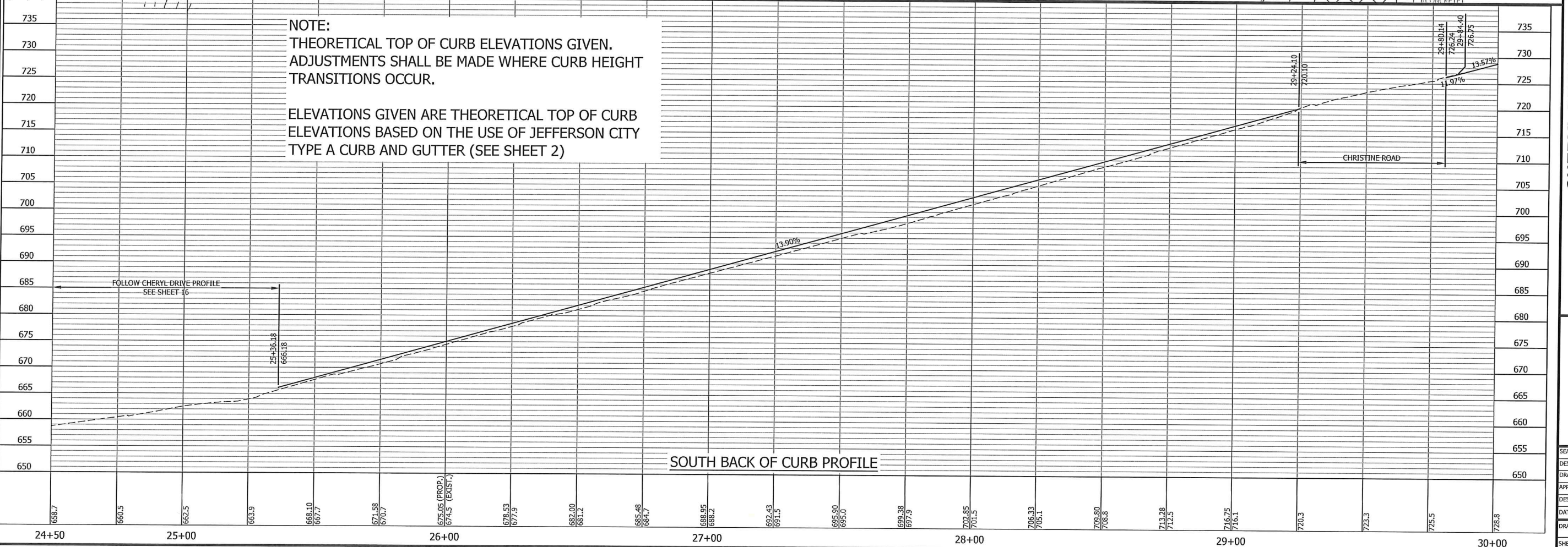
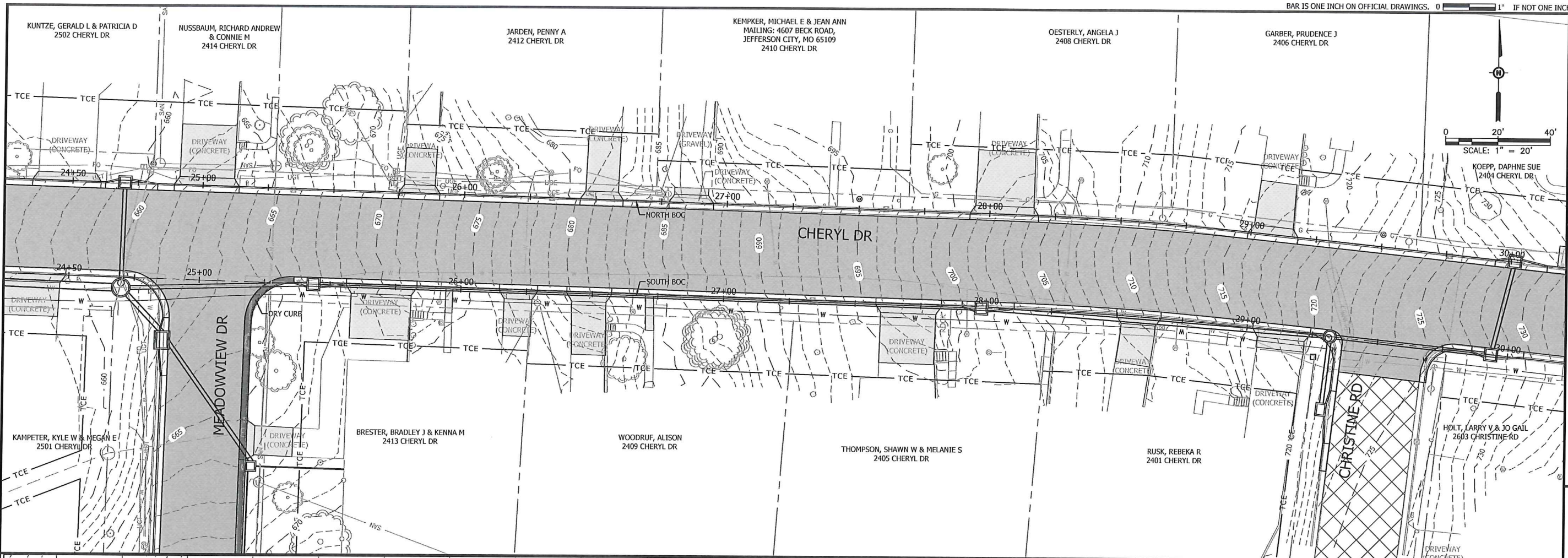


NOTE:  
 THEORETICAL TOP OF CURB ELEVATIONS GIVEN.  
 ADJUSTMENTS SHALL BE MADE WHERE CURB HEIGHT  
 TRANSITIONS OCCUR.

ELEVATIONS GIVEN ARE THEORETICAL TOP OF CURB  
 ELEVATIONS BASED ON THE USE OF JEFFERSON CITY  
 TYPE A CURB AND GUTTER (SEE SHEET 2)

	MISSOURI CERTIFICATE OF AUTHORITY NO. 006167 - ENGINEERING JEFFERSON CITY, MO 64504 572-459-6724 www.bartlettwest.com
	<b>CHERYL DRIVE</b> <b>NORTH BACK OF CURB PLAN &amp; PROFILE</b> <b>STA 30+00 - 35+00</b> MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT PROJECT NO. 2016-201-0 COLE COUNTY, MISSOURI
	SEALED DATE: 02-02-2018 DESIGNED BY: MKA DRAWN BY: MKA APPROVED BY: TCK DESIGN PROJ: 15937.600 DATE: FEBRUARY 2018 DRAWING NO: SHEET NO: 22 of 44

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SOUTH BACK OF CURB PROFILE

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 MISSOURI CERTIFICATE OF AUTHORITY NO. 000497 - ENGINEERING  
 JEFFERSON CITY, MO 64504  
 573-659-6734  
 www.bartlettwest.com

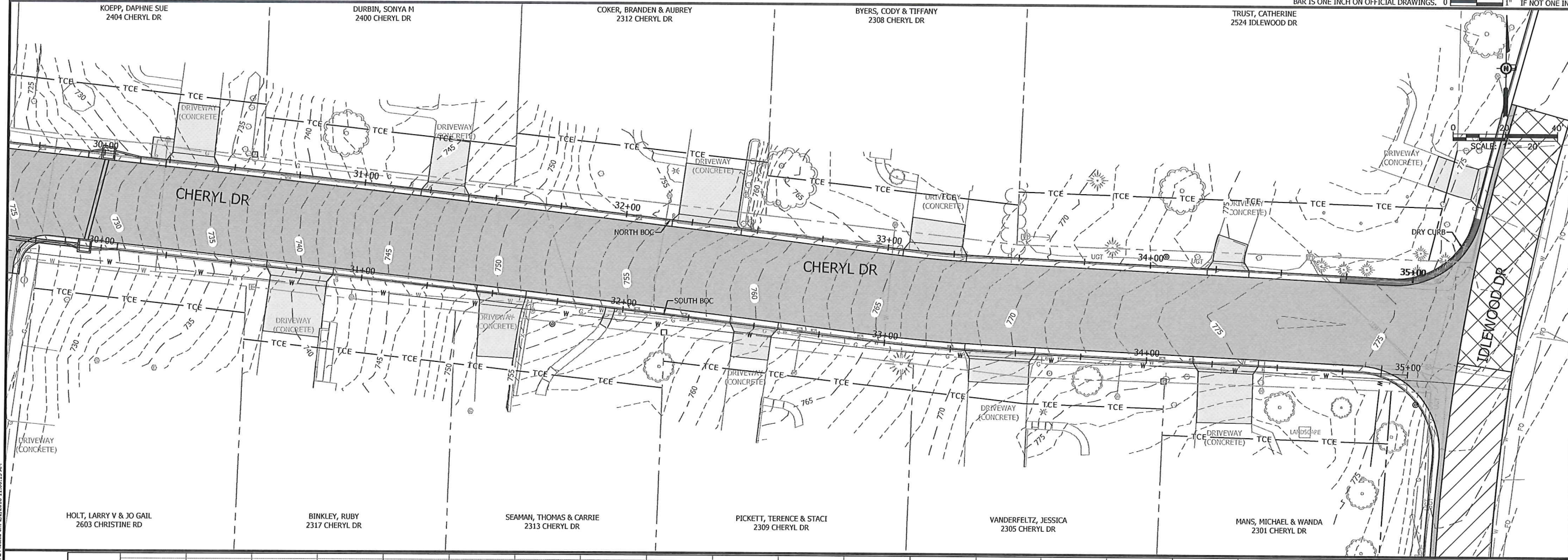
**CHERYL DRIVE  
 SOUTH BACK OF CURB PLAN & PROFILE  
 STA 24+50 - 30+00  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI**



SEALED DATE:	02-02-2018
DESIGNED BY:	MKA
DRAWN BY:	MKA
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	23 of 44

Last edit: 02-21-2018 9:25 AM by: AK031272  
 Drawings Name: C:\bentley\toprad\01\14601272\dms229931\8937.600C\_Cheryl Drive Plan & Profile.dwg  
 Layout Name: SOUTH\_BOC\_01\_Plot.dwg  
 Plotted on: 2/22/2018 11:00:09 AM

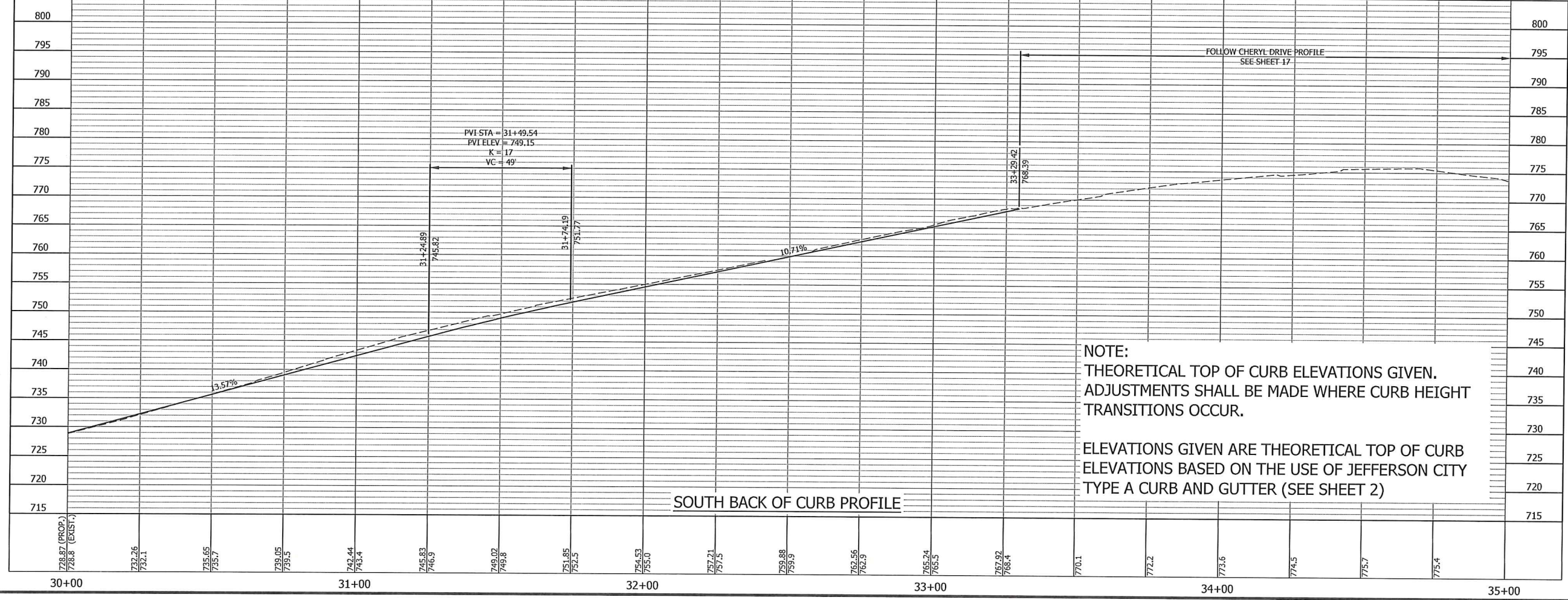
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NO.	DATE	DESCRIPTION

**Bartlett & West**  
 JEFFERSON CITY, MO  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000197 - EXPIRES 07-24-2024  
 www.bartlettwest.com

**CHERYL DRIVE  
 SOUTH BACK OF CURB PLAN & PROFILE  
 STA 30+00 - 35+00  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI**



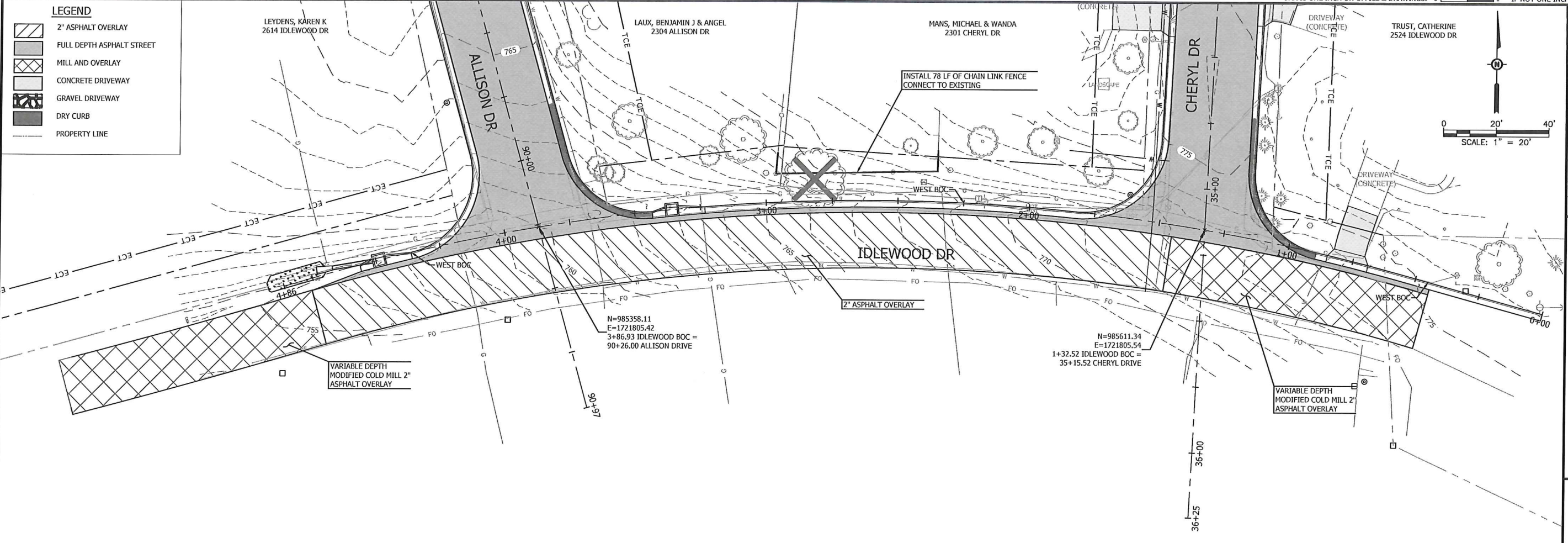
**NOTE:**  
 THEORETICAL TOP OF CURB ELEVATIONS GIVEN.  
 ADJUSTMENTS SHALL BE MADE WHERE CURB HEIGHT TRANSITIONS OCCUR.

ELEVATIONS GIVEN ARE THEORETICAL TOP OF CURB ELEVATIONS BASED ON THE USE OF JEFFERSON CITY TYPE A CURB AND GUTTER (SEE SHEET 2)



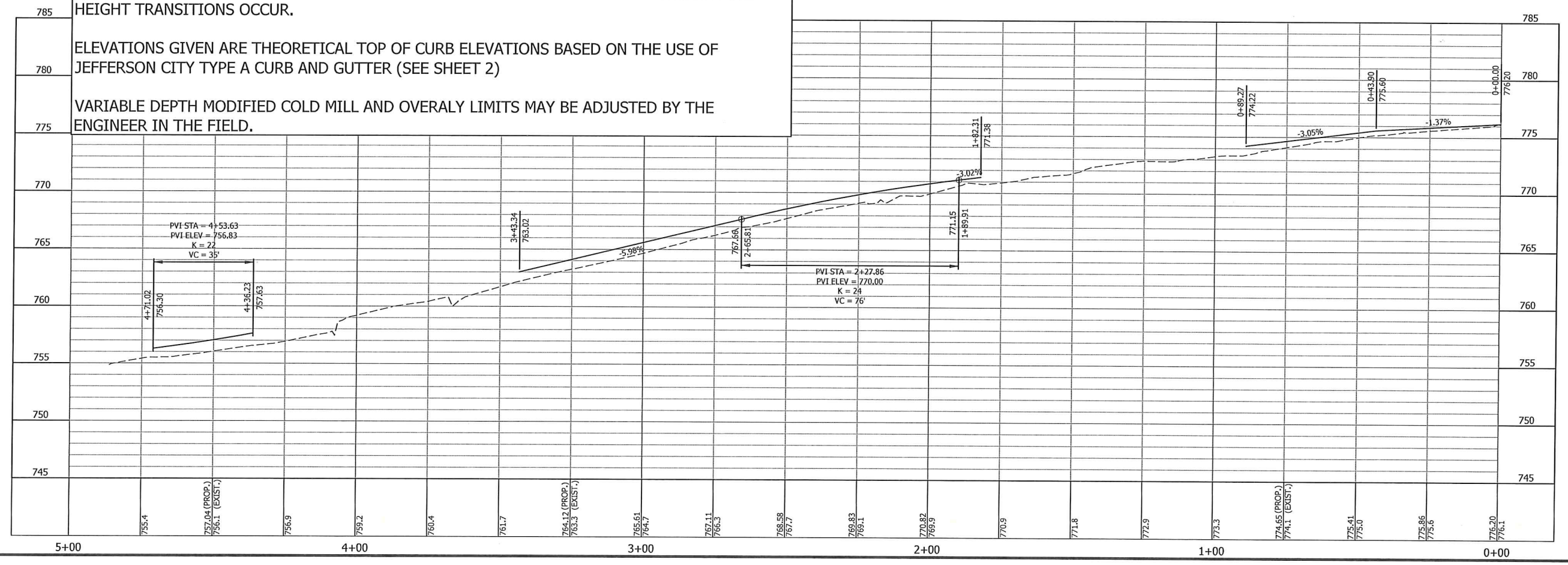
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DESIGNED BY:	MKA
DRAWN BY:	NIKA
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	24 of 44

Last edit on: 2/1/2018 9:35 AM by: AK31222  
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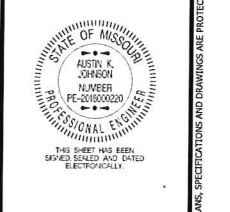
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 Last edit on: 2/1/2018 9:35 AM by: AKO1272

**NOTE:**  
 THEORETICAL TOP OF CURB ELEVATIONS GIVEN. ADJUSTMENTS SHALL BE MADE WHERE CURB HEIGHT TRANSITIONS OCCUR.  
 ELEVATIONS GIVEN ARE THEORETICAL TOP OF CURB ELEVATIONS BASED ON THE USE OF JEFFERSON CITY TYPE A CURB AND GUTTER (SEE SHEET 2)  
 VARIABLE DEPTH MODIFIED COLD MILL AND OVERLAY LIMITS MAY BE ADJUSTED BY THE ENGINEER IN THE FIELD.



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**IDLEWOOD DRIVE  
 WEST BACK OF CURB PLAN & PROFILE  
 STA 0+00 - 5+00  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI**



SEALED DATE:	02-02-2018
DESIGNED BY:	AKJ
DRAWN BY:	MKA
APPROVED BY:	TCK
DESIGN PROJ:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO:	
SHEET NO:	25 of 44

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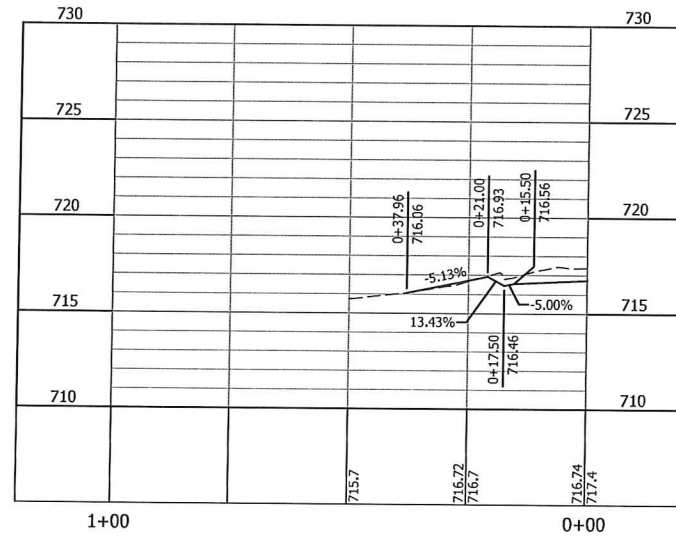




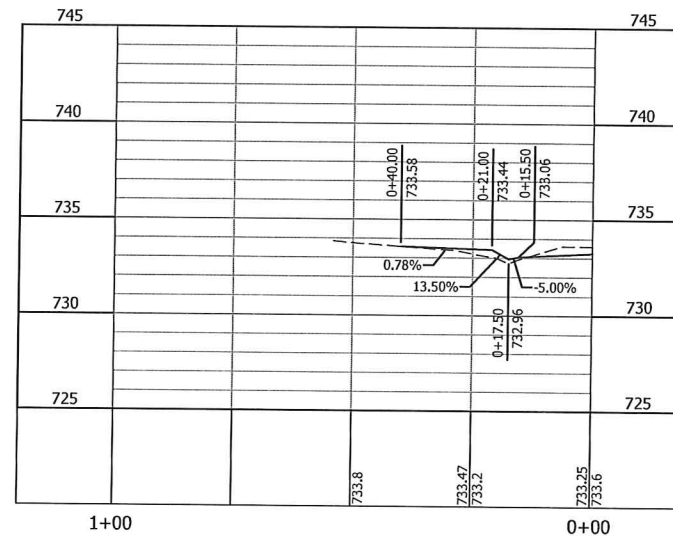




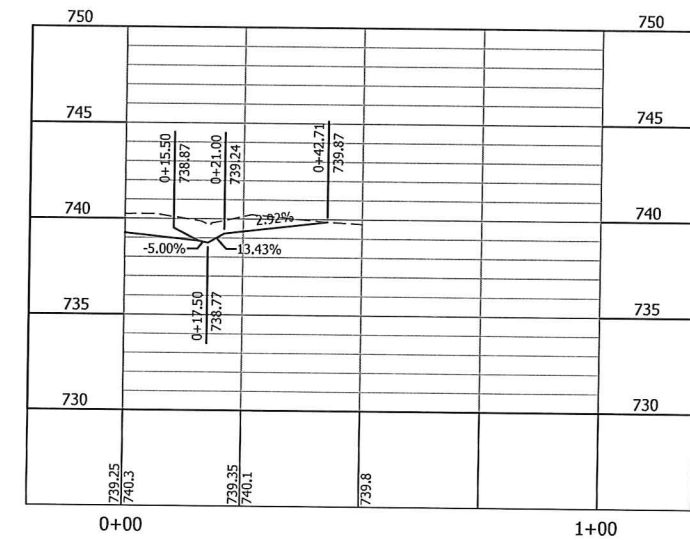




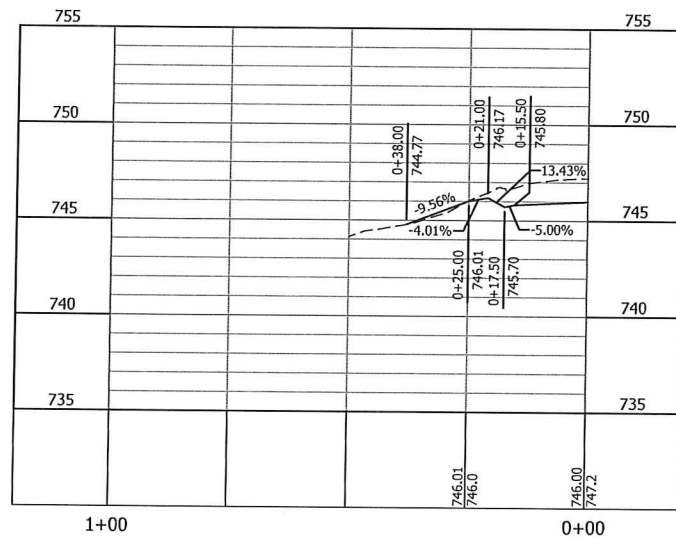
2406 CHERYL DRIVE - STA 29+07.11



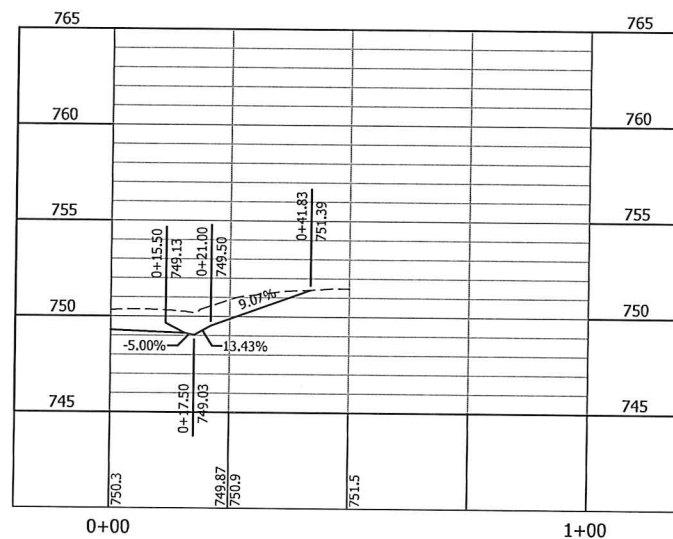
2404 CHERYL DRIVE - STA 30+32.23



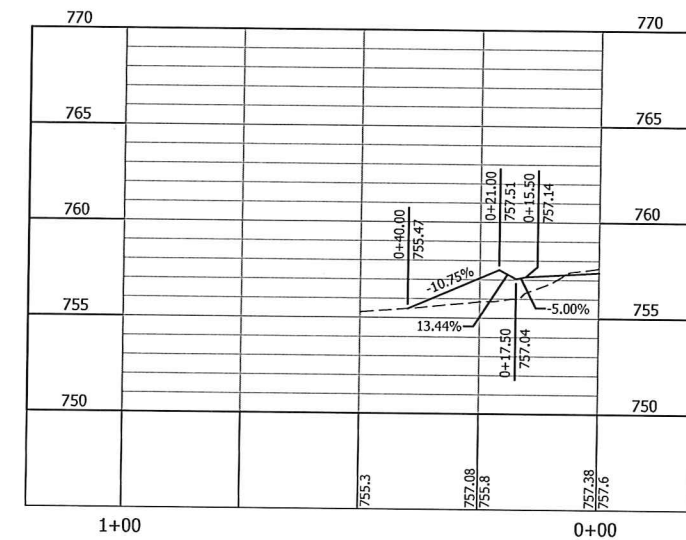
2317 CHERYL DRIVE - STA 30+77.67



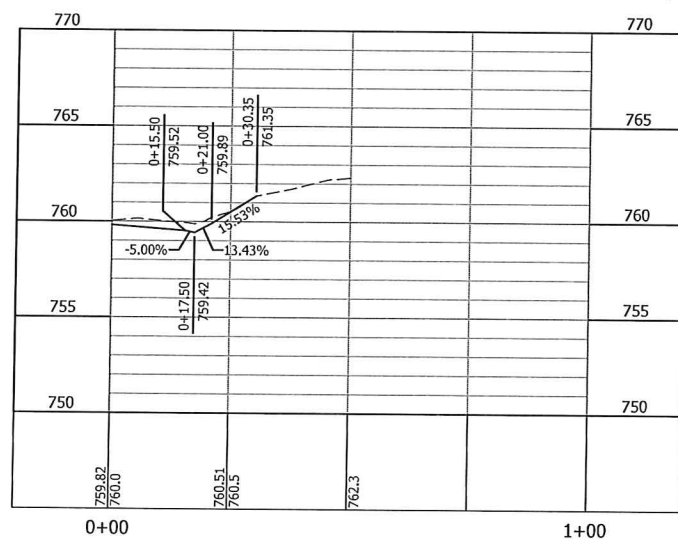
2400 CHERYL DRIVE - STA 31+28.94



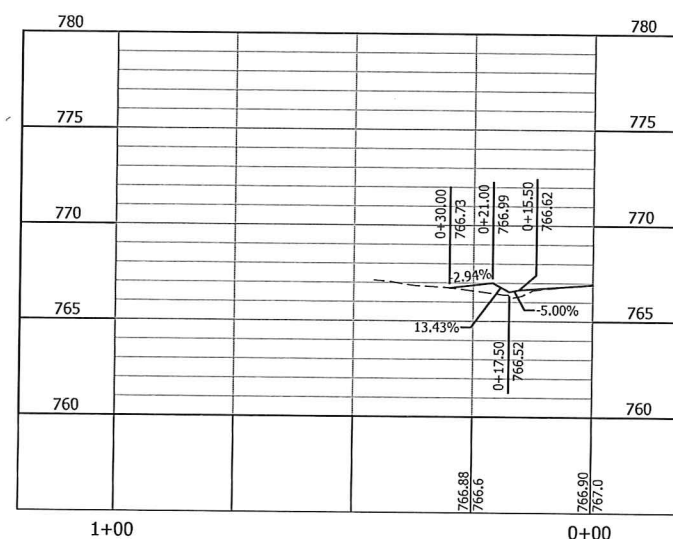
2313 CHERYL DRIVE - STA 31+55.40



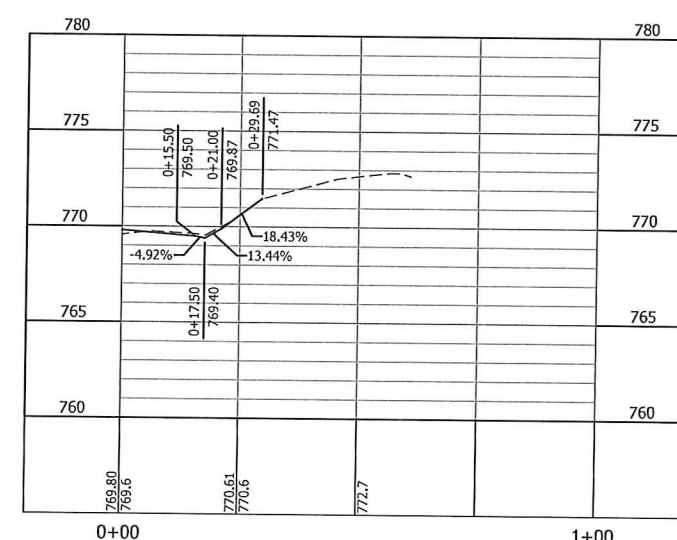
2312 CHERYL DRIVE - STA 32+29.13



2309 CHERYL DRIVE - STA 32+51.57



2308 CHERYL DRIVE - STA 33+16.91



2305 CHERYL DRIVE - STA 33+44.15

Last edit on: Jan 18, 2018 by: A001272 Drawing Name: c:\pwworkspace\18401272\dms229318937.dwg - C:\P\DRIVE PROFILES.dwg Layout Name: DRIVE PROFILES (3) Plotted By: A001272 Plotted on: 2/2/2018 11:05:13 AM

**DRIVE PROFILES**

**Bartlett & West**  
 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65104-4000  
 PHONE 573.634.3181 - FAX 573.634.7904  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 0001607 - ENGINEERING

**MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI**



SEALED DATE:	02-02-2018
DESIGNED BY:	AJK
DRAWN BY:	AJK
APPROVED BY:	TCK
DESIGN PROJ:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO:	
SHEET NO:	31 of 44

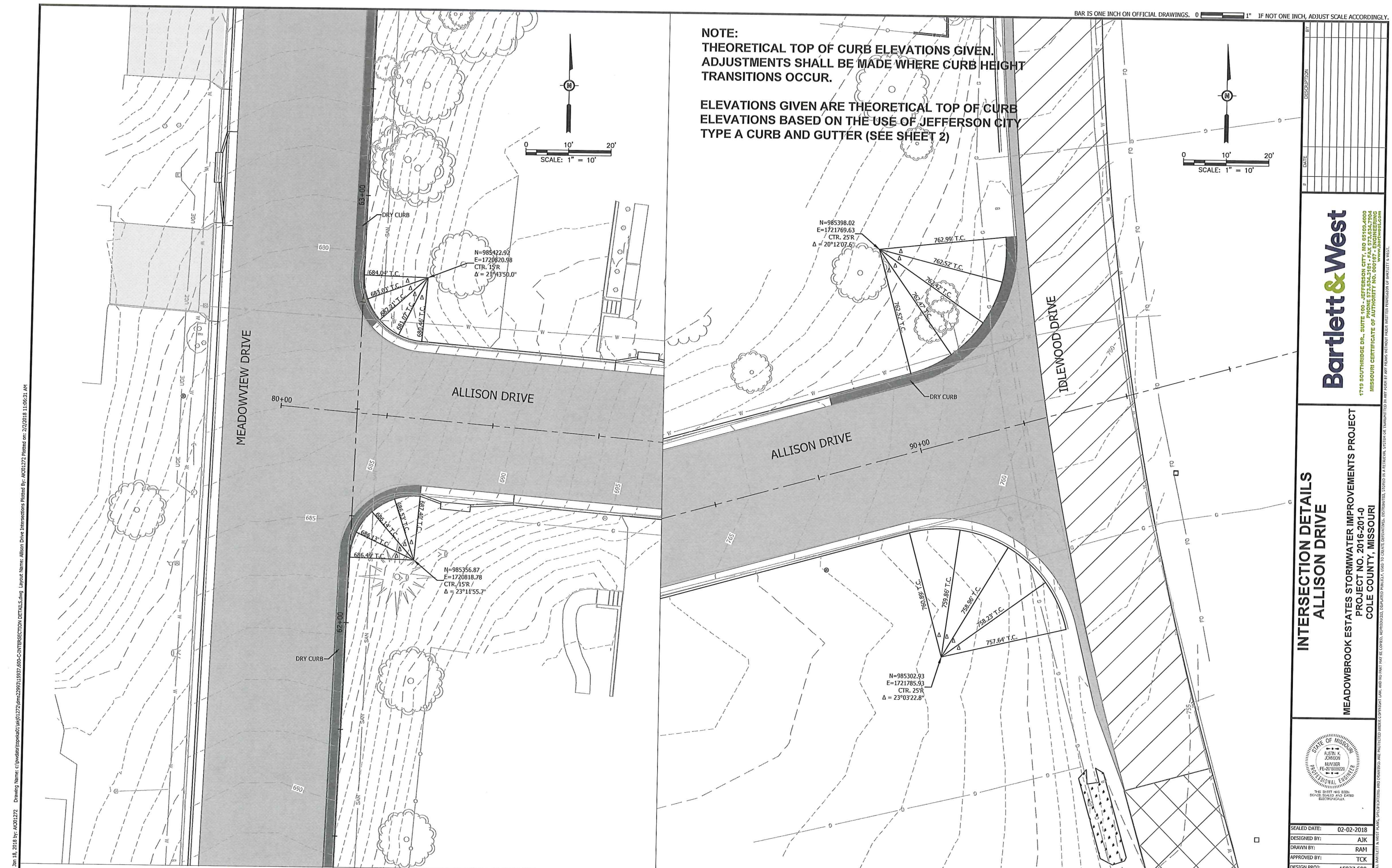
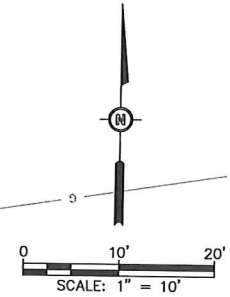
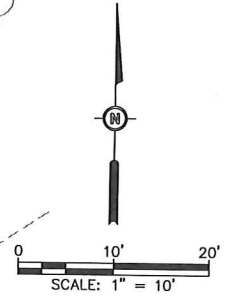






**NOTE:**  
THEORETICAL TOP OF CURB ELEVATIONS GIVEN.  
ADJUSTMENTS SHALL BE MADE WHERE CURB HEIGHT  
TRANSITIONS OCCUR.

ELEVATIONS GIVEN ARE THEORETICAL TOP OF CURB  
ELEVATIONS BASED ON THE USE OF JEFFERSON CITY  
TYPE A CURB AND GUTTER (SEE SHEET 2)



**ALLISON AND MEADOWVIEW**

**ALLISON AND IDLEWOOD**

**INTERSECTION DETAILS  
ALLISON DRIVE**

MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
PROJECT NO. 2016-201-0  
COLE COUNTY, MISSOURI



SEALED DATE:	02-02-2018
DESIGNED BY:	AJK
DRAWN BY:	RAM
APPROVED BY:	TCK
DESIGN PROJ.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	35 of 44

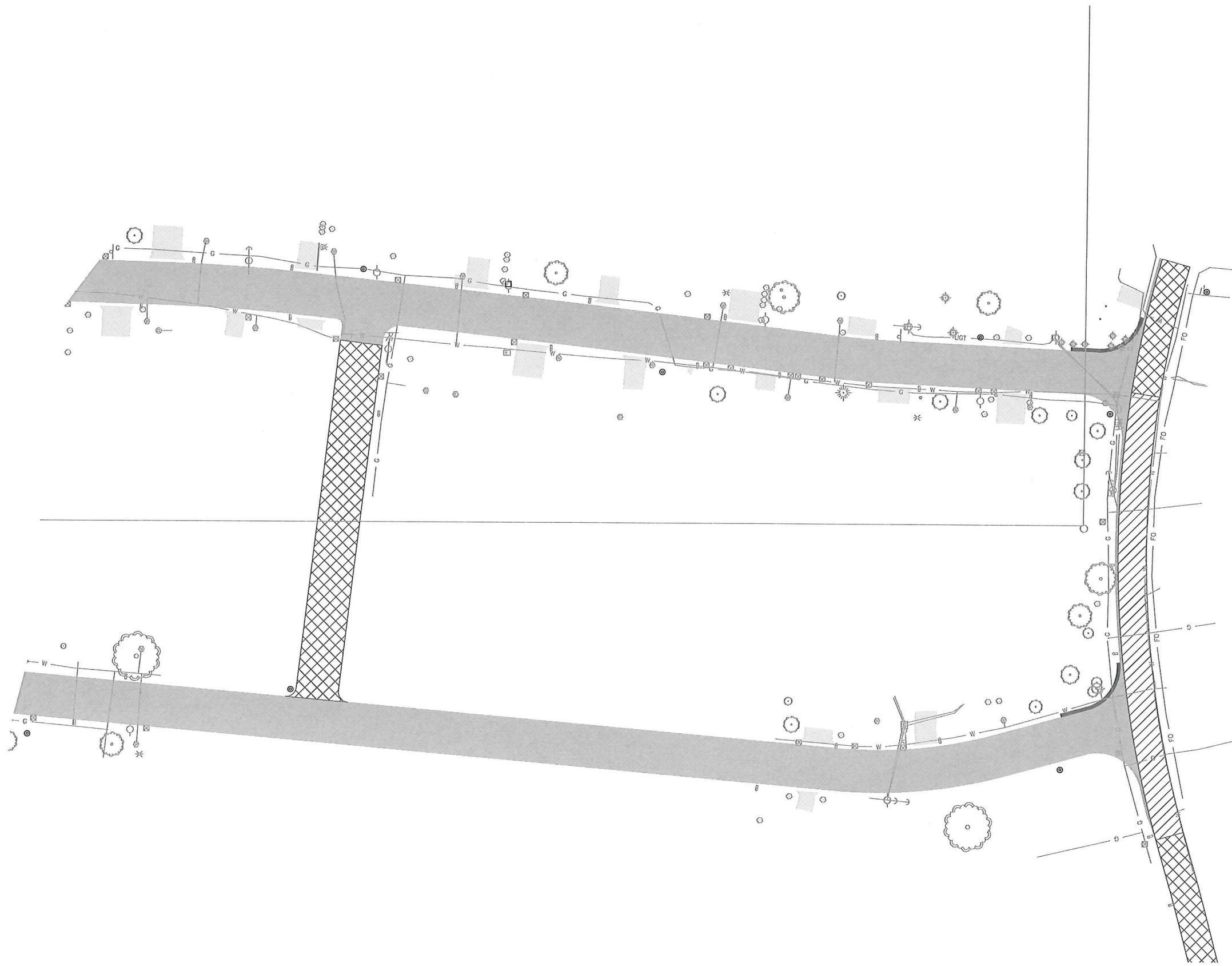
**Bartlett & West**

1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000  
MISSOURI CERTIFICATE OF AUTHORITY NO. 000187 - ENGINEERING  
www.bartlettwest.com

Last edit on: Jan 18, 2018 by: AK01222. Drawing Name: c:\p\khan\topped01\ak01222\intersections\DETAILS.dwg Layout Name: Allison Drive Intersections Placed By: AK01222 Placed on: 2/2/2018 11:56:51 AM





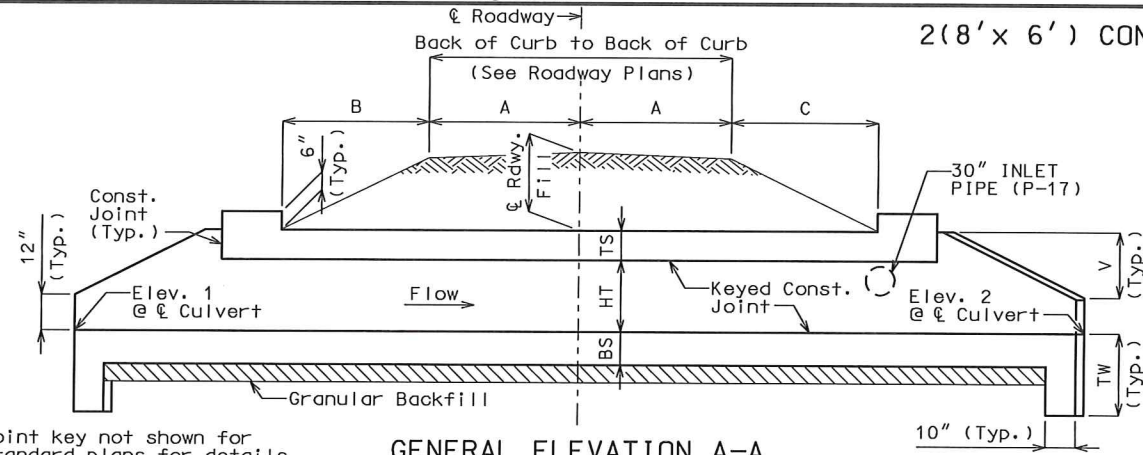


STATE OF MISSOURI  
 ALVIN K. JOHNSON  
 NUMBER  
 PE-30800000  
 PROFESSIONAL ENGINEER

THIS SHEET HAS BEEN  
 IMPROVED, REPAIRED AND DATED  
 ELECTRICALLY.

2(8' x 6') CONCRETE BOX CULVERT

SEC/SUR 26 TWP 44N RGE 12W



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.

Var.	Equation	Dim.	Var.	Equation	Dim.	Var.	Equation	Dim.
S	---	8'-0"	F	2S + 2TX + TI	18'	W	2A + B + C + 2E	82'-4 3/4"
HT	---	6'-0"	G	2V	12'-2"	X	3" + TX(tan Z)	5 1/8"
TS	---	1'-1"	H	(A + C + E)(tan Z)	11'-6 3/4"	Z	Skew Angle	15°0'0"
BS	---	9"	I	3"(cos Z)	2 7/8"	BB	(A + B)(sec Z)	25'-10 5/8"
TX	---	8"	J	(A + B + E)(tan Z)	10'-6 1/4"	CC	(A + C)(sec Z)	29'-11"
TI	---	8"	K	(S + TI/2)(sec Z)	8'-7 1/2"	EE	E(sec Z)	14'-9"
A	---	18'-0"	L	2EE + BB + CC	85'-3 3/8"	HH	20"(sec Z)	20 3/4"
B	---	7'-0"	D	I + YY	5"	QQ	TX(cos Z)	7 3/4"
C	---	10'-10 3/4"	T	G(sec Z)	12'-7 1/8"	YY	TX(sin Z)	2 1/8"
E	G + D + 20"	14'-3"	V	HT + TS - 12"	6'-1"	TW	Max{3'-4" or (BS + 12")}	3'-4"

Upstream (Elev. 1) = 643.99
Downstream (Elev. 2) = 641.34
Pr. Gr. at Tie Sta. = 651.71

& Rdwy at & Culvert = 2'-3" ft
Design (All units) = Max values 2 ft to 4 ft

		Final
Removal of Bridges	lump sum	1
Class B-1 Concrete (Culverts-Bridge)	cu. yard	123.2
Reinforcing Steel (Culverts-Bridge)	pound	27,700

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

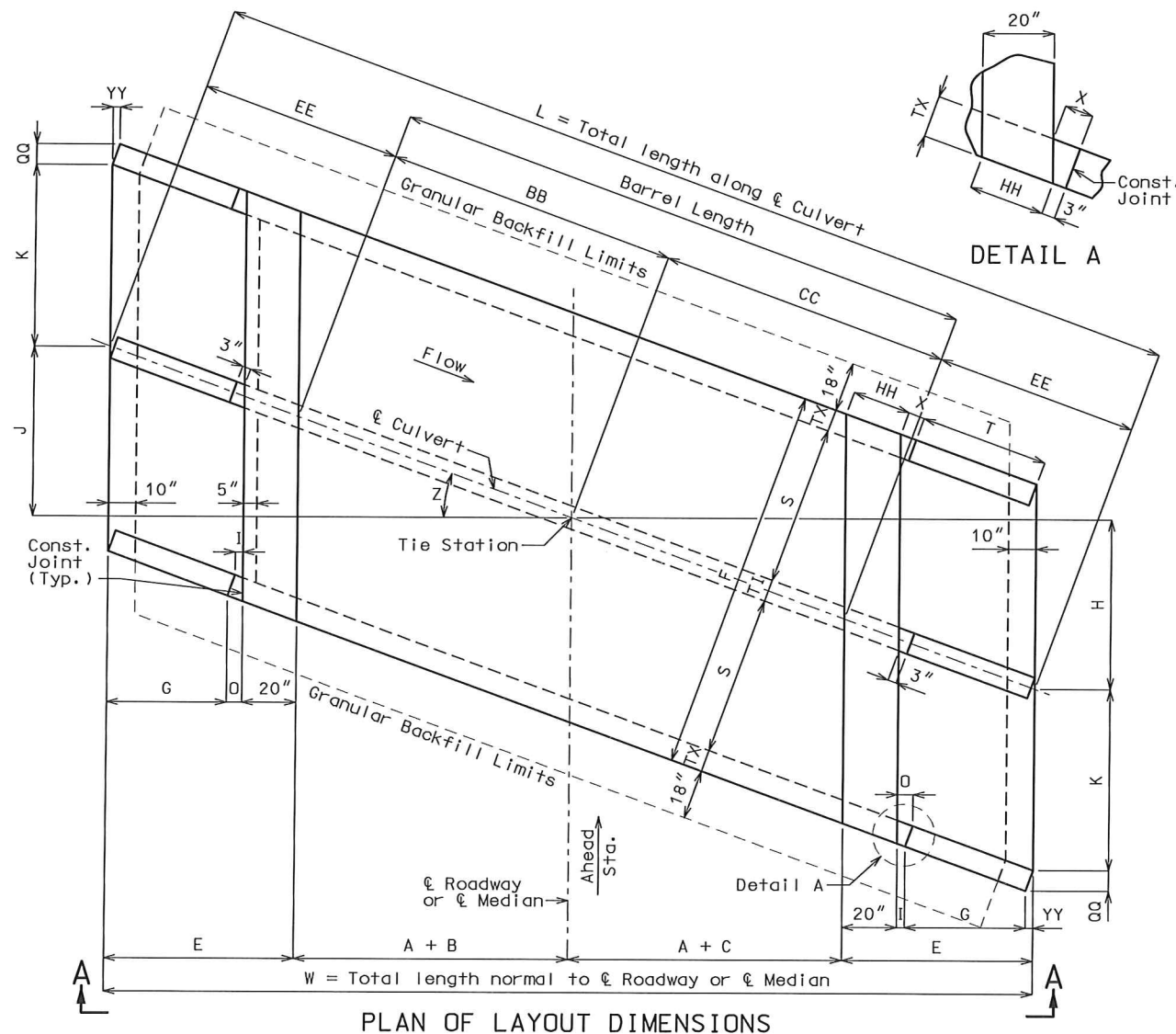
Miscellaneous:  
When alternate precast concrete box sections are used, the minimum distance from inside face of headwalls to precast sections measured along the shortest wall shall be 3 feet. Reinforcement and dimensions for wings and headwalls shall be in accordance with Missouri Standard Plans.

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.

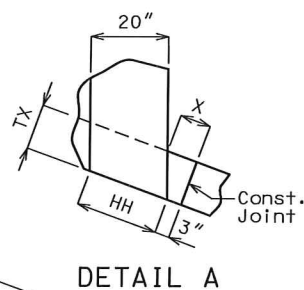
Station	Offset	F.L. Elev.
22+81.59	26.26' RT	644.50

B.M. PT. 6198  
N: 1720528.324  
E: 985666.304  
ELEV. 652.46

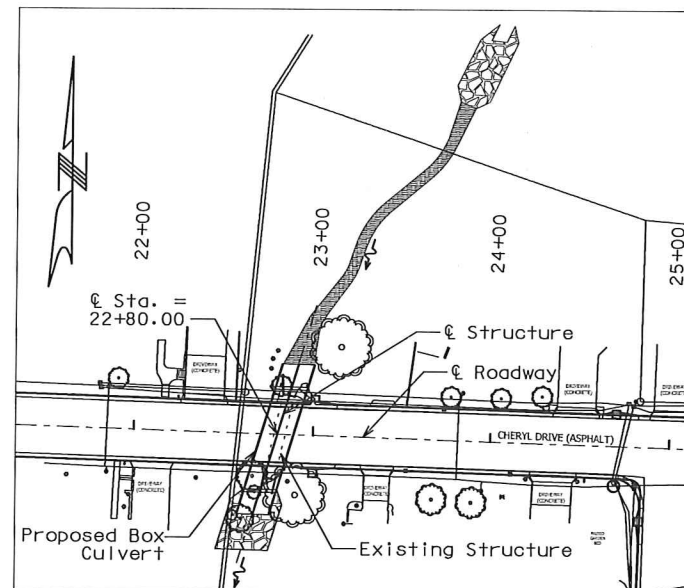
CULVERT: CHERYL DRIVE  
OVER DITCH  
TIE STA. 22+80.00



PLAN OF LAYOUT DIMENSIONS



DETAIL A



LOCATION SKETCH

Top Slab Reinforcement						Bottom Slab Reinforcement						Wall Reinforcement															
A1 Bars	J3 Bars		H1 Bars		H2 Bars	A2 Bars	J4 Bars		H3 Bars	B1 Bars	B2 Bars																
Sz. Spa.	Sz. Spa.	C1	K2	Sz. Spa.	C5	Sz. Spa.	C6	C4	K3	Sz. Spa.	C7	Sz. Spa.	Sz. Spa.	G1													
5	6	5	6.5	41.8	29.0	5	13	81.5	5	13	26.5	4	6	4	6	4	6	39.1	77	6	6	42.5	5	9.5	5	12	12

Substitute table for tables shown on Standard Plan 703.47

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

**Bartlett & West**

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CULVERT GEOMETRY  
CHERYL DRIVE STA. 22+80

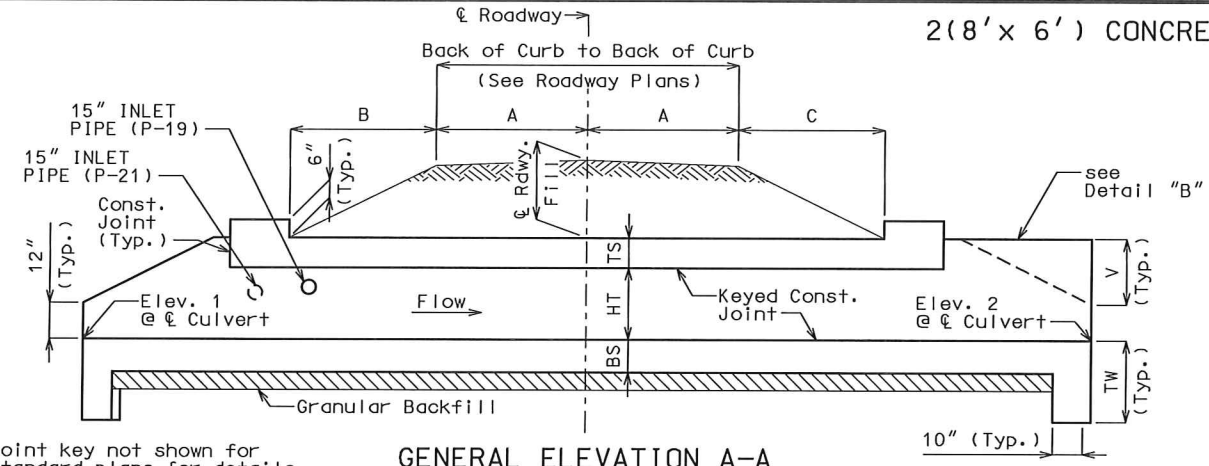
MEADOWBROOK ESTATES STORMWATER IMPROVEMENT PROJECT  
PROJECT NO. 2016-201-0  
COLE COUNTY, MISSOURI



STD. 703.37	SEALED DATE: 2/2/2018
STD. 703.42	DESIGNED BY: AKJ
STD. 703.46	DRAWN BY: TAA
STD. 703.47	APPROVED BY: TCK
STD. 703.60	DESIGN PROJ: 15937.600
STD. 706.35	SCALE: N/A
	DATE: FEBRUARY 2018
	DRAWING NO:
	SHEET NO: 39 of 44

2(8' x 6') CONCRETE BOX CULVERT

SEC/SUR 26 TWP 44N RGE 12W



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.

For details of retaining wall adjacent to northwest wing, see sheet Nos. ??-??

Var.	Equation	Dim.	Var.	Equation	Dim.	Var.	Equation	Dim.
S	---	8'-0"	F	2S + 2TX + TI	18'	W	2A + B + C + 2E	87'-7 5/8"
HT	---	6'-0"	G	2V	12'-2"	X	3" + TX(tan Z)	4 3/8"
TS	---	1'-1"	H	(A + C + E)(tan Z)	8'-4 3/8"	Z	Skew Angle	10°0'0"
BS	---	9"	I	3"(cos Z)	3"	BB	(A + B)(sec Z)	26'-4 7/8"
TX	---	8"	J	(A + B + E)(tan Z)	7'-1"	CC	(A + C)(sec Z)	33'-9 1/8"
TI	---	8"	K	(S + TI/2)(sec Z)	8'-5 1/2"	EE	E(sec Z)	14'-5"
A	---	18'-0"	L	2EE + BB + CC	88'-11 7/8"	HH	20"(sec Z)	1'-8 1/4"
B	---	8'-0"	O	I + YY	4 3/8"	QQ	TX(cos Z)	7 7/8"
C	---	15'-3"	T	G(sec Z)	12'-4 1/4"	YY	TX(sin Z)	1 3/8"
E	G + O + 20"	14'-2 3/8"	V	HT + TS - 12"	6'-1"	TW	Max{3'-4" or (BS + 12")}	3'-4"

Upstream (Elev. 1) = 631.84
Downstream (Elev. 2) = 629.24
Pr. Gr. at Tie Sta. = 639.67

℄ Rdwy at ℄ Culvert = 2'-10" ft
Design (All units) = Max values 2 ft to 4 ft

		Final
Removal of Bridges	lump sum	1
Class B-1 Concrete (Culverts-Bridge)	cu. yard	126.5
Reinforcing Steel (Culverts-Bridge)	pound	28,460

PIPE	Station	Offset	F.L. Elev.
P-19	11+09.76	21.00' LT	633.00
P-21	10+91.81	26.82' LT	632.50

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.)

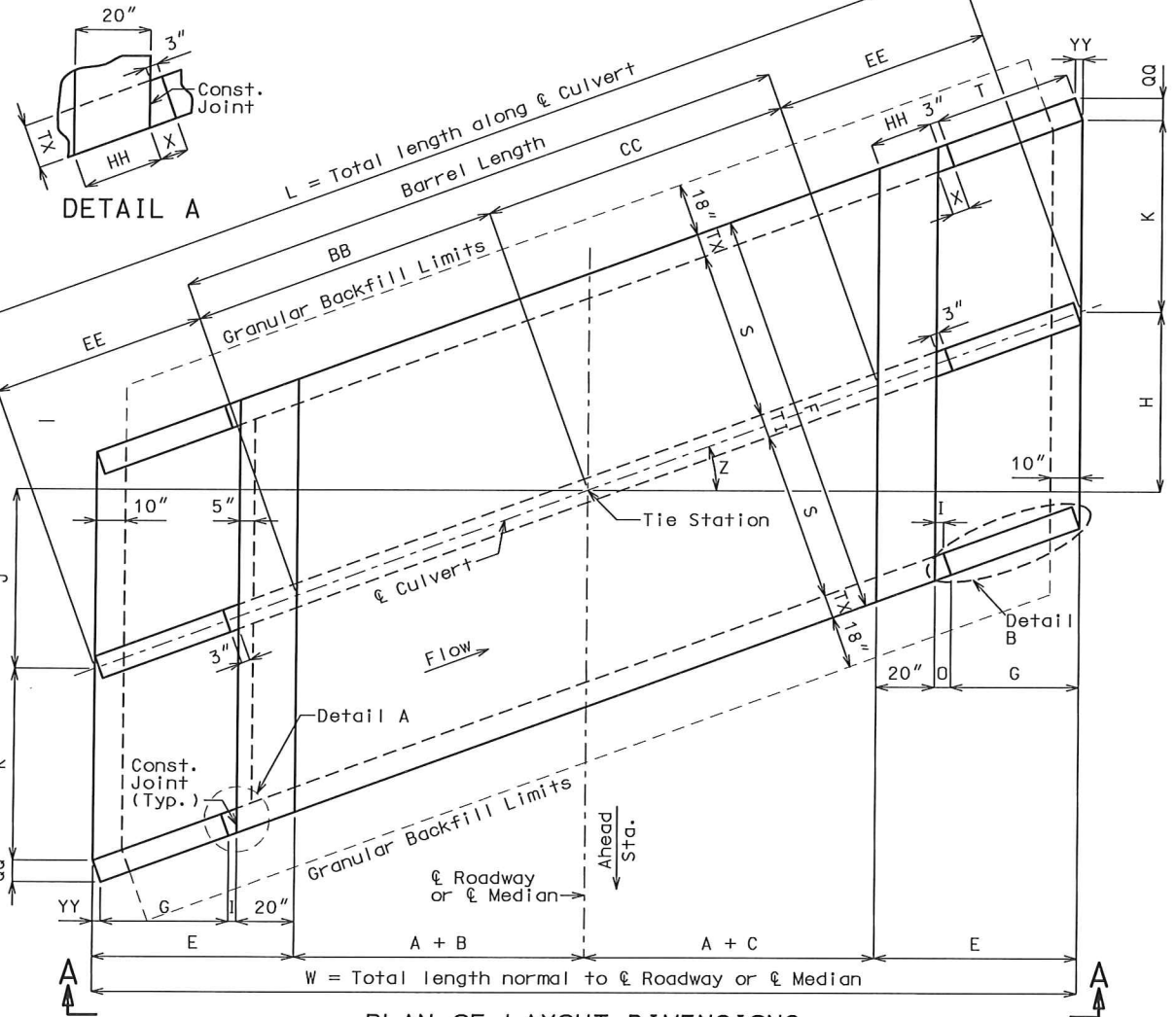
**Design Unit Stresses:**  
Class B-1 Concrete (Box Culvert) f'c = 4,000 psi  
Reinforcing Steel (Grade 60) fy = 60,000 psi

**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.

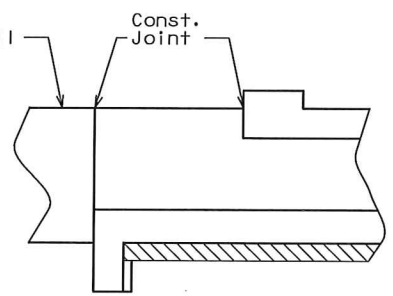
Channel bottom shall be graded within the right-of-way for transition of channel bed to culvert openings. Channel banks shall be tapered to match culvert openings.

B.M. PT. 6107  
N: 1720319.184  
E: 985188.718  
ELEV. 639.56

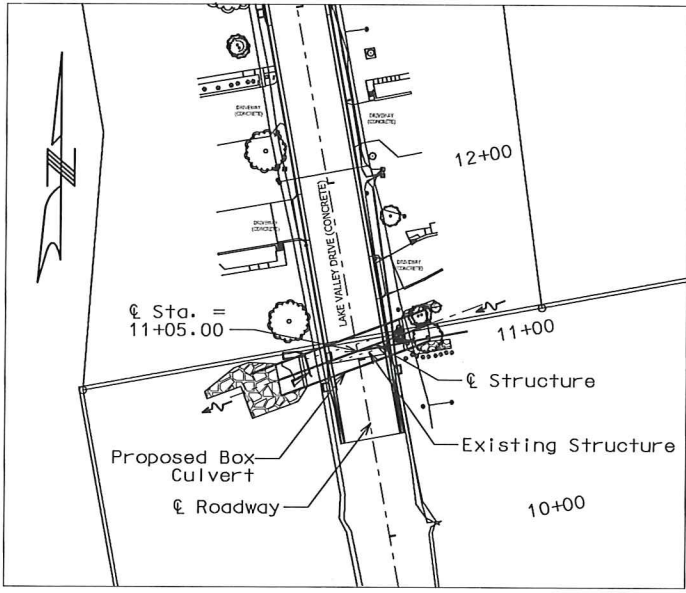
CULVERT: LAKE VALLEY DRIVE  
OVER DITCH  
TIE STA. 11+05.00



PLAN OF LAYOUT DIMENSIONS



**DETAIL B**  
Showing full-height wingwall adjacent to retaining wall.  
NOTE: Add additional reinforcement to full-height wingwall at the same size, spacing and clear cover as shown in Std 703.37 & Std 703.44



LOCATION SKETCH

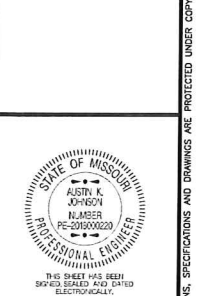
Top Slab Reinforcement						Bottom Slab Reinforcement						Wall Reinforcement						
A1 Bars			J3 Bars			A2 Bars			J4 Bars			B1 Bars		B2 Bars				
Sz.	Spa.	C1	Sz.	Spa.	C2	Sz.	Spa.	C3	Sz.	Spa.	C4	Sz.	Spa.	C5	Sz.	Spa.	C6	
5	6	5	6.5	41.8	29.0	5	13	81.5	5	13	26.5	4	6	4	6	39.1	77	
												6	6	42.5	5	9.5	5	12

Substitute table for tables shown on Standard Plan 703.47

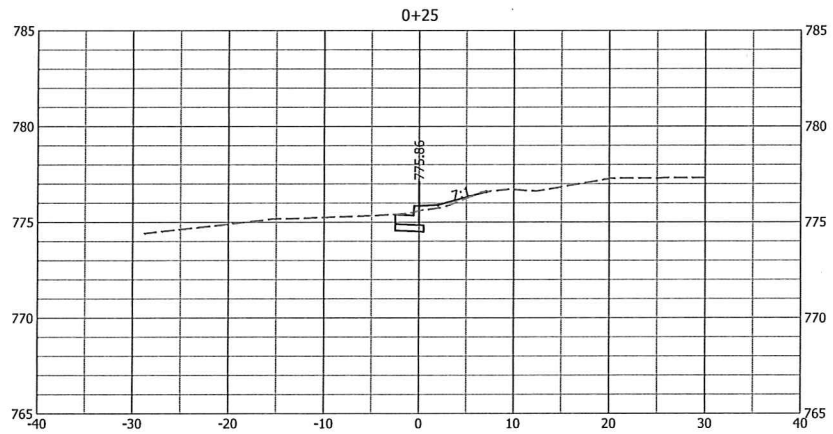
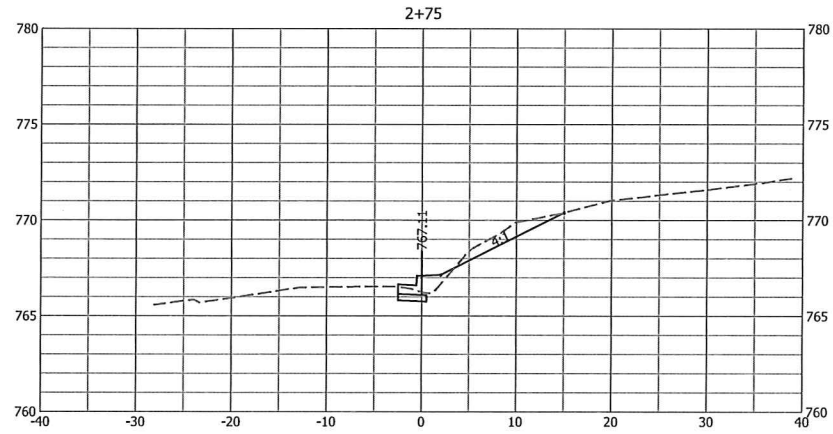
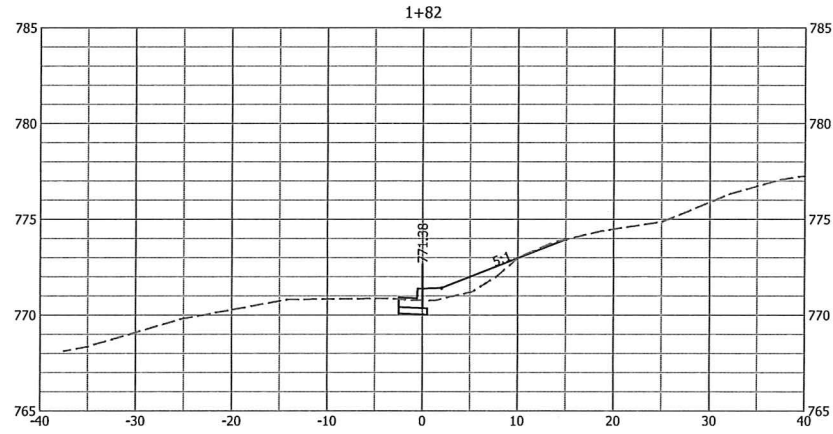
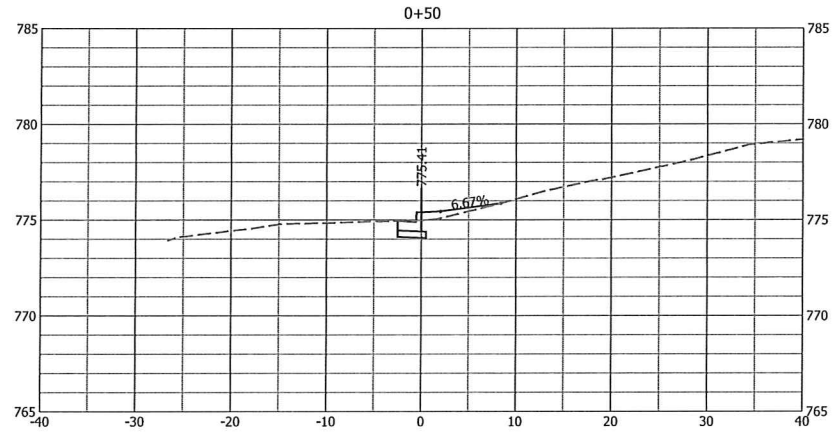
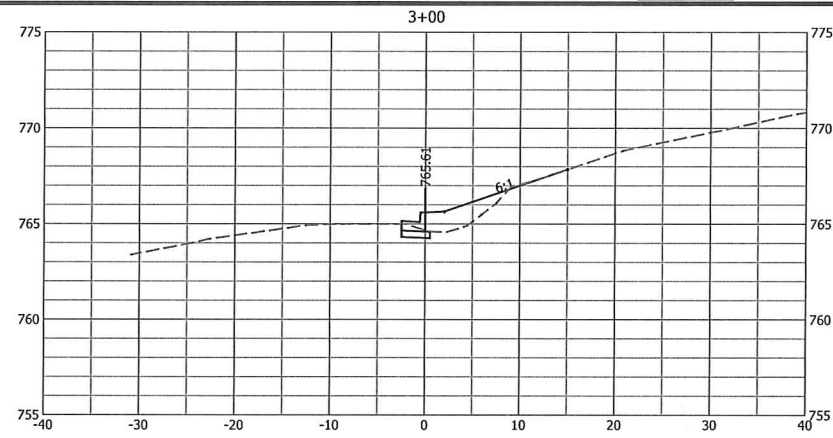
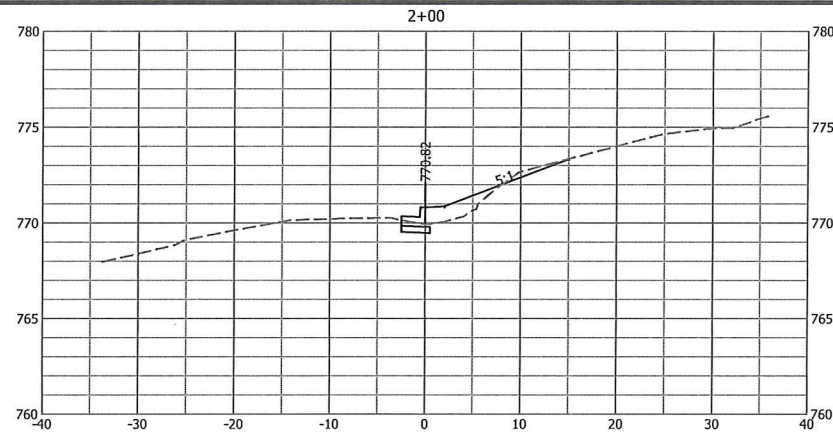
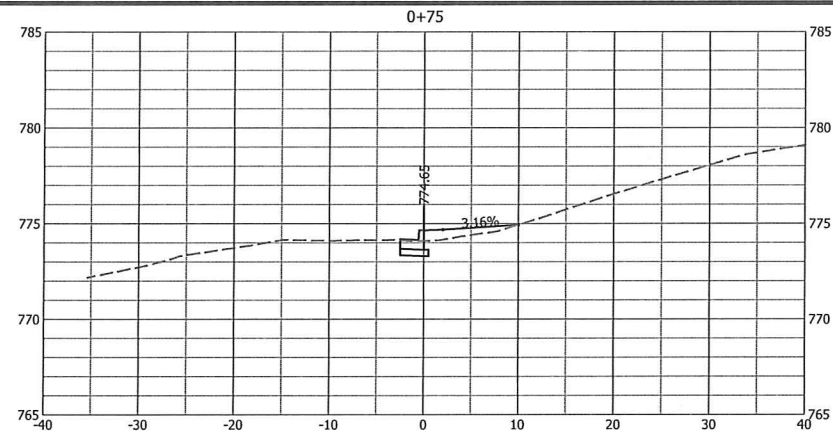
Note: This drawing is not to scale. Follow dimensions.

**Bartlett & West**  
1719 SOUTHBRIDGE DR., SUITE 100-JEFFERSON CITY, MO 65109-4000  
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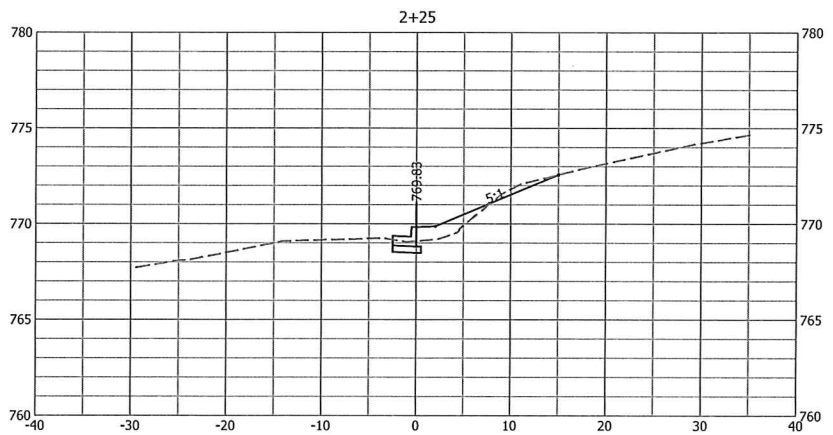
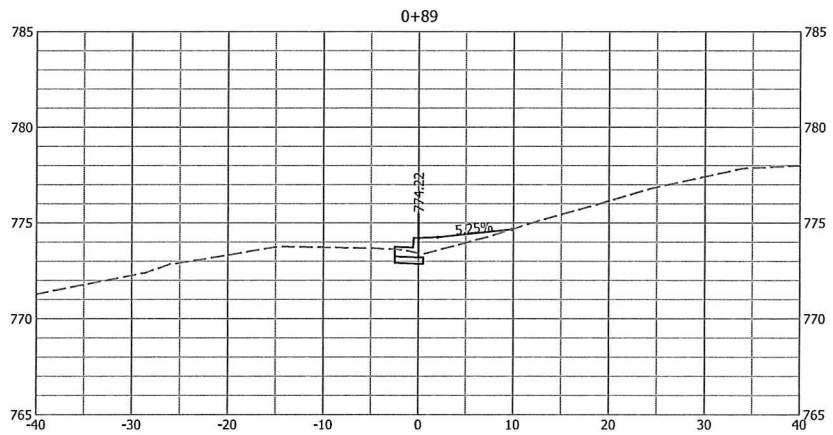
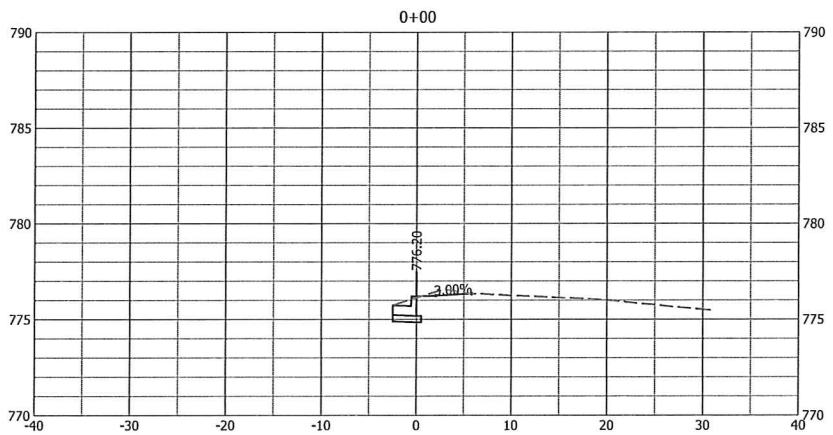
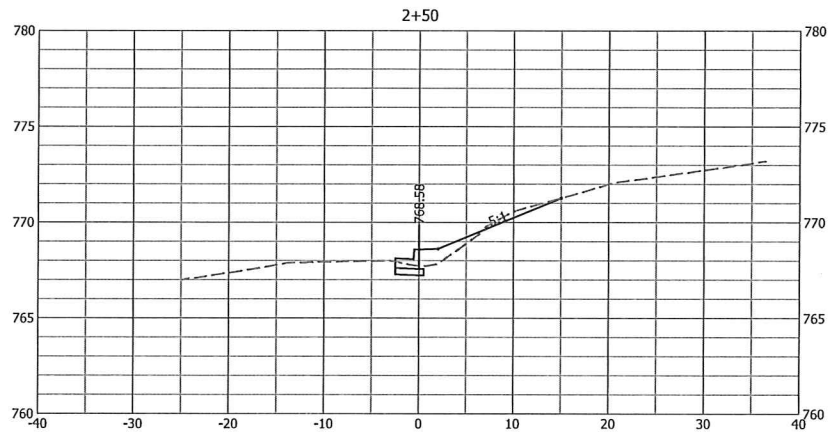
**CULVERT GEOMETRY**  
**LAKE VALLEY STA. 11+05.00**  
MEADOWBROOK ESTATES STORMWATER IMPROVEMENT PROJECT  
PROJECT NO. 2016-201-O  
COLE COUNTY, MISSOURI



STD. 703.37	SEALED DATE: 2/2/2018
STD. 703.44	DESIGNED BY: AKJ
STD. 703.46	DRAWN BY: TAA
STD. 703.47	APPROVED BY: TCK
STD. 703.60	DESIGN PROJ: 15937.600
STD. 706.35	SCALE: N/A
	DATE: FEBRUARY 2018
	DRAWING NO:
	SHEET NO: 40 of 44



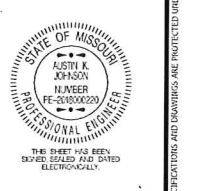
CHERYL DRIVE AND IDLEWOOD ROAD INTERSECTION.  
SEE INTERSECTION DETAILS, SHEET 34



NO.	DATE	DESCRIPTION

**Bartlett & West**  
 1719 SOUTHRIDGE DR., SUITE 100 - JEFFERSON CITY, MO 65109-4000  
 PHONE 573.634.3181 - FAX 573.634.7904  
 MISSOURI CERTIFICATE OF AUTHORITY NO. 000167 - ENGINEERING  
 WWW.BARTLETTWEST.COM

**CROSS SECTIONS  
 IDLEWOOD BACK OF CURB**  
 MEADOWBROOK ESTATES STORMWATER IMPROVEMENTS PROJECT  
 PROJECT NO. 2016-201-0  
 COLE COUNTY, MISSOURI



SEALED DATE:	02-02-2018
DESIGNED BY:	AKJ
DRAWN BY:	MKA
APPROVED BY:	TCK
DESIGN PROJ. NO.:	15937.600
DATE:	FEBRUARY 2018
DRAWING NO.:	
SHEET NO.:	41 of 44

Late edit on: Jan 31, 2018 by: AKJ01222 Drawing Name: c:\pvd\at\top\ak01\ak01222\dms225931\5937.600C\_X\_Sections - Idlewood.dwg Layout Name: X SECTIONS 01 Plotted By: AKJ01222 Plotted on: 2/2/2018 11:12:26 AM





TIME OF CONCENTRATION														
DA	Overland flow				Ditch/Channel Flow				Curb flow				Total Length	DA
	Length	Slope	C	Time	Length	Slope	Velocity	Time	Length	Slope	Velocity	Time		
1	54	7	0.30	5.53				0.00	455	12	15	0.51	509	6.04
2	46	9	0.30	4.70				0.00	415	12	15	0.46	461	5.16
3	100	6	0.30	7.92	380	12	15	0.42	91	1.5	7	0.22	571	8.57
4														
5	55	6	0.60	1.47				0.00	206	9	15	0.23	261	5.00
6	26	12	0.90	0.80				0.00	230	13	15	0.26	256	5.00
7	100	6	0.30	7.92	82	10	15	0.09	315	5	10	0.53	497	8.55
8	44	3	0.30	6.62				0.00	206	7	15	0.23	250	6.86
9	28	10	0.60	0.88				0.00	317	12	15	0.35	345	5.00
10	43	10	0.30	4.38				0.00	653	12	15	0.73	696	5.11
11	100	8	0.30	7.20	300	12	15	0.33	96	11	15	0.11	496	7.65
12	100	14	0.30	5.97	350	12	15	0.39				0.00	450	6.37
13	100	14	0.30	5.97	420	12	15	0.47	11	2	7	0.03	531	6.47
14	47	15	0.30	4.00				0.00	500	12	15	0.56	547	5.00
15														
16	100	10	0.30	6.68				0.00	154	6	15	0.17	254	6.86
17	20	2	0.90	1.28				0.00	280	7	15	0.31	300	5.00
18	100	15	0.30	5.84	35	9	15.00	0.04	83	2.5	10	0.16	228	6.04
19	100	10	0.30	6.68	235	12	15	0.26	400	8	15	0.44	735	7.39
20	56	9	0.30	5.18	210	18	15	0.23	310	2	10	0.52	576	5.94
21	44	3	0.30	6.62				0.00	140	1.5	7	0.33	184	6.96
22	57	3	0.60	4.71	287	6	10	0.48				0.00	344	5.19
23	94	3	0.30	9.68				0.00	87	3	7	0.21	181	9.89

INLET DESIGN																		
Drainage Area Information																		
Inlet	DS Inlet	Inlet Type	Area (acres)	Tc (min)	"C" Value	L (ft)	S <sub>prop</sub> (ft/ft)	S <sub>man</sub> (ft/ft)	"K" Value	10-Year								
										I (in/hr)	Q <sub>r</sub> (cfs)	Q (cfs)	D (ft)	W (ft)	Q <sub>i</sub> (cfs)	Q <sub>by</sub> (cfs)		
I-1	I-6	CI	0.63	6.04	0.70	4	0.13	0.0504	1.00	6.99	3.1	3.1	0.18	4.2	1.6	1.5		
I-2	I-5	CI	0.75	5.16	0.70	4	0.13	0.0538	1.00	7.17	3.7	3.7	0.20	4.3	1.7	2.0		
I-3	I-5	CI	2.68	8.57	0.50	4	0.03	0.1085	1.00	6.39	8.6	8.6	0.47	4.9	3.7	4.8		
I-4		MH	0.00	0.00	0.00				1.00	#N/A	#N/A	#N/A						
I-5	I-8	CI	0.18	5.00	0.85	4	0.136	0.02	1.00	7.20	1.1	8.0	0.18	9.7	2.1	5.9		
I-6	I-16	CI	0.11	5.00	0.80	4	0.12	0.015	1.00	7.20	0.6	8.0	0.17	11.8	2.2	5.8		
I-7	I-11	CI	1.59	8.55	0.40	4	0.089	0.013	1.00	6.39	4.1	4.1	0.13	10.7	2.0	2.1		
I-8	I-11	CI	0.32	6.86	0.80	4	0.089	0.042	1.00	6.74	1.7	1.7	0.15	4.1	1.2	0.6		
I-9	I-11	CI	0.11	5.00	0.90				1.00	7.20	0.7	0.7						
I-10	I-11	CI	1.31	5.11	0.60				1.00	7.18	5.6	5.6						
I-11	I-13	CI	1.31	7.65	0.60	4	0.085	0.039	1.00	6.57	5.2	7.8	0.25	7.1	2.5	5.3		
I-12	I-13	AI	1.00	6.37	0.40	4	0.06	0.066	1.00	6.89	2.7	2.7	0.22	4.0	1.7	1.0		
I-13	I-17	CI	1.63	6.47	0.40	4	0.06	0.066	1.00	6.86	4.5	9.8	0.36	6.0	3.0	6.7		
I-14	I-16	CI	0.82	5.00	0.55	4	0.072	0.02	1.00	7.20	3.3	3.3	0.15	8.0	1.8	1.4		
I-15		MH	0.00	0.00	0.00				1.00	#N/A	#N/A	#N/A						
I-16		CI	0.59	6.86	0.70	4	SUMP	0.02	1.00	6.74	2.8	10.0	0.12	6.6	10.0	0.0		
I-17		CI	0.33	5.00	0.80	4	SUMP	0.02	1.00	7.20	1.9	8.6	0.06	3.4	8.6	0.0		
I-18	I-20	CI	0.57	6.04	0.60	4	0.009	0.02	1.00	6.99	2.4	2.4	0.19	10.3	1.8	0.6		
I-19	I-21	CI	0.94	7.39	0.50	4	0.007	0.025	1.00	6.62	3.1	3.1	0.24	10.3	2.4	0.7		
I-20		CI	1.80	5.94	0.40	4	SUMP	0.02	1.00	7.01	5.0	5.6	0.00	0.6	5.6	0.0		
I-21		CI	0.46	6.96	0.70	4	SUMP	0.02	1.00	6.71	2.1	2.9	0.00	0.6	2.9	0.0		
I-22	I-23	CI	0.56	5.19	0.75	4	0.06	0.02	1.00	7.16	3.0	3.0	0.15	8.0	1.8	1.2		
I-23		CI	0.31	9.89	0.75	4	0.06	0.02	1.00	6.12	1.4	1.4	0.11	6.2	1.0	0.4		

Abbreviations:

- C = Runoff Coefficient
- Tc = Time of Conc. to Inlet
- L = Length of inlet
- Ch = Curb Inlet
- AI = Area Inlet
- ES = End Section
- I = Intensity of Rainfall, based on equations according to Table 5602.2, APWA 5600
- Qr = Peak Rate of Runoff (Qr=kcia)
- Qby = Runoff Bypassing Inlet
- Q = Runoff Reaching Inlet (Qr+Qby)
- Qi = Inlet Capacity (See Fig. 5604-2 through Fig. 5604-10, use Q to determine Qi, and multiply by 0.8)
- D = Depth of Gutter Flow (ft.), using Izzard Equation for inlets on grade, or Figure 5604-21 for sump inlets
- W = Width of Spread from Gutter (ft.)

PIPE DESIGN																																						
Pipe Layout				Drainage Area Information										Hydrology										Manning's Design Results														
Pipe Number	DS Pipe	Area (acres)	Sum A (acres)	Ti	Tc at US Pipe	US Branch	Tc (min)	"C" Value	C'A	Sum C'A	Design Storm (year)	Added Q (cfs)	Q (cfs)	Dia (in)	Pipe Type	Pipe Area (sq. ft.)	Conv. Factor	Length (ft)	US Invert	DS Invert	Slope (ft/ft)	Qf (cfs)	Vf (ft/s)	Q/Qf	V/Vf	D/Df	D (ft)	V (ft/s)	Ke	Top Elev of US Structure	Inlet Depth (ft)	Minor Head Loss (ft)	HGL @ US Invert	Min Slope	HGL @ DS Invert	Elev 6" below Opening	Height Remaining @ US	
P-1	P-2	0.63	0.63	6.04	6.04	0.06	6.10	0.00	6.04	0.70	0.44	0.44	10	3.1	15	RCP	1.227	64.7	33	724.00	722.50	4.55%	13.79	11.2	0.22	0.80	0.30	0.38	8.99	1.00	729.21	5.21	1.26	725.63	0.23%	722.88	728.71	3.08
P-2	P-4	0.75	1.38	5.16	6.10	0.06	6.16	8.10	6.10	0.70	0.52	0.96	10	6.8	15	RCP	1.227	64.7	58	722.00	715.00	12.07%	22.48	18.3	0.3	0.87	0.37	0.46	15.93	1.00	728.54	6.54	3.94	726.41	1.09%	715.46	726.79	0.38
P-3	P-4	2.68	2.68	8.57	8.57	0.03	8.60	0.00	8.57	0.50	1.34	1.34	10	8.6	15	RCP	1.227	64.7	24	717.00	715.00	8.33%	18.68	15.2	0.46	0.96	0.46	0.58	14.61	1.00	723.28	6.28	3.31	720.89	1.75%	715.58	721.53	0.64
P-4	P-5		4.06	0.00	8.60	0.11	8.71	8.60	8.60		0.00	2.30	10	14.7	15	RCP	1.227	64.7	130	714.50	697.75	12.88%	23.22	18.9	0.63	1.04	0.56	0.70	19.68	0.40	720.50	6.00	2.41	717.61	5.17%	698.45	718.75	1.14
P-5	P-6	0.18	4.24	5.00	8.71	0.20	8.91	8.71	8.71	0.85	0.15	2.46	10	15.6	15	RCP	1.227	64.7	251	697.25	661.00	14.44%	24.59	20.0	0.64	1.05	0.57	0.71	21.04	0.15	702.60	5.35	1.03	698.99	5.84%	661.71	700.85	1.86
P-6	P-15	0.11	0.11	5.00	8.91	0.07	8.97	8.91	8.91	0.80	0.09	2.55	10	16.1	15	RCP	1.227	64.7	69	680.00	654.00	8.70%	19.08	15.5	0.84	1.11	0.69	0.86	17.26	0.15	667.22	7.22	0.69	661.56	6.17%	654.86	665.47	3.91
P-7	P-8	1.59	1.59	8.55	8.55	0.06	8.61	0.00	8.55	0.40	0.63	0.63	10	4.1	15	RCP	1.227	64.7	30	690.50	689.50	3.33%	11.81	9.6	0.34	0.89	0.39	0.49	8.57	1.00	694.63	4.13	1.14	692.13	0.39%	689.99	692.88	0.75
P-8	P-11	0.32	1.91	6.86	8.61	0.23	8.84	8.61	8.61	0.80	0.25	0.89	10	5.7	15	RCP	1.227	64.7	190	689.00	671.00	9.47%	19.91	16.2	0.29	0.86	0.36	0.45	13.96	1.00	694.69	5.69	3.02	692.47	0.77%	671.45	692.94	0.47
P-9	P-10	0.11	0.11	5.00	5.00	0.07	5.07	0.00	5.00	0.90	0.10	0.10	10	0.7	15	RCP	1.227	64.7	52	691.00	683.00	15.38%	25.38	20.7	0.03	0.61	0.20	0.25	12.61	1.00	695.61	4.61	2.47	693.72	0.01%	683.25	693.86	0.14
P-10	P-11	1.31	1.42	5.11	5.11	0.11	5.22	5.07	5.11	0.60	0.78	0.88	10	6.5	15	RCP	1.227	64.7	93	679.75	671.00	9.41%	19.85	16.2	0.33	0.89	0.38	0.48	14.39	1.00	687.81	8.06	3.22	683.44	1.00%	671.48	686.06	2.62
P-11	P-13	1.31	3.22	7.65	8.84	0.21	9.04	8.84	8.84	0.60	0.79	1.68	10	10.6	15	RCP	1.227	64.7	189	670.50	655.50	7.94%	18.23	14.9	0.58	1.03	0.54	0.68	15.30	1.00	678.14	7.64	3.63	674.81	2.69%	656.18	676.39	1.58
P-12	P-13	1.00	1.00	6.37	6.37	0.09	6.46	0.00	6.37	0.40	0.40	0.40	10	2.8	15	RCP	1.227	64.7	56	659.00	655.50	6.25%	16.18	13.2	0.17	0.75	0.27	0.34	9.89	1.00	666.99	7.99	1.52	660.85	0.18%	655.84	665.24	4.39
P-13	P-15	1.63	4.85	6.47	9.04	0.02	9.06	9.04	9.04	0.40	0.65	2.33	10	14.6	18	RCP	1.767	105.1	21	655.00	653.50	7.04%	27.89	15.8	0.53	1.01	0.51	0.77	15.94	1.00	663.07	8.07	3.95	659.71	1.94%	654.27	661.32	1.61
P-14	P-15	0.82	0.82	5.00	5.00	0.08	5.08	0.00	5.00	0.55	0.45	0.45	10	3.3	15	RCP	1.227	64.7	35	655.00	654.00	2.86%	10.94	8.9	0.3	0.87	0.37	0.46	7.75	1.00	659.31	4.31	0.93	656.40				