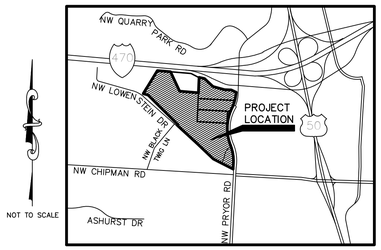
MASS GRADING PLAN
FOR
STREETS OF WEST PRYOR
LEE'S SUMMIT, MISSOURI

JANUARY 2019

LEGEND

- SECTION CORNER, ORIGIN UNKNOWN UNLESS OTHERWISE NOTED
- MONUMENT FOUND, ORIGIN UNCERTAIN UNLESS OTHERWISE NOTED
- (D) DESCRIBED
- (M) MEASURED
- (C) CALCULATED
- (P) PLATTED
- STREET SIGN
- CANOPY SUPPORT
- UTILITY POLE
- LP UTILITY POLE W/ LIGHT
- UTILITY POLE W/TRANSFORMER
- LIGHT POLE
- DEADMAN ANCHOR
- (5) OU OVERHEAD UTILITY – # LINES
- AIR CONDITIONING UNIT
- ELECTRIC PEDESTAL
- E ELECTRIC METER
- T ELECTRIC TRANSFORMER
- BB BREAKER BOX
- E UNDERGROUND ELECTRIC LINE
- UTILITY MANHOLE
- CTV CABLE TV SIGN
- CP CABLE TV PEDESTAL
- GAS SIGN
- G GAS METER
- G UNDERGROUND GAS LINE
- GTS GAS CATHODIC PROTECTION STATION
- W WATER LINE
- WATER LINE GATE VALVE
- WS WATER SPIGOT
- W WATER METER
- WELL
- FIRE HYDRANT
- SV SPRINKLER VALVE
- S SANITARY SEWER MANHOLE
- S SANITARY SEWER LINE
- CO SANITARY SEWER CLEANOUT
- STORM SEWER MANHOLE
- TELEPHONE SIGN
- TELEPHONE MANHOLE
- TELEPHONE PEDESTAL
- T UNDERGROUND TELEPHONE LINE
- SPLICE BOX
- FOC FIBER OPTIC CABLE SIGN
- FOC UNDERGROUND FIBER OPTIC CABLE
- TRAFFIC CONTROL POLE
- P PULL BOX
- FLAG POLE
- MB MAILBOX
- ADA HANDICAP SIGN
- HANDICAP PAINTED SYMBOL
- LEFT TURN ARROW
- STRAIGHT ARROW
- RIGHT TURN ARROW
- GP GATE POST
- FENCE POST
- WOOD FENCE
- CHAIN LINK FENCE
- BARBED WIRE FENCE
- 18" DECIDUOUS TREE W/SIZE & DRIP LINE
- 22" EVERGREEN TREE W/SIZE & DRIP LINE
- SAP SAPPLING TREE
- SHRUB
- STUMP
- TREE LINE
- SHRUB LINE
- 10 PARKING STALL COUNT
- 970 1' CONTOUR INTERVAL
- RESTRICTED ACCESS
- B/B BACK OF CURB TO BACK OF CURB
- E/E EDGE TO EDGE



LOCATION MAP
CITY OF LEE'S SUMMIT, MISSOURI

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UTILITY STATEMENT:
THE UNDERGROUND UTILITIES SHOWN HEREON ARE FROM FIELD SURVEY INFORMATION OF ONE–CALL LOCATED UTILITIES, FIELD SURVEY INFORMATION OF ABOVE GROUND OBSERVABLE EVIDENCE, AND/OR THE SCALING AND PLOTTING OF EXISTING UTILITY MAPS AND DRAWINGS AVAILABLE TO THE SURVEYOR AT THE TIME OF SURVEY. THE SURVEYOR MAKES NO GUARANTEE THAT THE UNDERGROUND UTILITIES SHOWN COMPRISE ALL SUCH UTILITIES IN THE AREA, EITHER IN SERVICE OR ABANDONED. FURTHERMORE, THE SURVEYOR DOES NOT WARRANT THAT THE UNDERGROUND UTILITIES SHOWN ARE IN THE EXACT LOCATION INDICATED ALTHOUGH HE DOES CERTIFY THAT THEY ARE LOCATED AS ACCURATELY AS POSSIBLE FROM INFORMATION AVAILABLE. THE SURVEYOR HAS NOT PHYSICALLY LOCATED THE UNDERGROUND UTILITIES BY EXCAVATION UNLESS OTHERWISE NOTED ON THIS SURVEY.

CAUTION – NOTICE TO CONTRACTOR
THE CONTRACTOR IS SPECIFICALLY CAUTIONED THAT THE LOCATION AND/OR ELEVATION OF EXISTING UTILITIES AS SHOWN ON THESE PLANS IS BASED ON RECORDS OF THE VARIOUS UTILITY COMPANIES AND, WHERE POSSIBLE, MEASUREMENTS TAKEN IN THE FIELD. THE INFORMATION IS NOT TO BE RELIED ON AS BEING EXACT OR COMPLETE. THE CONTRACTOR MUST CALL THE APPROPRIATE UTILITY COMPANY AT LEAST 72 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO RELOCATE ALL EXISTING UTILITIES WHICH CONFLICT WITH PROPOSED IMPROVEMENTS SHOWN ON THE PLANS.
THE CONTRACTOR SHALL EXPOSE EXISTING UTILITIES AT LOCATIONS OF POSSIBLE CONFLICTS PRIOR TO ANY CONSTRUCTION.

SAFETY NOTICE TO CONTRACTOR
IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR WILL BE SOLELY AND COMPLETELY RESPONSIBLE FOR CONDITIONS OF THE JOB SITE, INCLUDING SAFETY OF ALL PERSONS AND PROPERTY DURING PERFORMANCE OF THE WORK. THIS REQUIREMENT WILL APPLY CONTINUOUSLY AND NOT BE LIMITED TO NORMAL WORKING HOURS.

WARRANTY / DISCLAIMER
THE DESIGNS REPRESENTED IN THESE PLANS ARE IN ACCORDANCE WITH ESTABLISHED PRACTICES OF CIVIL ENGINEERING FOR THE DESIGN FUNCTIONS AND USES INTENDED BY THE OWNER AT THIS TIME. HOWEVER, NEITHER KAW VALLEY ENGINEERING, INC NOR ITS PERSONNEL CAN OR DO WARRANTY THESE DESIGNS OR PLANS AS CONSTRUCTED, EXCEPT IN THE SPECIFIC CASES WHERE KAW VALLEY ENGINEERING PERSONNEL INSPECT AND CONTROL THE PHYSICAL CONSTRUCTION ON A CONTEMPORARY BASIS AT THE SITE.

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
1-16-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
PROFESSIONAL ENGINEER

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rebeccadavis@google.com

CALL BEFORE YOU DIG – DRILL – BLAST
1–800–344–7483
(TOLL FREE)
MISSOURI ONE CALL SYSTEM, INC.

DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=985.05

BM #2: CHISELED "SQUARE" ON NORTHWEST CORNER AREA INLET, 25'± EAST OF CURB LINE AND ON–LINE WITH SOUTH CURB OF LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

LEON D. OSBOURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
TITLE SHEET

PROJ. NO. A14_7067–1
DESIGNER LDO | DRAWN BY JT
CFN 7067–1G_TS
SHEET C–1 | REV 0

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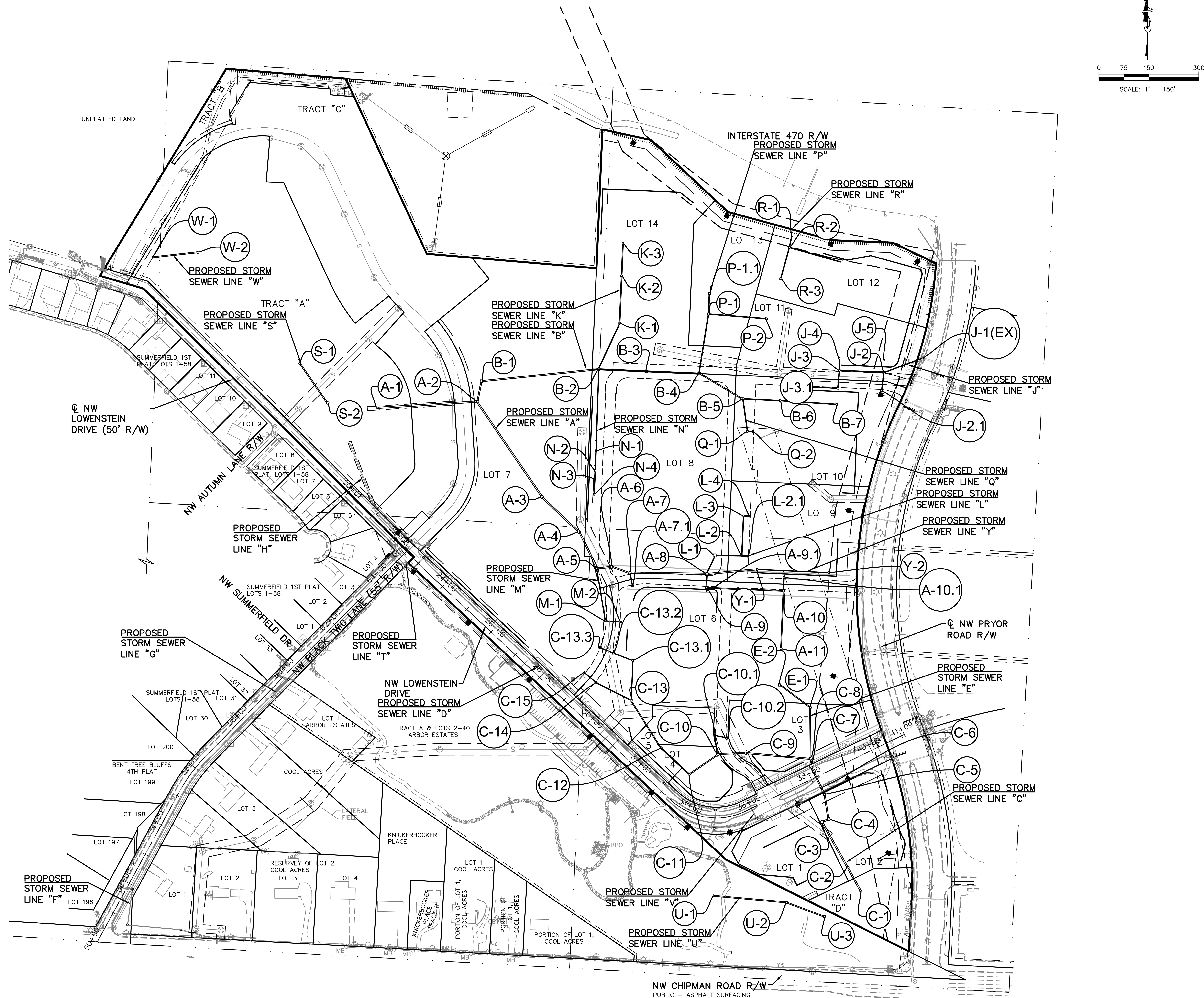

PUBLIC WATER AND SANITARY SEWER ARE BY SEPARATE PLANS

REV	DATE	DESCRIPTION
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DSN LDO · DWN JT · CHK LDO

STATE OF MISSOURI · LEON D. OSBOURN · NUMBER E-21726 · REGISTERED PROFESSIONAL ENGINEER · 1-6-19

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ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GENERAL LAYOUT SHEET

PROJ. NO. A14_7067-1
DESIGNER LDO
DRAWN BY JT
CFN 7067-1G_GLS
SHEET C-2
REV 0

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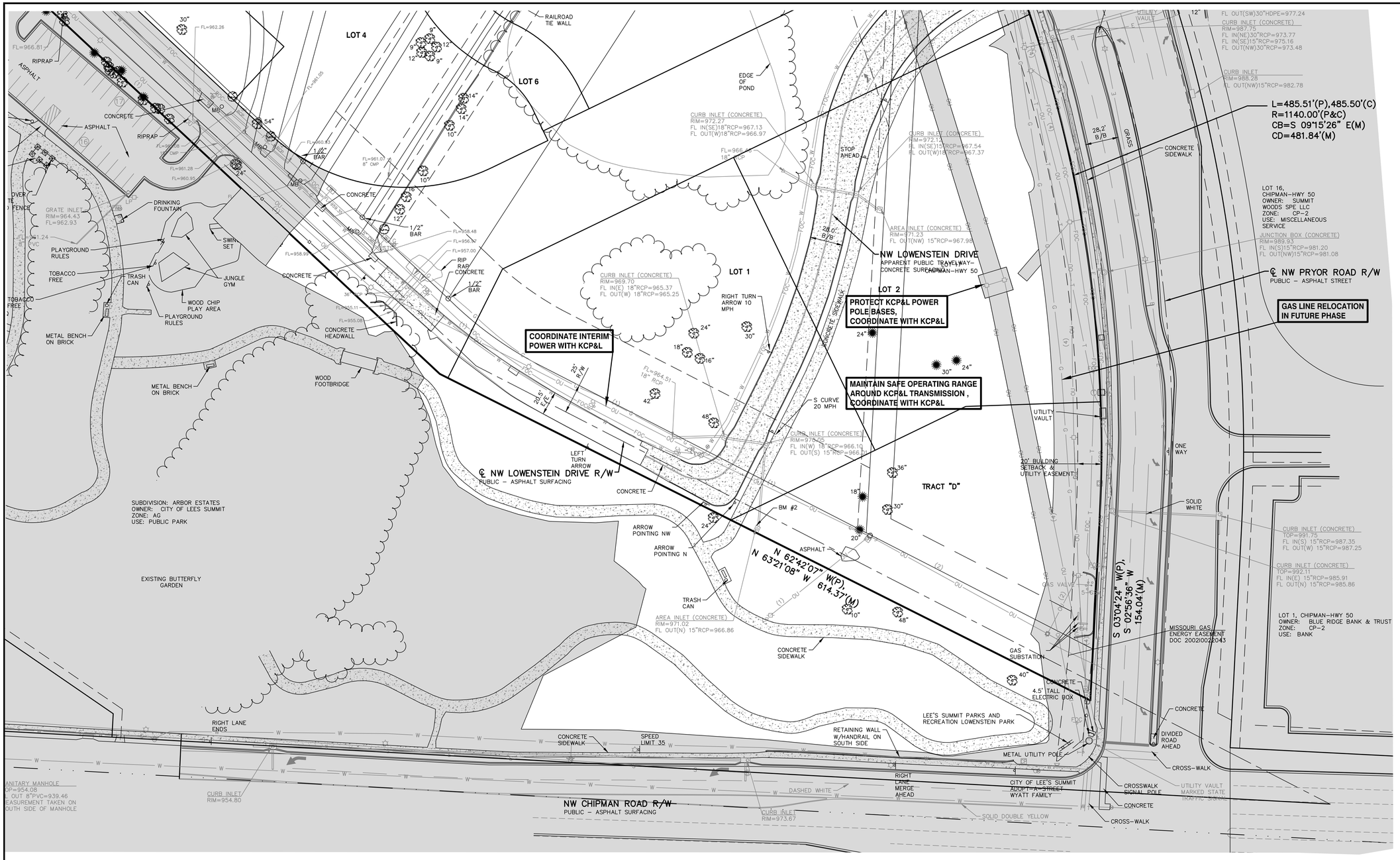

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GENERAL NOTES:

1. CONTRACTOR SHALL VERIFY SITE CONDITIONS PRIOR TO BIDDING. CONTRACTOR SHALL REMOVE ALL BUILDINGS, UTILITIES, PAVEMENT, FOUNDATIONS, FENCES, CURBS AND ALL OTHER STRUCTURES FROM WITHIN PROPERTY LINES EXCEPT AS DESIGNATED "TO REMAIN" OR "TO BE REMOVED BY OTHERS", IN ACCORDANCE WITH THE SPECIFICATIONS AND THE CITY OF LEE'S SUMMIT AND STATE REGULATIONS. SITE CONDITIONS SHOWN WERE AS OF MARCH 30, 2018.

2. ALL UTILITY PIPE LINES TO BE ABANDONED SHALL BE PLUGGED PER CITY AND STATE REGULATIONS.

3. DRIVES, PAVING AND OTHER STRUCTURES ON STREET OR HIGHWAY RIGHT–OF–WAY SHALL BE REMOVED AS NECESSARY TO CONSTRUCT IMPROVEMENTS SHOWN ON THESE PLANS. REMOVAL AND DISPOSAL SHALL BE IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

4. ALL PAVING WITHIN PROPERTY TO BE REMOVED AND DISPOSED OF IN CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

5. ALL EXISTING UTILITIES ETC. LOCATED WITHIN THE BOUNDARIES OF THE PROPOSED BUILDING SHALL BE COMPLETELY REMOVED TO 10 FEET OUTSIDE OF BUILDING LINE.

6. ALL HAZARDOUS ASBESTOS AND OTHER HAZARDOUS MATERIALS MUST BE IDENTIFIED AND REMOVED PRIOR TO ANY BUILDING DEMOLITION, IN STRICT CONFORMANCE WITH LOCAL, STATE AND FEDERAL REGULATIONS.

7. CONTRACTOR SHALL VERIFY THAT ALL UTILITIES TO EXISTING STRUCTURES HAVE BEEN DISCONNECTED PRIOR TO COMMENCING DEMOLITION.

8. EXISTING POWER LINES AND APPURTENANCES TO BE RELOCATED BY KANSAS POWER & LIGHT.

9. TREE LINES AND INDIVIDUAL TREES SHOWN ARE BASED ON ORIGINAL SURVEY. INITIAL CLEARING AND GRUBBING HAS BEEN COMPLETED. CONTRACTOR SHALL REMOVE ANY ADDITIONAL TREES AND SHRUB IN AREAS INDICATED FOR GRADING AND DEMOLITION.

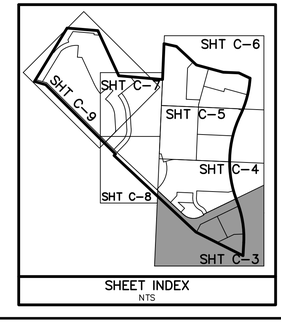
10. COORDINATE WITH KAW VALLEY ENGINEERING PRIOR TO REMOVAL OF SECTION MONUMENTS AND PROPERTY PINS. KAW VALLEY ENGINEERING WILL RESET NECESSARY MONUMENTS WITHIN THE DISTURBED AREAS FOLLOWING DEMOLITION. CARE SHALL BE TAKEN TO PRESERVE PROPERTY PINS ALONG THE OUTSIDE PERIMETER OF THE SITE.

11. CONTRACTOR SHALL OBTAIN DEMOLITION PERMITS FOR EACH INDIVIDUAL HOUSE WITHIN THE AREA SHOWN. ALL SERVICE LINE SHUT–OFFS, WELL PLUGGING, SEPTIC TANK REMOVALS AND OTHER UTILITY REMOVALS SHALL BE HANDLED IN ACCORDANCE WITH STATE AND CITY CODES.

12. KCPL TRANSMISSION MAIN SHALL REMAIN IN PLACE DURING DEMOLITION. FOLLOW ALL KCPL REQUIREMENTS CONCERNING WORK IN THEIR EASEMENT AND IN PROXIMITY TO THEIR LINES, INCLUDING PROTECTION OF POLES AND SAFE WORKING DISTANCES FROM LINES.

LEGEND

NOT A PART OF DEMOLITION ACTIVITIES



SHEET INDEX
NTS

DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

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LDO CHK
JT DWN
LDO DSN

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
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MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO.	A14_7067–1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067–1G_DEMO
SHEET	C–3
REV	0

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HOUSE REMOVAL

PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L

MAINTAIN SAFE OPERATING RANGE AROUND KCP&L TRANSMISSION , COORDINATE WITH KCP&L

LOT 8

LOT 9

LOT 1
PRYOR ACRES

LOT 7

LOT 5

LOT 4

LOT 6

LOT 1

LOT 2
CORLEW'S ESTATE

UTILITY EASEMENT
I-940472, BOOK I1962, PAGE 1148
(ESMT NO. 2)

100' ELECTRIC EASEMENT
DOC. NO. I34200
BK I864, PG 244

100' ELECTRIC EASEMENT
DOC. NO. I34200
BK I864, PG 244

20' UTILITY EASEMENT

15' UTILITY EASEMENT
DOC. NO. I940472
BK I1962, PG 1148

30' RESIDENTIAL ROAD EASEMENT
DB 1220, PG 56
RELEASED IN DOC 756725 BK 1481 PG 537 PER ITEM 10
LIPCAN SURVEY

10' UTILITY EASEMENT
(PER CORLEW PLAT)

100' ELECTRIC EASEMENT
DOC. NO. I57841
BK 1496, PG 527

℄ NW PRYOR ROAD
(120' R/W)
PUBLIC – ASPHALT STREET

TRACT D
CHIPMAN HWY. 50

ONE WAY

60' R/W

SOLID WHITE LINE

SCALE: 1" = 40'

1.5" ALUM CAP
LS 78D MO

SOUTH LINE LOT 1

SMOOTH WIRE FENCE

1/2" BAR

1/2" BAR FOUND
1.96' E & 0.89' S

3/8" BAR

CHAIN LINK FENCE

5' FENCE

SMOOTH WIRE FENCE

SHED

HOUSE

WOOD DECK

CONCRETE

WOOD RETAINING WALL

CONCRETE SIDEWALK

RAILROAD TIE RETAINING WALL

CONCRETE RETAINING WALL

CONCRETE RETAINING WALL W/STEPS

UTILITY VAULT

TRAFFIC SIGNAL VAULT

ELECTRIC BOX ON CONCRETE

UTILITY VAULT ON CONC. PAD

UNPLATTED LAND

NW LOWENSTEIN DRIVE
PUBLIC – ASPHALT SURFACING

ASPHALT DRIVE

CONCRETE DRIVE

GRAVEL DRIVE

RAILROAD TIE WALL

EDGE OF POND

PRIVATE DRIVE
(ASPHALT SURFACE)

CONCRETE ENTRANCE

RAMP

STOP/EXIT TO CHIPMAN LEFT ARROW

STOP BAR

CROSS-WALK

S CURVE 20 MPH

STOP

HANDICAP RAMP

UTILITY VAULT FOR AT&T

PULL BOX FOR LIGHTING

STREET LIGHTING VAULT

JUNCTION BOX (CONCRETE)
TOP=981.83
FL IN(SW) 36"RCP=969.03
FL OUT(SE) 36"RCP=969.4

JUNCTION BOX (CONCRETE)
TOP=984.36
FL IN(S)36"RCP=967.24
FL IN(E)15"RCP=967.46
FL OUT(N)36"RCP=967.11

CURB INLET (CONCRETE)
TOP=984.11
FL OUT(W) 15"RCP=969.58

JUNCTION BOX (CONCRETE)
TOP=986.22
FL IN(SE)30"RCP=969.44
FL IN(E)30"RCP=969.67
FL OUT(N)36"RCP=969.33

JUNCTION BOX (CONCRETE)
TOP=981.45
FL IN(E) 30"RCP=970.75
FL OUT(W) 30"RCP=970.75

CURB INLET (CONCRETE)
RIM=972.27
FL IN(SE)18"RCP=967.13
FL OUT(W)18"RCP=966.97

CURB INLET (CONCRETE)
RIM=969.70
FL IN(E) 18"RCP=965.37

GRATE INLET
RIM=964.43
FL=962.93

FL=970.04

FL=966.81

FL=962.26

FL=961.28

FL=960.93

FL=961.07
8" CMP

FL=960.65

FL=966.22

FL=964.89

FL=966.44
18" CMP

FL=958.48

FL=956.62

FL=957.00

FL=958.56

FL=961.24
8" PVC

RIPRAP

ASPHALT

CONCRETE

TRASH CAN

ACCESSIBLE RAMP

CONC

CANOPY OVER CONCRETE W/WOOD FENCE

DRINKING FOUNTAIN

PLAYGROUND RULES

TOBACCO FREE

TRASH CAN

SWING SET

JUNGLE GYM

PARK BENCH ON CONC & BRICK W/TRASH CAN

RIP RAP CONCRETE

1/2" BAR

12" CMP

UTILITY VAULT

TRASH CAN

WALL

NCRETE

SHEET INDEX
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SHEET C-4 | REV 0

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LOT 14

LOT 7

7.5' UTILITY EASEMENT

E LINE OF THE W 1/2 OF SE 1/4, SEC 35 PER OLSON SURVEY AND ERICKSON ACRES 1ST PLAT

1/2" BAR W/KS LS 114 MO LC 366 CAP

7.5' UTILITY EASEMENT (PER PLAT)

LOT 1
ERICKSON ACRES, 1ST PLAT

LOT 11

ELECTRIC OVERHUNG EASEMENT (NO WIDTH SPECIFIED)
BK 985, PG 124

2 STRAND BARBED WIRE

4 STRAND BARBED WIRE

SMOOTH WIRE FENCE

UNPLATTED LAND

LOT 10

LOT 9

100' MISSOURI PUBLIC SERVICE CO EASEMENT
DOC NO 757841,
BK 1484, PG 527

1" OD PIPE

5 STRAND

LOT 8

LOT 9

PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L

MAINTAIN SAFE OPERATING RANGE AROUND KCP&L TRANSMISSION , COORDINATE WITH KCP&L

48" 60

LOT 1
PRYOR ACRES

100' ELECTRIC EASEMENT
DOC. NO. 134200
BK 1864, PG 244

SOUTH LINE

SMOOTH WIRE FENCE

1/2" BAR

L=1040.70'(P), 1040.64'(C)
R=1260.00'(P&C)
CB=S 02°12'10" W(M)
CD=1011.31'(M)

20' UTILITY EASEMENT (PER PLAT)
30' BUILDING LINE (PER PLAT)

SANITARY MANHOLE
TOP=972.71
FL IN(S) 8"PVC=964.75
FL OUT(E) 8"PVC=964.66

TRAFFIC SIGNAL MANHOLE

TRAFFIC SIGNAL VAULT

CONCRETE

4.5' TALL ELECTRIC BOX

CURB INLET (CONCRETE)
TOP=973.35
FL IN(S) 42"RCP=960.45
FL IN(E) 30"RCP=961.25
FL OUT(N) 42"RCP=960.40

1/2" BAR OLSSON CAP

1/2" BAR W/OLSSON KSLC 114 MO LC 366 CAP

SANITARY MANHOLE
TOP=975.91
FL IN(S) 8"PVC=966.22
FL OUT(N) 8"PVC=966.16

SANITARY MANHOLE
TOP=978.45
FL IN(S) 8"PVC=970.73
FL OUT(N) 8"PVC=970.60

CURB INLET (CONCRETE)
TOP=978.69
FL IN(S) 36"RCP=962.67
FL IN(E) 18"RCP=968.17
FL OUT(N) 42"RCP=962.17

CONC

TRAFFIC SIGNAL VAULT

TRACT C
CHIPMAN-HWY 50

20' PRIVATE ACCESS EASEMENT (PER PLAT)

SANITARY MANHOLE
TOP=980.28
FL OUT(N) 8"PVC=972.78

UTILITY EASEMENT I-940472, BOOK 11962, PAGE 1148 (ESMT NO. 2)

7.50'

JUNCTION BOX (CONCRETE)
TOP=981.83
FL IN(SW) 36"RCP=965.03
FL OUT(SE) 36"RCP=964.44

20' UTILITY EASEMENT

℄ NW PRYOR ROAD (120' R/W)
PUBLIC - ASPHALT STREET

DASHED WHITE

TRAFFIC SIGNAL MANHOLE

TRAFFIC SIGNAL VAULT

JUNCTION BOX
TOP=971.21
FL IN(SW) 42"R
FL OUT(SE) 42

JUNCTION BOX (C
TOP=991.22
FL IN(W) 42"RCP=
FL OUT(E) 42"RCI

TRACT B-1, CHIPMAN-H
OWNER: SUMMIT WOOD
ZONE: CP-2
USE: COMMERCIAL IMPF

JUNCTION 470

EDGE OF LANDSCAPING

CHISELED "X" FOUND

CONCRETE PAD 10"

DIVIDED ROADWAY AHEAD

RAMP

EDGE OF LANDSCAPING

SUMMIT WOODS CROSSING

PAINTED DASHED WHITE LINE

PAINTED SOLID WHITE LINE

SANITARY MANHOLE
TOP=971.87
FL IN(W) 8"PVC=953.92
FL IN(E) 8"PVC=952.92
FL OUT(N) 12"PVC=951.32

PRIVATE DRIVE (ASPHALT SURFACE)

CROSSWALKS POLE

PAINTED SOLID YELLOW LINE

RAMP

RETAINING WALL

UTILITY VAULT FOR TRAFFIC SIGNAL

CURB INLET
RIM=976.60
FL IN(S)30"RCP=968.00
FL OUT(W)30"RCP=967.75

CURB INLET (CONCRETE)
RIM=973.14
FL IN(E)30"RCP=965.34
FL OUT(W)36"RCP=964.14

CURB INLET (CONCRETE)
TOP=976.12
FL IN(S) 42"RCP=961.50
FL OUT(N) 42"RCP=961.30

LOT 15, CHIPMAN-HWY 50
OWNER: SUMMIT WOODS SPE LLC
ZONE: CP-2
USE: MISCELLANEOUS SERVICE

℄ NW PRYOR ROAD (120' R/W)
PUBLIC - ASPHALT STREET

CURB INLET (CONCRETE)
TOP=978.55
FL IN(NE) 15"RCP=970.21
FL IN(SE) 15"RCP=969.70
FL OUT(W) 18"RCP=969.60

0 20 40 80
SCALE: 1" = 40'

SHT C-6
SHT C-7
SHT C-9
SHT C-5
SHT C-4
SHT C-8
SHT C-3

SHEET INDEX
NTS

DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=985.05

BM #2: CHISELED "SQUARE" ON NORTHWEST CORNER AREA INLET, 25'± EAST OF CURB LINE AND ON-LINE WITH SOUTH CURB OF NW LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON OSBOURN NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
PH. (785) 762-5040 | FAX (785) 762-7744
jo@kveng.com | www.kveng.com

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DEMO
SHEET C-5 | REV 0

THIS DRAWING SHALL NOT BE UTILIZED BY ANY PERSON, FIRM, OR CORPORATION IN WHOLE OR IN PART WITHOUT THE SPECIFIC PERMISSION OF KAW VALLEY ENGINEERING, INC.

PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L

MAINTAIN SAFE OPERATING RANGE AROUND KCP&L TRANSMISSION , COORDINATE WITH KCP&L

UTILITY VAULT MARKED STATE TRAFFIC VAULT

RIPRAP

FL=931.78
36" RCP

5/8" BAR ALUM CAP STAMPED AFFINIS CORP MO CLS 2000175358

S 77°50'38" E 148.55'(M)

N 2°28'04" E(P)
N 02°27'18" E 417.29'(M)

BARBED WIRE FENCE

CONCRETE BLOCK & METAL DEBRIS PILE

20' SETBACK (PER PLAT)

EDGE OF POND

SMOOTH WIRE FENCE

1/2" BAR W/KS LS 114 MO LC 366 CAP

20' SETBACK (PER PLAT)

7.5' UTILITY EASEMENT

E LINE OF THE W 1/2 OF SE 1/4, SEC 35 PER OLSON SURVEY AND ERICKSON ACRES 1ST PLAT

LOT 14

S 46°58'04" E 317.20'(M)

OVERHEAD HIGHWAY SIGN "BLUE PARKWAY STRAIGHT, RIGHT LANES TURN RIGHT"

UTILITY VAULT MARKED STATE TRAFFIC VAULT

FL=952.12

36" RCP

FL=954.45

FOOD

INTERSTATE 470 R/W
(PUBLIC R/W VARIES)

BLUE PARKWAY STRAIGHT/ WRONG WAY

S 74°45'44" E 322.94'(M)

5' FENCE

S 87°42'21" E 182.05'(M)

S 64°40'25" E 144.66'(M)

LACK OF ABUTTERS RIGHTS DOC NO. 2007E0074065

LOT 18
CHIPMAN-HWY 50

LOT 12

3 STRAND BARBED WIRE

LOT 13

LOT 1
ERICKSON ACRES, 1ST PLAT

LOT 11

ELECTRIC OVERHANG EASEMENT (NO WIDTH SPECIFIED)
BK 985, PG 124

UTILITY VAULT MARKED STATE TRAFFIC VAULT

FOOD

FL=961.74
15" RCP
CONC END SECTION NO LONGER ATTACHED

CURB INLET (CONCRETE)
TOP=967.67
FL IN(E) 15"RCP=962.89
FL OUT(NW) 15"RCP=962.32

CROSSWALK SIGNAL POLE

TRAFFIC SIGNAL MANHOLE

WEST I-470
LEFT 2 LANES

ELECTRIC BOX MARKED MODOT LIGHTING CONTROL

L=444.52'(C)
R=1140.00'(C)
CB=N 14°41'33" E(M)
CD=441.71'(M)

CONCRETE

CONCRETE SIDEWALK

LACK OF ABUTTERS RIGHTS DOC NO. 2007E0074065

3.5' DIA MANHOLE MARKED AT&T

20' SETBACK & UTILITY EASEMENT (PER PLAT)

CONCRETE SIDEWALK

SPEED LIMIT 35

CITY MAINTENANCE BEGINS
5/8" BAR FOUND

CONCRETE

℄ NW PRYOR ROAD
(120' R/W)
PUBLIC - ASPHALT STREET

DASHED WHITE

JUNCTION BOX (CON
TOP=971.21
FL IN(SW) 42"RCP=
FL OUT(SE) 42"RCP

JUNCTION BOX (CONCR
TOP=991.22
FL IN(W) 42"RCP=956.
FL OUT(E) 42"RCP=95

TRAFFIC SIGNAL VAULT

TRACT B-1, CHIPMAN-HWY
OWNER: SUMMIT WOODS SP

TRAFFIC SIGNAL MANHOLE

CONCRETE

TRAFFIC SIGNAL VAULT

20' UTILITY EASEMENT (PER PLAT)
30' BUILDING LINE (PER PLAT)

4.5' TALL ELECTRIC BOX

CONCRETE

SANITARY MANHOLE
TOP=972.71
FL IN(S) 8"PVC=964.75
FL OUT(E) 8"PVC=964.66

TRAFFIC SIGNAL VAULT

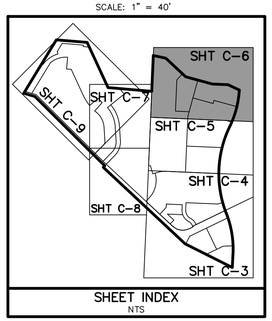
CONCRETE

DIVID
ROAD
AHE

PAINTED DASH

0 20 40 80
SCALE: 1" = 40'

SHEET INDEX
NTS



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VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI BY STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DEMO	
SHEET	REV
C-6	0

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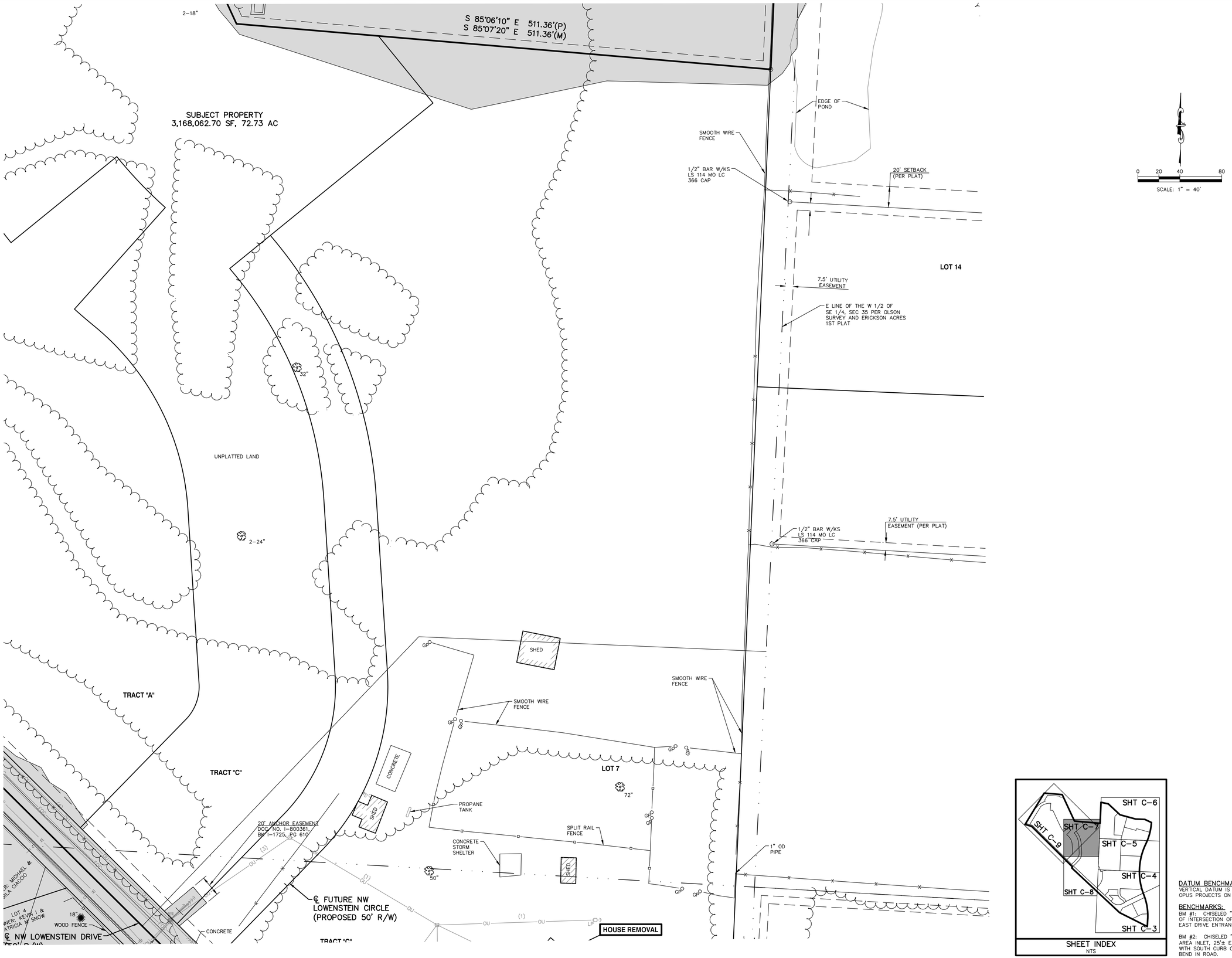

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBORN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-6-19

LEON D. OSBORN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN KANSAS. KANSAS STATE CERTIFICATE OF AUTHORITY # 000642. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DEMO	
SHEET	REV
C-7	0

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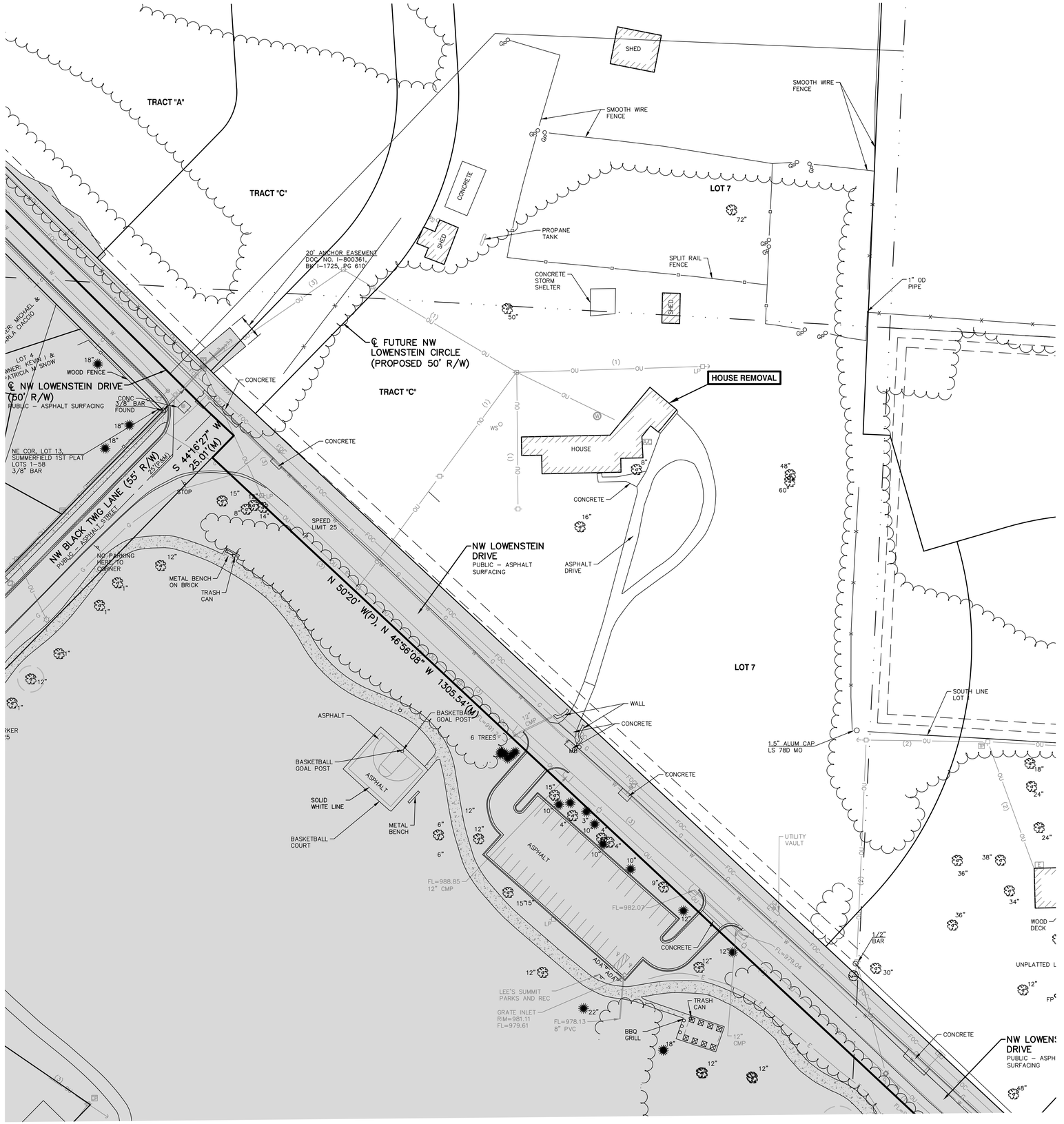

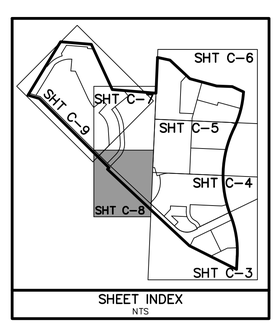

SHEET INDEX
NTS

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON OSBORN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-6-19

LEON D. OSBORN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO.	A14_7067-1	
DESIGNER	LDO	DRAWN BY JT
CFN	7067-1C_DEMO	
SHEET	C-8	REV 0

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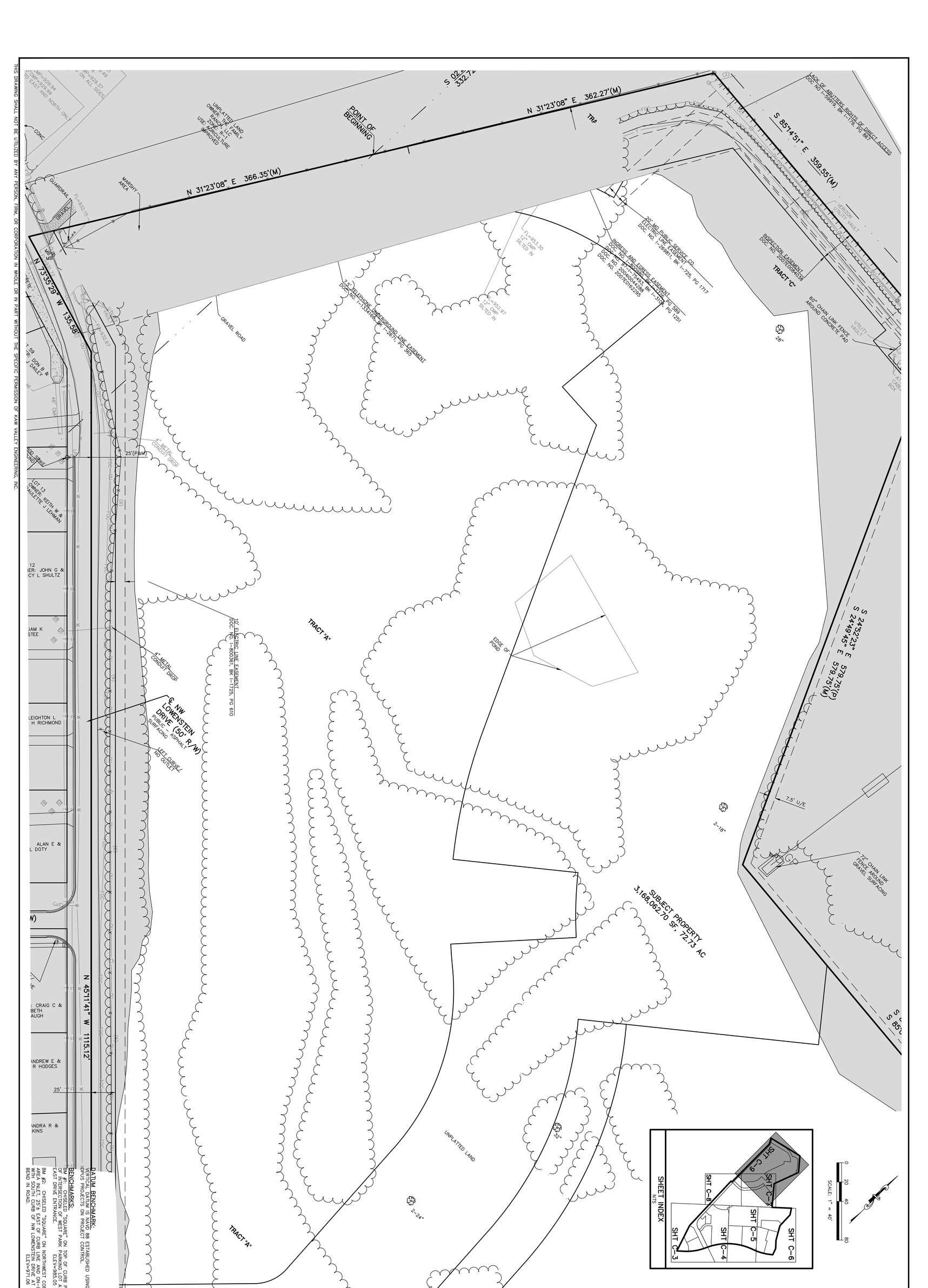

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C-9
0
REV.

PROJ. NO. A14-7087-1
DESIGNER LDO
DRAWN BY JT
CHK'D 7087-16-DRAD

STREETS OF WEST PRYOR

NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EXISTING CONDITIONS & DEMOLITION PLAN

KAW VALLEY ENGINEERING
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JUNCTION CITY, KANSAS 66441
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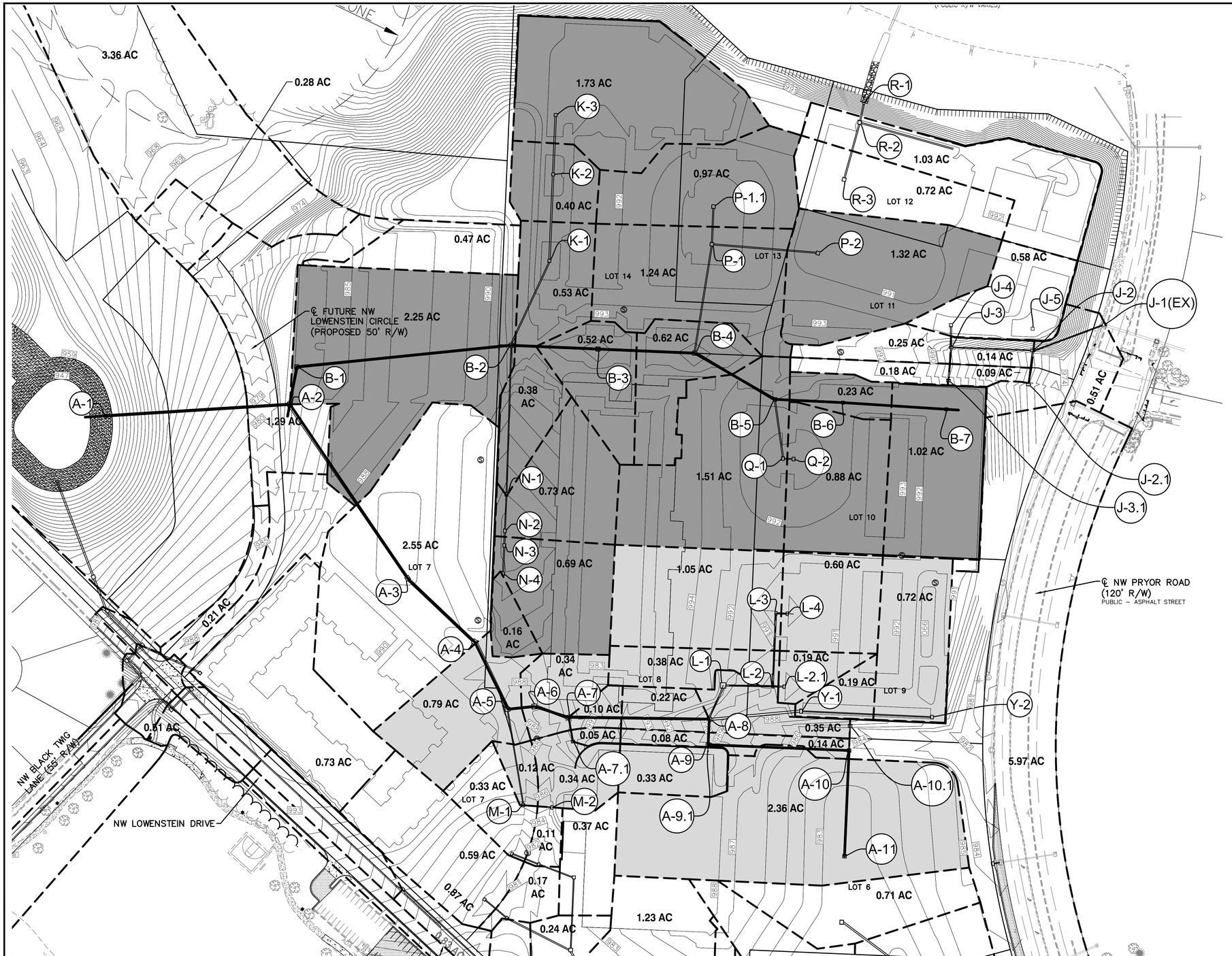
KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

LEON D. OSBOURN
ENGINEER
MO # 021726

REV	DATE	DESCRIPTION			
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO
			DSN	DWN	CHK



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STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
DRAINAGE AREA MAP - STORM SEWER LINES A, B, J & R

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DAM_AB	
SHEET	REV
C-10	0

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KVE

Design Storm	Structure	Downstream Structure	Pipe	Tributary Area (A)	Runoff coefficient ("C")	A x C	Antecedent Precipitation (K)	A x C x K	Time of Concentration Tc	Rainfall Intensity	Tributary Runoff (cfs)	Total Runoff (cfs)	Total Area	Summation of Inlet A x C x K	System Tc	System Rainfall Intensity	System Discharge1	Node Condition
25-year	A11	A10	A11 - A10	2.36	0.90	2.12	1.1	2.34	5.0	8.5	19.9	19.9	2.36	2.34	5.0	8.5	19.9	Inlet
100-year							1.25	2.66		10.3	27.4	27.4		2.66		10.3	27.4	
25-year	A10	A9	A10 - A9	0.49	0.90	0.44	1.1	0.49	5.0	8.5	4.1	24.1	2.85	2.82	5.4	8.4	23.6	Inlet
100-year							1.25	0.55		10.3	5.7	33.1		3.21		10.1	32.5	
25-year	A9	A8	A9 - A8	0.41	0.90	0.37	1.1	0.41	5.0	8.5	3.5	27.5	3.26	3.23	5.9	8.2	26.5	Inlet
100-year							1.25	0.46		10.3	4.8	37.9		3.67		9.9	36.5	
25-year	A8	A7	A8 - A7	3.35	0.90	3.02	1.1	3.32	5.0	8.5	28.3	55.8	6.61	6.54	6.0	8.2	53.6	Inlet
100-year							1.25	3.77		10.3	38.9	76.8		7.44		9.9	73.8	
25-year	A7	A6	A7 - A6	0.15	0.90	0.14	1.1	0.15	5.0	8.5	1.3	57.1	6.76	6.69	6.4	8.0	53.8	Inlet
100-year							1.25	0.17		10.3	1.7	78.5		7.61		9.8	74.2	
25-year	A6	A5	A6 - A5	0.34	0.90	0.31	1.1	0.34	5.0	8.5	2.9	60.0	7.10	7.03	6.5	8.0	56.3	Inlet
100-year							1.25	0.38		10.3	3.9	82.5		7.99		9.7	77.6	
25-year	A5	A4	A5 - A4	1.25	0.90	1.13	1.1	1.24	5.0	8.5	10.6	70.5	8.35	8.27	6.6	8.0	66.0	Inlet
100-year							1.25	1.41		10.3	14.5	97.0		9.39		9.7	91.1	
25-year	A4	A3	A4 - A3			0.00	1.1	0.00	5.0	8.5	0.0	70.5	8.35	8.27	6.8	7.9	65.5	Junction Box
100-year							1.25	0.00		10.3	0.0	97.0		9.39		9.6	90.3	
25-year	A3	A2	A3 - A2	2.55	0.90	2.30	1.1	2.52	5.0	8.5	21.5	92.0	10.90	10.79	7.1	7.8	84.6	Inlet
100-year							1.25	2.87		10.3	29.6	126.6		12.26		9.5	116.7	
25-year	A2	A1	A2 - A1	15.02	0.90	13.52	1.1	14.87	5.0	8.5	126.8	218.9	25.92	25.66	7.6	7.7	197.0	Junction Box
100-year							1.25	16.90		10.3	174.4	301.0		29.16		9.3	272.1	
25-year	L4	L3	L4 - L3	0.60	0.90	0.54	1.1	0.59	5.0	8.5	5.1	5.1	0.60	0.59	5.0	8.5	5.1	Inlet
100-year							1.25	0.68		10.3	7.0	7.0		0.68		10.3	7.0	
25-year	L3	L2	L3 - L2	1.05	0.90	0.95	1.1	1.04	5.0	8.5	8.9	13.9	1.65	1.63	5.0	8.5	13.9	Inlet
100-year							1.25	1.18		10.3	12.2	19.2		1.86		10.3	19.1	
25-year	L2	L1	L2 - L1	0.57	0.90	0.51	1.1	0.56	5.0	8.5	4.8	18.7	2.22	2.20	5.3	8.4	18.5	Inlet
100-year							1.25	0.64		10.3	6.6	25.8		2.50		10.2	25.5	
25-year	L1	A8	L1 - A8			0.00	1.1	0.00	5.0	8.5	0.0	18.7	2.22	2.20	5.5	8.4	18.4	Junction Box
100-year							1.25	0.00		10.3	0.0	25.8		2.50		10.1	25.3	
25-year	L2.1	L2	L2.1 - L2	0.19	0.90	0.17	1.1	0.19	5.0	8.5	1.6	1.6	0.19	0.19	5.0	8.5	1.6	Inlet
100-year							1.25	0.21		10.3	2.2	2.2		0.21		10.3	2.2	
25-year	A9.1	A9	A9.1 - A9	0.33	0.90	0.30	1.1	0.33	5.0	8.5	2.8	2.8	0.33	0.33	5.0	8.5	2.8	Inlet
100-year							1.25	0.37		10.3	3.8	3.8		0.37		10.3	3.8	
25-year	A10.1	A10	A10.1 - A10	0.35	0.90	0.32	1.1	0.35	5.0	8.5	3.0	3.0	0.35	0.35	5.0	8.5	3.0	Inlet
100-year							1.25	0.39		10.3	4.1	4.1		0.39		10.3	4.1	
25-year	A7.1	A7	A7.1 - A7	0.05	0.90	0.05	1.1	0.05	5.0	8.5	0.4	0.4	0.05	0.05	5.0	8.5	0.4	Inlet
100-year							1.25	0.06		10.3	0.6	0.6		0.06		10.3	0.6	
25-year	M2	M1	M2 - M1	0.34	0.90	0.31	1.1	0.34	5.0	8.5	2.9	2.9	0.34	0.34	5.0	8.5	2.9	Inlet
100-year							1.25	0.38		10.3	3.9	3.9		0.38		10.3	3.9	
25-year	M1	A5	M1 - A5	0.12	0.90	0.11	1.1	0.12	5.0	8.5	1.0	3.9	0.46	0.46	5.1	8.5	3.9	Inlet
100-year							1.25	0.14		10.3	1.4	5.3		0.52		10.3	5.3	
25-year	R3	R2	R3 - R2	0.72	0.90	0.65	1.1	0.71	5.0	8.5	6.1	6.1	0.72	0.71	5.0	8.5	6.1	Inlet
100-year							1.25	0.81		10.3	8.4	8.4		0.81		10.3	8.4	
25-year	R2	R1	R2 - R1	1.03	0.90	0.93	1.1	1.02	5.0	8.5	8.7	14.8	1.75	1.73	5.2	8.4	14.6	Inlet
100-year							1.25	1.16		10.3	12.0	20.3		1.97		10.2	20.1	
25-year	J4	J3	J4 - J3	0.58	0.90	0.52	1.1	0.57	5.0	8.5	4.9	4.9	0.58	0.57	5.0	8.5	4.9	Inlet
100-year							1.25	0.65		10.3	6.7	6.7		0.65		10.3	6.7	
25-year	J3	J2	J3 - J2	0.43	0.90	0.39	1.1	0.43	5.0	8.5	3.6	8.5	1.01	1.00	5.1	8.5	8.5	Inlet
100-year							1.25	0.48		10.3	5.0	11.7		1.14		10.3	11.7	
25-year	J2	J1Ex	J2 - J1Ex	0.23	0.90	0.21	1.1	0.23	5.0	8.5	1.9	10.5	1.24	1.23	5.2	8.5	10.4	Inlet
100-year							1.25	0.26		10.3	2.7	14.4		1.40		10.2	14.3	
25-year	J1Ex	J0Ex	J1Ex - J0Ex	6.48	0.90	5.83	1.1	6.42	5.0	8.5	54.7	65.2	7.72	7.64	5.4	8.4	64.2	Inlet
100-year							1.25	7.29		10.3	75.3	89.7		8.69		10.2	88.4	
25-year	J3.1	J3	J3.1 - J3	0.18	0.90	0.16	1.1	0.18	5.0	8.5	1.5	1.5	0.18	0.18	5.0	8.5	1.5	Inlet
100-year							1.25	0.20		10.3	2.1	2.1		0.20		10.3	2.1	
25-year	J2.1	J2	J2.1 - J2	0.09	0.90	0.08	1.1	0.09	5.0	8.5	0.8	0.8	0.09	0.09	5.0	8.5	0.8	Inlet
100-year							1.25	0.10		10.3	1.0	1.0		0.10		10.3	1.0	
25-year	Y2	Y1	Y2 - Y1	0.72	0.90	0.65	1.1	0.71	5.0	8.5	6.1	6.1	0.72	0.71	5.0	8.5	6.1	Inlet
100-year							1.25	0.81		10.3	8.4	8.4		0.81		10.3	8.4	
25-year	Y1	A8	Y1 - A8	0.19	0.90	0.17	1.1	0.19	5.0	8.5	1.6	7.7	0.91	0.90	5.5	8.3	7.5	Inlet
100-year							1.25	0.21		10.3	2.2	10.6		1.02		10.1	10.3	
25-year	B7	B6	B7 - B6	1.02	0.90	0.92	1.1	1.01	5.0	8.5	8.6	8.6	1.02	1.01	5.0	8.5	8.6	Inlet
100-year							1.25	1.15		10.3	11.8	11.8		1.15		10.3	11.8	
25-year	B6	B5	B6 - B5	0.23	0.90	0.21	1.1	0.23	5.0	8.5	1.9	10.6	1.25	1.24	5.5	8.4	10.3	Inlet
100-year							1.25	0.26		10.3	2.7	14.5		1.41		10.1	14.2	
25-year	B5	B4	B5 - B4	2.39	0.90	2.15	1.1	2.37	5.0	8.5	20.2	30.7	3.64	3.60	5.8	8.3	29.7	Junction Box
100-year							1.25	2.69		10.3	27.8	42.3		4.10		10.0	41.0	
25-year	B4	B3	B4 - B3	4.15	0.90	3.74	1.1	4.11	5.0	8.5	35.0	65.8	7.79	7.71	6.1	8.1	62.8	Inlet
100-year							1.25	4.67		10.3	48.2	90.5		8.76		9.9	86.5	
25-year	B3	B2	B3 - B2	0.52	0.90	0.47	1.1	0.51	5.0	8.5	4.4	70.2	8.31	8.23	6.4	8.1	66.3	Inlet
100-year							1.25	0.59		10.3	6.0	96.5		9.35		9.8	91.4	
25-year	B2	B1	B2 - B1	4.46	0.90	4.01	1.1	4.42	5.0	8.5	37.7	107.8	12.77	12.64	6.7	8.0	100.8	Junction Box
100-year							1.25	5.02		10.3	51.8	148.3		14.37		9.7	139.0	
25-year	B1	A2	B1 - A2	2.25	0.90	2.03	1.1	2.23	5.0	8.5	19.0	126.8	15.02	14.87	7.1	7.8	116.4	Inlet
100-year							1.25	2.53		10.3	26.1	174.4		16.90		9.5	160.7	
25-year	Q2	Q1	Q2 - Q1	0.88	0.90	0.79	1.1	0.87	5.0	8.5	7.4	7.4	0.88	0.87	5.0	8.5	7.4	Inlet
100-year							1.25	0.99		10.3	10.2	10.2		0.99		10.3	10.2	
25-year	Q1	B5	Q1 - B5	1.51	0.90	1.36	1.1	1.49	5.0	8.5	12.8	20.2	2.39	2.37	5.0	8.5	20.1	Inlet
100-year							1.25	1.70		10.3	17.5	27.8		2.69		10.3	27.7	
25-year	P2	P1	P2 - P1	1.32	0.90	1.19	1.1	1.31	5.0	8.5	11.1	11.1	1.32	1.31	5.0	8.5	11.1	Inlet
100-year							1.25	1.49		10.3	15.3	15.3		1.49		10.3	15.3	
25-year	P1	B4	P1 - B4	2.21	0.90	1.99	1.1	2.19	5.0	8.5	18.7	29.8	3.53	3.49	5.5	8.4	29.2	Inlet
100-year							1.25	2.49		10.3	25.7	41.0		3.97		10.1	40.2	
25-year	P1.1	P1	P1.1 - P1	0.97	0.90	0.87	1.1	0.96	5.0	8.5	8.2	8.2	0.97	0.96	5.0	8.5	8.2	Inlet
100-year							1.25	1.09		10.3	11.3	11.3		1.09		10.3	11.3	
25-year	K3	K2	K3 - K2	1.73	0.90	1.56	1.1	1.71	5.0	8.5	14.6	14.6	1.73	1.71	5.0	8.5	14.6	Inlet
100-year							1.25	1.95		10.3	20.1	20.1		1.95		10.3	20.1	
25-year	K2	K1	K2 - K1	0.40	0.90	0.36	1.1	0.40	5.0	8.5	3.4	18.0	2.13	2.11	5.2	8.5	17.8	Inlet
100-year							1.25	0.45		10.3	4.6	24.7		2.40		10.2	24.5	
25-year	K1	B2	K1 - B2	0.53	0.90	0.48	1.1	0.52	5.0	8.5	4.5	22.5	2.66	2.63	5.6	8.3	21.9	Inlet
100-year							1.25	0.60		10.3	6.2	30.9		2.99		10.1	30.2	
25-year	N4	N3	N4 - N3	0.16	0.90	0.14	1.1	0.16	5.0	8.5	1.4	1.4	0.16	0.16	5.0	8.5	1.4	Inlet
100-year							1.25	0.18		10.3	1.9	1.9		0.18		10.3	1.9	
25-year	N3	N2	N3 - N2	0.69	0.90	0.62	1.1	0.68	5.0	8.5	5.8	7.2	0.85	0.84	5.2	8.5	7.1	Inlet
100-year							1.25	0.78		10.3	8.0	9.9		0.96		10.2	9.8	
25-year	N2	N1	N2 - N1	0.73	0.90	0.66	1.1	0.72	5.0	8.5	6.2	13.3	1.58	1.56	5.2	8.4	13.2	Inlet
100-year							1.25	0.82		10.3	8.5	18.3		1.78		10.2	18.2	
25-year	N1	B2	N1 - B2	0.38	0.90	0.34	1.1	0.38	5.0	8.5	3.2	16.6	1.96	1.94	5.4	8.4	16.3	Inlet
100-year							1.25	0.43		10.3	4.4	22.8		2.21		10.2	22.4	

Pipe	Pipe Material	Pipe Shape	Pipe Size	Manning's Coefficient	Upstream Invert	Downstream Invert	Length	Pipe Slope	**Design Flow**	Full Flow Capacity	Design Velocity	Full Flow Velocity	Depth (in.)	Flow Time (sec)	Upstream Crown Elevations	Downstream Crown Elevations	Upstream Depth of Cover	Downstream Depth of Cover	Rim Elevation (Structure Design)	Hydraulic Grade Line (100-YR) Downstream	Hydraulic Grade Line (100-YR) Upstream
LINE A																					
A11 - A10	RCP	Circular	30	0.013	978.00	977.10	174.0	0.52%	**27.4**	29.5	6.825	6.0	22.869	25.5	980.5	979.6	1.5	4.9	982.00	978.88	979.79
A10 - A9	RCP	Circular	30	0.013	976.90	975.40	232.0	0.65%	**32.5**	33.0	7.659	6.7	24.231	30.3	979.4	977.9	5.1	11.6	984.50	977.27	978.84
A9 - A8	RCP	Circular	30	0.013	975.20	974.80	42.0	0.95%	**36.5**	40.0	9.243	8.2	22.494	4.5	977.7	977.3	11.8	12.2	989.50	976.55	977.24
A8 - A7	RCP	Circular	42	0.013	973.80	972.50	231.0	0.56%	**73.8**	75.5	8.941	7.8	33.596	25.8	977.3	976.0	12.2	14.0	989.50	975.09	976.48
A7 - A6	RCP	Circular	42	0.013	972.30	971.90	59.0	0.68%	**74.2**	82.8	9.738	8.6	31.025	6.1	975.8	975.4	14.2	11.8	990.00	974.44	974.99
A6 - A5	RCP	Circular	42	0.013	971.70	971.40	44.0	0.68%	**77.6**	83.1	9.812	8.6	32.189	4.5	975.2	974.9	12.0	12.3	987.20	973.89	974.44
A5 - A4	RCP	Circular	48	0.013	970.90	970.20	123.0	0.57%	**91.1**	108.4	9.662	8.6	33.691	12.7	974.9	974.2	12.3	15.8	987.20	972.86	973.78
A4 - A3	RCP	Circular	48	0.013	970.00	969.20	152.0	0.53%	**90.3**	104.2	9.336	8.3	34.517	16.3	974.0	973.2	16.0	14.3	990.00	972.23	972.86
A3 - A2	RCP	Circular	48	0.013	969.00	966.70	345.0	0.67%	**116.7**	117.3	10.640	9.3	39.130	32.4	973.0	970.7	14.5	12.3	987.50	970.45	972.23
A2 - A1	RCP	Circular	48	0.013	966.50	954.85	305.0	3.82%	**272.1**	280.7	25.454	22.3	38.074	12.0	970.5	958.9	12.5	0.0	983.00	958.82	970.45
L4 - L3	HDPE	Circular	18	0.01	985.50	985.30	19.0	1.05%	**7.0**	14.0	7.917	7.9	8.971	2.4	987.0	986.8	2.5	2.7	989.50		
L3 - L2	HDPE	Circular	24	0.01	984.80	983.90	120.0	0.75%	**19.1**	25.5	8.900	8.1	15.523	13.5	986.8	985.9	2.7	3.6	989.50		
L2 - L1	RCP	Circular	30	0.013	983.40	982.90	82.0	0.61%	**25.5**	32.0	7.243	6.5	20.229	11.3	985.9	985.4	3.6	6.6	989.50		
L1 - A8	RCP	Circular	30	0.013	982.70	982.40	60.0	0.50%	**25.3**	29.0	6.659	5.9	21.696	9.0	985.2	984.9	6.8	4.6	992.00		
L2.1 - L2	HDPE	Circular	18	0.01	985.50	985.30	19.0	1.05%	**2.2**	14.0	5.783	7.9	4.829	3.3	987.0	986.8	2.5	2.7	989.50		
A9.1 - A9	HDPE	Circular	18	0.01	982.50	982.20	11.0	2.73%	**3.8**	22.6	9.513	12.8	5.020	1.2	984.0	983.7	2.5	5.8	986.50		
A10.1 - A10	HDPE	Circular	18	0.01	978.10	977.90	11.0	1.82%	**4.1**	18.4	8.365	10.4	5.746	1.3	979.6	979.4	4.9	5.1	984.50		
A7.1 - A7	HDPE	Circular	15	0.01	986.50	986.00	41.0	1.22%	**0.6**	9.3	4.210	7.6	2.544	9.7	987.8	987.3	2.3	2.8	990.00		
M2 - M1	HDPE	Circular	15	0.01	982.70	982.20	47.5	1.05%	**3.9**	8.6	6.868	7.0	7.128	6.9	984.0	983.5	1.3	1.8	985.20		
M1 - A5	HDPE	Circular	18	0.01	981.90	980.60	159.5	0.82%	**5.3**	12.3	6.718	7.0	8.260	23.7	983.4	982.1	1.8	5.1	985.20		
LINE R																					
R3 - R2	HDPE	Circular	18	0.01	983.20	982.50	98.0	0.71%	**8.4**	11.5	7.117	6.5	11.356	13.8	984.7	984.0	5.3	6.0	990.00	983.61	984.32
R2 - R1	HDPE	Circular	24	0.01	982.00	981.70	33.6	0.89%	**20.1**	27.8	9.640	8.8	15.144	3.5	984.0	983.7	6.0		990.00	983.31	983.61
LINE J																					
J4 - J3	HDPE	Circular	18	0.01	984.70	984.40	37.0	0.81%	**6.7**	12.3	7.116	7.0	9.502	5.2	986.2	985.9	3.8	2.0	990.00	985.50	985.7
J3 - J2	HDPE	Circular	18	0.01	984.20	974.50	134.1	7.23%	**11.7**	36.7	18.461	20.8	6.979	7.3	985.7	976.0	2.2	2.6	987.88	975.14	985.5
J2 - J1Ex	HDPE	Circular	18	0.01	967.10	963.70	123.9	2.74%	**14.3**	22.6	13.538	12.8	10.375	9.2	968.6	965.2	10.0	6.0	978.60	964.67	968.48
J1Ex - J0Ex	RCP	Circular	42	0.013	958.66	956.07	91.4	2.83%	**88.4**	169.4	17.789	17.6	21.533	5.1	962.2	959.6	9.1	11.1	971.21	958.97	961.56
J3.1 - J3	HDPE	Circular	15	0.01	984.50	984.20	54.4	0.55%	**2.1**	6.2	4.578	5.1	5.982	11.9	985.8	985.5	2.1	2.4	987.88		
J2.1 - J2	HDPE	Circular	15	0.01	975.00	974.70	56.0	0.54%	**1.0**	6.1	3.734	5.0	4.185	15.0	976.3	976.0	2.4	2.6	978.60		
Y2 - Y1	HDPE	Circular	18	0.01	985.50	984.10	215.0	0.65%	**8.4**	11.0	6.859	6.2	11.725	31.3	987.0	985.6	2.5	3.9	989.50		
Y1 - A8	HDPE	Circular	24	0.01	983.60	982.70	151.0	0.60%	**10.3**	22.7	7.059	7.2	11.369	21.4	985.6	984.7	3.9	4.8	989.50		
LINE B																					
B7 - B6	RCP	Circular	24	0.013	987.00	986.00	170.0	0.59%	**11.8**	17.4	5.943	5.5	14.551	28.6	989.0	988.0	2.0	3.0	991.00	987.15	988.23
B6 - B5	RCP	Circular	24	0.013	985.80	985.20	112.0	0.54%	**14.2**	16.6	5.927	5.3	17.155	18.9	987.8	987.2	3.2	5.3	991.00	986.54	987.15
B5 - B4	RCP	Circular	36	0.013	984.20	983.40	153.0	0.52%	**41.0**	48.2	7.658	6.8	25.477	20.0	987.2	986.4	5.3	5.1	992.50	985.38	986.27
B4 - B3	RCP	Circular	42	0.013	981.20	980.00	159.0	0.75%	**86.5**	87.4	10.357	9.1	34.049	15.4	984.7	983.5	6.8	8.0	991.50	982.64	984.07
B3 - B2	RCP	Circular	48	0.013	979.50	978.90	143.0	0.42%	**91.4**	93.0	8.440	7.4	38.602	16.9	983.5	982.9	8.0	10.1	991.50	981.84	982.45
B2 - B1	RCP	Circular	48	0.013	972.00	968.60	354.0	0.96%	**139.0**	140.8	12.771	11.2	38.794	27.7	976.0	972.6	17.0	10.4	993.00	972.05	975.48
B1 - A2	RCP	Circular	48	0.013	968.40	967.60	62.8	1.27%	**160.7**	162.1	14.708	12.9	38.952	4.3	972.4	971.6	10.6	11.4	983.00	970.56	972.05
Q2 - Q1	RCP	Circular	18	0.013	986.40	986.20	17.7	1.13%	**10.2**	11.2	7.165	6.3	13.541	2.5	987.9	987.7	2.1	2.3	990.00		
Q1 - B5	RCP	Circular	30	0.013	985.20	984.70	98.0	0.51%	**27.7**	29.3	6.790	6.0	23.244	14.4	987.7	987.2	2.3	5.3	990.00		
P2 - P1	RCP	Circular	24	0.013	985.50	984.50	175.0	0.57%	**15.3**	17.1	6.157	5.4	17.738	28.4	987.5	986.5	2.5	2.5	990.00		
P1 - B4	RCP	Circular	30	0.013	984.00	982.20	181.0	0.99%	**40.2**	40.9	9.499	8.3	24.150	19.1	986.5	984.7	2.5	8.3	989.00		
P1.1 - P1	RCP	Circular	24	0.013	984.90	984.50	65.0	0.62%	**11.3**	17.7	5.981	5.6	13.882	10.9	986.9	986.5	2.1	5.0	989.00		
K3 - K2	RCP	Circular	24	0.013	983.40	982.60	98.0	0.82%	**20.1**	20.4	7.416	6.5	19.308	13.2	985.4	984.6	4.6	5.9	990.00		
K2 - K1	RCP	Circular	30	0.013	982.10	981.30	142.0	0.56%	**24.5**	30.8	6.962	6.3	20.229	20.4	984.6	983.8	5.9	6.7	990.50		
K1 - B2	RCP	Circular	30	0.013	981.10	980.20	153.0	0.59%	**30.2**	31.5	7.298	6.4	23.580	21.0	983.6	982.7	6.9	10.3	990.50		
N4 - N3	RCP	Circular	18	0.013	982.00	981.60	46.0	0.87%	**1.9**	9.8	4.263	5.5	5.312	10.8	983.5	983.1	2.5	1.9	986.00		
N3 - N2	RCP	Circular	18	0.013	976.50	976.20	24.0	1.25%	**9.8**	11.7	7.438	6.6	12.568	3.2	978.0	977.7	7.0	7.3	985.00		
N2 - N1	RCP	Circular	24	0.013	975.70	975.30	61.0	0.66%	**18.2**	18.3	6.648	5.8	19.502	9.2	977.7	977.3	7.3	8.7	985.00		
N1 - B2	RCP	Circular	30	0.013	974.80	973.50	245.0	0.53%	**22.4**	29.9	6.680	6.1	19.386	36.7	977.3	976.0	8.7	17.0	986.00		

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI — LEON D. OSBOURN — NUMBER E-21726 — REGISTERED PROFESSIONAL ENGINEER — 1-6-19

LEON D. OSBOURN
ENGINEER
MO # 021726

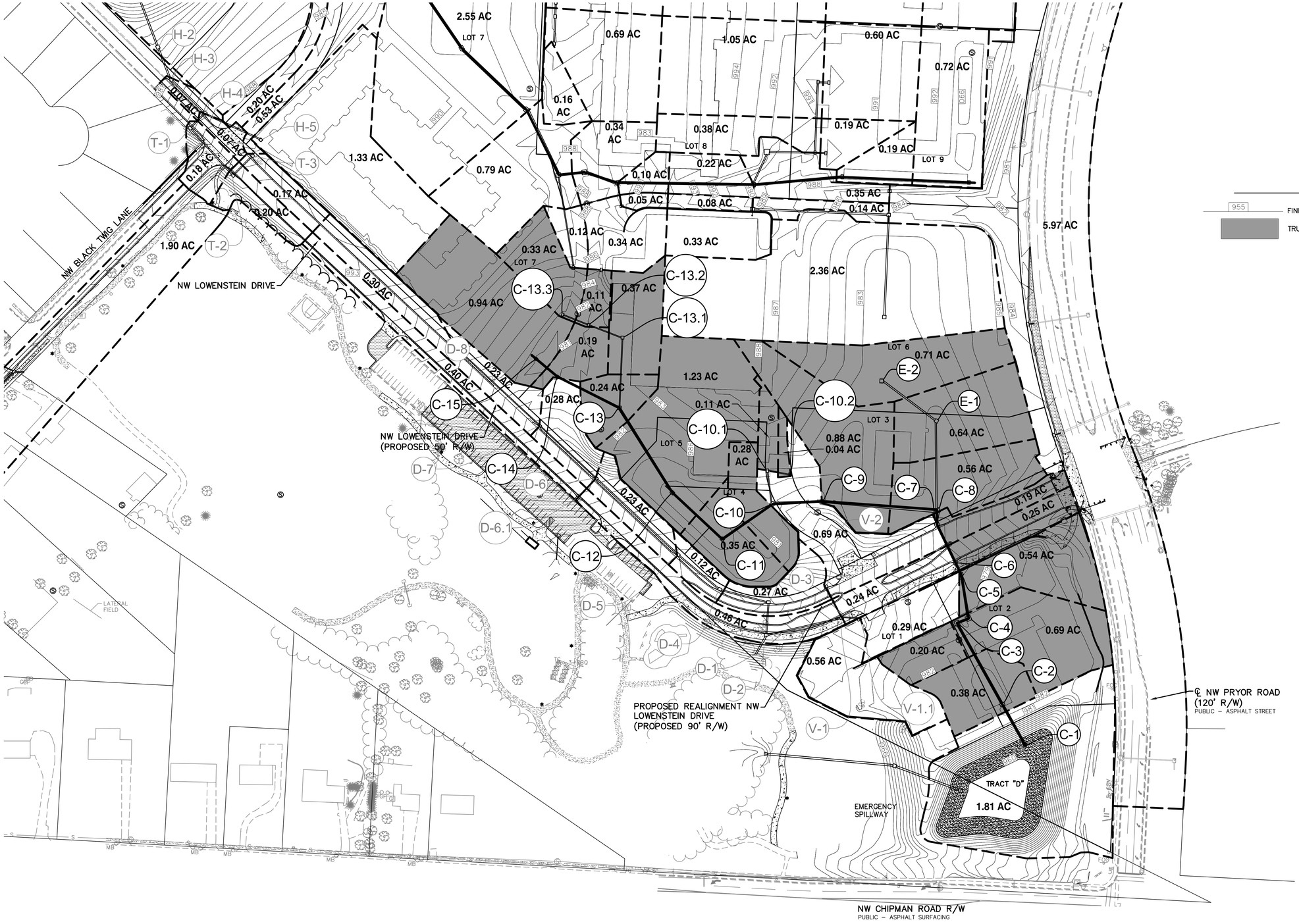
KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
PH. (785) 762-5040 | FAX (785) 762-7744
jc@kveng.com | www.kveng.com

KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
DRAINAGE AREA MAP - DESIGN TABLES STORM LINES A, B, J, & R

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DAM_CHART
SHEET C-12 | REV 0



CONTRACTOR TO COORDINATE WITH CONSTRUCTION OF STORM LINES, D, V, T, H – SEE SEPARATE NW LOWENSTIEN DRIVE STREET PLANS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI BY CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
DRAINAGE AREA MAP - STORM SEWER LINE C

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DAM_C	
SHEET	REV
C-12	0

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		Overland Flow										System Flow					Node	Pipe Design																Structure Design	Hydraulic Grade Line (100-YR)	
	Design Storm	Structure	Downstream Structure	Pipe	Tributary Area (A)	Runoff coefficient ("C")	A x C	Antecedent Precipitation	A x C x K	Time of Concentration	Rainfall Intensity	Tributary Runoff (cfs)	Total Runoff (cfs)	Total Area	Summation of (Ac) A x C x K	System Tc	System Rainfall Intensity	System Discharge1	Node Condition	Pipe Material	Pipe Shape	Pipe Size	Manning's Coefficient	Upstream Invert	Downstream Invert	Length	Pipe Slope	**Design Flow**	Full Flow Capacity	Design Velocity	Full Flow Velocity	Depth (in.)	Flow Time (sec)	Upstream Ground Elevations	Downstream Ground Elevations	Upstream Depth of Cover	Downstream Depth of Cover	Rim Elevation	Downstream	Upstream
KVE	25-year	C15	C14	C15 - C14	0.95	0.60	0.57	1.1	0.63	5.0	8.5	5.3	5.3	0.95	0.63	5.0	8.5	5.3	Inlet	RCP	Circular	18	0.013	977.10	976.80	47.0	0.64%	**7.4**	8.4	5.355	4.7	13.059	8.8	978.6	978.3	1.8	2.1	980.40	979.73	980.17
	100-year							1.25	0.71		10.3	7.4	7.4		0.71		10.3	7.4																				
	25-year	C14	C13	C14 - C13	0.17	0.90	0.15	1.1	0.17	5.0	8.5	1.4	6.8	1.12	0.80	5.1	8.5	6.7	Inlet	RCP	Circular	24	0.013	976.30	975.70	118.0	0.51%	**9.3**	16.1	5.313	5.1	13.049	22.2	978.3	977.7	2.1	4.3	980.40	979.33	979.65
	100-year							1.25	0.19		10.3	2.0	9.3		0.90		10.3	9.3																				
	25-year	C13	C12	C13 - C12	1.05	0.90	0.95	1.1	1.04	5.0	8.5	8.9	15.6	2.17	1.83	5.5	8.3	15.3	Inlet	RCP	Circular	30	0.013	975.20	974.30	170.0	0.53%	**21.1**	29.8	6.591	6.1	18.606	25.8	977.7	976.8	4.3	2.2	982.00	978.58	979.1
	100-year							1.25	1.18		10.3	12.2	21.5		2.09		10.1	21.1																				
	25-year	C12	C11	C12 - C11	1.23	0.90	1.11	1.1	1.22	5.0	8.5	10.4	26.0	3.40	3.05	5.9	8.2	25.0	Inlet	RCP	Circular	36	0.013	973.80	973.20	116.0	0.52%	**34.5**	48.0	7.384	6.8	22.594	15.7	976.8	976.2	2.2	2.8	979.00	978.12	978.44
	100-year							1.25	1.38		10.3	14.3	35.8		3.47		9.9	34.5																				
	25-year	C11	C10	C11 - C10	0.35	0.90	0.32	1.1	0.35	5.0	8.5	3.0	29.0	3.75	3.40	6.2	8.1	27.6	Inlet	RCP	Circular	36	0.013	973.10	972.50	104.0	0.58%	**38.0**	50.7	7.866	7.2	23.270	13.2	976.1	975.5	2.9	5.0	979.00	977.27	977.61
	100-year							1.25	0.39		10.3	4.1	39.9		3.86		9.8	38.0																				
	25-year	C10	C9	C10 - C9	0.43	0.90	0.39	1.1	0.43	5.0	8.5	3.6	32.6	4.18	3.82	6.4	8.0	30.8	Junction Box	RCP	Circular	36	0.013	972.30	971.80	84.0	0.60%	**42.4**	51.5	8.131	7.3	24.905	10.3	975.3	974.8	5.2	4.9	980.50	976.56	976.9
	100-year							1.25	0.48		10.3	5.0	44.9		4.35		9.8	42.4																				
	25-year	C9	C8	C9 - C8	0.88	0.90	0.79	1.1	0.87	5.0	8.5	7.4	40.1	5.06	4.70	6.6	8.0	37.5	Inlet	RCP	Circular	42	0.013	971.30	970.40	195.0	0.46%	**51.7**	68.4	7.811	7.1	27.313	25.0	974.8	973.9	4.9	7.1	979.70	975.99	976.48
	100-year							1.25	0.99		10.3	10.2	55.1		5.34		9.7	51.7																				
	25-year	C8	C7	C8 - C7	1.91	0.90	1.72	1.1	1.89	5.0	8.5	16.1	56.2	6.97	6.59	7.0	7.9	51.8	Inlet	RCP	Circular	42	0.013	970.20	970.00	25.0	0.80%	**71.5**	90.0	10.377	9.4	28.262	2.4	973.7	973.5	7.3	6.0	981.00	974.97	975.09
	100-year							1.25	2.15		10.3	22.2	77.3		7.49		9.5	71.5																				
	25-year	C7	C6	C7 - C6	0.19	0.90	0.17	1.1	0.19	5.0	8.5	1.6	57.8	7.16	6.77	7.1	7.9	53.2	Inlet	RCP	Circular	48	0.013	969.50	969.10	72.0	0.56%	**73.4**	107.1	9.177	8.5	29.179	7.8	973.5	973.1	6.0	6.4	979.50	974.53	974.7
	100-year							1.25	0.21		10.3	2.2	79.5		7.70		9.5	73.4																				
	25-year	C6	C5	C6 - C5	0.25	0.90	0.23	1.1	0.25	5.0	8.5	2.1	59.9	7.41	7.02	7.2	7.8	54.9	Inlet	RCP	Circular	48	0.013	968.90	968.80	22.0	0.45%	**75.7**	96.8	8.525	7.7	31.930	2.6	972.9	972.8	6.6	4.6	979.50	974.39	974.44
	100-year							1.25	0.28		10.3	2.9	82.4		7.98		9.5	75.7																				
	25-year	C5	C4	C5 - C4	0.54	0.90	0.49	1.1	0.53	5.0	8.5	4.6	64.5	7.95	7.56	7.2	7.8	58.9	Inlet	RCP	Circular	48	0.013	968.60	968.20	76.0	0.53%	**81.3**	104.2	9.171	8.3	31.896	8.3	972.6	972.2	4.8	7.9	977.35	973.95	974.17
	100-year							1.25	0.61		10.3	6.3	88.6		8.59		9.5	81.3																				
	25-year	C4	C3	C4 - C3	0.69	0.90	0.62	1.1	0.68	5.0	8.5	5.8	70.3	8.64	8.24	7.4	7.8	63.9	Inlet	RCP	Circular	54	0.013	967.70	967.60	21.5	0.47%	**88.2**	134.1	9.001	8.4	31.957	2.4	972.2	972.1	7.9	7.6	980.10	973.43	973.47
	100-year							1.25	0.78		10.3	8.0	96.7		9.36		9.4	88.2																				
	25-year	C3	C2	C3 - C2	0.20	0.90	0.18	1.1	0.20	5.0	8.5	1.7	72.0	8.84	8.44	7.4	7.7	65.4	Junction Box	RCP	Circular	54	0.013	967.40	966.60	158.0	0.51%	**90.2**	139.9	9.349	8.8	31.547	16.9	971.9	971.1	7.9	10.3	979.75	972.63	972.92
	100-year							1.25	0.23		10.3	2.3	99.0		9.59		9.4	90.2																				
	25-year	C2	C1	C2 - C1	0.38	0.90	0.34	1.1	0.38	5.0	8.5	3.2	75.2	9.22	8.81	7.7	7.7	67.5	Inlet	RCP	Circular	54	0.013	966.40	966.00	80.6	0.50%	**93.3**	138.5	9.345	8.7	32.443	8.6	970.9	970.5	10.5		981.36	972.39	972.55
	100-year							1.25	0.43		10.3	4.4	103.4		10.02		9.3	93.3																				
	25-year	C13.3	C13.2	C13.3 - C13.2	0.33	0.90	0.30	1.1	0.33	5.0	8.5	2.8	2.8	0.33	0.33	5.0	8.5	2.8	Inlet	RCP	Circular	15	0.013	978.00	977.60	48.0	0.83%	**3.8**	5.9	5.115	4.8	8.808	9.4	979.3	978.9	2.3	2.6	981.50		
	100-year							1.25	0.37		10.3	3.8	3.8		0.37		10.3	3.8																				
	25-year	C13.2	C13.1	C13.2 - C13.1	0.11	0.90	0.10	1.1	0.11	5.0	8.5	0.9	3.7	0.44	0.44	5.2	8.5	3.7	Inlet	RCP	Circular	15	0.013	977.40	976.20	61.0	1.97%	**5.1**	9.1	7.593	7.4	8.030	8.0	978.7	977.5	2.9	4.5	981.50		
	100-year							1.25	0.12		10.3	1.3	5.1		0.50		10.3	5.1																				
	25-year	C13.1	C13	C13.1 - C13	0.37	0.90	0.33	1.1	0.37	5.0	8.5	3.1	6.8	0.81	0.80	5.3	8.4	6.8	Inlet	RCP	Circular	18	0.013	975.90	974.90	119.0	0.84%	**9.3**	9.6	6.207	5.4	14.224	19.2	977.4	976.4	4.6	5.6	982.00		
	100-year							1.25	0.42		10.3	4.3	9.4		0.91		10.2	9.3																				
	25-year	C10.2	C10.1	C10.2 - C10.1	0.04	0.90	0.04	1.1	0.04	5.0	8.5	0.3	0.3	0.04	0.04	5.0	8.5	0.3	Inlet	RCP	Circular	15	0.013	978.00	977.60	39.0	1.03%	**0.5**	6.5	3.083	5.3	2.706	12.7	979.3	978.9	2.3	3.1	981.50		
	100-year							1.25	0.05		10.3	0.5	0.5		0.05		10.3	0.5																				
	25-year	C10.1	C10	C10.1 - C10	0.11	0.90	0.10	1.1	0.11	5.0	8.5	0.9	1.3	0.15	0.15	5.2	8.5	1.3	Inlet	RCP	Circular	15	0.013	977.40	977.00	57.5	0.70%	**1.7**	5.4	3.907	4.4	5.838	14.7	978.7	978.3	3.4	2.3	982.00		
	100-year							1.25	0.12		10.3	1.3	1.7		0.17		10.2	1.7																				
	25-year	E2	E1	E2 - E1	0.71	0.90	0.64	1.1	0.70	5.0	8.5	6.0	6.0	0.71	0.70	5.0	8.5	6.0	Inlet	RCP	Circular	18	0.013	977.50	976.70	115.0	0.70%	**8.2**	8.8	5.638	5.0	13.882	20.4	979.0	978.2	3.0	2.8	982.00		
	100-year							1.25	0.80		10.3	8.2	8.2		0.80		10.3	8.2																				
	25-year	E1	C8	E1 - C8	0.64	0.90	0.58	1.1	0.63	5.0	8.5	5.4	11.4	1.35	1.34	5.3	8.4	11.2	Inlet	RCP	Circular	24	0.013	976.20	975.30	151.0	0.60%	**15.5**	17.5	6.278	5.6	17.561	24.1	978.2	977.3	2.8	3.7	981.00		
	100-year							1.25	0.72		10.3	7.4	15.7		1.52		10.2	15.5																				

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
DRAINAGE AREA MAP - DESIGN TABLES STORM LINES C

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DAM_CHART
SHEET C-13 | REV 0

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DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=985.05

BM #2: CHISELED "SQUARE" ON NORTHWEST CORNER AREA INLET, 25'± EAST OF CURB LINE AND ON-LINE WITH SOUTH CURB OF NW LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
OVERALL GRADING PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_GP	
SHEET	REV
C-14	0

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PROPOSED RETAINING WALL "C"

PROPOSED 40' SANITARY SEWER EASEMENT

LOT 4

PROPOSED RETAINING WALL "D"

PROPOSED 25' SANITARY SEWER EASEMENT

30' BLDG SETBACK & UTILITY EASEMENT

UTILITY VAULT

511+00

515+45

515+00

512+00

521+00

520+00

℄ PROPOSED REALIGNMENT NW LOWENSTEIN DRIVE (PROPOSED 90' R/W)

513+00

514+00

90' R/W

TW=983.0
TOE=980.0

TW=986.0
TOE=986.0

547+36

547+00

546+36

545+40

PROPOSED RETAINING WALL "H"

30' BLDG SETBACK & SIDEWALK ESMT

LOT 2

PROPOSED SIDEWALK EASEMENT

PROPOSED 40' BUILDING SETBACK, SIDEWALK EASEMENT & UTILITY EASEMENT

TW=983.0
GR=983.0
TW=986.0
GR=983.0

PROPOSED RETAINING WALL "G"

CONCRETE SIDEWALK

541+86

541+00

CURB INLET (CONCRETE)
RIM=987.75
FL IN(NE)30"RCP=973.77
FL IN(SE)15"RCP=975.16
FL OUT(NW)30"RCP=973.48

JUNCTION BOX (CONCRETE)
RIM=989.93
FL IN(S)15"RCP=981.20
FL OUT(NW)15"RCP=981.08

UTILITY RELOCATION REQUIRED **(BY OTHERS)**

GRATE INLET
RIM=964.43
FL=962.93

FL=961.24
PVC

PLAYGROUND RULES

TOBACCO FREE

PLAYGROUND RULES

525+00

524+00

PROPOSED RETAINING WALL "F"

TW=974.0
TOE=972.0

TW=977.0
TOE=977.0

536+65

536+00

LOT 1

PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L

TW=983.0
GR=983.0

TW=988.0
GR=983.0

PROPOSED SIDEWALK EASEMENT

PROPOSED 30' BUILDING SETBACK & UTILITY EASEMENT

535+00

538+00

TW=976.0
GR=969.0

WOOD FOOTBRIDGE

TW=977.0
GR=961.5

PROPOSED RETAINING WALL "E"

528+00

529+41

527+00

TW=978.0
GR=963.5

PROPOSED 16' SIDEWALK EASEMENT

TW=980.0
GR=973.0

TW=981.0
GR=969.0

℄ NW PRYOR ROAD
(120' R/W)
PUBLIC – ASPHALT STREET

UTILITY VAULT

ONE WAY

CURB INLET (CONCRETE)
TOP=991.75
FL IN(S) 15"RCP=987.35
FL OUT(W) 15"RCP=987.25

CURB INLET (CONCRETE)
TOP=992.11
FL IN(E) 15"RCP=985.91
FL OUT(N) 15"RCP=985.86

TRACT "D"

PROPOSED SIDEWALK EASEMENT

GAS SUBSTATION

RETAINING WALL

MISSOURI GAS ENERGY EASEMENT DOC 2002I0022043

LEE'S SUMMIT PARKS AND RECREATION LOWENSTEIN PARK

4.5' TALL ELECTRIC BOX

METAL UTILITY POLE

DIVIDED ROAD AHEAD

RIGHT LANE ENDS

SPEED LIMIT 35

CURB INLET
RIM=954.80

RIGHT LANE MERGE AHEAD

RETAINING WALL W/HANDRAIL ON SOUTH SIDE

CURB INLET
RIM=973.67

CITY OF LEE'S SUMMIT ALICE A. WYATT FAMILY

UTILITY VAULT MARKED STATE TRAFFIC SIGNAL

NW CHIPMAN ROAD R/W
PUBLIC – ASPHALT SURFACING

0 20 40 80
SCALE: 1" = 40'

LEGEND (PROPOSED)

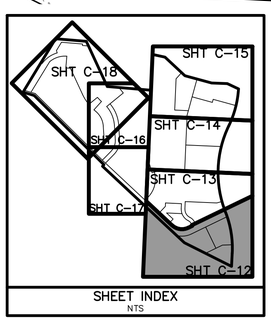
TW=983.6 TOP OF RETAINING WALL
GR=983.1 GROUND ELEVATION @ WALL

FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

ROCK RIPRAP (D_{50}=18")

SHEET INDEX
NTS



DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=985.05

BM #2: CHISELED "SQUARE" ON NORTHWEST CORNER AREA INLET, 25'± EAST OF CURB LINE AND ON-LINE WITH SOUTH CURB OF NW LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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JUNCTION CITY, KANSAS 66441
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KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN THE STATE OF MISSOURI UNDER CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GRADING PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_GP
SHEET C-15 | REV 0

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AFTER COMPLETION OF WEST DETENTION BASIN BUT PRIOR TO STORM SEWER INSTALLATION, ROUTE OVERLAND DITCH. GRADE TO DRAIN

SANITARY SEWER EASEMENT

LOT 8

LOT 9

PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L

PROPOSED RETAINING WALL "K"

SANITARY MANHOLE TOP=982.28 FL OUT(N) 60"PVC=972.28

550+00

551+00

552+00

553+00

TW=989.0 TOE=989.0

TW=991.0 TOE=988.0

TW=991.0 TOE=987.0

TW=991.0 TOE=985.0

601+00

602+00

603+00

600+00

TW=988.0 TOE=988.0

PROPOSED RETAINING WALL "J"

PROPOSED PUBLIC COMMON AREA EASEMENT

TW=987.5 TOE=987.5

603+62

JUNCTION BOX (CONCRETE) TOP=981.83 FL IN(W) 36"RCP=969.13 FL OU(SE) 36"RCP=969.44

PROPOSED 30' BUILDING SETBACK, SIDEWALK EASEMENT & UTILITY EASEMENT

LOT 7

TW=989.0 TOE=989.0

600+47

PROPOSED RETAINING WALL "B"

TW=987.5 TOE=984.0

100' ELECTRIC EASEMENT DOC. NO. 134200 BK 1864, PG 244

℄ NW PRYOR ROAD (120' R/W)
PUBLIC – ASPHALT STREET

CURB INLET (CONCRETE) TOP=984.11 FL OUT(W) 15"RCP=969.58

7.5' ELECTRIC LINE EASEMENT DOC. NO. 1338992 BK I-858, PG 2159

TW=982.5 TOE=982.5

PROPOSED 35' SANITARY SEWER EASEMENT

PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L

LOT 6

JUNCTION BOX (CONCRETE) TOP=984.36 FL IN(S)36"RCP=967.24 FL IN(E)15"RCP=967.46 FL OUT(N)36"RCP=967.11

60' R/W

TRAFFIC SIGNAL VAULT

STREET LIGHTING VAULT

PROPOSED KCP&L EASEMENT

JUNCTION BOX (CONCRETE) TOP=981.45 FL IN(E) 30"RCP=970.75 FL OUT(W) 30"RCP=970.75

PROPOSED PUBLIC COMMON AREA EASEMENT

100' ELECTRIC EASEMENT DOC. NO. 757841 BK 1484, PG 527

PROPOSED 40' SANITARY SEWER EASEMENT

LOT 3

GRADE TO DRAIN HERE. TEMPORARY INLET OPENING TO PIPE

ELECTRIC BOX ON CONCRETE

JUNCTION BOX (CONCRETE) TOP=986.0 FL IN(E) 30"RCP=969.44 FL IN(S) 30"RCP=969.97 FL OUT(W) 30"RCP=969.33

CURB INLET (CONCRETE) TOP=981.57 FL IN(E)30"HDPE=970.37 FL IN(S)15"RCP=977.27 FL OUT(SW)30"RCP=969.33

30' BUILDING SETBACK & UTILITY 980

℄ NW LOWENSTEIN DRIVE (PROPOSED 50' R/W)

LOT 5

PROPOSED RETAINING WALL "C"

511+00

512+00

513+00

514+00

515+00

515+43

520+00

521+00

PROPOSED 40' SANITARY SEWER EASEMENT

LOT 4

PROPOSED RETAINING WALL "D"

PROPOSED 25' SANITARY SEWER EASEMENT

30' BLDG SETBACK & UTILITY EASEMENT

UTILITY VAULT

STOP

TW=986.0 TOE=986.0

TW=985.0 TOE=980.0

521+56

PROPOSED 40' BUILDING SETBACK

℄ PROPOSED REALIGNMENT NW LOWENSTEIN DRIVE (PROPOSED 90' R/W)

90° R/W

545+00

545+43

546+00

GRATE INLET RIM=964.43 FL=962.93

FL=961.24 8" PVC

PLAYGROUND RULES

TOBACCO FREE

525+00

TW=973.0 TOE=972.0

PROPOSED RETAINING WALL "F"

536+00

536+65

TW=977.0 TOE=977.0

LOT 1

SHEET INDEX
NTS

SHT C-15
SHT C-18
SHT C-14
SHT C-16
SHT C-13
SHT C-17
SHT C-12

DATUM BENCHMARK:
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0 20 40 80
SCALE: 1" = 40'

LEGEND (PROPOSED)

TW=983.6 / GR=983.1 TOP OF RETAINING WALL GROUND ELEVATION @ WALL

FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

REV	DATE	DESCRIPTION	DSN	DWN	CHK
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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
1-2-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN THE STATE OF MISSOURI. CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GRADING PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_GP
SHEET C-16 | REV 0

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E-21726
REGISTERED PROFESSIONAL ENGINEER

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GRADING PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_GP	
SHEET	REV
C-17	0

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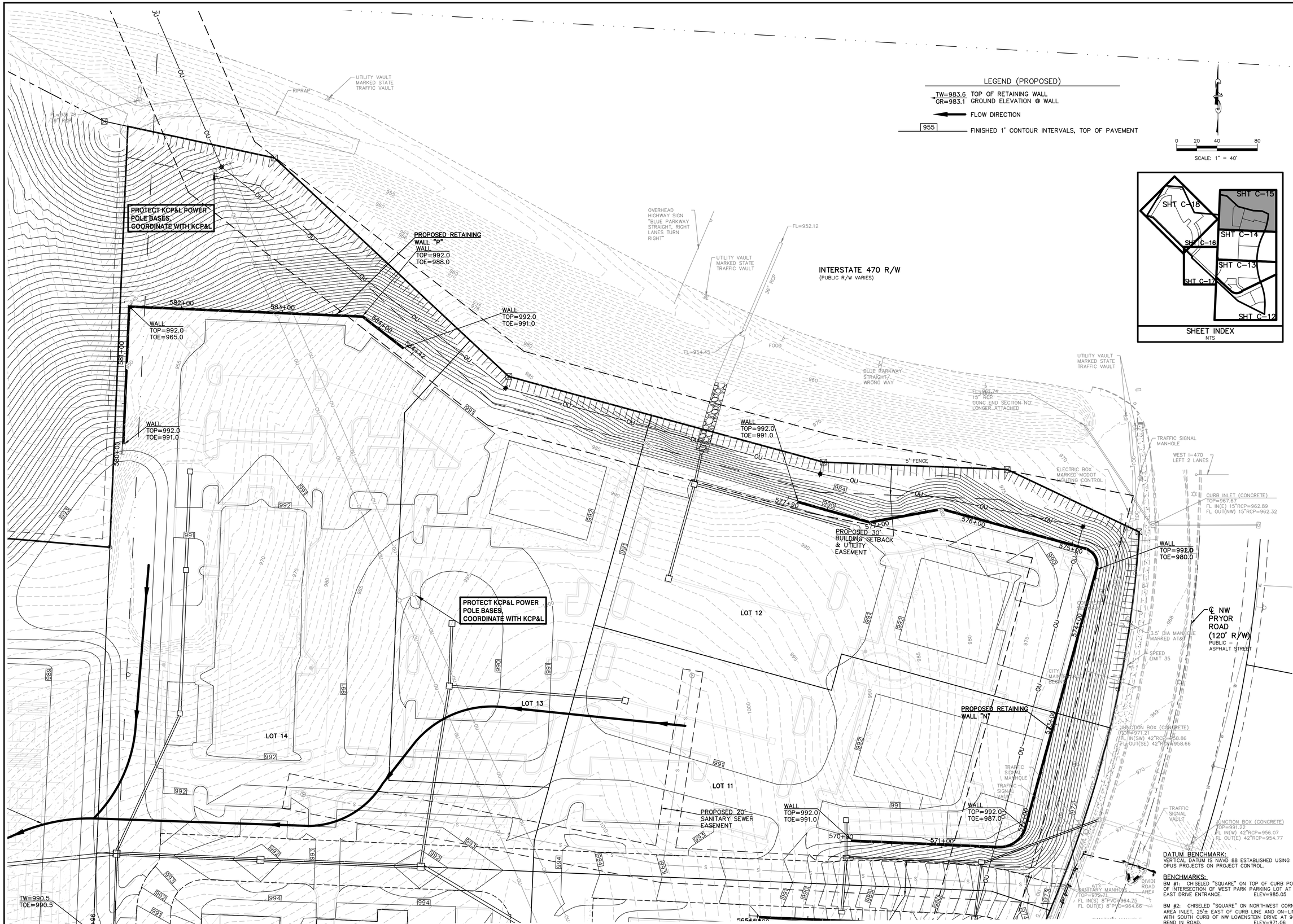

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KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GRADING PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_GP	
SHEET	REV
C-18	0

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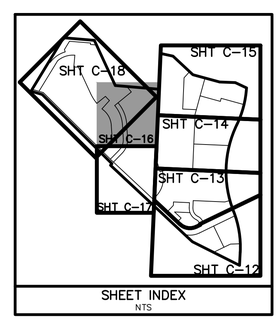
0 20 40 80

SCALE: 1" = 40'

LEGEND (PROPOSED)

- TW=983.6 / GR=983.1 — TOP OF RETAINING WALL / GROUND ELEVATION @ WALL
- FLOW DIRECTION
- 955 — FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT



SHEET INDEX
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LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GRADING PLAN

PROJ. NO.	A14_7067-1	
DESIGNER	LDO	DRAWN BY JT
CFN	7067-1G_GP	
SHEET	C-19	REV 0

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0 20 40 80

SCALE: 1" = 40'

LEGEND (PROPOSED)

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- FLOW DIRECTION
- 955 — FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

SHEET INDEX
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STREETS OF WEST PRYOR

NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE

LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS

GRADING PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_GP	
SHEET	REV
C-20	0

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LEGEND (PROPOSED)

TW=983.6 TOP OF RETAINING WALL
GR=983.1 GROUND ELEVATION @ WALL

FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

ROCK RIPRAP (D_{50}=18")

0 20 40 80
SCALE: 1" = 40'

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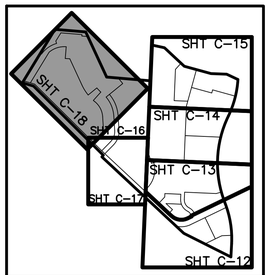

MAINTAIN POSITIVE DRAINAGE, OVERLAND DITCH

AFTER COMPLETION OF WEST BASIN BUT PRIOR TO STORM SEWER INSTALLATIONS ROUTE OVERLAND DITCH GRADED TO DRAIN

TRACT "A"

TRACT "B"

TRACT "C"

℄ FUTURE NW LOWENSTEIN CIRCLE (PROPOSED 50' R/W)

℄ NW LOWENSTEIN DRIVE (50' R/W)
PUBLIC - ASPHALT SURFACING

INGRESS/EGRESS EASEMENT BOOK NO. 2007E0030358 RECORDED 6-26-2007

PROPOSED 10' UTILITY EASEMENT

PROPOSED 20' UTILITY EASEMENT

PROPOSED 50' UTILITY EASEMENT

PROPOSED 12' UTILITY EASEMENT

PROPOSED 10' UTILITY EASEMENT

10' ELECTRIC LINE EASEMENT BOOK NO. 2006E0030176, PG RD RECORDED 11-17-1965

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
GRADING PLAN

PROJ. NO.	A14_7067-1	
DESIGNER	LDO	DRAWN BY JT
CFN	7067-1G_GP	
SHEET	C-21	REV 0

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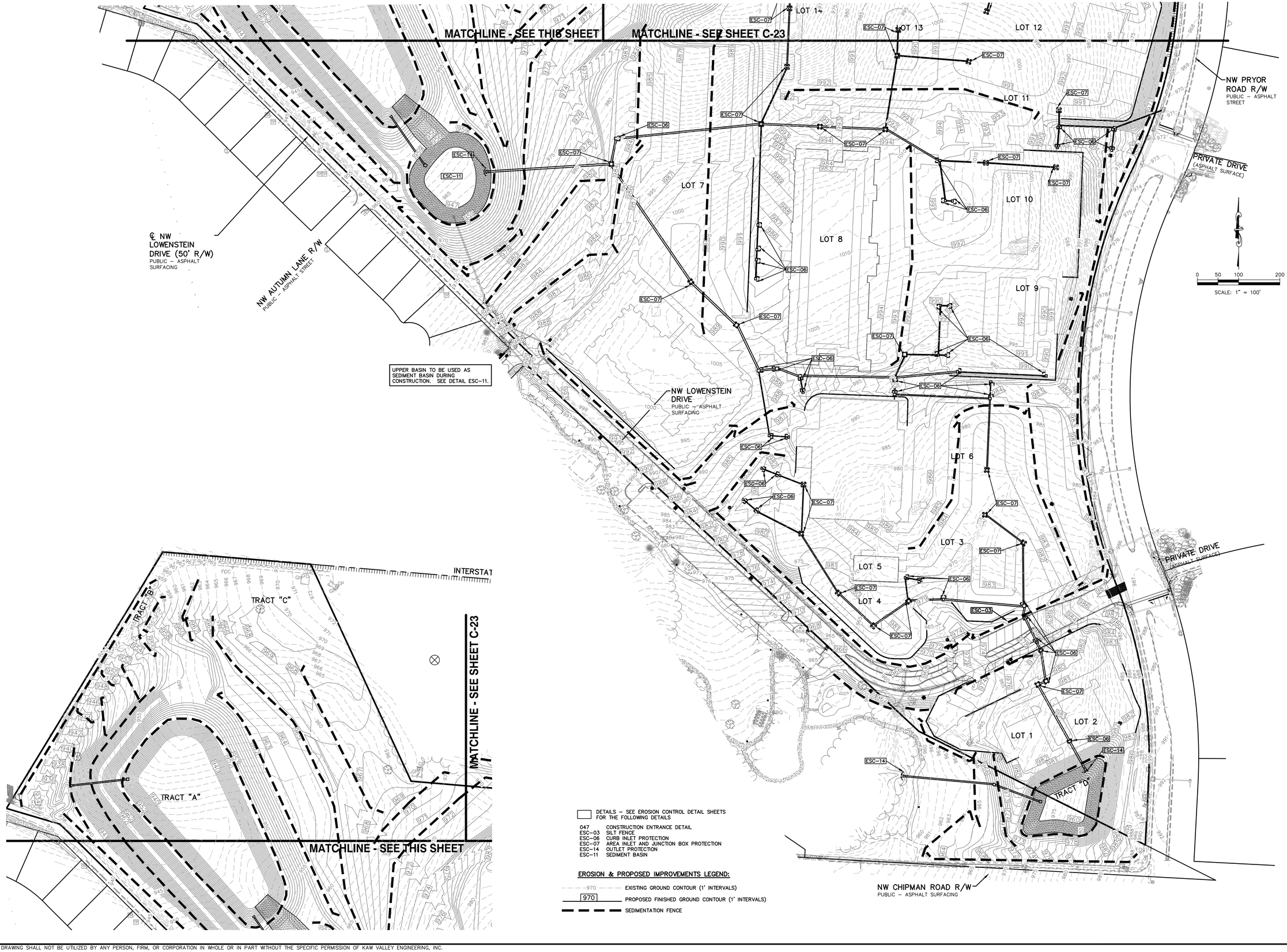

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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_ECP	
SHEET	REV
C-22	0

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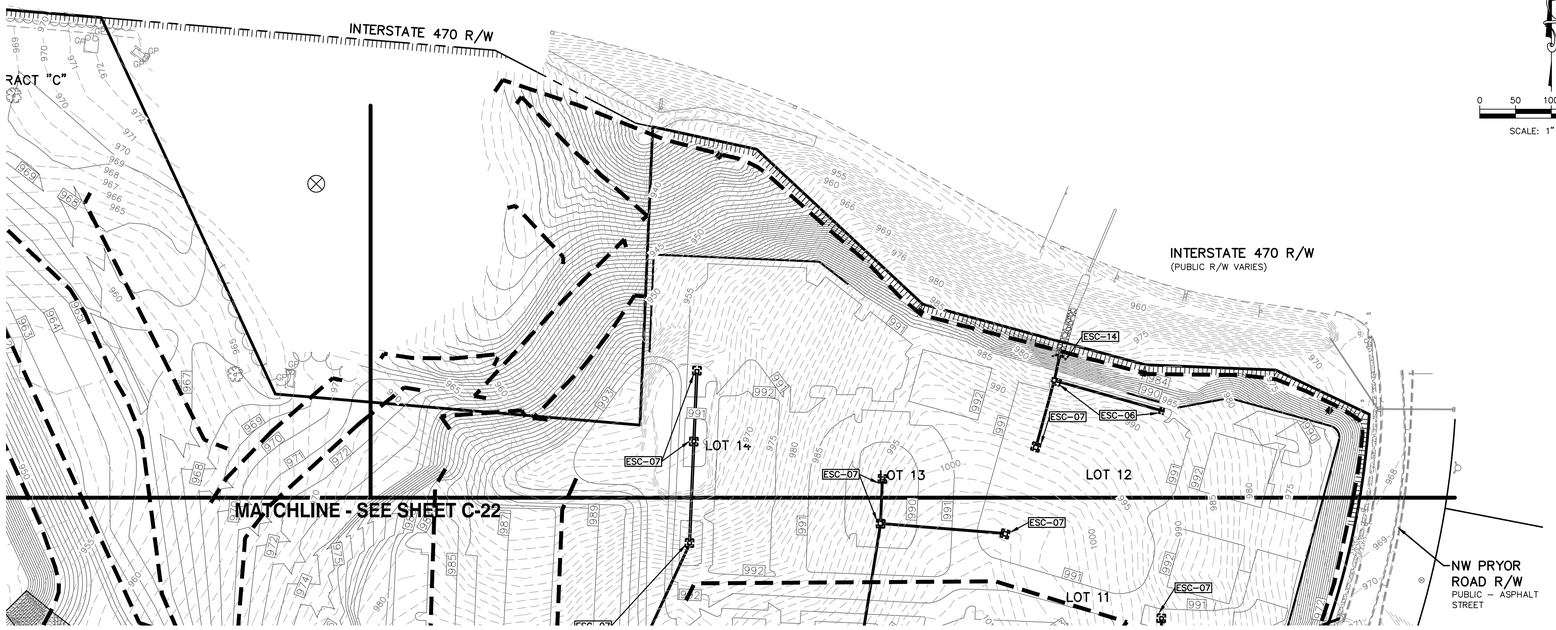

0 50 100 200

SCALE: 1" = 100'

GENERAL NOTES:

1. PROPERTY LINE IS LIMITS OF CONSTRUCTION EXCEPT AS SHOWN.
2. THE CONTRACTOR SHALL INSTALL EROSION CONTROL MEASURES AS SHOWN ON THE DRAWINGS PRIOR TO BEGINNING EARTHWORK OPERATIONS.
3. THE CONTRACTOR SHALL MAINTAIN ALL SILT CONTROL MEASURES DURING CONSTRUCTION.
4. ALL SILT SHALL REMAIN ON SITE AND SURROUNDING STREETS SHALL BE KEPT CLEAR OF ALL MUD AND DEBRIS.
5. A SEDIMENTATION BARRIER IS TO BE INSTALLED AS SHOWN.
6. ACCUMULATED SEDIMENT SHALL BE REMOVED AND THE SEDIMENTATION BARRIERS MAINTAINED AS NEEDED TO PREVENT SEDIMENTATION BYPASS OF THE BARRIER.
7. SLOPES ARE TO BE LEFT IN A ROUGH CONDITION DURING GRADING.
8. CURB INLET SEDIMENTATION BARRIERS ARE TO BE INSTALLED AROUND INLETS AND WEIRS WHERE SEDIMENTATION IS A CONCERN. INLET BARRIERS SHALL BE EITHER BLOCK AND GRAVEL, OR SECURED STRAW BALES, OR SILT FENCE.
9. SEDIMENT IS TO BE REMOVED FROM STORM WATER DRAINAGE SYSTEMS.
10. RIPRAP IS TO BE INSTALLED AT AREAS OF CONCENTRATED FLOW (I.E. CULVERT OUTLETS).
11. CONTRACTOR IS RESPONSIBLE FOR INSTALLING ANY ADDITIONAL EROSION CONTROL AS HE/SHE DEEMS NECESSARY.
12. THE CONTRACTOR SHALL PROVIDE ALL MATERIALS, TOOLS, EQUIPMENT AND LABOR AS NECESSARY TO INSTALL AND MAINTAIN ADEQUATE EROSION AND SILTATION CONTROLS REQUIRED TO PREVENT SOIL EROSION FROM LEAVING THE PROJECT SITE. IT SHALL BE THE CONTRACTOR'S SOLE RESPONSIBILITY TO ENSURE THAT METHODS UTILIZED ARE ADEQUATE AND COMPLY WITH REQUIREMENTS OF THE SPECIFICATIONS AND GOVERNMENTAL AGENCIES HAVING JURISDICTION OVER THE WORK.
13. TEMPORARY SEDIMENT FENCE TO REMAIN UNTIL ADEQUATE VEGETATION IS ESTABLISHED.
14. MUD AND DEBRIS SHALL BE CLEANED UP AT THE CONCLUSION OF EACH WORKING DAY, OR AFTER EACH RAINFALL IF SILT IS PRESENT.
15. INSPECTION, MAINTENANCE AND REPAIR OF EROSION CONTROL DEVICES SHALL BE ON GOING THROUGHOUT THE LIFE OF BUILDING CONSTRUCTION TO KEEP THE DEVICES IN OPERABLE CONDITION AT ALL TIMES. ADDITIONAL MEASURES SHALL BE INSTALLED AS REQUIRED BY ACTUAL FIELD CONDITIONS AND/OR GOVERNING INSPECTION AGENCIES.
16. INSTALL CONSTRUCTION ENTRANCE AT ANY POINT WHERE TRAFFIC WILL BE ENTERING OR LEAVING THE SITE AND AS SHOWN ON PLANS.
17. AT COMPLETION OF SITE GRADING AND OTHER RELATED CONSTRUCTION ACTIVITIES, ALL DISTURBED AREAS WITHIN THE PROJECT SITE SHALL BE SEEDED, SODDED, OR LANDSCAPED AS SHOWN ON THE LANDSCAPE PLAN WITHIN 14 DAYS.
18. TOPSOIL IS TO BE PLACED IN AREAS UNSUITABLE FOR VEGETATIVE GROWTH.
19. STRIP TOPSOIL PRIOR TO EXCAVATION, STOCKPILE AND SPREAD ONTO DISKED SUBGRADE (4" MIN) A THICKNESS OF 4 INCHES.
20. ROCK LINING (RIPRAP) SHALL BE DURABLE STONE CONTAINING A COMBINED TOTAL OF NOT MORE THAN 10 PERCENT OF EARTH, SAND, SHALE AND NON-DURABLE ROCK. AT LEAST 60 PERCENT OF THE MASS SHALL BE OF PIECES HAVING A MINIMUM WEIGHT OF 150 POUNDS OR MORE PER CUBIC FOOT.
21. THE CONTRACTOR SHALL HAVE THE RESPONSIBILITY FOR RESOLVING COMPLAINTS IN THE EVENT THAT COMPLAINTS OR DAMAGE CLAIMS ARE FILED DUE TO DAMAGES OCCURRING ADJACENT TO OR DOWNSTREAM FROM PROPERTY BY SEDIMENT RESULTING FROM EROSION ON THE PROJECT SITE.
22. GOOD HOUSEKEEPING PRACTICES SHALL BE MAINTAINED ON SITE TO KEEP SOLID WASTE FROM ENTRY INTO WATERS.
23. ALL FUELING FACILITIES PRESENT ON SITE SHALL ADHERE TO APPLICABLE FEDERAL AND STATE REQUIREMENTS CONCERNING UNDERGROUND STORAGE, ABOVE GROUND STORAGE AND DISPENSERS, INCLUDING SPILL PREVENTION, CONTROL AND COUNTER MEASURES.
24. RIGHT OF WAY TO BE STABILIZED AS REQUIRED BY APWA SECTION 2400.
25. EROSION CONTROL IS TO BE PLACED IN PHASING AS CONSTRUCTION PROGRESSES.
26. MINIMAL WASHING OF CONCRETE EQUIPMENT ALLOWED, CHUTE ETC. CONCRETE WASHOUT OF THE DRUM IS NOT ALLOWED. ANY PIT/WASHOUT AREA NEEDS TO BE MAINTAINED IN A NON-DISCHARGING MANNER AND ANY WASTE RESIDUE WILL NEED TO BE CLEANED OUT AND REMOVED AT THE END OF PROJECT.
27. EROSION CONTROL SEDIMENT FENCE TO BE INSTALLED 1'-0" BEHIND CURB & GUTTER UPON COMPLETION OF BACKFILL OF CURB IN ALL AREAS WHERE SLOPES FROM LOT DRAIN TOWARDS CURB. UPON COMPLETION OF FINAL GRADING THE TOES OF ALL EMBANKMENTS IN EXCESS OF TWO FEET IN HEIGHT WILL HAVE EROSION CONTROL SEDIMENT FENCE INSTALLED.

DETAILS – SEE EROSION CONTROL DETAIL SHEETS FOR THE FOLLOWING DETAILS

047	CONSTRUCTION ENTRANCE DETAIL
ESC-03	SILT FENCE
ESC-06	CURB INLET PROTECTION
ESC-07	AREA INLET AND JUNCTION BOX PROTECTION
ESC-14	OUTLET PROTECTION
ESC-11	SEDIMENT BASIN

EROSION & PROPOSED IMPROVEMENTS LEGEND:

970 EXISTING GROUND CONTOUR (1' INTERVALS)

970 PROPOSED FINISHED GROUND CONTOUR (1' INTERVALS)

SEDIMENTATION FENCE

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
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KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_ECP
SHEET C-23 | REV 0

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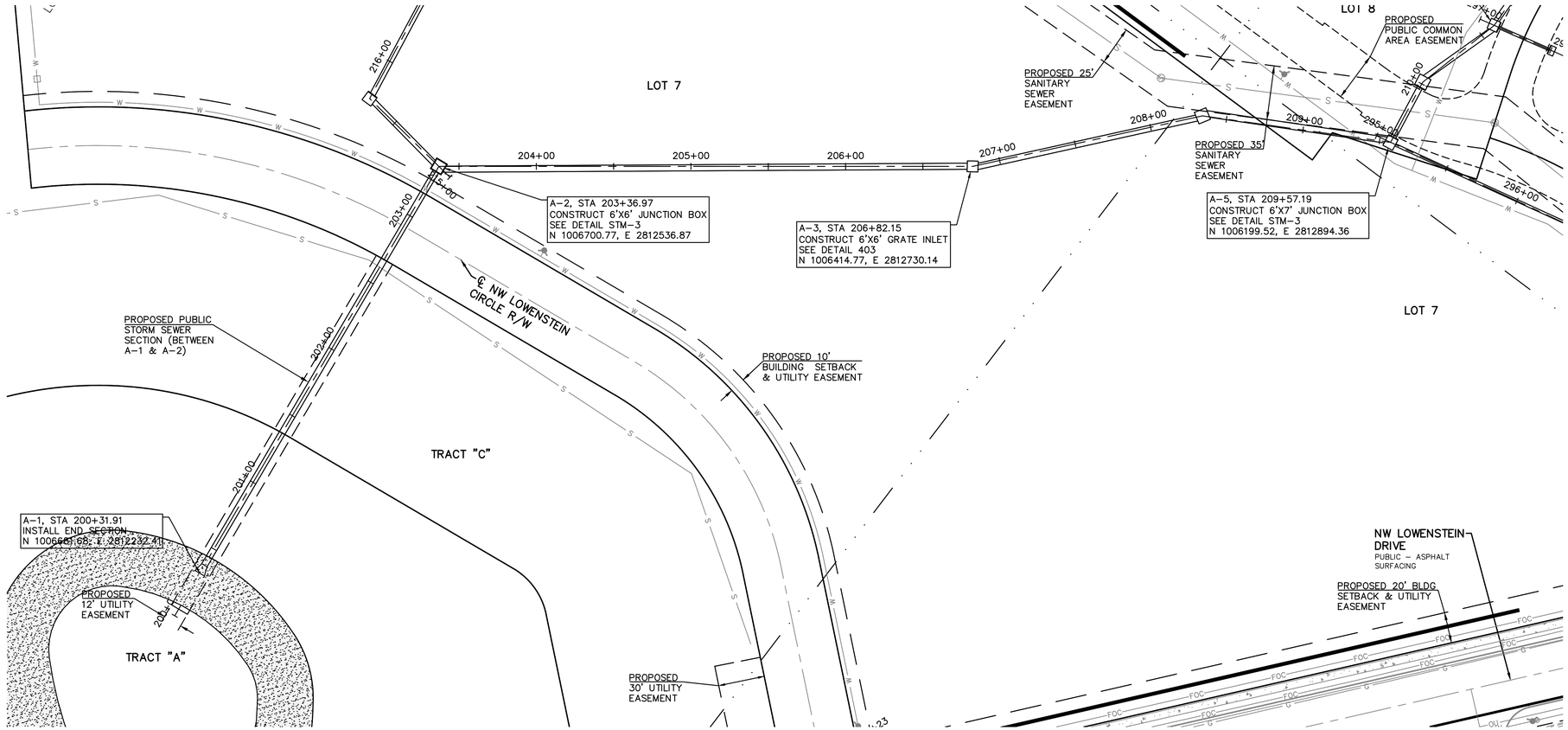

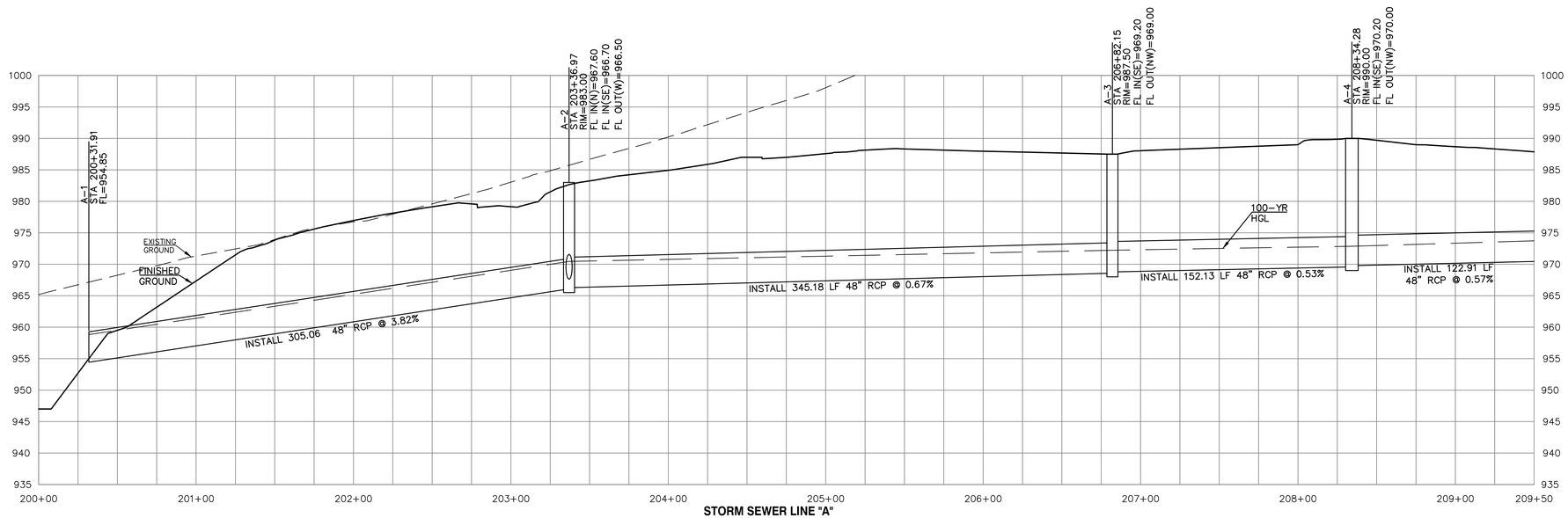

STORM SEWER LINE "A"

ALL PROPOSED STORM LINES ARE PRIVATE UNLESS NOTED OTHERWISE

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000642. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE A - PLAN AND PROFILE

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_DPP
SHEET	C-24
REV	0

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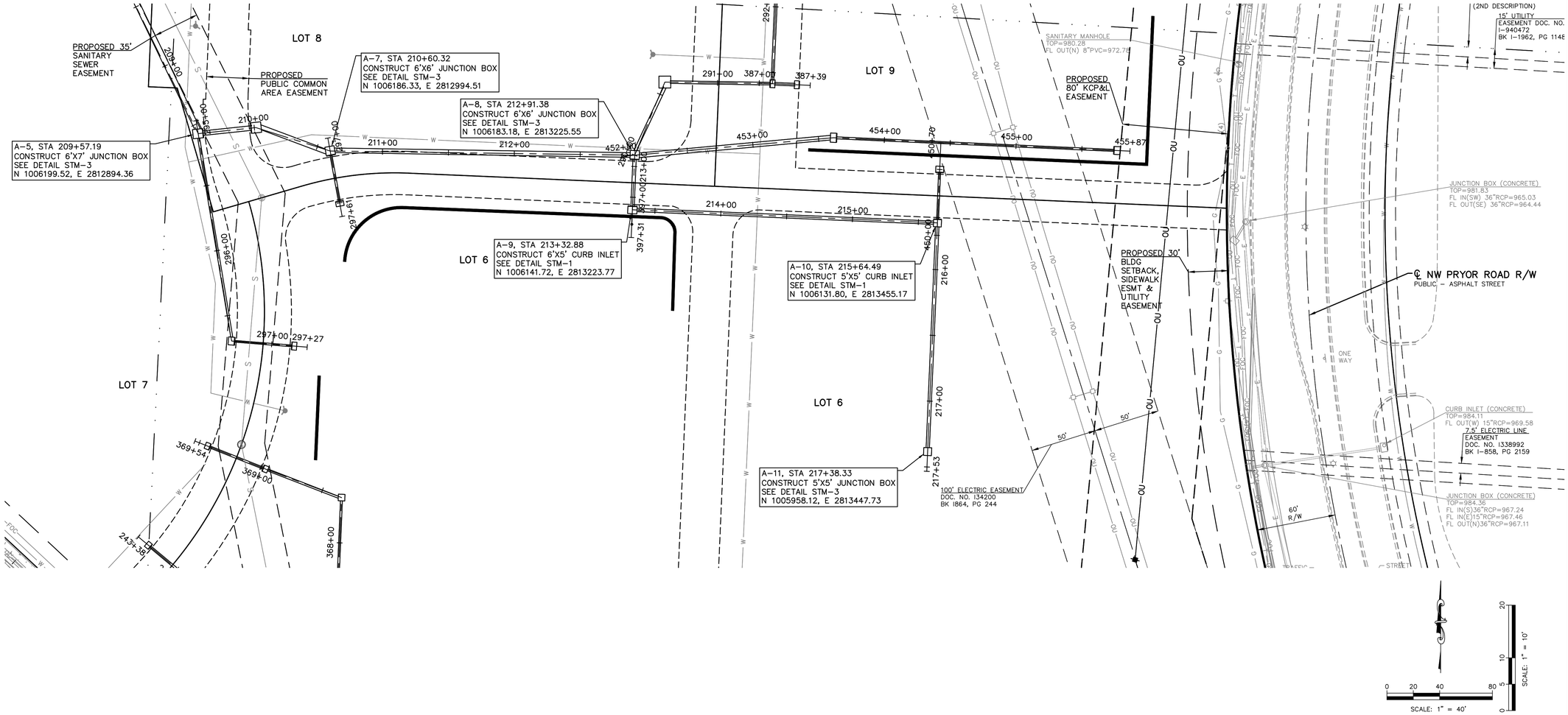

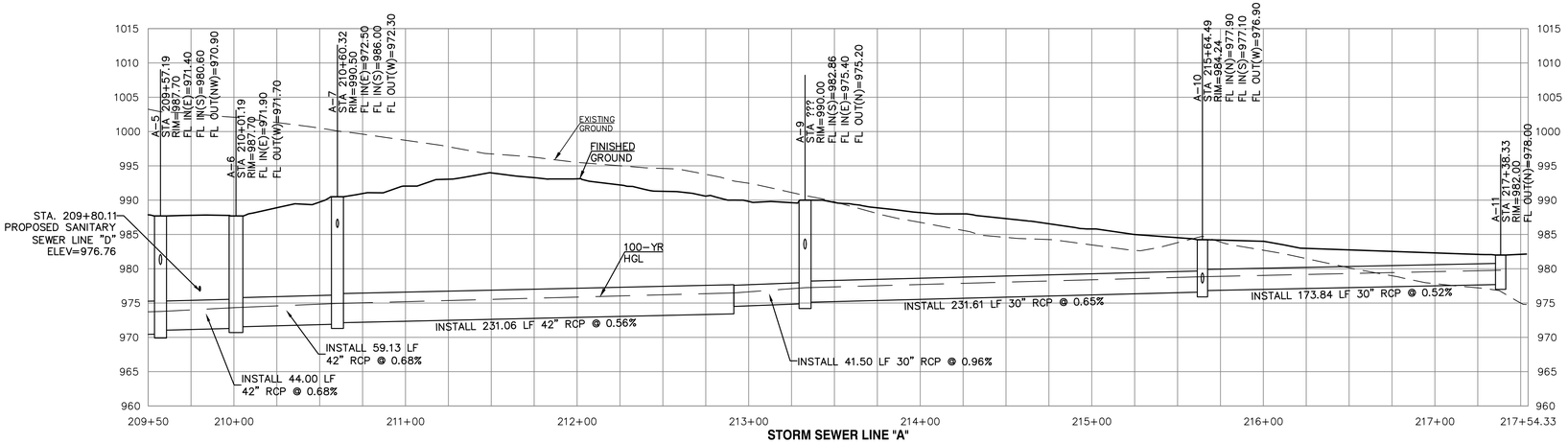

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE A - PLAN AND PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DPP	
SHEET	REV
C-25	0

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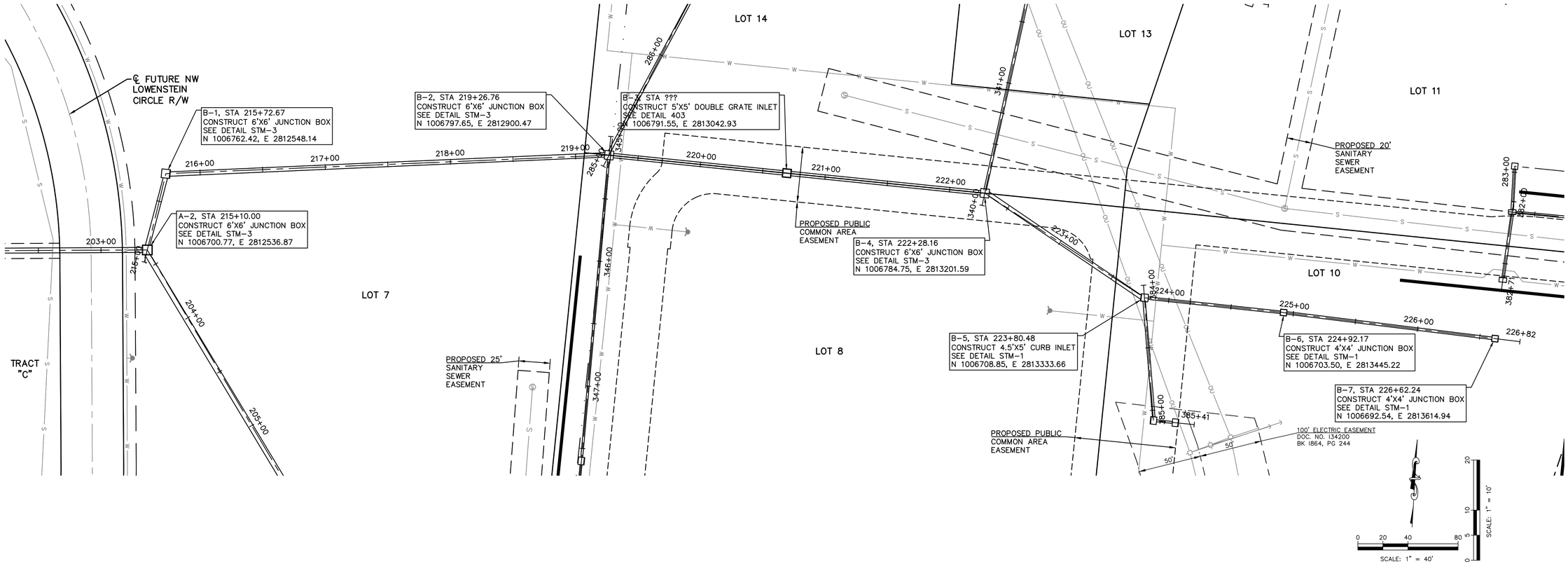

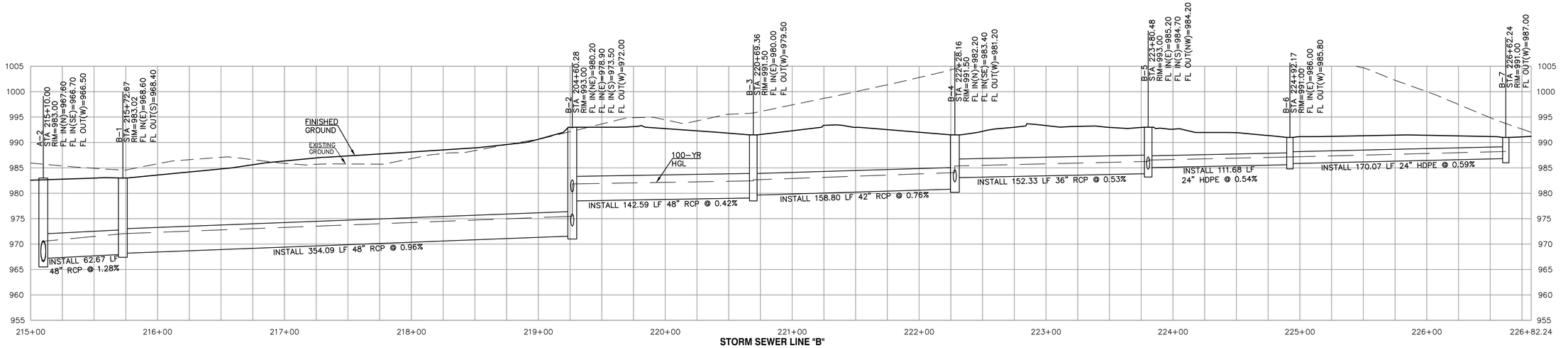

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON OSBORN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBORN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE B - PLAN AND PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DPP	
SHEET	REV
C-26	0

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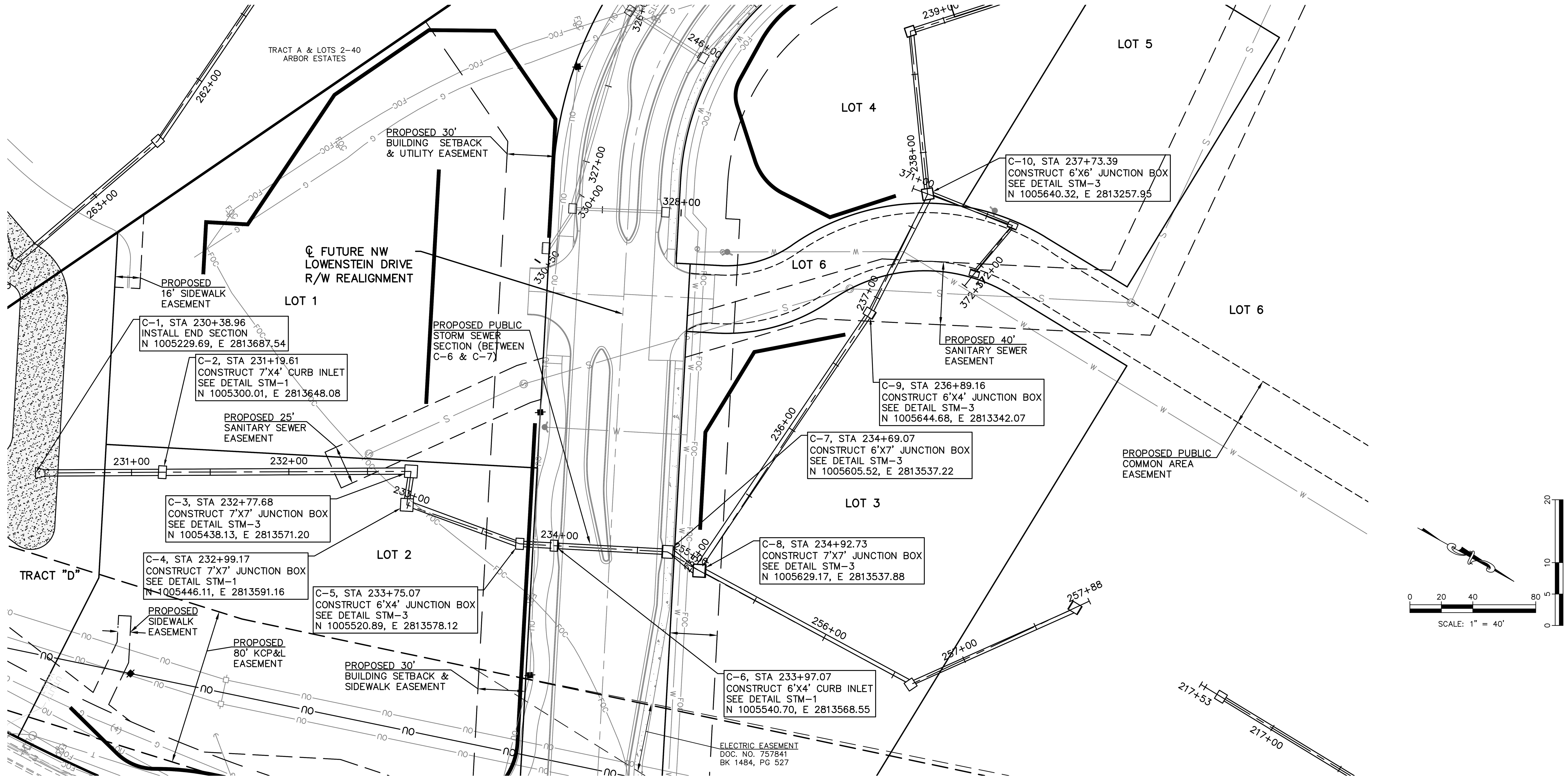

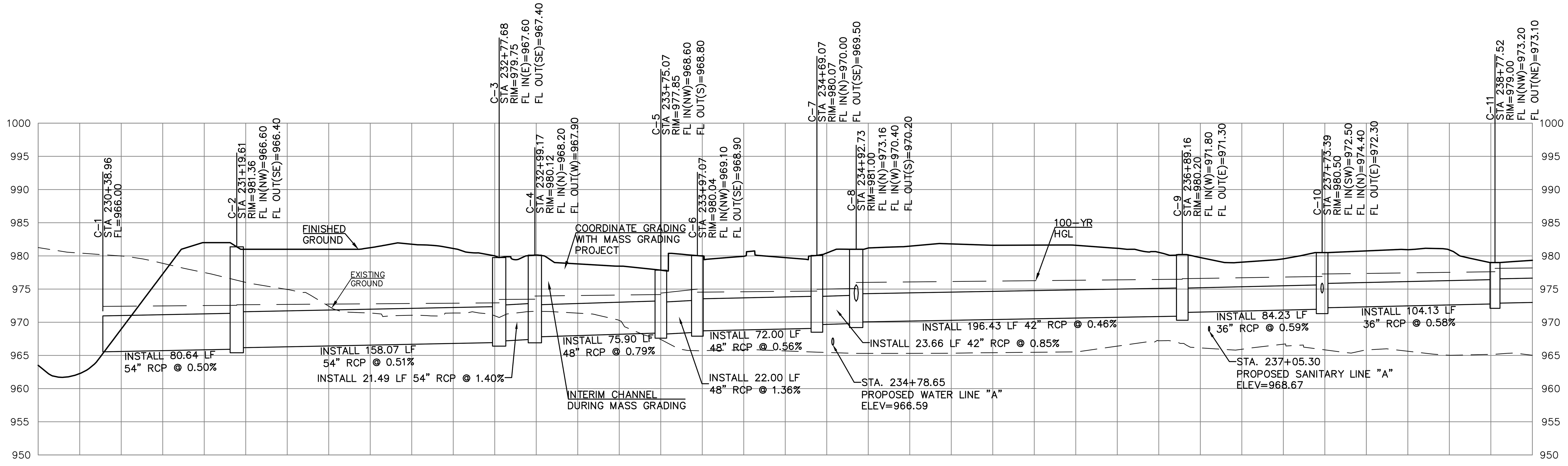

STORM SEWER LINE "C"

ALL PROPOSED STORM LINES ARE PRIVATE UNLESS NOTED OTHERWISE

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI — LEON D. OSBOURN — NUMBER E-21726 — REGISTERED PROFESSIONAL ENGINEER — 1-6-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE C - PLAN AND PROFILE

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DPP
SHEET C-27 | REV 0

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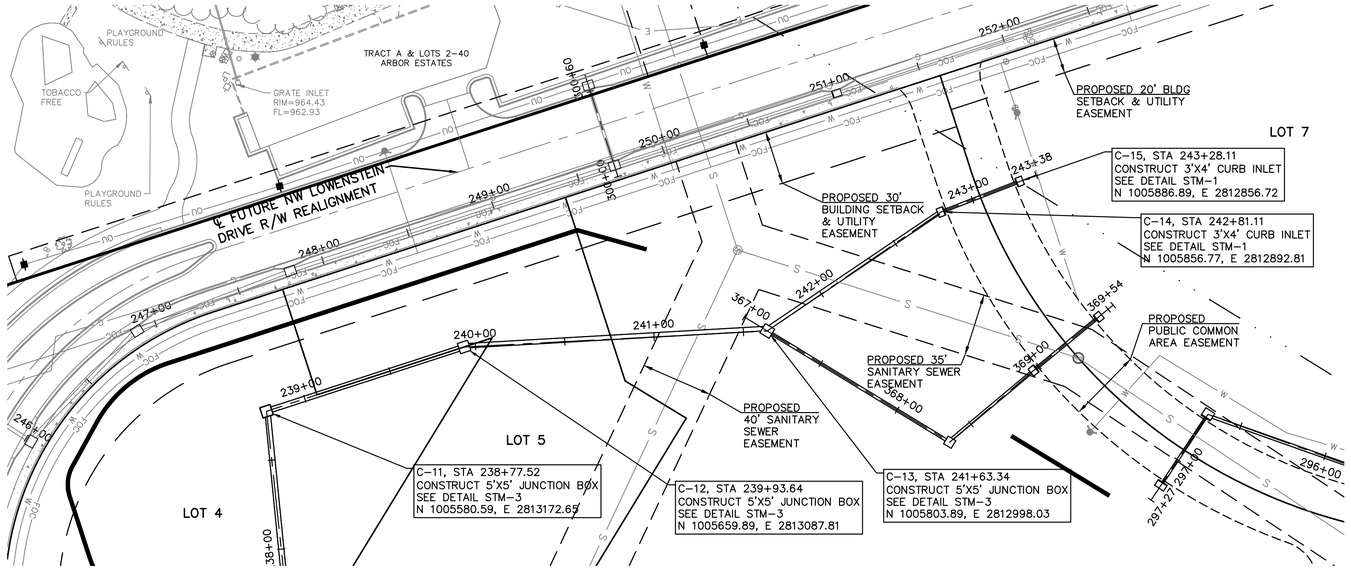

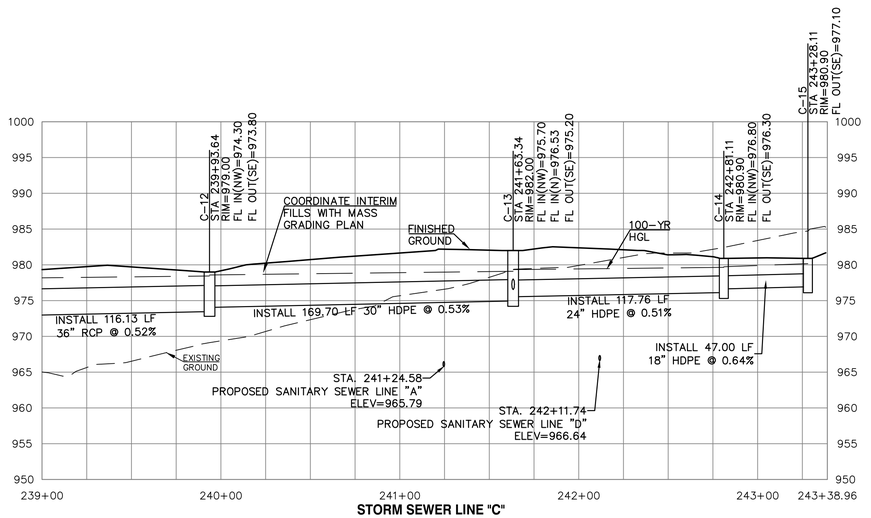

STORM SEWER LINE "C"

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE C - PLAN AND PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DPP	
SHEET	REV
C-28	0

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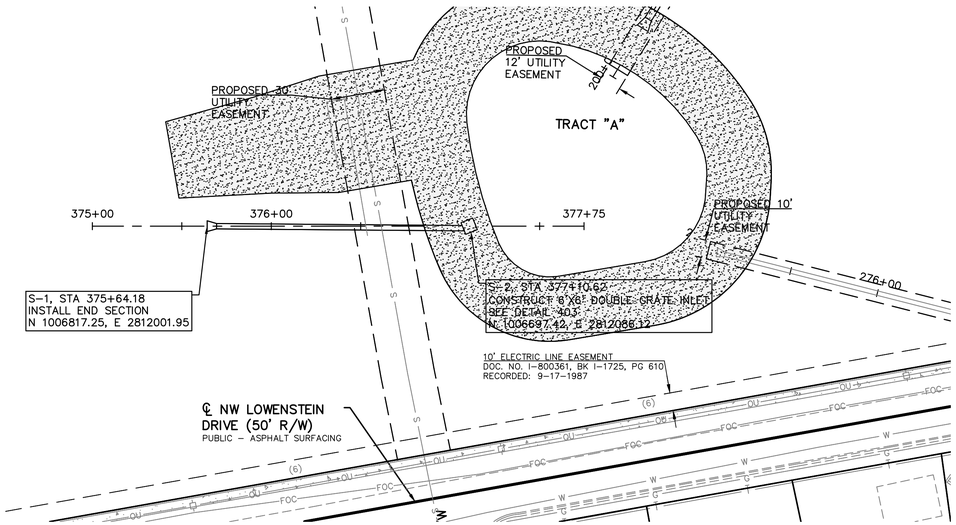
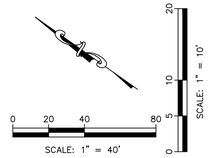
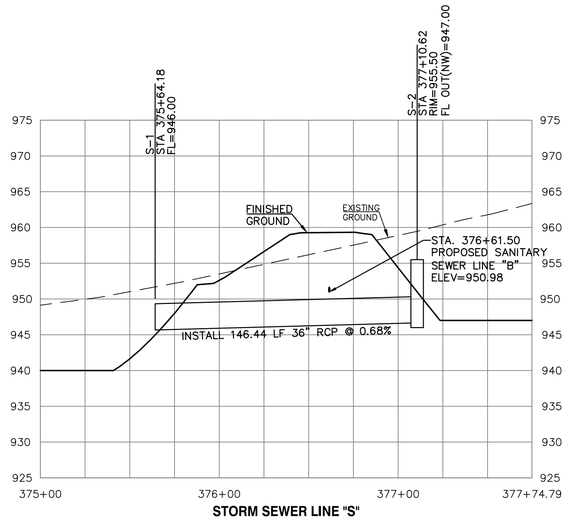
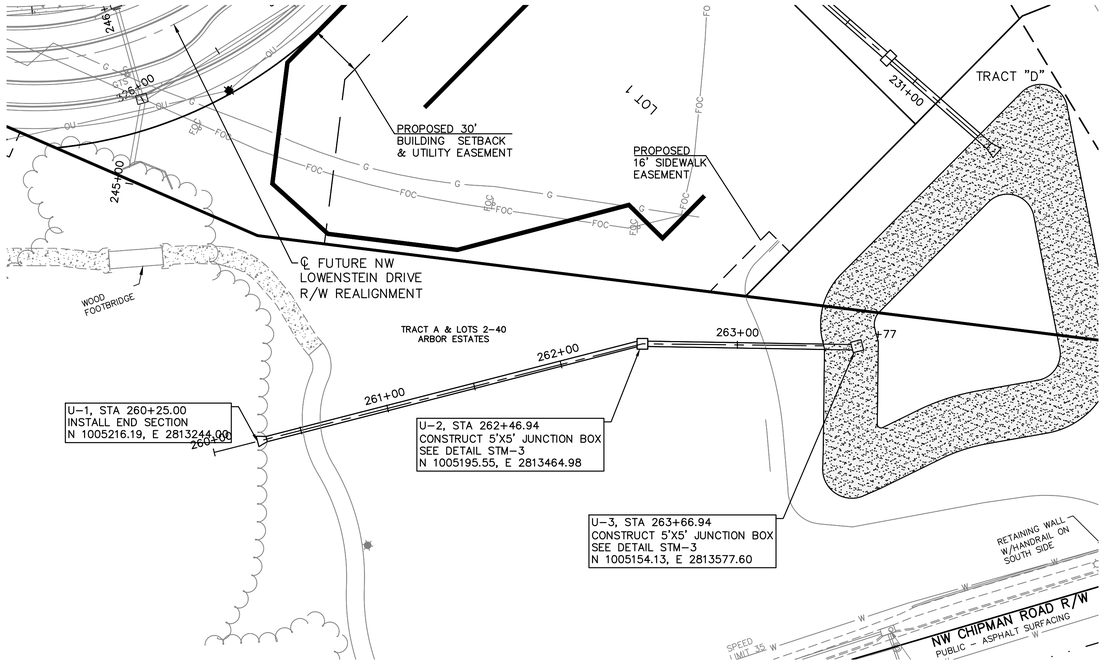
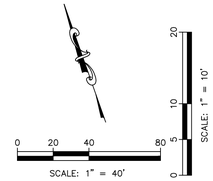




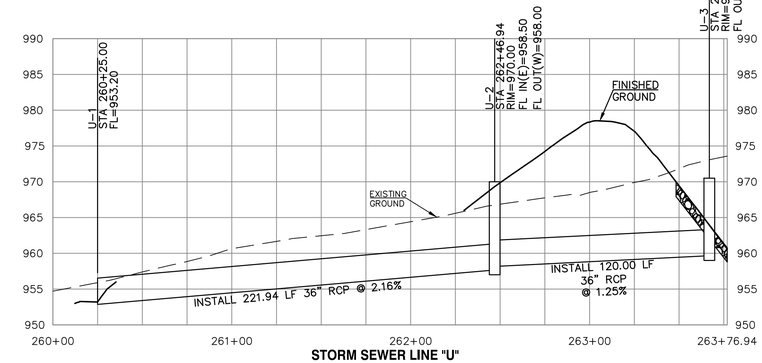


STORM SEWER LINE "S"





STRUCTURE OS-3
RISER CONTROL ELEMENTS:
2-4" DIA ORIFICE OPENINGS AT EL 966.0, SOUTH FACE
2 - 8" DIA ORIFICE OPENINGS AT EL 968.0, SOUTH FACE
2- 8" DIA ORIFICE OPENINGS A EL 969.0, NORTH FACE
TRASH RACK AND GRATE INLET, IN RISER TOP, 2FT X 2 FT OPENING, EL 970.50



STORM SEWER LINE "U"

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN KANSAS. KANSAS STATE CERTIFICATE OF AUTHORITY # 000642. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE J & R - PLAN AND PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DPP	
SHEET	REV
C-29	0

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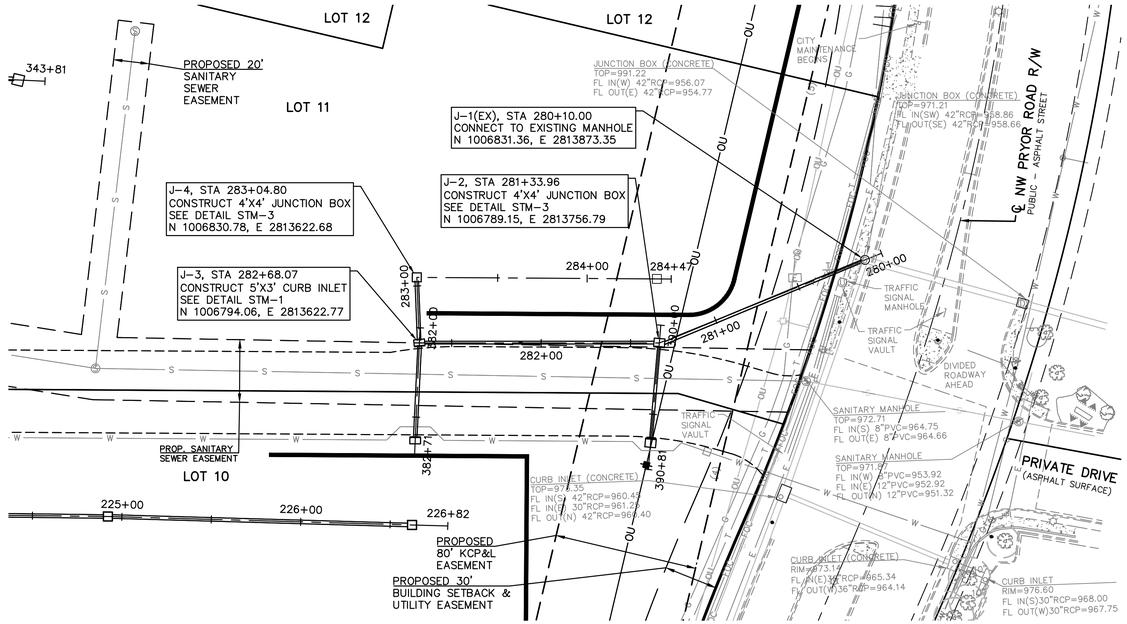

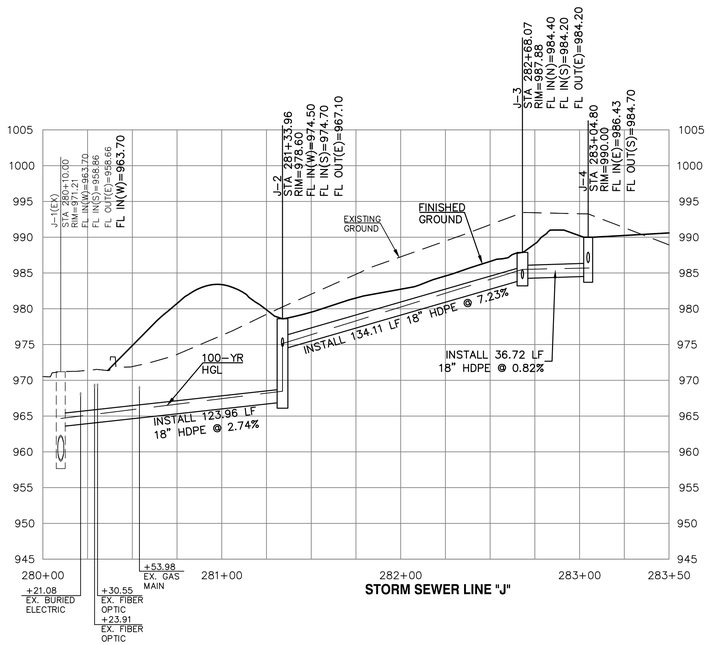

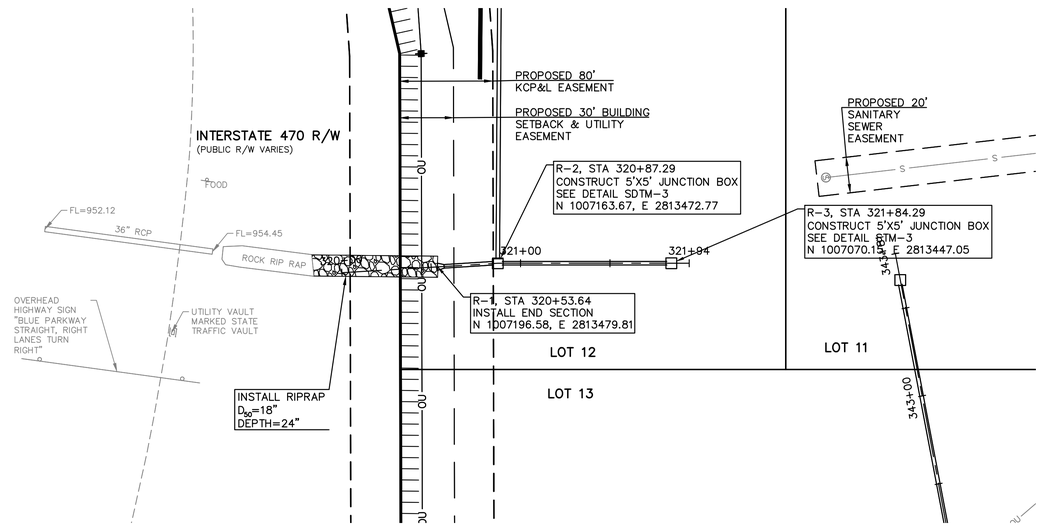

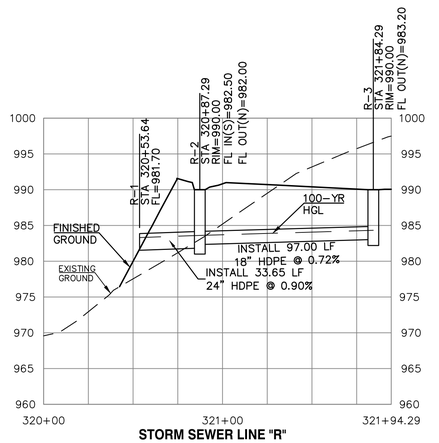

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBORN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBORN
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MO # 021726

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KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE J & R - PLAN AND PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DPP	
SHEET	REV
C-30	0

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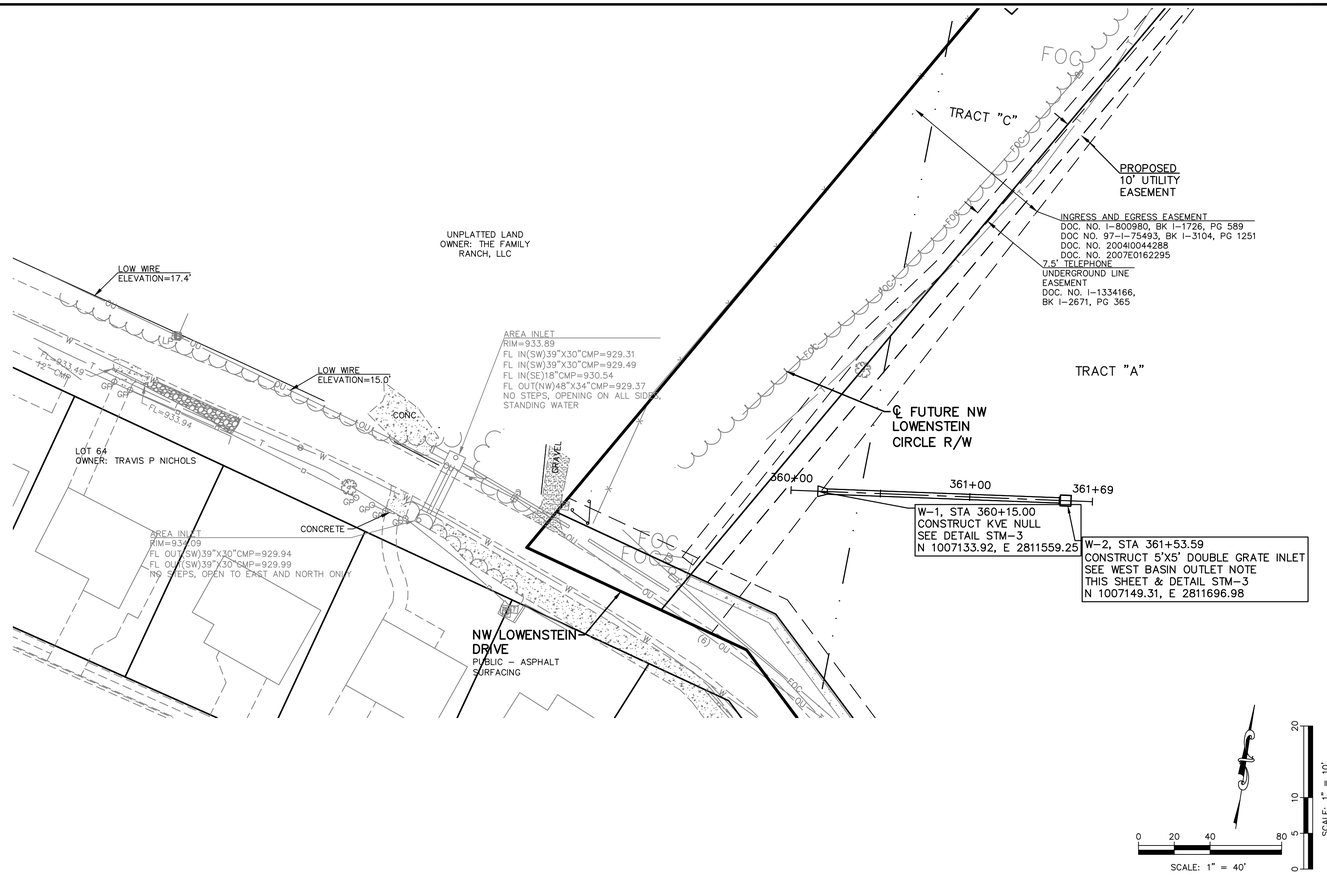
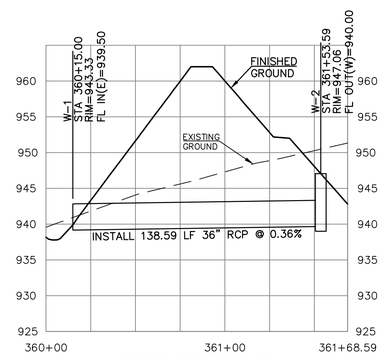


WEST BASIN OUTLET NOTE:
1 – 5" DIA ORIFICE OPENINGS AT EL 950.0, EAST FACE
3 – 12" DIA ORIFICE OPENINGS AT EL 952.0, NORTH FACE
3 – 15" DIA ORIFICE OPENINGS AT EL 955.0, SOUTH FACE
SOLID TOP RISER, AS SHOWN



STORM SEWER LINE "W"

ALL PROPOSED STORM LINES ARE PRIVATE UNLESS NOTED OTHERWISE

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

2319 N. JACKSON | P.O. BOX 1304
JACKSON, CITY, MO 63755-6444
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pd@kvengr.com | www.kvengr.com

KAW VALLEY ENGINEERING

KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE W - PLAN AND PROFILE

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DPP
SHEET C-31 | REV 0

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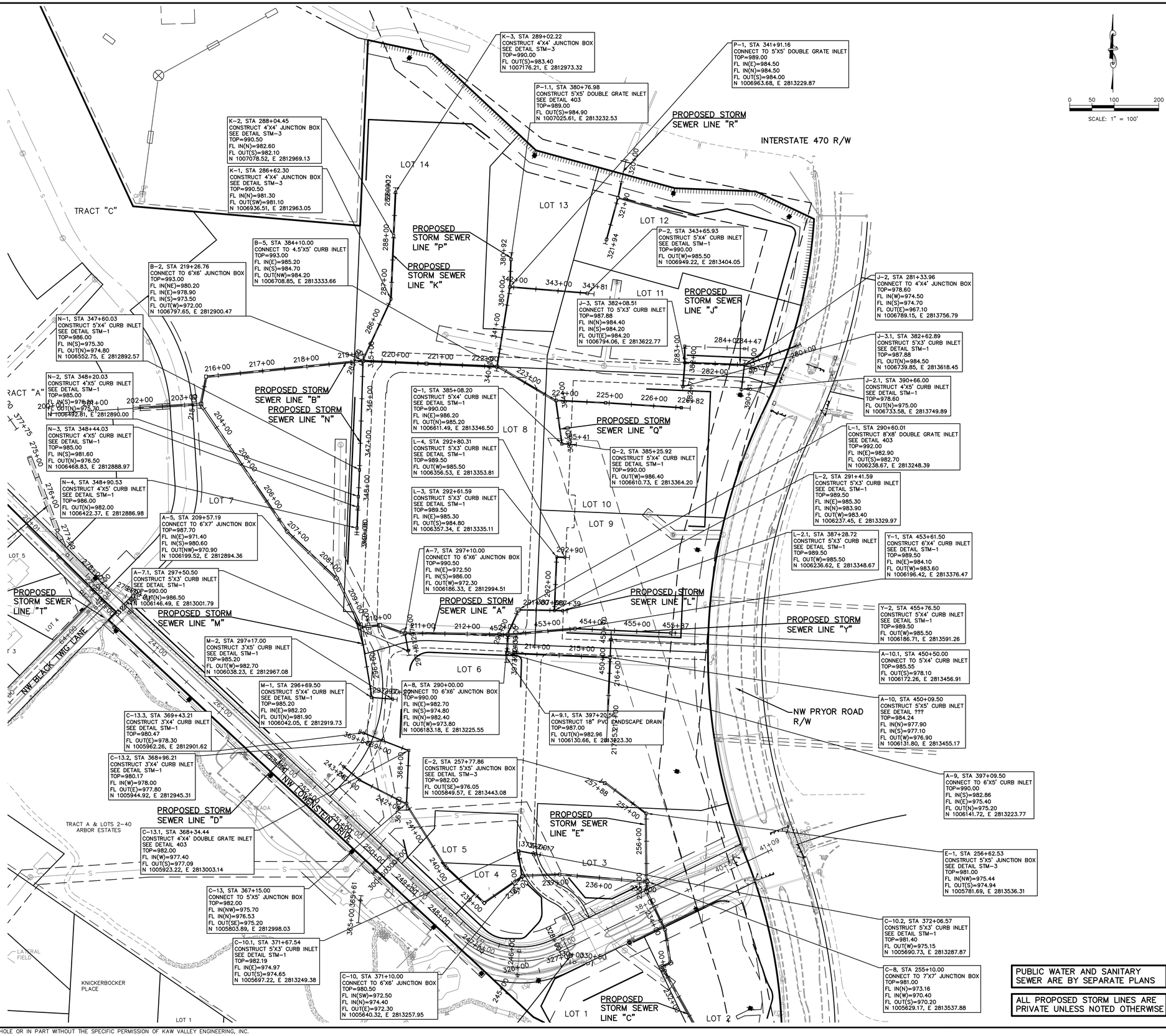

PUBLIC WATER AND SANITARY SEWER ARE BY SEPARATE PLANS

ALL PROPOSED STORM LINES ARE PRIVATE UNLESS NOTED OTHERWISE

REV	DATE	DESCRIPTION
0	1-16-19	INITIAL ISSUE

DSN: LDO
DWN: JT
CHK: LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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JUNCTION CITY, KANSAS 66441
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jo@kveng.com | www.kveng.com
KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI UNDER STATE CERTIFICATE OF AUTHORITY # 000842; EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DPP2
SHEET C-32 | REV 0

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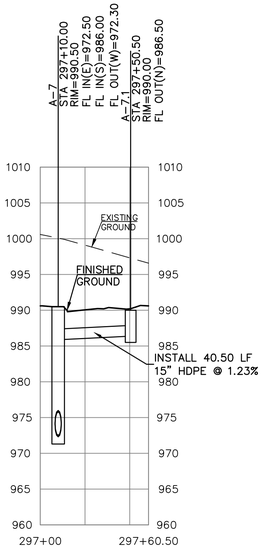
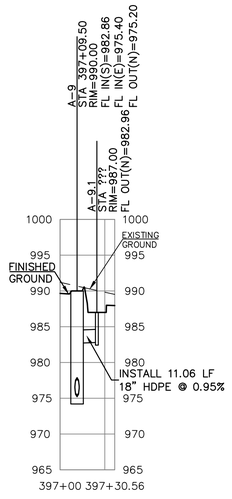
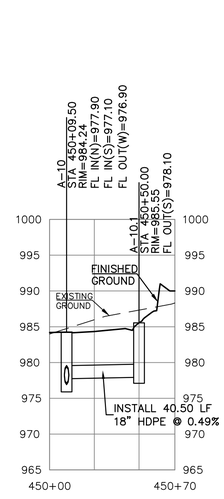


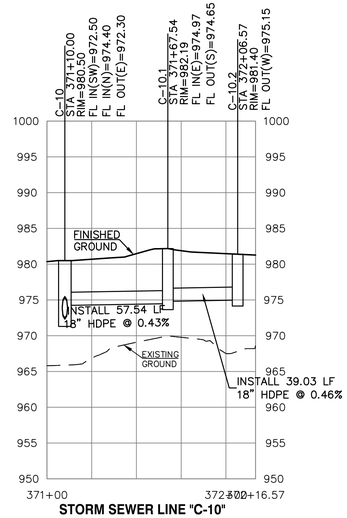
STORM SEWER LINE "A-7"



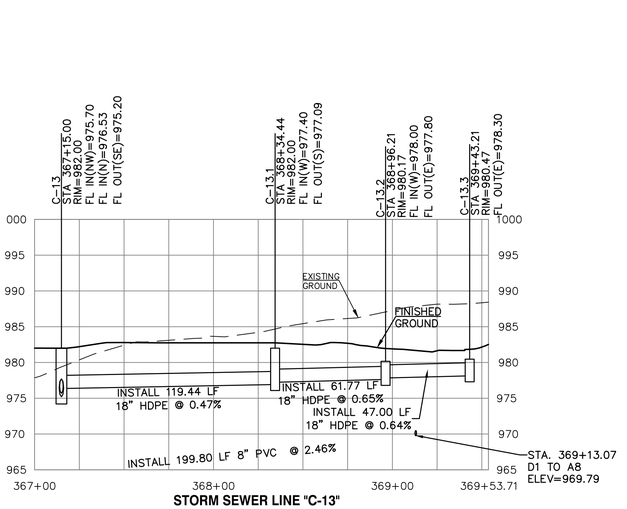
STORM SEWER LINE "A-9"



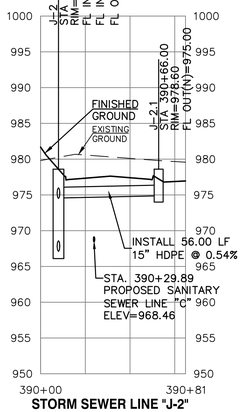
STORM SEWER LINE "A-10"



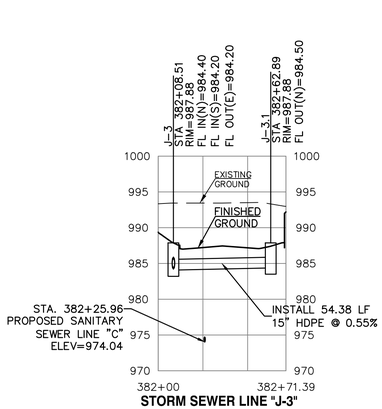
STORM SEWER LINE "C-10"



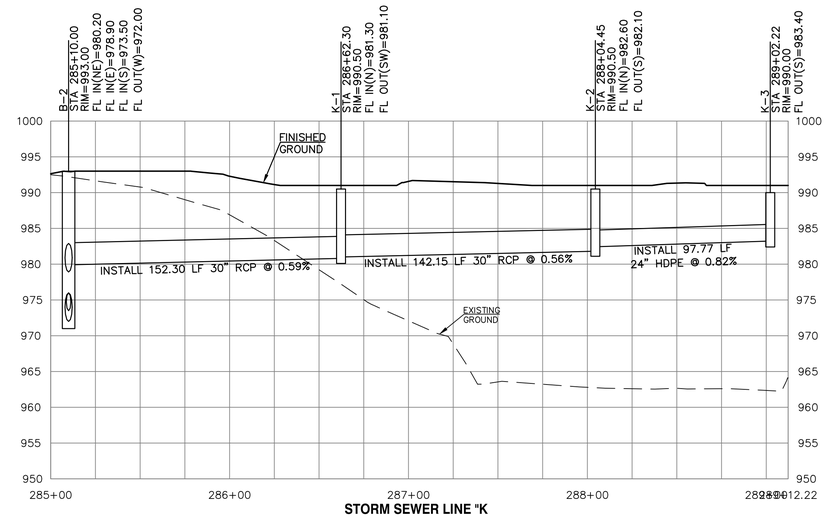
STORM SEWER LINE "C-13"



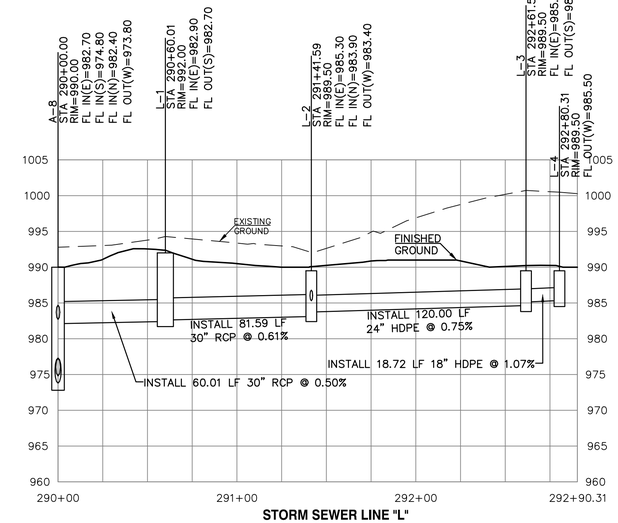
STORM SEWER LINE "J-2"



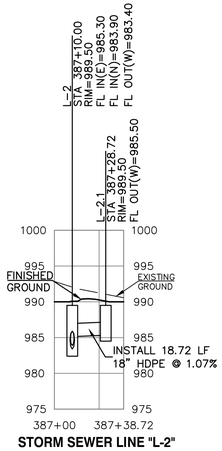
STORM SEWER LINE "J-3"



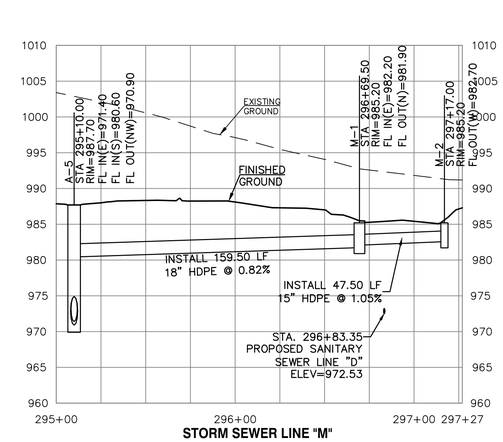
STORM SEWER LINE "K"



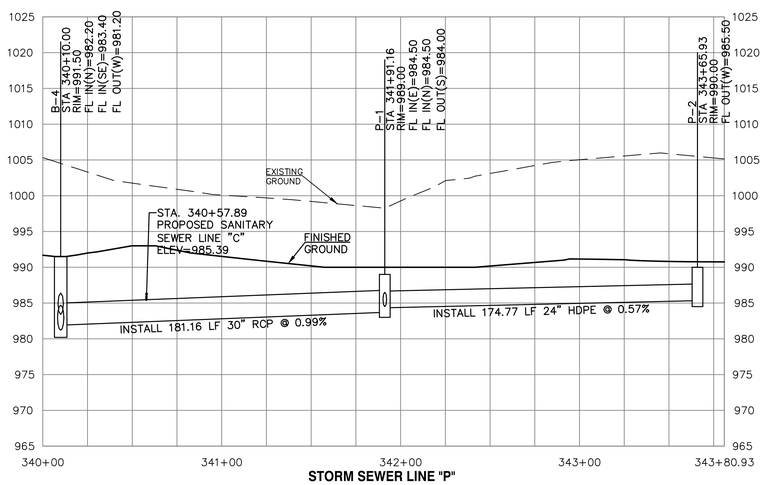
STORM SEWER LINE "L"



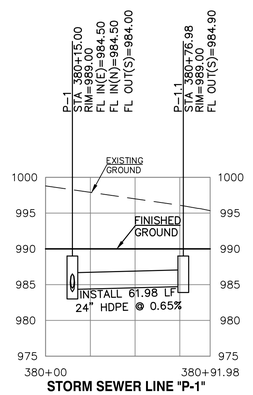
STORM SEWER LINE "L-2"



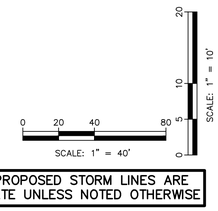
STORM SEWER LINE "M"



STORM SEWER LINE "P"



STORM SEWER LINE "P-1"



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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON OSBURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE LINES A-7, A-9, A-10, C-10, C-13, J-2, J-3, K, L, L-2, & M PROFILES

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DPP2	
SHEET	REV
C-33	0

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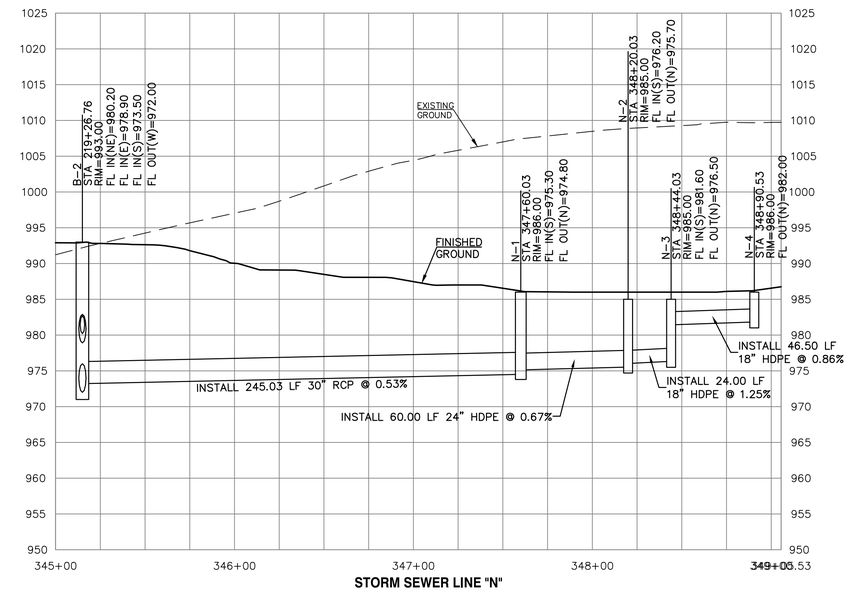
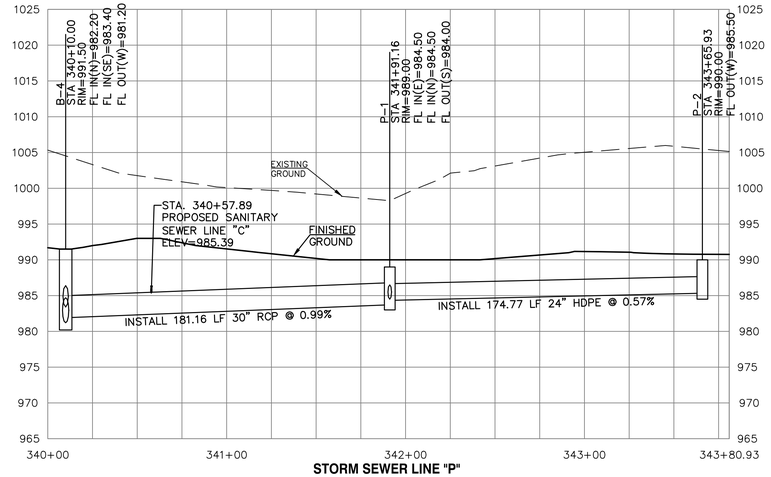
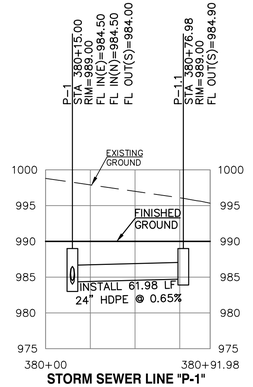


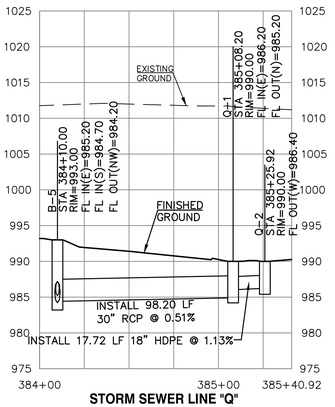
STORM SEWER LINE "N"



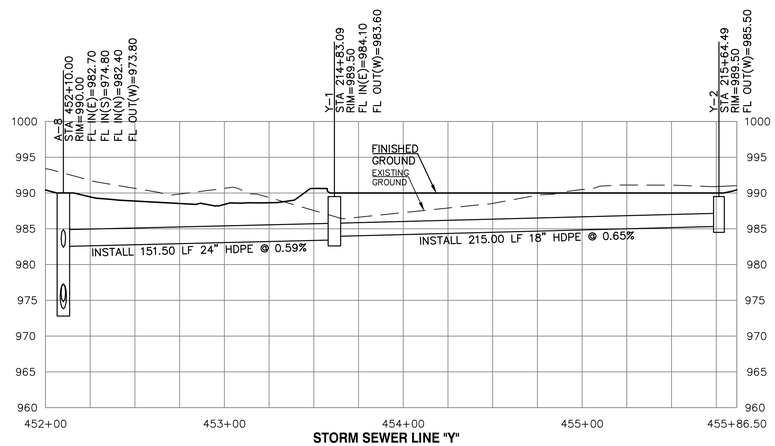
STORM SEWER LINE "P"



STORM SEWER LINE "P-1"



STORM SEWER LINE "Q"



STORM SEWER LINE "Y"

SCALE: 1" = 40'

SCALE: 1" = 10'

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REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEONARD D. OSBORN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
PH. (785) 762-5040 | FAX (785) 762-7744
jc@kveng.com | www.kveng.com

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER LINE LINES N, P, P-1, Q, & Y PROFILES

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_DPP2
SHEET	C-34
REV	0

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LOT 4

LOT 6

℄ PROPOSED REALIGNMENT
NW LOWENSTEIN DRIVE
(PROPOSED 90' R/W)

90' R/W

LOT 2

LOT 1

TRACT "D"

℄ PROPOSED SECTION THRU
EMBANKMENT AND POND
(SOUTH BASIN)

EMERGENCY
SPILLWAY

ROCK
RIPAP

973.5

510+00

511+00

512+00

513+00

514+00

515+00

515+58

NW CHIPMAN ROAD R/W
PUBLIC - ASPHALT SURFACING

RETAINING WALL
W/HANDRAIL ON
SOUTH SIDE

RIGHT LANE ENDS

SPEED LIMIT 35

RIGHT LANE MERGE AHEAD

CONCRETE SIDEWALK

CURB INLET
RIM=954.80

CURB INLET
RIM=973.67

NITARY MANHOLE
IP=954.08
OUT 8"PVC=939.46
ASUREMENT TAKEN ON
UTH SIDE OF MANHOLE

GRATE INLET
RIM=964.43
FL=962.93

FL=961.24
PVC

PLAYGROUND
RULES

TOBACCO
FREE

TRASH
CAN

SWING
SET

JUNGLE
GYM

DRINKING
FOUNTAIN

BBQ

METAL BENCH
ON BRICK

PLAYGROUND
RULES

PLAY AREA

METAL BENCH
ON BRICK

ASPHALT

CONCRETE

RIM=987.57
FL IN(E)30"HDPE=975.37
FL IN(S)15"RCP=977.23
FL OUT(SW)30"RCP=975.35

UTILITY
VAULT

CURB INLET (CONCRETE)
RIM=987.75
FL IN(NE)30"RCP=973.77
FL IN(SE)15"RCP=975.16
FL OUT(NW)30"RCP=973.48

JUNCTION BOX (CONCRETE)
RIM=989.93
FL IN(S)15"RCP=981.20
FL OUT(NW)15"RCP=981.08

4.5' TALL
ELECTRIC BOX

UTILITY
VAULT

ONE
WAY

CURB INLET (CONCRETE)
TOP=991.75
FL IN(S) 15"RCP=987.35
FL OUT(W) 15"RCP=987.25

℄ NW PRYOR ROAD
(120' R/W)
PUBLIC - ASPHALT STREET

CURB INLET (CONCRETE)
TOP=993.11
FL IN(E) 15"RCP=985.91
FL OUT(W) 15"RCP=985.86

GAS
SUBSTATION

RETAINING
WALL

MISSOURI GAS
ENERGY EASEMENT
DOC 2002I0222043

LEE'S SUMMIT PARKS
AND RECREATION
LOWENSTEIN PARK

DIVIDED
ROAD
AHEAD

METAL
UTILITY
POLE

CITY OF LEE'S SUMMIT
AUDREY J. PARKER
WYATT FAMILY

SOLID DOUBLE YELLOW

UTILITY VAULT
MARKED STATE
TRAFFIC SIGNAL

CROSS-WALK

CONCRETE

SCALE: 1" = 40'

0 20 40 80

LEGEND (PROPOSED)

TW=983.6 TOP OF RETAINING WALL
GR=983.1 GROUND ELEVATION @ WALL

FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=985.05

BM #2: CHISELED "SQUARE" ON NORTHWEST CORNER AREA INLET, 25'± EAST OF CURB LINE AND ON-LINE WITH SOUTH CURB OF NW LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
1-6-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
SOUTH DETENTION BASIN PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO
DRAWN BY JT
CFN 7067-1G_BASIN
SHEET C-35
REV 0

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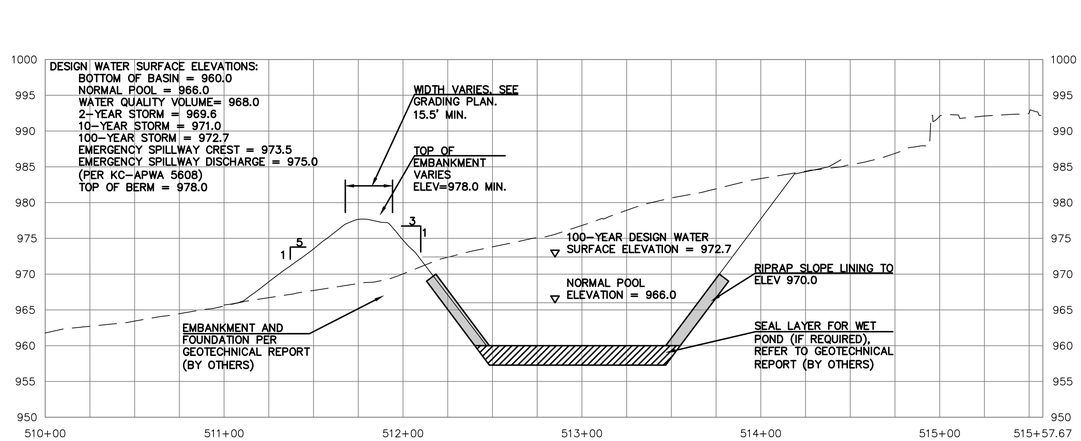
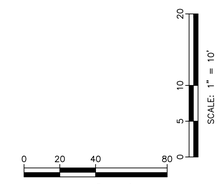


PROPOSED SECTION THRU
EMBANKMENT AND POND (SOUTH BASIN)



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STATE OF MISSOURI
LEON OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-6-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
SOUTH DETENTION BASIN PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_BASIN	
SHEET	REV
C-36	0

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LEGEND (PROPOSED)

TW=983.6 TOP OF RETAINING WALL
GR=983.1 GROUND ELEVATION @ WALL

FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

0 20 40 80
SCALE: 1" = 40'

TRACT "B"

℄ FUTURE NW LOWENSTEIN CIRCLE (PROPOSED 50' R/W)

℄ PROPOSED SECTION THRU EMBANKMENT AND POND (WEST BASIN)

TRACT "A"

℄ NW LOWENSTEIN DRIVE (50' R/W)
PUBLIC – ASPHALT SURFACING

NW AUTUMN LANE (50' R/W)
PUBLIC – ASPHALT STREET

POINT "A"

505+00 506+00 506+67 507+00 508+00 509+00 510+00 511+00 501+00 502+00 503+00 504+00

DATUM BENCHMARK:
VERTICAL DATUM IS NAVD 88 ESTABLISHED USING OPUS PROJECTS ON PROJECT CONTROL.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=985.05

BM #2: CHISELED "SQUARE" ON NORTHWEST CORNER AREA INLET, 25'± EAST OF CURB LINE AND ON-LINE WITH SOUTH CURB OF NW LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

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1-2-19

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KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
PH. (785) 762-5040 | FAX (785) 762-7744
jo@kveng.com | www.kveng.com

KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
WEST DETENTION BASIN PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_BASIN	
SHEET	REV
C-37	0

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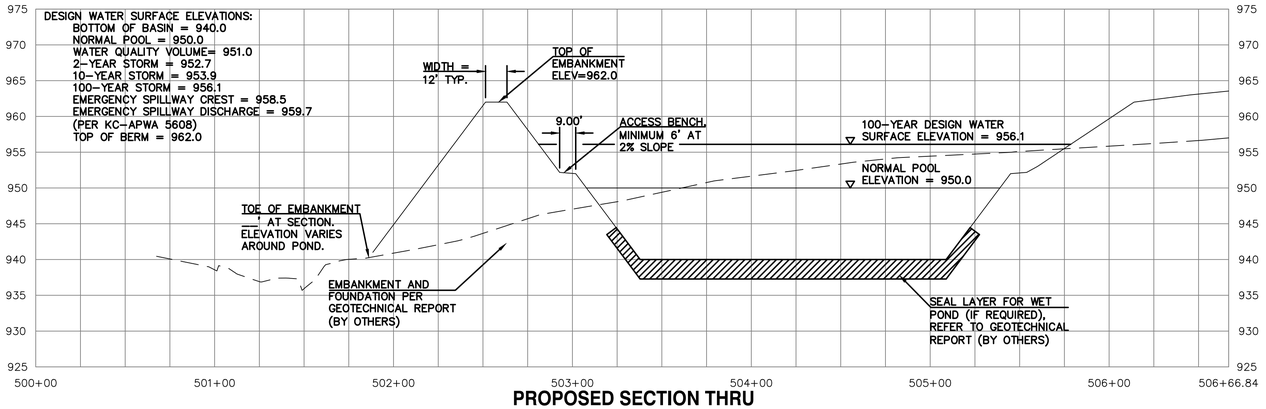

PROPOSED SECTION THRU
EMBANKMENT AND POND (WEST BASIN)

SCALE: 1" = 40'

SCALE: 1" = 10'

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
WEST DETENTION BASIN PROFILE

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_BASIN	
SHEET	REV
C-38	0

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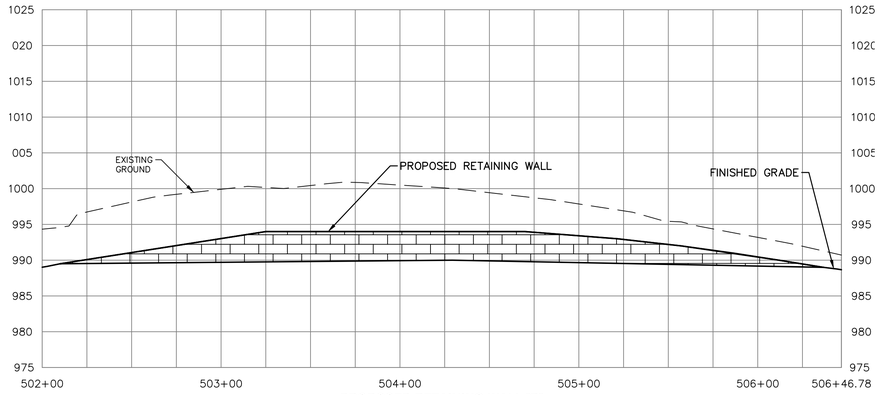

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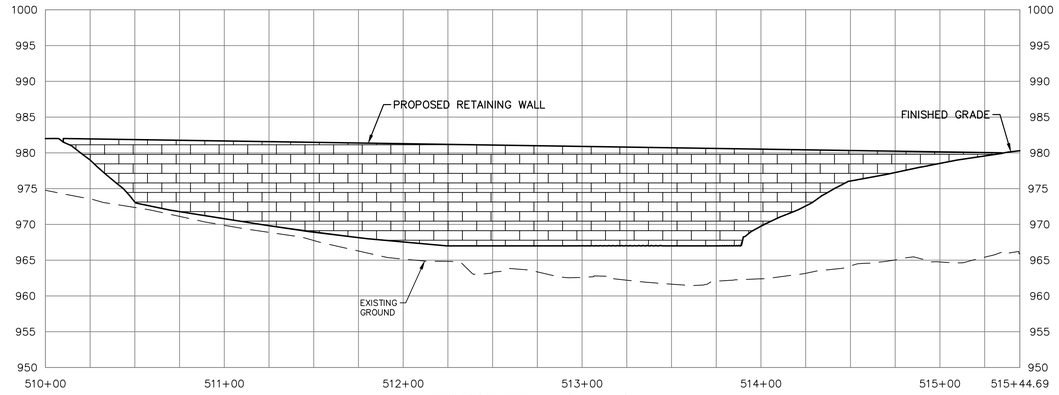

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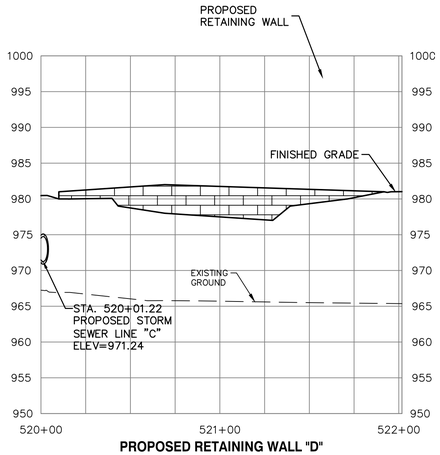

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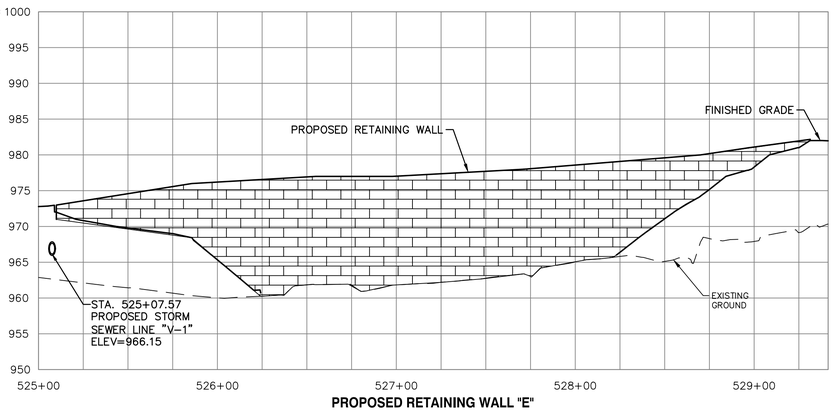

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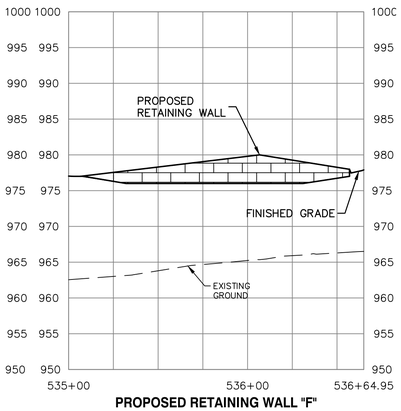

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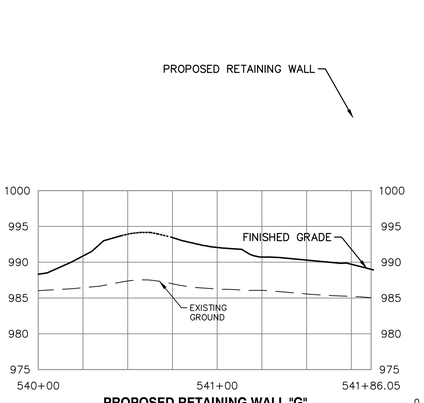

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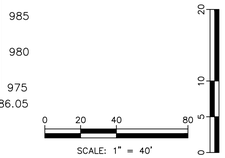

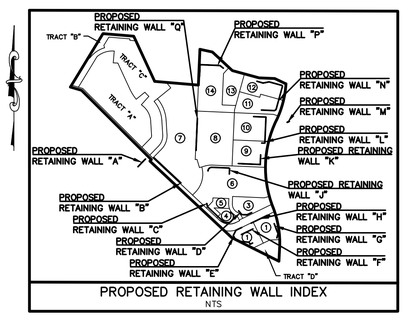

PROPOSED RETAINING WALL INDEX
NTS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
RETAINING WALL PROFILES - B THRU G

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_RWALLPP
SHEET	C-39
REV	0

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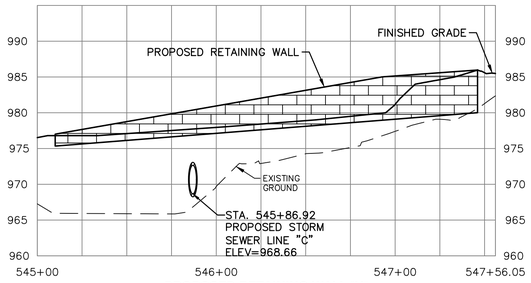

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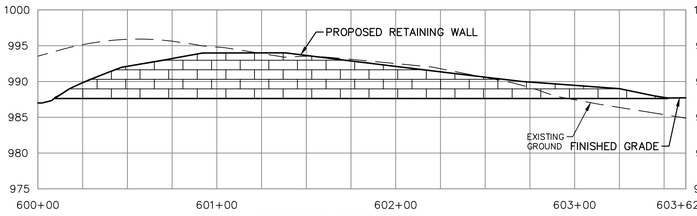

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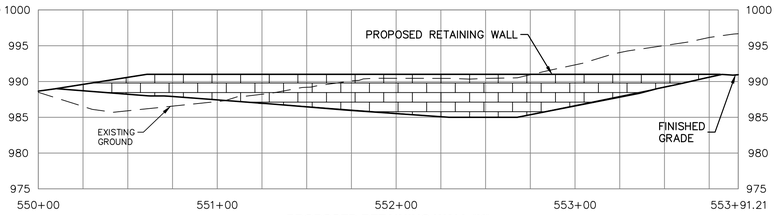

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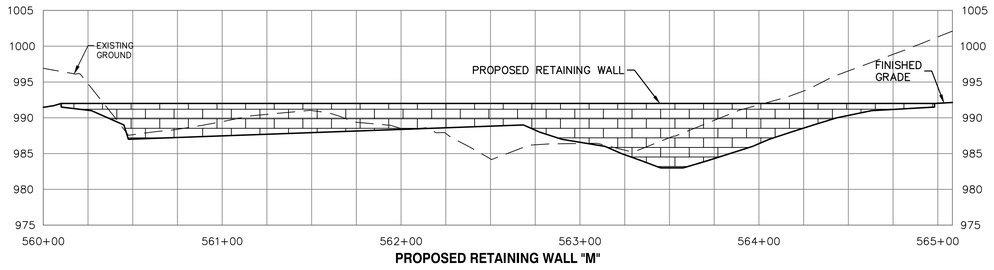

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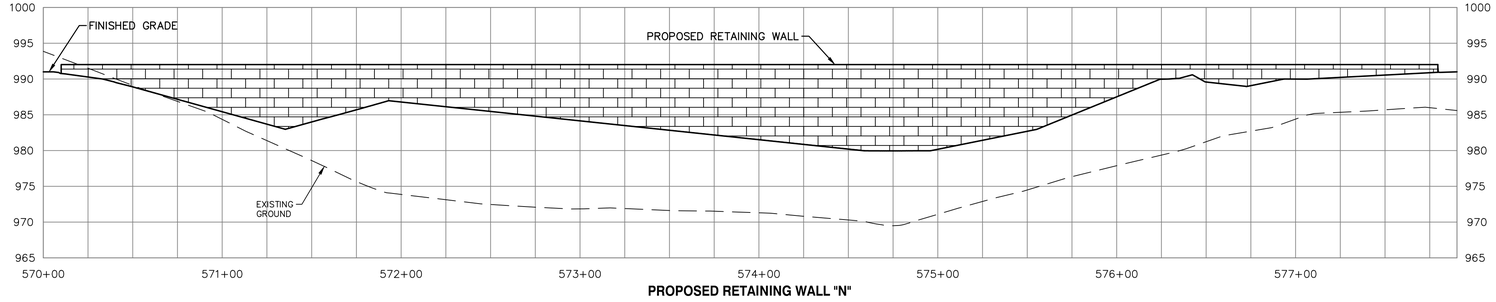

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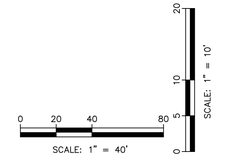

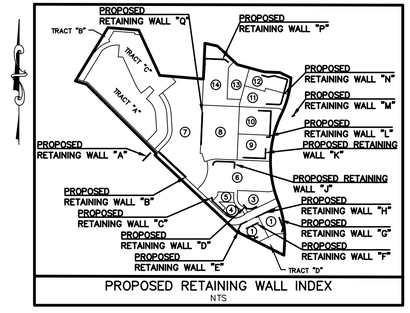

PROPOSED RETAINING WALL INDEX
NTS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
RETAINING WALL PROFILES - H THRU N

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_RWALLPP	
SHEET	REV
C-40	0

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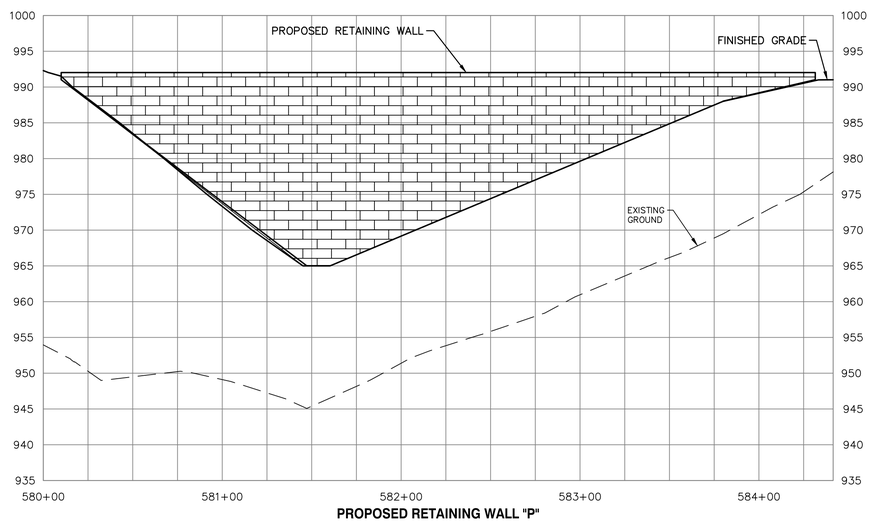

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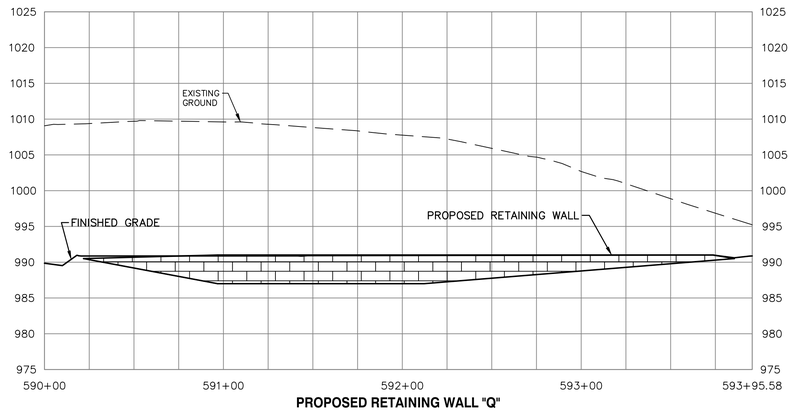

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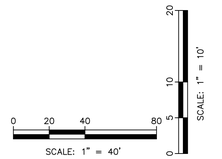

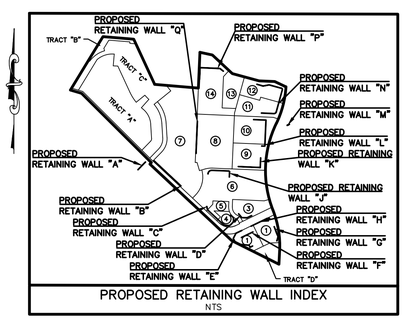

PROPOSED RETAINING WALL INDEX
NTS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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KAW VALLEY ENGINEERING, INC. IS AUTHORIZED TO OFFER ENGINEERING SERVICES IN MISSOURI. STATE CERTIFICATE OF AUTHORITY # 2008042. EXPIRES 12/31/19

STREETS OF WEST PRYOR

NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE

LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS

RETAINING WALL PROFILES - P & Q

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_RWALLPP	
SHEET	REV
C-41	0

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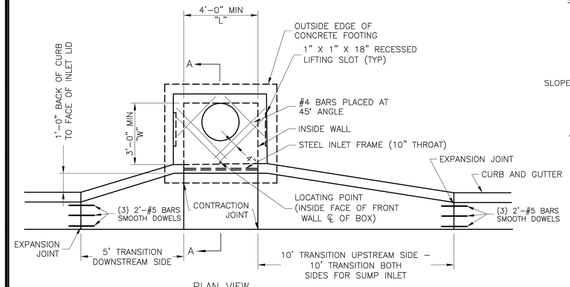
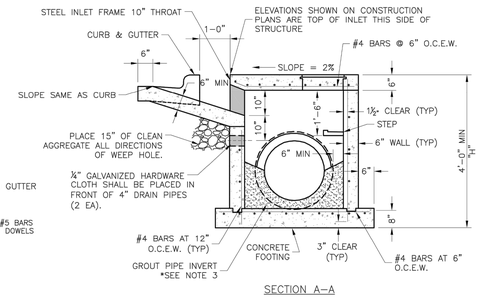
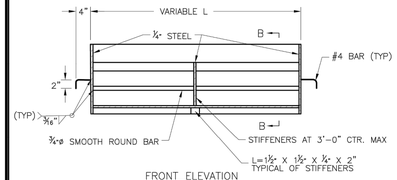


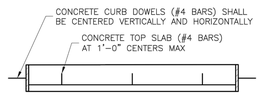
PLAN VIEW



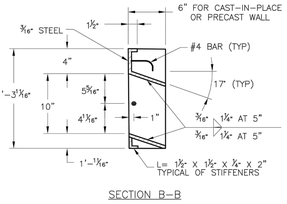
SECTION A–A



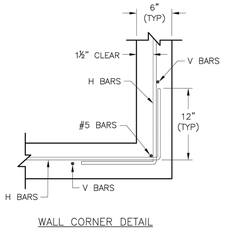
FRONT ELEVATION



PLAN VIEW



SECTION B–B



WALL CORNER DETAIL

STEEL FRAME NOTES:
1. ALL WELDS SHALL BE PERFORMED IN ACCORDANCE WITH APPROPRIATE AWS SPECIFICATIONS AND PROCEDURES.
2. ALL WELDS ON EXPOSED SURFACES SHALL BE DRESSED SO AS TO PROVIDE A PLEASING FINISHED APPEARANCE.
3. THE ENTIRE FRAME SHALL BE PAINTED A SINGLE COAT OF CHEM–PRIME #37H–78 PRIMER (GRAY) OR EQUAL.

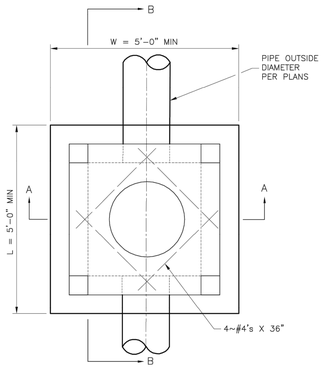
GENERAL NOTES:
1. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION.
2. FLOW LINES LISTED ON THE PROJECT PLANS ARE LISTED AT THE INSIDE FACE OF THE WALL.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.
4. LOCATE MH RING AND COVER ON BLANK WALL IF POSSIBLE.
5. STEPS SHALL BE SPACED AT 1'–4" O.C. VERTICALLY ON BLANK WALL IF POSSIBLE.
6. BEVEL ALL EXPOSED EDGES WITH ¾"CHAMFER OR ½" TOOLED EDGE.
7. ON–GRADE INLETS SHALL CONFORM TO THE STREET GRADE AND SUMP INLETS SHALL BE LEVEL.
8. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON–SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
9. LIFTING RINGS SHALL BE REMOVED AND SEALED WITH NON–SHRINKABLE GROUT
10. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.

LEE'S SUMMIT MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

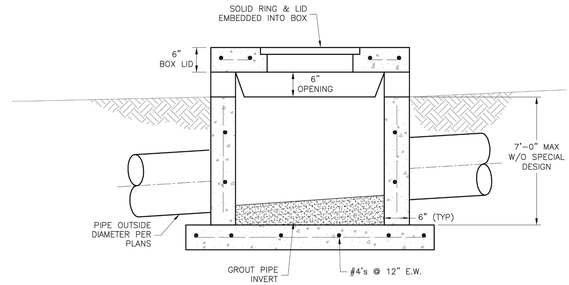
Project: STANDARD DETAILS CITY OF LEE'S SUMMIT, MO LEE'S SUMMIT, JACKSON COUNTY, MO
Sheet Name: CURB INLET DETAIL

Drawn By: MJF
Checked By: DL
Date: 04/17
Proj. #:

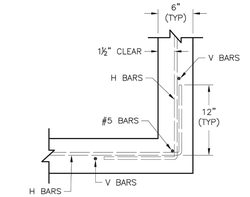
STM-1



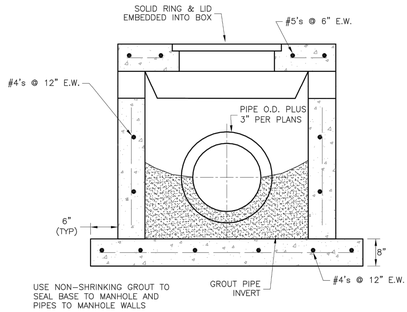
PLAN VIEW



SECTION B–B



WALL CORNER DETAIL



USE NON–SHRINKING GROUT TO SEAL BASE TO MANHOLE AND PIPES TO MANHOLE WALLS

SECTION A–A

GENERAL NOTES:
1. LOCATE RING AND COVER OVER OUTLET ON BLANK WALL.
2. USE ¾" CHAMFER ON ALL EXPOSED CONCRETE CORNERS.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.
4. STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 3' ON BLANK WALL IF POSSIBLE.
5. BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH THE CORNERS OF THE STRUCTURE.
6. THE MINIMUM REINFORCING SHALL BE 1 H–BAR OVER A CAST–IN–PLACE PIPE AND 2 H–BARS OVER A PRECAST BOXOUT.
7. SHOW FIELD INLET ORIENTATION ON PLANS PLUS NUMBER AND SIDE OF OPENINGS.
8. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON–SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
9. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.

LEE'S SUMMIT MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

Project: STANDARD DETAILS CITY OF LEE'S SUMMIT, MO LEE'S SUMMIT, JACKSON COUNTY, MO
Sheet Name: FIELD INLET DETAIL

Drawn By: MJF
Checked By: DL
Date: 04/17
Proj. #:

STM-2

REV	DATE	DESCRIPTION	DSN	DWN	CHK

STATE OF MISSOURI
LEON OSBORN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

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2319 N. JACKSON | P.O. BOX 1304
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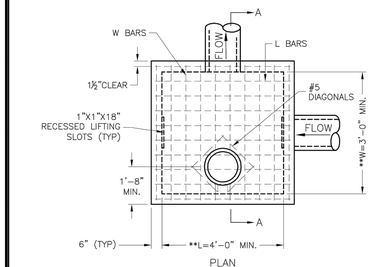
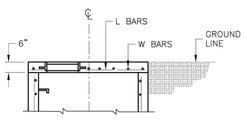


PLAN

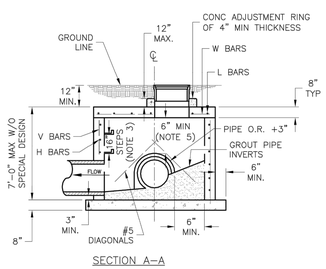


SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

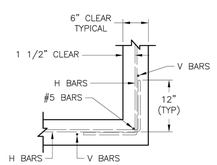
** INCREASE IN MULTIPLES OF 6" (7'–0") MAX WITHOUT SPECIAL DESIGN. (SEE PROJECT PLANS FOR DETAILS)

REINFORCING

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



SECTION A–A



WALL CORNER DETAIL

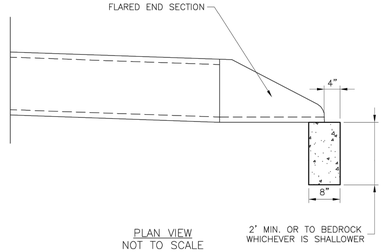
GENERAL NOTES:
1. LOCATE RING AND COVER ON BLANK WALL.
2. USE ¾" CHAMFER STRIP OR ½" R EDGER TOOL ON ALL EXPOSED CONCRETE CORNERS.
3. STEPS REQUIRED AT 16" O.C. WHEN DEPTH FROM TOP OF CASTING TO INVERT EXCEEDS 4' ON BLANK WALL IF POSSIBLE.
4. BOXOUTS WILL NOT BE ALLOWED TO PROJECT THROUGH THE CORNERS OF THE STRUCTURE AND THE MINIMUM DISTANCE BETWEEN BOXOUTS IS 6".
5. THE MINIMUM REINFORCING SHALL BE 1 H–BAR OVER A CAST–IN–PLACE PIPE AND 2 H–BARS OVER A PRECAST BOXOUT.
8. PRECAST LIDS SHALL BE PINNED, SEALED WITH NON–SHRINKABLE GROUT AND REMOVABLE FOR FUTURE MAINTENANCE.
9. REINFORCING OF COVERS IN STREETS REQUIRE SPECIAL DESIGN.
10. FOR RING AND COVER SEE THE STORMWATER APPROVED PRODUCT LIST.

LEE'S SUMMIT MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

Project: STANDARD DETAILS CITY OF LEE'S SUMMIT, MO LEE'S SUMMIT, JACKSON COUNTY, MO
Sheet Name: JUNCTION BOX DETAIL

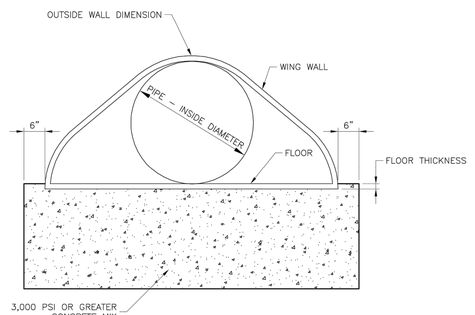
Drawn By: MJF
Checked By: DL
Date: 04/17
Proj. #:

STM-3



PLAN VIEW
NOT TO SCALE

2' MIN. OR TO BEDROCK WHICHEVER IS SHALLOWER

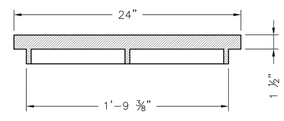


END VIEW
NOT TO SCALE

LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063
FLARED END SECTION SUPPORT DETAIL

Date: 04/17
Drawn By: MJF
Checked By: DL

STM-5



STANDARD 24" MANHOLE COVER
MINIMUM WEIGHT = 160 LB
NOTE: PICK HOLES NOT SHOWN

*COVER AND FRAME MODEL INFORMATION REFER TO THE STORMWATER APPROVED PRODUCT LIST.

LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063
STORM MANHOLE COVER DETAIL

Date: 04/17
Drawn By: MJF
Checked By: DL

STM-6

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER DETAIL SHEET

PROJ. NO. A14_7067–1
DESIGNER LDO | DRAWN BY JT
CFN 7067–1G_DET
SHEET C–42 | REV

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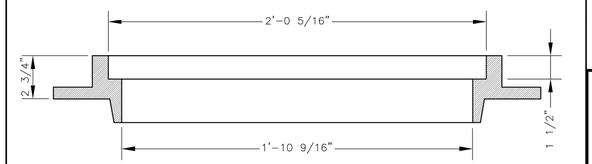
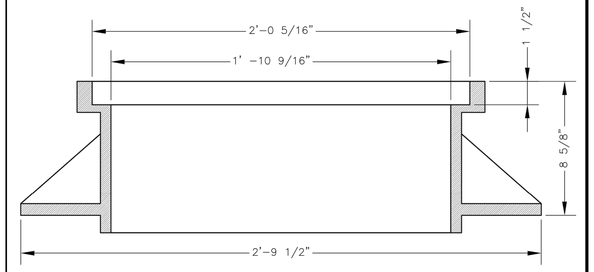


SLAB MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS103A
MINIMUM WEIGHT = 145 LB



STANDARD 24" MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS101A
MINIMUM WEIGHT = 250 LB

*COVER AND FRAME MODEL INFORMATION REFER TO THE STORMWATER APPROVED PRODUCTS LIST.

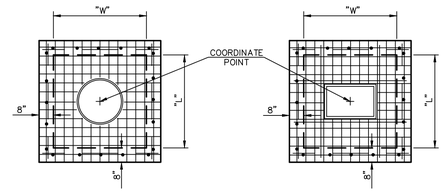
LS

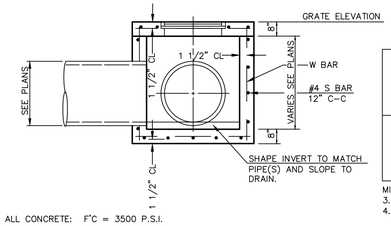
LEE'S SUMMIT
MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

STORM MANHOLE FRAME DETAIL

Date: 04/17
Drawn By: MJF
Checked By: DL

STM-7





L OR W	S BARS
≤4'	#4@6"
4-6'	#5@6"
6-8'	#6@6"

H	W BARS
≤5'	#4@12"
5-8'	#5@6"
8-12'	#6@6"

MIN. BOX SIZE:
3.5' X 4.0' FOR SINGLE GRATE &
4.0' X 5.5' FOR DOUBLE GRATE

ALL CONCRETE: F'C = 3500 P.S.I.

NOTE: WHERE PIPE SIZE ALLOWS, A 4' DIAMETER PRECAST MANHOLE, CONSTRUCTED AND REINFORCED IN ACCORDANCE WITH ANSI/ASTM C478, MAY BE USED IN LIEU OF CAST IN PLACE BOX. ALTERNATE MATERIALS AND CONSTRUCTION METHODS MAY BE USED WITH THE ENGINEER'S APPROVAL.

CASTING NUMBERS ARE NEENAH FOUNDARY. EQUAL SUBSTITUTIONS ARE PERMITTED.
JUNCTION BOX LID AND RING – R-6019
GRATE – R-6673-J, USE R-6673-0 WHERE DOUBLE GRATE IS SPECIFIED
UNLESS OTHERWISE NOTED ON SITE GRADING PLAN

GRATE INLET
OR JUNCTION BOX 403

REV	DATE	DESCRIPTION	DSN	DWN	CHK

STATE OF MISSOURI
LEON D. OSBURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
12-6-19

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
PH. (785) 762-5040 | FAX (785) 762-7744
jd@kveng.com | www.kveng.com

STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
STORM SEWER DETAIL SHEET

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DET
SHEET C-43 | REV

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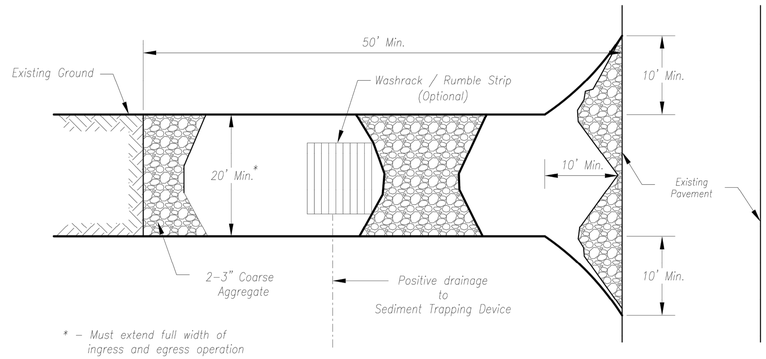
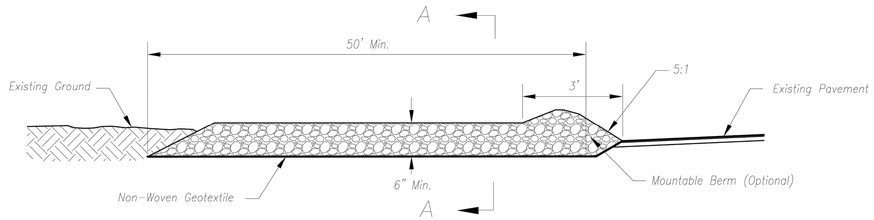


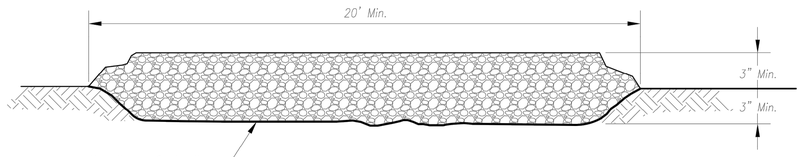
Plan View

Not to Scale



Side Elevation

Not to Scale



Section A-A

Not to Scale

Notes for Construction Entrance:

1. *Avoid locating on steep slopes, at curves on public roads, or downhill of disturbed area.*
2. *Remove all vegetation and other unsuitable material from the foundation area, grade, and crown for positive drainage.*
3. *If slope towards the public road exceeds 2%, construct a 6- to 8-inch high ridge with 3H:1V side slopes across the foundation approximately 15 feet from the edge of the public road to divert runoff from it.*
4. *Install pipe under the entrance if needed to maintain drainage ditches along public roads.*
5. *Place stone to dimensions and grade as shown on plans. Leave surface sloped for drainage.*
6. *Divert all surface runoff and drainage from the entrance to a sediment control device.*
7. *If conditions warrant, place geotextile fabric on the graded foundation to improve stability.*

Maintenance for Construction Entrance:

1. *Reshape entrance as needed to maintain function and integrity of Installation. Top dress with clean aggregate as needed.*

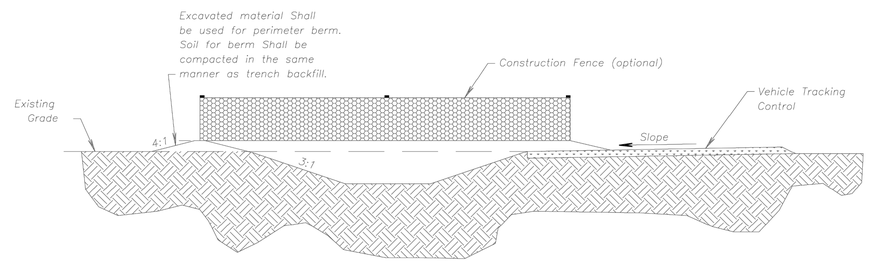
CONSTRUCTION ENTRANCE

Notes for Concrete Washout:

1. *Concrete washout areas shall be installed prior to any concrete placement on site.*
2. *Concrete washout area shall include a flat subsurface pit sized relative to the amount of concrete to be placed on site. The slopes leading out of the subsurface pit shall be 3:1. The vehicle tracking pad shall be sloped towards the concrete washout area.*
3. *Vehicle tracking control is required at the access point to all concrete washout areas.*
4. *Signs shall be placed at the construction site entrance, washout area and elsewhere as necessary to clearly indicate the location(s) of the concrete washout area(s) to operators of concrete truck and pump rigs.*
5. *A one-piece impervious liner may be required along the bottom and sides of the subsurface pit in sandy or gravelly soils.*

Maintenance for Concrete Washout:

1. *Concrete washout materials shall be removed once the materials have filled the washout to approximately 75% full.*
2. *Concrete washout areas shall be enlarged as necessary to maintain capacity for wasted concrete.*
3. *Concrete washout water, wasted pieces of concrete and all other debris in the subsurface pit shall be transported from the job site in a water-tight container and disposed of properly.*
4. *Concrete washout areas shall remain in place until all concrete for the project is placed.*
5. *When concrete washout areas are removed, excavations shall be filled with suitable compacted backfill and topsoil, any disturbed areas associated with the installation, maintenance, and/or removal of the concrete washout areas shall be stabilized.*



CONCRETE WASHOUT

Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control; Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION

KANSAS CITY METRO CHAPTER

CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT

STANDARD DRAWING NUMBER ESC-01

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-44	0

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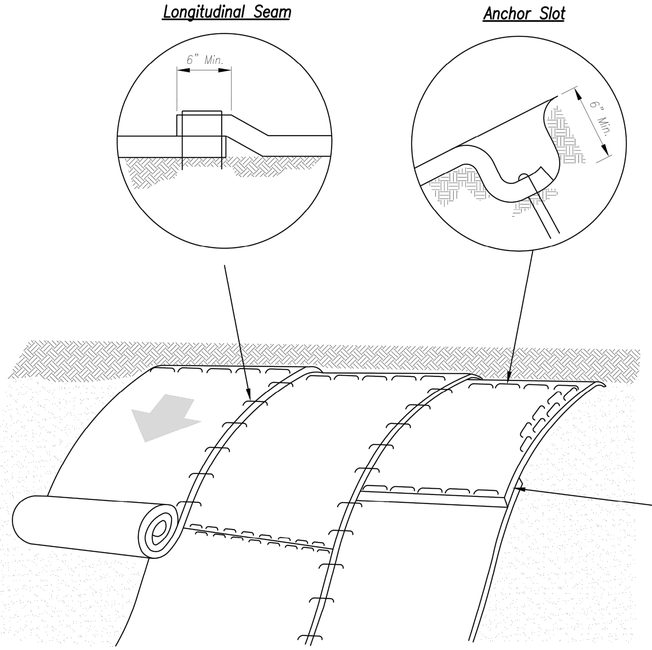


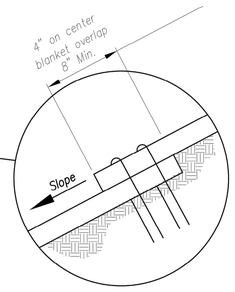
Installation on Slopes

General Notes:

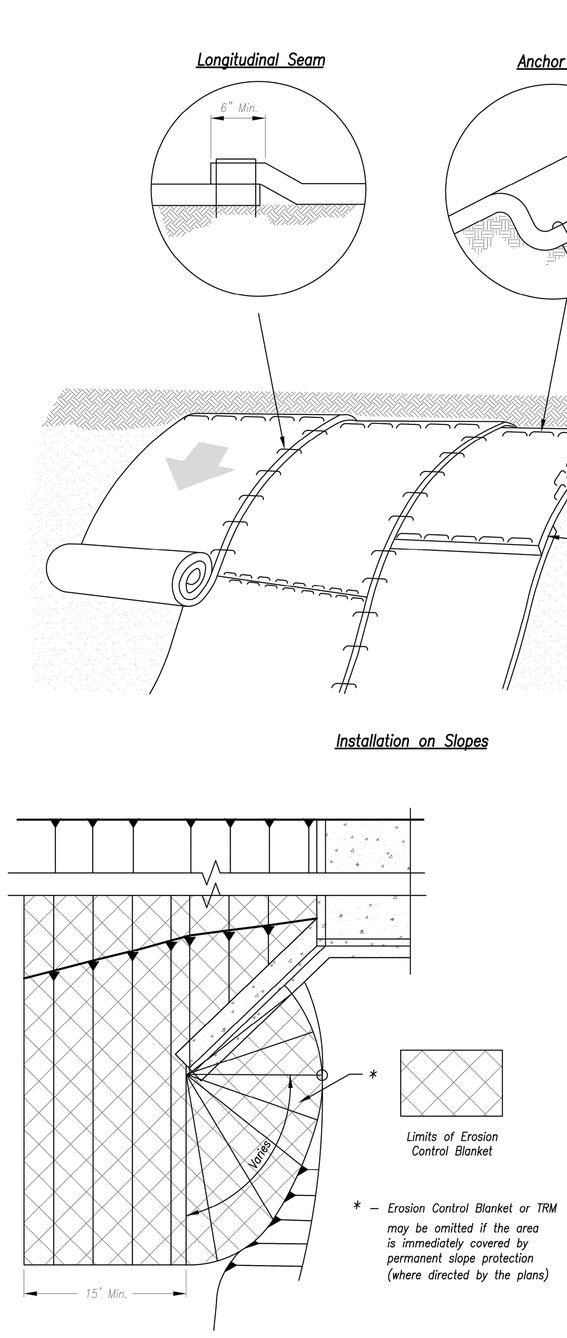
1. APWA Specifications 2150 and Design Guidance 5100 shall be referenced to select type of blanket or mat to be used.
2. Typical anchors and pattern/spacing shall be installed according to the manufacturers instructions.
3. LONGITUDINAL SEAMS: The edges of the blanket or mat should overlap each other a minimum of 6 inches, with anchors catching the edges of both blankets.

Maintenance:

1. Torn or degraded product shall be repaired or replaced, unless such degradation is within the functional longevity specified by the manufacturer.
2. Edges or seams that are loose or frayed shall be secured.



Splice Seam



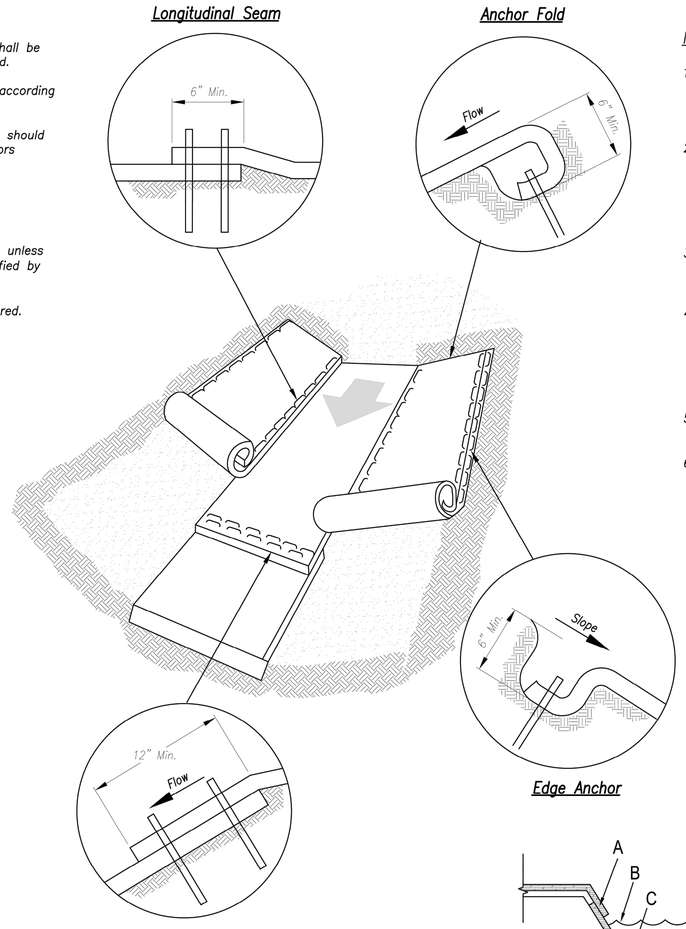
* – Erosion Control Blanket or TRM may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans)

Partial Box Culvert Plan
Not to Scale

Installation Around Culvert Slope

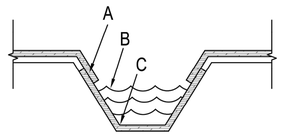
Notes for Installation on Slopes:

1. Erosion Control Blankets and TRMs shall be laid in the direction of the slope. In order for blanket to be in contact with the soil, lay blanket loosely, avoiding stretching.
2. ANCHOR SLOTS: The top of the blanket should be "slotted in" at the top of the slope and anchored in place with anchors 6 inches apart. The slots should be 6 inches wide x 6 inches deep with the blanket anchored in the bottom of the slot, then backfilled, tamped and seeded.
3. SPLICE SEAM: When splices are necessary, overlap end a minimum of 8 inches in direction of water flow. Stagger splice seams.
4. TERMINAL FOLD: The bottom edge of the blanket shall be turned under a minimum of 4 inches, then anchored in place with anchors 9 inches apart.

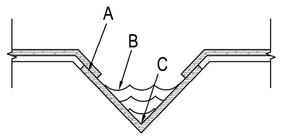


Splice Seam

Edge Anchor



Trapezoidal Channel



V Channel

Critical Points:

A – Overlaps and seams;

B – Projected water line;

C – Channel bottom / side slope vertices;

Installation in Channels

Notes for Installation in Channels:

1. Erosion Control Blankets and TRMs shall be laid in the direction of the flow, with the first course at the centerline of channel, where applicable. In order for the mat to be in contact with the soil, lay the mat loosely, avoiding stretching.
2. ANCHOR FOLD: The top of the mat should be folded under, buried and secured with wood or other approved anchors placed 6 inches apart. The top edge of the mat should be buried in a slot 6 inches wide x 6 inches deep, anchored in the bottom of the slot, backfilled, and the mat folded over the top as shown in detail.
3. SPLICE SEAM: When splices are necessary, overlap end a minimum of 12 inches in direction of water flow. Stagger splice seams.
4. CHECK SLOTS: Establish check slots transverse to slope every 30 feet. The slots should be 6 inches wide x 6 inches deep. The mat shall be cut to a length 12 inches beyond the slot. The top of the downstream mat shall be slotted in, secured and buried similar to the edge anchor fold. The upstream mat shall then cover the slot and be anchored as shown.
5. EDGE ANCHORS: Lay outside edge of mat into trench at top of the slope and anchor.
6. TERMINUS: The bottom edge of the mat shall be anchored.

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA American Public Works Association

KANSAS CITY METRO CHAPTER

EROSION CONTROL BLANKETS AND TURF REINFORMENT MATS

STANDARD DRAWING NUMBER ESC-02

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBORN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-6-19

LEON D. OSBORN
ENGINEER
MO # 021726

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jd@kveng.com | www.kveng.com

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-45	0

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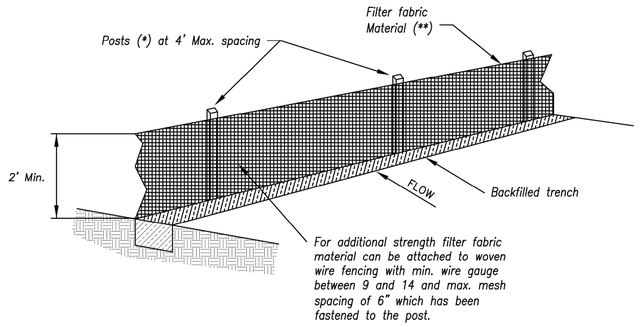
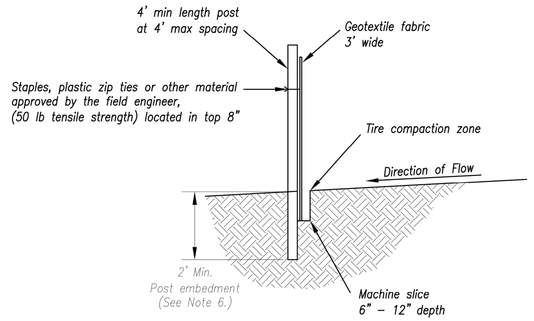




(*) POSTS

- MIN, LENGTH 4'
- HARDWOOD 1 3/16" x 1 3/16"
- NO.2 SOUTHERN PINE 2 5/8" x 2 5/8"
- STEEL 1.33 LB/FT

(**) – Geotextile Fabric shall meet the requirements of AASHTO M288

SILT FENCE DETAILS

Not to Scale

Notes:

1. In order to contain water, the ends of the silt fence must be turned uphill (Figure A).
2. Long perimeter runs of silt fence must be limited to 100'. Runs should be broken up into several smaller segments to minimize water concentrations (Figure A).
3. Long slopes should be broken up with intermediate rows of silt fence to slow runoff velocities.
4. Attach fabric to upstream side of post.
5. Install posts a minimum of 2' into the ground.
6. Trenching will only be allowed for small or difficult installation, where slicing machine cannot be reasonably used.

Maintenance:

1. Remove and dispose of sediment deposits when the deposit approaches ⅓ the height of silt fence.
2. Repair as necessary to maintain function and structure.

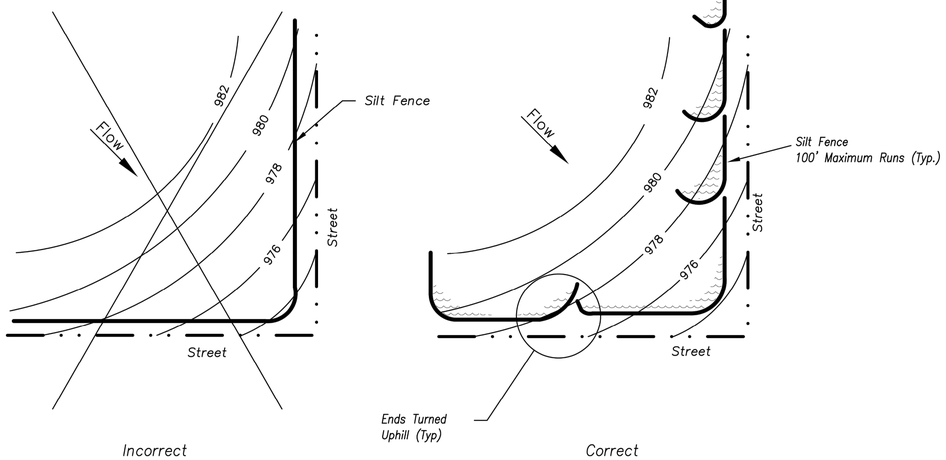
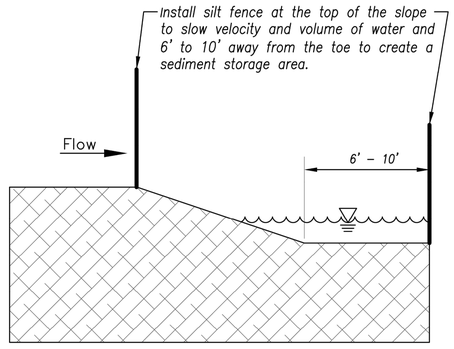
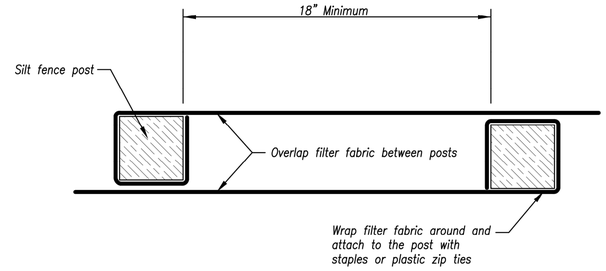


Figure A

SILT FENCE LAYOUT

Not to Scale





JOINING FENCE SECTIONS

Not to Scale

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA American Public Works Association

KANSAS CITY METRO CHAPTER

SILT FENCE

STANDARD DRAWING NUMBER ESC-03

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-46	0

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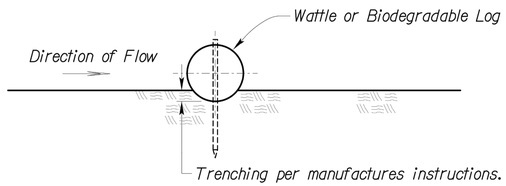
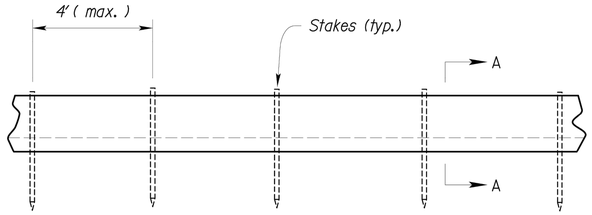


Section A–A



Typical Elevation

WATTLES AND BIODEGRADABLE LOG

Notes for Wattles and Biodegradable Log Slope Protection:

1. *The Slope barriers shall be placed along contour lines, with a short section turned upgrade at each end of the barrier. The maximum length of the slope barrier shall not exceed 250 feet, and the barrier ends need to be staggered.*
2. *Install wattles and biodegradable logs per manufacturer's instructions.*
3. *Spacing of stakes per manufacturer's instructions with 4' max. spacing. Length of stakes shall be a minimum of 2 times the diameter of the log with minimum of 24".*

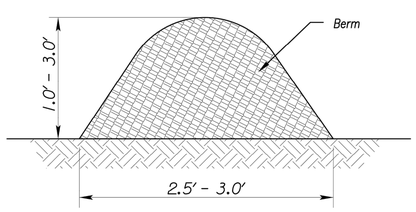


Figure 1
(Perimeter Control)

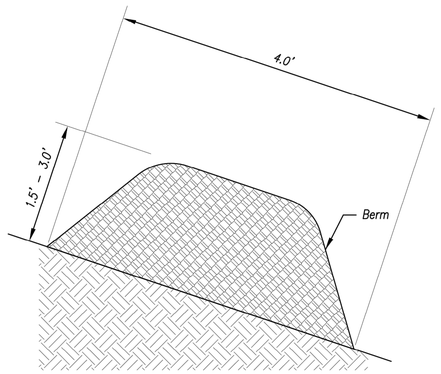


Figure 2
(Steep Slopes)

MULCH OR COMPOST FILTER BERMS

Notes for Mulch and Compost Filter Beam:

1. *The sediment control berm shall be placed uncompacted in a windrow at locations shown on the plans or as directed by the engineer.*
2. *Parallel to the base of the slope, or around the perimeter of other affected areas, construct a 1 to 3 foot high by 2.5 to 3 foot wide berm (see Figure 1). For maximum water treatment ability or for steep slopes, construct a 1.5 to 3 foot high trapezoidal berm that is a minimum of 4 feet wide at the base (see Figure 2). In extreme conditions, or where specified by the engineer, a second berm shall be constructed at the top of the slope. Engineer will specify berm requirements.*
3. *If berm is to be left as permanent or part of the natural landscape, the compost berm may be seeded during application for permanent vegetation.*
4. *Do not use compost or wood mulch berms in any runoff channels or concentrated flow areas.*
5. *Wood mulch shall consist of tree and shrub debris resulting from clearing and grubbing and shall be ground by the mechanical means such as a chipper, hammermill, tub grinder or other approved method. Mulch sizing varies with a maximum width of 2" and a maximum length of 10".*

Maintenance for Mulch and Compost Filter Beam;

1. *Berm shall be reshaped and material added as necessary to maintain function and dimensions.*
2. *Breaches in the berm shall be repaired promptly.*

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

KANSAS CITY METRO CHAPTER

WATTLES/BIODEGRADABLE LOG AND MULCH/COMPOST FILTER BERM

STANDARD DRAWING NUMBER ESC-04

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DET
SHEET C-47 | REV 0

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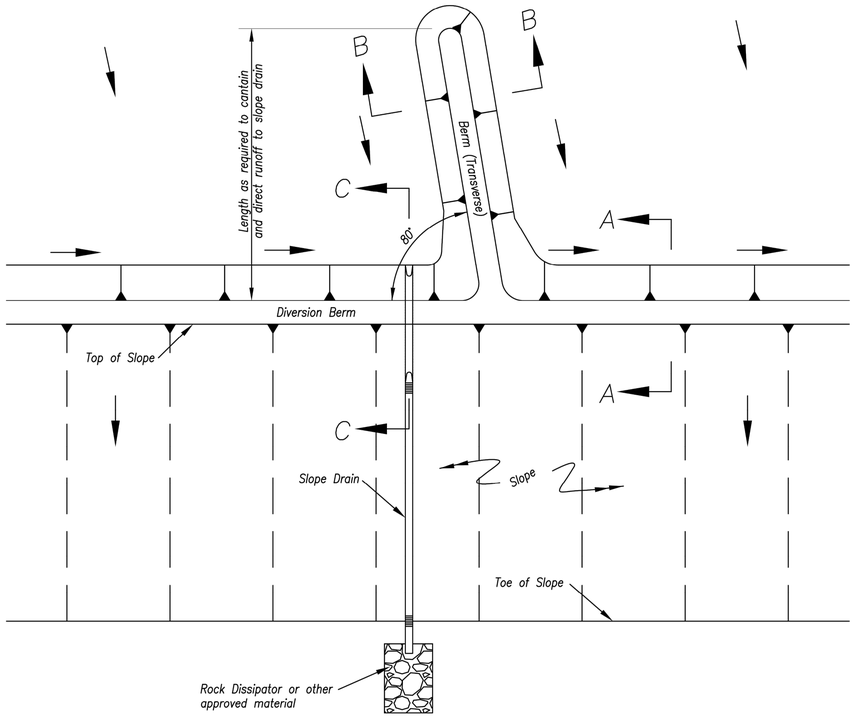


TYPICAL PLAN VIEW OF DIVERSION BERM AND SLOPE DRAIN

Notes for Diversion Berm:

1. Slope drains are optional, but may be required by the engineer if the berm is at the top of a steep slope.
2. Diversion berms must be installed as a first step in the land–disturbing activity and must be functional prior to upslope land disturbance.
3. The berm should be adequately compacted to prevent failure.
4. Temporary or permanent seeding and mulch shall be applied to the berm immediately following its construction.
5. Place the berm so to minimize damages by construction operations and traffic.
6. The berm must discharge to a temporary sediment trap or stabilized area.
7. All trees, brush, stumps, obstructions and other objectionable material shall be removed and disposed of so as not to interfere with the proper functioning of diversion.
8. The diversion shall be excavated or shaped to line, grade and cross–section as required to meet the criteria specified herein, free of irregularities which will impede flow.
9. Fills shall be compacted as needed to prevent unequal settlement that would cause damage in the completed diversion. Fill shall be composed of soil which is free from excessive organic debris, rocks or other objectionable materials.

Maintenance:

1. Berm shall be reshaped, compacted, and stabilized as necessary to maintain its function.
2. Breaches in the berm shall be repaired immediately.

Notes for Slope Drain:

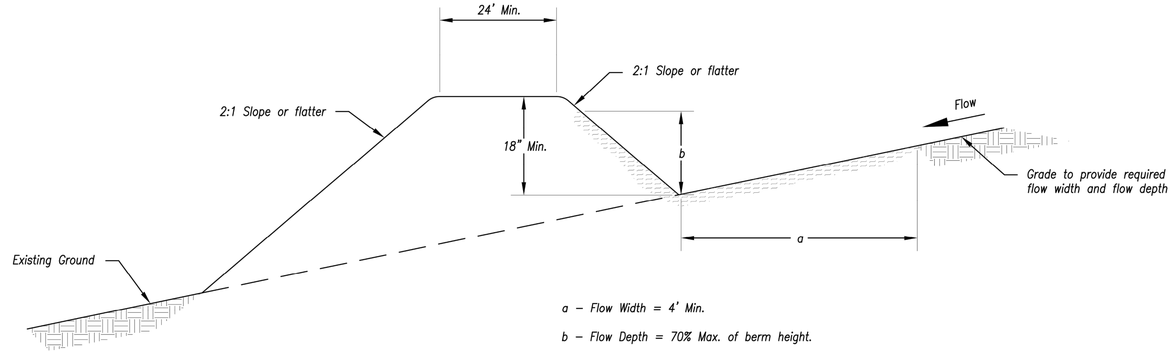
1. Slope Drain and Diversion Berm may be used on either project foreslopes or project backslopes.
2. Discharge of Slope Drains shall be into stabilized ditch or area, or into Sediment Basin.
3. Pipe shall be secured in place as approved by Engineer.

Maintenance:

1. Accumulation of any visible sediment at the inlet and outlet shall be removed promptly.
2. Outlet conditions shall be repaired if scour is observed. Leaking or damaged section of pipe shall be repaired immediately.
3. Barriers directing water to the inlet shall be monitored for continuity and effectiveness.

TYPICAL PROFILE OF DIVERSION BEAM

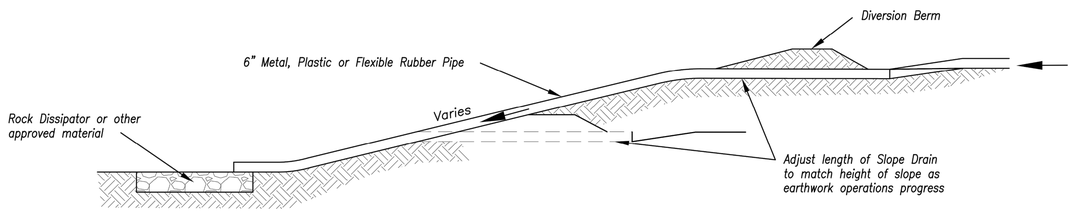
Not to Scale

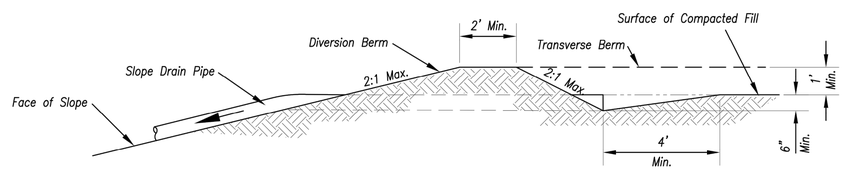


a – Flow Width = 4' Min.

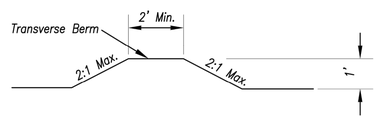
b – Flow Depth = 70% Max. of berm height.

TYPICAL PROFILE OF DIVERSION BERM





Section C–C



Section B–B

TYPICAL PROFILE OF DIVERSION BERM WITH SLOPE DRAIN

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA American Public Works Association

KANSAS CITY METRO CHAPTER

DIVERSION BERMS AND SLOPE DRAINS

STANDARD DRAWING NUMBER ESC-05

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
			LDO	JT	LDO
0	1-16-19	INITIAL ISSUE			

STATE OF MISSOURI · LEON D. OSBOURN · NUMBER E-21726 · REGISTERED PROFESSIONAL ENGINEER

1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-48	0

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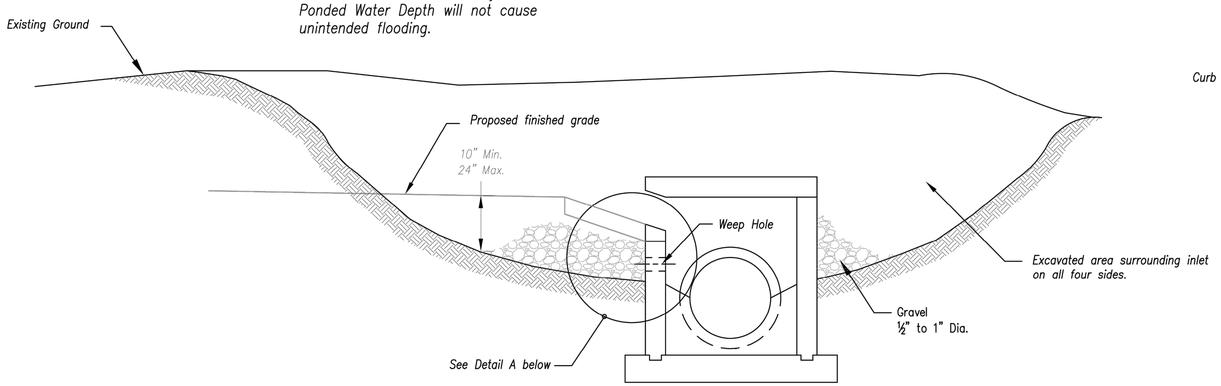
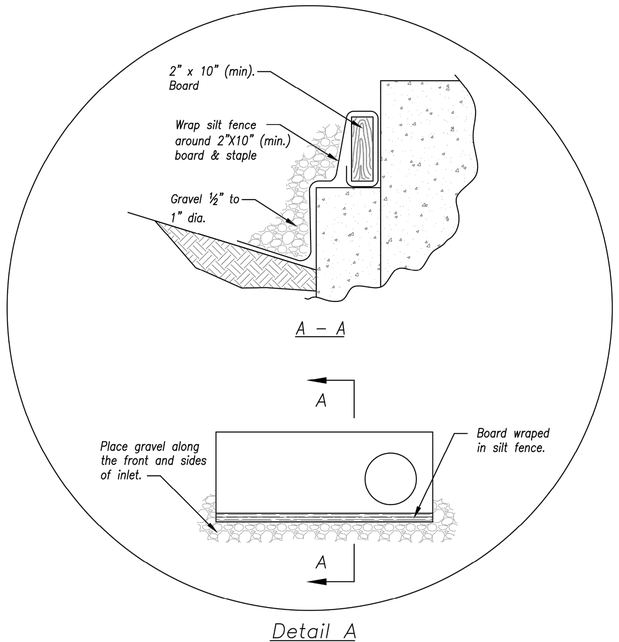
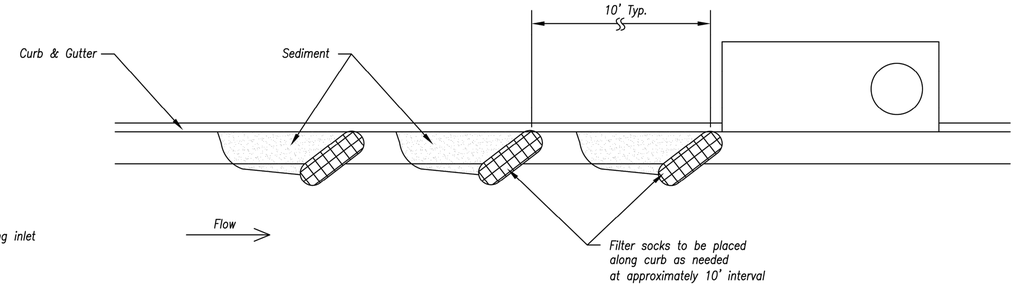




Detail A

EARLY STAGE CURB INLET
(Open Box and Prior to Pouring Curb and Inlet Throat)



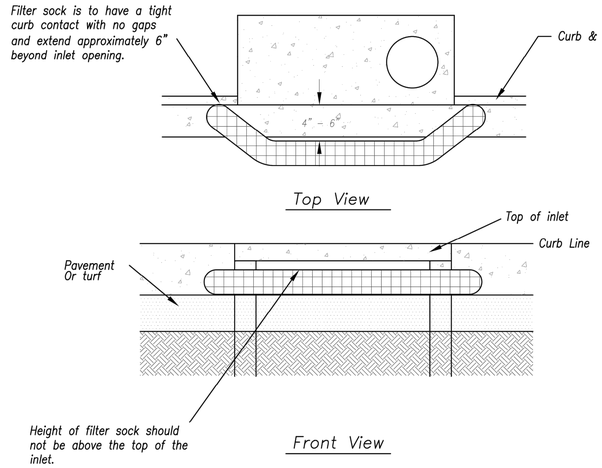
On Grade Curb Inlet Protection

Notes:

1. Immediately following inlet construction and prior to construction of curb and inlet throat, protect inlet opening by installing 2" X 10" (min.) board wrapped in silt fence. Structures shall have excavated storage area on all four sides to allow settling of sediment (Early Stage Curb Inlet).
2. When inlet is completed and curb poured, filter socks or approved equal should be used (Late Stage Curb Inlet). Straw wattles are not approved for curb inlet use.
3. Contractor to field verify ponding water shall not create a traffic hazard.

Maintenance:

1. Remove deposited sediment from excavated storage areas when available storage has been reduced by 20%.
2. Remove deposited sediment from filter socks or similar when any accumulation of sediment is visible.
3. Repair or replace as necessary to maintain function and integrity of installation.



Sump Inlet Sediment Filter

LATE STAGE CURB INLET
(After Pouring Curb and Inlet Throat)

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-6-19

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

AMERICAN PUBLIC WORKS ASSOCIATION
Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER

CURB INLET PROTECTION

STANDARD DRAWING NUMBER ESC-06
ADOPTED: 10/24/2016

PROJ. NO.	
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SHEET	REV
C-49	0

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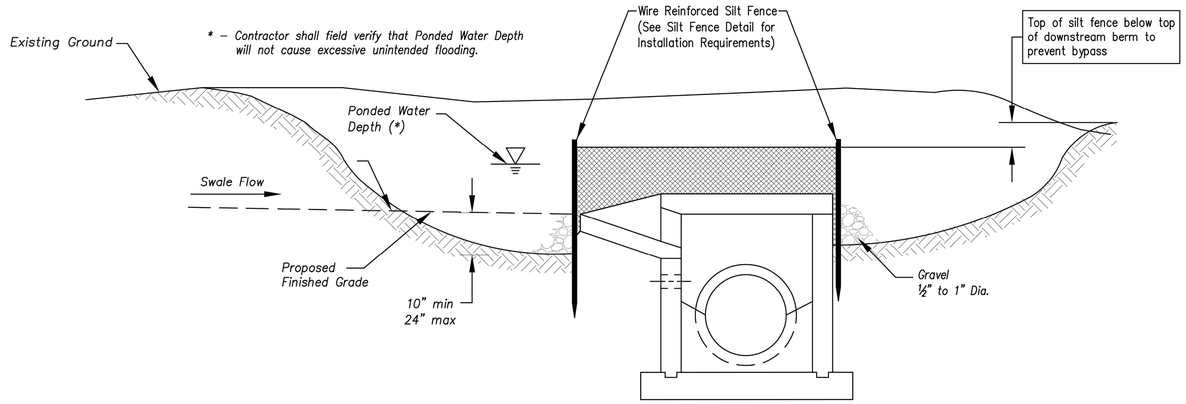
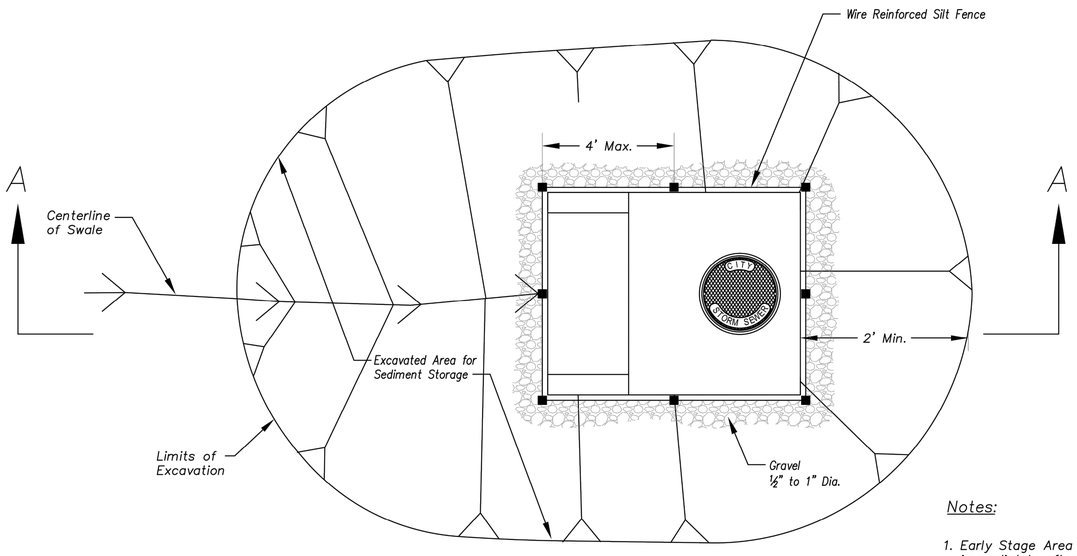


Section A–A

Not to Scale

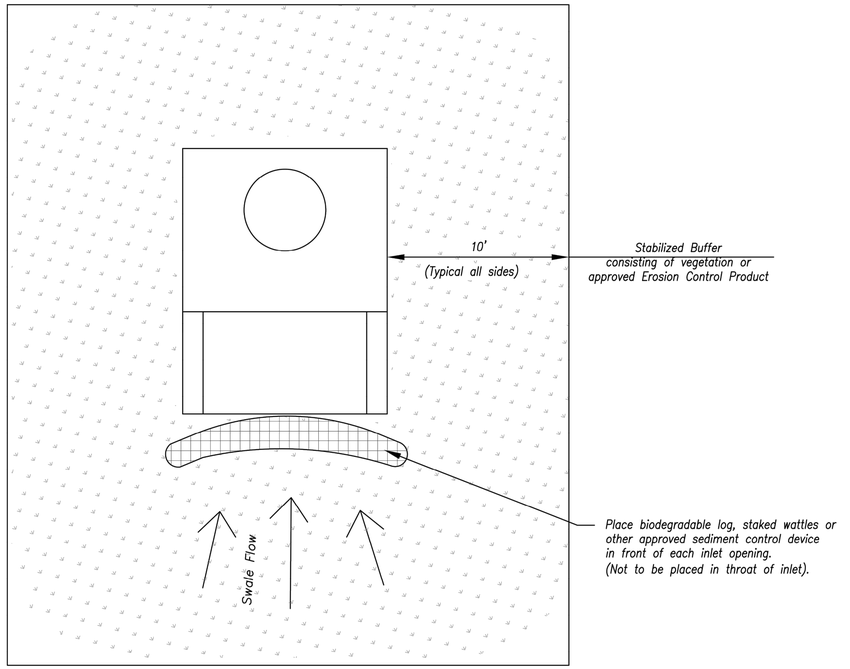


Plan

Not to Scale

EARLY STAGE AREA INLET

(All open boxes and inlets not at final grade)



Plan

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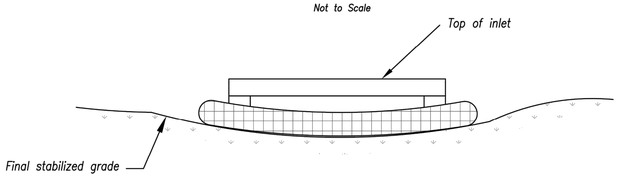

Front View

LATE STAGE AREA INLET

(Area inlets at final grade and existing inlets)

Notes:

1. Early Stage Area Inlet Sediment Barrier to be installed immediately after inlet or junction box is constructed.
2. Silt fence shall remain in place until excavated area is removed and Late Stage Area Inlet is being installed.
3. Backfill excavated area ONLY after final grading of the site. Stabilization of the site is to immediately follow.
4. Wire reinforced silt fence may be used in place of silt fence attached to wood frame.

Maintenance:

1. Remove deposited sediment from excavated storage areas when available storage has been reduced by 20%.
2. Remove deposited sediment from filter socks or similar when any accumulation of sediment is visible.
3. Repair or replace as necessary to maintain function and integrity of installation.

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION

KANSAS CITY METRO CHAPTER

AREA INLET AND JUNCTION BOX PROTECTION

STANDARD DRAWING NUMBER ESC-07

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI LEON DAVID OSBOURN NUMBER E-21726 REGISTERED PROFESSIONAL ENGINEER 1-2-19

LEON D. OSBOURN
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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
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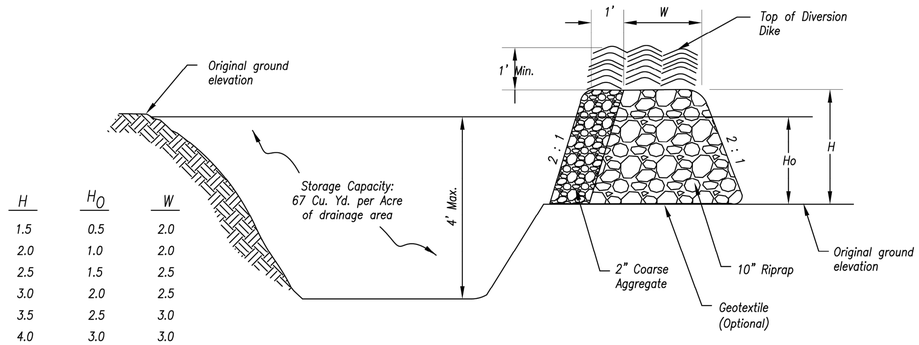
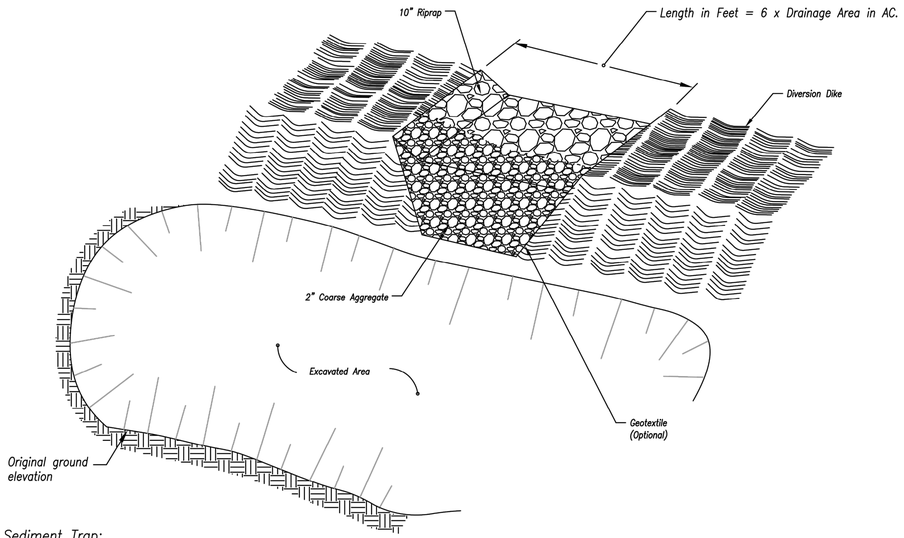


H	H_0	W
1.5	0.5	2.0
2.0	1.0	2.0
2.5	1.5	2.5
3.0	2.0	2.5
3.5	2.5	3.0
4.0	3.0	3.0
4.5	3.5	4.0
5.0	4.0	4.5

(*) Cross Section of Outlet

Not to Scale



(*) Perspective View of Outlet

Not to Scale

(*) – The perspective view and cross section are schematic in nature. Construction plans must provide specific site construction arrangements.

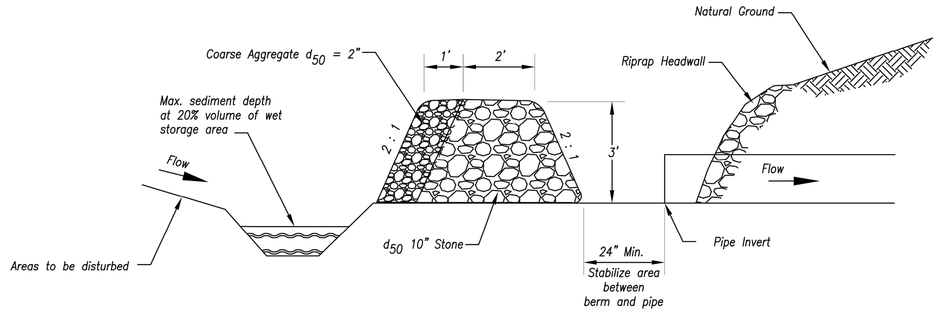
Notes for Sediment Trap:

1. The area under the embankment shall be cleared, grubbed, and stripped of any vegetation and root mat.
2. Fill material for the embankment shall be free of roots or other woody vegetation, organic material, large stones, and other objectionable material. The embankment should be compacted in 6–inch layers by traversing with construction equipment.
3. The earthen embankment shall be stabilized immediately after installation.
4. Construction operations shall be carried out to minimize erosion and water pollution.
5. The structure shall be removed and the area stabilized when the upslope drainage area has been stabilized.
6. All cut and fill slopes shall be 2H : 1V or flatter, except for excavated, wet storage areas which may be at a maximum 1H : 1V grade.

Maintenance for Sediment Trap:

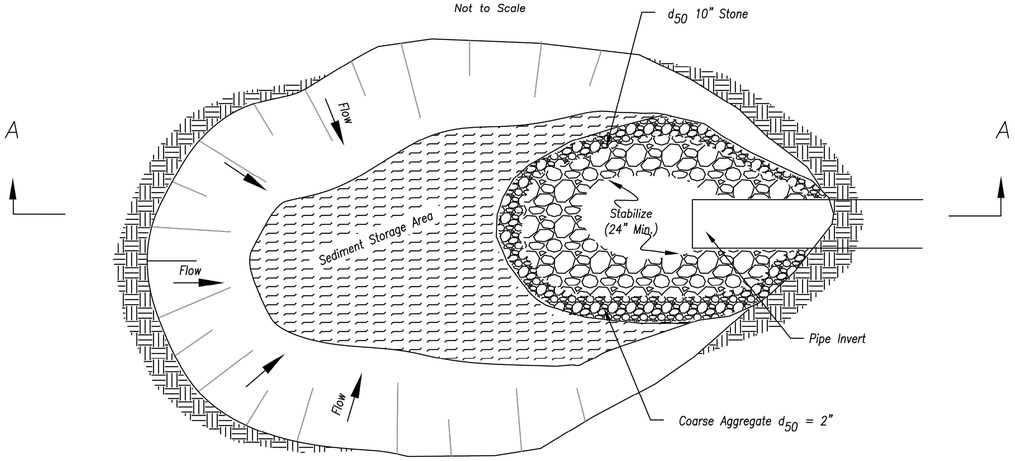
1. Check sediment traps after periods of significant runoff.
2. Remove sediment and restore the trap to its original dimensions when sediment accumulates to 20% of the storage capacity.
3. Immediately repair any erosion damage to the embankment and outlet.
4. Keep outlet and pool area free of all trash and other debris.

SEDIMENT TRAP



Section A–A

Not to Scale



Plan View

Not to Scale

Notes for Sediment Trap at Culvert Opening:

1. The inlet protection device shall be constructed in a manner that will facilitate clean–out and disposal of trapped sediment and minimize interference with construction activities.
2. The inlet protection devices shall be constructed in such manner that any resultant ponding stormwater will not cause excessive inconvenience or damage to adjacent areas or structures.
3. Geometry of the design will be a horseshoe shape around the culvert inlet.
4. The toe of the riprap shall be no closer than 24" from the culvert opening to provide an acceptable emergency outlet for flows from larger storm events.
5. Storage requirements equivalent to that of temporary sediment trap.
6. 67 C.Y./Acre wet storage below base of stone.
7. 67 C.Y./Acre dry storage from base of stone to top of stone berm.

Maintenance for Sediment Trap at Culvert Opening:

1. Check sediment traps after periods of significant runoff.
2. Remove sediment and restore the trap to its original dimensions when sediment accumulates to 20% of the storage capacity.
3. Immediately repair any erosion damage to the embankment and outlet.
4. Keep outlet and pool area free of all trash and other debris.

SEDIMENT TRAP AT CULVERT OPENING

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA American Public Works Association

KANSAS CITY METRO CHAPTER

SEDIMENT TRAPS

STANDARD DRAWING NUMBER ESC-08

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI – LEON D. OSBURN NUMBER E-21726 – REGISTERED PROFESSIONAL ENGINEER – 1-2-19

LEON D. OSBURN
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KAW VALLEY ENGINEERING

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067–1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067–1G_DET	
SHEET	REV
C–51	0

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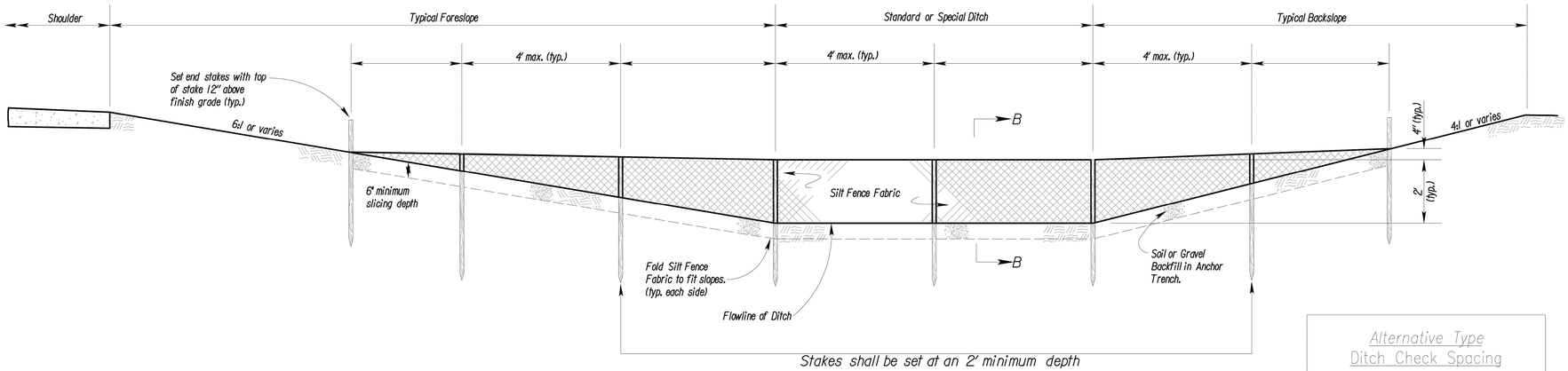
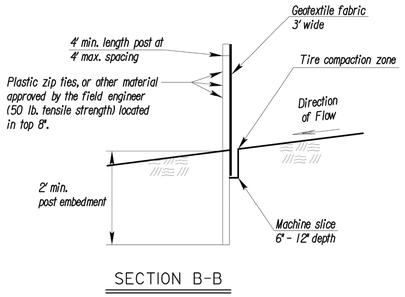
Notes for Silt Fence Ditch Check:

1. Stakes shall be 4' (min.) long and one of the following materials:
   a. Hardwood – 1 3/16" x 1 3/16";
   b. Southern Pine (No. 2) – 2 5/8" x 2 5/8";
   c. Steel U, T, L, or C Section – .95 lbs. per 1'–0";
   d. Synthetic – same strength as wood stakes.
2. Cross pieces shall be of same material as stakes.
3. Attach fence fabric securely on 6" centers (max.).
4. Use of high flow material is acceptable.
5. Refer to plan sheets to estimate the length of silt fence required.
6. Use support fencing when tributary area is greater than 2.4 acres or when ditch gradient is greater than 2 percent.
7. Silt fence sliced in to a 6" minimum depth.
8. Elevation at tie in points shall be a minimum of 4" higher than the center.

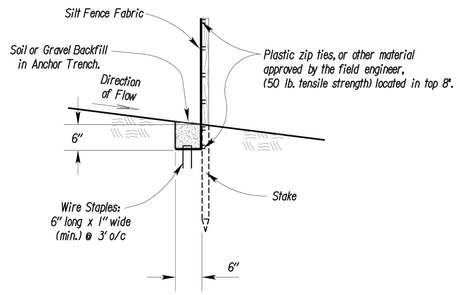


Stakes shall be set at an 2' minimum depth

TYPICAL ELEVATION



SECTION B-B



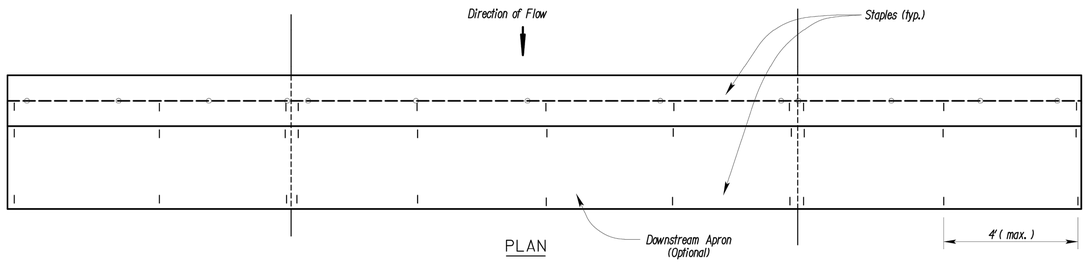
SILT FENCE DITCH CHECK

NO SCALE

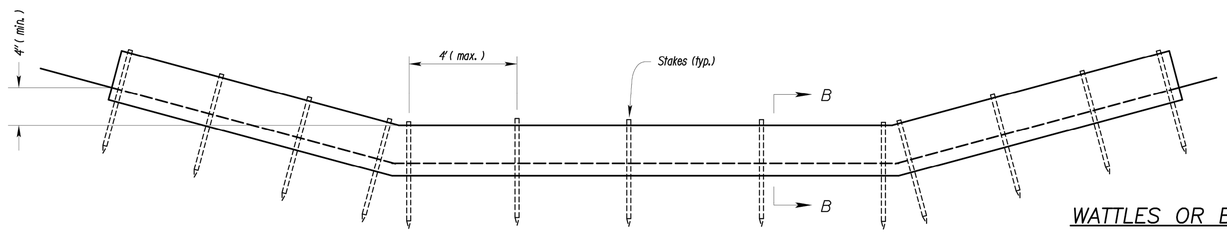
Alternative Type Ditch Check Spacing

Ditch Centerline Slope (%)	Spacing Interval (Feet)
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	33

Note: Use this spacing for all except Rock Ditch Checks.



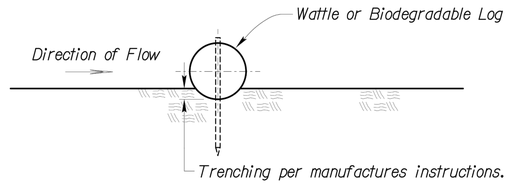
PLAN



TYPICAL ELEVATION

Notes for Wattles and Biodegradable Log Ditch Check:

1. Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.
2. Overlap sections a minimum of 18"
3. Stakes shall be per manufacturer's instructions. Length of stakes shall be a minimum of 2 times the diameter of the log or 24" minimum.
4. Use Erosion Control (Class 1) (Type C) as the downstream apron when directed by the Engineer.
5. Use 9" diameter logs when used with Erosion Control (Class 2) (Any Type) channel lining. Smaller diameter logs may be used with Erosion Control (Class 2) (Any Type) channel lining as directed by the Engineer.



SECTION B - B

WATTLES OR BIODEGRADABLE LOG DITCH CHECKS

OR Filter Sock Ditch Check

NO SCALE

Modified from Kansas Department of Transportation Standard Details for Erosion Control and Sediment Control.

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBORN NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-2-19

LEON D. OSBORN
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KAW VALLEY ENGINEERING

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER

SILT FENCE AND WATTLE/ BIODEGRADABLE LOG DITCH CHECKS

STANDARD DRAWING NUMBER ESC-09
ADOPTED: 10/24/2016

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-52	0

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STREETS OF WEST PRYOR

NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
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MASS GRADING PLANS
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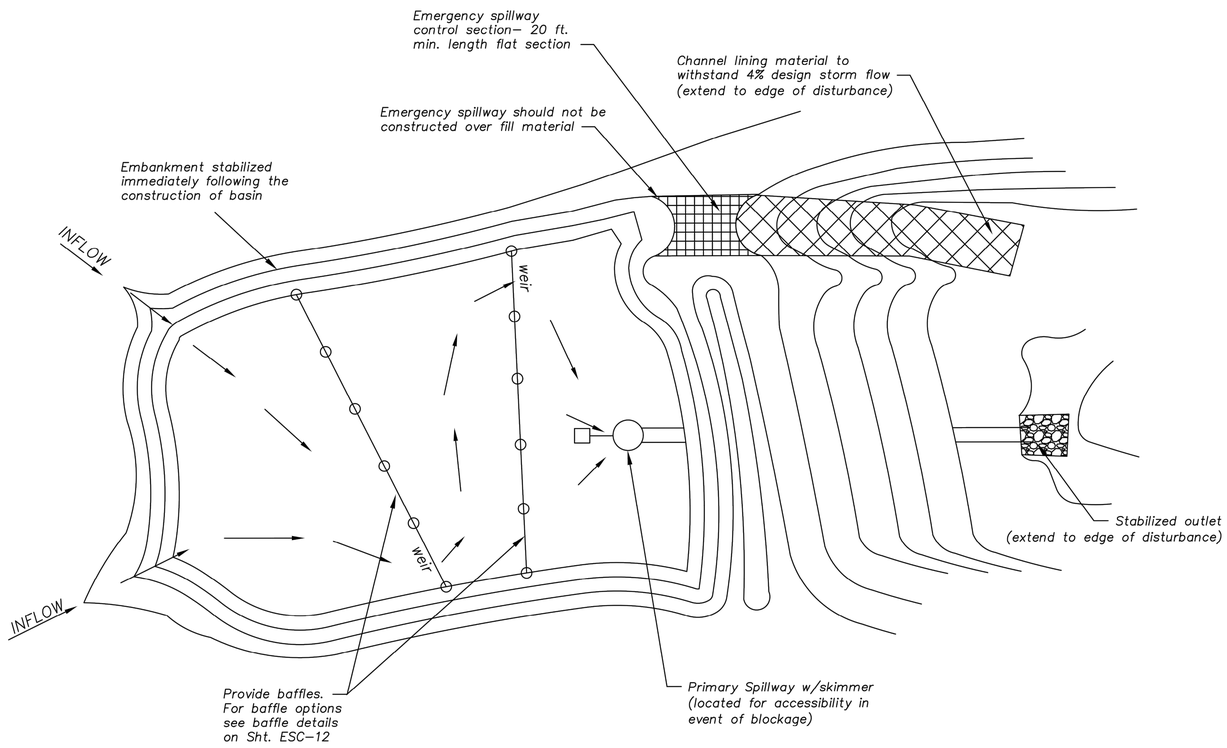
LEON D. OSBOURN
ENGINEER
MO # 021726

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
PROFESSIONAL ENGINEER

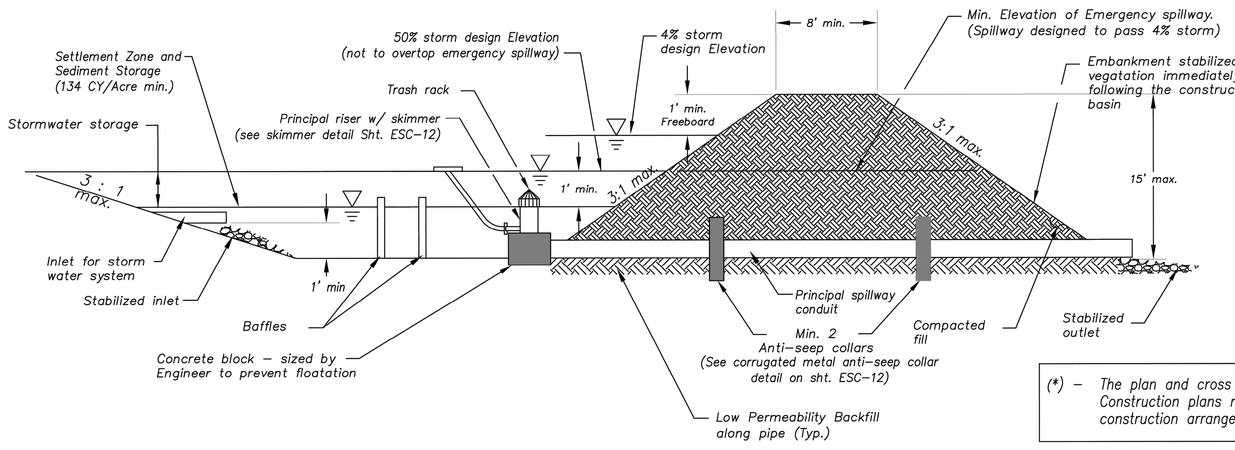
REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

PROJ. NO. A14_7067-1
DESIGNER LDO
DRAWN BY JT
CPN 7067-16_DET
SHEET C-53
REV. 0



Plan View (*)

Not to Scale



Cross Section (*)

Not to Scale

(*) – The plan and cross section are schematic in nature. Construction plans must provide specific site construction arrangements.

Sediment Basin Design Summary (**)

Design Item	Basin #1	Basin #2	Units	Notes
Site Data:				
Tributary Drainage Area to Pond	34.5		Acres	34.5 acres draining to "Upper" basin
50% (2 yr) Design Flow	137.6		cfs	
4% (25 yr) Design Flow	266.4		cfs	
Pond Data:				
Minimum Sediment Storage Volume	4,623		cu yd	134 cy/acre required minimum
Provided Sediment Storage Volume	6,813		cu yd	
Bottom Elevation	947		Ft	
Sediment Cleanout Elevation	948.3		Ft	Elevation equal to 20% of original design volume
Top of Riser Elevation	955.5		Ft	Top of dry storage volume
Emergency Spillway Elevation	956.5		Ft	at or above Q–2 elevation. 1.0 ft min above principal spillway
Top of Dam Elevation	959.0		Ft	1.0 ft min above Q–25 elevation
Basin Shape Data:				
A = Area at Normal Pool	22,884		SF	
L = Length of Flow Path	152		Ft	
We = Effective Width = A/L	150		Ft	
Length to Width Ratio = L/We	1.01			
Principal Spillway Data:				
Riser Pipe dia	24"		in	15" min. Size for 2 year flow minimum
Barrel Pipe dia	24"		in	15" min. Size for 2 year flow minimum
Concrete Base size for Riser Pipe	N/A (concrete box)		CY	Size to prevent flotation. 1.25 safety factor required
Skimmer Size	1.5" Faircloth 1.2" Diameter Orifice			Designer to provide specific details and calculations per application to dewater in 48 to 72 hours
Emergency Spillway Data:				
Design Depth in Spillway	1.51		ft	
Design Velocity in Spillway	3.67		ft/sec	
Lining Material	18"-24" Rip-Rap			Designer to provide specific details and calculations per application

(**) – Required on all Sediment Basin Plan Sheets

Sediment Basin Notes:

1. Interior baffles shall be provided to reduce short–circuiting of the basin. See Sht. ESC–12 for approved baffle options.
2. Emergency spillways to be located in a non–fill location when feasible and shall be lined with a non–erodible material such as Riprap or Turf Reinforcement Mat.
3. When directed, sediment basins shall be fenced using construction fence or other material for safety reasons and include warning signs, reading: "Danger – KEEP OUT".

Maintenance:

1. Check temporary sediment basins after periods of significant runoff.
2. Remove sediment and restore the basin to its original dimensions when sediment accumulates to 20% of the storage capacity.
3. Immediately repair any erosion damage to the embankment and outlets.
4. Repair and/or replace baffles as necessary to maintain function and integrity of installation.
5. Keep outlet, skimmer and pool area free of all trash and other debris.

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA AMERICAN PUBLIC WORKS ASSOCIATION

KANSAS CITY METRO CHAPTER

SEDIMENT BASIN

STANDARD DRAWING NUMBER ESC-11

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DET
SHEET C–54 | REV 0

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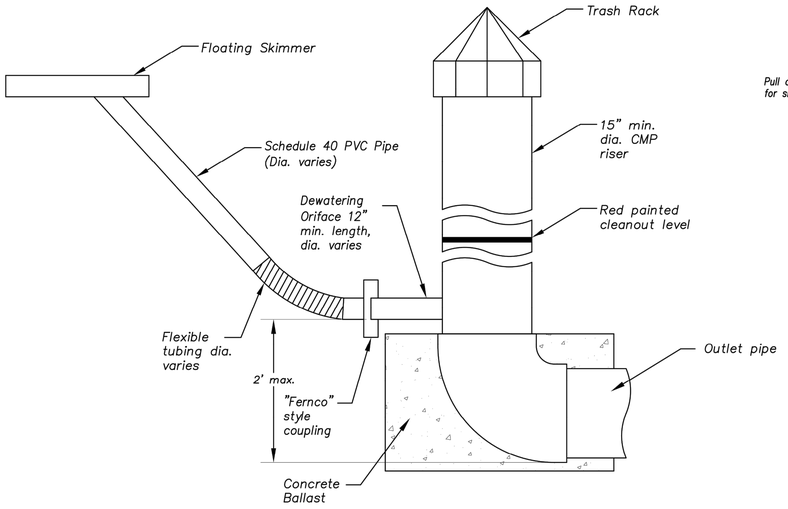
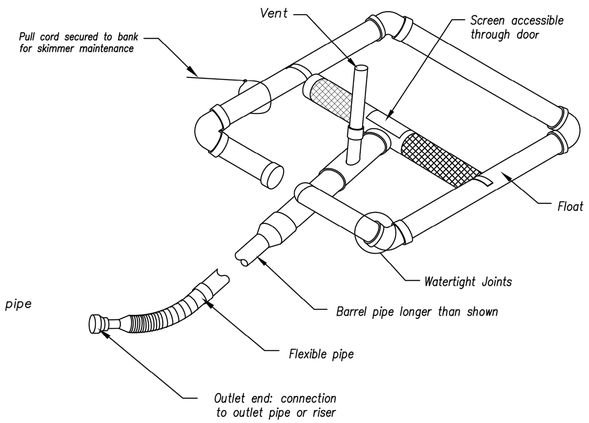
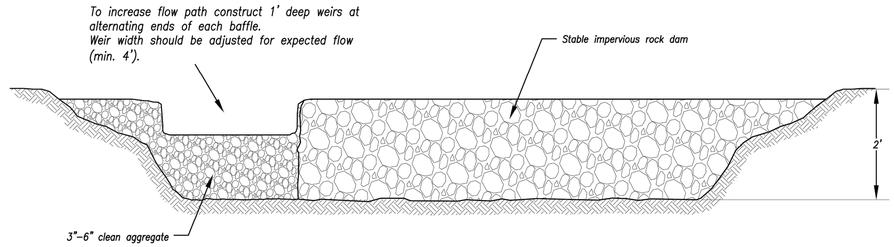


PRINCIPAL SPILLWAY DETAIL

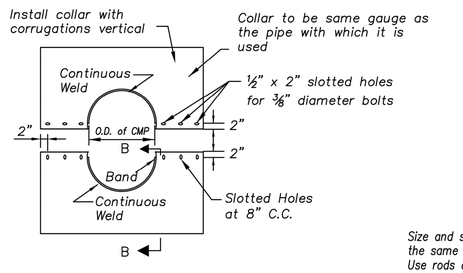


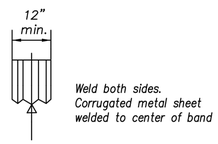
SKIMMER DETAIL (Typ.) *

* Designer to provide specific details per application (e.g. pipe sizes, screen sizes, perforation, etc.) as required.



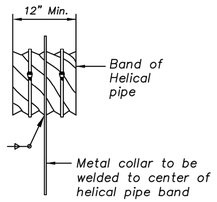
Option A – Rock with Weir



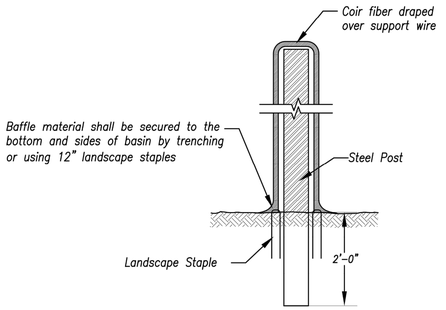


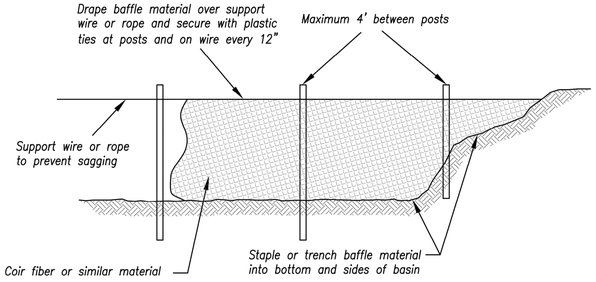
SECTION B–B

Size and spacing of slotted openings shall be the same as shown for CM collar. Use rods and lugs to clamp bands securely to pipe.



PARTIAL ELEVATION

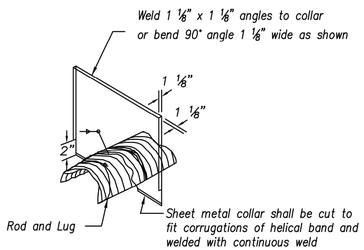




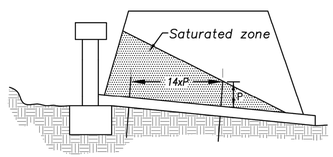
Option B – Coir Fiber Material

BAFFLE DETAILS

Not to Scale



ISOMETRIC VIEW



ANTI–SEEPAGE COLLAR LOCATIONS

CORRUGATED METAL ANTI–SEEPAGE COLLAR DETAIL

Not to Scale

Anti–Seepage Collar Notes:

1. Connections between the anti–seepage collar and the barrel must be watertight.
2. P = projection distance. Sized as required to achieve at least a 10% increase in seepage length.
3. 14xP = Max. spacing between collars.
4. Collars shall generally be placed in the middle third of the embankment, and within the saturated zone.
5. All materials to be in accordance with construction material specifications.
6. When specified on the plans, coating of collars shall be in accordance with construction material specifications.
7. Unassembled collars shall be marked by painting or tagging to identify matching pairs.
8. The lap between the two half sections and between the pipe and connecting band shall be caulked with asphalt mastic at the time of installation.
9. Each collar shall be furnished with two (2) ½" diameter rods with standard tank lugs for connecting the collars to the pipe.
10. For bands and collars, modification of the details shown may be used providing equal water tightness is maintained and detailed drawings are Submitted and approved by the Engineer prior to delivery.
11. Two other types of anti–seep collars are:
    a. Corrugated metal, similar to above, except shop welded to a 4 ft. section of the pipe and connected to the pipe with connecting bands.
    b. Concrete, 6 inches thick, formed around the pipe with #3 rebar spaced 15".

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER

SEDIMENT BASIN - DETAILS

STANDARD DRAWING NUMBER ESC-12
ADOPTED: 10/24/2016

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-55	0

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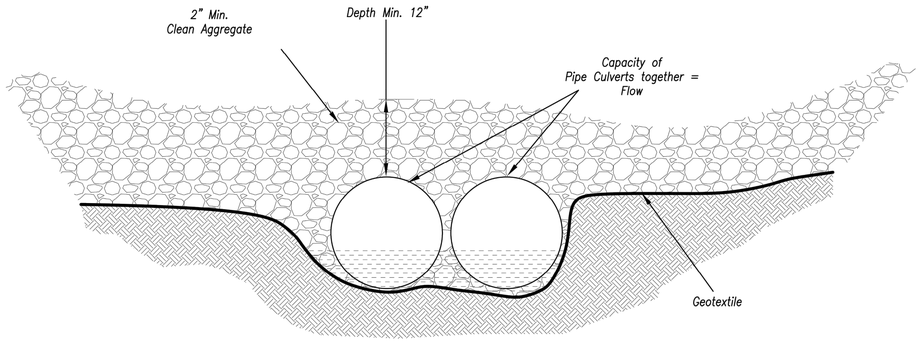


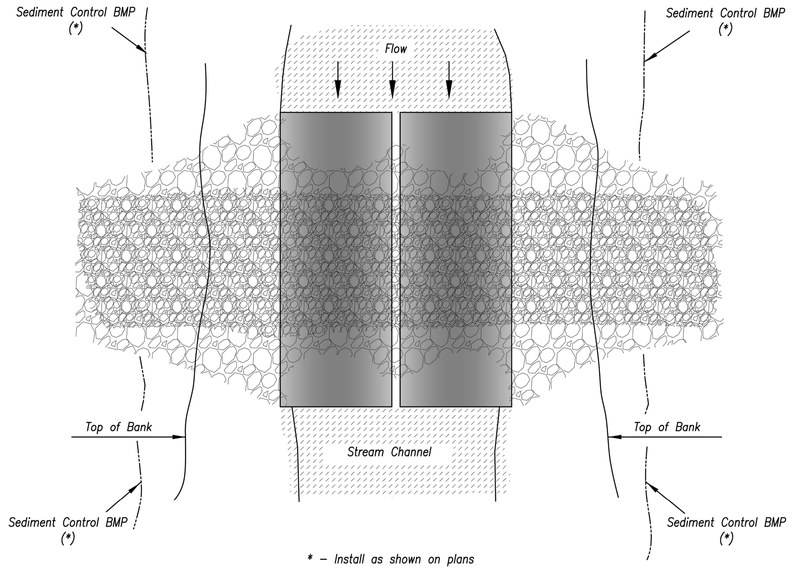
ELEVATION

Maintenance:

1. Repair stream bank erosion by stabilizing with erosion control BMPs such as erosion control blankets.
2. For in-stream degradation, armor the culvert outlet(s) with riprap to dissipate energy.
3. If sediment or debris is accumulating upstream of the crossing, remove as needed to maintain the functionality of the crossing.
4. If a temporary crossing is requiring excessive maintenance, replacement with a larger culvert or alternate design may be necessary.

Notes for Temporary Stream Crossing:

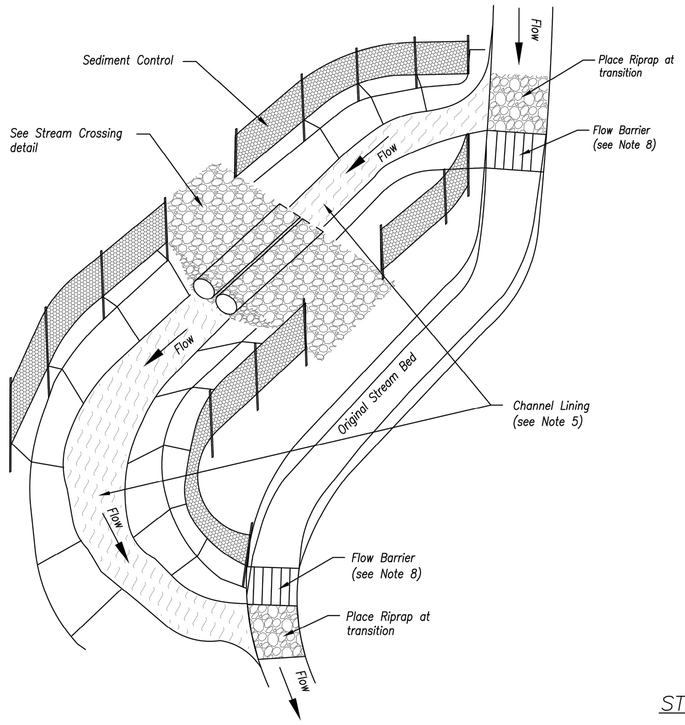
1. Clearing and excavation of the stream bed and banks shall be kept to a minimum.
2. Place one pipe, buried 6" into the stream bottom, at the lowest point of the channel to allow the passage of aquatic organisms. Additional pipes shall be placed along the remainder of the stream channel bottom such that ordinary high water (OHW) flows designated in the Contract Documents shall flow through the pipes without overtopping the crossing. (See Specification for more information).
3. Geotextile shall be placed on the streambed and streambanks prior to placement of the pipe culvert and aggregate. The geotextile shall cover the streambed and extend a minimum of 6 inches and a maximum of 1 foot beyond the end of culvert and bedding material. Filter cloth reduces settlement and improves crossing stability.
4. The culvert shall extend a minimum of 1 foot beyond the upstream and downstream toe of the aggregate placed around the culvert. In no case shall the culvert exceed 40 feet in length.
5. The culvert shall be covered with a minimum of 1 foot of aggregate. If multiple culverts are used, they shall be separated by at least 12" of compacted aggregate fill.
6. As soon as crossing no longer needed, all structures including culverts, bedding and geotextile materials shall be removed. Removal of the structure and clean-up of the area shall be accomplished without construction equipment working in the channel.
7. Upon removal of the structure, the stream and banks shall immediately be shaped to its original cross-section and properly stabilized. Take care to minimize the amount of sediment lost into the stream.



* – Install as shown on plans

PLAN VIEW

TEMPORARY STREAM CROSSING



Notes for Temporary Diversion Channel:

1. The diversion channel crossing must be operational before work is done in the stream. Construction will be performed in the dry.
2. Minimum width of bottom shall be 6 feet or equal to bottom width of existing streambed, whichever is less.
3. Maximum steepness of side slopes shall be 2H:1V. Depth and grade may be variable, dependent on site conditions, but shal be sufficient to ensure continuous flow of water in diversion.
4. Channel must be lined with riprap or turf reinforcement mat depending on the expected velocity and shear stress in the channel.
5. Stream diversion liners shall be secured at the upstream and downstream sides with non-erodible weights such as riprap. These weights shall allow normal flow of the stream. Soil shall not be mixed with stream diversion weights. Weights may also be needed along the diversion's length to secure liner.
6. Stream diversion liners shall be entrenched at the top of slopes along with a sediment control BMP.
7. Non-erodible materials such as riprap, Jersey barriers. sand bags, plywood, or sheet piling shall be used as flow barriers to divert the stream away from it's original channel and prevent or reduce water backup into the construction area.
8. Stream should be re-diverted only after backfilling and re-stabilization of original streambed and banks is completed.

STREAM DIVERSION CHANNEL

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION

Kansas City Metro Chapter APWA American Public Works Association

KANSAS CITY METRO CHAPTER

STREAM CROSSINGS AND DIVERSION CHANNELS

STANDARD DRAWING NUMBER ESC-13

ADOPTED: 10/24/2016

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
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NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-56	0

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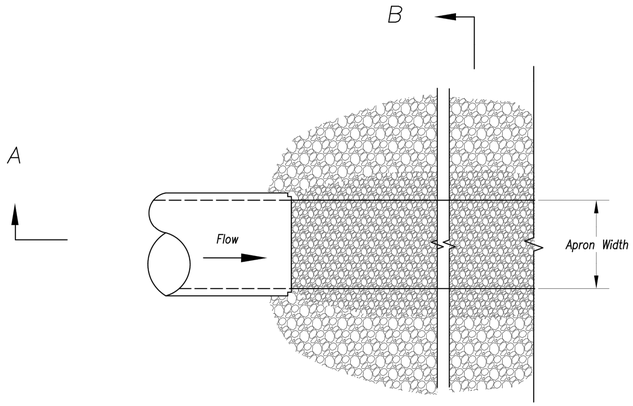
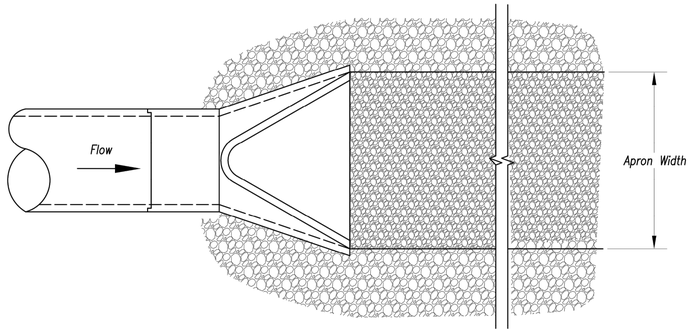
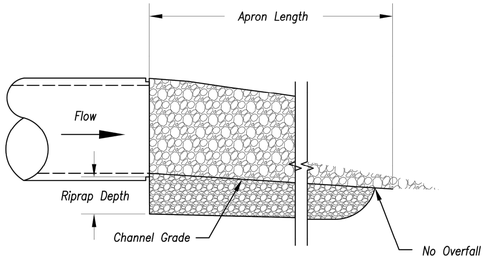


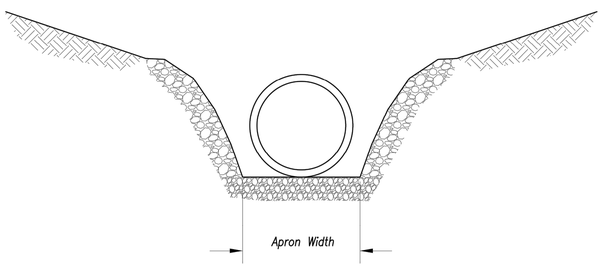
Plan View
Not to Scale



Plan View
Not to Scale

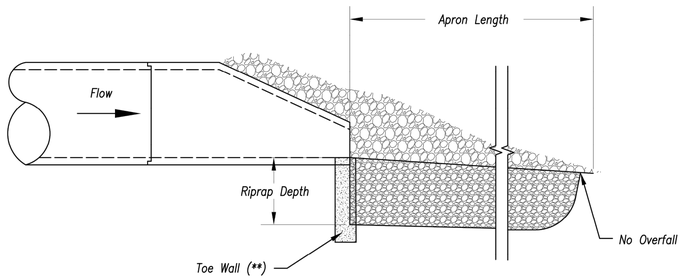


Section A–A
Not to Scale



Section B–B
Not to Scale

OUTLET PROTECTION W/O END SECTION



Section A–A
Not to Scale

OUTLET PROTECTION WITH END SECTION

Notes:

1. Rock all sides steeper than 3:1.
2. Stabilize all disturbed areas downstream of outlet to the limits of disturbance.
3. Alternative outlet protection and slope stabilization measures may be used with approval by the Engineer.
4. Install riprap apron so that it is no higher than flowline of pipe.
5. Reference APWA Specification 2650 for rock type, size, and placement.

Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
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STREETS OF WEST PRYOR
NWQ NW PRYOR ROAD & NW LOWENSTEIN DRIVE
LEE'S SUMMIT, MISSOURI

MASS GRADING PLANS
EROSION CONTROL DETAIL SHEET

AMERICAN PUBLIC WORKS ASSOCIATION
KANSAS CITY METRO CHAPTER

OUTLET PROTECTION

STANDARD DRAWING NUMBER ESC-14
ADOPTED: 10/24/2016

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_DET	
SHEET	REV
C-57	0

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