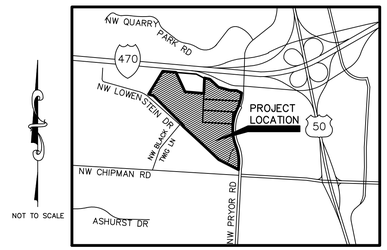
MASS GRADING & STORM SEWER IMPROVEMENTS
FOR
STREETS OF WEST PRYOR
LEE'S SUMMIT, MISSOURI

2 JULY 2019

LEGEND

- SECTION CORNER, ORIGIN UNKNOWN UNLESS OTHERWISE NOTED
- MONUMENT FOUND, ORIGIN UNCERTAIN UNLESS OTHERWISE NOTED
- RIGHT-OF-WAY MARKER FOUND
- (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
- ELECTRIC METER
- ELECTRIC TRANSFORMER
- BB BREAKER BOX
- E UNDERGROUND ELECTRIC LINE
- UTILITY MANHOLE
- CTV CABLE TV SIGN
- CABLE TV PEDESTAL
- GAS SIGN
- GAS METER
- G UNDERGROUND GAS LINE
- GTS GAS CATHODIC PROTECTION STATION
- W WATER LINE
- WATER LINE GATE VALVE
- WS WATER SPIGOT
- WATER METER
- WELL
- FIRE HYDRANT
- SV SPRINKLER VALVE
- 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
- PULL BOX
- FP 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

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.

CONSTRUCTION NOTES:

1. ALL CONSTRUCTION SHALL CONFORM TO LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.

2. CONTRACTOR SHALL NOTIFY DEVELOPMENT ENGINEERING INSPECTION AT 816-969-1200 AT LEAST 48 HOURS PRIOR TO STARTING WORK.

3. PIPE LENGTHS ARE CENTER TO CENTER OF STRUCTURE OR TO END OF END SECTIONS.

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KCP&L
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CALL BEFORE YOU
DIG – DRILL – BLAST
1-800-344-7483
(TOLL FREE)

MISSOURI ONE CALL SYSTEM, INC.

OWNER:
STREETS OF WEST PRYOR, LLC
7200 WEST 132ND STREET
OVERLAND PARK, KS 66213
CONTACT: MATT PENNINGTON
email: matt@drakekc.com

DEVELOPER:
STREETS OF WEST PRYOR, LLC
7200 WEST 132ND STREET
OVERLAND PARK, KS 66213
AGENT: DAVID N. OLSON
email: daveolson@monarchprojectllc.com

PREPARED BY:
KAW VALLEY ENGINEERING, INC.
2319 N. JACKSON
JUNCTION CITY, KS 66441
785-762-5040
CONTACT: LEON D OSBOURN
EMAIL: ldo@kveng.com

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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 LOWENSTEIN DRIVE AT 90° BEND IN ROAD. ELEV=971.06

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

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 BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
TITLE SHEET

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

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.

Summary of Quantities

Earthwork

Item No.	Item	Estimated Quantity	Unit	Unit Cost	Extension
1	Mobilization	1	L.S.	$282,630.00	$282,630.00
2	Clearing and Grubbing	1	L.S.	$133,800.00	$133,800.00
3	Demolition and Removal	1	L.S.	$138,820.00	$138,820.00
4	Traffic Control (Temporary)	1	L.S.	$0.00	$0.00
5	Excavation	530,227	C.Y.	$0.00	$0.00
6	Embankment	500,998	C.Y.	$0.00	$0.00
7	Modular Block Retaining Wall	4,776	L.F.	$236.42	$1,129,259.26
		Earthwork Total:			**$1,684,509.26**

Erosion Control

Item No.	Item	Estimated Quantity	Unit	Unit Cost	Extension
1	SC 250 Turf Reinforcing Mat	3,591	S.Y.	$3.78	$13,572.48
2	18" Riprap	5,512	Ton	$5.94	$32,742.47
3	Seeding	3,104,655	S.F.	$0.03	$93,139.64
4	Erosion Control Devices, Sedimentation Fence	21,743	L.F.	$1.39	$30,223.34
5	Erosion Control Devices, Curb Inlet Protection	41	Ea.	$75.60	$3,099.60
6	Erosion Control Devices, Area Inlet & Junction Box Protection	26	Ea.	$81.00	$2,106.00
7	Erosion Control Devices, Temporary Construction Entrance	1	Ea.	$1,200.00	$1,200.00
8	Erosion Control Devices, Outlet Protection	89	L.F.	$40.00	$3,565.36
9	Erosion Control Devices, Sediment Basin	2	Ea.	$6,755.00	$13,510.00
		Erosion Control Total:			**$193,158.89**

Storm Sewer (Public)

Item No.	Item	Estimated Quantity	Unit	Unit Cost	Extension
1	RCP (48")(CLASS 3)	170	L.F.	$133.93	$22,719.89
2	RCP (54")(CLASS 3)	260	L.F.	$211.40	$55,006.28
3	RCP (60")(CLASS 4)	305	L.F.	$211.40	$64,489.68
4	Double Grate Inlet (7'x4')	1	Ea.	$9,245.00	$9,245.00
5	Double Grate Inlet (7'x7')	2	Ea.	$9,940.00	$19,880.00
6	Setback Curb Inlet (6'x4')	1	Ea.	$5,560.00	$5,560.00
7	Setback Curb Inlet (7'x6')	1	Ea.	$8,500.00	$8,500.00
8	Curb Inlet (3'x'5)	1	Ea.	$3,980.00	$3,980.00
9	End Section RCP (54")	1	Ea.	$2,800.00	$2,800.00
10	End Section RCP (60")	1	Ea.	$2,800.00	$2,800.00
		Storm Sewer (Public) Total:			**$194,980.85**

Storm Sewer (Private)

Item No.	Item	Estimated Quantity	Unit	Unit Cost	Extension
1	HDPE (15")	211	L.F.	$26.73	$5,646.45
2	HDPE (18")	1,234	L.F.	$44.39	$54,777.70
3	HDPE (24")	1,311	L.F.	$72.76	$95,367.99
4	HDPE (30")	1,444	L.F.	$80.77	$116,639.96
5	HDPE (36")	457	L.F.	$98.26	$44,887.13
6	RCP (30")(CLASS 3)	60	L.F.	$80.77	$4,847.01
7	RCP (36")(CLASS 3)	368	L.F.	$98.26	$36,197.02
8	RCP (42")(CLASS 3)	379	L.F.	$182.20	$69,033.76
9	RCP (36")(CLASS 4)	259	L.F.	$98.26	$25,409.05
10	RCP (42")(CLASS 4)	334	L.F.	$182.20	$60,889.42
11	RCP (48")(CLASS 4)	1,180	L.F.	$136.87	$161,447.75
12	Junction Box (7'x7')	1	Ea.	$7,880.00	$7,880.00
13	Double Grate Inlet (4'x4')	6	Ea.	$3,525.00	$21,150.00
14	Double Grate Inlet (5'x5')	11	Ea.	$4,885.00	$53,735.00
15	Double Grate Inlet (6'x6')	6	Ea.	$6,135.00	$36,810.00
16	Double Grate Inlet (7'x7')	1	Ea.	$7,625.00	$7,625.00
17	Double Grate Inlet (8'x8')	0	Ea.	$8,115.00	$0.00
18	Setback Curb Inlet (5'x3')	5	Ea.	$3,980.00	$19,900.00
19	Setback Curb Inlet (5'x4')	4	Ea.	$4,460.00	$17,840.00
20	Setback Curb Inlet (5'x5')	1	Ea.	$4,885.00	$4,885.00
21	Setback Curb Inlet (6'x5')	2	Ea.	$7,520.00	$15,040.00
22	Setback Curb Inlet (6'x6')	2	Ea.	$8,210.00	$16,420.00
23	Setback Curb Inlet (6'x7')	1	Ea.	$8,725.00	$8,725.00
24	Setback Curb Inlet (7'x7')	1	Ea.	$9,115.00	$9,115.00
25	Setback Curb Inlet (8'x3')	2	Ea.	$5,620.00	$11,240.00
26	Curb Inlet (5'x3')	5	Ea.	$3,985.00	$19,925.00
27	Curb Inlet (5'x4')	4	Ea.	$4,070.00	$16,280.00
28	Curb Inlet (5'x4.5')	1	Ea.	$5,105.00	$5,105.00
29	Curb Inlet (6'x4')	2	Ea.	$5,590.00	$11,180.00
30	Curb Inlet (6'x6')	1	Ea.	$8,210.00	$8,210.00
31	Curb Inlet (8'x4')	1	Ea.	$6,485.00	$6,485.00
32	Curb Inlet (8'x5')	1	Ea.	$7,220.00	$7,220.00
33	Special Inlet Riser (5'x5')	3	Ea.	$7,755.00	$23,265.00
34	Landscape Drain (18")(PVC)	1	Ea.	$1,800.00	$1,800.00
35	End Section HDPE (24")	1	Ea.	$1,265.00	$1,265.00
36	End Section RCP (36")	3	Ea.	$1,900.00	$5,700.00
		Storm Sewer (Private) Total:			**$1,011,943.23**

ADDED SHEET 0

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	7-3-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-2-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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JUNCTION CITY, KANSAS 66441-7744
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NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
SUMMARY OF QUANTITIES

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

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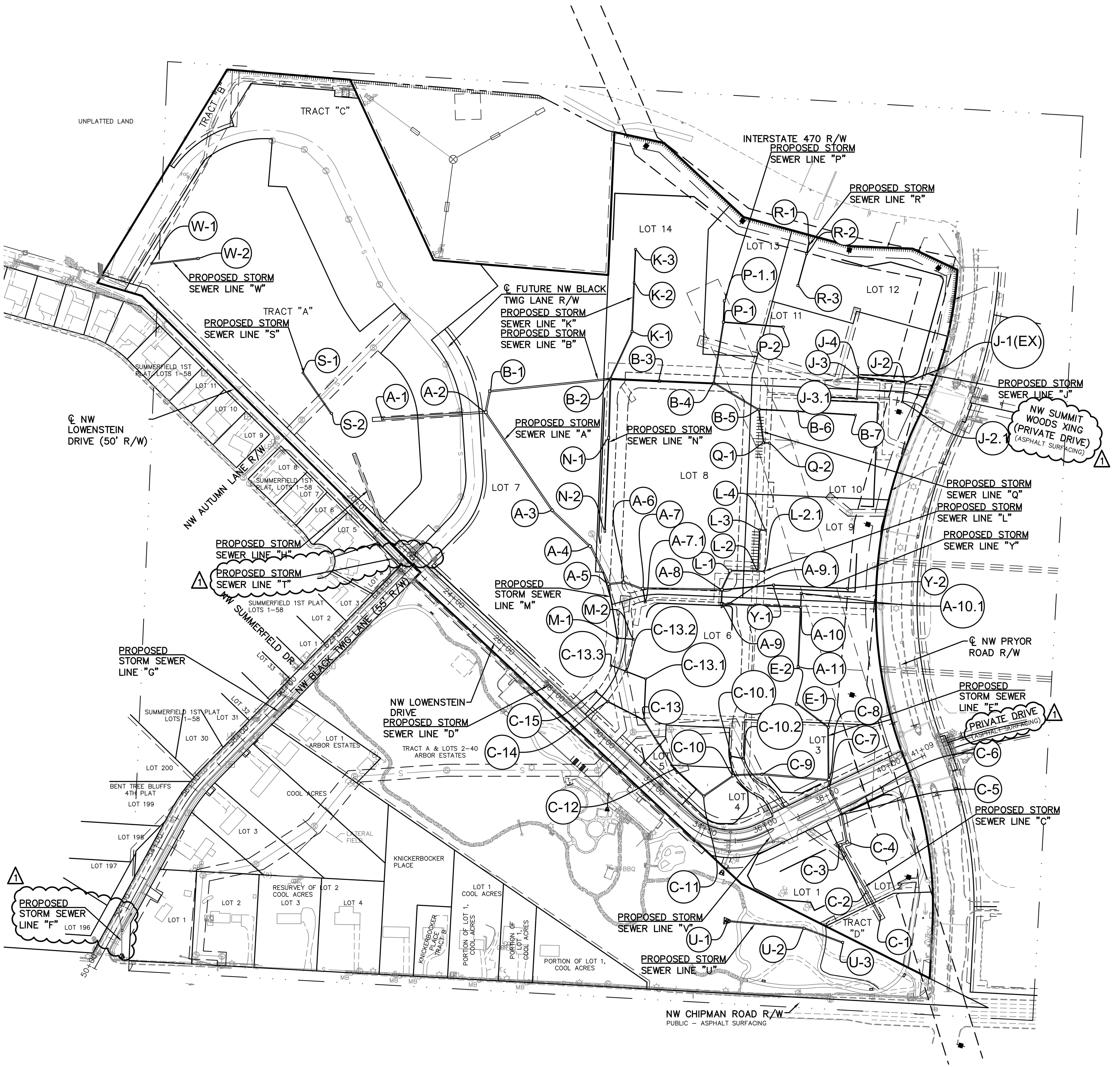

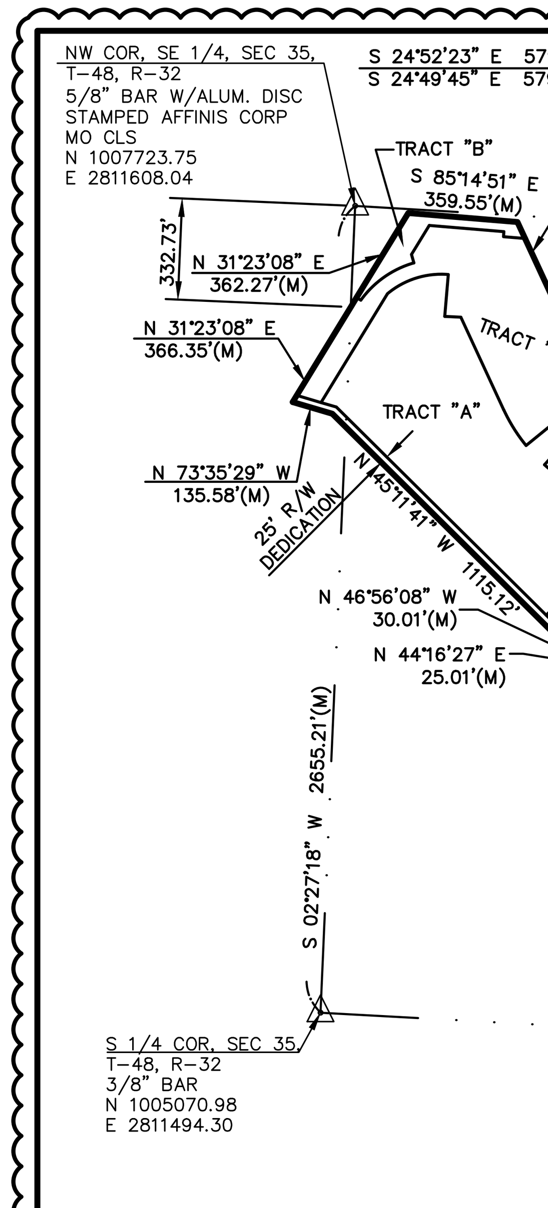

BOUNDARY INFORMATION & SURVEY CONTROL

SCALE: 1"=500'

(SEE FINAL PLAT OF STREETS OF WEST PRYOR LOTS 1 THRU 14. TRACTS "A", "B", "C", & "D" FOR ADDITIONAL INFORMATION)

0 75 150 300

SCALE: 1" = 150'

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
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7-5-19

LEON D. OSBOURN
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STREETS OF WEST PRYOR

NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
GENERAL LAYOUT SHEET

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

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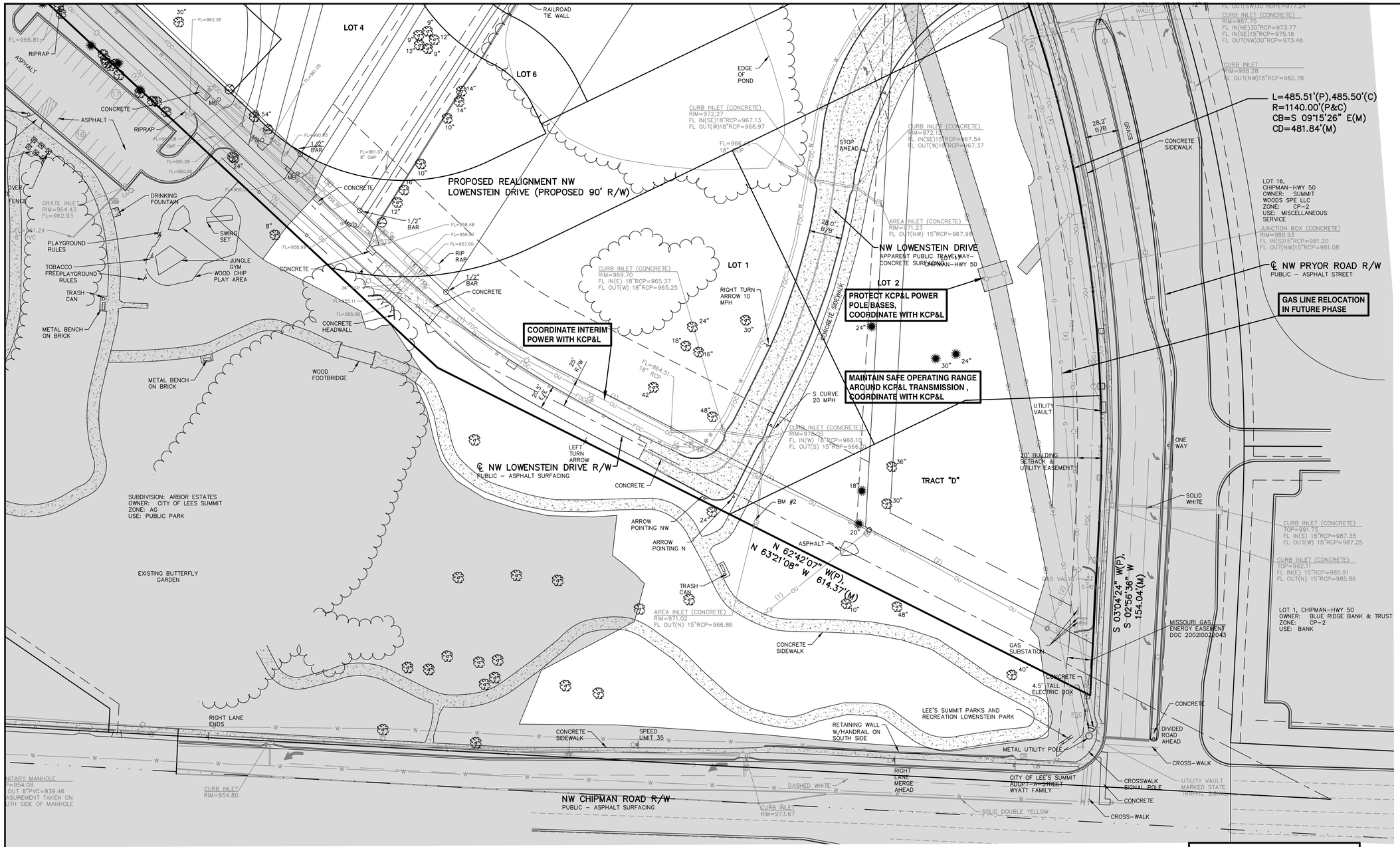

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SAFETY NOTICE TO CONTRACTOR

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.

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.

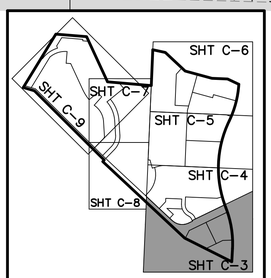
10. COORDINATE WITH KAW VALLEY ENGINEERING PRIOR TO REMOVAL OF SECTION MONUMENTS AND PROPERTY PINS. KAW VALLEY ENGINEERING WILL RESET NECESSARY MONUMENTS WITHIN THE DISTURBED AREAS FOLLOWING DEMOLITION. CARE SHALL BE TAKEN TO PRESERVE PROPERTY PINS ALONG THE OUTSIDE PERIMETER OF THE SITE.

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.

BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=984.97

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=970.98

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

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JOPLIN, MO 64801 | KANSAS 66441–7744
PH: (785) 242–4044 | FAX: (785) 242–7744
jo@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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO.	
A14_7067–1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067–1G_DEMO	
SHEET	REV
C–3	2

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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 6

LOT 5

LOT 4

LOT 3

LOT 2
CORLEW'S ESTATE

LOT 1
CORLEW'S ESTATE

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

UTILITY EASEMENT
I-940472, BOOK I962, PAGE 1148 (ESMT NO. 2)
7.50'

100' ELECTRIC EASEMENT
DOC. NO. 134200
BK I864, PG 244

JUNCTION BOX (CONCRETE)
TOP=981.83
FL IN(SW) 36"RCP=965.03
FL OUT(SE) 36"RCP=964.73

20' UTILITY EASEMENT

15' UTILITY EASEMENT
DOC. NO. I940472
BK I962, PG 1148

TRACT D CHAPMAN-HWY. 50

ONE WAY

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

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

1/2" BAR FOUND 1.96' E & 0.8' S

3/8" BAR

5' FENCE

10' UTILITY EASEMENT (PER CORLEW PLAT)

60' R/W

SMOOTH WIRE FENCE

TRAFFIC SIGNAL VAULT

STREET LIGHTING VAULT

ELECTRIC BOX/ CONCRETE

SOLID WHITE LINE

EDGE OF LANDSCAPING
20'

PULL BOX FOR LIGHTING

SUMMIT WOODS CROSSING

PRIVATE DRIVE
(ASPHALT SURFACE)

CONCRETE ENTRANCE

STOP
EXIT TO CHIPMAN
LEFT ARROW

STOP BAR

RAMP

CROSS-WALK

S CURVE
20 MPH

STOP

HANDICAP RAMP

UTILITY VAULT FOR AT&T

UTILITY VAULT

CONCRETE

SMOOTH WIRE FENCE

1.5" ALUM CAP
LS 78D MO

SOUTH LINE LOT

1/2" BAR

HOUSE REMOVAL

SHED

CONCRETE

WOOD DECK

CHAIN LINK FENCE

HOUSE

CONCRETE RETAINING WALL

WOOD RETAINING WALL

CONCRETE SIDEWALK

RAILROAD TIE RETAINING WALL

CONCRETE RETAINING WALL W/STEPS

UNPLATTED LAND

HOUSE REMOVAL

HOUSE

GRAVEL DRIVE

RAILROAD TIE WALL

EDGE OF POND

UTILITY VAULT ON CONC. PAD

100' ELECTRIC EASEMENT
DOC. NO. I87841
BK 1486, PG 527

UTILITY VAULT

NW LOWENSTEIN DRIVE
PUBLIC – ASPHALT SURFACING

ASPHALT DRIVE

CONCRETE DRIVE

TRASH CAN

12" CMP

RIPRAP

ASPHALT

ACCESSIBLE RAMP

CONC

CANOPY OVER CONCRETE W/WOOD FENCE

GRATE INLET
RIM=964.43
FL=962.93

DRINKING FOUNTAIN

PARK BENCH ON CONC & BRICK W/TRASH CAN

PLAYGROUND RULES

TOBACCO FREEPLAYGROUND RULES

SWING SET

JUNGLE GYM

WOOD CHIP PLAY AREA

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

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

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

0 20 40 80
SCALE: 1" = 40'

SHEET INDEX
NTS

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

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EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DEMO
SHEET C-4 | REV 2

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LOT 14

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 1
ERICKSON ACRES, 1ST PLAT

LOT 11

LOT 7

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

7.5' UTILITY EASEMENT (PER PLAT)

2 STRAND BARBED WIRE

4 STRAND BARBED WIRE

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

SMOOTH WIRE FENCE

UNPLATTED LAND

LOT 10

LOT 9

LOT 8

LOT 1
PRYOR ACRES

1" OD PIPE

5 STRAND

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

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

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

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

48" 60"

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

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

TRAFFIC SIGNAL MANHOLE

CONCRETE

TRAFFIC SIGNAL VAULT

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

4.5' TALL ELECTRIC BOX

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

JUNCTION BOX
TOP=971.21
FL IN(SW) 42"F
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 IMPR

JUNCTION 470

EDGE OF LANDSCAPING

CHISELED "X" FOUND

CONCRETE PAD

DIVIDED ROADWAY AHEAD

RAMP

EDGE OF LANDSCAPING

SUMMIT WOODS CROSSING

PAINTED DASHED WHITE LINE

PAINTED SOLID WHITE LINE

NW SUMMIT WOODS XING (PRIVATE DRIVE)
(ASPHALT SURFACE)

CROSSWALK POLE

RETAINING WALL

PAINTED SOLID YELLOW LINE

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=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

SANITARY MANHOLE
TOP=971.87
FL IN(W) 8"PVC=953.92
FL IN(E) 10"PVC=952.92
FL OUT(N) 12"PVC=951.32

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

0 20 40 80
SCALE: 1" = 40'

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

20' UTILITY EASEMENT (PER PLAT)

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.

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

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LEON D. OSBOURN
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7-5-19

LEON D. OSBOURN
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MASS GRADING & STORM SEWER IMPROVEMENTS
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LDO	JT
CFN	
7067-1G_DEMO	
SHEET	REV
C-5	2

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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 22°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)

3 STRAND BARBED WIRE

LOT 13

LOT 12

LOT 11

LOT 1
ERICKSON ACRES, 1ST PLAT

LOT 18
CHIPMAN-HWY 50

LACK OF ABUTTERS RIGHTS
DOC NO. 2007E0074065

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)

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

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

FOOD

UTILITY VAULT MARKED STATE TRAFFIC VAULT

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

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

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

TRAFFIC SIGNAL MANHOLE

CONCRETE

TRAFFIC SIGNAL VAULT

20' UTILITY EASEMENT (PER PLAT)
20' 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

TRAFFIC SIGNAL VAULT

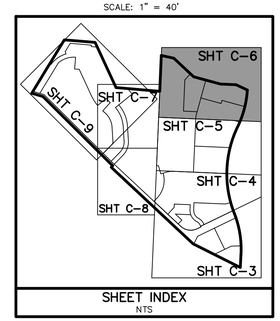
DASHED WHITE

PAINTED DAGUE

DIVID ROAD AHEA

0 20 40 80
SCALE: 1" = 40'

SHEET INDEX
NTS



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CFN 7067-1G_DEMO
SHEET C-6 | REV 2

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S 85°06'10" E 511.36'(P)
S 85°07'20" E 511.36'(M)

2-18"

SUBJECT PROPERTY
3,168,062.70 SF, 72.73 AC

EDGE OF POND

SMOOTH WIRE FENCE

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

20' SETBACK (PER PLAT)

LOT 14

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

0 20 40 80
SCALE: 1" = 40'

UNPLATTED LAND

PROPOSED NW BLACKTWIG LANE
(PROPOSED 90' R/W)

2-24"

32"

TRACT "A"

TRACT "C"

20' ANCHOR EASEMENT
DOC. NO. I-800361,
BK. I-1725, PG 610

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

18"
WOOD FENCE

SHED

SMOOTH WIRE FENCE

SMOOTH WIRE FENCE

CONCRETE

SHED

LOT 7

72"

PROPANE TANK

SPLIT RAIL FENCE

CONCRETE STORM SHELTER

50"

SHED

1" OD PIPE

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

7.5' UTILITY EASEMENT (PER PLAT)

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

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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=970.98

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REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

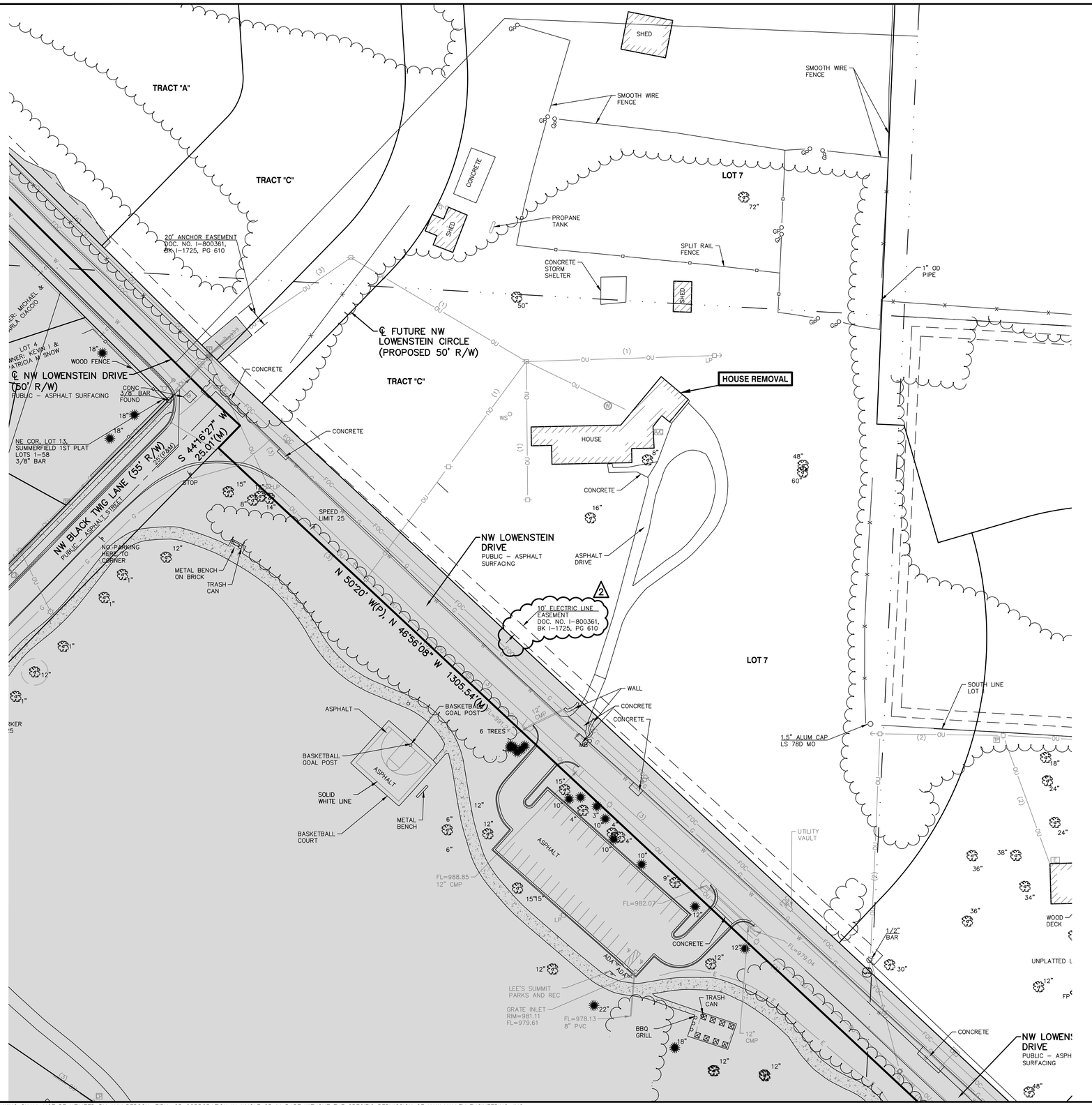
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
PH. (785) 762-5040 | FAX (785) 762-7744
pc@kveng.com | www.kveng.com
KAW VALLEY ENGINEERING

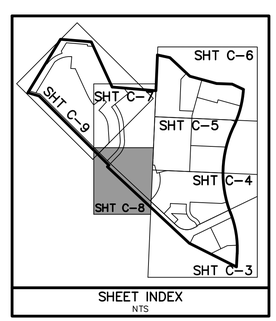
KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EXISTING CONDITIONS & DEMOLITION PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DEMO
SHEET C-7 | REV. 2





SHEET INDEX
NTS

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

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PROJ. NO. A14_7067-1
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CFN 7067-1G_DEMO
SHEET C-8 | REV 2

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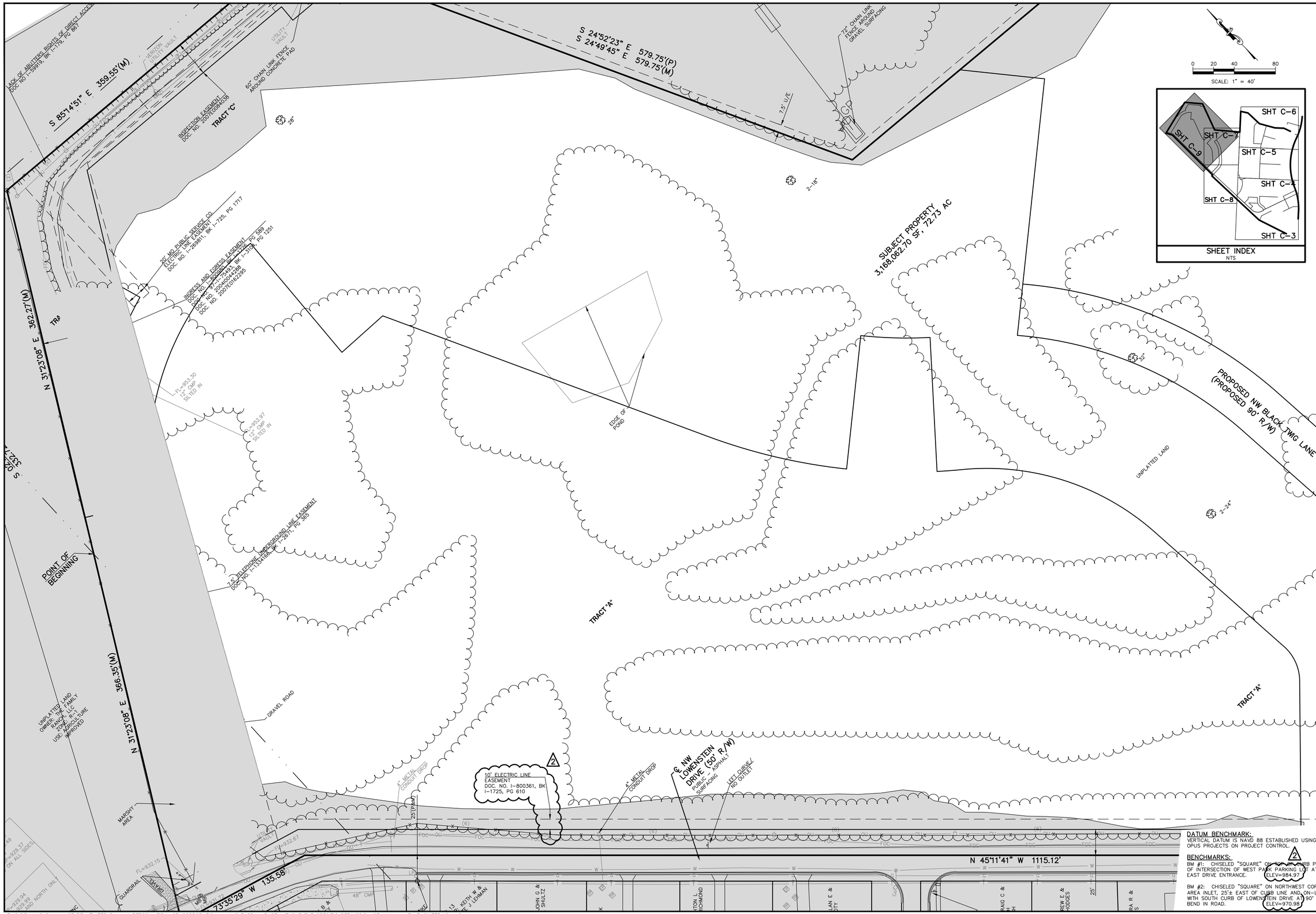

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PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_DEMO
SHEET	C-9
REV	2

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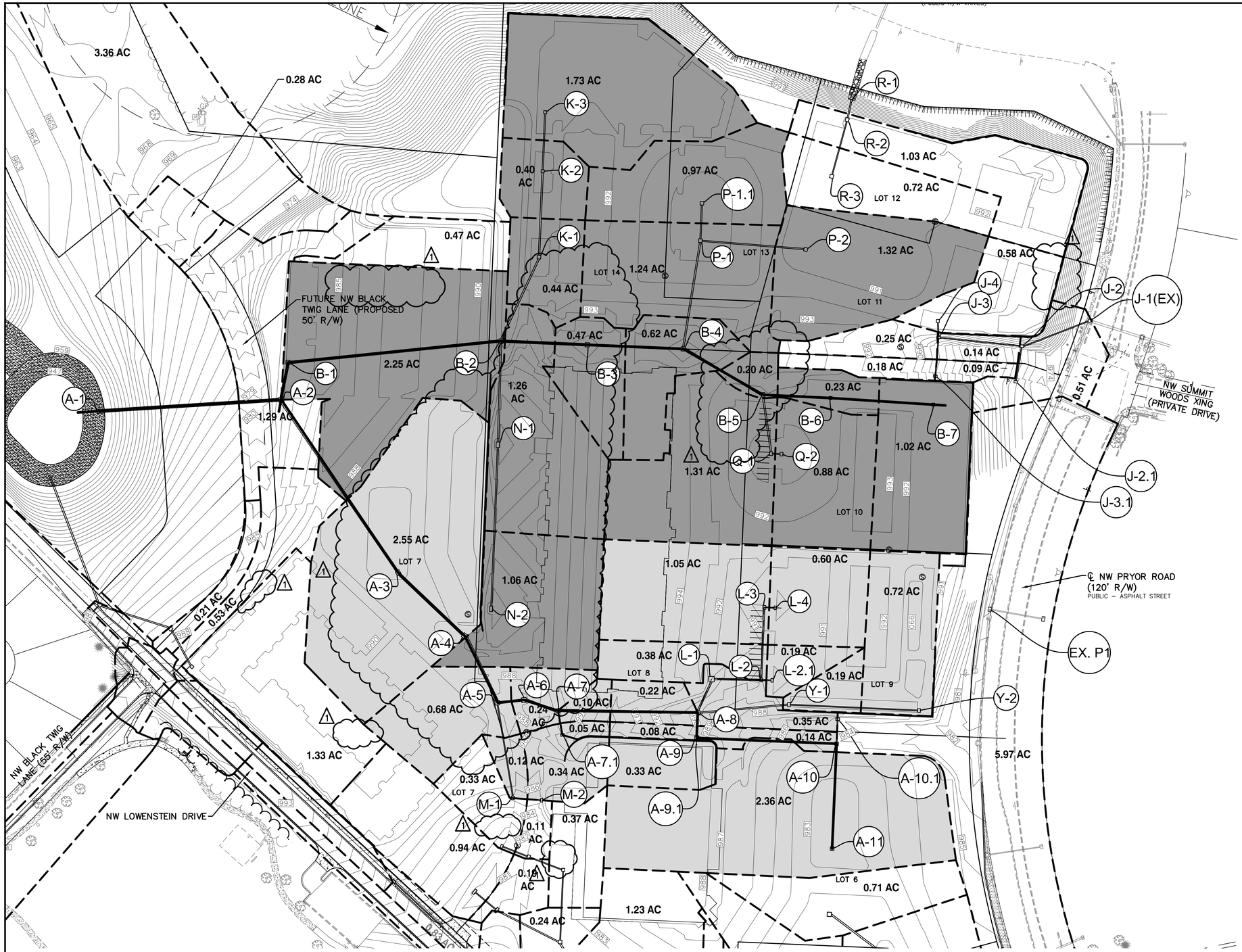

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NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
5-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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MASS GRADING & STORM SEWER IMPROVEMENTS
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	1

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Line ID	Incr.Area	TotalArea	RunoffCoeff.	IncrC x A	Total C x A	Inlet Time	TimeConc	Rnfal Int	Total Runoff (100-year)	Line Length	PipeSize	Grnd/Rim Up	Pipe Slope	Inv ElevDn	Inv ElevUp	Capac Full	Veloc	HGLDn	HGLUp
	(ac)	(ac)	(C)			(min)	(min)	(in/hr)	(cfs)	(ft)	(in)	(ft)	(%)	(ft)	(ft)	(cfs)	(ft/s)	(ft)	(ft)
A1 TO A2	-	28.24	-	-	28.24	-	8.80	9.00	255.51	305.0	60	983.89	3.16	954.85	964.50	463.31	19.00	957.50	968.95
A2 TO A3	2.55	10.90	1.0	2.55	10.90	5.00	8.00	9.30	101.16	345.2	48	987.50	1.16	965.00	969.00	154.63	8.53	970.92	972.35
A3 TO A4	-	8.35	-	-	8.35	-	7.60	9.40	78.63	152.1	48	990.00	0.53	969.20	970.00	104.17	7.59	972.97	972.68
A4 TO A5	1.25	8.35	1.0	1.25	8.35	5.00	7.20	9.50	79.56	122.9	48	980.43	0.57	970.20	970.90	108.41	8.27	973.26	973.60
A5 TO A6	0.34	7.10	1.0	0.34	7.10	5.00	7.10	9.60	67.91	44.0	42	987.70	0.68	971.40	971.70	83.07	8.84	974.03	974.28
A6 TO A7	0.15	6.76	1.0	0.15	6.76	5.00	7.00	9.60	65.00	59.1	42	990.50	0.68	971.90	972.30	82.75	8.17	974.81	974.82
A7 TO A8	3.35	6.61	1.0	3.35	6.61	5.00	6.40	9.80	64.89	231.1	42	990.00	0.56	972.50	973.80	75.46	8.29	975.31	976.32
A8 TO A9	0.41	3.26	1.0	0.41	3.26	5.00	6.30	9.90	32.13	42.0	30	990.00	0.95	974.80	975.20	40.02	7.69	976.84	977.13
A9 TO A10	0.49	2.85	1.0	0.49	2.85	5.00	5.60	10.10	28.77	231.6	30	984.23	0.65	975.40	976.90	33.00	6.93	977.57	978.73
A10 TO A11	2.36	2.36	1.0	2.36	2.36	5.00	5.00	10.30	24.35	174.3	30	982.00	0.52	977.10	978.00	29.47	6.12	979.22	979.73
A2 TO B1	2.25	17.34	1.0	2.25	17.34	5.00	8.10	9.30	160.41	62.7	48	983.02	5.58	965.00	968.50	339.46	13.03	969.39	972.17
B1 TO B2	4.46	15.09	1.0	4.46	15.09	5.00	7.60	9.40	142.16	354.1	48	993.00	1.75	968.70	974.90	190.08	11.72	972.92	978.43
B2 TO B3	0.52	8.31	1.0	0.52	8.31	5.00	7.20	9.50	79.33	142.6	48	991.50	0.42	978.90	979.50	93.18	8.33	981.74	982.33
B3 TO B4	4.15	7.79	1.0	4.15	7.79	5.00	6.80	9.70	75.26	158.8	42	991.50	0.76	980.00	981.20	87.46	9.57	982.62	983.91
B4 TO B5	2.39	3.64	1.0	2.39	3.64	5.00	6.30	9.80	35.79	152.3	36	993.00	0.53	983.40	984.20	48.33	7.44	985.32	986.14
B5 TO B6	0.23	1.25	1.0	0.23	1.25	5.00	5.80	10.00	12.50	111.7	24	991.00	0.54	985.20	985.80	16.58	5.36	986.75	987.07
B6 TO B7	1.02	1.02	1.0	1.02	1.02	5.00	5.00	10.30	10.52	170.1	24	991.00	0.59	986.00	987.00	17.34	4.83	987.53	988.16
C1 TO C2	0.38	9.22	1.0	0.38	9.22	5.00	9.30	8.90	82.17	80.6	54	981.36	0.50	966.00	966.40	138.51	5.17	972.60	972.74
C2 TO C3	0.20	8.84	1.0	0.20	8.84	5.00	8.70	9.10	80.19	158.1	54	979.75	0.51	966.60	967.40	139.91	5.04	972.82	973.09
C3 TO C4	0.69	8.64	1.0	0.69	8.64	5.00	8.60	9.10	78.57	21.5	54	980.12	0.47	967.60	967.70	134.18	4.94	973.50	973.53
C4 TO C5	0.54	7.95	1.0	0.54	7.95	5.00	8.40	9.20	72.84	75.9	48	980.02	0.53	968.20	968.60	104.27	5.80	973.90	974.10
C5 TO C6	0.25	7.41	1.0	0.25	7.41	5.00	8.30	9.20	68.05	22.0	48	980.04	0.45	968.80	968.90	96.86	5.42	974.33	974.38
C6 TO C7	0.19	7.16	1.0	0.19	7.16	5.00	8.10	9.30	66.28	72.0	48	980.07	0.56	969.10	969.50	107.07	5.27	974.47	974.63
C7 TO C8	1.91	6.97	1.0	1.91	6.97	5.00	8.00	9.30	64.66	25.4	42	981.00	0.79	970.00	970.20	89.19	6.72	974.83	974.94
C8 TO C9	0.88	5.06	1.0	0.88	5.06	5.00	7.30	9.50	48.02	195.4	42	980.20	0.46	970.40	971.30	68.27	4.99	975.96	976.40
C9 TO C10	0.43	4.18	1.0	0.43	4.18	5.00	7.10	9.60	40.02	84.3	36	980.50	0.59	971.80	972.30	51.37	5.66	976.46	976.77
C10 TO C11	0.35	3.75	1.0	0.35	3.75	5.00	6.70	9.70	36.33	104.1	36	979.00	0.58	972.50	973.10	50.63	5.14	977.14	977.45
C11 TO C12	1.23	3.40	1.0	1.23	3.40	5.00	6.30	9.80	33.43	116.1	36	979.00	0.52	973.20	973.80	47.94	4.73	977.92	978.21
C12 TO C13	1.05	2.17	1.0	1.05	2.17	5.00	5.70	10.10	21.83	169.7	30	982.00	0.53	974.30	975.20	29.87	4.45	978.36	978.84
C13 TO C14	0.17	1.12	1.0	0.17	1.12	5.00	5.10	10.30	11.49	117.8	24	980.90	0.51	975.70	976.30	16.14	3.66	979.12	979.42
C14 TO C15	0.95	0.95	1.0	0.95	0.95	5.00	5.00	10.30	9.80	47.0	18	980.90	0.64	976.80	977.10	8.39	5.55	979.48	979.89
EX1 TO EX3	6.48	7.72	1.0	6.48	7.72	5.00	5.90	10.00	77.17	91.4	42	971.21	2.83	956.07	958.66	169.34	8.78	959.57	961.41
J1 TO J2	0.43	1.01	1.0	0.43	1.01	5.00	5.20	10.20	10.35	134.1	18	987.88	7.23	974.50	984.20	28.24	10.69	975.13	985.44
J1EX TO J2	0.23	1.24	1.0	0.23	1.24	5.00	5.60	10.10	12.53	124.0	18	978.60	2.74	963.70	967.10	17.39	9.13	964.64	968.43
J2 TO J3	0.58	0.58	1.0	0.58	0.58	5.00	5.00	10.30	5.98	36.7	18	990.00	0.82	984.40	984.70	9.49	4.26	985.85	985.64
B2 TO N1	1.26	2.32	1.0	1.26	2.32	5.00	6.30	9.80	22.81	170.0	30	985.30	0.53	976.40	977.30	29.84	4.65	980.37	980.90
N1 TO N2	1.06	1.06	1.0	1.06	1.06	5.00	5.00	10.30	10.94	275.0	24	985.30	0.55	977.80	979.30	16.70	3.48	981.10	981.74
R1 TO R2	1.03	1.75	1.0	1.03	1.75	5.00	5.40	10.20	17.80	33.7	24	990.00	0.89	981.70	982.00	21.35	7.15	983.14	983.52
R2 TO R3	0.72	0.72	1.0	0.72	0.72	5.00	5.00	10.30	7.43	97.0	18	990.00	0.72	982.50	983.20	8.92	4.90	984.00	984.25

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MASS GRADING & STORM SEWER IMPROVEMENTS
DRAINAGE AREA MAP- DESIGN TABLES STORM LINES A, B, C, & R

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DAW_CHART
SHEET C-11 | REV. 1

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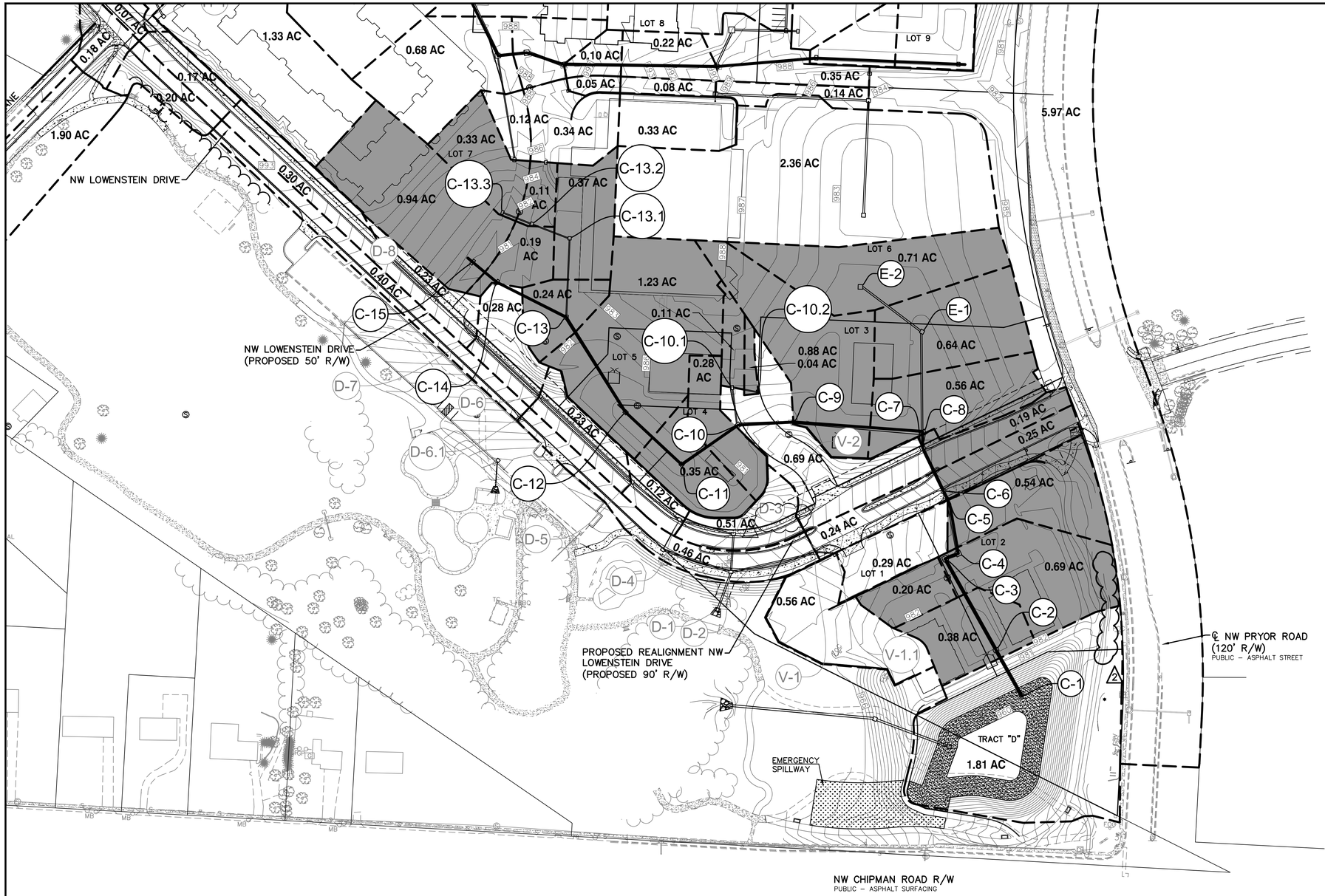

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

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

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LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
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	2

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Inlet Capacity Chart

for Neenah R-6673-O Double Grate Inlet

in Sumps

H (ft)		80% Q (cfs)	Flow Regime
0.1	1.4	1.1	Weir
0.2	4.0	3.2	Weir
0.3	7.3	5.9	Weir
0.4	11.3	9.0	Weir
0.5	13.0	10.4	Trans
0.6	15.6	12.5	Trans
0.7	19.7	15.8	Orifice
0.8	21.1	16.9	Orifice
0.9	22.4	17.9	Orifice
1	23.6	18.9	Orifice
1.1	24.7	19.8	Orifice
1.2	25.8	20.7	Orifice
1.3	26.9	21.5	Orifice
1.4	27.9	22.3	Orifice
1.5	28.9	23.1	Orifice
1.6	29.8	23.9	Orifice
1.7	30.8	24.6	Orifice
1.8	31.7	25.3	Orifice
1.9	32.5	26.0	Orifice
2	33.4	26.7	Orifice
2	33.4	26.7	Orifice
2.1	34.2	27.4	Orifice
2.2	35.0	28.0	Orifice

Calculated using Neenah Capacity Calculator

Perimeter - 13.5 feet. Open Area =4.9 sq ft

Inlet Capture Calculation

Structure	Bypasses To	Type	Slope	Inlet Area	cK (Runoff Coeff for 100 yr Storm)	Tc	Rainfall Intensity (100 year)	Q Inlet (cfs)	Q carry over (cfs)	Q total (cfs)	Qcap-tured (cfs)	Qby-pass (cfs)		Depth Relative to Lip of Curb
C13	- - -	Dbl Grate	Sump	0.20	1.00	5	10.3	2.1		2.1	2.1			0.10
C12	- - -	Dbl Grate	Sump	1.23	1.00	5	10.3	12.7		12.7	12.7			0.60
C11	- - -	Dbl Grate	Sump	0.35	1.00	5	10.3	3.6		3.6	3.6			0.20
C10	- - -	5 ft CG-1	Sump	0.28	1.00	5	10.3	2.9		2.9	2.9			-
C9	- - -	5 ft CG-1	Sump	0.88	1.00	5	10.3	9.1		9.1	9.1			-
C8	- - -	Dbl Grate	Sump	0.56	1.00	5	10.3	5.8		5.8	5.8			0.20
C4	- - -	Dbl Grate	Sump	0.69	1.00	5	10.3	7.1		7.1	7.1			0.30
C2	- - -	5 ft CG-1	Sump	0.38	1.00	5	10.3	3.9		3.9	3.9			-
C13.1	- - -	Dbl Grate	Sump	0.37	1.00	5	10.3	3.8		3.8	3.8			0.20
E2	- - -	Dbl Grate	Sump	0.71	1.00	5	10.3	7.3		7.3	7.3			0.30
E1	- - -	Dbl Grate	Sump	0.64	1.00	5	10.3	6.6		6.6	6.6			0.30
								-						
A7	A6	5 ft CG-1	4%	0.10	1.00	5	10.3	1.0	-	1.0	0.8	0.2		0.11
A6	- - -	5 ft CG-1	Sump	0.24	1.00	5	10.3	2.5	0.2	2.7	2.7			-
								-						
A7.1	M2	5 ft CG-1	5%	0.05	1.00	5	10.3	0.5	-	0.5	0.4	0.1		0.08
M2	C13.2	5 ft CG-1 **	4%	0.34	1.00	5	10.3	3.5	0.1	3.6	2.3	1.3		0.17
C13.2	C14	5 ft CG-1	2%	0.11	1.00	5	10.3	1.1	1.3	2.5	1.8	0.6		0.17
C14	- - -	5 ft CG-1	Sump	0.19	1.00	5	10.3	2.0	0.6	2.6	2.6	-		-
								-						
M1	C13.3	5 ft CG-1 **	4%	0.12	1.00	5	10.3	1.2	-	1.2	1.0	0.3		0.12
C13.3	C15	5 ft CG-1	2%	0.33	1.00	5	10.3	3.4	0.3	3.7	2.5	1.1		0.20
C15	- - -	5 ft CG-1	Sump	0.95	1.00	5	10.3	9.8	1.1	10.9	10.9			-
								-						
C7	V2	7 ft CG-1	3%	0.19	1.00	5	10.3	2.0	-	2.0	1.5	0.5		0.15
C10.2	V2	5 ft CG-1	5%	0.04	1.00	5	10.3	0.4	0.5	0.9	0.7	0.2		0.10
C10.1	V2	5 ft CG-1	3%	0.11	1.00	5	10.3	1.1	0.2	1.3	1.0	0.3		0.13
V2	D3	5 ft CG-1	3%	0.69	1.00	5	10.3	7.1	1.0	8.1	3.9	4.2		0.25
D3	D4	5 ft CG-1	3%	0.51	1.00	5	10.3	5.3	4.2	9.4	4.2	5.2		0.26
D4	- - -	5 ft CG-1	Sump	0.12	1.00	5	10.3	1.2	5.2	6.4	6.4			-
								-						
C6	V1	5 ft CG-1	3%	0.25	1.00	5	10.3	2.6	-	2.6	1.8	0.7		0.16
C5	V1	5 ft CG-1	4%	0.54	1.00	5	10.3	5.6		5.6	3.0	2.5		0.20
C3	V1	Dbl Grate	1%	0.20	1.00	5	10.3	2.1		2.1	1.6	0.5		0.18
V1.1	V1	5 ft CG-1	4%	0.56	1.00	5	10.3	5.8	-	5.8	3.1	2.7		0.21
V1	D2	5 ft CG-1	4%	0.53	1.00	5	10.3	5.5	6.4	11.9	4.2	7.7		0.27
D2	D4.1	5 ft CG-1	2%	0.46	1.00	5	10.3	4.7	7.7	12.5	5.3	7.1		0.31
D6.1	D4.1	5 ft CG-1	4%	0.40	1.00	5	10.3	4.1	-	4.1	2.5	1.6		0.18
D4.1	- - -	5 ft CG-1	Sump	0.30	1.00	5	10.3	3.1	8.7	11.8	11.8			-
								-						
A11	- - -	Dbl Grate	Sump	2.36	1.00	5	10.3	24.3		24.3	24.3			1.60
								-						-
A9		5 ft CG-1	3%	0.08	1.00	5	10.3	0.8	-	0.8	0.7	0.2		0.11
A10		5 ft CG-1	1%	0.14	1.00	5	10.3	1.4	0.2	1.4	1.1	0.3		0.16
								-						-
A8		5 ft CG-1	3%	0.22	1.00	5	10.3	2.3	-	2.3	1.6	0.6		0.15
A10.1	Ex-P1	5 ft CG-1	1%	0.35	1.00	5	10.3	3.6	0.6	3.6	2.6	1.0		0.23
								-						-
A5	- - -	5 ft CG-1	Sump	0.68	1.00	5	10.3	7.0		7.0	7.0			-
A4		Junction Box	N/a	-	1.00			-		-				
L4	- - -	5 ft CG-1	Sump	0.60	1.00	5	10.3	6.2		6.2	6.2			-
L3	- - -	5 ft CG-1	Sump	1.05	1.00	5	10.3	10.8		10.8	10.8			-
L2	A10.1	5 ft CG-1	3%	0.38	1.00	5	10.3	3.9		3.9	2.5	1.4		0.19
L1		Junction Box	N/a		1.00			-		-				
L2.1	- - -	5 ft CG-1	Sump	0.19	1.00	5	10.3	2.0		2.0	2.0			-
A9.1	- - -	5 ft CG-1	Sump	0.33	1.00	5	10.3	3.4		3.4	3.4			-
					1.00			-						
Y2	- - -	5 ft CG-1	Sump	0.72	1.00	5	10.3	7.4		7.4	7.4			-
Y1	- - -	5 ft CG-1	Sump	0.19	1.00	5	10.3	2.0		2.0	2.0			-
					1.00			-						
B7	- - -	Dbl Grate	Sump	1.02	1.00	5	10.3	10.5		10.5	10.5			0.50
B6	- - -	Dbl Grate	Sump	0.23	1.00	5	10.3	2.4		2.4	2.4			0.10
B5	Q1	5 ft CG-1	3%	-	1.00	5	10.3	-		-	-			-
B4	- - -	Dbl Grate	Sump	0.62	1.00	5	10.3	6.4		6.4	6.4			0.30
B3	- - -	Dbl Grate	Sump	0.47	1.00	5	10.3	4.8		4.8	4.8			0.20
B2	- - -	Junction Box	N/a	-	1.00	5	10.3							
B1	- - -	Dbl Grate	Sump	2.25	1.00	5	10.3	23.2		23.2	23.2			1.50
Q2	- - -	5 ft CG-1	Sump	0.88	1.00	5	10.3	9.1		9.1	9.1			-
Q1	- - -	5 ft CG-1	Sump	1.51	1.00	5	10.3	15.6		15.6	15.6			0.05
P2	- - -	5 ft CG-1	Sump	1.32	1.00	5	10.3	13.6		13.6	13.6			-
P1	- - -	Dbl Grate	Sump	1.24	1.00	5	10.3	12.8		12.8	12.8			0.60
P1.1	- - -	Dbl Grate	Sump	0.97	1.00	5	10.3	10.0		10.0	10.0			0.40
K3	- - -	Dbl Grate	Sump	1.73	1.00	5	10.3	17.8		17.8	17.8			0.80
K2	- - -	Dbl Grate	Sump	0.40	1.00	5	10.3	4.1		4.1	4.1			0.20
K1	- - -	Dbl Grate	Sump	0.44	1.00	5	10.3	4.5		4.5	4.5			0.20
								-						
N2	- - -	8 ft CG-1	Sump	1.06	1.00	5	10.3	10.9		10.9	10.9			-
N1	- - -	8 ft CG-1	Sump	1.26	1.00	5	10.3	13.0		13.0	13.0			-
								-						
R3	- - -	Dbl Grate	Sump	0.72	1.00	5	10.3	7.4		7.4	7.4			0.30
R2	- - -	Dbl Grate	Sump	1.03	1.00	5	10.3	10.6		10.6	10.6			0.50
J4	- - -	Dbl Grate	Sump	0.58	1.00	5	10.3	6.0		6.0	6.0			0.30
J3	J2	5 ft CG-1	1%	0.25	1.00	5	10.3	2.6		2.6	2.0	0.6		0.20
J2	J1(ex)	4 ft CG-1	1%	0.14	1.00	5	10.3	1.4	0.6	1.4	1.1	0.4		0.11
J1Ex	DS	5 ft CG-1	2%	0.51	1.00	5	10.3	5.3	1.8	5.3	3.3	2.0		0.23
J3.1	J2.1	5 ft CG-1	1%	0.18	1.00	5	10.3	1.9		1.9	1.3	0.6		0.12
J2.1	J1(ex)	5 ft CG-1	1%	0.09	1.00	5	10.3	0.9		0.9	0.7	0.2		0.09

				Overland Flow								System Flow					Node	Pipe Design																Structure Design	Hydraulic Grade Line (100-YR)	
KVE	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 (Area) x A x C x K	System Tc	System Rainfall Intensity	System Discharge	Node Condition	Pipe Material	Pipe Shape	Pipe Size	Manning's Coefficient	Upstream Invert	Downstream Invert	Length	Pipe Slope	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	Downstream	Upstream
	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	44.6		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		1.82		10.2	15.5																				

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0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
5-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR

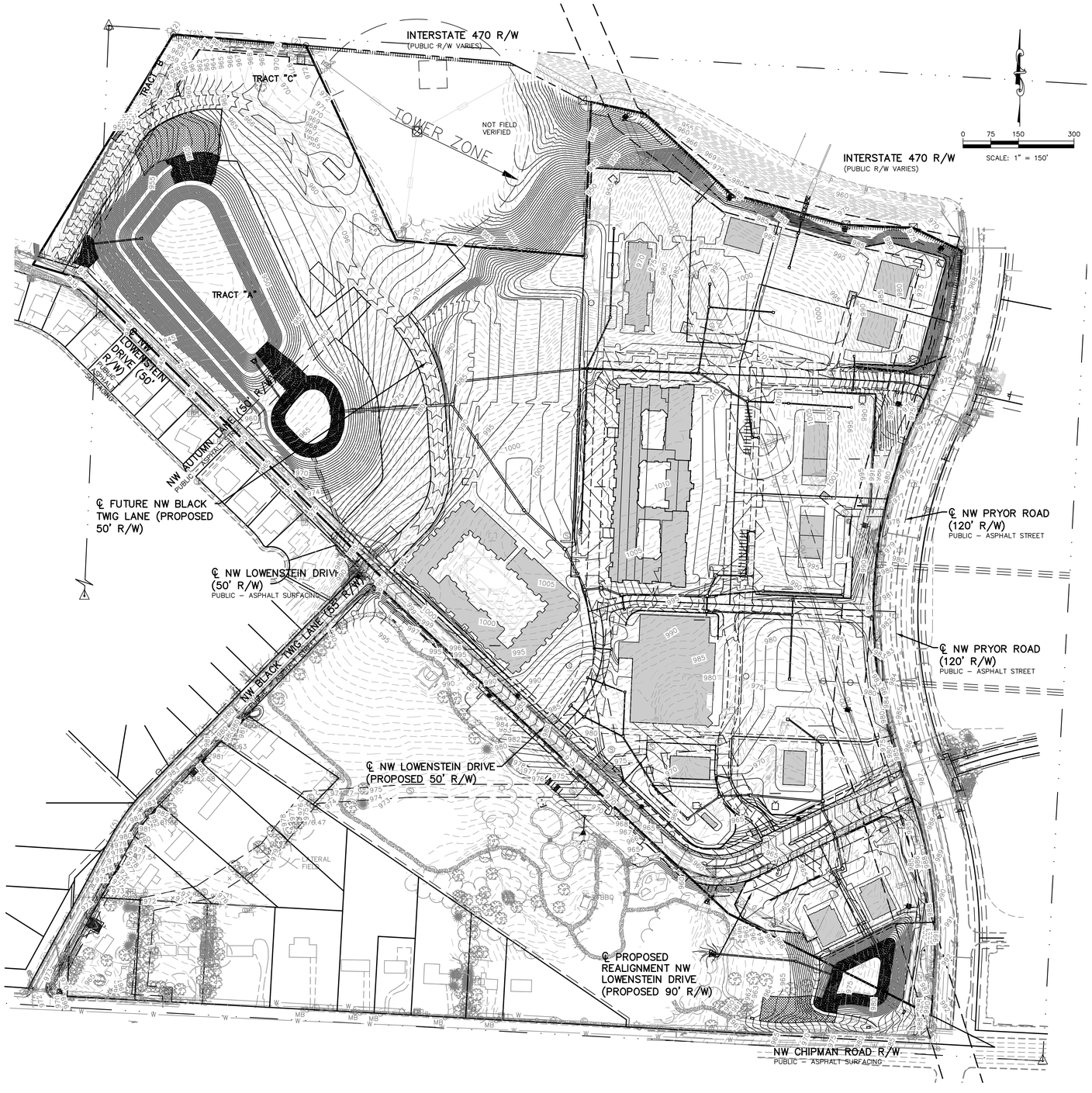
NWQ NW PRYOR RD & NW LOWENSTEIN DR

LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS

DRAINAGE AREA MAP-DESIGN TABLE-STORM LINE C

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



IF DISCREPANCIES EXIST BETWEEN THE GRADING NOTES BELOW AND THE RECOMMENDATIONS OUTLINED IN THE PROJECT GEOTECHNICAL REPORT, THE RECOMMENDATIONS OUTLINED IN THE GEOTECHNICAL REPORT SHALL GOVERN.

GRADING NOTES:

1. THE CONSTRUCTION AREA SHALL BE CLEARED, GRUBBED, AND STRIPPED OF TOPSOIL AND ORGANIC MATTER FROM ALL AREAS TO BE OCCUPIED BY BUILDING AND PAVING. TOPSOIL FOR REPLACEMENT ON SLOPES MAY BE STOCKPILED ON SITE. EXCESS TOPSOIL MAY BE WASTED IN FILL SLOPES PROVIDED THAT NO TOPSOIL WILL BE WASTED WITHIN 10 FEET OF THE EDGE OF THE BUILDING OR PARKING AREA. BURNING OF TIMBER WILL NOT BE PERMITTED UNLESS APPROVAL IS OBTAINED FROM GOVERNING OFFICIALS. STRIPPING EXISTING TOPSOIL AND ORGANIC MATTER SHALL BE TO A MINIMUM DEPTH OF 6 INCHES.

2. AREAS TO RECEIVE FILL SHALL BE SCARIFIED AND THE TOP 8-INCH DEPTH COMPACTED TO 95% STANDARD PROCTOR DENSITY. ANY UNSUITABLE AREAS SHALL BE UNDERCUT AND REPLACED WITH SUITABLE MATERIAL BEFORE ANY FILL MATERIAL CAN BE APPLIED.

3. OFF-SITE FILL MATERIAL SHALL HAVE A PLASTICITY INDEX OF 25 OR LESS, A LIQUID LIMIT OF 45 OR LESS AND CONTAIN NO ROCK LARGER THAN FOUR INCHES. OFF-SITE FILL MATERIAL SHALL BE APPROVED BY THE ENGINEER PRIOR TO BRINGING ON SITE.

4. EARTHWORK UNDER THE BUILDING SHALL COMPLY WITH THE PROJECT ARCHITECTURAL PLANS. OTHER FILL MATERIAL SHALL BE MADE IN LIFTS NOT TO EXCEED EIGHT INCHES DEPTH COMPACTED TO 95% STANDARD PROCTOR DENSITY. FILL MATERIAL MAY INCLUDE ROCK FROM ON-SITE EXCAVATION IF CAREFULLY PLACED SO THAT LARGE STONES ARE WELL DISTRIBUTED AND VOIDS ARE COMPLETELY FILLED WITH SMALLER STONES, EARTH, SAND OR GRAVEL TO FURNISH A SOLID EMBANKMENT. NO ROCK LARGER THAN THREE INCHES IN ANY DIMENSION NOR ANY SHALE SHALL BE PLACED IN THE TOP 12 INCHES OF EMBANKMENT.

5. AREAS THAT ARE TO BE CUT TO SUBGRADE LEVELS SHALL BE PROOF ROLLED WITH A MODERATELY HEAVY LOADED DUMP TRUCK OR SIMILAR APPROVED CONSTRUCTION EQUIPMENT TO DETECT UNSUITABLE SOIL CONDITIONS.

6. IN ALL AREAS OF EXCAVATION, IF UNSUITABLE SOIL CONDITIONS ARE ENCOUNTERED, A QUALIFIED GEOTECHNICAL ENGINEER SHALL RECOMMEND TO THE ENGINEER THE METHODS OF UNDERCUTTING AND REPLACEMENT OF PROPERLY COMPACTED, APPROVED FILL MATERIAL. ALL PROOFROLLING AND UNDERCUTTING SHOULD BE PERFORMED DURING A PERIOD OF DRY WEATHER.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONTROL OF DUST AND DIRT RISING AND SCATTERING IN THE AIR DURING CONSTRUCTION AND SHALL PROVIDE WATER SPRINKLING OR OTHER SUITABLE METHODS OF CONTROL. THE CONTRACTOR SHALL COMPLY WITH ALL GOVERNING REGULATIONS PERTAINING TO ENVIRONMENTAL PROTECTION.

8. ALL SLOPES ARE TO BE 3:1 OR FLATTER UNLESS OTHERWISE INDICATED.

9. ALL SLOPES EXCEEDING 3:1 SHALL BE PROTECTED BY RIP RAP, CONCRETE PAVING, OR OTHER METHODS INDICATED ON THESE PLANS, THAT WILL PREVENT EROSION AND PLACED SUCH THAT THE SURFACE IS FLUSH WITH SURROUNDING GROUND AND SHAPED TO CHANNEL WATER IN DIRECTIONS INDICATED.

10. ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH AND FOUR INCHES OF TOPSOIL APPLIED. IF ADEQUATE TOPSOIL IS NOT AVAILABLE ON-SITE, THE CONTRACTOR SHALL PROVIDE TOPSOIL, APPROVED BY THE OWNER, AS NEEDED. THE AREA SHALL THEN BE SEEDED, FERTILIZED, MULCHED, WATERED AND MAINTAINED UNTIL HARDY GRASS GROWTH IS ESTABLISHED IN ALL AREAS. ANY AREAS DISTURBED FOR ANY REASON SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER PRIOR TO FINAL ACCEPTANCE OF THE PROJECT.

11. CONTRACTOR SHALL USE SILT FENCE OTHER MEANS OF CONTROLLING EROSION ALONG THE EDGE OF THE PROPERTY OR OTHER BOTTOM OF SLOPE LOCATIONS.

12. CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS.

13. THE CONTRACTOR SHALL TAKE ALL PRECAUTIONS NECESSARY TO AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. THE CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR ANY DAMAGES TO THE ADJACENT PROPERTIES OCCURRING DURING THE CONSTRUCTION PHASES OF THIS PROJECT.

14. IT IS NOT THE DUTY OF THE ENGINEER OR THE OWNER TO REVIEW THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE AT ANY TIME DURING CONSTRUCTION.

15. PIPE LENGTHS ARE CENTER TO CENTER OF STRUCTURE OR TO END OF END SECTIONS.

16. CONTRACTOR TO PROVIDE WALL DETAILS AND PLANS SEALED BY A MISSOURI LICENSED ENGINEER. WALL DESIGNER TO VERIFY BEARING CAPACITY AND GLOBAL STABILITY FOR WALL CALCULATIONS.

17. HANDICAP STALLS SHALL MEET ADA REQUIREMENTS AND SHALL NOT EXCEED 2% SLOPE IN ANY DIRECTION AT THE BUILDING ENTRY AND ACCESSIBLE PARKING STALLS. SLOPES EXCEEDING 2.0% WILL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

DATUM BENCHMARK:
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BENCHMARKS:
BM #1: CHISELED "SQUARE" ON TOP OF CURB POINT OF INTERSECTION OF WEST PARK PARKING LOT AT EAST DRIVE ENTRANCE. ELEV=984.97

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=970.98

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
OVERALL GRADING PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_GP
SHEET C-14 | REV 2

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PROP. 38' SANITARY ESMT
BUILDING FF=986.0
PROPOSED RETAINING WALL "C"
TW=982.0 GR=982.0
PROP. 20' UTILITY ESMT
PROP. 15' UTILITY ESMT
LOT 4
511+00
512+00
513+00
514+00
515+00
515+43
520.5 LF
TW=980.0 GR=980.0
FUTURE BUILDING FF=981.5
℄ PROPOSED REALIGNMENT NW LOWENSTEIN DRIVE (PROPOSED 90' R/W)
PROP. 38' SANITARY ESMT
BUILDING FF=983.0
TW=981.0 GR=981.0
180.4 LF PROPOSED RETAINING WALL "D"
520+00
520+78
522+02
522+90
PROP. 22' SANITARY ESMT
TW=982.0 GR=978.0
521+80
PROPOSED 13' UTILITY ESMT
30' BLDG SETBACK
UTILITY VAULT
STOP
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
TW=981.5 GR=981.5
TW=985.0 GR=980.0
545+00
545+54
PROP. 40' BUILDING SETBACK, SIDEWALK ESMT & UTILITY ESMT
545+08
PROPOSED RETAINING WALL "H"
102.8 LF
TW=986.0 GR=986.0
30' BLDG SETBACK & SIDEWALK ESMT
CONCRETE SIDEWALK
LOT 2
PROP. SIDEWALK ESMT
JUNCTION BOX (CONCRETE)
RIM=989.93
FL IN(S)15"RCP=981.20
FL OUT(NW)15"RCP=981.08
PROP. 22' SANITARY ESMT
PROTECT KCP&L POWER POLE BASES, COORDINATE WITH KCP&L
FUTURE BUILDING FF=982.5
PROP. SIDEWALK ESMT
PROP. 20' UTILITY ESMT
℄ NW PRYOR ROAD (120' R/W)
PUBLIC – ASPHALT STREET
UTILITY VAULT
ONE WAY
PROP. 100' KCP&L ESMT
PROP. 16' SIDEWALK ESMT
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
PROP. UTILITY ESMT
GAS SUBSTATION
RETAINING WALL
MISSOURI GAS ENERGY EASEMENT DOC 2002I0022043
GRATE INLET RIM=964.43 FL=962.93
FL 961.24 PVC
PLAYGROUND RULES
TOBACCO FREE
PROP. 20' UTILITY ESMT
PROP. 30' BUILDING SETBACK
525+00
526+00
TW=973.0 GR=972.0
PROPOSED RETAINING WALL "F"
526+65
TW=977.0 TOE=977.0
TW=980.0 TOE=976.0
536+00
LOT 1
148.9 LF
TW=978.00 TOE=977.0
TW=976.0 GR=969.0
WOOD FOOTBRIDGE
TW=977.0 GR=961.5
PROPOSED RETAINING WALL "E"
417.0 LF
528+00
529+41
TW=978.0 GR=965.0
PROP. 16' SIDEWALK ESMT
TW=980.0 GR=973.0
TW=981.0 GR=969.0
PROP. 15' UTILITY ESMT
TRACT "D"
RIGHT LANE ENDS
SPEED LIMIT 35
CURB INLET RIM=954.80
RETAINING WALL W/HANDRAIL ON SOUTH SIDE
CURB INLET RIM=973.67
RIGHT LANE MERGE AHEAD
LEE'S SUMMIT PARKS AND RECREATION LOWENSTEIN PARK
CCC
METAL UTILITY POLE
4.5' TALL ELECTRIC BOX
DIVIDED ROAD AHEAD
CITY OF LEE'S SUMMIT "ADDIE J. DAVIS" WYATT FAMILY
UTILITY VAULT MARKED STATE TRAFFIC SIGNAL
NW CHIPMAN ROAD R/W
PUBLIC – ASPHALT SURFACING

0 20 40 80
SCALE: 1" = 40'

SHEET INDEX
NTS
SHT C-18
SHT C-21
SHT C-19
SHT C-17
SHT C-16
SHT C-20
SHT C-15

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")
TURF REINFORCING MAT 2

NOTES:
24B MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

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BENCHMARKS:
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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=970.98

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-3-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
GRADING PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_GP
SHEET C-15 | REV 2

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SCALE: 1" = 40'

SHEET INDEX
NTS

SHT C-18
SHT C-21
SHT C-17
SHT C-19
SHT C-16
SHT C-20
SHT C-15

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

PROPOSED RETAINING WALL "K"

PROP. 30' BLDG SETBACK, SIDEWALK & UTILITY ESMT

PROP. 30' BUILDING SETBACK, SIDEWALK ESMT & UTILITY ESMT

PROPOSED RETAINING WALL "J"

PROPOSED RETAINING WALL "B"

PROPOSED RETAINING WALL "C"

PROPOSED RETAINING WALL "D"

PROPOSED RETAINING WALL "F"

VERIFY FINAL GRADING AND LAYOUT REQUIREMENTS WITH LOT 8 ENGINEER PRIOR TO CONSTRUCTION

VERIFY FINAL GRADING AND LAYOUT REQUIREMENTS WITH LOT 6 ENGINEER PRIOR TO CONSTRUCTION

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

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

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

LOT 3 LOT 4 LOT 5 LOT 6 LOT 7 LOT 8 LOT 9

FUTURE BUILDING FF=990.0

FUTURE BUILDING FF=988.00

FUTURE BUILDING FF=986.0

FUTURE BUILDING FF=983.0

FUTURE BUILDING FF=981.5

PROP. 15' UTILITY ESMT

PROP. 18' UTILITY ESMT

PROP. 20' UTILITY ESMT

PROP. 22' SANITARY ESMT

PROP. 25' UTILITY ESMT

PROP. 35' UTILITY ESMT

PROP. 38' SANITARY ESMT

PROP. 13' UTILITY ESMT

PROP. PUBLIC COMMON AREA ESMT

PROP. 15' PRIVATE WATER LINE ESMT

PROP. 35' SANITARY ESMT

100' ELECTRIC EASEMENT DOC. NO. I342200 BK I864, PG 244

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

7.5' ELECTRIC LINE EASEMENT DOC. NO. I338992 BK I-858, PG 2159

24B 369.2 LF

24B 339.0 LF

24B 180.4 LF

24B 520.5 LF

TW=989.0 GR=989.0

TW=991.0 GR=988.0

TW=991.0 GR=987.0

TW=991.0 GR=985.0

TW=988.0 GR=988.0

TW=988.0 GR=969.0

TW=987.5 GR=987.5

TW=982.0 GR=982.0

TW=981.0 GR=981.0

TW=980.0 GR=980.0

TW=982.0 GR=978.0

TW=981.5 GR=981.5

TW=980.0 GR=980.0

TW=973.0 GR=972.0

SANITARY MANHOLE TOP=980.28 FL OUT(W) 8"PVC=972.1

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

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

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

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

JUNCTION BOX (CONCRETE) TOP=986.66 FL IN(E)30"RCP=969.44 FL IN(N)24"RCP=969.33 FL OUT(S)30"RCP=969.33

CURB INLET (CONCRETE) RIM=987.57 FL IN(E)30"HDPE=970.57 FL IN(S)15"RCP=971.07 FL OUT(W)30"RCP=970.98

GRATE INLET RIM=964.43 FL=962.93

361.24 PVC

PLAYGROUND RULES

TOBACCO

TRAFFIC SIGNAL VAULT

STREET LIGHTING VAULT

UTILITY VAULT ON CONC. PAD

ELECTRIC BOX ON CONCRETE

UTILITY VAULT

STOP

ONE WAY

60' R/W

50'

90'

PROP. 40' BUILDING SETBACK, SIDEWALK

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
- NOTES:
- 24B — MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER 021726
REGISTERED PROFESSIONAL ENGINEER
7-2-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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GRADING PLAN

PROJ. NO. A14_7067-1

DESIGNER	DRAWN BY
LDO	JT

CFN 7067-1G_GP

SHEET	REV
C-16	2

LOT 14

LOT 11

LOT 10

LOT 9

LOT 8

LOT 7

PROP. UTILITY ESMT

PROP. 30' SANITARY ESMT

PROP. 20' SANITARY ESMT

PROP. 20' UTILITY ESMT

PROP. 30' SANITARY ESMT

PROP. 15' UTILITY ESMT

PROP. 15' PRIVATE WATER LINE ESMT

PROP. 32' SANITARY ESMT

PROP. PUBLIC COMMON AREA ESMT

PROP. 32' UTILITY ESMT

PROP. 20' PRIVATE WATER LINE ESMT

PROP. 18' UTILITY ESMT

PROP. 30' BUILDING SETBACK, SIDEWALK ESMT & UTILITY ESMT

PROP. 30' BUILDING SETBACK & UTILITY ESMT

PROP. 30' BLDG SETBACK, SIDEWALK & UTILITY ESMT

FUTURE BUILDING FF=992.0

FUTURE RETAIL FF=995.0

FUTURE APT FF=999.0

FUTURE BASEMENT GARAGE FF=982.0

FUTURE BUILDING FF=993.0

FUTURE BUILDING FF=990.0

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

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

VERIFY FINAL GRADING AND LAYOUT REQUIREMENTS WITH LOT 8 ENGINEER PRIOR TO CONSTRUCTION

PROPOSED RETAINING WALL "Q"

PROPOSED RETAINING WALL "L"

PROPOSED RETAINING WALL "K"

PROPOSED RETAINING WALL "J"

PROPOSED RETAINING WALL "M"

TW=990.5 GR=990.5

TW=991.0 GR=987.0

TW=991.0 GR=987.5

TW=992.0 GR=987.5

TW=992.0 GR=991.0

TW=992.0 GR=992.0

TW=991.0 GR=991.0

TW=989.0 GR=989.0

TW=991.0 GR=988.0

TW=991.0 GR=987.0

TW=991.0 GR=985.0

TW=988.0 GR=988.0

WALL TOP=992.0 GR=987.0

WALL TOP=992.0 GR=991.0

425.9 LF 24B

484.2 LF 24B

369.2 LF 24B

339.0 LF 24B

SANITARY MANHOLE TOP=975.97 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

SANITARY MANHOLE TOP=980.28 FL OUT(W) 8"PVC=972.

SANITARY MANHOLE TOP=972.34 FL IN(S) 8"PVC=956.75 FL OUT(E) 8"PVC=964.66

SANITARY MANHOLE TOP=971.87 FL IN(W) 8"PVC=953.92 FL IN(E) 12"PVC=952.92 FL OUT(N) 12"PVC=951.2

JUNCTION BOX (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

JUNCTION BOX (CONCRETE) TOP=978.45 FL IN(W) 36"RCP=965.03 FL OUT(SE) 36"RCP=964.44

JUNCTION BOX (CONCRETE) TOP=971.21 FL IN(SW) 42"RCP=958.86 FL OUT(SE) 42"RCP=958.66

JUNCTION BOX (CONCRETE) TOP=971.22 FL IN(W) 42"RCP=956.07 FL OUT(E) 42"RCP=954.

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

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

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

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

TRAFFIC SIGNAL MANHOLE

TRAFFIC SIGNAL VAULT

DIVIDED ROADWAY AHEAD

NW SUMMIT WOODS XING

560+00 561+00 562+00 563+00 564+00 565+08 565+00 570+00 571+00 501+00 502+00 503+00 504+00 504+46 550+00 551+00 552+00 553+00 553+91 601+00 602+00 603+00 603+62

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

NOTES:

24B MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)

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=984.97)

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=970.98)

SHEET INDEX

SHT C-15 SHT C-16 SHT C-17 SHT C-18 SHT C-19 SHT C-20 SHT C-21

NTS

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

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

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
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0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-27126
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR

NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
GRADING PLAN

PROJ. NO.	A14_7067-1	
DESIGNER	LDO	DRAWN BY JT
CFN	7067-1G_GP	
SHEET	C-17	REV 2

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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

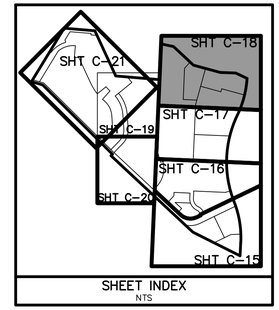
0 20 40 80

SCALE: 1" = 40'

NOTES:

24B MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)

SHEET INDEX
NTS



PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

UTILITY VAULT MARKED STATE TRAFFIC VAULT

RIPRAP

FL=957.78 36" RCP

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

PROPOSED RETAINING WALL "P" WALL TOP=992.0 GR=988.0

582+00

583+00

WALL TOP=992.8 GR=965.0

24B 418.9 LF

584+08

584+42

WALL TOP=992.0 GR=991.0

580+08

581+00

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

UTILITY VAULT MARKED STATE TRAFFIC VAULT

FL=952.12

36" RCP

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

FL=954.45

FOOD

BLUE PARKWAY STRAIGHT/ WRONG WAY

UTILITY VAULT MARKED STATE TRAFFIC VAULT

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

WALL TOP=992.0 GR=991.0

5' FENCE

577+00

577+90

576+00

575+00

574+00

573+00

572+06

571+00

570+00

FUTURE BUILDING FF=992.0

PROP. 30' BUILDING SETBACK & UTILITY ESMT

RELOCATION OF OVERHEAD POWER AND UTILITY POLES BY OTHERS

FUTURE BUILDING FF=992.0

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

LOT 12

LOT 13

LOT 14

LOT 11

PROP. UTILITY ESMT

PROP. 30' SANITARY ESMT

PROP. 20' SANITARY ESMT

PROP. 20' UTILITY ESMT

PROP. 30' SANITARY ESMT

PROP. 15' UTILITY ESMT

PROP. UTILITY ESMT

TW=990.5 GR=990.5

504+46

565+08

766.6 LF 24B

PROPOSED RETAINING WALL "N"

PROP. 30' BUILDING SETBACK, SIDEWALK, ESMT & UTILITY ESMT

FUTURE BUILDING FF=992.0

WALL TOP=992.0 GR=987.0

WALL TOP=992.0 GR=991.0

WALL TOP=992.0 GR=980.0

TRAFFIC SIGNAL MANHOLE

WEST I-470 LEFT 2 LANES

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

ELECTRIC BOX MARKED MODOT SIGNAL CONTROL

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

3.5" DIA MANHOLE MARKED AT&T

SPEED LIMIT 35

CITY MAINTENANCE BEGINS

JUNCTION BOX (CONCRETE) TOP=971.21 FL IN(SW) 42"RCP=958.86 FL OUT(SE) 42"RCP=958.66

TRAFFIC SIGNAL MANHOLE

TRAFFIC SIGNAL VAULT

TRAFFIC SIGNAL VAULT

JUNCTION BOX (CONCRETE) TOP=971.22 FL IN(W) 42"RCP=956.07 FL OUT(E) 42"RCP=954.77

SANITARY MANHOLE TOP=972.21 FL IN(S) 8"PVC=954.75 FL OUT(E) 8"PVC=954.66

DIVIDE ROAD AHEA

DATUM BENCHMARK:
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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR

NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
GRADING PLAN

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_GP
SHEET	C-18
REV	2

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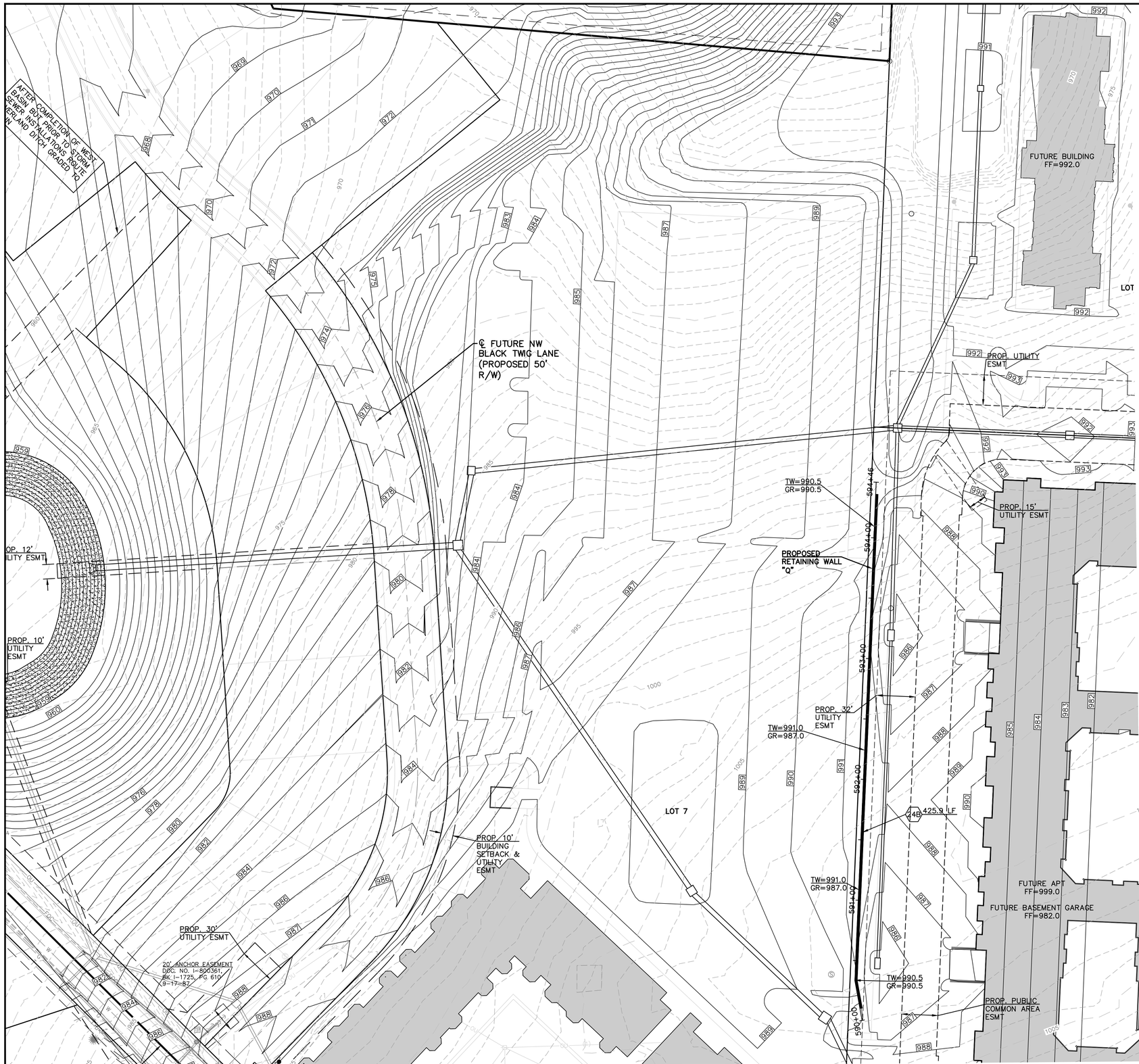


0 20 40 80

SCALE: 1" = 40'

LEGEND (PROPOSED)

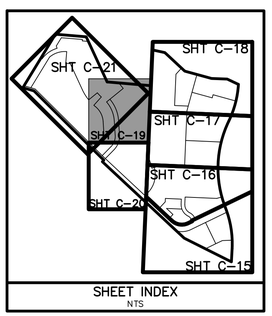
TW=983.6 TOP OF RETAINING WALL
GR=983.1 GROUND ELEVATION @ WALL

FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

NOTES:

24B MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)



SHEET INDEX
NTS

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

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NUMBER E-21726
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7-3-19

LEON D. OSBOURN
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MO # 021726

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PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_GP
SHEET C-19 | REV 2

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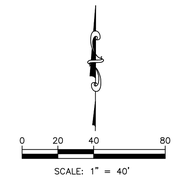

LEGEND (PROPOSED)

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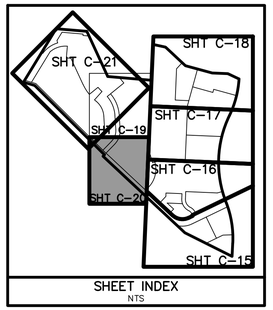
FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

NOTES:

24B MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)



SHEET INDEX
NTS

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

LEON D. OSBOURN
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MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
GRADING PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_GP
SHEET C-20 | REV 2

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NOTES:

24B MODULAR BLOCK RETAINING WALL (LINEAR FOOT NOTED)

LEGEND (PROPOSED)

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FLOW DIRECTION

955 FINISHED 1' CONTOUR INTERVALS, TOP OF PAVEMENT

ROCK RIPRAP (D_{50}=18")

TURF REINFORCING MAT (2)

0 20 40 80

SCALE: 1" = 40'

PUBLIC WATER, SANITARY SEWER AND STREET IMPROVEMENTS ARE BY SEPARATE PLANS

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SHT C-17
SHT C-16
SHT C-20
SHT C-15

INSPECTION EASEMENT DOC. NO. 2007E0043038 RECORDED: 6-28-2007

TRACT "C"

MAINTAIN POSITIVE DRAINAGE, OVERLAND DITCH

TRACT "B"

PROP. 10' UTILITY ESMT

PROP. 12' UTILITY ESMT

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

℄ FUTURE NW BLACK TWIG LANE (PROPOSED 50' R/W)

TRACT "A"

PROP. 30' UTILITY ESMT

PROP. 12' UTILITY ESMT

PROP. 10' UTILITY ESMT

10' ELECTRIC LINE EASEMENT DOC. NO. 8808A1 PG 816 RECORDED: 3-17-1967

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

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MASS GRADING & STORM SEWER IMPROVEMENTS
GRADING PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_GP	
SHEET	REV
C-21	2

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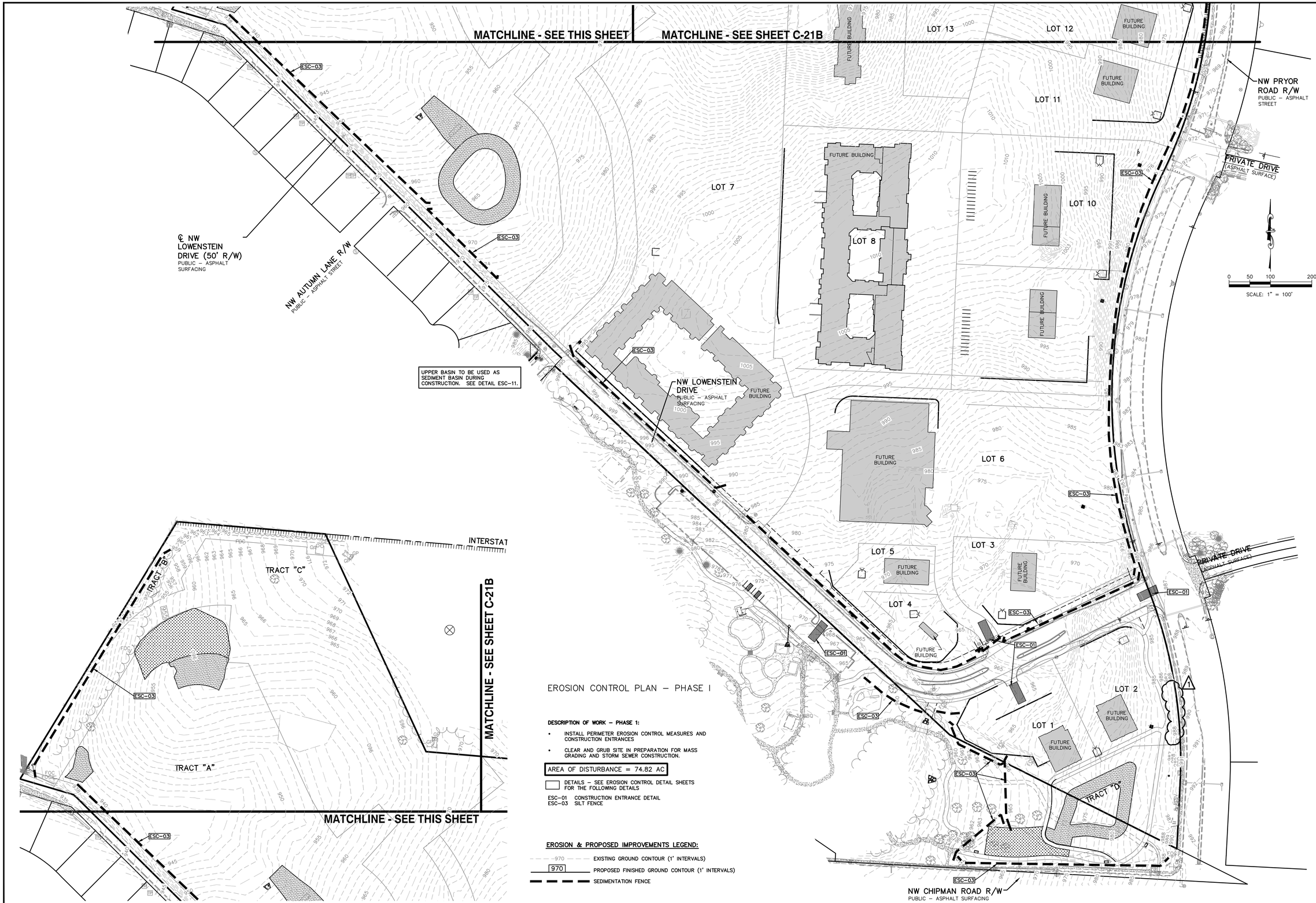

EROSION CONTROL PLAN – PHASE I

DESCRIPTION OF WORK – PHASE 1:

- INSTALL PERIMETER EROSION CONTROL MEASURES AND CONSTRUCTION ENTRANCES
- CLEAR AND GRUB SITE IN PREPARATION FOR MASS GRADING AND STORM SEWER CONSTRUCTION.

AREA OF DISTURBANCE = 74.82 AC

DETAILS – SEE EROSION CONTROL DETAIL SHEETS FOR THE FOLLOWING DETAILS

ESC-01 CONSTRUCTION ENTRANCE DETAIL
ESC-03 SILT FENCE

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
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EROSION CONTROL PLAN - PHASE 1

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CFN	7067-1G_ECP1	
SHEET	C-21A	REV 1

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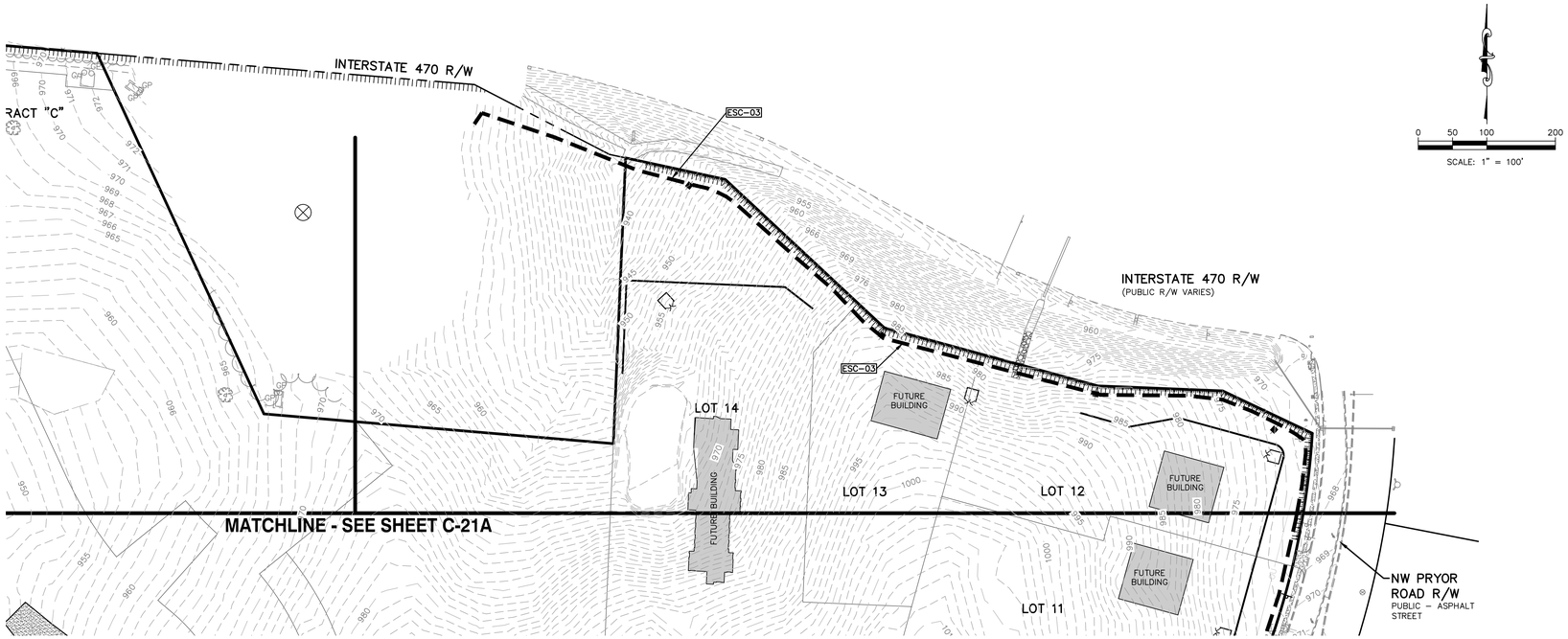

GENERAL NOTES:

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

ESC-01 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

ADDED SHEET 0

REV	DATE	DESCRIPTION	DSN	DWN	CHK
0	5-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
5-16-19
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 BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL PLAN - PHASE 1

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_ECP1
SHEET C-21B | REV 0

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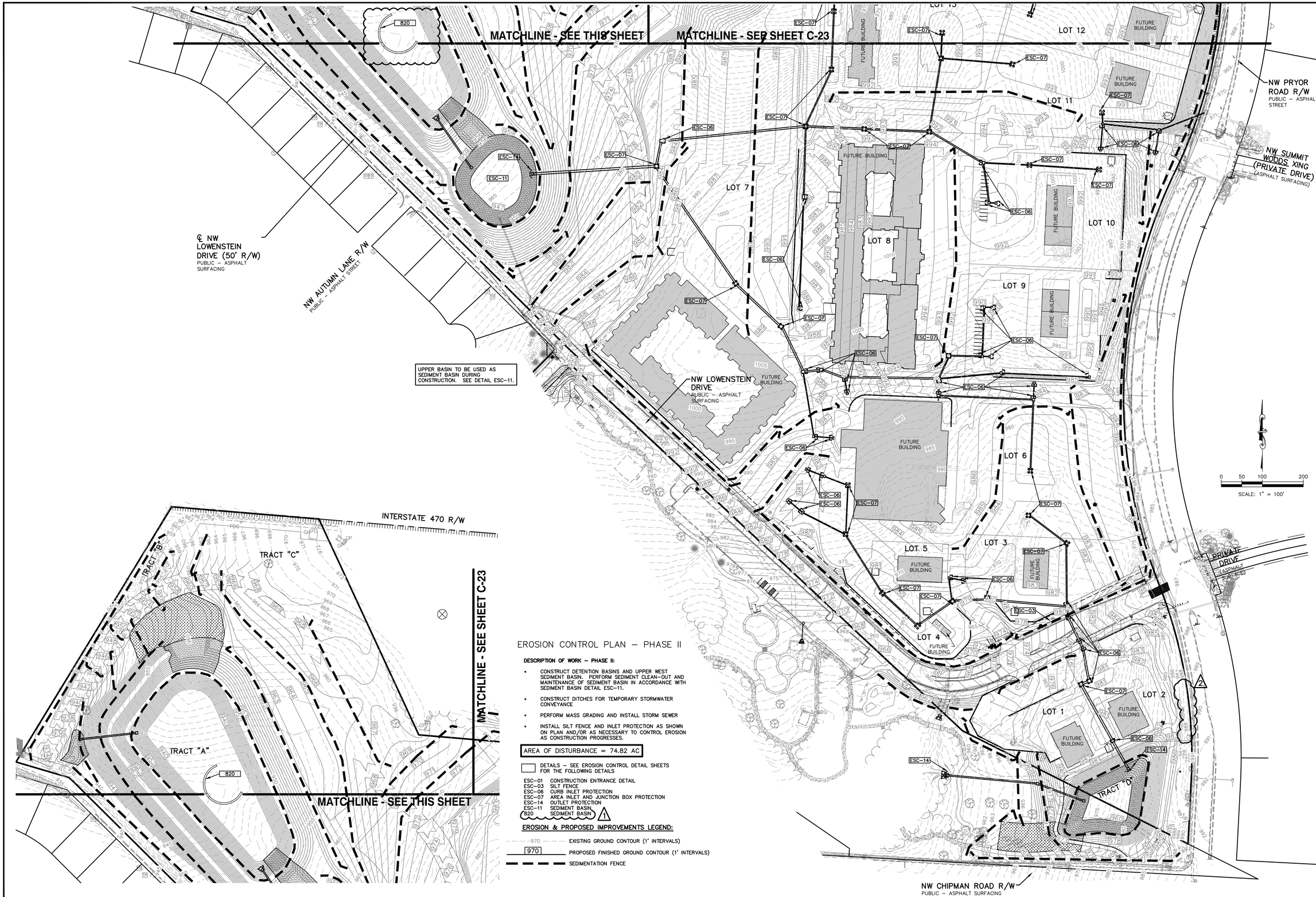

EROSION CONTROL PLAN – PHASE II

DESCRIPTION OF WORK – PHASE II:

- CONSTRUCT DETENTION BASINS AND UPPER WEST SEDIMENT BASIN. PERFORM SEDIMENT CLEAN-OUT AND MAINTENANCE OF SEDIMENT BASIN IN ACCORDANCE WITH SEDIMENT BASIN DETAIL ESC-11.
- CONSTRUCT DITCHES FOR TEMPORARY STORMWATER CONVEYANCE
- PERFORM MASS GRADING AND INSTALL STORM SEWER
- INSTALL SILT FENCE AND INLET PROTECTION AS SHOWN ON PLAN AND/OR AS NECESSARY TO CONTROL EROSION AS CONSTRUCTION PROGRESSES.

AREA OF DISTURBANCE = 74.82 AC

DETAILS – SEE EROSION CONTROL DETAIL SHEETS FOR THE FOLLOWING DETAILS

ESC-01 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
820 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
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-15-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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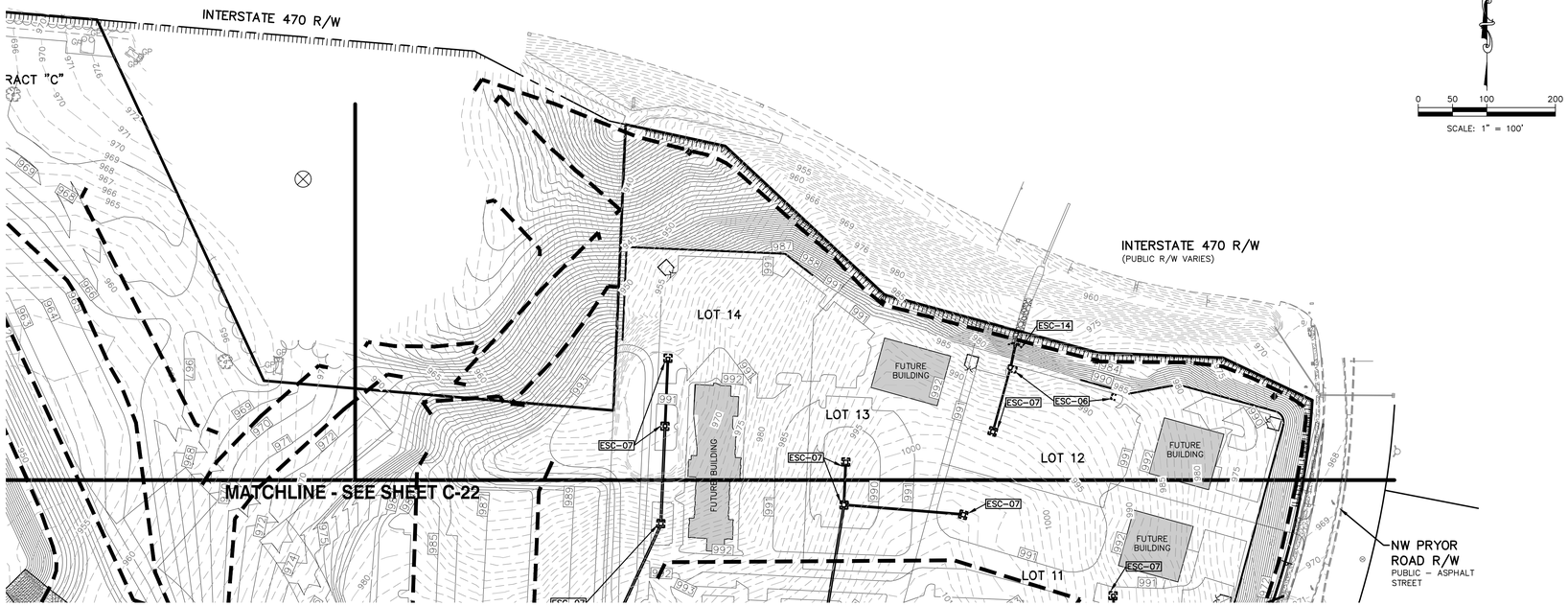
STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL PLAN - PHASE 2

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_ECP2
SHEET	C-22
REV	2

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.



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.

1

EROSION CONTROL PLAN – PHASE II

DESCRIPTION OF WORK – PHASE II:

- CONSTRUCT DETENTION BASINS AND UPPER WEST SEDIMENT BASIN. PERFORM SEDIMENT CLEAN-OUT AND MAINTENANCE OF SEDIMENT BASIN IN ACCORDANCE WITH SEDIMENT BASIN DETAIL ESC-11.
- CONSTRUCT DITCHES FOR TEMPORARY STORMWATER CONVEYANCE
- PERFORM MASS GRADING AND INSTALL STORM SEWER
- INSTALL SILT FENCE AND INLET PROTECTION AS SHOWN ON PLAN AND/OR AS NECESSARY TO CONTROL EROSION AS CONSTRUCTION PROGRESSES.

AREA OF DISTURBANCE = 74.82 AC

DETAILS – SEE EROSION CONTROL DETAIL SHEETS FOR THE FOLLOWING DETAILS

1 ESC-01 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
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
1-25-19
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 BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

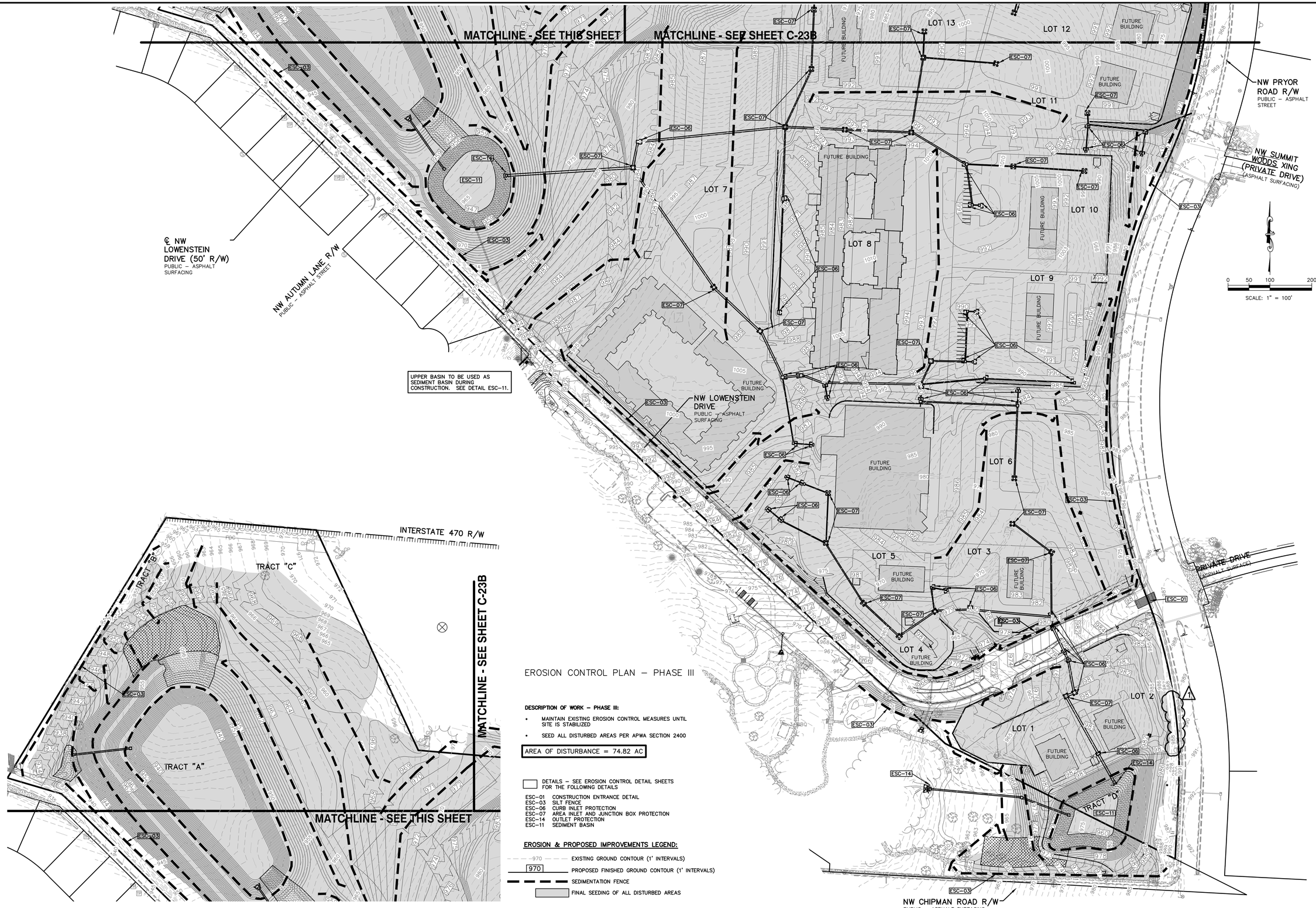
STREETS OF WEST PRYOR

NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL PLAN - PHASE 2

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_ECP2
SHEET	C-23
REV	1

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.



EROSION CONTROL PLAN – PHASE III

DESCRIPTION OF WORK – PHASE III:

- MAINTAIN EXISTING EROSION CONTROL MEASURES UNTIL SITE IS STABILIZED
- SEED ALL DISTURBED AREAS PER APWA SECTION 2400

AREA OF DISTURBANCE = 74.82 AC

DETAILS – SEE EROSION CONTROL DETAIL SHEETS FOR THE FOLLOWING DETAILS

ESC-01	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
- FINAL SEEDING OF ALL DISTURBED AREAS

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
1	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	5-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL PLAN - PHASE 3

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_ECP3
SHEET	C-23A
REV	1

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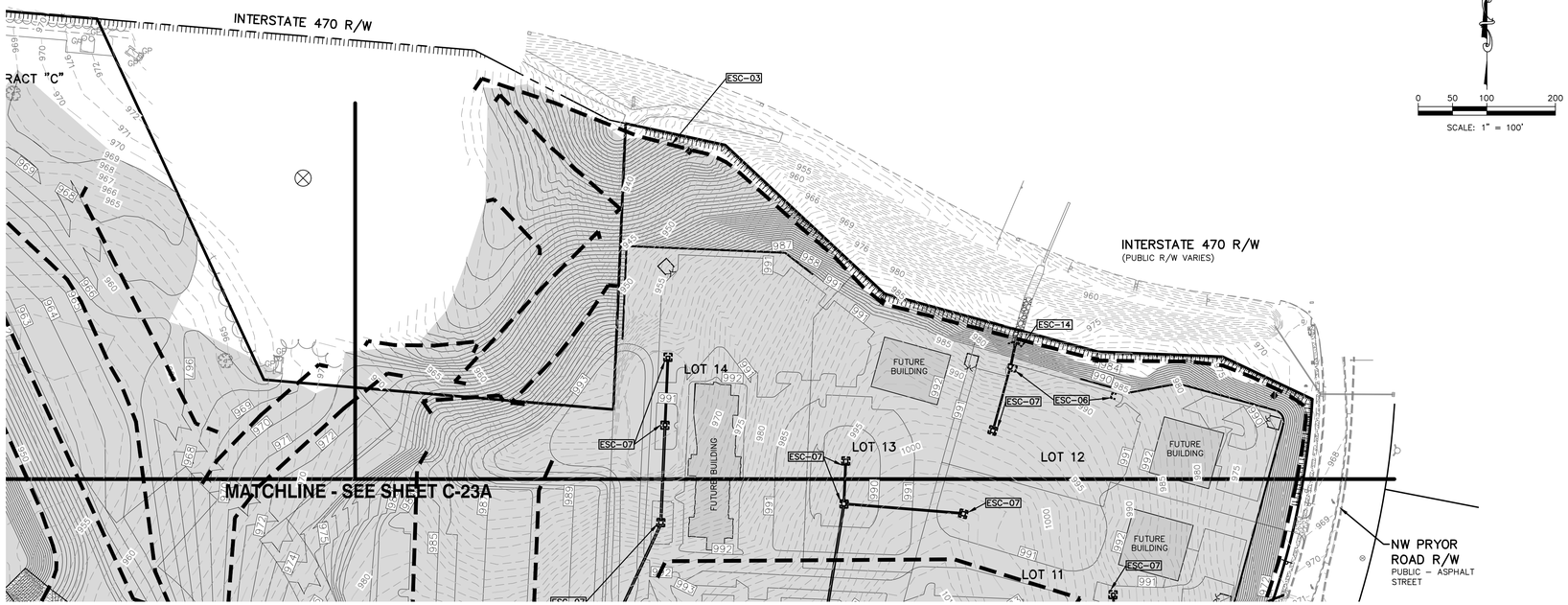

GENERAL NOTES:

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.
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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.

EROSION CONTROL PLAN – PHASE III

DESCRIPTION OF WORK – PHASE III:

- MAINTAIN EXISTING EROSION CONTROL MEASURES UNTIL SITE IS STABILIZED
- SEED ALL DISTURBED AREAS PER APWA SECTION 2400

AREA OF DISTURBANCE = 74.82 AC

DETAILS – SEE EROSION CONTROL DETAIL SHEETS FOR THE FOLLOWING DETAILS

ESC-01 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
FINAL SEEDING OF ALL DISTURBED AREAS

0 ADDED SHEET

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
			LDO		LDO
				JT	
0	5-16-19	INITIAL ISSUE	LDO		

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
5/16/19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL PLAN - PHASE 3

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_ECP3
SHEET C-23B | REV 0

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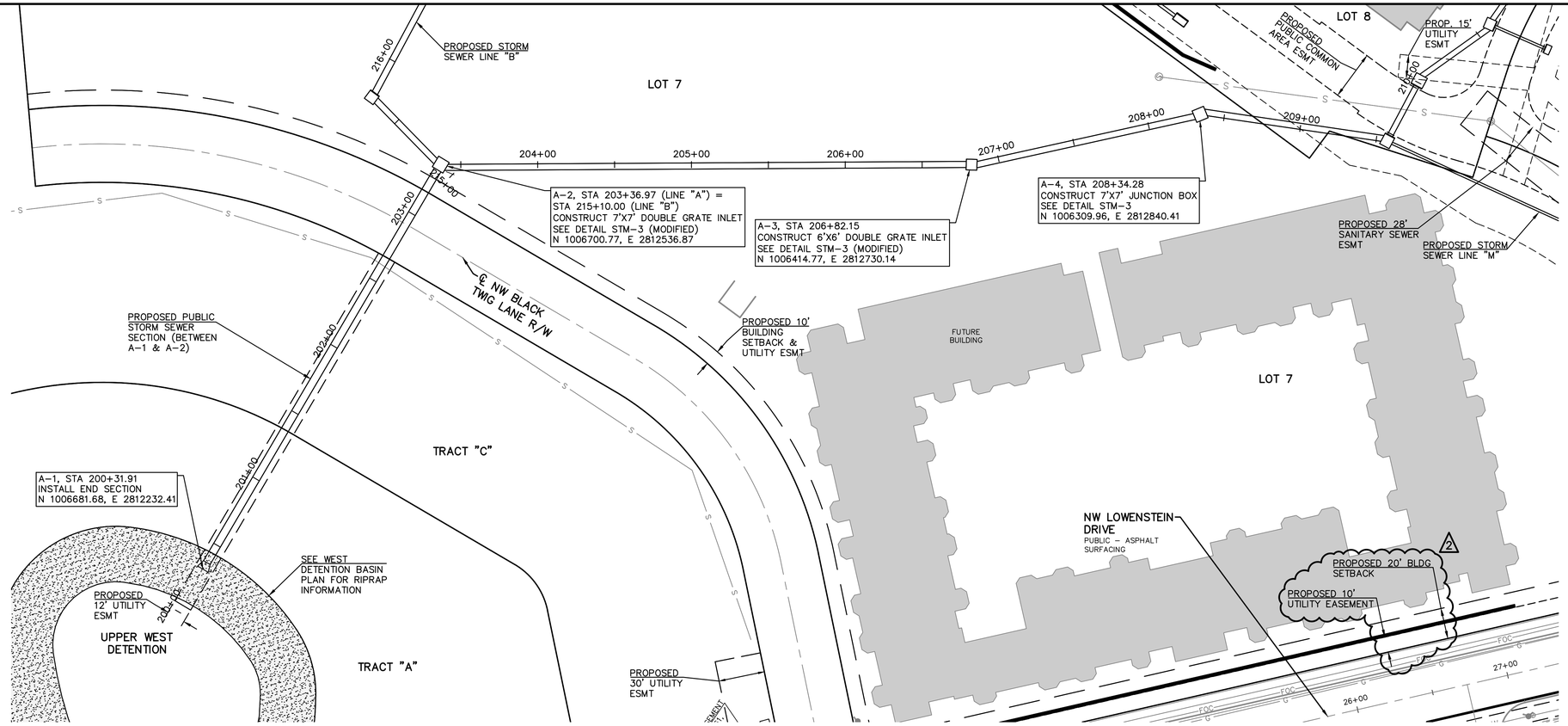

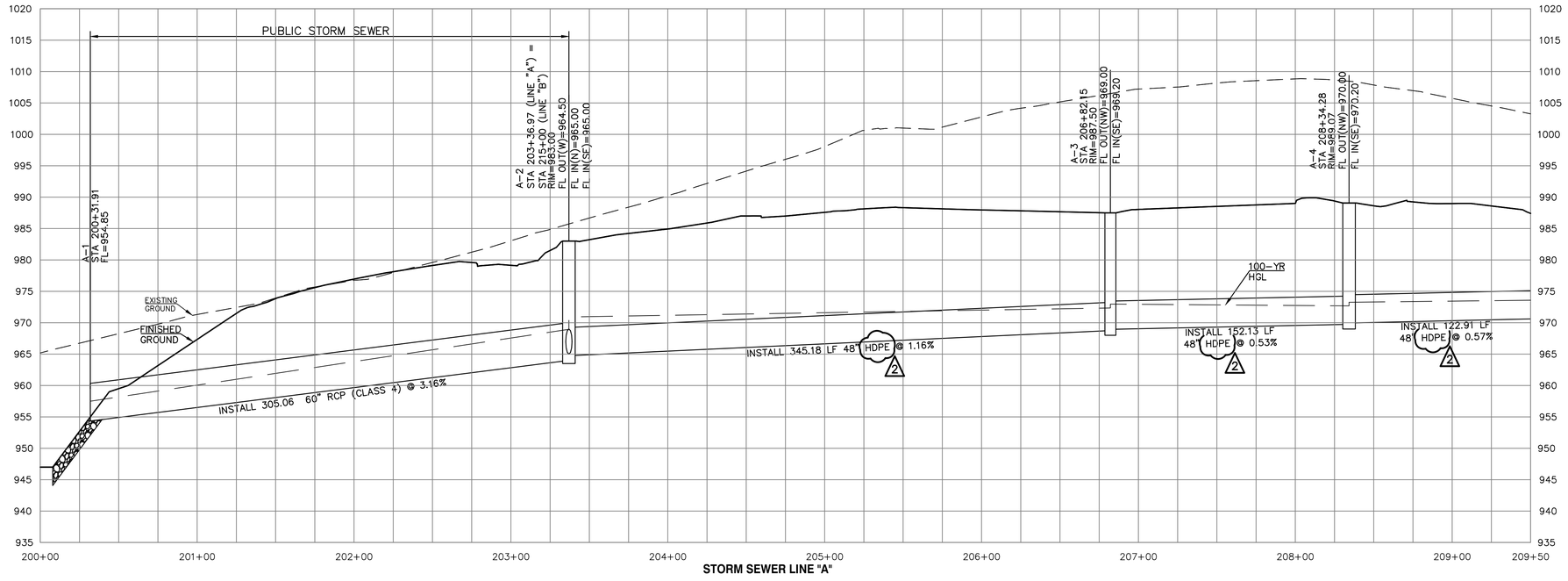

ALL RCP SHALL BE CLASS 3 EXCEPT WHERE INDICATED OTHERWISE.

PUBLIC STREET, STORM AND WATER ARE BY SEPARATE PLANS

ALL PROPOSED STORM LINES ARE PRIVATE UNLESS NOTED OTHERWISE

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7–3–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5–16–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JOPLIN, MISSOURI 64802 | KANSAS CITY, KANSAS 66160
PH. (785) 762-5091 | FAX (785) 841-7744
js@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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER LINE A - PLAN AND PROFILE

PROJ. NO.	
A14_7067–1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067–1G_DPP	
SHEET	REV
C–24	2

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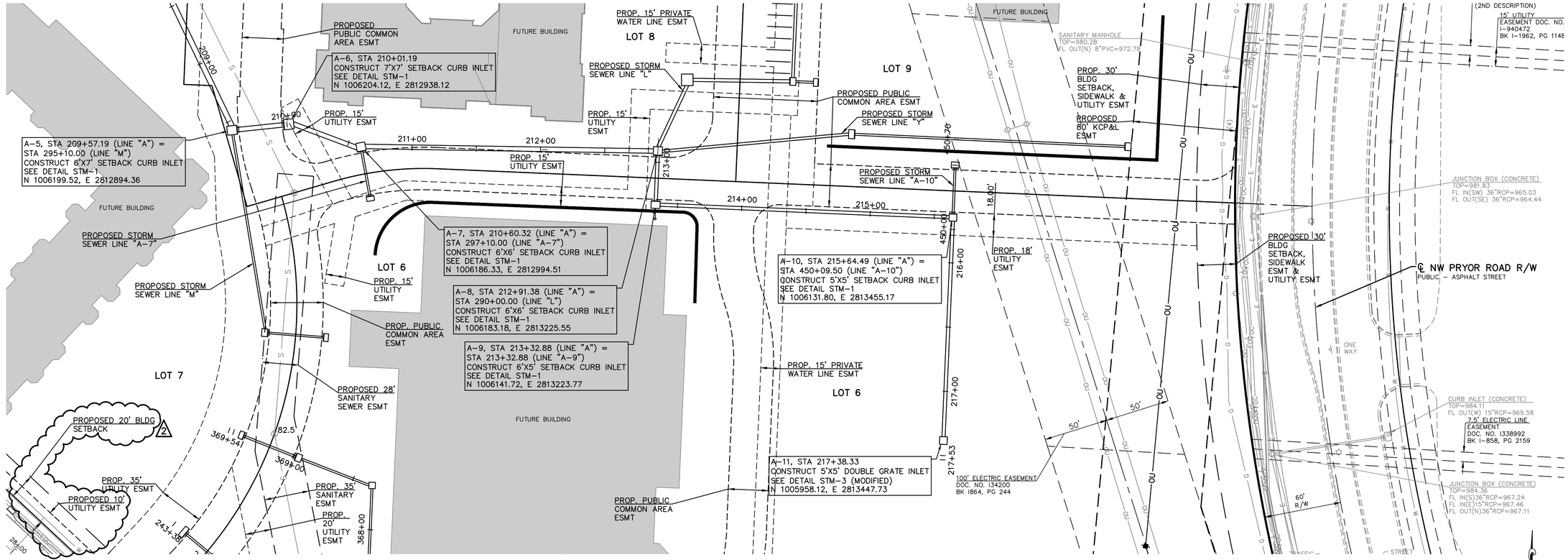

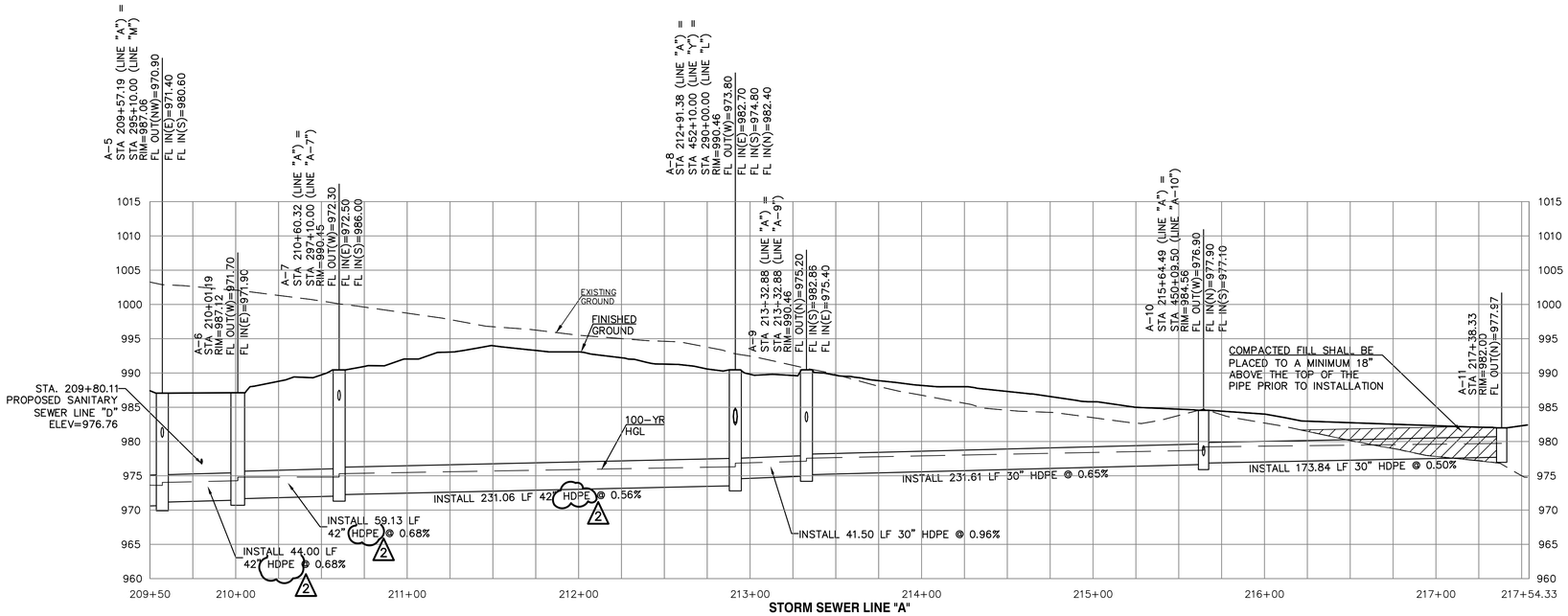

ALL HDPE PIPE SHALL BE DUAL-WALLED GASKETED JOINT PIPE MEETING ASHTO M-294 AND INSTALLED FOR MANUFACTURERS REQUIREMENTS AND ASTM D2321, CLASS 2 BEDDING W/96% COMPACTION.

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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JEFFERSON CITY, MISSOURI 65102
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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER LINE A - PLAN AND PROFILE

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_DPP
SHEET	C-25
REV	2

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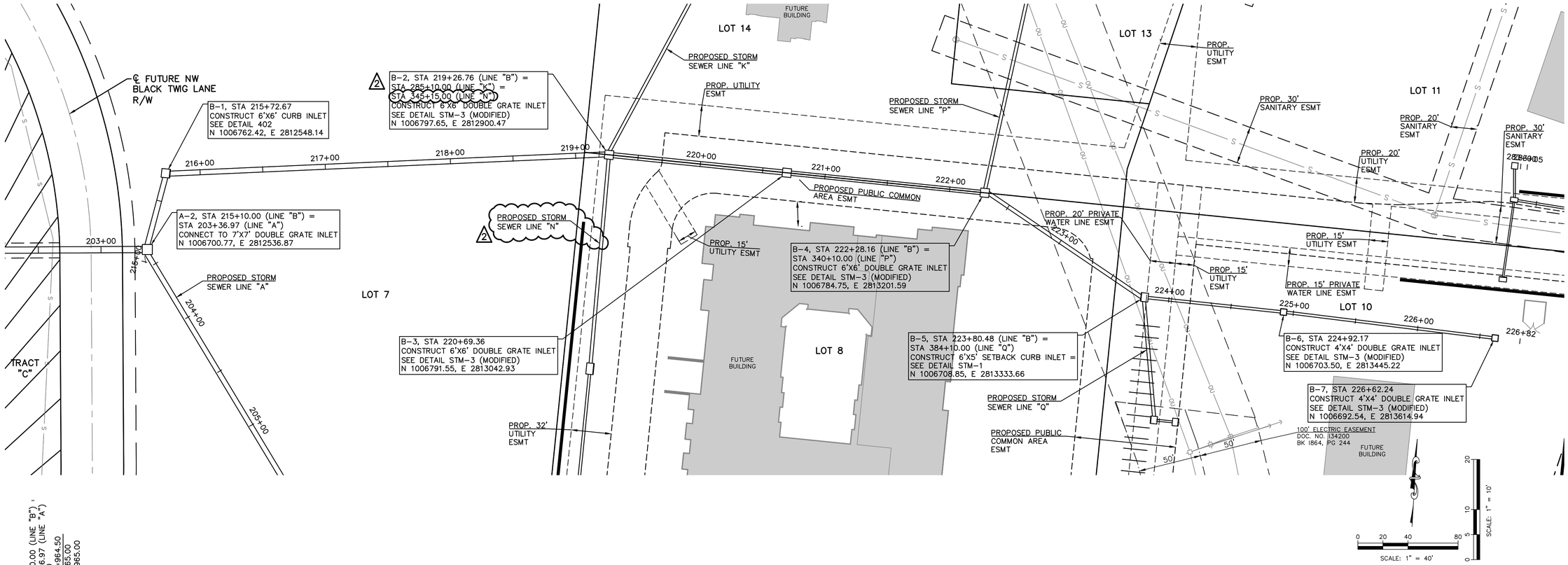

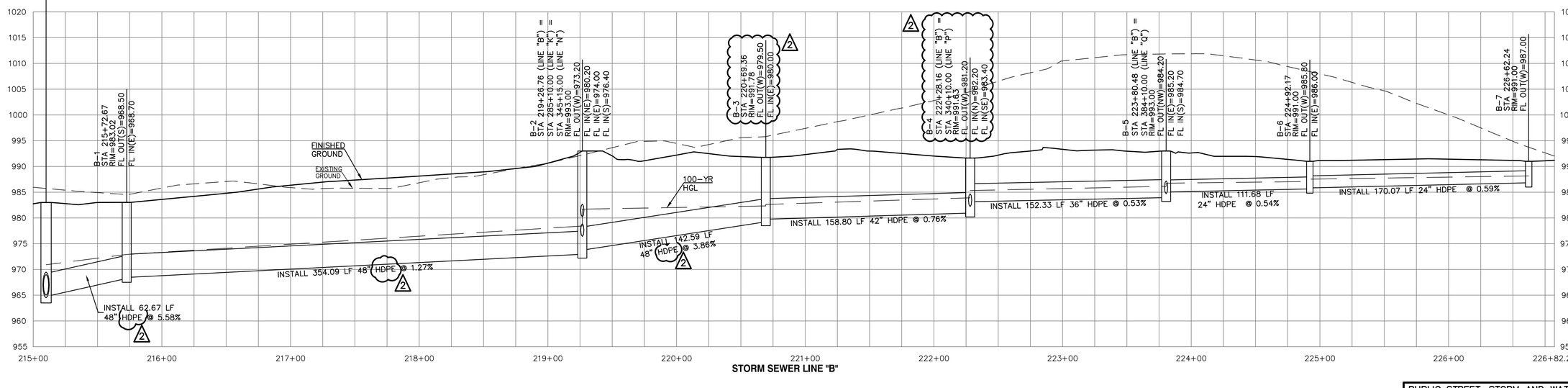

STORM SEWER LINE "B"

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0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
1-25-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
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	2

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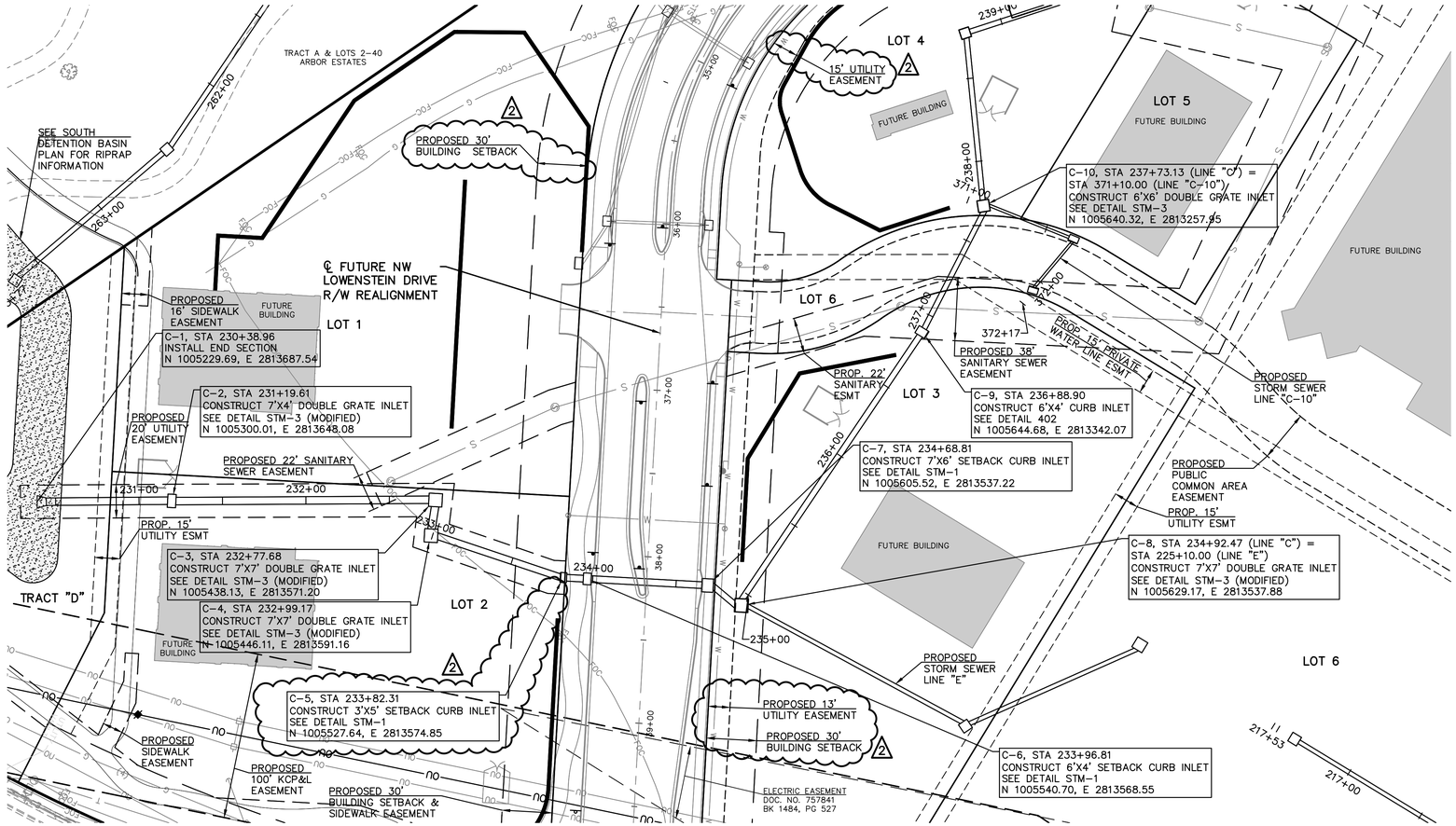

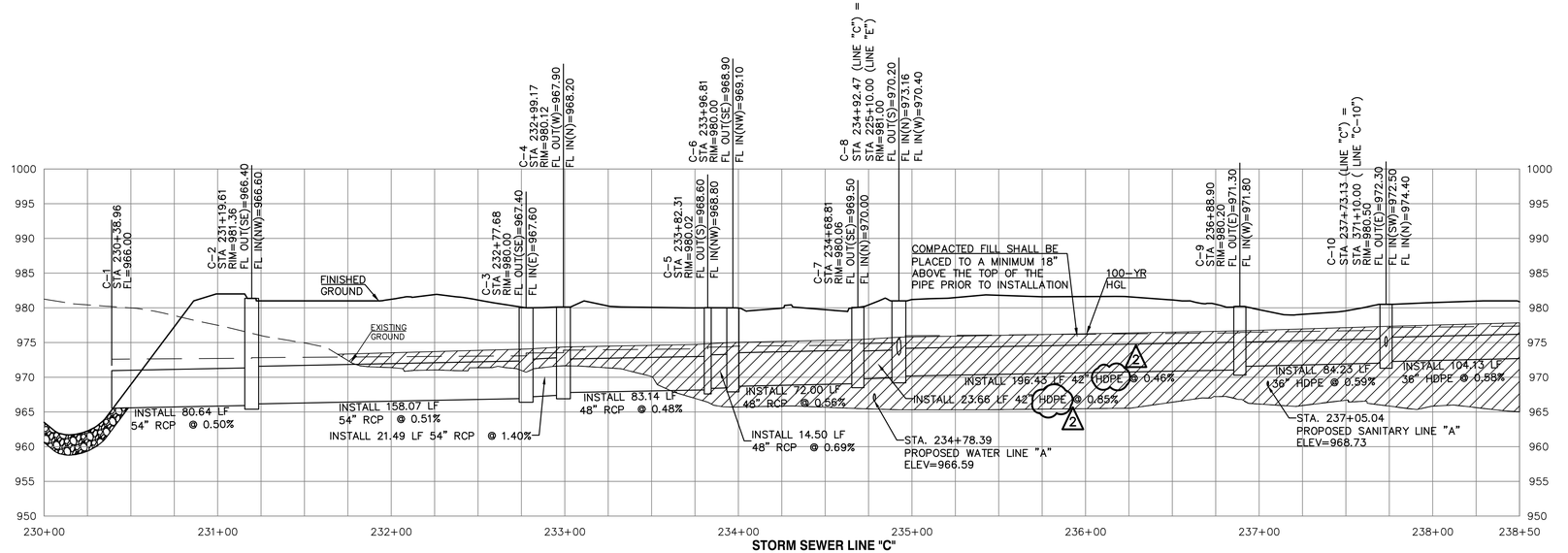

STORM SEWER LINE "C"

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
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 2

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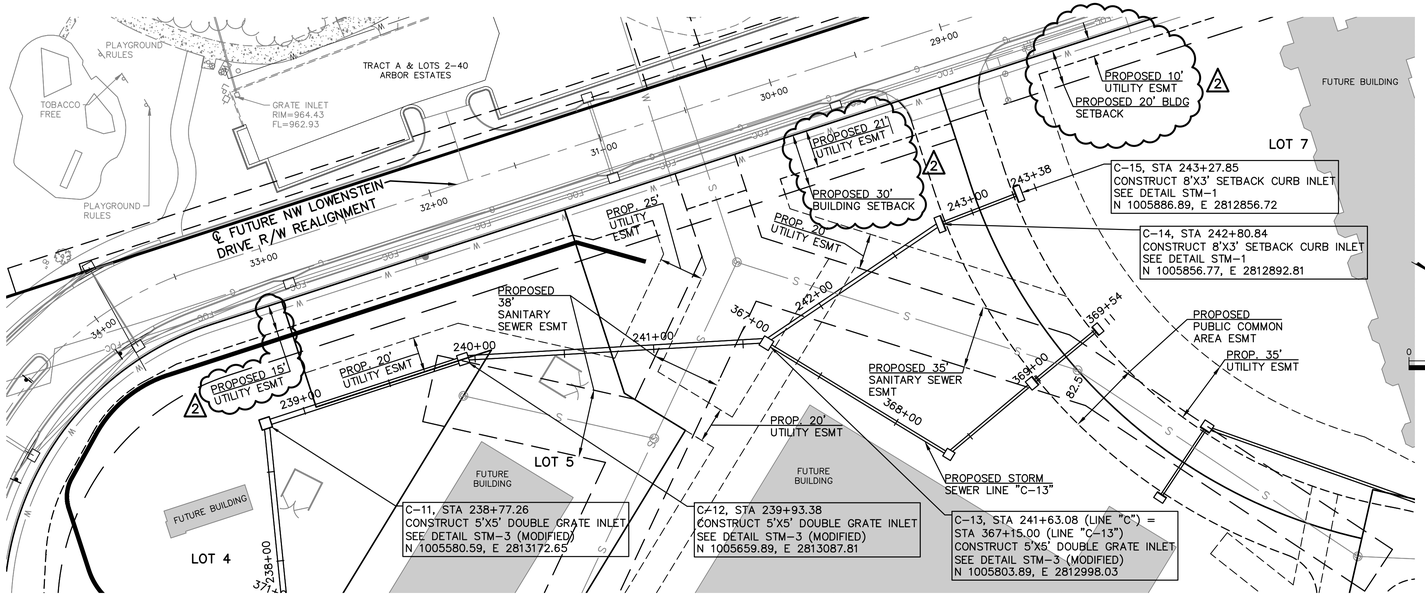

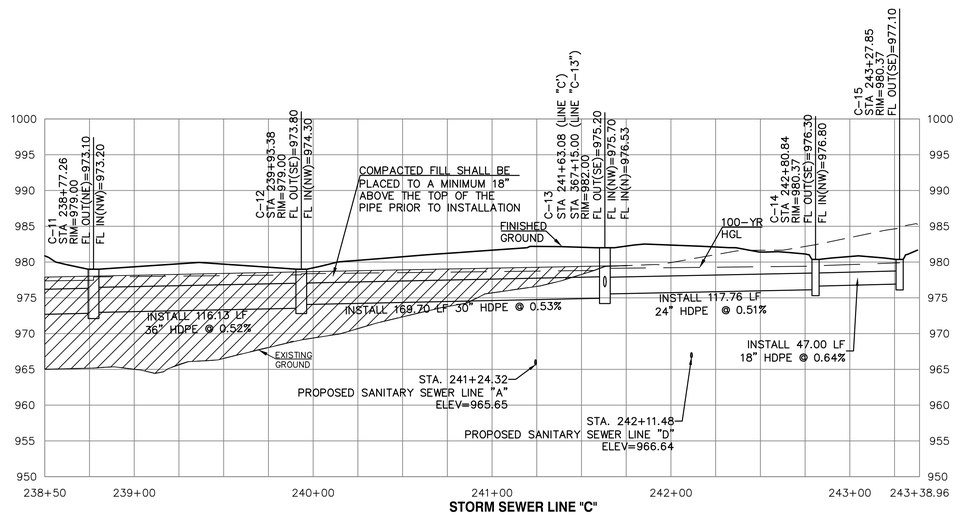

STORM SEWER LINE "C"

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER LINE C - PLAN AND PROFILE

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_DPP
SHEET	C-28
REV	2

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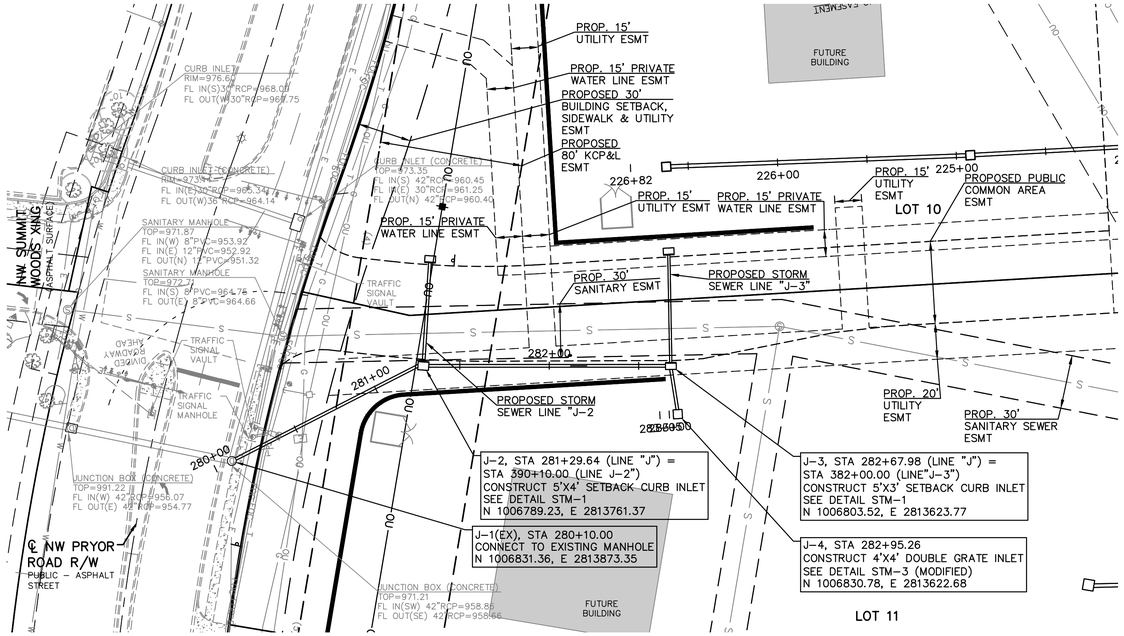

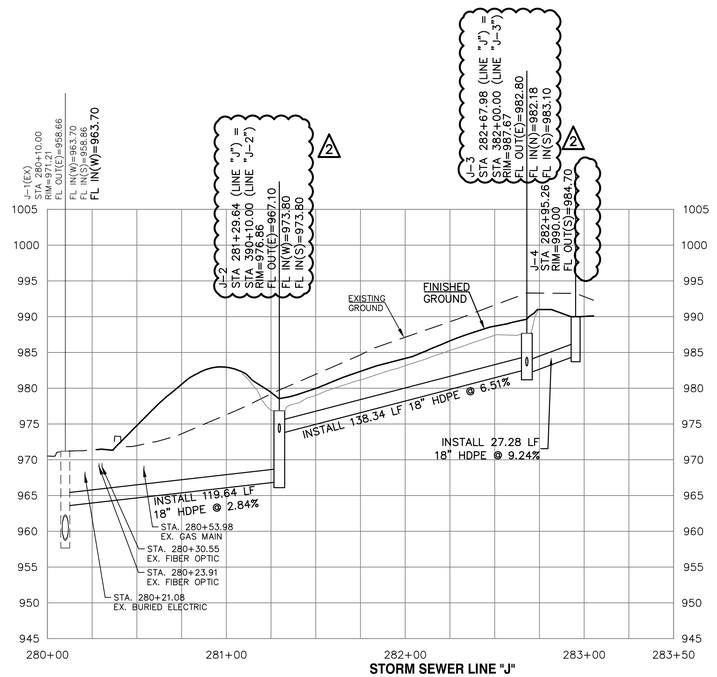

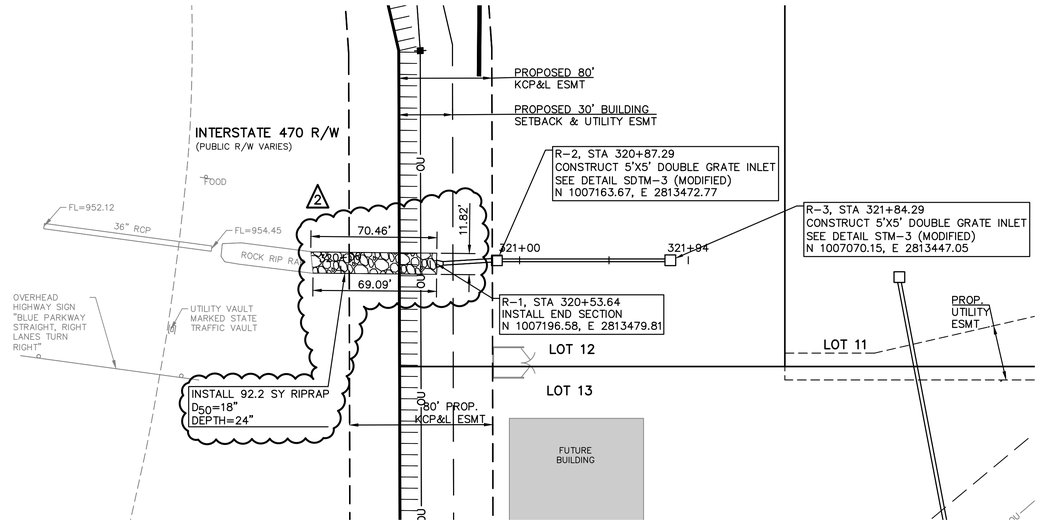

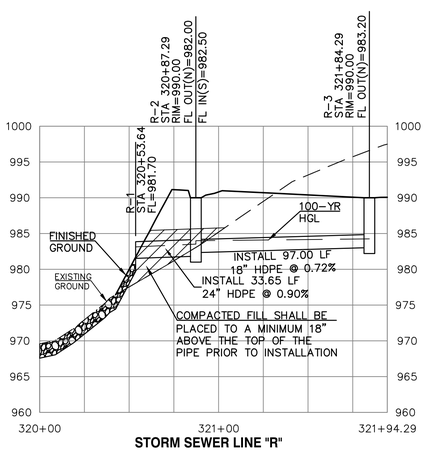

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0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER 021726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DPP
SHEET C-29 | REV 2

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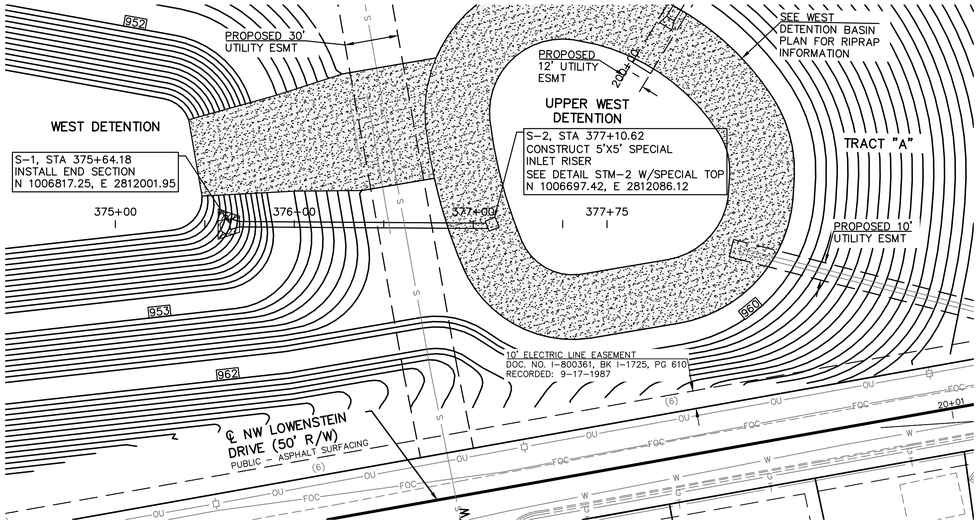
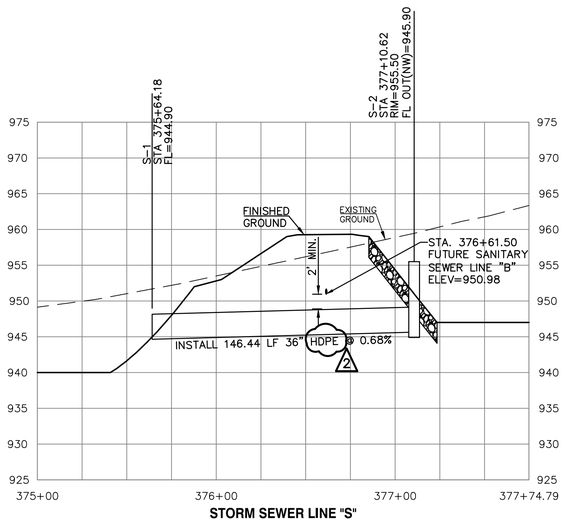
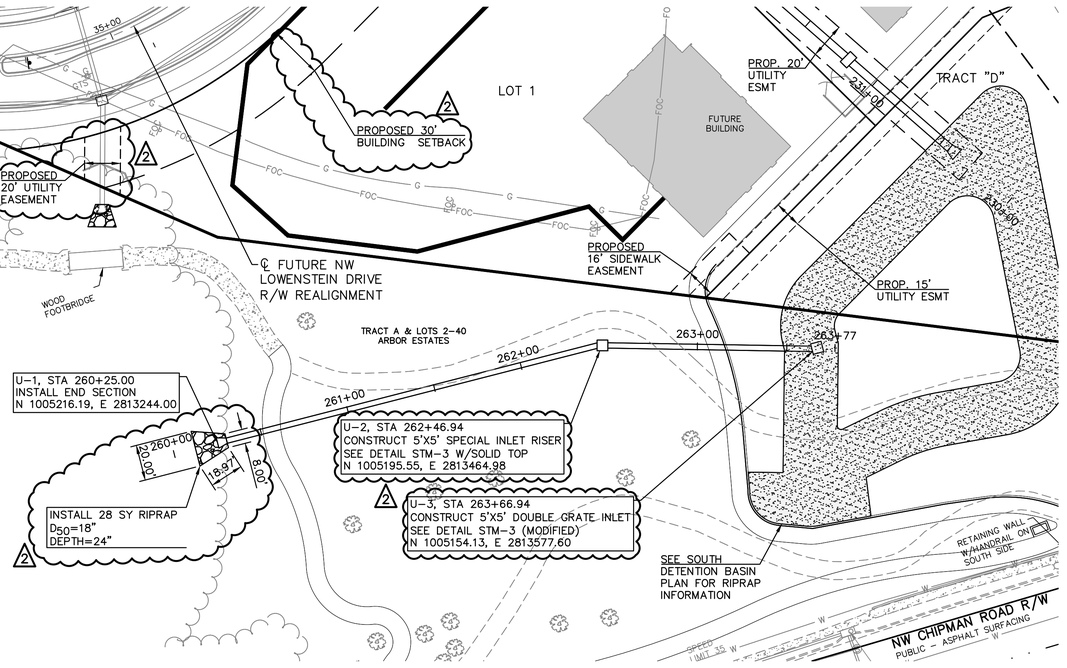
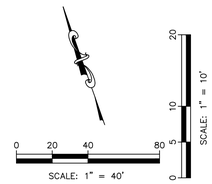


STRUCTURE S-2
RISER CONTROL ELEMENTS:
TRASH RACK AND GRATE INLET, IN RISER TOP, 5'X5' OPENING,
WEIR EL 955.50, TRASH RACK EL=956.17

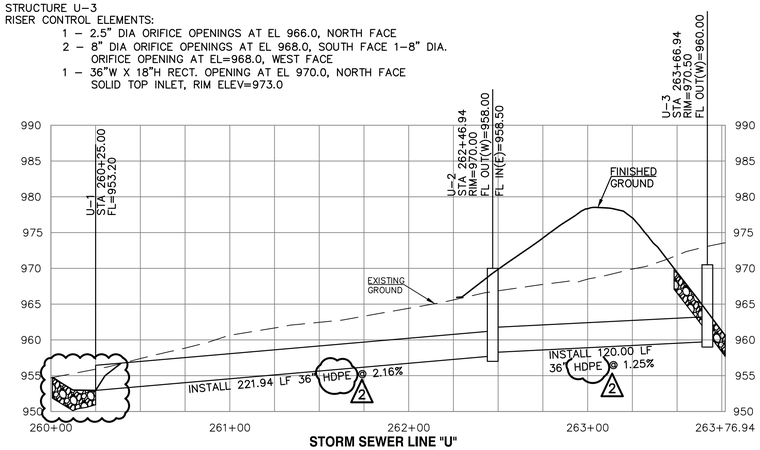


STORM SEWER LINE "S"





STRUCTURE U-3
RISER CONTROL ELEMENTS:
1 - 2.5" DIA ORIFICE OPENINGS AT EL 966.0, NORTH FACE
2 - 8" DIA ORIFICE OPENINGS AT EL 968.0, SOUTH FACE 1-8" DIA.
ORIFICE OPENING AT EL=968.0, WEST FACE
1 - 36"W X 18"H RECT. OPENING AT EL 970.0, NORTH FACE
SOLID TOP INLET, RIM ELEV=973.0



STORM SEWER LINE "U"

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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KAW VALLEY ENGINEERING

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LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER LINE S & U - PLAN AND PROFILE

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DPP
SHEET C-30 | REV 2

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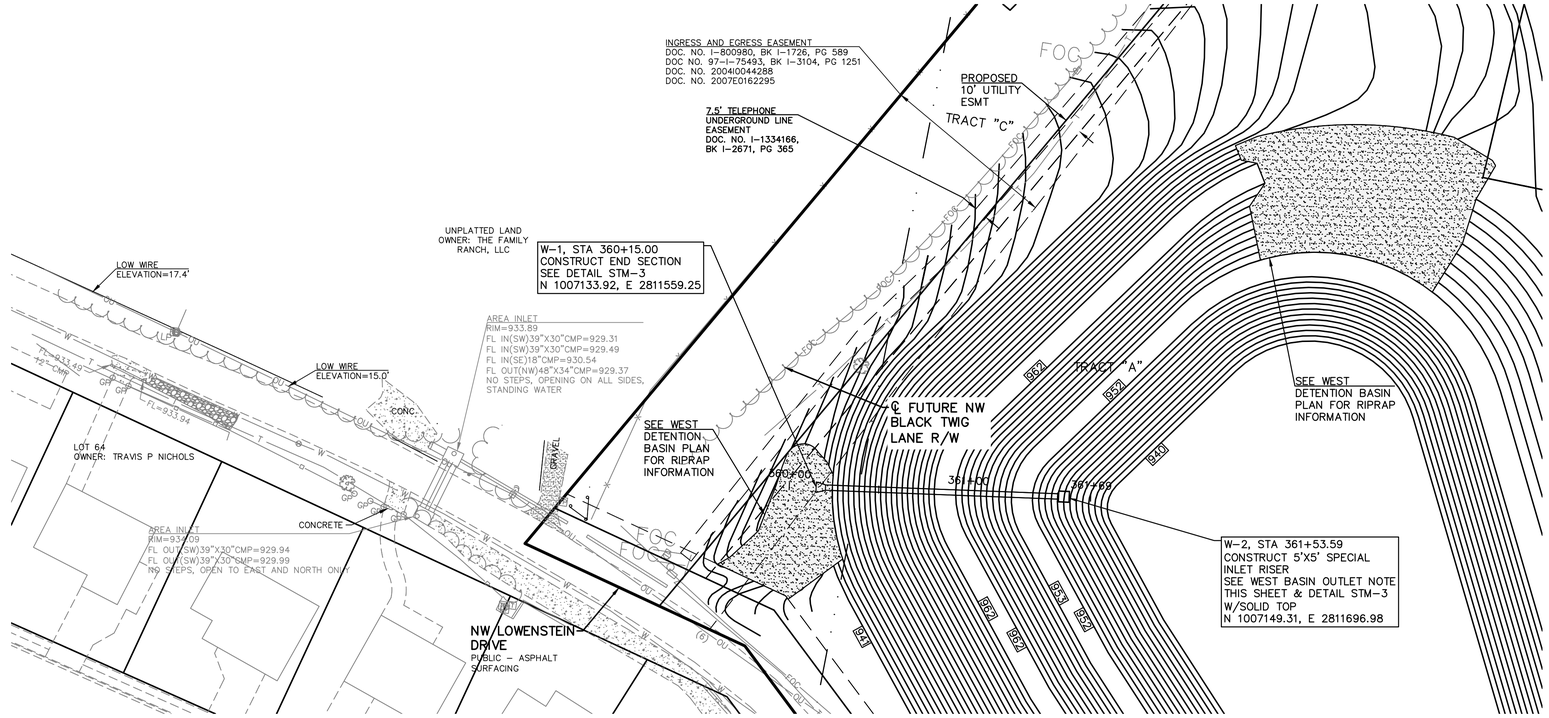
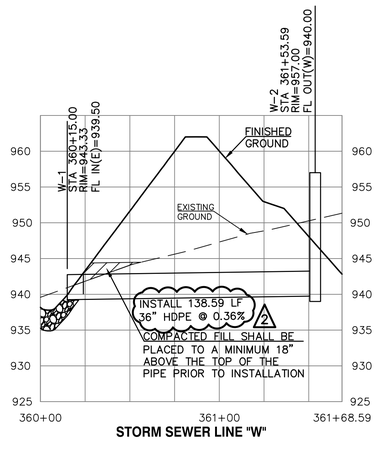


WEST BASIN OUTLET NOTE:
1 - 5" DIA ORIFICE OPENINGS AT EL 950.0, SOUTH FACE
1 - 30"W X 12"H RECT. OPENING AT 952.0, NORTH FACE
1 - 30"W X 18"H RECT. OPENING AT 955.0, SOUTH FACE
SOLID TOP INLET, RIM ELEV=957.00

SCALE: 1" = 40'

SCALE: 1" = 10'



STORM SEWER LINE "W"

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER LINE W - PLAN AND PROFILE

PROJ. NO.	
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LDO	JT
CFN	
7067-1G_DPP	
SHEET	REV
C-31	2

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K-3, STA 289+02.22
CONSTRUCT 4'X4' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=990.00
FL OUT(S)=983.40
N 1007176.21, E 2812973.32

B-4, STA 340+10.00 (LINE "P")=
STA 222+28.16 (LINE "B")
CONNECT TO 6'X6' DOUBLE GRATE INLET
TOP=991.63
FL IN(N)=982.20
FL IN(SE)=983.40
FL OUT(W)=981.20
N 1006784.75, E 2813201.59

K-2, STA 288+04.45
CONSTRUCT 4'X4' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=990.50
FL IN(N)=982.60
FL OUT(S)=982.10
N 1007078.52, E 2812969.13

B-2, STA 285+10.00 (LINE "K") =
STA 219+26.76 (LINE "B") =
STA 345+15.00 (LINE "N")
CONNECT TO 6'X6' DOUBLE GRATE INLET
TOP=993.00
FL IN(NE)=980.20
FL IN(E)=974.00
FL IN(S)=976.40
FL OUT(W)=973.20
N 1006797.65, E 2812900.47

K-1, STA 286+62.30
CONSTRUCT 5'X5' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=990.50
FL IN(N)=981.30
FL OUT(SW)=981.10
N 1006936.51, E 2812963.05

N-1, STA 346+86.51
CONSTRUCT 8'X5' CURB INLET
SEE DETAIL 402
TOP=985.80
FL IN(S)=977.80
FL OUT(N)=977.30
N 1006626.22, E 2812895.22

N-2, STA 349+58.05
CONSTRUCT 8'X4' CURB INLET
SEE DETAIL 402
TOP=985.80
FL OUT(N)=979.30
N 1006354.91, E 2812884.09

A-7.1, STA 297+50.50
CONSTRUCT 5'X3' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=990.45
FL OUT(N)=986.50
N 1006146.49, E 2813001.79

A-5, STA 295+10.00 (LINE "M") =
STA 209+57.19 (LINE "A")
CONNECT TO 6'X7' SETBACK CURB INLET
TOP=987.06
FL IN(E)=971.40
FL IN(S)=980.60
FL OUT(NW)=970.90
N 1006199.52, E 2812894.36

M-2, STA 297+17.00
CONSTRUCT 5'X3' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=985.81
FL OUT(W)=982.34
N 1006038.23, E 2812967.08

M-1, STA 296+69.50
CONSTRUCT 5'X4' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=985.81
FL IN(E)=982.10
FL OUT(N)=981.80
N 1006042.05, E 2812919.73

C-13.3, STA 369+43.21
CONSTRUCT 5'X3' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=982.24
FL OUT(E)=978.30
N 1005962.26, E 2812901.62

C-13.2, STA 368+95.71
CONSTRUCT 5'X4' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=982.24
FL IN(W)=978.00
FL OUT(E)=977.80
N 1005944.73, E 2812945.77

C-13.1, STA 368+34.44
CONSTRUCT 4'X4' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=982.00
FL IN(W)=977.40
FL OUT(S)=977.09
N 1005923.22, E 2813003.14

C-13, STA 367+15.00 (LINE "C-13") =
STA 241+63.08 (LINE "C")
CONNECT TO 5'X5' DOUBLE GRATE INLET
TOP=982.00
FL IN(NW)=975.70
FL IN(N)=976.53
FL OUT(SE)=975.20
N 1005803.89, E 2812998.03

C-10.1, STA 371+67.54
CONSTRUCT 5'X3' CURB INLET
SEE DETAIL 402
TOP=982.19
FL IN(E)=974.97
FL OUT(S)=974.65
N 1005697.22, E 2813249.38

C-10, STA 371+10.00 (LINE "C-10")=
STA 237+73.13 (LINE "C")
CONNECT TO 6'X6' DOUBLE GRATE INLET
TOP=980.50
FL IN(SW)=972.50
FL IN(N)=974.40
FL OUT(E)=972.30
N 1005640.32, E 2813257.95

P-1.1, STA 380+76.98
CONSTRUCT 5'X5' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=989.00
FL OUT(S)=984.90
N 1007025.61, E 2813232.53

P-1, STA 380+15.00 (LINE "P-1") =
STA 341+91.16 (LINE "P")
CONNECT TO 5'X5' DOUBLE GRATE INLET
TOP=989.00
FL IN(E)=984.50
FL IN(N)=984.50
FL OUT(S)=984.00
N 1006963.68, E 2813229.87

P-2, STA 343+65.93
CONSTRUCT 5'X4' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=990.00
FL OUT(W)=985.50
N 1006949.22, E 2813404.05

B-5, STA 384+10.00 (LINE "Q")=
STA 223+80.48 (LINE "B")
CONNECT TO 6'X5' SETBACK CURB INLET
TOP=993.00
FL IN(E)=985.20
FL IN(S)=984.70
FL OUT(NW)=984.20
N 1006708.85, E 2813333.66

J-3, STA 382+00.00 (LINE "J-3") =
STA 282+77.79 (LINE "J")
CONNECT TO 5'X3' SETBACK CURB INLET
TOP=987.67
FL IN(N)=982.18
FL IN(S)=983.10
FL OUT(E)=982.80
N 1006803.52, E 2813623.77

J-2, STA 390+10.00 (LINE "J-2")=
STA 281+29.64 (LINE "J")
CONNECT TO 5'X4' SETBACK CURB INLET
TOP=976.86
FL IN(W)=973.80
FL IN(S)=973.80
FL OUT(E)=967.10
N 1006789.23, E 2813761.37

J-3.1, STA 382+63.89
CONSTRUCT 5'X3' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=988.04
FL OUT(N)=983.70
N 1006739.85, E 2813618.45

J-2.1, STA 390+69.50
CONSTRUCT 5'X3' CURB INLET
SEE DETAIL 402
TOP=976.95
FL OUT(W)=974.10
N 1006730.55, E 2813751.52

L-1, STA 290+60.01
CONSTRUCT 8'X8' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=992.00
FL IN(E)=982.90
FL OUT(S)=982.70
N 1006238.67, E 2813248.39

L-2, STA 387+10.50 (LINE "L-2")=
STA 291+42.10 (LINE "L")
CONSTRUCT 5'X4' CURB INLET
SEE DETAIL 402
TOP=990.50
FL IN(E)=985.30
FL IN(N)=983.90
FL OUT(W)=983.40
N 1006237.44, E 2813330.47

L-2.1, STA 387+28.72
CONSTRUCT 5'X3' CURB INLET
SEE DETAIL 402
TOP=989.50
FL OUT(W)=985.50
N 1006236.62, E 2813348.67

Y-1, STA 453+61.50
CONSTRUCT 6'X4' CURB INLET
SEE DETAIL 402
TOP=990.20
FL IN(E)=984.10
FL OUT(W)=983.60
N 1006196.42, E 2813376.47

Y-2, STA 455+76.50
CONSTRUCT 5'X4' CURB INLET
SEE DETAIL 402
TOP=990.20
FL OUT(W)=985.50
N 1006186.71, E 2813591.26

A-10.1, STA 450+50.00
CONSTRUCT 5'X4' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=984.56
FL OUT(S)=978.10
N 1006172.26, E 2813456.91

A-10, STA 450+09.50 (LINE "Y") =
STA 215+64.49 (LINE "A")
CONNECT TO 5'X5' SETBACK CURB INLET
SEE DETAIL STM-1
TOP=984.56
FL IN(N)=977.90
FL IN(S)=977.10
FL OUT(W)=976.90
N 1006131.80, E 2813455.17

A-8, STA 452+10.00 (LINE "L") =
STA 212+91.38 (LINE "A") =
STA 452+10.00 (LINE "Y")
CONNECT TO 6'X6' SETBACK CURB INLET
TOP=990.46
FL IN(E)=982.70
FL IN(S)=974.80
FL IN(N)=982.40
FL OUT(W)=973.80
N 1006183.18, E 2813225.55

A-9, STA 213+32.88 (LINE "A-9") =
STA 213+32.88 (LINE "A")
CONNECT TO 6'X5' SETBACK CURB INLET
TOP=990.46
FL IN(S)=982.86
FL IN(E)=975.40
FL OUT(N)=975.20
N 1006141.72, E 2813223.77

E-1, STA 256+62.53
CONSTRUCT 5'X5' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=982.00
FL IN(NW)=975.44
FL OUT(S)=974.94
N 1005781.69, E 2813536.31

C-8, STA 255+10.00 (LINE "E") =
STA 234+92.47 (LINE "C")
CONNECT TO 7'X7' DOUBLE GRATE INLET
TOP=981.00
FL IN(N)=973.16
FL IN(W)=970.40
FL OUT(S)=970.20
N 1005629.17, E 2813537.88

C-10.2, STA 372+06.57
CONSTRUCT 5'X3' CURB INLET
SEE DETAIL 402
TOP=981.40
FL OUT(W)=975.15
N 1005690.73, E 2813287.87

Q-1, STA 385+08.24
CONSTRUCT 5'X4.5' CURB INLET
SEE DETAIL 402
TOP=990.00
FL IN(E)=986.20
FL OUT(N)=985.20
N 1006611.48, E 2813346.75

L-4, STA 292+80.30
CONSTRUCT 5'X3' CURB INLET
SEE DETAIL 402
TOP=990.50
FL OUT(W)=985.50
N 1006356.53, E 2813353.81

L-3, STA 292+62.08
CONSTRUCT 5'X4' CURB INLET
SEE DETAIL 402
TOP=990.50
FL IN(E)=985.30
FL OUT(S)=984.80
N 1006357.31, E 2813335.61

A-7, STA 297+10.00 =
STA 210+60.32 (LINE "A")
CONNECT TO 6'X6' SETBACK CURB INLET
TOP=990.45
FL IN(E)=972.50
FL IN(S)=986.00
FL OUT(W)=972.30
N 1006186.33, E 2812994.51

Q-2, STA 385+25.71
CONSTRUCT 5'X4' CURB INLET
SEE DETAIL 402
TOP=990.00
FL OUT(W)=986.40
N 1006610.73, E 2813364.20

A-9.1, STA 397+20.56
CONSTRUCT 18" PVC LANDSCAPE DRAIN
TOP=987.00
FL OUT(N)=982.96
N 1006130.66, E 2813223.30

E-2, STA 257+77.86
CONSTRUCT 6'X6' DOUBLE GRATE INLET
SEE DETAIL STM-3 (MODIFIED)
TOP=982.00
FL OUT(SE)=976.05
N 1005849.57, E 2813443.08

INTERSTATE 470 R/W

LOT 14
LOT 13
LOT 12
LOT 11
LOT 10
LOT 9
LOT 8
LOT 7
LOT 6
LOT 5
LOT 4
LOT 3
LOT 2
LOT 1
TRACT "A"
TRACT "C"
TRACT A & LOTS 2-40 ARBOR ESTATES
LOT 1 COOL ACRES

PROPOSED STORM SEWER LINE "K"
PROPOSED STORM SEWER LINE "P"
PROPOSED STORM SEWER LINE "R"
PROPOSED STORM SEWER LINE "J"
PROPOSED STORM SEWER LINE "B"
PROPOSED STORM SEWER LINE "N"
PROPOSED STORM SEWER LINE "Q"
PROPOSED STORM SEWER LINE "T"
PROPOSED STORM SEWER LINE "M"
PROPOSED STORM SEWER LINE "A"
PROPOSED STORM SEWER LINE "L"
PROPOSED STORM SEWER LINE "Y"
PROPOSED STORM SEWER LINE "D"
PROPOSED STORM SEWER LINE "E"
PROPOSED STORM SEWER LINE "C"

NW BLACK TWIG LANE
NW LOWENSTEIN DRIVE
NW PRYOR ROAD R/W
LATERAL FIELD
KNICKERBOCKER PLACE

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0 50 100 200
SCALE: 1" = 100'

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-27126
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

2319 N. JACKSON | P.O. BOX 1304
JOPLIN, MISSOURI 64801 | (417) 782-7744
PH. (785) 762-5040 | FAX (785) 762-7744
js@kveng.com | www.kveng.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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER PLAN

PROJ. NO. A14_7067-1
DESIGNER LDO | DRAWN BY JT
CFN 7067-1G_DPP2
SHEET C-32 | REV 2

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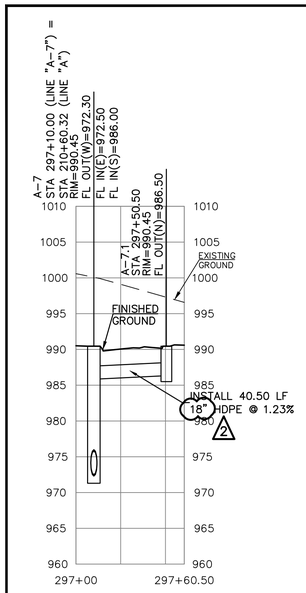
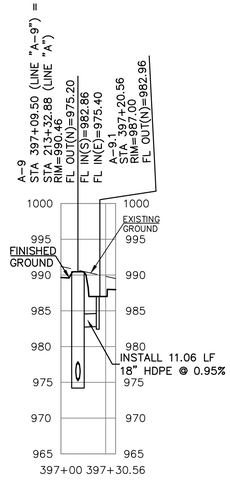
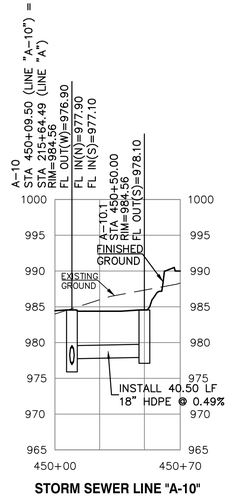


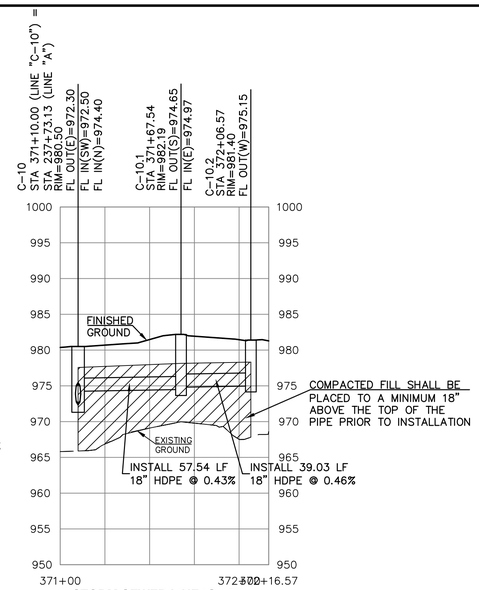
STORM SEWER LINE "A-7"



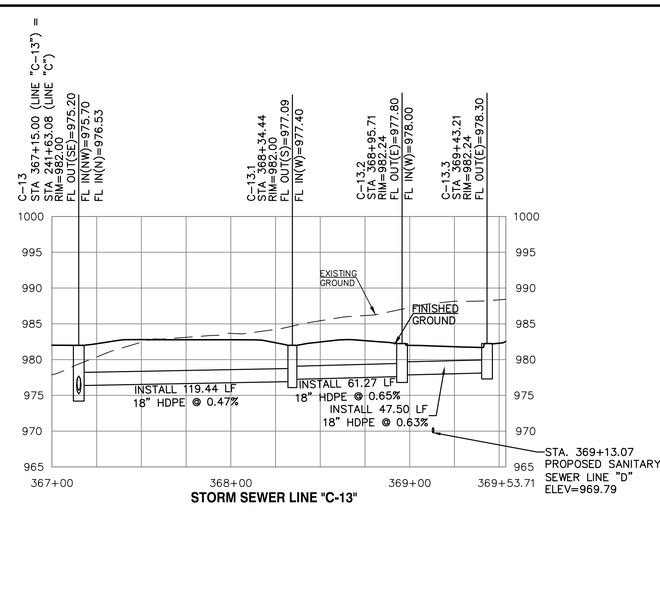
STORM SEWER LINE "A-9"



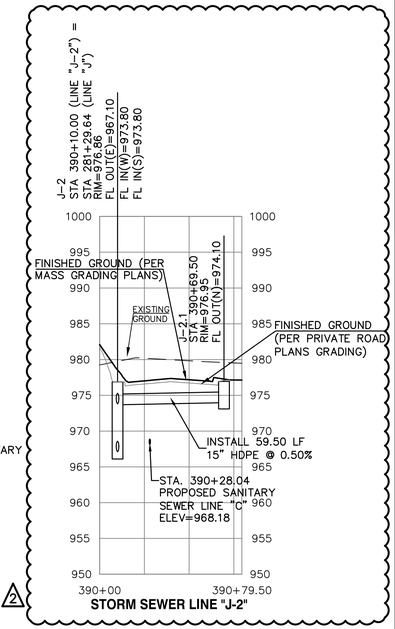
STORM SEWER LINE "A-10"



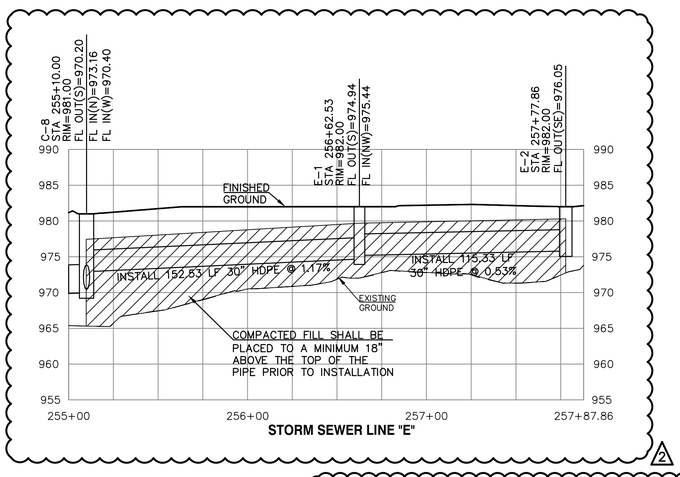
STORM SEWER LINE "C-10"



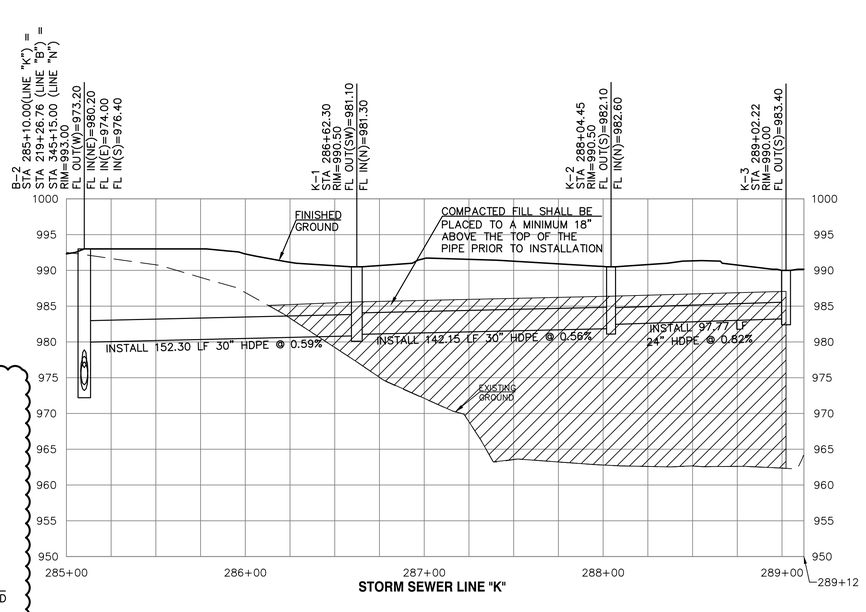
STORM SEWER LINE "C-13"



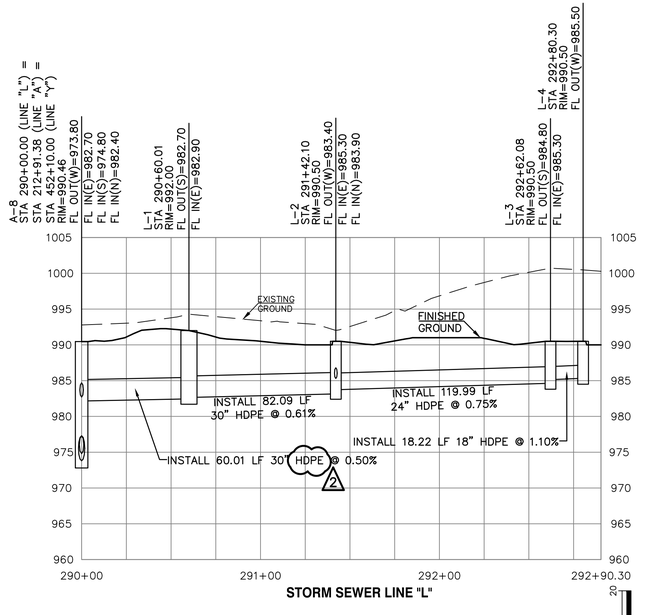
STORM SEWER LINE "J-2"



STORM SEWER LINE "E"



STORM SEWER LINE "K"



STORM SEWER LINE "L"

STORM SEWER LINE "J-3"

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0 20 40 80
SCALE: 1" = 40'

SCALE: 1" = 10'
0 5 10 20

REV	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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JOPLIN, MISSOURI, 64802 | 64804
PH. (785) 272-2001 | FAX (785) 842-7744
js@kveng.com | www.kveng.com

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

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

PROJ. NO.	A14_7067-1	
DESIGNER	LDO	DRAWN BY JT
CFN	7067-1G_DPP2	
SHEET	C-33	REV 2

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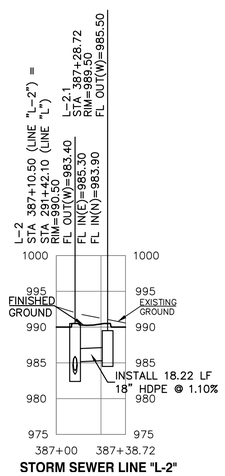
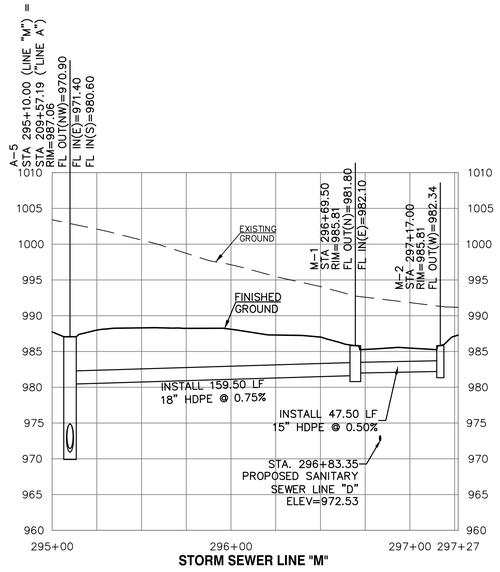
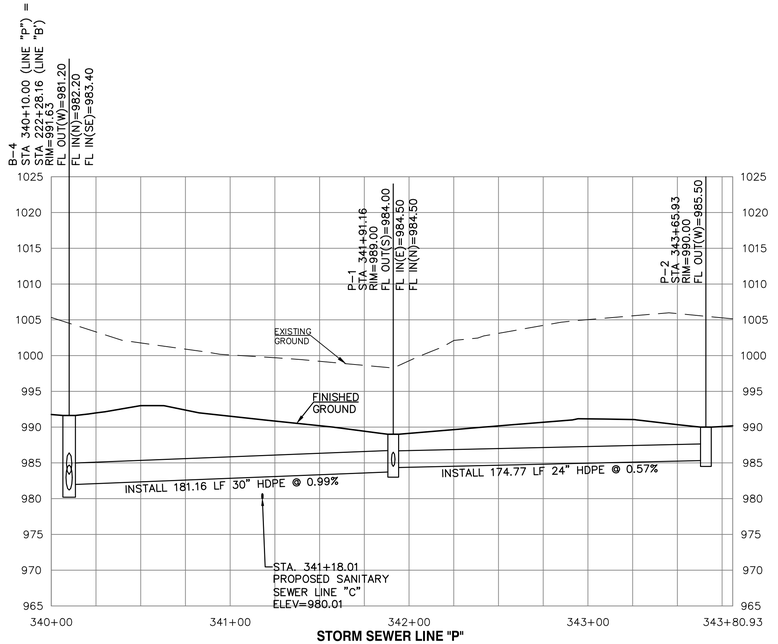


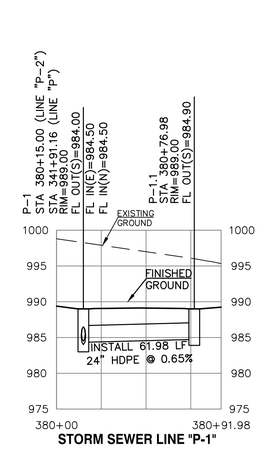
STORM SEWER LINE "L-2"



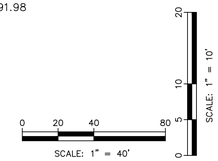
STORM SEWER LINE "M"

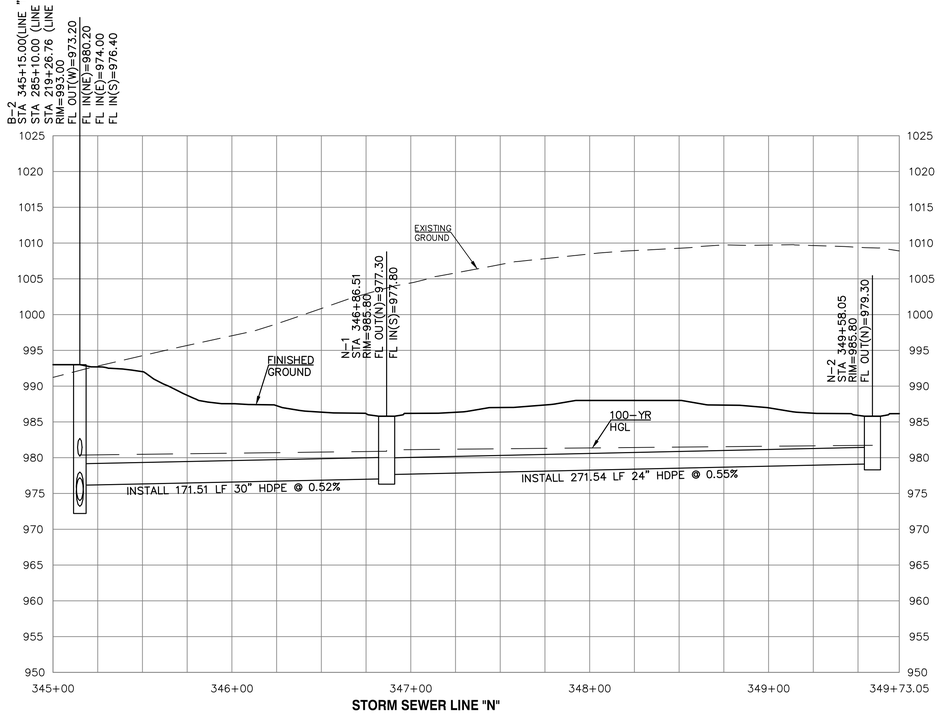


STORM SEWER LINE "P"

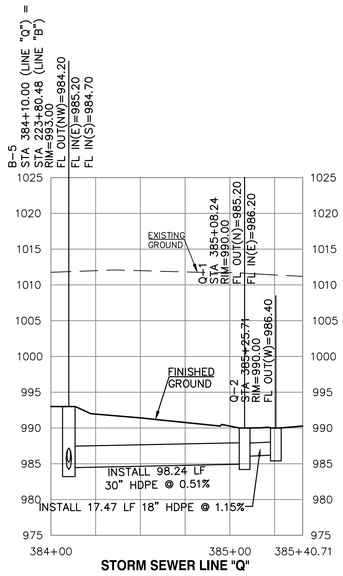


STORM SEWER LINE "P-1"

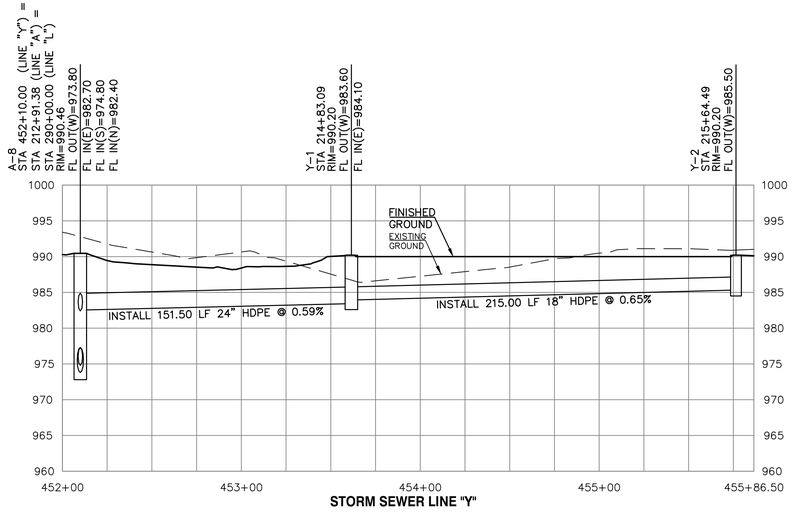




STORM SEWER LINE "N"



STORM SEWER LINE "Q"



STORM SEWER LINE "Y"

EXTENSIVE REVISIONS

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
5-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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

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STREETS OF WEST PRYOR

NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER LINES L-2, M, P, P-1, N, Q, & Y PROFILES

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

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.

PROP. 38' SANITARY ESMT
FUTURE BUILDING
PROP. 38' SANITARY ESMT
FUTURE BUILDING
PROP. 20' UTILITY ESMT
LOT 4
LOT 6
PROP. 13' UTILITY ESMT
UTILITY VAULT
PROP. 15' UTILITY ESMT
PROP. 22' SANITARY ESMT
FUTURE BUILDING
℄ PROPOSED REALIGNMENT NW LOWENSTEIN DRIVE (PROPOSED 90' R/W)
90' R/W
PROP. 40' BUILDING SETBACK, SIDEWALK ESMT & UTILITY ESMT
CONCRETE SIDEWALK
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
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
GRATE INLET RIM=964.43 FL=962.93
FL 961.24 PVC
PLAYGROUND RULES
TOBACCO FREE
DRINKING FOUNTAIN
TRASH CAN
SWING SET
JUNGLE GYM
METAL BENCH ON BRICK
PLAYGROUND RULES
PLAY AREA
METAL BENCH ON BRICK
LOT 2
PROP. SIDEWALK ESMT
PROP. 22' SANITARY ESMT
PROP. 30' BUILDING SETBACK
PROP. 20' UTILITY ESMT
LOT 1
FUTURE BUILDING
PROP. SIDEWALK ESMT
FUTURE BUILDING
PROP. 16' SIDEWALK ESMT
PROP. 20' UTILITY ESMT
UTILITY VAULT
ONE WAY
PROP. 16' SIDEWALK ESMT
PROP. 15' UTILITY ESMT SOUTH BASIN
TRACT "D"
PROP. UTILITY ESMT
GAS SUBSTATION
RETAINING WALL
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=992.11
FL IN(E) 15"RCP=985.91
FL OUT(N) 15"RCP=985.86
510+00
511+00
512+00
513+00
514+00
515+00
515+58
PROPOSED SECTION THRU EMBANKMENT AND POND (SOUTH BASIN)
INSTALL 1202.60 SY SC 250 TURF REINFORCING MAT (NORTH AMERICAN GREEN) AND SEED
PROPOSED SECTION ALONG SPILLWAY ELEV=973.50
537+56
541+00
537+00
535+00
536+00
542+00
542+49
70.00'
20'
℄ PROPOSED OVERFLOW
MISSOURI GAS ENERGY EASEMENT DOC. 2002I0022043
LEE'S SUMMIT PARKS AND RECREATION LOWENSTEIN PARK
4.5' TALL ELECTRIC BOX
RIGHT LANE ENDS
CURB INLET RIM=954.80
CONCRETE SIDEWALK
SPEED LIMIT 35
RETAINING WALL W/HANDRAIL ON SOUTH SIDE
RIGHT LANE MERGE AHEAD
CITY OF LEE'S SUMMIT "ADULT & ENERGY WYATT FAMILY"
SOLID DOUBLE YELLOW
CURB INLET RIM=973.67
METAL UTILITY POLE
UTILITY VAULT MARKED STATE TRAFFIC SIGNAL
DIVIDED RD AHEAD
CROSS-WALK
NW CHIPMAN ROAD R/W
PUBLIC – ASPHALT SURFACING
INSTALL 1932.12 SY OF D_{50}=18" RIPRAP TO 30" MIN DEPTH

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=984.97

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=970.98

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
7-5-19
E-21726
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441-1304
PH. (785) 762-5040 | FAX (785) 762-7744
js@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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
SOUTH DETENTION BASIN PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_BASIN	
SHEET	REV
C-35	2

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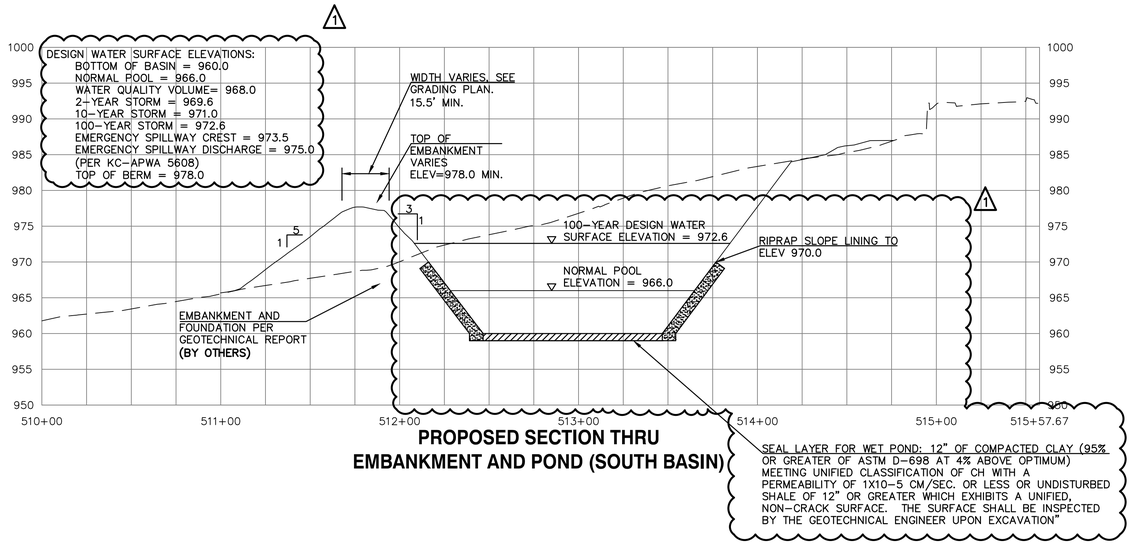
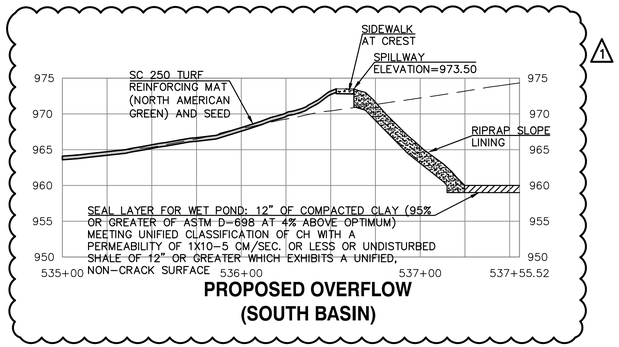
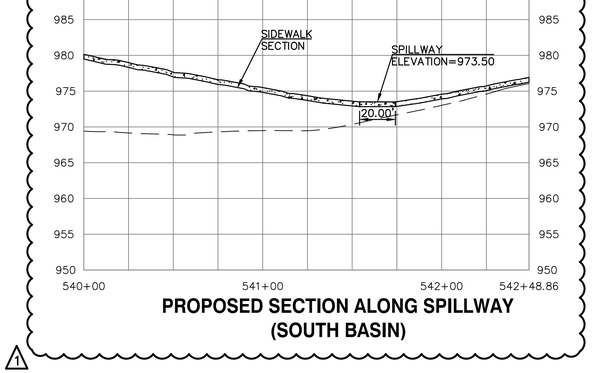


PROPOSED SECTION THRU EMBANKMENT AND POND (SOUTH BASIN)

SEAL LAYER FOR WET POND: 12" OF COMPACTED CLAY (95% OR GREATER OF ASTM D-698 AT 4% ABOVE OPTIMUM) MEETING UNIFIED CLASSIFICATION OF CH WITH A PERMEABILITY OF 1X10-5 CM/SEC. OR LESS OR UNDISTURBED SHALE OF 12" OR GREATER WHICH EXHIBITS A UNIFIED, NON-CRACK SURFACE. THE SURFACE SHALL BE INSPECTED BY THE GEOTECHNICAL ENGINEER UPON EXCAVATION"



PROPOSED OVERFLOW (SOUTH BASIN)



PROPOSED SECTION ALONG SPILLWAY (SOUTH BASIN)

SCALE: 1" = 40'

SCALE: 1" = 10'

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
5-16-19

LEON D. OSBOURN
ENGINEER
MO # 021726

2319 N. JACKSON | P.O. BOX 1304
JUNCTION CITY, KANSAS 66441
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jd@kveng.com | www.kveng.com
KAW VALLEY ENGINEERING

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
~~SOUTH DETENTION BASIN PROFILE~~

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

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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

0 20 40 80

SCALE: 1" = 40'

INSTALL 2,388.00 SY SC 250 TURF REINFORCING MAT (NORTH AMERICAN GREEN) AND SEED

INSTALL 1018.54 SY OF D_{50}=18" RIPRAP TO 30" MIN DEPTH AS EMERGENCY SPILLWAY

PROPOSED SECTION THROUGH OVERFLOW SPILLWAY

TRACT "A"

TRACT "B"

PROP. 10' UTILITY ESMT

PROP. 10' UTILITY ESMT

PROPOSED OVERFLOW WEST DETENTION POND

WEST DETENTION POND

℄ PROPOSED SECTION THRU EMBANKMENT AND POND (WEST BASIN)

INSTALL 17.6 SY OF D_{50}=5" RIPRAP TO 18" MIN DEPTH

INSTALL 848.62 SY OF D_{50}=18" RIPRAP TO 30" MIN DEPTH

INSTALL 347.33 SY OF D_{50}=18" RIPRAP TO 30" MIN DEPTH

10' ELECTRIC LINE EASEMENT
DOC. NO. I-800361, BK I-1725, PG 610
RECORDED: 9-17-1987

INSTALL 2119.60 SY OF D_{50}=18" RIPRAP TO 30" MIN DEPTH AS SHORE LINE PROTECTION

PROP. 30' UTILITY ESMT

PROPOSED OVERFLOW SPILLWAY

PROP. 12' UTILITY ESMT

UPPER WEST POND

PROP. 10' UTILITY ESMT

℄ FUTURE NW BLACK TWIG LANE (PROPOSED 50' R/W)

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

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

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=984.97

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=970.98

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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
WEST DETENTION BASIN PLAN

PROJ. NO.	
A14_7067-1	
DESIGNER	DRAWN BY
LDO	JT
CFN	
7067-1G_BASIN	
SHEET	REV
C-37	2

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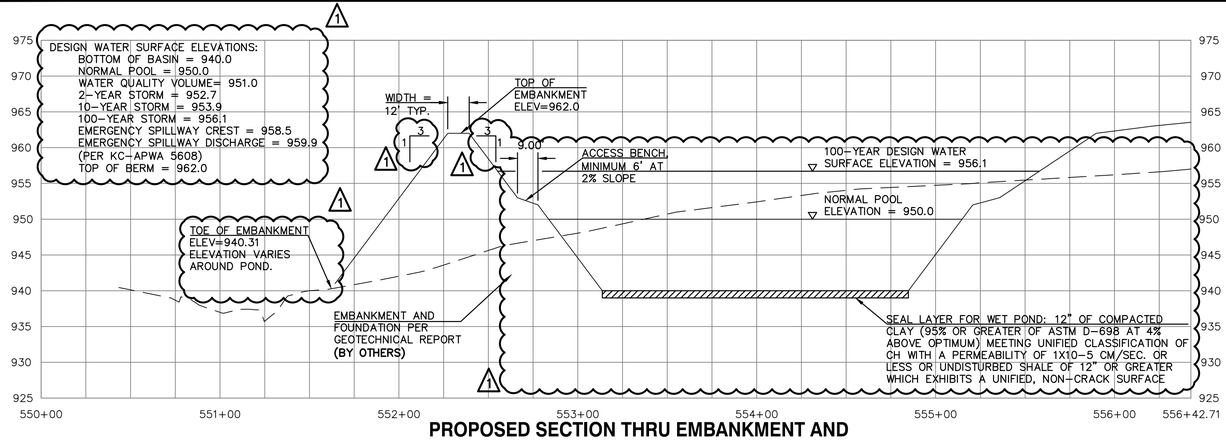
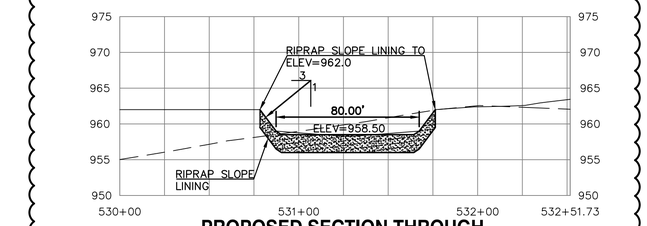
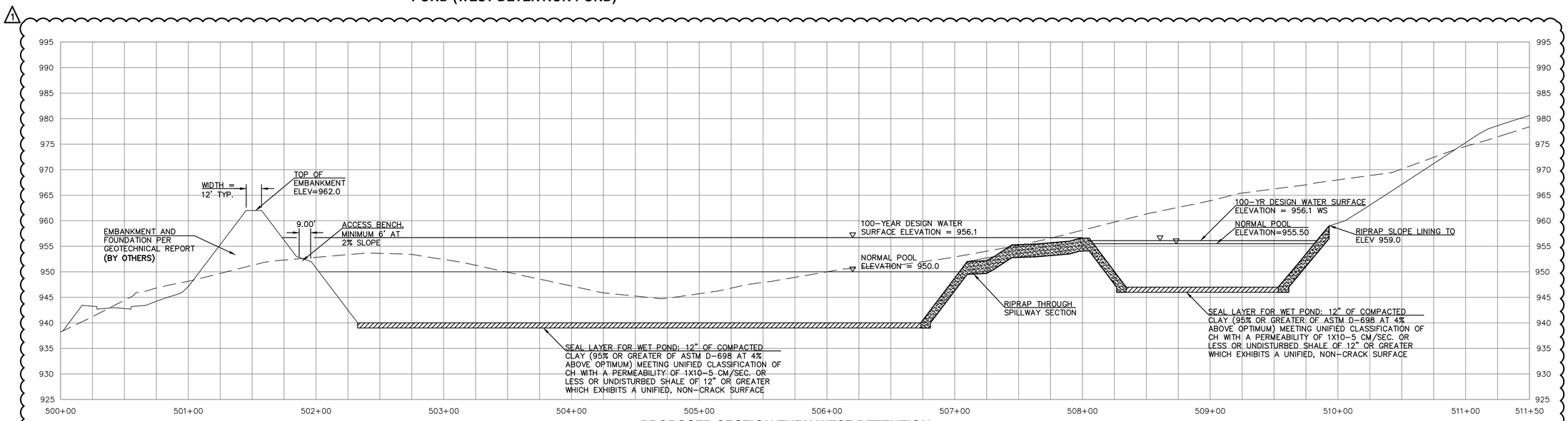


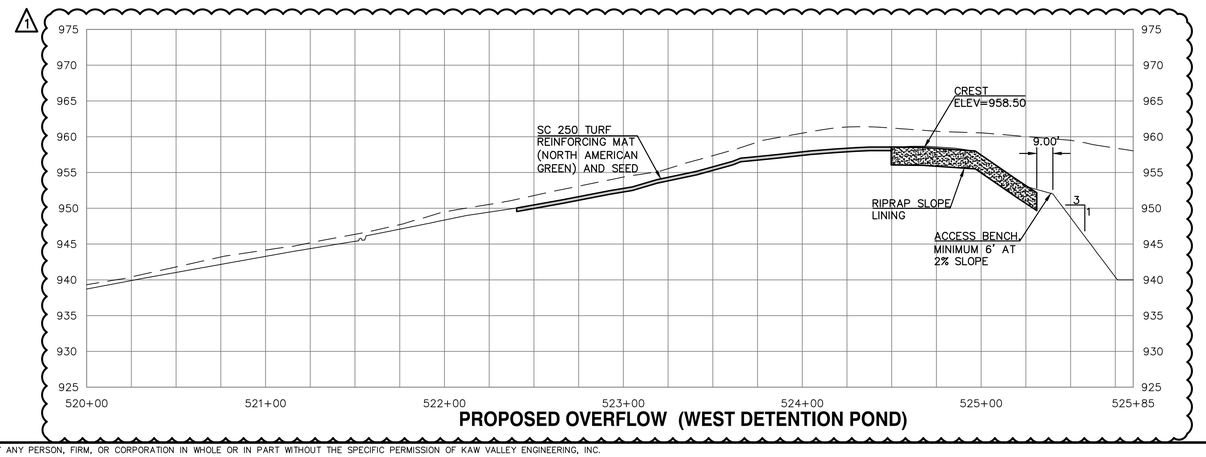
PROPOSED SECTION THRU EMBANKMENT AND POND (WEST DETENTION POND)



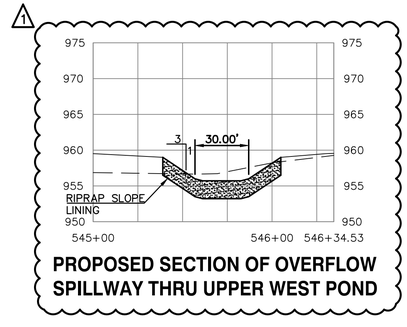
PROPOSED SECTION THROUGH OVERFLOW SPILLWAY IN THE WEST DETENTION POND



PROPOSED SECTION THRU WEST DETENTION POND AND UPPER WEST POND



PROPOSED OVERFLOW (WEST DETENTION POND)



PROPOSED SECTION OF OVERFLOW SPILLWAY THRU UPPER WEST POND

SCALE: 1" = 40'

SCALE: 1" = 10'

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
WEST DETENTION BASIN PROFILE

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

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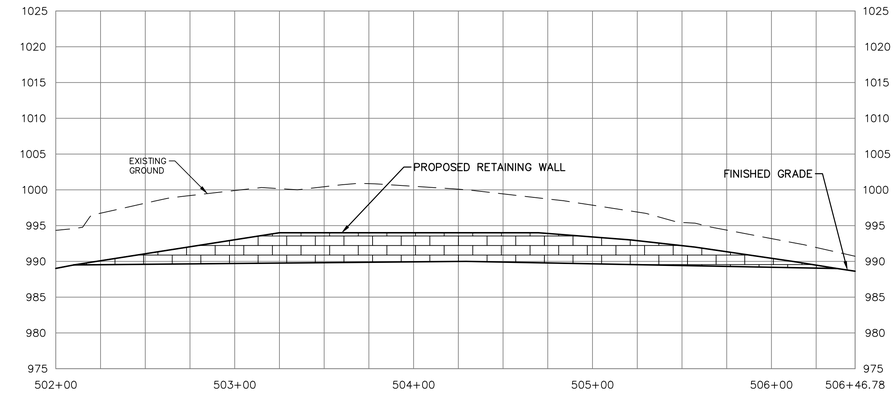
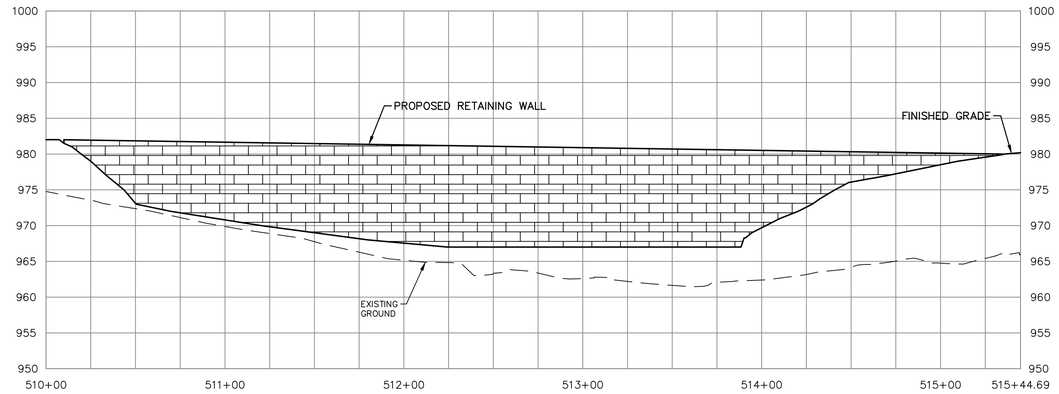
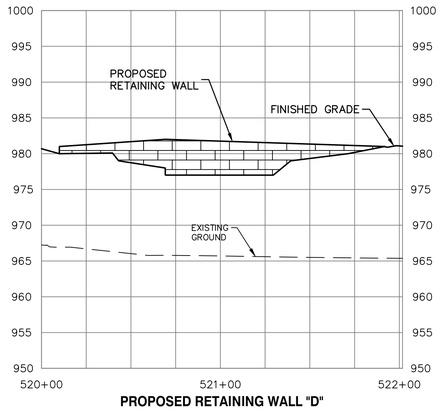


PROPOSED RETAINING WALL "B"



PROPOSED RETAINING WALL "C"



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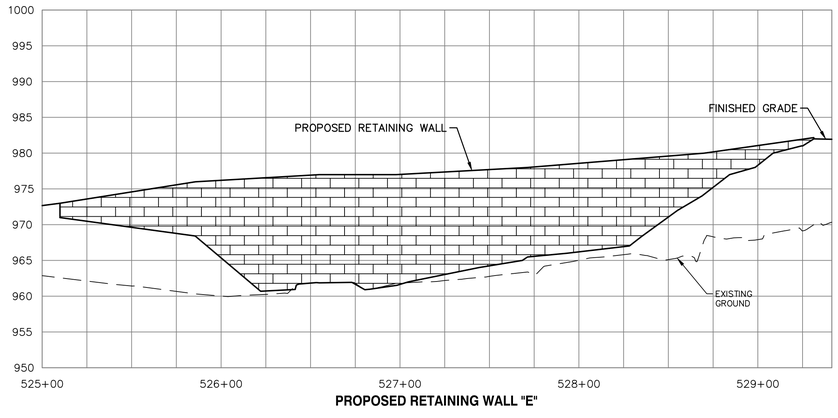
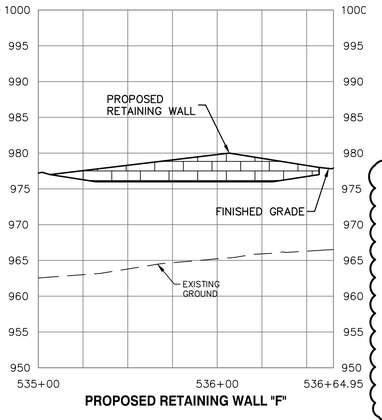
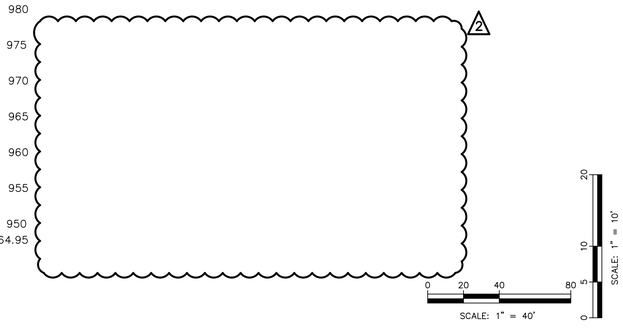
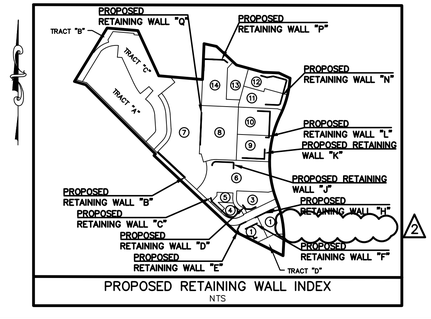


PROPOSED RETAINING WALL "E"



PROPOSED RETAINING WALL "F"





PROPOSED RETAINING WALL INDEX
NTS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
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STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
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E-21726
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
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MO # 021726

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STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
RETAINING WALL PROFILES - B THRU G

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_RWALLPP
SHEET	C-39
REV	2

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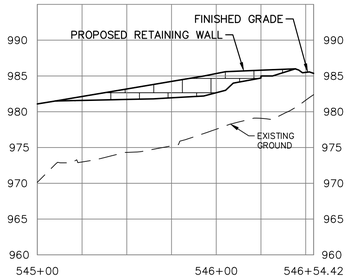
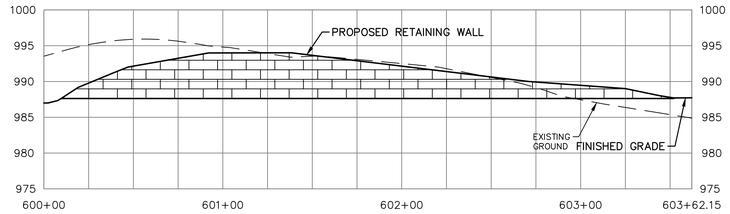
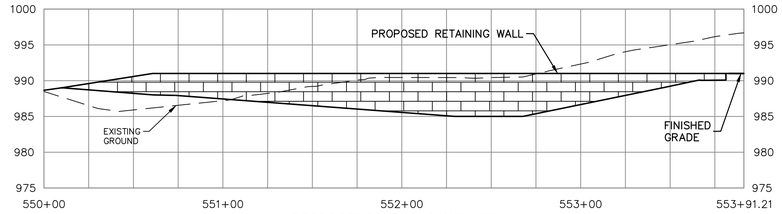


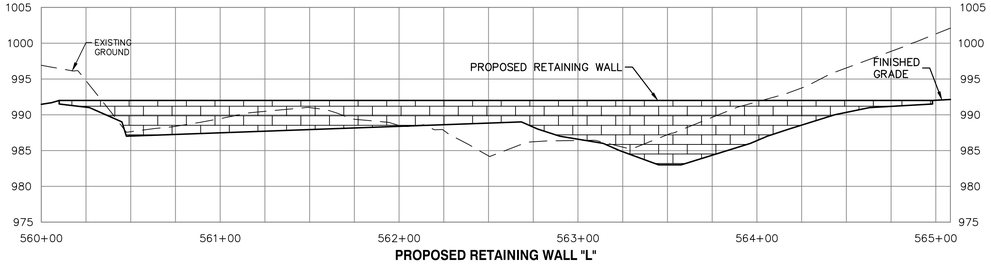
PROPOSED RETAINING WALL "H"



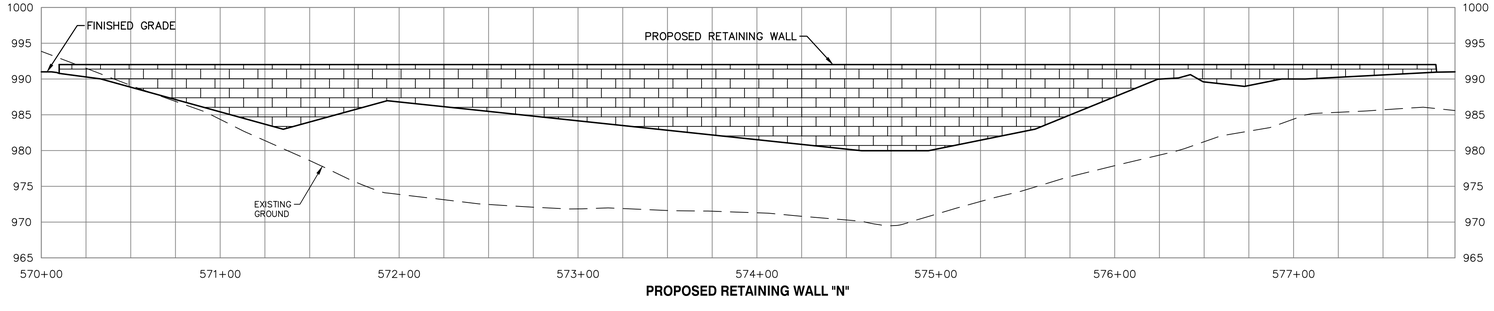
PROPOSED RETAINING WALL "J"



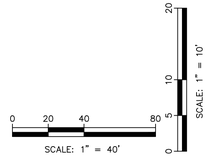
PROPOSED RETAINING WALL "K"

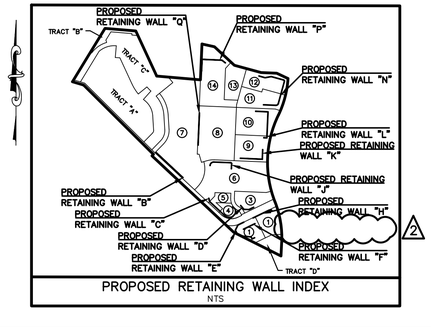


PROPOSED RETAINING WALL "L"



PROPOSED RETAINING WALL "N"





PROPOSED RETAINING WALL INDEX
NTS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
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1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-5-19

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
KANSAS CITY, KANSAS 66117
PH. (785) 760-0041 | FAX (785) 842-7744
jo@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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
RETAINING WALL PROFILES - H THRU L & N

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067-1G_RWALLPP
SHEET	C-40
REV	2

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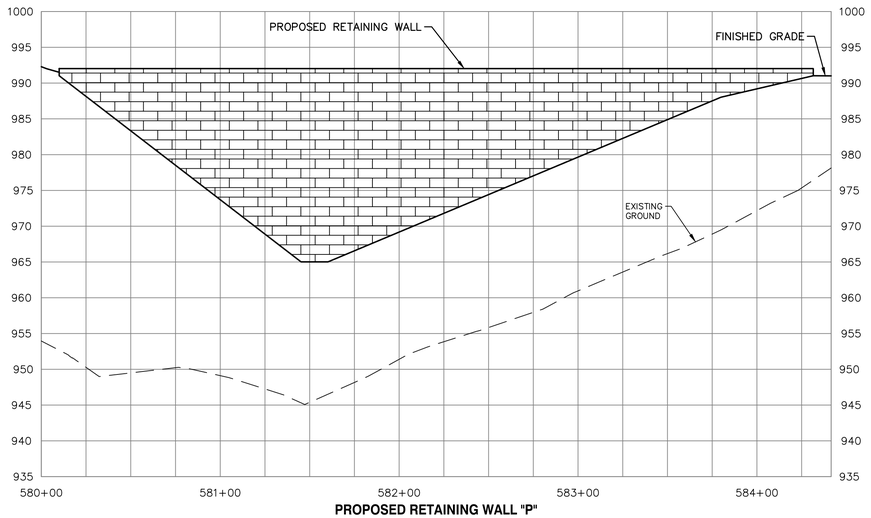
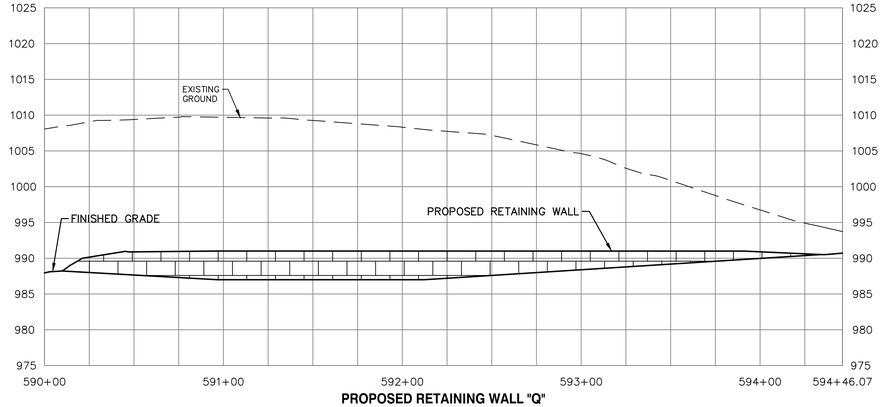


PROPOSED RETAINING WALL "P"



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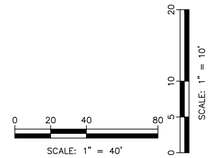

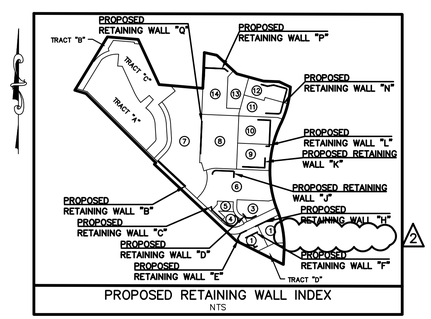

PROPOSED RETAINING WALL INDEX
NTS

REV	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER
E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
RETAINING WALL PROFILES - P & Q

PROJ. NO.	A14_7067-1
DESIGNER	LDO
DRAWN BY:	JT
CFN	7067-1G_RWALLPP
SHEET	C-41
REV	2

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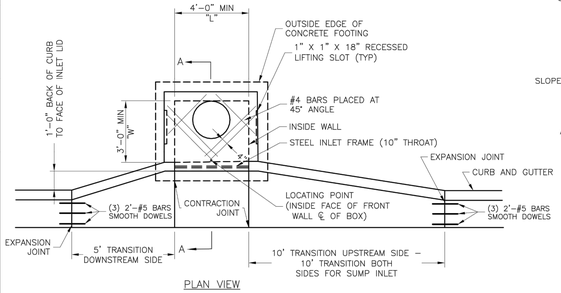
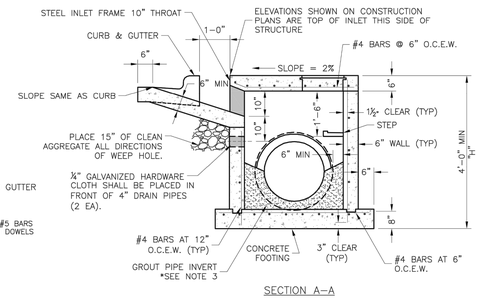
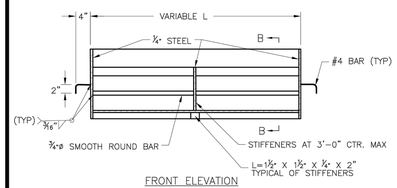


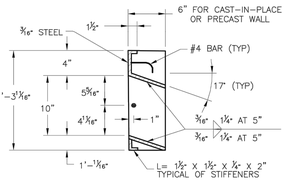
PLAN VIEW



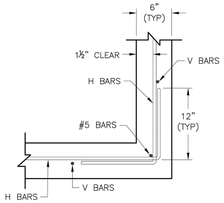
SECTION A–A



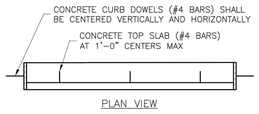
FRONT ELEVATION



SECTION B–B



WALL CORNER DETAIL



PLAN VIEW

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.

1 NOTE:
FOR ALL INLETS EXCEEDING 7'–0" IN DEPTH, THE PRECAST INLET MANUFACTURER SHALL PROVIDE AN ENGINEERED DESIGN

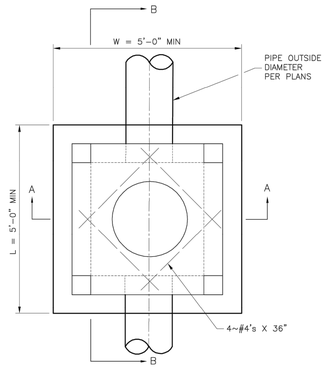
GENERAL NOTES:
1. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION.
2. FLOW LINES LISTED ON THE PROJECT PLANS ARE LISTED AT THE INSIDE FACE OF THE WALL.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.
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 A 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

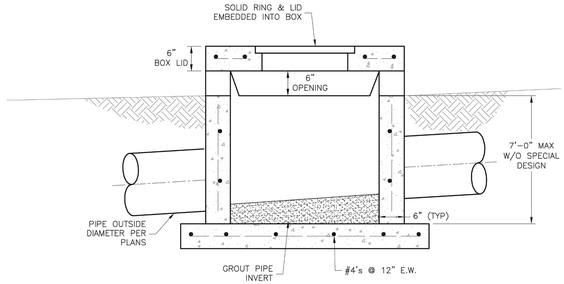
STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
Sheet Name: CURB INLET DETAIL
Project:

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

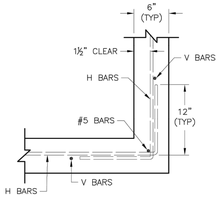
STM-1



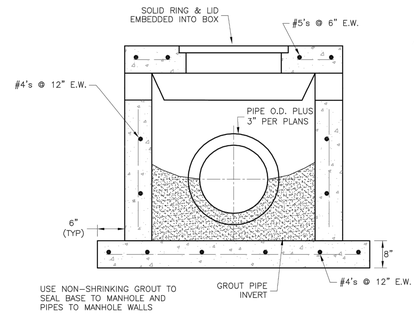
PLAN VIEW



SECTION B–B



WALL CORNER DETAIL



SECTION A–A

1 NOTE:
FOR ALL INLETS EXCEEDING 7'–0" IN DEPTH, THE PRECAST INLET MANUFACTURER SHALL PROVIDE AN ENGINEERED DESIGN

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

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

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

STM-2

REV	DATE	DESCRIPTION	DSN	DWN	CHK
					LDO
				JT	LDO
			LDO		
1	5–16–19	REVISED PER CITY COMMENTS			
0	1–16–19	INITIAL ISSUE			

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
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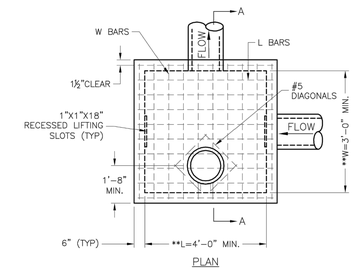
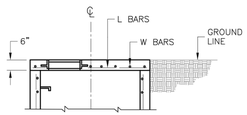
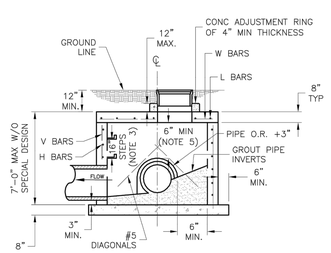


PLAN

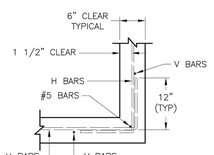


SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

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



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.

REINFORCING

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

1 SEE SHEET 43 FOR MODIFIED TOP FOR GRATE INLET

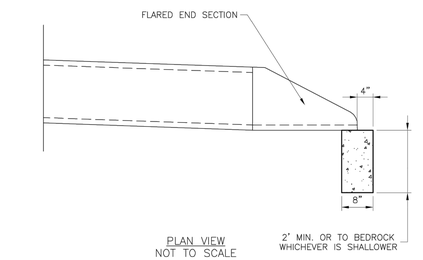
1 NOTE:
FOR ALL INLETS EXCEEDING 7'–0" IN DEPTH, THE PRECAST INLET MANUFACTURER SHALL PROVIDE AN ENGINEERED DESIGN

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

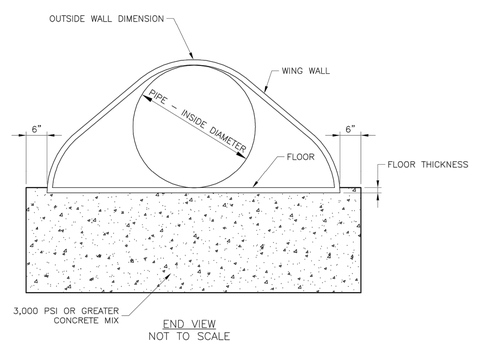
STANDARD DETAILS
CITY OF LEE'S SUMMIT, MO
LEE'S SUMMIT, JACKSON COUNTY, MO
Sheet Name: JUNCTION BOX DETAIL
Project:

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

STM-3



PLAN VIEW
NOT TO SCALE



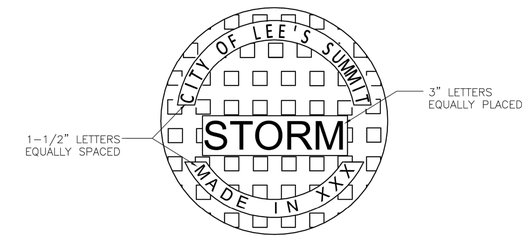
END VIEW
NOT TO SCALE

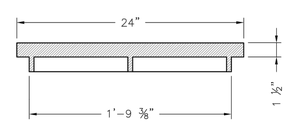
LEE'S SUMMIT MISSOURI
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

1 MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER DETAIL SHEET

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

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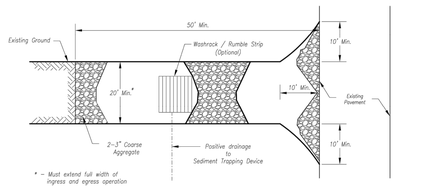
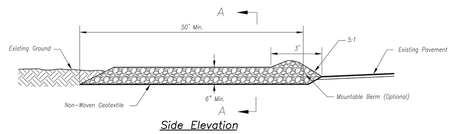
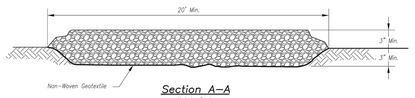


Plan View
Not to Scale



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

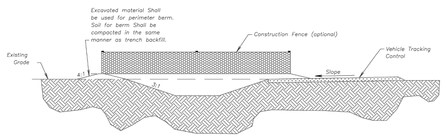
Construction Entrance modified from 2015 Overland Park Standard Details for Erosion and Sediment Control, Concrete Washout modified from 2009 City of Great Bend Standard Drawings.

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.

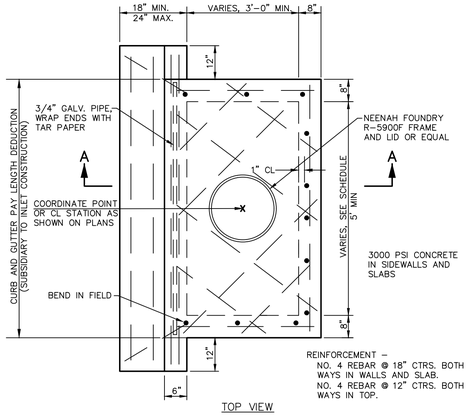
Maintenance for Concrete Washout:

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.

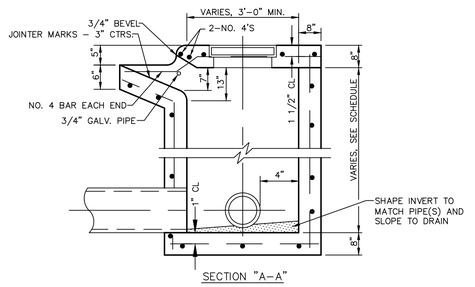


CONCRETE WASHOUT

AMERICAN PUBLIC WORKS ASSOCIATION	KANSAS CITY METRO CHAPTER
CONSTRUCTION ENTRANCE AND CONCRETE WASHOUT	STANDARD DRAWING NUMBER ESC-01 ADOPTED: 10/24/2016



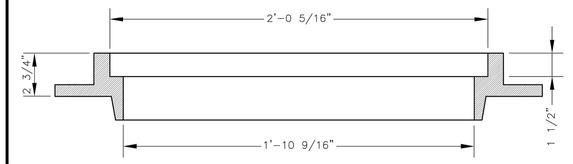
TOP VIEW



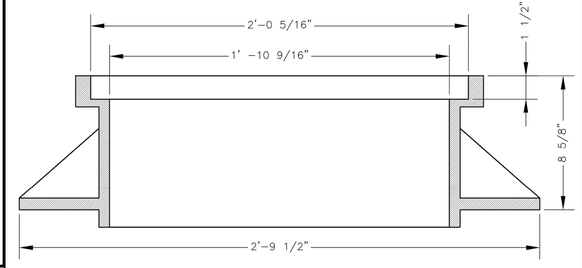
SECTION "A–A"

NOTES:
1. USE 4000 P.S.I. CONCRETE IN SIDE WALL AND SLAB.
2. PROVIDE 3/4" ROUNDED EDGE ON ALL EXPOSED CORNERS.
3. WHERE INLETS ARE SET IN CURVES, FORM FRONT WALL TO CONFORM TO CURVE.
4. PRE–CAST UNITS MAY BE SUBSTITUTED WITH THE ENGINEERS APPROVAL. SHOP DRAWINGS AND DESIGN CALCULATIONS MUST BE SUBMITTED.
5. THE TOP OF THE INLET SHALL BE SLOPED TO FIT STREET, SIDEWALK, OR FINISHED GROUND ELEVATIONS

CURB INLET 402



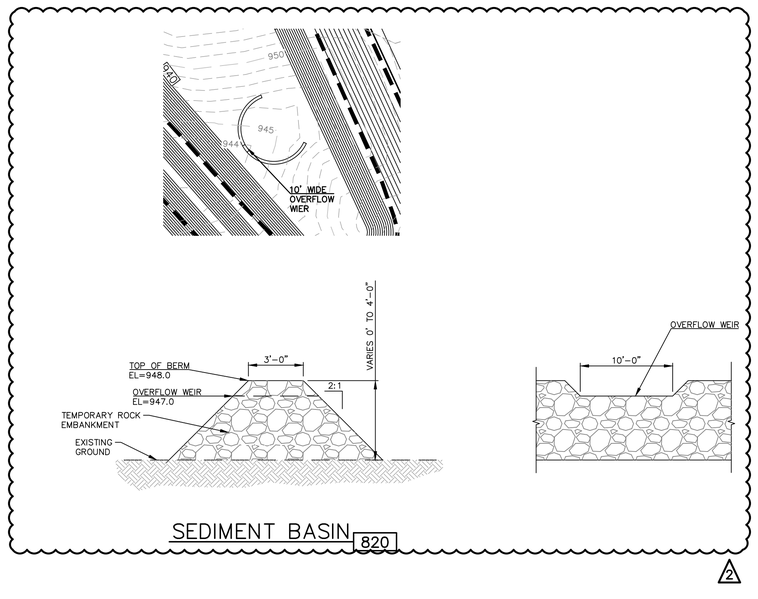
SLAB MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS103A
MINIMUM WEIGHT = 145 LB



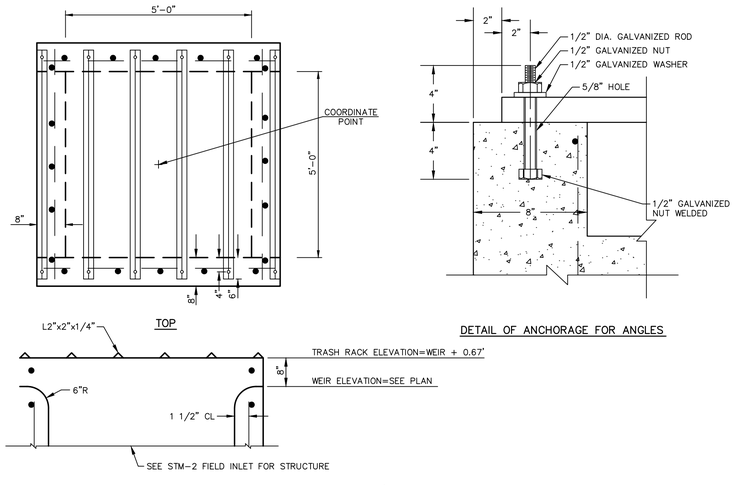
STANDARD 24" MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS101A
MINIMUM WEIGHT = 250 LB

*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



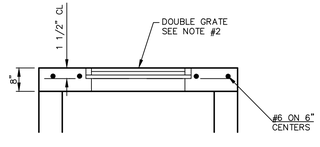
SEDIMENT BASIN 820



DETAIL OF ANCHORAGE FOR ANGLES

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

SPECIAL TRASH RACK AND GRATE INLET DETAIL 400



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@8"
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:
1. L AND W BARS SHALL BE #6@6" CENTER
2. GRATE – R–6673–J, USE R–6673–0 WHERE DOUBLE GRATE IS SPECIFIED UNLESS OTHERWISE NOTED ON SITE GRADING PLAN.

ALTERNATE TOP TO STM–3 FOR DOUBLE GRATE INLET

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7–3–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5–16–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

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) 452-7744
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

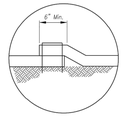
STREETS OF WEST PRYOR
NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
STORM SEWER DETAIL & EROSION CONTROL DETAIL SHEET

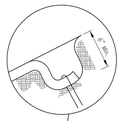
PROJ. NO.	A14_7067–1
DESIGNER	LDO
DRAWN BY	JT
CFN	7067–1G_DET
SHEET	C–43
REV.	2

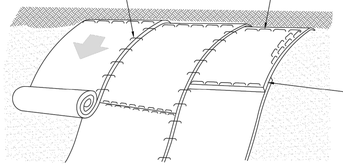
THIS DRAWING SHALL NOT BE UTILIZED BY ANY PERSON, FIRM, OR CORPORATION IN WHOLE OR IN PART WITHOUT THE SPECIFIC PERMISSION OF KAW VALLEY ENGINEERING, INC.

Longitudinal Seam

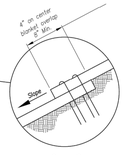


Anchor Slot





Installation on Slopes



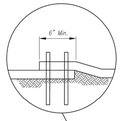
General Notes:

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.

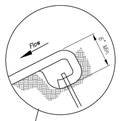
Maintenance:

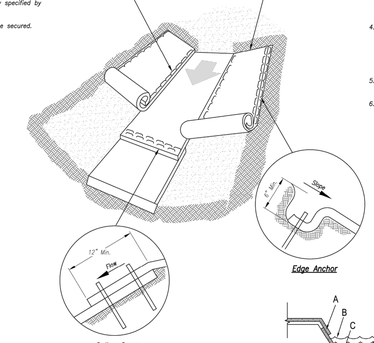
1. Torn or degraded product shall be repaired or replaced, unless such degradation is within the functional longevity specified by the manufacturer.
2. Edges or seams that are loose or frayed shall be secured.

Longitudinal Seam



Anchor Fold



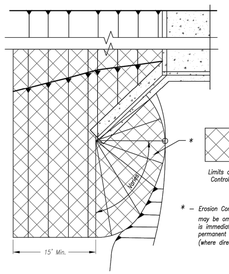


Splice Seam

Edge Anchor

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.



Partial Box Culvert Plan
Not to Scale

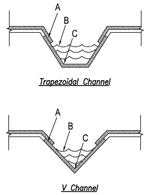
* – Erosion Control Blanket or TRM may be omitted if the area is immediately covered by permanent slope protection (where directed by the plans)

Installation Around Culvert Slope

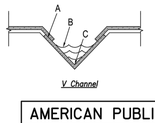
Notes for Installation on Slopes:

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.

Installation in Channels



Trapezoidal Channel



V Channel

Critical Points:

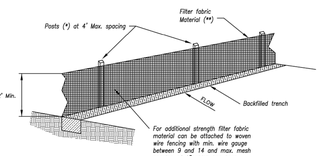
A – Overlaps and seams;

B – Projected water line;

C – Channel bottom / side slope vertices;

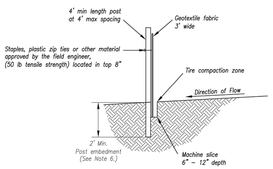
Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

AMERICAN PUBLIC WORKS ASSOCIATION	
KANSAS CITY METRO CHAPTER	
EROSION CONTROL BLANKETS AND TURF REINFORMENT MATS	STANDARD DRAWING NUMBER ESC-02 ADOPTED: 10/24/2016



(*) *POSTS*
- MIN. LENGTH 4'
- HARDWOOD 1 ⅜" x 1 ⅜"
- NO.2 SOUTHERN PINE 2 ⅜" x 2 ⅜"
- 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 silcing machine cannot be reasonably used.

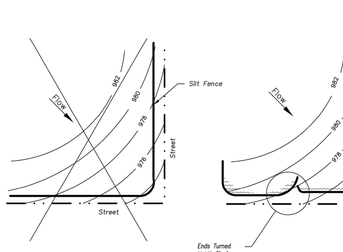
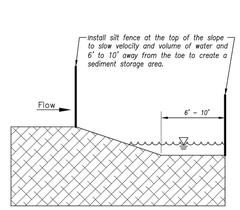


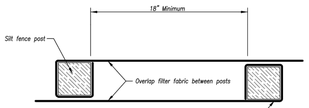
Figure A



SILT FENCE LAYOUT
Not to Scale

Maintenance:

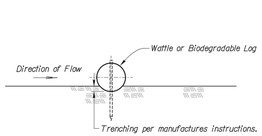
1. Remove and dispose of sediment deposits when the deposit approaches ½ the height of silt fence.
2. Repair as necessary to maintain function and structure.



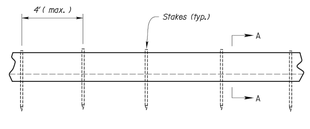
JOINING FENCE SECTIONS
Not to Scale

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

AMERICAN PUBLIC WORKS ASSOCIATION	
KANSAS CITY METRO CHAPTER	
SILT FENCE	STANDARD DRAWING NUMBER ESC-03 ADOPTED: 10/24/2016



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".

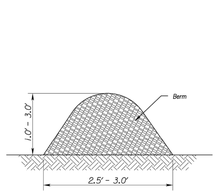


Figure 1
(Perimeter Control)

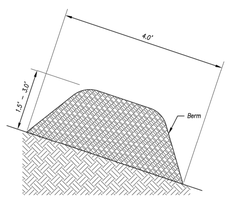


Figure 2
(Steep Slopes)

MULCH OR COMPOST FILTER BERMS

Notes for Mulch and Compost Filter Beam:

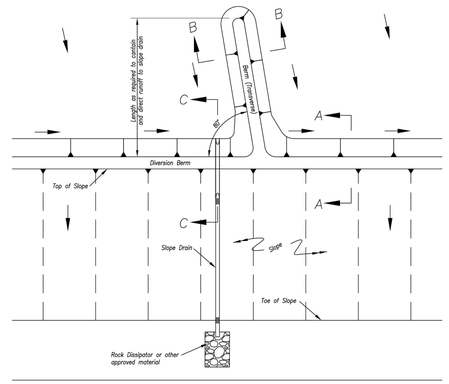
1. The sediment control berm shall be placed uncompacted in a windrow at locations shown on the plans or as directed by the engineer.
2. Parallel to the base of the slope, or around the perimeter of other affected areas, construct a 1 to 3 foot high by 2.5 to 3 foot wide berm (see Figure 1). For maximum 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



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.

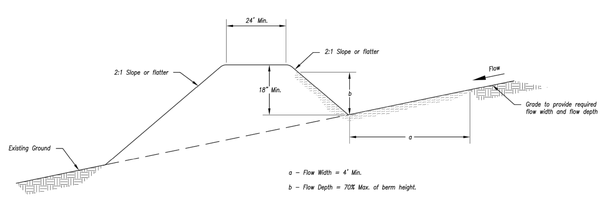
Notes for Slope Drain:

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.

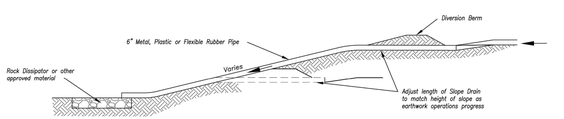
Maintenance:

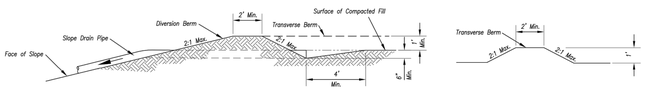
1. Accumulation of any visible sediment at the inlet and outlet shall be removed promptly.
2. Outlet conditions shall be repaired if scour is observed. Leaking or damaged section of pipe shall be repaired immediately.
3. Barriers directing water to the inlet shall be monitored for continuity and effectiveness.

TYPICAL PROFILE OF DIVERSION BEAM
Not to Scale



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	
DIVERSION BERMS AND SLOPE DRAINS	STANDARD DRAWING NUMBER ESC-05 ADOPTED: 10/24/2016

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7-3-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5-16-19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1-16-19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
REGISTERED PROFESSIONAL ENGINEER
7-3-19

LEON D. OSBOURN
ENGINEER
MO # 021726

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ADVANCE, MO 63730 | KANSAS CITY, MO 64142 – 7744
PH. (785) 210-2041 | FAX (785) 242-7744
jason@kvaeng.com | www.kvaeng.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 RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL DETAIL SHEET

PROJ. NO. A14_7067-1
DESIGNER LDO
DRAWN BY JT
CFN 7067-1G_DET
SHEET C–44
REV 2

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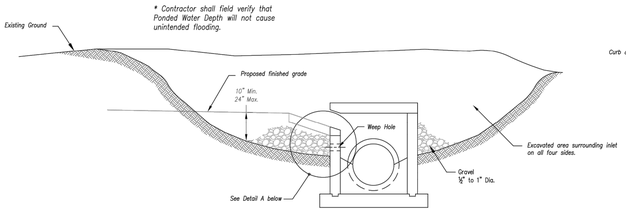
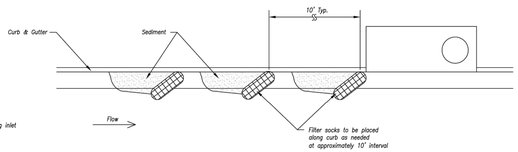
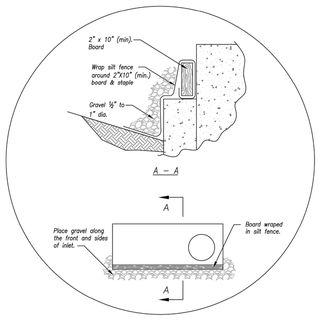
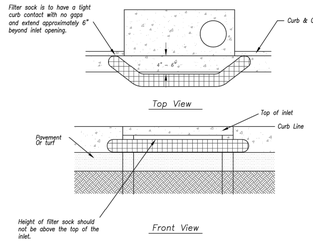




On Grade Curb Inlet Protection



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



Sump Inlet Sediment Filter

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.

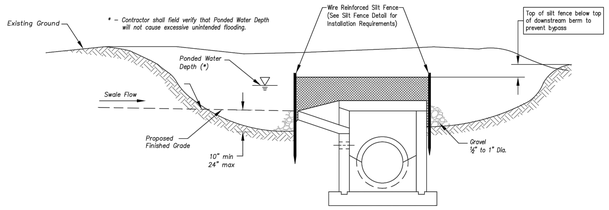
Maintenance:

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.

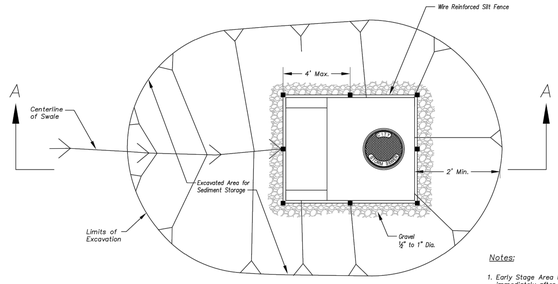
LATE STAGE CURB INLET
(After Pouring Curb and Inlet Throat)

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



Section A–A
Not to Scale

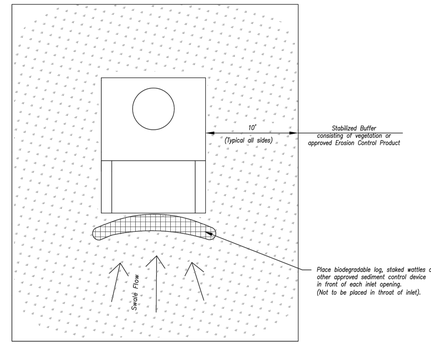


Plan
Not to Scale

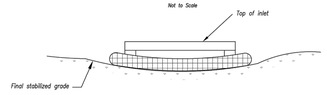
EARLY STAGE AREA INLET
(All open boxes and inlets not at final grade)

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.



Plan
Not to Scale



Front View

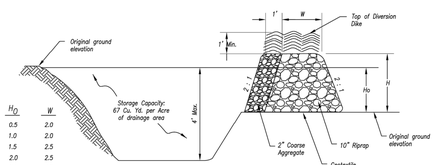
LATE STAGE AREA INLET
(Area inlets at final grade and existing inlets)

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.

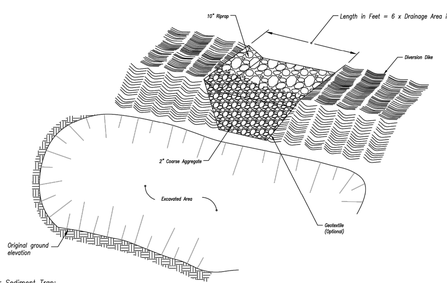
Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

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



H	Ho	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.

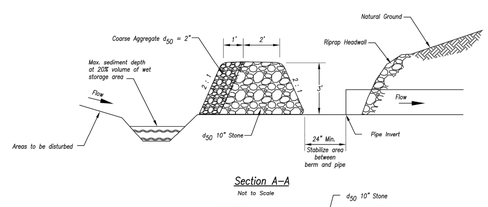
Maintenance for Sediment Trap:

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.

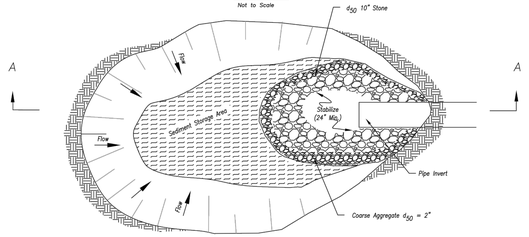
Notes for Sediment Trap:

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.

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.

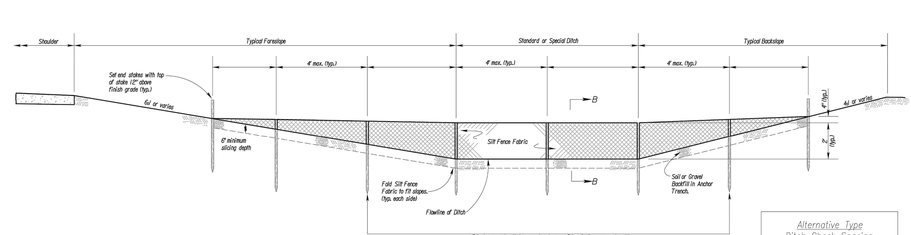
SEDIMENT TRAP AT CULVERT OPENING

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

Notes for Silt Fence Ditch Check:

1. Stakes shall be 4" (min.) long and one of the following materials:
   a. Hardwood – 1 ⅜" x 1 ⅜";
   b. Southern Pine (No. 2) – 2 ⅜" x 2 ⅜";
   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.

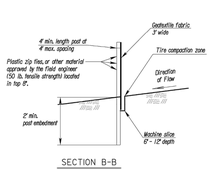


Stakes shall be set at an 2' minimum depth

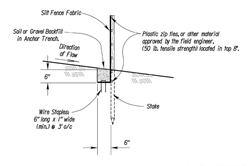
TYPICAL ELEVATION

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.



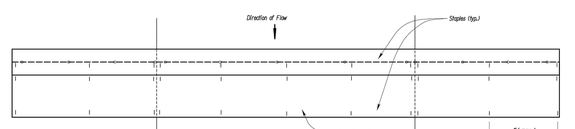
SECTION B-B



SILT FENCE DITCH CHECK
NO SCALE

Notes for Wattles and Biodegradable Log Ditch Check:

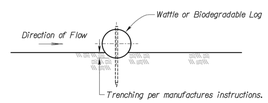
1. Use as many biodegradable log sections as necessary to ensure water does not flow around end of ditch check.
2. Overlap sections a minimum of 18"
3. Stakes shall be per manufacturer's instructions. Length of stakes shall be a minimum of 2 times the diameter of the log or 24" minimum.
4. Use Erosion 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.



TYPICAL ELEVATION

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.



SECTION B - B

AMERICAN PUBLIC WORKS ASSOCIATION	
Kansas City Metro Chapter APWA 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

REV.	DATE	DESCRIPTION	DSN	DWN	CHK
2	7–3–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5–16–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7-5-19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

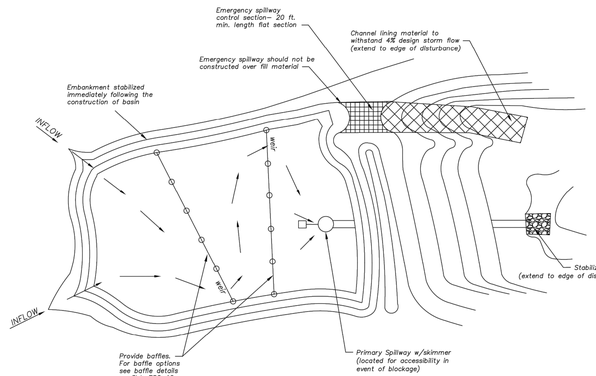
KAW VALLEY ENGINEERING
2319 N. JACKSON | P.O. BOX 1304
PH: (785) 762-5040 | FAX: (785) 762-7744
jo@kveng.com | www.kveng.com
KAW VALLEY ENGINEERING, INC., IS AUTHORIZED TO OFFER ENGINEERING SERVICES BY MISSOURI STATE CERTIFICATE OF AUTHORITY # 000842. EXPIRES 12/31/19

STREETS OF WEST PRYOR
NW/Q NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL DETAIL SHEET

PROJ. NO.	A14_7067–1	
DESIGNER	LDO	DRAWN BY: JT
CFN	7067–1G_DET	
SHEET	C–45	REV 2

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.

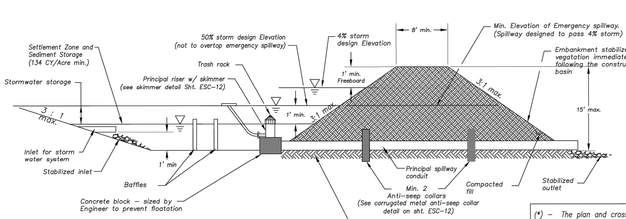


Plan View (*)
Not to Scale

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



Cross Section (*)
Not to Scale

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

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:

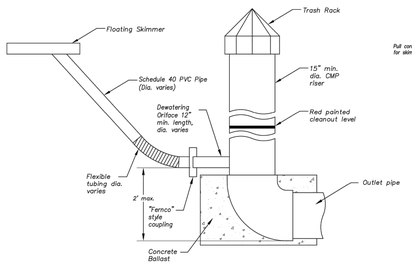
1. Check temporary sediment basins after periods of significant runoff.
2. Remove sediment and restore the basin to its original dimensions when sediment accumulates to 20% of the storage capacity.
3. Immediately repair any erosion damage to the embankment and outlets.
4. Repair and/or replace baffles 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.

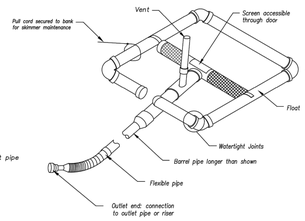
AMERICAN PUBLIC WORKS ASSOCIATION
Kansas City Metro Chapter
KANSAS CITY METRO CHAPTER

SEDIMENT BASIN

STANDARD DRAWING NUMBER ESC–11
ADOPTED: 10/24/2016

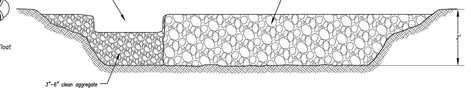


PRINCIPAL SPILLWAY DETAIL

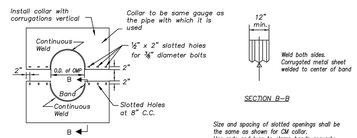


SKIMMER DETAIL (Typ.) *

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

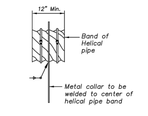


Option A – Rock with Weir

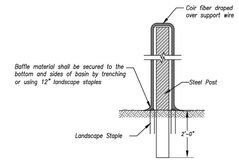


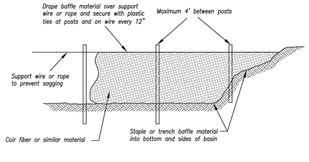
SECTION B–B

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.

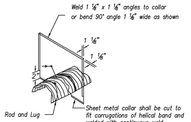


PARTIAL ELEVATION

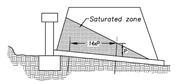




Option B – Coir Fiber Material



ISOMETRIC VIEW



ANTI–SEEPAGE COLLAR LOCATIONS

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. 14ø" = 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) ⅝" 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".

CORRUGATED METAL ANTI–SEEPAGE COLLAR DETAIL
Not to Scale

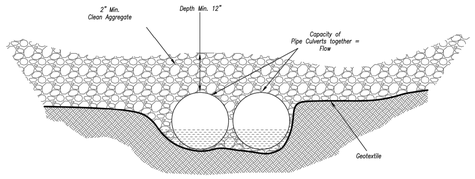
Modified from 2015 Overland Park Standard Details for Erosion and Sediment Control.

BAFFLE DETAILS
Not to Scale

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

SEDIMENT BASIN – DETAILS

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



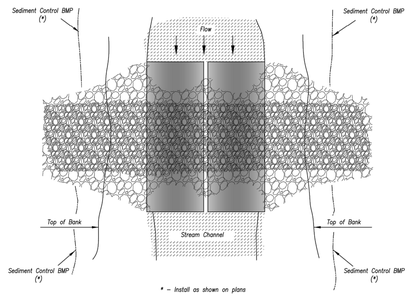
ELEVATION

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:

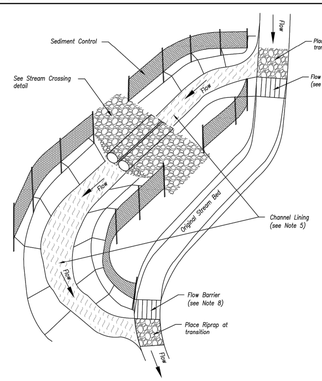
1. Clearing and excavation of the stream bed and banks shall be kept to a minimum.
2. Place one pipe, buried 6" into the stream bottom, at the lowest point of the channel to allow the passage of aquatic organisms. Additional pipes shall be placed along the remainder of the stream channel bottom such 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 shall 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.

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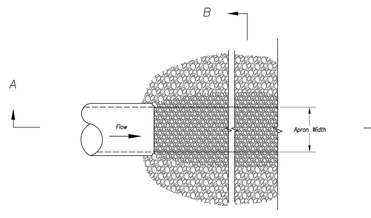
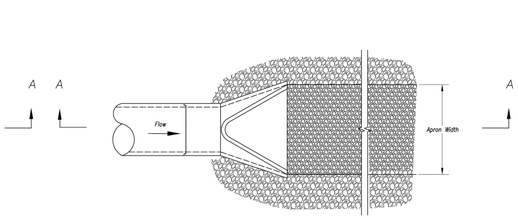
STREAM CROSSINGS AND DIVERSION CHANNELS

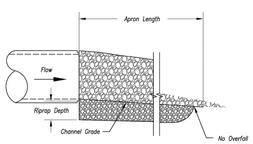
STANDARD DRAWING NUMBER ESC–13
ADOPTED: 10/24/2016



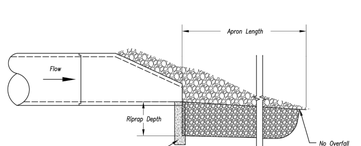
Plan View
Not to Scale



Plan View
Not to Scale

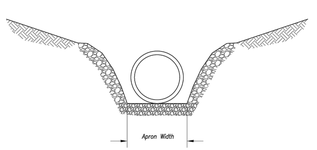


Section A–A
Not to Scale



Section A–A
Not to Scale

OUTLET PROTECTION WITH END SECTION



Section B–B
Not to Scale

OUTLET PROTECTION W/O 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.

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OUTLET PROTECTION

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

REV	DATE	DESCRIPTION	DSN	DWN	CHK
2	7–3–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
1	5–16–19	REVISED PER CITY COMMENTS	LDO	JT	LDO
0	1–16–19	INITIAL ISSUE	LDO	JT	LDO

STATE OF MISSOURI
LEON D. OSBOURN
NUMBER E-21726
7–5–19
REGISTERED PROFESSIONAL ENGINEER

LEON D. OSBOURN
ENGINEER
MO # 021726

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STREETS OF WEST PRYOR

NWQ NW PRYOR RD & NW LOWENSTEIN DR
LEE'S SUMMIT, MISSOURI

MASS GRADING & STORM SEWER IMPROVEMENTS
EROSION CONTROL DETAIL SHEET

PROJ. NO. A14_7067–1
DESIGNER LDO | DRAWN BY JT
CFN 7067–1G_DET
SHEET C–46 | REV 2

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