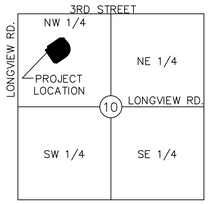
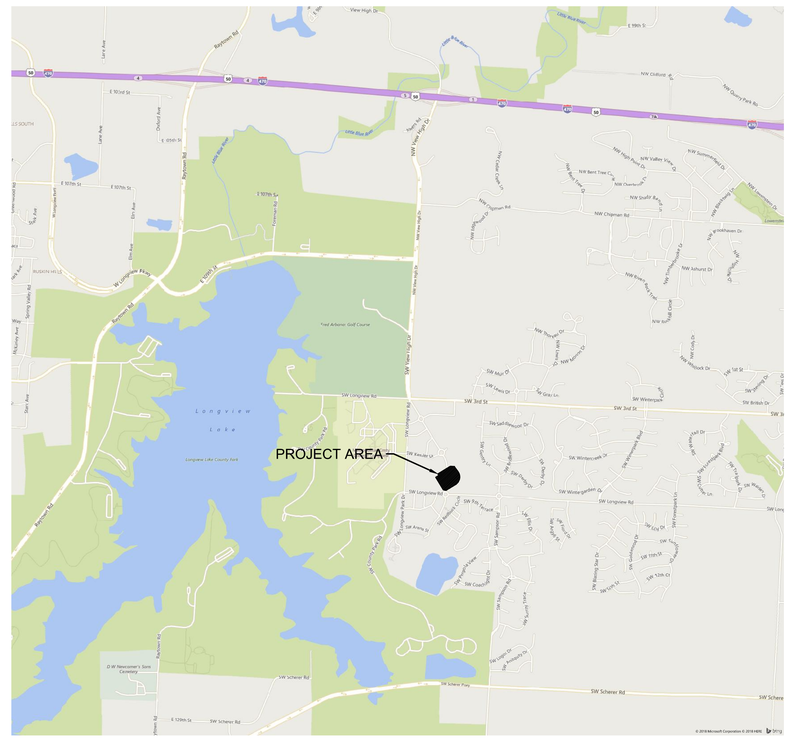
KESSLER RIDGE APARMENTS
PUBLIC STORM SEWER PLANS

SECTION 10, TOWNSHIP 47 N, RANGE 32 W
IN LEE'S SUMMIT, JACKSON COUNTY, MO



LOCATION MAP
Sec. 10, Twp. 47 N., Rge. 32 W.
(N.T.S.)

PROJECT TEAM & UTILITY CONTACT LIST	
OWNER / DEVELOPER THE YARCO COMPANIES 7920 WARD PKWY KANSAS CITY, MISSOURI 64114 CONTACT: GRUBE, MIKE PHONE: 816.300.0640 FAX: 816.389.5640	UTILITY SERVICE NUMBERS NAME: LEE'S SUMMIT PUBLIC WORKS PHONE: 816–969–1800 NAME: LEE'S SUMMIT WATER & SERVICES DEPARTMENT PHONE: 816–969–1940 NAME: SPIRE (MGE) PHONE: 314–342–0500 NAME: AT&T PHONE: 800–286–8313 NAME: KCP&L PHONE: 816–471–5275 NAME: SPECTRUM (TWC) PHONE: 877–772–2253 NAME: GOOGLE FIBER PHONE: 877–454–6959
ENGINEER OLSSON ASSOCIATES 1301 BURLINGTON, SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: NICHOLAS D. HEISER, P.E. PHONE: 816.587.4320	
SURVEYOR OLSSON ASSOCIATES 1301 BURLINGTON, SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: JASON ROUDEBUSH PHONE: 816.587.4320	



PROPERTY DESCRIPTION:

LOT 2, MINOR PLAT OF FASCINATION AT NEW LONGVIEW, LOTS 1 & 2, A SUBDIVISION IN LEE'S SUMMIT, JACKSON COUNTY, MISSOURI. CONTAINING 6.76 ACRES MORE OR LESS.

BENCHMARK

THE STATION IS A KC METRO DISK SET IN CONCRETE AND FLUSH WITH THE GROUND. THE STATION IS TAMPED JA–147, 2000. STATION JA–148

Sheet List Table	
Sheet Number	Sheet Title
C401	TITLE SHEET
C402	GENERAL NOTES
C403	GENERAL LAYOUT
C404	STORM SEWER PLAN & PROFILE
C405	DRAINAGE PLAN
C406	10 YR DRAINAGE TABLES
C407	100 YR DRAINAGE TABLES
C408	STORM DETAILS
C409	STORM DETAILS

OLSSON ASSOCIATES HAS BEEN RETAINED TO PROVIDE AS-BUILT DRAWINGS FOR THIS PROJECT.

NICHOLAS D. HEISER, P.E. — 04/20/18
CIVIL ENGINEER — DATE
MO#2015000555

CALL BEFORE YOU DIG 1-800-DIG-RITE MISSOURI ONE CALL SYSTEM

OLSSON ASSOCIATES
MO Certificate of Authority #001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

STATE OF MISSOURI — NICHOLAS D. HEISER — NUMBER PE-2015000555 — PROFESSIONAL ENGINEER — 04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

TITLE SHEET
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C401

DWG: F:\2017\3501–4000\017–3697\40–Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_TTL01_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:44pm

GENERAL NOTES:

1. THE CONSTRUCTION COVERED BY THESE PLANS SHALL CONFORM TO THE LEE'S SUMMIT, MISSOURI DESIGN AND CONSTRUCTION MANUAL AS ADOPTED BY ORDINANCE 5813. WHERE DISCREPANCIES EXIST BETWEEN THESE PLANS AND THE DESIGN AND CONSTRUCTION MANUAL, THE DESIGN AND CONSTRUCTION MANUAL SHALL PREVAIL.

2. ALL MANHOLES, CATCH BASINS, UTILITY VALVES, AND METER PITS TO BE ADJUSTED OR REBUILT TO GRADE AS REQUIRED.

3. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTROL DOWNSTREAM EROSION AND SILTATION DURING ALL PHASES OF CONSTRUCTION. EROSION CONTROL PLANS AND PROCEDURES SHALL BE IN PLACE PRIOR TO ANY EXCAVATION.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RECORDING ROCK ELEVATIONS AT 25 FOOT (MAXIMUM) INTERVALS WHERE ENCOUNTERED, AND FURNISHING THIS INFORMATION TO THE DESIGN ENGINEER FOR USE ON "AS-BUILT" PLANS.

5. THE LOCATIONS OF EXISTING UTILITIES AS SHOWN ARE APPROXIMATE. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES.

6. NO SUBSURFACE EXPLORATION FOR THE DETERMINATION OF AND/OR THE LOCATION OF EXISTING ROCK HAS BEEN MADE.

7. CONTRACTOR SHALL PROVIDE EARTHWORK AND MATERIAL TESTING TO COMPLY WITH THE STANDARD SPECIFICATIONS OF THE PUBLIC WORKS DEPARTMENT OR AS REQUIRED BY THE CITY'S FIELD REPRESENTATIVE.

8. CONTRACTOR MUST CONTACT PUBLIC WORKS INSPECTIONS AT 816-969-1827 48 HOURS PRIOR TO ANY CONSTRUCTION ACTIVITIES.

LEGEND

GENERAL	
ACU	AIR CONDITIONING UNIT
AST	ARROW STRAIGHT
ATL	ARROW TURN LEFT
ATR	ARROW TURN RIGHT
BLB	BILLBOARD
BOV	BLOW OFF VALVE
BSH	BUSH
COL	COLUMN
CTR	CONIFEROUS TREE
DRN	DRAIN GRATE
DTR	DECIDUOUS TREE
FLP	FLAG POLE
GDP	GUARD POST
GPL	GUY POLE
GTP	GREASE TRAP
GUY	GUY WIRE
HCP	ACCESSABLE PARKING MARKER
LST	LIFT STATION
MLB	MAILBOX
MP	MILE POST MARKER
MWL	MONITORING WELL
PIV	POST INDICATOR VALVE
PPT	PROPANE TANK
RAT	RADIO TOWER
SAD	SATELLITE
SCV	SPRINKLER CONTROL VALVE
SGN	SIGN
SLB	STREET LIGHT BOX
SLC	STREET LIGHT CABINET
SPB	SPRINKLER BOX
SPH	SPRINKLER HEAD
STP	STUMP
SVL	SEWER VALVE
TCB	TRAFFIC CONTROL BOX
TSA	TRAFFIC SIGNAL WITH MAST ARM
TSC	TRAFFIC SIGNAL CABINET
TSMH	TRAFFIC SIGNAL MANHOLE
TSP	TRAFFIC SIGNAL POLE
	EXISTING TREELINE
	PROPOSED TREELINE
	EXISTING SIDEWALK
	PROPOSED SIDEWALK
	EXISTING BUILDINGS
	PROPOSED BUILDINGS
	EXISTING EDGE OF PAVEMENT
	PROPOSED EDGE OF PAVEMENT
	EXISTING ROADWAY CENTER LINE
	PROPOSED ROADWAY CENTER LINE
	EXISTING CURB & GUTTER
	PROPOSED CURB & GUTTER
R	RADIUS
L	ARC DISTANCE
D	DELTA / CENTRAL ANGLE

EASEMENTS & SETBACKS	
A.E.	ACCESS EASEMENT
B.M.P.	BEST MANAGEMENT PRACTICE EASEMENT
B.L.	BUILDING SETBACK
C.T.V.E.	CABLE TV EASEEMNT
C.E.	CONSERVATION EASEMENT
C.G.E.	CONSTRUCTION GRADING EASEMENT
F.P.E.	FLOOD PLAIN EASEMENT
F.O.E.	FIBER OPTIC EASEMENT
F.P.S.E.	FIRE PROTECTION SYSTEM EASEMENT
F.L.E.	FUEL LINE EASEMENT
L.S.E.	LANDSCAPE EASEMENT
G.E.	NATURAL GAS EASEMENT
T.E.	TELEPHONE EASEMENT
E.E.	POWER\ELECTRIC EASEMENT
P.S.	PARKING SETBACK
S.B.	STREAM BUFFER
S.D.E.	SURFACE DRAINAGE EASEMENT
SIGHT DIST. ESMT.	SIGHT DISTANCE EASEMENT
S.E.	SANITARY SEWER EASEMENT
S.L.E.	STEAM LINE EASEMENT
D.E.	STORM DRAINAGE EASEMENT
S.W.M.E.	STORM WATER MANAGEMENT EASEMENT
T.C.D.S.E.	TEMPORARY CUL-DE-SAC EASEMENT
TEMP. ESMT.	TEMPORARY EASEMENT
TRAIL ESMT.	TRAIL\PATH EASEMENT
U.E.	UTILITY EASEMENT
W.E.	WATER EASEMENT
F.Y.S	FRONT YARD SETBACK
R.Y.S.	REAR YARD SETBACK
S.Y.S.	SIDE YARD SETBACK

SURVEY MARKERS	
BMK	BENCHMARK
CPT	CONTROL POINT
FND	FOUND MONUMENT
ROW	ROW MARKER
SCR	SECTION CORNER
SET	SET MONUMENT

BOUNDARIES	
	SECTION LINE
ER	EXISTING PROPERTY BOUNDARY
PL	PROPOSED PROPERTY BOUNDARY
	EXISTING LOT LINE
	PROPOSED LOT LINE
ER/W	EXISTING RIGHT-OF-WAY
PL/W	PROPOSED RIGHT-OF-WAY

UTILITIES	
CAB	CABLE BOX
CAV	CABLE VAULT
TVP	TELEVISION PEDESTAL
TVR	TELEVISION RISER
ECTVOH	EXISTING CABLE TV, OVERHEAD
ECTV	EXISTING CABLE TV, UNDERGROUND
CTVOH	PROPOSED CABLE TV, OVERHEAD
CTV	PROPOSED CABLE TV, UNDERGROUND
FOB	FIBER OPTIC BOX
FOM	FIBER OPTIC MANHOLE
FOP	FIBER OPTIC PEDESTAL
FOV	FIBER OPTIC VAULT
EFOOH	EXISTING FIBER OPTIC, OVERHEAD
EFO	EXISTING FIBER OPTIC, UNDERGROUND
FOOH	PROPOSED FIBER OPTIC, OVERHEAD
FO	PROPOSED FIBER OPTIC, UNDERGROUND
FDC	FIRE DEPT. CONNECTION
EFP	EXISTING FIRE PROTECTION SYSTEM LINE
FP	PROPOSED FIRE PROTECTION SYSTEM LINE
EFL	EXISTING FUEL LINE
FPL	PROPOSED FUEL LINE
GAR	GAS RISER
GMH	GAS MANHOLE
GMK	GAS MARKER
GMT	GAS METER
GRG	GAS REGULATOR
GVL	GAS VALVE
EG	EXISTING NATURAL GAS LINE
G	PROPOSED NATURAL GAS LINE
TEC	TELEPHONE CABINET
TEP	TELEPHONE PEDESTAL
TER	TELEPHONE RISER
TEV	TELEPHONE VAULT
TMH	TELEPHONE MANHOLE
ETELOH	EXISTING TELEPHONE LINE, OVERHEAD
ETEL	EXISTING TELEPHONE LINE, UNDERGROUND
TELOH	PROPOSED TELEPHONE LINE, OVERHEAD
TEL	PROPOSED TELEPHONE LINE, UNDERGROUND
GLT	GROUND LIGHT
LTP	LIGHT POLE
PWP	POWER POLE
TRF	ELECTRIC TRANSFORMER
EBX	ELECTRIC BOX
ELC	ELECTRIC CABINET
ELR	ELECTRIC RISER
EMH	ELECTRIC MANHOLE
EMT	ELECTRIC METER
ESC	ELECTRIC SECTIONALIZER
EVT	ELECTRIC VAULT
YDL	YARD LIGHT
ELOH	EXISTING POWER\ELECTRIC LINE, OVERHEAD
EE	EXISTING POWER\ELECTRIC LINE, UNDERGROUND
SCO	SEWER CLEANOUT
SSMH	SANITARY MANHOLE
ESS	EXISTING SANITARY SEWER
SS	PROPOSED SANITARY SEWER
ESL	EXISTING STEAM LINE
SL	PROPOSED STEAM LINE
SDMH	STORM SEWER MANHOLE
FES	FLARED END SECTION
RDN	ROOF DRAIN
EST	EXISTING STORM SEWER
ST	PROPOSED STORM SEWER
FH	FIRE HYDRANT
WMH	WATER MANHOLE
WMK	WATER MARKER
WMT	WATER METER
WVL	WATER VALVE
EW	EXISTING WATER LINE
W	PROPOSED WATER LINE

CONTOURS	
100	EXISTING INDEX CONTOURS
100	EXISTING INTERMEDIATE CONTOURS
100	PROPOSED INDEX CONTOURS
100	PROPOSED INTERMEDIATE CONTOURS

Control Point Information

Point Number	Elevation	North	Easting	Description
CP #102	988.71	999264.487	2804343.208	At intersection of SW. Fascincation Dr. and SW Kessler Dr. go south along SW. Kessler Dr. to where curb jogs right (west) up against sidewalk.
CP#100	988.67	999658.163	2803977.829	At intersection of SW Fascination Drive and SW Kessler Drive go west along SW Fascination Drive to west side of parking stalls on south side of street.
CP #26	1010.42	999510.913	2803459.510	In south east quadrant of roundabout located at intersection of S.W. Fascination Dr. and Longview Parkway. West 1' to east edge of sidewalk. Southwest to corner of side walk where side walk ends but will be connected to at a later date.
CP#101	1003.96	999030.752	2803749.080	At intersection of Longview Parkway and SW Fascination Drive go south to second entrance on east signe of Longview Parkway.

ESTIMATE OF QUANTITIES

ITEM NO.	DESCRIPTION	UNIT	QUANTITY	AS-BUILT
	STORM			
1	STD. CURB INLET (5'x5' INSIDE)	EA.	2	
2	STD. JUNCTION BOX (5'x5' INSIDE)	EA.	2	
3	STD. FIELD INLET (4'x4' INSIDE)	EA.	1	
4	STD. MANHOLE (4' DIA INSIDE)	EA.	2	
5	30" HDPE	L.F.	462.07	
6	36" HDPE	L.F.	275.62	
7	42" HDPE	L.F.	176.59	
8	30" PIPE REMOVAL	L.F.	319	
9	36" PIPE REMOVAL	L.F.	140	
10	42" PIPE REMOVAL	L.F.	34	
11	END SECTION SECTION REMOVAL	EA.	2	
12	CONNECTION TO EXISTING STRUCTURE	EA.	2	
13	RIP-RAP REMOVAL	S.Y.	36	

SUMMARY OF QUANTITIES AS INDICATED ABOVE AND ANY QUANTITIES AS SHOWN WITHIN THE PLANS HAVE BEEN PROVIDED FOR PERMITTING PURPOSES ONLY AND ARE NOT INTENDED FOR USE IN PREPARATION OF CONTRACT DOCUMENTS. QUANTITIES INTENDED FOR, BUT NOT LIMITED TO, THE PREPARATION OF PROPOSALS AND BID DOCUMENTS SHALL BE INDEPENDENTLY EVALUATED BY THE ESTIMATING PARTY BASED UPON THE CONTENTS OF THESE PLANS.

OLSSON ASSOCIATES
MO Certificate of Authority #001592
2301 Maplewood Drive
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D JEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

GENERAL NOTES
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

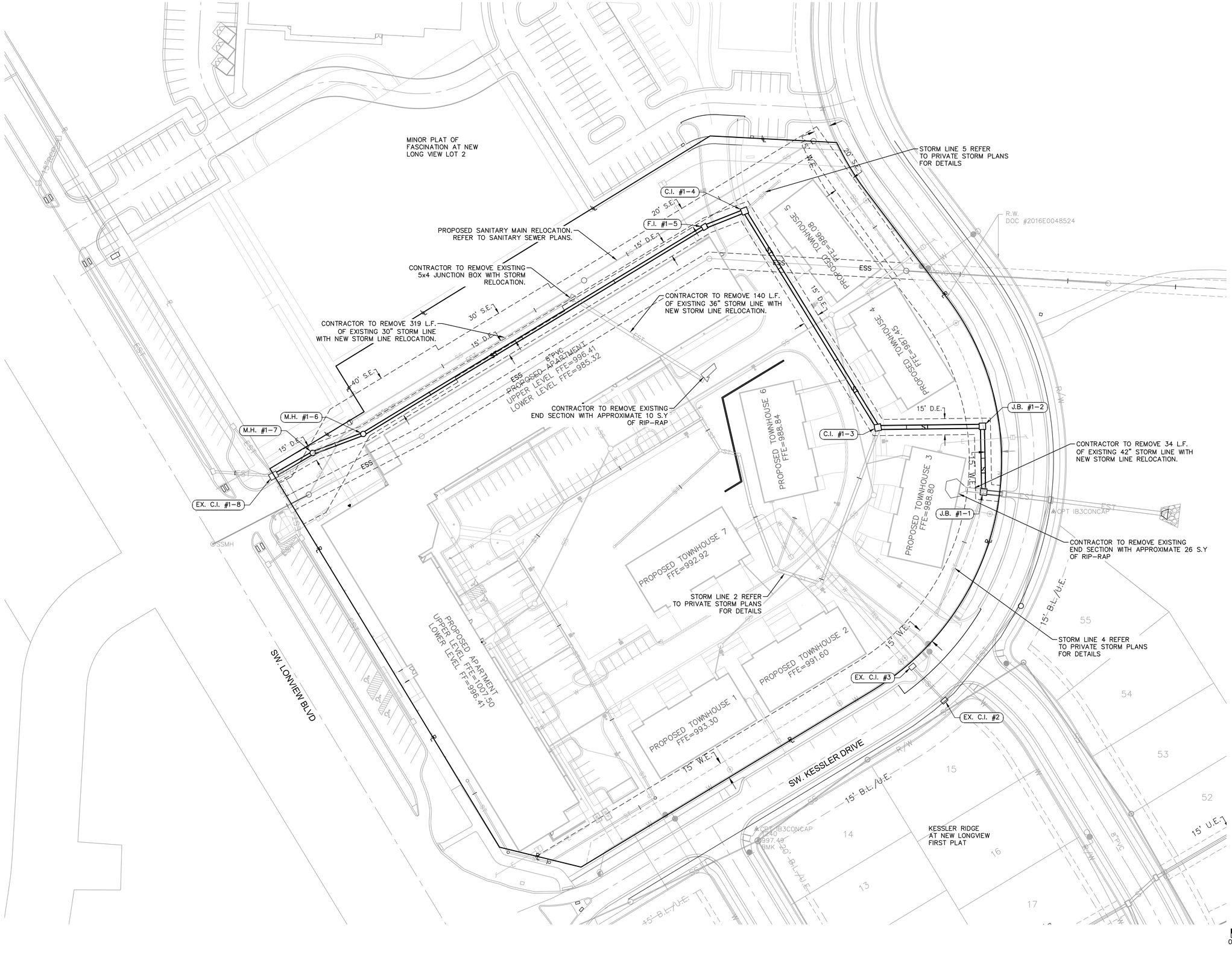
LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C402

DWG: F:\2017\3501-4000\017-3697\40-Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_GEN01_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:44pm



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OLSSON ASSOCIATES

MO Certificate of Authority #001592
KS Certificate of Authority #E-1005
NORTH KANSAS CITY, MO 64116

TEL 816.587.4320
FAX 816.587.1393

www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D. HEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

GENERAL LAYOUT
PUBLIC STORM SEWER PLANS

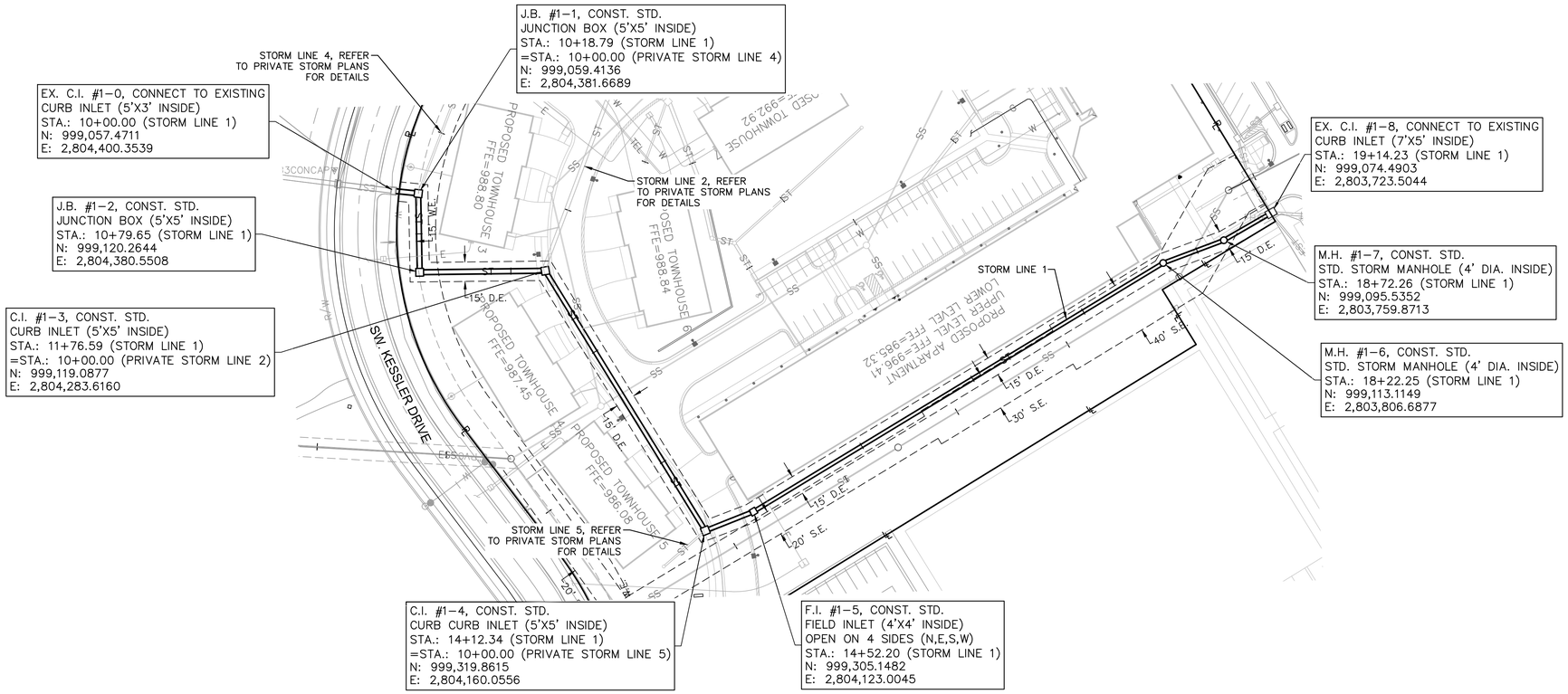
KESSLER RIDGE APARMENTS

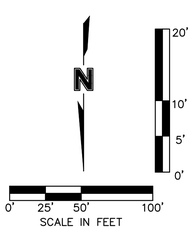
LEE'S SUMMIT, MO

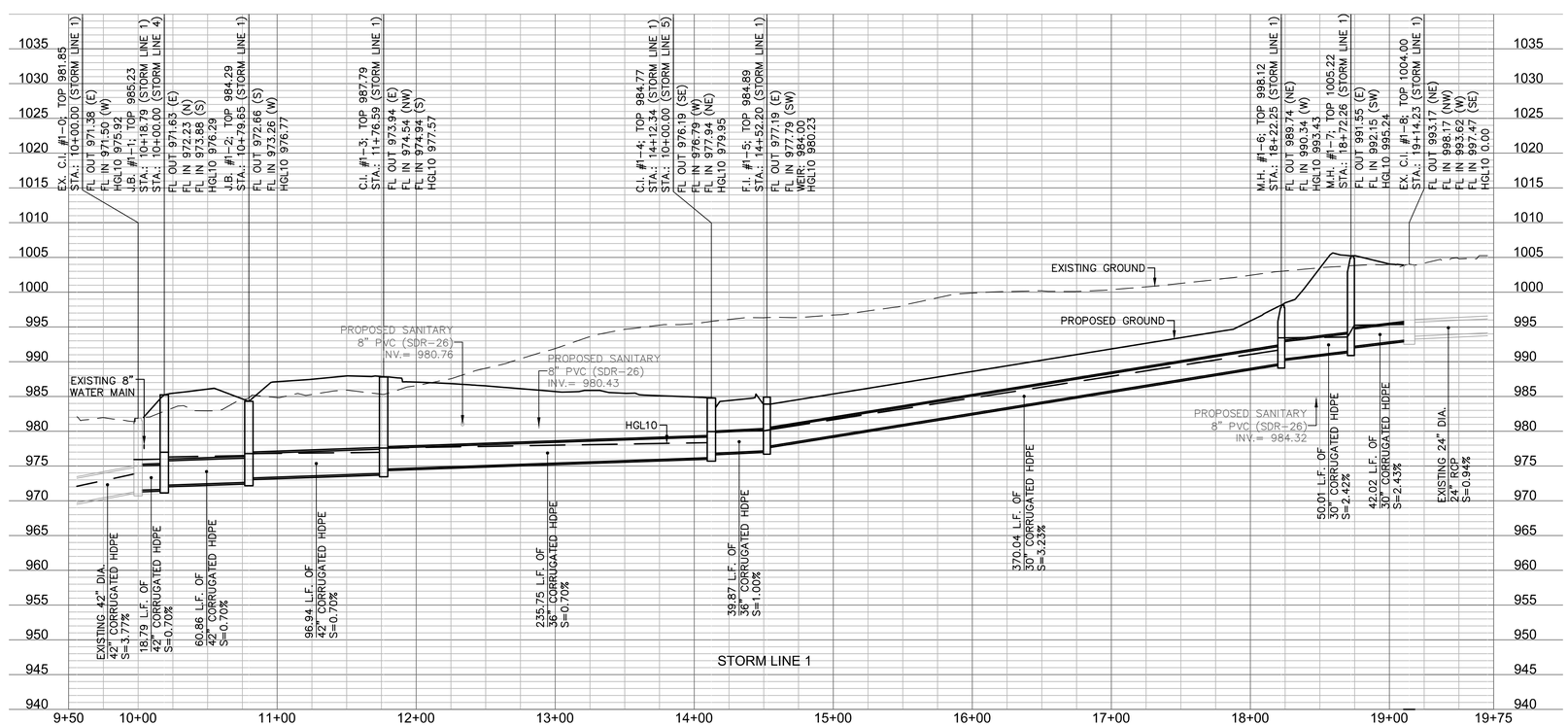
2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C403







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DATE: Apr 19, 2018 3:48pm

OLSSON ASSOCIATES
MO Certificate of Authority #001592
KS Certificate of Authority #E-1005
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D. HEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER PLAN & PROFILE
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
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QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C404

LEGEND	
100	FINISHED INDEX CONTOURS
100	FINISHED INTERMEDIATE CONTOURS
	RIDGE LINE
A	DRAINAGE AREA
C	RUNOFF COEFFICIENT
(C.I. 0-0)	STORM STRUCTURE NUMBER

NOTES:

1.. THE SITE IS LOCATED IN ZONE X, "AREAS OUTSIDE THE 1-PERCENT ANNUAL CHANCE FLOODPLAINS, AREAS OF 1-PERCENT ANNUAL CHANCE SHEET FLOW FLOODING WHERE THE AVERAGE DEPTHS ARE LESS THAN 1 FOOT, AREAS OF 1-PERCENT ANNUAL CHANCE STREAM FLOODING WHERE THE CONTRIBUTING DRAINAGE AREA IS LESS THAN 1 SQUARE MILE, OR AREAS PROTECTED FROM THE 1-PERCENT ANNUAL CHANCE FLOOD BY LEVEES. NO BASE FLOOD ELEVATIONS OR DEPTHS ARE SHOWN WITHIN THIS ZONE"

2. THE SITE IS LOCATED OUTSIDE OF ANY REQUIRED BUFFER ZONES FOR NATURAL STREAMS.

DWG: F:\2017\3501-4000\017-3697\40-Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_DRN01_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:49pm

OLSSON ASSOCIATES

MO Certificate of Authority #001592
KS Certificate of Authority #E-2003
NORTH KANSAS CITY, MO 64116

TEL 816.587.4320
FAX 816.587.1393

www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D. HEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

DRAINAGE PLAN
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C405

STORM SEWER DESIGN CALCULATION (10-YR)

Upstream Structure	Downstream Structure	Line Length (ft)	Upstream Invert (ft)	Downstream Invert (ft)	Pipe Slope (%)	Pipe Size (in)	Manning's n	Total Flow (cfs)	Upstream Velocity (ft/s)	Downstream Velocity (ft/s)	Pipe Capacity (cfs)	Upstream Depth (ft)	Downstream Depth (ft)	Upstream Struct. HGL (ft)	Downstream Struct. HGL (ft)	Upstream Top Elev. (ft)
EX. C.I. 0-0	EX. F.E.S.	109.094	967.18	959.93	6.65	42	0.012	74.47	9.35	8.26	280.97	2.70**	3.10	969.88	963.03	982.04
EX. C.I. 1-0	EX. C.I. 0-0	44.069	971.38	969.72	3.77	42	0.012	68.43	8.96	9.98	211.54	2.59**	2.35	973.97	972.07	981.85
EX. MH.	EX. C.I. 0-0	102.052	973.40	971.69	1.68	15	0.012	4.79	5.15	7.48	9.06	0.89**	0.65	974.29	972.34	983.32
EX. C.I. 2	EX. MH.	112.800	975.51	973.90	1.43	15	0.012	4.79	5.15	4.49	8.36	0.89**	1.01	976.40 j	974.91	984.94
EX. C.I. 3	EX. C.I. 2	43.171	979.53	978.33	2.78	15	0.012	3.98	4.75	8.60	11.66	0.81**	0.50	980.34	978.83	985.07
J.B. 1-1	EX. C.I. 1-0	18.786	971.63	971.50	0.69	42	0.012	64.62	6.72	6.72	90.67	3.50	3.50	975.99	975.92	985.23
J.B. 1-2	J.B. 1-1	60.861	972.66	972.23	0.71	42	0.012	63.90	6.64	6.64	91.61	3.50	3.50	976.50	976.29	984.29
C.I. 1-3	J.B. 1-2	96.942	973.94	973.26	0.70	42	0.012	63.90	7.23	6.64	91.28	3.02	3.50	976.96	976.77	987.79
C.I. 1-4	C.I. 1-3	235.748	976.19	974.54	0.70	36	0.012	44.58	8.13	6.31	60.45	2.17**	3.00	978.36 j	977.57	984.77
F.I. 1-5	C.I. 1-4	39.866	977.19	976.79	1.00	36	0.012	38.40	5.54	5.43	72.38	2.85	3.00	980.04	979.95	985.00
MH. 1-6	F.I. 1-5	370.045	989.74	977.79	3.23	30	0.012	34.16	8.17	7.01	79.84	1.99**	2.44	991.73 j	980.23	998.12
MH. 1-7	MH. 1-6	50.008	991.55	990.34	2.42	30	0.012	34.16	8.17	6.96	69.11	1.99**	2.50	993.54	993.43	1004.82
EX. C.I. 1-8	MH. 1-7	42.017	993.17	992.15	2.43	30	0.012	34.16	7.49	6.96	69.22	2.19	2.50	995.36	995.24	1004.00
C.I. 2-1	C.I. 1-3	155.590	977.99	974.94	1.96	30	0.012	17.67	6.13	3.60	62.21	1.42**	2.50	979.41 j	977.57	990.16
J.B. 2-2	C.I. 2-1	42.946	979.13	978.29	1.96	30	0.012	14.54	5.73	3.57	62.14	1.28**	1.93	980.41 j	980.22	991.59
D.B. 2-3	J.B. 2-2	62.732	980.65	979.43	1.94	30	0.012	14.31	5.69	4.11	61.96	1.27**	1.67	981.92 j	981.10	989.33
D.B. 2-4	D.B. 2-3	48.656	981.90	980.95	1.95	30	0.012	14.31	5.69	4.17	62.08	1.27**	1.65	983.17 j	982.60	987.92
D.B. 2-5	D.B. 2-4	17.848	982.75	982.40	1.96	24	0.012	13.85	6.19	5.68	34.31	1.34**	1.45	984.09 j	983.85	991.82
C.I. 2-6	D.B. 2-5	34.353	983.72	983.05	1.95	24	0.012	11.94	5.83	3.85	34.22	1.24**	1.92	984.96 j	984.97	993.63
C.I. 2-7	C.I. 2-6	148.010	985.50	984.02	1.00	24	0.012	10.82	5.62	3.81	24.50	1.18**	1.70	986.68 j	985.72	993.70
C.I. 2-8	C.I. 2-7	68.522	986.49	985.80	1.01	24	0.012	5.84	4.57	2.21	24.59	0.85**	1.57	987.34 j	987.37	994.61
C.I. 2-9	C.I. 2-8	93.500	987.68	986.79	0.95	24	0.012	3.92	4.05	2.59	23.91	0.69**	0.97	988.37 j	987.76	994.44
C.I. 2-10	C.I. 2-9	68.890	989.12	988.43	1.00	15	0.012	2.06	3.77	4.96	7.00	0.57**	0.46	989.69	988.89	993.85
D.B. 2-11	C.I. 2-10	28.102	989.70	989.42	1.00	15	0.012	0.23	2.03	0.43	6.98	0.19**	0.56	989.89	989.98	992.50
D.B. 2-12	D.B. 2-11	63.952	991.20	990.00	1.88	15	0.012	0.09	1.59	2.46	9.58	0.12**	0.09	991.32	990.09	995.39
D.B. 2-13	D.B. 2-12	114.855	997.24	991.50	5.00	15	0.012	0.09	1.59	3.45	15.64	0.12**	0.07	997.36	991.57	1006.69
D.B. 2-14	D.B. 2-13	39.251	999.38	997.54	4.69	15	0.012	0.09	1.59	3.37	15.15	0.12**	0.07	999.50	997.61	1008.50
D.B. 2-15	D.B. 2-14	76.318	1003.25	999.68	4.68	15	0.012	0.09	1.59	3.37	15.13	0.12**	0.07	1003.37	999.75	1005.89
D.B. 3-1	J.B. 2-2	50.000	983.00	980.38	5.24	15	0.012	0.23	2.03	0.32	16.01	0.19**	0.72	983.19 j	981.10	987.25
C.I. 4-1	J.B. 1-1	121.970	980.00	973.88	5.02	15	0.012	0.72	2.76	0.59	15.67	0.33**	1.25	980.33 j	976.97	984.44
D.B. 5-1	C.I. 1-4	42.346	978.79	977.94	2.01	15	0.012	1.19	1.00	0.97	9.91	1.17	1.25	979.96	979.95	982.54
D.B. 6-1	D.B. 2-5	132.592	986.15	983.50	2.00	15	0.012	1.37	3.32	1.12	9.89	0.46**	1.25	986.61 j	984.97	991.69

Notes: j - Line contains hyd. jump; ** - critical depth

Drainage Area Design Table

10 Year Return Frequency

Inlet ID	Drainage Area (ac)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
EX. C.I. 3 (L)	0.87	0.62	5.0	7.35	1.0	3.98
EX. C.I. 3 (R)	0.00	0.00	5.0	7.35	1.0	0.00
EX. C.I. 3 (B)	0.00	0.00	5.0	7.35	1.0	0.00
EX. C.I. 3	0.87	0.62	5.0	7.35	1.0	3.98
EX. C.I. 1-0 (L)	0.24	0.59	5.0	7.35	1.0	1.05
EX. C.I. 1-0 (R)	0.64	0.59	5.0	7.35	1.0	2.76
EX. C.I. 1-0 (B)	0.00	0.59	5.0	7.35	1.0	0.00
EX. C.I. 1-0	0.88	0.59	5.0	7.35	1.0	3.81
C.I. 1-3	0.27	0.83	5.0	7.35	1.0	1.65
C.I. 1-4 (L)	0.06	0.78	5.0	7.35	1.0	0.32
C.I. 1-4 (R)	0.81	0.78	5.0	7.35	1.0	4.67
C.I. 1-4 (B)	0.00	0.78	5.0	7.35	1.0	0.00
C.I. 1-4	0.87	0.78	5.0	7.35	1.0	4.99
F.I. 1-5	1.92	0.30	5.0	7.35	1.0	4.24
C.I. 2-1	0.52	0.82	5.0	7.35	1.0	3.13
D.B. 2-4	0.11	0.59	5.0	7.35	1.0	0.46
D.B. 2-5	0.17	0.44	5.0	7.35	1.0	0.54
C.I. 2-6 (L)	0.04	0.89	5.0	7.35	1.0	0.26
C.I. 2-6 (R)	0.00	0.89	5.0	7.35	1.0	0.00
C.I. 2-6 (B)	0.13	0.90	5.0	7.35	1.0	0.86
C.I. 2-6	0.17	0.90	5.0	7.35	1.0	1.12
C.I. 2-7 (L)	0.15	0.88	5.0	7.35	1.0	0.99
C.I. 2-7 (R)	0.16	0.88	5.0	7.35	1.0	1.07
C.I. 2-7 (B)	0.45	0.88	5.0	7.35	1.0	2.92
C.I. 2-7	0.77	0.88	5.0	7.35	1.0	4.98
C.I. 2-8 (L)	0.01	0.87	5.0	7.35	1.0	0.04
C.I. 2-8 (R)	0.13	0.87	5.0	7.35	1.0	0.84
C.I. 2-8 (B)	0.16	0.87	5.0	7.35	1.0	1.05
C.I. 2-8	0.30	0.87	5.0	7.35	1.0	1.92
C.I. 2-9 (L)	0.05	0.87	5.0	7.35	1.0	0.32
C.I. 2-9 (R)	0.09	0.87	5.0	7.35	1.0	0.58
C.I. 2-9 (B)	0.15	0.87	5.0	7.35	1.0	0.96
C.I. 2-9	0.29	0.87	5.0	7.35	1.0	1.86
C.I. 2-10	0.29	0.86	5.0	7.35	1.0	1.83
D.B. 2-11	0.05	0.41	5.0	7.35	1.0	0.14
D.B. 2-15	0.04	0.30	5.0	7.35	1.0	0.09
D.B. 3-1	0.09	0.34	5.0	7.35	1.0	0.23
C.I. 4-1	0.15	0.67	5.0	7.35	1.0	0.72
D.B. 5-1	0.33	0.50	5.0	7.35	1.0	1.19
D.B. 6-1	0.43	0.43	5.0	7.35	1.0	1.37

Inlet Design Table

10 Year Return Frequency

Inlet ID	Inlet Location	Peak Flow (cfs)	Upstream Bypass (cfs)	Total Flow (cfs)	Clogging Factor	Inlet Capacity (cfs)	Sag Inlet Capacity (Note 1) (cfs)	Captured Flow (cfs)	Bypass Flow (cfs)	Inlet Efficiency (Note 2) (%)	Gutter Depth (ft)	Gutter Spread (ft)	Ponding Depth (ft)
EX. C.I. 3 (L)	SAG	3.98	0.00	3.98	0.8	19.40	15.52	3.98	0.00	100.00%	0.16	7.49	...
EX. C.I. 3 (R)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	0.00	0.00	...
EX. C.I. 3 (B)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	...	...	...
EX. C.I. 3	SAG	3.98	0.00	3.98	0.8	19.40	15.52	3.98	0.00	100.00%	...	...	...
EX. C.I. 1-0 (L)	SAG	1.05	0.38	1.43	0.8	19.40	15.52	1.43	0.00	100.00%	0.15	6.74	...
EX. C.I. 1-0 (R)	SAG	2.76	0.00	2.76	0.8	19.40	15.52	2.76	0.00	100.00%	0.16	7.18	...
EX. C.I. 1-0 (B)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	...	...	...
EX. C.I. 1-0	SAG	3.81	0.00	3.81	0.8	19.40	15.52	3.81	0.00	100.00%	...	...	...
C.I. 1-3	GRADE	1.65	0.00	1.65	1.0	1.48	1.48	1.48	0.17	89.48%	0.16	7.78	...
C.I. 1-4 (L)	SAG	0.32	0.00	0.32	0.8	19.40	15.52	0.32	0.00	100.00%	0.07	3.33	...
C.I. 1-4 (R)	SAG	4.67	0.17	4.84	0.8	19.40	15.52	4.84	0.00	100.00%	0.23	11.69	...
C.I. 1-4 (B)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	...	...	...
C.I. 1-4	SAG	4.99	0.00	4.99	0.8	15.52	12.42	4.99	0.00	100.00%	...	...	...
F.I. 1-5	SAG	4.24	0.00	4.24	0.8	39.60	31.68	4.24	0.00	100.00%	...	...	0.23
C.I. 2-1	GRADE	3.13	0.11	3.24	1.0	2.59	2.59	2.59	0.65	79.82%	0.20	10.02	...
D.B. 2-4	GRADE	0.46	0.00	0.46	0.8	20.72	16.58	0.46	0.00	100.00%	...	...	0.08
D.B. 2-5	GRADE	0.54	0.00	0.54	0.8	20.72	16.58	0.54	0.00	100.00%	...	...	0.09
C.I. 2-6 (L)	SAG	0.26	0.00	0.26	0.8	11.64	9.31	0.26	0.00	100.00%	0.07	3.37	...
C.I. 2-6 (R)	SAG	0.00	0.00	0.00	0.8	11.64	9.31	0.00	0.00	...	0.00	0.00	...
C.I. 2-6 (B)	SAG	0.86	0.00	0.86	0.8	11.64	9.31	0.86	0.00	100.00%	...	...	...
C.I. 2-6	SAG	1.12	0.00	1.12	0.8	11.64	9.31	1.12	0.00	100.00%	...	...	...
C.I. 2-7 (L)	SAG	0.99	0.00	0.99	0.8	11.64	9.31	0.99	0.00	100.00%	0.13	5.97	...
C.I. 2-7 (R)	SAG	1.07	0.00	1.07	0.8	11.64	9.31	1.07	0.00	100.00%	0.13	6.02	...
C.I. 2-7 (B)	SAG	2.92	0.00	2.92	0.8	11.64	9.31	2.92	0.00	100.00%	...	...	...
C.I. 2-7	SAG	4.98	0.00	4.98	0.8	11.64	9.31	4.98	0.00	100.00%	...	...	...
C.I. 2-8 (L)	SAG	0.04	0.00	0.04	0.8	11.64	9.31	0.04	0.00	100.00%	0.04	1.63	...
C.I. 2-8 (R)	SAG	0.84	0.00	0.84	0.8	11.64	9.31	0.84	0.00	100.00%	0.11	5.25	...
C.I. 2-8 (B)	SAG	1.05	0.00	1.05	0.8	11.64	9.31	1.05	0.00	100.00%	...	...	...
C.I. 2-8	SAG	1.92	0.00	1.92	0.8	11.64	9.31	1.92	0.00	100.00%	...	...	...
C.I. 2-9 (L)	SAG	0.32	0.00	0.32	0.8	11.64	9.31	0.32	0.00	100.00%	0.08	3.82	...
C.I. 2-9 (R)	SAG	0.58	0.00	0.58	0.8	11.64	9.31	0.58	0.00	100.00%	0.10	4.74	...
C.I. 2-9 (B)	SAG	0.96	0.00	0.96	0.8	11.64	9.31	0.96	0.00	100.00%	...	...	...
C.I. 2-9	SAG	1.86	0.00	1.86	0.8	11.64	9.31	1.86	0.00	100.00%	...	...	...
C.I. 2-10	GRADE	1.83	0.00	1.83	1.0	1.71	1.71	1.71	0.11	93.77%	0.15	6.98	...
D.B. 2-11	SAG	0.14	0.00	0.14	0.8	20.72	16.58	0.14	0.00	100.00%	...	...	0.04
D.B. 2-15	SAG	0.09	0.00	0.09	0.8	20.72	16.58	0.09	0.00	100.00%	...	...	0.03
D.B. 3-1	SAG	0.23	0.00	0.23	0.8	20.72	16.58	0.23	0.00	100.00%	...	...	0.05
C.I. 4-1	GRADE	0.72	0.65	1.37	1.0	0.99	0.99	0.99	0.38	72.07%	0.11	5.66	...
D.B. 5-1	SAG	1.19	0.00	1.19	0.8	20.72	16.58	1.19	0.00	100.00%	...	...	0.15
D.B. 6-1	SAG	1.37	0.00	1.37	0.8	20.72	16.58	1.37	0.00	100.00%	...	...	0.16

Notes:

1. Inlet capacity at sag location has been reduced by a clogging factor of 0.80, reducing theoretical capacity to 80% capacity, as required per APWA Section 5600.
   Both theoretical capacity and reduced capacity are shown.
2. Inlet efficiency shown in the tables is Captured Flow/Total Flow, denoting the actual percentage of flow captured after the capacity has been reduced to 80% of theoretical capacity.

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MO Certificate of Authority #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

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NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

10 YR DRAINAGE TABLES
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C406

DWG: F:\2017\3501-4000\017-3697\40-Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_TAB01_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:50pm

DWG: F:\2017\3501-4000\017-3697\40-Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_TAB01_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:50pm

STORM SEWER DESIGN CALCULATION (100-YR)

Upstream Structure	Downstream Structure	Line Length (ft)	Upstream Invert (ft)	Downstream Invert (ft)	Pipe Slope (%)	Pipe Size (in)	Manning's n	Total Flow (cfs)	Upstream Velocity (ft/s)	Downstream Velocity (ft/s)	Pipe Capacity (cfs)	Upstream Depth (ft)	Downstream Depth (ft)	Upstream Struct. HGL (ft)	Downstream Struct. HGL (ft)	Upstream Top Elev. (ft)
EX. C.I. 0-0	EX. F.E.S.	109.094	967.18	959.93	6.65	42	0.012	118.36	12.74	13.13	280.97	3.24**	3.10	970.42	963.03	982.04
EX. C.I. 1-0	EX. C.I. 0-0	44.069	971.38	969.72	3.77	42	0.012	111.59	11.60	11.60	211.54	3.50	3.50	975.83	975.36	981.85
EX. MH.	EX. C.I. 0-0	102.052	973.40	971.69	1.68	15	0.012	5.08	4.14	4.14	9.06	1.25	1.25	975.90	975.36	983.32
EX. C.I. 2	EX. MH.	112.800	975.51	973.90	1.43	15	0.012	5.08	4.77	4.14	8.36	1.01	1.25	976.52	976.01	984.94
EX. C.I. 3	EX. C.I. 2	43.171	979.53	978.33	2.78	15	0.012	3.98	4.75	8.60	11.66	0.81**	0.50	980.34	978.83	985.07
J.B. 1-1	EX. C.I. 1-0	18.786	971.63	971.50	0.69	42	0.012	104.91	10.90	10.91	90.67	3.50	3.50	978.75	978.57	985.23
J.B. 1-2	J.B. 1-1	60.861	972.66	972.23	0.71	42	0.012	103.65	10.77	10.78	91.61	3.50	3.50	980.08	979.53	984.29
C.I. 1-3	J.B. 1-2	96.942	973.94	973.26	0.70	42	0.012	103.65	10.77	10.78	91.28	3.50	3.50	981.68	980.80	987.79
C.I. 1-4	C.I. 1-3	235.748	976.19	974.54	0.70	36	0.012	71.43	10.11	10.11	60.45	3.00	3.00	984.92	982.62	984.77
F.I. 1-5	C.I. 1-4	39.866	977.19	976.79	1.00	36	0.012	64.34	9.10	9.10	72.38	3.00	3.00	986.17	985.86	985.00
MH. 1-6	F.I. 1-5	370.045	989.74	977.79	3.23	30	0.012	60.10	12.24	12.25	79.84	2.50	2.50	993.46	986.69	998.12
MH. 1-7	MH. 1-6	50.008	991.55	990.34	2.42	30	0.012	60.10	12.24	12.25	69.11	2.50	2.50	997.97	997.05	1004.82
EX. C.I. 1-8	MH. 1-7	42.017	993.17	992.15	2.43	30	0.012	60.10	12.24	12.25	69.22	2.50	2.50	999.63	998.86	1004.00
C.I. 2-1	C.I. 1-3	155.590	977.99	974.94	1.96	30	0.012	29.32	5.97	5.97	62.21	2.50	2.50	984.33	983.65	990.16
J.B. 2-2	C.I. 2-1	42.946	979.13	978.29	1.96	30	0.012	23.83	4.85	4.86	62.14	2.50	2.50	984.86	984.74	991.59
D.B. 2-3	J.B. 2-2	62.732	980.65	979.43	1.94	30	0.012	23.43	4.77	4.77	61.96	2.50	2.50	985.20	985.02	989.33
D.B. 2-4	D.B. 2-3	48.656	981.90	980.95	1.95	30	0.012	23.43	4.77	4.77	62.08	2.50	2.50	985.47	985.34	987.92
D.B. 2-5	D.B. 2-4	17.848	982.75	982.40	1.96	24	0.012	22.63	7.20	7.20	34.31	2.00	2.00	985.77	985.61	991.82
C.I. 2-6	D.B. 2-5	34.353	983.72	983.05	1.95	24	0.012	19.27	6.13	6.13	34.22	2.00	2.00	986.06	985.85	993.63
C.I. 2-7	C.I. 2-6	148.010	985.50	984.02	1.00	24	0.012	17.30	6.85	5.51	24.50	1.50**	2.00	987.00 j	986.24	993.70
C.I. 2-8	C.I. 2-7	68.522	986.49	985.80	1.01	24	0.012	8.56	2.98	2.73	24.59	1.72	2.00	988.21	988.15	994.61
C.I. 2-9	C.I. 2-8	93.500	987.68	986.79	0.95	24	0.012	6.88	4.81	2.65	23.91	0.93**	1.54	988.61 j	988.33	994.44
C.I. 2-10	C.I. 2-9	68.890	989.12	988.43	1.00	15	0.012	3.62	4.58	5.61	7.00	0.77**	0.65	989.89	989.08	993.85
D.B. 2-11	C.I. 2-10	28.102	989.70	989.42	1.00	15	0.012	0.41	2.37	0.42	6.98	0.25**	0.93	989.95	990.35	992.50
D.B. 2-12	D.B. 2-11	63.952	991.20	990.00	1.88	15	0.012	0.16	1.84	2.92	9.58	0.15**	0.11	991.35	990.11	995.39
D.B. 2-13	D.B. 2-12	114.855	997.24	991.50	5.00	15	0.012	0.16	1.84	4.12	15.64	0.15**	0.09	997.39	991.59	1006.69
D.B. 2-14	D.B. 2-13	39.251	999.38	997.54	4.69	15	0.012	0.16	1.84	4.02	15.15	0.15**	0.09	999.53	997.63	1008.50
D.B. 2-15	D.B. 2-14	76.318	1003.25	999.68	4.68	15	0.012	0.16	1.84	4.02	15.13	0.15**	0.09	1003.40	999.77	1005.89
D.B. 3-1	J.B. 2-2	50.000	983.00	980.38	5.24	15	0.012	0.40	0.33	0.33	16.01	1.25	1.25	985.38	985.37	987.25
C.I. 4-1	J.B. 1-1	121.970	980.00	973.88	5.02	15	0.012	1.26	1.03	1.03	15.67	1.25	1.25	981.36	981.32	984.44
D.B. 5-1	C.I. 1-4	42.346	978.79	977.94	2.01	15	0.012	2.10	1.71	1.71	9.91	1.25	1.25	987.14	987.10	982.54
D.B. 6-1	D.B. 2-5	132.592	986.15	983.50	2.00	15	0.012	2.41	3.96	1.96	9.89	0.62**	1.25	986.77 j	985.85	991.69

Notes: j - Line contains hyd. jump; ** - critical depth

Drainage Area Design Table

100 Year Return Frequency

Inlet ID	Drainage Area (ac)	C	Tc (min)	i (in/hr)	K	Peak Flow (cfs)
EX. C.I. 3 (L)	0.87	0.62	5.0	10.32	1.25	6.98
EX. C.I. 3 (R)	0.00	0.00	5.0	10.32	1.25	0.00
EX. C.I. 3 (B)	0.00	0.00	5.0	10.32	1.25	0.00
EX. C.I. 3	0.87	0.62	5.0	10.32	1.25	6.98
EX. C.I. 1-0 (L)	0.24	0.59	5.0	10.32	1.25	1.84
EX. C.I. 1-0 (R)	0.64	0.59	5.0	10.32	1.25	4.85
EX. C.I. 1-0 (B)	0.00	0.59	5.0	10.32	1.25	0.00
EX. C.I. 1-0	0.88	0.59	5.0	10.32	1.25	6.68
C.I. 1-3	0.27	0.83	5.0	10.32	1.25	2.90
C.I. 1-4 (L)	0.06	0.78	5.0	10.32	1.25	0.57
C.I. 1-4 (R)	0.81	0.78	5.0	10.32	1.25	8.19
C.I. 1-4 (B)	0.00	0.78	5.0	10.32	1.25	0.00
C.I. 1-4	0.87	0.78	5.0	10.32	1.25	8.76
F.I. 1-5	1.92	0.30	5.0	10.32	1.25	7.43
C.I. 2-1	0.52	0.82	5.0	10.32	1.25	5.49
D.B. 2-4	0.11	0.59	5.0	10.32	1.25	0.80
D.B. 2-5	0.17	0.44	5.0	10.32	1.25	0.95
C.I. 2-6 (L)	0.04	0.89	5.0	10.32	1.25	0.46
C.I. 2-6 (R)	0.00	0.89	5.0	10.32	1.25	0.00
C.I. 2-6 (B)	0.13	0.90	5.0	10.32	1.25	1.51
C.I. 2-6	0.17	0.90	5.0	10.32	1.25	1.97
C.I. 2-7 (L)	0.15	0.88	5.0	10.32	1.25	1.75
C.I. 2-7 (R)	0.16	0.88	5.0	10.32	1.25	1.87
C.I. 2-7 (B)	0.45	0.88	5.0	10.32	1.25	5.12
C.I. 2-7	0.77	0.88	5.0	10.32	1.25	8.74
C.I. 2-8 (L)	0.01	0.87	5.0	10.32	1.25	0.06
C.I. 2-8 (R)	0.13	0.87	5.0	10.32	1.25	1.47
C.I. 2-8 (B)	0.16	0.87	5.0	10.32	1.25	1.84
C.I. 2-8	0.30	0.87	5.0	10.32	1.25	3.37
C.I. 2-9 (L)	0.05	0.87	5.0	10.32	1.25	0.56
C.I. 2-9 (R)	0.09	0.87	5.0	10.32	1.25	1.01
C.I. 2-9 (B)	0.15	0.87	5.0	10.32	1.25	1.68
C.I. 2-9	0.29	0.87	5.0	10.32	1.25	3.26
C.I. 2-10	0.29	0.86	5.0	10.32	1.25	3.21
D.B. 2-11	0.05	0.41	5.0	10.32	1.25	0.25
D.B. 2-15	0.04	0.30	5.0	10.32	1.25	0.16
D.B. 3-1	0.09	0.34	5.0	10.32	1.25	0.40
C.I. 4-1	0.15	0.67	5.0	10.32	1.25	1.26
D.B. 5-1	0.33	0.50	5.0	10.32	1.25	2.10
D.B. 6-1	0.43	0.43	5.0	10.32	1.25	2.41

Inlet Design Table

100 Year Return Frequency

Inlet ID	Inlet Location	Peak Flow (cfs)	Upstream Bypass (cfs)	Total Flow (cfs)	Clogging Factor	Inlet Capacity (cfs)	Sag Inlet Capacity (Note 1) (cfs)	Captured Flow (cfs)	Bypass Flow (cfs)	Inlet Efficiency (Note 2) (%)	Gutter Depth (ft)	Gutter Spread (ft)	Ponding Depth (ft)
EX. C.I. 3 (L)	SAG	6.98	0.00	6.98	0.8	19.40	15.52	6.98	0.00	100.00%	0.20	9.25	...
EX. C.I. 3 (R)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	0.00	0.00	...
EX. C.I. 3 (B)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	...	...	...
EX. C.I. 3	SAG	6.98	0.00	6.98	0.8	19.40	15.52	6.98	0.00	100.00%	...	...	...
EX. C.I. 1-0 (L)	SAG	1.84	1.66	3.50	0.8	19.40	15.52	3.50	0.00	100.00%	0.20	9.43	...
EX. C.I. 1-0 (R)	SAG	4.85	0.00	4.85	0.8	19.40	15.52	4.85	0.00	100.00%	0.19	8.87	...
EX. C.I. 1-0 (B)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	...	...	...
EX. C.I. 1-0	SAG	6.68	0.00	6.68	0.8	19.40	15.52	6.68	0.00	100.00%	...	...	...
C.I. 1-3	GRADE	2.90	0.00	2.90	1.0	2.37	2.37	2.37	0.53	81.77%	0.19	9.61	...
C.I. 1-4 (L)	SAG	0.57	0.00	0.57	0.8	19.40	15.52	0.57	0.00	100.00%	0.08	4.11	...
C.I. 1-4 (R)	SAG	8.19	0.53	8.72	0.8	19.40	15.52	8.72	0.00	100.00%	0.29	14.58	...
C.I. 1-4 (B)	SAG	0.00	0.00	0.00	0.8	19.40	15.52	0.00	0.00	...	...	...	...
C.I. 1-4	SAG	8.76	0.00	8.76	0.8	15.52	12.42	8.76	0.00	100.00%	...	...	...
F.I. 1-5	SAG	7.43	0.00	7.43	0.8	39.60	31.68	7.43	0.00	100.00%	...	...	0.33
C.I. 2-1	GRADE	5.49	0.52	6.01	1.0	3.98	3.98	3.98	2.03	66.17%	0.25	12.62	...
D.B. 2-4	GRADE	0.80	0.00	0.80	0.8	20.72	16.58	0.80	0.00	100.00%	...	...	0.11
D.B. 2-5	GRADE	0.95	0.00	0.95	0.8	20.72	16.58	0.95	0.00	100.00%	...	...	0.13
C.I. 2-6 (L)	SAG	0.46	0.00	0.46	0.8	11.64	9.31	0.46	0.00	100.00%	0.09	4.16	...
C.I. 2-6 (R)	SAG	0.00	0.00	0.00	0.8	11.64	9.31	0.00	0.00	...	0.00	0.00	...
C.I. 2-6 (B)	SAG	1.51	0.00	1.51	0.8	11.64	9.31	1.51	0.00	100.00%	...	...	...
C.I. 2-6	SAG	1.97	0.00	1.97	0.8	11.64	9.31	1.97	0.00	100.00%	...	...	...
C.I. 2-7 (L)	SAG	1.75	0.00	1.75	0.8	11.64	9.31	1.75	0.00	100.00%	0.16	7.37	...
C.I. 2-7 (R)	SAG	1.87	0.00	1.87	0.8	11.64	9.31	1.87	0.00	100.00%	0.16	7.44	...
C.I. 2-7 (B)	SAG	5.12	0.00	5.12	0.8	11.64	9.31	5.12	0.00	100.00%	...	...	...
C.I. 2-7	SAG	8.74	0.00	8.74	0.8	11.64	9.31	8.74	0.00	100.00%	...	...	...
C.I. 2-8 (L)	SAG	0.06	0.00	0.06	0.8	11.64	9.31	0.06	0.00	100.00%	0.04	2.01	...
C.I. 2-8 (R)	SAG	1.47	0.00	1.47	0.8	11.64	9.31	1.47	0.00	100.00%	0.14	6.49	...
C.I. 2-8 (B)	SAG	1.84	0.00	1.84	0.8	11.64	9.31	1.84	0.00	100.00%	...	...	...
C.I. 2-8	SAG	3.37	0.00	3.37	0.8	11.64	9.31	3.37	0.00	100.00%	...	...	...
C.I. 2-9 (L)	SAG	0.56	0.00	0.56	0.8	11.64	9.31	0.56	0.00	100.00%	0.10	4.72	...
C.I. 2-9 (R)	SAG	1.01	0.00	1.01	0.8	11.64	9.31	1.01	0.00	100.00%	0.13	5.85	...
C.I. 2-9 (B)	SAG	1.68	0.00	1.68	0.8	11.64	9.31	1.68	0.00	100.00%	...	...	...
C.I. 2-9	SAG	3.26	0.00	3.26	0.8	11.64	9.31	3.26	0.00	100.00%	...	...	...
C.I. 2-10	GRADE	3.21	0.00	3.21	1.0	2.69	2.69	2.69	0.52	83.78%	0.19	8.61	...
D.B. 2-11	SAG	0.25	0.00	0.25	0.8	20.72	16.58	0.25	0.00	100.00%	...	...	0.05
D.B. 2-15	SAG	0.16	0.00	0.16	0.8	20.72	16.58	0.16	0.00	100.00%	...	...	0.04
D.B. 3-1	SAG	0.40	0.00	0.40	0.8	20.72	16.58	0.40	0.00	100.00%	...	...	0.07
C.I. 4-1	GRADE	1.26	2.03	3.30	1.0	1.63	1.63	1.63	1.66	49.48%	0.16	7.86	...
D.B. 5-1	SAG	2.10	0.00	2.10	0.8	20.72	16.58	2.10	0.00	100.00%	...	...	0.22
D.B. 6-1	SAG	2.41	0.00	2.41	0.8	20.72	16.58	2.41	0.00	100.00%	...	...	0.24

Notes:

1. Inlet capacity at sag location has been reduced by a clogging factor of 0.80, reducing theoretical capacity to 80% capacity, as required per APWA Section 5600.
   Both theoretical capacity and reduced capacity are shown.
2. Inlet efficiency shown in the tables is Captured Flow/Total Flow, denoting the actual percentage of flow captured after the capacity has been reduced to 80% of theoretical capacity.

OLSSON ASSOCIATES
MO Certificate of Authority #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D. HEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

100 YR DRAINAGE TABLES
PUBLIC STORM SEWER PLANS

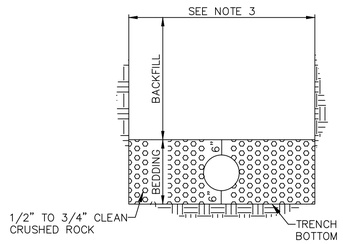
KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C407



TYPICAL SECTION FOR PLASTIC PIPE
(IN ROCK OR SOIL)

UNDERGROUND PIPE INSTALLATION FOR STORM SEWER LINES

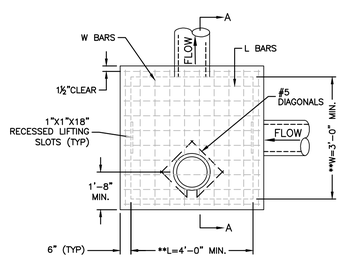
N.T.S.

1. BACKFILL SHALL BE JOB EXECAVATED MATERIAL FREE FROM DEBRIS AND STONES COMPACTED TO 90% OF MAXIMUM DENSITY AT OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D698. BACKFILL UNDER PAVEMENT (EXISTING OR PROPOSED), SHALL BE FLOWABLE FILL.

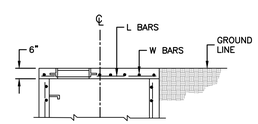
2. TRENCH BANKS MAY BE CUT BACK ON SLOPES IN ACCORDANCE WITH CURRENT OSHA REGULATIONS, BUT ONLY IN AREAS WHERE THE INCREASED TRENCH WIDTH WILL NOT INTERFERE WITH SURFACE FEATURES. SLOPES MUST NOT EXTEND BELOW TOP OF BEDDING.

3. MINIMUM AND MAXIMUM WIDTHS SHALL BE IN ACCORDANCE WITH PIPE MANUFACTURER'S RECOMMENDATION AS APPROVED ON ENGINEERING PLANS.

N.T.S.
01 PIPE EMBEDMENT DETAIL



PLAN

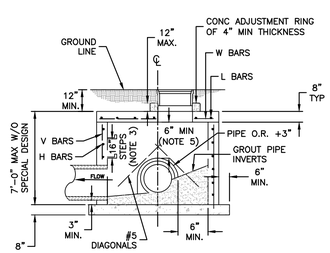


SLAB TOP ALTERNATE FOR JUNCTION BOX (SHALLOW)

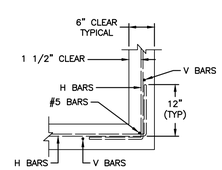
** INCREASE IN MULTIPLES OF 6" (7'-0") MAX WITHOUT SPECIAL DESIGN. (SEE PROJECT PLANS FOR DETAILS)

REINFORCING

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



SECTION A–A



WALL CORNER DETAIL

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

N.T.S.
02 JUNCTION BOX DETAIL

OLSSON ASSOCIATES
MO Certificate of Authority #001592
KS Certificate of Authority #E-1009
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D. HEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM DETAILS
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
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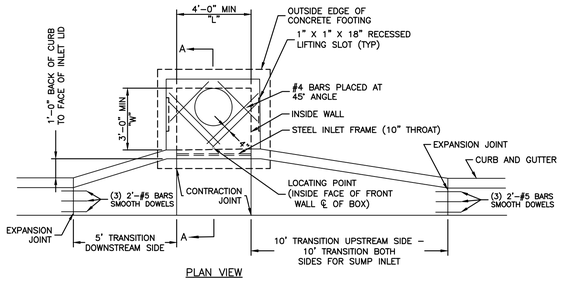
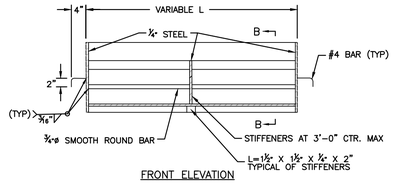
SHEET
C408

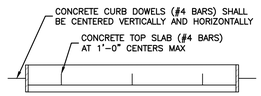
DWG: F:\2017\3501-4000\017-3697\40-Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_DTL03_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:51pm



PLAN VIEW



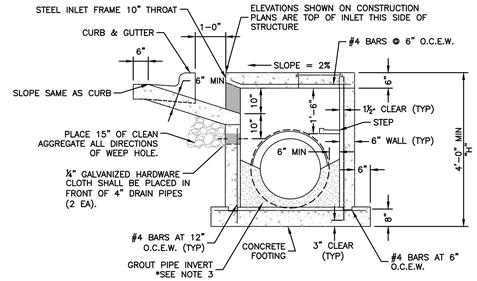
FRONT ELEVATION



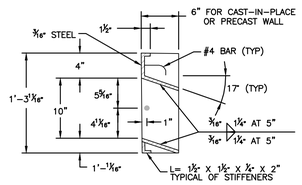
PLAN VIEW

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.

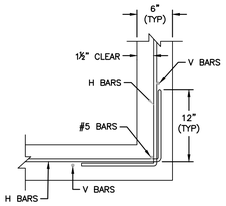
N.T.S.
01 CURB INLET DETAIL



SECTION A–A

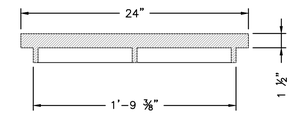


SECTION B–B



WALL CORNER DETAIL

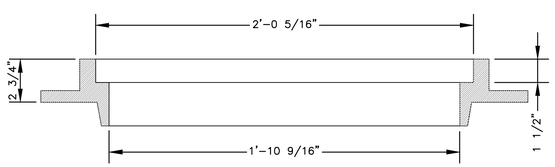
GENERAL NOTES:
1. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION.
2. FLOW LINES LISTED ON THE PROJECT PLANS ARE LISTED AT THE INSIDE FACE OF THE WALL.
3. FLOOR OF INLET GROUTED AND SHAPED TO MATCH PIPE INVERT TO PROVIDE SMOOTH FLOW.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



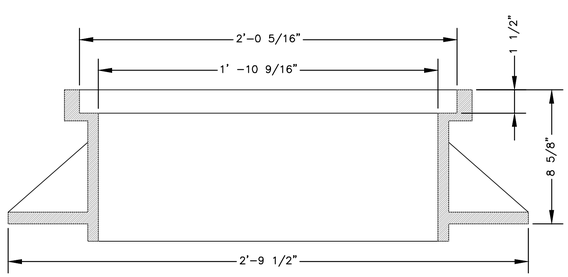
STANDARD 24" MANHOLE COVER
MINIMUM WEIGHT = 160 LB
NOTE: PICK HOLES NOT SHOWN

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

N.T.S.
02 STORM MANHOLE COVER DETAIL



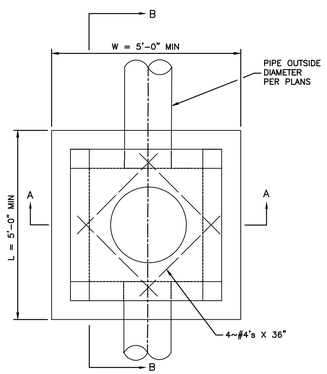
SLAB MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS103A
MINIMUM WEIGHT = 145 LB



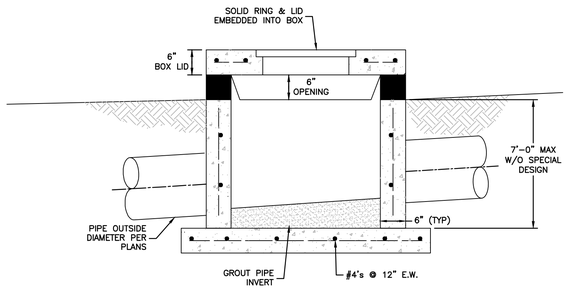
STANDARD 24" MANHOLE FRAME
LEE'S SUMMIT PART NO.: LS101A
MINIMUM WEIGHT = 250 LB

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

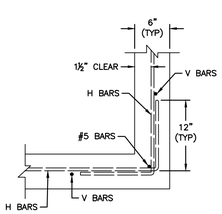
N.T.S.
03 STORM MANHOLE FRAME DETAIL



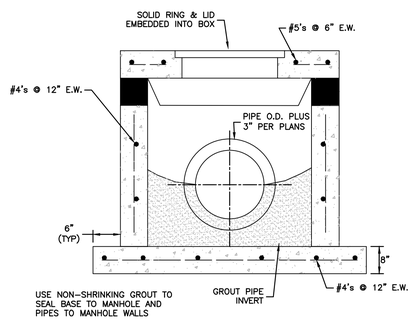
PLAN VIEW



SECTION B–B



WALL CORNER DETAIL



SECTION A–A

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

N.T.S.
04 FIELD INLET DETAIL

OLSSON ASSOCIATES®
MO Certificate of Authority #001592
KS Certificate of Authority #E-1005
NORTH KANSAS CITY, MO 64116
TEL 816.587.4320
FAX 816.587.1393
www.olssonassociates.com

STATE OF MISSOURI
NICHOLAS D. HEISER
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
04/20/18

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM DETAILS
PUBLIC STORM SEWER PLANS

KESSLER RIDGE APARMENTS

LEE'S SUMMIT, MO

2018

drawn by: D.A.HO
checked by: N.D.H.
designed by: N.D.H.
QA/QC by: M.G.D.
project no.: 017-3697
date: 2018-04-20

SHEET
C409

DWG: F:\2017\3501-4000\017-3697\40-Design\AutoCAD\Final Plans\Sheets\GNCV\01_Street & Storm_36x24\C_DTL03_73697.dwg USER: nheiser
DATE: Apr 19, 2018 3:51pm