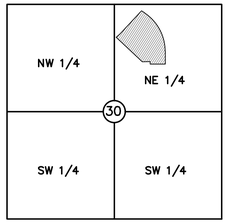
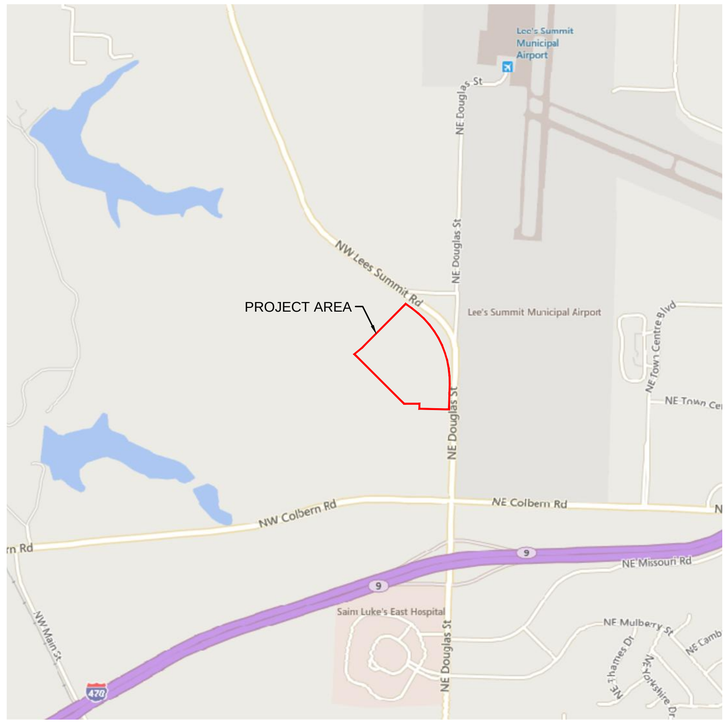


VICINITY MAP
S30, T48N, R31W
N.T.S.

ARIA APARTMENTS
PHASE 1
SITE DEVELOPMENT PLANS

SECTION 30, TOWNSHIP 48N, RANGE 31W
IN LEE'S SUMMIT, JACKSON COUNTY, MO

PROJECT TEAM & UTILITY CONTACT LIST	
OWNER ARIA LS, LLC 4220 PHILIPS FARM RD. COLUMBIA, MO 65201 CONTACT: BRIAN MAENNER PHONE: 573.449.9902 EMAIL: BPMAENEER@CENTRALSTATESCONST.COM	**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: EVERGY PHONE: 816-471-5275 NAME: SPECTRUM (TWC) PHONE: 877-772-2253 NAME: GOOGLE FIBER PHONE: 877-454-6959
DEVELOPER CENTRAL STATES CONSTRUCTION 4215 PHILIPS FARM RD. SUITE 109 COLUMBIA, MO 65201 CONTACT: BRIAN MAENNER PHONE: 573.449.9902 EMAIL: BPMAENEER@CENTRALSTATESCONST.COM	
ENGINEER OLSSON 1301 BURLINGTON, SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: NICHOLAS HEISER PHONE: 816.361.1177 EMAIL: NHEISER@OLSSON.COM	
SURVEYOR OLSSON 1301 BURLINGTON, SUITE 100 NORTH KANSAS CITY, MO 64116 CONTACT: JASON ROUDEBUSH PHONE: 816.361.1177 EMAIL: JROUDEBUSH@OLSSON.COM	



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STORM SEWER DESIGN TABLES	C503–C504
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DEVELOPMENT DATA	
EXISTING ZONING	RP-4
GROSS AREA (AC.)	22.50
PROPOSED STREET R/W (AC.)	0.00
NET AREA (AC.)	22.50
IMPERVIOUS COVERAGE	60.10%
LAND USE (EXISTING/ PROPOSED)	UNDEVELOPED/ MULTI-FAMILY RESIDENTIAL
NUMBER OF FLOORS	4
FLOOR AREA (S.F.)	553,841
BUILDING COVERAGE (S.F.)	190,357
# OF UNITS	257 1-BR 216 2-BR 12 3-BR 485 TOTAL
F.A.R.	0.19
REQUIRED PARKING (RATIO)	1 PER STUDIO UNIT 1.5 PER 1 OR 2 BR UNIT 2 PER 3+ BR UNIT PLUS 0.5 PER UNIT
REQUIRED PARKING SPACES	976
PROVIDED PARKING SPACES	976

☐ NOT FOR CONSTRUCTION

☐ REVIEWED FOR CONSTRUCTION

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

PROPERTY DESCRIPTION:

AS PROVIDED BY STEWART TITLE GUARANTY COMPANY:
TRACT OF LAND IN THE NORTHEAST QUARTER OF SECTION 30 TOWNSHIP 48 NORTH, RANGE 31 WEST OF THE 5TH PRINCIPAL MERIDIAN IN LEE'S SUMMIT, JACKSON COUNTY, MISSOURI BEING BOUNDED AND DESCRIBED AS FOLLOWS: COMMENCING AT THE NORTHWEST CORNER OF SAID NORTHEAST QUARTER SECTION; THENCE SOUTH 01 DEGREES 37 MINUTES 50 SECONDS WEST, ON THE WEST LINE OF SAID QUARTER SECTION, 853.75 FEET TO A POINT ON THE SOUTHEAST LOT LINE OF LOT 1, LEE'S SUMMIT ROAD PUMP STATION, A SUBDIVISION RECORDED IN BOOK I 51 AT PAGE 90 IN THE JACKSON COUNTY RECORDER OF DEEDS OFFICE; THENCE NORTH 50 DEGREES 41 MINUTES 15 SECONDS EAST, ON SAID SOUTHEAST LOT LINE, 59.22 FEET; TO THE POINT OF BEGINNING OF THE TRACT OF LAND TO BE HEREIN DESCRIBED; THENCE CONTINUING NORTH 50 DEGREES 41 MINUTES 15 SECONDS EAST ALONG SAID LINE, 116.89 FEET; THENCE NORTH 44 DEGREES 49 MINUTES 51 SECONDS EAST, 792.38 FEET TO A POINT ON THE WESTERLY RIGHT-OF-WAY LINE OF NW LEE'S SUMMIT ROAD AS ESTABLISHED BY DOCUMENT NUMBER 2015E0017982 IN THE JACKSON COUNTY RECORDER OF DEEDS OFFICE; THENCE ON SAID WESTERLY RIGHT-OF-WAY LINE, SOUTH 54 DEGREES 34 MINUTES 12 SECONDS EAST, 95.69 FEET; THENCE SOUTHEASTERLY ALONG A CURVE TO THE RIGHT BEING TANGENT TO THE LAST DESCRIBED COURSE WITH A RADIUS OF 1,142.00 FEET, A CENTRAL ANGLE OF 56 DEGREES 01 MINUTES 43 SECONDS AND AN ARC DISTANCE OF 1,116.74 FEET; THENCE SOUTH 01 DEGREES 27 MINUTES 31 SECONDS WEST, 322.27 FEET; THENCE LEAVING SAID RIGHT-OF-WAY LINE, NORTH 88 DEGREES 32 MINUTES 29 SECONDS WEST, 375.74 FEET; THENCE NORTH 01 DEGREES 27 MINUTES 27 SECONDS EAST, 62.94 FEET; THENCE SOUTH 90 DEGREES 00 MINUTES 00 SECONDS WEST, 195.68 FEET; THENCE NORTH 45 DEGREES 00 MINUTES 00 SECONDS WEST, 889.18 FEET TO THE POINT OF BEGINNING, SUBJECT TO THAT PART, IF ANY, IN STREETS, ROADWAYS, HIGHWAYS OR OTHER PUBLIC RIGHT-OF-WAYS.

BENCHMARK

BMK 1
LOCATED NEAR SE CORNER OF COLBERN RD. & DOUGLAS ST. INTERSECTION.
N: 1012195.53
E: 282382.89
EL: 982.46

BMK 2
LOCATED ON LIGHTPOLE BASE AT NE CORNER OF LEE'S SUMMIT RD. & DOUGLAS ST INTERSECTION.
N: 1014699.72
E: 2823025.86
EL: 932.31

BMK 5
N: 1014159.31
E: 2822030.75
EL: 908.88

olsson
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015005555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

TITLE SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEES SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C101

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_TTL01_ B190012.dwg ~ Layout: TITLE SHEET ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

GENERAL NOTES:

1. ALL PAVING DIMENSIONS ARE TO BACK OF CURB UNLESS OTHERWISE NOTED.

2. REFER TO DETAIL SHEET FOR INSTALLATION OF SIGNS.

3. CONTRACTOR SHALL MATCH EXISTING PAVEMENT IN GRADE AND ALIGNMENT TO PROVIDE SMOOTH SURFACE TRANSITIONS BETWEEN NEW ENTRANCE DRIVES AND EXISTING STREETS.

4. CONTRACTOR SHALL MATCH EXISTING CURB & GUTTER IN GRADE, SIZE, TYPE, AND ALIGNMENT AT CONNECTIONS TO EXISTING STREETS.

5. ALL WORK ON THIS PLAN SHALL BE DONE IN STRICT ACCORDANCE WITH THE OWNER'S SITE WORK SPECIFICATIONS.

6. ALL TRAFFIC CONTROL SIGNS SHALL BE FABRICATED AS SHOWN IN THE NATIONAL MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS.

7. CONTRACTOR SHALL REFER TO ARCHITECTURAL PLANS FOR EXACT LOCATIONS AND DIMENSIONS OF VESTIBULE, SLOPED PAVING, EXIT PORCHES, RAMPS, TRUCK DOCKS, PRECISE BUILDING DIMENSIONS, SIDEWALK AND SPECIFIC BUILDING AREA TREATMENTS AND IMPROVEMENTS. FOR EXACT BUILDING DIMENSIONS, SEE ARCHITECTURAL PLANS. CONTRACTOR TO STAKE AND CONSTRUCT FOUNDATIONS AND FOOTINGS FROM STRUCTURAL PLAN. BUILDING DIMENSIONS ON THIS PLAN ARE FOR REFERENCE ONLY.

8. ALL DIMENSIONS SHOWN ON BUILDING ARE TO OUTSIDE FACE OF BUILDING.

9. CONTRACTOR SHALL COORDINATE PROTECTION OF BUILDING CORNERS, TRANSFORMERS, AND ALL OTHER APPLICABLE STRUCTURES WITH GUARD POST BOLLARDS WITHIN 5' OF THE BUILDINGS TO BE INSTALLED BY GENERAL CONTRACTOR.

10. PARKING LOT STRIPING SHALL BE INCLUDED IN PAVING CONTRACTOR'S SCOPE OF WORK. ALL STRIPING IS TO BE TWO LAYERS, 4" STROKE, REFLECTIVE PAINT, INCLUDING ADA SYMBOL AND HATCHING. PAINT COLOR TO BE WHITE ON ASPHALT AND YELLOW ON CONCRETE.

11. ALL ACCESSIBLE PARKING SIGNAGE AND STRIPING SHALL BE IN ACCORDANCE WITH THE AMERICANS WITH DISABILITIES ACT (ADA) REQUIREMENTS.

12. THE CONTRACTOR SHALL SUPPLY THE OWNER WITH A LIST OF ALL SUBCONTRACTORS PRIOR TO COMMENCEMENT OF ANY CONSTRUCTION.

13. ALL ASPHALT PAVING SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF LEES SUMMIT DESIGN AND CONSTRUCTION MANUAL SECTION 2200.

14. THE GENERAL CONTRACTOR WILL BE HELD SOLELY RESPONSIBLE FOR, AND SHALL TAKE ALL PRECAUTIONS NECESSARY TO, AVOID PROPERTY DAMAGE TO ADJACENT PROPERTIES DURING THE CONSTRUCTION PHASES OF THIS PROJECT. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE TO ANY EXISTING IMPROVEMENTS DURING CONSTRUCTION, SUCH AS, BUT NOT LIMITED TO: DRAINAGE UTILITIES, PAVEMENT, STRIPING, CURB, ETC. ANY WORK IN CITY R.O.W. REPAIRS SHALL BE EQUAL TO OR BETTER THAN EXISTING CONDITIONS. CONTRACTOR IS RESPONSIBLE FOR PROTECTION OF ALL PROPERTY CORNERS AND SURVEY MONUMENTS AND IS RESPONSIBLE FOR RE-ESTABLISHMENT OF ANY PROPERTY CORNERS OR SURVEY MONUMENTS IF DISTURBED BY CONSTRUCTION ACTIVITIES.

15. SAFETY NOTICE TO CONTRACTOR: IN ACCORDANCE WITH GENERALLY ACCEPTED CONSTRUCTION PRACTICES, THE CONTRACTOR SHALL 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. ANY CONSTRUCTION OBSERVATION BY THE ENGINEER OF THE CONTRACTOR'S PERFORMANCE IS NOT INTENDED TO INCLUDE REVIEW OF THE ADEQUACY OF THE CONTRACTOR'S SAFETY MEASURES, IN, ON OR NEAR THE CONSTRUCTION SITE.

16. ALL CONSTRUCTION IN STATE HIGHWAY DEPARTMENT RIGHT-OF-WAY SHALL BE COORDINATED WITH THE HIGHWAY DEPARTMENT RESIDENT MAINTENANCE ENGINEER PRIOR TO START OF CONSTRUCTION. LATEST SPECIFICATIONS ADOPTED BY US DEPARTMENT OF TRANSPORTATION AND STATE HIGHWAY DEPARTMENT SHALL GOVERN ON THIS PROJECT.

17. ALL SITE WORK FOR THIS PROJECT SHALL MEET OR EXCEED THE SPECIFICATIONS OF THE RELEVANT UTILITY COMPANY OR REGULATORY AUTHORITY, AND THE SPECIFICATIONS FOR THE CONSTRUCTION OF THE EXISTING IMPROVEMENTS WHICH ARE BEING ALTERED OR REPLACED. CONTRACTOR SHALL CONTACT THE ENGINEER FOR SPECIFICATION SECTIONS FOR ITEMS SUCH AS LANDSCAPING AND IRRIGATION THAT ARE AFFECTED BY THE WORK BUT NOT COMPLETELY DETAILED OR SPECIFIED ON THESE PLANS.

18. ALL CONSTRUCTION WITHIN THE RIGHT-OF-WAY SHALL CONFORM TO THE CITY OF LEE'S SUMMIT, MISSOURI STANDARDS AND SPECIFICATIONS.

19. ALL CURB RETURN RADII ARE 4.0' UNLESS OTHERWISE NOTED.

20. SITE TOPOGRAPHY TAKEN FROM FIELD WORK BY OLSSON ASSOCATES ON THE SURVEY DATED 10-2016. CONTRACTOR TO VERIFY EXISTING CONDITIONS OF THE SITE THAT MAY NOT BE REPRESENTATIVE OF THE CONSTRUCTION PLANS.

WETLANDS NOTICE:

1. ANY DEVELOPMENT, EXCAVATION, CONSTRUCTION, OR FILLING IN A U.S. CORPS OF ENGINEERS DESIGNATED WETLAND IS SUBJECT TO LOCAL, STATE AND FEDERAL APPROVALS. THE CONTRACTOR SHALL COMPLY WITH ALL PERMIT REQUIREMENTS AND/OR RESTRICTIONS AND ANY VIOLATION WILL BE SUBJECT TO FEDERAL PENALTY. THE CONTRACTOR SHALL HOLD THE OWNER/DEVELOPER, THE ENGINEER AND THE LOCAL GOVERNING AGENCIES HARMLESS AGAINST SUCH VIOLATION.

WARRANTY/DISCLAIMER:

1. 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 THE ENGINEER NOR ITS PERSONNEL CAN OR DO WARRANT THESE DESIGNS OR PLANS AS CONSTRUCTED EXCEPT IN THE SPECIFIC CASES WHERE THE ENGINEER INSPECTS AND CONTROLS THE PHYSICAL CONSTRUCTION ON A TEMPORARY BASIS AT THE SITE.

FLOOD CERTIFICATION:

1. THE ENTIRE SITE IS LOCATED WITHIN ZONE X, "AREAS OUTSIDE THE 0.2% ANNUAL CHANCE FLOODPLAIN" AS DEPICTED ON THE FEMA FLOOD INSURANCE RATE MAP (FIRM) MAP NUMBER 290174 0412G, REVISION DATE JANUARY 20, 2017

OIL/GAS WELLS:

NO OIL OR GAS WELLS LOCATED WITHIN THE PROJECT LIMITS.

INFORMATION OBTAINED FROM THE MISSOURI DEPARTMENT OF NATURAL RESOURCES, GEOLOGICAL SURVEY GEOSCIENCES TECHNICAL RESOURCE ASSESSMENT TOOL (GEOSTRAT).

DEMOLITION NOTES:

1. CONTRACTOR SHALL BE RESPONSIBLE FOR RAISING AND REMOVAL OF THE EXISTING STRUCTURES, RELATED UTILITIES, PAVING, AND ANY OTHER EXISTING IMPROVEMENTS AS NOTED.

2. CONTRACTOR IS TO REMOVE AND DISPOSE OF ALL DEBRIS, RUBBISH AND OTHER MATERIALS RESULTING FROM PREVIOUS AND CURRENT DEMOLITION OPERATIONS. DISPOSAL WILL BE IN ACCORDANCE WITH ALL LOCAL, STATE AND/OR FEDERAL REGULATIONS GOVERNING SUCH OPERATIONS.

3. ALL DEMOLITION WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE OWNER'S SITE WORK SPECIFICATIONS.

4. CONTRACTOR IS RESPONSIBLE FOR REPAIRS OF DAMAGE AND ADJUSTMENTS DUE TO CONFLICTS OR GRADING TO ANY EXISTING STRUCTURES OR UNDERGROUND UTILITIES THAT ARE TO REMAIN IN PLACE.

5. ALL ITEMS DESIGNATED TO BE DEMOLISHED AND REMOVED FROM THE SITE SHALL BE DISPOSED OF IN AN APPROPRIATE LOCATION IN ACCORDANCE WITH STATE OR LOCAL GUIDELINES.

6. PUBLIC STREETS AND SIDEWALKS SHALL BE KEPT CLEAN AND CLEAR OF TRASH AND DEBRIS FROM DEMOLITION OPERATIONS AT ALL TIMES.

7. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DUST AND EROSION CONTROL DURING DEMOLITION OPERATIONS.

8. THE CONTRACTOR SHALL COORDINATE WITH ALL APPLICABLE UTILITY COMPANIES PRIOR TO REMOVAL OR RELOCATION OF ANY UTILITIES AND TO SAFELY STOP SERVICES AND DISMANTLE SERVICE LINES PRIOR TO BEGINNING DEMOLITION OPERATIONS.

9. CONTRACTOR IS TO REMOVE AND RE-USE SEWER PIPES, POWER POLES AND GUY WIRES, WATER LINES AND METERS, VEGETATION, ASPHALT, AND OTHER UNSUITABLE DEBRIS OR MATERIAL. SHOWN OR NOT SHOWN WITHIN CONSTRUCTION LIMITS AND WHERE NECESSARY TO ALLOW FOR CONSTRUCTION ACTIVITY. ALL MATERIAL TO BE REMOVED AS UNCLASSIFIED EXCAVATION.

10. ALL CAVITIES CREATED BY REMOVAL OF EXISTING FACILITIES IN THE AREA OF PROPOSED CONSTRUCTION SHALL BE FILLED AND COMPACTED IN ACCORDANCE WITH THE SITE WORK SPECIFICATIONS TO SUBGRADE ELEVATION.

11. THE CONTRACTOR SHALL EXERCISE EXTREME CAUTION WHEN WORKING IN THE VICINITY OF EXISTING OVERHEAD ELECTRICAL POWER LINES.

12. EXISTING UTILITIES ARE SHOWN AS LOCATED AND IDENTIFIED IN THE FIELD BY UTILITY COMPANY REPRESENTATIVE. THE OWNER AND THE ENGINEER MAKE NO ASSURANCE OF THE ACTUAL LOCATION, DEPTH, SIZE OR TYPE OF UTILITY LINES SHOWN. THE OWNER AND THE ENGINEER MAKES NO ASSURANCE THAT ALL OF THE EXISTING UTILITY LINES ON THE SITE ARE SHOWN.

GRADING AND CLEARING NOTES:

1. EXISTING UTILITIES AS SHOWN ARE APPROXIMATE LOCATIONS ONLY. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE LOCATIONS OF ALL EXISTING UTILITIES PRIOR TO THE START OF ANY CONSTRUCTION WORK. ANY DAMAGE TO EXISTING STRUCTURES, UTILITIES, FENCES AND/OR INCIDENTALS NOT DESIGNATED FOR REMOVAL SHALL BE REPAIRED AT THE CONTRACTORS EXPENSE.

2. CONTRACTOR SHALL ADHERE TO THE "DESIGN AND CONSTRUCTION MANUAL" SECTION 2100 AS ADOPTED BY THE CITY OF LEES SUMMIT, MISSOURI (LATEST EDITION), FOR EXCAVATION AND EMBANKMENT WORK WITHIN THE PROPOSED DRIVE LANES.

3. CONTRACTOR SHALL PROVIDE A LEVEL BUILDING PAD BASED UPON PROPOSED FINISHED FLOOR ELEVATION TO ± 0.10' OR AS ESTABLISHED THROUGH ALTERNATIVE BID DOCUMENTS.

4. PRIOR TO FINAL ACCEPTANCE OF THE PROJECT, ALL SLOPES AND AREAS DISTURBED BY CONSTRUCTION SHALL BE GRADED SMOOTH A MINIMUM OF 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 PRIOR TO FINAL ACCEPTANCE OF THE PROJECT SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER.

5. AREAS OF CONSTRUCTION SHALL BE STRIPPED OF ALL VEGETATION, ORGANIC MATTER AND TOPSOIL TO A DEPTH AS RECOMMENDED BY GEOTECHNICAL ENGINEER AND/ OR TESTING AGENCY. SOILS REMOVED DURING SITE STRIPPING SHOULD BE EVALUATED TO DETERMINE IF PORTIONS OF THE TOPSOIL STRATUM MAY BE UTILIZED AS STRUCTURAL FILL WITHIN PAVEMENT AREAS. ANY MATERIAL NOT DEEMED AS SUITABLE FILL MATERIAL BY THE GEOTECHNICAL ENGINEER AND/ OR TESTING AGENCY SHALL BE REMOVED FROM THE JOB SITE BY THE CONTRACTOR AT HIS EXPENSE.

6. CONTRACTOR SHALL ADHERE TO THE SITE PREPARATION AND STRUCTURAL FILL RECOMMENDATIONS AS CALLED OUT IN THE GEOTECHNICAL REPORT AND ENGINEERING EVALUATION AS PROVIDED BY THE GEOTECHNICAL ENGINEER.

7. ALL EMBANKMENT SHOULD BE PLACED IN CONTROLLED LIFTS HAVING A MAXIMUM LOOSE LIFT THICKNESS OF 9". EMBANKMENT PLACED WITHIN THE PAVEMENT AREAS SHOULD BE COMPACTED TO A MINIMUM OF 95% OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (STANDARD PROCTOR COMPACTION). EMBANKMENT PLACED WITHIN THE BUILDING AREAS SHOULD BE COMPACTED TO A MINIMUM OF 95% OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (STANDARD PROCTOR COMPACTION). MOISTURE CONTENT OF THE FILL AT THE TIME OF COMPACTION SHALL BE WITHIN A RANGE OF 0 TO 4 PERCENT ABOVE OPTIMUM MOISTURE CONTENT AS DEFINED BY THE STANDARD PROCTOR COMPACTION PROCEDURE. ALL EMBANKMENT PLACED WITHIN 18" OF THE BUILDING SUBGRADE SHOULD HAVE A LIQUID LIMIT LESS THAN 60. THE GEOTECHNICAL REPORT SHALL SUPERSEDE RECOMMENDATIONS AS STATED IN THIS PLAN SET.

UTILITY CONSTRUCTION NOTES:

1. PRIOR TO INSTALLATION OF ANY PROPOSED UTILITY THE CONTRACTOR SHALL EXCAVATE, VERIFY, AND CALCULATE ALL CROSSINGS WITH EXISTING UTILITIES AND INFORM THE OWNER AND THE ENGINEER OF ANY CONFLICTS. THE ENGINEER WILL BE HELD HARMLESS IN THE EVENT THE ENGINEER IS NOT NOTIFIED OF CONFLICTS WITH EXISTING UTILITIES.

2. 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 48 HOURS BEFORE ANY EXCAVATION TO REQUEST EXACT FIELD LOCATION OF UTILITIES. IT IS THE CONTRACTORS RESPONSIBILITY TO RELOCATE AND/OR ADJUST ALL EXISTING UTILITIES THAT CONFLICT WITH PROPOSED SITE IMPROVEMENTS.

3. UNLESS OTHERWISE SHOWN, CALLED OUT OR SPECIFIED HEREON OR WITHIN THE SPECIFICATIONS:
   ALL STORM DRAIN PIPE BEDDING SHALL BE INSTALLED PER CITY STANDARD DETAILS.
   ALL STORM DRAIN PIPES ARE MEASURED FROM CENTER OF STRUCTURES AND ENDS OF FLARED END SECTIONS.

4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO CONTROL DOWNSTREAM EROSION AND SILTATION DURING ALL PHASES OF CONSTRUCTION. EROSION CONTROL MEASURES SHALL BE IN PLACE PRIOR TO CONSTRUCTION.

5. TELEPHONE CONDUIT SHALL HAVE A MINIMUM COVER OF 30". CONDUIT SHALL BE DUAL 4" SCHEDULE 40 PVC. CONTRACTOR SHALL COORDINATE LOCATION WITH THE UTILITY REPRESENTATIVE AND LOCATE PVC CROSSINGS AS NECESSARY. SEE ELEC. PLANS FOR ENTRANCE LOCATIONS.

6. FOR ALL SERVICE LINE ENTRANCE LOCATIONS WITHIN THE BUILDING, INCLUDING ROOF DRAIN CONNECTIONS, SEE ARCHITECTURAL PLANS AND DETAILS.

7. ALL WATER SERVICE LINES SHALL BE A MINIMUM OF 48" BELOW FINISHED GRADE.

8. ALL SANITARY SEWER LINES SHALL BE SDR-26 WITH 42" MIN. COVER.

9. CONTRACTOR SHALL COORDINATE ANY DISRUPTIONS TO EXISTING UTILITY SERVICES WITH ADJACENT PROPERTY OWNERS A MINIMUM OF 48 HOURS PRIOR TO DISRUPTION.

10. ALL ELECTRIC AND TELEPHONE, INCLUDING SERVICE LINES SHALL BE CONSTRUCTED TO THE APPROPRIATE UTILITY COMPANY SPECIFICATIONS. ALL UTILITY DISCONNECTION'S SHALL BE COORDINATED WITH THE DESIGNATED UTILITY COMPANIES.

11. PRIOR TO ORDERING PRECAST STRUCTURES, SHOP DRAWINGS SHALL BE SUBMITTED TO THE DESIGN ENGINEER FOR APPROVAL.

12. ALL PRIVATE INSTALLATIONS SHALL CONFORM TO THE CURRENT STANDARDS AND SPECIFICATIONS AS ADOPTED BY THE CITY OF LEE'S SUMMMIT, MISSOURI.

13. EXTENSION OF BOTH DOMESTIC WATER SERVICE AND FIRE PROTECTION LINE MAY NOT BE PROVIDED UNTIL PUBLIC MAIN HAS BEEN TESTED AND ACCEPTED BY WRITTEN AUTHORIZATION FROM LEE'S SUMMIT WATER DEPARTMENT.

14. CONTRACTOR TO CONTACT LEE'S SUMMIT WATER SERVICES DEPARTMENT FOR MAIN LINE TAP AND METER SET A MINIMUM OF 48 HOURS PRIOR TO CONNECTION.

17. CONSTRUCTION SHALL NOT START ON ANY PUBLIC UTILITY SYSTEM UNTIL THE APPROPRIATE PERMITS HAVE BEEN PULLED FROM THE CITY OF LEE'S SUMMIT AND/OR JACKSON COUNTY AND CONTRACTOR HAS BEEN NOTIFIED BY THE ENGINEER.

18. ALL ELECTRICAL CONDUIT SHALL BE SCHEDULE 40 ELECTRICAL PVC, AS CALLED OUT AND HAVE AN AVERAGE OF 36" TO 42" COVER WITH A MINIMUM OF 30" CONFORMING TO THE CURRENT REGULATIONS SET FORTH BY MISSOURI PUBLIC SERVICE. SEE MECH. PLANS FOR ENTRANCE LOCATIONS.

19. CONTRACTOR SHALL MAKE APPLICATION WITH SPIRE ENERGY FOR PROPOSED METER.

LEGEND

GENERAL		SURVEY MARKERS	
ACU	AIR CONDITIONING UNIT	BMK	BENCHMARK
AST	ARROW STRAIGHT	CPT	CONTROL POINT
ATL	ARROW TURN LEFT	FND	FOUND MONUMENT
ATR	ARROW TURN RIGHT	ROW	ROW MARKER
BLB	BILLBOARD	SCR	SECTION CORNER
BOV	BLOW OFF VALVE	SET	SET MONUMENT
BSH	BUSH	**BOUNDARIES**	
COL	COLUMN		SECTION LINE
CTR	CONIFEROUS TREE		EXISTING PROPERTY BOUNDARY
DRN	DRAIN GRATE		PROPOSED PROPERTY BOUNDARY
DTR	DECIDUOUS TREE		EXISTING LOT LINE
FLP	FLAG POLE		PROPOSED LOT LINE
GDP	GUARD POST		EXISTING RIGHT-OF-WAY
GPL	GUY POLE		PROPOSED RIGHT-OF-WAY
GTP	GREASE TRAP	**UTILITIES**	
GUY	GUY WIRE	CAB	CABLE BOX
HCP	ACCESSABLE PARKING MARKER	CAV	CABLE VAULT
LST	LIFT STATION	TVP	TELEVISION PEDESTAL
MLB	MAILBOX	TVR	TELEVISION RISER
MP	MILE POST MARKER		EXISTING CABLE TV, OVERHEAD
MWL	MONITORING WELL		EXISTING CABLE TV, UNDERGROUND
PIV	POST INDICATOR VALVE		PROPOSED CABLE TV, OVERHEAD
PPT	PROPANE TANK		PROPOSED CABLE TV, UNDERGROUND
RAT	RADIO TOWER	FOB	FIBER OPTIC BOX
SAD	SATELLITE	FOM	FIBER OPTIC MANHOLE
SCV	SPRINKLER CONTROL VALVE	FOP	FIBER OPTIC PEDESTAL
SGN	SIGN	FOV	FIBER OPTIC VAULT
SLB	STREET LIGHT BOX		EXISTING FIBER OPTIC, OVERHEAD
SLC	STREET LIGHT CABINET		EXISTING FIBER OPTIC, UNDERGROUND
SPB	SPRINKLER BOX		PROPOSED FIBER OPTIC, OVERHEAD
SPH	SPRINKLER HEAD		PROPOSED FIBER OPTIC, UNDERGROUND
STP	STUMP	FDC	FIRE DEPT. CONNECTION
SVL	SEWER VALVE		EXISTING FIRE PROTECTION SYSTEM LINE
TCB	TRAFFIC CONTROL BOX		PROPOSED FIRE PROTECTION SYSTEM LINE
TSA	TRAFFIC SIGNAL WITH MAST ARM		EXISTING FUEL LINE
TSC	TRAFFIC SIGNAL CABINET		PROPOSED FUEL LINE
TSMH	TRAFFIC SIGNAL MANHOLE	GAR	GAS RISER
TSP	TRAFFIC SIGNAL POLE	GMH	GAS MANHOLE
	EXISTING TREELINE	GMK	GAS MARKER
	PROPOSED TREELINE	GMT	GAS METER
	EXISTING SIDEWALK	GRG	GAS REGULATOR
	PROPOSED SIDEWALK	GVL	GAS VALVE
	FUTURE SIDEWALK		EXISTING NATURAL GAS LINE
	EXISTING BUILDINGS		PROPOSED NATURAL GAS LINE
	PROPOSED BUILDINGS	TEC	TELEPHONE CABINET
	FUTURE BUILDINGS	TEP	TELEPHONE PEDESTAL
	EXISTING EDGE OF PAVEMENT	TER	TELEPHONE RISER
	PROPOSED EDGE OF PAVEMENT	TEV	TELEPHONE VAULT
	FUTURE EDGE OF PAVEMENT	TMH	TELEPHONE MANHOLE
	EXISTING ROADWAY CENTER LINE		EXISTING TELEPHONE LINE, OVERHEAD
	PROPOSED ROADWAY CENTER LINE		EXISTING TELEPHONE LINE, UNDERGROUND
	FUTURE ROADWAY CENTER LINE		PROPOSED TELEPHONE LINE, OVERHEAD
	EXISTING CURB & GUTTER		PROPOSED TELEPHONE LINE, UNDERGROUND
	PROPOSED CURB & GUTTER	GLT	GROUND LIGHT
	FUTURE CURB & GUTTER	LTP	LIGHT POLE
R	RADIUS	PWP	POWER POLE
L	ARC DISTANCE	TRF	ELECTRIC TRANSFORMER
D	DELTA / CENTRAL ANGLE	EBX	ELECTRIC BOX
EASEMENTS & SETBACKS		ELC	ELECTRIC CABINET
A.E.	ACCESS EASEMENT	ELR	ELECTRIC RISER
B.M.P.	BEST MANAGEMENT PRACTICE EASEMENT	EMH	ELECTRIC MANHOLE
B.L.	BUILDING SETBACK	EMT	ELECTRIC METER
C.T.V.E.	CABLE TV EASEEMNT	ESC	ELECTRIC SECTIONALIZER
C.E.	CONSERVATION EASEMENT	EVT	ELECTRIC VAULT
C.G.E.	CONSTRUCTION GRADING EASEMENT	YDL	YARD LIGHT
F.P.E.	FLOOD PLAIN EASEMENT		EXISTING POWER\ELECTRIC LINE, OVERHEAD
F.O.E.	FIBER OPTIC EASEMENT		EXISTING POWER\ELECTRIC LINE, UNDERGROUND
F.P.S.E.	FIRE PROTECTION SYSTEM EASEMENT	SCO	SEWER CLEANOUT
F.L.E.	FUEL LINE EASEMENT	SSMH	SANITARY MANHOLE
L.S.E.	LANDSCAPE EASEMENT		EXISTING SANITARY SEWER
G.E.	NATURAL GAS EASEMENT		PROPOSED SANITARY SEWER
T.E.	TELEPHONE EASEMENT		FUTURE SANITARY SEWER
E.E.	POWER\ELECTRIC EASEMENT		EXISTING STEAM LINE
P.S.	PARKING SETBACK		PROPOSED STEAM LINE
S.B.	STREAM BUFFER	SDMH	STORM SEWER MANHOLE
S.D.E.	SURFACE DRAINAGE EASEMENT	FES	FLARED END SECTION
SIGHT DIST. ESMT.	SIGHT DISTANCE EASEMENT	RDN	ROOF DRAIN
S.E.	SANITARY SEWER EASEMENT		EXISTING STORM SEWER
S.L.E.	STEAM LINE EASEMENT		PROPOSED STORM SEWER
D.E.	STORM DRAINAGE EASEMENT		
S.W.M.E.	STORM WATER MANAGEMENT EASEMENT	FH	FIRE HYDRANT
T.C.D.S.E.	TEMPORARY CUL-DE-SAC EASEMENT	WMH	WATER MANHOLE
TEMP. ESMT.	TEMPORARY EASEMENT	WMK	WATER MARKER
TRAIL ESMT.	TRAIL\PATH EASEMENT	WMT	WATER METER
U.E.	UTILITY EASEMENT	WVL	WATER VALVE
W.E.	WATER EASEMENT		EXISTING WATER LINE
F.Y.S	FRONT YARD SETBACK		PROPOSED WATER LINE
R.Y.S.	REAR YARD SETBACK		
S.Y.S.	SIDE YARD SETBACK		
CONTOURS			
–100–	EXISTING INDEX CONTOURS		
–100–	EXISTING INTERMEDIATE CONTOURS		
100	PROPOSED INDEX CONTOURS		
100	PROPOSED INTERMEDIATE CONTOURS		

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 2003592
KS CERTIFICATE OF AUTHORITY # E-2003
TEL 816.361.1177
NORTH KANSAS CITY, MO 64116

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO.	REVISIONS DESCRIPTION	DATE	BY

GENERAL NOTES
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C102

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SHEET
C103

drawn by:	M.A.D.
checked by:	N.D.H.
designed by:	M.A.D.
QA/QC by:	N.D.H.
project no.	0012-0012.B
date:	2020.08.27

EXISTING CONDITIONS
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO | 2020

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

NICHOLAS D. HEISER, P.E.
MO# 2015000555

STATE OF MISSOURI
NICHOLAS D. HEISER
2015000555
08/27/2020
PROFESSIONAL ENGINEER

olsson

OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116 TEL 816.361.1177 www.olsson.com

LEE'S SUMMIT RD.

NE DOUGLAS ST.

NE DOUGLAS ST.

BLDG 13 (FUTURE)

BLDG 7 (FUTURE)

BLDG 8 (FUTURE)

BLDG 12 (FUTURE)

BLDG 6

BLDG 5

BLDG 9 (FUTURE)

BLDG 11 (FUTURE)

BLDG 2

BLDG 1 CLUBHOUSE

BLDG 4

BLDG 10 (FUTURE)

BLDG 3

MAINT. BLDG

15' D.E.

T.C.E.

E.S.E.

L.S.E.

20' D.E.

0' 30' 60' 120'
SCALE IN FEET

N

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116

TEL 816.361.1177

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NO. REV.	DATE	BY

REVISIONS DESCRIPTION

REVISIONS

GENERAL LAYOUT
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
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project no.: 019-0012-B
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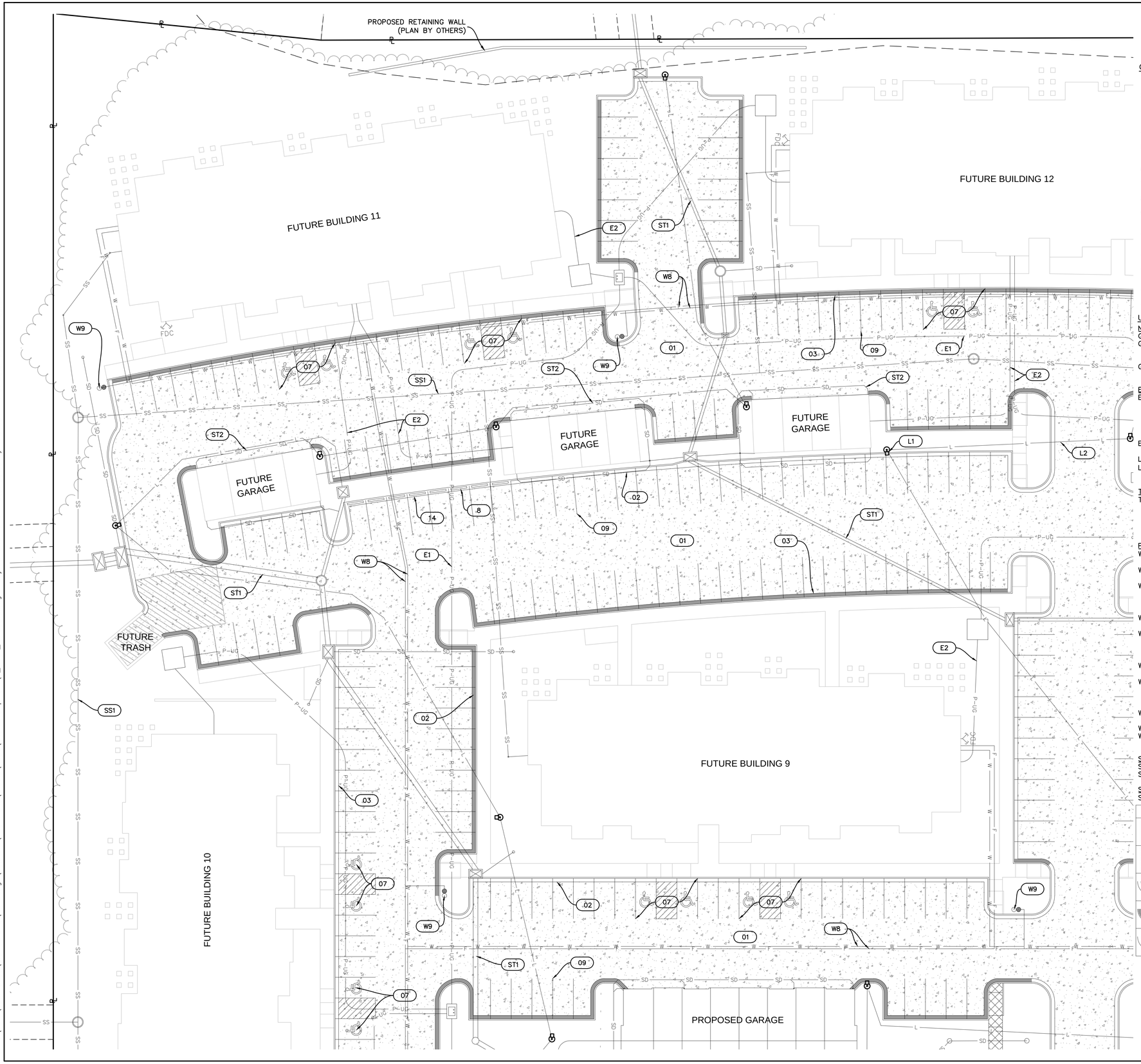
SHEET
C104



PROPERTY LEGEND	
℄ R/W	PROPERTY / RIGHT-OF-WAY LINE
- - - - - - - - - -	EASEMENT LINE

CONSTRUCTION NOTES (##)

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2. CONSTRUCT TYPE CG-1 CONCRETE CURB AND GUTTER (TYP.) (SEE LEGEND)
3. CONSTRUCT TYPE CG-1 'DRY' CONCRETE CURB AND GUTTER (TYP.) (SEE LEGEND)
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5. CONSTRUCT ACCESSIBLE PARALLEL SIDEWALK RAMP (SEE SPOT ELEVATION PLANS)
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11. TRASH ENCLOSURE, RE: ARCH PLANS
12. CONSTRUCT CONCRETE PAD AND INSTALL BICYCLE RACKS PER MANUFACTURER SPECIFICATIONS.
13. PROPOSED MONUMENT SIGN. RE: LANDSCAPE PLANS.
14. CONSTRUCT RIBBON CURB (TYP.) (SEE LEGEND)

UTILITY NOTES (##)

NATURAL GAS SERVICE

G1. COORDINATE WITH SPIRE ENERGY FOR GAS SERVICE LINE EXTENSION.
G2. CONTRACTOR TO MAKE APPLICATION WITH SPIRE ENERGY FOR METER SET AND COORDINATE WITH SPIRE AND ENGINEER FOR SIZE, LOCATION, AND ROUTING OF GAS SERVICE TO BUILDING.
G3. COORDINATE WITH ARCHITECT, MEP, OWNER, AND AMENITY DESIGNER TO PROVIDE GAS SERVICE TO AMENITY AREA.

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E2. SEE MEP PLANS FOR SECONDARY CONDUITS AND WIRE, BUILDING CONNECTION, METERING, AND CONTINUATION.
L1. PRIVATE SITE LIGHTING (TYP.), RE: LIGHTING PLANS FOR DETAILS.
L2. PRIVATE SITE LIGHTING WIRING ROUTING (TYP.), RE: LIGHTING PLANS FOR DETAILS.

TELEPHONE/CABLE/DATA SERVICE

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PRIVATE WATER MAIN

W1. COORDINATE WITH CITY TO CONNECT TO PROPOSED 12" PVC WATER MAIN AT GATE VALVE INSTALLED WITH PUBLIC WATER MAIN EXTENSION.
W2. INSTALL APPROX. 10 L.F. 4" C900 (48" MIN. COVER) TO PROPOSED WATER METER.
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W4. INSTALL 10 L.F. 4" PVC (C900) (48" MIN. COVER) AND REQUIRED FITTINGS TO EXTEND SERVICE LINE TO CITY-STANDARD BACKFLOW PREVENTER VAULT.
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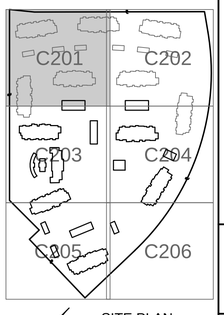
STORM SEWER

ST1. PROPOSED PRIVATE STORM SEWER. RE: SHEETS C505-C509.
ST2. PROPOSED BUILDING STORM SEWER. RE: SHEETS C520-C536.

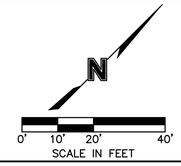
SANITARY SEWER

SS1. PROPOSED 8" PRIVATE SANITARY SEWER MAIN. RE: SHEET C701-C706.

CONSTRUCTION LEGEND	
	STD. DUTY CONCRETE PAVEMENT (See Detail Sheet)
	HEAVY DUTY CONCRETE PAVEMENT (See Detail Sheet)
	CG-1 CURB & GUTTER (See Detail Sheet)
	CG-1 DRY CURB & GUTTER (See Detail Sheet)
	RIBBON CURB (See Detail Sheet)



SITE PLAN KEY MAP
NOT TO SCALE



SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY # 001592
KS CERTIFICATE OF AUTHORITY # E-1015
1301 MCGEE STREET, SUITE 500
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
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PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SITE PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C201

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PROPERTY LEGEND	
R/W	PROPERTY / RIGHT-OF-WAY LINE
	EASEMENT LINE

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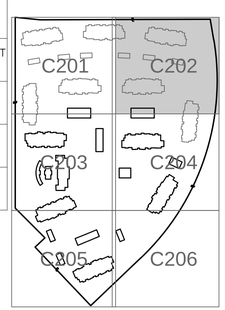
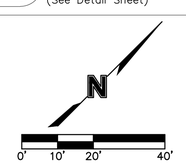


SITE PLAN KEY MAP
NOT TO SCALE



SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY # 001592
3301 BROADWAY, SUITE 100
NORTH KANSAS CITY, MO 64116
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NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
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QA/QC by: N.D.H.
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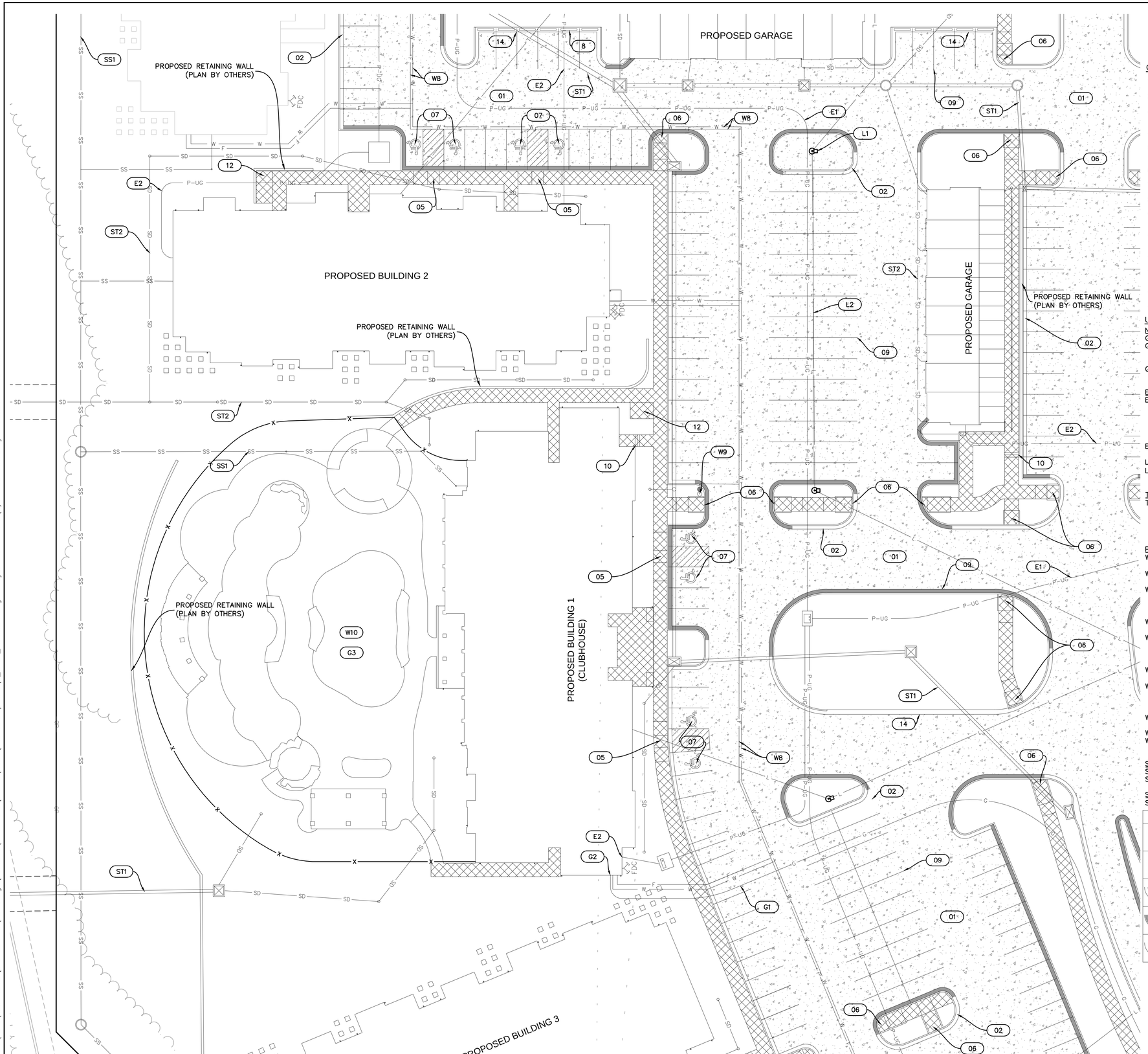
SHEET
C202

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SIT01_ B190012.dwg ~ Layout: SITE PLAN (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



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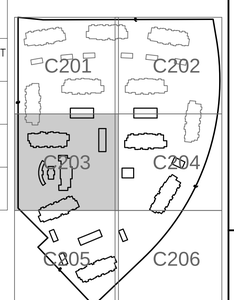

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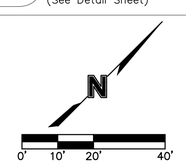

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MO CERTIFICATE OF AUTHORITY # 001592
201 E. 18TH STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

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LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
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SHEET
C203

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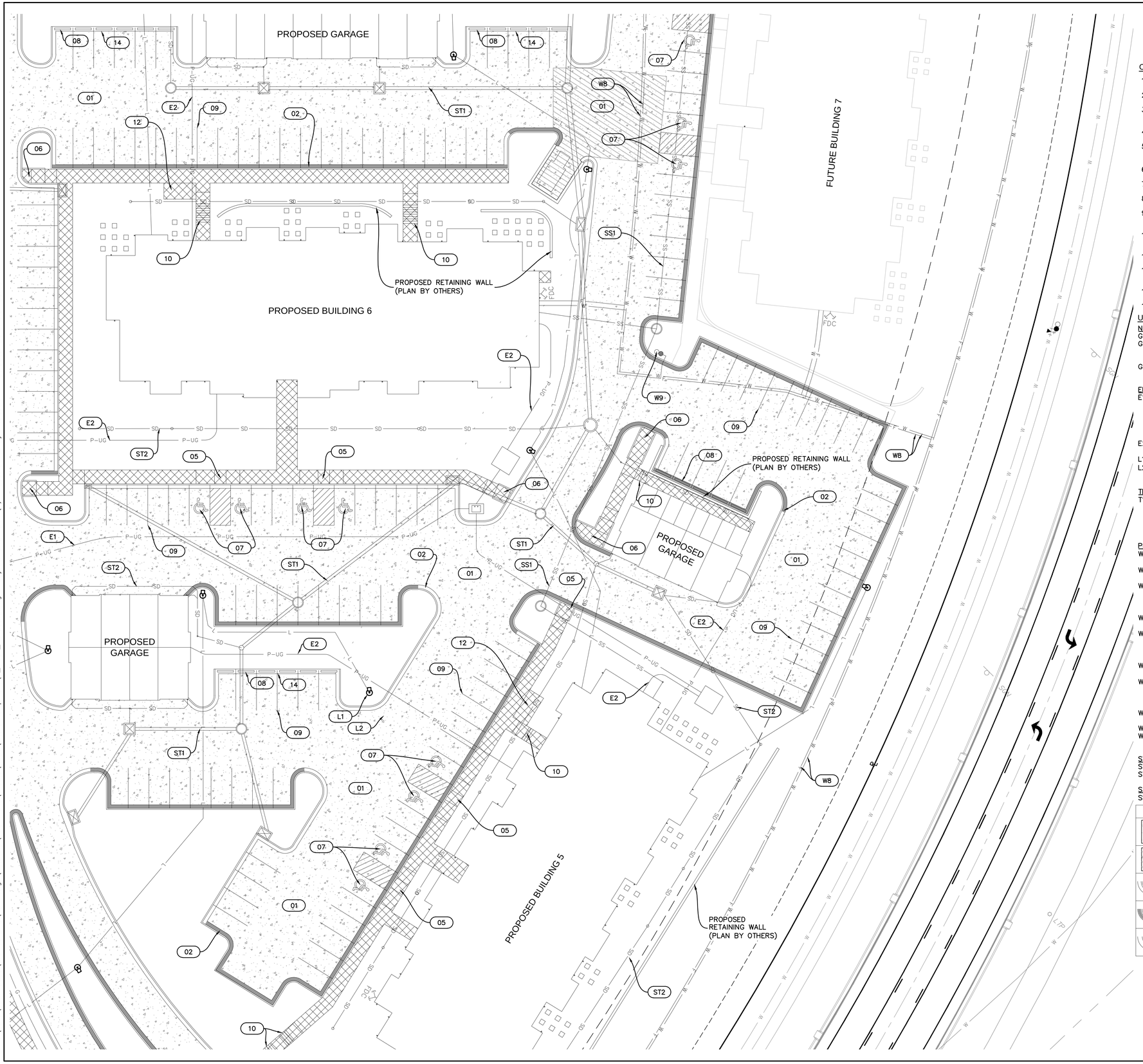

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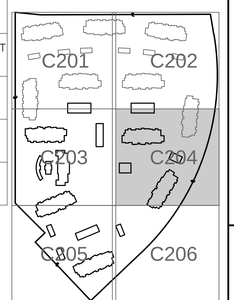

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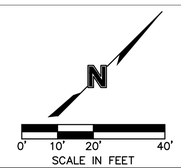

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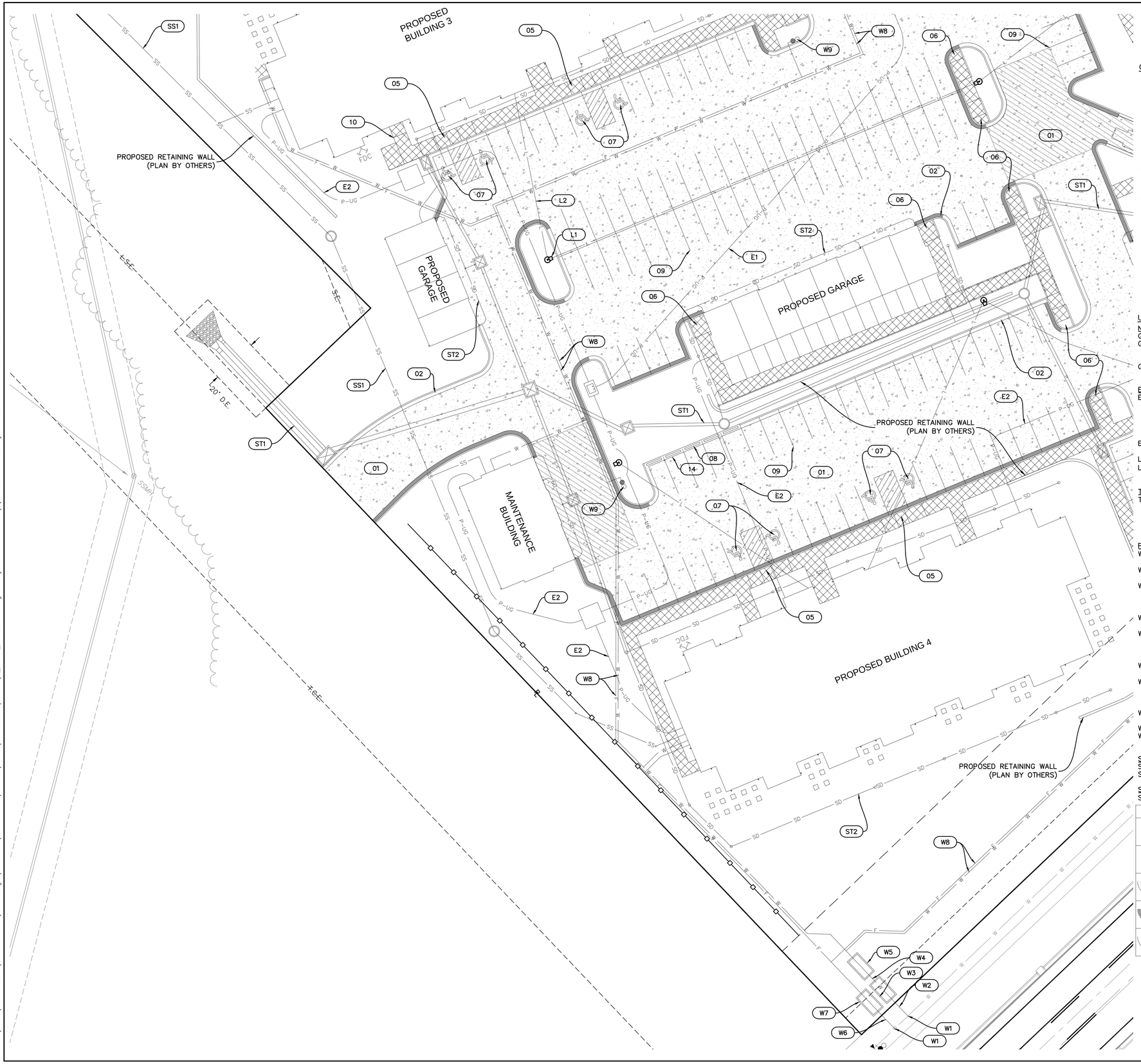

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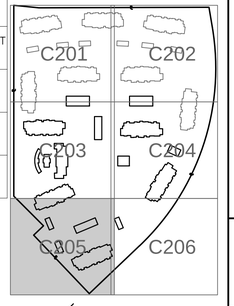
0' 10' 20' 40'
SCALE IN FEET



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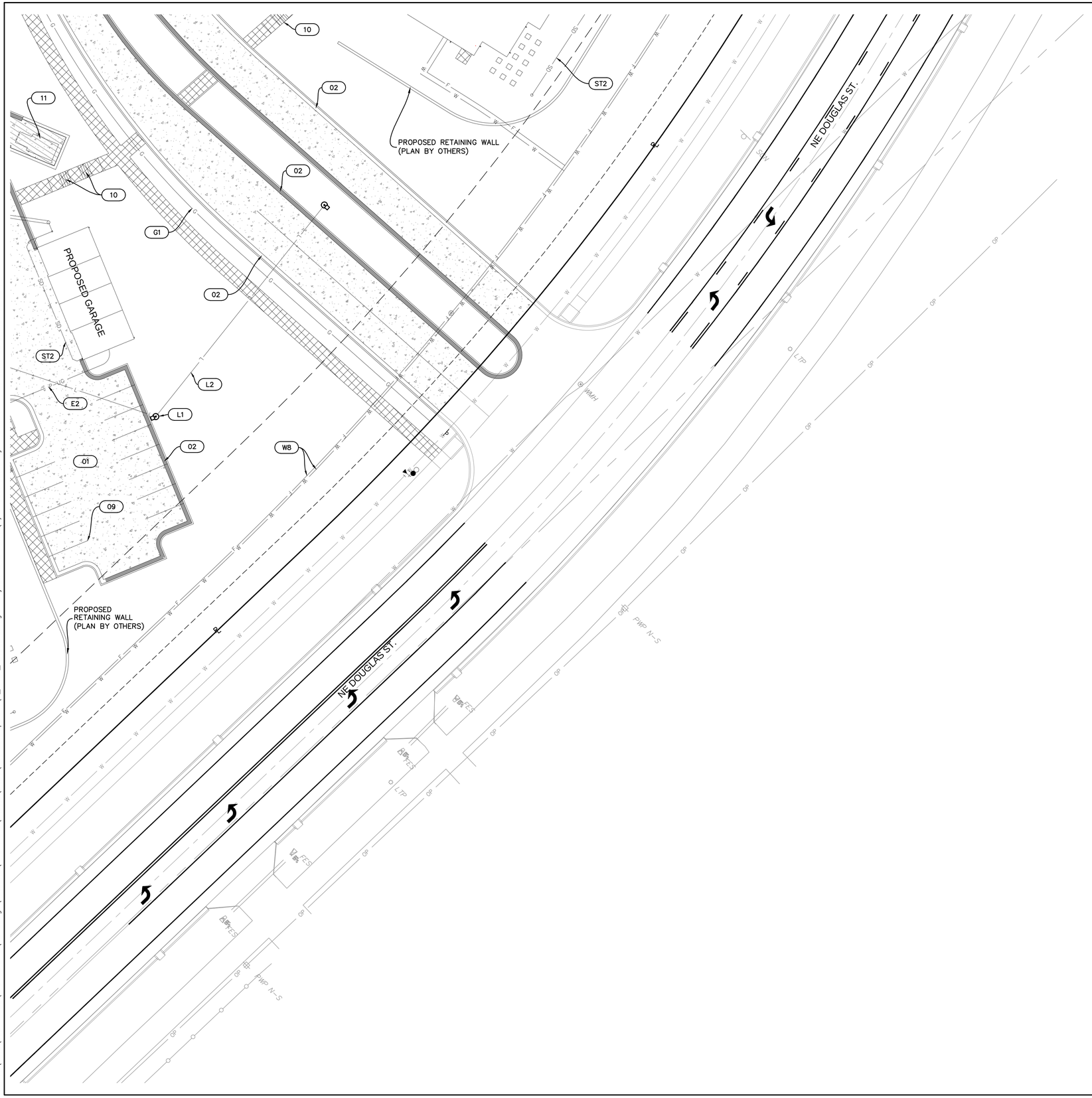

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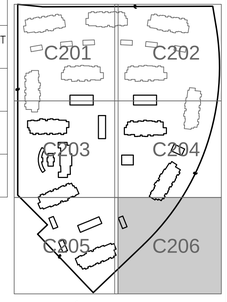
	RIBBON CURB (See Detail Sheet)



N

0' 10' 20' 40'
SCALE IN FEET

SITE PLAN
KEY MAP
NOT TO SCALE

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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

SITE PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

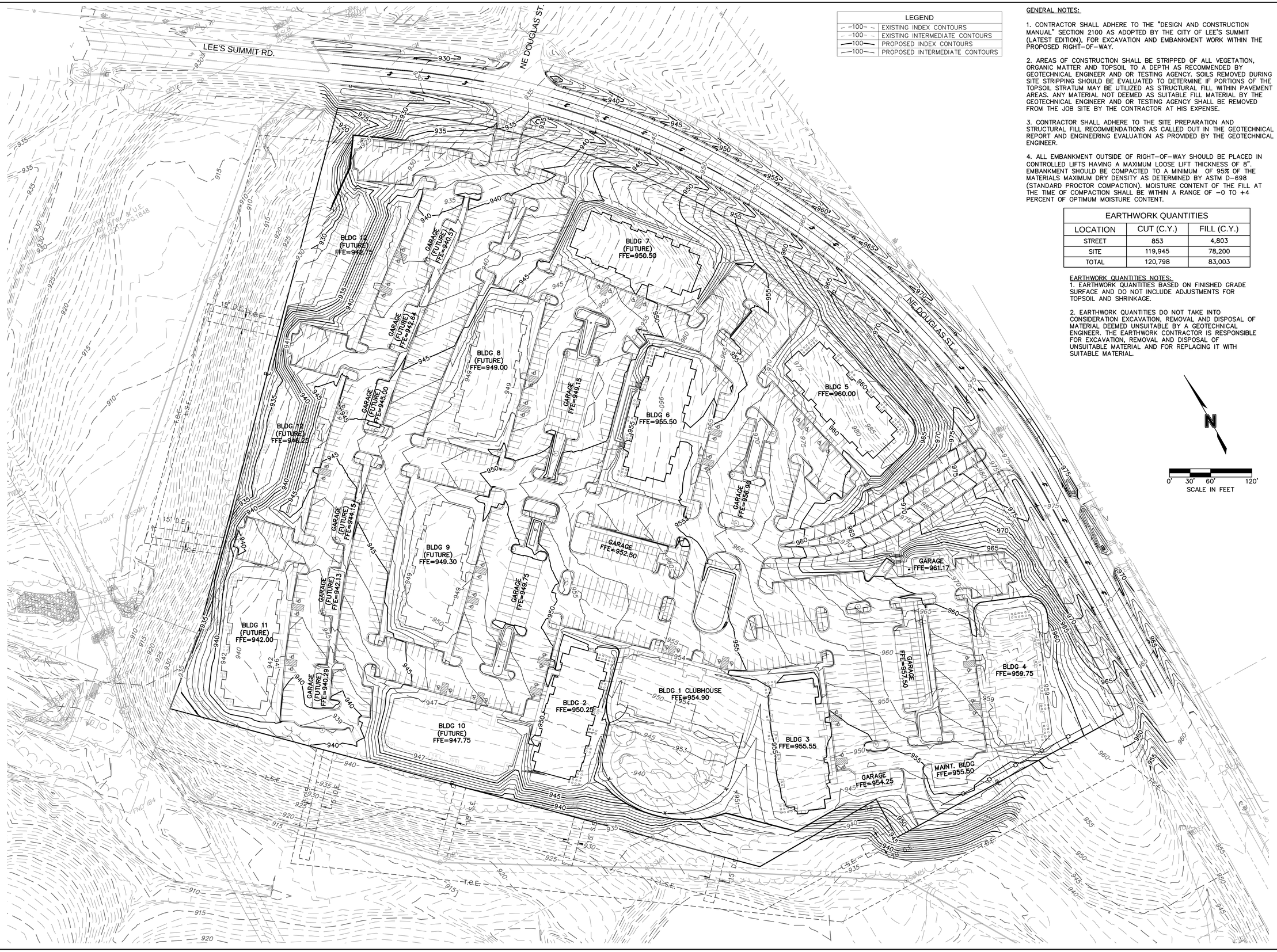
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C206

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SIT01_ B190012.dwg ~ Layout: SITE PLAN (6) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



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

GENERAL NOTES:

1. CONTRACTOR SHALL ADHERE TO THE "DESIGN AND CONSTRUCTION MANUAL" SECTION 2100 AS ADOPTED BY THE CITY OF LEE'S SUMMIT (LATEST EDITION), FOR EXCAVATION AND EMBANKMENT WORK WITHIN THE PROPOSED RIGHT-OF-WAY.

2. AREAS OF CONSTRUCTION SHALL BE STRIPPED OF ALL VEGETATION, ORGANIC MATTER AND TOPSOIL TO A DEPTH AS RECOMMENDED BY GEOTECHNICAL ENGINEER AND OR TESTING AGENCY. SOILS REMOVED DURING SITE STRIPPING SHOULD BE EVALUATED TO DETERMINE IF PORTIONS OF THE TOPSOIL STRATUM MAY BE UTILIZED AS STRUCTURAL FILL WITHIN PAVEMENT AREAS. ANY MATERIAL NOT DEEMED AS SUITABLE FILL MATERIAL BY THE GEOTECHNICAL ENGINEER AND OR TESTING AGENCY SHALL BE REMOVED FROM THE JOB SITE BY THE CONTRACTOR AT HIS EXPENSE.

3. CONTRACTOR SHALL ADHERE TO THE SITE PREPARATION AND STRUCTURAL FILL RECOMMENDATIONS AS CALLED OUT IN THE GEOTECHNICAL REPORT AND ENGINEERING EVALUATION AS PROVIDED BY THE GEOTECHNICAL ENGINEER.

4. ALL EMBANKMENT OUTSIDE OF RIGHT-OF-WAY SHOULD BE PLACED IN CONTROLLED LIFTS HAVING A MAXIMUM LOOSE LIFT THICKNESS OF 8". EMBANKMENT SHOULD BE COMPACTED TO A MINIMUM OF 95% OF THE MATERIALS MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698 (STANDARD PROCTOR COMPACTION). MOISTURE CONTENT OF THE FILL AT THE TIME OF COMPACTION SHALL BE WITHIN A RANGE OF -0 TO +4 PERCENT OF OPTIMUM MOISTURE CONTENT.

EARTHWORK QUANTITIES		
LOCATION	CUT (C.Y.)	FILL (C.Y.)
STREET	853	4,803
SITE	119,945	78,200
TOTAL	120,798	83,003

EARTHWORK QUANTITIES NOTES:
1. EARTHWORK QUANTITIES BASED ON FINISHED GRADE SURFACE AND DO NOT INCLUDE ADJUSTMENTS FOR TOPSOIL AND SHRINKAGE.

2. EARTHWORK QUANTITIES DO NOT TAKE INTO CONSIDERATION EXCAVATION, REMOVAL AND DISPOSAL OF MATERIAL DEEMED UNSUITABLE BY A GEOTECHNICAL ENGINEER. THE EARTHWORK CONTRACTOR IS RESPONSIBLE FOR EXCAVATION, REMOVAL AND DISPOSAL OF UNSUITABLE MATERIAL AND FOR REPLACING IT WITH SUITABLE MATERIAL.

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MO CERTIFICATE OF AUTHORITY #:003592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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MO# 2015000555

NO./REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

GRADING PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C301

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GRD01_ B190012.dwg ~ Layout: GRADING PLAN ~ Last Saved By: mdlebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

FUTURE BUILDING 11
FFE=942.00

FUTURE BUILDING 12
FFE=935.25

FUTURE GARAGE
FFE=940.30

FUTURE GARAGE
FFE=942.13

FUTURE GARAGE

RIBBON CURB

FUTURE TRASH

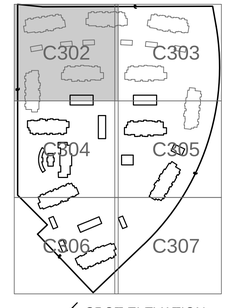
FUTURE BUILDING 10
FFE=947.75

FUTURE BUILDING 9
FFE=949.30

PROPOSED GARAGE

SEE ADA DETAIL 3
ON SHEET C308

SCALE IN FEET
0' 10' 20' 40'



SPOT ELEVATION
KEY MAP
NOT TO SCALE

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www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
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MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C302

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SPT01_B190012.dwg ~ Layout: SPOT ELEVATION PLAN ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

FUTURE BUILDING 13
FFE=931.75

FUTURE GARAGE
FFE=945.00

FUTURE GARAGE
FFE=942.64

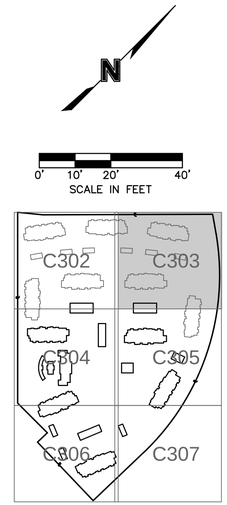
FUTURE GARAGE
FFE=940.88

RIBBON CURB

RIBBON CURB

FUTURE BUILDING 8
FFE=949.00

PROPOSED GARAGE
FFE=949.15



SPOT ELEVATION
KEY MAP
NOT TO SCALE

0' 10' 20' 40'
SCALE IN FEET

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1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO REV	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C303

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SPT01_ B190012.dwg ~ Layout: SPOT ELEVATION PLAN (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

PROPOSED GARAGE
FFE=949.75

PROPOSED BUILDING 2
FFE=950.25

PROPOSED GARAGE
FFE=952.50

PROPOSED BUILDING 1
(CLUBHOUSE)
FFE=954.90

PROPOSED BUILDING 3
FFE=955.55

COMMON AREA
FFE=953.40

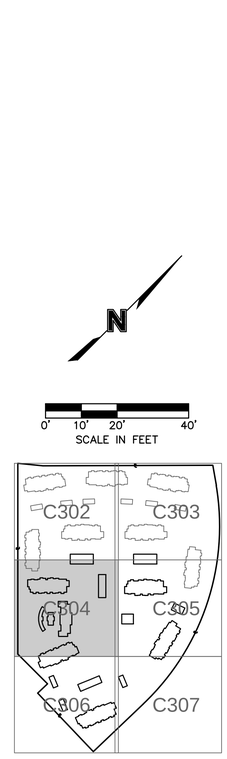
RIBBON CURB

SEE ADA DETAIL 1
ON SHEET C308

SEE ADA DETAIL 2
ON SHEET C308

SEE ADA DETAIL 3
ON SHEET C308

SEE ADA DETAIL 6
ON SHEET C310



SPOT ELEVATION
KEY MAP
NOT TO SCALE

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C304

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SP101_ B190012.dwg ~ Layout: SPOT ELEVATION PLAN (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

PROPOSED GARAGE
FFE=949.15

PROPOSED BUILDING 6
FFE=955.00

PROPOSED GARAGE
FFE=955.30

PROPOSED GARAGE
FFE=956.90

PROPOSED BUILDING 5
FFE=960.00

FUTURE BUILDING 7
FFE=950.50

CONSTRUCT 9 STEPS

CONSTRUCT 9 STEPS

SEE ADA DETAIL 6
ON SHEET C309

SEE ADA DETAIL 5
ON SHEET C309

SEE ADA DETAIL 4
ON SHEET C309

RIBBON CURB

TRACT A
979,988 SQ. FT.
22.50 AC.±

NE DOUGLAS ST.

SCALE IN FEET
0' 10' 20' 40'

SPOT ELEVATION
KEY MAP
NOT TO SCALE

C302 C303 C304 C305 C306 C307

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1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C305

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\1C_SPT01_ B190012.dwg ~ Layout: SPOT ELEVATION PLAN (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

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3301 BROADWAY, SUITE 1
NORTH KANSAS CITY, MO 64116

TEL 816.361.1177

www.olsson.com

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

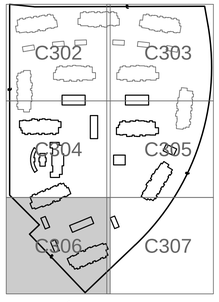
SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEES SUMMIT, MO

2020

0' 10' 20' 40'
SCALE IN FEET



SPOT ELEVATION KEY MAP
NOT TO SCALE

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET C306

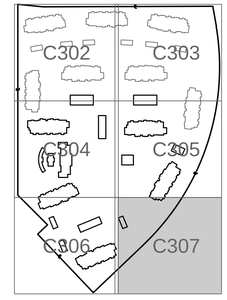
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SPT01_ B190012.dwg ~ Layout: SPOT ELEVATION PLAN (5) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

PROPOSED GARAGE FFE=961.17

NE DOUGLAS ST.

SCALE IN FEET
0' 10' 20' 40'



SPOT ELEVATION KEY MAP
NOT TO SCALE

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1301 BURLINGTON, SUITE 100
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MO# 2015000555

NO/REV	DATE	BY	REVISIONS DESCRIPTION

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

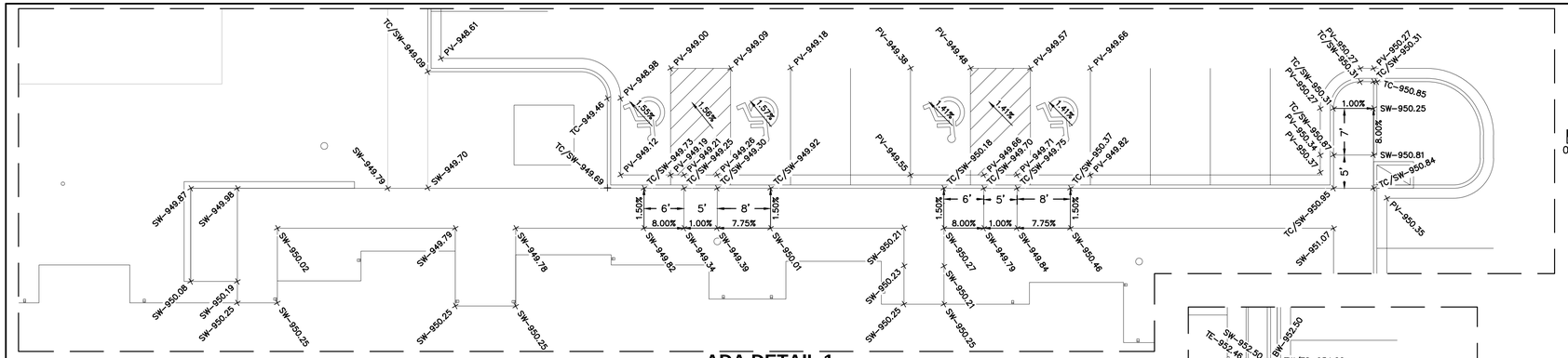
LEE'S SUMMIT, MO

2020

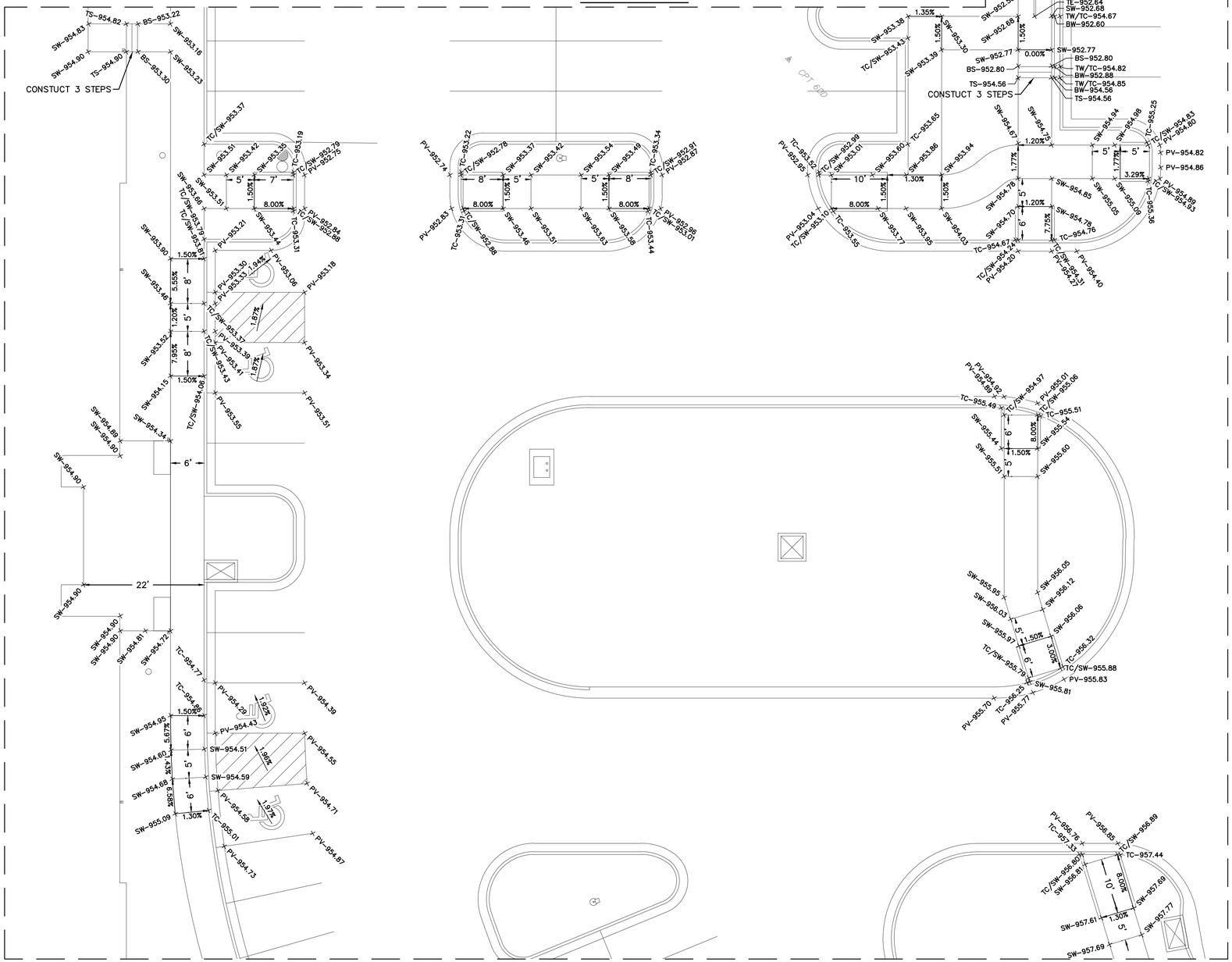
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

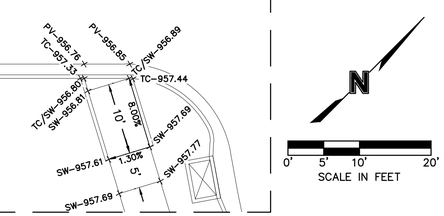
SHEET
C307

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SPT01_ B190012.dwg ~ Layout: SPOT ELEVATION PLAN (6) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



ADA DETAIL 1





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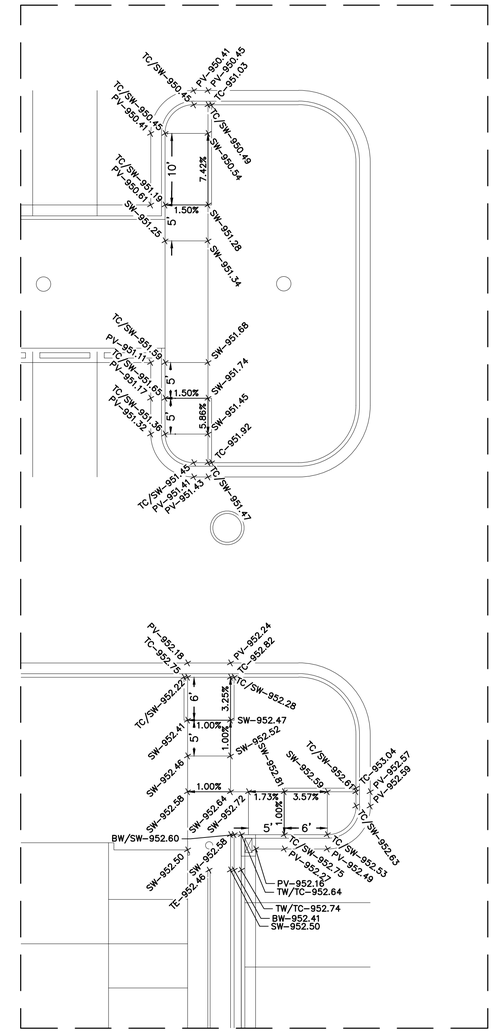
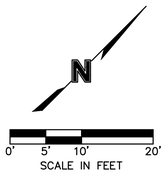


ADA DETAIL 3



LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
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NORTH KANSAS CITY, MO 64116
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NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

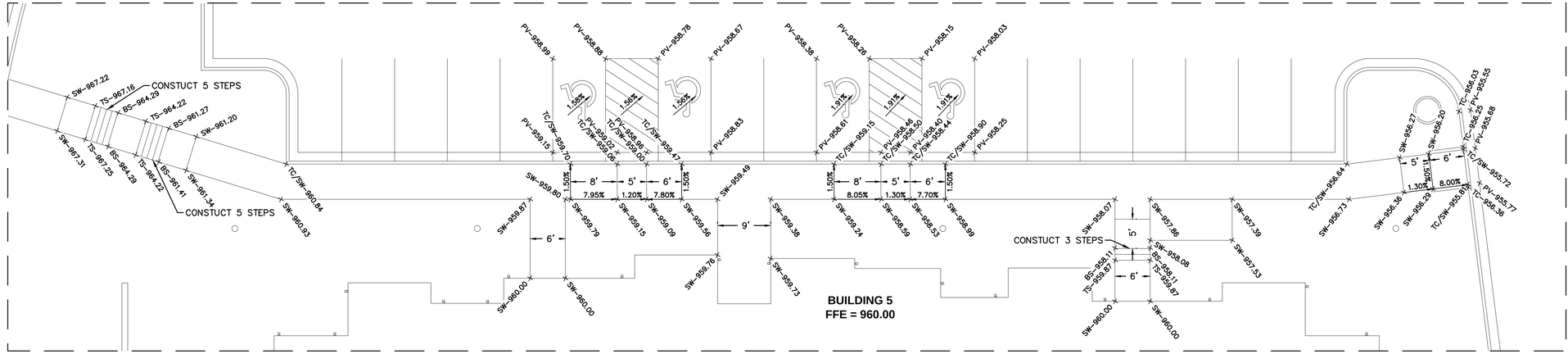
LEE'S SUMMIT, MO

2020

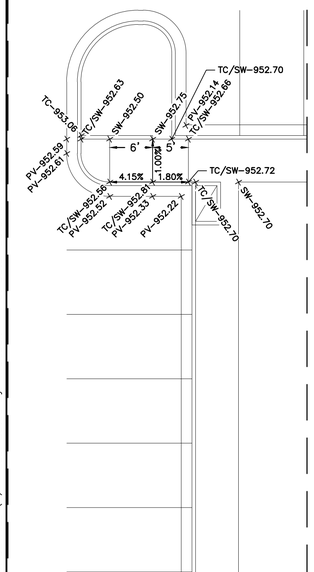
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

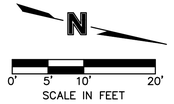
SHEET
C308

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_ADA01_ B190012.dwg ~ Layout: ADA DETAILS ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

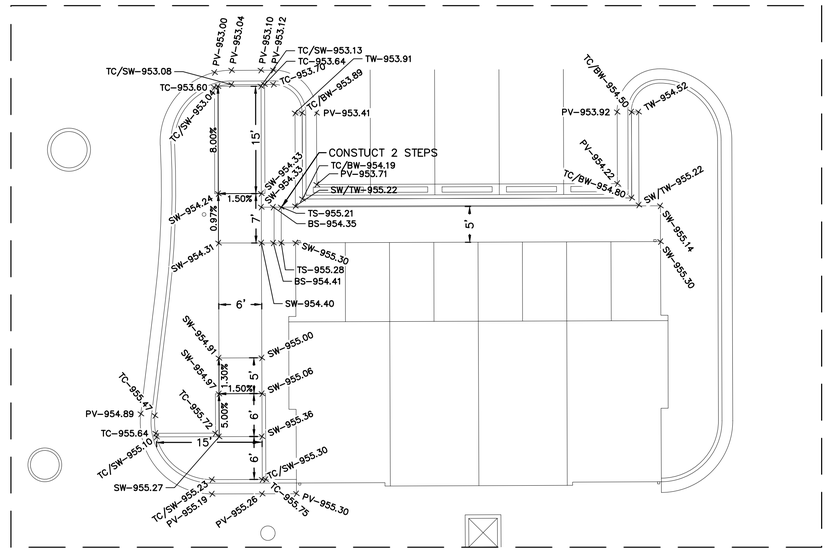


ADA DETAIL 4





LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL



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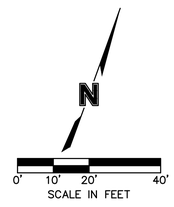
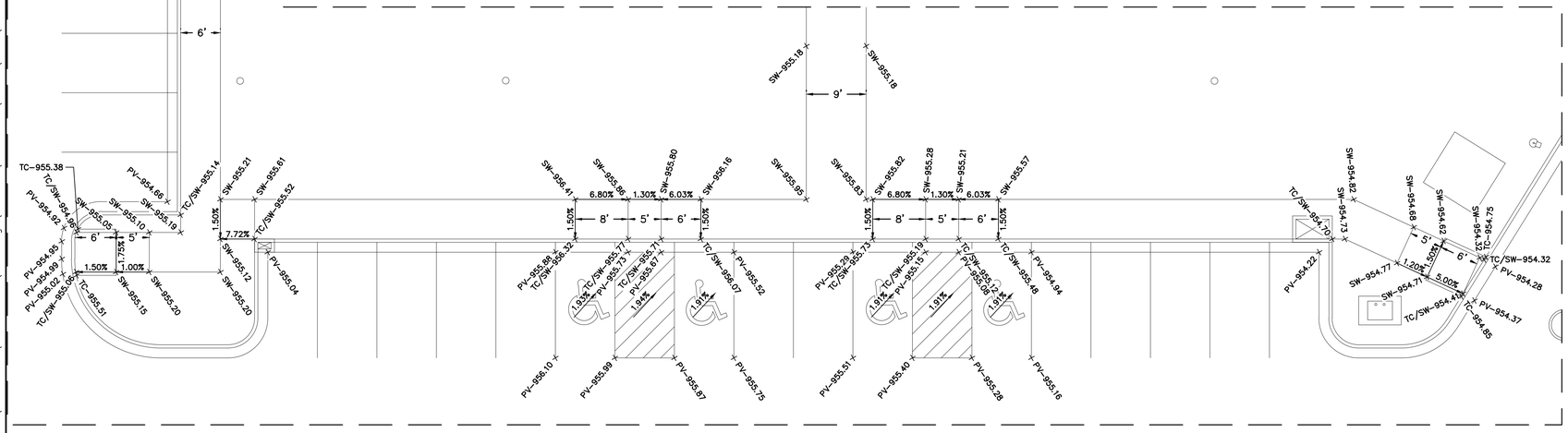
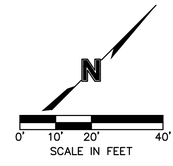




ADA DETAIL 6



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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

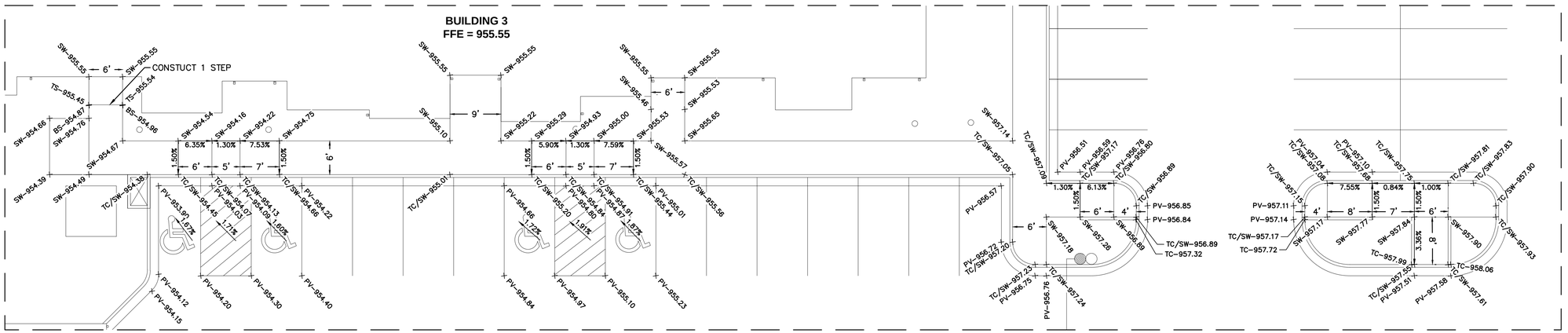
LEE'S SUMMIT, MO

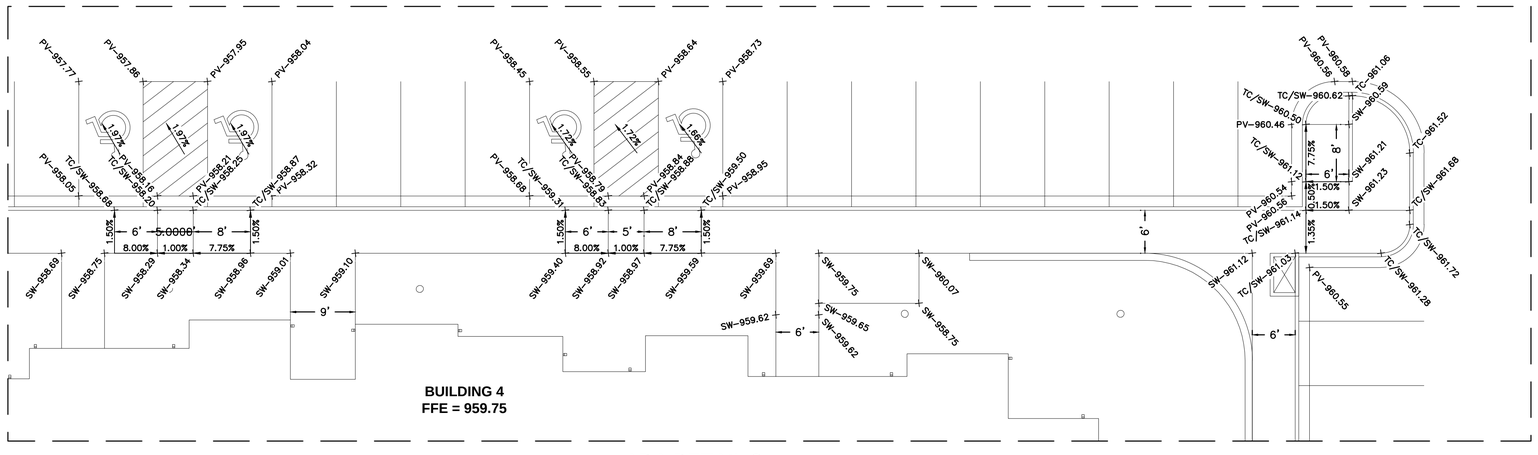
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C309

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_ADA01_ B190012.dwg ~ Layout: ADA DETAILS (2) ~ Last Saved By: mdeboit ~ Plot Date: 2019.10.01 03:03 PM





LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL

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NORTH KANSAS CITY, MO 64116
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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

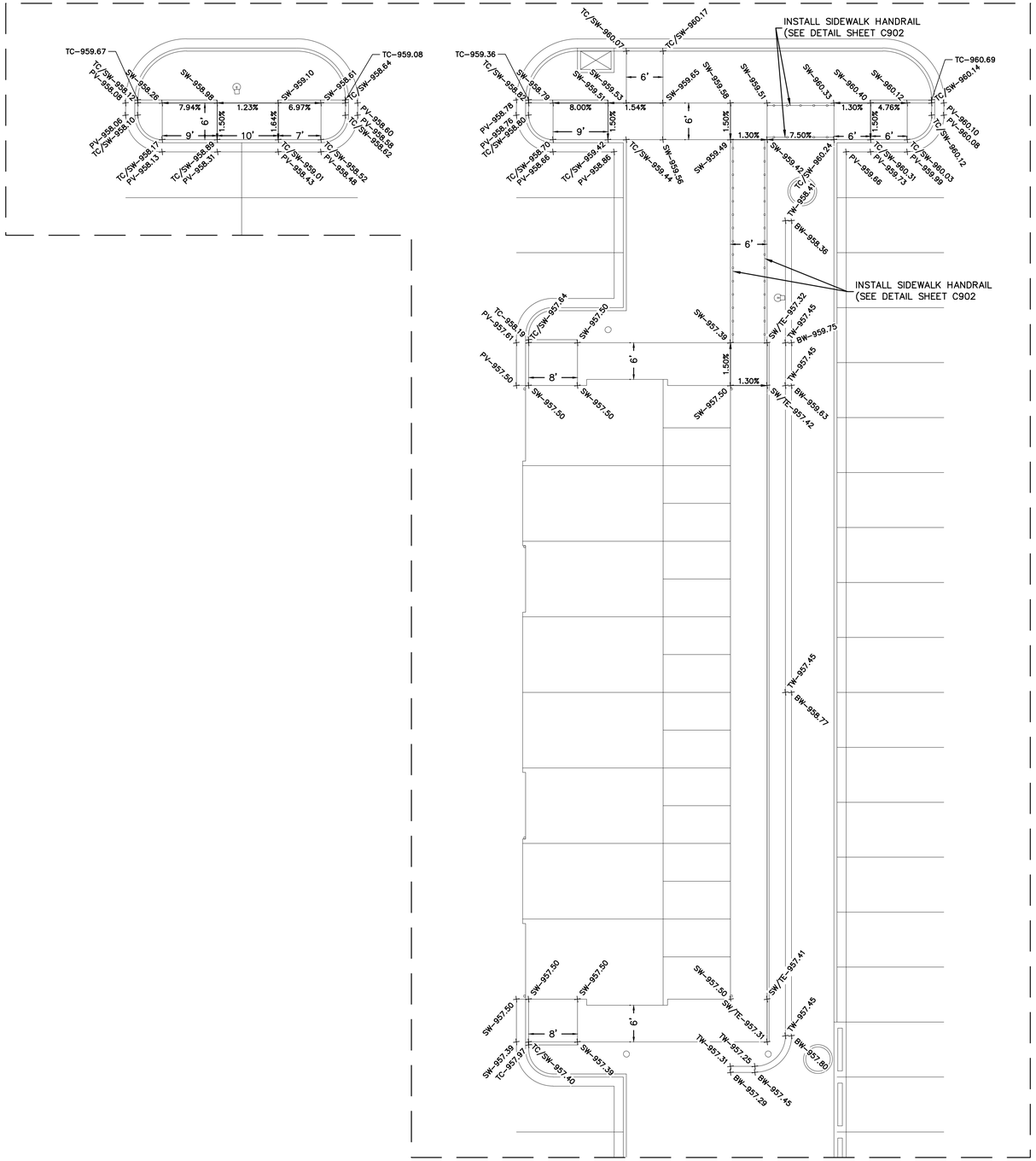
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C310

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_ADA01_ B190012.dwg ~ Layout: ADA DETAILS (3) ~ Last Saved By: mdlebolt ~ Plot Date: 2019.10.01 03:03 PM

LEGEND	
TC–	TOP OF CURB
PV–	TOP OF PAVEMENT
SW–	SIDEWALK
TE–	TOP ELEVATION OF STRUCTURE
TS–	TOP OF STEPS
BS–	BOTTOM OF STEPS
TW–	PROPOSED GRADE AT TOP OF WALL
BW–	PROPOSED GRADE AT BOTTOM OF WALL



ADA DETAIL 9

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1301 MCGEE STREET, SUITE 500
NORTH KANSAS CITY, MO 64116

TEL 816.361.1177

www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

REVISIONS

SPOT ELEVATION PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

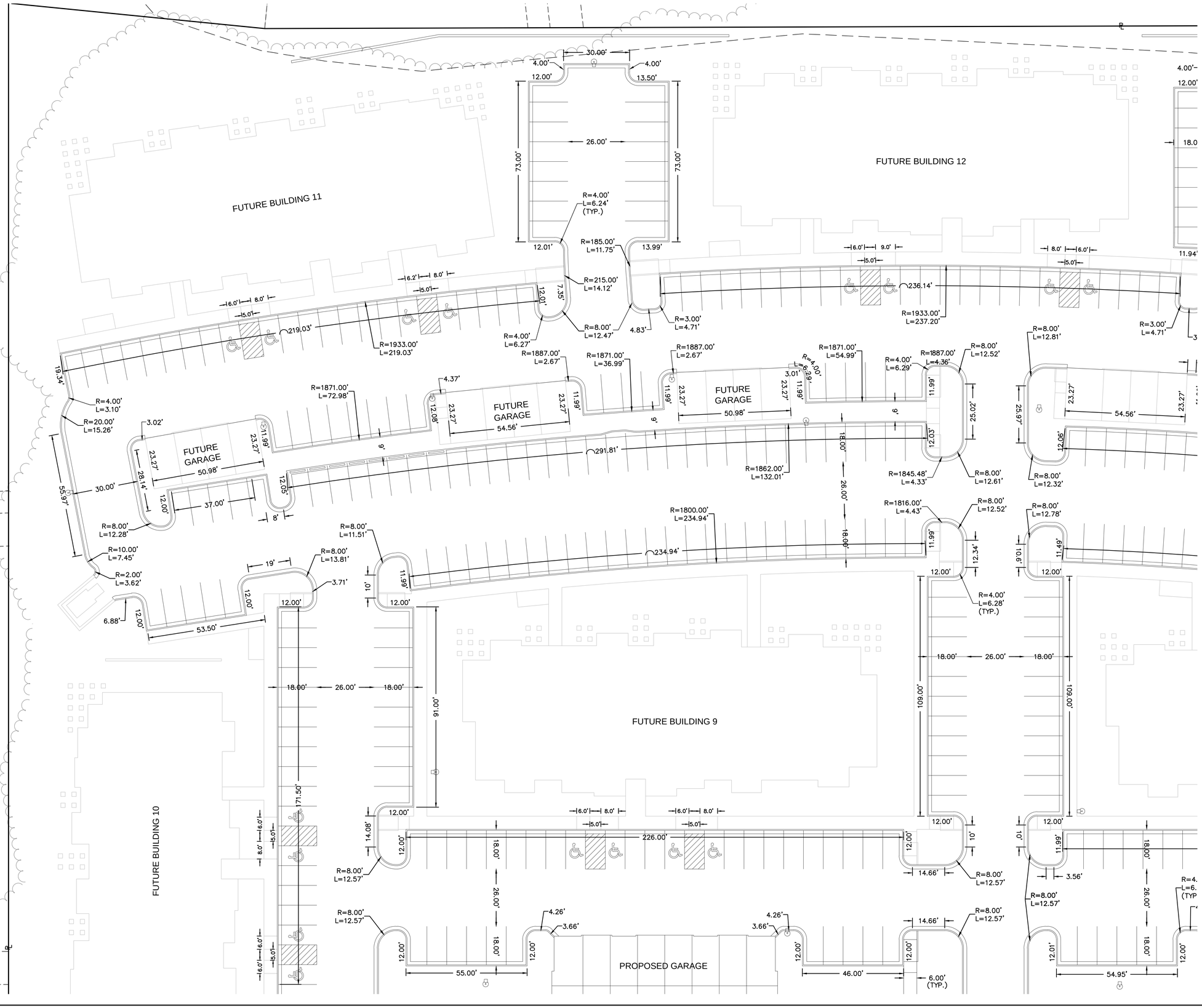
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C311

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_ADA01_ B190012.dwg ~ Layout: ADA DETAILS (4) ~ Last Saved By: mdlebolt ~ Plot Date: 2019.10.01 03:03 PM



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TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

GEOMETRIC PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C401

FUTURE BUILDING 13

FUTURE BUILDING 8

PROPOSED GARAGE

FUTURE GARAGE

FUTURE GARAGE

FUTURE GARAGE

REFER TO PUBLIC STREET & STORM PLANS FOR ENTRANCE CONSTRUCTION WITHIN PUBLIC R/W.

SCALE IN FEET

0' 10' 20' 40'

SITE GEOMETRY KEY MAP
NOT TO SCALE

C401 C402 C403 C404 C405 C406

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MO CERTIFICATE OF AUTHORITY # 001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116

TEL 816.361.1177

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

GEOMETRIC PLAN (2)
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C402

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GE001_ B190012.dwg ~ Layout: GEOMETRIC PLAN (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

PROPOSED GARAGE
PROPOSED BUILDING 2
PROPOSED GARAGE
PROPOSED BUILDING 1
(CLUBHOUSE)
PROPOSED BUILDING 3
55.00'
46.00'
30.00'
30.89'
50.45'
22.95'
109.00'
26.00'
14.66'
43.21'
33.21'
72.47'
24.33'
19.25'
25.39'
92.36'
60.68'
R=8.00'
L=12.57'
R=2.00'
L=1.57'
R=23.00'
L=36.13'
R=23.00'
L=36.60'
R=23.00'
L=35.66'
R=8.00'
L=15.12'
R=8.00'
L=4.83'
R=109.00'
L=5.67'
R=15.00'
L=29.43'
R=13.00'
L=13.99'
R=4.00'
L=6.77'
R=13.00'
L=20.42'
R=155.00'
L=60.68'
R=352.00'
L=225.11'
R=8.00'
L=12.57'
3.66'
4.26'
3.51'
3.19'
3.17'
2.66'
2.46'
6.93'
4.00'
7.52'
6.98'
6.00'
(TYP.)
18.00'
26.00'
38.00'
30.13'
136.00'
127.00'
19.00'
28.00'
30.00'
12.47'
10'
12.00'
5'
6'
X
C401
C402
C403
C404
C405
C406
0' 10' 20' 40'
SCALE IN FEET
SITE GEOMETRY
KEY MAP
NOT TO SCALE

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER
NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS
NO. REV. | DATE | REVISIONS DESCRIPTION | BY

GEOMETRIC PLAN (3)
SITE DEVELOPMENT PLANS
ARIA APARTMENTS
PHASE 1
LEE'S SUMMIT, MO
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C403

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GE001_ B190012.dwg ~ Layout: GEOMETRIC PLAN (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

PROPOSED GARAGE

PROPOSED BUILDING 6

TRACT B
979,983 SQ.FT.±
22.50 AC.±

FUTURE BUILDING 7

PROPOSED GARAGE

PROPOSED GARAGE

PROPOSED BUILDING 5

11.99' 55.00' 18.00' 12.00' 3.66' 4.31' 3.66' 12.00' 46.00' 12.00' 28.00' 2.69' R=8.00' L=11.74' R=8.00' L=12.57' 15.0' 8.0' 16'

15.37' 2.18' 15.39' 198.79' 12.00' 10' 12.00' 18.00' 15.0' 6.0' 8.0' 208.00' 80.40' 127.00'

3.91' 12.00' 12.00' R=8.00' L=9.93' 10' 82.00' R=98.00' L=44.35' R=8.00' L=12.93' R=128.00' L=21.56' 5.84' 21.56' 12.00' 5.75' R=4.00' L=6.28' 17.19' 23.75' R=8.00' L=12.57' 16.46' 46.00' 12.00' 38.19' 6.00' (TYP.) 33.68' 12.00' 2.66' 12.00' 163.00' 18.00' 12.00' 10.2' R=4.00' L=6.28' (TYP.) R=13.00' L=20.42' 7' R=8.00' L=8.12' R=8.00' L=13.55' 11.77' 50.98' R=8.00' L=12.57' 108.00'

2.64' 3.79' R=13.00' L=21.25' 3.65' R=5.00' L=11.78' 11.78' 82.00' 18.00' 12.00' 26.00' 2.71' R=8.00' L=17.02' R=8.00' L=11.58' 7' 12.00' 122.32' 18.50' R=298.00' L=25.77' 4.24' R=13.00' L=18.09' 11.46' 18.00' 55.00' 12.00' 40.67' 28.00' 3.65' R=5.00' L=11.78' 25.00' 8.26' R=8.00' L=8.12'

R=13.00' L=20.76' 1.42' 2.05' 12.00' 82.00' 18.00' 12.00' R=8.00' L=17.02' R=297.00' L=5.99' 5.08' 22.34' 12.00' 46.00' 12.00' 10.50' 30.00' 10.50' 12.00' 18.00' R=298.00' L=136.70' R=318.00' L=163.61' R=352.00' L=225.11' R=200.00' L=77.76'

0' 10' 20' 40'
SCALE IN FEET

C401 C402 C403 C404 C405 C406

SITE GEOMETRY KEY MAP
NOT TO SCALE

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

GEOMETRIC PLAN (4)
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

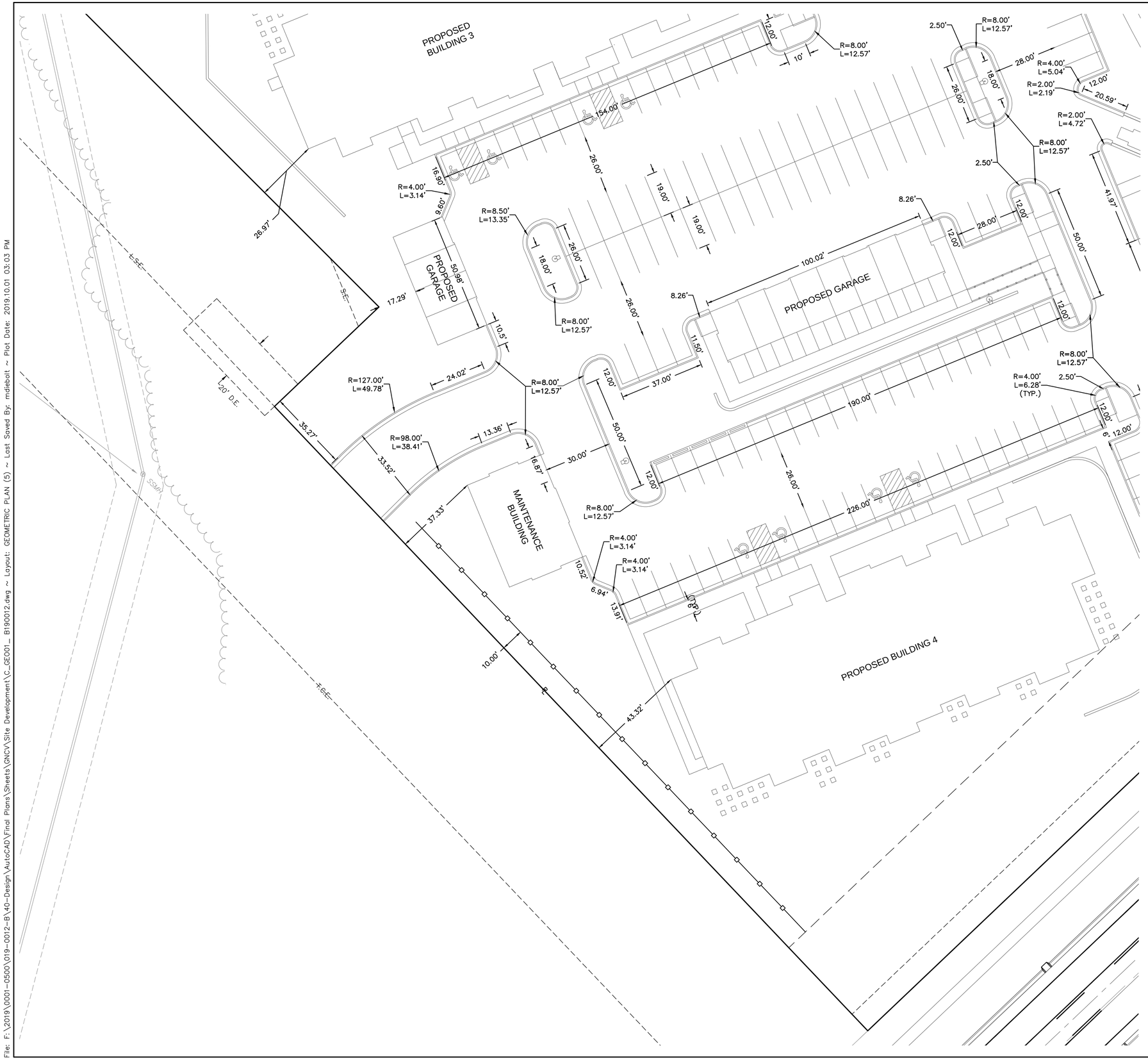
LEE'S SUMMIT, MO

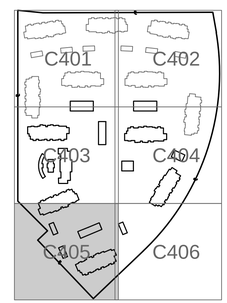
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C404

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GE001_ B190012.dwg ~ Layout: GEOMETRIC PLAN (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM





SITE GEOMETRY KEY MAP
NOT TO SCALE

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08/27/2020
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PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

GEOMETRIC PLAN (5)
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

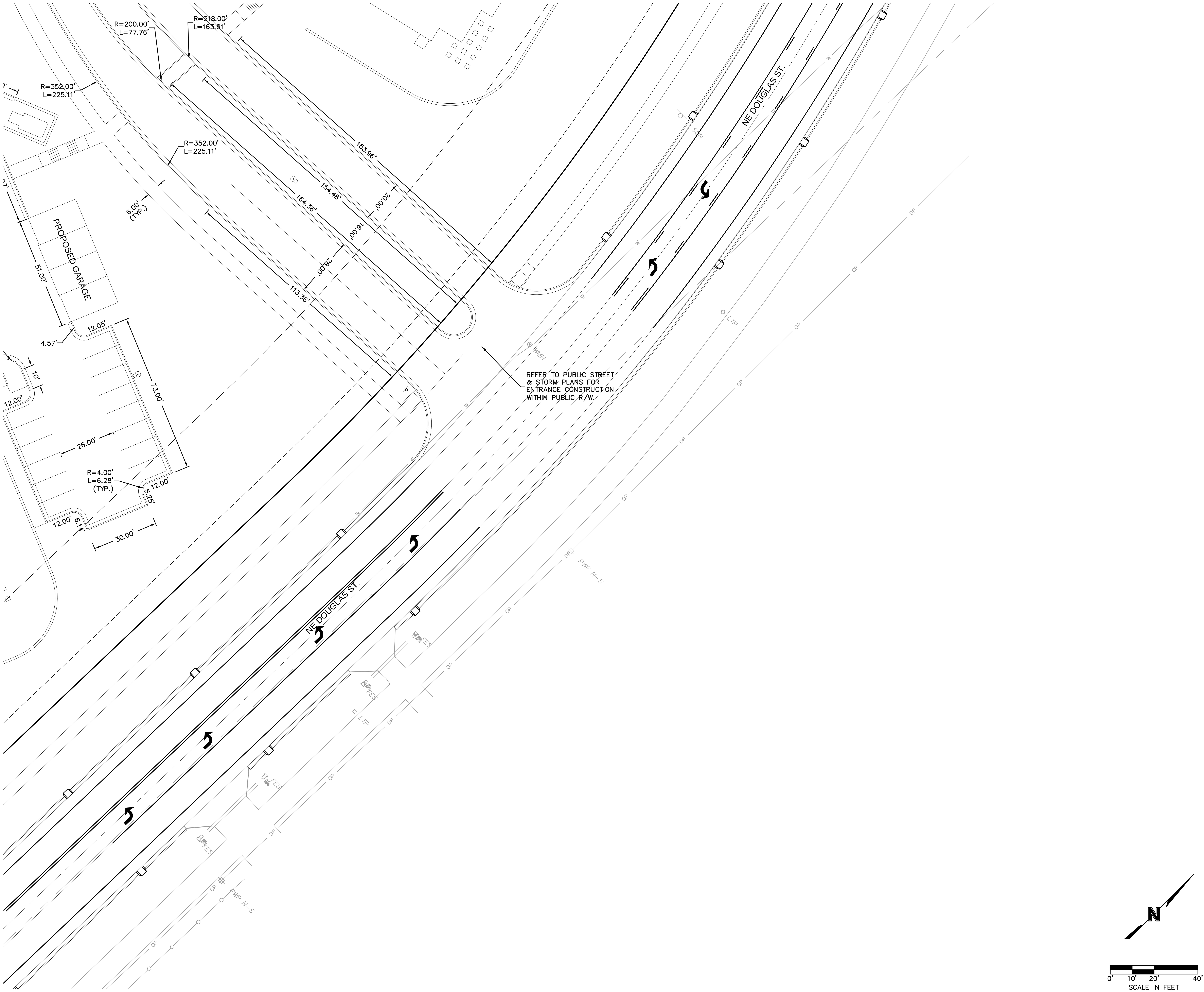
LEE'S SUMMIT, MO

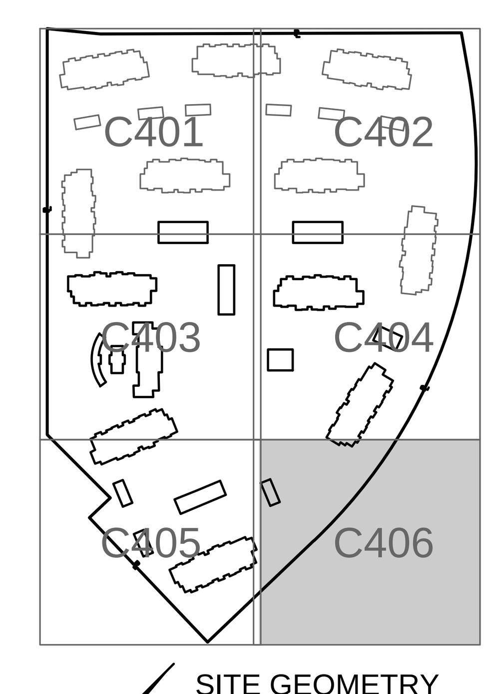
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C405

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GE001_ B190012.dwg ~ Layout: GEOMETRIC PLAN (5) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM





SITE GEOMETRY
KEY MAP
NOT TO SCALE

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GE001_ B190012.dwg ~ Layout: GEOMETRIC PLAN (6) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

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REVISIONS

GEOMETRIC PLAN (6)
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

2020

LEE'S SUMMIT, MO

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C406

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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NICHOLAS D. HEISER
STATE OF MISSOURI
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORMWATER MANAGEMENT PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.06.12

SHEET
C501

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GEN04_ B190012.dwg ~ Layout: STORMWATER MANAGEMENT PLAN ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

BLDG 2

BLDG 1
CLUBHOUSE

BLDG 3

BLDG 4

BLDG 5

BLDG 6

YD-O2
A=0.91 ac.
C=0.80

10-9
A=0.88 ac.
C=0.82

12-3
A=0.04 ac.
C=0.90

12-5
A=0.15 ac.
C=0.90

12-6
A=0.22 ac.
C=0.88

1-12
A=0.31 ac.
C=0.65

1-12
A=0.06 ac.
C=0.60

1-12
A=0.02 ac.
C=0.90

1-11
A=0.55 ac.
C=0.84

20-1
A=0.06 ac.
C=0.90

6-1
A=0.01 ac.
C=0.90

1-16
A=0.1
C=0.

10-12
A=0.22 ac.
C=0.70

7-1
A=0.21 ac.
C=0.70

1-14
A=0.66 ac.
C=0.82

14-2
A=0.82 ac.
C=0.75

10-11
A=0.54 ac.
C=0.85

1-18
A=0.10 ac.
C=0.75

6-2
A=0.84 ac.
C=0.82

7-2
A=0.24 ac.
C=0.60

16-2
A=0.79 ac.
C=0.85

16-1
A=0.11 ac.
C=0.82

15-7
A=0.04 ac.
C=0.90

15-8
A=0.10 ac.
C=0.55

10-13
A=0.30 ac.
C=0.85

15-5
A=0.10 ac.
C=0.90

15-4
A=0.58 ac.
C=0.85

15-2
A=0.09 ac.
C=0.82

17-1
A=0.28 ac.
C=.80

18-1
A=0.22 ac.
C=0.60

17-2
A=0.64 ac.
C=0.60

ES-01

14-1

15' S.E.

15' D.E.

L.S.E.

S.E.

T.E.E.

P-UG

SS

SD

W

G

OHP

PWP N-S

0' 20' 40' 80'
SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY #:001592
KS CERTIFICATE OF AUTHORITY #:E-2000
NORTH KANSAS CITY, MO 64116

TEL 816.361.1177

www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

STORMWATER MANAGEMENT PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEES SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.06.12

SHEET
C502

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_GEN04_ B190012.dwg ~ Layout: STORMWATER MANAGEMENT PLAN (2) ~ Last Saved By: mdeboit ~ Plot Date: 2019.10.01 03:03 PM

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Drainage Area Design Table

10 Year Return Frequency

Inlet ID	Drainage Area	C	Tc	i	K	Peak Flow
	(ac)		(min)	(in/hr)		(cfs)
1-2	0.38	0.82	5.00	7.35	1.00	2.29
1-3	0.12	0.90	5.00	7.35	1.00	0.79
1-4	0.50	0.80	5.00	7.35	1.00	2.94
1-5	0.47	0.80	5.00	7.35	1.00	2.76
1-6	0.03	0.90	5.00	7.35	1.00	0.20
1-8	0.64	0.85	5.00	7.35	1.00	4.00
1-9	0.31	0.85	5.00	7.35	1.00	1.94
1-11	0.55	0.84	5.00	7.35	1.00	3.40
1-12	0.33	0.65	5.00	7.35	1.00	1.58
1-14	0.66	0.82	5.00	7.35	1.00	3.98
1-16	0.14	0.88	5.00	7.35	1.00	0.91
1-18	0.10	0.75	5.00	7.35	1.00	0.55
2-1	0.41	0.80	5.00	7.35	1.00	2.41
2-2	0.58	0.50	5.00	7.35	1.00	2.13
3-1	0.23	0.75	5.00	7.35	1.00	1.27
4-1	0.43	0.82	5.00	7.35	1.00	2.59
5-1	0.15	0.80	5.00	7.35	1.00	0.88
5-2	0.28	0.80	5.00	7.35	1.00	1.65
5-4	0.12	0.75	5.00	7.35	1.00	0.66
6-1	0.01	0.90	5.00	7.35	1.00	0.07
6-2	0.84	0.50	5.00	7.35	1.00	3.09
7-1	0.21	0.70	5.00	7.35	1.00	1.08
7-2	0.24	0.60	5.00	7.35	1.00	1.06
8-3	0.17	0.88	5.00	7.35	1.00	1.10
8-4	0.06	0.90	5.00	7.35	1.00	0.40
8-5	0.18	0.85	5.00	7.35	1.00	1.13
9-4	0.23	0.85	5.00	7.35	1.00	1.44
9-5	0.06	0.90	5.00	7.35	1.00	0.40
9-6	0.28	0.85	5.00	7.35	1.00	1.75
9-7	0.34	0.83	5.00	7.35	1.00	2.08
9-8	0.09	0.90	5.00	7.35	1.00	0.60
9-9	0.09	0.90	5.00	7.35	1.00	0.60
10-3	0.89	0.85	5.00	7.35	1.00	5.56
10-5	0.58	0.85	5.00	7.35	1.00	3.63
10-6	0.55	0.85	5.00	7.35	1.00	3.44
10-7	0.12	0.75	5.00	7.35	1.00	0.66
10-8	0.05	0.90	5.00	7.35	1.00	0.33
10-9	0.88	0.82	5.00	7.35	1.00	5.31
10-11	0.54	0.85	5.00	7.35	1.00	3.38
10-12	0.22	0.75	5.00	7.35	1.00	1.21
10-13	0.30	0.85	5.00	7.35	1.00	1.88
11-1	0.56	0.85	5.00	7.35	1.00	3.50
12-1	0.08	0.88	5.00	7.35	1.00	0.52
12-2	0.16	0.85	5.00	7.35	1.00	1.00
12-3	0.04	0.90	5.00	7.35	1.00	0.26
12-5	0.15	0.90	5.00	7.35	1.00	0.99
12-6	0.22	0.88	5.00	7.35	1.00	1.42
13-1	0.14	0.60	5.00	7.35	1.00	0.62
13-2	0.04	0.60	5.00	7.35	1.00	0.18
14-2	0.82	0.75	5.00	7.35	1.00	4.52
15-2	0.09	0.82	5.00	7.35	1.00	0.54
15-4	0.58	0.85	5.00	7.35	1.00	3.63
15-5	0.10	0.90	5.00	7.35	1.00	0.66
15-7	0.04	0.90	5.00	7.35	1.00	0.26
15-8	0.10	0.55	5.00	7.35	1.00	0.40
16-1	0.11	0.82	5.00	7.35	1.00	0.66
16-2	0.79	0.85	5.00	7.35	1.00	4.94
17-1	0.28	0.80	5.00	7.35	1.00	1.65
17-2	0.65	0.60	5.00	7.35	1.00	2.87
18-1	0.22	0.60	5.00	7.35	1.00	0.97
19-1	0.07	0.88	5.00	7.35	1.00	0.45
20-1	0.06	0.90	5.00	7.35	1.00	0.40
YD-O2	0.91	0.80	5.00	7.35	1.00	5.35

Storm Sewer Design Calculation Table

10 Year Return Frequency

Upstream Structure	Downstream Structure	Length	Upstream Invert	Downstream Invert	Slope	Diameter	Manning's n	Total Flow	Velocity	Capacity	Flow Depth	Upstream Struct. HGL	Upstream Top Elev.
		(ft)	(ft)	(ft)	(%)	(in)		(cfs)	(ft/s)	(cfs)	(ft)	(ft)	(ft)
1-2	1-1	33.35	921.67	919.00	8.01	24	0.012	43.08	13.72	69.33	1.96	923.63	935.46
1-3	1-2	105.47	927.63	923.67	3.75	30	0.012	40.79	17.30	86.09	2.14	929.77	939.31
1-4	1-3	27.74	928.68	928.13	1.98	30	0.012	40.00	11.68	62.56	2.13	930.81	939.36
1-5	1-4	53.79	930.26	929.18	2.01	30	0.012	37.06	10.95	62.95	2.06	932.32	940.25
1-6	1-5	71.06	934.39	931.08	4.66	30	0.012	28.04	11.55	95.89	1.80	936.19	941.24
1-7	1-6	67.19	937.24	934.89	3.50	30	0.012	25.25	9.75	83.09	1.71	938.95	943.96
1-8	1-7	83.31	938.57	937.74	1.00	30	0.012	25.25	9.33	44.35	1.71	940.28	947.18
1-9	1-8	73.04	939.80	939.07	1.00	24	0.012	21.25	8.78	24.50	1.65	941.45	947.30
1-10	1-9	35.74	940.66	940.30	1.01	24	0.012	19.31	8.67	24.59	1.58	942.24	947.97
1-11	1-10	59.52	943.22	941.16	3.46	24	0.012	16.12	9.33	45.59	1.45	944.67	950.39
1-12	1-11	87.37	945.47	943.72	2.00	18	0.012	12.72	10.10	16.10	1.34	946.81	952.91
1-13	1-12	44.18	946.85	945.97	1.99	18	0.012	11.14	9.81	16.06	1.28	948.13	954.72
1-14	1-13	40.80	947.76	947.35	1.00	18	0.012	7.98	6.98	11.40	1.09	948.85	954.78
1-15	1-14	85.69	949.12	948.26	1.00	15	0.012	4.00	5.90	7.01	0.81	949.93	956.57
1-16	1-15	31.43	949.93	949.62	1.00	15	0.012	3.60	5.71	6.95	0.77	950.70	956.10
1-17	1-16	35.27	950.78	950.43	1.00	15	0.012	2.69	5.31	6.97	0.66	951.44	957.21
1-18	1-17	46.51	953.61	951.28	5.01	15	0.012	0.55	5.97	15.66	0.29	953.90	959.05
2-1	1-5	80.82	934.19	933.38	1.00	18	0.012	5.81	6.47	11.39	0.93	935.12	940.75
2-2	2-1	106.82	937.86	934.69	2.97	15	0.012	2.13	5.71	12.05	0.58	938.44	944.64
3-1	2-1	61.23	935.30	934.69	1.00	15	0.012	1.27	3.40	6.98	0.44	935.74	939.63
4-1	1-6	63.37	936.27	935.00	2.00	15	0.012	2.59	2.14	9.90	0.64	936.91	942.00
5-1	1-10	81.58	941.98	941.16	1.01	15	0.012	3.19	2.83	7.01	0.72	942.70	948.72
5-2	5-1	50.24	942.98	942.48	1.00	15	0.012	2.31	5.10	6.98	0.61	943.59	948.72
5-3	5-2	40.43	943.88	943.48	1.00	15	0.012	0.66	3.57	6.96	0.32	944.20	949.73
5-4	5-3	35.71	944.74	944.38	1.00	15	0.012	0.66	3.59	7.02	0.32	945.06	949.10
6-1	1-13	32.58	948.23	947.90	1.00	15	0.012	3.16	5.58	7.04	0.72	948.95	955.39
6-2	6-1	30.07	948.73	948.43	1.00	15	0.012	3.09	5.52	6.99	0.71	949.44	955.00
7-1	1-17	48.59	951.83	951.28	1.13	15	0.012	2.14	5.24	7.44	0.58	952.41	956.50
7-2	7-1	45.44	953.92	952.33	3.50	15	0.012	1.06	6.41	13.09	0.40	954.32	958.76
8-2	8-1	30.00	908.70	907.20	5.00	15	0.012	2.63	2.41	15.64	0.65	909.35	917.35
8-3	8-2	79.43	929.40	912.86	20.82	15	0.012	2.63	15.71	31.92	0.65	930.05	941.22
8-4	8-3	89.89	935.00	931.40	4.00	15	0.012	1.53	7.48	14.00	0.49	935.49	944.84
8-5	8-4	35.60	936.39	935.50	2.50	15	0.012	1.13	5.80	11.06	0.42	936.81	944.43
9-2	9-1	33.33	908.00	906.00	6.00	15	0.012	6.87	5.62	17.14	1.05	909.05	915.45
9-3	9-2	38.36	916.75	911.00	14.99	15	0.012	6.87	18.41	27.08	1.05	917.80	924.78
9-4	9-3	33.15	924.97	920.00	14.99	15	0.012	6.87	18.41	27.09	1.05	926.02	940.11
9-5	9-4	92.79	934.67	932.81	2.00	15	0.012	5.43	8.25	9.90	0.94	935.61	943.35
9-6	9-5	27.97	935.45	935.17	1.00	15	0.012	5.03	6.21	7.00	0.91	936.36	943.34
9-7	9-6	54.90	936.50	935.95	1.00	15	0.012	3.28	5.61	7.00	0.73	937.23	944.46
9-8	9-7	155.37	941.68	937.00	3.01	15	0.012	1.20	6.30	12.14	0.43	942.11	948.53
9-9	9-8	66.00	943.50	942.18	2.00	15	0.012	0.60	4.44	9.89	0.30	943.80	948.53
10-2	10-1	54.35	914.17	912.00	3.99	24	0.012	35.11	11.18	48.96	1.92	916.09	924.98
10-3A	10-2	107.56	927.29	919.21	7.51	24	0.012	35.11	21.60	67.16	1.92	929.21	939.42
10-3	10-3A	10.00	932.60	932.10	5.00	24	0.012	35.11	18.51	54.79	1.92	934.52	938.93
10-4	10-3	87.39	932.85	931.10	2.00	30	0.012	29.55	6.02	62.87	1.85	934.70	941.58
10-5	10-4	30.97	934.37	933.35	3.29	24	0.012	26.05	11.53	44.47	1.79	936.16	943.41
10-6	10-5	115.86	937.19	934.87	2.00	24	0.012	22.42	10.50	34.67	1.69	938.88	947.51
10-7	10-6	72.50	939.28	937.69	2.19	24	0.012	18.98	9.77	36.29	1.57	940.85	948.25
10-8	10-7	69.03	940.58	939.78	1.16	24	0.012	18.32	9.07	26.38	1.54	942.12	949.74
10-9	10-8	42.04	941.50	941.08	1.00	24	0.012	13.00	7.87	24.49	1.30	942.80	950.87
10-10	10-9	139.50	944.32	942.93	1.00	18	0.012	7.69	6.90	11.36	1.07	945.39	953.37
10-11	10-10	74.43	945.56	944.82	1.00	15	0.012	7.69	6.27	6.98	1.25	946.97	954.55
10-12	10-11	102.33	947.08	946.06	1.00	15	0.012	4.31	3.64	6.98	0.84	947.92	954.00
10-13	10-12	97.33	951.98	947.58	4.52	15	0.012	3.10	9.57	14.87	0.71	952.69	957.97
11-1	10-4	39.65	934.50	934.10	1.00	15	0.012	3.50	5.72	7.03	0.75	935.25	940.75
12-1	10-8	29.38	942.38	942.09	1.00	18	0.012	4.99	6.19	11.30	0.86	943.24	949.32
12-2	12-1	50.24	943.38	942.88	1.00	18	0.012	4.47	6.04	11.35	0.81	944.19	949.32
12-3	12-2	35.22	944.23	943.88	1.00	15	0.012	3.47	5.67	6.97	0.75	944.98	950.33
12-4	12-3	56.84	945.87	944.73	2.00	15	0.012	2.41	6.66	9.91	0.62	946.49	951.68
12-5	12-4	44.47	946.81	946.37	1.00	15	0.012	2.41	5.15	6.96	0.62	947.43	952.25
12-6	12-5	62.52	947.94	947.31	1.00	15	0.012	1.42	4.48	7.02	0.47	948.41	952.78
13-1	12-3	46.17	945.29	944.83	1.00	15	0.012	0.80	3.78	6.98	0.35	945.64	949.50
13-2	13-1	33.58	945.83	945.49	1.00	15	0.012	0.18	2.16	7.04	0.16	945.99	950.75
14-2	14-1	126.56	938.86	930.00	7.00	15	0.012	4.52	3.77	18.51	0.86	939.72	950.81
15-2	15-1	69.134	942.81	936.52	9.10	18	0.012	16.58	9.38	34.31	1.43	944.24	952.14
15-3	15-2	93.367	944.94	943.08	2.00	24	0.012	16.04	8.46	34.58	1.44	946.38	954.75
15-4	15-3	45.465	948.01	946.83	2.60	18	0.012	5.92	9.25	18.33	0.94	948.95	955.90
15-5	15-4	41.988	949.6	948.51	2.60	15	0.012	2.29	5.96	11.27	0.60	950.20	957.14
15-6	15-5	142.086	953.64	950.1	2.49	15	0.012	1.63	6.44	11.04	0.51	954.15	959.11
15-7	15-6	40.072	954.54	954.14	1.00	15	0.012	0.66	3.58	6.99	0.32	954.86	959.89
15-8	15-7	45.363	955.5	955.04	1.00	15	0.012	0.40	3.11	7.04	0.25	955.75	959.98
16-1	15-3	59.43	947.03	946.44	1.00	15	0.012	5.60	6.31	6.97	0.96	947.99	953.84
16-2	16-1	49.33	948.02	947.53	1.00	15	0.012	4.94	6.16	6.97	0.90	948.92	954.49
17-1	15-3	51.48	946.88	946.37	1.00	15	0.012	4.52	6.04	6.96	0.86	947.74	955.12
17-2	17-1	70.16	948.08	947.38	1.00	15	0.012	2.87	5.41	6.99	0.68	948.76	956.60
18-1	15-6	76.376	955	954.24	1.00	15	0.012	0.97	4.00	6.98	0.39	955.39	961.15
19-1	1-5	99.50	932.50	931.51	1.00	15	0.012	0.45	0.54	6.98	0.26	932.76	936.13
20-1	1-15	104.30	950.66	949.62	1.00	15	0.012	0.40	1.70	6.99	0.25	950.91	955.29
YD-O2	ES-01	98.08	935.79	925.98	10.00	12	0.012	5.35	6.81	12.20	0.93	936.72	947.00

olsson
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

STORMWATER MANAGEMENT CALCULATIONS
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.06.12

SHEET
C503

Drainage Area Design Table						
100 Year Return Frequency						
Inlet ID	Drainage Area	C	Tc	i	K	Peak Flow
	(ac)		(min)	(in/hr)		(cfs)
1-2	0.38	0.82	5.00	10.32	1.25	3.92
1-3	0.12	0.90	5.00	10.32	1.25	1.24
1-4	0.50	0.80	5.00	10.32	1.25	5.16
1-5	0.47	0.80	5.00	10.32	1.25	4.85
1-6	0.03	0.90	5.00	10.32	1.25	0.31
1-8	0.64	0.85	5.00	10.32	1.25	6.61
1-9	0.31	0.85	5.00	10.32	1.25	3.20
1-11	0.55	0.84	5.00	10.32	1.25	5.68
1-12	0.33	0.65	5.00	10.32	1.25	2.77
1-14	0.66	0.82	5.00	10.32	1.25	6.81
1-16	0.14	0.88	5.00	10.32	1.25	1.45
1-18	0.10	0.75	5.00	10.32	1.25	0.97
2-1	0.41	0.80	5.00	10.32	1.25	4.23
2-2	0.58	0.50	5.00	10.32	1.25	3.74
3-1	0.23	0.75	5.00	10.32	1.25	2.23
4-1	0.43	0.82	5.00	10.32	1.25	4.44
5-1	0.15	0.80	5.00	10.32	1.25	1.55
5-2	0.28	0.80	5.00	10.32	1.25	2.89
5-4	0.12	0.75	5.00	10.32	1.25	1.16
6-1	0.01	0.90	5.00	10.32	1.25	0.10
6-2	0.84	0.50	5.00	10.32	1.25	5.42
7-1	0.21	0.70	5.00	10.32	1.25	1.90
7-2	0.24	0.60	5.00	10.32	1.25	1.86
8-3	0.17	0.88	5.00	10.32	1.25	1.75
8-4	0.06	0.90	5.00	10.32	1.25	0.62
8-5	0.18	0.85	5.00	10.32	1.25	1.86
9-4	0.23	0.85	5.00	10.32	1.25	2.37
9-5	0.06	0.90	5.00	10.32	1.25	0.62
9-6	0.28	0.85	5.00	10.32	1.25	2.89
9-7	0.34	0.83	5.00	10.32	1.25	3.51
9-8	0.09	0.90	5.00	10.32	1.25	0.93
9-9	0.09	0.90	5.00	10.32	1.25	0.93
10-3	0.89	0.85	5.00	10.32	1.25	9.19
10-5	0.58	0.85	5.00	10.32	1.25	5.99
10-6	0.55	0.85	5.00	10.32	1.25	5.68
10-7	0.12	0.75	5.00	10.32	1.25	1.16
10-8	0.05	0.90	5.00	10.32	1.25	0.52
10-9	0.88	0.82	5.00	10.32	1.25	9.08
10-11	0.54	0.85	5.00	10.32	1.25	5.57
10-12	0.22	0.75	5.00	10.32	1.25	2.13
10-13	0.30	0.85	5.00	10.32	1.25	3.10
11-1	0.56	0.85	5.00	10.32	1.25	5.78
12-1	0.08	0.88	5.00	10.32	1.25	0.83
12-2	0.16	0.85	5.00	10.32	1.25	1.65
12-3	0.04	0.90	5.00	10.32	1.25	0.41
12-5	0.15	0.90	5.00	10.32	1.25	1.55
12-6	0.22	0.88	5.00	10.32	1.25	2.27
13-1	0.14	0.60	5.00	10.32	1.25	1.08
13-2	0.04	0.60	5.00	10.32	1.25	0.31
14-2	0.82	0.75	5.00	10.32	1.25	7.94
15-2	0.09	0.82	5.00	10.32	1.25	0.93
15-4	0.58	0.85	5.00	10.32	1.25	5.99
15-5	0.10	0.90	5.00	10.32	1.25	1.03
15-7	0.04	0.90	5.00	10.32	1.25	0.41
15-8	0.10	0.55	5.00	10.32	1.25	0.71
16-1	0.11	0.82	5.00	10.32	1.25	1.14
16-2	0.79	0.85	5.00	10.32	1.25	8.15
17-1	0.28	0.80	5.00	10.32	1.25	2.89
17-2	0.65	0.60	5.00	10.32	1.25	5.03
18-1	0.22	0.60	5.00	10.32	1.25	1.70
19-1	0.07	0.88	5.00	10.32	1.25	0.72
20-1	0.06	0.90	5.00	10.32	1.25	0.62
YD-O2	0.91	0.80	5.00	10.32	1.25	9.39

Storm Sewer Design Calculation Table													
100 Year Return Frequency													
Upstream Structure	Downstream Structure	Length (ft)	Upstream Invert (ft)	Downstream Invert (ft)	Slope (%)	Diameter (in)	Manning's n	Total Flow (cfs)	Velocity (ft/s)	Capacity (cfs)	Flow Depth (ft)	Upstream Struct. HGL (ft)	Upstream Top Elev. (ft)
1-2	1-1	33.35	921.67	919.00	8.01	24	0.012	73.84	23.51	69.33	2.00	924.03	935.46
1-3	1-2	105.47	927.63	923.67	3.75	30	0.012	69.92	14.25	86.09	2.50	930.13	939.31
1-4	1-3	27.74	928.68	928.13	1.98	30	0.012	68.68	13.99	62.56	2.50	932.06	939.36
1-5	1-4	53.79	930.26	929.18	2.01	30	0.012	63.52	12.94	62.95	2.50	934.37	940.25
1-6	1-5	71.06	934.39	931.08	4.66	30	0.012	47.75	9.73	95.89	2.27	936.66	941.24
1-7	1-6	67.19	937.24	934.89	3.50	30	0.012	43.00	11.59	83.09	2.19	939.43	943.96
1-8	1-7	83.31	938.57	937.74	1.00	30	0.012	43.00	10.29	44.35	2.19	940.76	947.18
1-9	1-8	73.04	939.80	939.07	1.00	24	0.012	36.39	11.59	24.50	2.00	942.68	947.30
1-10	1-9	35.74	940.66	940.30	1.01	24	0.012	33.19	10.57	24.59	2.00	944.17	947.97
1-11	1-10	59.52	943.22	941.16	3.46	24	0.012	27.59	8.78	45.59	2.00	945.62	950.39
1-12	1-11	87.37	945.47	943.72	2.00	18	0.012	21.90	12.40	16.10	1.50	949.34	952.91
1-13	1-12	44.18	946.85	945.97	1.99	18	0.012	19.13	10.83	16.06	1.50	951.55	954.72
1-14	1-13	40.80	947.76	947.35	1.00	18	0.012	13.61	7.70	11.40	1.50	952.86	954.78
1-15	1-14	85.69	949.12	948.26	1.00	15	0.012	6.80	5.54	7.01	1.25	954.04	956.57
1-16	1-15	31.43	949.93	949.62	1.00	15	0.012	6.18	5.04	6.95	1.25	954.48	956.10
1-17	1-16	35.27	950.78	950.43	1.00	15	0.012	4.73	3.86	6.97	1.25	954.79	957.21
1-18	1-17	46.51	953.61	951.28	5.01	15	0.012	0.97	0.79	15.66	1.25	954.90	959.05
2-1	1-5	80.82	934.19	933.38	1.00	18	0.012	10.20	5.77	11.39	1.50	936.07	940.75
2-2	2-1	106.82	937.86	934.69	2.97	15	0.012	3.74	3.05	12.05	0.78	938.64	944.64
3-1	2-1	61.23	935.30	934.69	1.00	15	0.012	2.23	1.82	6.98	1.02	936.32	939.63
4-1	1-6	63.37	936.27	935.00	2.00	15	0.012	4.44	3.62	9.90	0.85	937.12	942.00
5-1	1-10	81.58	941.98	941.16	1.01	15	0.012	5.60	4.56	7.01	1.25	945.39	948.72
5-2	5-1	50.24	942.98	942.48	1.00	15	0.012	4.05	3.30	6.98	1.25	945.69	948.72
5-3	5-2	40.43	943.88	943.48	1.00	15	0.012	1.16	0.95	6.96	1.25	945.77	949.73
5-4	5-3	35.71	944.74	944.38	1.00	15	0.012	1.16	0.95	7.02	1.04	945.78	949.10
6-1	1-13	32.58	948.23	947.90	1.00	15	0.012	5.52	4.50	7.04	1.25	952.48	955.39
6-2	6-1	30.07	948.73	948.43	1.00	15	0.012	5.42	4.42	6.99	1.25	952.79	955.00
7-1	1-17	48.59	951.83	951.28	1.13	15	0.012	3.76	3.06	7.44	1.25	955.03	956.50
7-2	7-1	45.44	953.92	952.33	3.50	15	0.012	1.86	1.52	13.09	1.19	955.11	958.76
8-2	8-1	30.00	908.70	907.20	5.00	15	0.012	4.23	3.88	15.64	0.83	909.53	917.35
8-3	8-2	79.43	929.40	912.86	20.82	15	0.012	4.23	18.03	31.92	0.83	930.23	941.22
8-4	8-3	89.89	935.00	931.40	4.00	15	0.012	2.48	8.60	14.00	0.63	935.63	944.84
8-5	8-4	35.60	936.39	935.50	2.50	15	0.012	1.86	6.70	11.06	0.54	936.93	944.43
9-2	9-1	33.33	908.00	906.00	6.00	15	0.012	11.25	9.20	17.14	1.21	909.21	915.45
9-3	9-2	38.36	916.75	911.00	14.99	15	0.012	11.25	21.04	27.08	1.21	917.96	924.78
9-4	9-3	33.15	924.97	920.00	14.99	15	0.012	11.25	21.04	27.09	1.21	926.18	940.11
9-5	9-4	92.79	934.67	932.81	2.00	15	0.012	8.88	9.13	9.90	1.15	935.82	943.35
9-6	9-5	27.97	935.45	935.17	1.00	15	0.012	8.26	6.73	7.00	1.25	936.81	943.34
9-7	9-6	54.90	936.50	935.95	1.00	15	0.012	5.37	4.57	7.00	0.94	937.44	944.46
9-8	9-7	155.37	941.68	937.00	3.01	15	0.012	1.86	4.84	12.14	0.54	942.22	948.53
9-9	9-8	66.00	943.50	942.18	2.00	15	0.012	0.93	5.06	9.89	0.38	943.88	948.53
10-2	10-1	54.35	914.17	912.00	3.99	24	0.012	56.92	18.13	48.96	2.00	916.84	924.98
10-3A	10-2	107.56	927.29	919.21	7.51	24	0.012	56.92	23.98	67.16	1.99	929.28	939.42
10-3	10-3A	10.00	932.60	932.10	5.00	24	0.012	56.92	19.81	54.79	1.99	934.59	938.93
10-4	10-3	87.39	932.85	931.10	2.00	30	0.012	56.92	11.60	62.87	2.50	936.02	941.58
10-5	10-4	30.97	934.37	933.35	3.29	24	0.012	41.95	13.36	44.47	2.00	937.77	943.41
10-6	10-5	115.86	937.19	934.87	2.00	24	0.012	35.96	11.45	34.67	2.00	941.37	947.51
10-7	10-6	72.50	939.28	937.69	2.19	24	0.012	30.28	9.64	36.29	2.00	943.30	948.25
10-8	10-7	69.03	940.58	939.78	1.16	24	0.012	29.12	9.27	26.38	2.00	944.85	949.74
10-9	10-8	42.04	941.50	941.08	1.00	24	0.012	19.88	6.33	24.49	2.00	945.66	950.87
10-10	10-9	139.50	944.32	942.93	1.00	18	0.012	10.80	6.11	11.36	1.50	947.17	953.37
10-11	10-10	74.43	945.56	944.82	1.00	15	0.012	10.80	8.80	6.98	1.25	949.18	954.55
10-12	10-11	102.33	947.08	946.06	1.00	15	0.012	5.23	4.26	6.98	1.25	950.23	954.00
10-13	10-12	97.33	951.98	947.58	4.52	15	0.012	3.10	2.53	14.87	0.71	952.69	957.97
11-1	10-4	39.65	934.50	934.10	1.00	15	0.012	5.78	4.71	7.03	1.25	937.13	940.75
12-1	10-8	29.38	942.38	942.09	1.00	18	0.012	8.72	4.94	11.30	1.50	945.56	949.32
12-2	12-1	50.24	943.38	942.88	1.00	18	0.012	7.89	4.47	11.35	1.50	945.95	949.32
12-3	12-2	35.22	944.23	943.88	1.00	15	0.012	7.48	6.10	6.97	1.25	946.48	950.33
12-4	12-3	56.84	945.87	944.73	2.00	15	0.012	4.54	3.70	9.91	1.01	946.88	951.68
12-5	12-4	44.47	946.81	946.37	1.00	15	0.012	4.54	6.04	6.96	0.86	947.67	952.25
12-6	12-5	62.52	947.94	947.31	1.00	15	0.012	2.27	5.10	7.02	0.60	948.54	952.78
13-1	12-3	46.17	945.29	944.83	1.00	15	0.012	1.39	1.13	6.98	1.25	946.73	949.50
13-2	13-1	33.58	945.83	945.49	1.00	15	0.012	0.31	0.25	7.04	0.22	946.05	950.75
14-2	14-1	126.56	938.86	930.00	7.00	15	0.012	7.94	6.62	18.51	1.11	939.97	950.81
15-2	15-1	69.13	942.81	936.52	9.10	18	0.012	27.98	15.84	34.31	1.49	944.30	952.14
15-3	15-2	93.37	944.94	943.08	2.00	24	0.012	27.05	12.18	34.58	1.81	946.75	954.75
15-4	15-3	45.47	948.01	946.83	2.60	18	0.012	9.84	10.55	18.33	1.21	949.22	955.90
15-5	15-4	41.99	949.60	948.51	2.60	15	0.012	3.85	5.36	11.27	0.79	950.39	957.14
15-6	15-5	142.09	953.64	950.10	2.49	15	0.012	2.82	7.52	11.04	0.67	954.31	959.11
15-7	15-6	40.07	954.54	954.14	1.00	15	0.012	1.12	4.17	6.99	0.42	954.96	959.89
15-8	15-7	45.36	955.50	955.04	1.00	15	0.012	0.71	3.68	7.04	0.33	955.83	959.98
16-1	15-3	59.43	947.03	946.44	1.00	15	0.012	9.29	7.57	6.97	1.25	948.74	953.84
16-2	16-1	49.33	948.02	947.53	1.00	15	0.012	8.15	6.64	6.97	1.25	949.76	954.49
17-1	15-3	51.48	946.88	946.37	1.00	15	0.012	7.92	6.46	6.96	1.25	948.28	955.12
17-2	17-1	70.16	948.08	947.38	1.00	15	0.012	5.03	4.24	6.99	0.91	948.99	956.60
18-1	15-6	76.38	955.00	954.24	1.00	15	0.012	1.70	4.69	6.98	0.52	955.52	961.15
19-1	1-5	99.50	932.50	931.51	1.00	15	0.012	0.72	0.59	6.98	1.25	935.43	936.13
20-1	1-15	104.30	950.66	949.62	1.00	15	0.012	0.62	0.51	6.99	1.25	954.24	955.29
YD-O2	ES-01	98.08	935.79	925.98	10.00	12	0.012	9.39	11.96	12.20	0.99	936.78	947.00

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MO CERTIFICATE OF AUTHORITY #:001592
2301 Main Street, Suite 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO.	REVISIONS DESCRIPTION	DATE	BY

REVISIONS

STORMWATER MANAGEMENT CALCULATIONS
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.06.12

SHEET
C504

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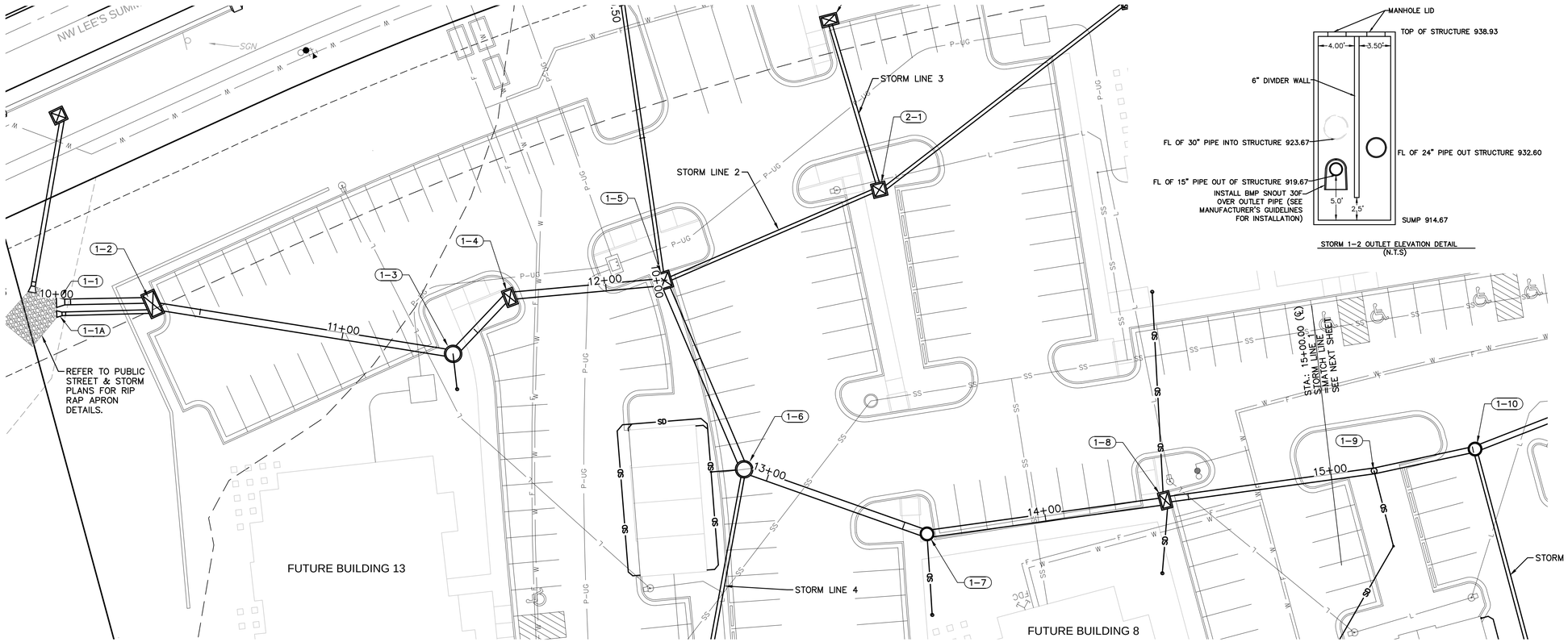
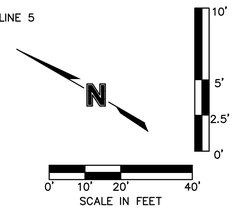


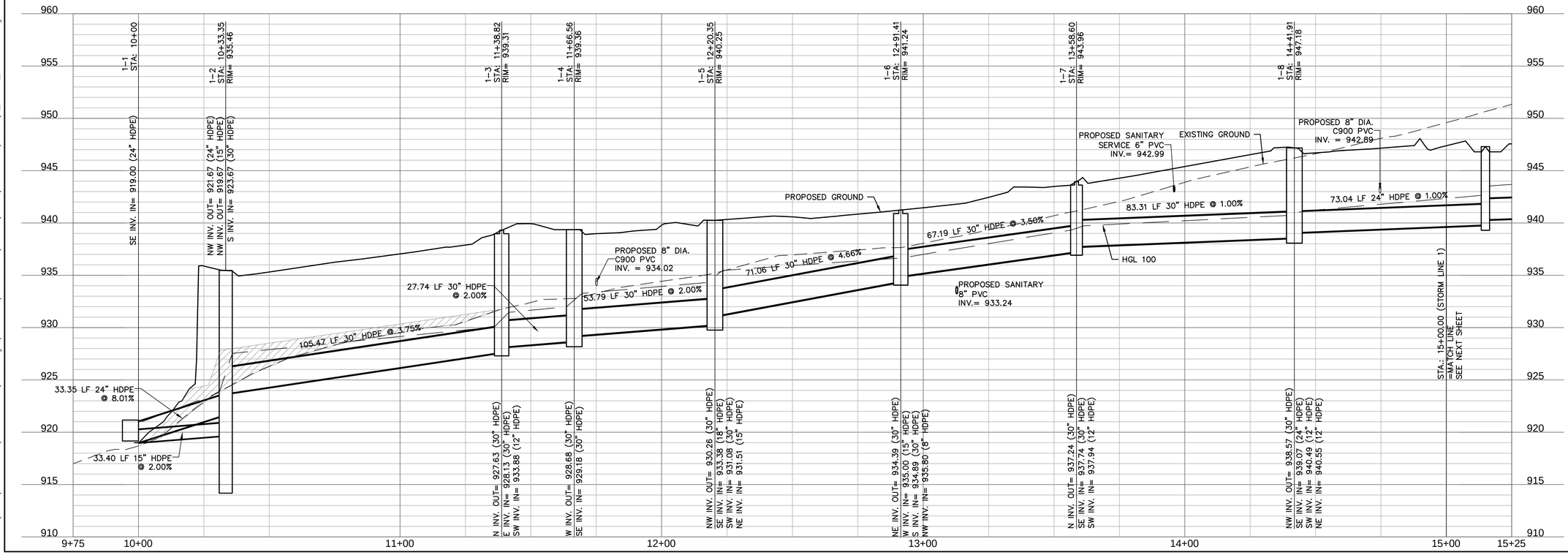
STORM 1–2 OUTLET ELEVATION DETAIL
(N.T.S)

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

ID	DESCRIPTION
1–1	10+00 STORM LINE 1 24" FES N: 1014723.073; E: 2822780.699
1–1A	10+00.26 STORM LINE 1 15" FES N: 1014720.702; E: 2822776.823
1–2	10+33.35 STORM LINE 1 8' X 4' CURB INLET (NON–SETBACK) (SEE DETAIL) N: 1014693.673; E: 2822796.441
1–3	11+38.82 STORM LINE 1 60" MH N: 1014594.917; E: 2822833.471
1–4	11+66.56 STORM LINE 1 5' X 3' CURB INLET (NON–SETBACK) N: 1014587.648; E: 2822860.241
1–5	12+20.35 STORM LINE 1 5' X 4' CURB INLET (NON–SETBACK) N: 1014544.291; E: 2822892.079
1–6	12+91.41 STORM LINE 1 60" MH N: 1014487.617; E: 2822849.210
1–7	13+58.60 STORM LINE 1 48" MH N: 1014421.553; E: 2822861.471
1–8	14+41.91 STORM LINE 1 5' X 3' CURB INLET (NON–SETBACK) N: 1014355.953; E: 2822912.816



STORM LINE 1 (9+75 - 15+25)



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MO CERTIFICATE OF AUTHORITY # 001592
101 E. 6TH STREET, SUITE 250
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C505

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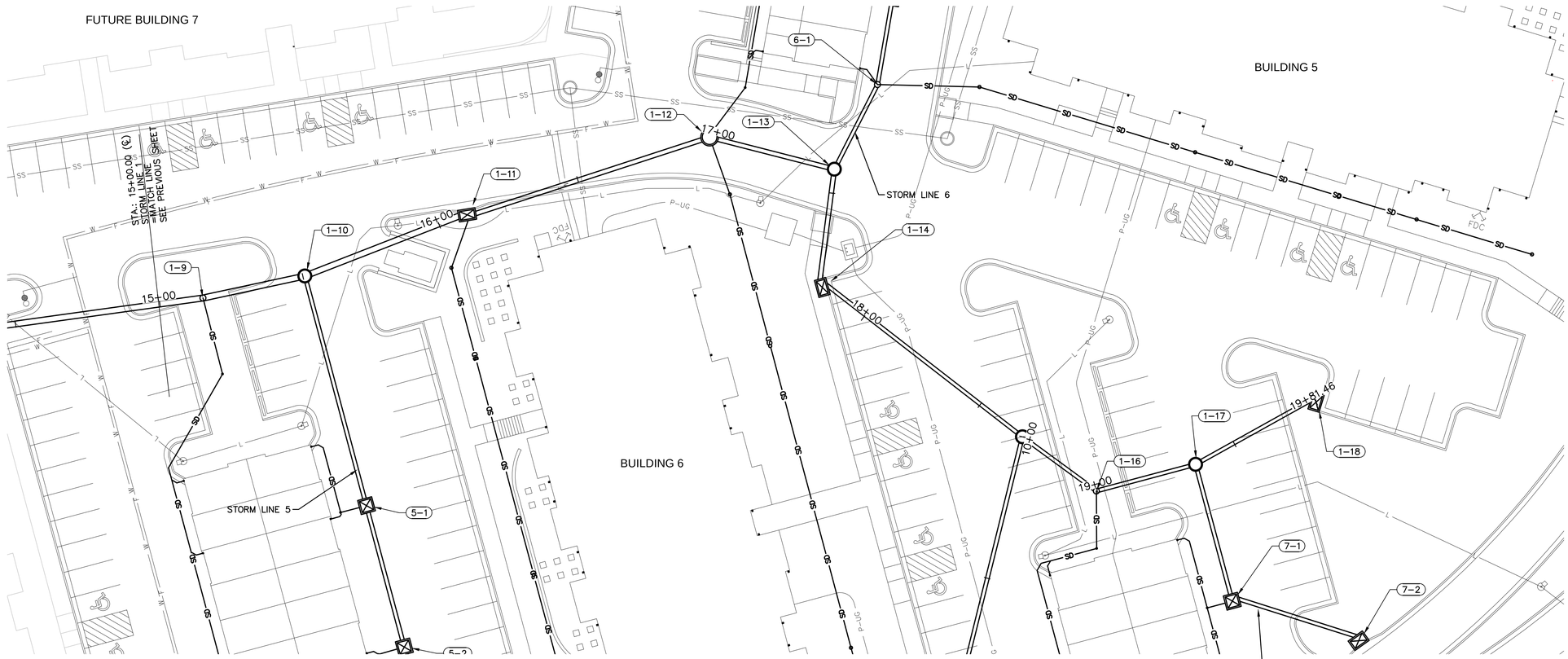
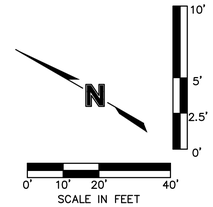
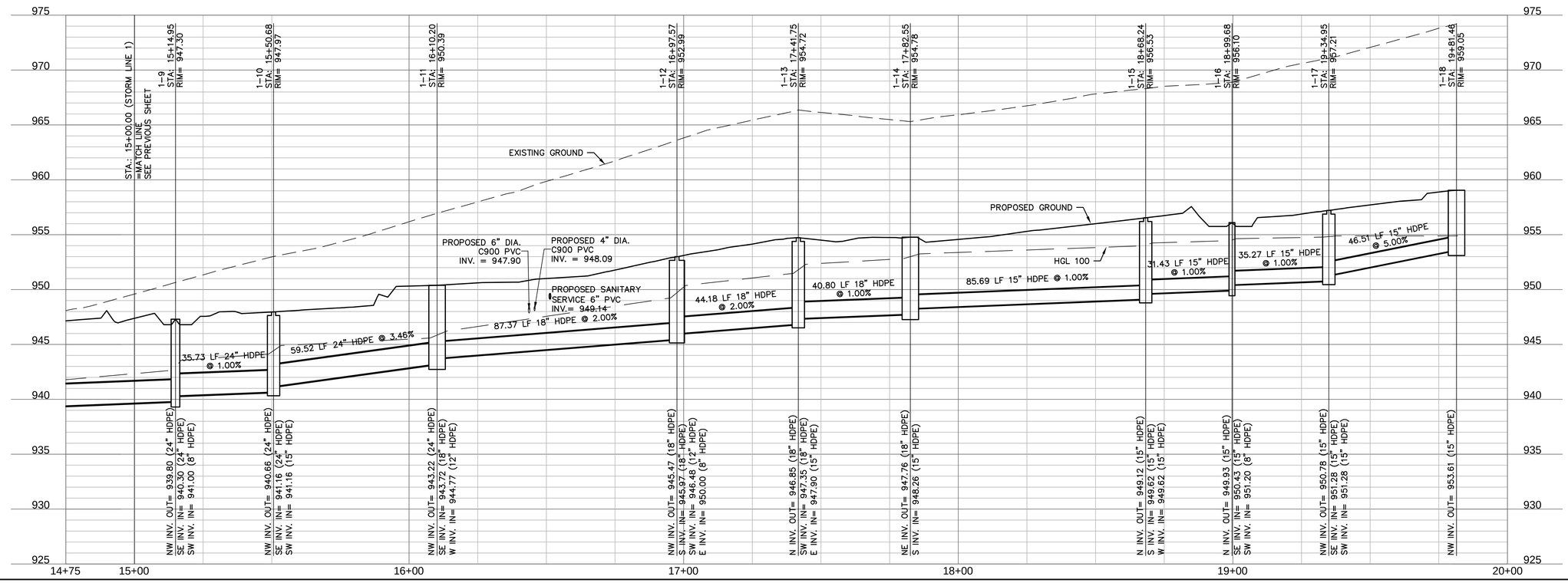


NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

STRUCTURES	
ID	DESCRIPTION
1-9	15+14.95 STORM LINE 1 30" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014298.415; E: 2822957.809
1-10	15+50.68 STORM LINE 1 48" MH N: 1014271.938; E: 2822981.808
1-11	16+10.20 STORM LINE 1 5' X 3' CURB INLET (SETBACK) N: 1014234.207; E: 2823027.836
1-12	16+97.57 STORM LINE 1 60" MH N: 1014175.468; E: 2823092.511
1-13	17+41.75 STORM LINE 1 48" MH N: 1014132.919; E: 2823104.401
1-14	17+82.55 STORM LINE 1 5' X 3' CURB INLET (NON-SETBACK) N: 1014116.225; E: 2823067.168
1-15	18+68.24 STORM LINE 1 48" MH N: 1014031.124; E: 2823057.120
1-16	18+99.68 STORM LINE 1 18" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013999.876; E: 2823053.703
1-17	19+34.95 STORM LINE 1 48" MH N: 1013974.937; E: 2823078.641
1-18	19+81.46 STORM LINE 1 5' X 3' CURB INLET (NON-SETBACK) N: 1013949.833; E: 2823117.797



STORM LINE 1 (14+75 - 20+00)



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MO CERTIFICATE OF AUTHORITY #:001592
2301 MAIN STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

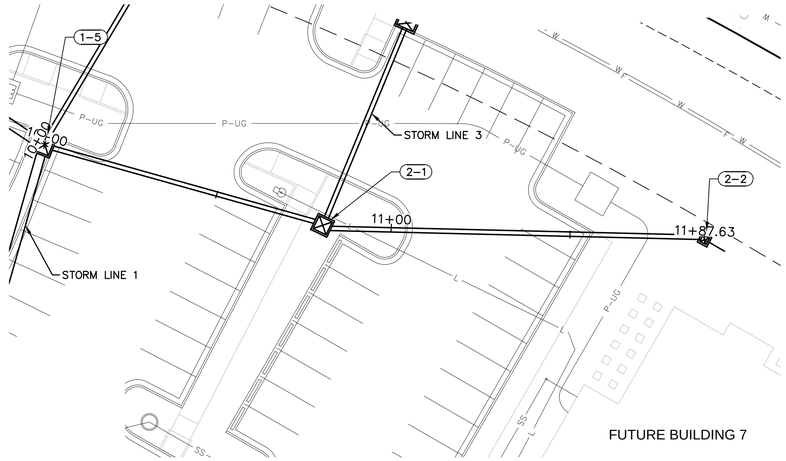
LEE'S SUMMIT, MO

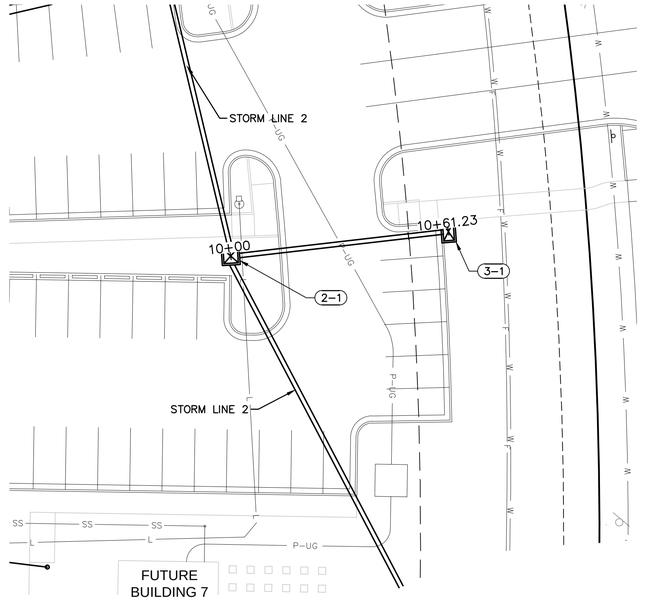
2020

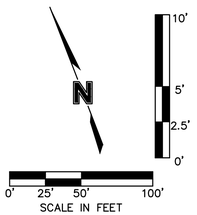
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C506

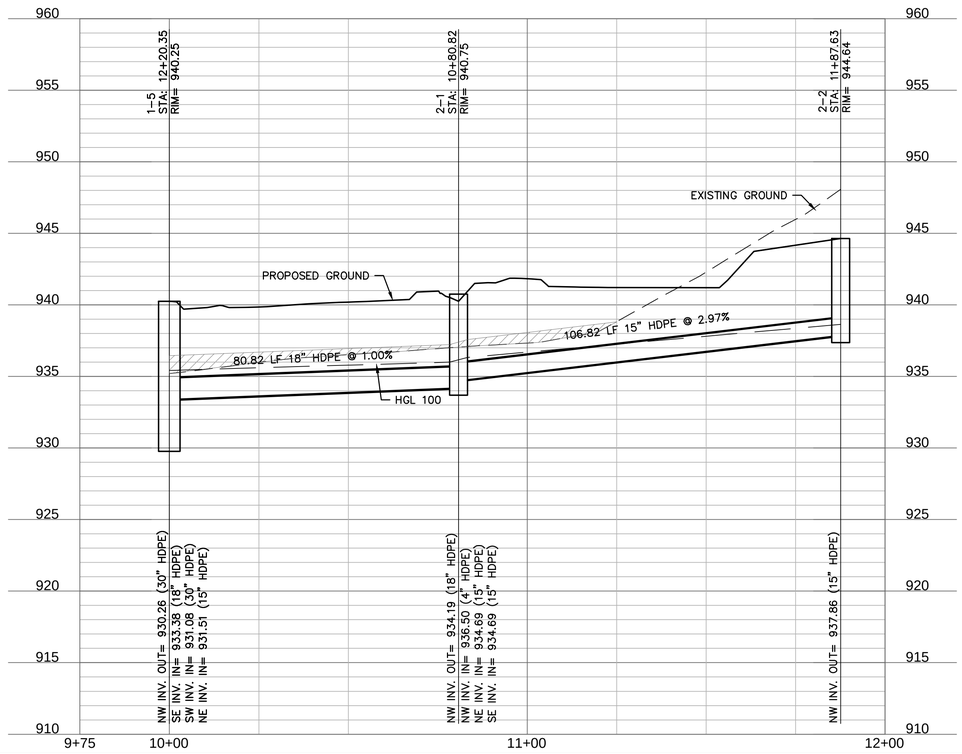
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



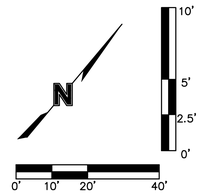




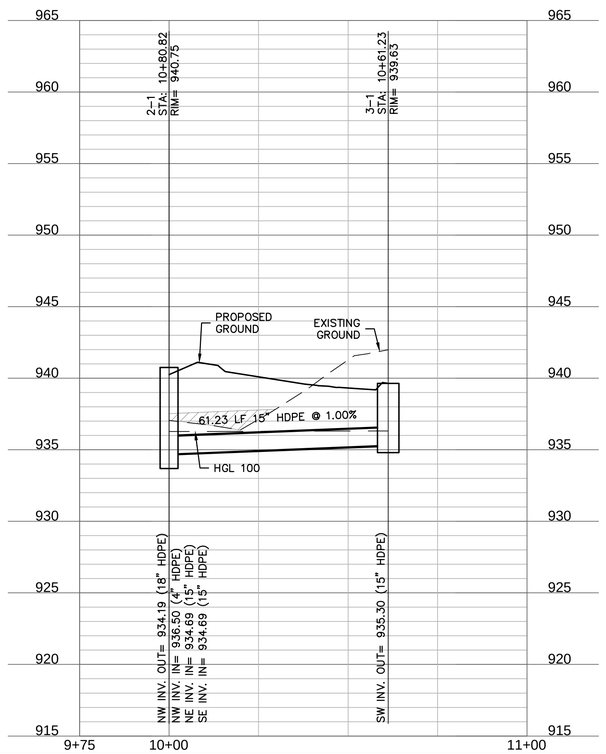
STORM LINE 2 (9+75 - 12+00)



STRUCTURES	
ID	DESCRIPTION
2-1	10+80.82 STORM LINE 2 4' X 4' FIELD INLET (OPEN 2 SIDES) N: 1014495.562; E: 2822956.552
2-2	11+87.63 STORM LINE 2 4' X 4' AREA INLET N: 1014453.644; E: 2823054.799



STORM LINE 3 (9+75 - 11+00)



STRUCTURES	
ID	DESCRIPTION
3-1	10+61.23 STORM LINE 3 5' X 3' CURB INLET (NON-SETBACK) N: 1014539.914; E: 2822998.762

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TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

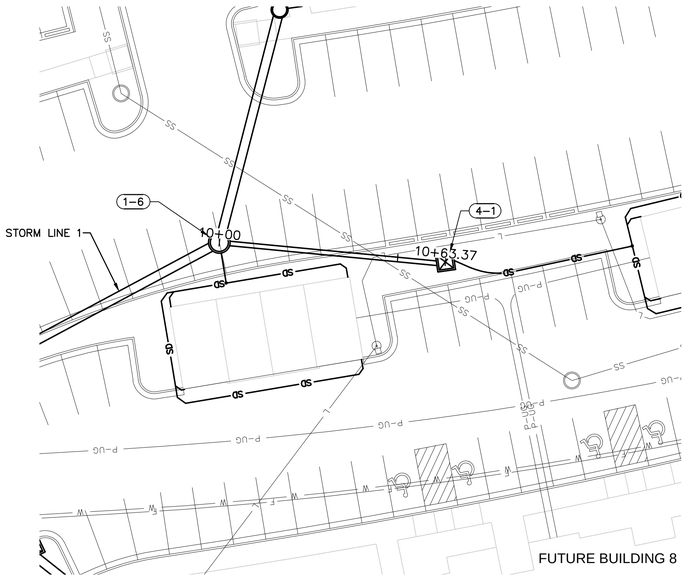
LEE'S SUMMIT, MO

2020

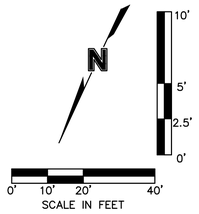
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C507

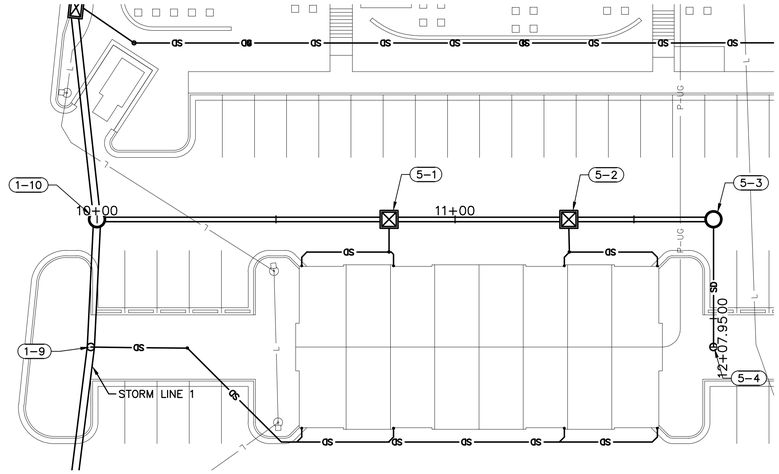
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM01_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

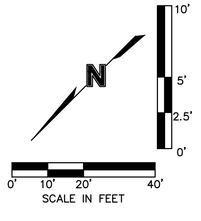


STRUCTURES	
ID	DESCRIPTION
4–1	10+63.37 STORM LINE 4 4' X 4' FIELD INLET (OPEN 3 SIDES) N: 1014465.854; E: 2822789.693



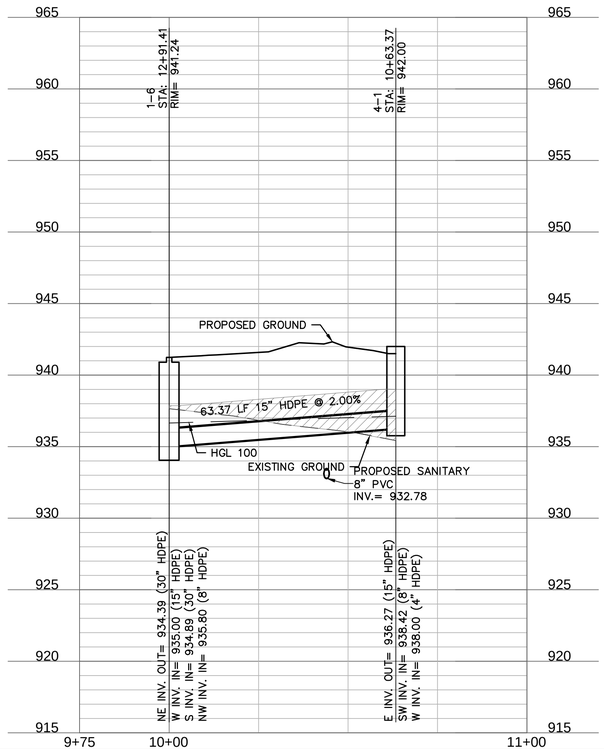
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



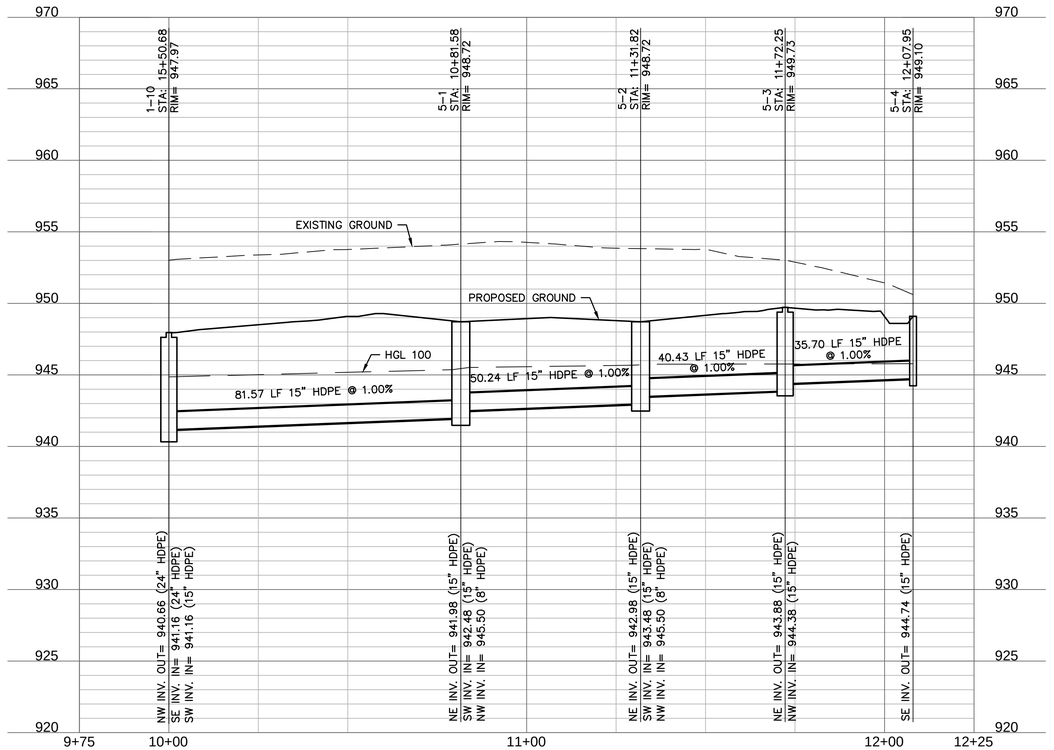


STRUCTURES	
ID	DESCRIPTION
5–1	10+81.58 STORM LINE 5 4' X 4' AREA INLET N: 1014214.237; E: 2822924.146
5–2	11+31.82 STORM LINE 5 4' X 4' AREA INLET N: 1014178.732; E: 2822888.601
5–3	11+72.25 STORM LINE 5 48" MH N: 1014150.141; E: 2822860.011
5–4	12+07.95 STORM LINE 5 15" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014175.388; E: 2822834.763

STORM LINE 4 (9+75 - 11+00)



STORM LINE 5 (9+75 - 12+25)



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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
2301 MCGEE STREET, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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08/27/2020
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PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

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REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

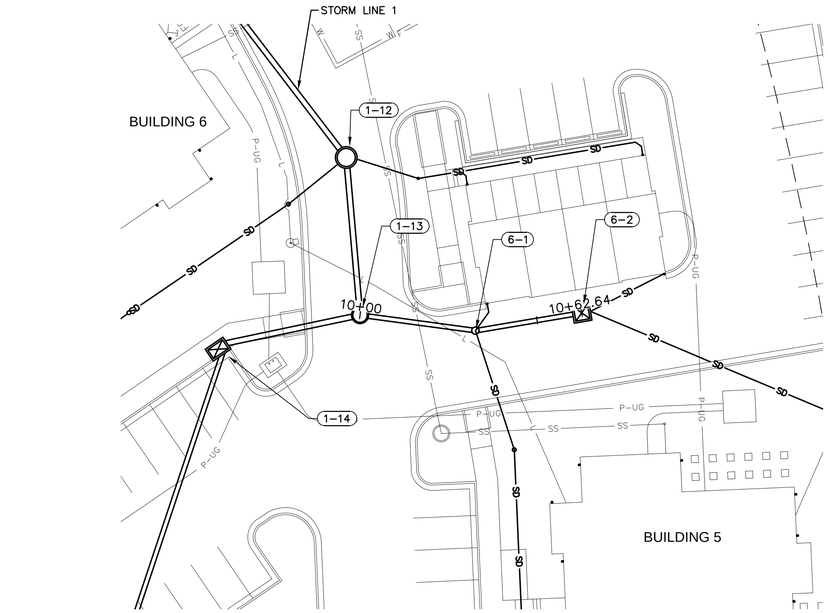
LEE'S SUMMIT, MO

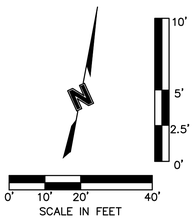
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

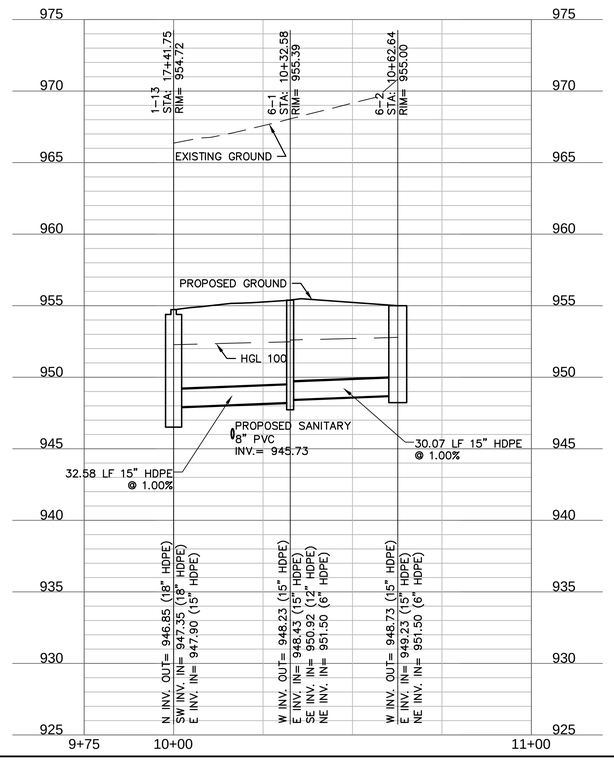
SHEET
C508

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM01_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



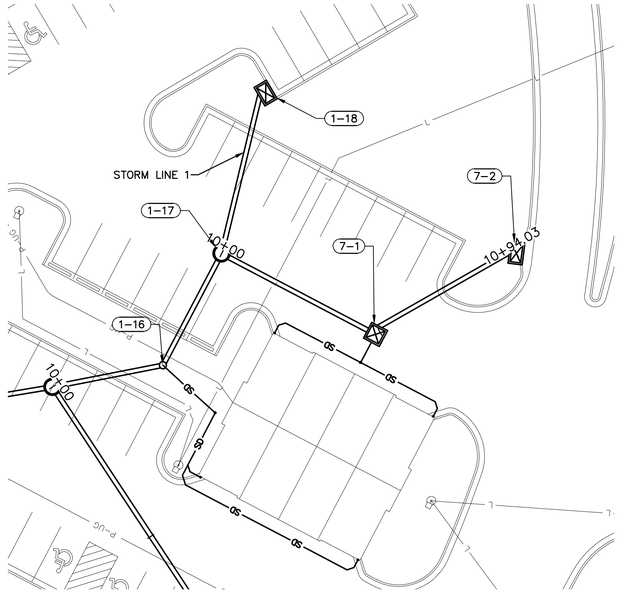


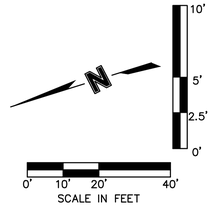
STORM LINE 6 (9+75 - 11+00)



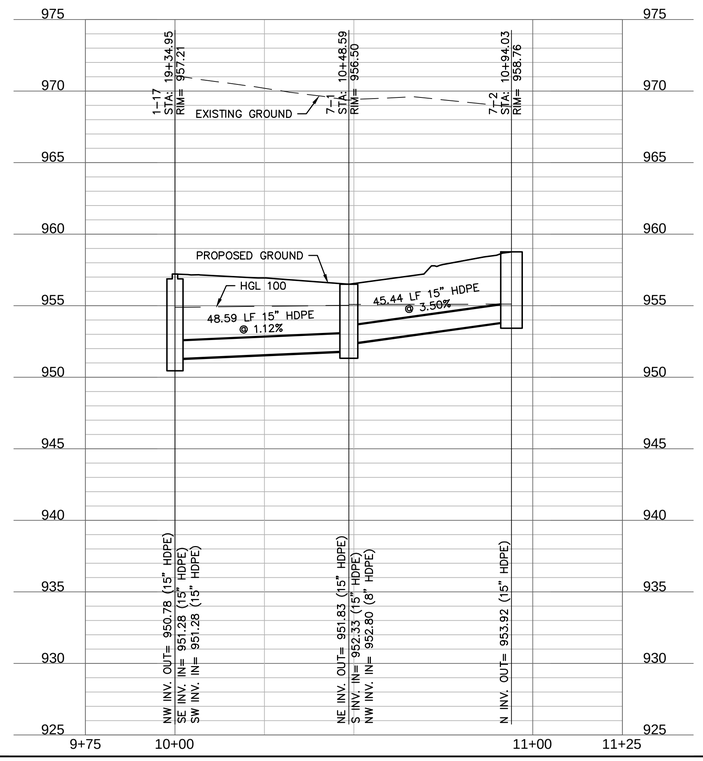
STRUCTURES	
ID	DESCRIPTION
6–1	10+32.58 STORM LINE 6 15" NYLOPLAST D.B. W/ SOLID TOP N: 1014134.610; E: 2823136.935
6–2	10+62.64 STORM LINE 6 4' X 4' AREA INLET N: 1014144.983; E: 2823165.156

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.





STORM LINE 7 (9+75 - 11+25)



STRUCTURES	
ID	DESCRIPTION
7–1	10+48.59 STORM LINE 7 4' X 4' AREA INLET N: 1013940.578; E: 2823044.281
7–2	10+94.03 STORM LINE 7 5' X 3' CURB INLET (SETBACK) N: 1013896.234; E: 2823054.194

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KS CERTIFICATE OF AUTHORITY #:E-1253
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

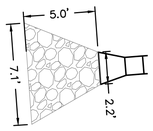
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C509

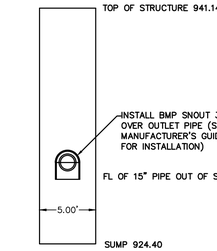
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM01_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (5) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

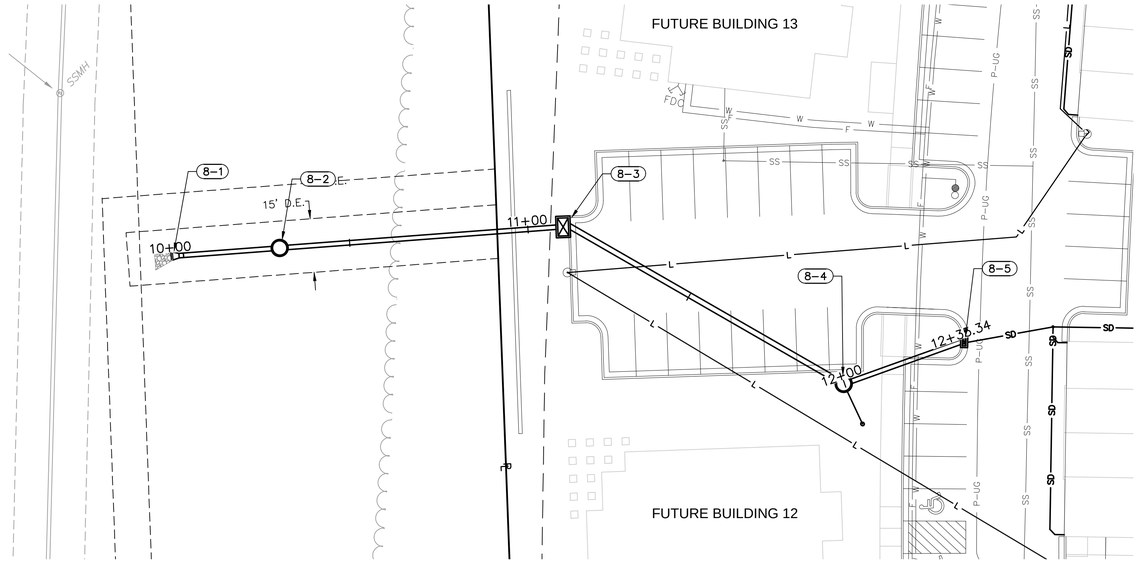


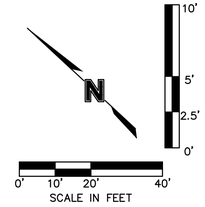
SCALE 1":5'

Riprap Calculations							
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
8-1	4.23	1.25	1	5	5	1.46	3.0
*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18							

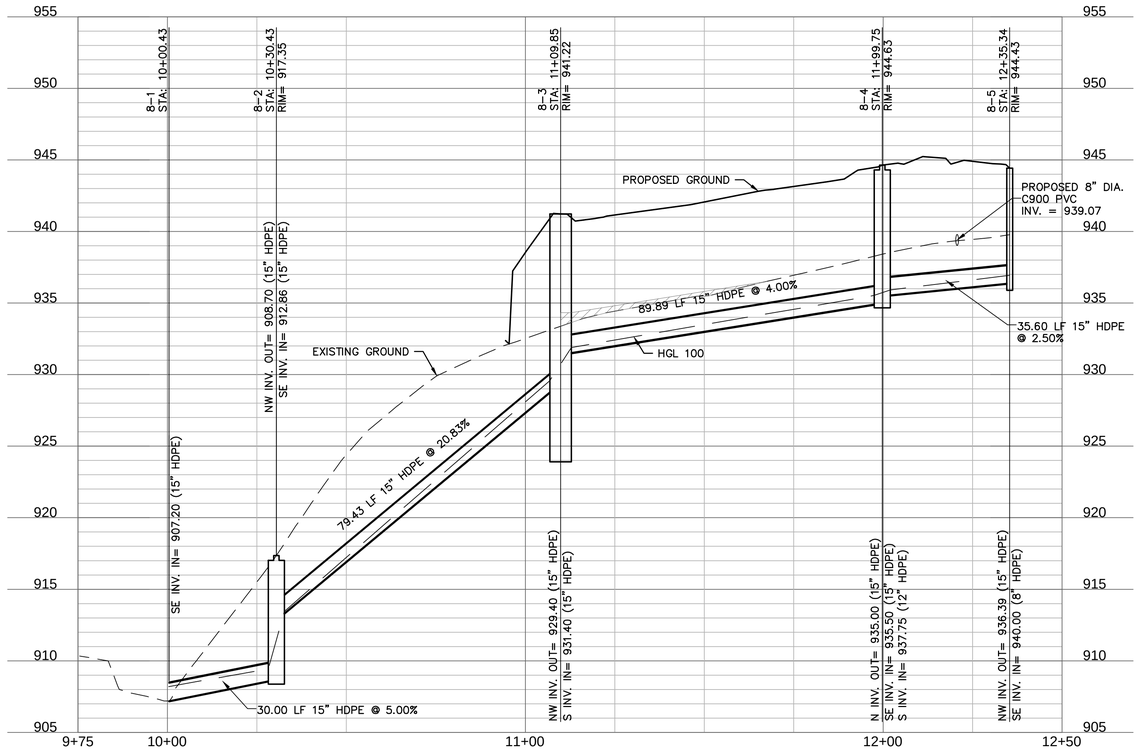


STORM 8-3 PIPE OUTLET ELEVATION DETAIL
(N.T.S)





STORM LINE 8 (9+75 - 12+50)



STRUCTURES	
ID	DESCRIPTION
8-1	10+00.43 STORM LINE 8 15" FES N: 1014576.203; E: 2822490.294
8-2	10+30.43 STORM LINE 8 48" MH N: 1014555.863; E: 2822512.346
8-3	11+09.85 STORM LINE 8 5' X 3' CURB INLET (NON-SETBACK) (SEE DETAIL) N: 1014502.013; E: 2822570.731
8-4	11+99.75 STORM LINE 8 48" MH N: 1014414.713; E: 2822592.155
8-5	12+35.34 STORM LINE 8 NYLOPLAST CURB INLET (15" – 2'X3') N: 1014398.103; E: 2822623.639

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MO CERTIFICATE OF AUTHORITY #:001592
1301 WILLOW LAKE BOULEVARD, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

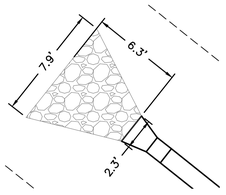
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

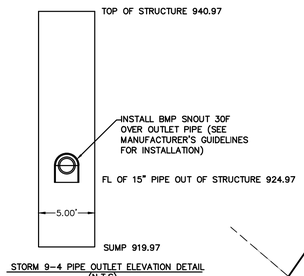
SHEET
C510

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM02_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (6) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

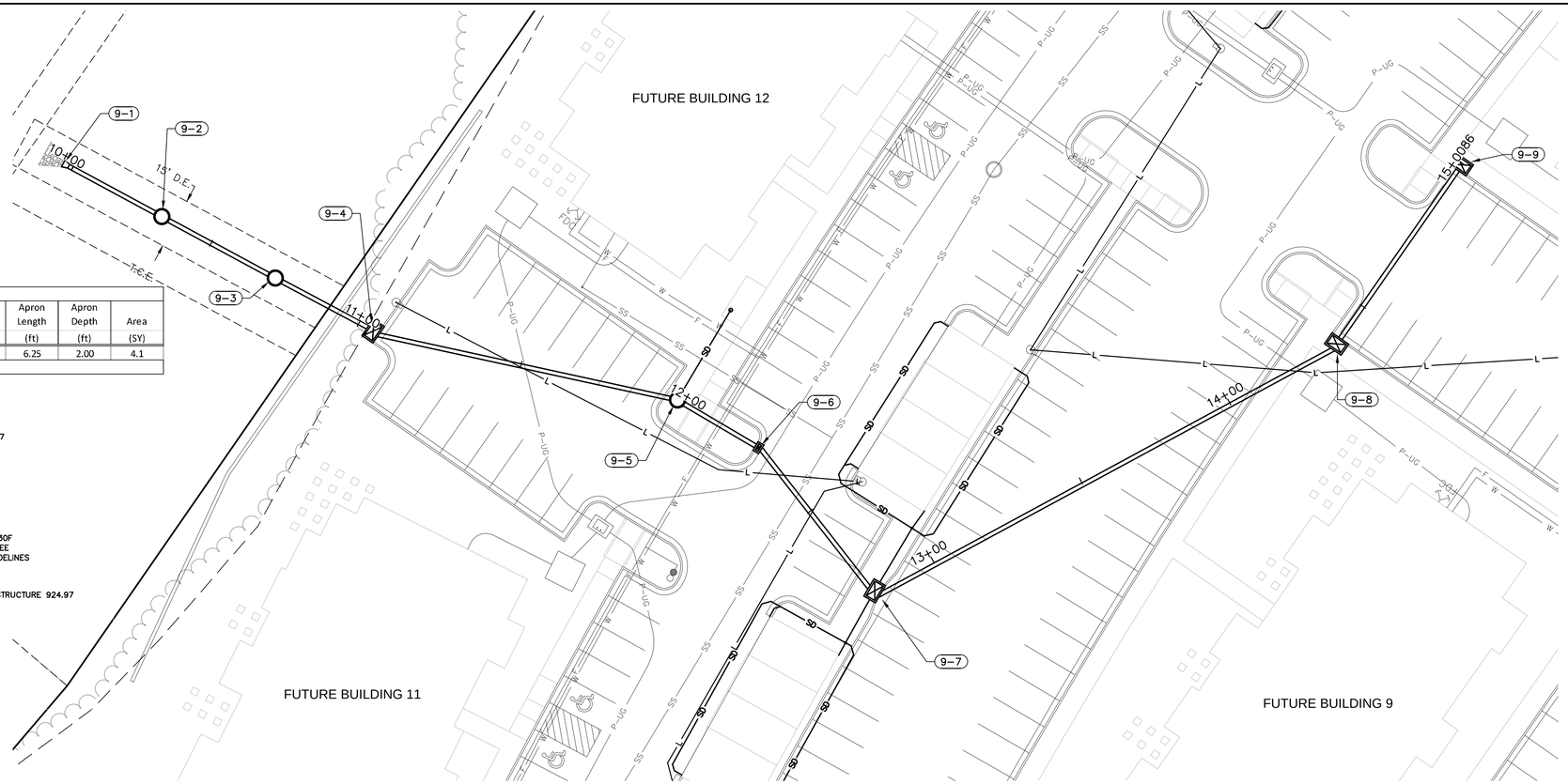


SCALE 1": 5'

Riprap Calculations							
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
9-1	11.25	1.25	3	10	6.25	2.00	4.1
*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18							

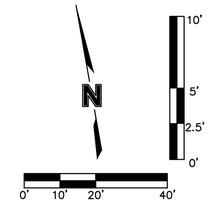


STORM 9-4 PIPE OUTLET ELEVATION DETAIL
(N.T.S)



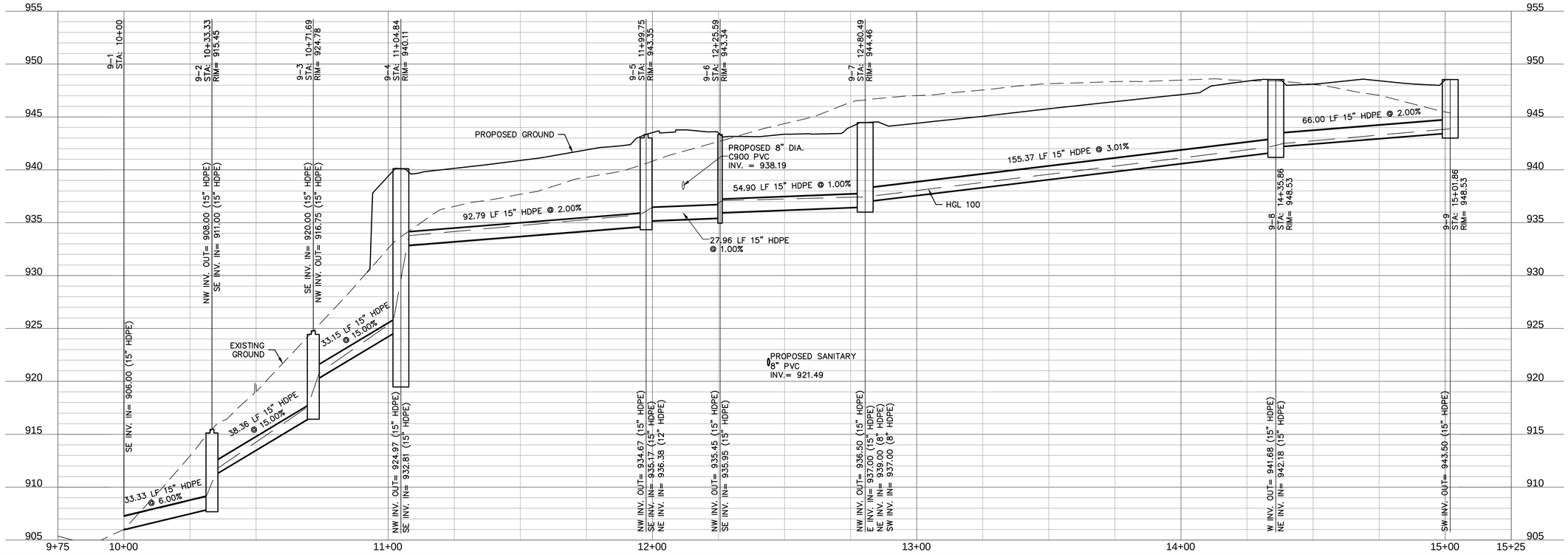
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

STRUCTURES	
ID	DESCRIPTION
9-1	10+00 STORM LINE 9 15" FES N: 1014345.160; E: 2822262.670
9-2	10+33.33 STORM LINE 9 48" MH N: 1014324.373; E: 2822288.723
9-3	10+71.69 STORM LINE 9 48" MH N: 1014300.448; E: 2822318.707
9-4	11+04.84 STORM LINE 9 5' X 3' CURB INLET (NON-SETBACK) (SEE DETAIL) N: 1014279.774; E: 2822344.617
9-5	11+99.75 STORM LINE 8 48" MH N: 1014243.618; E: 2822430.074
9-6	12+25.59 STORM LINE 9 NYLOPLAST CURB INLET (15" – 2'X3') N: 1014225.407; E: 2822451.297
9-7	12+80.49 STORM LINE 9 5' X 3' CURB INLET (SETBACK) N: 1014177.363; E: 2822477.866
9-8	14+35.86 STORM LINE 9 5' X 3' CURB INLET (NON-SETBACK) N: 1014225.119; E: 2822625.712
9-9	15+01.86 STORM LINE 9 5' X 3' CURB INLET (NON-SETBACK) N: 1014271.788; E: 2822672.381



SCALE IN FEET

STORM LINE 9 (9+75 - 15+25)



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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
2500 WEST 75TH STREET, SUITE 114
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

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MO# 2015000555

REVISIONS

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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checked by: N.D.H.
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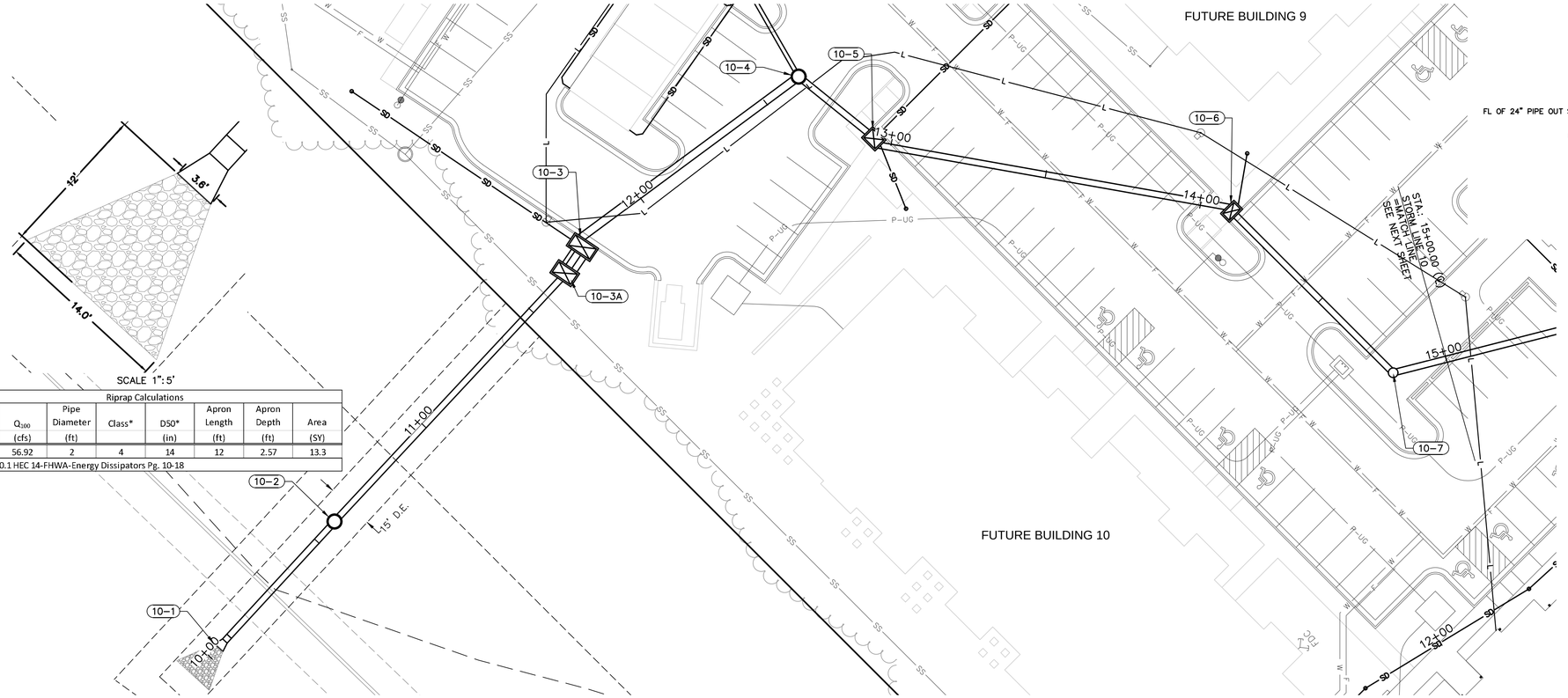
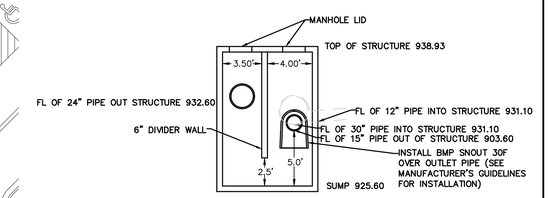
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C511

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM02_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (7) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



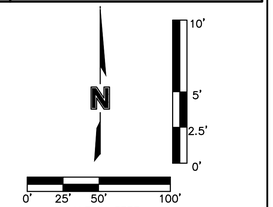
Riprap Calculations								
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
10-1	56.92	2	4	14	12	2.57	13.3
*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18							



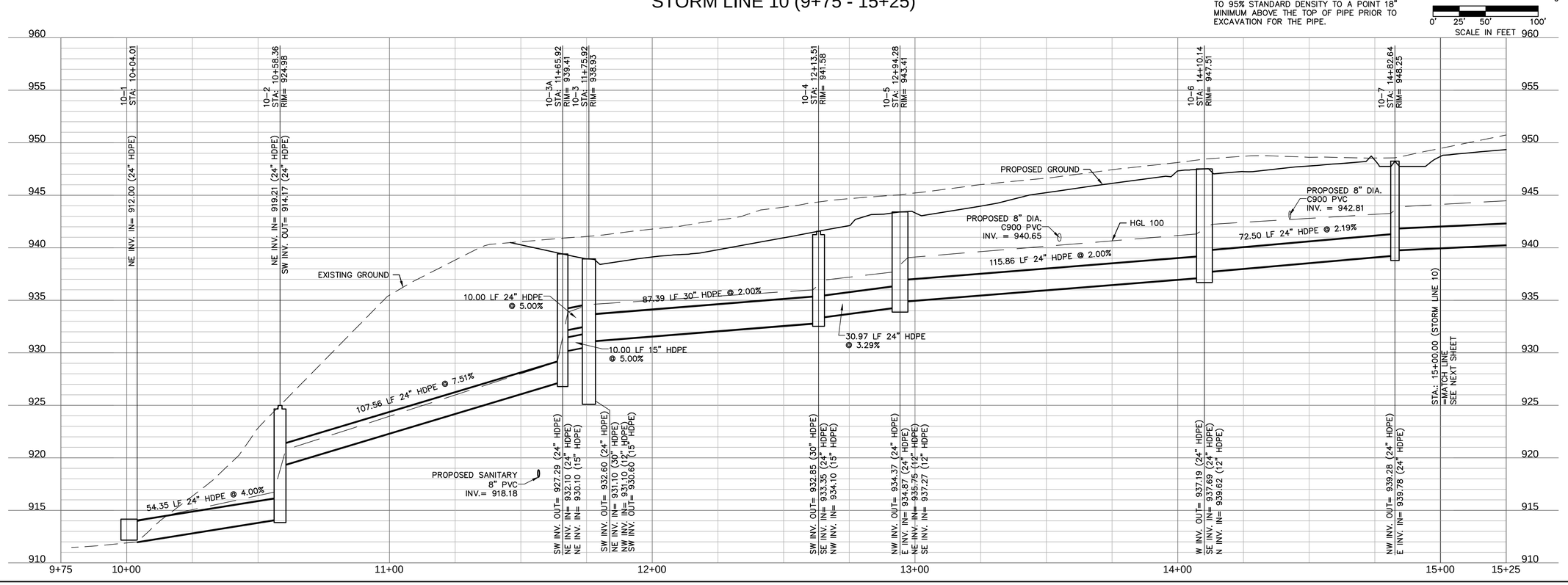
STORM 10-3 OUTLET ELEVATION DETAIL
(N.T.S)

ID	DESCRIPTION
10-1	10+04.01 STORM LINE 10 24" FES N: 1013844.614; E: 2822218.514
10-2	10+58.36 STORM LINE 10 48" MH N: 1013884.665; E: 2822255.256
10-3A	11+65.92 STORM LINE 10 7' X 4' JUNCTION BOX N: 1013963.537; E: 2822328.383
10-3	11+75.92 STORM LINE 10 8' X 4' CURB INLET (NON-SETBACK) (SEE DETAIL) N: 1013971.825; E: 2822333.979
10-4	12+13.51 STORM LINE 8 48" MH N: 1014025.927; E: 2822402.604
10-5	12+94.28 STORM LINE 10 5' X 4' CURB INLET (NON-SETBACK) N: 1014006.213; E: 2822426.490
10-6	14+10.14 STORM LINE 10 5' X 3' CURB INLET (NON-SETBACK) N: 1013983.175; E: 2822540.038
10-7	14+82.64 STORM LINE 10 30" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013931.909; E: 2822591.303

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



STORM LINE 10 (9+75 - 15+25)



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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

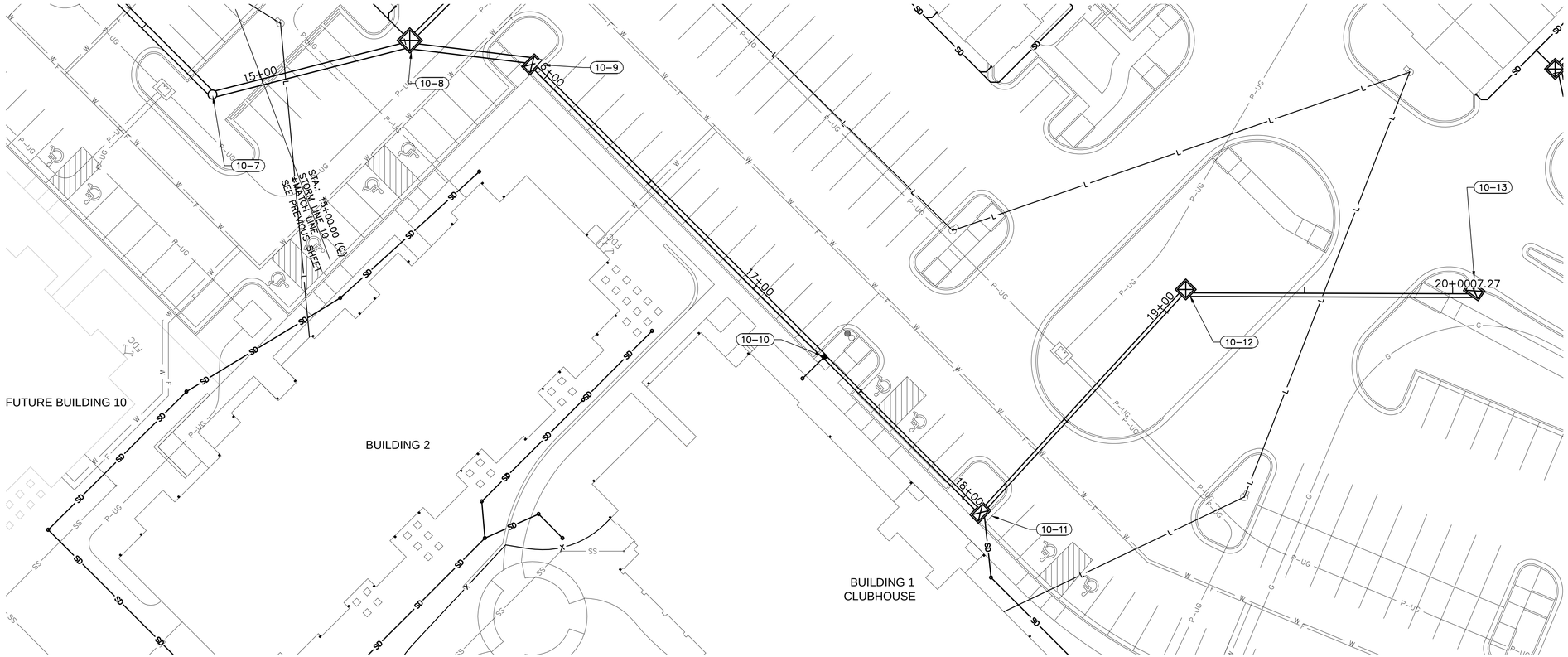
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C512

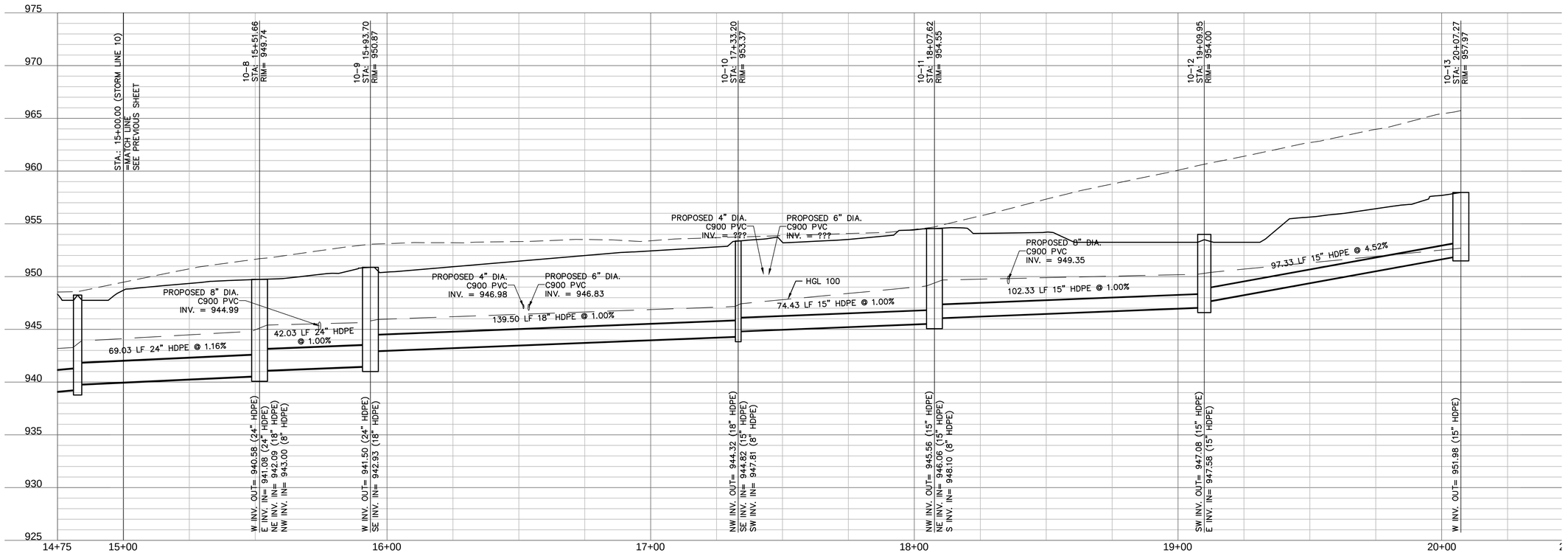
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM02_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (8) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

STRUCTURES	
ID	DESCRIPTION
10–8	15+51.66 STORM LINE 10 5' X 5' – JUNCTION BOX N: 1013950.205; E: 2822657.860
10–9	15+93.70 STORM LINE 10 5' X 3' CURB INLET (NON–SETBACK) N: 1013942.117; E: 2822699.109
10–10	17+33.20 STORM LINE 10 18" NYLOPLAST D.B. W/ SOLID TOP N: 1013843.476; E: 2822797.751
10–11	18+07.62 STORM LINE 10 5' X 3' CURB INLET (NON–SETBACK) N: 1013790.849; E: 2822850.377
10–12	19+09.95 STORM LINE 10 4' X 4' FIELD INLET (OPEN 4 SIDES) N: 1013866.168; E: 2822919.641
10–13	20+07.27 STORM LINE 10 5' X 3' CURB INLET (SETBACK) N: 1013865.704; E: 2823016.966

STORM LINE 10 (14+75 - 20+50)



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MO CERTIFICATE OF AUTHORITY #:001592
201 E. 18TH STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER
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PROFESSIONAL ENGINEER

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MO# 2015000555

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

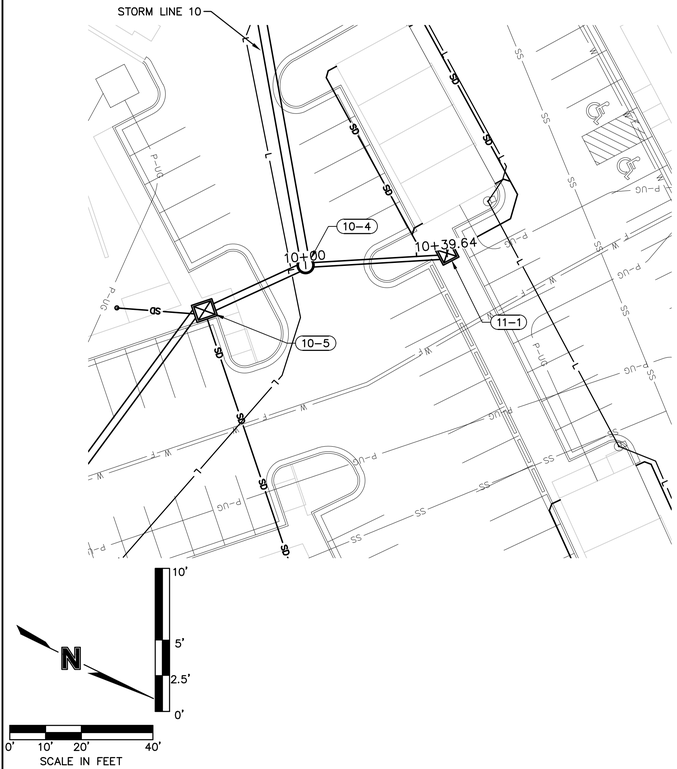
LEE'S SUMMIT, MO

2020

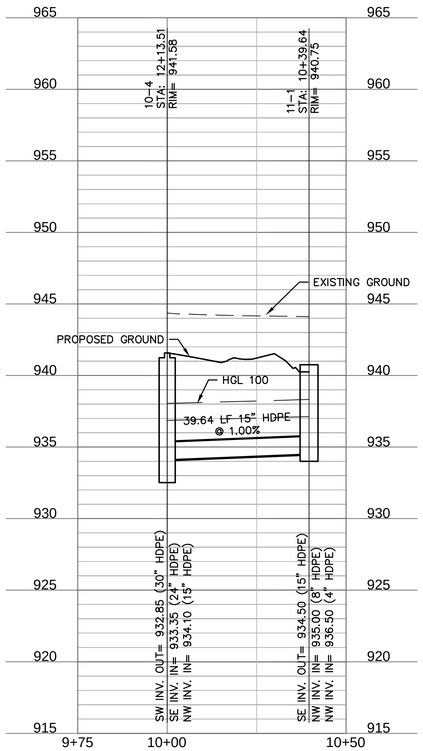
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C513

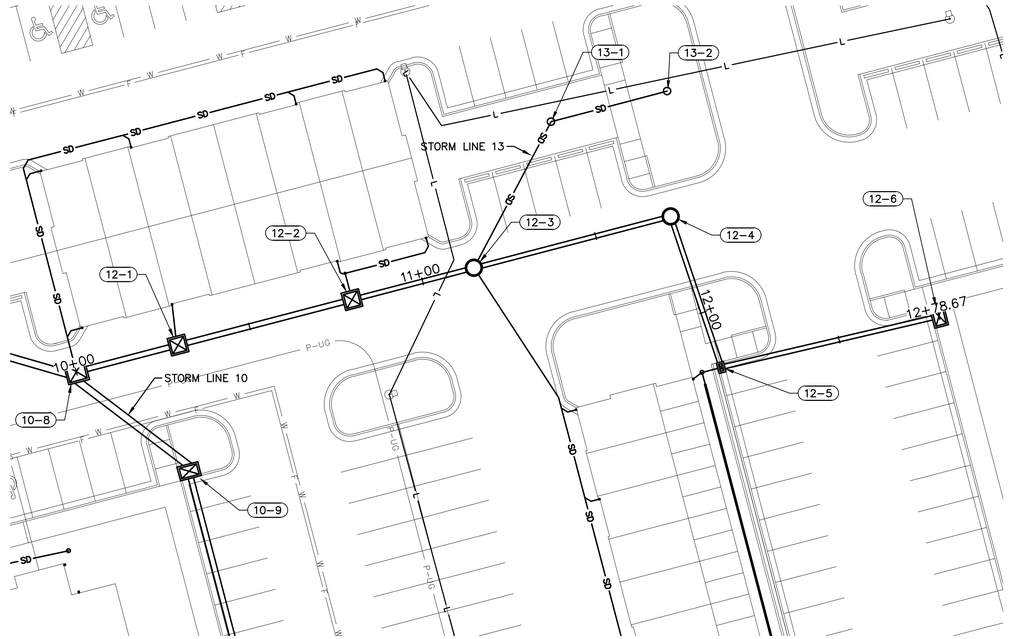
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM02_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (9) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



STORM LINE 11 (9+75 - 10+50)

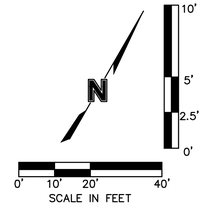


STRUCTURES	
ID	DESCRIPTION
11–1	10+39.64 STORM LINE 11 4' X 4' FIELD INLET (OPEN 2 SIDES) N: 1014059.816; E: 2822382.031

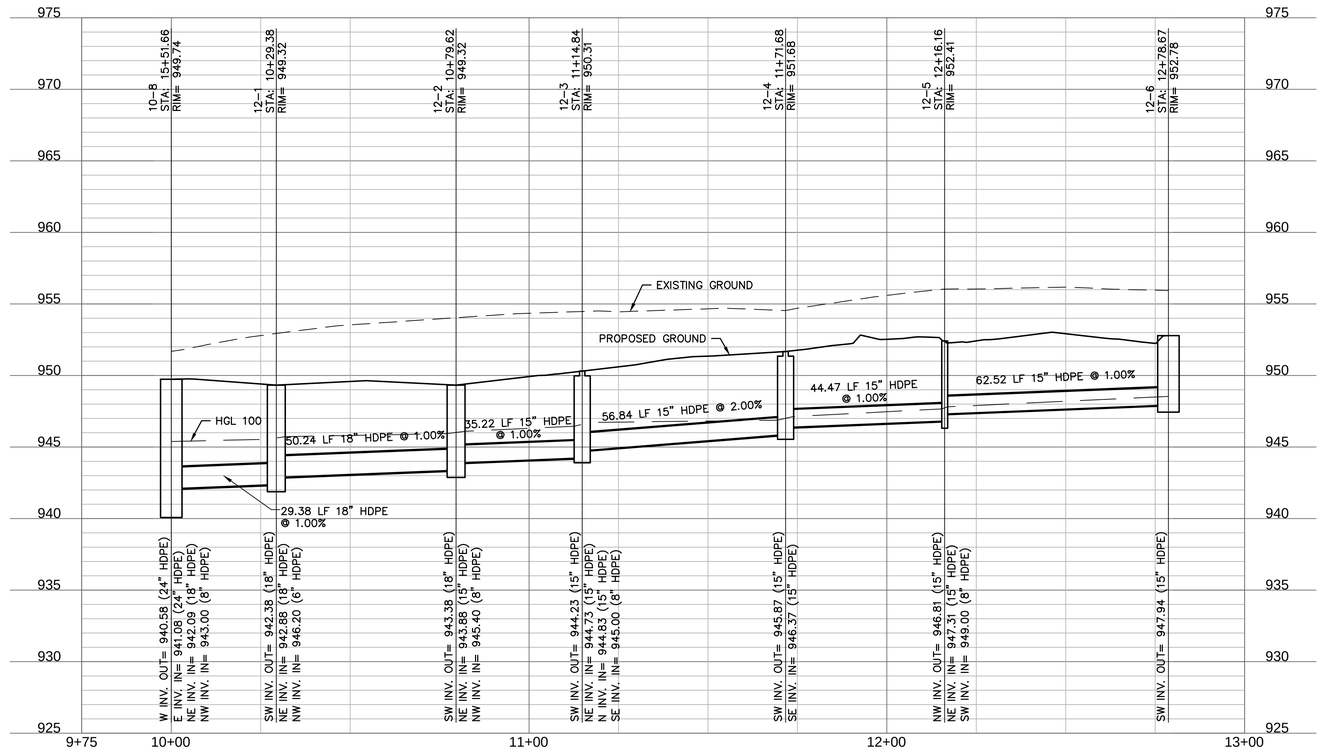


NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

STRUCTURES	
ID	DESCRIPTION
12–1	10+29.38 STORM LINE 12 4' X 4' AREA INLET N: 1013970.980; E: 2822678.635
12–2	10+79.62 STORM LINE 12 4' X 4' AREA INLET N: 1014006.505; E: 2822714.160
12–3	11+14.84 STORM LINE 12 48" MH N: 1014031.409; E: 2822739.064
12–4	11+71.68 STORM LINE 12 48" MH N: 1014071.602; E: 2822779.258
12–5	12+16.16 STORM LINE 12 NYLOPLAST CURB INLET (18" – 2'X3') N: 1014042.332; E: 2822812.742
12–6	12+78.67 STORM LINE 12 5' X 3' CURB INLET (NON-SETBACK) N: 1014085.465; E: 2822857.997



STORM LINE 12 (9+75 - 13+00)



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MO CERTIFICATE OF AUTHORITY #:003592
2020 BALTIMORE AVENUE
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

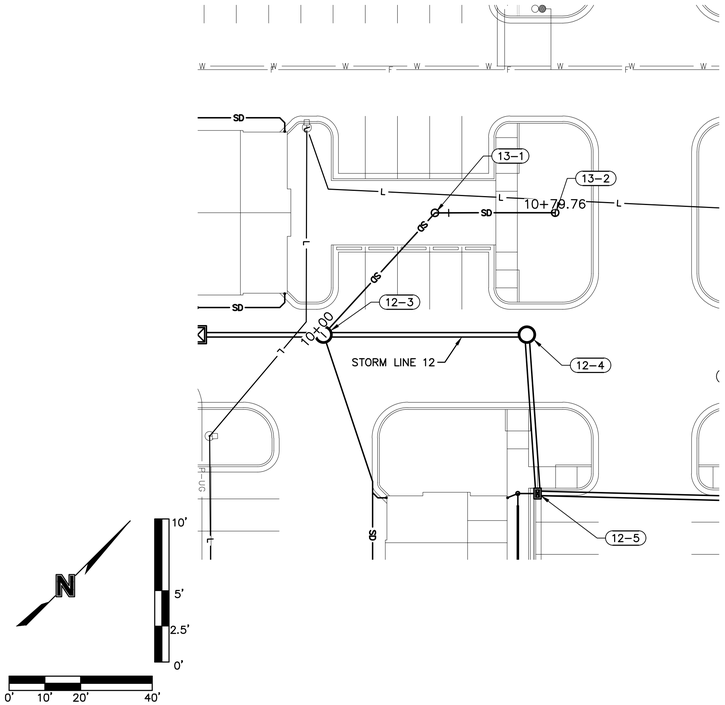
LEE'S SUMMIT, MO

2020

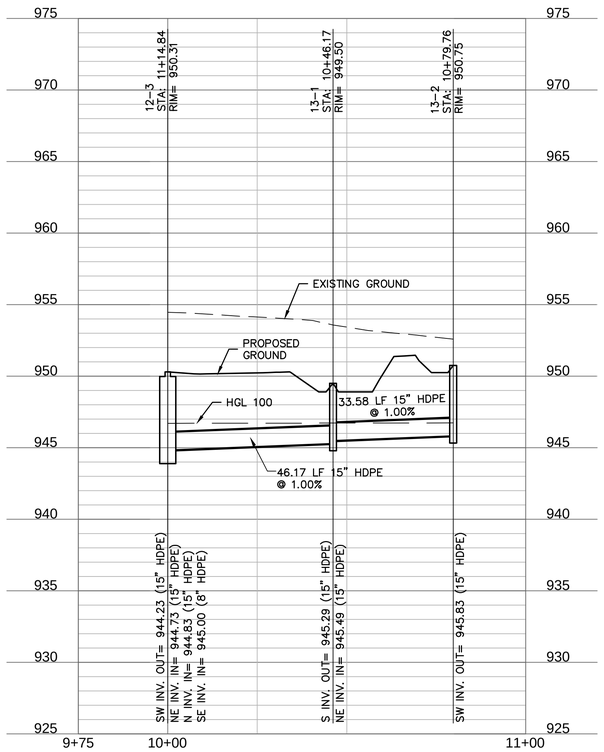
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C514

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM02_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (10) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

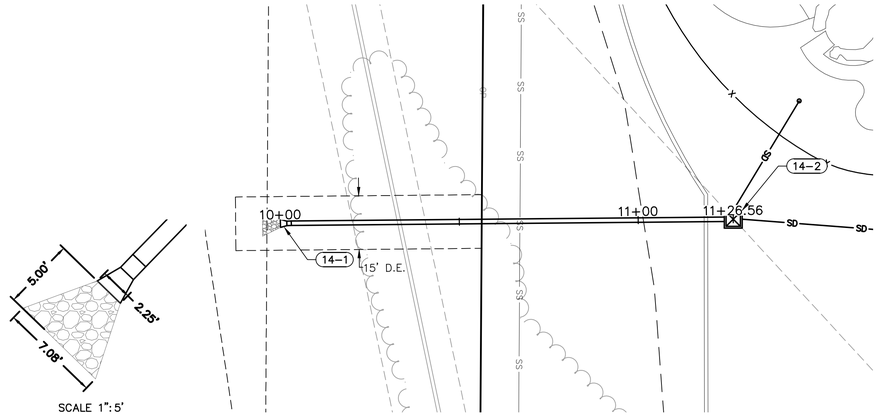


STORM LINE 13 (9+75 - 11+00)



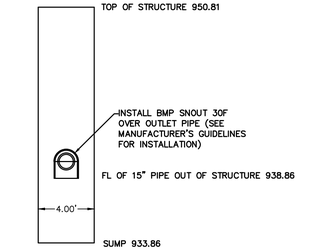
STRUCTURES	
ID	DESCRIPTION
13–1	10+46.17 STORM LINE 13 15" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014077.537; E: 2822737.002
13–2	10+79.76 STORM LINE 13 15" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014101.318; E: 2822760.712

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

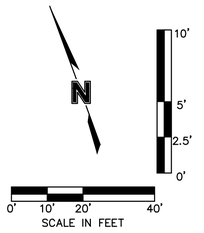


Riprap Calculations							
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
14-1	7.94	1.25	2	6	5	1.65	3.0

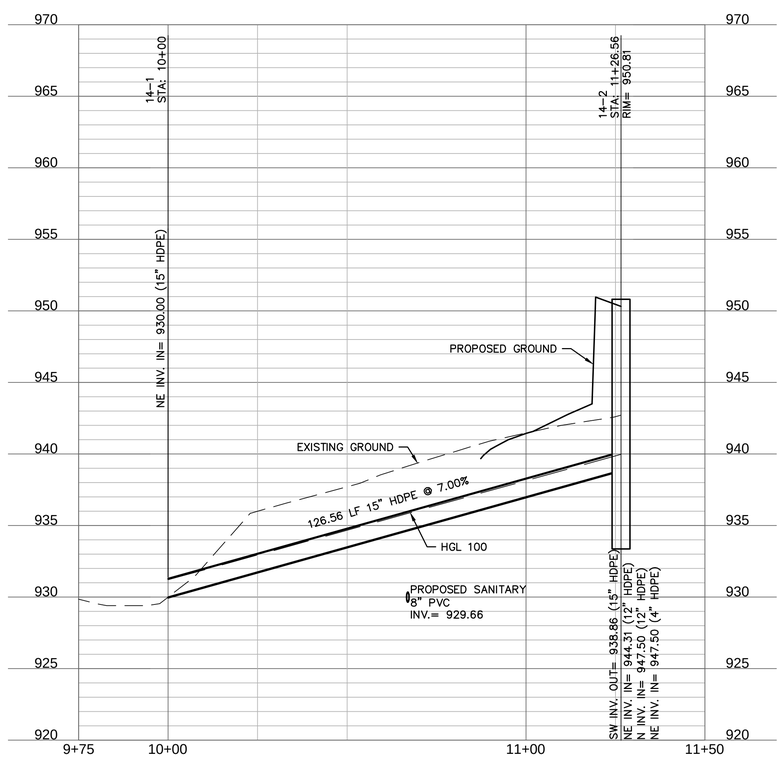
*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18



STORM 14–2 PIPE OUTLET ELEVATION DETAIL
(N.T.S)



STORM LINE 14 (9+75 - 11+50)



STRUCTURES	
ID	DESCRIPTION
14–1	10+00 STORM LINE 14 15" FES N: 1013490.977; E: 2822693.191
14–2	11+26.56 STORM LINE 14 4' X 4' FIELD INLET (OPEN 3 SIDES) (SEE DETAIL) N: 1013581.886; E: 2822781.243

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NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C515

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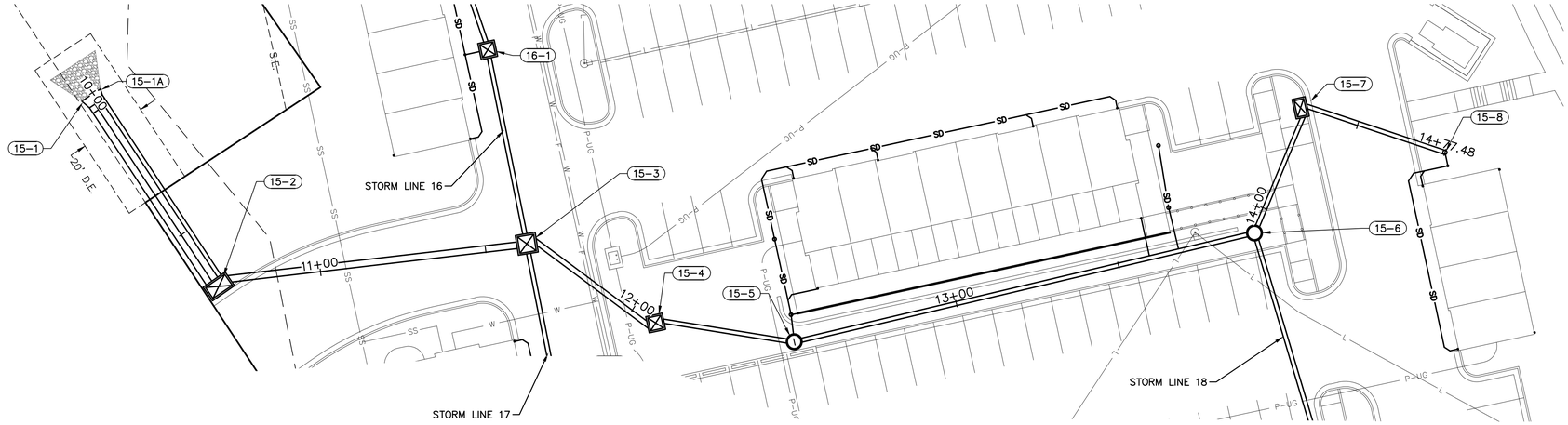
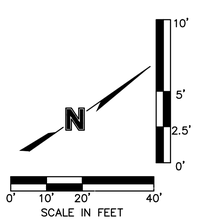
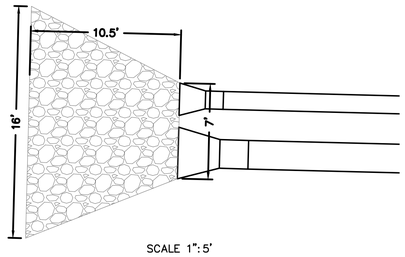
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



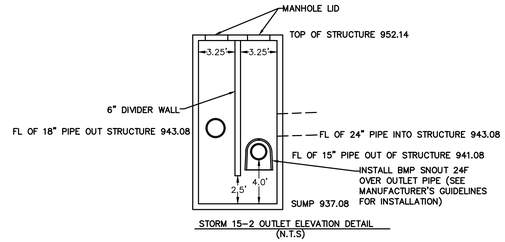
STRUCTURES	
ID	DESCRIPTION
15–1	10+00 STORM LINE 15 24" FES N: 1013429.663; E: 2822932.913
15–1A	10+00.10 STORM LINE 15 15" FES N: 1013433.411; E: 2822933.009
15–2	10+69.13 STORM LINE 15 7' X 4' CURB INLET (NON–SETBACK) (SEE DETAIL) N: 1013429.821; E: 2823002.048
15–3	11+62.50 STORM LINE 15 5' X 5' – JUNCTION BOX N: 1013513.040; E: 2823044.379
15–4	12+07.97 STORM LINE 15 4' X 4' FIELD INLET (OPEN 4 SIDES) N: 1013531.201; E: 2823086.059
15–5	12+49.95 STORM LINE 15 48" MH N: 1013562.104; E: 2823114.484
15–6	13+92.04 STORM LINE 15 48" MH N: 1013694.272; E: 2823166.637
15–7	14+32.11 STORM LINE 15 5' X 3' CURB INLET (NON–SETBACK) N: 1013727.098; E: 2823143.654
15–8	14+77.48 STORM LINE 15 15" NYLOPLAST D.B. N: 1013755.004; E: 2823179.418





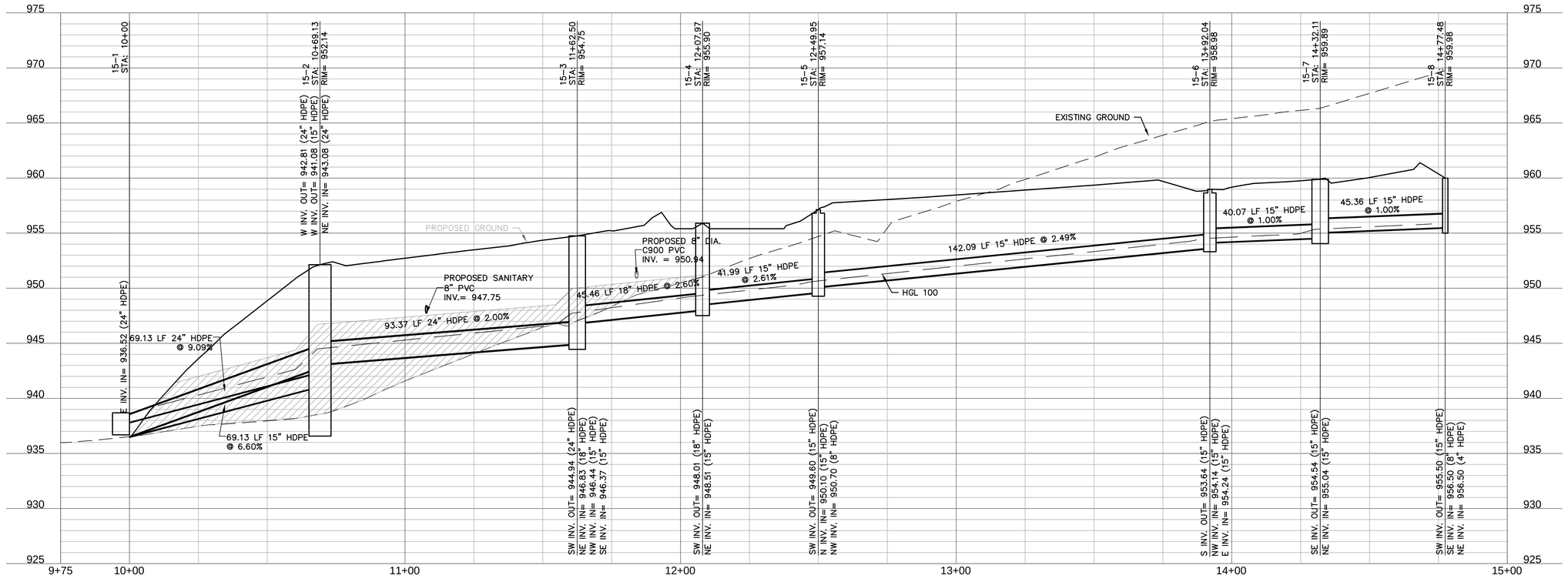
SCALE 1":5'

Riprap Calculations							
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
15-1	27.89	1.5	5	20	10.5	3.33	13.3
*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18							



STORM 15–2 OUTLET ELEVATION DETAIL
(N.T.S)

STORM LINE 15 (9+75 - 15+00)



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MO CERTIFICATE OF AUTHORITY # 001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C516

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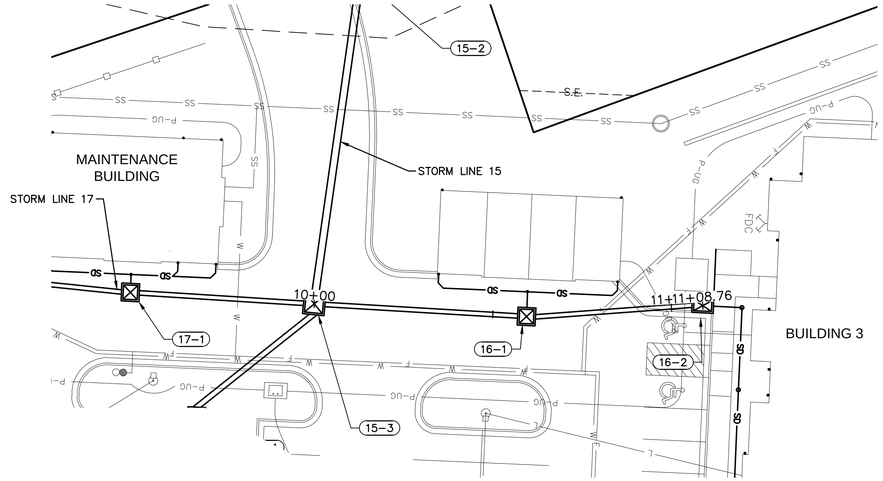
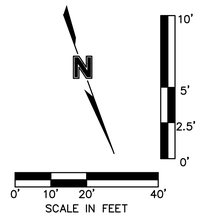
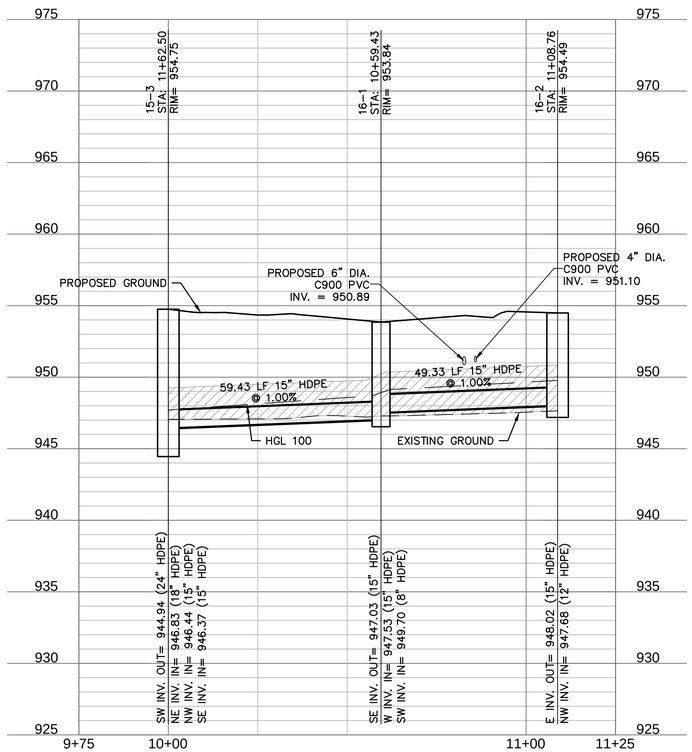
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.





STORM LINE 16 (9+75 - 11+25)



STRUCTURES	
ID	DESCRIPTION
16–1	10+59.43 STORM LINE 16 4' X 4' AREA INLET N: 1013536.697; E: 2822989.862
16–2	11+08.76 STORM LINE 16 5' X 3' CURB INLET (NON–SETBACK) N: 1013550.766; E: 2822942.580

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MO CERTIFICATE OF AUTHORITY #:001592
2301 MAIN STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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REVISIONS

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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designed by: M.J.D.
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project no.: 019-0012-B
date: 2020.08.27

SHEET
C517

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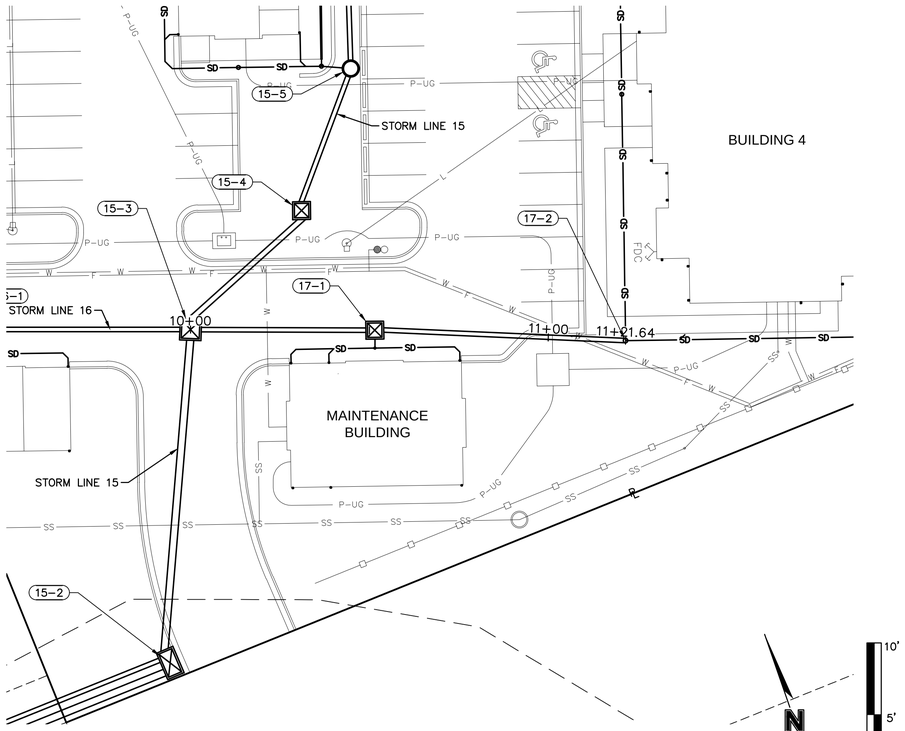
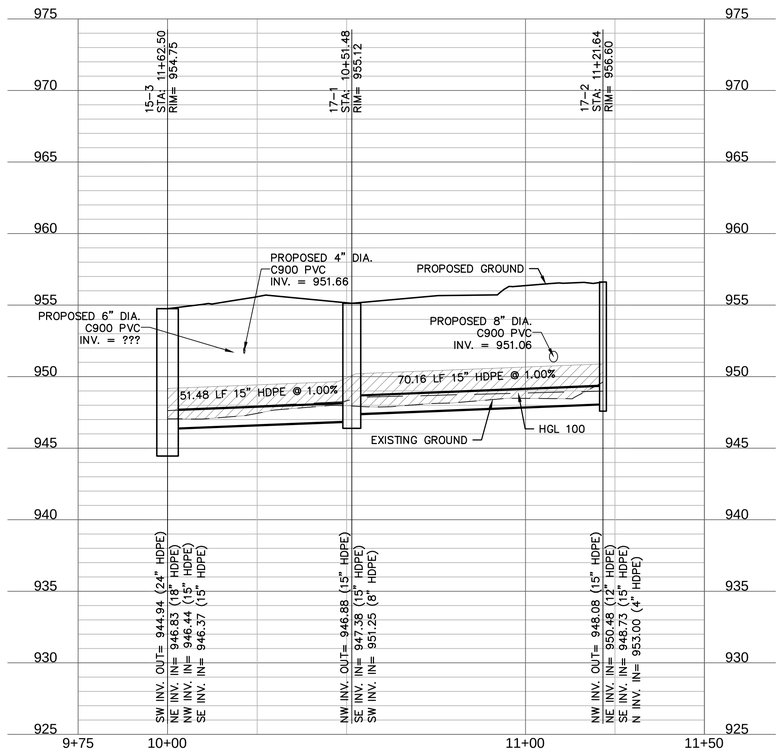
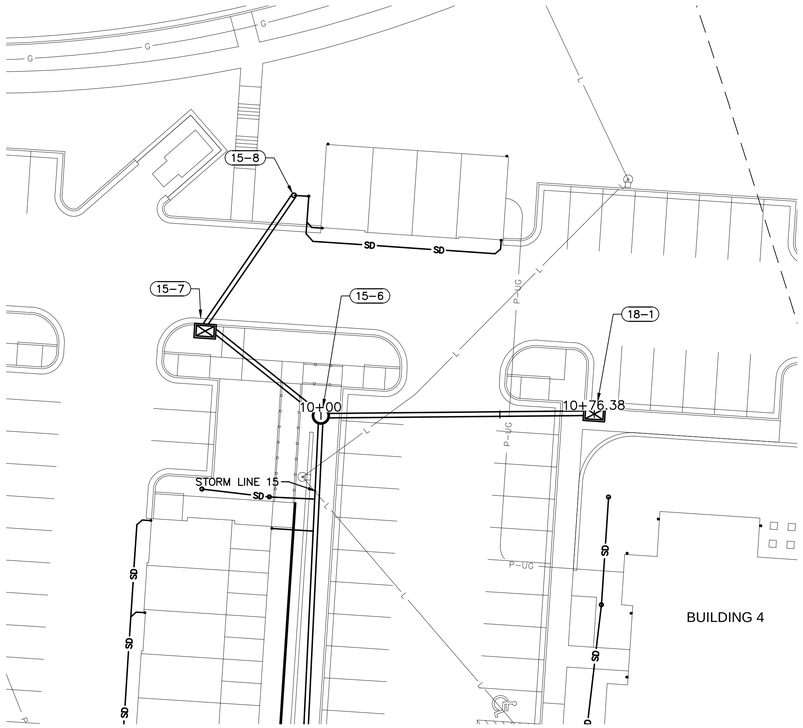


STORM LINE 17 (9+75 - 11+50)

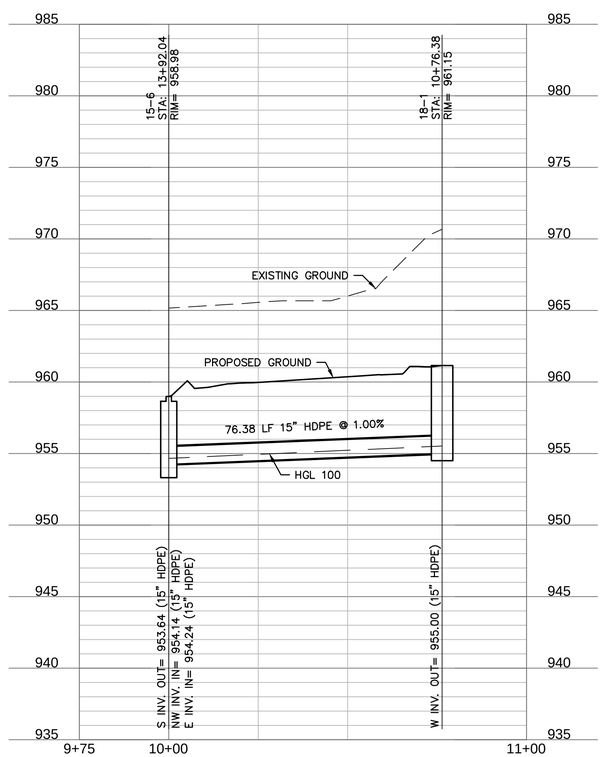


STRUCTURES	
ID	DESCRIPTION
17–1	10+51.48 STORM LINE 17 4' X 4' AREA INLET N: 1013492.378; E: 2823091.527
17–2	11+21.64 STORM LINE 17 15" NYLOPLAST D.B. W/ SOLID TOP N: 1013461.799; E: 2823154.678

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



STORM LINE 18 (9+75 - 11+00)



STRUCTURES	
ID	DESCRIPTION
18–1	10+76.38 STORM LINE 18 5' X 3' CURB INLET (NON–SETBACK) N: 1013670.106; E: 2823239.090

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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

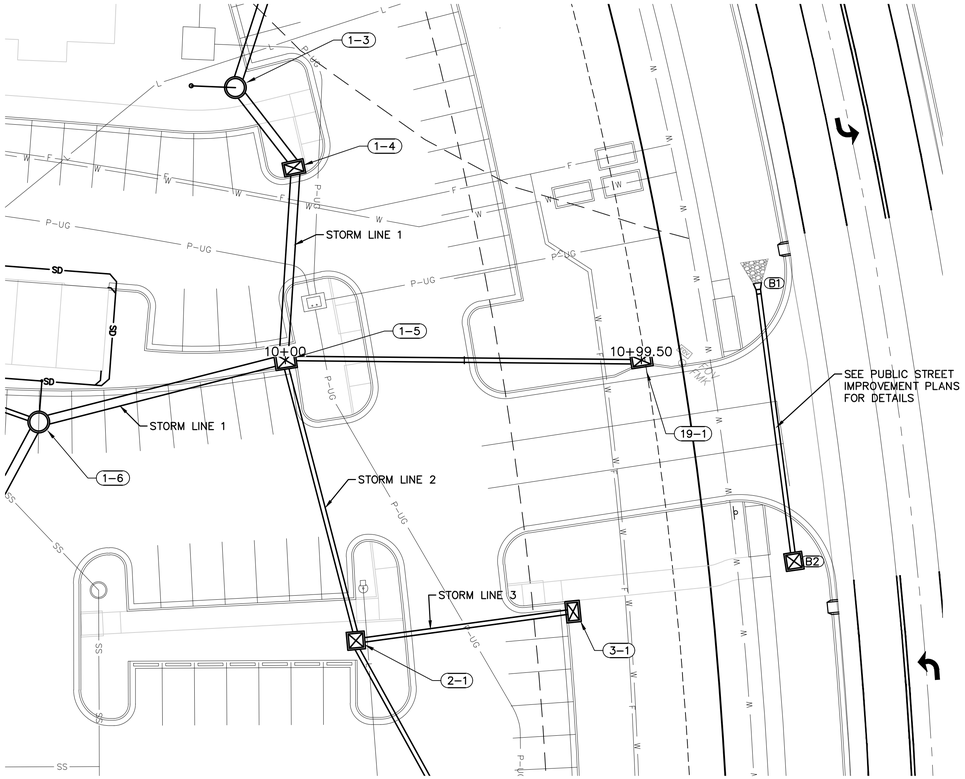
LEE'S SUMMIT, MO

2020

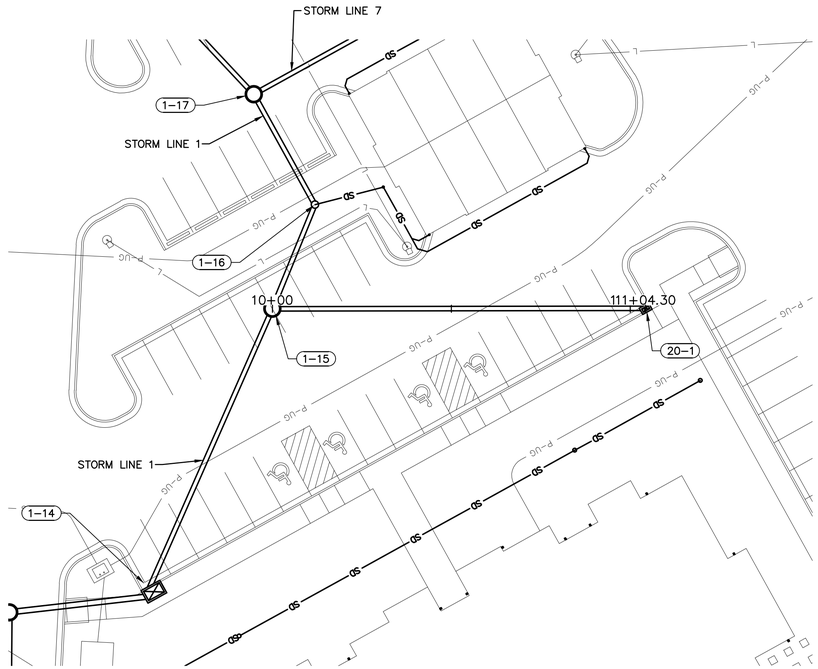
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C518

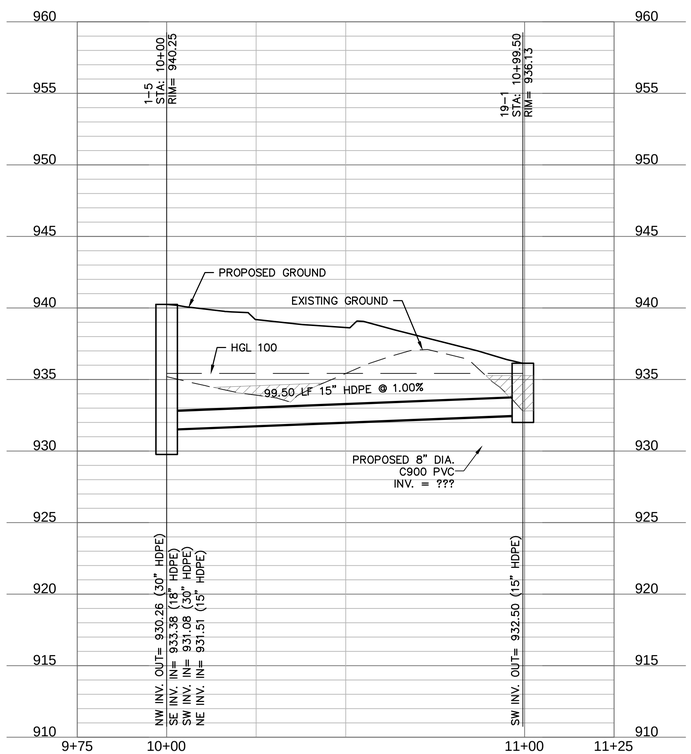
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\VC_STM03_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (14) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

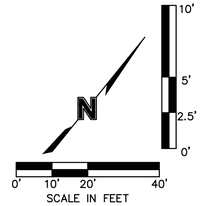


NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



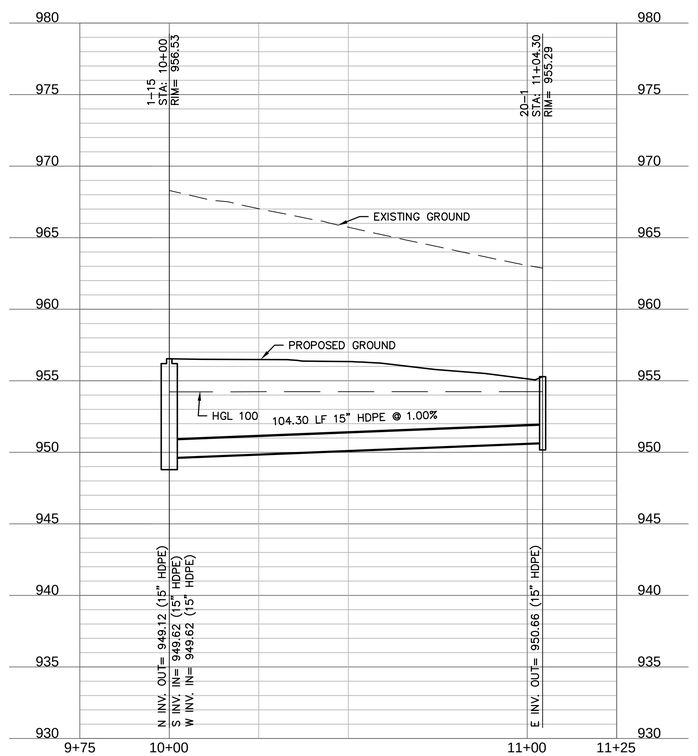
STORM LINE 19 (9+75 - 11+25)

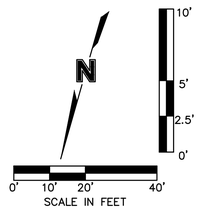




STRUCTURES	
ID	DESCRIPTION
19–1	10+99.50 STORM LINE 19 5' X 3' CURB INLET (SETBACK) N: 1014606.651; E: 2822969.610

STORM LINE 20 (9+75 - 11+25)





STRUCTURES	
ID	DESCRIPTION
20–1	11+04.30 STORM LINE 20 NYLOPLAST CURB INLET (15" – 2'X3') N: 1014002.381; E: 2822956.859

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
2301 MAIN STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

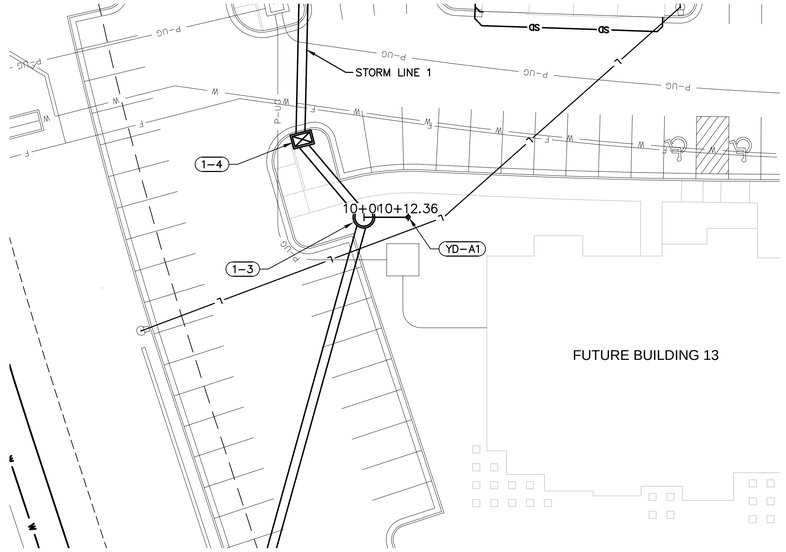
2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

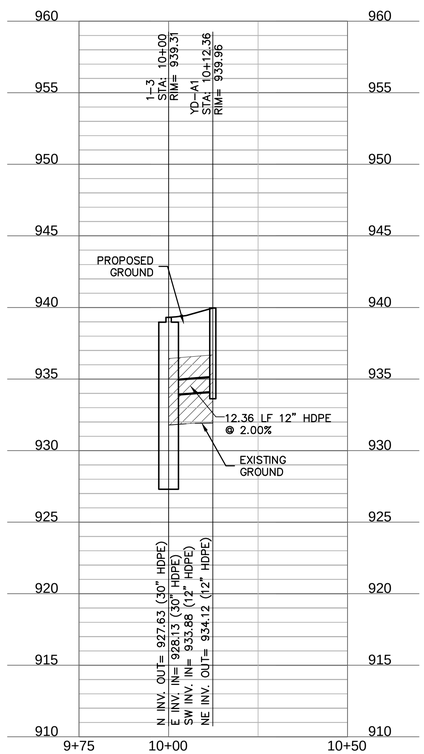
SHEET
C519

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_STM03_ B190012.dwg ~ Layout: STORM SEWER PLAN & PROFILE (15) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

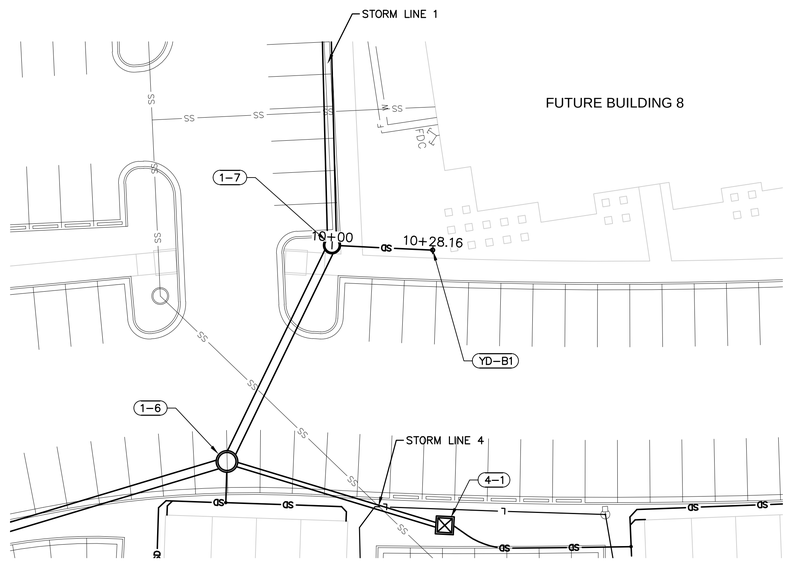
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

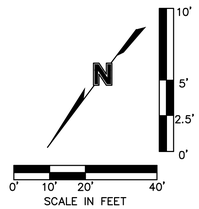


BUILDING STORM LINE A (9+75 - 10+50)

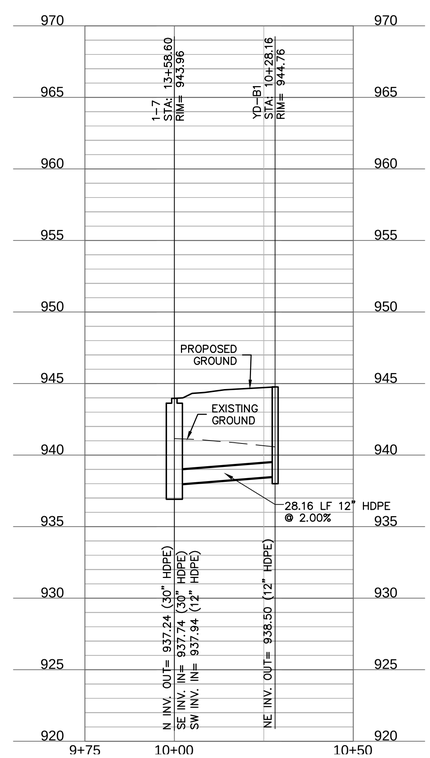


STRUCTURES	
ID	DESCRIPTION
YD–A1	10+12.36 BUILDING STORM LINE A 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014587.580; E: 2822823.521





BUILDING STORM LINE B (9+75 - 10+50)



STRUCTURES	
ID	DESCRIPTION
YD–B1	10+28.16 BUILDING STORM LINE B 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014405.960; E: 2822838.028

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 001592
2301 MAIN STREET, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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MO# 2015000555

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REVISIONS
REVISIONS DESCRIPTION

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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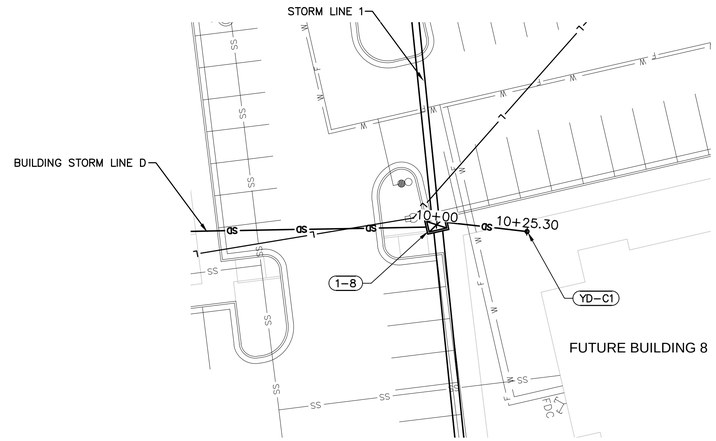
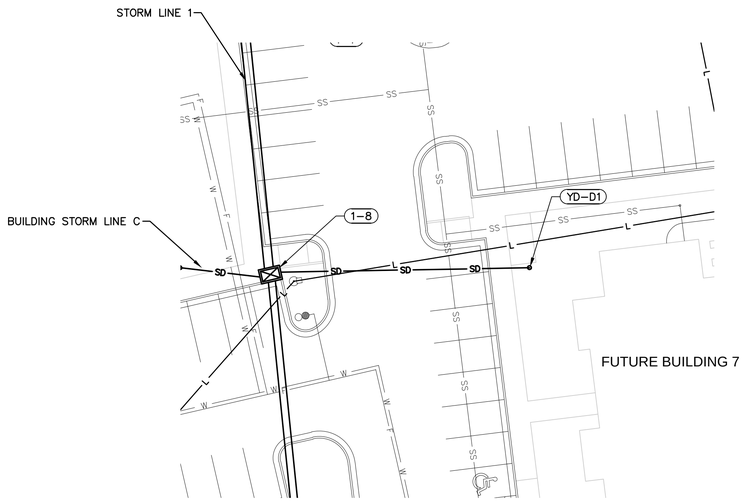
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

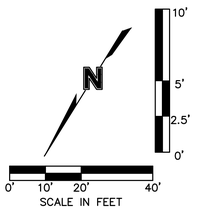
SHEET
C520

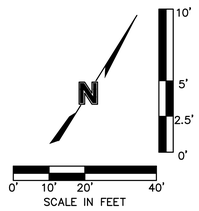
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP01_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE ~ Last Saved By: mdieboit ~ Plot Date: 2019.10.01 03:03 PM

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

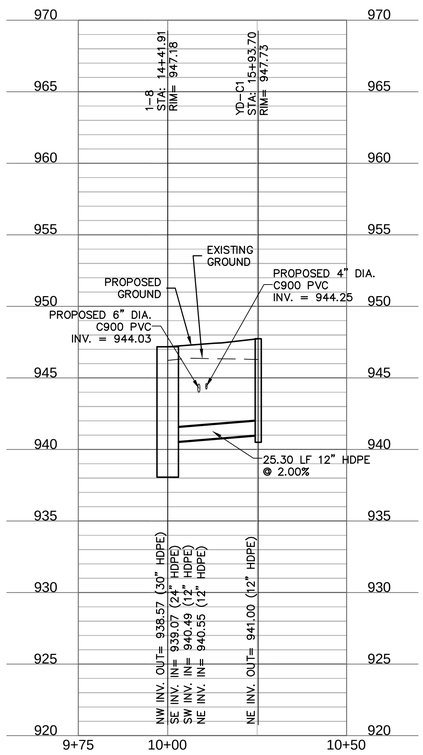






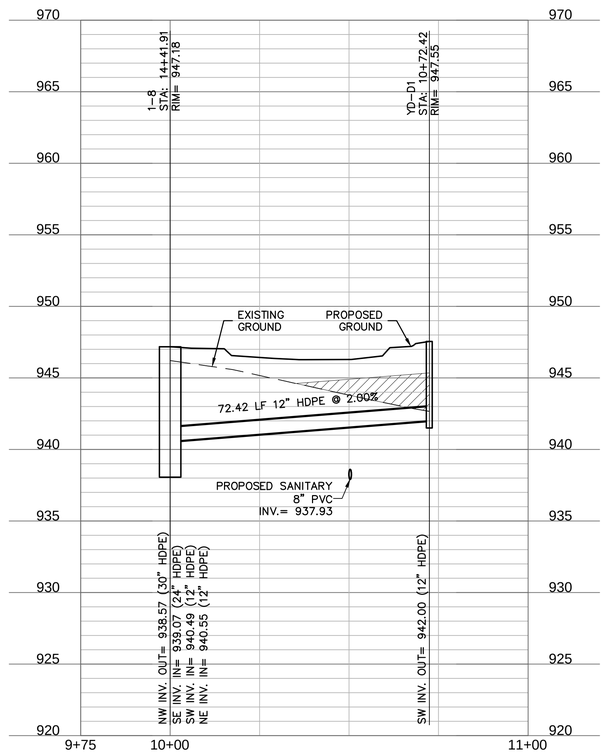


BUILDING STORM LINE C (9+75 - 10+50)



STRUCTURES	
ID	DESCRIPTION
YD-C1	15+93.70 STORM LINE 10 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014344.168; E: 2822890.425

BUILDING STORM LINE D (9+75 - 11+00)



STRUCTURES	
ID	DESCRIPTION
YD-D1	10+72.42 BUILDING STORM LINE D 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014396.001; E: 2822973.150

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www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

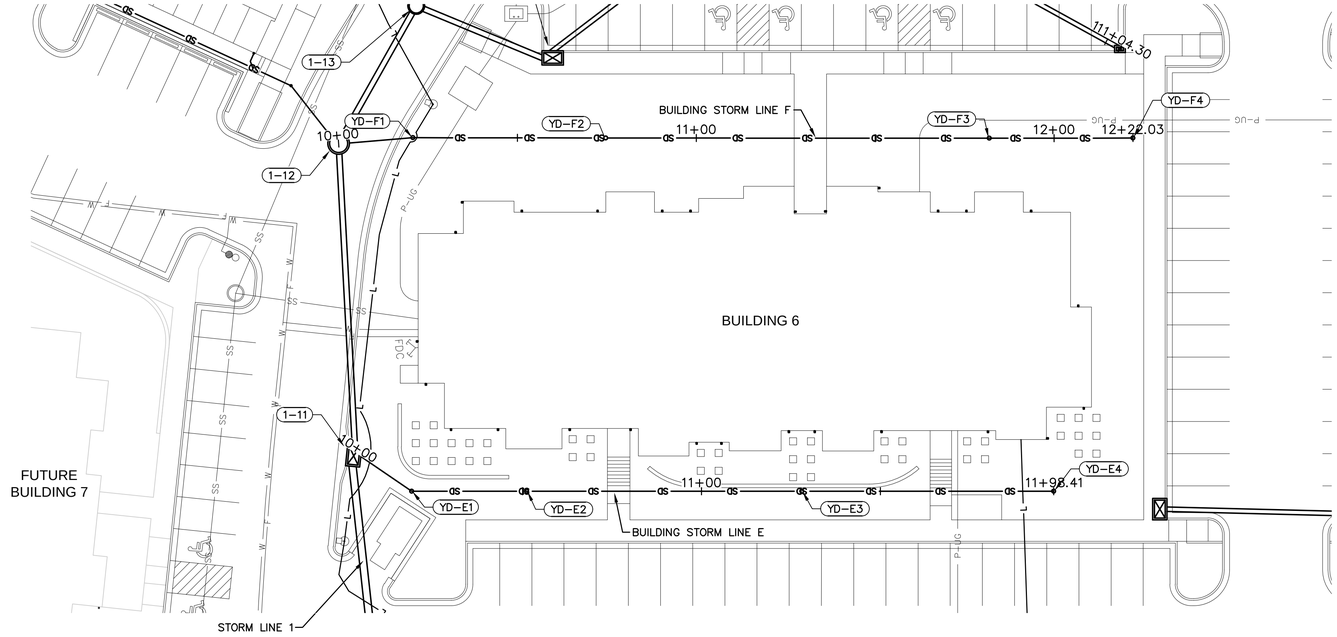
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C521

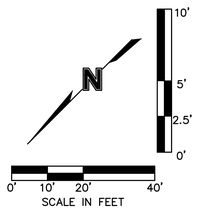
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP01_B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

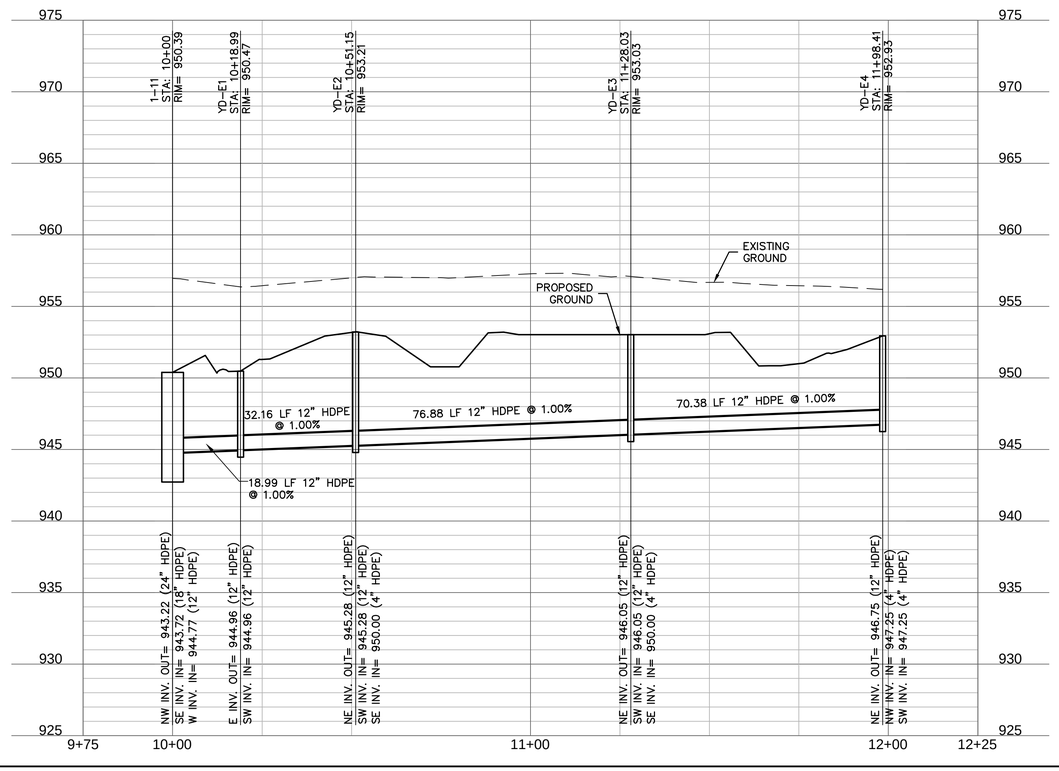
STRUCTURES	
ID	DESCRIPTION
YD-E1	10+18.99 BUILDING STORM LINE E 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014229.765; E: 2823009.368
YD-E2	10+51.15 BUILDING STORM LINE E 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014207.026; E: 2822986.629
YD-E3	11+28.03 BUILDING STORM LINE E 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014152.663; E: 2822932.270
YD-E4	11+98.41 BUILDING STORM LINE E 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014102.894; E: 2822882.505



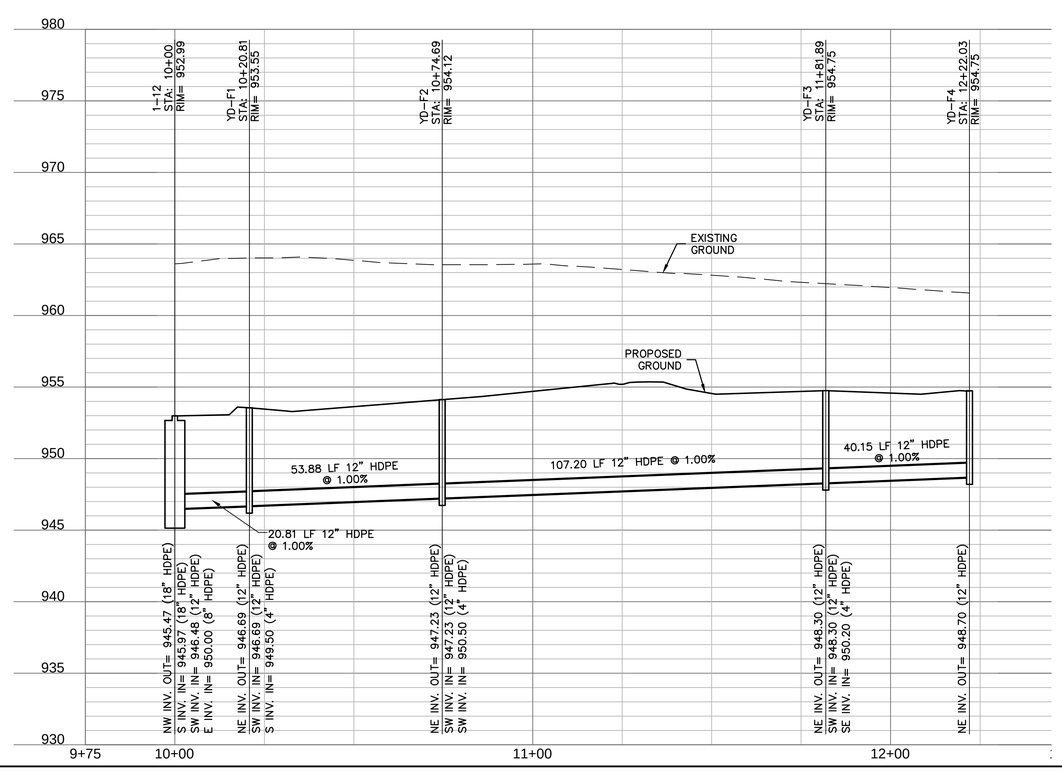
STRUCTURES	
ID	DESCRIPTION
YD-F1	10+20.81 BUILDING STORM LINE F 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014159.646; E: 2823078.997
YD-F2	10+74.69 BUILDING STORM LINE F 12" INLINE DRAIN W/ DOME GRATE TOP N: 1014121.610; E: 2823040.835
YD-F3	11+81.89 BUILDING STORM LINE F 12" INLINE DRAIN W/ DOME GRATE TOP N: 1014045.847; E: 2822964.998
YD-F4	12+22.03 BUILDING STORM LINE F 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014017.420; E: 2822936.649



BUILDING STORM LINE E (9+75 - 12+25)



BUILDING STORM LINE F (9+75 - 12+50)



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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 WILLOW LAKE BOULEVARD, SUITE 105
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
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PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

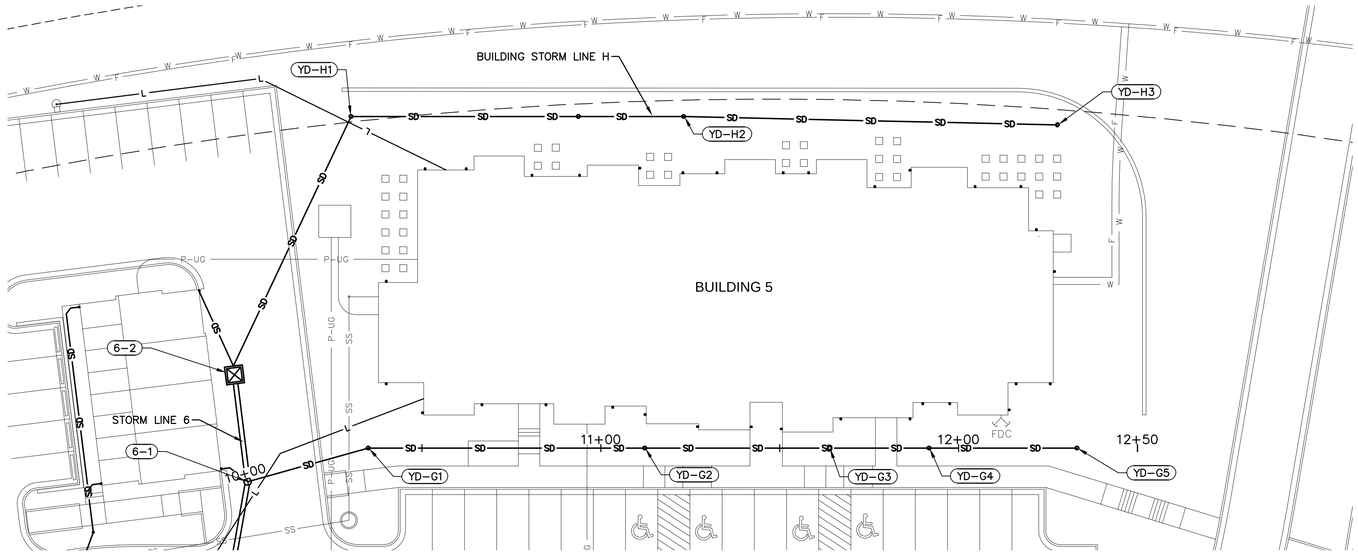
2020

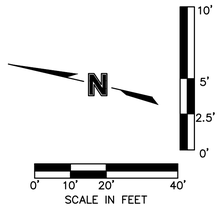
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C522

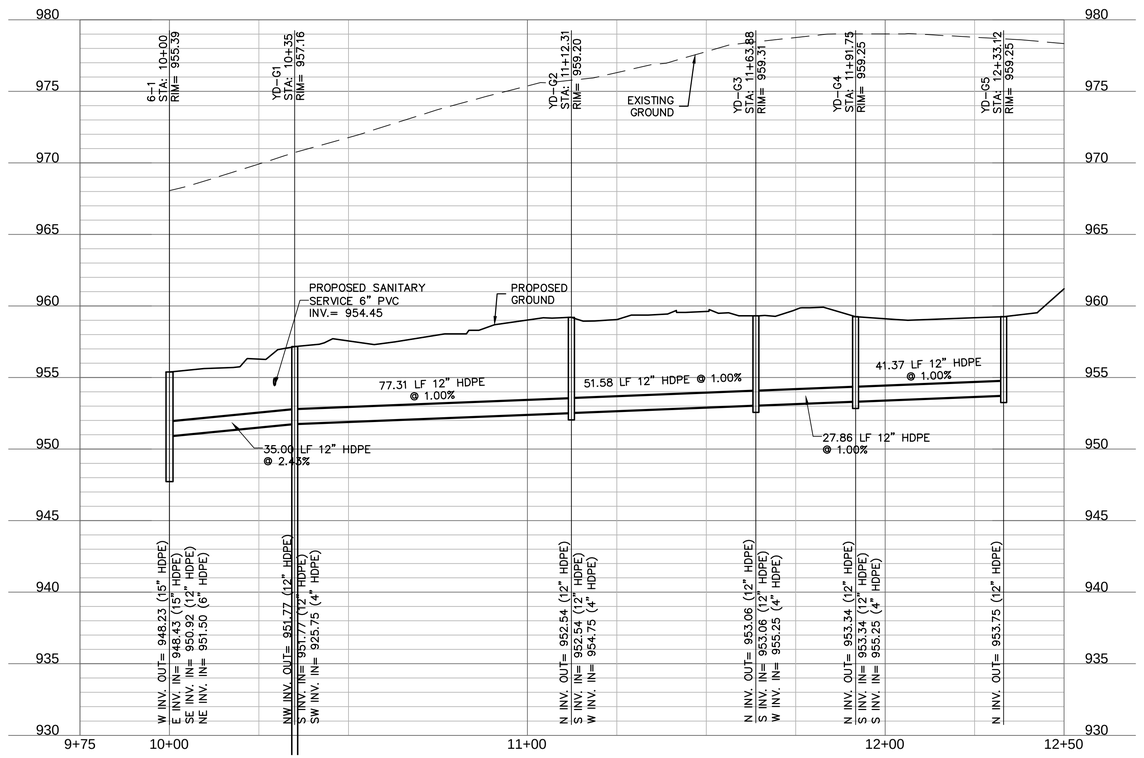
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP01_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.





BUILDING STORM LINE G (9+75 - 12+50)



STRUCTURES	
ID	DESCRIPTION
YD-G1	10+35 BUILDING STORM LINE G 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014103.902; E: 2823153.732
YD-G2	11+12.31 BUILDING STORM LINE G 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014028.617; E: 2823171.297
YD-G3	11+63.88 BUILDING STORM LINE G 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013978.389; E: 2823183.015
YD-G4	11+91.75 BUILDING STORM LINE G 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013951.257; E: 2823189.345
YD-G5	12+33.12 BUILDING STORM LINE G 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013910.966; E: 2823198.745

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 MCGEE STREET, SUITE 500
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER
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NO. REV.	DATE	BY	REVISIONS DESCRIPTION

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
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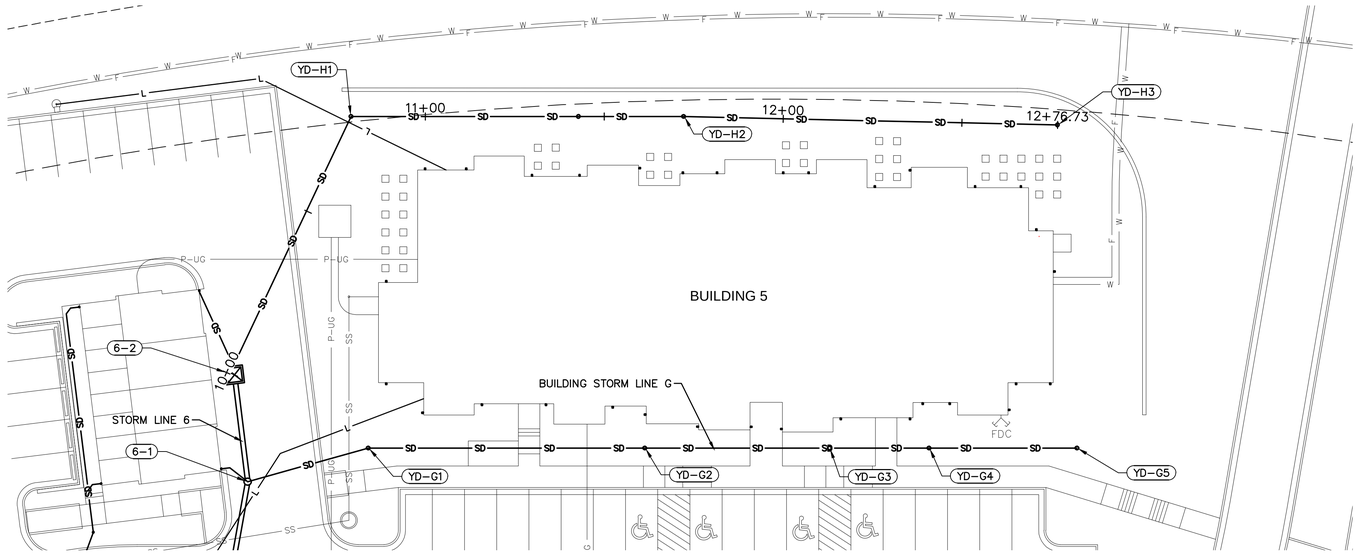
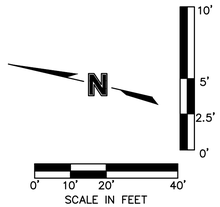
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C523

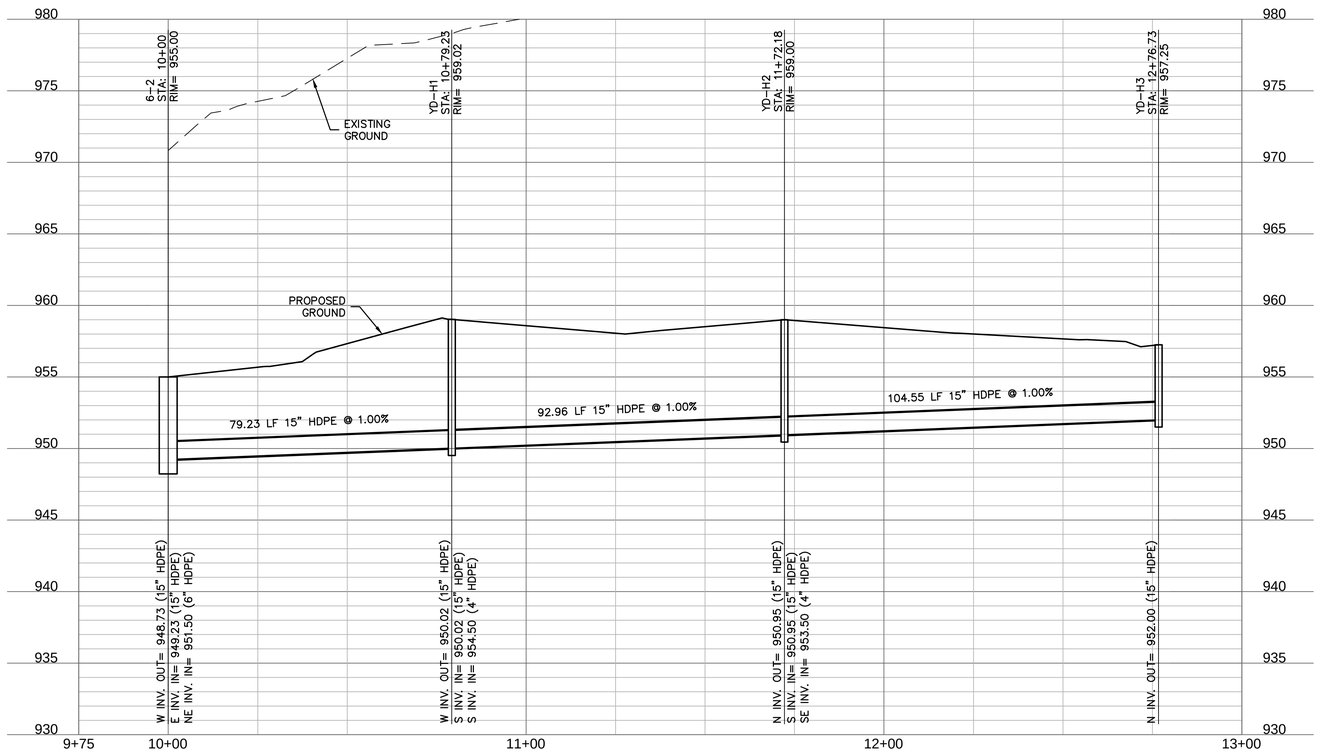
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP01_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.





BUILDING STORM LINE H (9+75 - 13+00)



STRUCTURES	
ID	DESCRIPTION
YD-H1	10+79.23 BUILDING STORM LINE H 15" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1014129.651; E: 2823242.886
YD-H2	11+72.18 BUILDING STORM LINE H 15" INLINE DRAIN W/ DOME GRATE TOP N: 1014039.119; E: 2823263.975
YD-H3	12+76.73 BUILDING STORM LINE H 15" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013936.796; E: 2823285.438

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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BUILDING STORM SEWER PLAN & PROFILE
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ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C524

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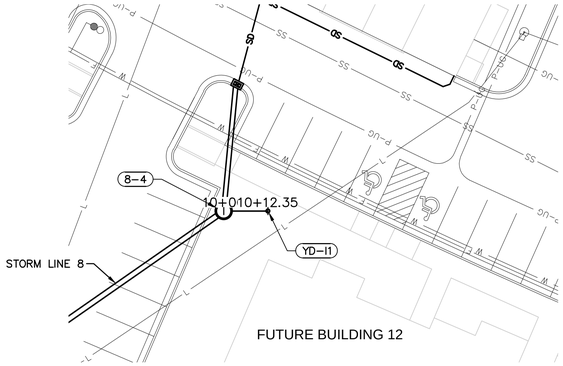
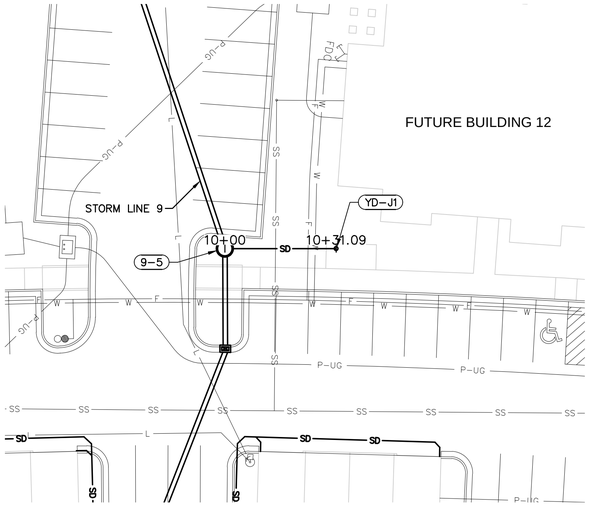
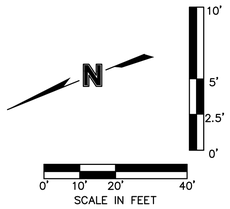
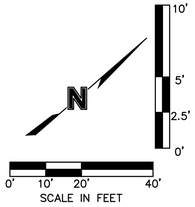
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

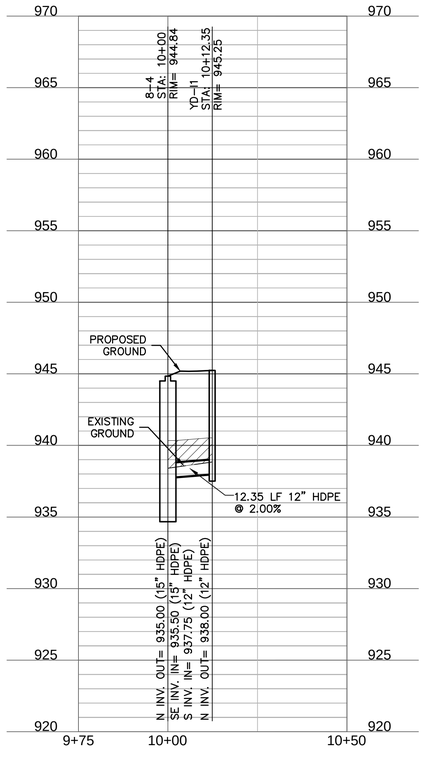






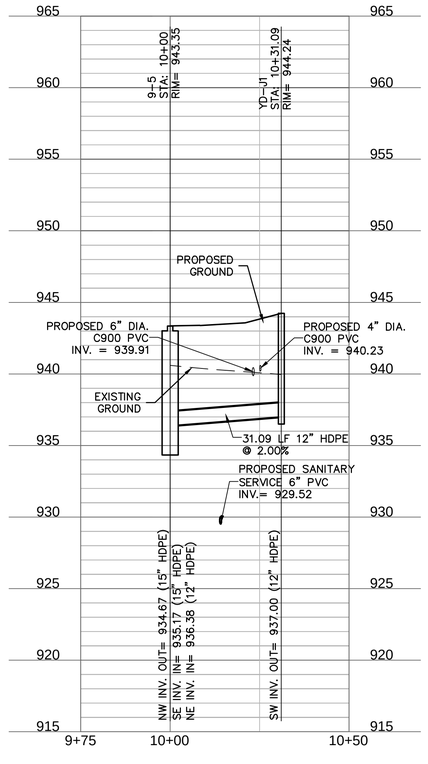


BUILDING STORM LINE I (9+75 - 10+50)



STRUCTURES	
ID	DESCRIPTION
YD–I1	10+12.35 BUILDING STORM LINE I 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014403.243; E: 2822587.583

BUILDING STORM LINE J (9+75 - 10+50)



STRUCTURES	
ID	DESCRIPTION
YD–J1	10+31.09 BUILDING STORM LINE J 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014267.141; E: 2822450.395

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www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019.0012-B
date: 2020.08.27

SHEET
C525

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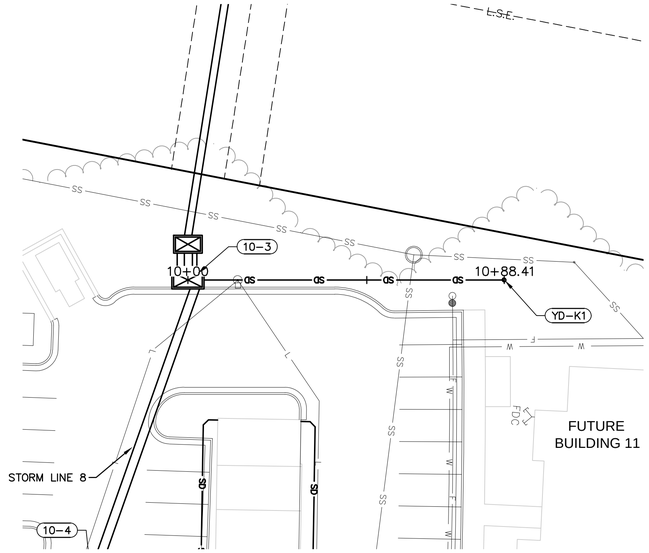
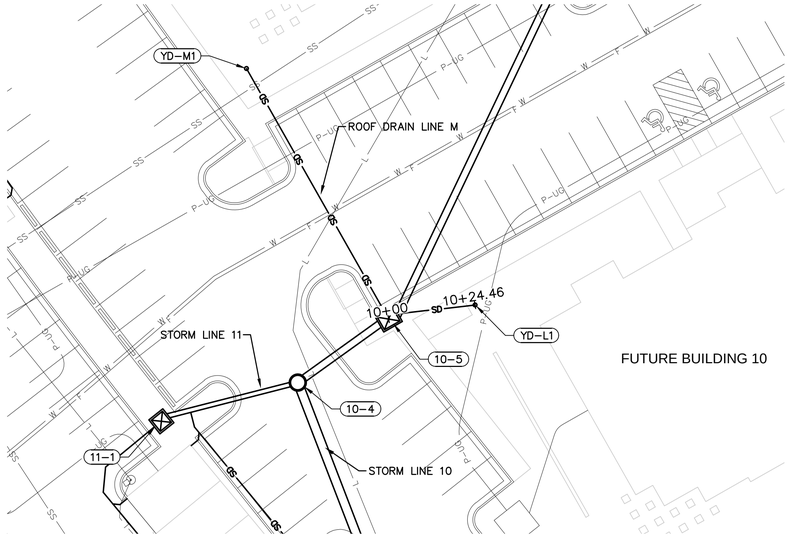
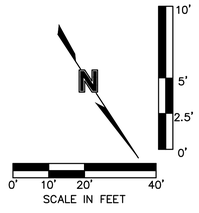
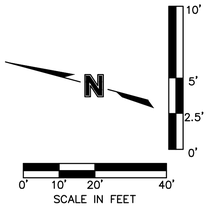
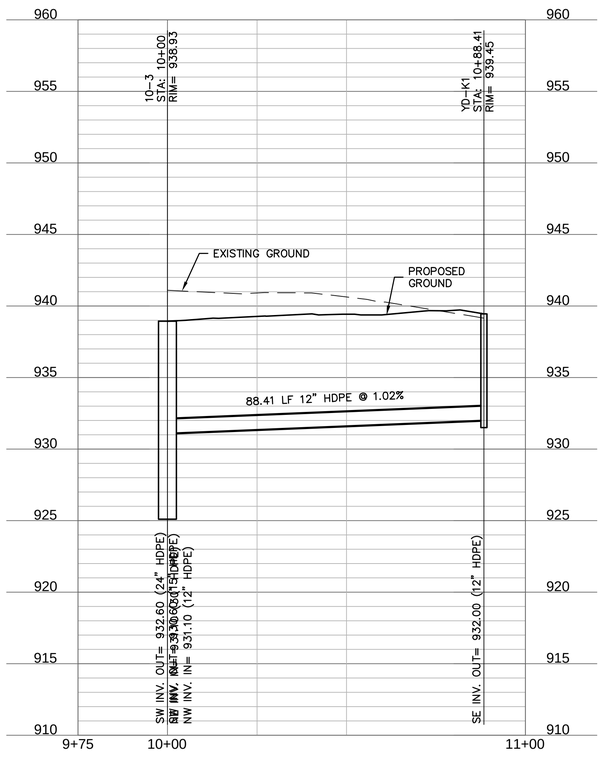






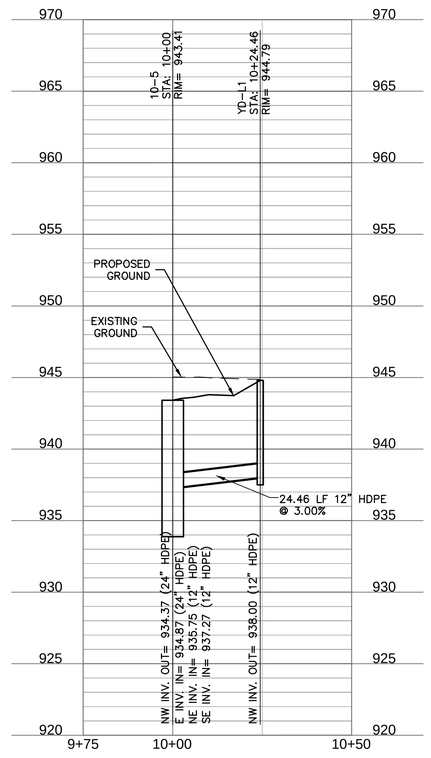


BUILDING STORM LINE K (9+75 - 11+00)



STRUCTURES	
ID	DESCRIPTION
YD–K1	10+88.41 BUILDING STORM LINE K 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014021.298; E: 2822260.711

BUILDING STORM LINE L (9+75 - 10+50)



STRUCTURES	
ID	DESCRIPTION
YD–L1	10+24.46 BUILDING STORM LINE L 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013983.988; E: 2822436.694

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NORTH KANSAS CITY, MO 64116
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MO# 2015000555

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REVISIONS

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
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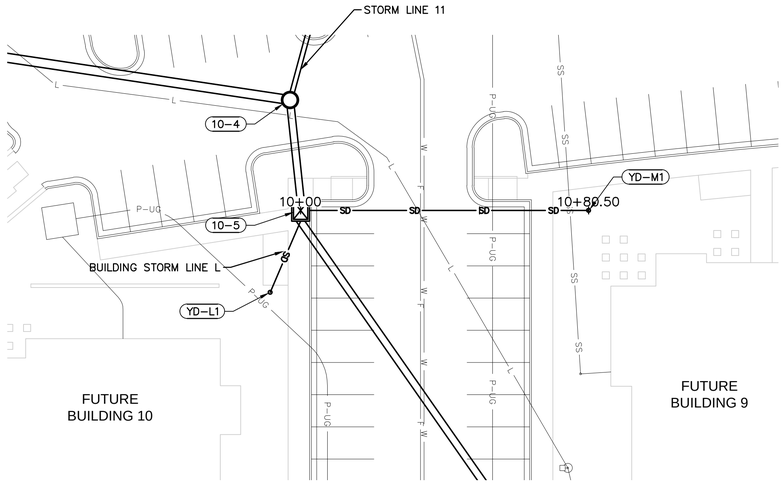
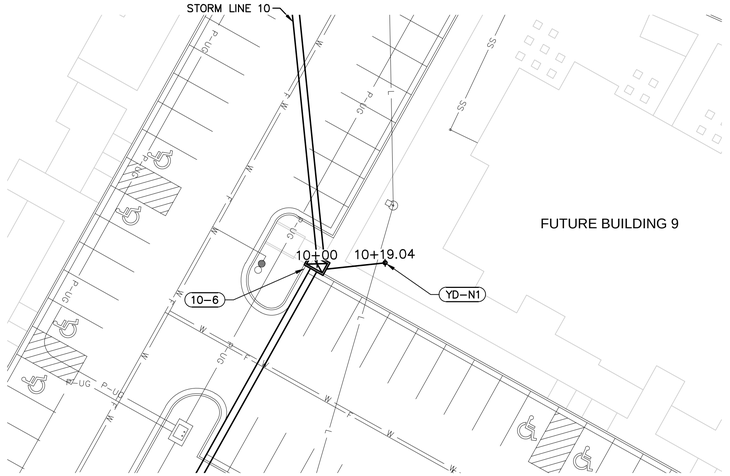
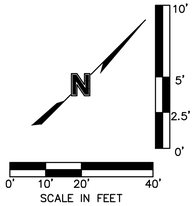
SHEET
C526

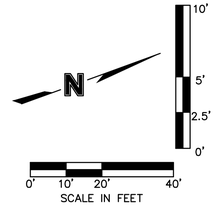
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP02_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (7) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

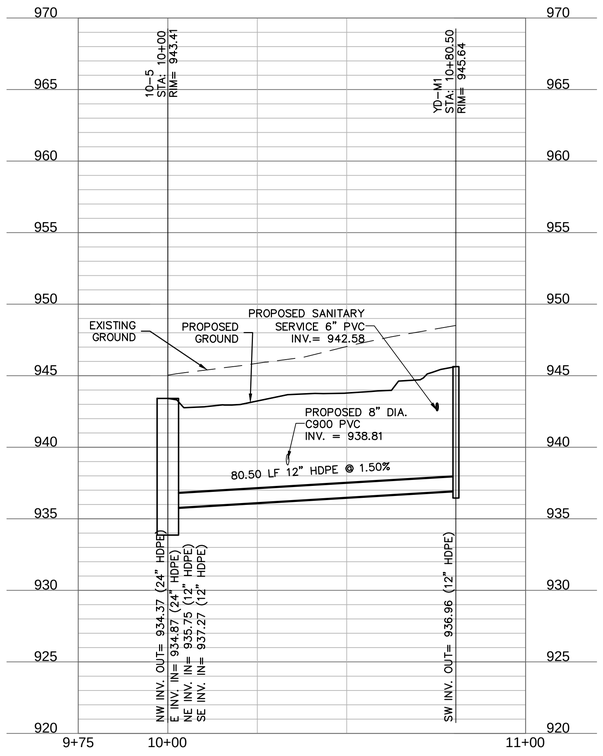






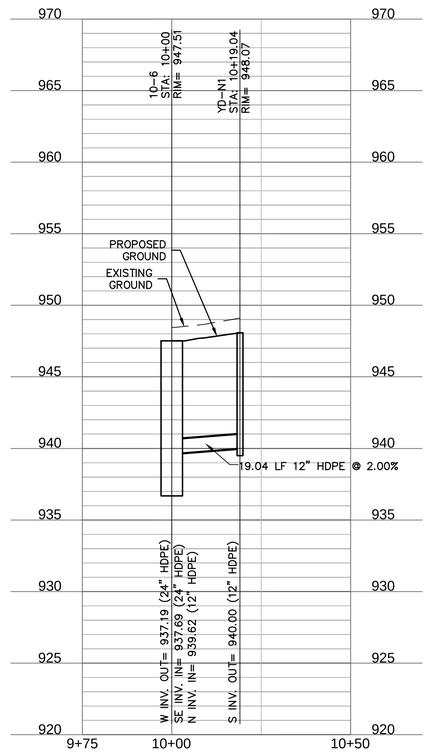


BUILDING STORM LINE M (9+75 - 11+00)



STRUCTURES	
ID	DESCRIPTION
YD-M1	10+80.50 BUILDING STORM LINE M 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014063.135; E: 2822483.413

BUILDING STORM LINE N (9+75 - 10+50)



STRUCTURES	
ID	DESCRIPTION
YD-N1	10+19.04 BUILDING STORM LINE N 12" NYLOPLAST D.B. W/ SOLID TOP N: 1014001.559; E: 2822544.988

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NORTH KANSAS CITY, MO 64116
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REVISIONS

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BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C527

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP02_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (8) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

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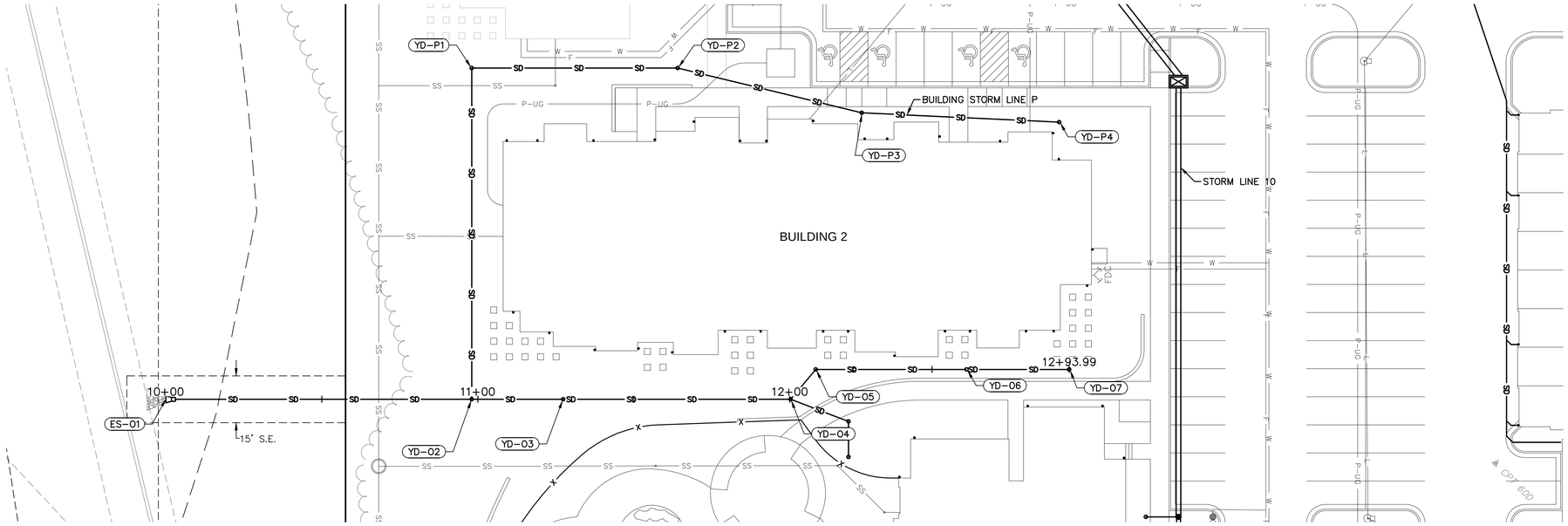
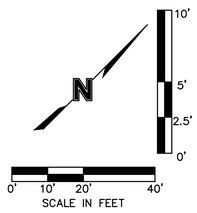
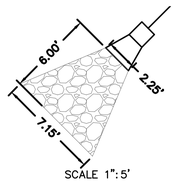
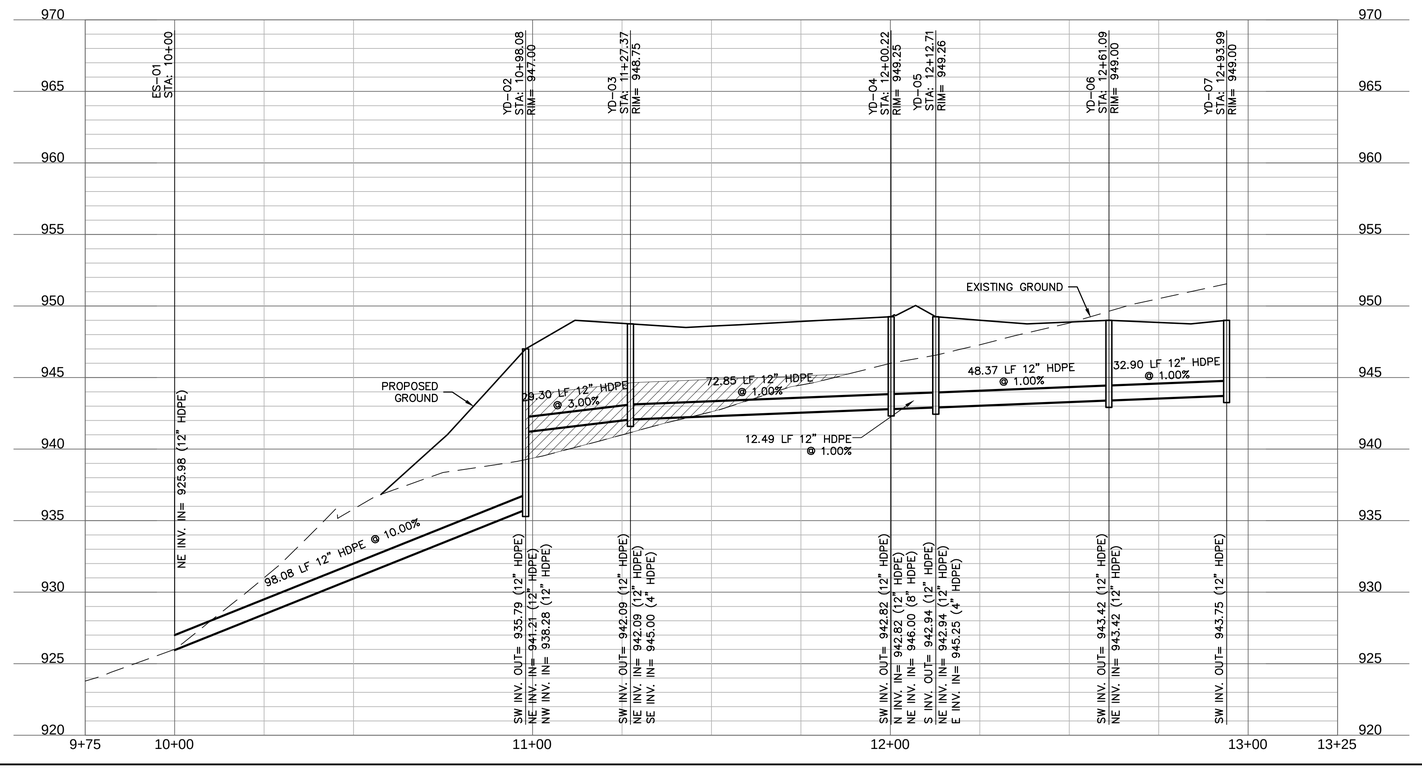






Riprap Calculations							
End Section	Q_{100} (cfs)	Pipe Diameter (ft)	Class*	D50* (in)	Apron Length (ft)	Apron Depth (ft)	Area (SY)
YD-01	9.39	1	4	14	6	2.57	3.3
*Per Table 10.1 HEC 14-FHWA-Energy Dissipators Pg. 10-18							

BUILDING STORM LINE O (9+75 - 13+25)



STRUCTURES	
ID	DESCRIPTION
ES-01	10+00 BUILDING STORM LINE O 15" FES N: 1013640.646; E: 2822541.605
YD-02	10+98.08 BUILDING STORM LINE O 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013709.996; E: 2822610.955
YD-03	11+27.37 BUILDING STORM LINE O 12" INLINE DRAIN W/ DOME GRATE TOP N: 1013730.712; E: 2822631.671
YD-04	12+00.22 BUILDING STORM LINE O 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013782.224; E: 2822683.183
YD-05	12+12.71 BUILDING STORM LINE O 12" INLINE DRAIN W/ DOME GRATE TOP N: 1013794.672; E: 2822682.122
YD-06	12+61.09 BUILDING STORM LINE O 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013828.878; E: 2822716.328
YD-07	12+93.99 BUILDING STORM LINE O 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013852.143; E: 2822739.593

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BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
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SHEET
C528

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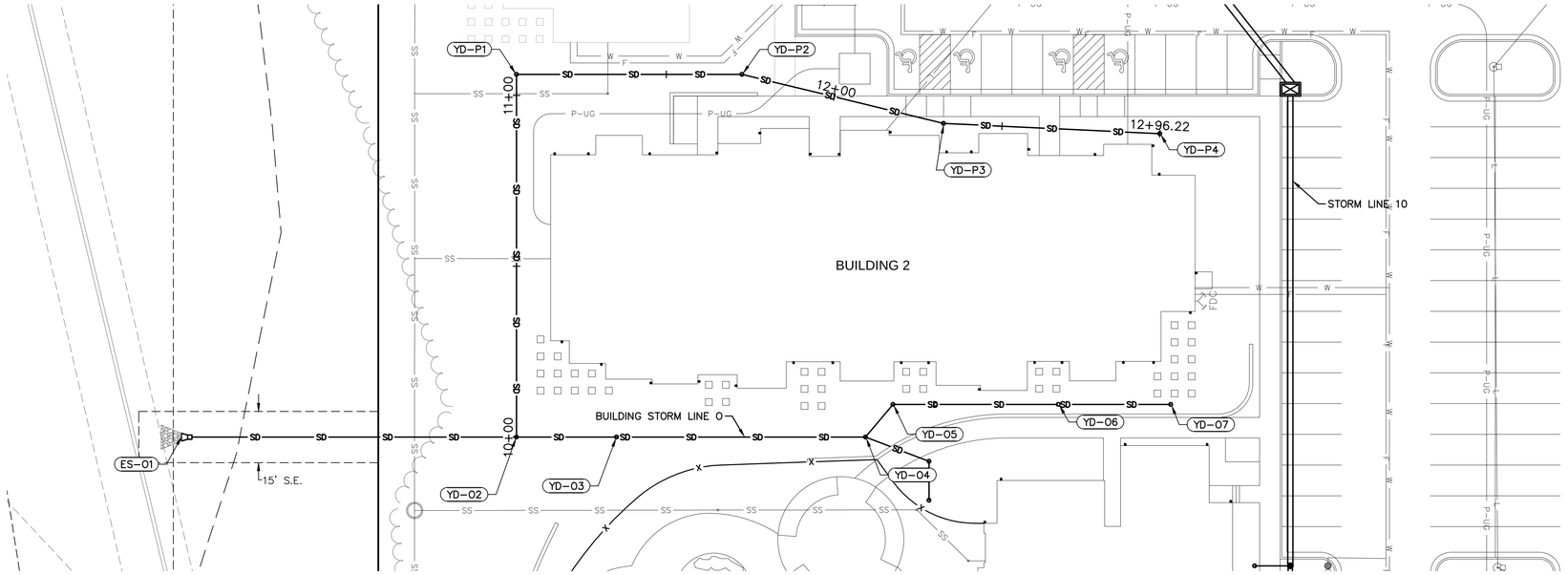
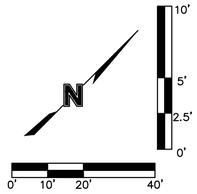
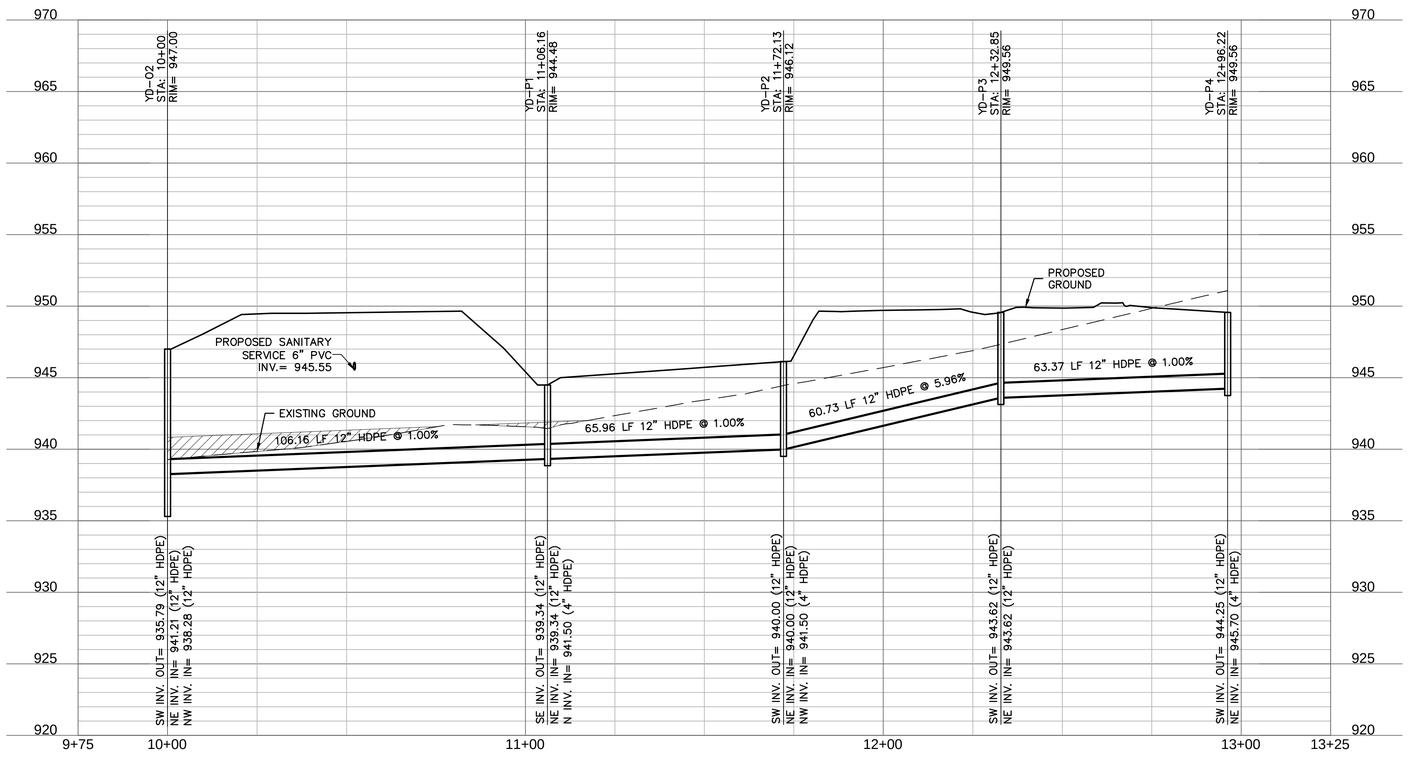




BUILDING STORM LINE P (9+75 - 13+25)



STRUCTURES	
ID	DESCRIPTION
YD-P1	11+06.16 BUILDING STORM LINE P 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013785.065; E: 2822535.886
YD-P2	11+72.13 BUILDING STORM LINE P 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013831.708; E: 2822582.530
YD-P3	12+32.85 BUILDING STORM LINE P 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013863.283; E: 2822634.400
YD-P4	12+96.22 BUILDING STORM LINE P 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013905.909; E: 2822681.292

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MO CERTIFICATE OF AUTHORITY # 001592
2301 MAIN STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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REVISIONS

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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SHEET
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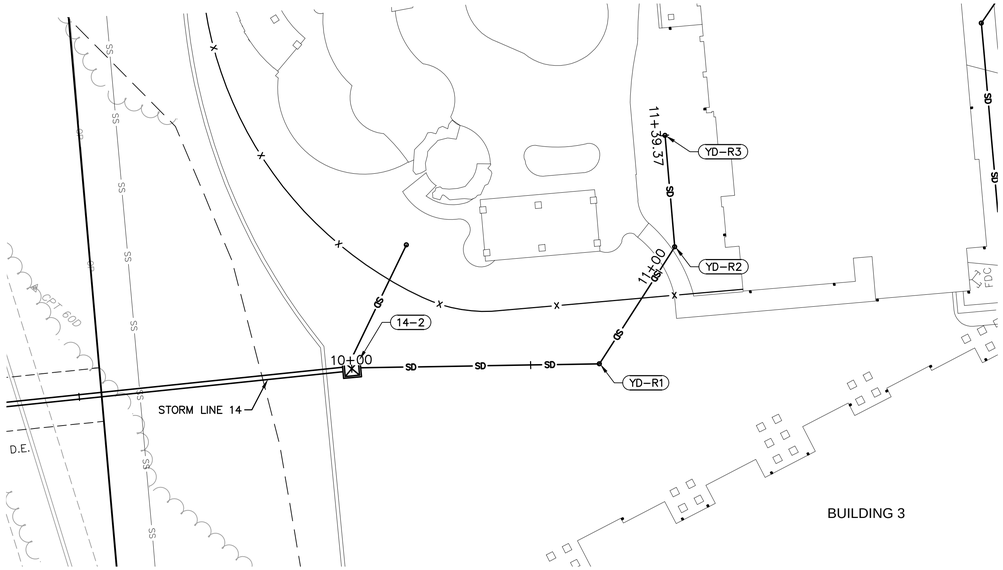
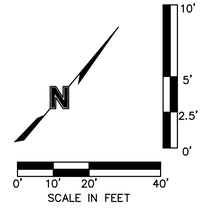
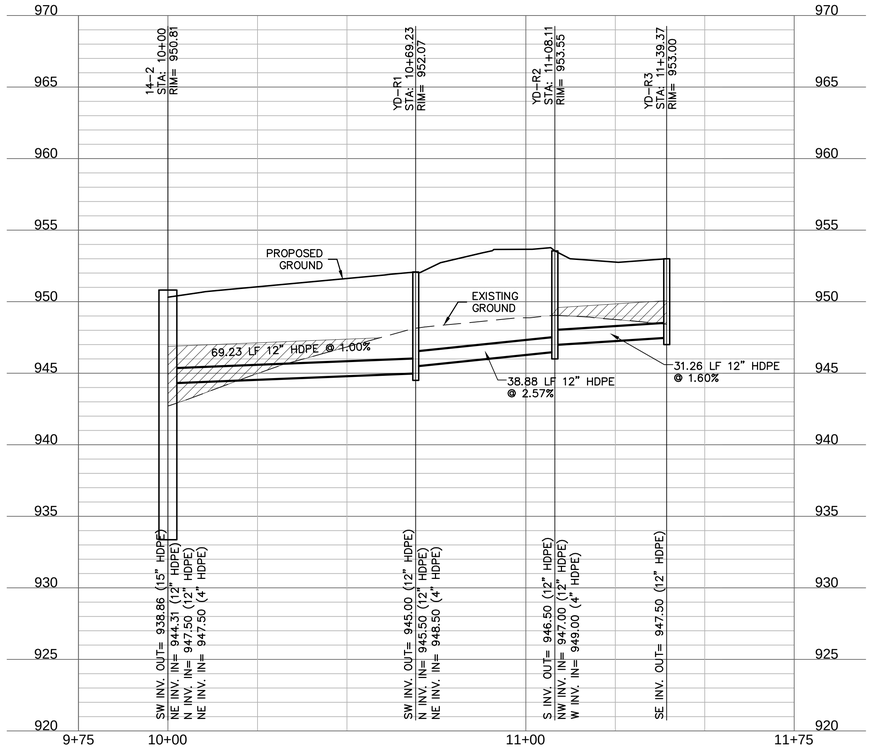




STRUCTURES	
ID	DESCRIPTION
YD–R1	10+69.23 BUILDING STORM LINE R 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013627.421; E: 2822833.391
YD–R2	11+08.11 BUILDING STORM LINE R 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013665.992; E: 2822828.507
YD–R3	11+39.37 BUILDING STORM LINE R 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013688.097; E: 2822806.402

BUILDING STORM LINE R (9+75 - 11+75)



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REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

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ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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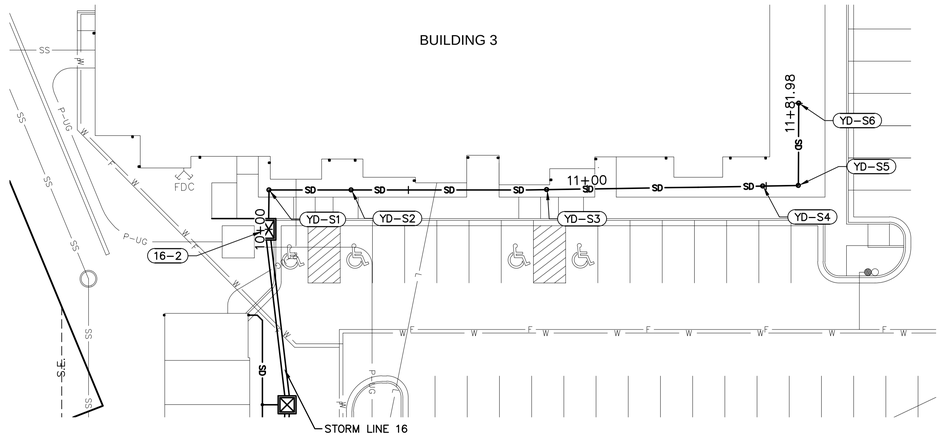
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C530

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP03_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (11) ~ Last Saved By: mdlebolt ~ Plot Date: 2019.10.01 03:03 PM



STRUCTURES	
ID	DESCRIPTION
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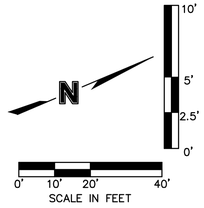
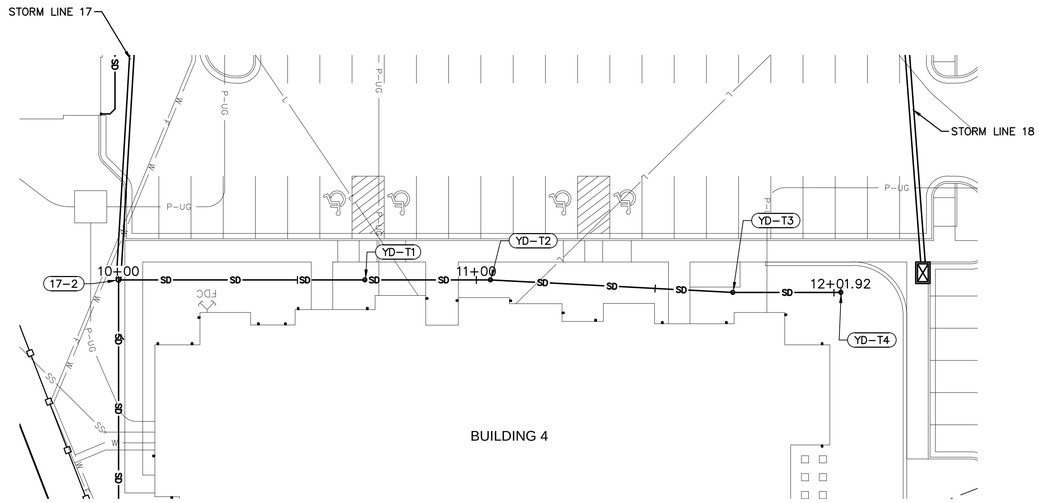
YD-S2	10+34 BUILDING STORM LINE S 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013576.281; E: 2822941.272
YD-S3	10+88.66 BUILDING STORM LINE S 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013626.793; E: 2822962.175
YD-S4	11+49.03 BUILDING STORM LINE S 12" INLINE DRAIN W/ DOME GRATE TOP N: 1013682.903; E: 2822984.432
YD-S5	11+59.01 BUILDING STORM LINE S 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013692.187; E: 2822988.108
YD-S6	11+81.98 BUILDING STORM LINE S 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013701.079; E: 2822966.927

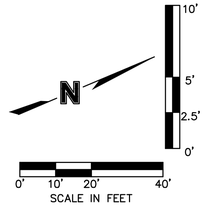


BUILDING STORM LINE S (9+75 - 12+25)

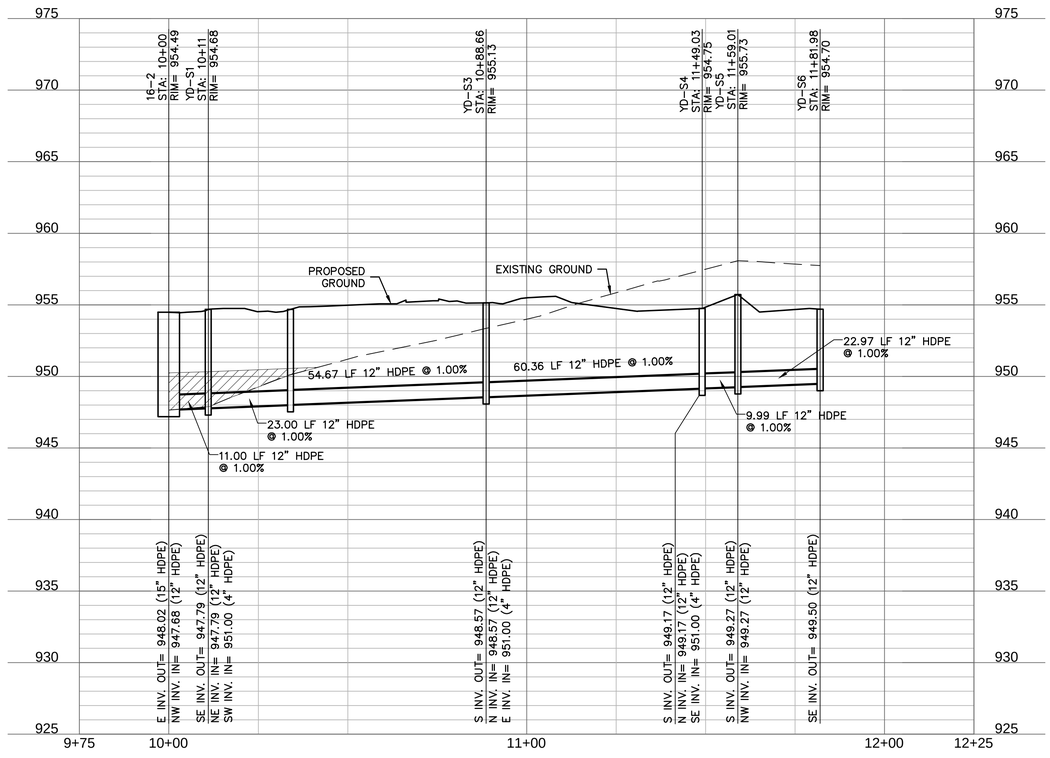
NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

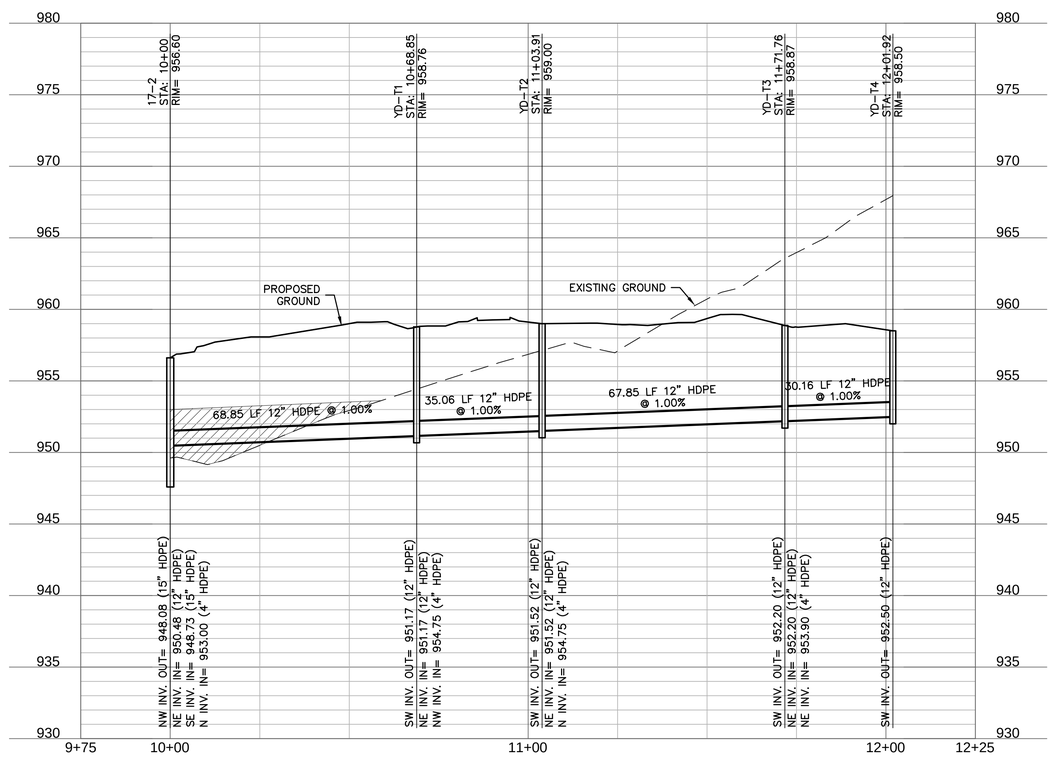


STRUCTURES	
ID	DESCRIPTION
YD-T1	10+68.85 BUILDING STORM LINE T 12" NYLOPLAST D.B. W/ SOLID TOP N: 1013525.379; E: 2823181.103
YD-T2	11+03.91 BUILDING STORM LINE T 12" NYLOPLAST D.B. W SOLID TOP N: 1013557.751; E: 2823194.558
YD-T3	11+71.76 BUILDING STORM LINE T 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013618.985; E: 2823223.783
YD-T4	12+01.92 BUILDING STORM LINE T 12" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013646.834; E: 2823235.366



BUILDING STORM LINE T (9+75 - 12+25)





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201 LOCUST STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

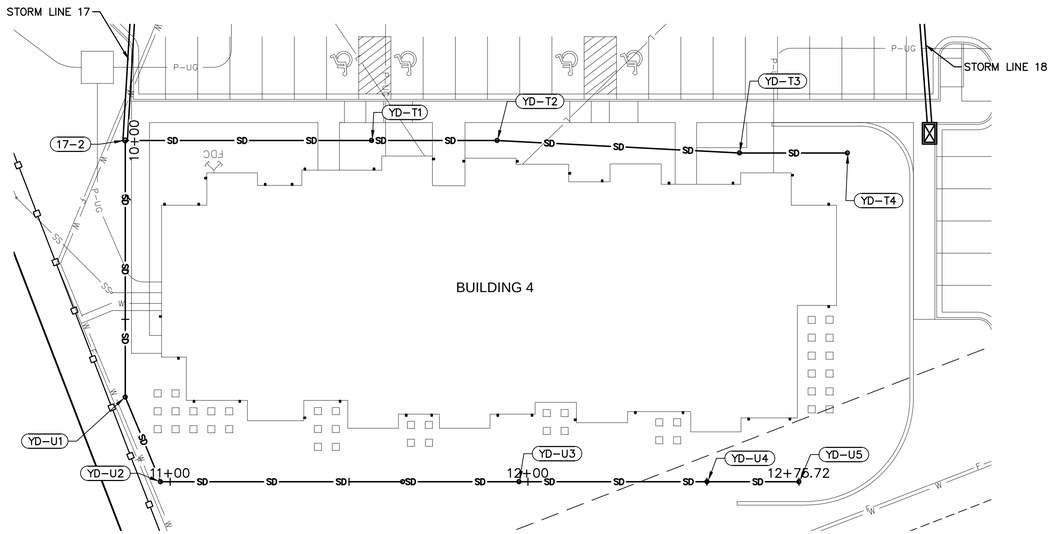
LEE'S SUMMIT, MO

2020

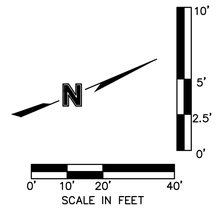
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C531

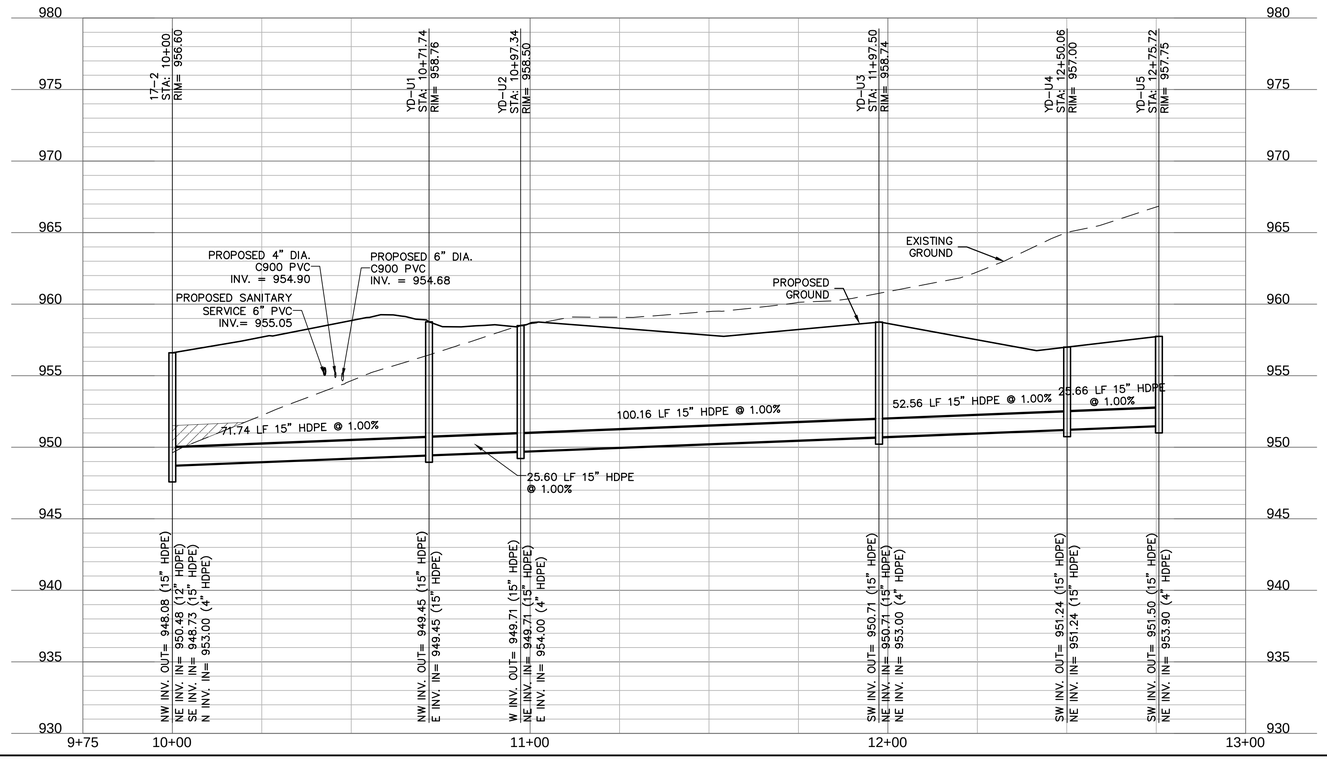
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP03_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (12) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



NOTE: CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



BUILDING STORM LINE U (9+75 - 13+00)



STRUCTURES	
ID	DESCRIPTION
YD-U1	10+71.74 BUILDING STORM LINE U 15" NYLOPLAST D.B. W/ SOLID TOP N: 1013434.264; E: 2823220.928
YD-U2	10+97.34 BUILDING STORM LINE U 15" NYLOPLAST D.B. W/ SOLID TOP N: 1013434.312; E: 2823246.524
YD-U3	11+97.50 BUILDING STORM LINE U 15" INLINE DRAIN W/ DOME GRATE TOP N: 1013526.801; E: 2823284.964
YD-U4	12+50.06 BUILDING STORM LINE U 15" INLINE DRAIN W/ DOME GRATE TOP N: 1013575.337; E: 2823305.136
YD-U5	12+75.72 BUILDING STORM LINE U 15" NYLOPLAST D.B. W/ DOME GRATE TOP N: 1013599.035; E: 2823314.985

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

BUILDING STORM SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

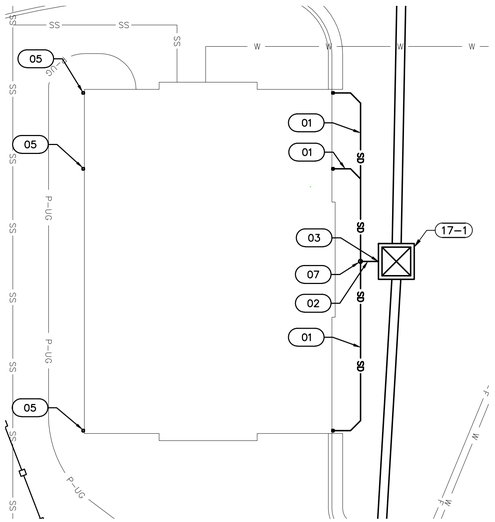
LEE'S SUMMIT, MO

2020

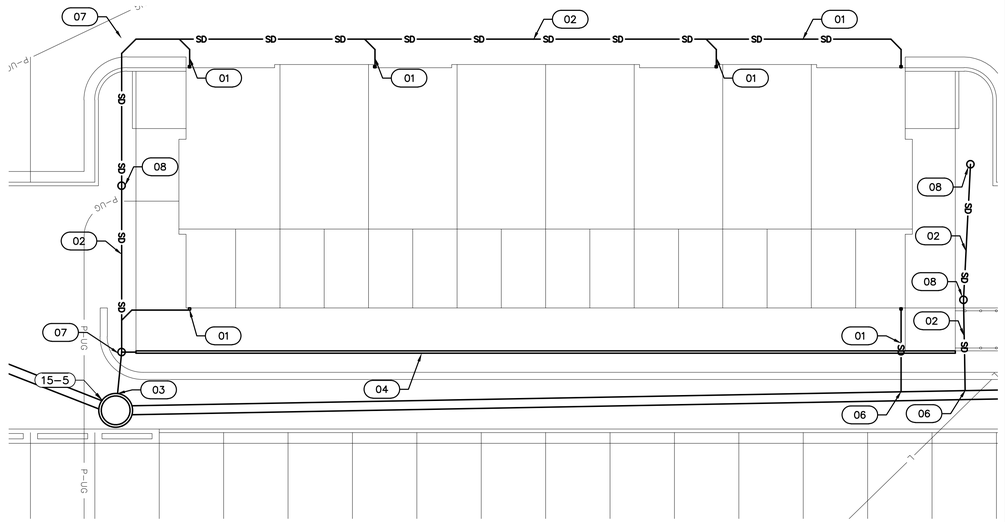
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C532

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP03_ B190012.dwg ~ Layout: ROOF DRAIN PLAN & PROFILE (13) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



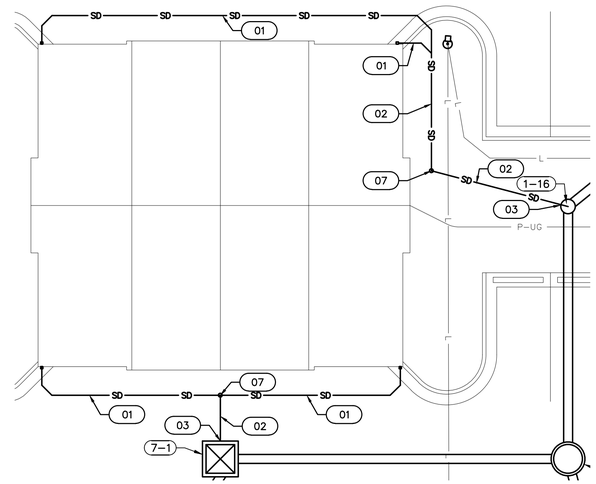
ROOF DRAINS @ MAINTENANCE BUILDING



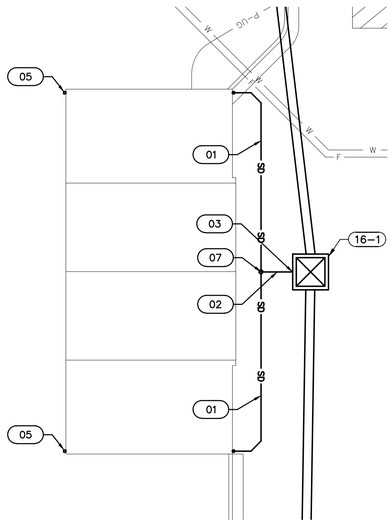
ROOF DRAINS @ GARAGE #2

ROOF DRAIN LINE NOTES ##

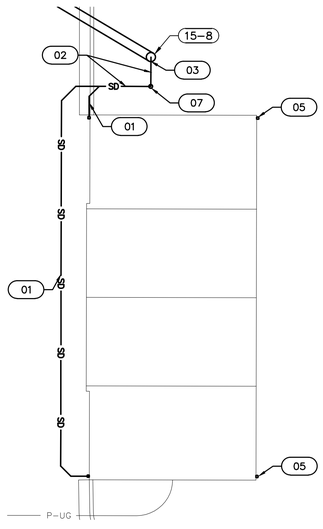
1. INSTALL 6" HDPE PIPE FROM DOWNSTREAM FITTING/STRUCTURE @ 2.0% MIN. SLOPE TO BUILDING ROOF DRAIN CONNECTION, INLCUDING ALL BENDS, FITTINGS, AND CONNECTIONS. FL @ BUILDING TO BE 3' MINUS BUILDING FFE.
2. INSTALL 8" HDPE PIPE @ 2.0% MIN. SLOPE INCLUDING ALL NECESSARY BENDS, FITTINGS, AND CLEANOUTS.
3. CONNECT ROOF DRAIN LINE TO PROPOSED STORM SEWER STRUCTURES. REFER TO STORM SEWER PLAN & PROFILE SHEETS (C505–C518) FOR ROOF DRAIN CONNECTION FL'S AT STORM STRUCTURES.
4. INSTALL ACO K100 TRENCH DRAIN (OR APPROVED EQUAL) W/ PEDESTRIAN HEEL PROOF GRATE AND INLINE CATCH BASIN. REFER TO DETAIL SHEETS FOR MANUFACTURER AND PRODUCT INFORMATION AND SPOT ELEVATION SHEETS FOR TOP OF TRENCH GRATE ELEVATIONS.
5. BUILDING DOWNSPOUT TO DISCHARGE AT GRADE.
6. CONNECT 6" ROOF DRAIN LINE TO 15" HDPE STORM SEWER WITH ADS INSERTA TEE.
7. INSTALL 10" NYLOPLAST D.B. W/ SOLID TOP.
8. INSTALL 8" NYLOPLAST IN–LINE DRAIN W/ DOME GRATE TOP.



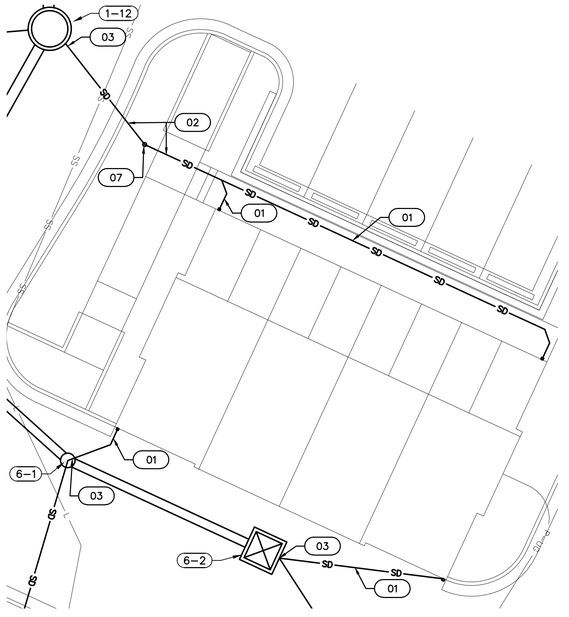
ROOF DRAINS @GARAGE #4



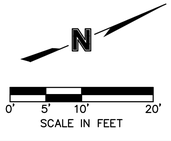
ROOF DRAINS @ GARAGE #1

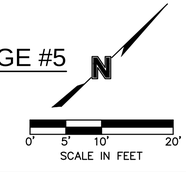


ROOF DRAINS @ GARAGE #3



ROOF DRAINS @ GARAGE #5





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2500 CLIFF POINTE, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROOF DRAIN PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

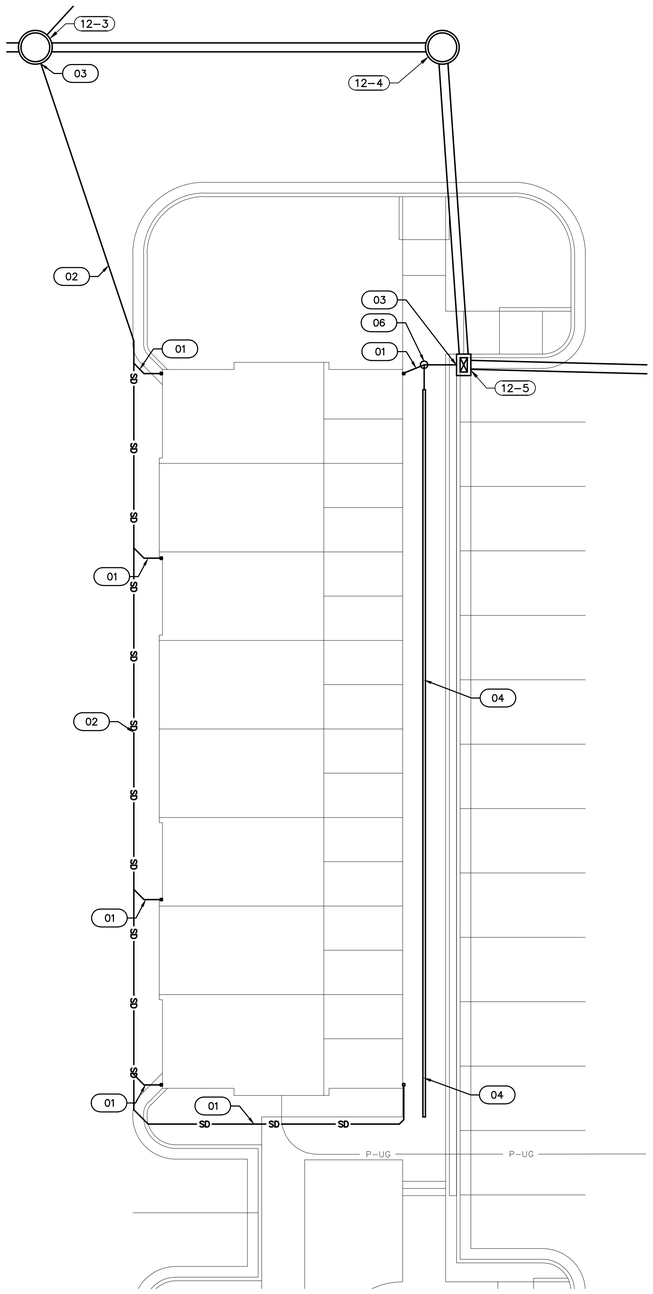
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C533

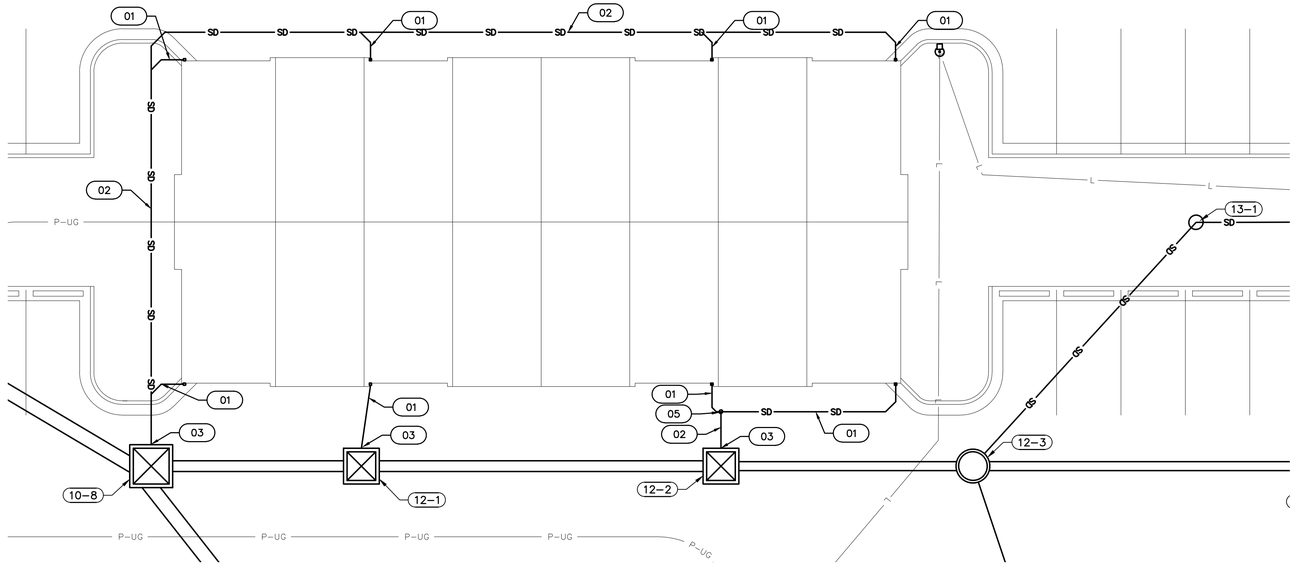
File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP04_ B190012.dwg ~ Layout: ROOF DRAIN PLAN ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

ROOF DRAIN LINE NOTES ##

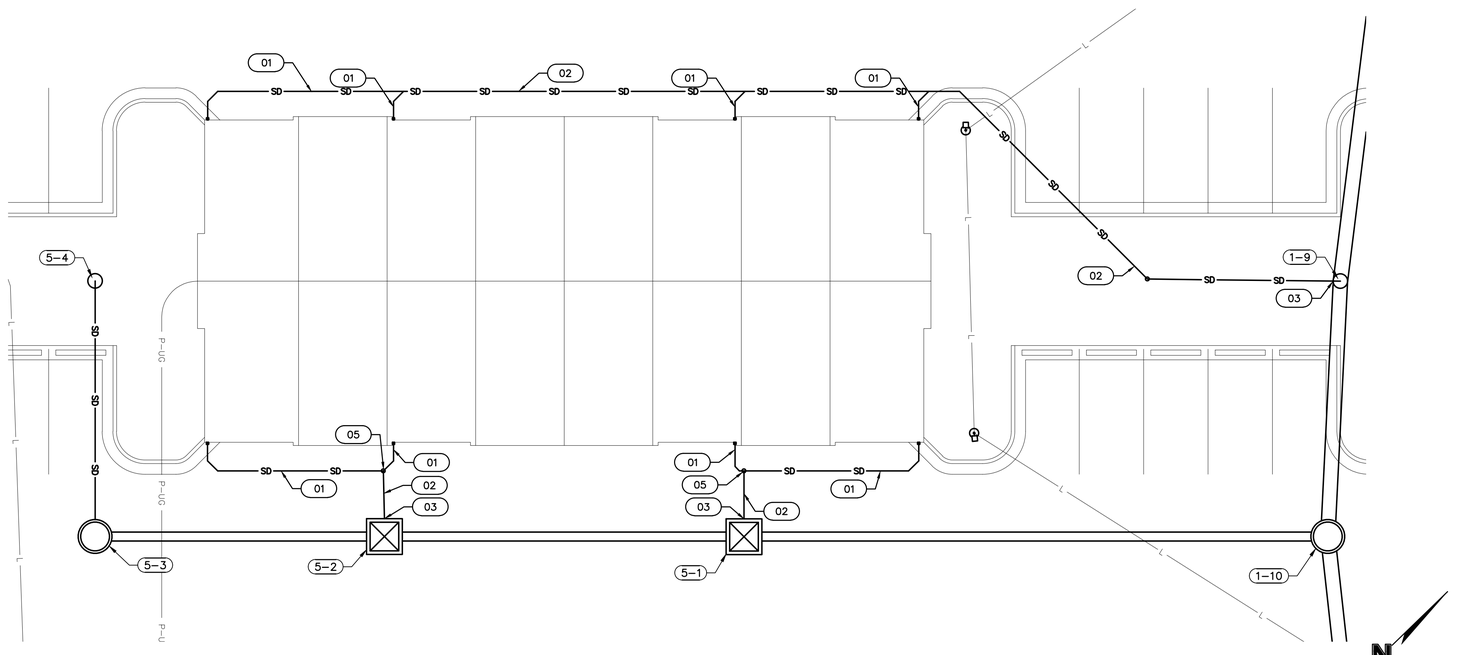
1. INSTALL 6" HDPE PIPE FROM DOWNSTREAM FITTING/STRUCTURE @ 2.0% MIN. SLOPE TO BUILDING ROOF DRAIN CONNECTION, INLCUDING ALL BENDS, FITTINGS, AND CONNECTIONS. FL @ BUILDING TO BE 3' MINUS BUILDING FFE.
2. INSTALL 8" HDPE PIPE @ 2.0% MIN. SLOPE INCLUDING ALL NECESSARY BENDS, FITTINGS, AND CLEANOUTS.
3. CONNECT ROOF DRAIN LINE TO PROPOSED STORM SEWER STRUCTURES. REFER TO STORM SEWER PLAN & PROFILE SHEETS (C505–C518) FOR ROOF DRAIN CONNECTION FL'S AT STORM STRUCTURES.
4. INSTALL ACO K100 TRENCH DRAIN (OR APPROVED EQUAL) W/ PEDESTRIAN HEEL PROOF GRATE AND INLINE CATCH BASIN. REFER TO DETAIL SHEETS FOR MANUFACTURER AND PRODUCT INFORMATION AND SPOT ELEVATION SHEETS FOR TOP OF TRENCH GRATE ELEVATIONS.
5. INSTALL 10" NYLOPLAST D.B. W/ SOLID TOP.



ROOF DRAINS @ GARAGE #6



ROOF DRAINS @ GARAGE #7



ROOF DRAINS @ GARAGE #8

0' 5' 10' 20'
SCALE IN FEET

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NORTH KANSAS CITY, MO 64116
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www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

ROOF DRAIN PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

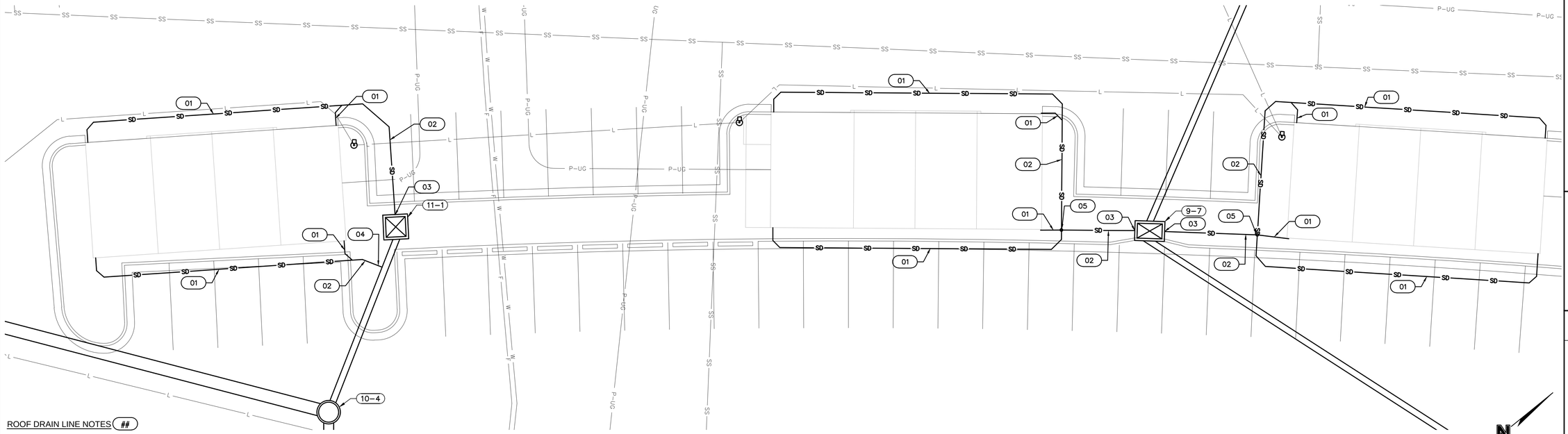
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C534

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP04_ B190012.dwg ~ Layout: ROOF DRAIN PLAN (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



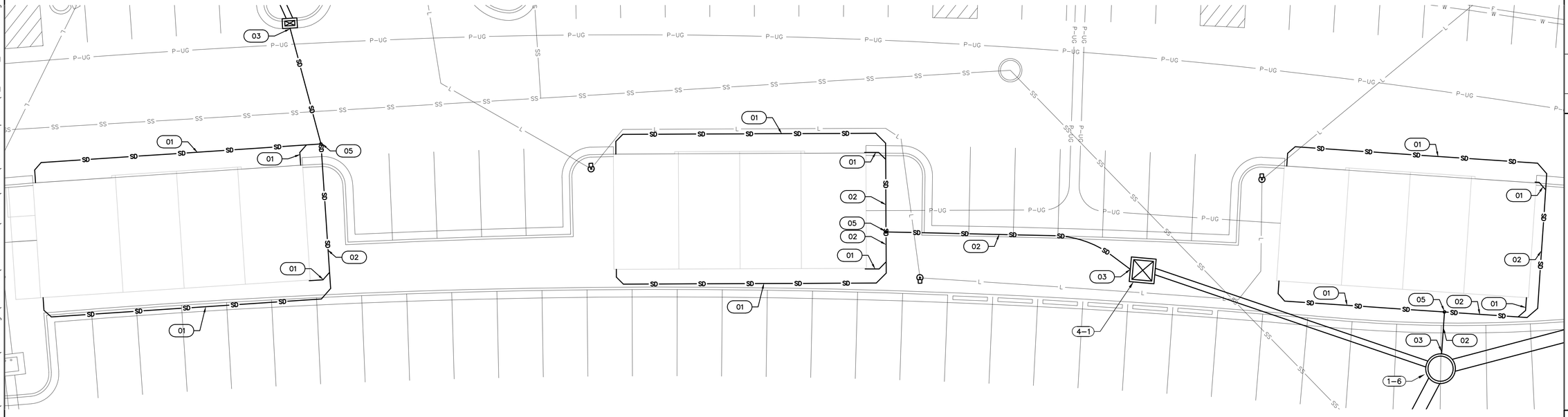
ROOF DRAIN LINE NOTES ##

1. INSTALL 6" HDPE PIPE FROM DOWNSTREAM FITTING/STRUCTURE @ 2.0% MIN. SLOPE TO BUILDING ROOF DRAIN CONNECTION, INLCUDING ALL BENDS, FITTINGS, AND CONNECTIONS. FL @ BUILDING TO BE 3' MINUS BUILDING FFE.
2. INSTALL 8" HDPE PIPE @ 2.0% MIN. SLOPE INCLUDING ALL NECESSARY BENDS, FITTINGS, AND CLEANOUTS.
3. CONNECT ROOF DRAIN LINE TO PROPOSED STORM SEWER STRUCTURES. REFER TO STORM SEWER PLAN & PROFILE SHEETS (C505–C518) FOR ROOF DRAIN CONNECTION FL'S AT STORM STRUCTURES
4. CONNECT ROOF DRAIN LINE TO PROPOSED STORM SEWER W/ INSERT–A–TEE.
5. INSTALL 10" NYLOPLAST D.B. W/ SOLID TOP.

ROOF DRAINS @ GARAGES #9,10, & 11

N

0' 5' 10' 20'
SCALE IN FEET



ROOF DRAINS @ GARAGES #12,13, & 14

N

0' 5' 10' 20'
SCALE IN FEET

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2301 MAIN STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROOF DRAIN PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

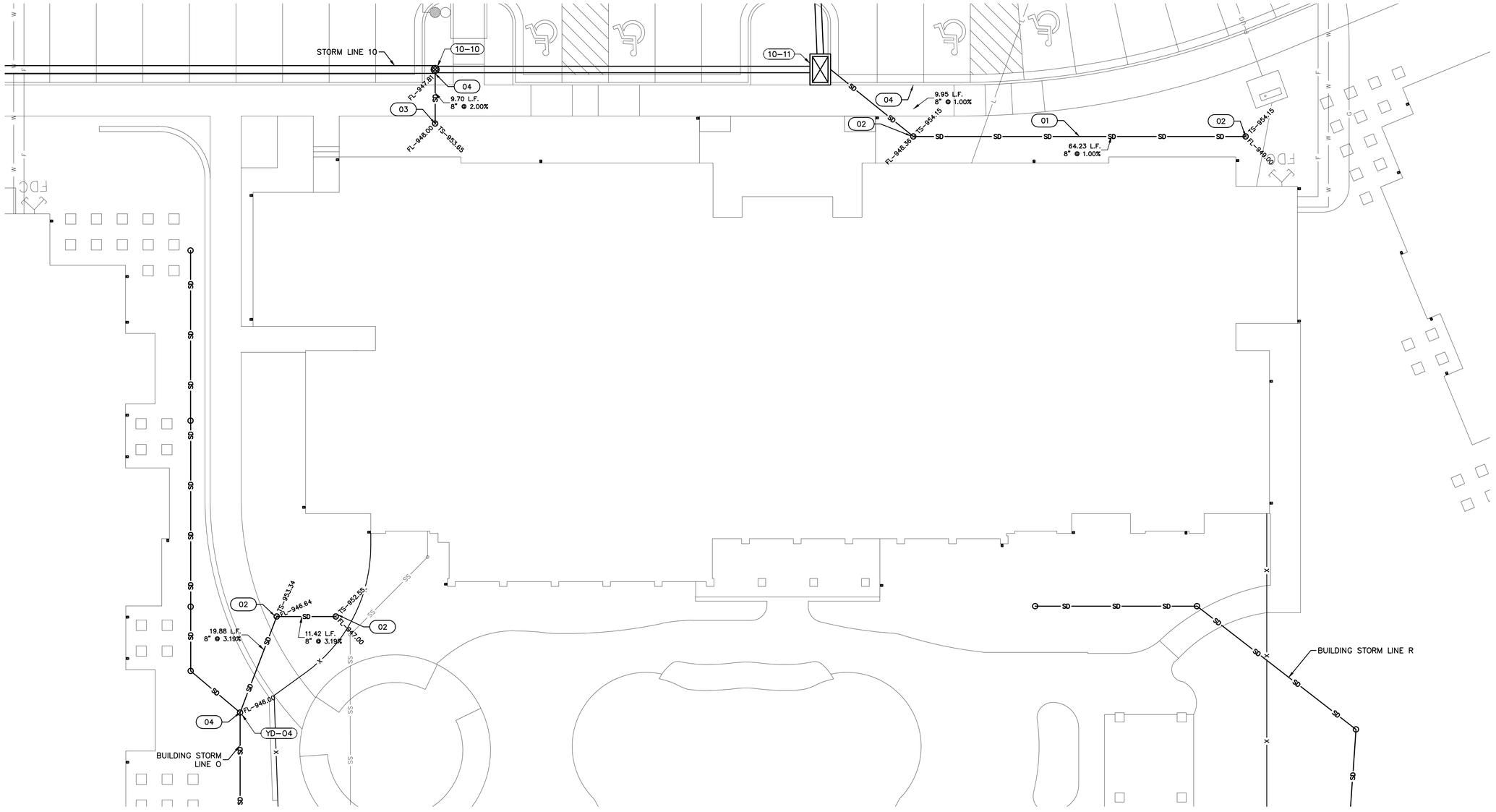
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C535

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP04_ B190012.dwg ~ Layout: ROOF DRAIN PLAN (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

ROOF DRAIN LINE NOTES (##)

1. INSTALL 8" HDPE PIPE @ 1.0% MIN. SLOPE INCLUDING ALL NECESSARY BENDS, FITTINGS, AND CLEANOUTS.
2. INSTALL 12" NYLOPLAST DRAIN BASIN W/ DOME GRATE TOP.
3. INSTALL 12" NYLOPLAST DRAIN BASIN W/ SOLID LID.
4. CONNECT BUILDING STORM LINE TO PROPOSED STORM SEWER STRUCTURES. REFER TO STORM SEWER PLAN & PROFILE SHEETS (C505–C518) FOR ROOF DRAIN CONNECTION FL'S AT STORM STRUCTURES.



ROOF DRAINS @ CLUBHOUSE (BLDG 1)

0' 5' 10' 20'
SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY #:001592
1301 MCGEE STREET, SUITE 500
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

ROOF DRAIN PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C536

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_RDP04_ B190012.dwg ~ Layout: ROOF DRAIN PLAN (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

NOTE:
INFILTRATION TRENCHES AROUND FUTURE BUILDINGS (BUIILDINGS 7–13) TO BE INSTALLED IN THE FUTURE, AT THE TIME OF BUILDING CONSTRUCTION.

LEE'S SUMMIT RD.

NE DOUGLAS ST.

S54°34'12"E
1,258.30'

BLDG 13 (FUTURE)

BLDG 12 (FUTURE)

BLDG 11 (FUTURE)

BLDG 10 (FUTURE)

BLDG 9 (FUTURE)

BLDG 8 (FUTURE)

BLDG 7 (FUTURE)

BLDG 6

BLDG 5

BLDG 4

BLDG 3

BLDG 2

BLDG 1 CLUBHOUSE

MAINT. BLDG

SEE SHEET C608

SEE SHEET C607

SEE SHEET C606

SEE SHEET C605

SEE SHEET C604

SEE SHEET C603

SEE SHEET C602

15' D.E.

T.C.E.

L.S.E.

15' S.E.

20' D.E.

SCALE IN FEET
0' 30' 60' 120'

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NORTH KANSAS CITY, MO 64116 TEL 816.361.1177
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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

INFILTRATION TRENCH GENERAL LAYOUT
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C601

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH GENERAL LAYOUT ~ Last Saved By: mdlebolt ~ Plot Date: 2019.10.01 03:03 PM

BUILDING 1
CLUBHOUSE

BUILDING 2

BUILDING 3

N: 1013855.84
E: 2822776.83
953.11 PG
949.50 SG

N: 1013864.14
E: 2822768.53
952.94 PG
949.50 SG

N: 1013850.92
E: 2822778.99
953.21 PG
949.50 SG

N: 1013801.69
E: 2822828.23
954.33 PG
949.50 SG

N: 1013859.23
E: 2822763.62
953.14 PG
949.50 SG

N: 1013847.46
E: 2822775.52
953.28 PG
949.50 SG

N: 1013850.93
E: 2822771.92
953.20 PG
949.50 SG

N: 1013798.21
E: 2822824.76
954.58 PG
949.50 SG

N: 1013774.62
E: 2822852.53
954.60 PG
951.00 SG

N: 1013725.68
E: 2822901.47
954.50 PG
951.00 SG

N: 1013771.08
E: 2822849.00
954.63 PG
951.00 SG

N: 1013722.11
E: 2822897.97
954.25 PG
951.00 SG

N: 1013693.80
E: 2822893.66
954.02 PG
949.00 SG

N: 1013691.94
E: 2822896.44
954.54 PG
949.00 SG

N: 1013825.82
E: 2822733.96
954.13 PG
949.20 SG

N: 1013822.99
E: 2822736.79
954.15 PG
949.20 SG

N: 1013650.83
E: 2822867.83
953.43 PG
949.00 SG

N: 1013657.55
E: 2822860.26
953.52 PG
949.00 SG

N: 1013790.35
E: 2822704.15
953.35 PG
949.20 SG

N: 1013739.08
E: 2822755.42
953.20 PG
949.20 SG

N: 1013709.69
E: 2822789.76
953.13 PG
949.50 SG

N: 1013671.46
E: 2822827.99
953.32 PG
949.50 SG

N: 1013790.70
E: 2822699.55
953.42 PG
949.20 SG

N: 1013737.08
E: 2822753.43
953.21 PG
949.20 SG

N: 1013704.74
E: 2822784.81
953.15 PG
949.50 SG

N: 1013666.51
E: 2822823.04
953.48 PG
949.50 SG

N: 1013626.03
E: 2822838.06
952.44 PG
949.00 SG

N: 1013633.43
E: 2822831.32
952.64 PG
949.00 SG

N: 1013630.18
E: 2822827.22
952.31 PG
947.00 SG

N: 1013622.74
E: 2822834.25
952.31 PG
947.00 SG

N: 1013585.61
E: 2822777.55
950.67 PG
947.00 SG

N: 1013578.16
E: 2822784.58
950.58 PG
947.00 SG

CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. NYLOPLAST DRAIN BASIN (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

N

0' 5' 10' 20'
SCALE IN FEET

olsson

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

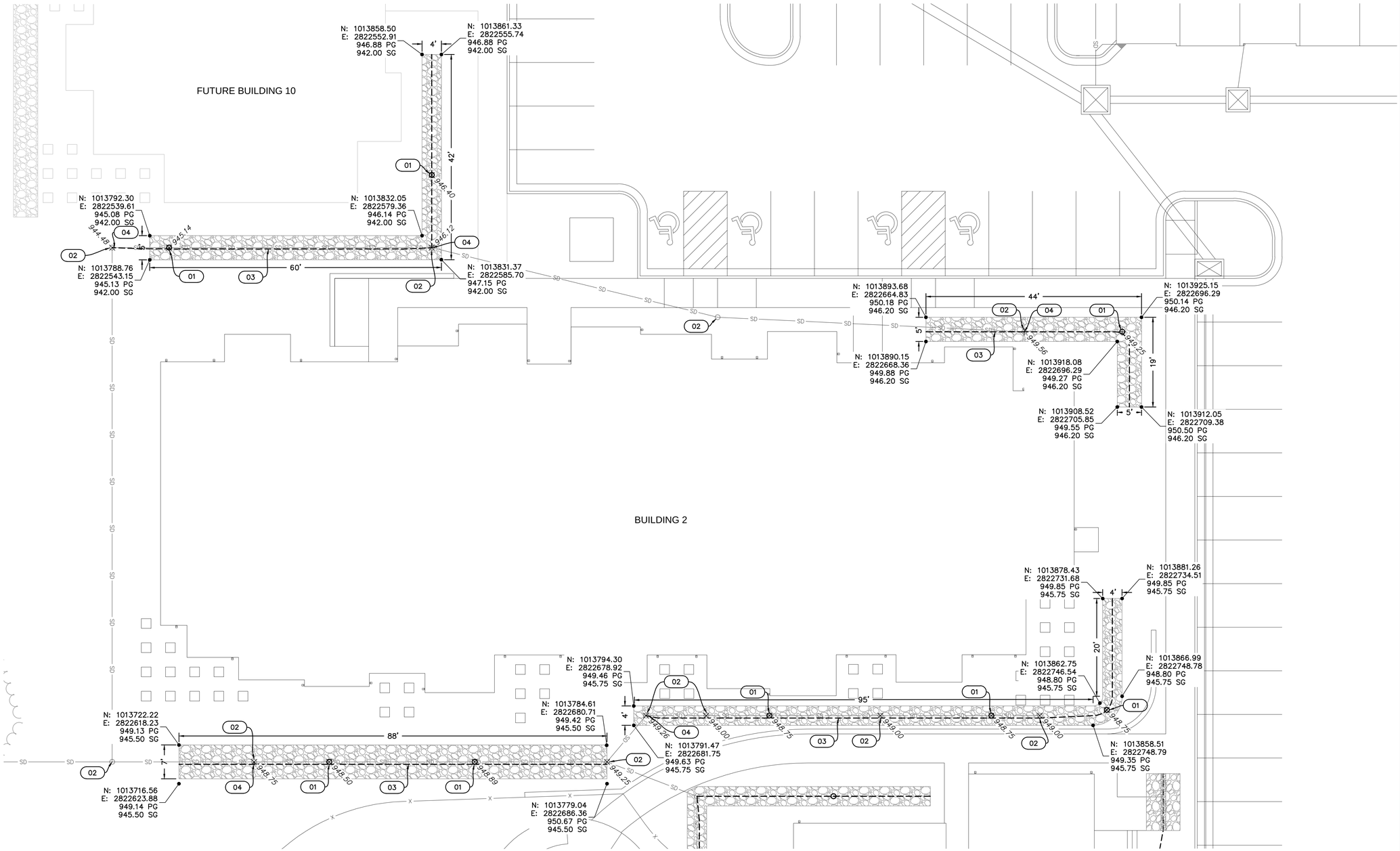
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C602

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH PLAN ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. NYLOPLAST DRAIN BASIN (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

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REVISIONS

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

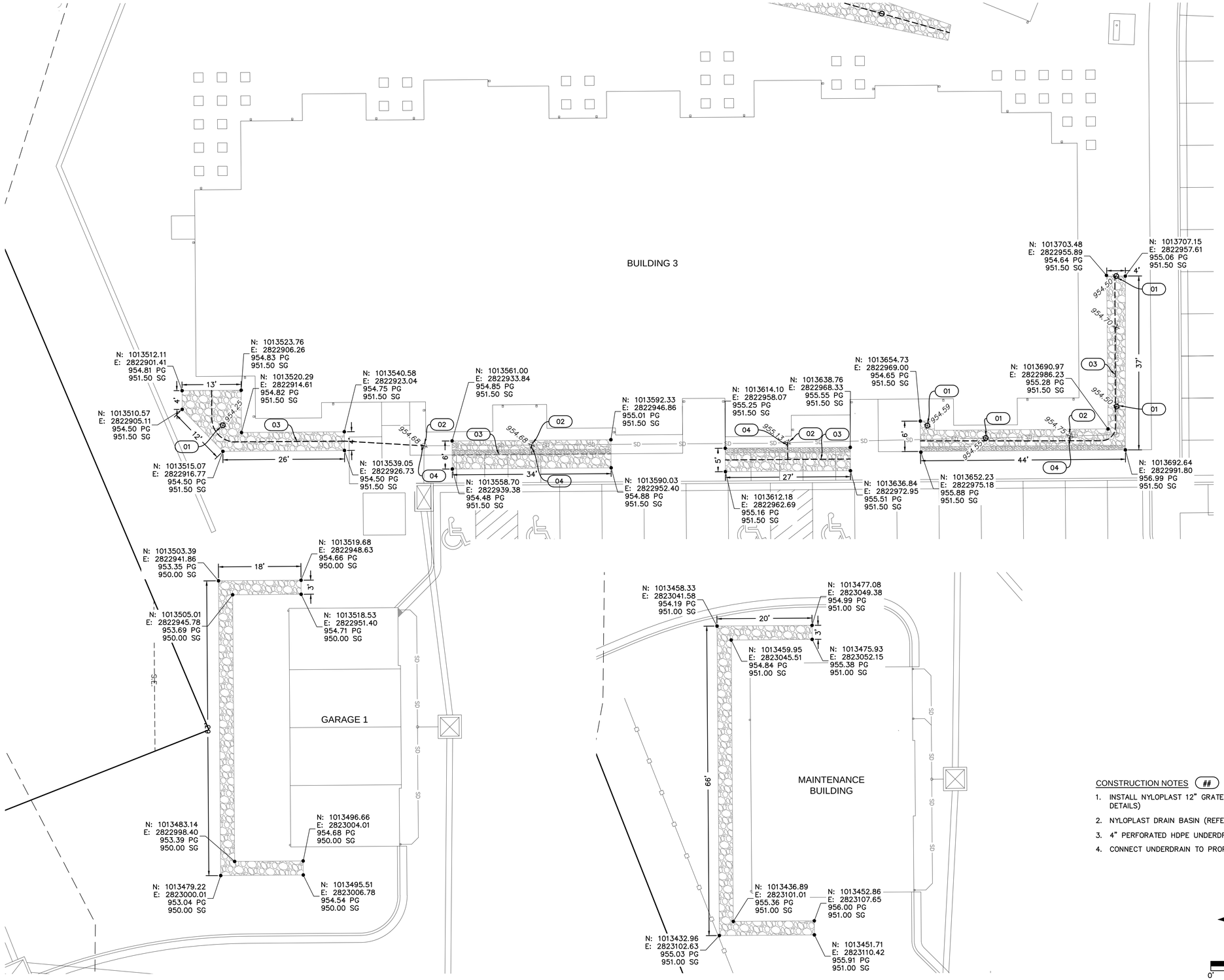
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C603

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILIRATION TRENCH PLAN (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. NYLOPLAST DRAIN BASIN (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

N

0' 5' 10' 20'
SCALE IN FEET

olsson

OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

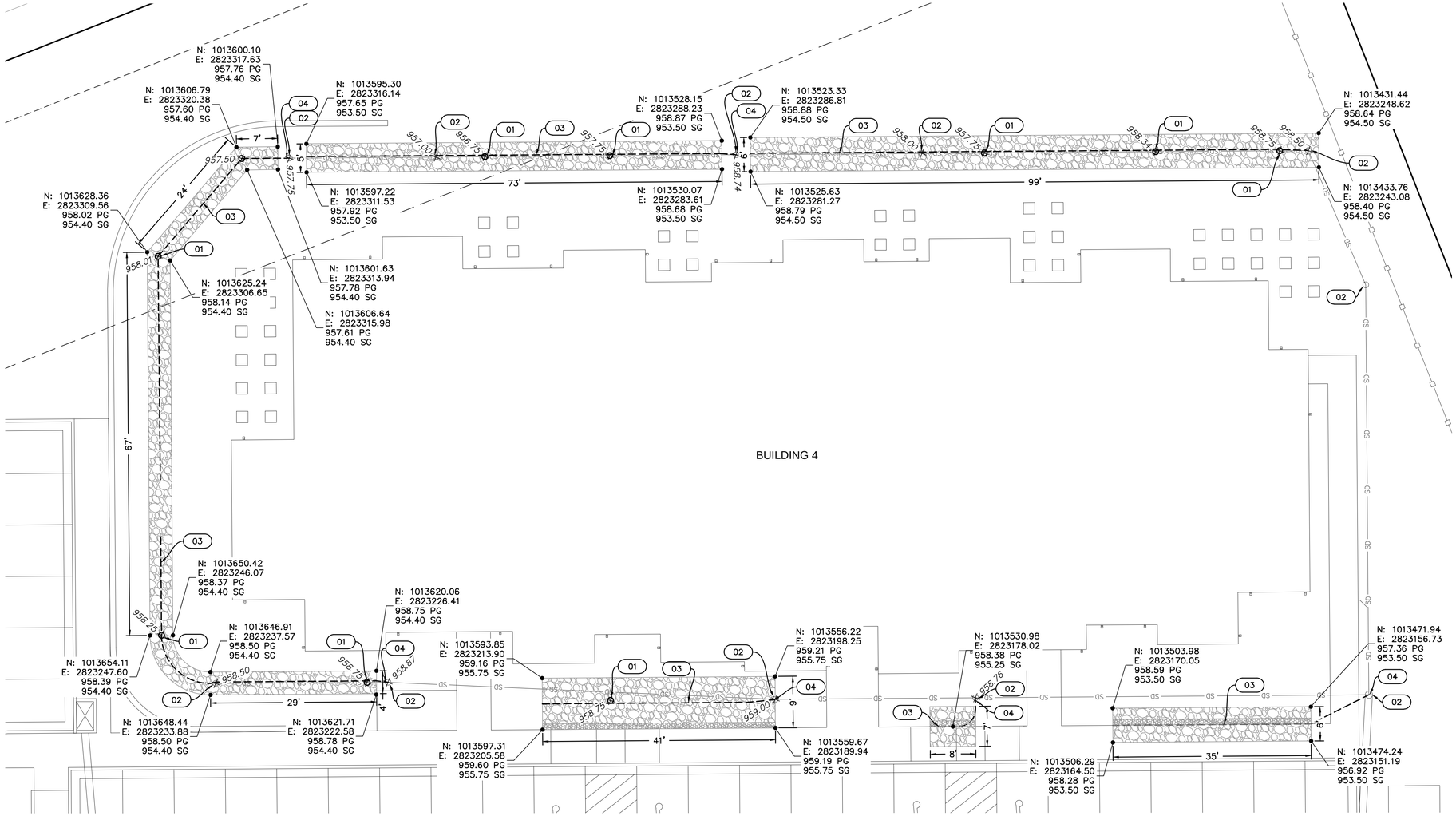
LEES SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C604

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH PLAN (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. NYLOPLAST DRAIN BASIN (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
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www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

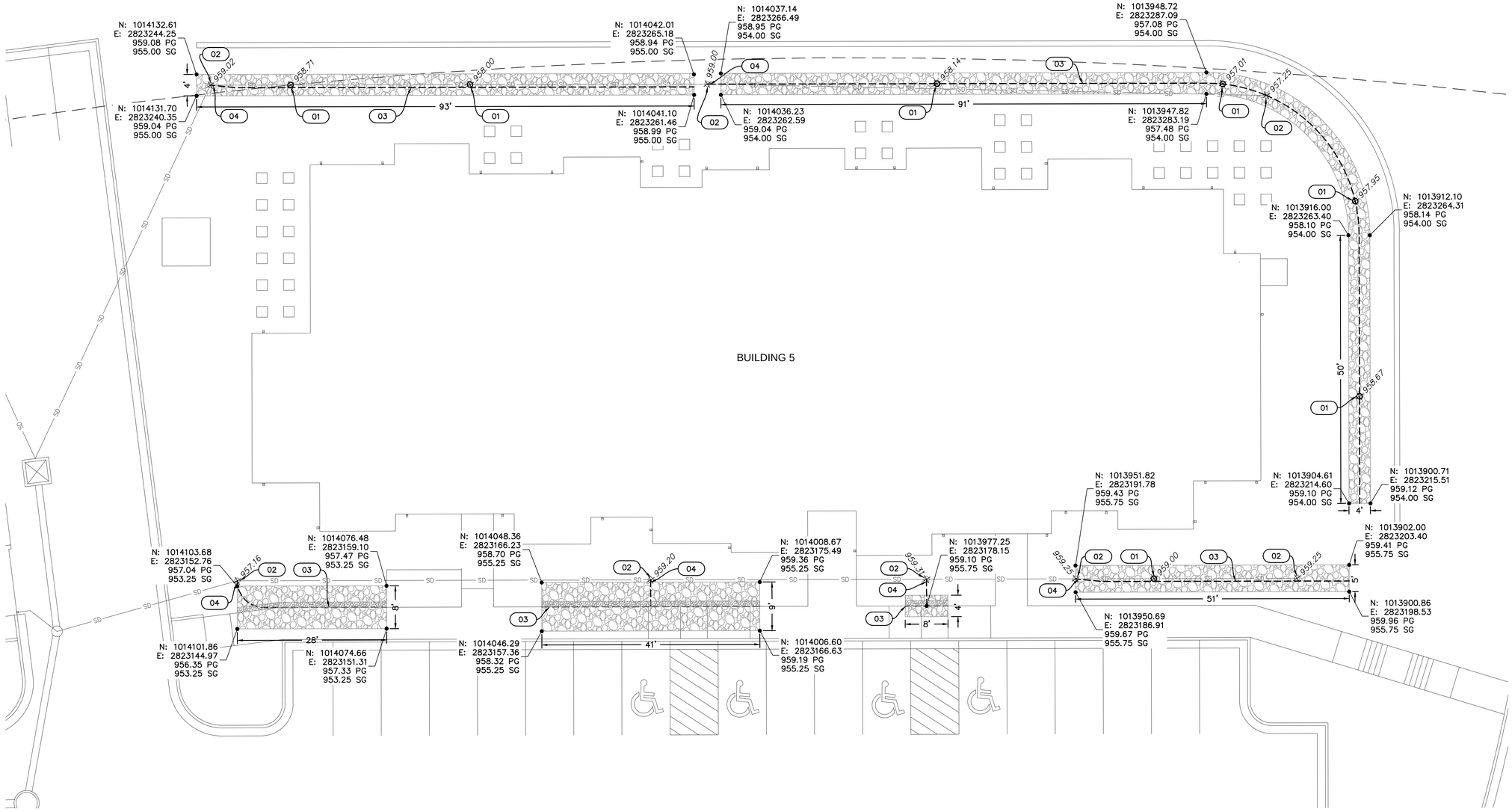
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C605

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH PLAN (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. NYLOPLAST DRAIN BASIN (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

N

0' 5' 10' 20'
SCALE IN FEET

olsson

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

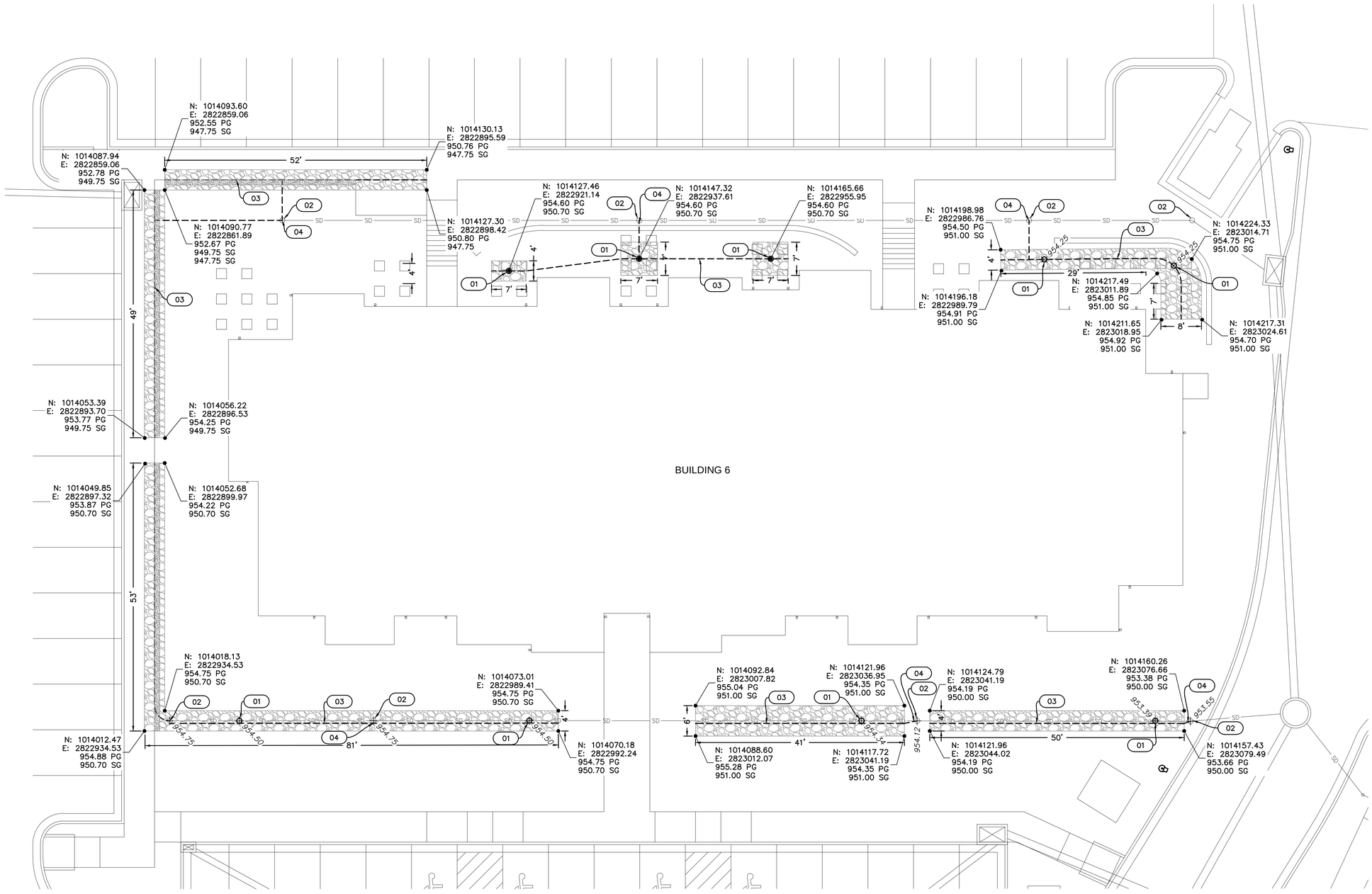
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C606

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH PLAN (5) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. NYLOPLAST DRAIN BASIN (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

N

0' 5' 10' 20'
SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

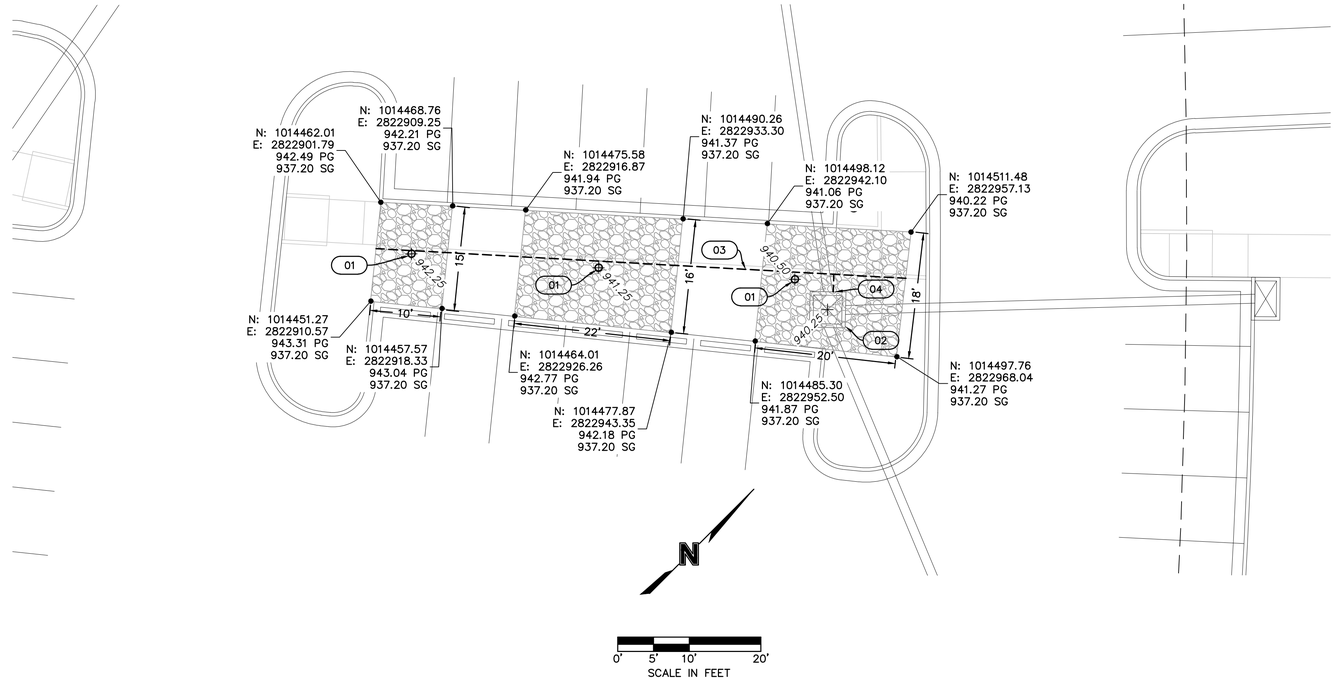
LEE'S SUMMIT, MO

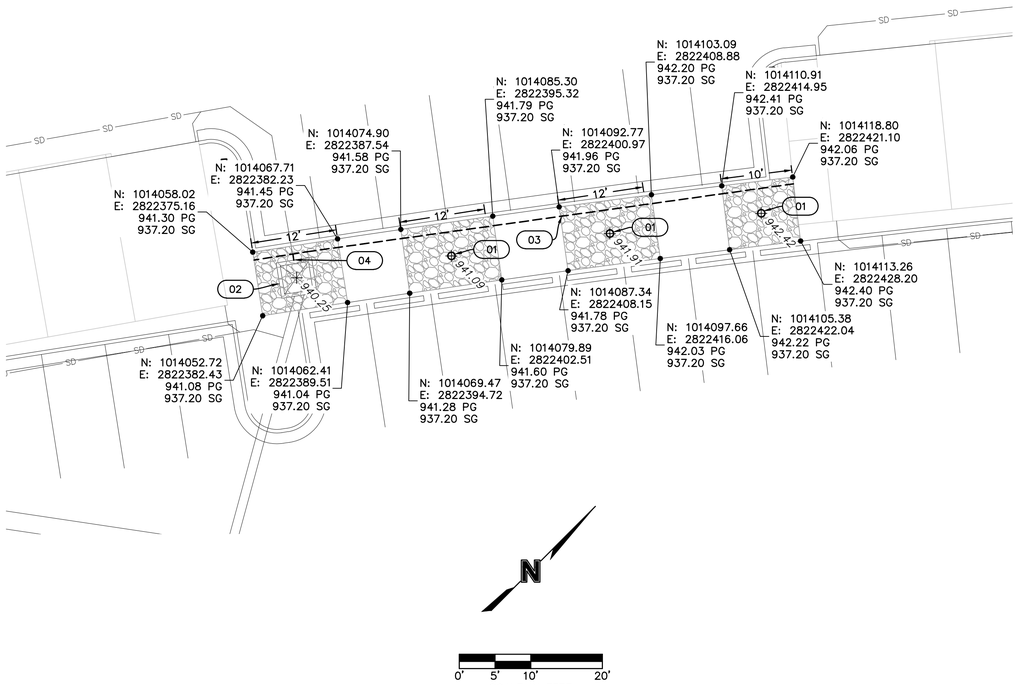
2020

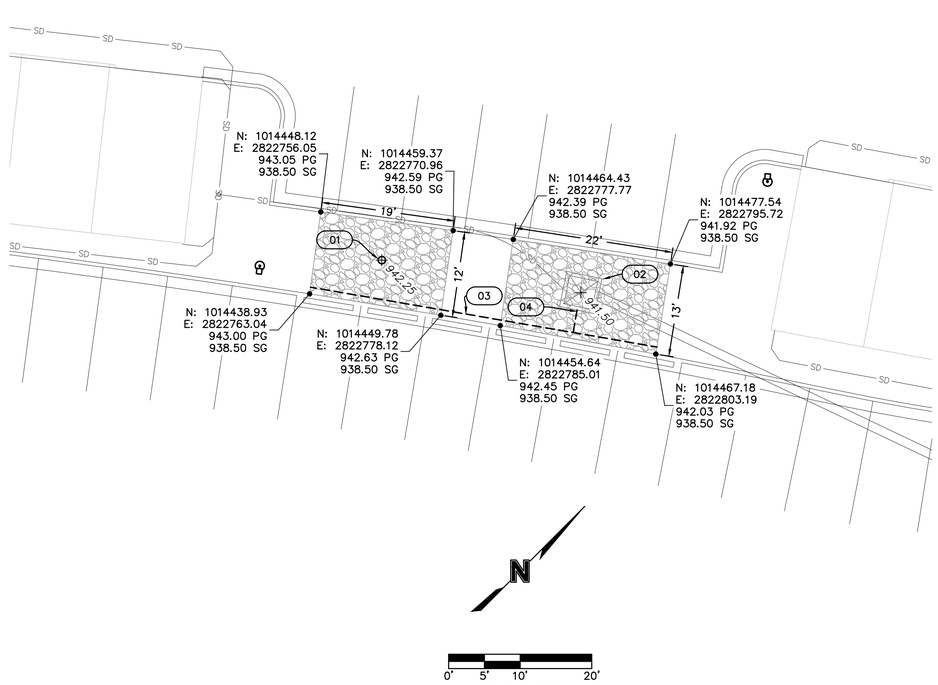
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C607

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH PLAN (6) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM







CONSTRUCTION NOTES (##)

1. INSTALL NYLOPLAST 12" GRATE INLET (REFER TO INFILTRATION TRENCH DETAILS)
2. FIELD INLET (REFER TO STORM SEWER PLAN & PROFILE SHEETS)
3. 4" PERFORATED HDPE UNDERDRAIN (REFER TO INFILTRATION TRENCH DETAILS)
4. CONNECT UNDERDRAIN TO PROPOSED STORM DRAINAGE BASIN

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MO CERTIFICATE OF AUTHORITY #:001592
1301 MCGEE STREET, SUITE 500
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

INFILTRATION TRENCH PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C608

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_BMP01_ B190012.dwg ~ Layout: INFILTRATION TRENCH PLAN (7) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

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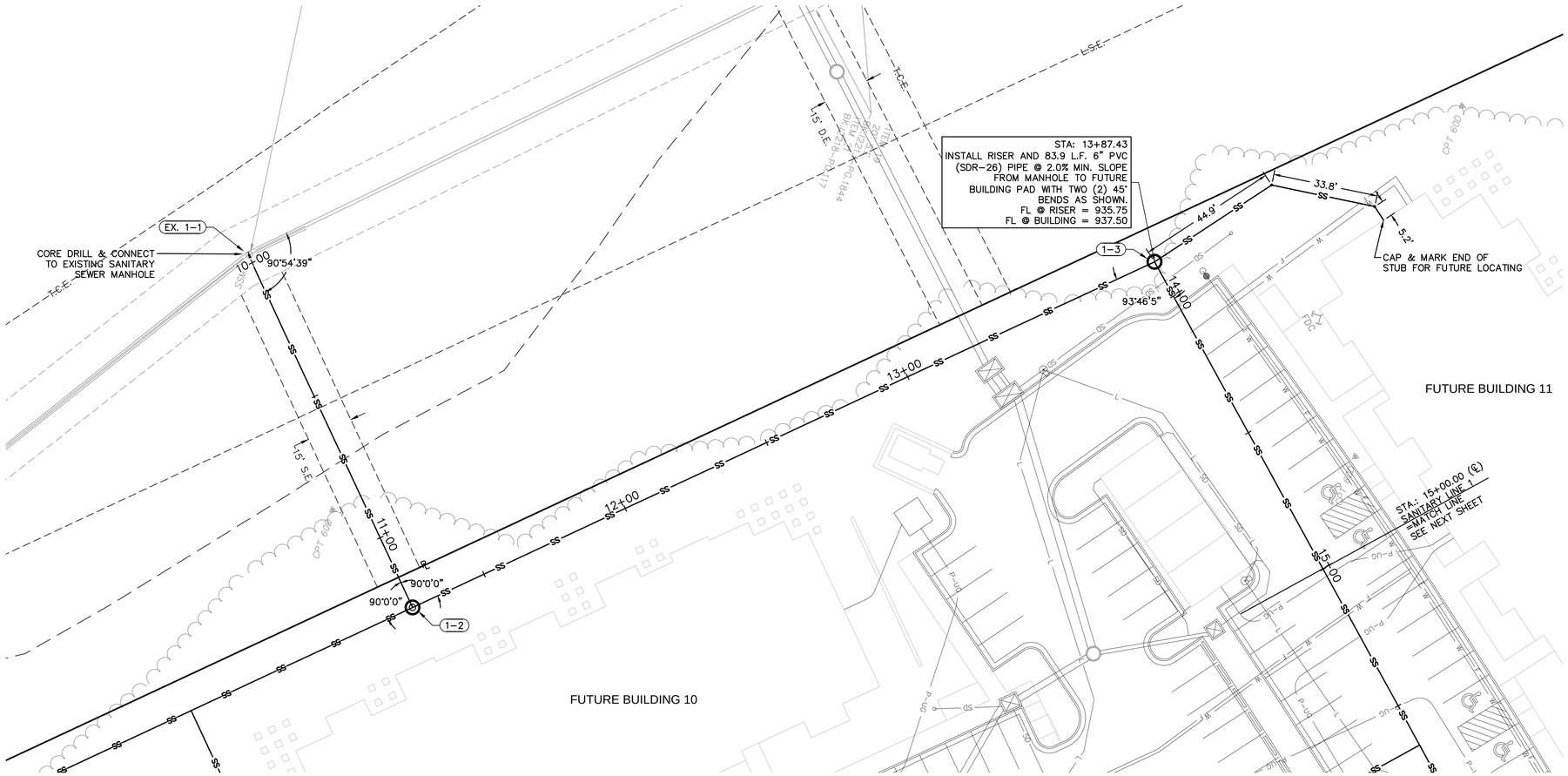

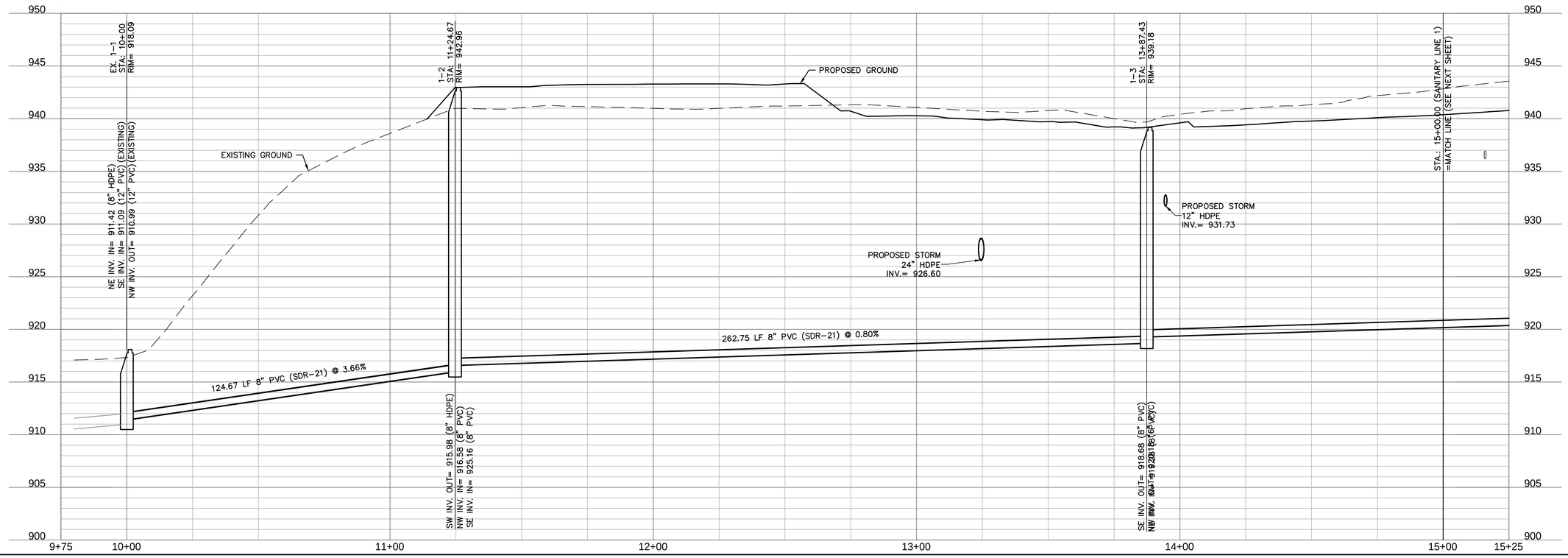

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MO CERTIFICATE OF AUTHORITY # 001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

STRUCTURES	
ID	DESCRIPTION
EX. 1–1	10+00 SANITARY LINE 1 48" MH N: 1013727.564; E: 2822374.980
1–2	11+24.67 SANITARY LINE 1 48" MH N: 1013815.438; E: 2822463.422
1–3	13+87.43 SANITARY LINE 1 48" MH N: 1014001.301; E: 2822277.693

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

SANITARY SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
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QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C701

FUTURE BUILDING 11

FUTURE BUILDING 12

FUTURE BUILDING 13

FUTURE BUILDING 9

CAP & MARK END OF STUB FOR FUTURE LOCATING

18.8'

STA: 15+64.34
INSTALL 8"X6" TEE, RISER AND 167.9 L.F. 6" PVC (SDR-26) PIPE @ 2.0% MIN. SLOPE FROM RISER TO FUTURE BUILDING PAD AS SHOWN.
FL @ RISER = 938.00
FL @ BUILDING = 944.75

STA: 15+00.00 (℄)
SANITARY LINE 1
=MATCH LINE
SEE PREVIOUS SHEET

STA: 16+84.21
INSTALL 8"X6" TEE, RISER AND 105.6 L.F. 6" PVC (SDR-26) PIPE @ 2.0% MIN. SLOPE FROM TEE TO FUTURE BUILDING PAD AS SHOWN.
FL @ RISER = 928.60
FL @ BUILDING = 930.75

86.8'

1-4

173°1'11"

20.2'

CAP & MARK END OF STUB FOR FUTURE LOCATING

86.4'

STA: 20+00.00 (℄)
SANITARY LINE 1
=MATCH LINE
SEE NEXT SHEET

STA: 19+62.34
INSTALL 8"X6" TEE AND 106.6 L.F. 6" PVC (SDR-26) PIPE @ 2.0% MIN. SLOPE FROM TEE TO FUTURE BUILDING PAD AS SHOWN.
FL @ MAIN = 924.50
FL @ BUILDING = 927.25

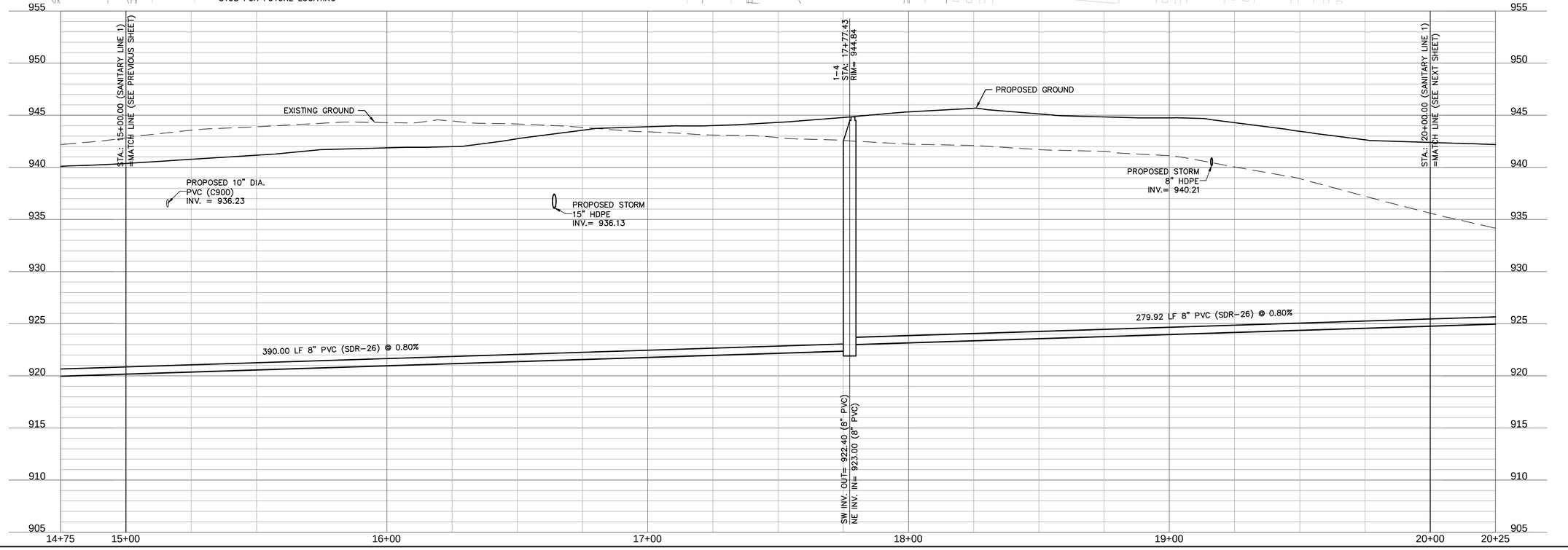
159.4'

8.5'

CAP & MARK END OF STUB FOR FUTURE LOCATING

STRUCTURES	
ID	DESCRIPTION
1-4	17+77.43 SANITARY LINE 1 48" MH N: 1014294.505; E: 2822534.853

SCALE IN FEET: 0' 10' 20' 40' | 0' 2.5' 5' 10'



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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 001592
1301 WILLOW ROAD, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

REVISIONS

SANITARY SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

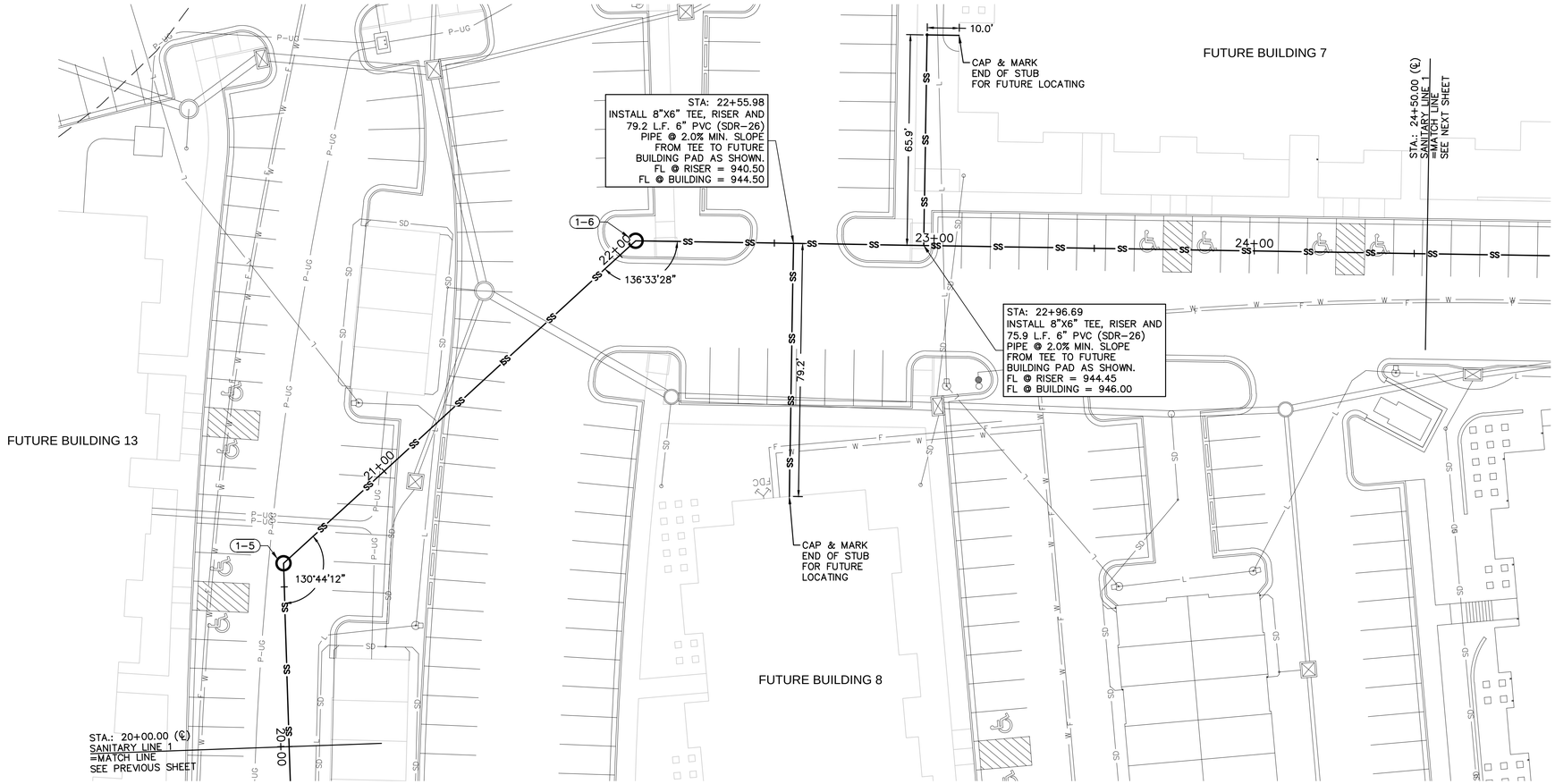
LEE'S SUMMIT, MO

2020

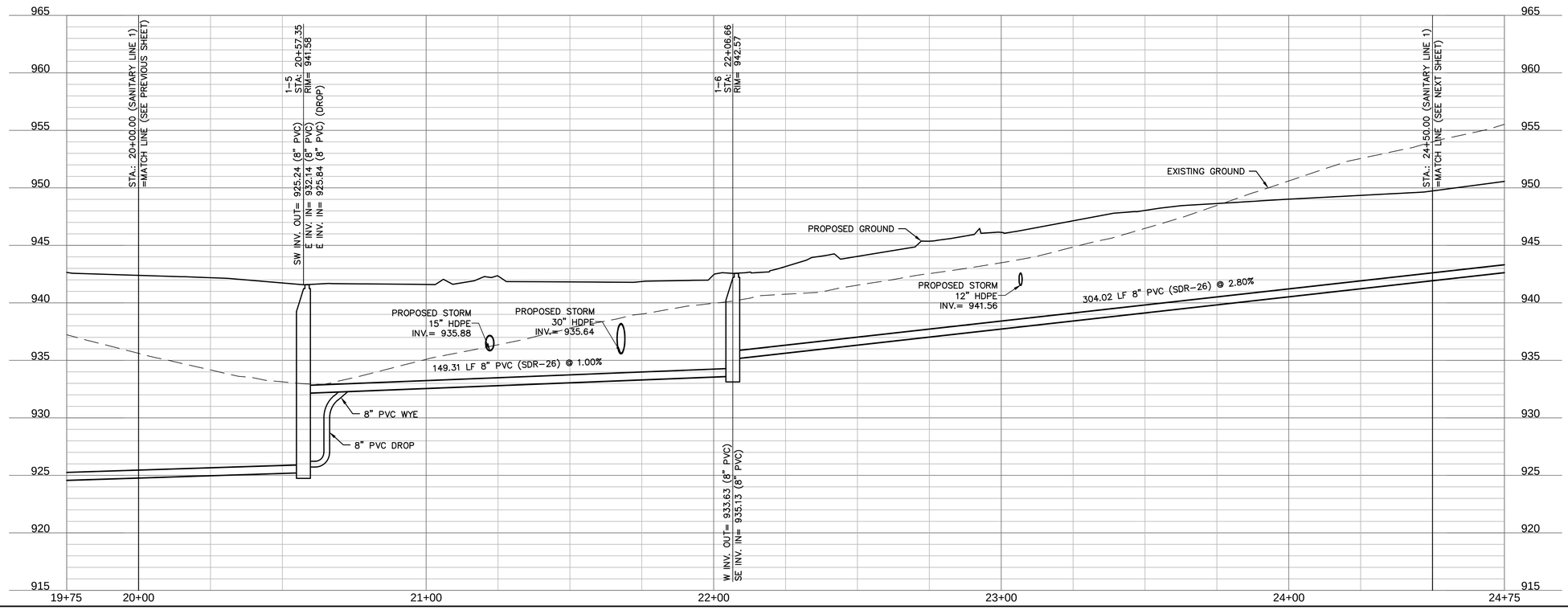
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C702

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SAN01_ B190012.dwg ~ Layout: SANITARY SEWER PLAN & PROFILE (2) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



STRUCTURES	
ID	DESCRIPTION
1-5	20+57.35 SANITARY LINE 1 48" MH N: 1014480.959; E: 2822743.634
1-6	22+06.66 SANITARY LINE 1 48" MH N: 1014461.478; E: 2822891.672



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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
2020 BALTIMORE, SUITE 1000
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO./REV.	DATE	BY	REVISIONS DESCRIPTION

REVISIONS

SANITARY SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

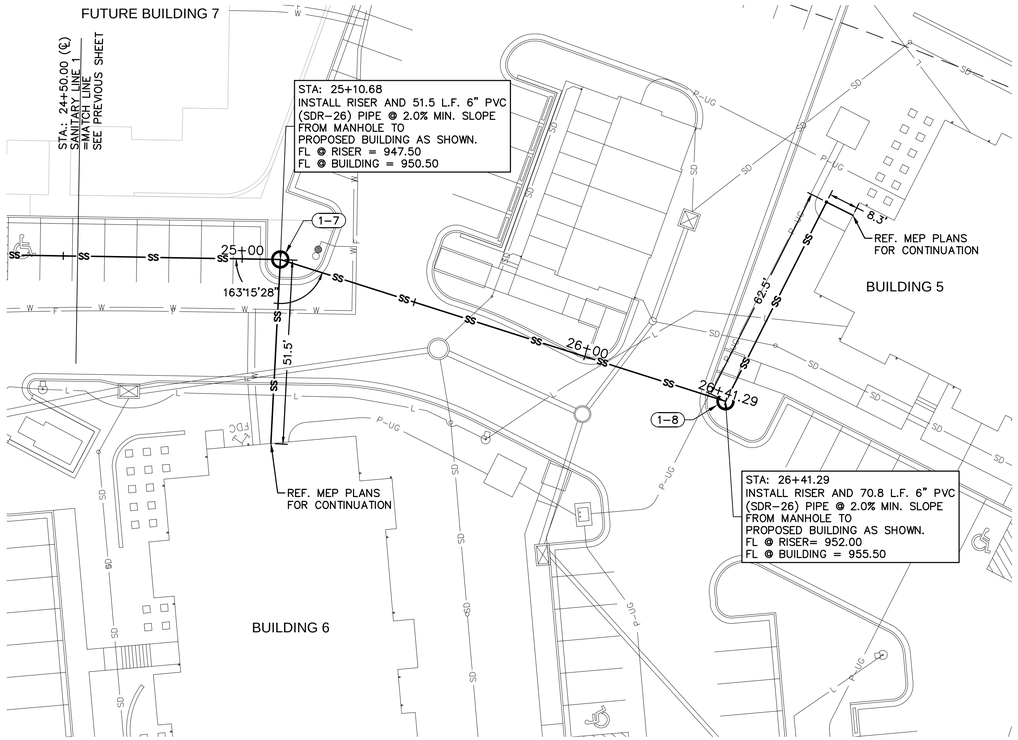
LEE'S SUMMIT, MO

2020

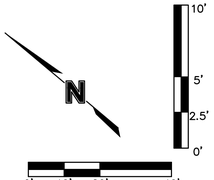
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

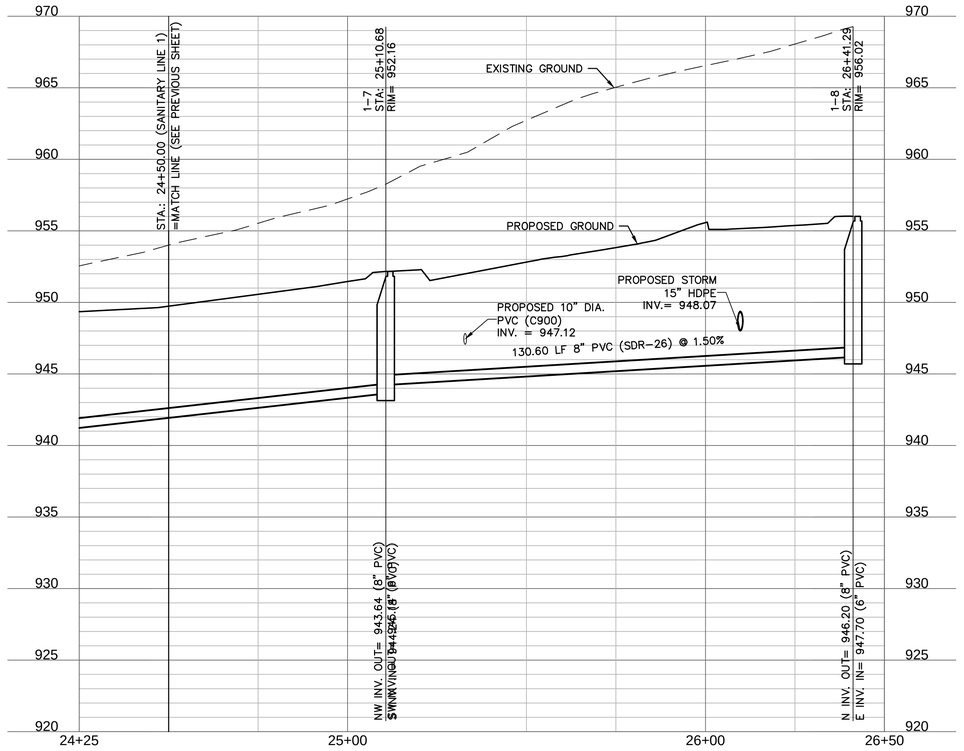
SHEET
C703

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SAN01_ B190012.dwg ~ Layout: SANITARY SEWER PLAN & PROFILE (3) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



STRUCTURES	
ID	DESCRIPTION
1-7	25+10.68 SANITARY LINE 1 48" MH N: 1014225.414; E: 2823083.250
1-8	26+41.29 SANITARY LINE 1 48" MH N: 1014104.595; E: 2823132.848





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10 SOUTH BROADWAY, SUITE 1000
NORTH KANSAS CITY, MO 64116
TEL: 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION

REVISIONS

SANITARY SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012.B
date: 2020.08.27

SHEET
C704

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_SAN01_ B190012.dwg ~ Layout: SANITARY SEWER PLAN & PROFILE (4) ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

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BUILDING 1 CLUBHOUSE

BUILDING 2

BUILDING 3

FUTURE BUILDING 10

NOTES:
CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 36" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.

STRUCTURES	
ID	DESCRIPTION
2–1	12+00.38 SANITARY LINE 2 48" MH N: 1013673.699; E: 2822605.057
2–2	14+47.73 SANITARY LINE 2 48" MH N: 1013498.863; E: 2822780.036

STA: 10+78.40
INSTALL 8"X6" TEE, RISER AND 71.8 L.F. 6" PVC (SDR-26) PIPE @ 2.0% MIN. SLOPE FROM TEE TO PROPOSED BUILDING AS SHOWN
FL @ RISER = 937.50
FL @ BUILDING = 943.25

STA: 11+26.63
INSTALL 8"X6" TEE AND 39.8 L.F. 6" PVC (SDR-26) PIPE @ 2.0% MIN. SLOPE FROM TEE TO PROPOSED BUILDING AS SHOWN
FL @ RISER = 937.50
FL @ BUILDING = 945.75

STA: 12+00.38
INSTALL RISER AND 173.2 L.F. 4" PVC (SDR-26) PIPE @ 2.0% MIN. SLOPE FROM MANHOLE TO PROPOSED BUILDING AS SHOWN
FL @ RISER = 946.50
FL @ BUILDING = 950.25

STA.: 15+00.00 (℄ SANITARY LINE 2)
=MATCH LINE (SEE NEXT SHEET)

SCALE IN FEET: 0' 10' 20' 40' | 0' 2.5' 5' 10'

1–2
STA: 11+24.67
RIM= 942.96
SW INV. OUT= 915.98 (8" HDPE)
NW INV. IN= 916.58 (8" PVC)
SE INV. IN= 925.16 (8" PVC)
SE INV. IN= 916.58 (8" PVC) (DROP)

2–1
STA: 12+00.38
RIM= 939.00
NW INV. OUT= 927.16 (8" PVC)
SE INV. IN= 927.76 (8" PVC)
NE INV. IN= 928.81 (4" PVC)

2–2
STA: 14+47.73
RIM= 939.27
NW INV. OUT= 930.23 (8" PVC)
E INV. IN= 930.83 (8" PVC)

STA.: 15+00.00 (SANITARY LINE 2)
=MATCH LINE (SEE NEXT SHEET)

PROPOSED GROUND
EXISTING GROUND
PROPOSED STORM 12" HDPE INV.= 932.81
PROPOSED STORM 15" HDPE INV.= 934.69
200.38 LF 8" PVC (SDR-26) @ 1.00%
247.36 LF 8" PVC (SDR-26) @ 1.00%
8" PVC WYE
8" PVC DROP

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MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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NICHOLAS D. HEISER, P.E.
MO# 2015000555

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		REVISIONS	

SANITARY SEWER PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

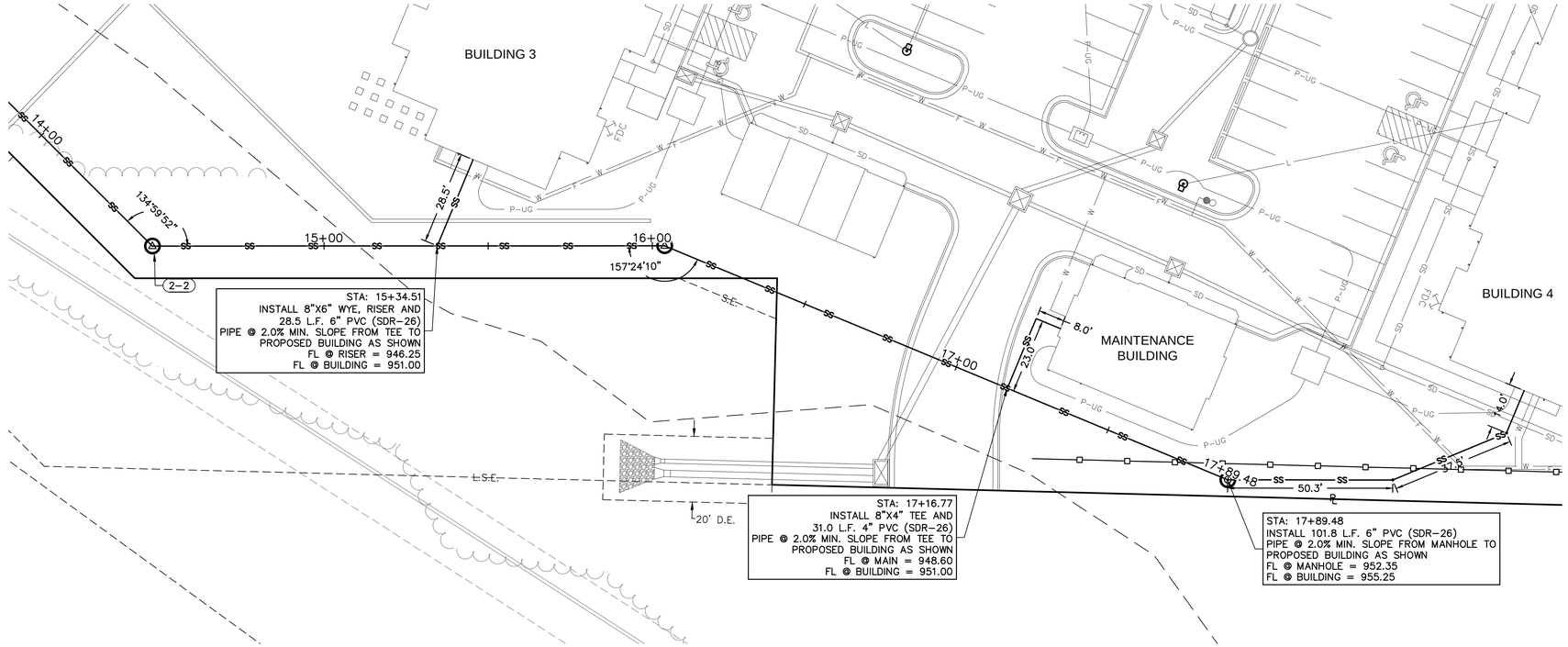
LEE'S SUMMIT, MO

2020

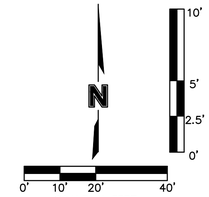
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

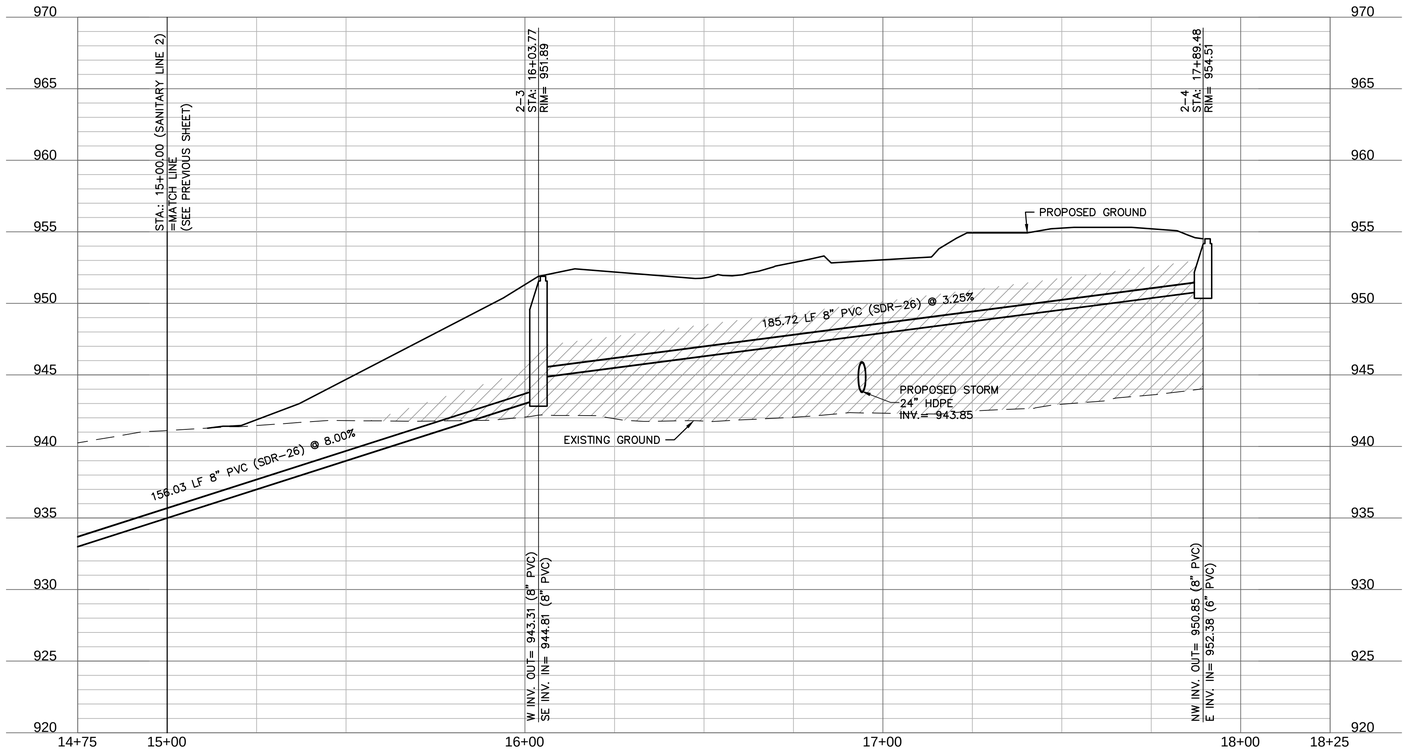
SHEET
C705

NOTES:
CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 36" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



STRUCTURES	
ID	DESCRIPTION
2-3	16+03.77 SANITARY LINE 2 48" MH N: 1013498.940; E: 2822936.069
2-4	17+89.48 SANITARY LINE 2 48" MH N: 1013427.662; E: 2823107.565





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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 001592
3101 BROADWAY, SUITE 300
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
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LEE'S SUMMIT, MO

2020

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checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C706

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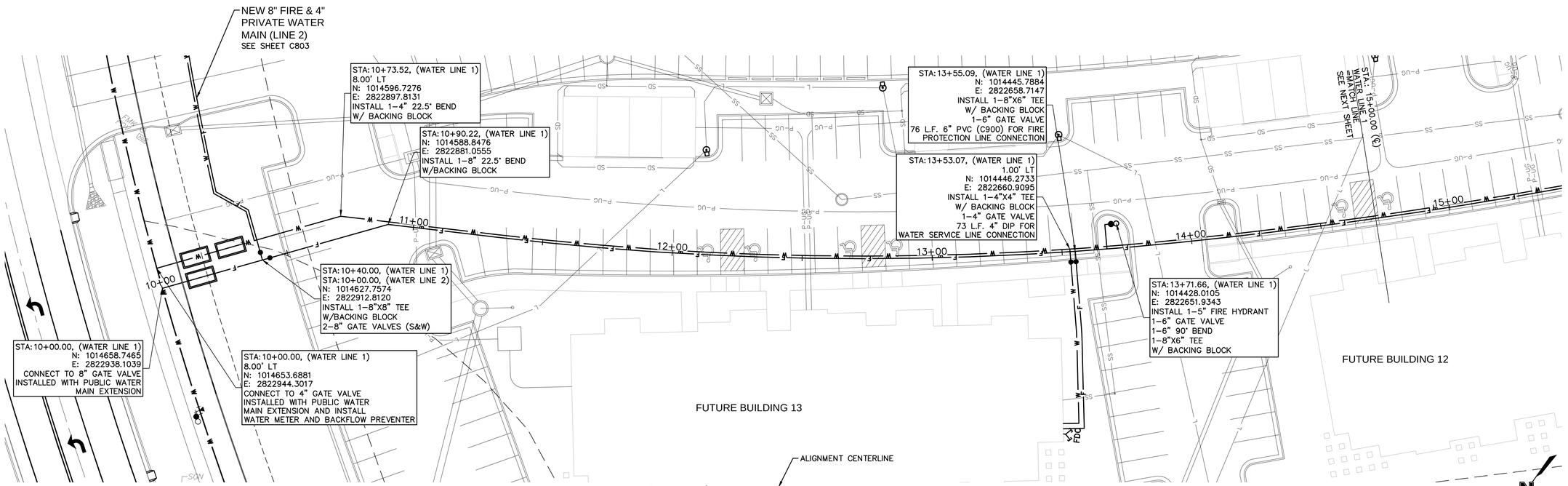

NOTES:
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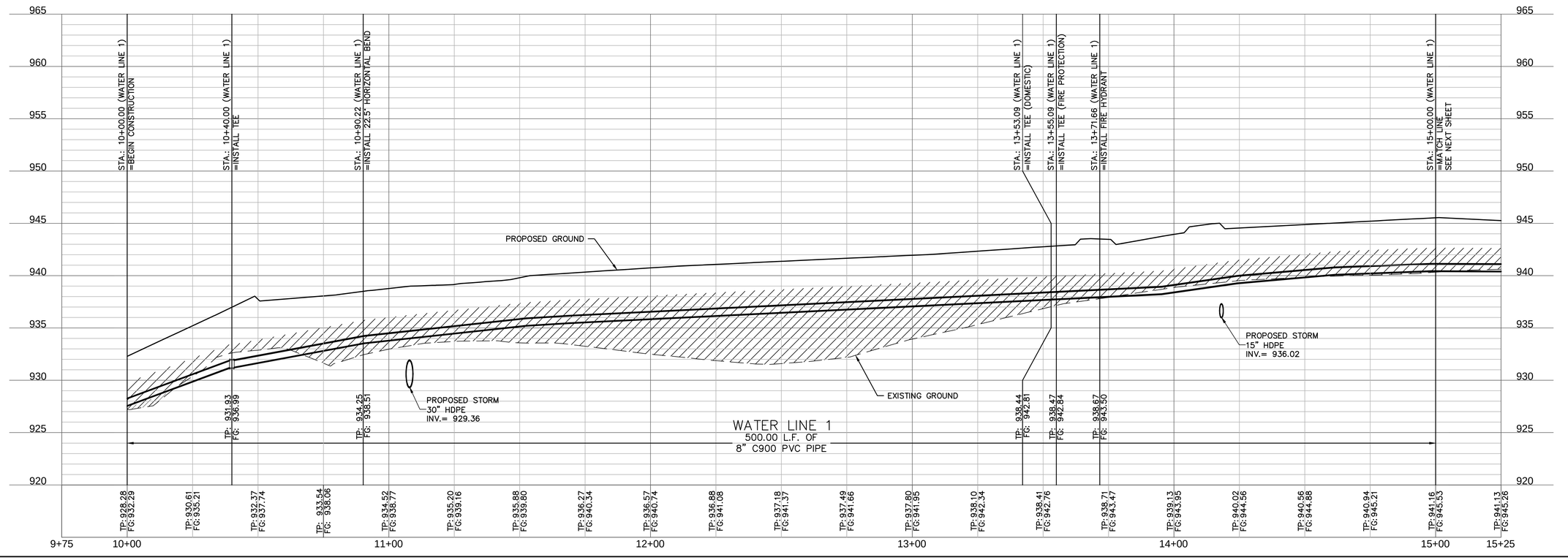

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MO CERTIFICATE OF AUTHORITY # 001592
2301 MAIN STREET, SUITE 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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MO# 2015000555

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WATER MAIN PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

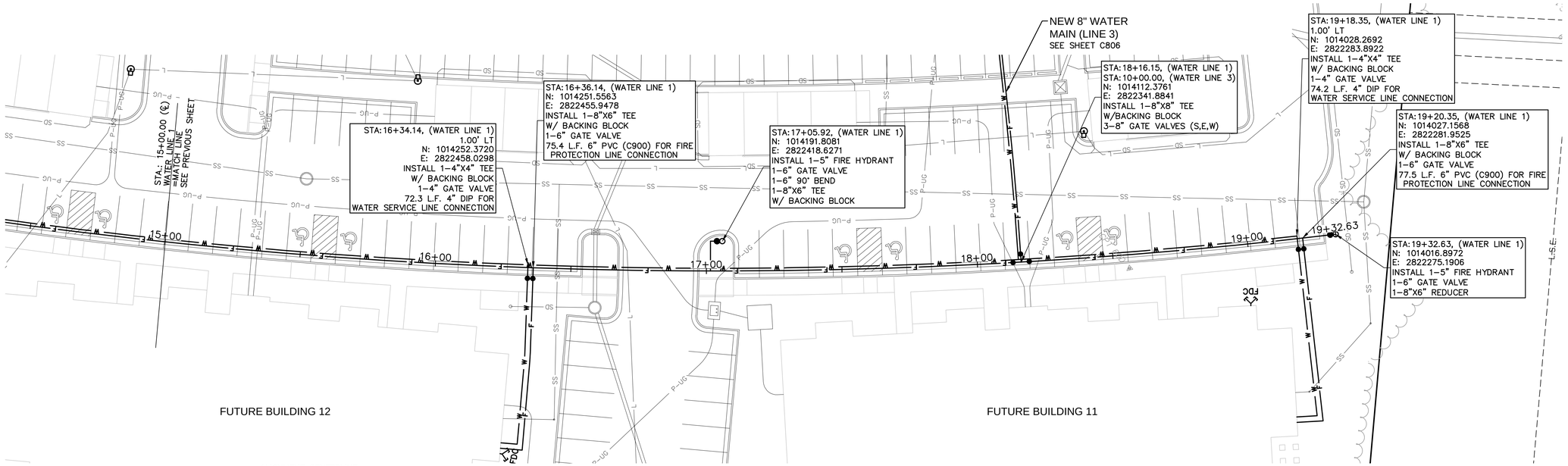
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-R
date: 2020.08.27

SHEET
C801

File: F:\2019\0001-0500\019-0012-R\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_WAT01_ B190012.dwg ~ Layout: WATER MAIN PLAN & PROFILE ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM



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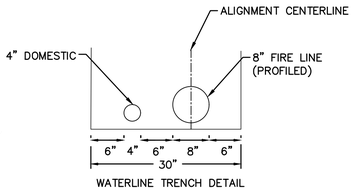
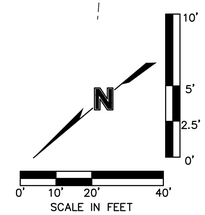
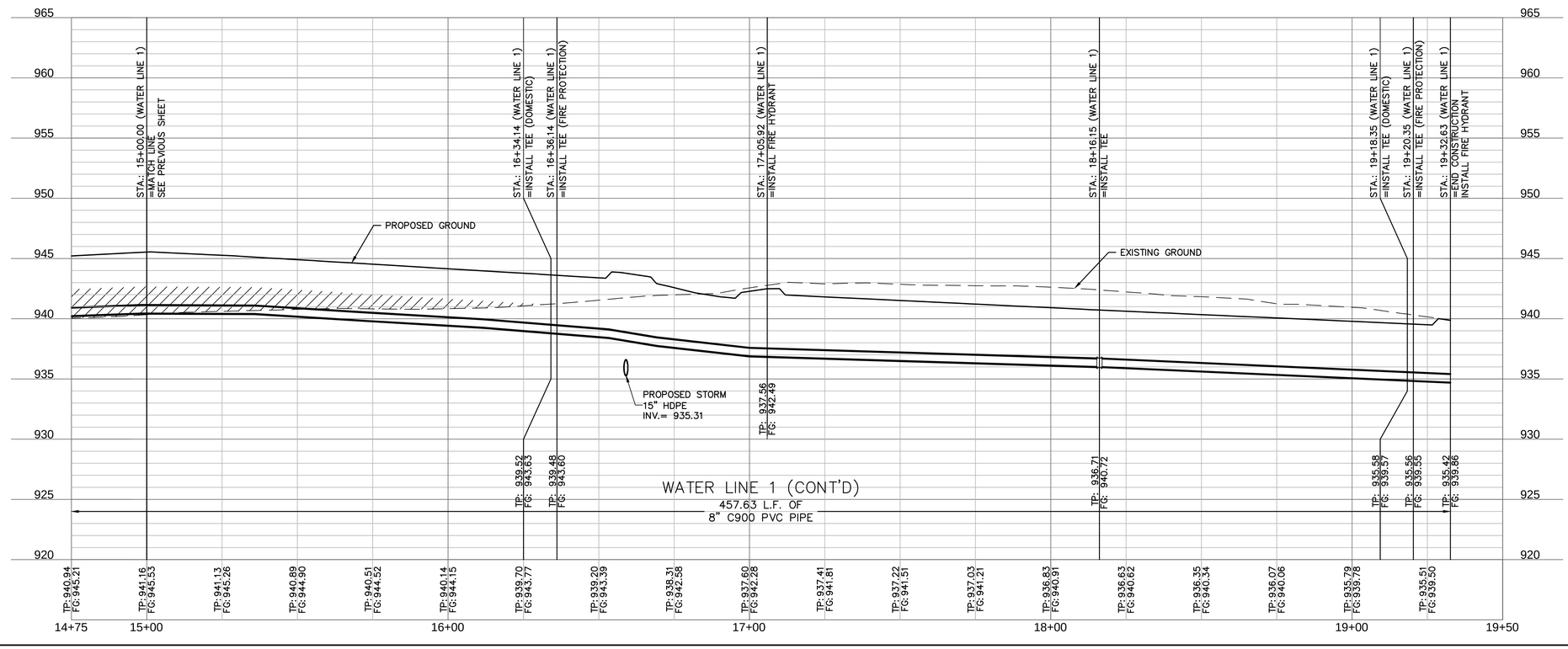


WATERLINE TRENCH DETAIL



SCALE IN FEET



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MO CERTIFICATE OF AUTHORITY # 001592
2301 Maple Avenue, Suite 200
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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MO# 2015000555

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WATER MAIN PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
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SHEET
C802

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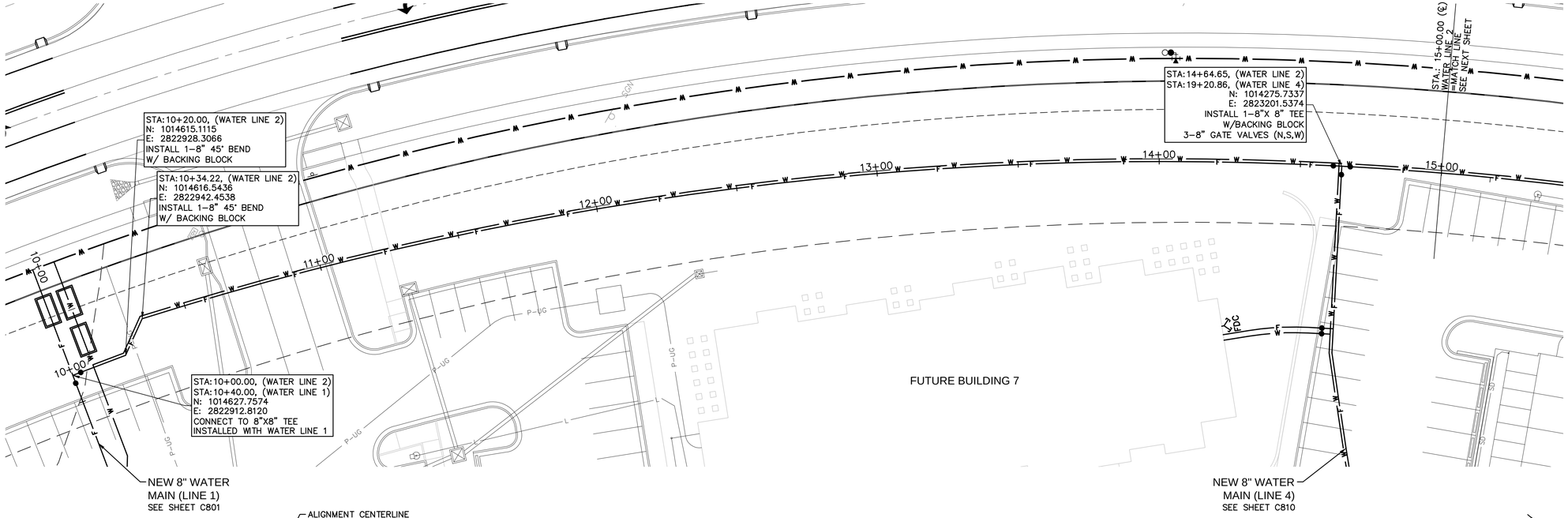

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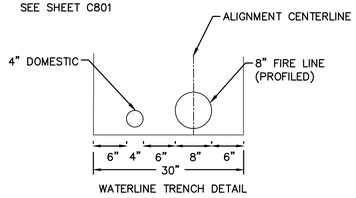
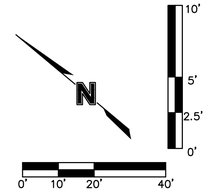


WATERLINE TRENCH DETAIL



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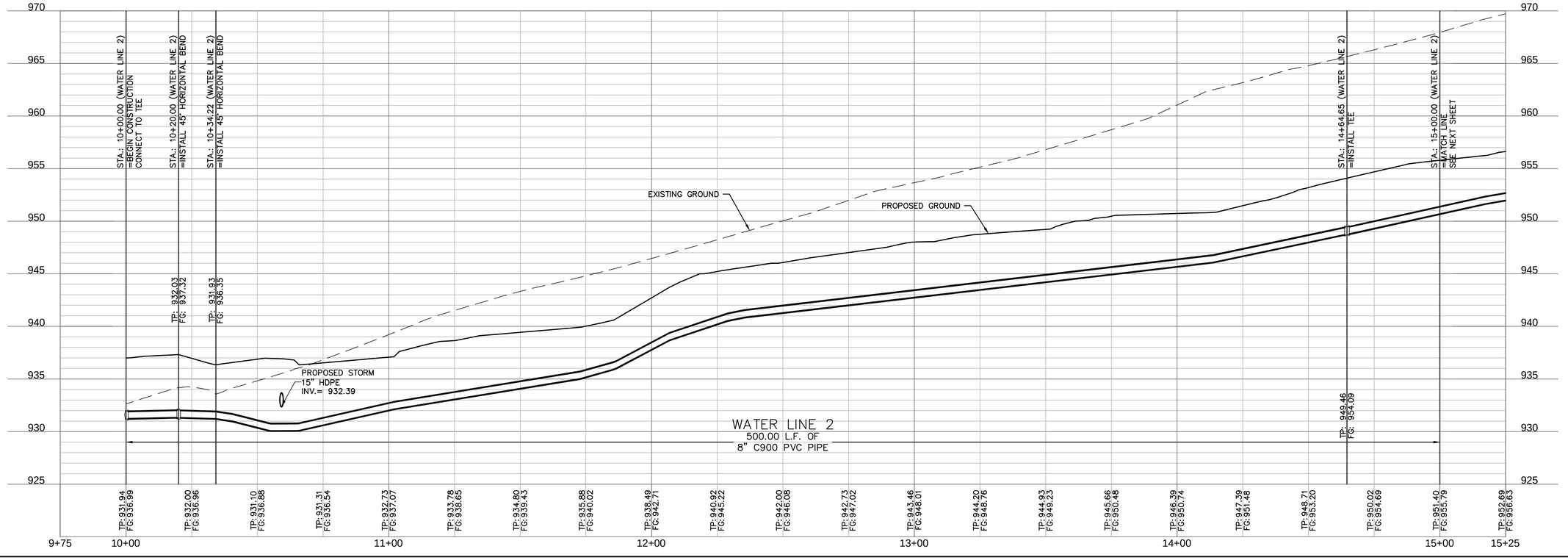

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MO CERTIFICATE OF AUTHORITY # 2003592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
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MO# 2015000555

NO./REV.	DATE	REVISIONS DESCRIPTION	BY
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WATER MAIN PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C803

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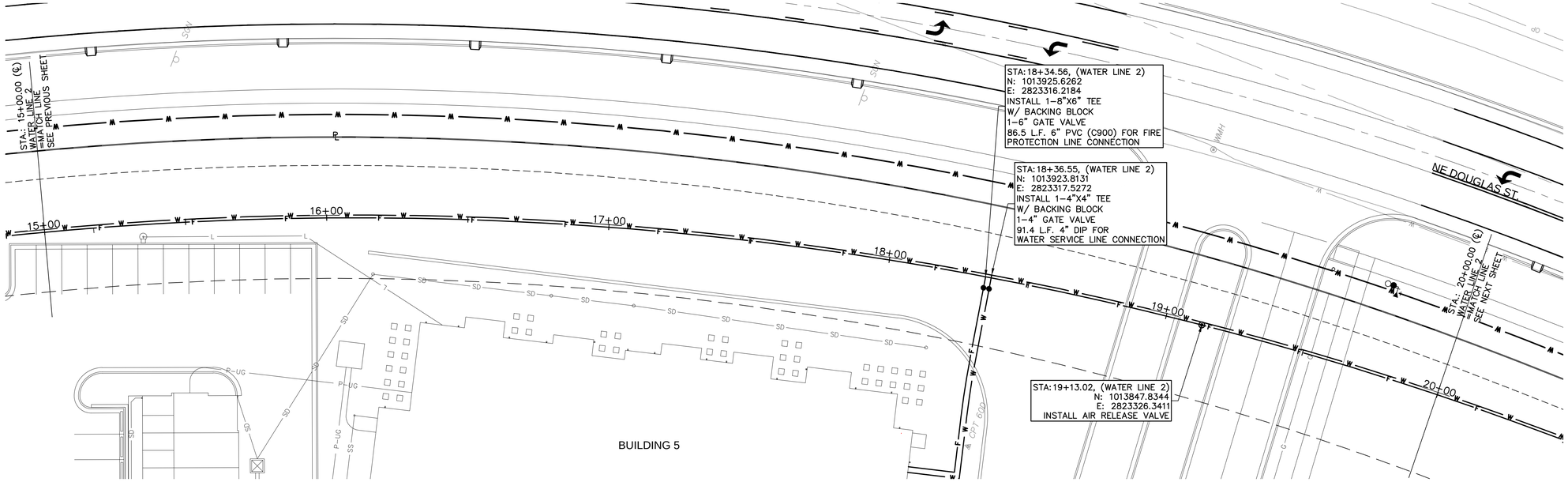

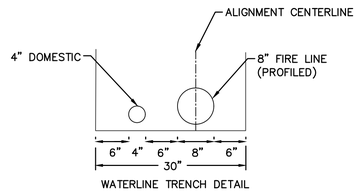

WATERLINE TRENCH DETAIL

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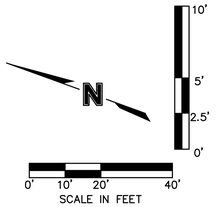

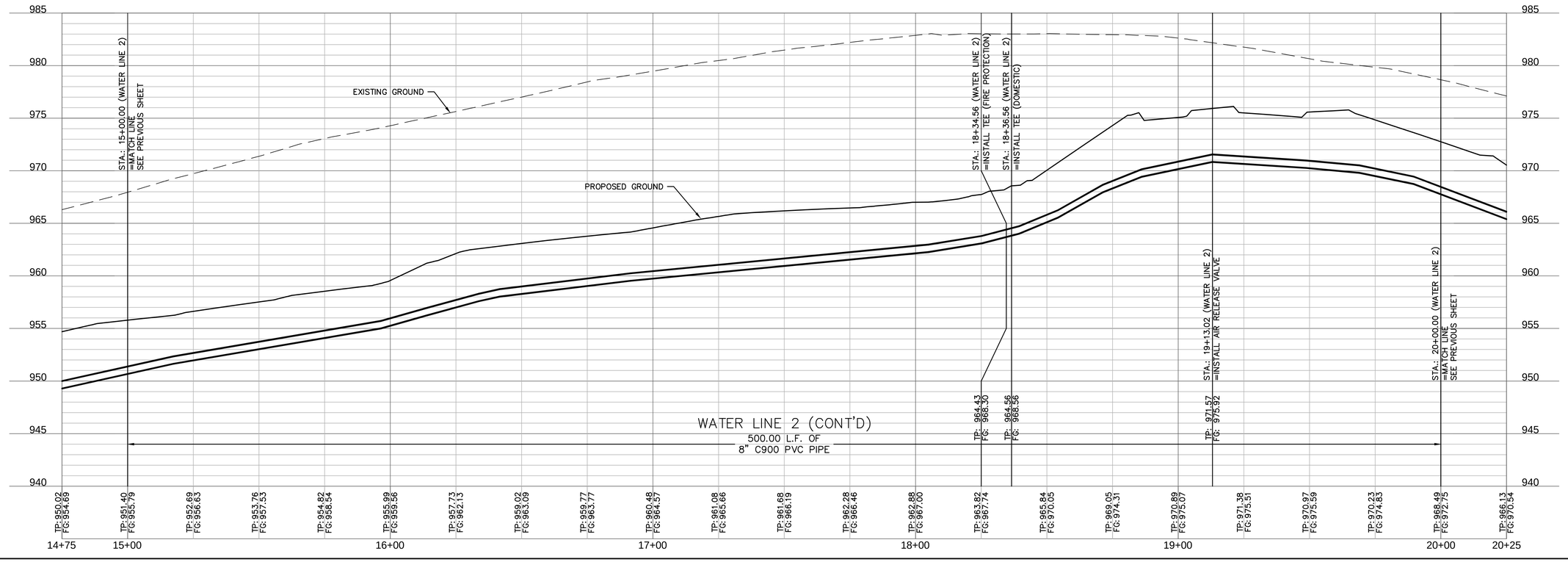

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MO CERTIFICATE OF AUTHORITY #:001592
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NORTH KANSAS CITY, MO 64116
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NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

WATER MAIN PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012.B
date: 2020.08.27

SHEET
C804

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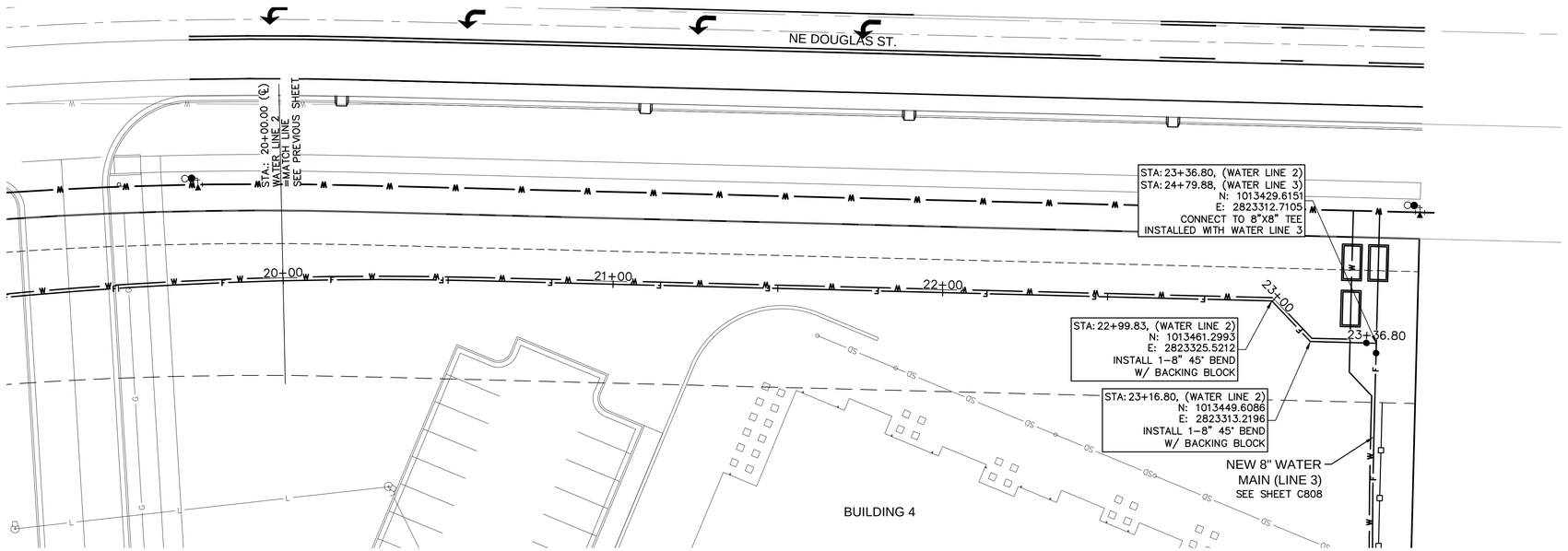

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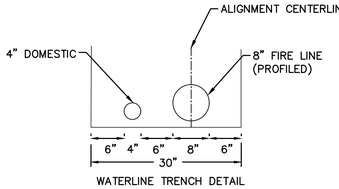
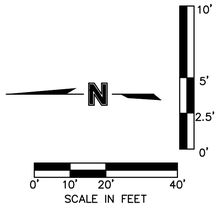
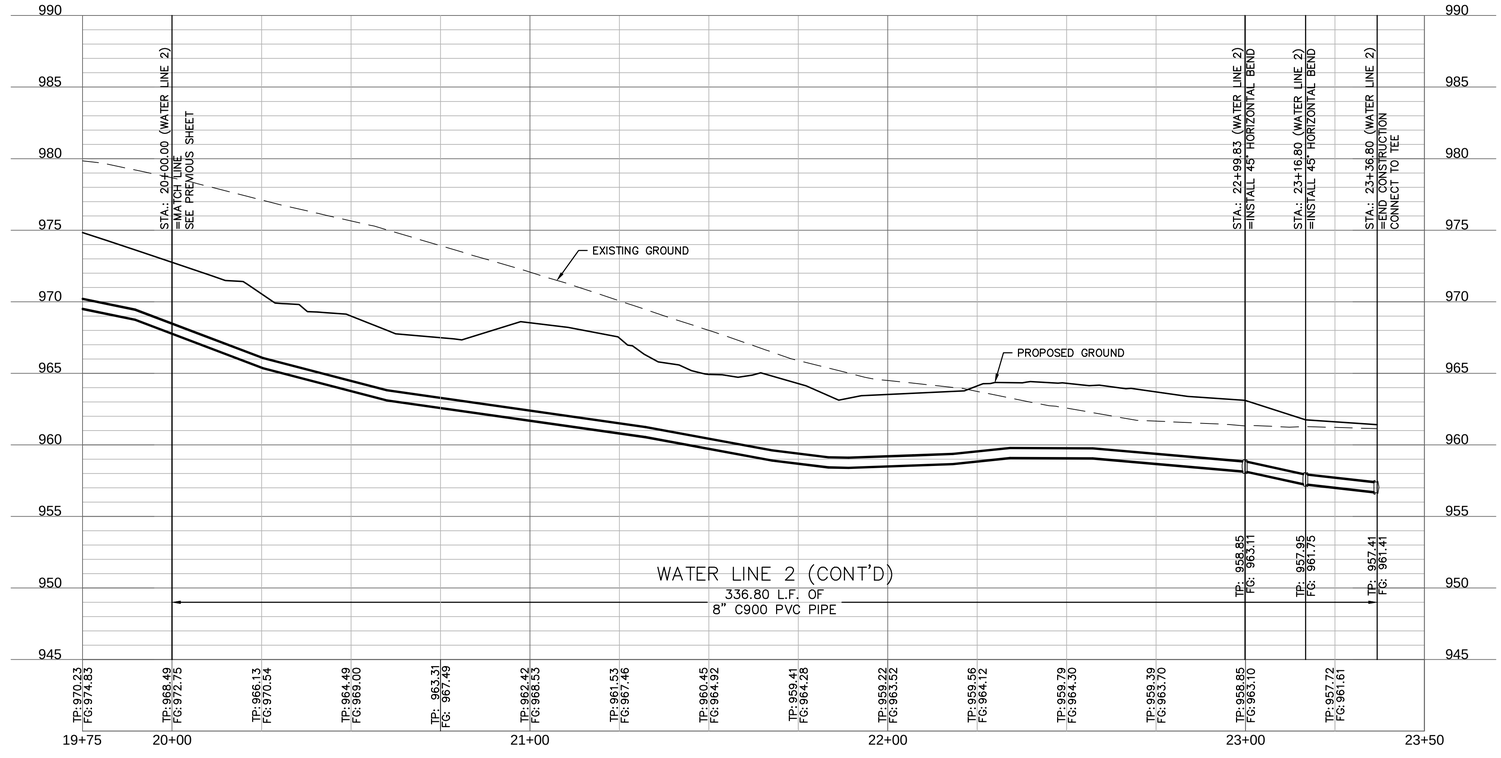


WATERLINE TRENCH DETAIL



SCALE IN FEET



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1301 BURLINGTON, SUITE 100
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		REVISIONS	

WATER MAIN PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C805

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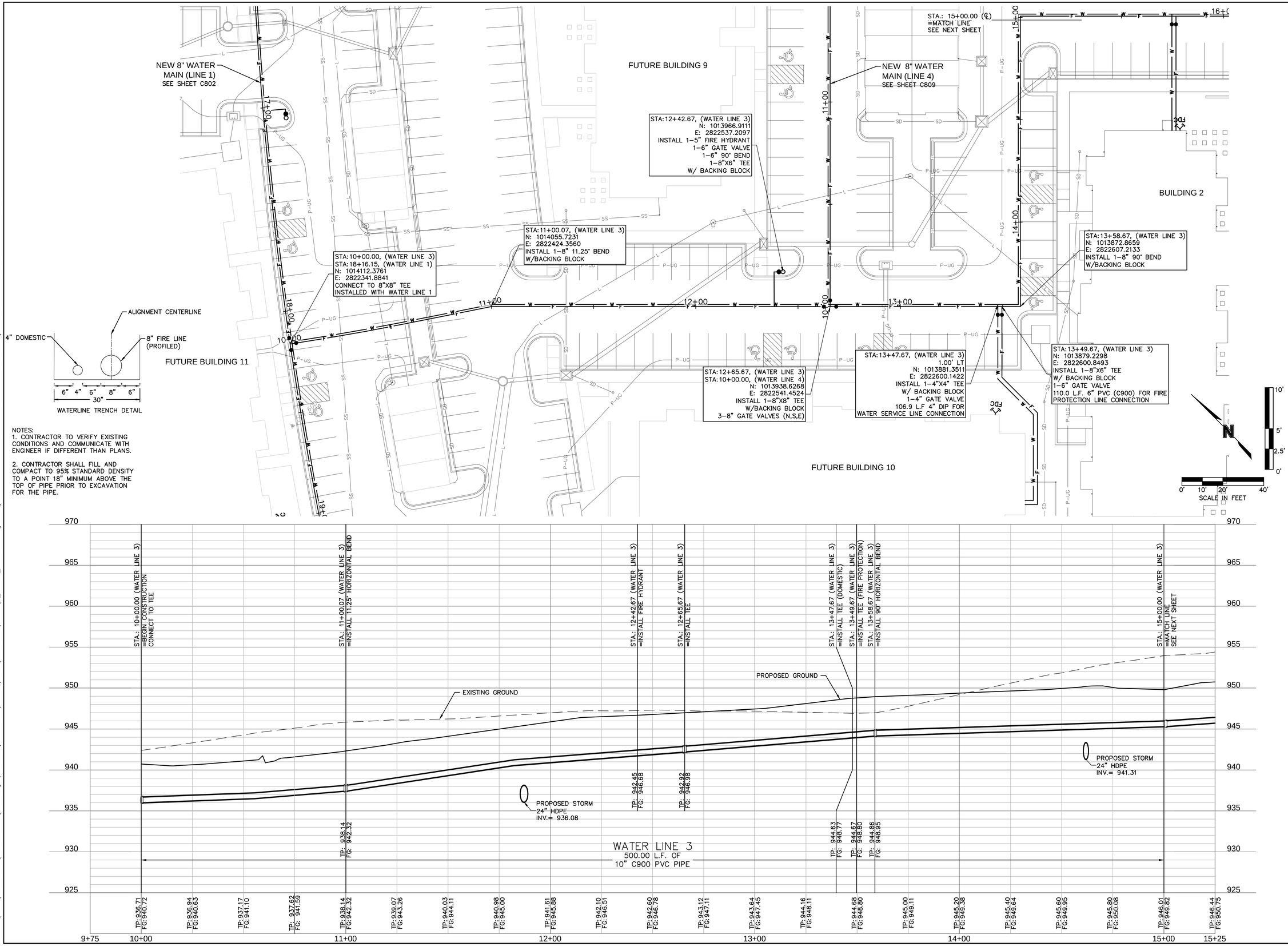

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LEES SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C806

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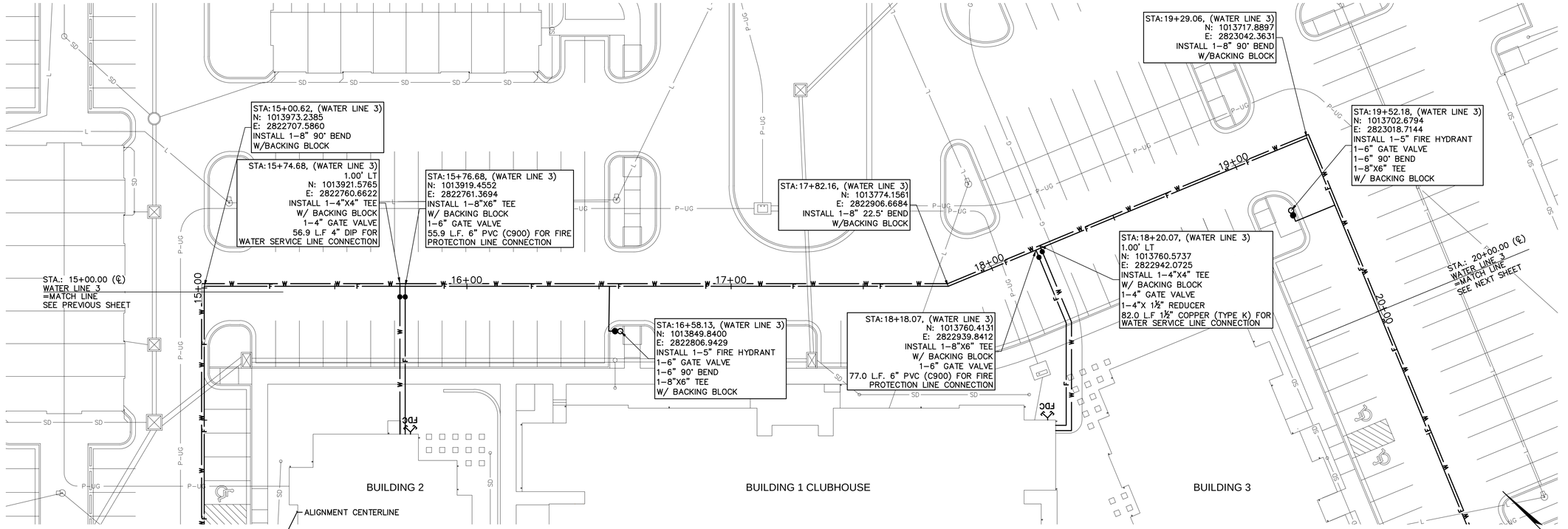
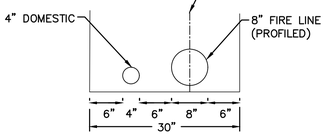
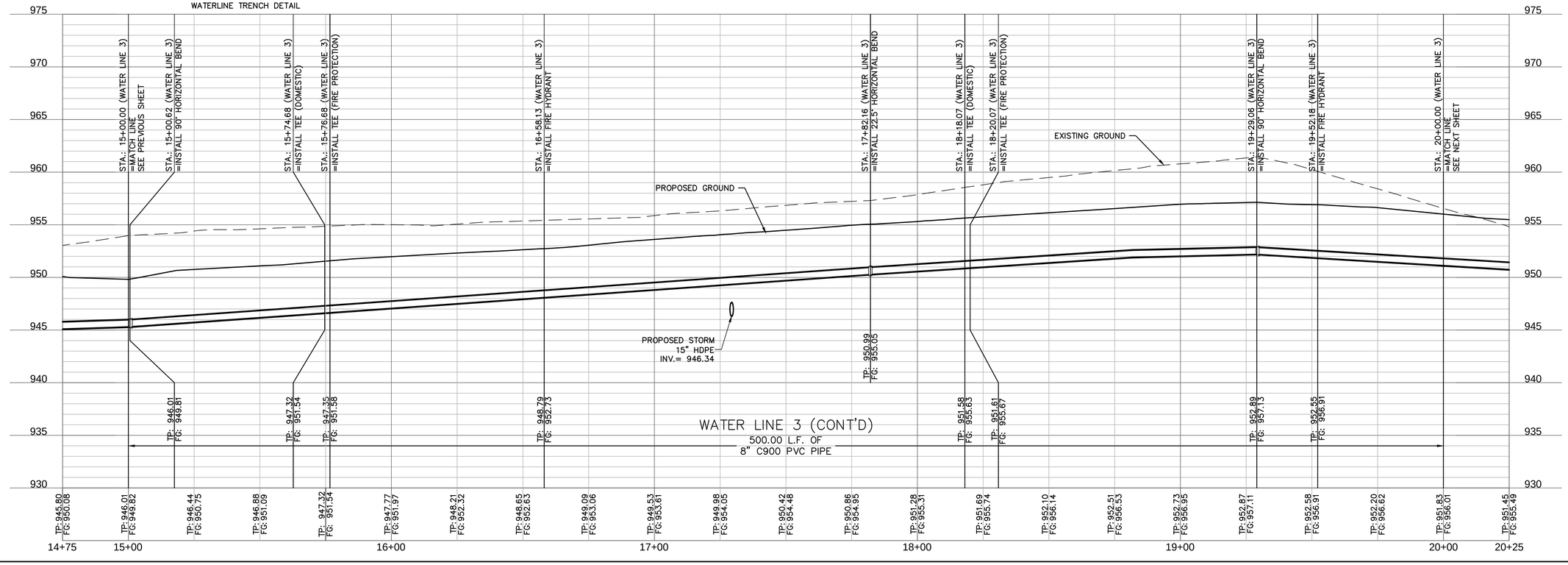


NOTES:
1. CONTRACTOR TO VERIFY EXISTING CONDITIONS AND COMMUNICATE WITH ENGINEER IF DIFFERENT THAN PLANS.

2. CONTRACTOR SHALL FILL AND COMPACT TO 95% STANDARD DENSITY TO A POINT 18" MINIMUM ABOVE THE TOP OF PIPE PRIOR TO EXCAVATION FOR THE PIPE.



WATERLINE TRENCH DETAIL



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TEL 816.361.1177
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STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

REVISIONS

NO./REV.	DATE	BY	REVISIONS DESCRIPTION

WATER MAIN PLAN & PROFILE
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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SHEET
C807

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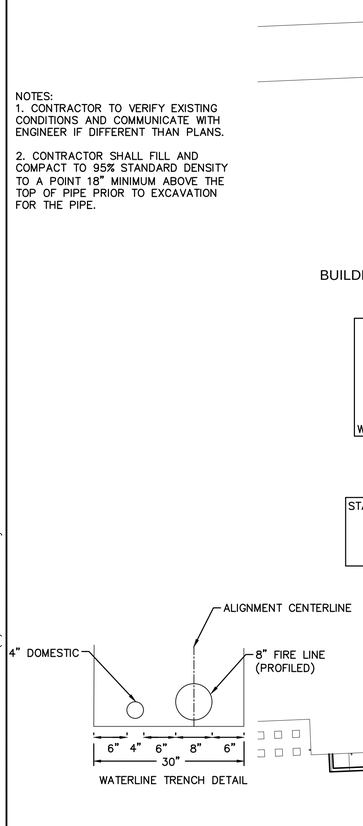

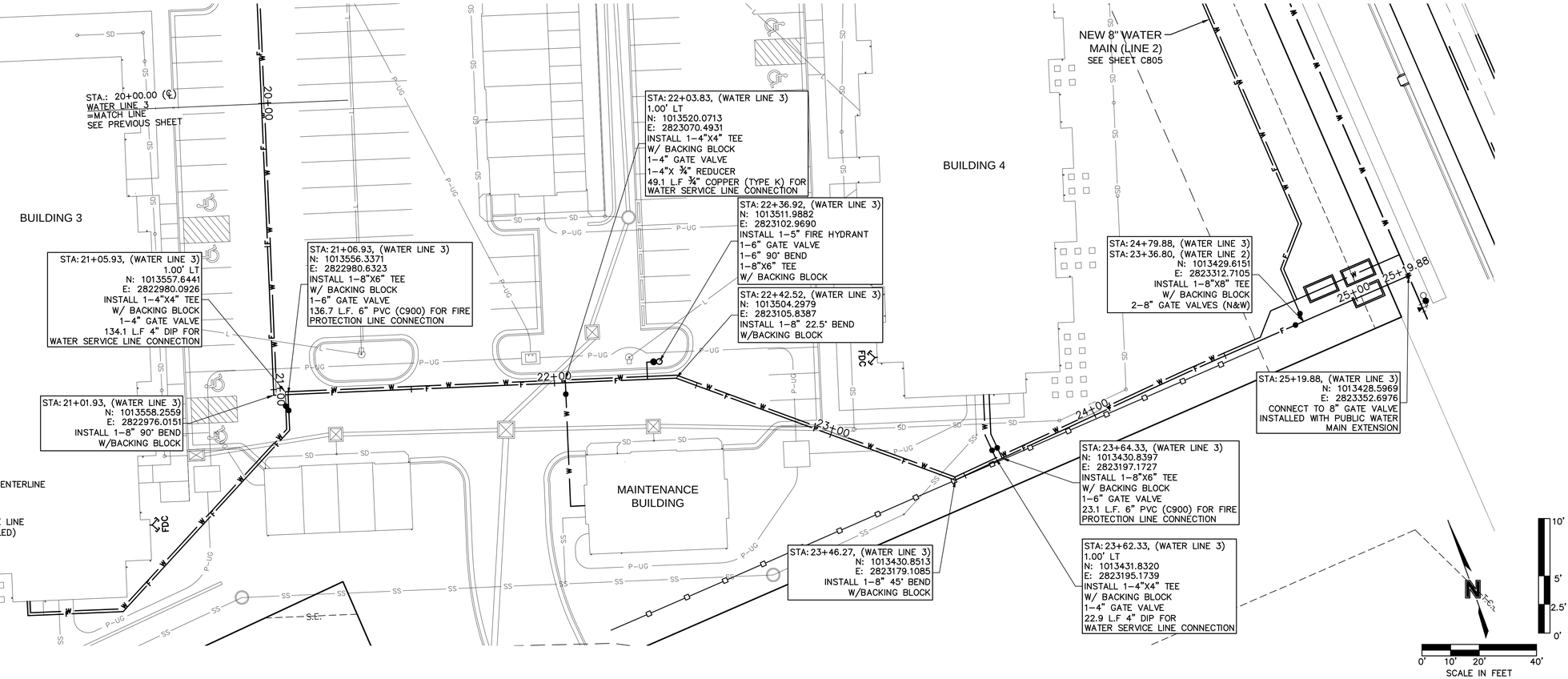

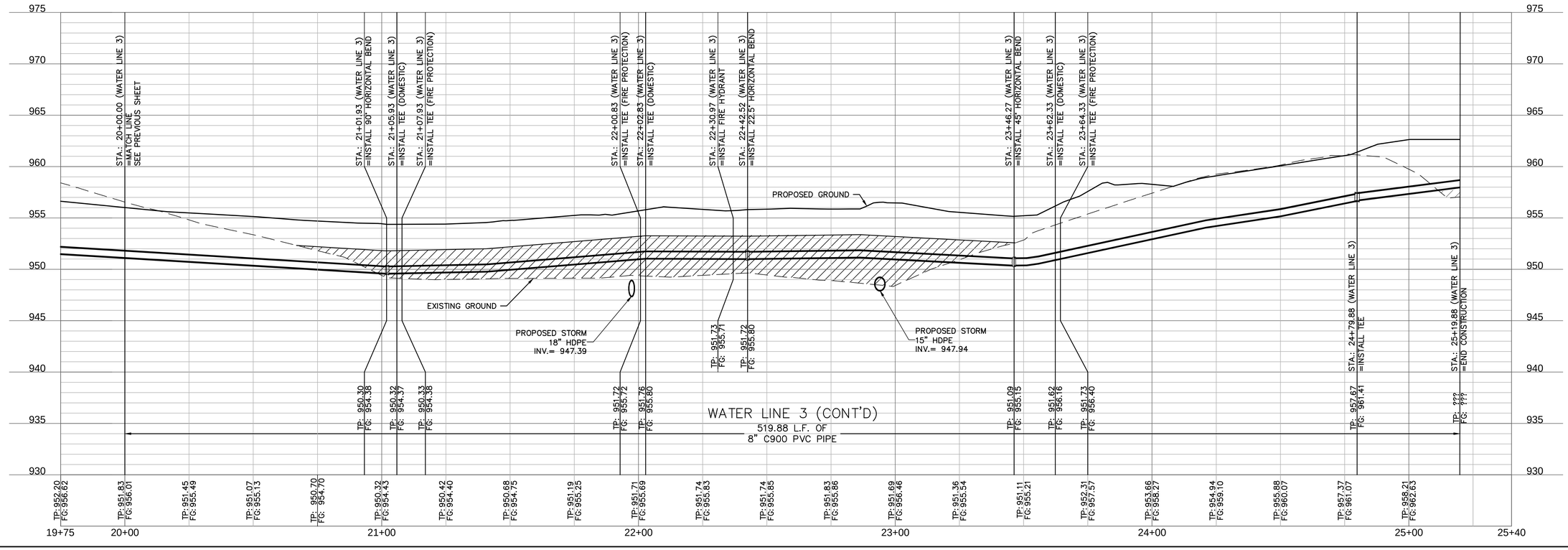

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MO CERTIFICATE OF AUTHORITY # 001592
2020 BALTIMORE AVENUE, SUITE 216
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

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SITE DEVELOPMENT PLANS

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SHEET
C808

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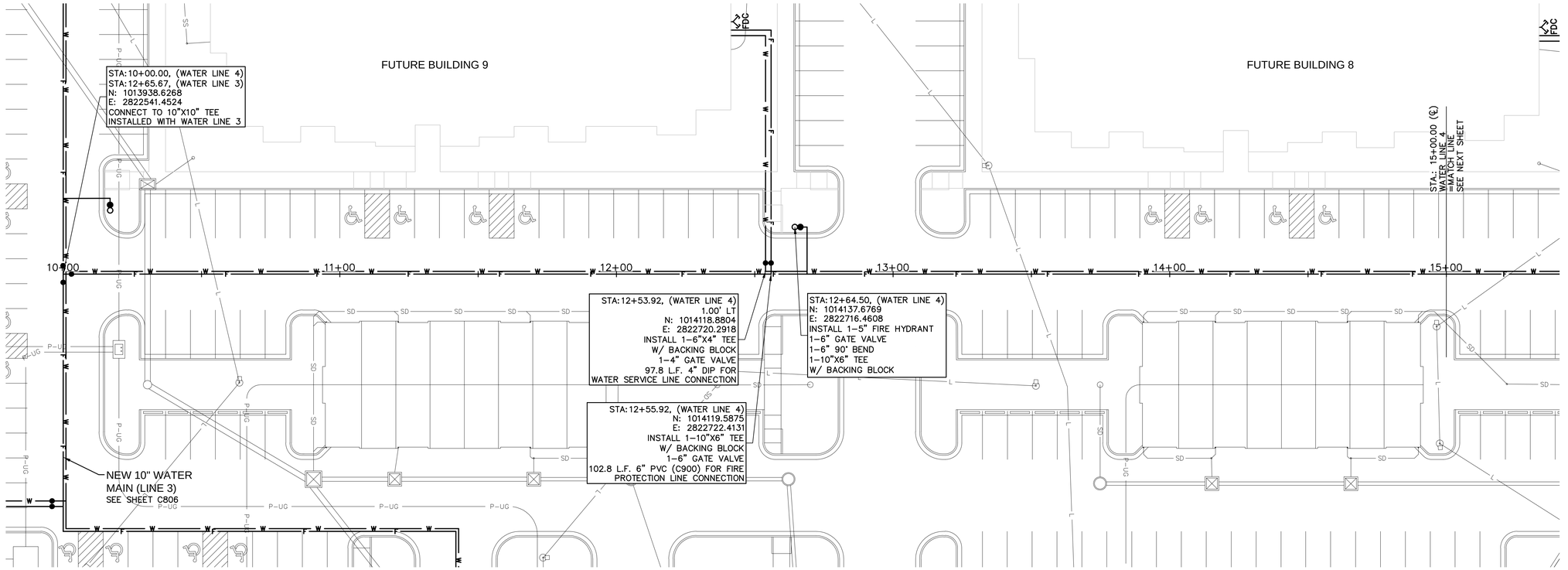

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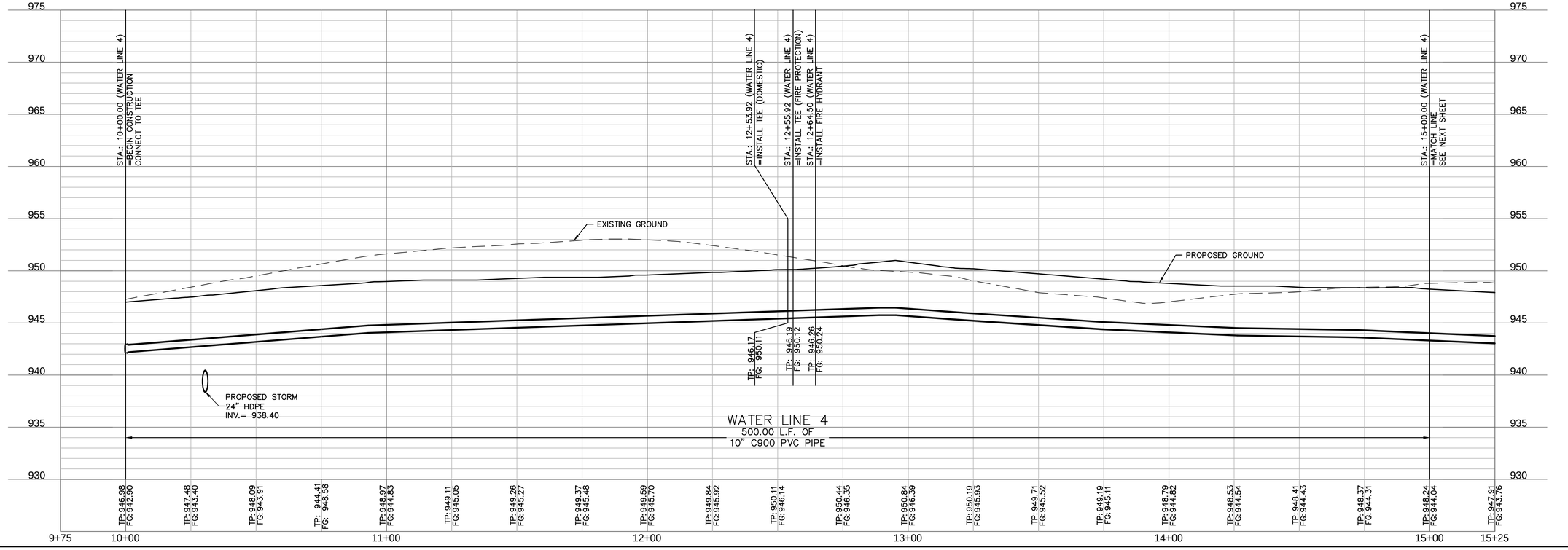

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MO CERTIFICATE OF AUTHORITY # 001592
2020 BALTIMORE AVENUE, SUITE 100
NORTH KANSAS CITY, MO 64116
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REVISIONS

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
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2020

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SHEET
C809

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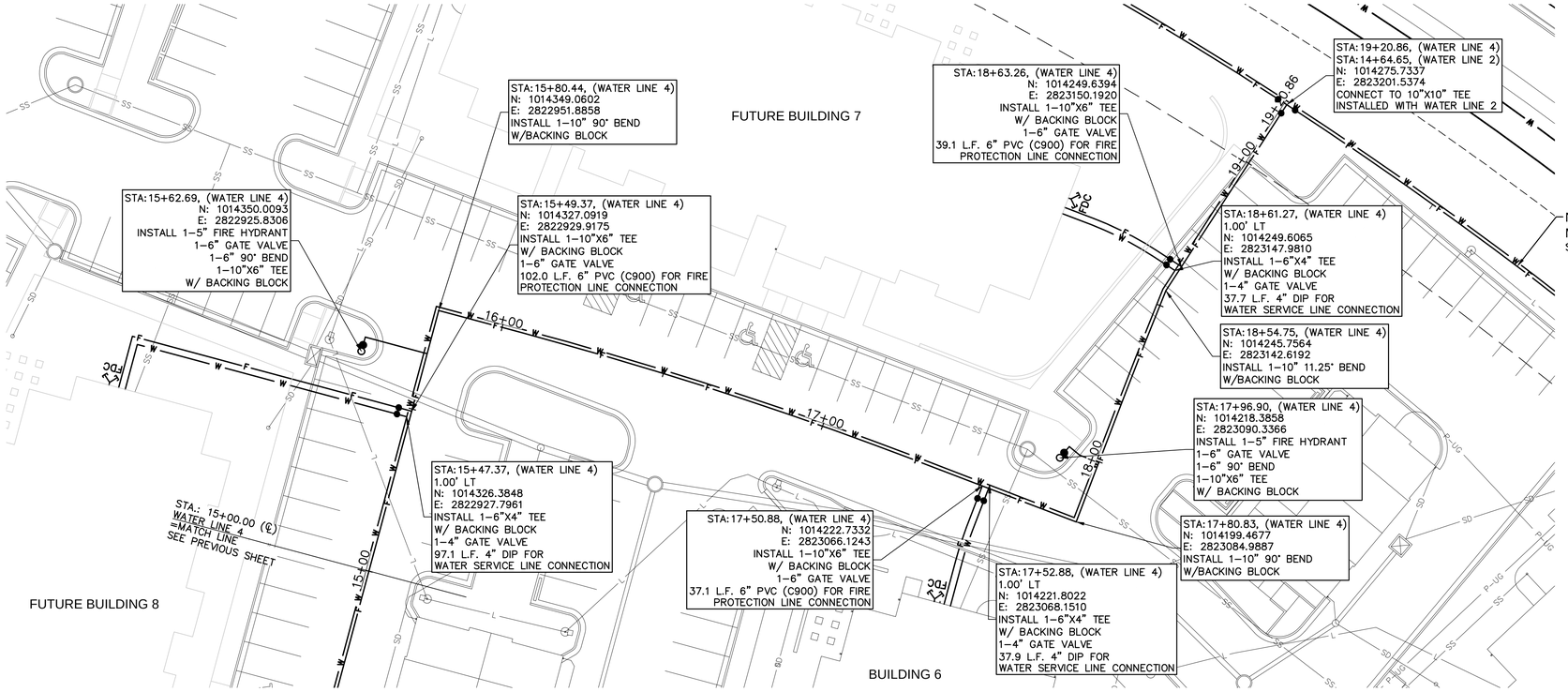

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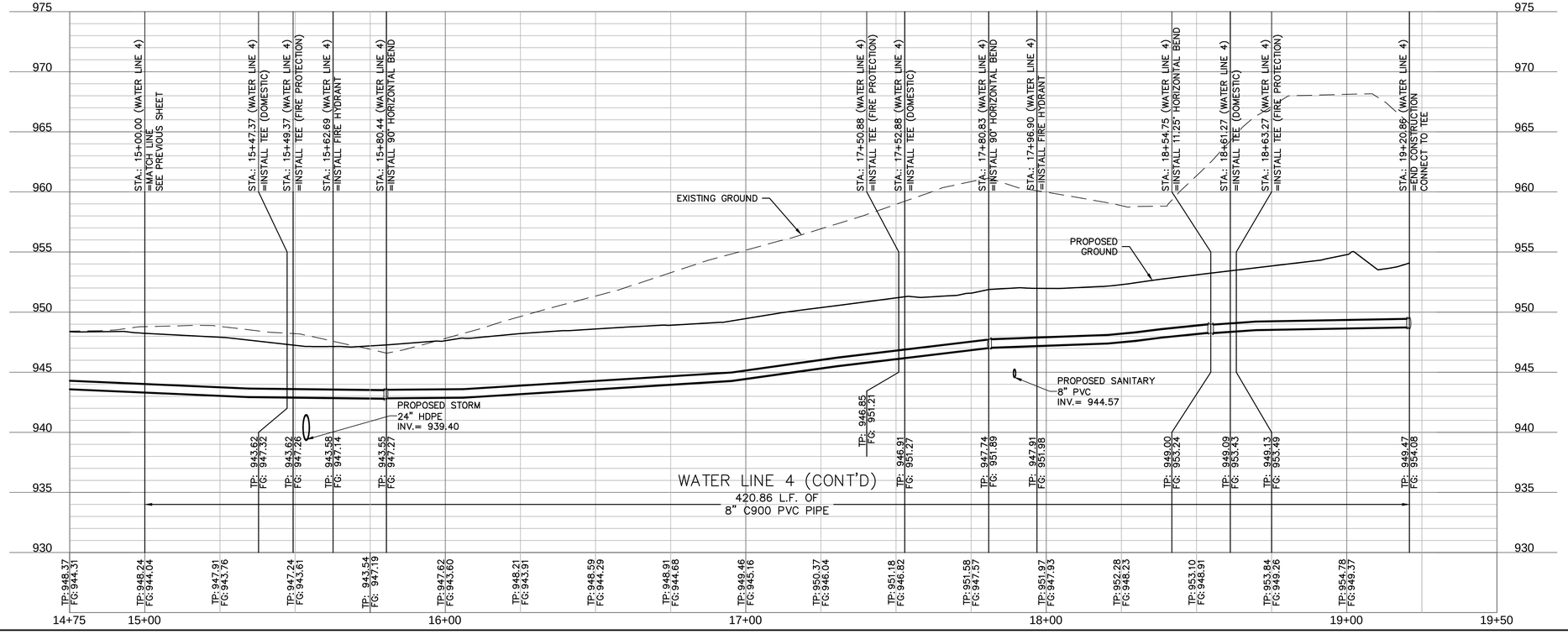

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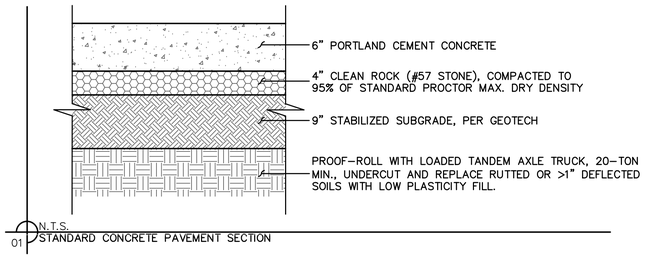
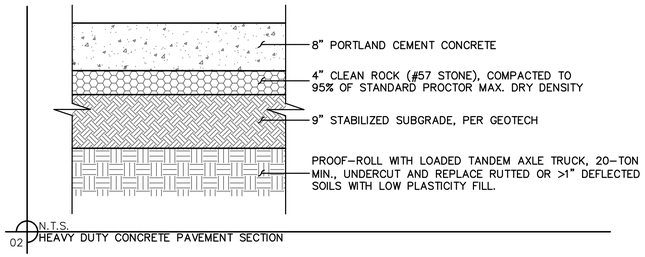
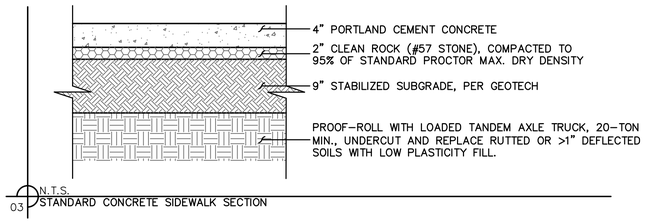


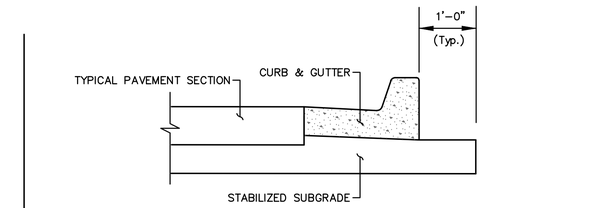
01 N.T.S. STANDARD CONCRETE PAVEMENT SECTION



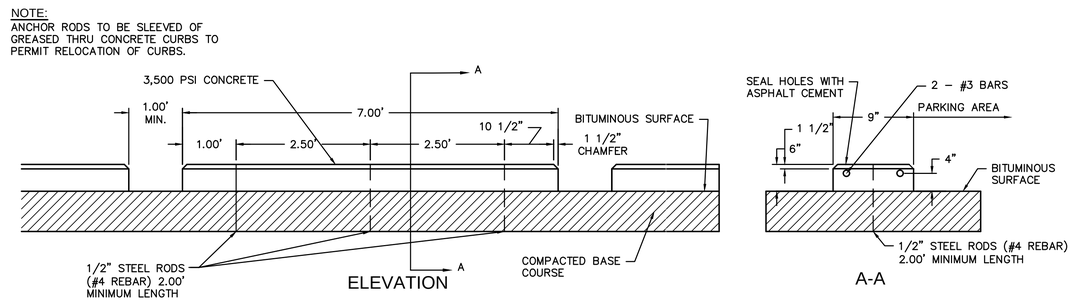
02 N.T.S. HEAVY DUTY CONCRETE PAVEMENT SECTION



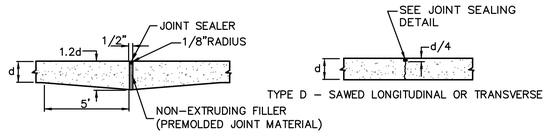
03 N.T.S. STANDARD CONCRETE SIDEWALK SECTION



04 N.T.S. PAVING DETAIL

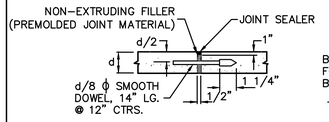


05 N.T.S. WHEEL STOP DETAIL

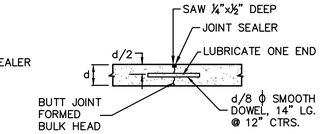


TYPE A - EXPANSION JOINT

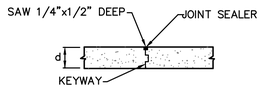
TYPE D - SAWED LONGITUDINAL OR TRANSVERSE



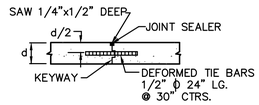
TYPE A - ALTERNATE EXPANSION JOINT



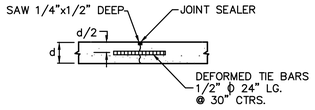
TYPE E - PLANNED TRANSVERSE CONSTRUCTION JOINT (USED AT NORMAL JOINT SPACING)



TYPE B - LONGITUDINAL CONSTRUCTION JOINT



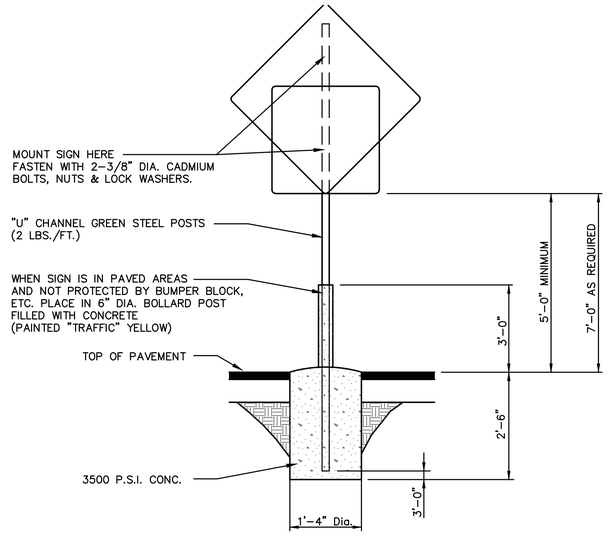
TYPE F - EMERGENCY TIED TRANSVERSE CONSTRUCTION JOINT (USED AT MIDDLE THIRD NORMAL JOINT SPACING)



TYPE C - TIED BUTT LONGITUDINAL CONSTRUCTION JOINT

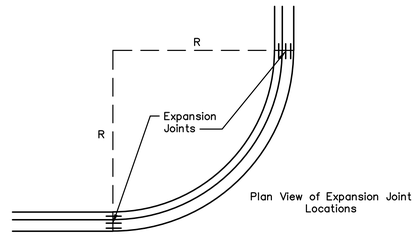
KEYWAYS FOR TYPE B AND F CONSTRUCTION JOINT

06 N.T.S. CONCRETE PAVEMENT JOINTING DETAILS



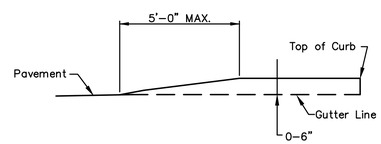
1. ALL SIGNS SHOULD COMPLY WITH U.S. DEPARTMENT OF TRANSPORTATION FEDERAL HIGHWAY ADMINISTRATION'S "UNIFORM TRAFFIC CONTROL DEVICES", AND LOCAL CODES AS SPECIFIED. MOUNT SIGNS IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS.
2. IF ANY SIGN PROTRUDES MORE THAN 1'-0" PAST THE CENTER LINE OF THE POST IT IS MOUNTED TO THE BOTTOM OF THE SIGN SHALL BE SET AT 7'-0" INSTEAD OF 5'-0".
3. ALL SIGNS MAY NOT BE APPLICABLE TO THIS PROJECT. USE SIGNS SPECIFIED ON PLOT PLAN.
4. SIGNS SHALL BE LOCATED 2'-6" BEHIND CURB WHERE THERE IS CURB & GUTTER.

07 N.T.S. SIGN BASE



NOTES:
1. 3/4" EXPANSION JOINTS WITH 2' DOWELS TO BE PLACED AT RADIUS POINTS AND AT 150' INTERVALS. THESES DOWELS SHALL BE GREASED AND WRAPPED ON ONE END WITH EXPANSION TUBES.
2. 2" DEEP CONTRACTION JOINTS SHALL BE INSTALLED AT APPROXIMATELY 10' INTERVALS.
3. FIX DOWELS WITH BAR CHAIRS OR EQUAL.

08 N.T.S. EXPANSION JOINT PLACEMENT DETAIL



09 N.T.S. CURB TERMINUS DETAIL

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MO CERTIFICATE OF AUTHORITY # 2003592
3301 BROADWAY, SUITE 100
NORTH KANSAS CITY, MO 64116
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NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

DETAIL SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

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SHEET
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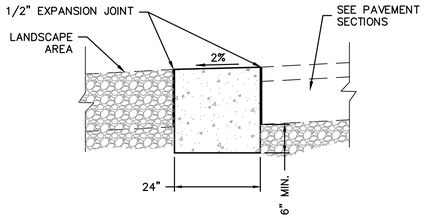
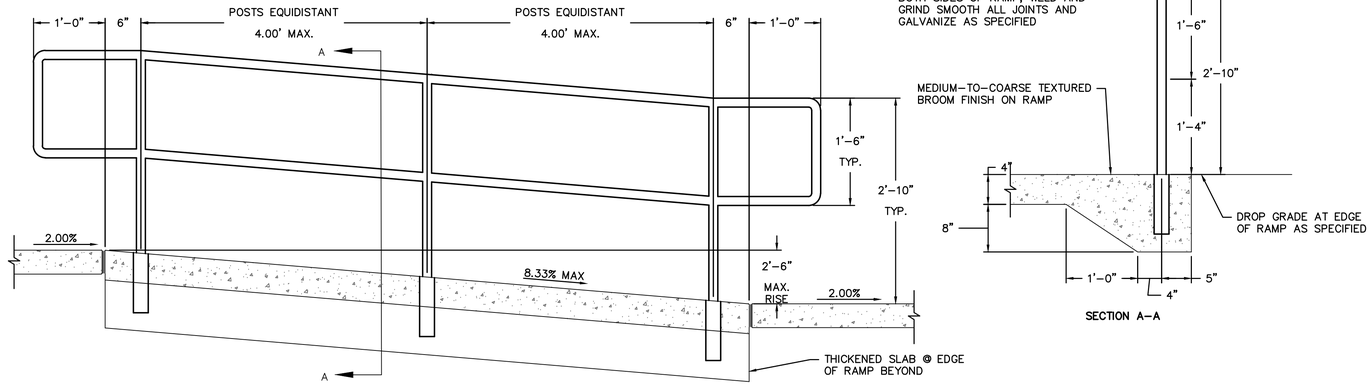


GENERAL NOTES:

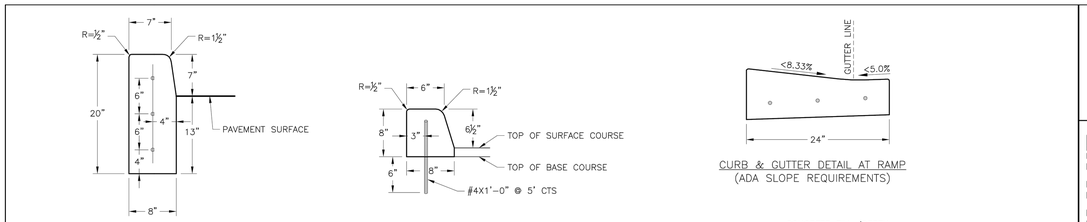
1. 3/4" ISOLATION JOINTS WITH 5/8" DIA. X 2' SMOOTH DOWELS SHALL BE PLACED AT RADIUS POINTS AND AT 150' INTERVALS. THESE DOWEL BARS SHALL BE GREASED AND WRAPPED ON ONE END WITH EXPANSION TUBES.
2. 1" DEEP CONTRACTION JOINTS SHALL BE INSTALLED AT APPROXIMATELY 10' INTERVALS. THESE JOINTS SHALL PASS ACROSS THE ENTIRE CURB SECTION.
3. FIX DOWEL BARS WITH BAR SUPPORTS.

01 N.T.S.
RIBBON CURB DETAIL



SECTION A-A

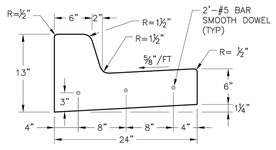
02 N.T.S.
SIDEWALK WITH HANDRAIL



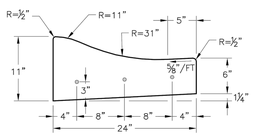
STRAIGHT CURB
(TYPE C-1)

DOWELLED CURB
(TYPE DC)

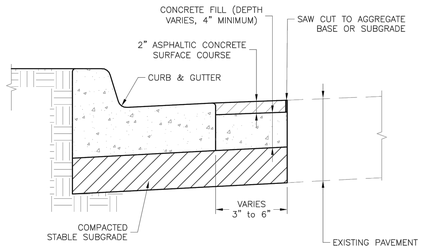
CURB & GUTTER DETAIL AT RAMP
(ADA SLOPE REQUIREMENTS)



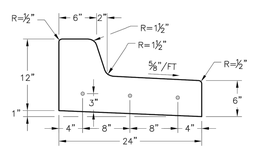
STRAIGHT BACK CURB & GUTTER
(TYPE CG-1)



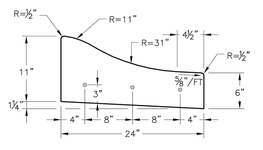
ROLL BACK CURB & GUTTER
(TYPE CG-2)



CURB REPLACEMENT DETAIL



STRAIGHT BACK DRY CURB & GUTTER
(TYPE CG-1 DRY)



ROLL BACK DRY CURB & GUTTER
(TYPE CG-2 DRY)

GENERAL NOTES

1. ¾" ISOLATION JOINTS WITH 3 (2'-#5 BAR) SMOOTH DOWELS SHALL BE PLACED AT RADIUS POINTS AND AT 150' INTERVALS. THESE DOWEL BARS SHALL BE GREASED AND WRAPPED ON ONE END WITH EXPANSION TUBES.
2. 3" DEEP CONTRACTION JOINTS SHALL BE INSTALLED AT APROXIMATELY 10' INTERVALS. THESE JOINTS SHALL PASS ACROSS THE ENTIRE CURB SECTION.
3. CONCRETE FILL SHALL HAVE UNIFORM AND SMOOTH FINISH
4. KCMMB 4K CONCRETE SHALL BE USED FOR ALL CURB.
5. ASPHALTIC CONCRETE SURFACE COURSE SHALL CONFORM TO STANDARD SPECIFICATIONS SECTION 2205.2.
6. CURBS FOR NEW STREETS SHALL BE BUILT ON ASPHALT OR AGGREGATE BASE AS SHOWN IN TYPICAL SECTION DETAIL.
7. WHITE CURING COMPOUND MUST BE APPLIED UNIFORMLY TO THE CONCRETE SURFACE IMMEDIATELY AFTER FINAL FINISHING.

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

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

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

GEN-4

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MO CERTIFICATE OF AUTHORITY # 2001592
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NUMBER PE-2015000555
PROFESSIONAL ENGINEER
NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

DETAIL SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

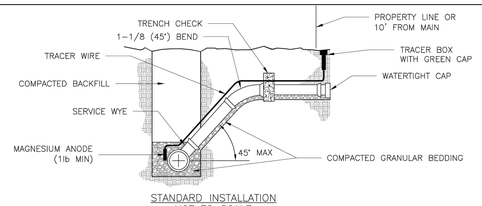
LEE'S SUMMIT, MO

2020

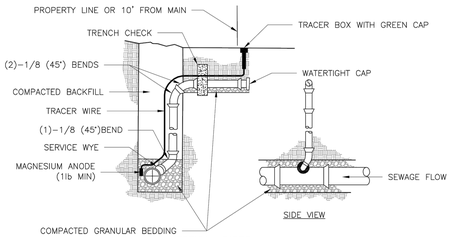
drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C902

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_DTL01_ B190012.dwg ~ Layout: DETAIL SHEET (1) ~ Last Saved By: mdlebolt ~ Plot Date: 2019.10.01 03:03 PM



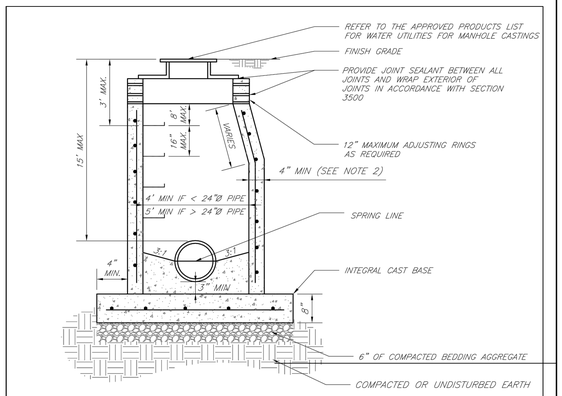
STANDARD INSTALLATION
NOT TO SCALE



VERTICAL RISER
NOT TO SCALE

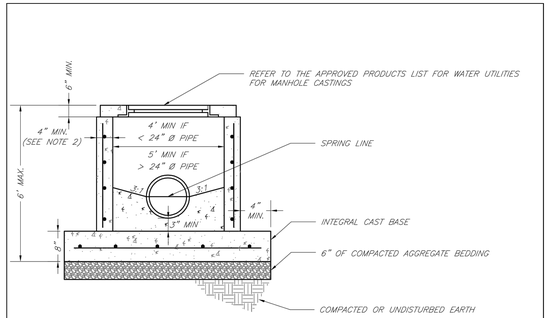
NOTES:
1. ALL SEWER STUBS SHALL BE CONSTRUCTED TO PROPERTY LINE OR 10' MINIMUM FROM THE MAIN. WHERE SIDEWALKS ARE PRESENT, CONTRACTOR SHALL EXTEND SERVICE LINE UNDER EXISTING SIDEWALK TO TWO FEET BEYOND.
2. ALL NEW CONSTRUCTION OFF SEWER STUBS SHALL BE TEMPORARILY MARKED WITH A MARKING STAKE, 36" ABOVE GROUND AND PAINTED GREEN.
3. IMPERVIOUS TRENCH CHECKS SHALL BE PLACED ON BUILDING SEWER STUBS (AT LEAST 5' AWAY FROM THE SANITARY SEWER MAIN).
4. TRENCH CHECKS ON THE BUILDING SEWER STUBS SHALL EXTEND 6" BELOW THE BOTTOM OF THE PIPE. LENGTH SHALL BE A MINIMUM OF 12", THE HEIGHT OF THE TRENCH CHECK SHALL EXTEND 12" ABOVE THE TOP OF THE PIPE. THE WIDTH OF THE TRENCH CHECK SHALL BE THE WIDTH OF THE TRENCH.
5. SEE SPECIFICATION SECTION 2100 FOR SEWER MAIN BEDDING AND BACKFILL.
6. #12 GAUGE GREEN INSULATED COPPER TRACER WIRE SHALL BE INSTALLED. TRACER WIRE TERMINAL BOXES SHALL BE INSTALLED DIRECTLY ABOVE THE SEWER SERVICE OR AS DETERMINED BY THE ENGINEER.
7. FOR SERVICES, TRACER WIRE SHALL RUN FROM THE WYE AND TERMINATE IN A FLUSH MOUNTED TRACER BOX WITH A GREEN CAST IRON LOCKABLE TOP. WIRE SHALL BE TAPED OR TIED TO THE PIPE AT 5' INTERVALS.
8. TRACER WIRE BOX SHALL BE INSTALLED WITHIN 1.0' OF PROPERTY LINE.
9. THE TRACER WIRE SHALL REMAIN CONTINUOUS TO THE GREATEST EXTENT POSSIBLE. SPLICES IN THE TRACER WIRE SHOULD BE MADE WITH SPLIT BOLT CONNECTORS. WIRE NUTS SHALL NOT BE USED. A WATER-PROOF CONNECTION IS NECESSARY TO PREVENT CORROSION.

LEE'S SUMMIT MISSOURI PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063	Date: 04/17 Drawn By: MJF Checked By: DL
BUILDING SEWER STUB AND RISER	SAN-1



NOTES:
1. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY THE SPECIFICATIONS.
2. A WALL THICKNESS NOT LESS THAN ONE-TWELFTH (1/12) OF THE INSIDE DIAMETER OR 4", WHICHEVER IS GREATER, SHALL BE USED WHEN THE MANHOLE DEPTH IS LESS THEN 15'.
3. WATERPROOFING SHALL BE REQUIRED ON THE OUTSIDE OF MANHOLES. THE WATERPROOFING SHALL CONSIST OF A TOTAL DRY FILM THICKNESS OF NOT LESS THAN 14 MILS OF BITUMINOUS COATING.
4. ONLY ECCENTRIC MANHOLE CONES WILL BE ALLOWED UNLESS OTHERWISE APPROVED BY THE CITY ENGINEER.
5. THE FILL CONCRETE FLOW CHANNEL FOR SIDE BRANCHES SHALL BE PLACED TO PROVIDE A SMOOTH TRANSITION INTO THE FLOW LINE.
6. REFER TO THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR APPROVED MANHOLE GASKET MODELS.
7. REFER TO THE APPROVED PRODUCTS LIST FOR APPROVED STEPS.

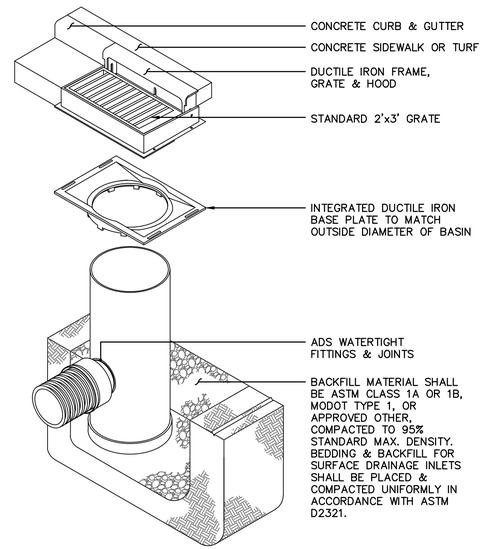
LEE'S SUMMIT MISSOURI PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063	Date: 02/13 Drawn By: JN Checked By: DL FILE: SAN-2 Rev: 1/14 Rev:
STANDARD PRECAST MANHOLE – SANITARY SEWER	



ELEVATION

NOTES:
1. PRECAST CONCRETE MANHOLES SHALL CONFORM TO ASTM C478 EXCEPT AS MODIFIED BY THE SPECIFICATIONS.
2. A WALL THICKNESS NOT LESS THAN ONE-TWELFTH (1/12) OF THE INSIDE DIAMETER OR 4", WHICHEVER IS GREATER SHALL BE USED.
3. WATERPROOFING SHALL BE REQUIRED ON THE OUTSIDE OF MANHOLES. THE WATERPROOFING SHALL CONSIST OF A TOTAL DRY FILM THICKNESS OF NOT LESS THEN 14 MILS OF BITUMINOUS COATING.
4. THE FILL CONCRETE FLOW CHANNEL FOR SIDE BRANCHES SHALL BE PLACED TO PROVIDE A SMOOTH TRANSITION INTO THE FLOW LINE.
5. REFER TO THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR MANHOLE GASKET MODELS.
6. PROVIDE STEPS AS SHOWN ON THE APPROVED PRODUCTS LIST FOR MANHOLE DEPTHS GREATER THAN 4'.

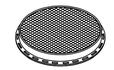
LEE'S SUMMIT MISSOURI PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063	Date: 02/13 Drawn By: JN Checked By: DL FILE: SAN-3 Rev: 1/14 Rev:
SHALLOW PRECAST MANHOLE – SANITARY SEWER	



DRAIN BASIN NOTES:

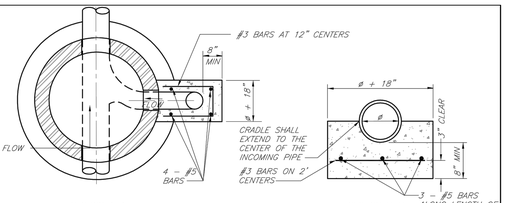
1. BOTH DRAIN BASINS AND CURB INLETS USE STANDARD BASIN ASSEMBLY.
2. UNLESS OTHERWISE COORDINATED WITH ENGINEER, NO SUBSTITUTION FOR ADS NYLOPLAST STRUCTURES, INCLUDING ALL PARTS. ALL CONSTRUCTION SHALL BE PER MANUFACTURER'S STANDARDS AND RECOMMENDATIONS.

DOME COVER

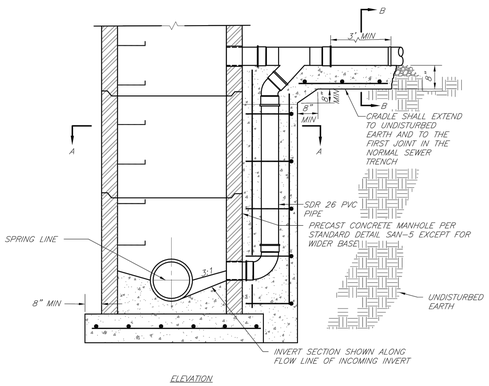


SOLID COVER

02 N.T.S.
ADS NYLOPLAST STRUCTURES



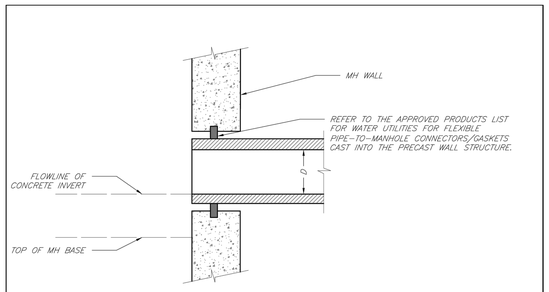
SECTION A-A SECTION B-B



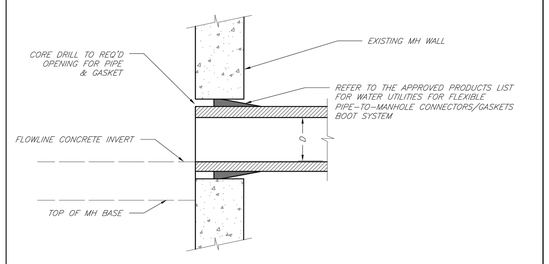
ELEVATION

NOTE:
REFER TO DRAWING SAN-2 FOR MANHOLE DETAILS NOT SHOWN.

LEE'S SUMMIT MISSOURI PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063	Date: 02/13 Drawn By: JN Checked By: DL FILE: SAN-4 Rev: 1/14 Rev:
DROP SANITARY SEWER MANHOLE	

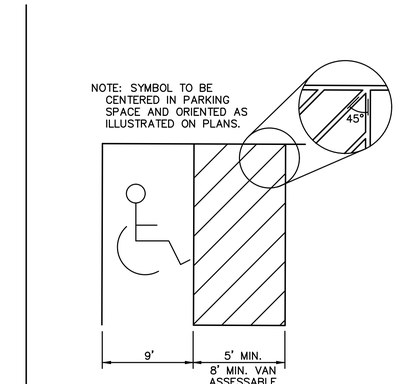


NEW MANHOLE



EXISTING MANHOLE

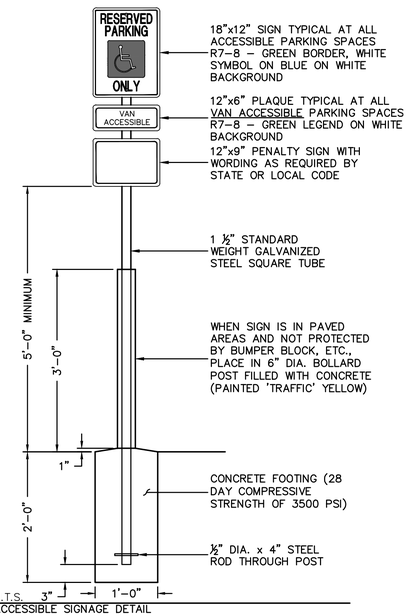
LEE'S SUMMIT MISSOURI PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063	Date: 02/13 Drawn By: JN Checked By: DL FILE: SAN-5 Rev: 1/14 Rev:
MANHOLE WALL CONNECTIONS	



01 N.T.S.
ACCESSIBLE STRIPING DETAIL

NOTES:
1. ALL SIGNS SHALL COMPLY WITH THE U.S. DEPARTMENT OF TRANSPORTATION, FEDERAL HIGHWAY ADMINISTRATION'S "MANUAL OF UNIFORM TRAFFIC CONTROL DEVICES", LOCAL CODES AND AS SPECIFIED. MOUNT SIGNS TO POST IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS
2. GALVANIZED SQUARE TUBE:
   POST TUBES – 2"x2"x3/16" 12GA.
   POST TUBE SHALL MEET ASTM A1011 GRADE 50.
   POST TUBE GALVANIZED AS PER ASTM A653 GRADE 90.
   ANCHOR TUBE – 2-1/4"x2-1/4"x3/16" 12GA.
   HEAVY DUTY ANCHOR TUBE SHALL MEET ASTM A500 GRADE B.
   STRUCTURAL TUBE AND STEEL SHALL BE HOT DIP GALVANIZED PER ASTM A123

   THE UPPER SIGN POST SHALL TELESCOPE INSIDE THE ANCHOR TUBE A MINIMUM OF 12". THE ANCHOR TUBE SHALL BE A MINIMUM 27" DEEP WITH 3" MIN., 4" MAX. EXPOSED ABOVE FINISH GRADE.



03 N.T.S.
ACCESSIBLE SIGNAGE DETAIL

olsson
www.olsson.com
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
201 E. DOUGLAS, SUITE 105
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

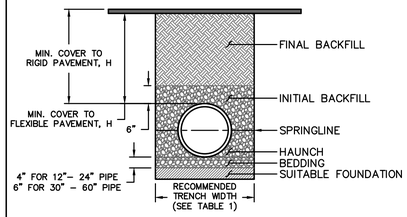
LEE'S SUMMIT, MO

2020

drawn by: MJD.
checked by: NDH.
designed by: MJD.
QA/QC by: NDH.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C903

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_DTL01_ B190012.dwg ~ Layout: DETAIL SHEET (2) ~ Last Saved By: mdeboit ~ Plot Date: 2019.10.01 03:03 PM



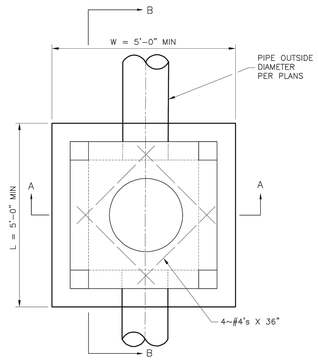
PIPE DIA.	MIN. TRENCH WIDTH*
<4"	O.D.+15"
4"	21"
6"	23"
8"	26"
10"	28"
12"	30"
15"	34"
18"	39"
24"	48"
30"	56"
36"	64"
42"	72"
48"	80"
54"	88"
60"	96"

*TRENCH CENTERED ON PIPE

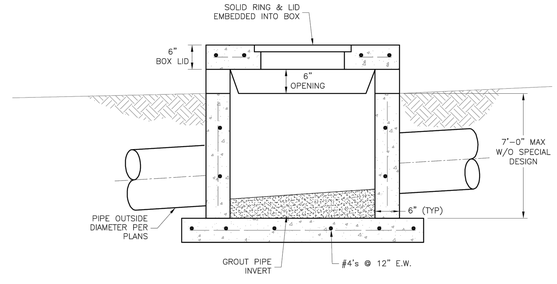
NOTES:

1. ALL HDPE AND PVC PIPE SYSTEMS SHALL BE INSTALLED IN ACCORDANCE WITH ASTM D2321, "STANDARD PRACTICE FOR UNDERGROUND INSTALLATION OF THERMOPLASTIC PIPE FOR SEWERS AND OTHER GRAVITY FLOW APPLICATIONS", LATEST EDITION.
2. IF TRENCH IS EXCAVATED IN ROCK OR HIGH–BEARING STRENGTH SOILS, TRENCH WIDTHS FOR 24" – 60" DIA. MAY BE REDUCED, FROM VALUES IN TABLE 1, TO THE PIPE OD PLUS 12".
3. MEASURES SHOULD BE TAKEN TO PREVENT MIGRATION OF NATIVE FINES INTO BACKFILL MATERIAL, WHEN REQUIRED.
4. FOUNDATION: WHERE THE TRENCH BOTTOM IS UNSTABLE, THE CONTRACTOR SHALL EXCAVATE TO A DEPTH REQUIRED BY THE GEOTECHNICAL ENGINEER AND REPLACE WITH SUITABLE MATERIAL AS SPECIFIED BY THE GEOTECHNICAL ENGINEER. AS AN ALTERNATIVE AND AT THE DISCRETION OF THE DESIGN ENGINEER, THE TRENCH BOTTOM MAY BE STABILIZED USING A GEOTEXTILE MATERIAL.
5. BEDDING: SUITABLE MATERIAL SHALL BE ASTM CLASS 1A OR 1B, MODOT TYPE 1, OR APPROVED OTHER, COMPACTED TO 95% STANDARD MAX. DENSITY.. THE CONTRACTOR SHALL PROVIDE DOCUMENTATION FOR MATERIAL SPECIFICATION TO ENGINEER. UNLESS OTHERWISE NOTED BY THE ENGINEER, MINIMUM BEDDING THICKNESS SHALL BE 4" (100mm) FOR PIPE 24" DIAMETER AND LESS; 6" FOR 30"–60" DIAMETER PIPE.
6. INITIAL BACKFILL: SUITABLE MATERIAL SHALL BE ASTM CLASS 1A OR 1B, MODOT TYPE 1, OR APPROVED OTHER, COMPACTED TO 95% STANDARD MAX. DENSITY IN THE PIPE ZONE EXTENDING NOT LESS THAN 6" ABOVE CROWN OF PIPE. MATERIAL SHALL BE INSTALLED AS REQUIRED IN ASTM D2321, LATEST EDITION. INSTALL AND COMPACT IN 6" MAXIMUM LIFTS.
7. FINAL BACKFILL: EXCEPT WHERE SUPERCEDED BY CITY REQUIREMENTS FOR RIGHT–OF–WAY CONSTRUCTION, GEOTECHNICAL REQUIREMENTS FOR UTILITY TRENCH BACKFILL, AND OTHER CONSIDERATIONS, SUITABLE MATERIAL MAY BE SITE SOILS COMPACTED TO 95% STANDARD MAX. DENSITY TO WITHIN 12" OF THE PAVEMENT SUBGRADE, AND TO SUBGRADE ELEVATION FOR NON–PAVED AREAS.
8. MINIMUM COVER: MINIMUM COVER, H, IN NON–TRAFFIC RATED APPLICATIONS (GRASS OR LANDSCAPE AREAS) IS 12" FROM THE TOP OF PIPE TO GROUND SURFACE. ADDITIONAL COVER MAY BE REQUIRED PER CITY AND/OR UTILITY STANDARDS AND/OR TO PREVENT FLOTATION. FOR TRAFFIC APPLICATIONS, MINIMUM COVER, H, IS 12" FOR UP TO 48" DIAMETER PIPE AND 24" OF COVER FOR UP TO 60" DIAMETER PIPE, MEASURED FROM TOP OF PIPE TO BOTTOM OF FLEXIBLE OR TO TOP OF RIGID PAVEMENT.

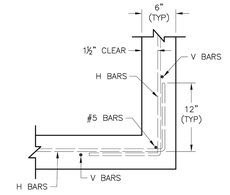
01 N.T.S.
PIPE TRENCHING & BEDDING



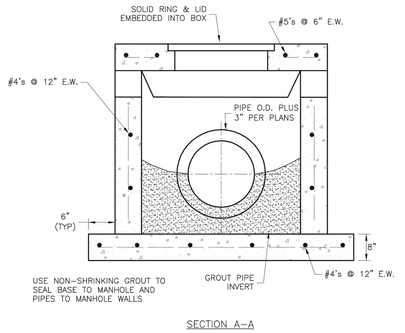
PLAN VIEW



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.

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

Project: FIELD INLET DETAIL

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

STM-2

olsson
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 2003592
2020 BALTIMORE AVENUE, SUITE 300
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
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DETAIL SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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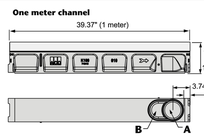
SHEET
C904

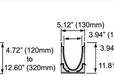
ACO DRAIN

KlassikDrain - K100 Galvanized steel edge rail channel system

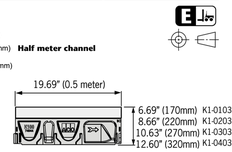
One meter channel



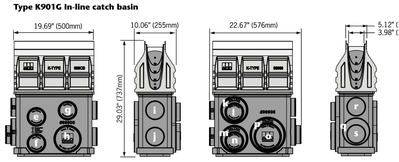
Knock-outs included on every 5th channel



Half meter channel



Type K901G In-line catch basin



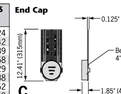
Total capacity = 10.49 gallons

Outlet flow rates

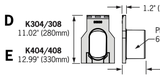
Outlet	Product	Outlet size (Sch. 40)	Invert Depth	GPM	CFS
a	Bottom outlet - K00	4" round	3.94"	108	0.24
a	Bottom outlet - K40	4" round	11.81"	187	0.42
b	Bottom outlet - K00	6" oval	3.94"	177	0.39
b	Bottom outlet - K40	6" oval	11.81"	306	0.68
c	End outlet - K20	4" round	7.87"	132	0.29
c	End outlet - K40	4" round	11.81"	171	0.38
d	K1-308-6 6" outlet cap	6" oval	9.84"	233	0.52
e	K1-408-6 6" outlet cap	6" oval	11.81"	264	0.59
f	Type K1-901G	4" round	19.30"	226	0.50
g	Type K1-901G	4" round	25.67"	265	0.59
h	Type K1-901G	4" round	25.30"	263	0.59
i	Type K1-901G	4" round	18.56"	222	0.49
j	Type K1-901G	6" round	25.85"	586	1.30
k	Type K1-901G	4" round	26.43"	269	0.60
l	Type K1-901G	4" round	19.36"	227	0.51
m	Type K1-901G	6" round	27.30"	604	1.35
n	Type K1-901G	6" round	19.99"	505	1.12
o	Type K1-901G	6" round	26.43"	593	1.32
p	Type K1-901G	8" round	27.30"	1051	2.34
q	Type K1-901G	4" round	27.17"	273	0.61
r	Type K1-901G	4" round	20.68"	235	0.52
s	Type K1-901G	4" round	18.99"	224	0.50
t	Type K1-901G	6" round	27.17"	6.02	1.34

Note: These are the pipe flow rates at the specified outlet, **NOT** channel flow rates. Catch basin flow rates are without trash bucket - using trash bucket reduces flow.

End Cap



6" Oval inlet cap



6" Oval outlet cap

April 2018

www.ACODrain.us

ACO Specification Information

ACO DRAIN

KlassikDrain - K100 Galvanized steel edge rail channel system

Description	Part No.	Invert Inches²	Invert mm²	Weight Lbs.
K1-00 Neutral channel - 39.37" (1m)	**74041**	**3.94**	**100**	**28.1**
K1-1 Sloped channel - 39.37" (1m)	**74001**	4.13	105	28.1
K1-2 Sloped channel - 39.37" (1m)	**74002**	4.33	110	28.9
K1-3 Sloped channel - 39.37" (1m)	**74003**	4.53	115	29.7
K1-4 Sloped channel - 39.37" (1m)	**74004**	4.72	120	30.5
K1-5 Sloped channel - 39.37" (1m)①	**74005**	4.92	125	31.3
K1-6 Sloped channel - 39.37" (1m)	**74006**	5.12	130	32.1
K1-7 Sloped channel - 39.37" (1m)	**74007**	5.31	135	32.9
K1-8 Sloped channel - 39.37" (1m)	**74008**	5.51	140	33.7
K1-9 Sloped channel - 39.37" (1m)	**74009**	5.71	145	34.5
K1-10 Sloped channel - 39.37" (1m)②	**74010**	5.91	150	35.3
K1-010 Neutral channel - 39.37" (1m)②	**74043**	**5.91**	**150**	**35.3**
K1-0103 Neutral channel - 19.69" (0.5m)②	**74044**	**5.91**	**150**	**17.0**
K1-11 Sloped channel - 39.37" (1m)	**74011**	6.10	155	36.1
K1-12 Sloped channel - 39.37" (1m)	**74012**	6.30	160	36.9
K1-13 Sloped channel - 39.37" (1m)	**74013**	6.50	165	37.7
K1-14 Sloped channel - 39.37" (1m)	**74014**	6.69	170	38.5
K1-15 Sloped channel - 39.37" (1m)②	**74015**	6.89	175	39.3
K1-16 Sloped channel - 39.37" (1m)	**74016**	7.09	180	40.1
K1-17 Sloped channel - 39.37" (1m)	**74017**	7.28	185	40.9
K1-18 Sloped channel - 39.37" (1m)	**74018**	7.48	190	41.7
K1-19 Sloped channel - 39.37" (1m)	**74019**	7.68	195	42.5
K1-20 Sloped channel - 39.37" (1m)②	**74020**	7.87	200	43.4
K1-020 Neutral channel - 39.37" (1m)②	**74045**	**7.87**	**200**	**43.4**
K1-0203 Neutral channel - 19.69" (0.5m)②	**74046**	**7.87**	**200**	**20.5**
K1-21 Sloped channel - 39.37" (1m)	**74021**	8.07	205	44.2
K1-22 Sloped channel - 39.37" (1m)	**74022**	8.27	210	45.0
K1-23 Sloped channel - 39.37" (1m)	**74023**	8.46	215	45.8
K1-24 Sloped channel - 39.37" (1m)	**74024**	8.66	220	46.6
K1-25 Sloped channel - 39.37" (1m)②	**74025**	8.86	225	47.4
K1-26 Sloped channel - 39.37" (1m)	**74026**	9.06	230	48.2
K1-27 Sloped channel - 39.37" (1m)	**74027**	9.25	235	49.0

Description	Part No.	Invert Inches²	Invert mm²	Weight Lbs.
K1-28 Sloped channel - 39.37" (1m)	**74028**	9.45	240	49.8
K1-29 Sloped channel - 39.37" (1m)	**74029**	9.65	245	50.6
K1-30 Sloped channel - 39.37" (1m)②	**74030**	9.84	250	51.4
K1-030 Neutral channel - 39.37" (1m)②	**74047**	**9.84**	**250**	**51.4**
K1-0303 Neutral channel - 19.69" (0.5m)②	**74048**	**9.84**	**250**	**24.0**
K1-31 Sloped channel - 39.37" (1m)	**74031**	10.04	255	52.2
K1-32 Sloped channel - 39.37" (1m)	**74032**	10.24	260	53.0
K1-33 Sloped channel - 39.37" (1m)	**74033**	10.43	265	53.8
K1-34 Sloped channel - 39.37" (1m)	**74034**	10.63	270	54.6
K1-35 Sloped channel - 39.37" (1m)②	**74035**	10.83	275	55.4
K1-36 Sloped channel - 39.37" (1m)	**74036**	11.02	280	56.2
K1-37 Sloped channel - 39.37" (1m)	**74037**	11.22	285	57.0
K1-38 Sloped channel - 39.37" (1m)	**74038**	11.42	290	57.9
K1-39 Sloped channel - 39.37" (1m)	**74039**	11.61	295	58.7
K1-40 Sloped channel - 39.37" (1m)②	**74040**	11.81	300	59.5
K1-040 Neutral channel - 39.37" (1m)②	**74049**	**11.81**	**300**	**59.5**
K1-0403 Neutral channel - 19.69" (0.5m)②	**74050**	**11.81**	**300**	**27.5**
K1-901G In-line catch basin - 19.69" (0.5m)②	**94608**	28.81	701.9	52.6
K1-621G catch basin - 19.69" (0.5m)②	**94617**	28.84	732.5	55.8
K1-631G catch basin - 19.69" (0.5m)②	**94631**	40.84	1037.4	65.8
K1-Series 600 Optional plastic riser	**99902**	-	-	10.0
Foul air trap - fits both 900 & 600 series basins	**90854**	-	-	1.2
K1-3046 6' Inlet Cap	**96839**	9.84	250	5.2
K1-3086 6' Outlet Cap	**96840**	9.84	250	5.0
K1-4046 6' Inlet Cap	**96834**	11.81	300	6.0
K1-4086 6' Outlet Cap	**96836**	11.81	300	5.8
Universal end cap	**96822**	11.81	300	0.4
Debris strainer for 4" bottom knockout	**93488**	-	-	0.2
4" Oval to 6" round outlet adapter	**95140**	-	-	1.1
K1-Installation device	**97477**	-	-	2.8
Grate removal tool	**01318**	-	-	0.3
K1-QuickLok locking bar	**02899**	-	-	0.1

Notes:
1. This channel offers a bottom knockout feature; 4" round/6" oval.
2. Inverts shown are for the male end; for female invert depth subtract 5mm (–0.2") from the male invert (except for neutral channels, where it will be same as male invert). To calculate the overall channel depth add 20mm (–0.8") to invert depth.
3. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, trash bucket and plastic base. Select an appropriate grate.
4. This catch basin kit includes a polymer concrete top, removable Quicklok locking bar, deep trash bucket, plastic riser and plastic base. Select an appropriate grate.

Specifications

General
The surface drainage system shall be ACO Drain K100 complete with gratings secured with 'QuickLok' locking as manufactured by ACO, Inc. or approved equal.

Materials
The trench system bodies shall be manufactured from polyester polymer concrete with the minimum properties as follows:

Compressive strength:	14,000 psi
Flexural strength:	4,000 psi
Water absorption	0.07%
Frost proof	YES
Salt proof	YES
Dilute acid and alkali resistant	YES

The nominal clear opening shall be 4" (100mm) with overall width of 5.12" (130mm). Pre-cast units shall be manufactured with either an invert slope of 0.5% or with neutral invert and have a wall thickness of at least 0.50" (13mm). Each unit will feature a partial radius in the trench bottom and a male to female interconnecting end profile. Units shall have horizontal cast in anchoring keys on the outside wall to ensure maximum mechanical bond to the surrounding bedding material and pavement surface. The galvanized steel edge rail will be integrally cast in by the manufacturer to ensure maximum homogeneity between polymer concrete body and edge rail. Each edge rail shall be at least 3/32" (2.5mm) thick.

Grates
Grates shall be specified. See separate ACO Spec Info grate sheets for details. After removal of grates and 'QuickLok' bar there shall be uninterrupted access to the trench to aid maintenance.

Installation
The trench drain system shall be installed in accordance with the manufacturer's installation instructions and recommendations.

ACO, Inc.
Northeast Sales Office
9470 Pinecone Drive
Mentor, OH 44060
Tel: (440) 639-7230
Toll free: (800) 543-4764
Fax: (440) 639-7235

West Sales Office
825 W. Beechcraft St.
Casa Grande, AZ 85122
Tel: (520) 421-9988
Toll Free: (888) 490-9552
Fax: (520) 421-9899

Southeast Sales Office
4211 Pleasant Road
Fort Mill, SC 29708
Toll free: (800) 543-4764
Fax: (803) 802-1063

Electronic Contact:
info@ACODrain.us
www.ACODrain.us

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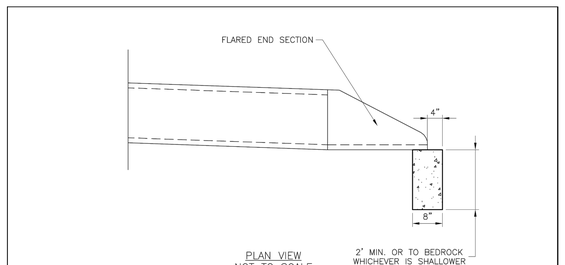
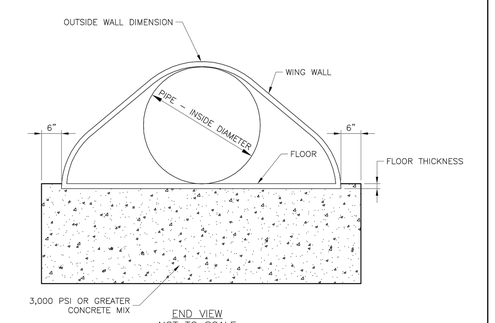
SPEC INFO

April 2018

www.ACODrain.us

ACO Specification Information





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

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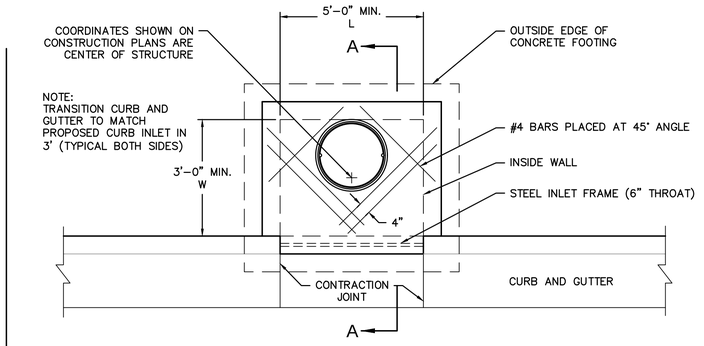
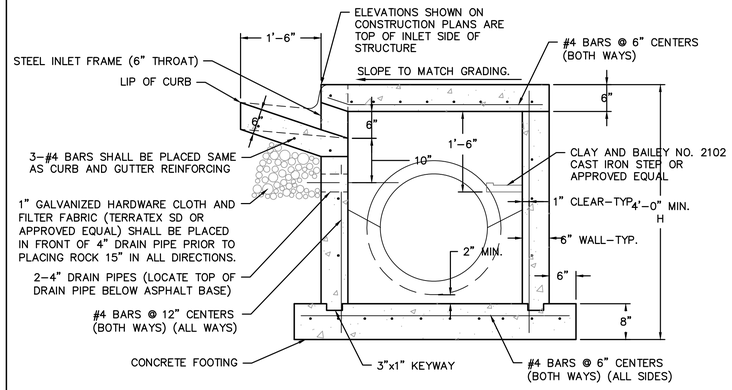


PLAN



SECTION A-A

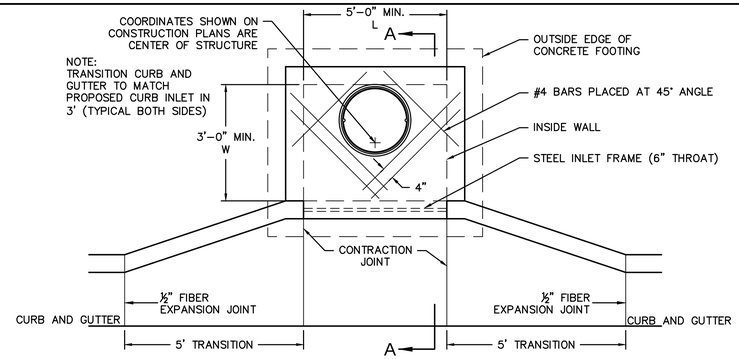
NON-SETBACK CURB INLET

N.T.S.

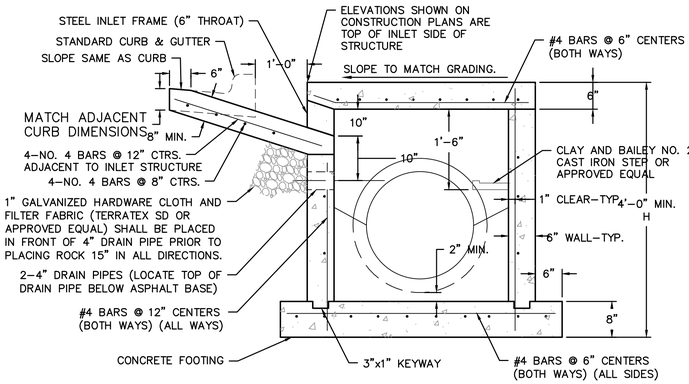
04 CURB INLETS

NOTES:

1. ALL STORM SEWER STRUCTURES SHALL BE PRECAST. PRECAST SHOP DRAWINGS SHALL BE APPROVED BY THE DESIGN ENGINEER.
2. PRECAST SHOP DRAWINGS ARE TO BE APPROVED BY THE CITY ENGINEER FOR PUBLICLY FINANCED OR ADMINISTERED PROJECTS. PRECAST SHOP DRAWINGS FOR PRIVATELY FINANCED PROJECTS ARE TO BE SUBMITTED TO THE ENGINEERING SERVICES DIVISION OF THE PLANNING AND DEVELOPMENT SERVICES DEPARTMENT.
3. DO NOT SCALE THESE DRAWINGS FOR DIMENSIONS OR CLEARANCES. ANY QUESTIONS REGARDING DIMENSIONS SHALL BE BROUGHT TO THE ATTENTION OF THE CITY ENGINEER PRIOR TO CONSTRUCTION.
4. RING & COVER TO BE NEENAH R-1537, CLAY & BAILEY #2020, DEETER #2016, OR APPROVED EQUAL.
5. ON-GRADE INLETS SHALL CONFORM TO THE STREET GRADE AND SUMP INLETS SHALL BE LEVEL.
6. THE FIRST DIMENSION LISTED IN THE CONSTRUCTION NOTES IS THE "L" DIMENSION. THE SECOND DIMENSION IS THE "W" DIMENSION. THE CONCRETE THICKNESS AND REINFORCEMENT SHOWN IS FOR BOXES WITH ("L"+"H") AND ("W"+"H") LESS THEN OR EQUAL TO 20. FOR BOXES WITH EITHER OF THESE CALCULATIONS GREATER THAN 20, A SPECIAL DESIGN IS REQUIRED.
7. CONCRETE USED IN THIS WORK SHALL BE APPROVED BY THE CITY, AND SHALL MEET THE REQUIREMENTS OF THE CITY MUNICIPAL CODE.
8. CONCRETE CONSTRUCTION SHALL MEET THE APPLICABLE REQUIREMENTS OF STANDARD SPECIFICATIONS FOR STATE ROAD AND BRIDGE CONSTRUCTION, DEPARTMENT OF TRANSPORTATION, LATEST EDITION, EXCEPT AS MODIFIED IN THE CITY MUNICIPAL CODE.
9. INLET FLOORS SHALL BE SHAPED WITH NON-REINFORCED CONCRETE INVERTS TO PROVIDE SMOOTH FLOW.
10. BEVEL ALL EXPOSED EDGES WITH 3/4" TRIANGULAR MOLDING.
11. REINFORCING STEEL SHALL BE NEW BILLET, MINIMUM GRADE 60 AS PER ASTM A615M, AND SHALL BE BENT COLD.
12. ALL DIMENSIONS RELATIVE TO REINFORCING STEEL ARE TO CENTERLINE OF BARS. 2" CLEARANCE SHALL BE PROVIDED THROUGHOUT UNLESS NOTED OTHERWISE. TOLERANCE OF +/- 1/8"SHALL BE PERMITTED.
13. ALL LAP SPLICES NOT SHOWN SHALL BE A MINIMUM OF 40 BAR DIAMETERS IN LENGTH.
14. ALL REINFORCING STEEL SHALL BE SUPPORTED ON FABRICATED STEEL BAR SUPPORTS @ 3'-0" MAXIMUM SPACING.
15. ALL DOWELS SHALL BE ACCURATELY PLACED AND SECURELY TIED IN PLACE PRIOR TO PLACEMENT OF BOTTOM SLAB CONCRETE. STICKING OF DOWELS INTO FRESH OR PARTIALLY HARDENED CONCRETE WILL NOT BE ACCEPTABLE.
16. PIPE CONNECTIONS TO PRE-CAST STRUCTURES SHALL HAVE A MINIMUM OF 6" OF CONCRETE AROUND THE ENTIRE PIPE WITHIN 2' OF THE STRUCTURE.
17. MATERIAL SELECTION AND COMPACTION REQUIREMENTS FOR BACKFILL AROUND STRUCTURES SHALL BE AS SPECIFIED IN THE GEOTECHNICAL REPORT.



PLAN



SECTION A-A

SETBACK CURB INLET

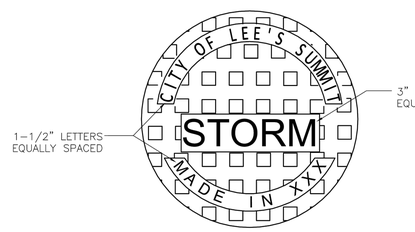
olsson
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS



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
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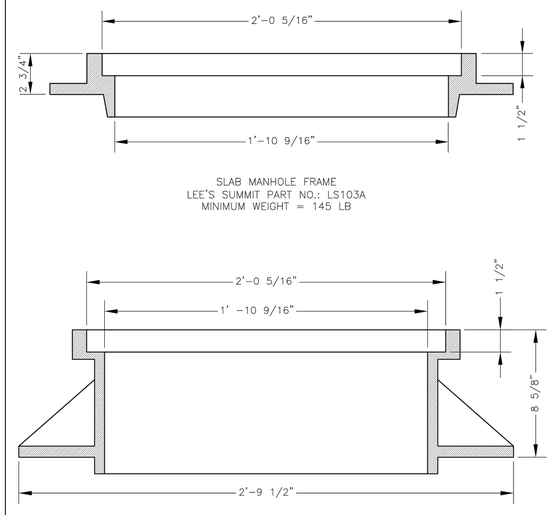
STORM MANHOLE COVER DETAIL

Date: 04/17
Drawn By: MJF
Checked By: DL
STM-6



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.

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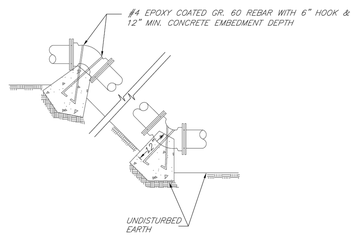
STORM MANHOLE FRAME DETAIL

Date: 04/17
Drawn By: MJF
Checked By: DL
STM-7

REQUIRED CONCRETE VOLUME (CUBIC FEET – CF)

NOM. DIA. (INCHES)	180 TEE, PLUG	90 BEND	45 BEND	22.5 BEND	11.25 BEND
6	50.5	71.4	38.6	19.7	9.9
8	89.8	126.9	68.7	35.0	17.6
10	140.2	198.3	107.3	54.7	27.5
12	202.0	REST. JT.	154.6	78.8	39.6
14	REST. JT.	REST. JT.	210.4	107.3	53.9
16	REST. JT.	REST. JT.	REST. JT.	140.1	70.4
18	REST. JT.	REST. JT.	REST. JT.	177.3	89.1
20	REST. JT.	REST. JT.	REST. JT.	REST. JT.	110.0
24	REST. JT.	REST. JT.	REST. JT.	REST. JT.	158.4

NOTES:
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
3. BEARING MUST BE AGAINST UNDISTURBED SOIL.
4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



LEE'S SUMMIT
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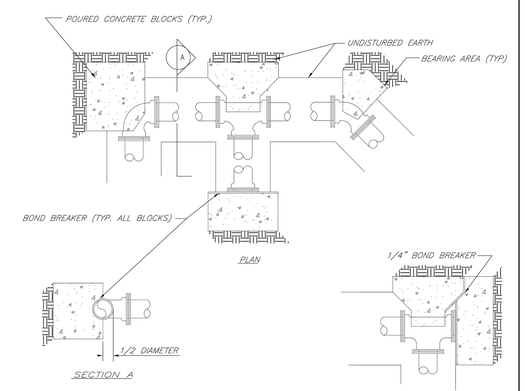
VERTICAL THRUST BLOCKS

Date: 02/13
Drawn By: JN
Checked By: DL
FILE: WAT-2
Rev: 1/14
Rev:

REQUIRED CONCRETE BEARING AREA (SQUARE FEET – SF)

NOM. DIA. (INCHES)	180 TEE, PLUG	90 BEND	45 BEND	22.5 BEND	11.25 BEND
6	4.7	6.7	4.0	4.0	4.0
8	8.4	11.8	6.4	4.0	4.0
10	13.1	18.5	10.0	5.1	4.0
12	18.8	26.7	14.4	7.4	4.0
14	25.7	36.3	19.6	10.0	5.0
16	33.5	47.4	25.6	13.1	6.6
18	42.4	REST. JT.	32.5	16.5	8.3
20	REST. JT.	REST. JT.	40.1	20.4	10.3
24	REST. JT.	REST. JT.	REST. JT.	29.4	14.8

NOTES:
1. ALL BENDS WITHOUT RESTRAINED JOINTS SHALL HAVE CONCRETE THRUST BLOCKS INSTALLED FOR RESTRAINT.
2. MEGA LUGS MAY BE USED ONLY IN CONJUNCTION WITH CONCRETE THRUST BLOCKING.
3. BEARING AREA MUST BE AGAINST UNDISTURBED SOIL.
4. DO NOT COVER JOINTS OR BOLTS (WHERE APPLICABLE) WITH CONCRETE.



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

HORIZONTAL THRUST BLOCKS

Date: 02/13
Drawn By: JN
Checked By: DL
FILE: WAT-1
Rev: 1/14
Rev:

DETAIL SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

2020

LEE'S SUMMIT, MO

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C905

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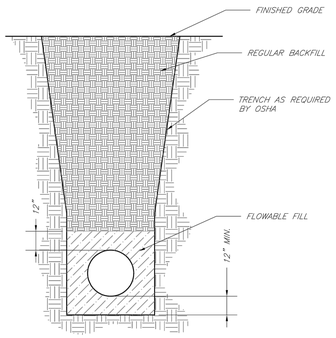

NOT TO SCALE

NOTES:
1. FLOWABLE FILL SHALL MEET THE REQUIREMENTS OF THE CITY OF LEE'S SUMMIT DESIGN AND CONSTRUCTION MANUAL.
2. REGULAR BACKFILL ABOVE THE TRENCH CHECK SHALL BE FREE OF DEBRIS, ORGANIC MATTER, AND STONES > 6" IN ANY DIMENSION.
3. TOP OF FLOWABLE BACKFILL SHALL EXTEND 12" ABOVE THE TOP OF THE PIPE.
4. LENGTH OF TRENCH CHECK SHALL BE A MINIMUM OF 12".

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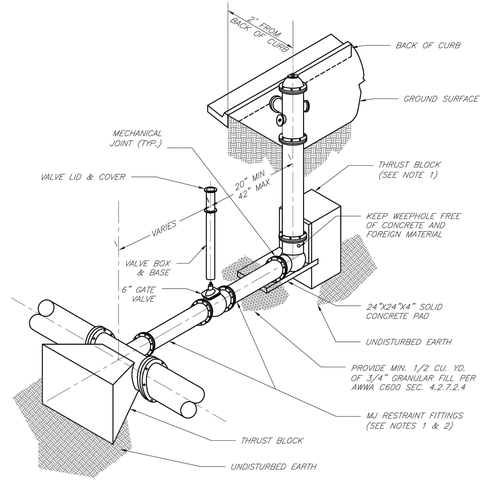
PUBLIC WORKS ENGINEERING DIVISION | 220 SE GREEN STREET | LEE'S SUMMIT, MO 64063

TRENCH CHECK

Date: 02/13 | Drawn By: JN | Checked By: DL | FILE: WAT-6 | Rev: 1/14 | Rev:

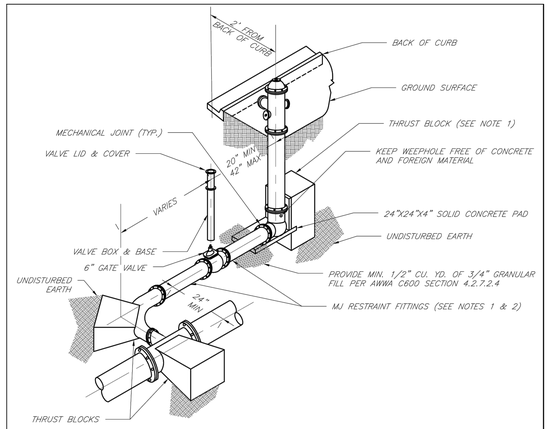


NOTES:
1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
4. BOTTOM HYDRANT FLANGE SHALL BE 2" TO 6" ABOVE FINISHED GRADE.
5. FOR STREETS WITHOUT CURBS FIRE HYDRANTS SHALL BE PLACED WITHIN 1 FOOT OF THE R/W LINE, BUT NOT MORE THAN 10' FROM EDGE OF PAVEMENT. FIRE HYDRANT SHALL NOT BE PLACED IN BOTTOM OF DITCH.
6. HYDRANT SHALL BE ROTATED AS DIRECTED BY INSPECTOR.

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

HYDRANT INSTALLATION – STRAIGHT SET

Date: 02/13 | Drawn By: JN | Checked By: DL | FILE: WAT-7 | Rev: 1/14 | Rev:

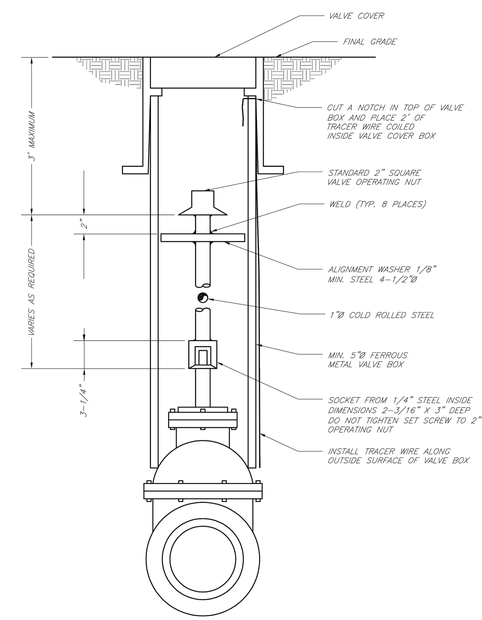


NOTES:
1. WHEN RETAINER GLANDS ARE USED IN LIEU OF MECHANICAL JOINT (MJ) RESTRAINT FITTINGS, HORIZONTAL THRUST BLOCKS ARE REQUIRED.
2. GATE VALVE MAY BE BOLTED DIRECTLY TO MJ RESTRAINT TEE.
3. SEE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR FIRE HYDRANT, VALVES, VALVE BOX LID, AND COVER.
4. BOTTOM HYDRANT FLANGE SHALL BE 2" TO 6" ABOVE FINISHED GRADE.
5. FOR STREETS WITHOUT CURBS FIRE HYDRANTS SHALL BE PLACED WITHIN 1 FOOT OF THE R/W LINE, BUT NOT MORE THAN 10' FROM EDGE OF PAVEMENT. FIRE HYDRANT SHALL NOT BE PLACED IN BOTTOM OF DITCH.
6. HYDRANT SHALL BE ROTATED AS DIRECTED BY INSPECTOR.

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

HYDRANT WITH 90 DEGREE BEND

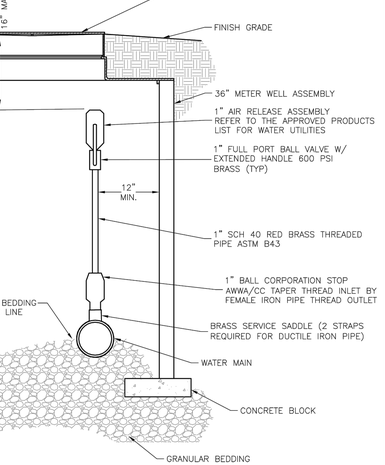
Date: 02/13 | Drawn By: JN | Checked By: DL | FILE: WAT-8 | Rev: 1/14 | Rev:



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

VALVE STEM EXTENSION AND VALVE BOX

Date: 02/13 | Drawn By: JN | Checked By: DL | FILE: WAT-9 | Rev: 1/14 | Rev:

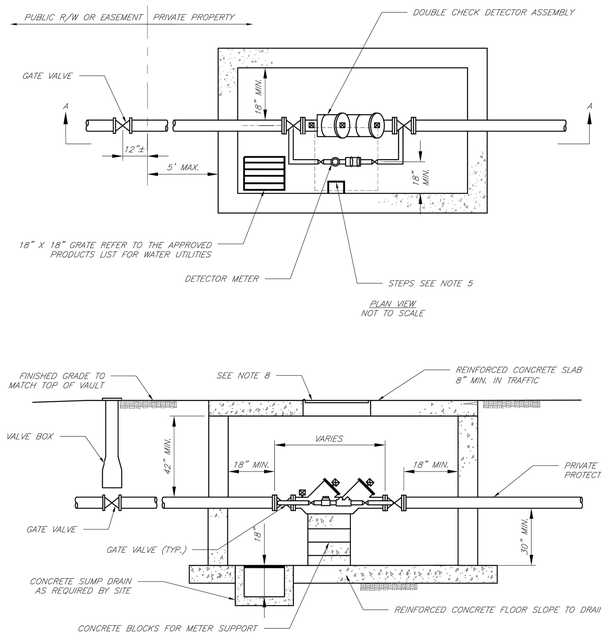


AIR RELEASE ASSEMBLY
NOT TO SCALE

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

AIR RELEASE ASSEMBLY

Date: 04/17 | Drawn By: MJF | Checked By: DL | WAT-10



PLAN VIEW
NOT TO SCALE

SECTION A-A
NOT TO SCALE

GENERAL NOTES:
1. METER VAULT WALLS TO BE POURED OR PRECAST CONCRETE. METER VAULT ROOF TO BE REINFORCED CONCRETE WITH OPENING CENTERED OVER DETECTOR METER. REINFORCED WALLS AND SLABS ARE TO BE DESIGNED BY THE OWNER'S ENGINEER OR PRECAST ENGINEER.
2. METER VAULT TO BE LOCATED, WHEN POSSIBLE, OUTSIDE TRAFFIC AREA AND WHERE SURFACE WATER WILL NOT DRAIN INTO IT. PROVIDE CONCRETE SUMP TO DRAIN TO AN ABOVE GROUND DISCHARGE POINT.
3. ALL PIPE AND FITTINGS FROM THE CITY WATER MAIN THROUGH THE VAULT SHALL BE PROVIDED WITH RESTRAINED JOINT FITTINGS.
4. ALL FITTINGS FOR THE DETECTOR METER TO BE BRASS.
5. STEPS SHALL BE IN ACCORDANCE WITH THE APPROVED PRODUCTS LIST FOR WATER UTILITIES AND SHALL BE ON 16" CENTERS.
6. A DEPARTMENT OF NATURAL RESOURCES APPROVED DOUBLE CHECK DETECTOR ASSEMBLY BACKFLOW PREVENTER MUST BE USED. FOR A COPY OF THE MISSOURI DEPARTMENT OF NATURAL RESOURCES APPROVED BACKFLOW PREVENTION ASSEMBLIES, CONTACT WATER UTILITIES AT 816-969-1900.
7. ALL VALVES SHALL HAVE RISING STEMS.
8. MANHOLE COVER SHALL BE A BILCO K-1 MODEL UNLESS IN A VEHICLE TRAFFIC AREA. SEE THE APPROVED PRODUCTS LIST FOR WATER UTILITIES FOR TRAFFIC CONDITIONS. THE COVER SHALL HAVE A 1-3/4" ø HOLE DRILLED FOR A TOUCH/READ DEVICE.
9. A MINIMUM OF 18" CLEARANCE SHALL BE PROVIDED AROUND ALL PIPING, VALVES, APPURTENANCES, ETC.
10. CONTACT PUBLIC WORKS ENGINEERING FOR VAULTS THAT INCLUDE A FIRE DEPARTMENT CONNECTION OR A 3" OR LARGER METER.

CITY OF LEE'S SUMMIT, MO
PUBLIC WORKS DEPARTMENT
ENGINEERING DIVISION
220 SE Green Street
LEE'S SUMMIT, MO 64063

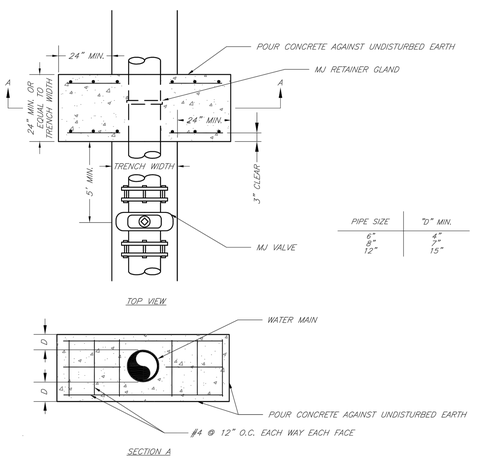
STANDARD DRAWINGS

Project: | Sheet Name: VAULT FOR DOUBLE CHECK DETECTOR CHECK

Drawn By: AS | Checked By: DL | Date: 1/14 | Rev: 1/14

or

WAT-12



NOTE:
THIS DETAIL NOT TO BE USED FOR PIPE GREATER THAN 12"

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

STRADDLE BLOCK

Date: 02/13 | Drawn By: JN | Checked By: DL | FILE: WAT-3 | Rev: 1/14 | Rev:

olsson

OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
3101 BROADWAY, SUITE 500
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV.	DATE	BY	REVISIONS DESCRIPTION
			REVISIONS

DETAIL SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C906

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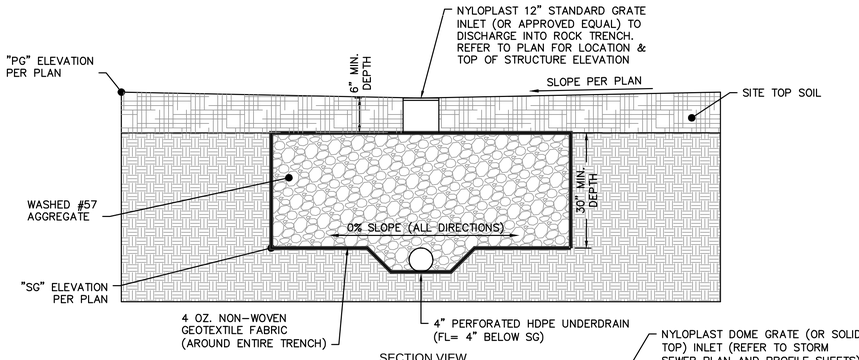
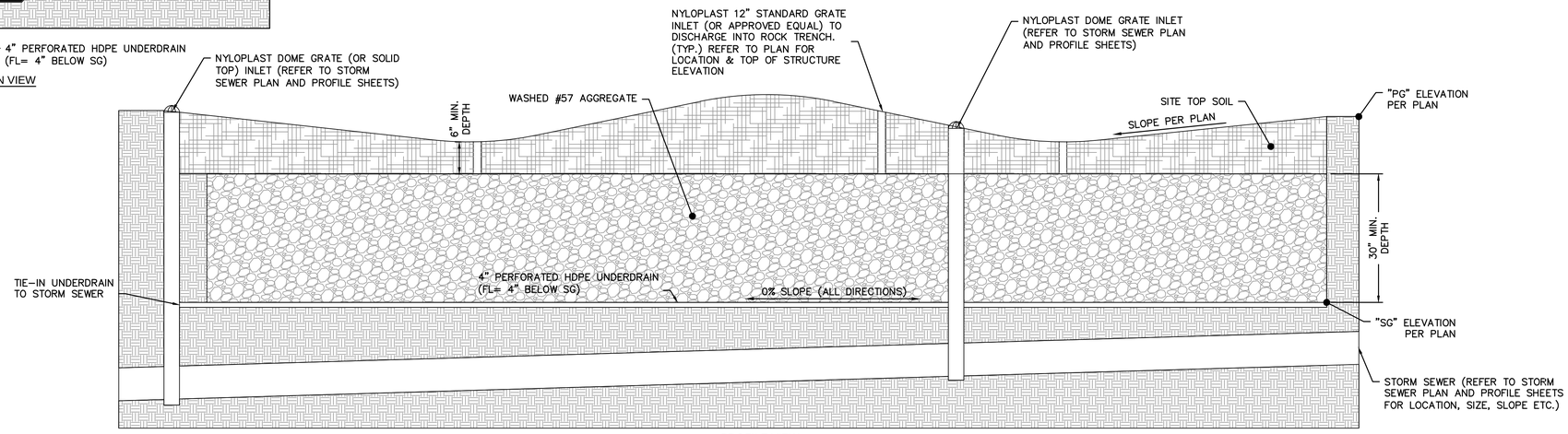
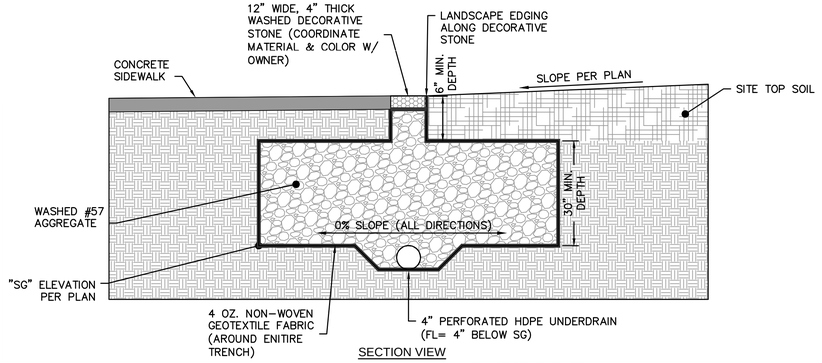
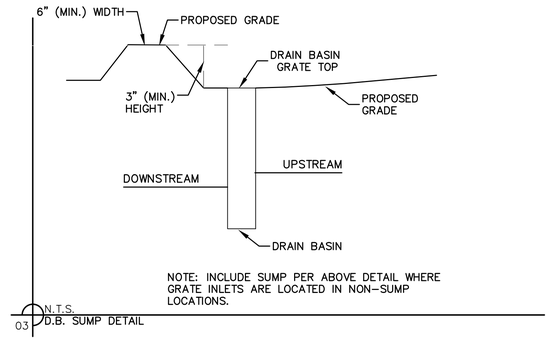




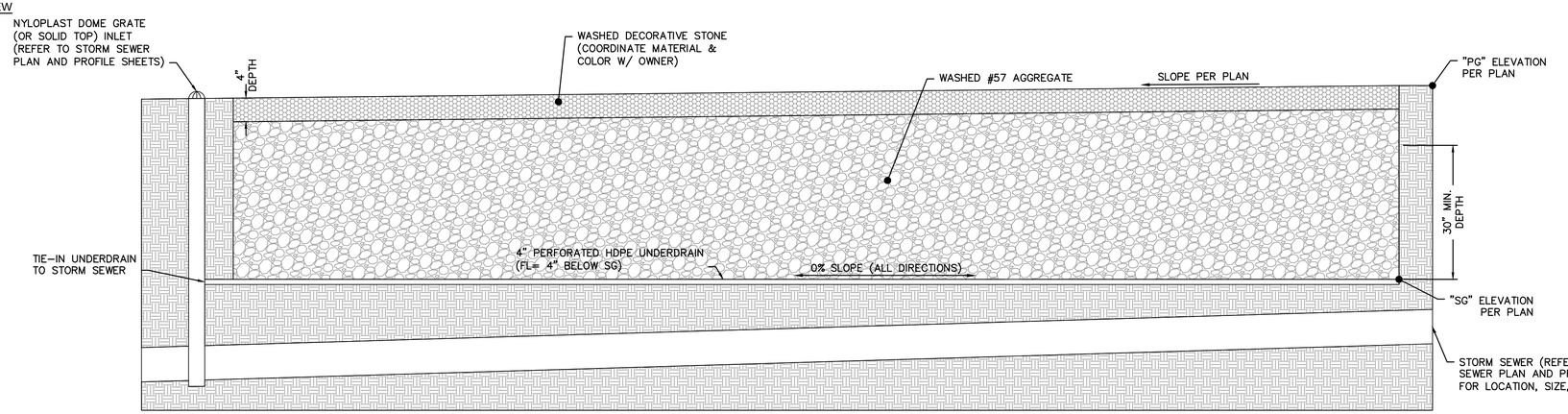
01 N.T.S.
INFILTRATION TRENCH DETAIL A





NOTE: INCLUDE SUMP PER ABOVE DETAIL WHERE GRATE INLETS ARE LOCATED IN NON-SUMP LOCATIONS.

03 N.T.S.
D.B. SUMP DETAIL



02 N.T.S.
INFILTRATION TRENCH DETAIL B

olsson
OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
KS CERTIFICATE OF AUTHORITY #: E-2045
1301 MCGEE STREET, SUITE 500
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177
www.olsson.com

STATE OF MISSOURI
NICHOLAS D. HEISER
08/27/2020
NUMBER PE-2015000555
PROFESSIONAL ENGINEER

NICHOLAS D. HEISER, P.E.
MO# 2015000555

NO. REV	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

DETAIL SHEET
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
C907

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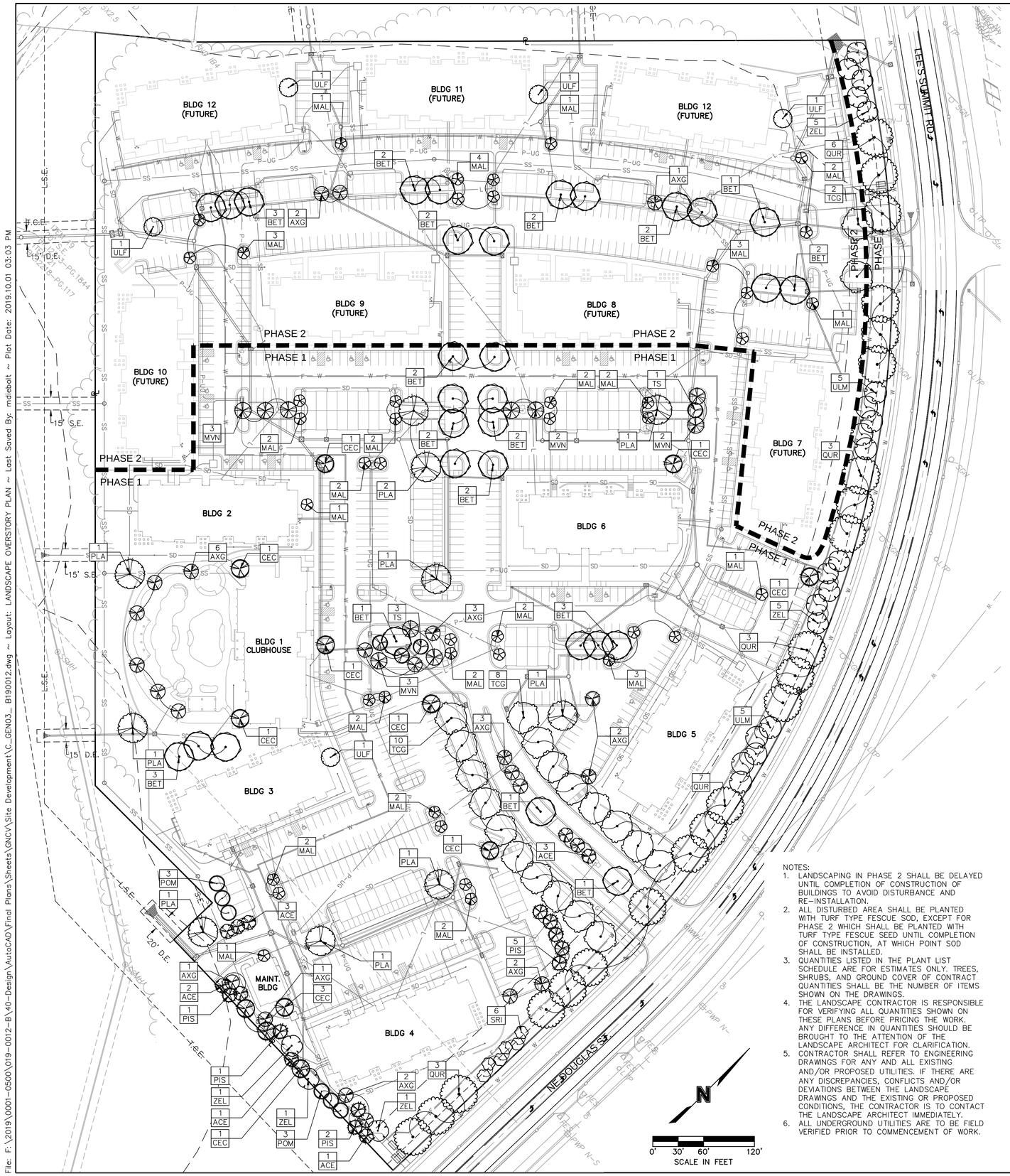

NOTES:

1. LANDSCAPING IN PHASE 2 SHALL BE DELAYED UNTIL COMPLETION OF CONSTRUCTION OF BUILDINGS TO AVOID DISTURBANCE AND RE-INSTALLATION.
2. ALL DISTURBED AREA SHALL BE PLANTED WITH TURF TYPE FESCUE SOD, EXCEPT FOR PHASE 2 WHICH SHALL BE PLANTED WITH TURF TYPE FESCUE SEED UNTIL COMPLETION OF CONSTRUCTION, AT WHICH POINT SOD SHALL BE INSTALLED.
3. QUANTITIES LISTED IN THE PLANT LIST SCHEDULE ARE FOR ESTIMATES ONLY. TREES, SHRUBS, AND GROUND COVER OF CONTRACT QUANTITIES SHALL BE THE NUMBER OF ITEMS SHOWN ON THE DRAWINGS.
4. THE LANDSCAPE CONTRACTOR IS RESPONSIBLE FOR VERIFYING ALL QUANTITIES SHOWN ON THESE PLANS BEFORE PRICING THE WORK. ANY DIFFERENCE IN QUANTITIES SHOULD BE BROUGHT TO THE ATTENTION OF THE LANDSCAPE ARCHITECT FOR CLARIFICATION.
5. CONTRACTOR SHALL REFER TO ENGINEERING DRAWINGS FOR ANY AND ALL EXISTING AND/OR PROPOSED UTILITIES. IF THERE ARE ANY DISCREPANCIES, CONFLICTS AND/OR DEVIATIONS BETWEEN THE LANDSCAPE DRAWINGS AND THE EXISTING OR PROPOSED CONDITIONS, THE CONTRACTOR IS TO CONTACT THE LANDSCAPE ARCHITECT IMMEDIATELY.
6. ALL UNDERGROUND UTILITIES ARE TO BE FIELD VERIFIED PRIOR TO COMMENCEMENT OF WORK.

PLANT SCHEDULE OVERALL

DECIDUOUS TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION
	ACE	10	ACER GRISEUM	PAPERBARK MAPLE	3" CAL.	B&B
	BET	31	BETULA NIGRA 'HERITAGE'	HERITAGE RIVER BIRCH	3" CAL.	B&B
	PLA	10	PLATANUS X ACERIFOLIA 'EXCLAMATION' TM	EXCLAMATION LONDON PLANE TREE	3" CAL.	B&B
	QUR	22	QUERCUS RUBRA	RED OAK	3" CAL.	B&B
	TS	4	TAXODIUM DISTICHUM 'SHAWNEE BRAVE' TM	BALD CYPRESS	3" CAL.	B&B
	TCG	20	TILIA CORDATA 'GREENSPIRE'	GREENSPIRE LITTLELEAF LINDEN	3" CAL.	B&B
	ULF	5	ULMUS X 'FRONTIER'	AMERICAN ELM	3" CAL.	B&B
	ULM	10	ULMUS X 'PATRIOT'	ELM	3" CAL.	B&B
	ZEL	13	ZELKOVA SERRATA 'GREEN VASE'	GREEN VASE SAWLEAF ZELKOVA	3" CAL.	B&B
EVERGREEN TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION
	POM	6	PICEA OMORIKA	SERBIAN SPRUCE	8' HT	B&B
	PIS	9	PINUS STROBUS	WHITE PINE	8' HT	B&B
ORNAMENTAL TREES	CODE	QTY	BOTANICAL NAME	COMMON NAME	SIZE	CONDITION
	AXG	23	AMELANCHIER X GRANDIFLORA	APPLE SERVICEBERRY	3" CAL.	B&B
	CEC	12	CERCIS CANADENSIS	EASTERN REDBUD	3" CAL.	B&B
	MVN	10	MAGNOLIA VIRGINIANA 'NORTHERN BELLE'	NORTHERN BELLE SWEET BAY MAGNOLIA	3" CAL.	B&B
	MAL	43	MALUS X 'ROYAL RAINDROPS'	ROYAL RAINDROPS CRABAPPLE	3" CAL.	B&B
	SRI	6	SYRINGA RETICULATA 'IVORY SILK'	IVORY SILK JAPANESE TREE LILAC	3" CAL.	B&B

PLANT SCHEDULE PHASE 1

DECIDUOUS TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	CONDITION
	ACE	10	ACER GRISEUM / PAPERBARK MAPLE	3" CAL.	B&B
	BET	14	BETULA NIGRA 'HERITAGE' / HERITAGE RIVER BIRCH	3" CAL.	B&B
	PLA	10	PLATANUS X ACERIFOLIA 'EXCLAMATION' TM / EXCLAMATION LONDON PLANE TREE	3" CAL.	B&B
	QUR	5	QUERCUS RUBRA / RED OAK	3" CAL.	B&B
	TS	4	TAXODIUM DISTICHUM 'SHAWNEE BRAVE' TM / BALD CYPRESS	3" CAL.	B&B
	TCG	17	TILIA CORDATA 'GREENSPIRE' / GREENSPIRE LITTLELEAF LINDEN	3" CAL.	B&B
	ULF	1	ULMUS X 'FRONTIER' / AMERICAN ELM	3" CAL.	B&B
	ZEL	8	ZELKOVA SERRATA 'GREEN VASE' / GREEN VASE SAWLEAF ZELKOVA	3" CAL.	B&B
EVERGREEN TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	CONDITION
	POM	6	PICEA OMORIKA / SERBIAN SPRUCE	8' HT	B&B
	PIS	9	PINUS STROBUS / WHITE PINE	8' HT	B&B
ORNAMENTAL TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	CONDITION
	AXG	20	AMELANCHIER X GRANDIFLORA / APPLE SERVICEBERRY	3" CAL.	B&B
	CEC	11	CERCIS CANADENSIS / EASTERN REDBUD	3" CAL.	B&B
	MVN	10	MAGNOLIA VIRGINIANA 'NORTHERN BELLE' / NORTHERN BELLE SWEET BAY MAGNOLIA	3" CAL.	B&B
	MAL	27	MALUS X 'ROYAL RAINDROPS' / ROYAL RAINDROPS CRABAPPLE	3" CAL.	B&B
	SRI	6	SYRINGA RETICULATA 'IVORY SILK' / IVORY SILK JAPANESE TREE LILAC	3" CAL.	B&B

PLANT SCHEDULE PHASE 2

DECIDUOUS TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	CONDITION
	BET	16	BETULA NIGRA 'HERITAGE' / HERITAGE RIVER BIRCH	3" CAL.	B&B
	TCG	2	TILIA CORDATA 'GREENSPIRE' / GREENSPIRE LITTLELEAF LINDEN	3" CAL.	B&B
	ULF	4	ULMUS X 'FRONTIER' / AMERICAN ELM	3" CAL.	B&B
ORNAMENTAL TREES	CODE	QTY	BOTANICAL / COMMON NAME	SIZE	CONDITION
	AXG	3	AMELANCHIER X GRANDIFLORA / APPLE SERVICEBERRY	3" CAL.	B&B
	MAL	15	MALUS X 'ROYAL RAINDROPS' / ROYAL RAINDROPS CRABAPPLE	3" CAL.	B&B

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY # 2003592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
CHRISTOPHER J. HOLMQUIST
NUMBER LA-2019026430
PROFESSIONAL LANDSCAPE ARCHITECT

2020.08.27
CHRIS HOLMQUIST, P.L.A.
MO# 2019026430

REVISIONS

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

LANDSCAPE OVERSTORY PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
L301

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HARDWOOD MULCH
PLANTING BED W/
SHOVEL-CUT EDGE (TYP.)

PHASE 2

PHASE 1

PLANT SCHEDULE - OVERALL

DECIDUOUS SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	CF	130	CORNUS SERICEA 'FARROW' / ARCTIC FIRE RED TWG DOGWOOD	3 GAL
	HR	17	HYDRANGEA QUERCIFOLIA 'RUBY SLIPPERS' / RUBY SLIPPERS HYDRANGEA	5 GAL
	RG	99	RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC	3 GAL
EVERGREEN SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BG	343	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	166	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	53	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	173	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	64	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	160	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	11	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	115	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BB	45	BOUTELOUA GRACILIS 'BLONDE AMBITION' / BLONDE AMBITION BLUE GRAMA	3 GAL
	CK	345	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL
	ST	108	SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPSEED	1 GAL
GROUND COVERS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	EH	602	EQUISETUM HYEMALE / HORSETAIL REED	1 GAL
	LC	449	LOBELIA CARDINALIS / CARDINAL FLOWER	1 GAL

PLANT SCHEDULE PHASE 1

DECIDUOUS SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	CF	130	CORNUS SERICEA 'FARROW' / ARCTIC FIRE RED TWG DOGWOOD	3 GAL
	HR	17	HYDRANGEA QUERCIFOLIA 'RUBY SLIPPERS' / RUBY SLIPPERS HYDRANGEA	5 GAL
	RG	99	RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC	3 GAL
EVERGREEN SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BG	163	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	67	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	25	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	79	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	27	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	88	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	4	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	61	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BB	45	BOUTELOUA GRACILIS 'BLONDE AMBITION' / BLONDE AMBITION BLUE GRAMA	3 GAL
	CK	170	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL
	ST	108	SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPSEED	1 GAL
GROUND COVERS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	EH	602	EQUISETUM HYEMALE / HORSETAIL REED	1 GAL
	LC	449	LOBELIA CARDINALIS / CARDINAL FLOWER	1 GAL

PLANT SCHEDULE PHASE 2

EVERGREEN SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	BG	209	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	99	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	28	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	44	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	39	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	72	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	7	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	48	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	CK	175	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL

NOTES:
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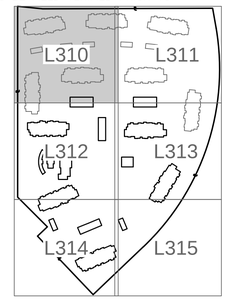

SITE PLAN
KEY MAP
NOT TO SCALE

SCALE IN FEET
0' 10' 20' 40'

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MO CERTIFICATE OF AUTHORITY # 001592
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www.olsson.com

STATE OF MISSOURI
CHRISTOPHER J. HOLMQUIST
NUMBER PLA-2019026430
LANDSCAPE ARCHITECT
2020.08.27
CHRIS HOLMQUIST, P.L.A.
MO# 2019026430

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
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LANDSCAPE UNDERSTORY PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
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SHEET
L310

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\QNCV\Site Development\C_LSP01_ B190012.dwg ~ Layout: LANDSCAPE UNDERSTORY PLAN ~ Last Saved By: cholmquist ~ Plot Date: 2019.10.01 03:03 PM

HARDWOOD MULCH PLANTING BED W/ SHOVEL-CUT EDGE (TYP.)

PHASE 1
PHASE 2

PHASE 2
PHASE 1

PHASE 2
PHASE 1

PLANT SCHEDULE - OVERALL

DECIDUOUS SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	CF	130	CORNUS SERICEA 'FARROW' / ARCTIC FIRE RED TWIG DOGWOOD	3 GAL
	HR	17	HYDRANGEA QUERCIFOLIA 'RUBY SLIPPERS' / RUBY SLIPPERS HYDRANGEA	5 GAL
	RG	99	RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC	3 GAL
EVERGREEN SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BG	343	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	166	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	53	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	173	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	64	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	160	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	11	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	115	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BB	45	BOUTELOUA GRACILIS 'BLONDE AMBITION' / BLONDE AMBITION BLUE GRAMA	3 GAL
	CK	345	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL
	ST	108	SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPSEED	1 GAL
GROUND COVERS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	EH	602	EQUISETUM HYEMALE / HORSETAIL REED	1 GAL
	LC	449	LOBELIA CARDINALIS / CARDINAL FLOWER	1 GAL

PLANT SCHEDULE PHASE 1

DECIDUOUS SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	CF	130	CORNUS SERICEA 'FARROW' / ARCTIC FIRE RED TWIG DOGWOOD	3 GAL
	HR	17	HYDRANGEA QUERCIFOLIA 'RUBY SLIPPERS' / RUBY SLIPPERS HYDRANGEA	5 GAL
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EVERGREEN SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BG	163	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	67	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	25	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	79	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	27	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	88	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	4	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	61	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
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	BB	45	BOUTELOUA GRACILIS 'BLONDE AMBITION' / BLONDE AMBITION BLUE GRAMA	3 GAL
	CK	170	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL
	ST	108	SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPSEED	1 GAL
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PLANT SCHEDULE PHASE 2

EVERGREEN SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	BG	209	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	99	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	28	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	44	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	39	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	72	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	7	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	48	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	CK	175	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL

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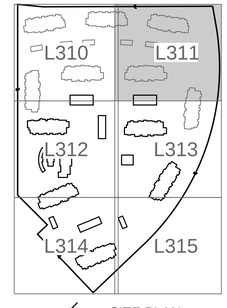

SITE PLAN KEY MAP
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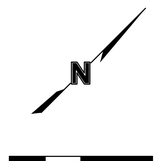

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ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

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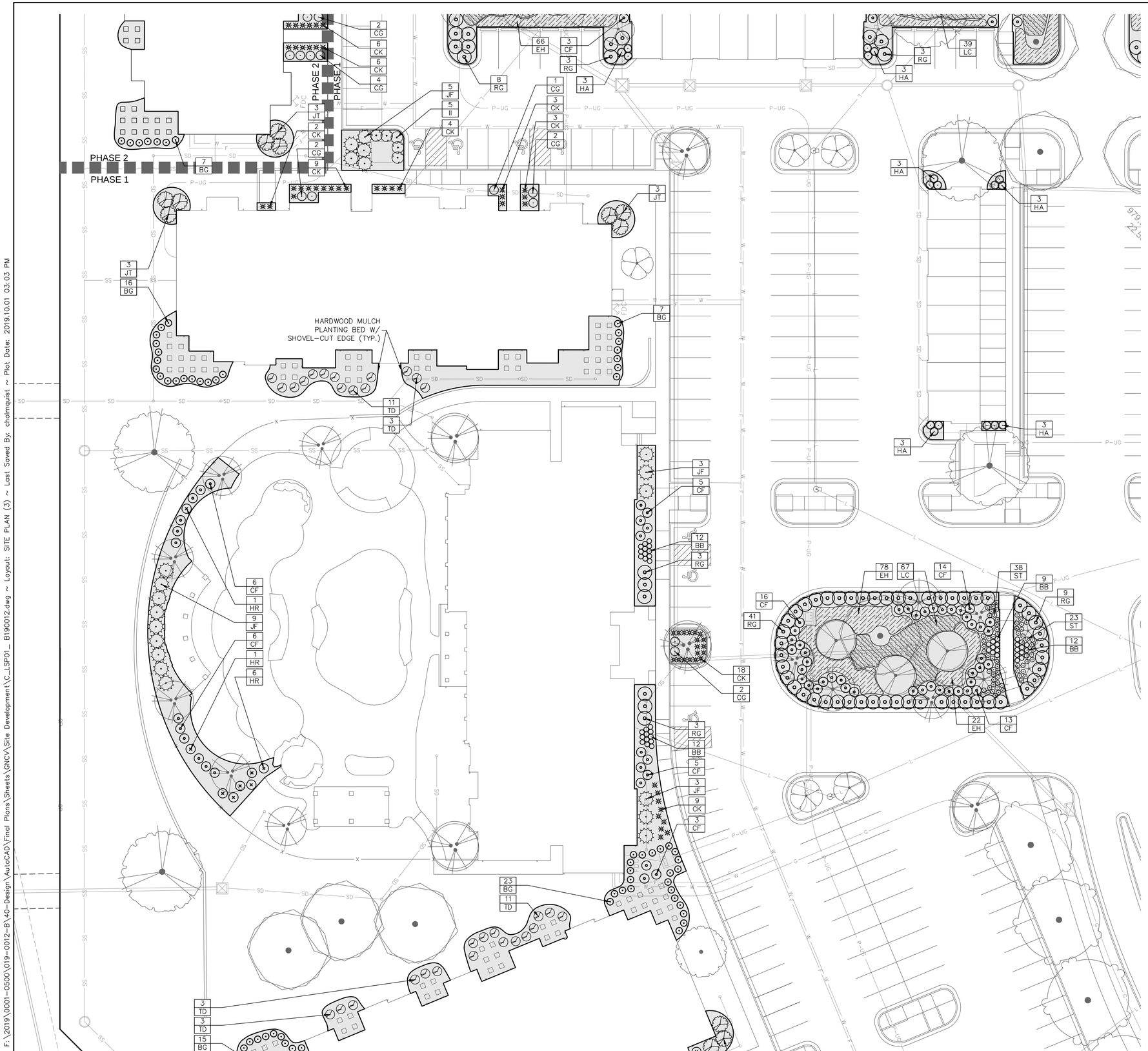

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PLANT SCHEDULE PHASE 2

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	BG	209	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	99	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
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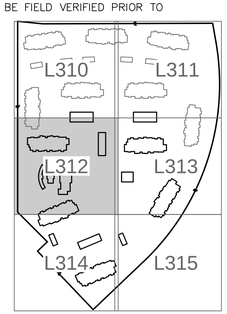

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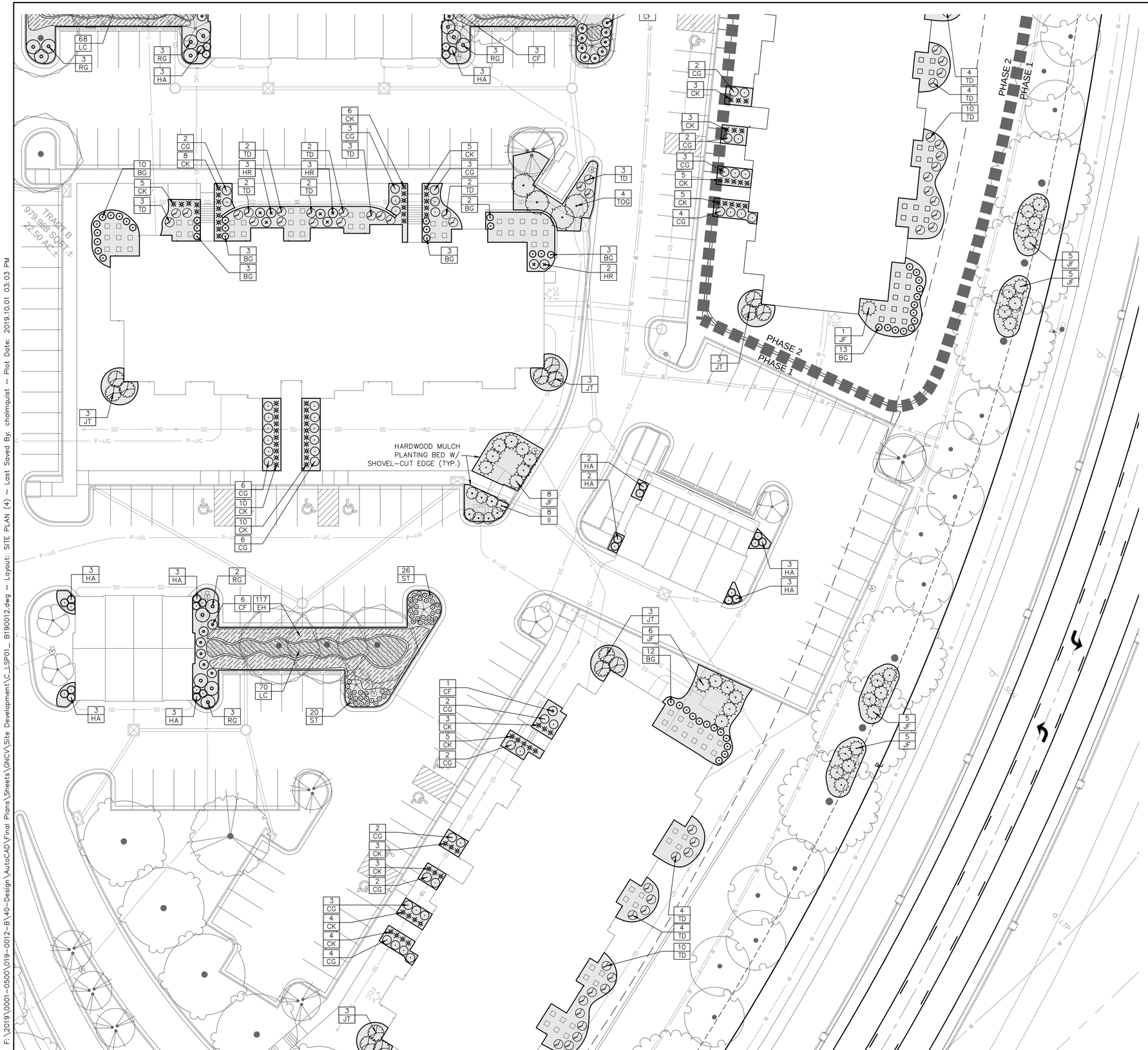

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GROUND COVERS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	EH	602	EQUISETUM HYEMALE / HORSETAIL REED	1 GAL
	LC	449	LOBELIA CARDINALIS / CARDINAL FLOWER	1 GAL

PLANT SCHEDULE PHASE 2

EVERGREEN SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	BG	209	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	99	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	28	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	44	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	39	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	72	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	7	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	46	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	CK	175	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL

NOTES:
1. LANDSCAPING IN PHASE 2 SHALL BE DELAYED UNTIL COMPLETION OF CONSTRUCTION OF BUILDINGS TO AVOID DISTURBANCE AND RE-INSTALLATION.
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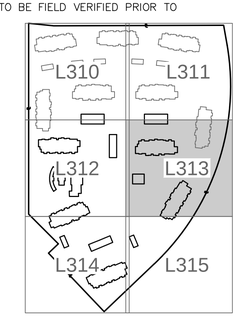

SITE PLAN
KEY MAP
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0' 10' 20' 40'
SCALE IN FEET

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MO CERTIFICATE OF AUTHORITY #:001592
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NORTH KANSAS CITY, MO 64116
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STATE OF MISSOURI
CHRISTOPHER J. HOLMQUIST
NUMBER PLA-2019026430
PROFESSIONAL LANDSCAPE ARCHITECT
2020.08.27
CHRIS HOLMQUIST, P.L.A.
MO# 2019026430

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

LANDSCAPE UNDERSTORY PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

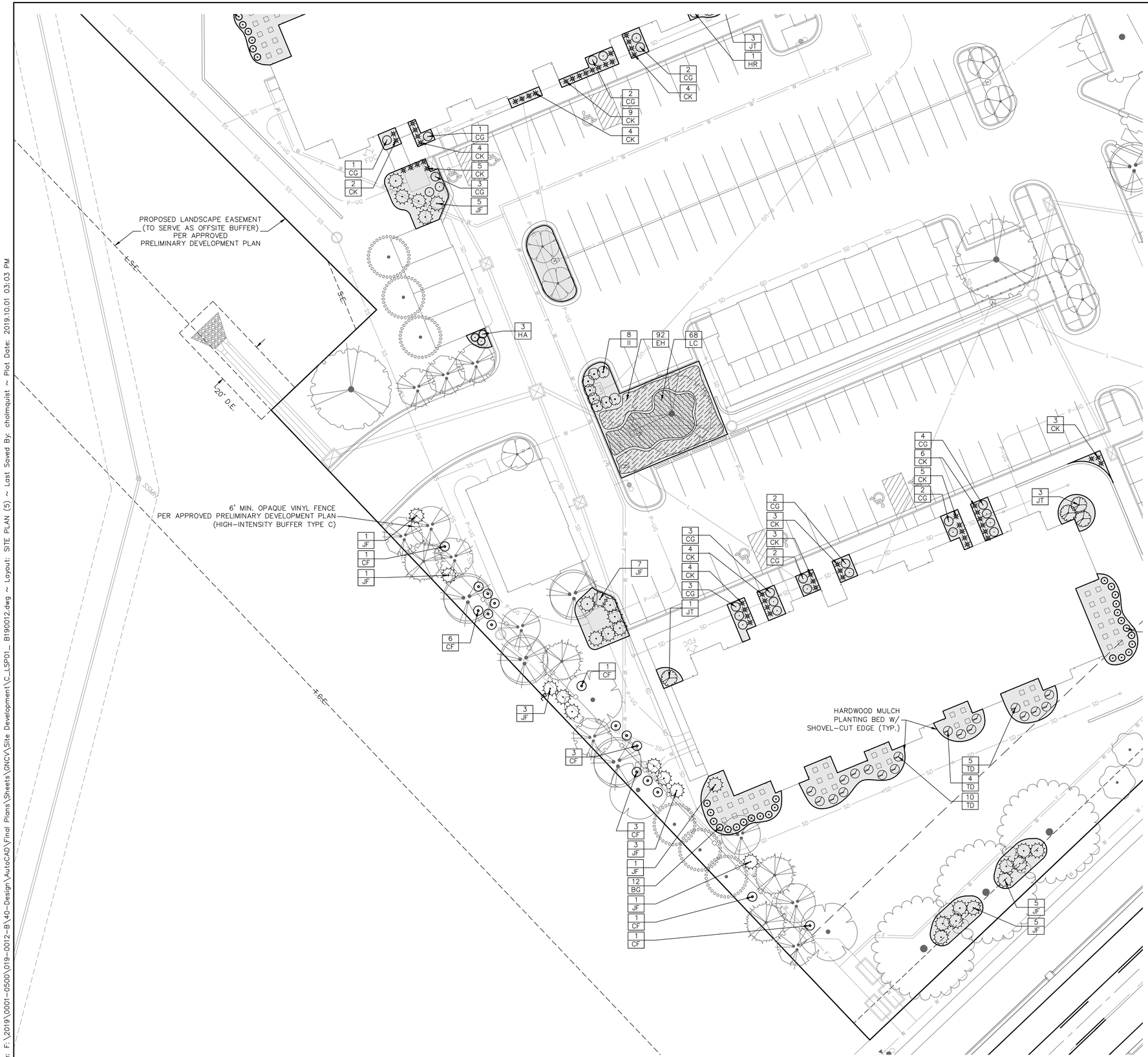
LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
L313

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\LC_LSP01_ B190012.dwg ~ Layout: SITE PLAN (4) ~ Last Saved By: cholmquist ~ Plot Date: 2019.10.01 03:03 PM



PLANT SCHEDULE - OVERALL

DECIDUOUS SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	CF	130	CORNUS SERICEA 'FARROW' / ARCTIC FIRE RED TWG DOGWOOD	3 GAL
	HR	17	HYDRANGEA QUERCIFOLIA 'RUBY SLIPPERS' / RUBY SLIPPERS HYDRANGEA	5 GAL
	RG	99	RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC	3 GAL
EVERGREEN SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BG	343	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	166	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	53	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	173	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	64	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	160	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	11	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	115	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BB	45	BOUTELOUA GRACILIS 'BLONDE AMBITION' / BLONDE AMBITION BLUE GRAMA	3 GAL
	CK	345	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL
	ST	108	SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPSEED	1 GAL
GROUND COVERS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	EH	602	EQUISETUM HYEMALE / HORSETAIL REED	1 GAL
	LC	449	LOBELIA CARDINALIS / CARDINAL FLOWER	1 GAL

PLANT SCHEDULE PHASE 1

DECIDUOUS SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	CF	130	CORNUS SERICEA 'FARROW' / ARCTIC FIRE RED TWG DOGWOOD	3 GAL
	HR	17	HYDRANGEA QUERCIFOLIA 'RUBY SLIPPERS' / RUBY SLIPPERS HYDRANGEA	5 GAL
	RG	99	RHUS AROMATICA 'GRO-LOW' / GRO-LOW FRAGRANT SUMAC	3 GAL
EVERGREEN SHRUBS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BG	163	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	67	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	25	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	79	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	27	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	88	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	4	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	61	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	BB	45	BOUTELOUA GRACILIS 'BLONDE AMBITION' / BLONDE AMBITION BLUE GRAMA	3 GAL
	CK	170	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL
	ST	108	SPOROBOLUS HETEROLEPIS 'TARA' / TARA PRAIRIE DROPSEED	1 GAL
GROUND COVERS	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**CONT**
	EH	602	EQUISETUM HYEMALE / HORSETAIL REED	1 GAL
	LC	449	LOBELIA CARDINALIS / CARDINAL FLOWER	1 GAL

PLANT SCHEDULE PHASE 2

EVERGREEN SHRUBS	CODE	QTY	BOTANICAL / COMMON NAME	SIZE
	BG	209	BUXUS X 'GREEN MOUNTAIN' / GREEN MOUNTAIN BOXWOOD	5 GAL
	CG	99	CHAMAECYPARIS PISIFERA 'GOLDEN MOP' / GOLDEN MOP THREADLEAF FALSE CYPRESS	5 GAL
	II	28	ILEX GLABRA 'COMPACTA' / COMPACT INKBERRY	5 GAL
	JF	44	JUNIPERUS CHINENSIS 'SEA GREEN' / SEA GREEN JUNIPER	5 GAL
	JT	39	JUNIPERUS VIRGINIANA 'TORULOSA' / TORULOSA JUNIPER	5 GAL
	TD	72	TAXUS X MEDIA 'DENSIFORMIS' / DENSE YEW	5 GAL
	TOG	7	THUJA OCCIDENTALIS 'GREEN GIANT' / GREEN GIANT ARBORVITAE	6'-8' HT.
	HA	48	THUJA OCCIDENTALIS 'HOLMSTRUP' / HOLMSTRUP CEDAR	3 GAL
ORNAMENTAL GRASSES	**CODE**	**QTY**	**BOTANICAL / COMMON NAME**	**SIZE**
	CK	175	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL

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0' 10' 20' 40'
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SITE PLAN
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CHRISTOPHER J. HOLMQUIST
NUMBER LA-2019026430
LICENSED LANDSCAPE ARCHITECT
2020.08.27
CHRIS HOLMQUIST, P.L.A.
MO# 2019026430

NO. REV.	DATE	REVISIONS DESCRIPTION	BY
		REVISIONS	

LANDSCAPE UNDERSTORY PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
L314

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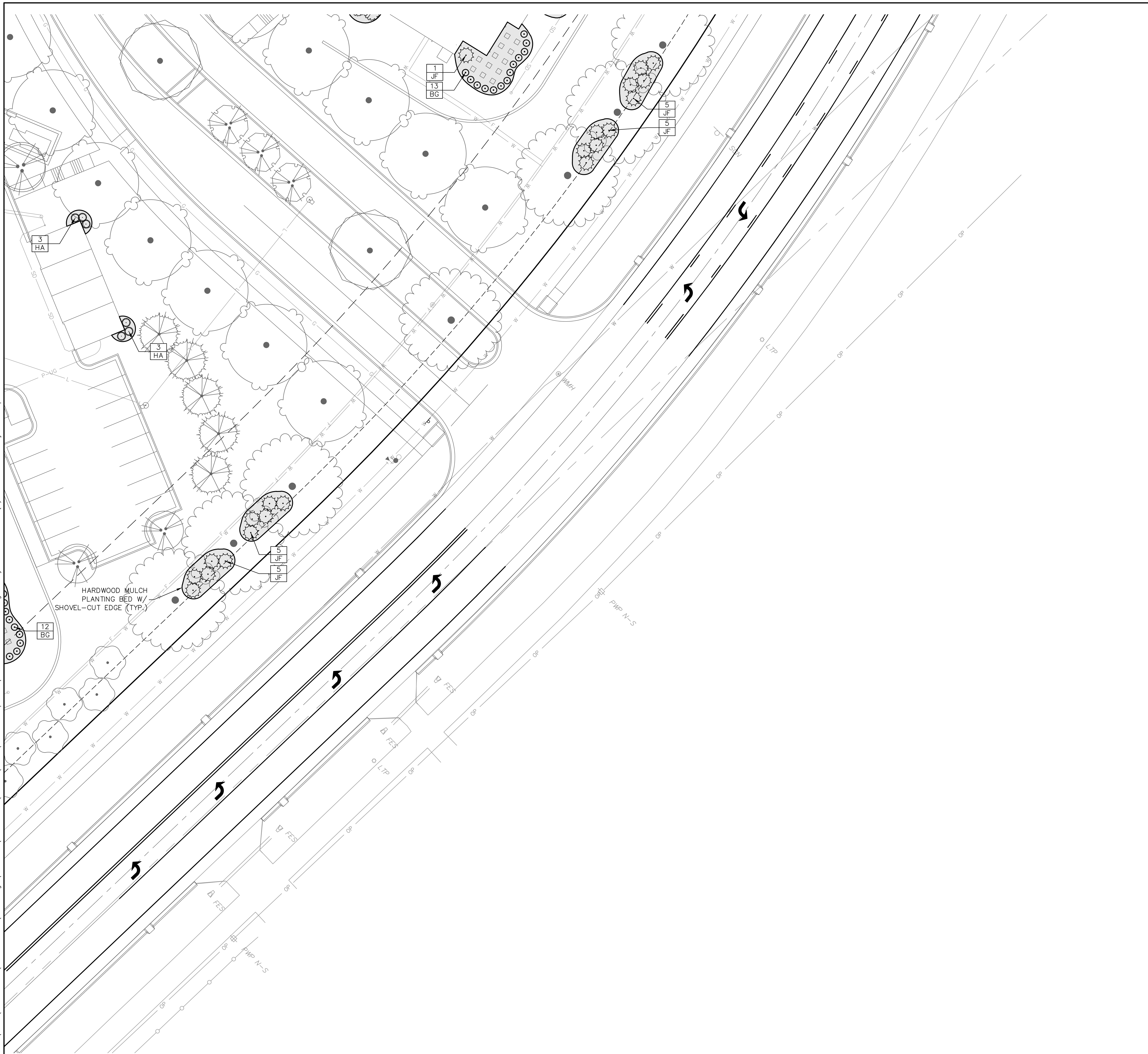

PLANT SCHEDULE - OVERALL

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PLANT SCHEDULE PHASE 1

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PLANT SCHEDULE PHASE 2

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	CK	175	CALAMAGROSTIS X ACUTIFLORA 'KARL FOERSTER' / KARL FOERSTER FEATHER REED GRASS	1 GAL

NOTES:

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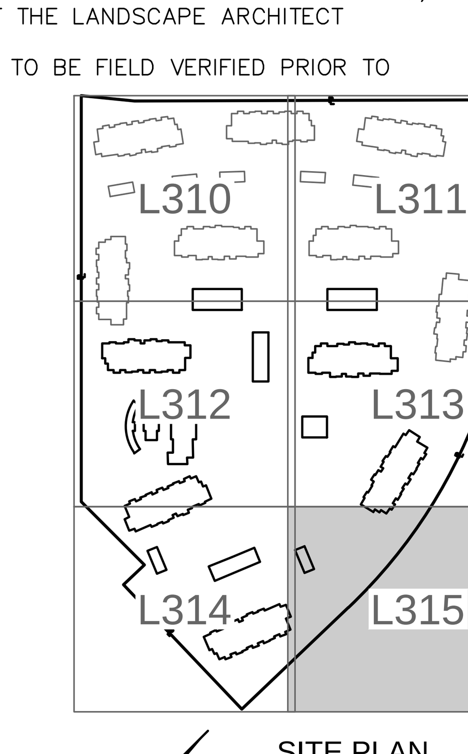

SITE PLAN
KEY MAP
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STATE OF MISSOURI
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2020.08.27
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REVISIONS

LANDSCAPE UNDERSTORY PLAN
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

2020

LEE'S SUMMIT, MO

drawn by:	M.J.D.
checked by:	N.D.H.
designed by:	M.J.D.
QA/QC by:	N.D.H.
project no.:	019-0012-B
date:	2020.08.27

SHEET
L315

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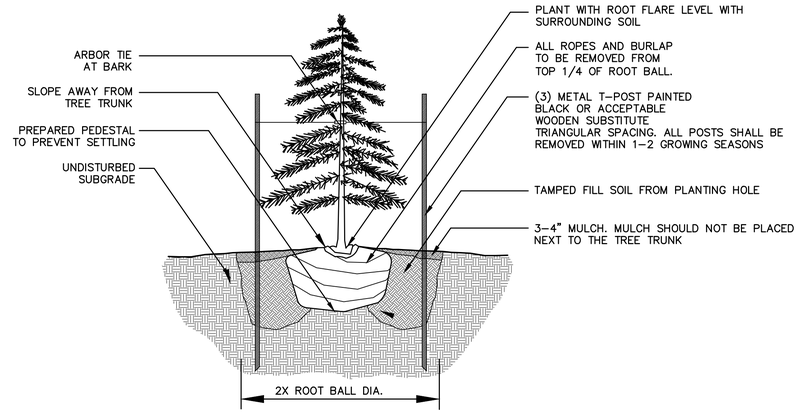
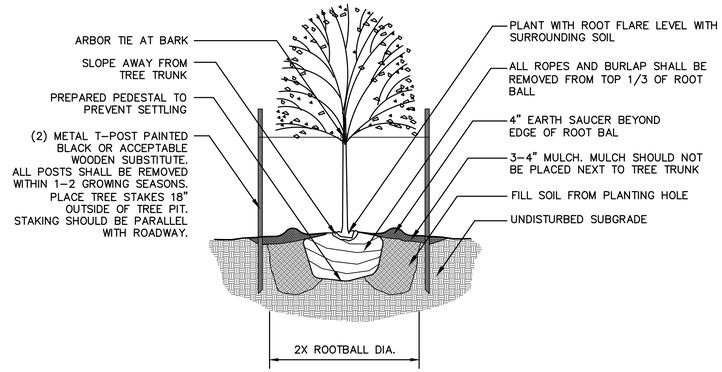


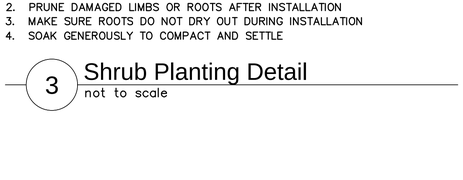
NOTES:
1. DO NOT ALLOW AIR POCKETS TO FORM WHEN BACKFILLING
2. IN AREAS OF TURF, SURROUND BED WITH 6' DIAMETER OF MULCH

1 Evergreen Tree Planting Detail
not to scale



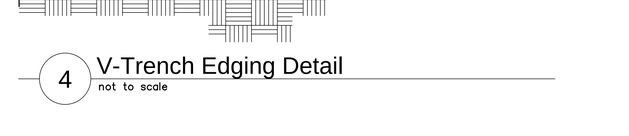
NOTES:
1. DO NOT ALLOW AIR POCKETS TO FORM WHEN BACKFILLING
2. IN AREAS OF TURF, SURROUND BED WITH 6' DIAMETER OF MULCH. ENSURE TREE STAKES ARE WITHIN MULCH AREA PLACED IN UNDISTURBED SUBGRADE.

2 Deciduous Tree Planting Detail
not to scale



NOTES:
1. MINIMUM ROOT SPREAD TO BE IN ACCORDANCE WITH ANLA STANDARDS
2. PRUNE DAMAGED LIMBS OR ROOTS AFTER INSTALLATION
3. MAKE SURE ROOTS DO NOT DRY OUT DURING INSTALLATION
4. SOAK GENEROUSLY TO COMPACT AND SETTLE

3 Shrub Planting Detail
not to scale



4 V-Trench Edging Detail
not to scale

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REVISIONS

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SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

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SHEET
L401

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PART 1 - GENERAL

1.1 PROJECT CONDITIONS

A. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.

B. Site Examination: Contractor shall verify all conditions, dimensions, and elevations in the field before starting work, and notify the project engineer or Landscape Architect immediately of any discrepancies between drawings and field conditions if encountered.

C. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
1. Notify Landscape Architect no fewer than seven (7) days in advance of proposed interruption of each service or utility.
2. Do not proceed with interruption of services or utilities without Landscape Architect's written permission.

D. Site Conditions:
1. Contractor shall keep the premises clean and free from rubbish and all debris associated with the work at all times. All unused materials and debris shall be removed from the site.
2. Contractor is responsible for repairs or damage to any existing improvements during construction such as but not limited to: drainage utilities, pavement, striping, curb, etc. Any repair work in the city R.O.W. shall be equal to or better than existing conditions.
3. Contractor shall comply with specifications prior to commencement of any type of work.
4. All disturbed areas outside of the project limits as shown on the plans are to be restored back to the original conditions with turf-type, tall fescue seed.
5. Contractor shall not commence with work until the site is free of debris caused by ongoing construction operations. Removal of debris shall be the responsibility of the General Contractor.
6. Contractor shall coordinate all work with other Contractors on site throughout the construction.

E. Safety:
1. Neither the Owner nor the Landscape Architect will enforce safety measures or regulations. The Contractor shall design, construct and maintain all safety devices, and shall be solely responsible for conforming to all local, state and federal safety and health standards, laws and regulations.

F. Utilities:
1. Contractor shall take all necessary precautions and responsibility to locate and protect any and all public and private underground or concealed conduit, plumbing or other utilities where new work is being performed. Contractor is responsible for repairing any and all damage to utilities, structures, site appurtenances, etc., which occur as a result of the landscape construction. Contractor shall maintain stakes set by others until all parties concerned mutually agree upon removal. In no case shall landscape material be planted in a way which will interfere with or cause damage to overhead or underground utilities.
2. Missouri one call system: 1-800-344-7483

G. Requirements:
1. All work shall conform to all federal, state, and local requirements for installation and maintenance.
2. The final, approved landscape plan must be available for onsite inspection at all times.

H. Clearzone:
1. The clearzone shall be maintained at all intersections that ingress and egress to the site. It is the Owner's responsibility to maintain the plant material at a height of not over thirty (30) inches above pavement and provide unobstructed sight distance for drivers in vehicles approaching the intersection.
2. Vertical clearance of at least eighty (80) inches must be provided above walks at all times. It is the Owner's responsibility to maintain trees and other overhanging objects to provide adequate headroom to comply with ADA guidelines.

I. Conflicts:
1. Should a conflict arise between specifications, codes, standards, ordinances and plans, the most stringent requirements shall apply.
2. Where no construction details are shown or noted for any part of the work, such details shall be the same as for similar work shown on the drawing and shall meet with Manufacturer's specifications.

J. Measurements:
1. Before commencing work or ordering any materials, the Contractor shall verify all measurements and shall be responsible for their accuracy. Any discrepancies shall be reported to the project Landscape Architect. The Contractor shall be responsible for the differences between actual dimensions and measurements indicated.
2. Written dimensions shall prevail. In no case shall working dimensions be scaled from plans, sections or details on the drawing.
3. Landscape Contractor shall supply bid to Olsson Associates for review. Bid shall include unit costs for all materials.

K. Plan Changes:
1. All drawings, specifications, and other work products developed by Olsson Associates are instruments of service for this project only and shall remain the property of Olsson Associates. Instruments of service may not be used, reproduced or changed in any form without the prior written permission of Olsson Associates.
2. In the event any changes are made to the plans and specifications by Owner or persons other than Olsson Associates, any liability arising out of such changes is waived against Olsson Associates. Owner assumes full responsibility for such changes unless Owner has given Olsson Associates prior notice and has received written consent for such changes.

L. Substitutions:
1. Any changes or deviations from these plans must be approved in writing by Owner, Olsson Associates and the Local Municipal Agencies. Changes shall possess the same characteristics as indicated on the plans and specifications.

M. Delegated design irrigation system:
1. If an irrigation system is not provided with the Landscape Plans, the Contractor is to design a 100 percent coverage irrigation system, including comprehensive engineering analysis by a qualified Professional Engineer, using performance requirements and design criteria indicated per Owner's direction.
2. Irrigation Contractor to design and install irrigation system and shall include all required components including, but not limited to, rain shut off sensor, controller, taps, backflow preventers, all approvals, and all fees required by city.
3. Irrigation Contractor shall submit a copy of plan to Owner's Representative or Project Landscape Architect for review prior to installation of system.
4. Irrigation Contractor shall conduct a training session with the owner (or representatives) demonstrating the operation of the system and the controller. As part of this training, Contractor shall provide one spring start-up and one fall shut-down of the system.
5. Landscape Contractor to provide cost estimates for irrigation system for all plant material indicated on plans.
6. Irrigation system shall be tested and approved by Owner's Representative or Landscape Architect prior to backfilling trenches. Irrigation system shall be fully operational prior to the installation of any plant materials.
7. All planting beds shall be watered by the irrigation system.
8. General Contractor to supply all power required to operate irrigation system.
9. Irrigation Contractor shall notify Owner's Representative or Project Landscape Architect of any changes to irrigation conduit locations or sizes.
10. It is the Landscape Contractor's responsibility to determine water application rates and timer cycling. The Irrigation Contractor will instruct the Owner on the operation and programming of the controller.
11. All zones and main lines will be pressure-tested at the time of installation and again prior to building turnover. Results shall be submitted in writing to Project Landscape Architect and Owner or Owner's Representative.
12. Irrigation shall not spray on building, sidewalks, and drives.
13. Irrigation controller location shall be coordinated with other wall-mounted service panels per Owner's approval.
14. Landscape Contractor shall hand-water all trees, turf grass areas, and native seed mix areas until substantial completion.
15. Treegator bags (or approved equal) shall be used for all proposed trees on site.

1.2 SUBMITTALS

A. Qualification Data for qualified Landscape Installers: Include list of similar projects completed by Landscape Contractor demonstrating Landscape Contractor's capabilities and experience. Include project names, addresses, and year completed, and include names and addresses of Owners' contact persons.

B. Samples shall be approved by Landscape Architect prior to installation on project.

C. Product Data: Provide for each type of product indicated, including soils.
1. Plant Materials: Include quantities, sizes, quality, and sources for plant materials.
2. Pesticides and Herbicides: Include product label and Manufacturer's application instructions specific to the Project.
3. Plant Photographs: Include color photographs in digital format of each required species and size of plant material as it will be furnished to the Project. Take photographs from an angle depicting true size and condition of the typical plant to be furnished. Include a scale rod or other measuring device in each photograph. For species where more than 20 plants are required, include a minimum of three photographs showing the average plant, the best quality plant, and the worst quality plant to be furnished. Identify each photograph with the full scientific name of the plant, plant size, and name of the growing nursery.

D. Samples for Verification: Provide as listed for each of the following:
1. Trees and Shrubs: Three samples of each variety and size must be delivered to the site for review. Maintain approved samples on-site as a standard for comparison.
2. Hardwood Mulch, Leaf Compost Mulch, & Rock Mulch: 1-quart volume of each organic mulch, in sealed plastic bags labeled with composition of materials by percentage weight and source of mulch, is required. Each Sample shall be typical of the lot of material to be furnished; provide an accurate representation of color, texture, and organic makeup.
3. Weed Control Barrier: 12 by 12 inches.

E. Product Certificates: Each type of manufactured product, from Manufacturer, shall comply with the following:
1. Manufacturer's certified analysis of standard products.
2. All plant material inspection certificates required by federal, state or other governing authorities will accompany each shipment and be turned over to the Owner's Representative upon delivery.
3. Analysis of other materials by a recognized laboratory made according to methods established by the Association of Official Analytical Chemists, where applicable.
4. Invoice:
   a. Vendor or Grower's invoice for each shipment of plants shall show sizes, quantities, and root treatment of plants, i.e. containerized, balled and burlapped, or plug.
   b. Invoice for each shipment of soil amendments and seed mixtures.
5. Label data substantiating that plants, trees, shrubs, perennials, seed and planting materials comply with specifications.
6. Seed Vendor's certified statement for each seed mixture required stating botanical and common name, percentages by weight, and percentages of purity, germination, and weed seed for each seed mixture.

F. Material Test Reports: For standardized ASTM D5268 topsoil, existing native surface topsoil, existing in-place surface soil and imported or manufactured topsoil.

G. Maintenance Instructions: Recommended typewritten instructions and procedures to be established by the Owner for maintenance of plants during a calendar year. Submit before start of required maintenance periods and prior to final acceptance of landscape material.

H. Warranty: Sample of special warranty.

1.3 QUALITY ASSURANCE

A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
2. Experience: A minimum of five (5) years experience on projects similar in characteristics and size. Contractor shall be a company specializing in landscape installation.
3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on project site when work is in progress.
4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
   a. Certified Landscape Technician - Exterior, with designated CLT-Exterior.
   b. Certified Ornamental Landscape Professional, designated COLP.
5. Pesticide Applicator: State licensed, commercial.

B. Soil Testing
1. Laboratory Qualifications: An independent or university laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in the types of tests to be performed.
2. The Contractor shall be responsible for having both the topsoil and existing soil tested for proposed plant material locations. Topsoil shall be tested by an independent soil testing agency. The Contractor shall furnish one (1) copy of the soil analysis plus recommended amendments prepared to meet the desired pH and nutritional and organic levels determined to be adequate for the area by the County Extension Agent or approved independent soil testing agency to the Landscape Architect prior to application of any amendments or fertilizer.

C. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.
1. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.
2. The soil testing laboratory shall oversee soil sampling with depth, location, and number of samples to be taken per instructions from Landscape Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.
3. Report suitability of tested soil for plant growth.
   a. Based upon the test results, state the recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cubic yard for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.
   b. Report presence of problem salts, minerals, or heavy metals including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

D. Measurements: Measure according to ANSI Z60.1 - American Standard for Nursery Stock. Do not prune to obtain required sizes.
1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container-grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.
2. Other Plants: Measure with stems, petioles, and foliage in their normal position.

E. Quality and Size:
1. Provide quality, size, genus, species, and variety of plants indicated, complying with applicable requirements in ANSI Z60.1 - American Standard for Nursery Stock.
2. Required plant materials shall conform to type stated on the plant list. Sizes shall be the minimum stated on the plant list or larger. All installation and measurements shall be in accordance with the latest editions of the American Standard for Nursery Stock (ANSI Z60.1) and with the general planting specifications as set forth by the local municipal agency's landscape ordinance.
3. Landscape plant material shall satisfy AAN American Standards, be State Department of Agriculture inspected, and no. 1 grade with straight, unscarred trunk and well developed uniform crown (park grade trees will not be accepted).
4. The plant material shall be nursery grown and inspected by the Owner's Representative before planting.
5. Plants designated "b&b" shall be balled and burlapped, with firm balls of earth.
6. All installed plant materials shall be certified by the State to be disease-free and pest-free and not of a species known to carry or be host to destructive pathogens or pests. Plants shall be healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practices, free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions or disfigurement.
7. All trees shall have a central leader and a radial branching structure.
8. Plant materials delivered to site and not planted within 24 hours of delivery shall be "heeled" and watered in a shaded area, protected from weather, mechanical damage and dehydration prior to planting.
9. Each tree and shrub shall be securely labeled with a waterproof tag indicating the botanical name, common name, and size for delivery to site.
10. Provide healthy, vigorous stock, grown in a recognized nursery in accordance with good horticultural practices, free of disease, insects, eggs, larvae and defects such as knots, sun-scald, injuries, abrasions or disfigurement. Place all plants in shaded area, protected from weather, mechanical damage and dehydration prior to planting.
11. All plant surfaces shall receive emulsion type, film-forming anti-desiccant agent designed to permit transpiration, but retard excessive loss of moisture from plants. Anti-desiccant to be delivered in Manufacturer's fully identified containers and mixed in accordance with Manufacturer's specifications.

F. Plant Material Observation: Landscape Architect may observe plant material either at place of growth or at site before planting for compliance with requirements for genus, species, variety, cultivar, size, and quality. Landscape Architect retains right to observe trees and shrubs further for size and condition of balls and root systems, pests, disease symptoms, injuries, and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Remove rejected trees or shrubs immediately from project site.
1. Notify Landscape Architect of sources of planting materials seven (7) days in advance of delivery to site.
2. Inspections and Testing:
   a. The Landscape Architect reserves the right to inspect and/or tag plants at place of growth with Landscape Contractor.
   b. All plants must be inspected and approved by the Landscape Architect before they are planted. Inspection and approval by the Landscape Architect at place of growth or upon delivery shall be for quality, size, and variety only and shall not in any way impair the right of rejection for failure to meet other requirements during progress of work. Plants damaged during delivery or at job site shall be rejected.
3. All site work, including plant locations, shall be staked by the Landscape Contractor and shall be approved by the Landscape Architect prior to installation. Any walks, walls or edging shall be installed in a manner consistent with the plans as shown, and shall be installed free of kinks, bends or abrupt curves.
4. All dead plant materials shall be removed and replaced as required in order to maintain an attractive landscape at all times.

G. Quantities:
1. Contractor is responsible for verifying all quantities shown on these plans before pricing the work. Any difference in quantities should be brought to the attention of the Landscape Architect for clarification.
2. Quantities listed in the plant list schedule are for estimates only. Trees, shrubs, and groundcover of contract quantities shall be the number of items shown on the drawings. Contractor shall supply the quantities necessary to complete the work as shown on the drawings. Quantities listed on the plant list are approximate only. Any difference in quantities should be brought to the attention of the Project Landscape Architect for clarification.
3. Contractor shall provide trees, shrubs, and plants of quantity, size, genus, species and variety shown and scheduled for landscape work.

H. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.
1. Spring Planting: April 1st to June 15th
2. Fall Planting: August 15th to November 1st

I. Weather Limitations: Proceed with plant material installation and sodding only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to Manufacturer's written instructions and warranty requirements.

J. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.
1. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

1.4 DELIVERY, STORAGE, AND HANDLING

A. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of Manufacturer, and indication of conformance with state and federal laws if applicable.

B. Bulk Materials:
1. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.
2. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.
3. Accompany each delivery of bulk fertilizers, lime, and soil amendments with appropriate certificates.

C. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

D. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

E. Handle planting stock by root ball.

F. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.
1. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.
2. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.
3. Do not remove container-grown stock from containers before time of planting.
4. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

G. Sod: Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" in TPI's "Guideline Specifications to Turfgrass Sodding." Deliver sod in time for planting within 24 hours of harvesting. Protect sod from breakage and drying.

1.5 WARRANTY

A. Special Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
1. Failures include, but are not limited to, the following:
   a. Death, unhealthy condition, plant material with more than 25% die back and unsatisfactory growth as determined by the Owner's Representative, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
   b. Structural failures including plantings falling or blowing over.
   c. Faulty performance of tree stabilization.
2. Warranty Periods from Date of Substantial Completion:
   a. Trees, Shrubs, Vines, and Ornamental Grasses: 12 months.
   b. Ground Covers, Biennials, Perennials, and Other Plants: 12 months.
   c. Annuals: Two months.
3. Include the following remedial actions as a minimum:
   a. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
   b. Replace plants that are not in good condition or in an unhealthy condition as judged by the Owner's Representative prior to Substantial Completion and at end of the warranty period at no additional cost to the Owner.
   c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
   d. Provide extended warranty for period equal to original warranty period for replaced plant material.

1.6 MAINTENANCE SERVICE

A. Installation Maintenance:
1. Maintenance shall begin immediately after installation of each plant, sod or turf. All plant material, sod and/or shall be maintained in a vigorous, thriving condition until all planting is completed and accepted.
2. Maintain turf, material and plants until Substantial Completion or until Owner accepts landscape installation.
3. Maintenance activities of turf or sod shall include watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth sodded surface, free of eroded or bare areas, free of weeds and acceptable by Owner.
4. Maintenance activities of plant material - trees, shrubs, ornamental grasses, perennials, annuals, and groundcover - include watering, weeding, cultivating, mulching, adjusting of stakes, removal of dead materials, resetting plants to proper grades or upright positions, restoration of the planting saucer, and any other procedures consistent with good horticultural practices necessary to insure normal, vigorous, and healthy growth.

B. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of Landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than the maintenance period below.
1. Maintenance Period: Twelve (12) months from date of Substantial Completion.

C. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of Landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than the maintenance period below.
1. Maintenance Period: Twelve (12) months from date of Substantial Completion.

D. Initial Maintenance Service for Turf: Provide full maintenance by skilled employees of Landscape Installer. Maintain as required in Part 3. Begin maintenance immediately after each area is planted and continue until acceptable turf is established but for not less than the following periods:
1. Sodded Turf: Twelve (12) months from date of Substantial Completion.

E. Continuing Maintenance Proposal: From Installer to Owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date initial maintenance service is concluded. State services, obligations, conditions, and terms for agreement period and for future renewal options.

PART 2 - PRODUCTS

2.1 PLANT MATERIAL

A. General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.
1. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch in diameter; or with stem girdling roots will be rejected.
2. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated. Park Grade material is not acceptable.

B. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.

C. Root Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.

D. Labeling: Label each plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.

E. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

F. Perennials: Provide healthy, disease-free plants of species and variety shown or listed, with well-established root systems reaching to sides of the container to maintain a firm ball, but not with excessive root growth encircling the container. Provide only plants that are acclimated to outdoor conditions before delivery.

2.2 NATIVE SEED

A. All disturbed areas, fills and embankments shall be seeded and fertilized as specified on the plans.

B. Native seed shall be obtained from sources specified on plans or approved alternate source.

2.3 TURF SEED

A. All disturbed areas, fills and embankments shall be seeded and fertilized as specified on the plans.

B. Grass seed shall have a rating of 6.0 or better in the Kansas State Turf Grass Test, with the following characteristics: Purity - 98%, and Inert - 1.75%

2.4 TURF SOD

A. Sod shall be grown from a seed with a rating of 6.0 or better in the Kansas State Turf Grass Test.

B. Sod shall be composed of fescue blend free from insects, disease, weeds and other grasses, cut in uniform strips consisting of 1 square yard per strip or approved equal.

2.5 PLANTING SOILS

A. Soil Testing:
1. Landscape Contractor to test soil on site and provide results to the Owner and Landscape Architect prior to commencement of work.
2. Landscape Contractor to verify and guarantee that the onsite topsoil will support grass seed, sod, and plant material.
3. Landscape Contractor to recommend soil amendments if soil test is not acceptable.

B. Planting Soil:
1. Existing, in-place surface soil. Verify suitability of existing surface soil to produce viable planting soil. Remove stones, roots, plants, sod, clods, clay lumps, pockets of coarse sand, concrete slurry, concrete layers or chunks, cement, plaster, building debris, and other extraneous materials harmful to plant growth.
2. ASTM D5268 topsoil, with pH range of 5.5 to 7, a minimum of five (5) percent organic material content; free of stones 1 inch or larger in any dimension and other extraneous materials harmful to plant growth. Soil shall be free from clay lumps, coarse sand, plant roots, sticks and other foreign materials. Mix ASTM D5268 topsoil with the following soil amendments and fertilizers as recommended by soil analysis.
3. Topsoil shall be fertile, friable, natural topsoil, typical of the locality, obtained from well-drained areas possessing characteristics of soils in the vicinity that produce heavy growth or grasses and other vegetative material. Stockpiled topsoil may be used. It shall be without admixture of subsoil or slag and shall be free of subsoil, stones, lumps, sticks, plants or their roots, toxic substances or other extraneous matter that may be harmful to plant growth.

2.6 MULCHES

A. Hardwood Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of the following:
1. Type: Double-shredded hardwood
2. Size Range: ½ inch minimum to 3 inches maximum
3. Color: Dark brown

B. Leaf Compost Mulch: Free from deleterious materials and suitable as a top dressing for ornamental grasses, perennials, and groundcovers.

C. Mineral Mulch: Hard, durable stone, washed free of loam, sand, clay, and other foreign substances, of following type, size, range, and color:
1. Type: Washed Cobble
2. Size Range: 8-inch maximum, 4-inch minimum
3. Color: Uniform tan-beige color range acceptable to Landscape Architect

2.4 WEED-CONTROL BARRIERS

A. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally-encountered chemicals, alkalis, and acids.

2.5 PESTICIDES

A. General: Pesticide registered and approved by EPA, acceptable to authorities having jurisdiction, and of type recommended by Manufacturer for each specific problem and as required for Project conditions and application. Do not use restricted pesticides unless authorized in writing by authorities having jurisdiction. Do not apply herbicide when weather conditions are unfavorable, such as during drought or high winds.

B. Pre-Emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer. Pre-emergence application of "treflan 5% granules" or equivalent applied according to manufacturer's recommendations and incorporated into soil as specified.

C. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated. Post-emergent application of "Roundup" or equivalent, applied as specified by manufacturer. Spray with extreme caution to avoid contact with landscape plantings.

2.8 MISCELLANEOUS PRODUCTS

A. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to Manufacturer's written instructions.

B. Burlap: Non-synthetic, biodegradable.

C. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
1. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
2. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
3. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
4. Uniformly moisten excessively dry soil that is not workable and which is too dusty.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

C. If contamination by foreign or deleterious material or liquid is present in planting area soil, remove the soil and contamination as directed by Owner's Representative and replace with new planting soil.

3.2 PREPARATION

A. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.

B. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

C. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

D. Lay out plants at locations directed by Landscape Architect. Stake locations of individual trees and shrubs and outline areas for multiple plantings.

E. Owner's Representative shall inspect all plant material prior to commencing with planting work. No plant excavations shall be undertaken by the Contractor prior to the approval of the Owner's Representative.

F. Power-spray antidesiccant to trees and shrubs to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
1. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.

G. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3.3 PLANTING AREA ESTABLISHMENT

A. Loosen subgrade of planting areas to a minimum depth of 12 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
1. Apply fertilizer directly to subgrade before loosening.
2. Thoroughly blend planting soil off-site before spreading or spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
   a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
   b. Mix lime with dry soil before mixing fertilizer.
3. Spread planting soil to a depth of 4 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
   a. Spread approximately one-half the thickness of planting soil over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil.

B. Underground utility lines must be taken into account in the excavation of the planting areas.

C. Finish Grading:
1. Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
2. Finished grades shall provide positive drainage, free of depressions and any irregularities, after thorough settlement and compaction of sod, and will be uniform in slope between grading controls and the elevations indicated.

D. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.4 NATIVE SEED ESTABLISHMENT

A. Prepare the area to be seeded with native plantings by removing existing vegetation. Begin herbicide application in September with additional applications as necessary to achieve a total kill of all vegetation. Ensure that herbicides will not be harmful to native plantings, and follow manufactures application recommendations.

B. Remove thatch, by burning, mowing, raking, and/or dragging with a harrow. Approximately 80% of soil should be exposed. Obtain all required permits if burning.

C. Place a 2" compacted layer of topsoil over all areas to be established with native plantings. The topsoil layer shall bring all native planting areas to finish grade. Prepare planting area by fine grading the surface to a smooth surface, remove all rocks, sticks, dirt clumps, and trash.

D. A cover crop shall be added to seed mixes to stabilize swale slopes until native seed is established.

E. Winter wheat shall be used as a cover crop if planting is to take place during winter months. Spring oats shall be used for spring planting.

F. Sow seeds with a drill to a depth of ¼" in rows.

G. Seedling operations must be completed by end of April.

H. Lightly mulch slopes with weed-free wheat or oat straw.

I. Provide water to keep seeds from drying out completely. Continual watering is not needed.

J. Do not fertilize.

K. Do not spray with herbicides.

3.5 TURF AREA PREPARATION

A. Limit turf subgrade preparation to areas to be planted.

B. Newly Graded Subgrades: Loosen subgrade to a minimum depth of 8 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
1. Apply fertilizer directly to subgrade before loosening.
2. Spread topsoil, apply soil amendments and fertilizer on surface, and thoroughly blend planting soil.
   a. Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
   b. Mix lime with dry soil before mixing fertilizer.
3. Spread planting soil to a depth of 2 inches but not less than required to meet finish grades after light rolling and natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
   a. Spread approximately 1/2 the thickness of planting soil over loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.
   b. Reduce elevation of planting soil to allow for soil thickness of sod.

C. Unchanged Subgrades: If turf is to be planted in areas unaltered or undisturbed by excavating, grading, or surface-soil stripping operations, prepare surface soil as follows:
1. Remove existing grass, vegetation, and turf. Do not mix surface soil.
2. Loosen surface soil to a depth of at least 8 inches. Apply soil amendments and fertilizers according to planting soil mix proportions and mix thoroughly into top 4 inches of soil. Till soil to a homogeneous mixture of fine texture.
3. Remove stones larger than 1 inch in any dimension and sticks, roots, trash, and extraneous matter.
4. Legally dispose of waste material, including grass, vegetation, and turf off Owner's property.

D. Finish Grading:
1. Grade planting areas to a smooth, uniform surface plane with loose, uniformly fine texture. Grade to within plus or minus 1/2 inch of finish elevation. Roll and rake, remove ridges, and fill depressions to meet finish grades. Limit finish grading to areas that can be planted in the immediate future.
2. Finished grades shall provide positive drainage, free of depressions and any irregularities, after thorough settlement and compaction of sod, and will be uniform in slope between grading controls and the elevations indicated.

E. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil.

F. Before planting, obtain Landscape Architect's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

3.6 HYDROSEEDING NEW TURF LAWNS

A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
1. Mix slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500 lb per acre dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.7 SODDING NEW TURF LAWNS

A. All areas specified as "sod" shall be sodded per direction of the Project Landscape Architect; Landscape Contractor shall verify quantities in field prior to installation.

B. Lay sod within 24 hours of stripping. Do not lay sod if dormant or if ground is frozen.

C. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.

D. Lay sod across angle of slopes exceeding 1:3.

E. Anchor sod on slopes exceeding 1:6 with wood pegs spaced as recommended by sod Manufacturer but not less than 2 anchors per sod strip to prevent slippage.

F. Saturate sod with fine water spray within 2 hours of planting. During first week, water daily or more frequently as needed to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below the sod.

G. After two weeks following sod installation, apply fertilizer at the Manufacturer's recommended rate for newly established lawns. Maintain turf during warranty period by watering, fertilizing, weeding, mowing, trimming, and other operations such as rolling, regrading and replanting as required to establish a smooth sodded surface, free of eroded or bare areas, free of weeds and acceptable by Owner.

3.8 EXCAVATION FOR TREES AND SHRUBS

A. Planting Pits and Trenches: Excavate circular planting pits with sides sloping inward at a 45-degree angle. Excavations with vertical sides are not acceptable. Trim perimeter of bottom leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. Do not further disturb base. Ensure that root ball will sit on undisturbed base soil to prevent settling. Scarify sides of planting pit smeared or smoothed during excavation.
1. Excavate at least 12 inches wider than root spread and deep enough to accommodate vertical roots for balled and burlapped stock.
2. Do not excavate deeper than depth of the root ball, measured from the root flare to the bottom of the root ball.
3. If area under the plant was initially dug too deep, add soil to raise it to the correct level and thoroughly tamp the added soil to prevent settling.
4. Maintain required angles of repose of adjacent materials as shown on the Drawings. Do not excavate subgrades of adjacent paving, structures, hardscapes, or other new or existing improvements.
5. Maintain supervision of excavations during working hours.
6. Keep excavations covered or otherwise protected when unattended by Installer's personnel.
7. If drain tile is shown on Drawings or required under planting areas, excavate to top of porous backfill over tile.

B. All landscape areas, especially parking lot islands and shrub beds next to buildings, shall be excavated of all building materials, debris and poor soils to a depth of twenty-four (24) inches and backfilled with a good, medium textured planting soil (loam or light yellow clay). All landscape areas shall have six (6) inches of topsoil, and area to be crowned a minimum of six (6) inches higher, or as specified on plans and details, than adjacent curbs or walks after earth settling.

C. Underground utility lines must be taken into account in the excavation of the planting areas.

D. Subsoil and topsoil removed from excavations may be used as planting soil.

E. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.
1. Hardpan Layer: Drill 6-inch diameter holes, 24 inches apart, into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.

F. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub planting pits.

G. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

3.7 TREE, SHRUB, AND VINE PLANTING

A. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the topmost root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.

B. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.

C. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 inch above adjacent finish grades.
1. Use planting soil for backfill.
2. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

D. Set balled and potted or container-grown stock plumb and in center of planting pit or trench with root flare 1" above adjacent finish grades.
1. Use planting soil for backfill.
2. Carefully remove root ball from container without damaging root ball or plant.
3. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
4. Place planting tablets in each planting pit when pit is approximately one-half filled; in amounts recommended in soil reports from soil-testing laboratory. Place tablets beside the root ball about 1 inch from root tips; do not place tablets in bottom of the hole.
5. Continue backfilling process. Water again after placing and tamping final layer of soil.

E. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

F. Planting:
1. The Contractor is responsible for planting the materials at the correct grades and spacing. The plants shall be oriented as to give the best appearance. Do not plant closer than four (4) feet from property lines.
2. Plant trees and shrubs generally no closer than four (4) feet from sidewalks, curbs and parking stalls.
3. The planting soil mixture specified for backfilling plant pits and beds shall be composed of topsoil and additional soil amendment appropriate for location and plantings. The Contractor shall blend one part existing soil, one part approved topsoil, one part mason's sand, one part sphagnum peat moss and additional fertilizer, terra-sorb and other soil amendments as specified on the Landscape Plan.
4. Stagger plant material from row to row. Space hedge plantings evenly and respace as required. Trim tops evenly after planting if applicable.
5. All plant material to receive Terra-Sorb Super Absorbant polymer, and GROlife or PHC Mycorrhizal Fungi Innoculant or approved equals: follow Manufacturer's specifications.
6. Remove the tree stakes and guys after first winter.
7. When conditions detrimental to plant growth are encountered such as rubble fill, rock, adverse drainage conditions or obstructions, Landscape Contractor shall notify Landscape Architect before planting.

3.8 TREE, SHRUB, AND VINE PRUNING

A. Remove only dead, dying, or broken branches. Do not prune for shape.

B. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs; prune to retain natural character.

C. Do not apply pruning paint to wounds.

D. Pruning
1. New plant material shall be pruned in the following manner: dead and broken branches shall be removed. Deciduous trees and shrubs shall be pruned to reduce total amount of anticipated foliage by 1/5. Evergreen plants shall not be pruned except to remove injured branches. Prune in accordance with standard horticultural practice to preserve natural character of plant. The amount of pruning shall be limited to the removal of dead or injured twigs to compensate for root loss from transplanting. Cuts should be flush, leaving no stubs.

3.9 LAWN RESTORATION

A. Existing lawns are to be inspected to determine viability. If found to support good turf development, restore them to uniform, dense and healthy turf, free from weeds, resembling new turf areas. Topsoil (refer to topsoil notes) will be added as needed to level out areas and fill holes prior to seeding or sodding. Those existing lawns found to be in poor condition will be stripped of poor lawn and weeds, regraded to level out bumps and depressions. Soil is to be level, porous, organic, and capable of supporting good turf growth.

3.10 GROUND COVER, ANNUAL, BIANNUAL AND PERENNIAL PLANTING

A. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.

B. Use planting soil for backfill.

C. Dig holes large enough to allow spreading of roots.

D. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.

E. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.

F. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.

G. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

3.11 PLANTING AREA MULCHING

A. Mulch backfilled surfaces of planting areas and other areas as indicated.
1. Hardwood mulch trees: Apply a 3-inch average thickness of hardwood mulch extending 12 inches beyond edge of individual planting pit or trench and over entire surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3 inches of trunks or stems.
2. Shrubs, perennials, grasses, and groundcover shall receive 1-2" dia. washed river rock mulch to a depth of 4".
3. Single trees and shrubs shall be mulched to the saucer or landscape island. Include an application of pre-emergent for weed control.
4. All mulch shall match grade of adjacent curb, walk, or edge of pavement.

3.12 EDGING INSTALLATION

A. Shovel-Cut Edging: Separate mulched areas from turf areas with a 45-degree, 4- to 6-inch deep, shovel cut edge.

3.13 SATISFACTORY TURF

A. Turf installations shall meet the following criteria as determined by the Landscape Architect:
1. Satisfactory Seeded Turf:
   a. At Substantial Completion and at the end of the maintenance period, a healthy, uniform, close stand of grass has been established, free of weeds and surface irregularities, with coverage exceeding 90 percent over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches.
   b. All areas that do not show a satisfactory catch of seeded turfgrass shall be reseeded at intervals of 21 days until dense, permanent turfgrass, free from any bare spots, areas of washout or erosion damage has been established.
2. Satisfactory Sodded Turf: At Substantial Completion and at the end of the maintenance period, a healthy, well-rooted, even-colored, viable turf has been established, free of weeds, open joints, bare areas, and surface irregularities.

3.14 OWNER'S ACCEPTANCE

A. The completion of the contract will be accepted and notice of completion recorded only when the entire contract is completed to the Owner's satisfaction.

B. Within ten (10) days of the Contractor's notification that the installation is complete, the Owner will inspect the installation and if a final acceptance is not given, he will prepare a "Punch List" which upon completion by the Contractor will signify acceptance by the Owner.

C. Final payment will not be made without the receipt of an accurate "As-Built" drawing provided to the Owner.

D. Final Acceptance
1. Landscape Contractor shall notify project Landscape Architect for inspection of plant material for Owner's acceptance.
2. Owner shall retain 10% for (12) twelve-month warranty period.
3. Final inspection and acceptance will be at the end of (12) twelve-month warranty period. Acceptance shall be based upon a satisfactory stand of trees, shrubs, ornamental grasses, perennials, annuals, as well as established turf at 100 percent coverage.
4. Areas that do not meet the contract requirements shall be reseeded or plant material replaced. Any rejected repairs or areas of lawn and/or other plant material within acceptable planting dates shall be directed by the Owner's Representative.

3.15 PLANT MAINTENANCE

A. General Maintenance:
1. All landscape areas to be installed and maintained in accordance with the Local Municipal Agencies standards and requirements, in a healthy growing condition, neat and orderly in appearance and free of refuse and debris.
2. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
3. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
4. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated past management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

B. Native Seed Maintenance:
1. Seedlings should not completely dry out, but do not need to be moist all of the time during the first 6-8 weeks. After 8 weeks only water if it does not rain for one week. Water should be provided to the top (6) six inches of soil.
2. Cut the prairie planting area to 6" if weed height reaches 12" in the first year. Cut as many times as necessary. Do not cut prior to annuals seed setting after blooming.
3. Remove all legumes immediately.
4. Do not fertilize.
5. Do not spray with herbicides.

C. Maintenance Proposal:
1. Contractor shall provide a separate maintenance proposal to Owner for maintaining plants in healthy growing condition for a period of twelve (12) months from substantial completion or date of acceptance by the Owner or Owner's Representative.
2. Any plant material that does not survive in good condition past this time period, as judged by the Owner or Owner's Representative, shall be replaced at no additional cost to the Owner and warranted for an additional twelve (12) months from the date of re-acceptance.

3.16 PESTICIDE APPLICATION

A. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and Manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.

B. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with Manufacturer's written recommendations. Do not apply to seeded areas.

C. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with Manufacturer's written recommendations.

D. Remove planting debris from the project site.

3.17 CLEANUP AND PROTECTION

A. During planting, keep adjacent paving and construction clean and work area in an orderly condition.

B. Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas.

C. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established.

D. Remove nondegradable erosion-control measures after grass establishment period.

E. Protect plants from damage due to landscape operations and operations of other Contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.

F. After installation, remove nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and project site. After Substantial Completion, remove nursery tags.

3.18 DISPOSAL

A. Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

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OLSSON - CIVIL ENGINEERING
MO CERTIFICATE OF AUTHORITY #:001592
1301 BURLINGTON, SUITE 100
NORTH KANSAS CITY, MO 64116
TEL 816.361.1177

STATE OF MISSOURI
CHRISTOPHER J. HOLMQUIST
NUMBER PLA-2019026430
PROFESSIONAL LANDSCAPE ARCHITECT

2020.08.27
CHRIS HOLMQUIST, P.L.A.
MO# 2019026430

NO. REV.	DATE	REVISIONS DESCRIPTION	BY

REVISIONS

LANDSCAPE NOTES
SITE DEVELOPMENT PLANS

ARIA APARTMENTS
PHASE 1

LEE'S SUMMIT, MO

2020

drawn by: M.J.D.
checked by: N.D.H.
designed by: M.J.D.
QA/QC by: N.D.H.
project no.: 019-0012-B
date: 2020.08.27

SHEET
L402

File: F:\2019\0001-0500\019-0012-B\40-Design\AutoCAD\Final Plans\Sheets\GNCV\Site Development\C_LSP03_ B190012.dwg ~ Layout: LANDSCAPE NOTES ~ Last Saved By: mdiebolt ~ Plot Date: 2019.10.01 03:03 PM

Aria Lee's Summit Retaining Walls

Lee's Summit, Jackson County, Missouri

1. MATERIALS

A. BACKFILL SOILS

a. REINFORCED STRUCTURAL BACKFILL MATERIALS SHALL BE APPROVED BY THE OWNER OR OWNER'S REPRESENTATIVE AND SHALL MEET THE STRENGTH REQUIREMENTS AS DEFINED IN SECTION 5.0. THE REINFORCED BACKFILL MATERIAL SHALL BE:

MODOT TYPE 1, TYPE 5, OR 1" CLEAN.

b. FURTHERMORE, REINFORCED BACKFILL AND RETAINED SOIL/FILL MATERIALS SHALL BE FREE OF EXCESS MOISTURE, ROOTS, MUCK, SOD, SNOW, FROZEN LUMPS, ORGANIC MATTER OR OTHER DELETERIOUS MATERIALS. ALL ROCK PARTICLES AND HARD EARTH CLODS SHALL BE LESS THAN THREE INCHES IN THE LONGEST DIMENSION. REINFORCED BACKFILL MATERIALS WHICH DO NOT MEET THIS CRITERION SHALL BE CONSIDERED UNSUITABLE AND SHALL BE REMOVED.

c. DRAINAGE FILL BEHIND BASKET FACE SHALL CONSIST OF CLEAN CRUSHED STONE OR CRUSHED GRAVEL (1" CLEAN).

B. GEOGRID REINFORCING SHALL BE SYNTEEN GEOGRIDS AS SHOWN OR APPROVED EQUAL

2. TECHNICAL REQUIREMENTS

A. PRIOR TO CONSTRUCTION OF THE WALLS, THE GRADING CONTRACTOR SHALL CLEAR AND GRUB THE REINFORCED BACKFILL ZONE AREA, REMOVING TOP SOILS, BRUSH, SOD OR OTHER ORGANIC MATERIALS. ANY UNSUITABLE SOILS SHALL BE OVER-EXCAVATED, REPLACED AND COMPACTED WITH REINFORCED BACKFILL MATERIAL TO PROTECT SPECIFICATIONS OR OTHERWISE DIRECTED BY THE OWNER'S GEOTECHNICAL ENGINEER.

B. THE GEOTECHNICAL ENGINEER SHALL CONFIRM THAT THE SITE HAS BEEN PROPERLY PREPARED AND THE DESIGN PARAMETERS IN SECTION 5 ARE APPROPRIATE PRIOR TO FILL PLACEMENT. A WRITTEN CONFIRMATION SHALL BE PROVIDED TO CROCKETT ENGINEERING PRIOR TO FILL PLACEMENT.

C. FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 10 INCHES IN UNCOMPACTED THICKNESS FOR HEAVY COMPACTION EQUIPMENT. FOR ZONES WHERE COMPACTION IS ACCOMPLISHED WITH HAND OPERATED EQUIPMENT, FILL SHALL BE PLACED IN HORIZONTAL LAYERS NOT EXCEEDING 6 INCHES IN UNCOMPACTED THICKNESS. ONLY HAND-OPERATED EQUIPMENT SHALL BE ALLOWED WITHIN THREE FEET OF THE BACK FACE WALL.

D. FILL MATERIALS SHALL BE PLACED FROM THE BACK OF THE FACING UNITS TOWARDS THE ENDS OF THE GEOGRID TO ENSURE FURTHER TENSIONING.

E. FILL SHALL BE COMPACTED AS SPECIFIED BY PROJECT SPECIFICATIONS OR TO A MINIMUM 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED IN ACCORDANCE WITH ASTM D-698.

F. TESTING METHODS, FREQUENCY, VERIFICATION OF MATERIAL SPECIFICATIONS, AND COMPACTION SHALL BE THE RESPONSIBILITY OF THE OWNER'S GEOTECHNICAL ENGINEER. A COPY OF THE REPORT SHALL BE PROVIDED TO CROCKETT ENGINEERING.

G. CAP UNITS SHALL BE PERMANENTLY SECURED TO THE BLOCK UNITS USING AN OUTDOOR CONSTRUCTION ADHESIVE.

3. GEOGRID PLACEMENT

A. GEOGRID SHALL BE PLACED AT THE LOCATIONS AND ELEVATIONS SHOWN ON THE DRAWINGS. REINFORCED FILL ZONE LENGTH IS MEASURED FROM THE BACK FACE OF THE WALL UNITS, EXTENDING TO THE END OF THE GEOGRID.

B. GEOGRID REINFORCEMENT SHALL BE CONTINUOUS THROUGHOUT THEIR EMBEDMENT LENGTH(S).

C. PRIOR TO PLACING FILL, THE GEOGRID MATERIALS SHALL BE PLACED IN BETWEEN BLOCK COURSES, THE SLACK REMOVED AND ANCHORED.

D. CONSTRUCTION EQUIPMENT SHALL NOT BE OPERATED DIRECTLY ON THE GEOGRID. A MINIMUM FILL THICKNESS OF SIX INCHES IS REQUIRED FOR OPERATION OF TRACKED VEHICLES OVER THE GEOGRID. TURNING OF TRACKED VEHICLES SHOULD BE KEPT TO A MINIMUM TO PREVENT TRACKS FROM DISPLACING THE FILL AND/OR THE GEOGRID.

E. GEOGRID SHALL BE ROLLED OUT WITH THE LONG AXIS OF THE APERTURES (MACHINE DIRECTION) PERPENDICULAR TO THE WALL FACE.

F. A MINIMUM OF 3 INCHES OF FILL MATERIAL SHALL BE REQUIRED BETWEEN OVERLAPPING LAYERS OF GEOGRID AND FILTER FABRIC, UNLESS OTHERWISE SHOWN.

4. DRAINAGE

A. AT THE END OF EACH WORK DAY, BACKFILL SURFACE SHALL BE COMPACTED WITH A SMOOTH PLATE COMPACTOR TO MINIMIZE PONDING OF WATER AND SATURATION OF THE BACKFILL.

B. PERMANENT SURFACE WATER DIVERSION SHALL BE AS REQUIRED AND PROVIDED BY THE OWNER OR OWNER'S REPRESENTATIVE.

5. DESIGN PARAMETERS

A. DESIGN OF THE REINFORCED SOIL STRUCTURE IS BASED ON THE FOLLOWING PARAMETERS BASED ON SITE EXPOSED ROCK ENTIRE WALL SURFACE:

	EFFECTIVE FRICTION ANGLE	EFFECTIVE COHESION	MOIST UNIT WT
REINFORCED FILL	34	0	125
RETAINED SOILS	23	0	120
FOUNDATION SOILS	23	0	120

MINIMUM BEARING CAPACITY 2,500 PSF

B. DESIGN METHODOLOGY: NCMA GUIDELINES

C. FACTOR OF SAFETY:

INTERNAL STABILITY: STATIC

MINIMUM FACTOR OF SAFETY (FOS) FOR UNCERTAINTIES = 1.5
MINIMUM FOS FOR GEOGRID PULLOUT = 1.5
MINIMUM FOS FOR CONNECTION = 1.5
MINIMUM FOS FOR FACING STABILITY = 1.5
MINIMUM FOS FOR SLIDING AT LOWEST GEOGRID = 1.5
SOIL – GEOGRID INTERACTION COEFFICIENT = 0.8
PERCENT COVERAGE OF GEOGRID = 100%

D. EXTERNAL STABILITY

MINIMUM FACTOR OF SAFETY FOR OVERTURNING = 1.5
MINIMUM FACTOR OF SAFETY FOR SLIDING = 1.5

E. SURCHARGE LOADING

100 PSF SIDEWALKS/PARKING LOTS

6. SPECIAL PROVISIONS

A. THE DESIGN PRESENTED HEREIN IS BASED ON SOIL PARAMETERS, FOUNDATION CONDITIONS, GROUNDWATER CONDITIONS, AND LOADINGS STATED IN SECTION 5.

B. WALL ELEVATION VIEWS AND LOCATIONS AND GEOMETRY OF EXISTING STRUCTURES AND GRADE ABOVE AND BELOW WALLS MUST BE VERIFIED BY THE CONTRACTOR, TO MATCH ELEVATIONS SHOWN IN THE CONTRACT DOCUMENTS, PRIOR TO CONSTRUCTION.

C. THE ENGINEER OF RECORD IS RESPONSIBLE FOR THE SEGMENTED RETAINING WALL & REINFORCED SOIL IN ITS FINAL CONDITION ONLY. GLOBAL STABILITY, BEARING CAPACITY, AND SETTLEMENT ANALYSIS IS THE RESPONSIBILITY OF THE OWNER'S GEOTECHNICAL ENGINEER. ANY CHANGES TO THE WALL REQUIRED BASED ON THE GEOTECHNICAL ANALYSIS SHOULD BE COORDINATED BY THE GEOTECHNICAL ENGINEER PRIOR TO WALL CONSTRUCTION.

D. REFER TO BLOCK MANUFACTURE'S WRITTEN INSTALLATION INSTRUCTIONS FOR SEGMENTED RETAINING WALL INSTALLATION, SPECIFICALLY REGARDING CONNECTIONS FROM BLOCK TO BLOCK AND GEOGRID INSTALLATION.

E. THE SOIL DESIGN PARAMETERS STATED IN SECTION 5.0 SHALL BE VERIFIED BY THE PROJECT GEOTECHNICAL ENGINEER. WRITTEN VERIFICATION OF DESIGN PARAMETERS SHALL BE SUBMITTED TO CROCKETT ENGINEERING AND PRIOR TO COMMENCING WITH CONSTRUCTION.

F. ANY REVISIONS TO DESIGN PARAMETERS STATED IN SECTION 5.0 OR STRUCTURE GEOMETRY SHALL REQUIRE DESIGN MODIFICATIONS PRIOR TO PROCEEDING WITH CONSTRUCTION.

7. GUARDRAIL SPEC

A. SHALL BE 42" TALL ABOVE ADJACENT WALKING SURFACE.

B. SHALL NOT HAVE OPENINGS LARGE ENOUGH TO PASS A 4" SPHERE.

C. MAIN RAILS SHALL RESIST 50 POUND PER LINEAL FOOT LATERALLY AT THE TOP RAIL OR 200 POUNDS CONCENTRATED LOAD LATERALLY.

D. INTERMEDIATE RAILS SHALL RESIST A CONCENTRATED LOAD OF 50 POUNDS LATERALLY.

INDEX OF SHEETS

GENERAL DATA	RW1
PARTIAL SITE PLAN	RW2
RETAINING WALL PROFILE	RW3-RW9
DETAILS	RW10

REVISIONS:

No.	Date
PERMIT SET	12/20/2019

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

STATE OF MISSOURI
GREGORY L LINNEMAN
NUMBER PE-2005001013

GREGORY L. LINNEMAN - PE
MO LICENSE - 2005001013

STRUCTURAL ENGINEER:
CROCKETT
ENGINEERING CONSULTANTS
1000 West Nifong Blvd. Bldg. 1
Columbia, Missouri 65203
(573) 447-0292
www.crockettengineering.com
Crockett Engineering Consultants, LLC
Missouri Certificate of Authority
#2004015501

CLIENT:
CENTRAL STATES CONSTRUCTION
4215 PHILIPS FARM RD
COLUMBIA, MISSOURI

ARIA LEE'S SUMMIT APARTMENTS
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

DRAWING INCLUDES:
GENERAL
STRUCTURAL DATA

DESIGNED:	JWV
DRAWN:	SEH
PROJECT NO.:	190299

SHEET:
RW1

1 RW2 RETAINING WALL PLAN

NOT TO SCALE

N PLAN NORTH

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DRAWING INCLUDES:

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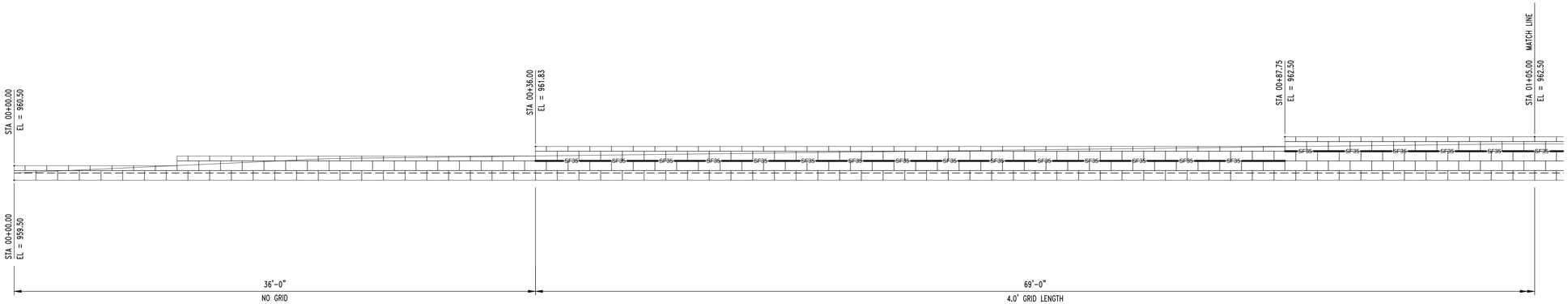
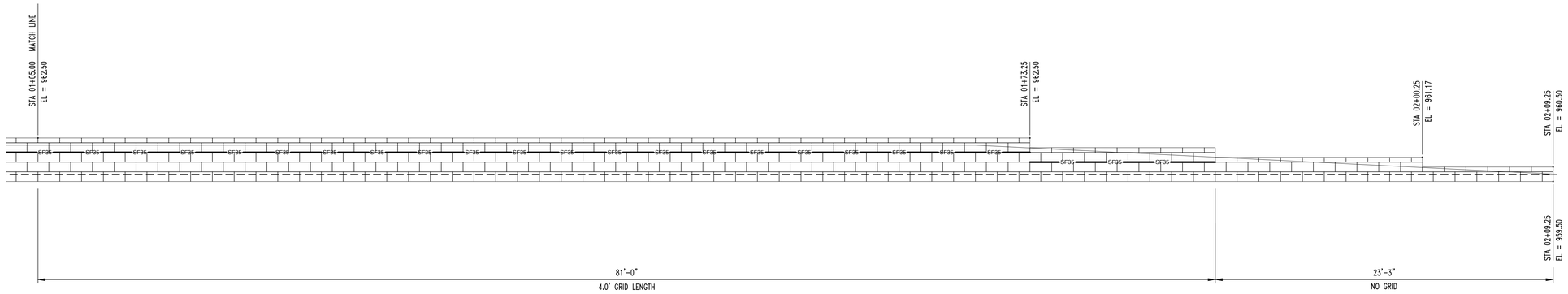
DESIGNED:	JWV
DRAWN:	SEH
PROJECT NO.:	190299
SHEET:	RW2



1 / RW3 RETAINING WALL 1 (AREA 492 SQ. FT.)

SCALE: ¼" = 1'-0"



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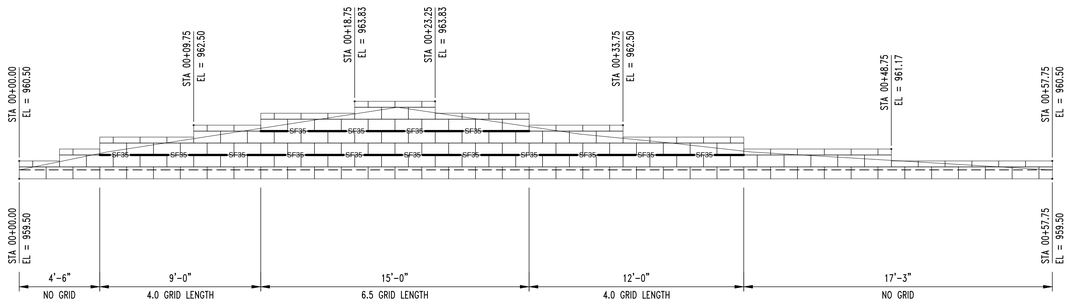
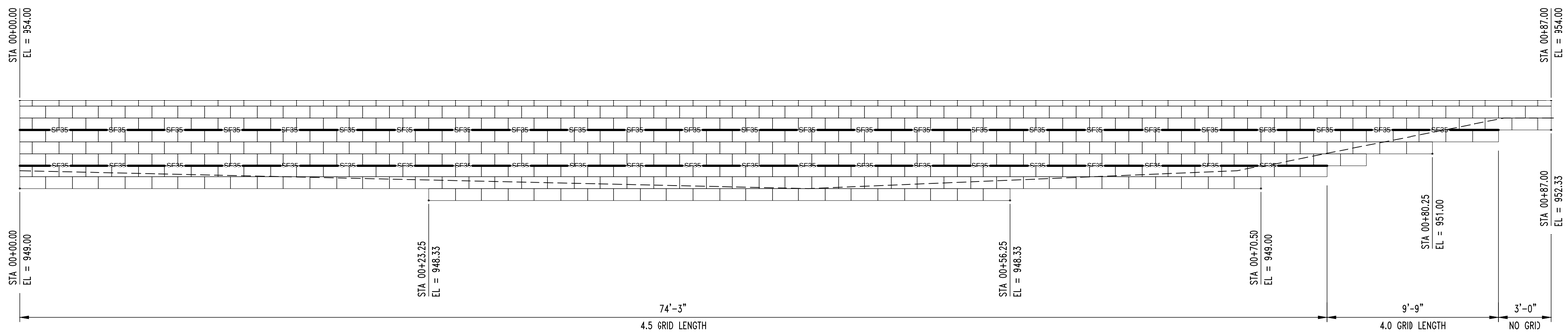
PROJECT NO.:	190299
SHEET:	RW3



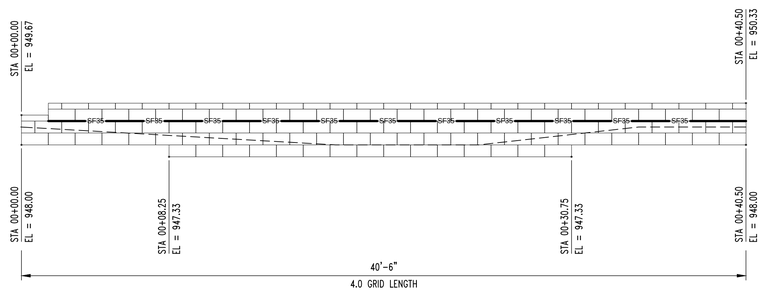
1 RW4 RETAINING WALL 2 (AREA 142 SQ. FT.)

SCALE: ¾" = 1'-0"



2 RW4 RETAINING WALL 3 (AREA 424 SQ. FT.)

SCALE: ¾" = 1'-0"



3 RW4 RETAINING WALL 4 (AREA 110 SQ. FT.)

SCALE: ¾" = 1'-0"

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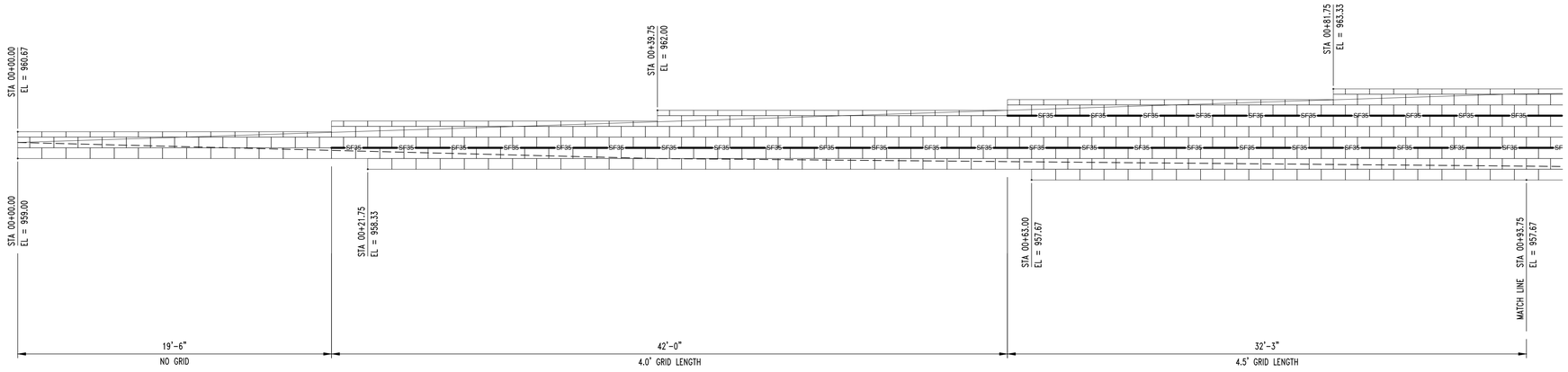
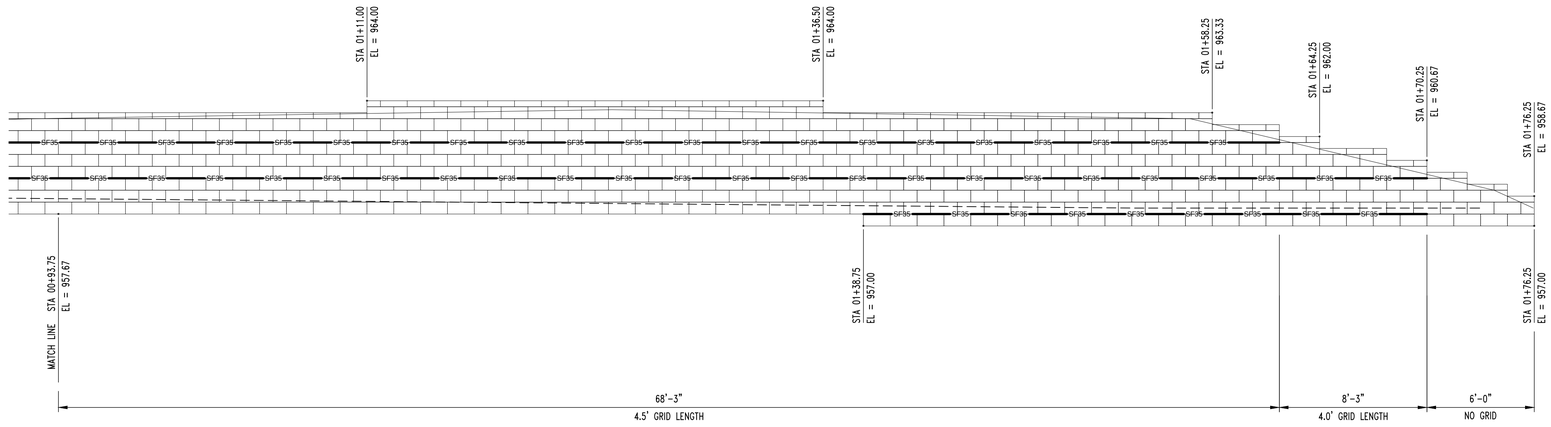
SHEET:	RW4



1 / RW5 RETAINING WALL 5 (AREA 807 SQ. FT.)

SCALE: 1/4" = 1'-0"



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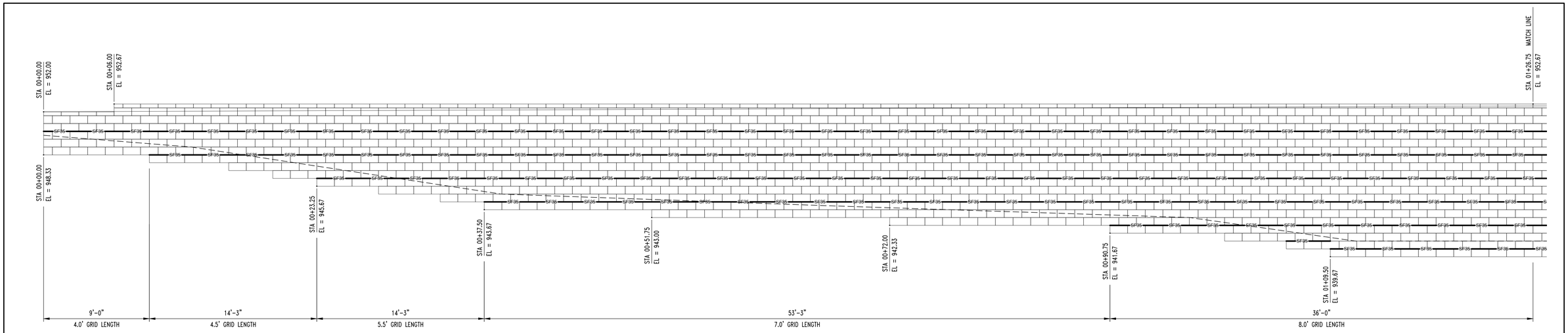
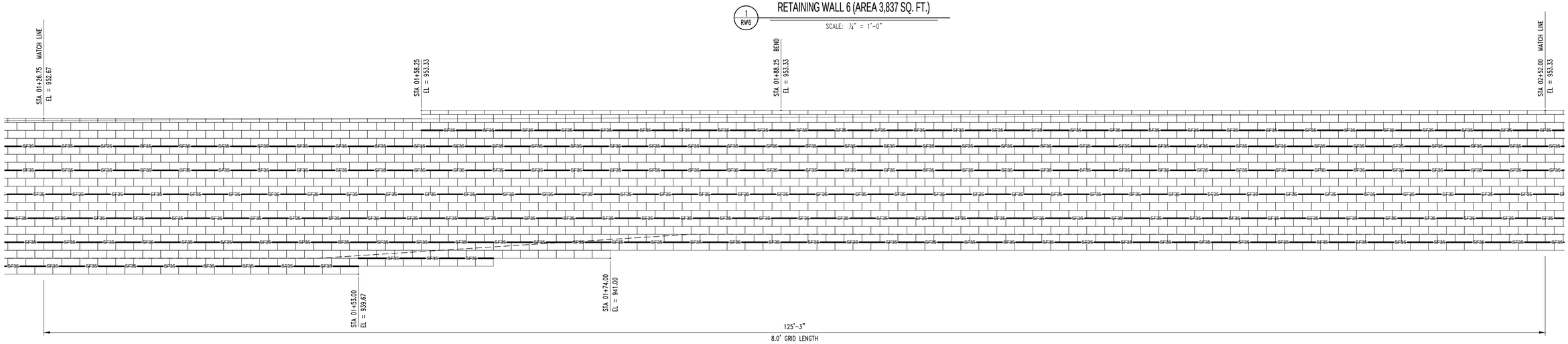


1 RW6 RETAINING WALL 6 (AREA 3,837 SQ. FT.)

SCALE: ¼" = 1'-0"



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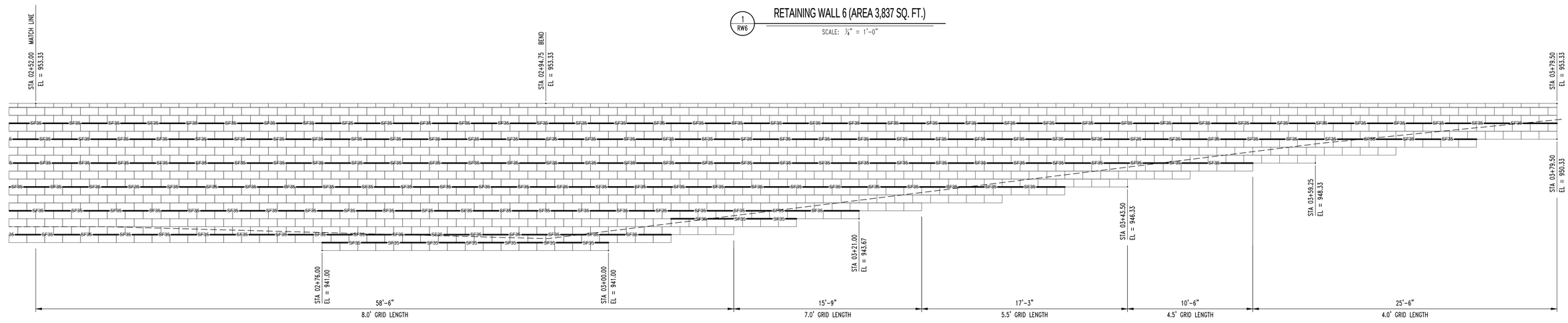

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SCALE: ¼" = 1'-0"

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1000 West Nifong Blvd. Bldg. I
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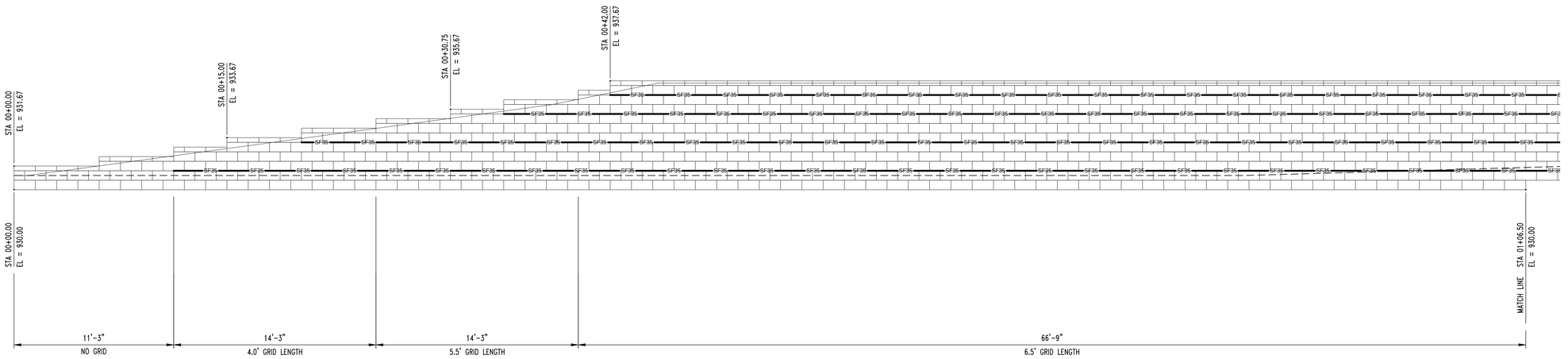
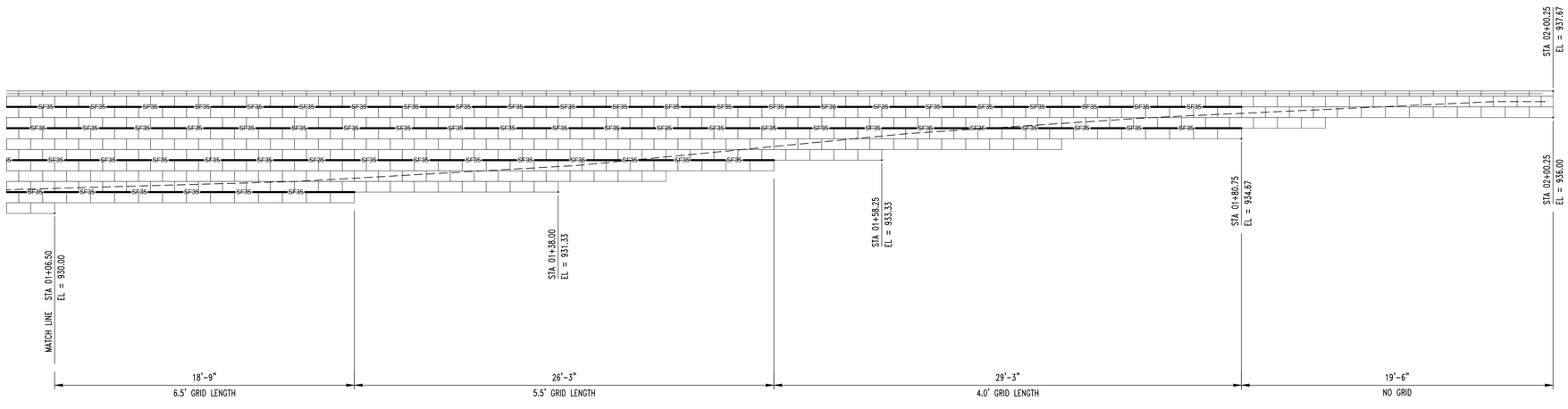


1 RW7 RETAINING WALL 7 (AREA 1,097 SQ. FT.)

SCALE: 1/4" = 1'-0"



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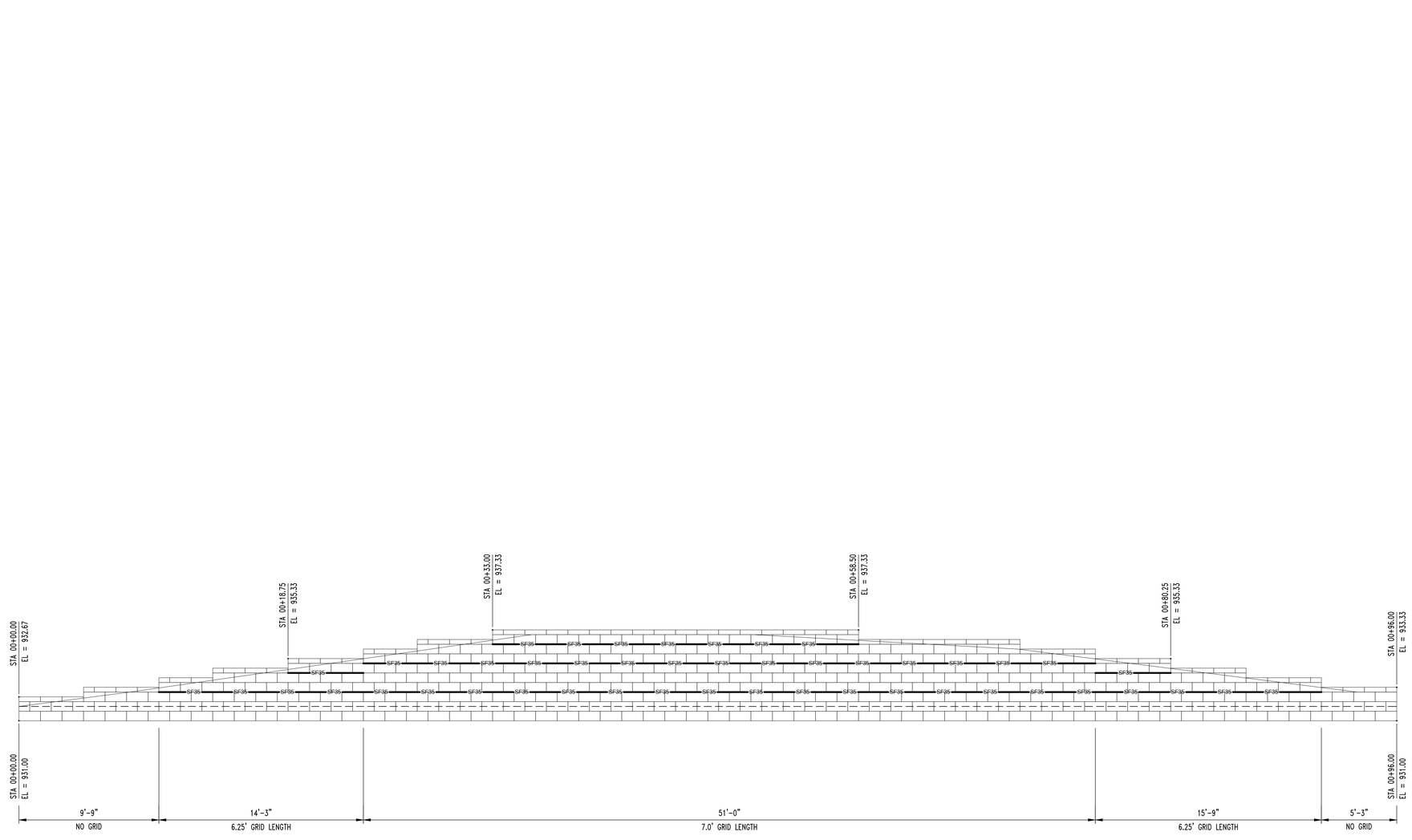

1 RW8 RETAINING WALL 8 (AREA 443 SQ. FT.)

SCALE: ¼" = 1'-0"

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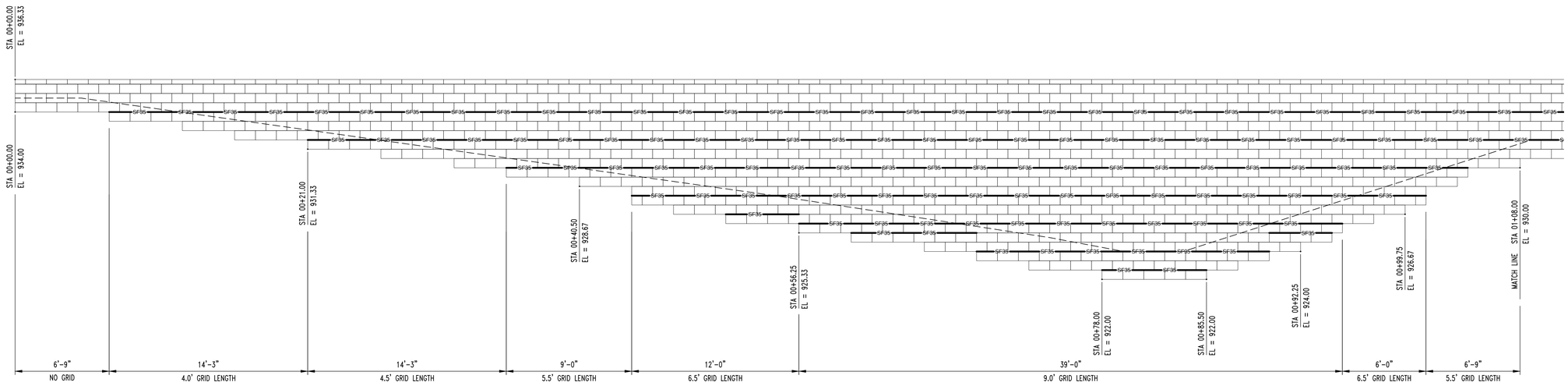
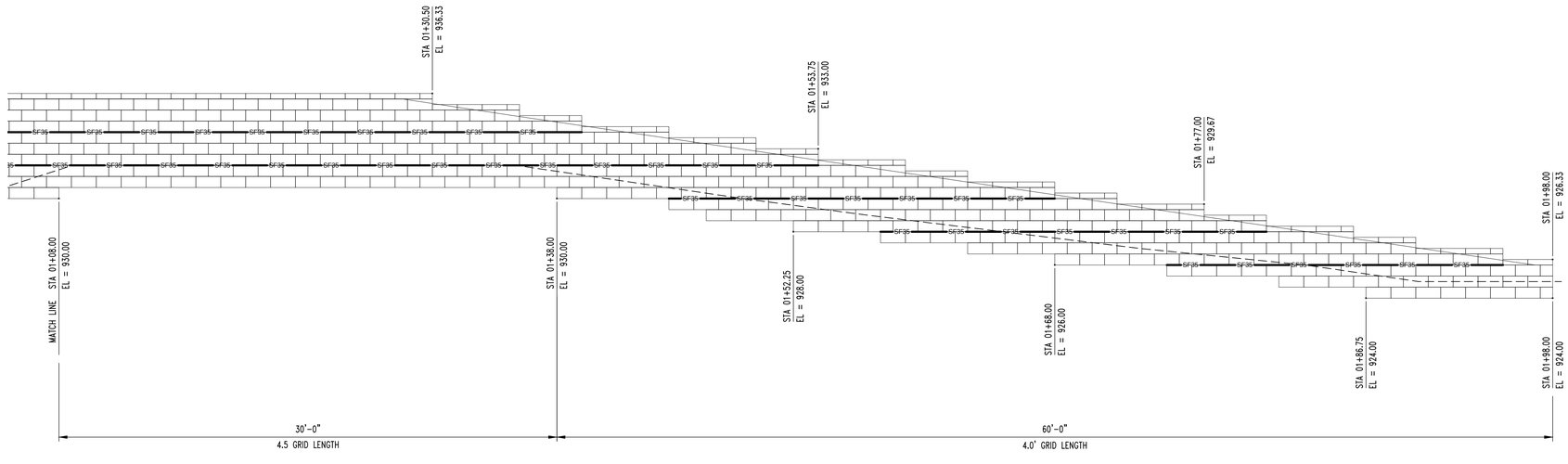


1 RW9 RETAINING WALL 9 (AREA 1,288 SQ. FT.)

SCALE: ¼" = 1'-0"



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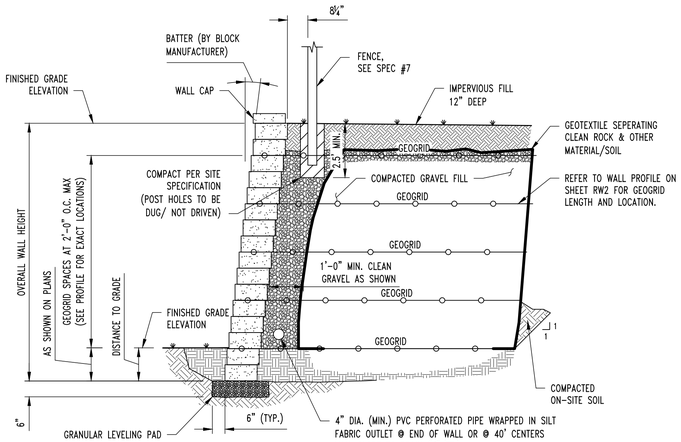
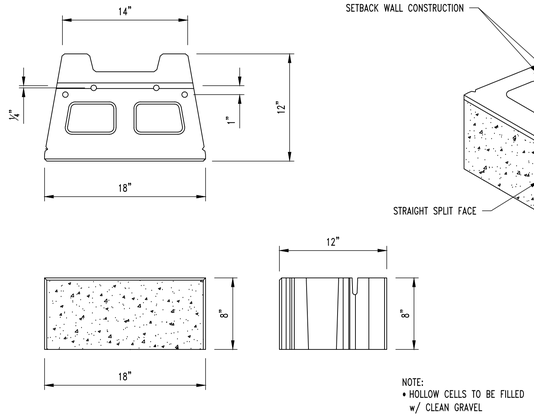


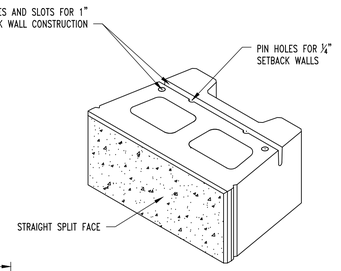
REINFORCED RETAINING WALL

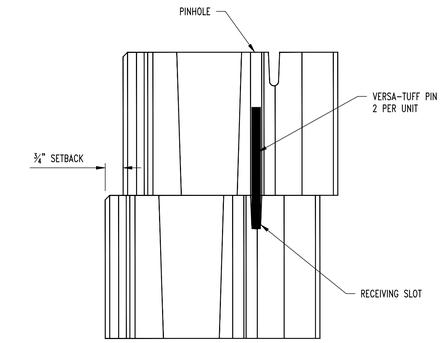
SCALE: NONE



VERSA-LOK SQUARE FOOT UNIT

SCALE: NONE





PINNING DETAIL

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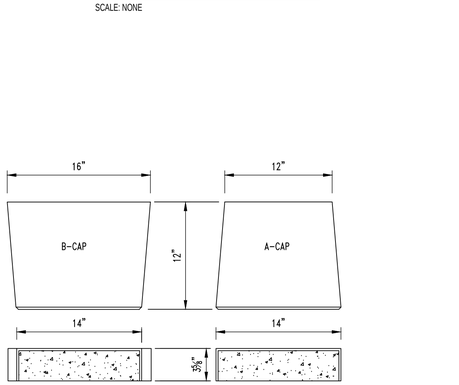

VERSA-LOK CAP UNITS

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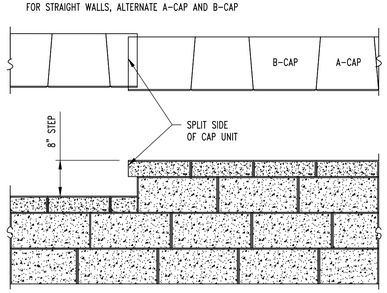
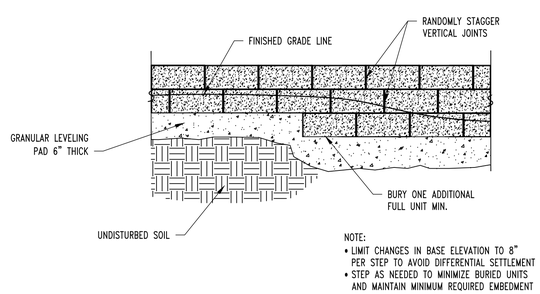


CAPPING DETAIL-PROFILE

SCALE: NONE



STEPPING BASE DETAIL

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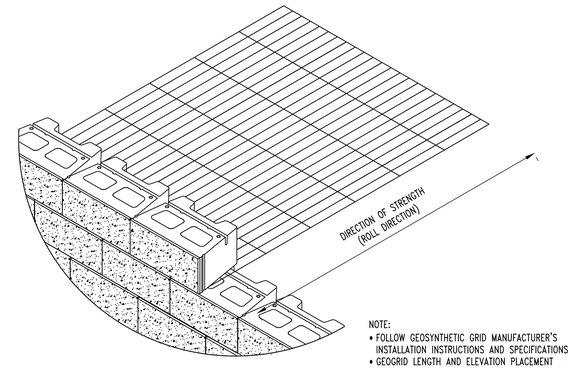

GEOSYNTHETIC INSTALLATION DETAIL

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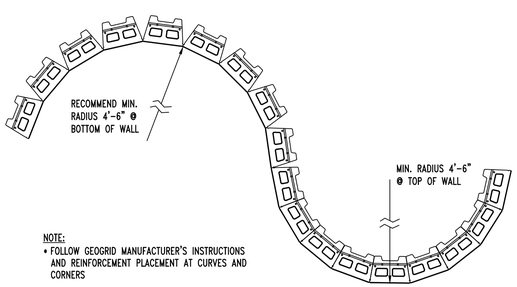
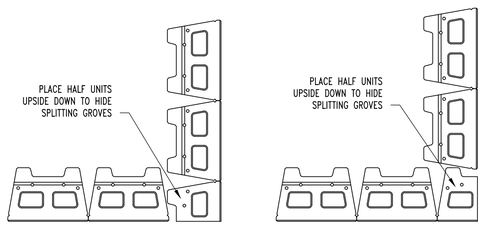


CURVE DETAIL

SCALE: NONE



CORNER DETAIL

SCALE: NONE

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DRAWN: SEH
PROJECT NO.: 190299

SHEET:
RW10

SITE LIGHTING PLAN SYMBOL LEGEND

CIRCUIT WIRING

X1 — "X1" INDICATES FIXTURE TYPE (REFER TO SCHEDULE)

POLE LIGHT

ARROW INDICATES FORWARD AIMING DIRECTION

PX-XX — CIRCUIT TAG

1.1 — PHOTOMETRIC CALCULATIONS (IN FOOT-CANDLES)

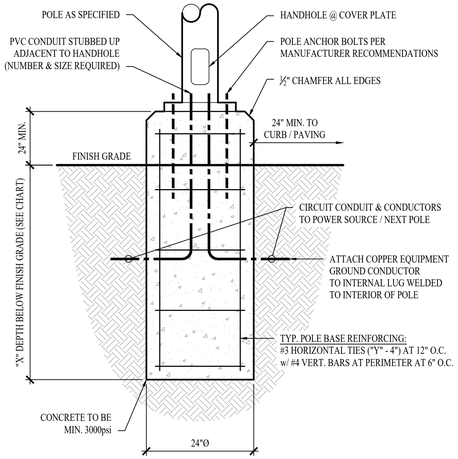
SITE LIGHTING PLAN GENERAL NOTES:

1. REFER TO E500 SERIES SHEETS FOR ELECTRICAL SCHEDULES, SPECIFICATIONS, ADDITIONAL REQUIREMENTS, ETC.
2. SITE PHOTOMETRIC VALUES SHOWN HAVE BEEN CALCULATED PER SPECIFIED FIXTURES AT INDICATED MOUNTING HEIGHTS. ANY CHANGES OR ALTERATIONS TO LIGHTING LAYOUT SHOWN WILL REQUIRE RECALCULATING SITE PHOTOMETRICS AND WILL BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR / EQUIPMENT SUPPLIER.
3. PHOTOMETRIC CALCULATIONS SHOWN DO NOT INCLUDE EXISTING LIGHT FIXTURES, ONLY NEW POLE LIGHTS SHOWN.

SITE LIGHTING PLAN KEY NOTES:

1. 1 ¼" PVC CONDUIT WITH (2) #3 CU. & (1) #8 CU. EQ. GRD.
2. 1 ¼" PVC CONDUIT WITH (2) #4 CU. & (1) #8 CU. EQ. GRD.
3. 1" PVC CONDUIT WITH (2) #6 CU. & (1) #10 CU. EQ. GRD.
4. 1" PVC CONDUIT WITH (2) #8 CU. & (1) #10 CU. EQ. GRD.
5. 1" PVC CONDUIT WITH (2) #10 CU. & (1) #10 CU. EQ. GRD.
6. WIRE THRU 'LCP1' (CLUBHOUSE) RELAYS #6 & #7.
7. WIRE THRU 'LCPB' RELAYS #2 & #3.
8. WIRE THRU 'LCPC' RELAYS #2 & #3.
9. WIRE THRU 'LCPA' RELAYS #2 & #3.

POLE HEIGHT	"X" DEPTH
10ft - 14ft	4'-6"
15ft - 20ft	6'-0"
21ft - 25ft	7'-0"



TYP. LIGHT POLE DETAIL - 1

MEP SITE UTILITIES PLAN

SCALE: 1" = 60'

SITE LIGHTING FIXTURE SCHEDULE

TAG	MANUFACTURER (OR EQUAL)	MODEL NUMBER (OR EQUAL)	DESCRIPTION	MOUNTING	LUMEN OUTPUT	CCT (°K)	CRI	VOLTS	WATTS	NOTES
PL1	MCGRAW-EDISON	GLEON-AF-08-LED-E1-5WQ-MS/DIM-L40	LED POLE LIGHT	26' POLE ON 2' BASE	33,106	4000	70	208	257	VALMONT 'SSS' POLE
PL2	MCGRAW-EDISON	GLEON-AF-04-LED-E1-SL3-MS/DIM-L40	LED POLE LIGHT	26' POLE ON 2' BASE	15,821	4000	70	208	129	VALMONT 'SSS' POLE
PL3	MCGRAW-EDISON	GLEON-AF-04-LED-E1-SL4-MS/DIM-L40	LED POLE LIGHT	26' POLE ON 2' BASE	15,033	4000	70	208	129	VALMONT 'SSS' POLE
PL4	MCGRAW-EDISON	GLEON-AF-04-LED-E1-T3-MS/DIM-L40	LED POLE LIGHT	26' POLE ON 2' BASE	15,824	4000	70	208	129	VALMONT 'SSS' POLE
PL5	MCGRAW-EDISON	GLEON-AF-04-LED-E1-T4FT-04-MS/DIM-L40	LED POLE LIGHT	26' POLE ON 2' BASE	15,915	4000	70	208	129	VALMONT 'SSS' POLE

NOTES:

1. VERIFY LIGHT FIXTURE FINISHES WITH OWNER / ARCHITECT PRIOR TO INSTALLATION

STATE OF MISSOURI
JAMES P. WATSON
NUMBER PE-2015017071
PROFESSIONAL ENGINEER

James Watson, P.E. August 26, 2020
PE-2015017071
MO Certificate of Authority # 2018029680

J-SQUARED ENGINEERING
2401 Bernadette Drive, Suite 201
Columbia, Missouri 65203
573 - 234 - 4492 phone
www.j-squaredeng.com

J2 PROJECT No:	J20055
J2 DESIGN:	ACW

ISSUE TITLE	DATE
PERMIT SET	08 - 26 - 2020

Mechanical - Electrical - Plumbing Design Drawings for

Aria Apartments - Lee's Summit

Northeast Douglas Road & Lee's Summit Road
Lee's Summit, Jackson County, Missouri

SHEET TITLE

SITE LIGHTING PLAN

SHEET NUMBER

MEP3

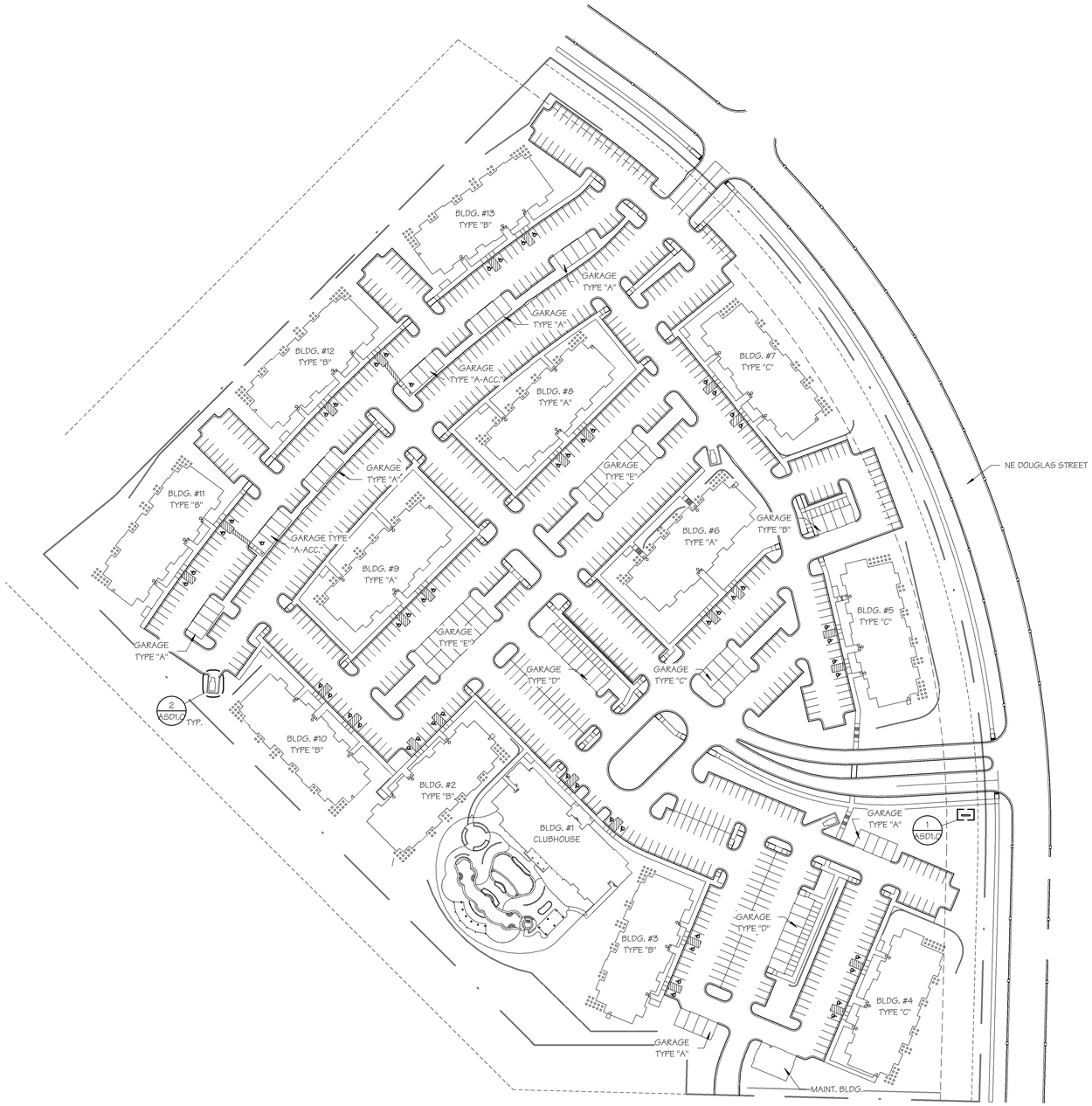
NOTE: INSTALL HANDRAILS @ ACCESSIBLE ROUTES AND WHERE OTHERWISE NOTED EXCEEDING 5% BUT LESS THAN 8.33%. 5'-0" LANDING REQUIRED AT TOP AND BOTTOM OF RAMP.

ACCESSIBILITY NOTES

1. SIDEWALK ON THE ACCESSIBLE ROUTE SHALL NOT EXCEED 5% (1'-0" IN 20'--0") RUNNING SLOPE WITH A 2% (1'-0" IN 50'-0") CROSS-SLOPE AND SHALL BE 4' WIDE MIN. EXCEPT AS NOTED ON SITE PLAN. PROVIDE STAIRS, RAMPS, CURBS, ETC., AS NOTED AND DETAILED.

2. PARKING AREAS AND ACCESSIBLE SPACES AND ACCESS AISLES SHALL NOT EXCEED A 2% (1'-0" IN 50'-0" SLOPE IN EACH DIRECTION. OTHER PORTIONS OF THE ACCESSIBLE ROUTE SHALL NOT EXCEED A 5% (1'-0" IN 20'-0") LONGITUDINAL SLOPE NOR A 2% (1'-0" IN 50'-0") CROSS-SLOPE.

NOTE: SEE CIVIL PLANS FOR ADDITIONAL INFORMATION



1 AS1.0 ARCHITECTURAL SITE PLAN

SCALE: 1" = 80'-0"

N

ARCHITECTURAL SITE PLAN

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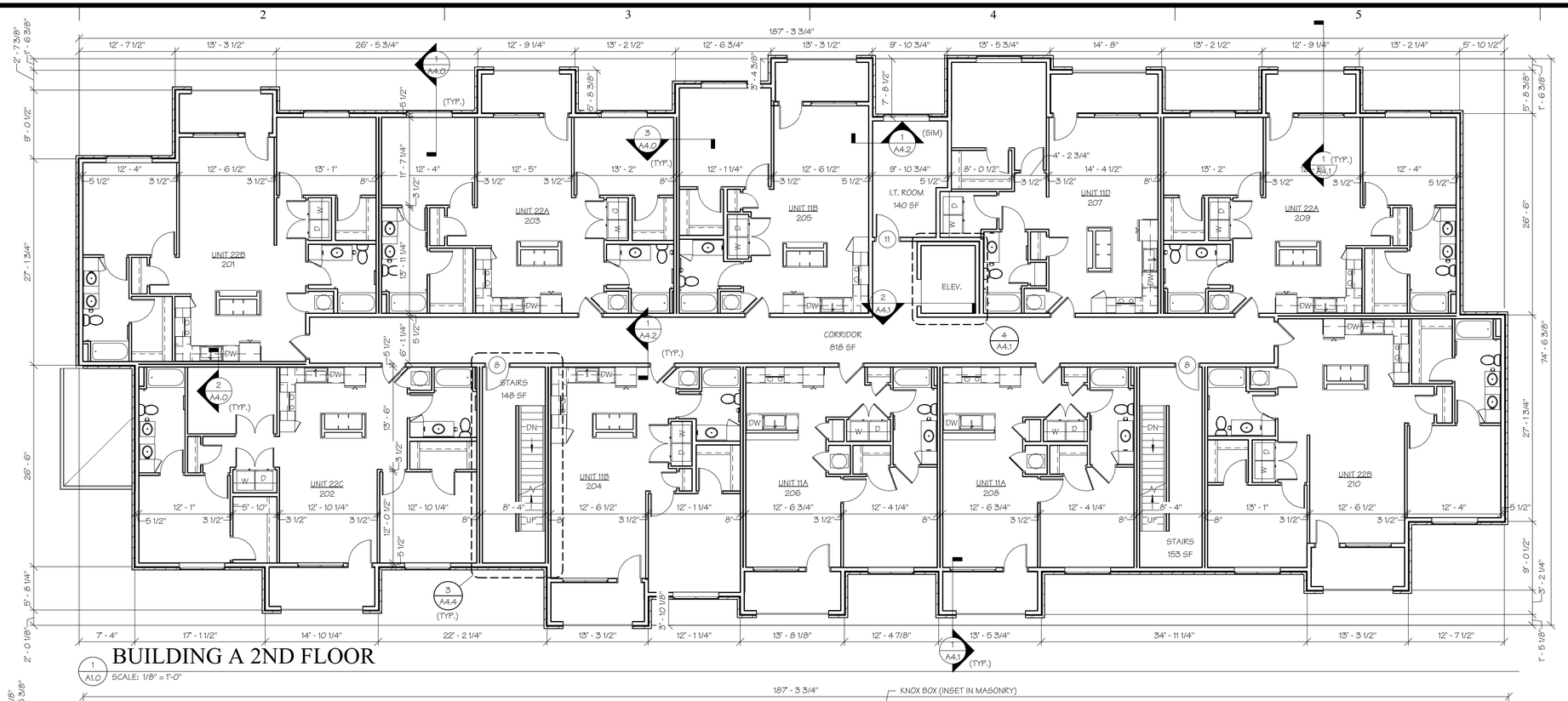
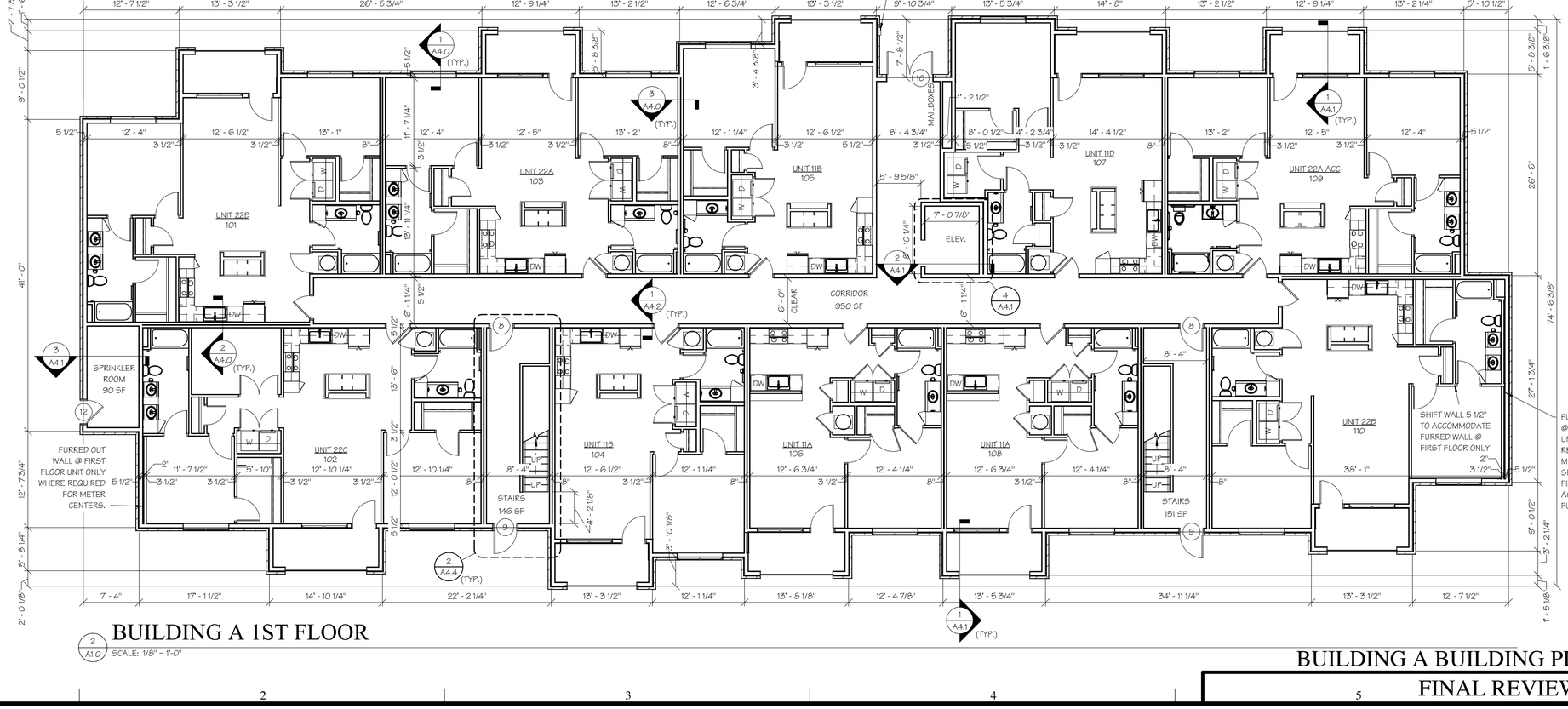


1 A1.0 SCALE: 1/8" = 1'-0"

BUILDING A 2ND FLOOR



2 A1.0 SCALE: 1/8" = 1'-0"

BUILDING A 1ST FLOOR

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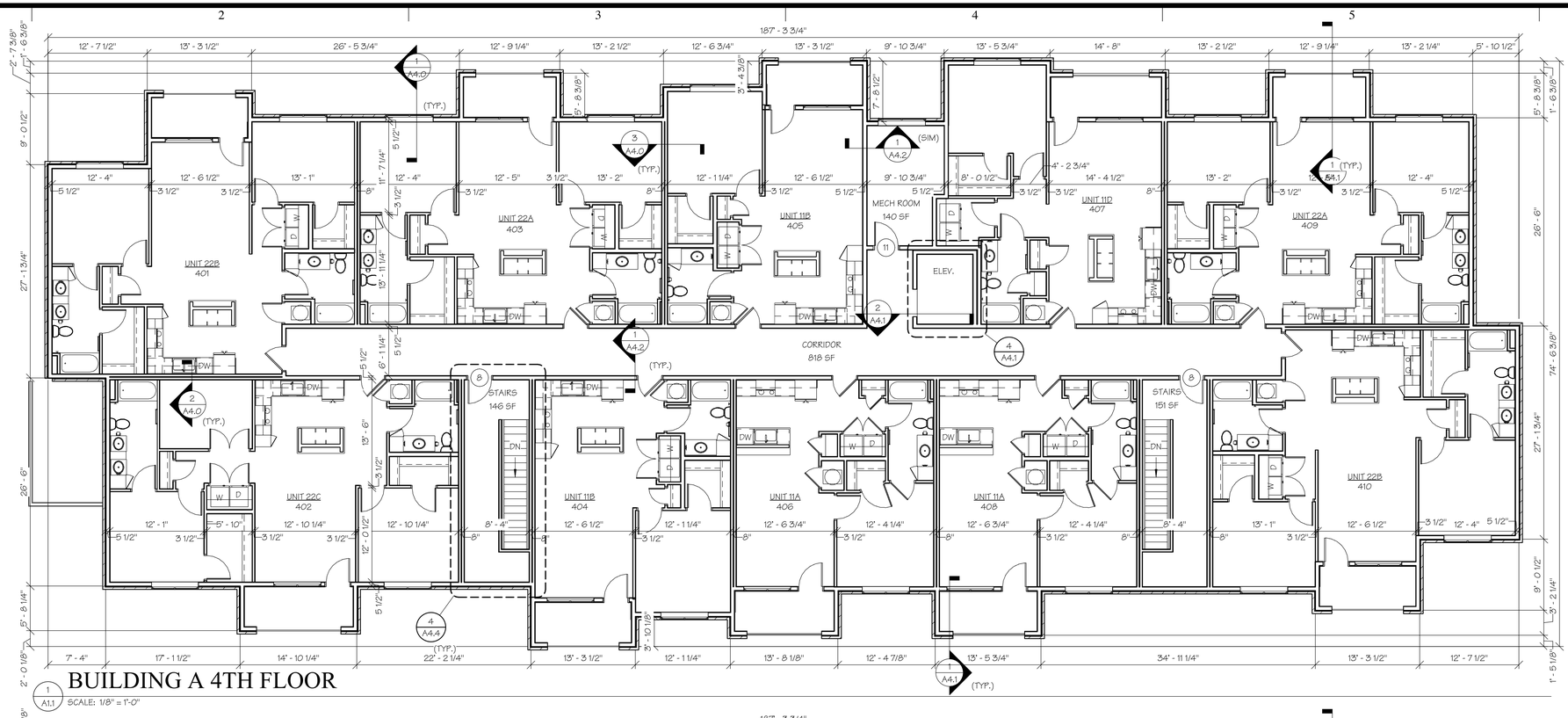
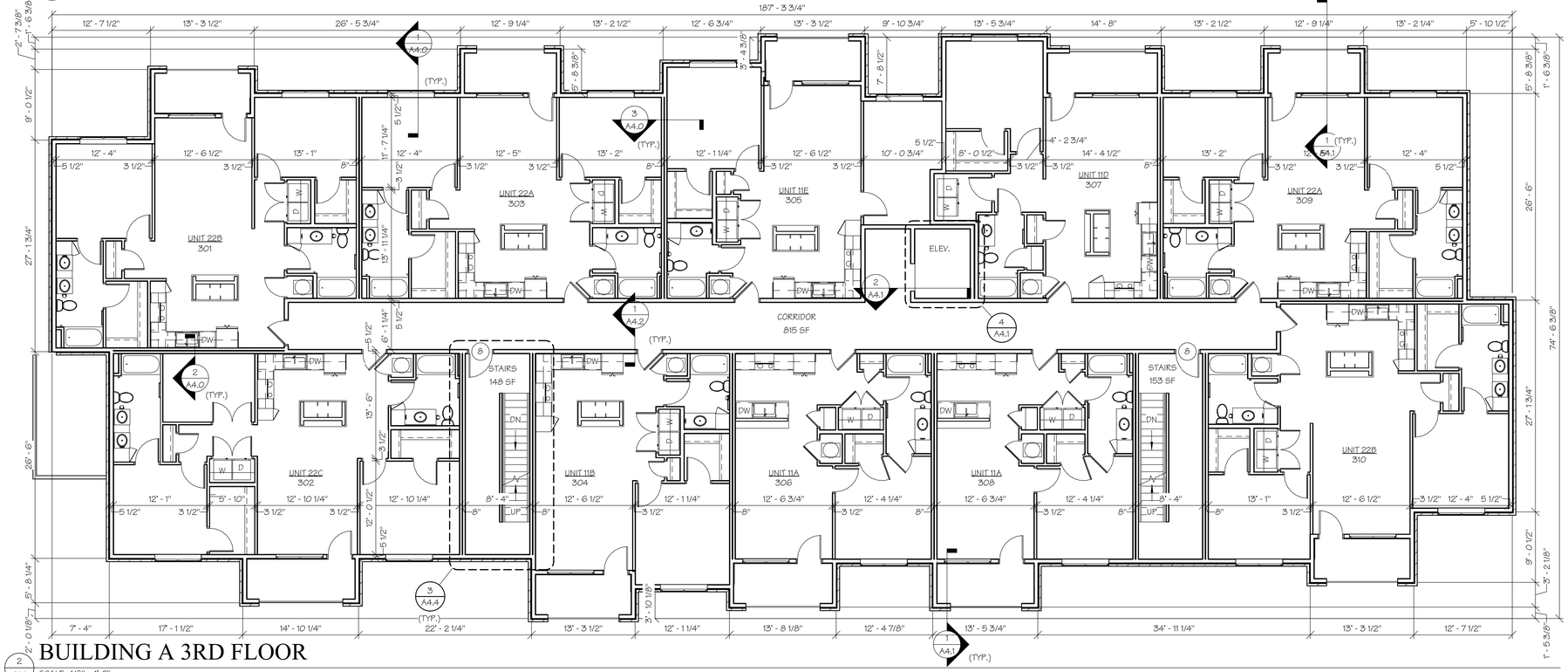


BUILDING A 4TH FLOOR

1 A1.1 SCALE: 1/8" = 1'-0"



BUILDING A 3RD FLOOR

2 A1.1 SCALE: 1/8" = 1'-0"

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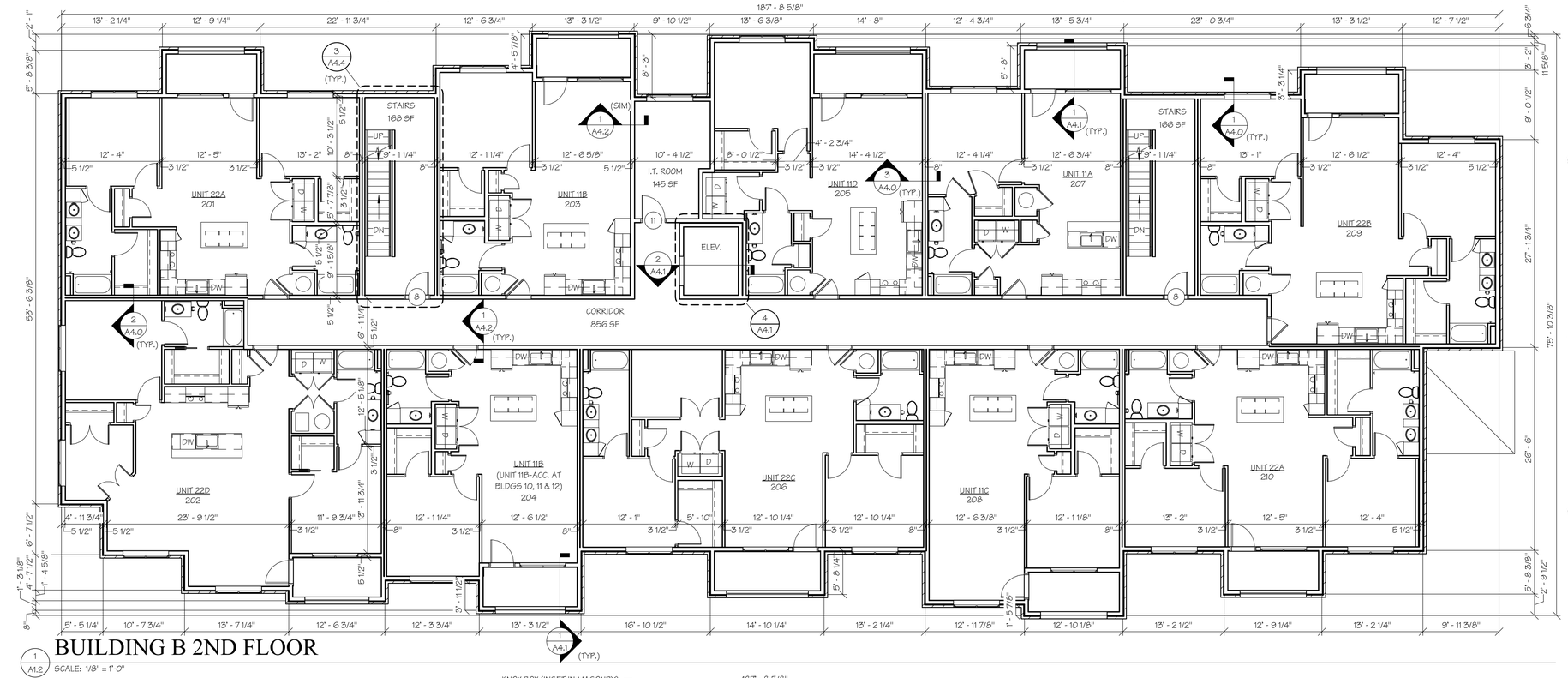

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BUILDING B BUILDING PLANS

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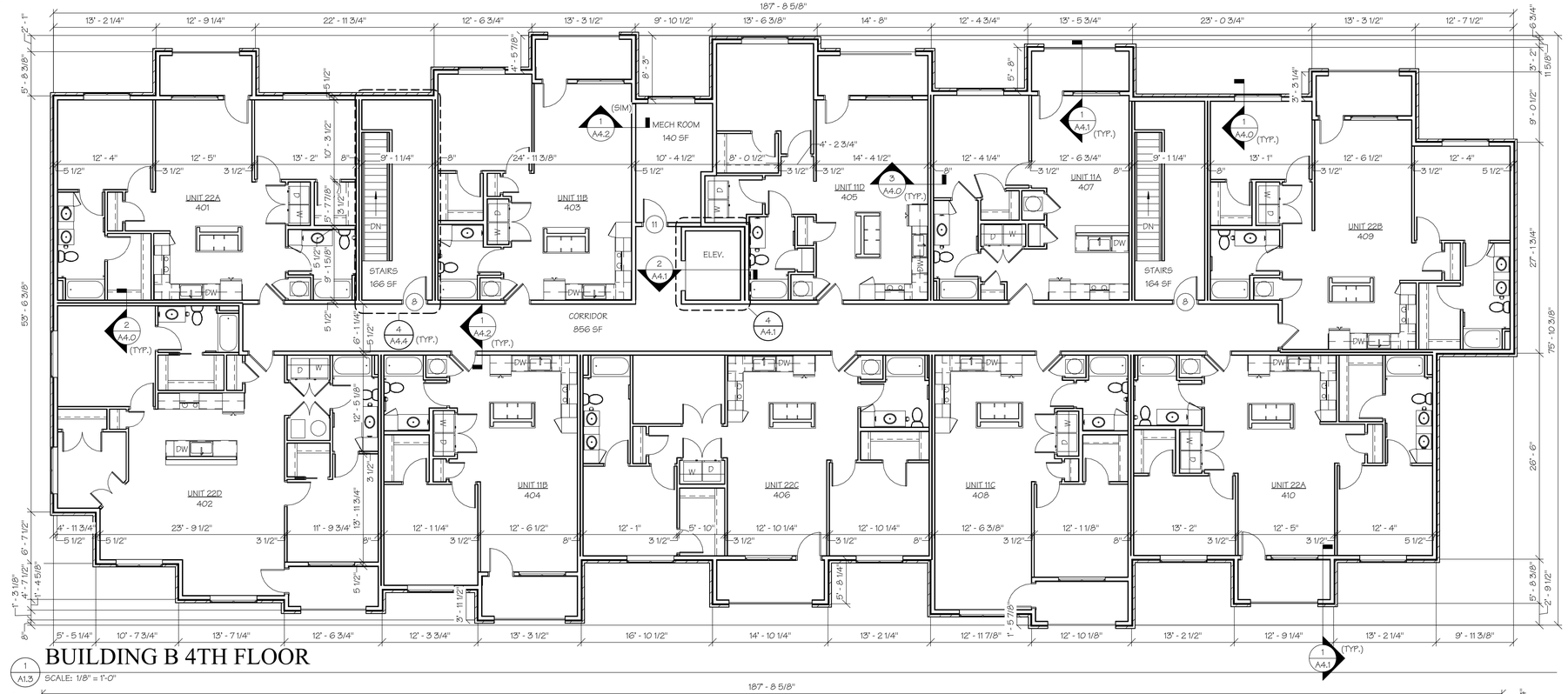
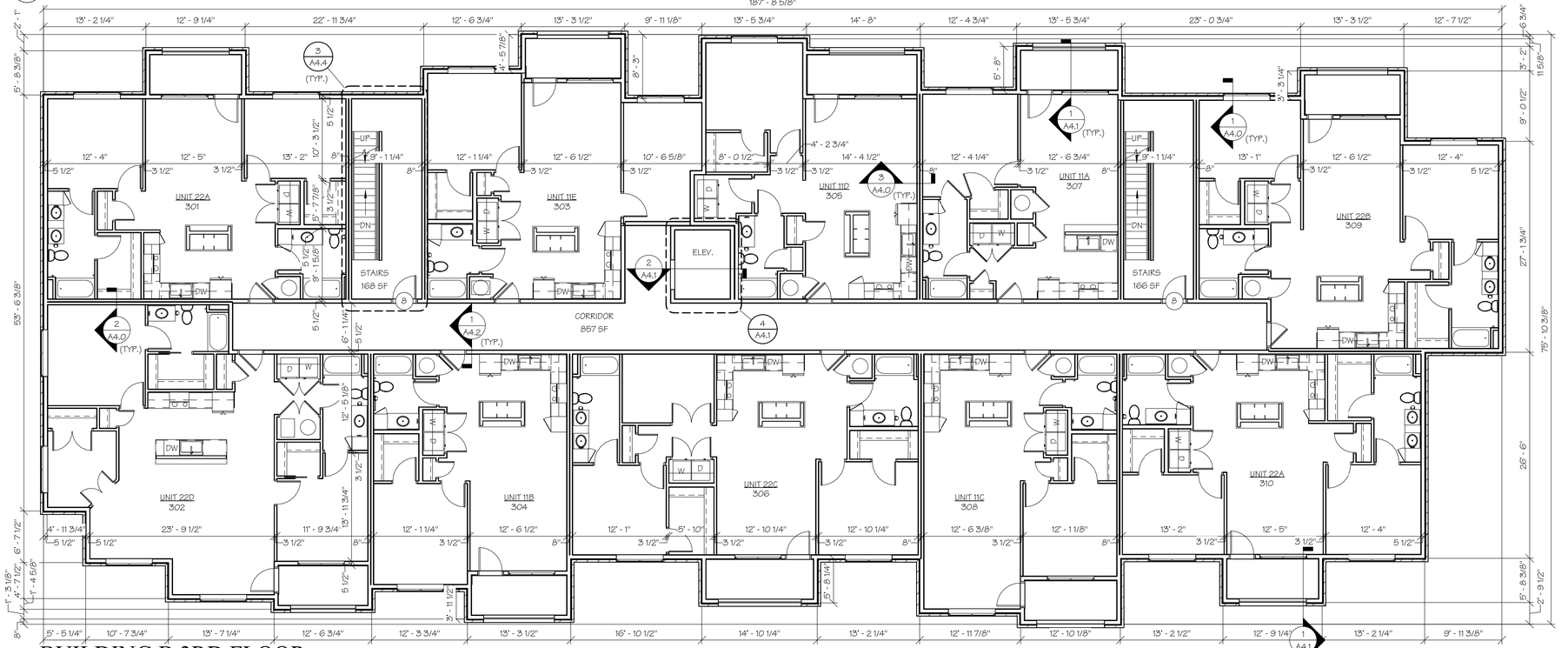


1 A1.3 BUILDING B 4TH FLOOR

SCALE: 1/8" = 1'-0"



2 A1.3 BUILDING B 3RD FLOOR

SCALE: 1/8" = 1'-0"

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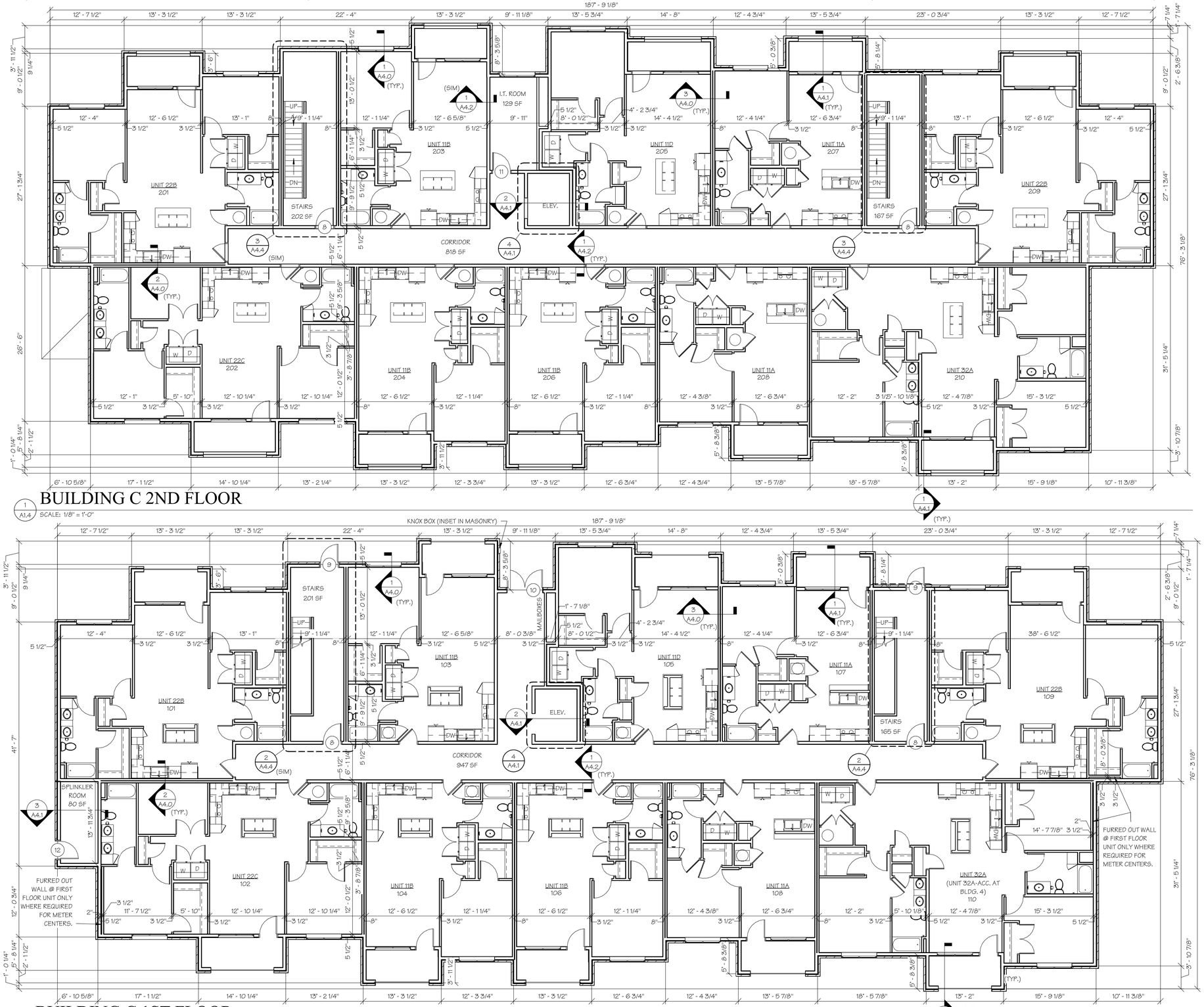

1 A1.4 SCALE: 1/8" = 1'-0"

BUILDING C 2ND FLOOR

2 A1.4 SCALE: 1/8" = 1'-0"

BUILDING C 1ST FLOOR

BUILDING C BUILDING PLANS

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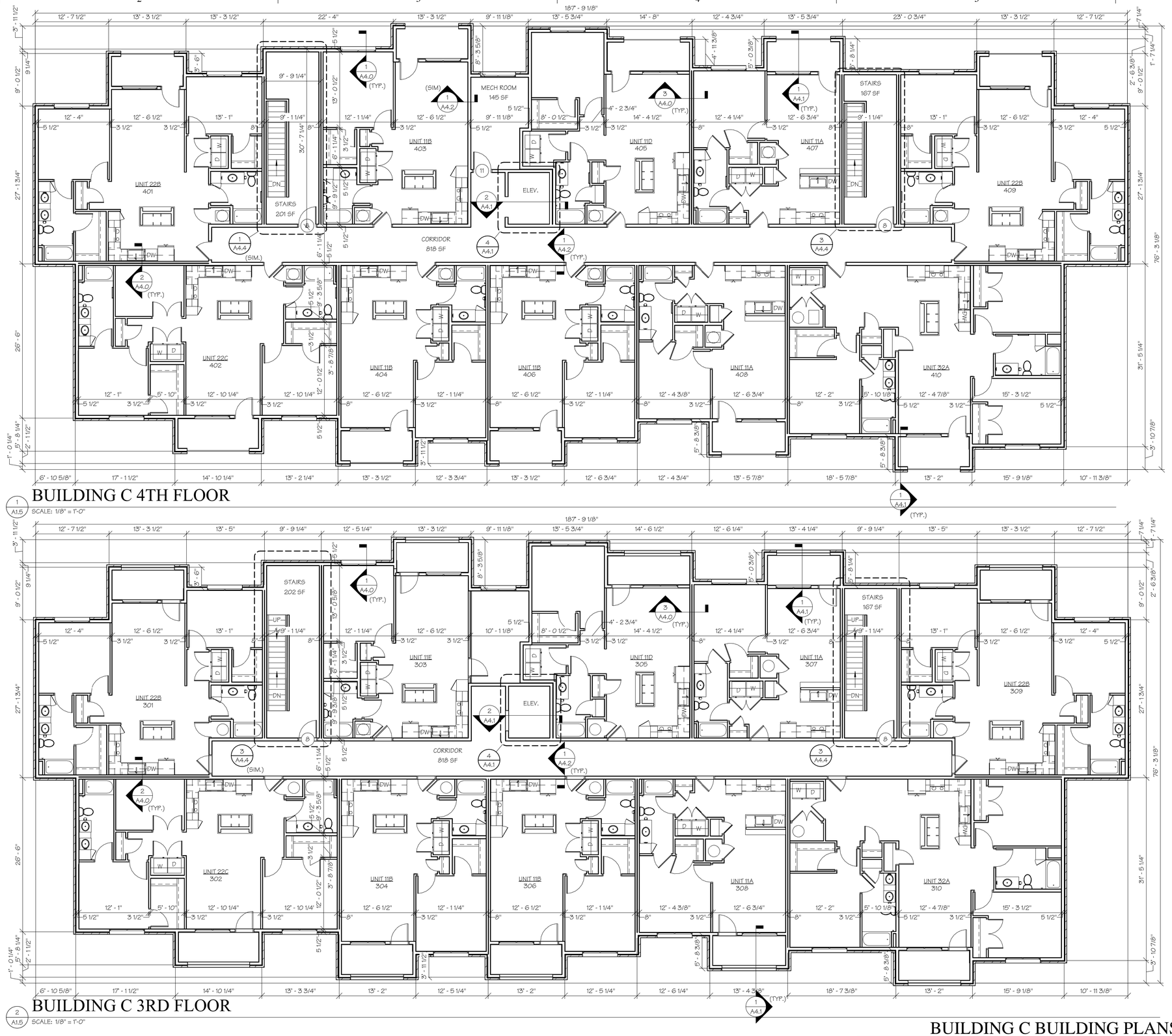

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BUILDING C BUILDING PLANS

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WINDOW SCHEDULE TYPE MARK

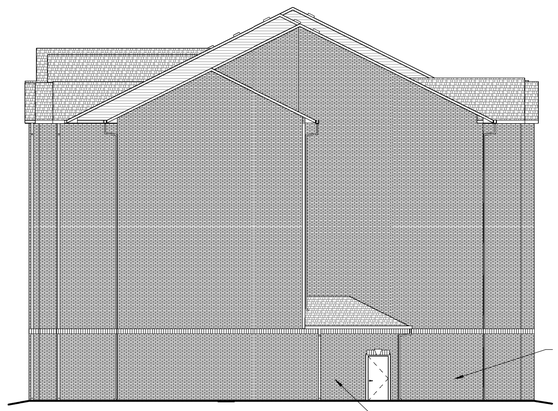
TYPE MARK	SIZE	HARDWARE	GLAZING	COMMENTS
1	PR. 3'-0" x 6'-0"	STANDARD	INSUL. LOW "E"	SINGLE HUNG W/SCREENS

WINDOW NOTES

1)	CONTRACTOR SHALL CERTIFY THAT BEDROOM WINDOWS INSTALLED PROVIDE EGRESS OPENING OF 5.7 SQ. FT. (MIN.) WITH MIN. CLEAR HEIGHT OF 24" AND MIN. CLEAR WIDTH OF 20".
2)	GLAZING WITHIN 24" OF DOORS SHALL BE SAFETY GLASS.
3)	INSTALL OPENING CONTROL DEVICES AT ALL WINDOWS, 2ND FLOOR AND ABOVE.
4)	ALL WINDOWS - MIN. U-FACTOR = 0.32 & SHGC = 0.40

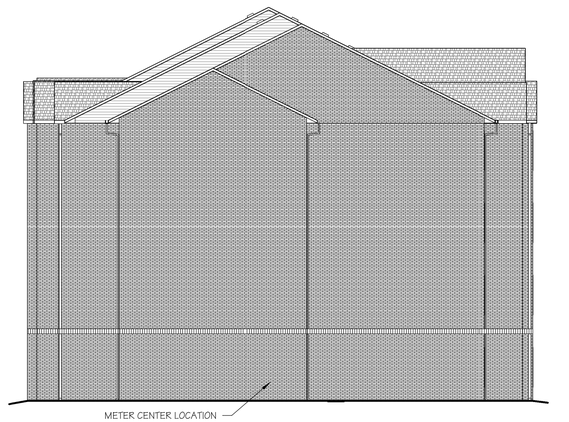
1 A3.0 BUILDING A REAR ELEVATION

SCALE: 3/32" = 1'-0"



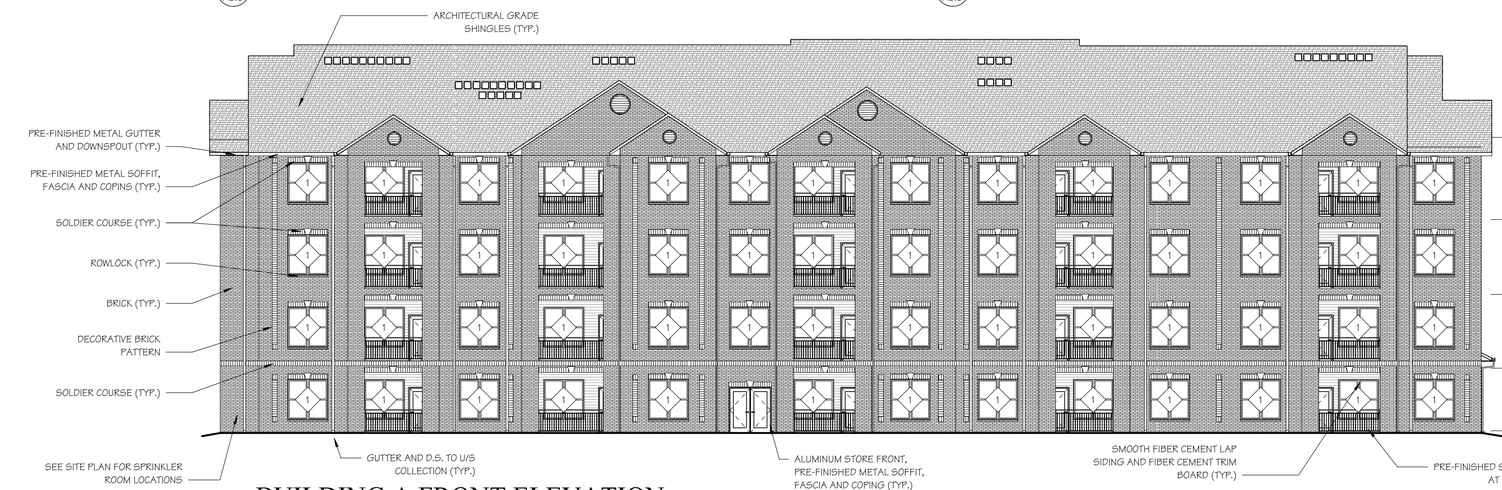
2 A3.0 BUILDING A LEFT SIDE ELEVATION

SCALE: 3/32" = 1'-0"



3 A3.0 BUILDING A RIGHT SIDE ELEVATION

SCALE: 3/32" = 1'-0"



4 A3.0 BUILDING A FRONT ELEVATION

SCALE: 3/32" = 1'-0"

BUILDING A EXTERIOR ELEVATIONS

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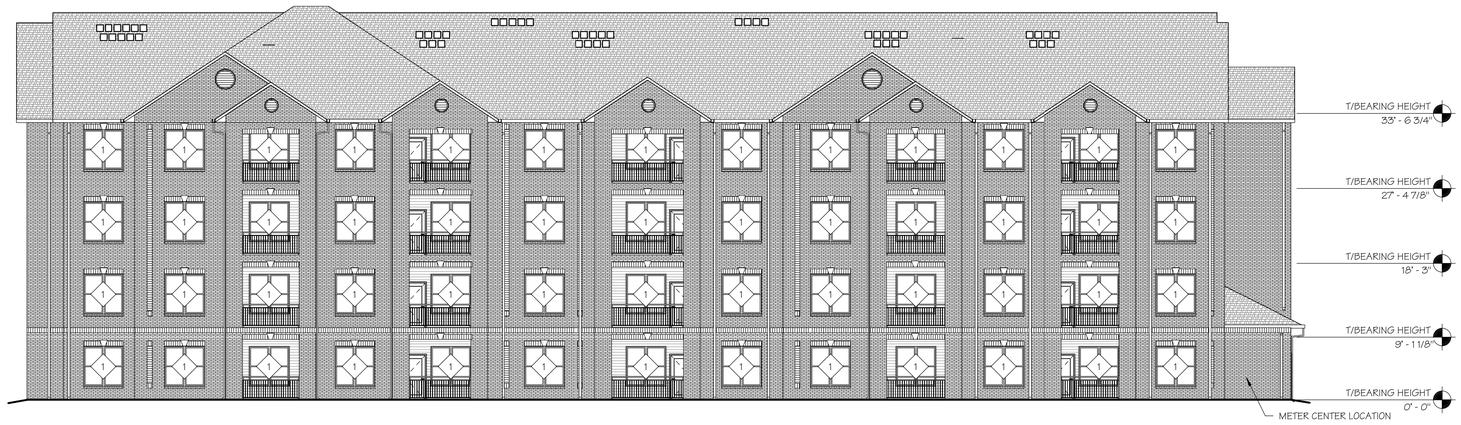
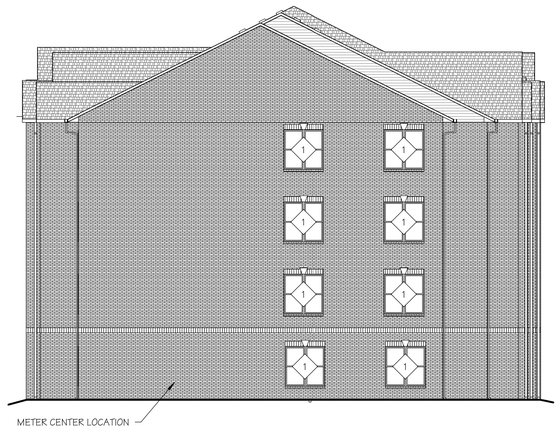


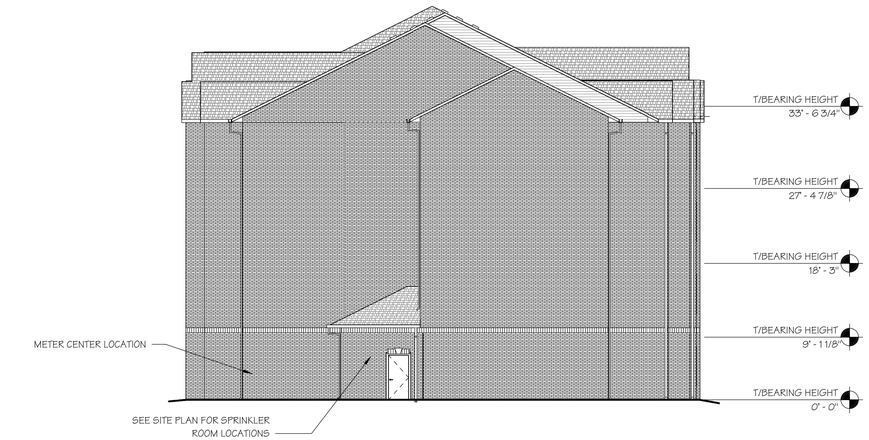
BUILDING B REAR ELEVATION

1 / A3.1 SCALE: 3/32" = 1'-0"



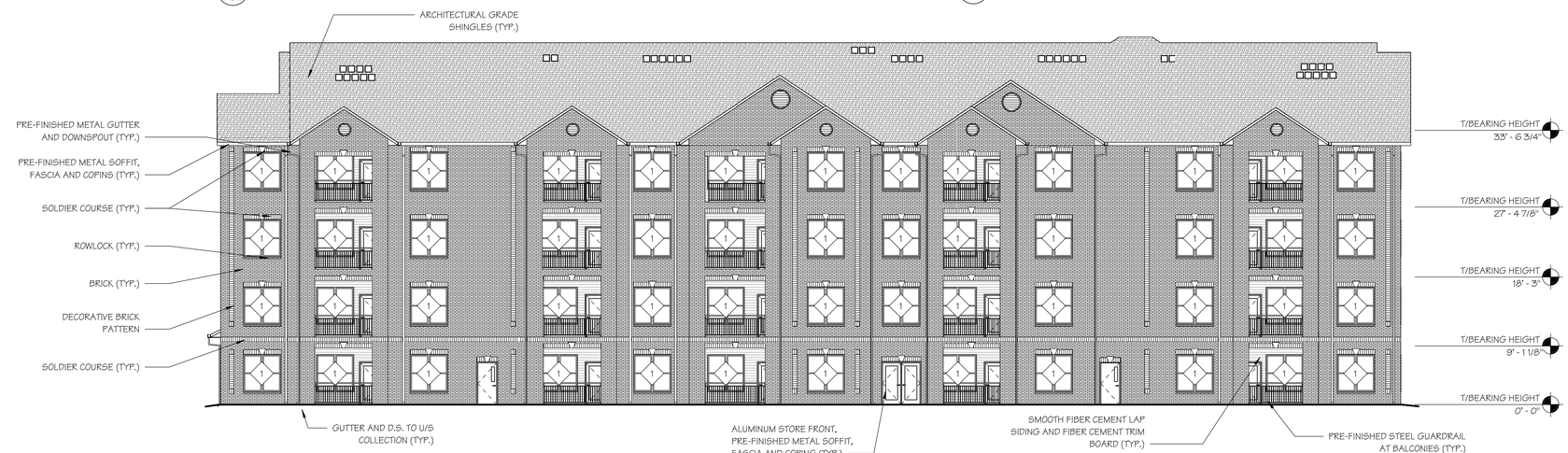
BUILDING B LEFT SIDE ELEVATION

2 / A3.1 SCALE: 3/32" = 1'-0"



BUILDING B RIGHT SIDE ELEVATION

3 / A3.1 SCALE: 3/32" = 1'-0"



BUILDING B FRONT ELEVATION

4 / A3.1 SCALE: 3/32" = 1'-0"

BUILDING B EXTERIOR ELEVATIONS

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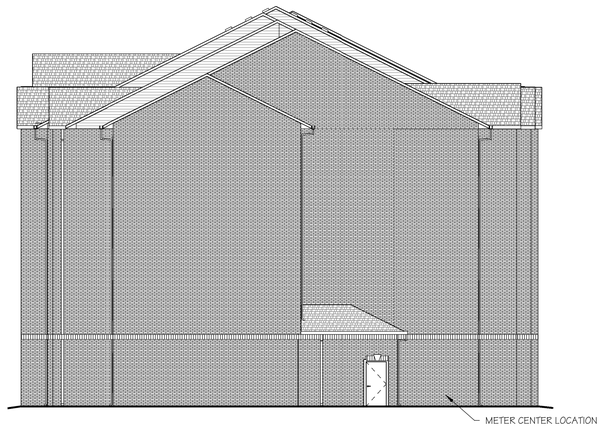
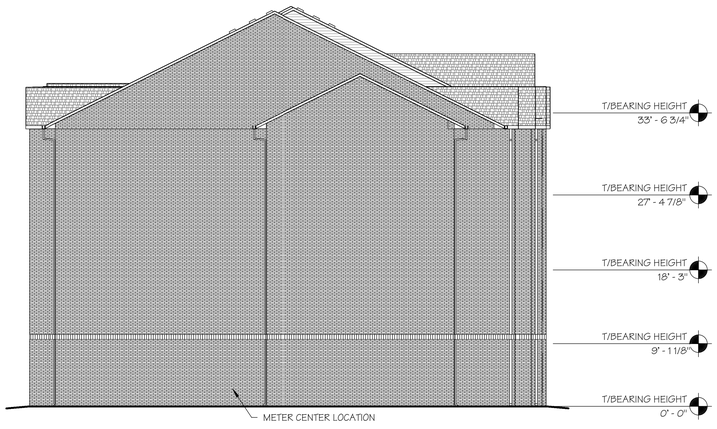
BUILDING C REAR ELEVATION

1 / A3.2 SCALE: 3/32" = 1'-0"



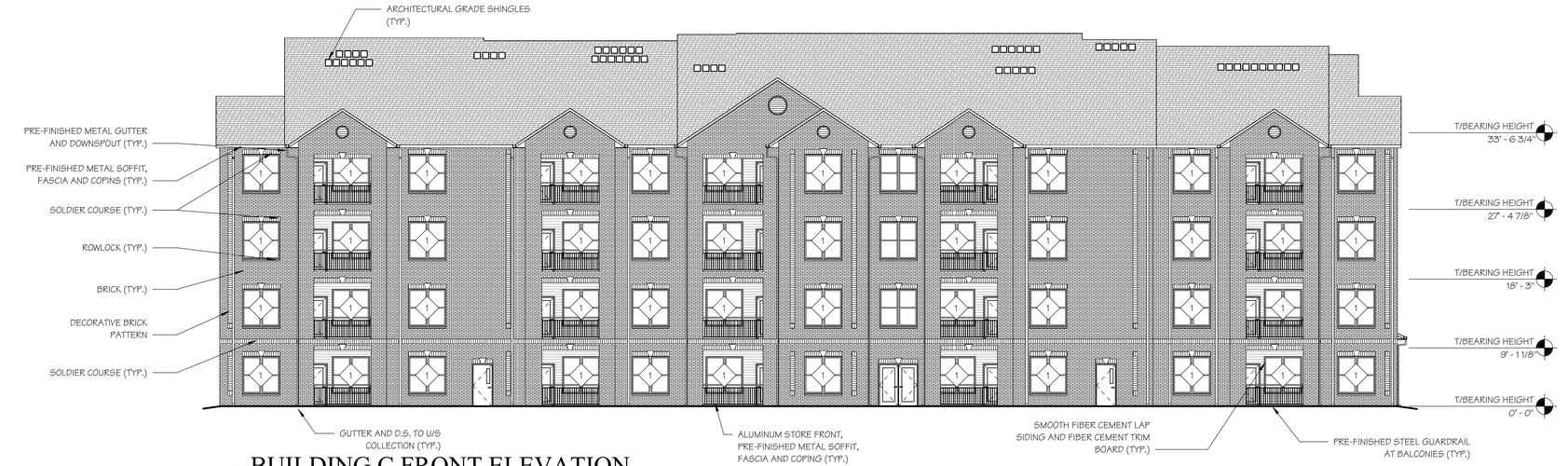
BUILDING C LEFT SIDE ELEVATION

2 / A3.2 SCALE: 3/32" = 1'-0"



BUILDING C RIGHT SIDE ELEVATION

4 / A3.2 SCALE: 3/32" = 1'-0"



BUILDING C FRONT ELEVATION

3 / A3.2 SCALE: 3/32" = 1'-0"

BUILDING C EXTERIOR ELEVATIONS

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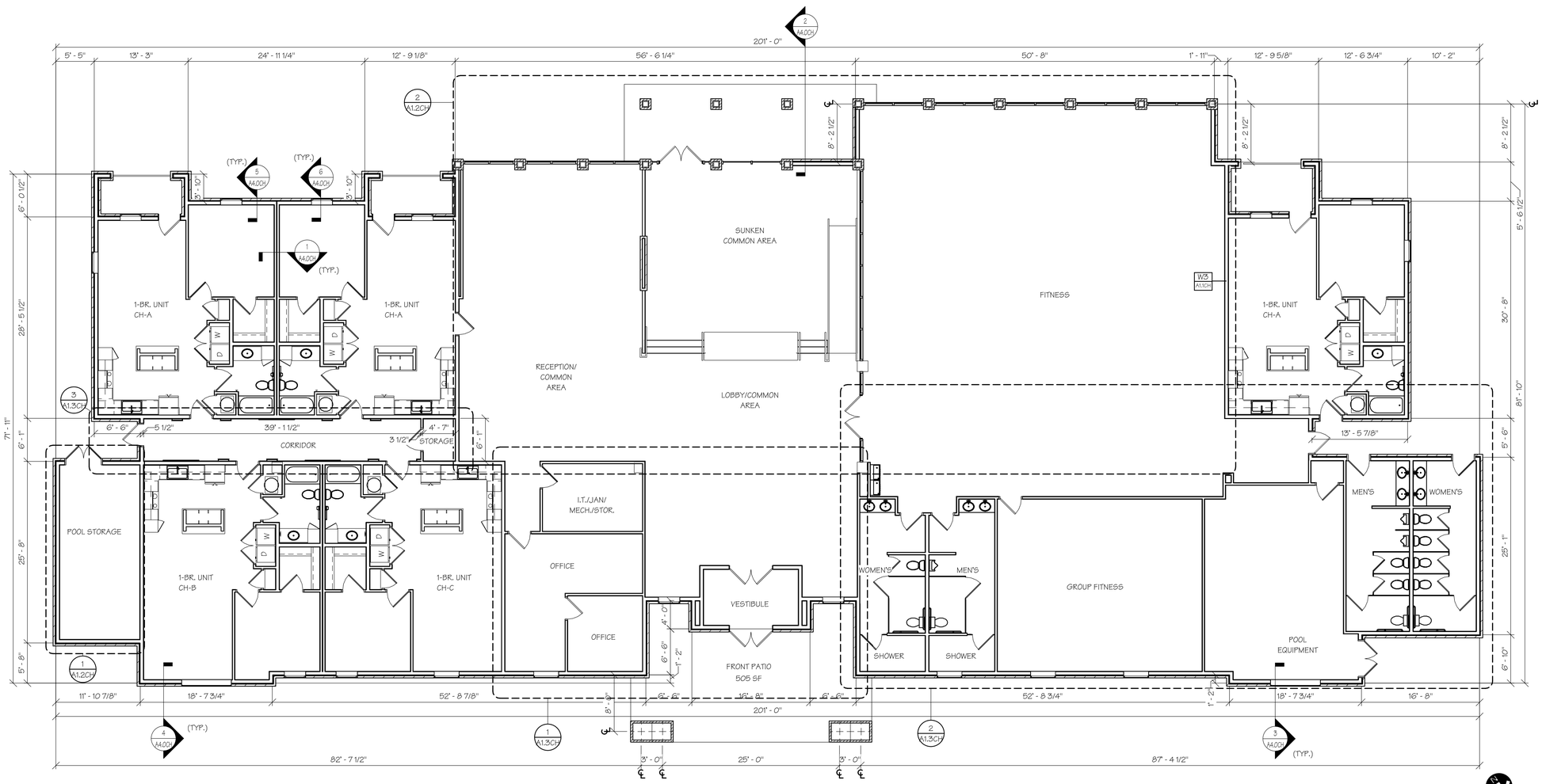

CLUBHOUSE FLOOR PLAN

1 A4.0CH SCALE: 1/8" = 1'-0"

BUILDING PLAN

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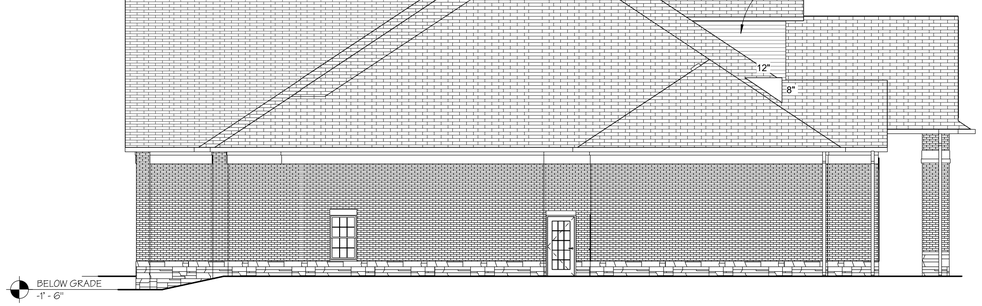
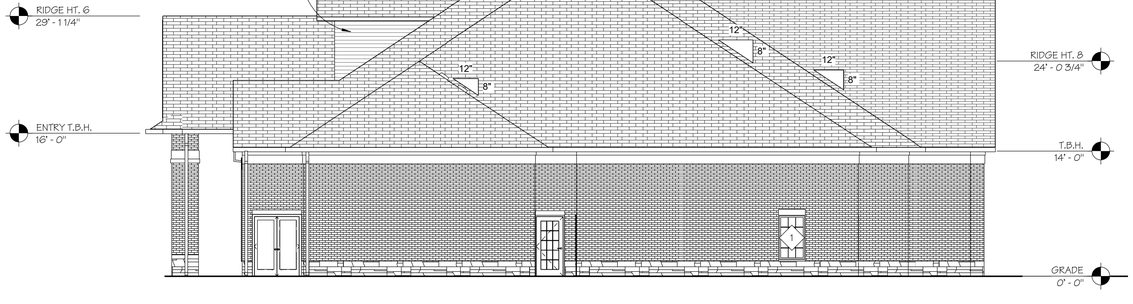
WINDOW SCHEDULE

TYPE MARK	SIZE	HARDWARE	GLAZING	COMMENTS
1	3'-0" x 5'-0"	STANDARD	INSUL. LOW "E" W/MUTINS	SINGLE-HUNG W/SCREENS
2	3'-0" x 7'-0"	STANDARD	INSUL. LOW "E" W/MUTINS	SINGLE-HUNG
3	3'-6" x 10'-3"	STANDARD	INSUL. LOW "E" W/MUTINS	SINGLE-HUNG
4	P.R. 3'-6" x 6'-0"	STANDARD	INSUL. LOW "E" W/MUTINS	CASEMENT
5	7'-0" x 11'-7"	STANDARD	INSUL. LOW "E" W/MUTINS	ARCH-TOP

1 / A3.0CH — CLUBHOUSE FRONT ELEVATION
SCALE: 3/32" = 1'-0"



2 / A3.0CH — CLUBHOUSE LEFT ELEVATION
SCALE: 1/8" = 1'-0"



3 / A3.0CH — CLUBHOUSE RIGHT ELEVATION
SCALE: 1/8" = 1'-0"

4 / A3.0CH — CLUBHOUSE REAR ELEVATION
SCALE: 3/32" = 1'-0"

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EXTERIOR ELEVATIONS

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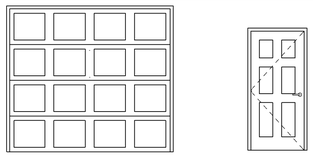
FINISH SCHEDULE

ROOM NAME	Finish			
	FLOOR	BASE	WALL	CEILING
ACCESSIBLE GARAGE	SEALED CONCRETE	NONE OR NO ADDITIONAL FINISH	PAINTED GYP BD.	PAINTED GYP BD.
GARAGE	SEALED CONCRETE	NONE OR NO ADDITIONAL FINISH	PAINTED GYP BD.	PAINTED GYP BD.
STORAGE	SEALED CONCRETE	NONE OR NO ADDITIONAL FINISH	PAINTED GYP BD.	PAINTED GYP BD.

DOOR SCHEDULE

TYPE MARK	SIZE	ELEV.	PANEL MATL.	DESCRIPTION
1	8'-0" x 8'-0" x 1 3/4"	A	STEEL	DECORATIVE MULTI-PANEL METAL
2	3'-0" x 6'-8" x 1 3/4"	B	STEEL	6 PANEL, CATCH CHAIN CLOSER, SECURITY HINGES

DOOR ELEVATIONS



A B

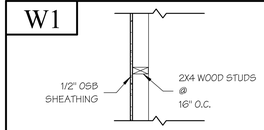
GENERAL NOTES

1)	DIMENSIONS SHOWN ARE FACE OF STUD TO FACE OF STUD
2)	SEAL CONCRETE FLOOR TO REDUCE MOISTURE PENETRATION.

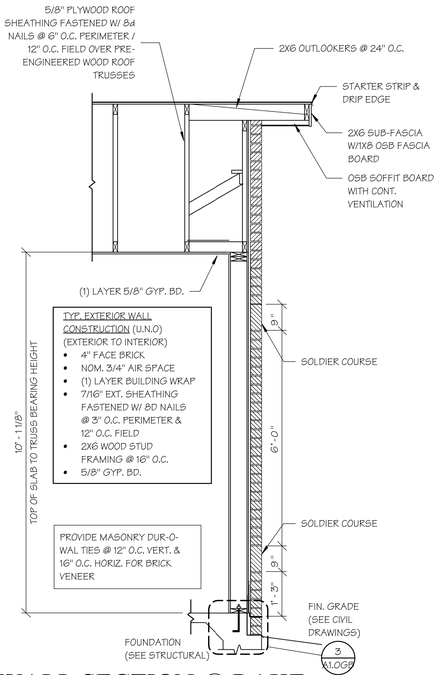
SPECIAL INSTRUCTION:
STRUCTURAL DRAWINGS AND SPECIFICATIONS TAKE PRECEDENCE OVER ANY DRAWING, DETAIL OR NOTE SHOWN ON THIS SHEET. CONTRACTORS, SUBCONTRACTORS, AND SUPPLIERS MUST REFERENCE STRUCTURAL DRAWINGS AND/ OR SPECIFICATIONS BEFORE CONSTRUCTING, OR SUPPLYING ANY LOAD-BEARING, OR LOAD-RESISTING ELEMENT SHOWN ON THIS SHEET.

WALL TYPE SCHEDULE

W1

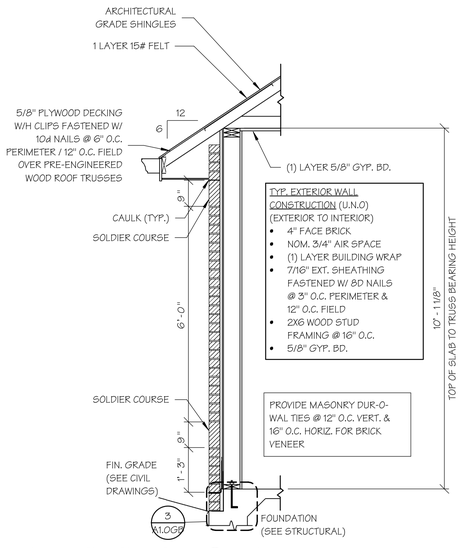


4-1/2" WALL
(NOT RATED)



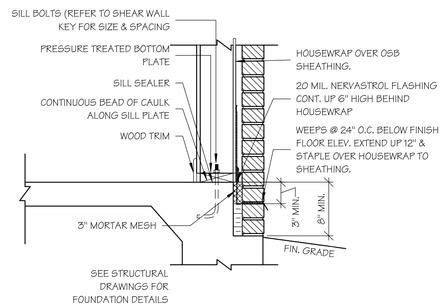
1 A1.0GB WALL SECTION @ RAKE

SCALE: 1/2" = 1'-0"



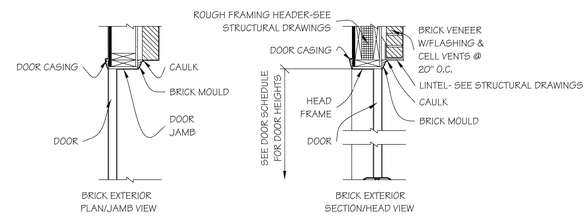
2 A1.0GB WALL SECTION @ EAVE

SCALE: 1/2" = 1'-0"



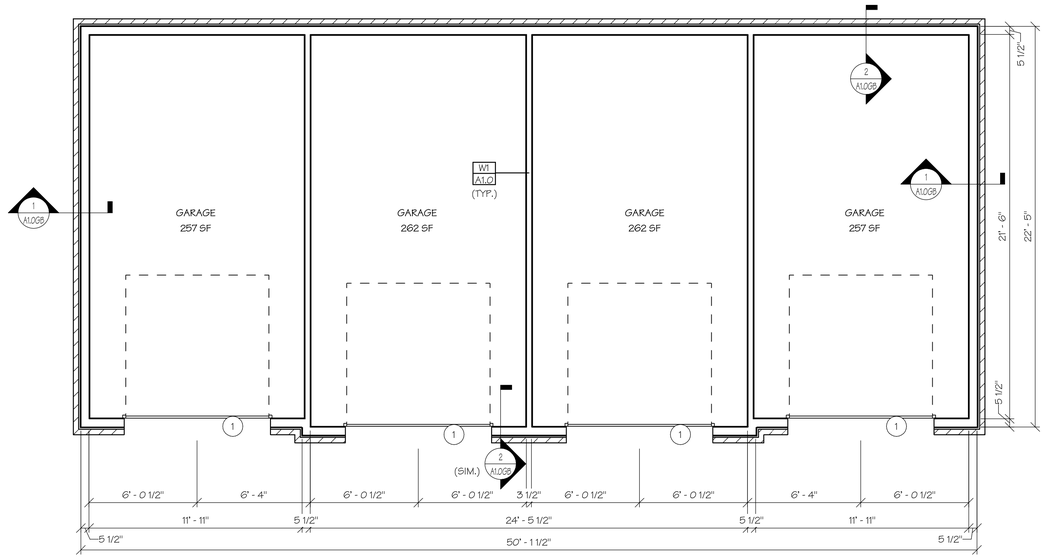
3 A1.0GB TYP. FOUNDATION FLASHING DETAIL

SCALE: 1" = 1'-0"



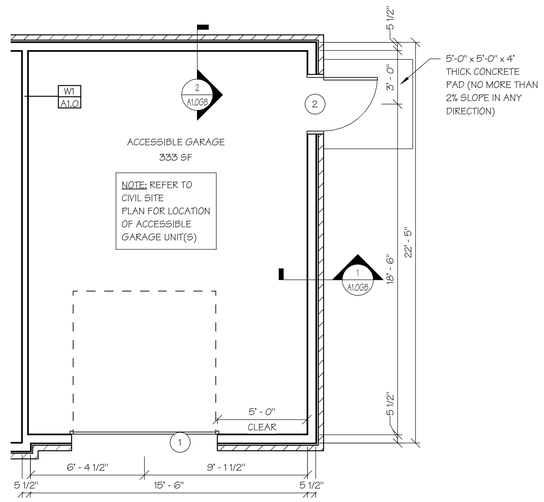
WALL SECTIONS AND DETAILS @ EXTERIOR DOORS

4 A1.0GB SCALE: 3/4" = 1'-0"



5 A1.0GB GARAGE TYPE "A" BUILIDNG PLAN/FINISH PLAN

SCALE: 1/4" = 1'-0"



GARAGE TYPE "A" BUILDING PLAN/FINISH PLAN

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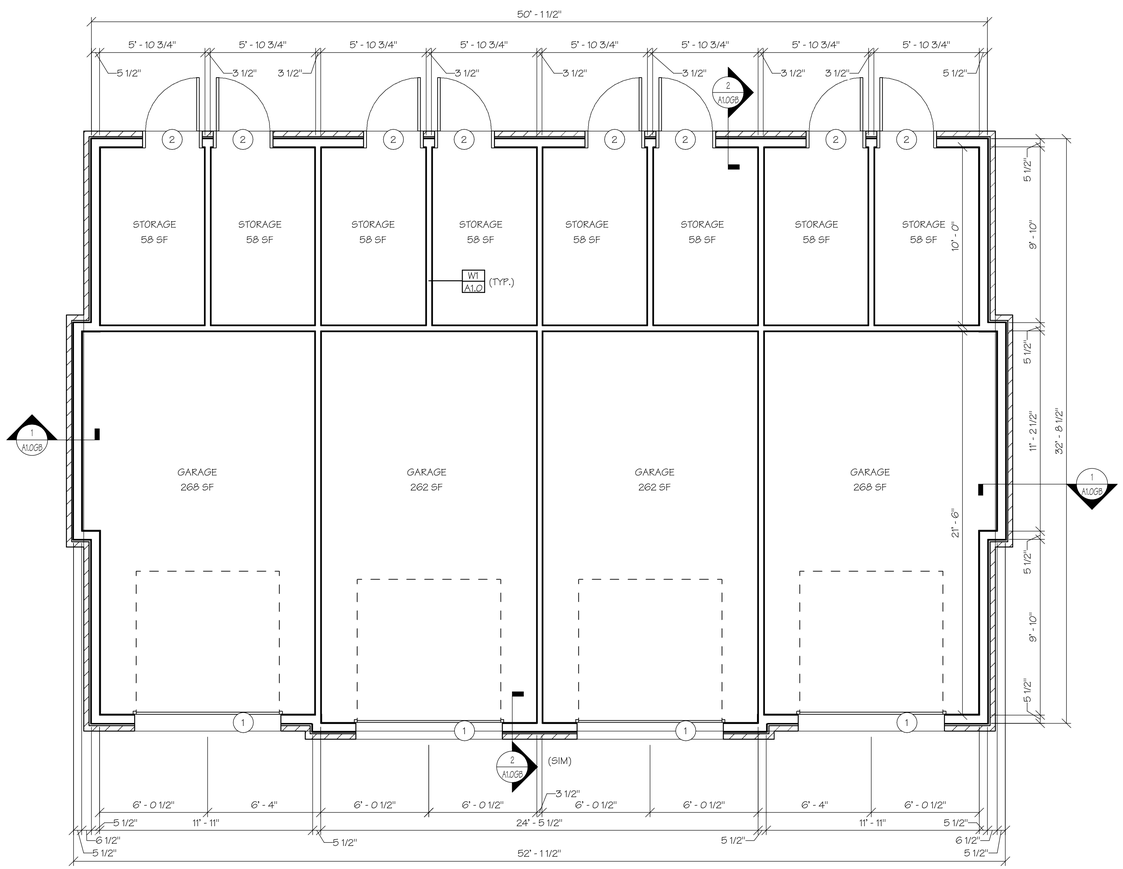
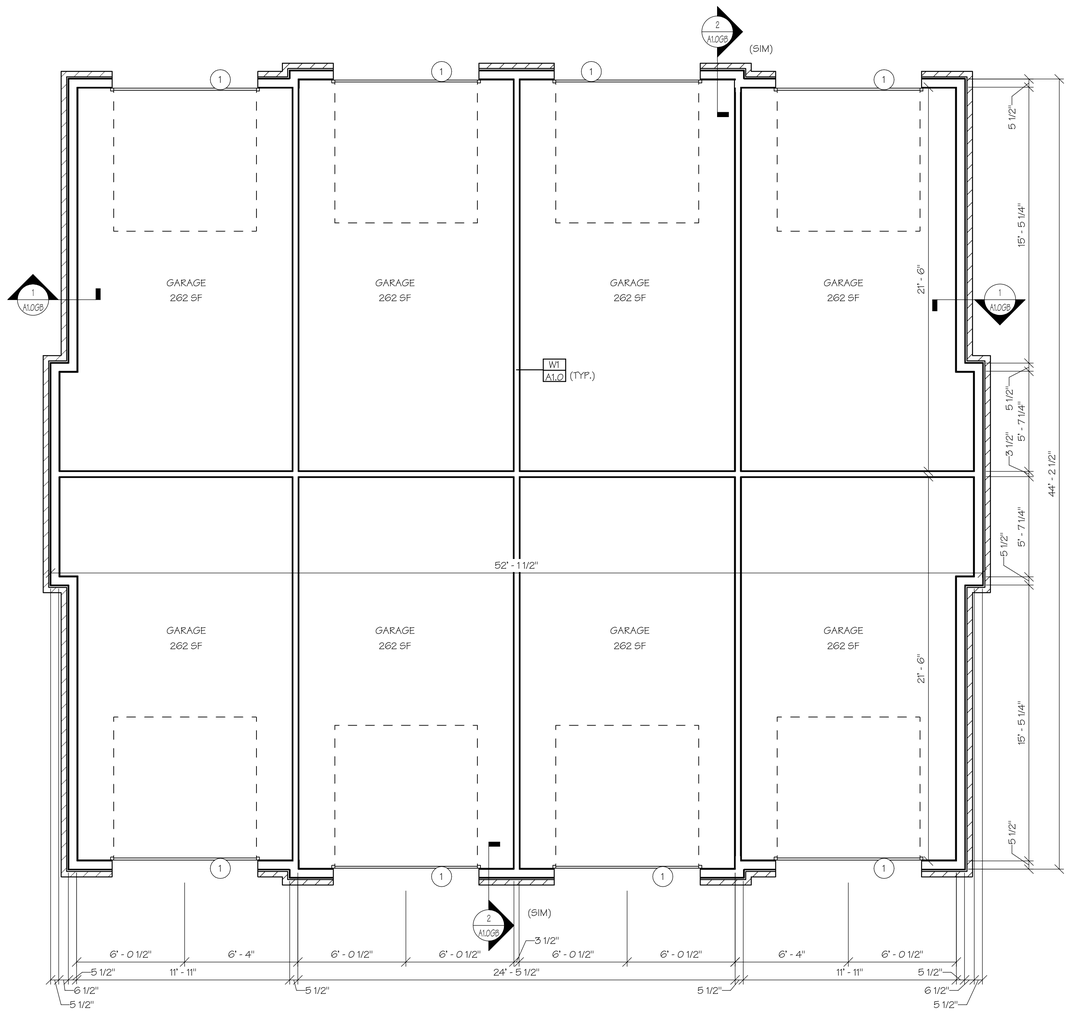


GARAGE TYPE "B" BUILDING PLAN/FINISH PLAN

1 A1.0GB SCALE: 1/4" = 1'-0"



GARAGE TYPE "C" BUILIDNG PLAN/FINISH PLAN

2 A1.0GB SCALE: 1/4" = 1'-0"

GARAGE TYPE "B" & "C" BUILDING PLANS/FINISH PLANS

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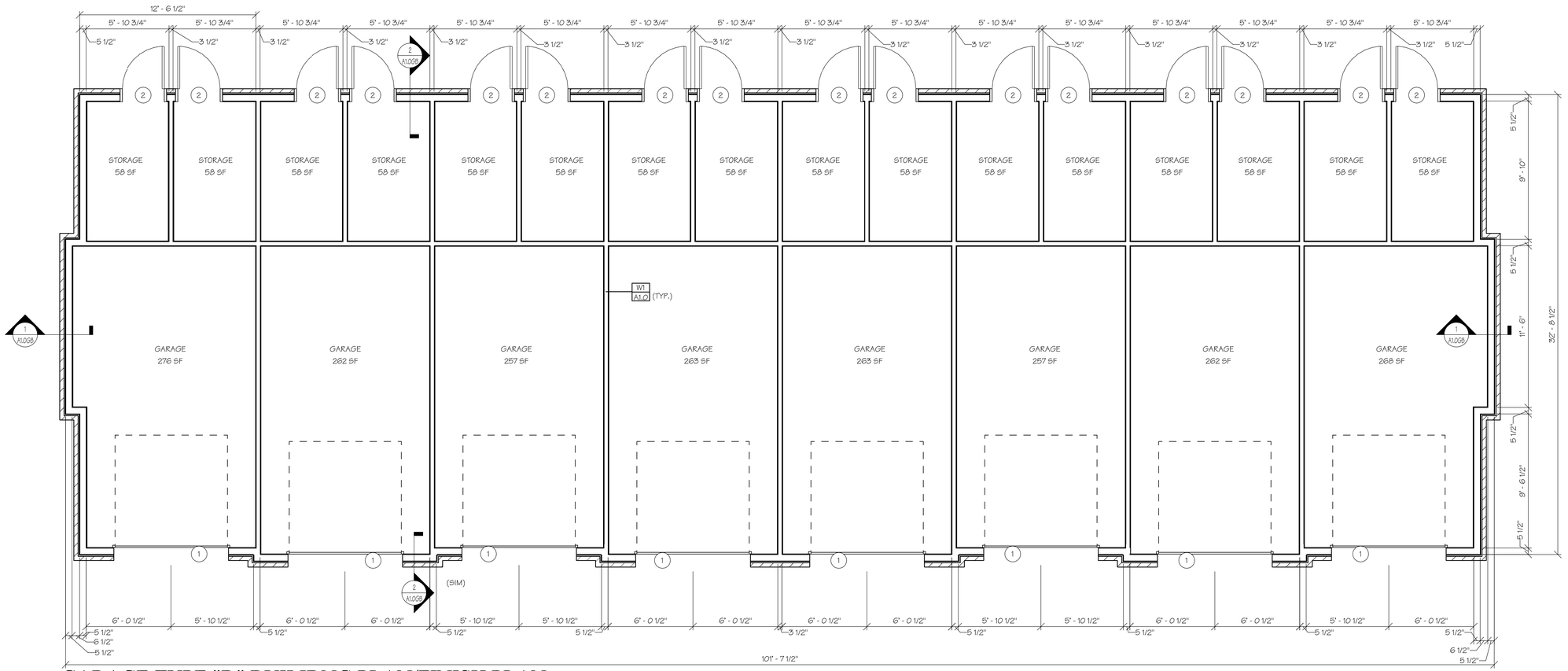

1 A1.2GB GARAGE TYPE "D" BUILIDNG PLAN/FINISH PLAN

SCALE: 1/4" = 1'-0"

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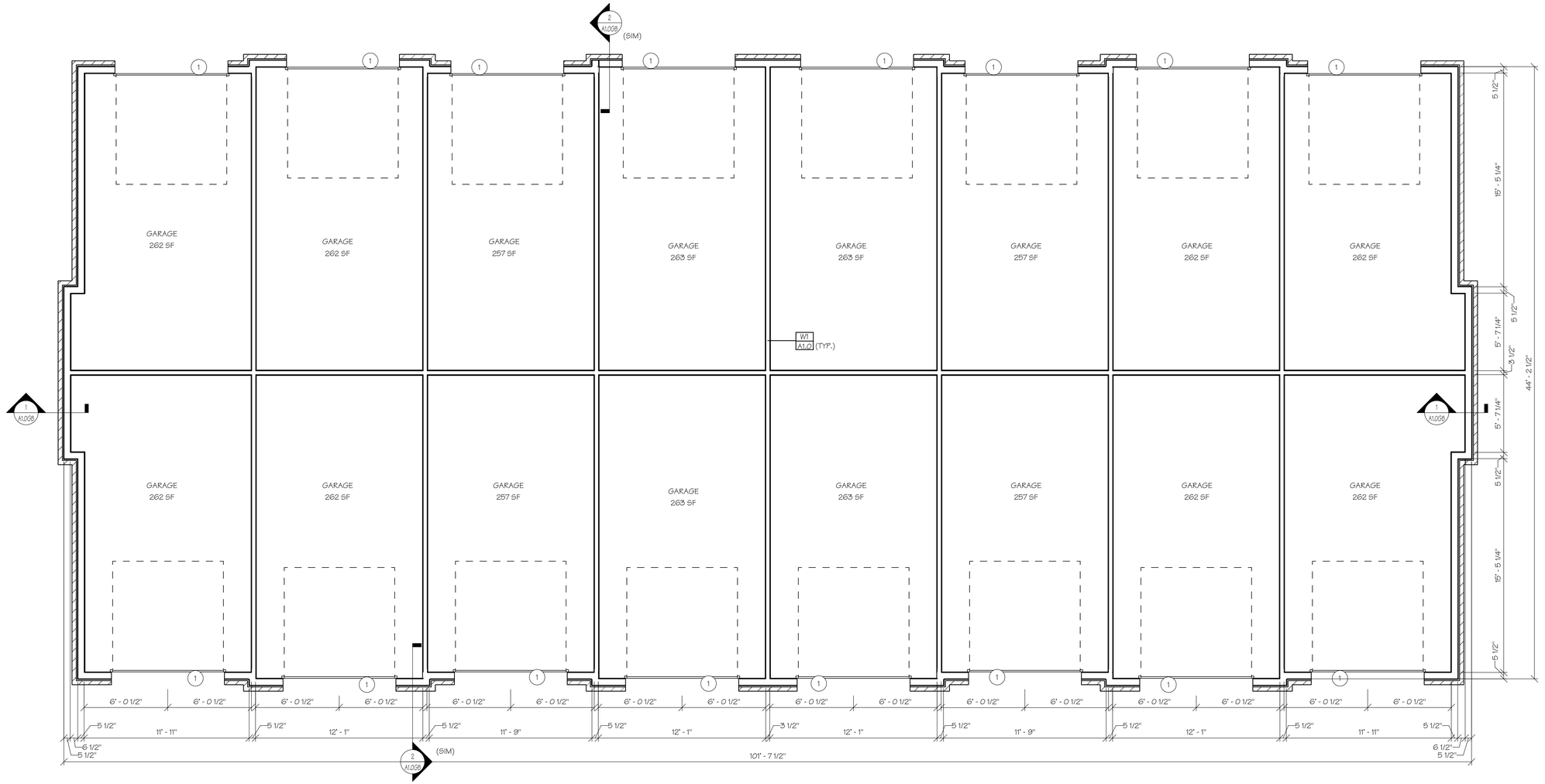

GARAGE TYPE "E" BUILDING PLAN/FINISH PLAN

1 / A1.3GB SCALE: 1/4" = 1'-0"

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GARAGE TYPE "E" BUILIDNG PLAN/FINISH PLAN

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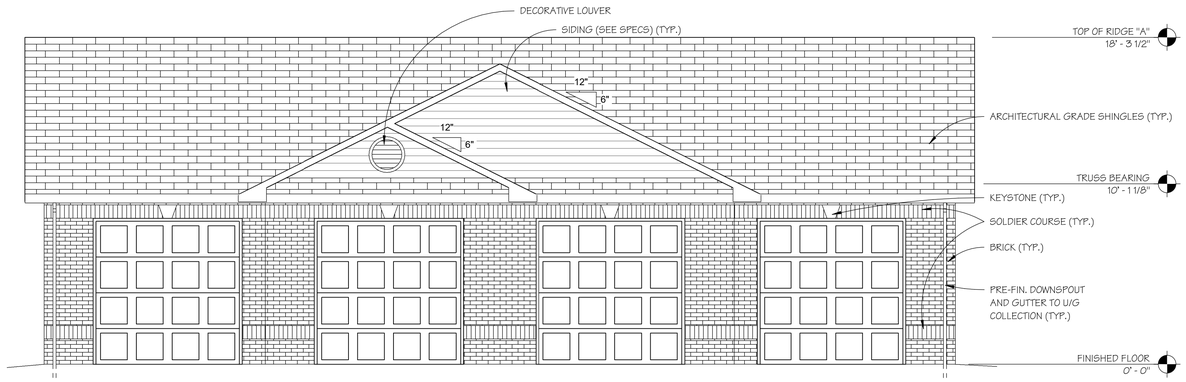

1 A3.0GB GARAGE "A" FRONT ELEVATION

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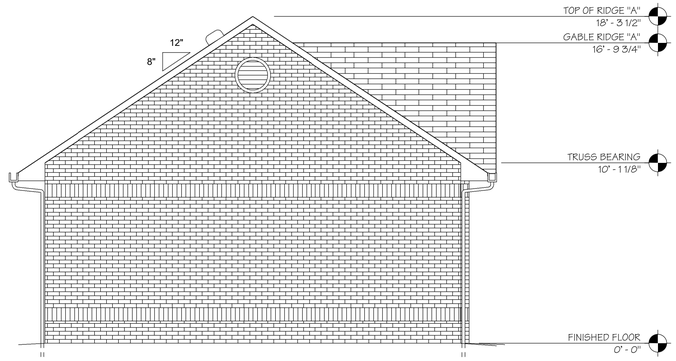
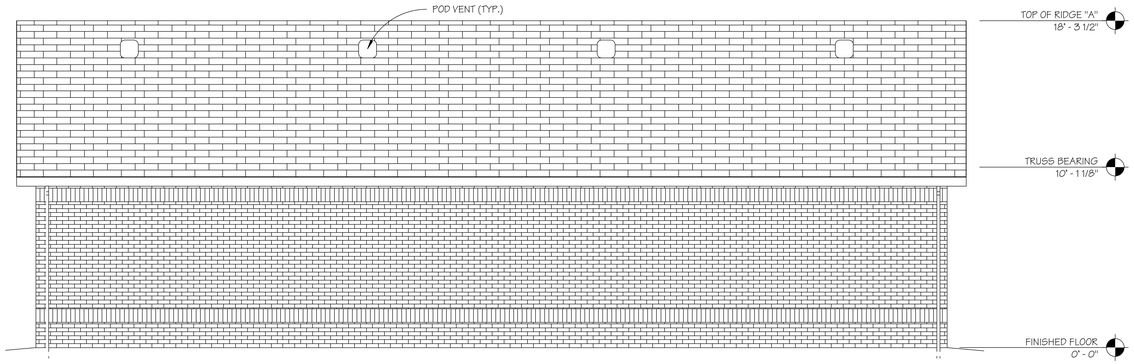


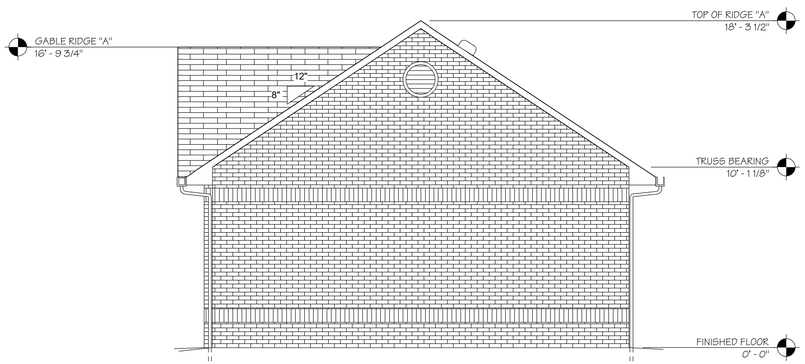
2 A3.0GB GARAGE "A" LEFT ELEVATION

SCALE: 1/4" = 1'-0"



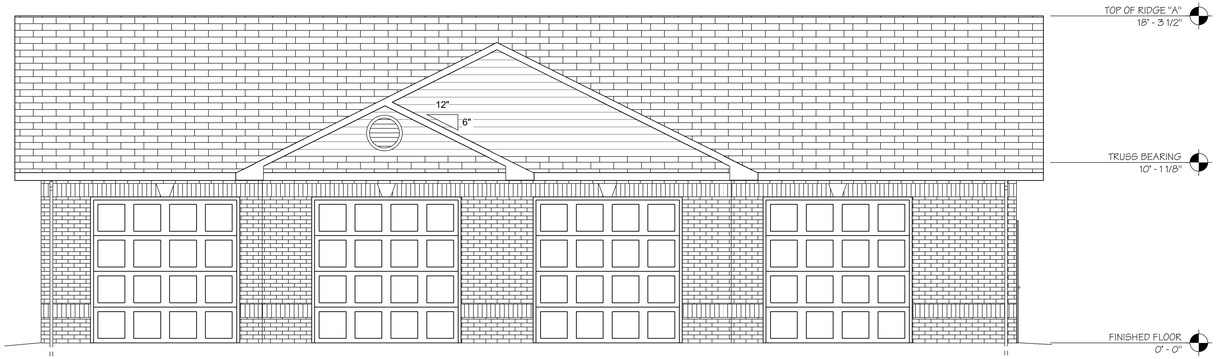
3 A3.0GB GARAGE "A" REAR ELEVATION

SCALE: 1/4" = 1'-0"



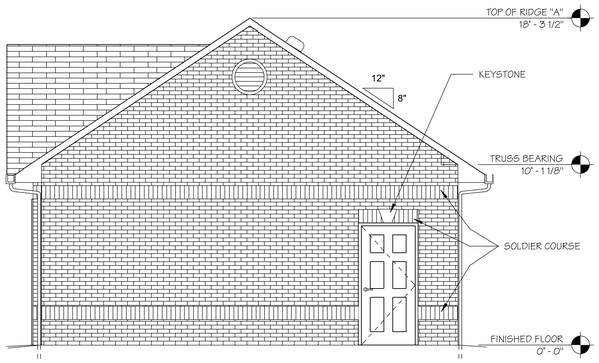
4 A3.0GB GARAGE "A" RIGHT ELEVATION

SCALE: 1/4" = 1'-0"



5 A3.0GB GARAGE "A" W/ ACCESSIBLE BAY FRONT ELEVATION

SCALE: 1/4" = 1'-0"



6 A3.0GB GARAGE "A" W/ ACCESSIBLE BAY RIGHT ELEVATION

SCALE: 1/4" = 1'-0"

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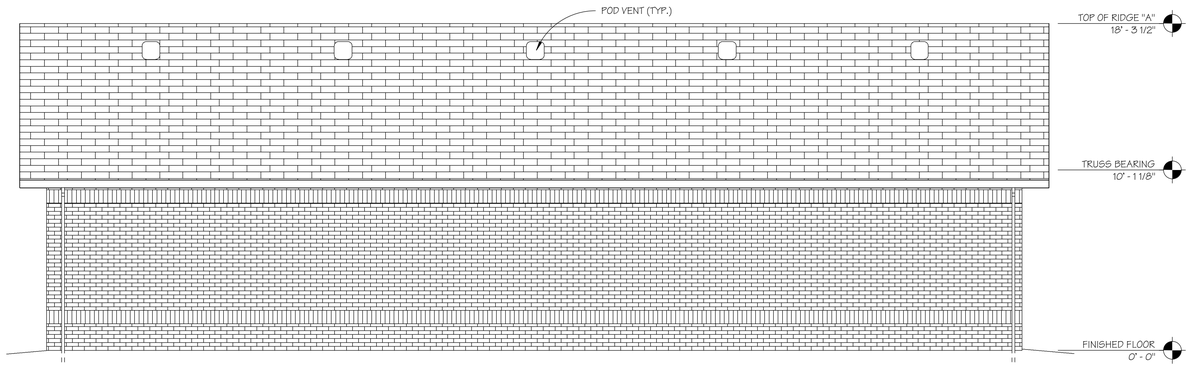
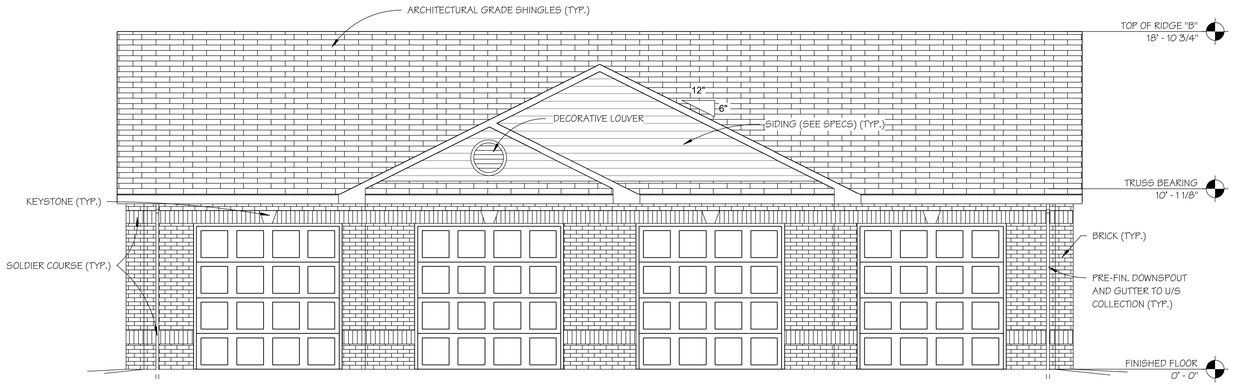


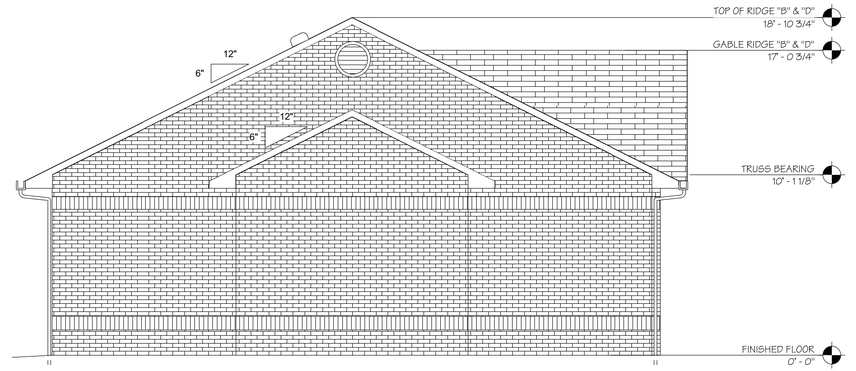
1 A3.1GB SCALE: 1/4" = 1'-0"

GARAGE "A" W/ ACCESSIBLE BAY REAR ELEVATION



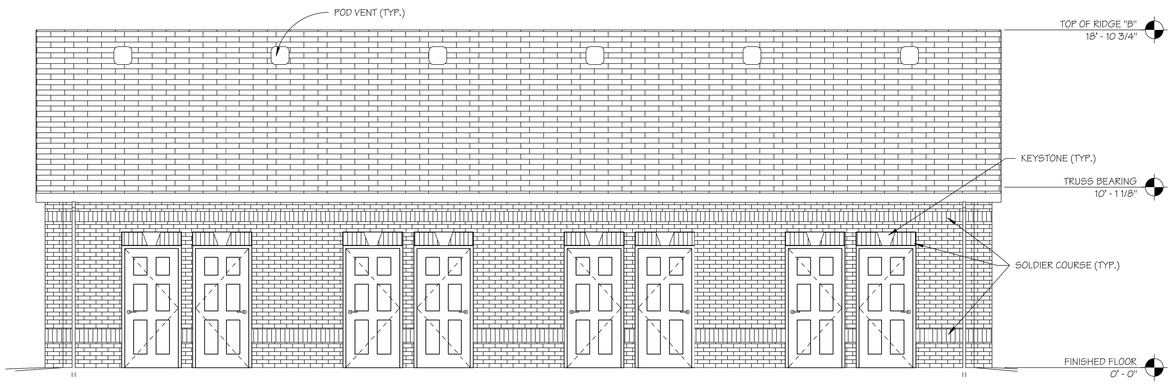
2 A3.1GB SCALE: 1/4" = 1'-0"

GARAGE "B" FRONT ELEVATION



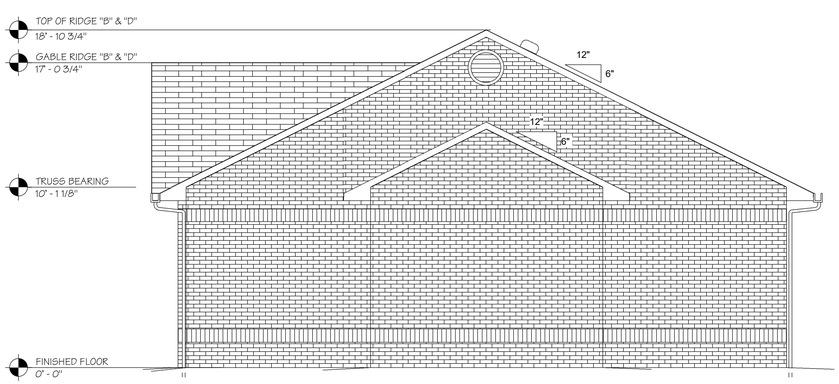
3 A3.1GB SCALE: 1/4" = 1'-0"

GARAGE "B" & "D" LEFT ELEVATIONS



4 A3.1GB SCALE: 1/4" = 1'-0"

GARAGE "B" REAR ELEVATION



5 A3.1GB SCALE: 1/4" = 1'-0"

GARAGE "B" & "D" RIGHT ELEVATION

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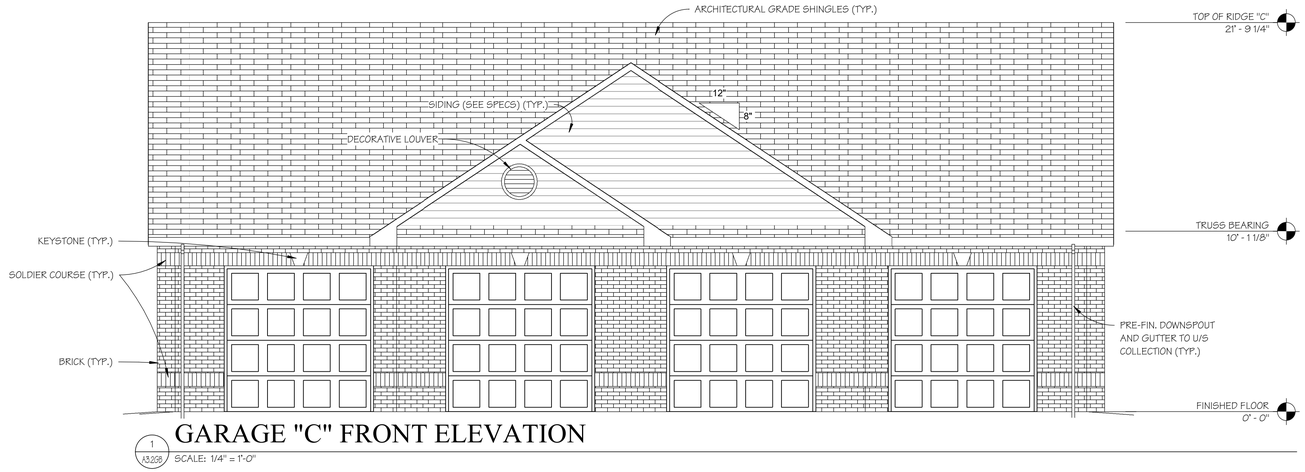
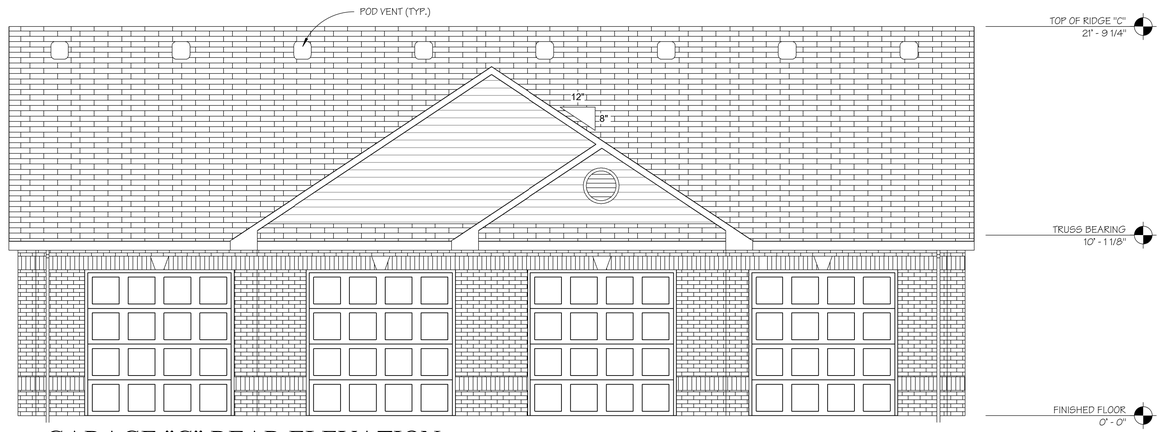


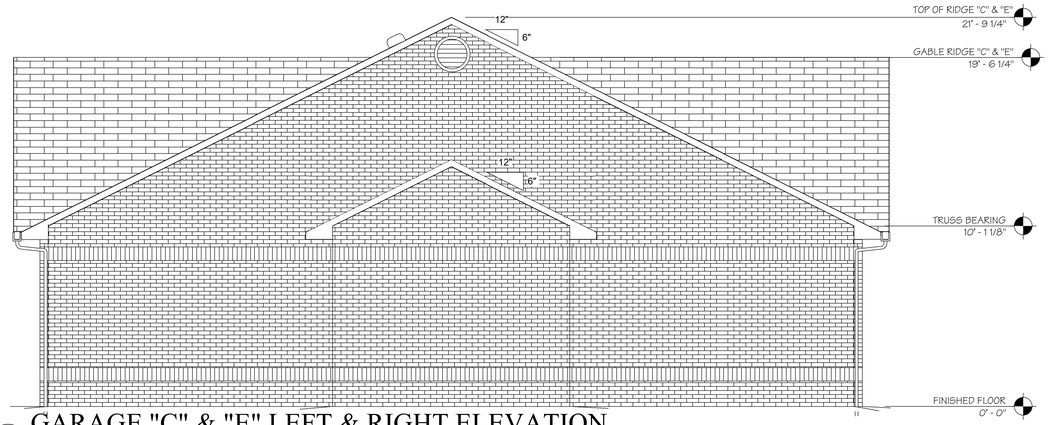
1 A3.2GB GARAGE "C" FRONT ELEVATION

SCALE: 1/4" = 1'-0"



2 A3.2GB GARAGE "C" REAR ELEVATION

SCALE: 1/4" = 1'-0"



3 A3.2GB GARAGE "C" & "E" LEFT & RIGHT ELEVATION

SCALE: 1/4" = 1'-0"

EXTERIOR ELEVATIONS

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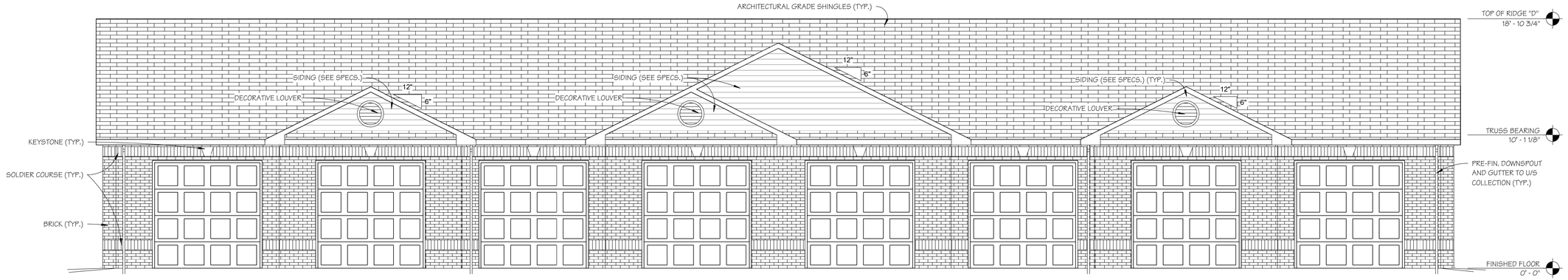
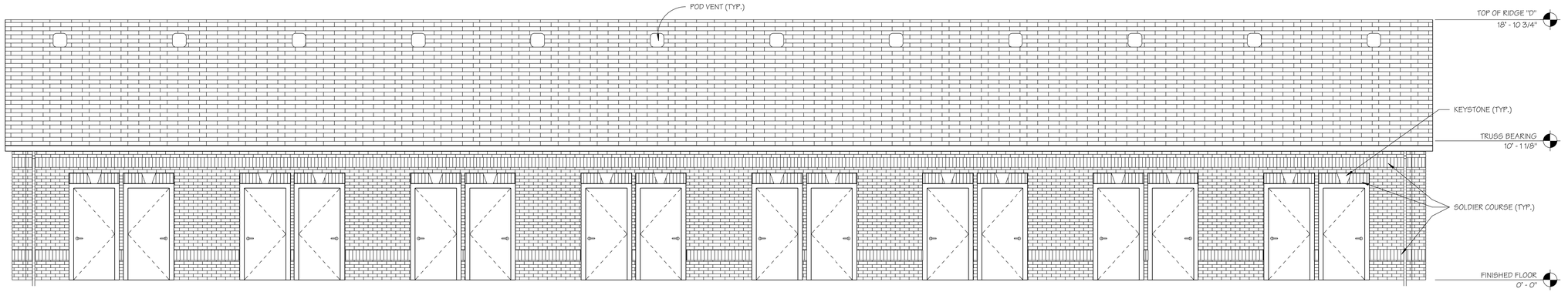


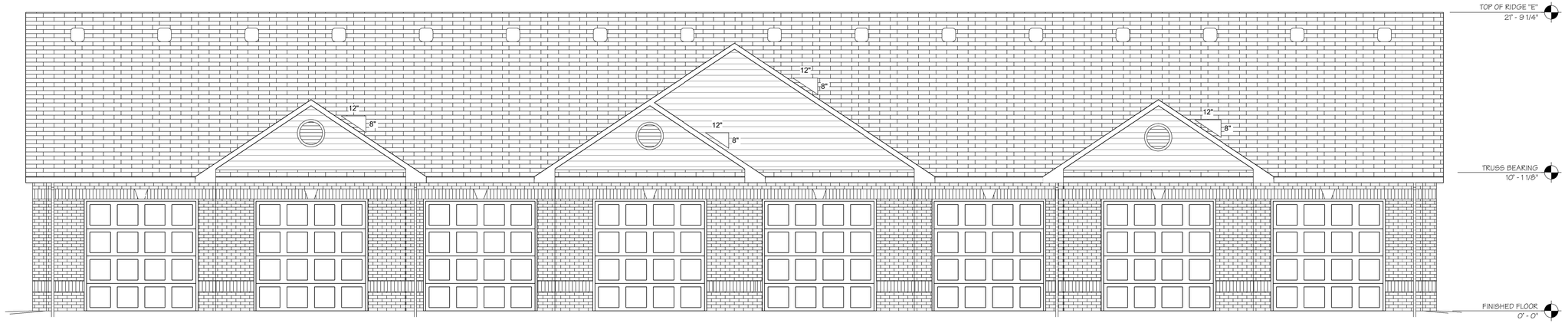
1 A3.3GB SCALE: 1/4" = 1'-0"

GARAGE "D" FRONT ELEVATION



2 A3.3GB SCALE: 1/4" = 1'-0"

GARAGE "D" REAR ELEVATION



GARAGE "E" FRONT ELEVATION SIMILAR

3 A3.3GB SCALE: 1/4" = 1'-0"

GARAGE "E" REAR ELEVATION

EXTERIOR ELEVATIONS

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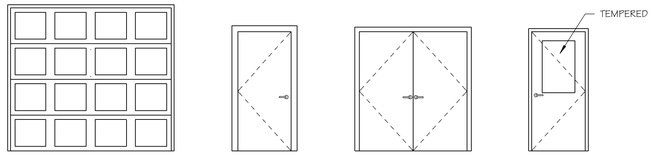
DOOR SCHEDULE

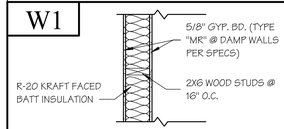
TYPE MARK	SIZE	ELEV.	PANEL MATL.	GLAZING	DESCRIPTION
1	11' x 9' x 1 3/4"	A	STEEL INSULATED	NONE	DECORATIVE MULTI-PANEL INSULATED METAL, R4.75 MIN. INSUL VAL.
2	3'-0" x 6'-8" x 1 3/4"	B	STEEL INSULATED	NONE	INSULATED, FLUSH PANEL
3	3'-0" x 6'-8" x 1 3/4"	B	STEEL INSULATED	NONE	INSULATED, FLUSH PANEL
4	3'-0" x 6'-8" x 1 3/4"	D	STEEL INSULATED	1/2" TEMPERED INSULATED GLASS	INSULATED, FLUSH PANEL
5	PR. 3'-0" x 6'-8" x 1 3/4"	C	STEEL INSULATED	NONE	INSULATED, FLUSH PANEL

DOOR ELEVATIONS



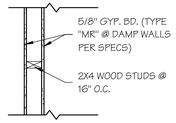
WALL TYPE SCHEDULE

W1



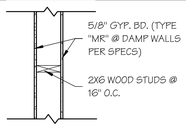
6-3/4" WALL
(NOT RATED)

W2



4-3/4" WALL
(NOT RATED)

W3



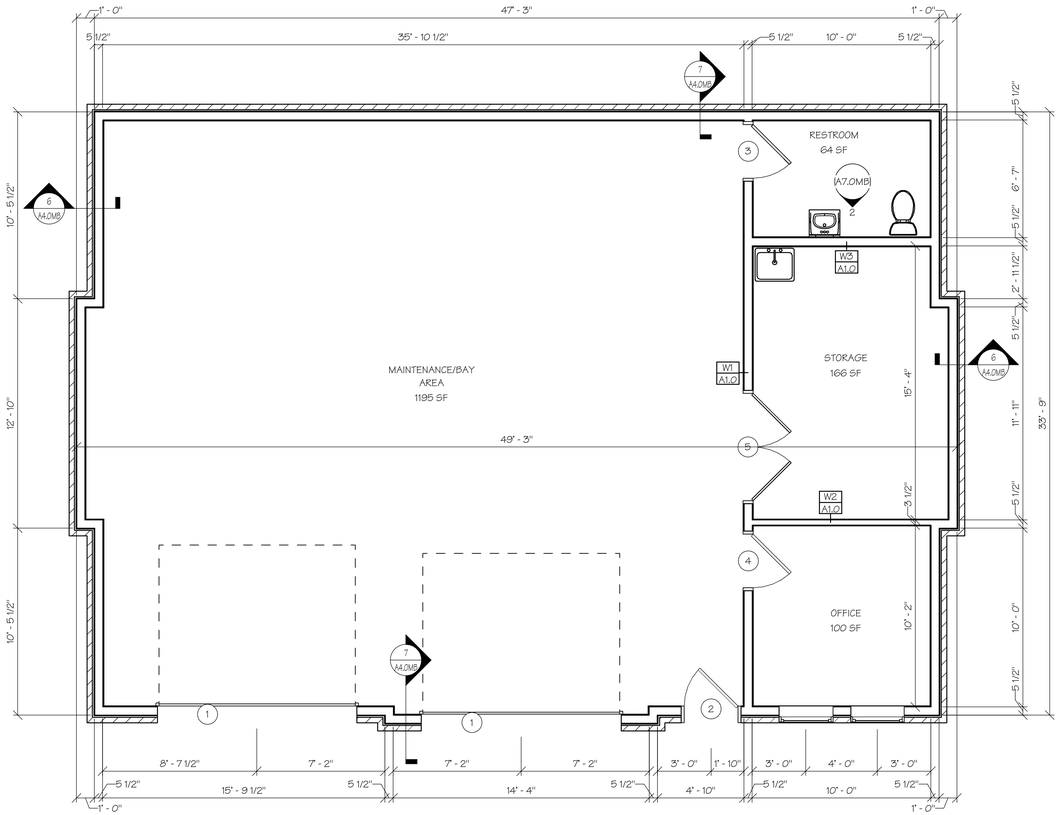
6-3/4" WALL
(NOT RATED)

FINISH SCHEDULE

ROOM NAME	FINISH			
	FLOOR	BASE	WALL	CEILING
MAINTENANCE/BAY AREA	SEALED CONCRETE	NONE OR NO ADDITIONAL FINISH	PAINTED GYP BD.	PAINTED GYP BD.
OFFICE	SEALED CONCRETE	HARDI-TRIM	PAINTED GYP BD.	PAINTED GYP BD.
RESTROOM	SEALED CONCRETE	HARDI-TRIM	PAINTED GYP BD.	PAINTED GYP BD.
STORAGE	SEALED CONCRETE	HARDI-TRIM	PAINTED GYP BD.	PAINTED GYP BD.

GENERAL NOTES

1) CERTIFICATION OF R-38 CEILING INSULATION MUST BE POSTED IN ATTIC.
2) DIMENSIONS SHOWN ARE FACE OF STUD TO FACE OF STUD
3) SEAL CONCRETE FLOOR TO REDUCE MOISTURE PENETRATION.
4) EXTEND FINISH FLOORING MATERIAL BENEATH LAVATORY IN TOILET ROOM.



1 A1.0MB DIMENSION PLAN
SCALE: 1/4" = 1'-0"

DIMENSION/FINISH PLANS

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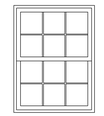
5/11/2020 2:00:56 PM

WINDOW SCHEDULE

TYPE MARK	SIZE	HARDWARE	GLAZING	COMMENTS
1	3'-0"" x 4'-0"	STANDARD	INSULATED LOW-E	SINGLE HUNG W/SCREEN

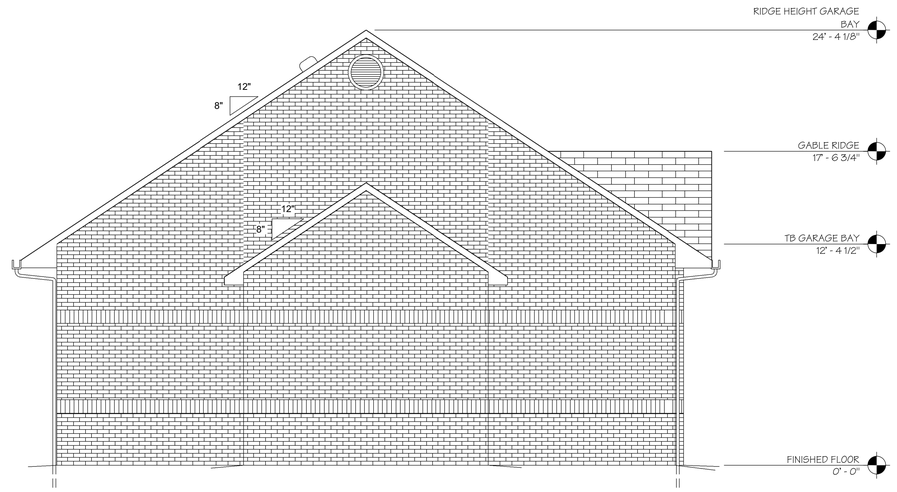
WINDOW ELEVATION



1

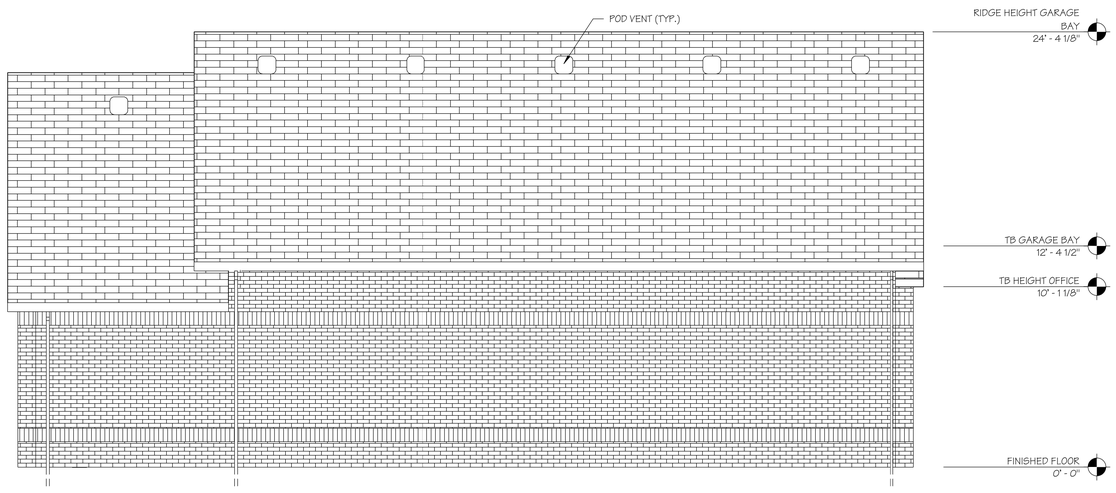
1 A3.0MB FRONT ELEVATION

SCALE: 1/4" = 1'-0"



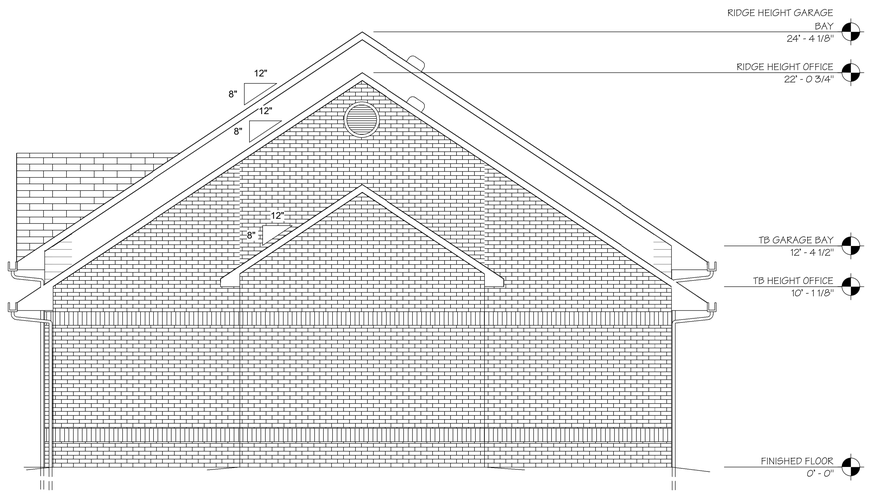
2 A3.0MB LEFT ELEVATION

SCALE: 1/4" = 1'-0"



3 A3.0MB BACK ELEVATION

SCALE: 1/4" = 1'-0"



4 A3.0MB RIGHT ELEVATION

SCALE: 1/4" = 1'-0"

ARIA APARTMENTS LEE'S SUMMIT
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

11 MAY 2020

Wallace ARCHITECTS L.L.C.
Columbia, MO
P 573-266-7200

WALLACE ARCHITECTS, LLC
MISSOURI STATE CERTIFICATE OF AUTHORITY: 2003019614

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DD MMM YYYY

ISSUE/REVISIONS

1	11 MAY 2020 FINAL REVIEW SET

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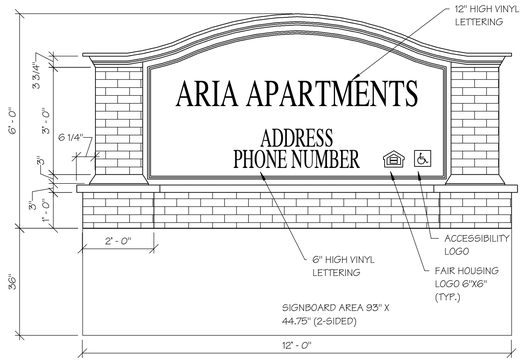
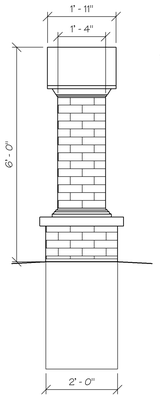
EXTERIOR ELEVATIONS

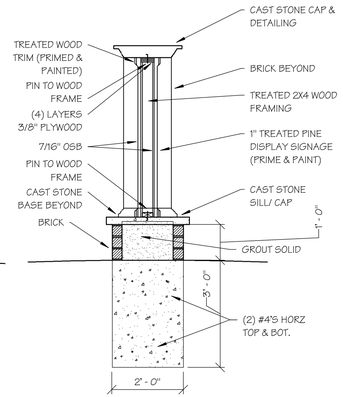
FINAL REVIEW SET



NOTES:
1) SIGN TO BE LIGHTED. COORDINATE WITH POWER CO. AND/OR ELECTRICAL CONTRACTOR.
2) REQUIRES OWNER APPROVAL PRIOR TO ORDERING.
3) SIGN TO BE TWO SIDED.



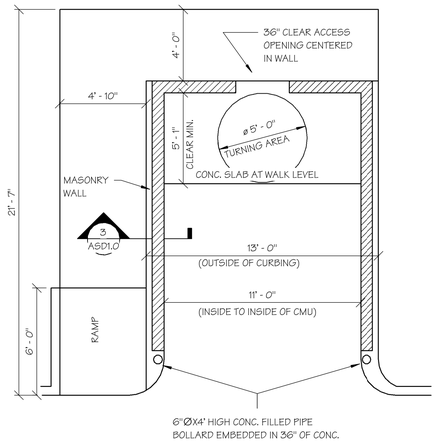
END ELEVATION



SECTION AA:

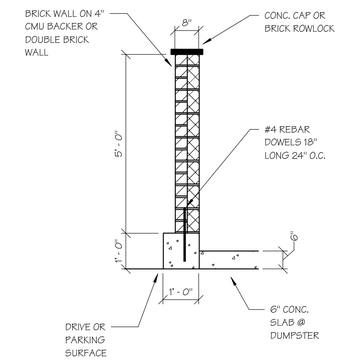
1 A501.0 PROJECT MONUMENT SIGN

SCALE: 1/2" = 1'-0"



2 A501.0 DUMPSTER ENCLOSURE

SCALE: 1/4" = 1'-0"



3 A501.0 DUMPSTER ENCLOSURE WALL SECTION

SCALE: 1/2" = 1'-0"

ARIA APARTMENTS LEE'S SUMMIT
LEE'S SUMMIT, JACKSON COUNTY, MISSOURI

11 MAY 2020

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1ST ISSUE
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ISSUE/REVISIONS

1	11 MAY 2020	FINAL REVIEW SET

SHEET NO. ASD1.0

SITE DETAILS

FINAL REVIEW SET

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