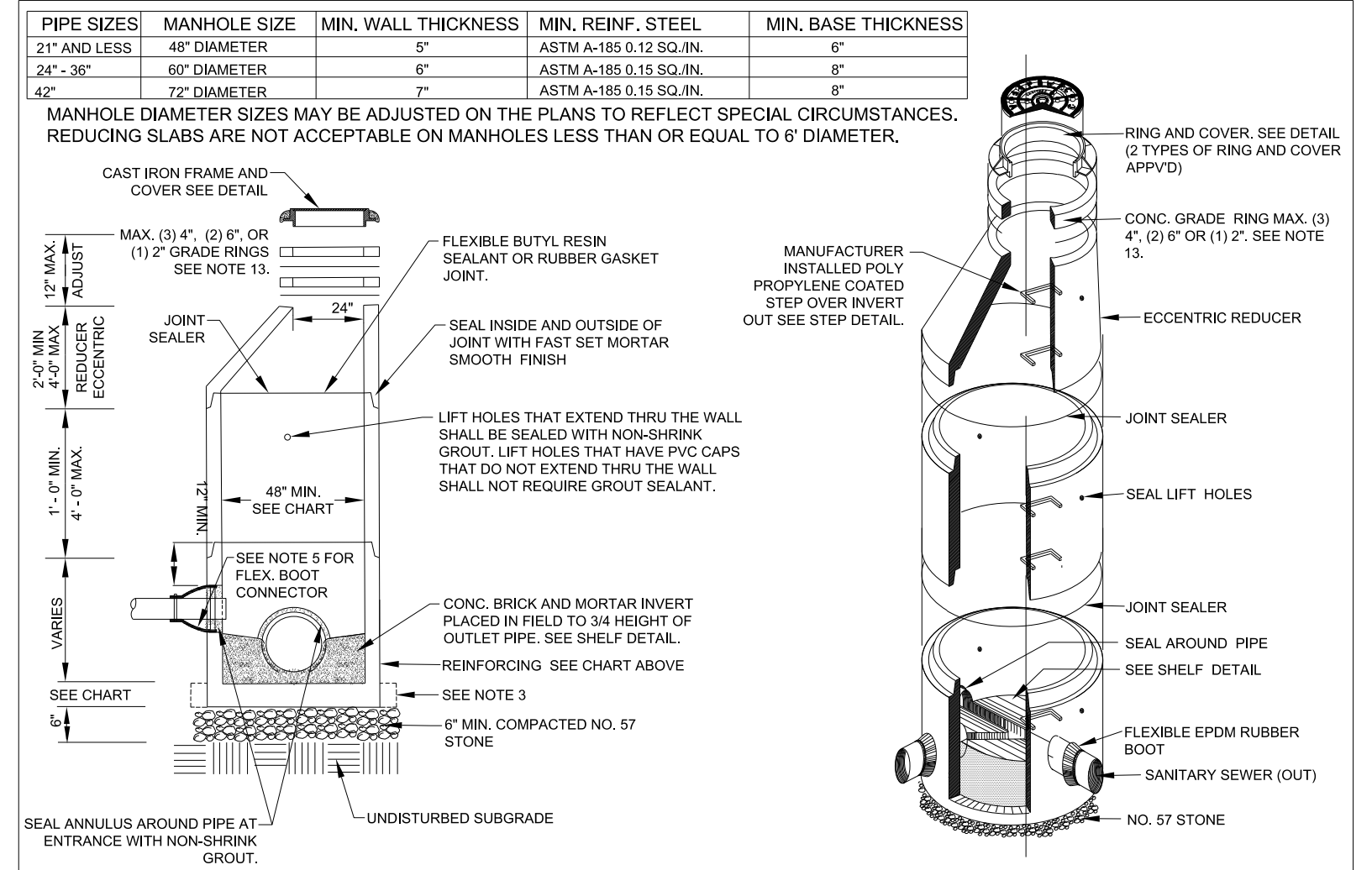


UTILITY CONSTRUCTION

- CONTRACTOR SHALL REPAIR ALL SEWER LATERALS AND MAINS DAMAGED DURING CONSTRUCTION. THE CONTRACTOR SHALL IMMEDIATELY REPORT ALL SEWER MAIN AND LATERAL BREAKS TO THE ENGINEER. THE CONTRACTOR SHALL INITIATE IMMEDIATE REPAIRS IN ACCORDANCE WITH THE UTILITY SPECIAL PROVISIONS.
- SEWER MAINS, LATERALS, AND MANHOLES SHALL BE INSTALLED UTILIZING AN APPROVED OUT-SHEET, INDICATING INSTALLATION DEPTH.
- TRANSFER OF SEWER SERVICES SHALL BE ACCOMPLISHED AS FOLLOWS:
 - INSTALL AND TEST NEW MAINS, MANHOLES, AND LATERALS. CLEANOUTS SHALL BE INSTALLED 18" INSIDE R/W OR PUE UNLESS OTHERWISE DIRECTED BY ENGINEER.
 - CONNECT EXISTING PLUMBING TO NEW LATERAL UTILIZING THE NECESSARY FITTINGS AS DIRECTED BY ENGINEER.
 - AFTER ALL SERVICES HAVE BEEN TRANSFERRED TO THE NEW MAIN, THE EXISTING SEWER SYSTEM SHALL BE ABANDONED IN ACCORDANCE WITH THE UTILITY SPECIAL PROVISIONS.
- WHEN THE EXISTING MAIN IS NOT TO BE ABANDONED, THE CONTRACTOR SHALL UNCOVER THE EXISTING LATERAL AT THE MAIN, CUT AND PLUG BOTH ENDS, REMOVE THE EXISTING CLEANOUT AND COMBINATION, AND PLUG THE LATERAL TO ABANDON THE OLD SERVICE.
- CONTRACTOR SHALL ABANDON ("KILL-OUT") ANY EXISTING SEWER SERVICES THAT WILL NOT BE UTILIZED BY UNCOVERING THE EXISTING LATERAL AT THE MAIN, CUT AND PLUG AT BOTH ENDS, REMOVE THE EXISTING CLEANOUT AND COMBINATION, AND PLUG THE LATERAL TO ABANDON THE OLD SERVICE. FOR LATERALS THAT CONNECT TO A MANHOLE AND ARE TO BE ABANDONED ("KILLED-OUT"), THE LATERAL SHALL BE REMOVED FROM THE MANHOLE AND THE REMAINING VOID IN THE MANHOLE SHALL BE FILLED WITH BRICK AND MORTAR.
- SEWER PLUGS SHALL BE INSTALLED TO ELIMINATE ANY DEBRIS OR OTHER MATERIAL FROM ENTERING THE ACTIVE SEWER SYSTEM. UPON ACCEPTANCE OF THE NEW SEWER SYSTEM, THE CONTRACTOR SHALL CLEAN THE NEW MAINS, REMOVE ALL DEBRIS, AND THEN REMOVE THE PLUG.
- ALL EXISTING UTILITIES IMPACTED BY CONSTRUCTION SHALL BE ADJUSTED TO FINISHED GRADE, IN ACCORDANCE WITH ELEVATIONS INDICATED OR SHOWN ON DRAWINGS.
- ALL WORK ON SEWER UTILITIES (MAINS, LATERALS, ETC) SHALL BE REFERENCED BY A LICENSED UTILITY CONTRACTOR. THE ENGINEER SHALL OBSERVE AND APPROVE ALL WORK ON SEWER UTILITIES. ALL WORK SHALL BE COMPLETED IN ACCORDANCE WITH THE UTILITY SPECIAL PROVISIONS.
- SEPARATION REQUIREMENTS:
 - LATERAL SEPARATION OF SEWERS AND WATER MAINS:** WATER MAINS SHALL BE LAID AT LEAST 10 FEET LATERALLY FROM EXISTING OR PROPOSED SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT A 10-FOOT LATERAL SEPARATION - IN WHICH CASE:
 - THE WATER MAIN IS LAID IN A SEPARATE TRENCH, WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL; OR
 - THE WATER MAIN IS LAID IN THE SAME TRENCH AS THE SEWER MAIN/LATERAL WITH THE WATER MAIN LOCATED AT ONE SIDE ON A BENCH OF UNDISTURBED EARTH AND WITH THE ELEVATION OF THE BOTTOM OF THE WATER MAIN AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL.
 - CROSSING A WATER MAIN OVER A SEWER:** WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS OVER A SEWER MAIN/LATERAL, THE WATER MAIN SHALL BE LAID AT SUCH AN ELEVATION THAT THE BOTTOM OF THE WATER MAIN IS AT LEAST 18 INCHES ABOVE THE TOP OF THE SEWER MAIN/LATERAL, UNLESS LOCAL CONDITIONS OR BARRIERS PREVENT AN 18 INCH VERTICAL SEPARATION - IN WHICH CASE BOTH THE WATER MAIN AND SEWER MAIN/LATERAL SHALL BE CONSTRUCTED OF FERROUS MATERIAL AND WITH JOINTS THAT ARE EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING.
 - CROSSING WATER MAIN UNDER A SEWER:** WHENEVER IT IS NECESSARY FOR A WATER MAIN TO CROSS UNDER A SEWER MAIN/LATERAL, BOTH THE WATER MAIN AND THE SEWER MAIN/LATERAL SHALL BE CONSTRUCTED OF DUCTILE IRON MATERIAL AND WITH JOINTS EQUIVALENT TO WATER MAIN STANDARDS FOR A DISTANCE OF 10 FEET ON EACH SIDE OF THE POINT OF CROSSING. A SECTION OF WATER MAIN PIPE SHALL BE CENTERED AT THE FRONT OF CROSSING.
 - CROSSING STORM DRAINAGE LINES:** A MINIMUM OF 24-INCHES OF VERTICAL CLEARANCE SHALL BE MAINTAINED BETWEEN A SEWER MAIN/LATERAL CROSSING UNDER A STORM DRAINAGE LINE UNLESS DUCTILE IRON PIPE IS USED. IF DUCTILE IRON PIPE IS USED, A MINIMUM OF SIX(6) INCHES OF SEPARATION SHALL BE MAINTAINED, UNLESS OTHERWISE APPROVED BY THE ENGINEER.

GENERAL NOTES		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
SANITARY SEWER UTILITY		FAYETTEVILLE, N.C.		1	07/16	ADDED NOTE 6
DWG. NO. S.1		DWG. BY: FAYPWC		2	01/18	ADDED NOTES 8, 8
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		3	07/24/18	REVISED NOTES 1, 2a, 2b, 7 AND 8 FOR NCDOT U-4405.

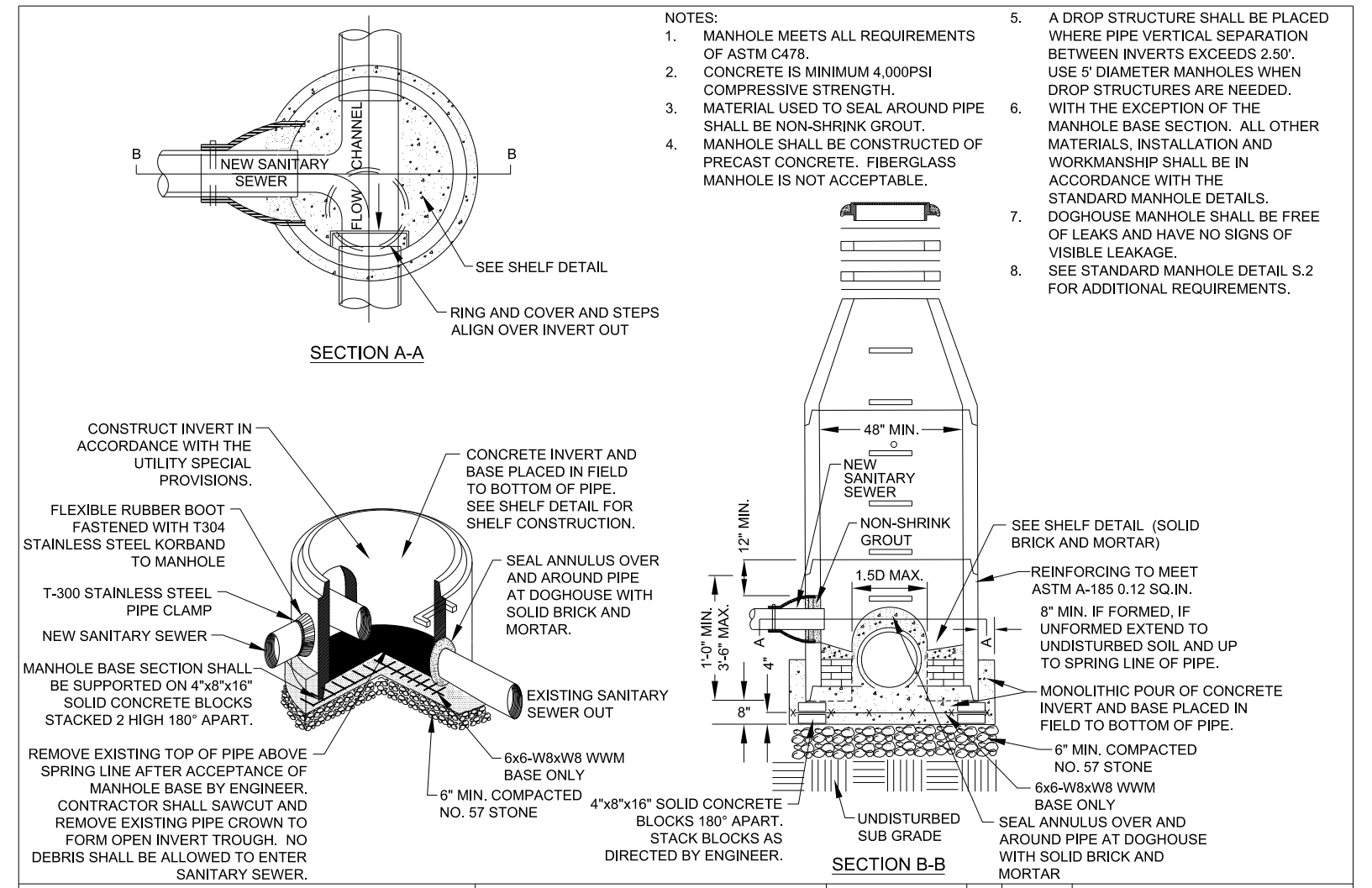


STANDARD MANHOLE		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
N.T.S.		FAYETTEVILLE, N.C.		1	02/07	CREATED S.2A ADDED NOTES 13-17
DWG. NO. S.2		DWG. BY: FAYPWC		2	07/13	ADDED SHEET 2 OF 2
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		3	07/24/18	REVISED PER NCDOT COMMENTS (U-4405)

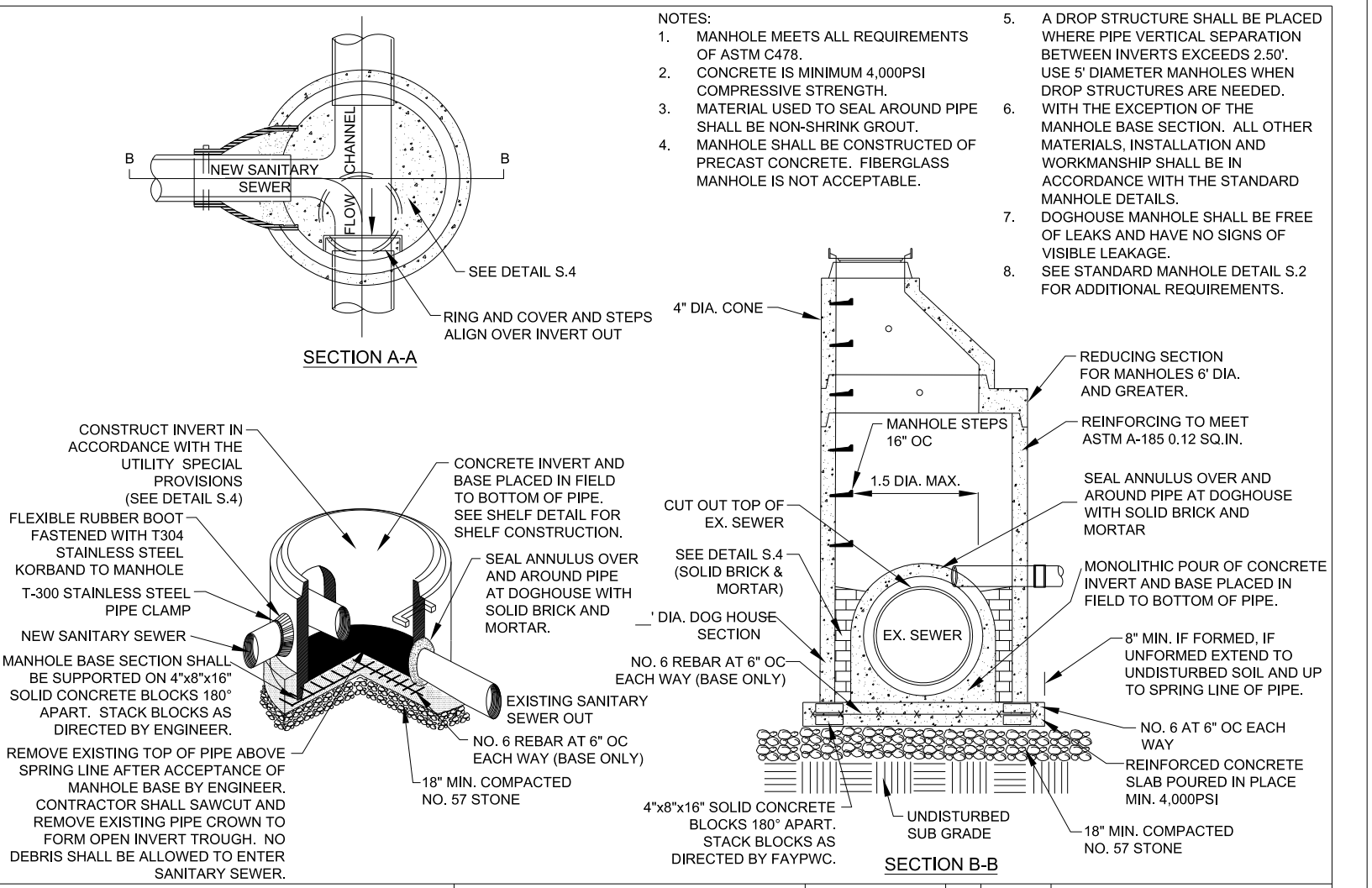
NOTE:
ANY REFERENCE TO FAYPWC PROJECT COORDINATOR, PWC COORDINATOR OR FAYPWC (FAYETTEVILLE PUBLIC WORKS COMMISSION) SHALL BE INTERPRETED AS A REFERENCE TO THE ENGINEER.

- PRECAST REINFORCED CONCRETE MANHOLES SHALL BE IN ACCORDANCE WITH ASTM C478.
- MINIMUM CONCRETE COMPRESSIVE STRENGTH SHALL BE 4,000PSI.
- MANHOLES GREATER THAN 12" DEPTH SHALL HAVE MINIMUM 6" EXTENDED BASE.
- FLEXIBLE BUTYL RESIN JOINT SEALANT SHALL BE IN ACCORDANCE WITH ASTM C999. RUBBER GASKET JOINTS SHALL BE IN ACCORDANCE WITH ASTM C443.
- FLEXIBLE EPDM RUBBER BOOT CONNECTORS SHALL BE IN ACCORDANCE WITH ASTM C923. INSTALLED BY MANUFACTURER WITH STAINLESS STEEL COMPRESSION RING AND TAKE-UP CLAMP. CONNECTION TO MAIN SHALL BE BY CONTRACTOR WITH STAINLESS STEEL PIPE CLAMP.
- CONNECTIONS TO EXISTING MANHOLES SHALL BE BY CORING MANHOLE AND FIELD INSTALLING A FLEX BOOT CONNECTOR. DO NOT ALLOW DEBRIS TO ENTER SYSTEM.
- MORTAR SHALL BE QUICK SETTING, NON-SHRINK GROUT MIXED IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
- MANHOLE STEPS SHALL BE IN ACCORDANCE WITH ASTM C478 AND OSHA REGULATIONS. ALIGN STEPS WITH INVERT OUT.
- PRECAST INVERTS ARE NOT ALLOWED. STANDING WATER IN INVERT OF MANHOLE IS NOT ACCEPTABLE.
- VERTICAL DROPS BETWEEN THE INFLOW PIPES AND OUTFLOW PIPES SHALL REQUIRE THE FOLLOWING:
 - GREATER THAN 2" SEE DROP STRUCTURE DETAIL (MIN. 5" DIAMETER MH REQUIRED).
 - 1" TO 2.5" SEE PIPE SLIDE DETAIL.
 - LESS THAN 1" SEE MORTAR SLIDE DETAIL.
- AN ECCENTRIC CONE SHALL BE UTILIZED ON ALL MANHOLES. DIAMETER MANHOLES SHALL BE APPROVED BY ENGINEER. 5" DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
- INVERT ON PLANS IS TO MANHOLE CENTERLINE.
- CONCRETE GRADE RINGS SHALL NOT BE USED FOR ABOVE GRADE ADJUSTMENTS (8" OR MORE). CONCRETE GRADE RINGS ARE ALLOWABLE IN YARD AREAS AND PAVEMENT, WHERE THE RING AND COVER ARE AT GROUND LEVEL.
- THE MINIMUM SLOPE ACROSS THE INVERT OF THE MANHOLE SHALL BE 1%, UNLESS OTHERWISE APPROVED BY ENGINEER.
- THE EXTERIOR MANHOLE RISER JOINTS, INCLUDING THE JOINT AT THE CONE, SHALL BE SEALED ON THE OUTSIDE BY AN APPROVED JOINT WRAP. THE WRAP SHALL BE IN ACCORDANCE WITH THE UTILITY SPECIAL PROVISIONS.
- MANHOLE BOOT FOR 4" INCH LATERALS. SHOULD IT BE NECESSARY TO INSTALL A 4" INCH LATERAL INTO A MANHOLE, THE RUBBER BOOT THAT THE LATERAL IS INSERTED INTO SHALL BE SECURELY FASTENED TO THE CORE HOLE BY UTILIZING A STAINLESS STEEL BAND THAT IS TIGHTENED USING A JACK OR A TORQUE WRENCH (DIRECT DRIVE). BOTH STANDARD SIZE AND STEP DOWN BOOTS ARE ALLOWED. THE TORQUE WRENCH SHALL BE SUPPLIED BY THE MANUFACTURER. NO OTHER TYPE BANDS OR METHOD OF SECURING THE BOOT TO THE MANHOLE SHALL BE ACCEPTED.
- FOR FOUR (4) INCH SDR 26 LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL BE 5.5 INCHES TO 4.25 INCHES.
- FOR FOUR (4) INCH DUCTILE IRON LATERALS, THE PIPE OUTSIDE DIAMETER RANGE OF THE BOOT SHALL EITHER BE AS FOR VC OR 4.25 INCHES TO 4.81 INCHES.
- IN ALL CASES, THE BOOT SHALL BE TIGHTENED ON THE LATERAL BY MEANS OF A SINGLE STAINLESS STEEL STRAP.
- THE LATERAL INVERT SHALL BE AT THE TOP OF THE SHELF.
- NO MORE THAN 4, FOUR INCH LATERALS OR 3, SIX INCH LATERALS SHALL ENTER A 4" DIAMETER TERMINAL MANHOLE. NO MORE THAN 2 LATERALS (REGARDLESS OF SIZE) SHALL ENTER ALL OTHER 4" DIAMETER MANHOLES. ALL LATERALS SHALL HAVE AN INDIVIDUAL TROUGH. 5" DIAMETER MANHOLES SHALL BE USED IF THE ABOVE CONDITIONS ARE NOT MET.
- NO MORE THAN 5 LATERALS SHALL ENTER A 5" DIAMETER
- USE OF TEE-WYES ON LATERALS IS NOT ALLOWED.
- ALL MANHOLES SHALL BE VACUUM TESTED IN ACCORDANCE WITH THE UTILITY SPECIAL PROVISIONS.

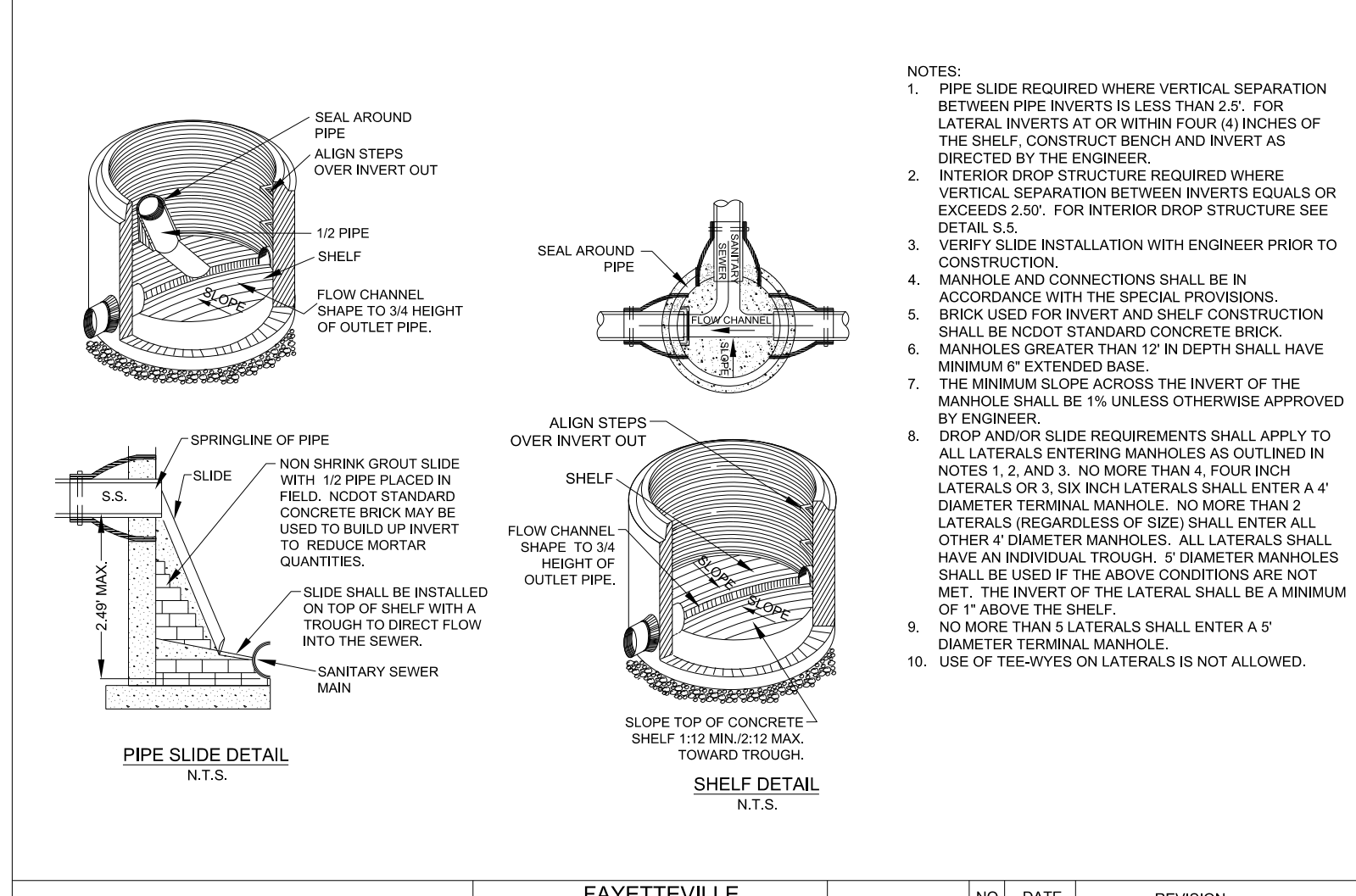
STANDARD MANHOLE		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
N.T.S.		FAYETTEVILLE, N.C.		1	07/18	CREATED DETAIL, ADDED NOTES 14-20
DWG. NO. S.2		DWG. BY: FAYPWC		2	07/13	REVISED NOTES 9, 10, 11, 15 CONVERTED TO S.2 SHEET 2 OF 2
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		3	07/24/18	REVISED PER NCDOT COMMENTS (U-4405)



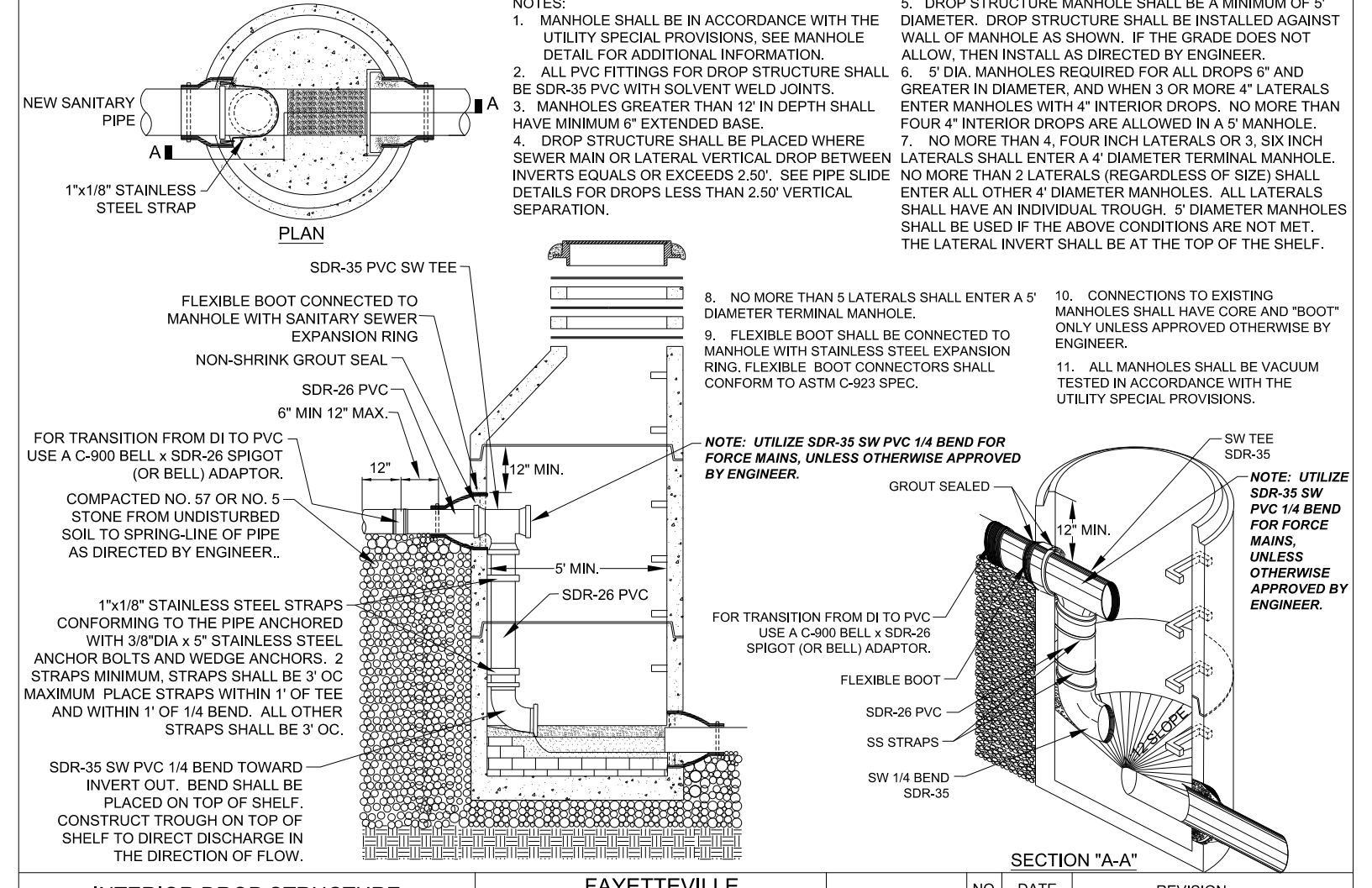
DOGHOUSE MANHOLE		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
N.T.S.		FAYETTEVILLE, N.C.		1	07/18	ADDED SHEET 2
DWG. NO. S.3		DWG. BY: FAYPWC		2	11/25/08	MADE CHANGES TO NOTES
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		3	07/24/18	REVISED NOTES AND CALLOUTS FOR NCDOT U-4405.



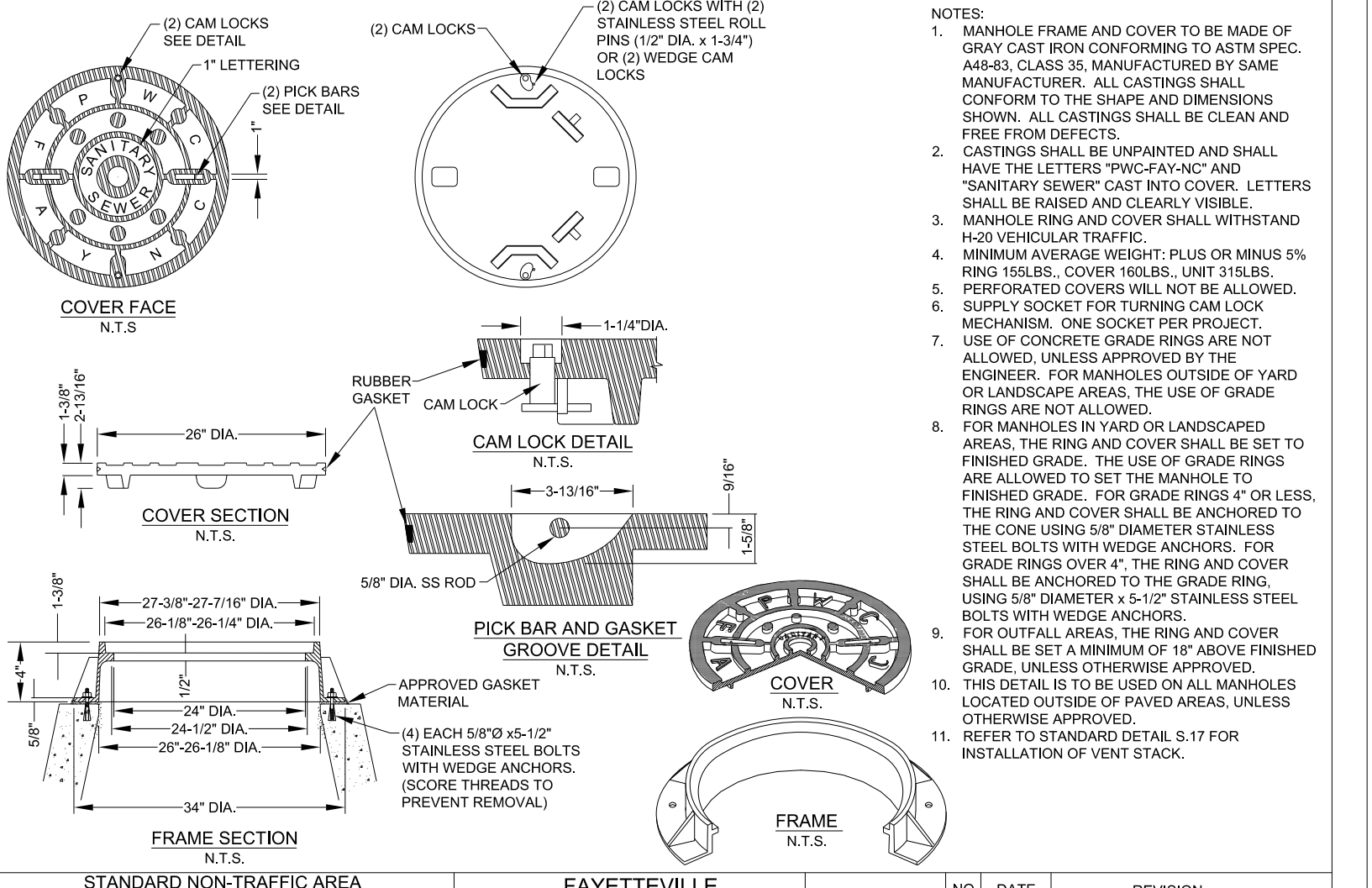
DOGHOUSE MANHOLE		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
N.T.S.		FAYETTEVILLE, N.C.		1	07/18	ADDED SHEET 2
DWG. NO. S.3		DWG. BY: FAYPWC		2	11/25/08	MADE CHANGES TO NOTES
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		3	07/24/18	REVISED NOTES AND CALLOUTS FOR NCDOT U-4405.



PIPE SLIDE AND SHELF DETAILS		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
N.T.S.		FAYETTEVILLE, N.C.		2	02/07	REVISED NOTE 5, SLIDE DETAIL, ADDED NOTES 10, 11, 12
DWG. NO. S.4		DWG. BY: FAYPWC		3	01/18	DELETED MORTAR SLIDE, REVISED NOTES
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		4	07/24/18	REVISED PER NCDOT COMMENTS (U-4405)



INTERIOR DROP STRUCTURE		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
SEWER MAINS & LATERALS		FAYETTEVILLE, N.C.		5	07/12	REVISED NOTES 5, 6, AND 8
DWG. NO. S.5		DWG. BY: FAYPWC		6	07/14	ADDED FORCE MAIN NOTE
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		7	07/24/18	REVISED NOTES AND CALLOUTS FOR NCDOT U-4405.



STANDARD NON-TRAFFIC AREA		FAYETTEVILLE PUBLIC WORKS COMMISSION		NO.	DATE	REVISION
MANHOLE RING AND COVER WITH WIPER GASKET AND CAM LOCK		FAYETTEVILLE, N.C.		2	07/17	ADDED NOTE ON WEDGE CAM LOCKS
DWG. NO. S.6		DWG. BY: FAYPWC		3	01/18	UPDATED NOTES 7 AND 8
DATE: JAN. 01, 2018		APPROVED BY: J.E.G.		4	07/24/18	REVISED PER NCDOT COMMENTS (U-4405)

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 UTILITY REV. - JULY 24, 2018 - REVISIONS TO DETAIL SHEETS
 5/14/2019

REVISIONS

S4-PSLIDE.dwg

S5-DROP.dwg

S6-RING-COVER.dwg