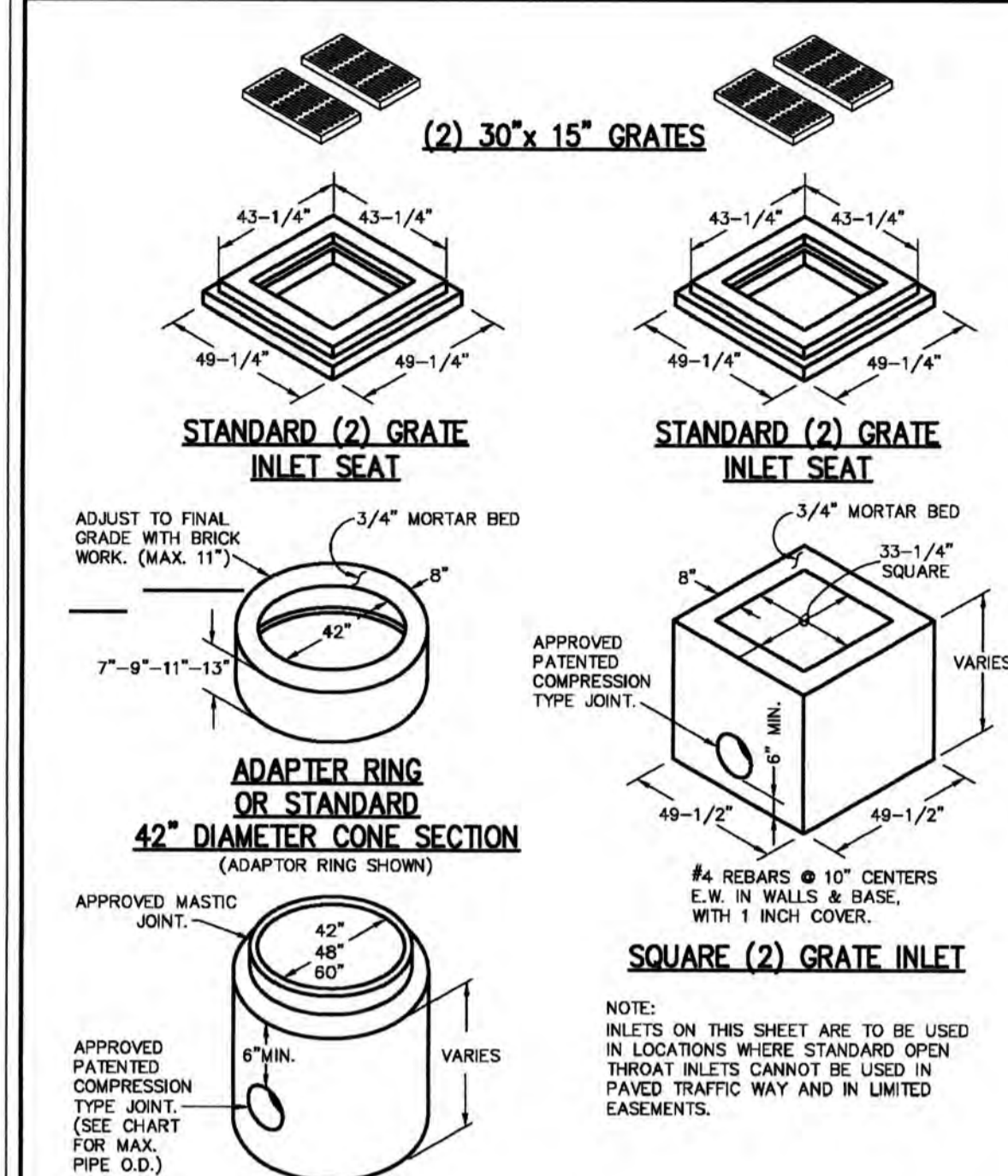
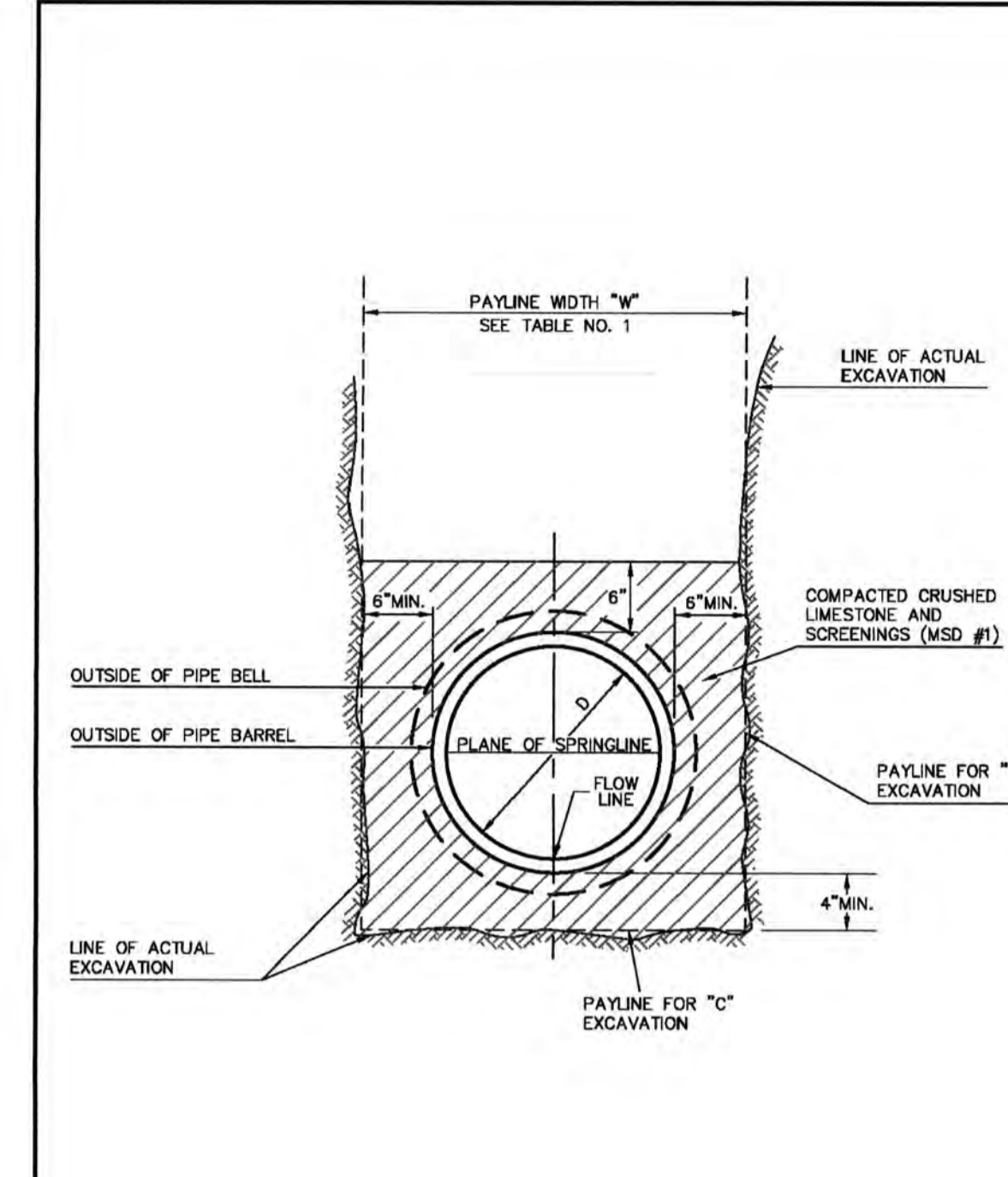


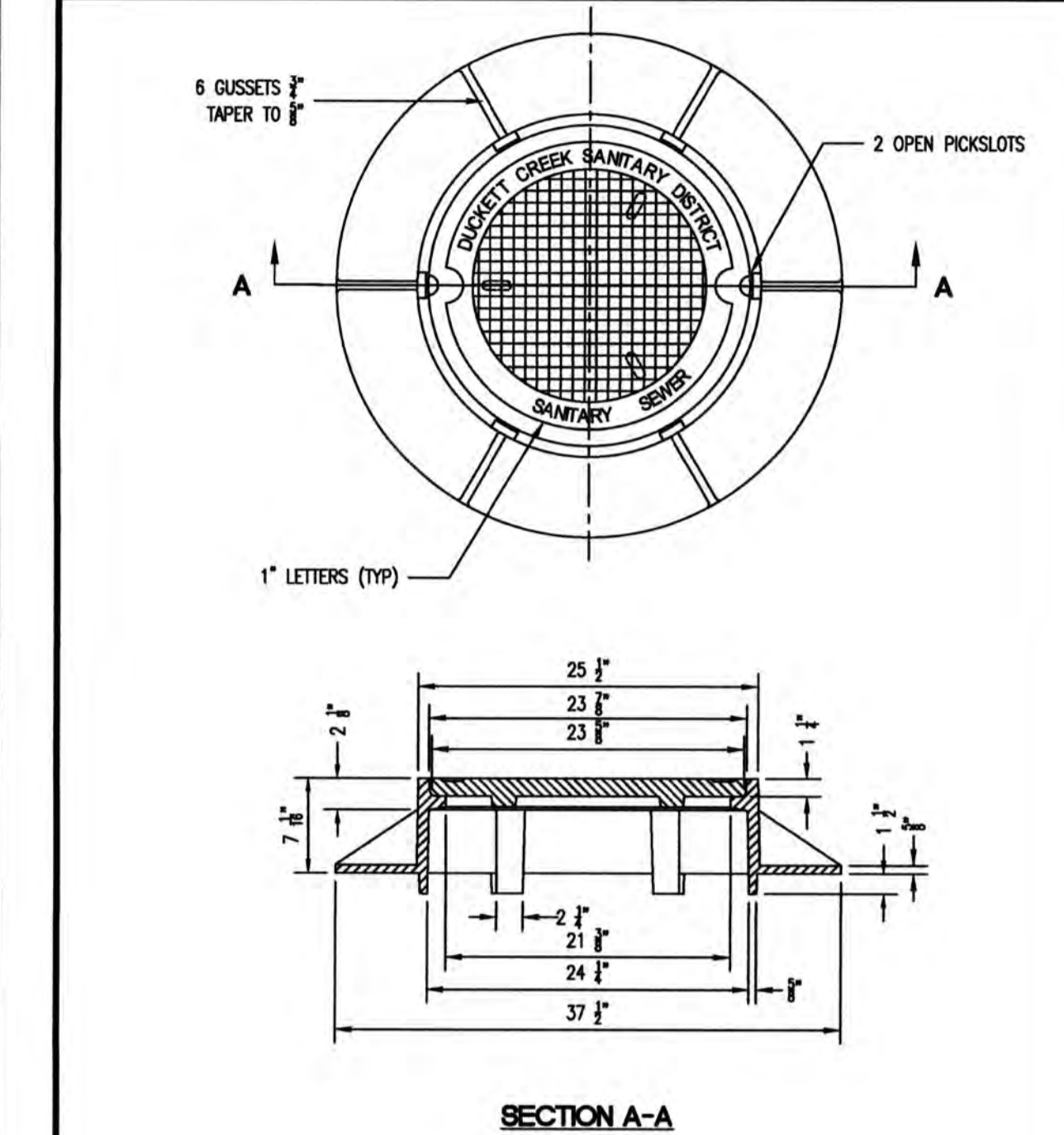
MANHOLE STEP FOR PRECAST & CAST-IN-PLACE MANHOLE
METROPOLITAN ST. LOUIS SEWER DISTRICT Standard Details of Sewer Construction
 Dr. O.A.B. Ch. J.C.K. 2009 SHEET 58



(2) 30" x 15" GRATES
STANDARD (2) GRATE INLET SEAT
ADAPTER RING OR STANDARD 42" DIAMETER CONE SECTION
(2) GRATE INLET (INLET MANHOLE BASE)
METROPOLITAN ST. LOUIS SEWER DISTRICT Standard Details of Sewer Construction
 Dr. W.S.H. Ch. J.C.K. 2009 SHEET 35



PIPE BEDDING CLASS "C" (FOR ALL 6" TO 18" PIPE EXCEPT REINFORCED CONCRETE PIPE)
METROPOLITAN ST. LOUIS SEWER DISTRICT Standard Details of Sewer Construction
 Dr. W.S.H. Ch. J.C.K. 2009 SHEET 4



Duckett Creek Sanitary District
MANHOLE FRAME AND COVER
 12
 DATE: 1/14/20

Installation Techniques - Link-Seal® Modular Seals

Online Installation Video
 Visit www.linkseal.com

Link-Seal® Model	Tool Size/Type Req.
LS-200, LS-275	4mm, Allen
LS-300, LS-315	6mm, Allen
LS-325, LS-340, LS-380	13mm, Hex
LS-400, LS-410, LS-426, LS-475	17mm, Hex
LS-500, LS-525, LS-575	19mm, Hex
LS-600	30mm, Hex
LS-850	19mm, Hex

Installation Notes: The Link-Seal® modular seal both heads are usually recessed below the well opening or the edge of casing pipe and therefore a socket or offset wrench must be used. Head Probe (free or provided draw down). (Tools not provided). Tools can be purchased from hardware stores, auto parts store, or home improvement store.

Always Wear Safety Equipment When Using Link-Seal® Modular Seals!

Link-Seal® Modular Seal - Do's

- Make sure pipe is centered.
- Install the seal with the pressure plates evenly spaced.
- Install the exact number of links indicated in staking charts.
- Check to make sure pipe is supported properly during backfill operations.
- Make Link-Seal modular seals are gapped between the pipe.
- Make sure seal assembly and pipe surfaces are free from dirt.
- For tight fits, use non-polluting liquid detergent to assist installation.

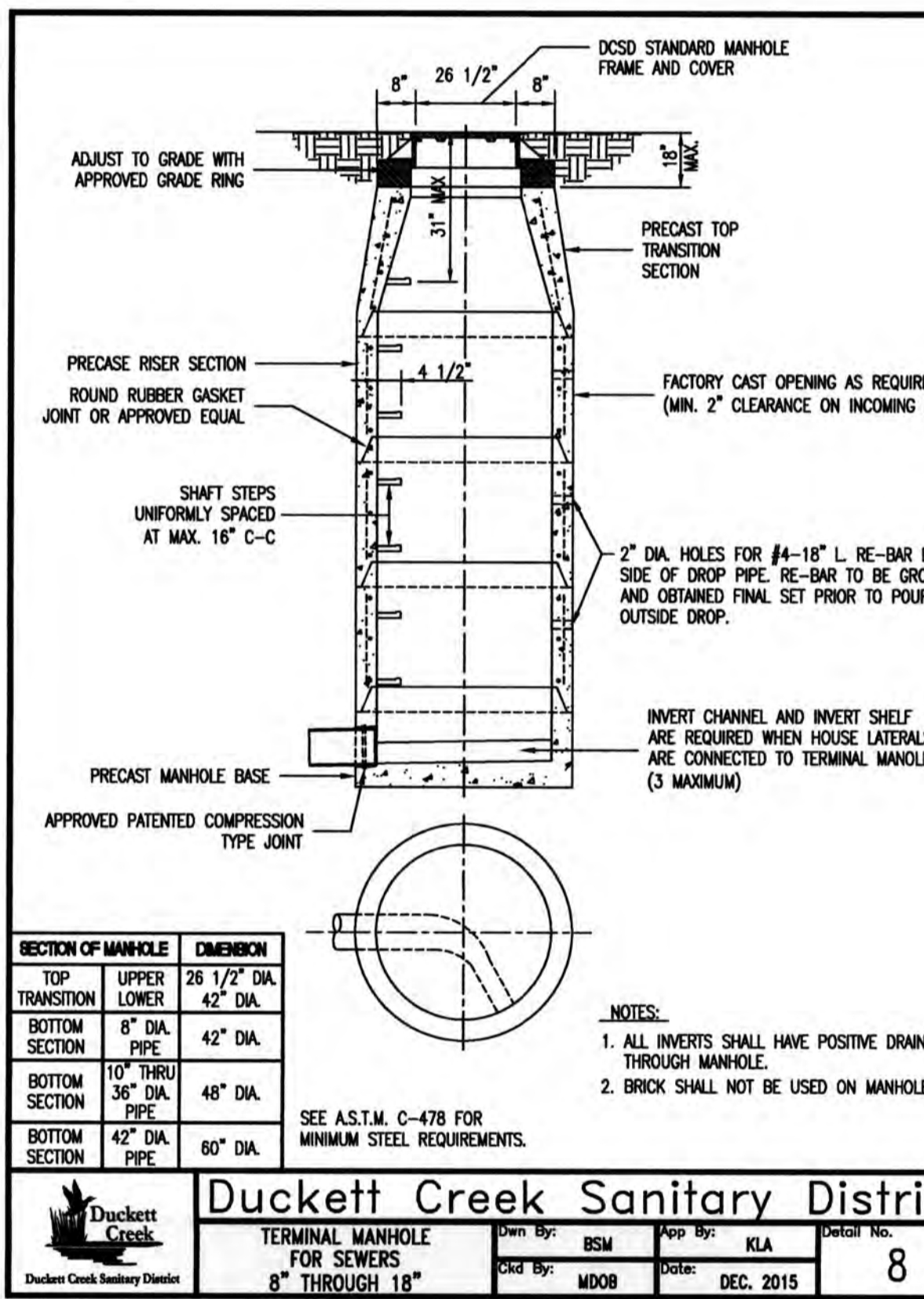
Link-Seal® Modular Seal - Don'ts

- Don't install the seal with the pressure plates aimed in irregular directions.
- Don't use high speed power tools (4500 rpm or more).
- Do not use power tools on Link-Seal modular seal 316 stainless steel bolts.
- Do not use grease in staking Link-Seal modular seals.

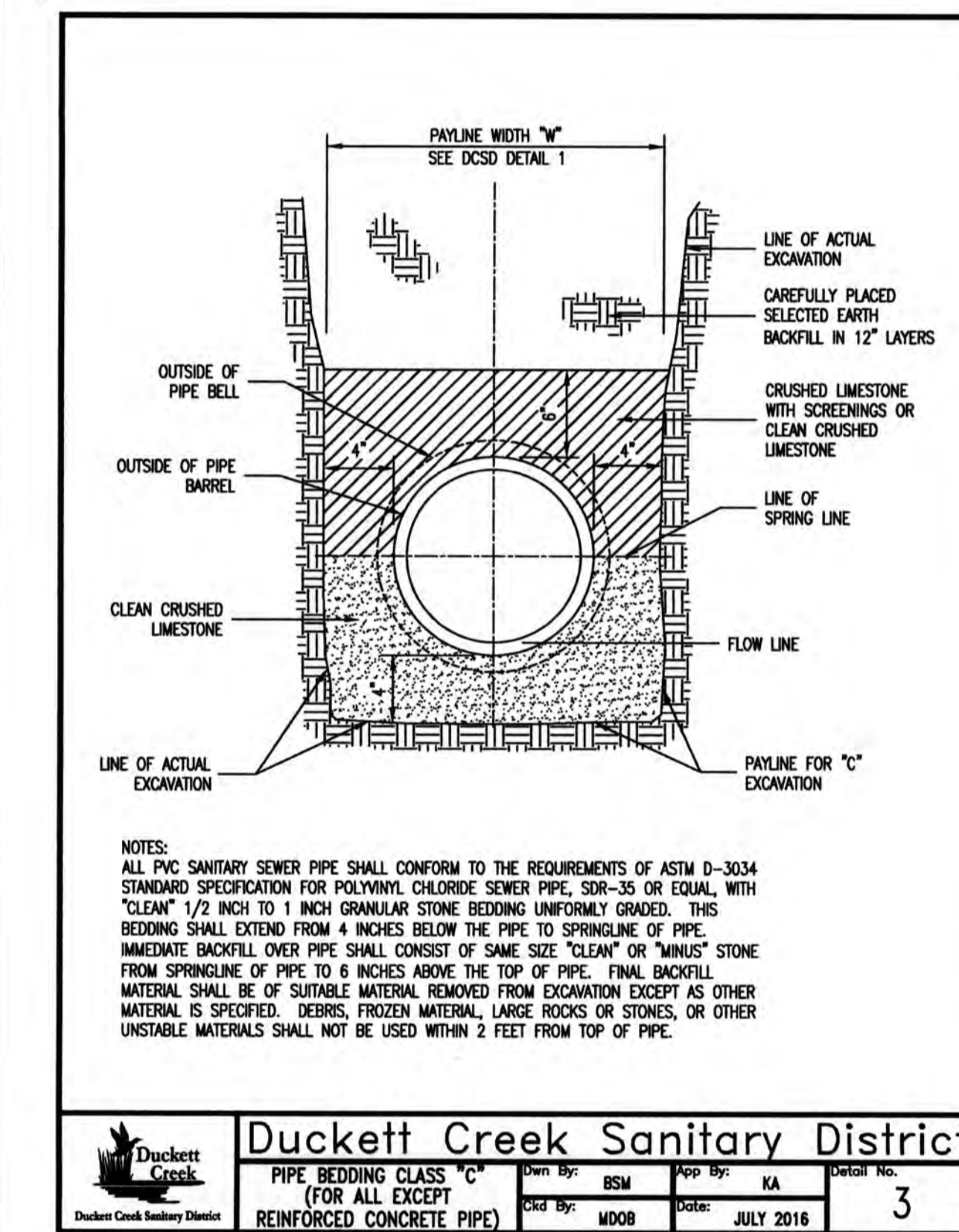
If the seal doesn't appear to be correct using the techniques provided, call PSI at 715-747-8963 or 800-423-2416.

ROUND PIPE				HORIZONTAL ELLIPTICAL PIPE			
INSIDE DIAMETER OF PIPE (INCHES)	"W" PAYLINE WIDTH OF TRENCH (INCHES)	"W" PAYLINE WIDTH OF TRENCH (FEET)	PAY-VOLUMES CONCRETE ENCASEMENT (CU. FT. PER FT.)	INSIDE DIMENSIONS OF PIPE (INCHES)	"W" PAYLINE WIDTH OF TRENCH (INCHES)	"W" PAYLINE WIDTH OF TRENCH (FEET)	PAY-VOLUMES CONCRETE ENCASEMENT (CU. FT. PER FT.)
4	30	2.50	3.28				
6	30	2.50	3.59				
8	30	2.50	3.87				
10	30	2.50	4.09				
12	30	2.50	4.25				
15	36	3.00	5.55				
18	36	3.00	5.77	14 x 23	41	3.42	5.94
21	39	3.25	6.61				
24	42	3.50	7.39	19 x 30	49	4.08	7.68
27	45	3.75	8.19	22 x 34	53	4.42	8.61
30	48	4.00	8.30	24 x 38	58	4.83	8.70
33	53	4.42	10.53	27 x 42	62	5.17	10.71
36	56	4.67	11.43	29 x 45	66	5.50	11.72
DISCONTINUED							
42	63	5.25	13.38	32 x 49	71	5.92	13.14
48	70	5.83	15.67	38 x 60	83	6.92	18.18
54	77	6.42	18.15	43 x 68	92	7.67	18.81
60	84	7.00	20.73	49 x 78	101	8.42	21.59
66	91	7.58	23.45	53 x 83	109	9.08	24.35
72	98	8.17	26.37	58 x 91	118	9.83	27.45
78	105	8.75	29.39	63 x 98	126	10.50	30.50
84	112	9.33	32.57	68 x 106	135	11.25	33.91
90	119	9.92	35.90	72 x 113	143	11.92	36.99
96	126	10.50	39.37	77 x 121	152	12.67	40.49
102	133	11.08	42.99	82 x 128	160	13.33	44.45
108	140	11.67	46.73	87 x 136	168	14.00	47.79
114	147	12.25	50.66	92 x 143	176	14.67	51.70
120	154	12.83	54.72	97 x 151	185	15.42	56.01
126	161	13.42	58.92				
132	168	14.00	63.27	106 x 166	202	16.83	64.48
144	182	15.17	72.40	118 x 180	218	18.17	73.59

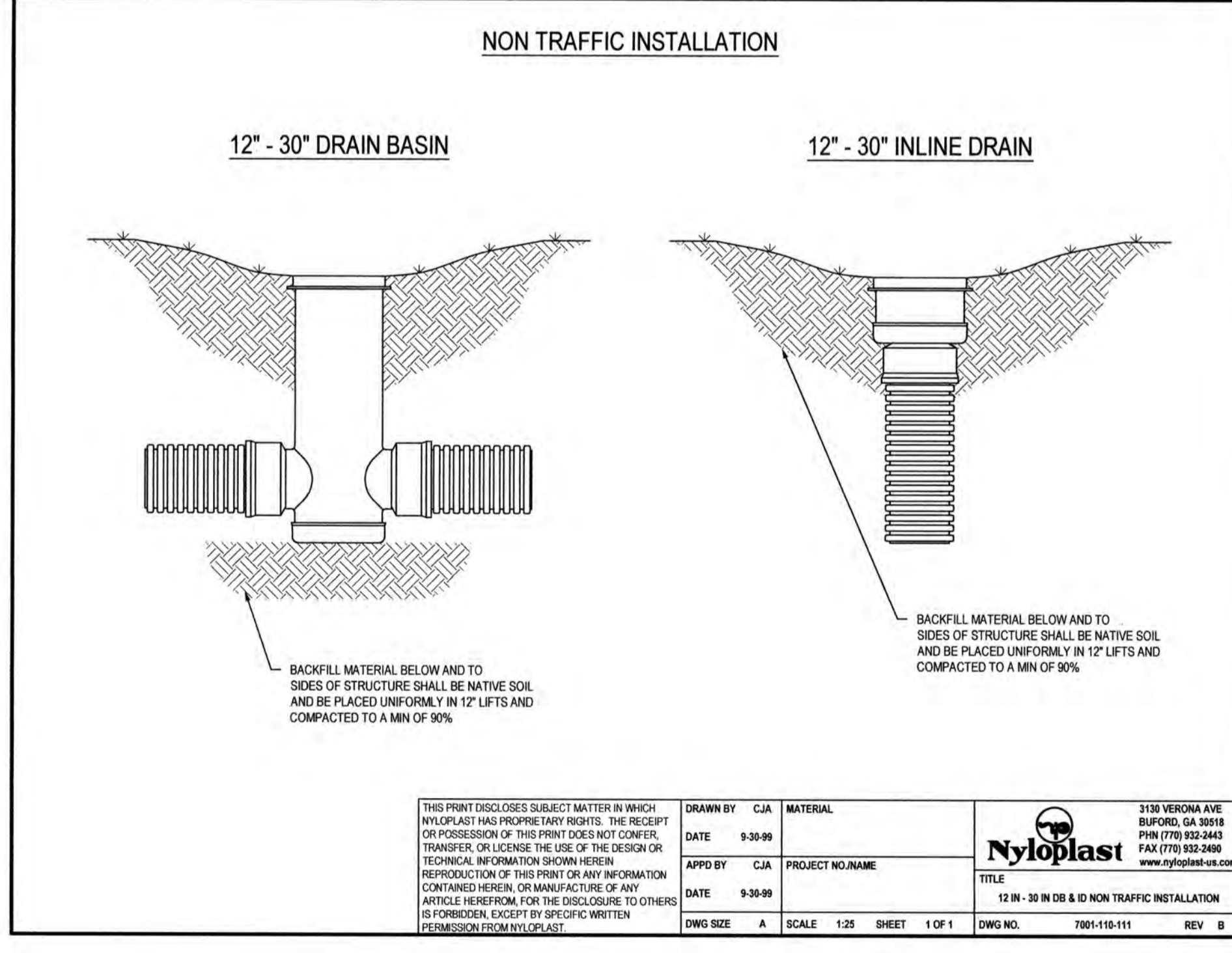
TABLE 1 PAYLINE WIDTHS OF TRENCH AND PAY-QUANTITIES OF CONCRETE
METROPOLITAN ST. LOUIS SEWER DISTRICT Standard Details of Sewer Construction
 Dr. B.E.B. Ch. J.C.K. 2009 SHEET 1



Duckett Creek Sanitary District
TERMINAL MANHOLE FOR SEWERS 8" THROUGH 18"
 DATE: DEC. 2015



Duckett Creek Sanitary District
PIPE BEDDING CLASS "C" (FOR ALL EXCEPT REINFORCED CONCRETE PIPE)
 DATE: JULY 2016



- DUCKETT CREEK SANITARY DISTRICT CONSTRUCTION NOTES**
- Underground utilities have been plotted from available information and therefore location shall be considered approximate only. The verification of the location of all underground utilities, either shown or not shown on these plans, shall be the responsibility of the contractor and shall be located prior to any grading or construction of improvements.
 - Gas, water and other underground utilities shall not conflict with the depth or horizontal location of existing or proposed sanitary and storm sewers, including house laterals.
 - All existing site improvements disturbed, damaged or destroyed shall be repaired or replaced to closely match preconstruction conditions.
 - All fill including places under proposed storm and sanitary sewer lines and paved areas including trench backfills within and off the road right-of-way shall be compacted to 90 percent of maximum density as determined by the Modified AASHTO T-190 Compaction Test (ASTM D1557). All tests shall be verified by a Soils Engineer concurrent with grading and backfilling operations. The compacted fill shall be free of rutting and shall be non-yielding and non-pumping during proofrolling and compaction.
 - The contractor shall prevent all storm, surface water, mud and construction debris from entering the existing sanitary sewer system. The contractor will be required to install a brick bulkhead on the downstream side of the first new manhole constructed when connecting into existing sewers.
 - All sanitary sewer flowlines and tops built without elevations furnished by the engineer will be the responsibility of the sewer contractor.
 - It is the responsibility of the contractor to adjust all sanitary sewer manholes (that are affected by the development) to finish grade.
 - Easements shall be provided for all sanitary sewers, storm sewers and all utilities on the record plat.
 - All sanitary sewer construction and materials shall conform to the current construction standards of the Duckett Creek Sanitary District.
 - The Duckett Creek Sanitary District shall be notified at least 48 hours prior to construction for coordination of inspection.
 - All sanitary sewer building connections shall be designed so that the minimum vertical distance from the low point of the basement to the flowline of a sanitary sewer at the corresponding building connection shall not be less than the diameter of the pipe plus the vertical distance of 2 1/2 feet.
 - All sanitary sewer manholes shall be watertight in accordance with Missouri Dept. of Natural Resources specification 10 CSR 20-8.120(6)(F) 1.

- All PVC sanitary sewer pipe shall conform to the requirements of ASTM D-3034 Standard Specification for PSM Polyvinyl Chloride Sewer Pipe, SDR-35 or equal, with "clean" 1/2 inch to 1 inch granular stone bedding uniformly graded. This bedding shall extend from 4 inches below the pipe to springline of pipe. Immediate backfill over pipe shall consist of same size "clean" or "minus" stone from springline of pipe to 6 inches above the top of pipe. Final backfill material shall be of suitable material removed from excavation except as other material is specified. Debris, frozen material, large rocks or stones, or other unstable materials shall not be used within 2 feet from top of pipe.
- All sanitary and storm sewer trench backfills shall be water jetted. Granular backfill will be used under pavement areas.
- All pipes shall have positive drainage through manholes. Flat invert structures not allowed.
- Epoxy Coating shall be used on all sanitary sewer manholes that receive pressurized manns.
- All creek crossings shall be lined with rip-rap as directed by District inspectors.
- Brick shall not be used on sanitary sewer manholes.
- Existing sanitary sewer service shall not be interrupted.
- Maintain access to existing residential driveways and streets.
- Pre-manufactured adapters shall be used at all PVC to DIP connections. Rubber boot / Mission-type couplings will not be allowed.
- Type N' Lock-Type Cover and Locking Device (Lock-Lug) shall be used where lock-type covers are required.
- All sanitary sewer work shall be conducted under the inspection of a representative of the District. All work may not require inspection but the District's representative may designate specific areas that must be inspected before the work is backfilled. All testing must be witnessed by the District's Inspector and the Contractor shall furnish all testing equipment as approved by the District. Testing shall include:
 - A mandrel test of all gravity sewers using a mandrel with a diameter that has a diameter 95% of the inside pipe diameter. If the mandrel test fails on any section of pipe, that section of pipe shall be uncovered and replaced. No expansion devices will be allowed to be used to "force" the pipe that is deformed back into round. Any string lines used in mandrel testing shall be removed after testing is completed. Deflection testing cannot be conducted prior to 30 days after final backfill.
 - An air pressure test of all gravity sewers to a pressure of 5 PSI with no observed drop in pressure during a test period of 5 minutes.
 - A vacuum test of all manholes for a period of 1 minute and the vacuum shall be 10" of mercury and not drop below 9" of mercury at the end of the 1 minute test.

ENGINEERS SEAL DOES NOT APPLY TO REFERENCE DETAILS ON THIS SHEET.

REFERENCE SHEET
 Clifford L. Hellmann
 LICENSE #28287
 ENGINEERING CONF. NO. 00065

WENTZVILLE, MISSOURI
 GEOTECHNICAL
 PSI, INC.

ADDITIONS AND RENOVATIONS AT FRONTIER MIDDLE SCHOOL
 CONSULTING ENGINEERS:
 HOENR ASSOCIATES, INC. - ARCHITECTS
 6707 PLAINVIEW AVENUE
 ST. LOUIS, MISSOURI 63109
 Ph. (314) 781-9855 Fax. (314) 781-0163

WENTZVILLE R-IV SCHOOL DISTRICT
HOENR ASSOCIATES, INC. - ARCHITECTS
 6707 PLAINVIEW AVENUE
 ST. LOUIS, MISSOURI 63109
 Ph. (314) 781-9855 Fax. (314) 781-0163

ALL DIMENSIONS MUST BE VERIFIED AT BUILDING BEFORE WORK IS EXECUTED. THIS DRAWING IS THE PROPERTY OF THE ARCHITECTS AND SHALL NOT BE COPIED OR DUPLICATED WITHOUT THE ARCHITECTS' PERMISSION.

proj. no. 19-06C
 date issued
 01/31/20
 date revised
 02/18/20 CITY REVIEW
 04/01/20 CITY/DCCS REVIEW

drawn by BWF
 checked by JCM
 sheet no.

C12.0

SEWER DETAILS