

LEGEND OF SYMBOLS

SYMBOL	EXISTING	ADJUSTED	PROPOSED
STORM MANHOLES			
STORM INLETS			
CATCH BASINS			
CURB INLETS			
CATCH BASIN/MANHOLES			
TWIN CURB INLETS			
YARD DRAINS			
SANITARY MANHOLES			
CLEANOUTS			
PUMP STATIONS			
WATER METER VAULT			
WATER METER MANHOLE			
LINE VALVE			
WATER SHUT-OFFS			
HYDRANTS			
ELECTRIC CO. MH/VAULTS			
POWER/UTILITY POLES			
LIGHT POLES			
TELEPHONE POLES			
COMBINATION POLES			
PHONE CO. MANHOLES/VAULTS			
GAS LINE VALVE			
GAS METER			
TRAFFIC SIGN			
TRAFFIC SIGNAL MAST ARM			
TRAFFIC PULLBOX			
TREES			
VEGETATION LINE			
CENTERLINE			
EASEMENT			
RIGHT-OF-WAY LINE			
PAVEMENT			
CURBS			
STORM SEWERS			
SANITARY SEWERS			
WATERLINE			
GASLINE			
TELEPHONE			
ELECTRIC CONDUIT			
CONCRETE			
EXISTING CONTOUR			
PROPOSED AGGREGATE BERM			

NOTE:

- CONTRACTOR SHALL VISIT SITE OF PROPOSED WORK AND BECOME FAMILIAR WITH LOCATIONS AND VARIOUS LOCAL CONDITIONS AFFECTING PROPOSED WORK. NO ADDITIONAL ALLOWANCE WILL BE GRANTED BECAUSE OF LACK OF KNOWLEDGE OF SUCH CONDITIONS.
- THE INFORMATION SHOWN CONCERNING EXISTING UTILITIES IS NOT REPRESENTED, WARRANTED OR GUARANTEED TO BE COMPLETE OR ACCURATE. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO PHYSICALLY LOCATE AND VERIFY, IN THE FIELD, ALL UTILITY LOCATIONS AND ELEVATIONS, WHETHER SHOWN ON THE PLAN OR NOT, PRIOR TO THE BEGINNING OF CONSTRUCTION OPERATIONS. PARTICULAR ATTENTION IS DIRECTED TO THE CONTRACTOR'S RESPONSIBILITY FOR DETERMINING IN THE FIELD THE EXACT LOCATION AND ELEVATIONS OF UTILITIES FOR WHICH CONNECTIONS ARE TO BE MADE, BEFORE ANY WORK IS STARTED ON THE ITEMS OF WORK THAT ARE SERVED BY SAID CONNECTIONS.
- THE CONTRACTOR SHALL GIVE ALL REQUISITE NOTICES, FILE PLANS IF REQUIRED, OBTAIN AND PAY FOR ALL PERMITS, INSPECTIONS, CERTIFICATES OF INSPECTIONS, DEPOSITS AND FEES NECESSARY FOR THE INSTALLATION OF THE WORK AND REQUIRED BY ALL LAWS, ORDINANCES, RULES, REGULATIONS, OR PUBLIC AUTHORITY HAVING JURISDICTION.

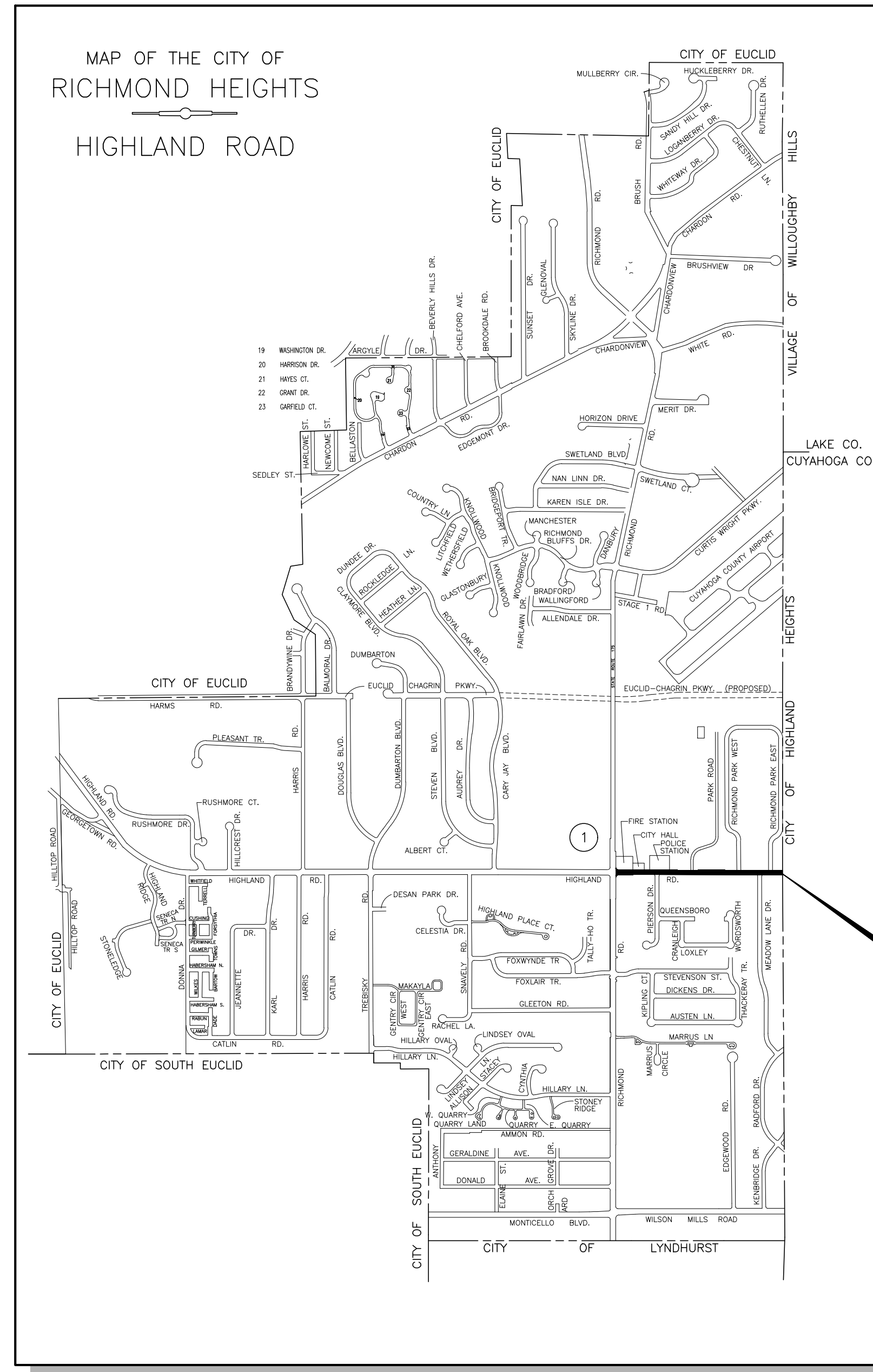
ABBREVIATIONS

EX	Existing	TELE	Telephone
STM	Storm	LP	Light Pole
SAN	Sanitary	PP	Power Pole
MH	Manhole	UP	Utility Pole
CO	Clean Out	HW	Headwall
CI	Curb Inlet	IP	Iron Pin
CB	Catch Basin	MON	Monument
IB	Inlet Basin	FND	Found
SWR	Sewer	E	East
INV	Invert	W	West
FL	Flow Line	N	North
WTR	Water	S	South
W.L.	Water Line	NE	North East
LV	Line Valve	NW	North West
WSD	Water Shut Off	SE	South East
HYD	Hydrant	SW	South West
MTR	Meter	OBS	Observed
G	Gas	REC	Record
ELEC	Electric	ASP	Asphalt
CONC	Concrete		

# IMPROVEMENT PLANS OF THE 2023 HIGHLAND ROAD RESURFACING (EAST OF RICHMOND)

IN AND FOR  
THE CITY OF RICHMOND HEIGHTS

JULY - 2023

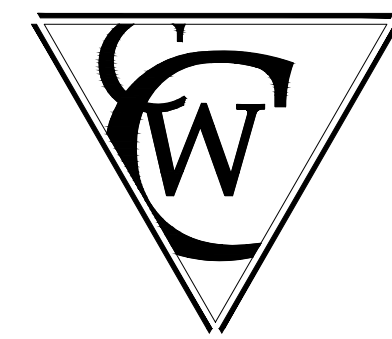


INDEX OF SHEETS

- 1 TITLE SHEET
- 2-4 HIGHLAND ROAD PLAN VIEW
- 5-8 DETAILS

**UNDERGROUND UTILITIES**  
TWO WORKING DAYS  
**BEFORE YOU DIG**  
CALL 1-800-362-2764 (TOLL FREE)  
OHIO UTILITIES PROTECTION SERVICE  
NON-MEMBERS  
MUST BE CALLED DIRECTLY  
OUPS REF. NO.: 000-000-000

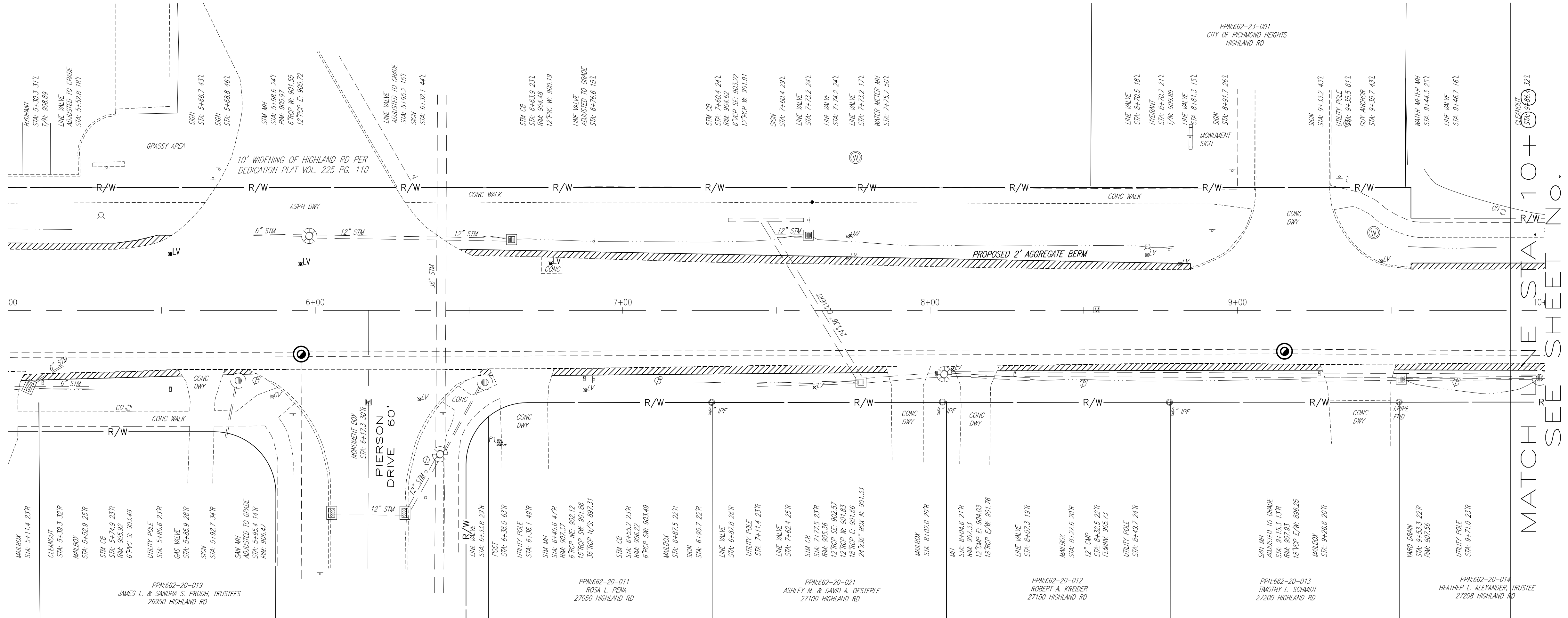
**WORK LOCATIONS:**  
① HIGHLAND ROAD



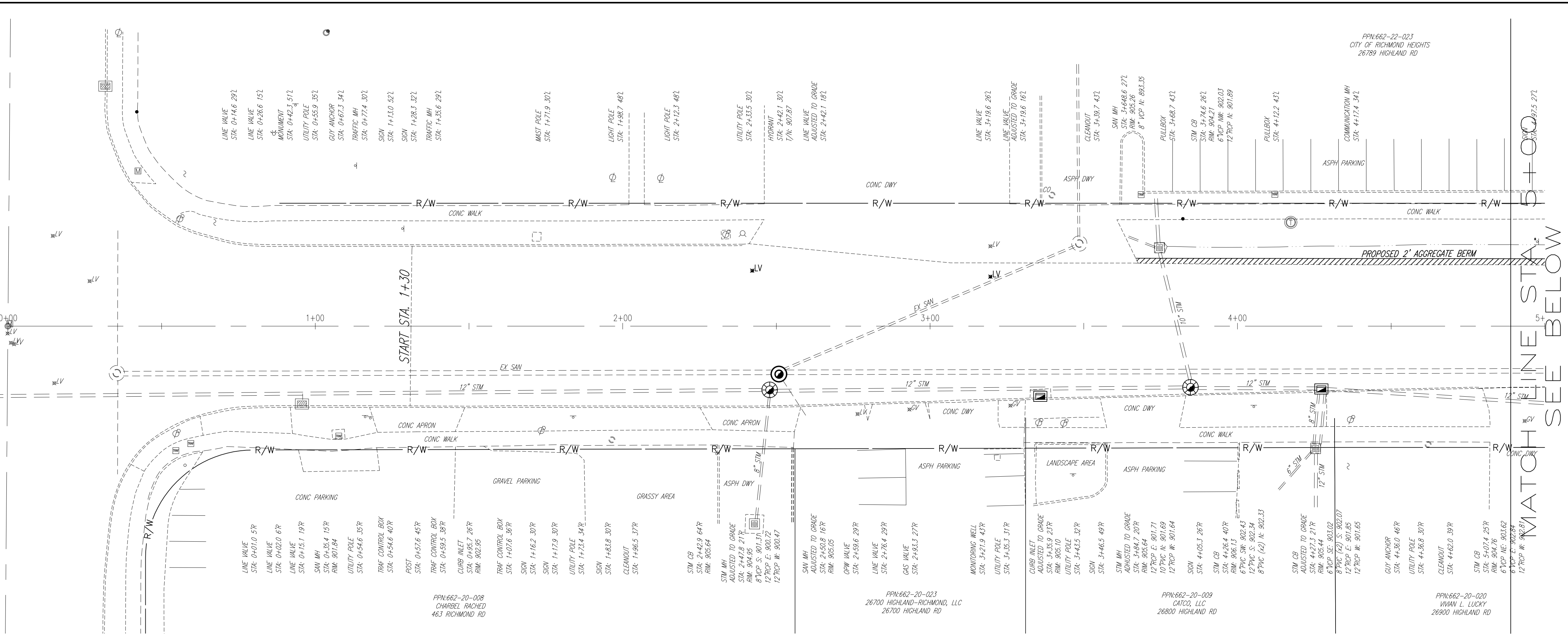
**THE C.W. COURTNEY COMPANY**  
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Cleveland, Ohio 44143-2384  
[phone] 440.449.4005 [fax] 440.449.0883  
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LOCATION MAP  
NOT TO SCALE

MATCH LINE STA. 5+00  
SEE ABOVE

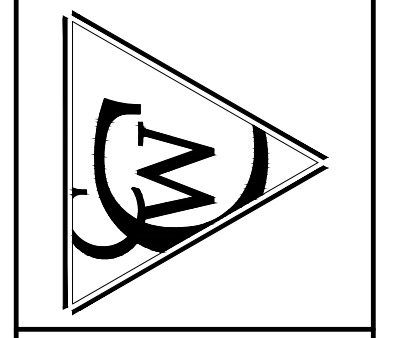


RICHMOND ROAD 80'



MATCH LINE STA. 10+00  
SEE SHEET No.

MATCH LINE STA. 5+00  
SEE BELOW

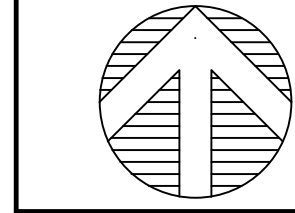


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 Chk'd By: CHECK  
 Horiz. Scale: 1"=20'  
 Vert. Scale: -  
 Date: JULY 2023  
 Job No.: 17-160  
 Sheet 2 of 8

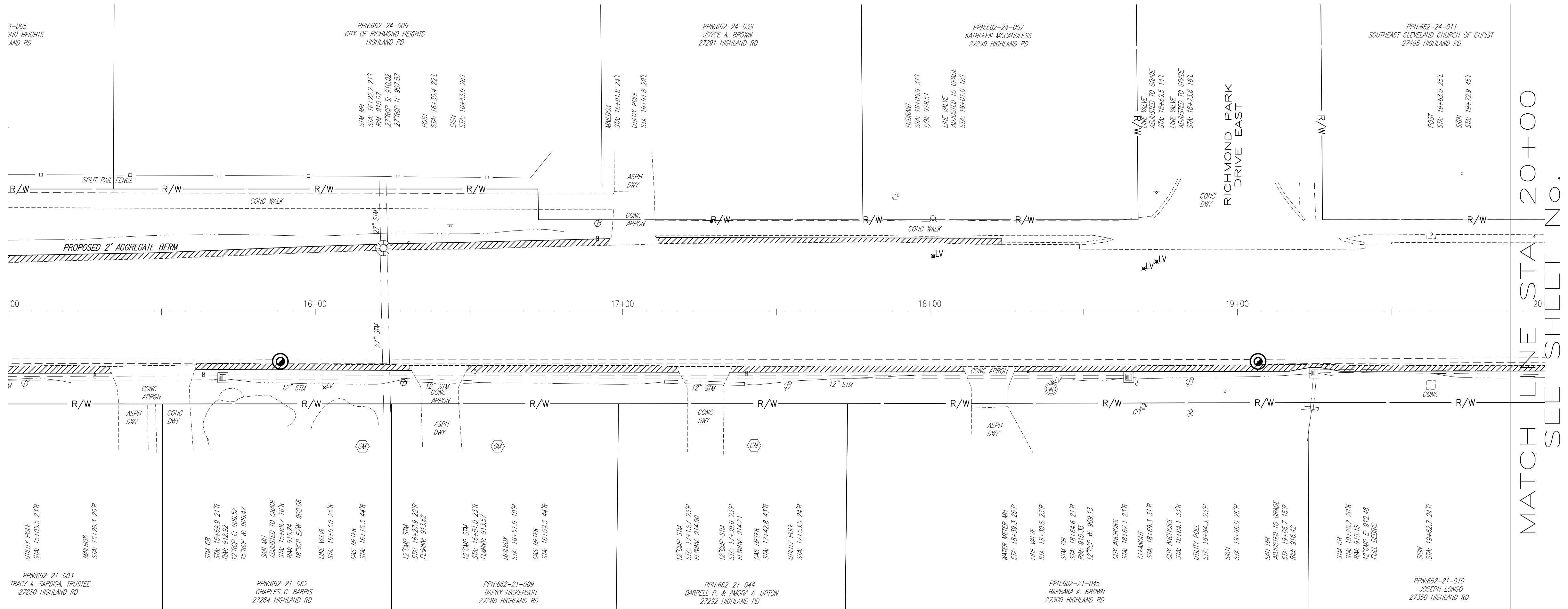
CITY OF RICHMOND HEIGHTS  
 2023 HIGHLAND ROAD  
 RESURFACING (EAST OF RICHMOND)

No.	Date	Remarks



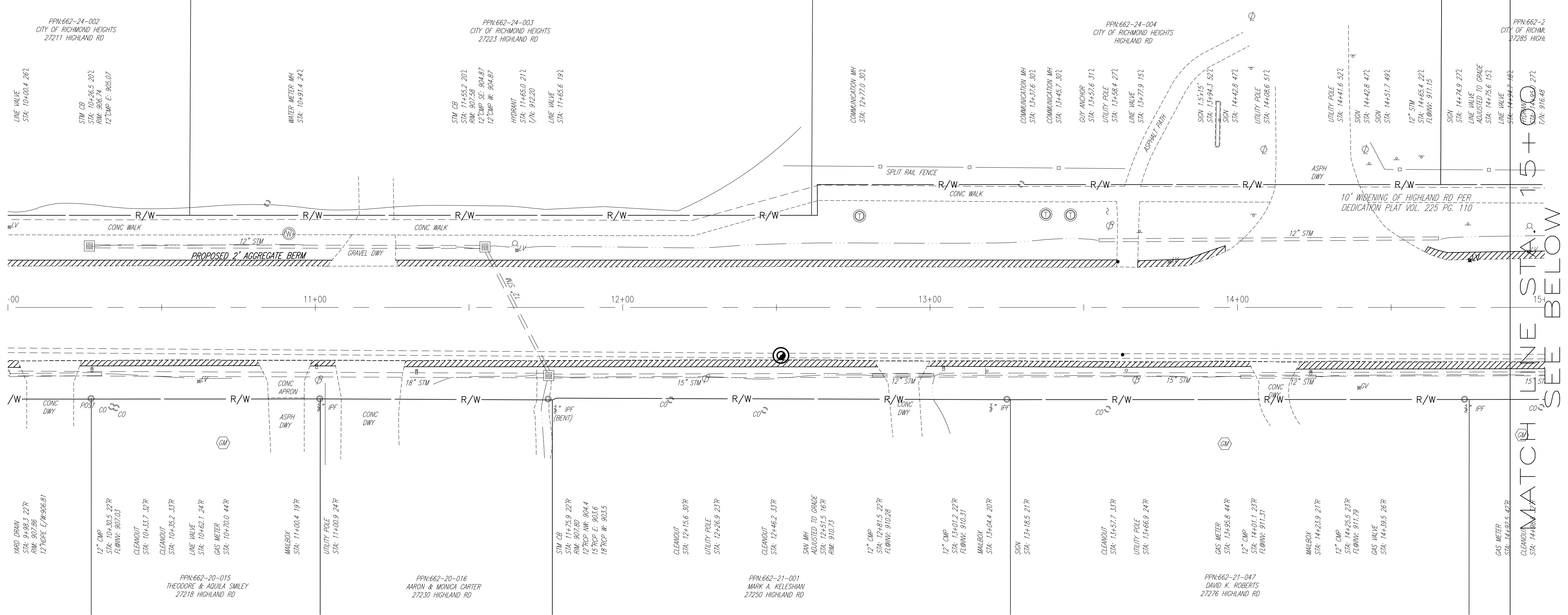
RICHMOND ROAD TO STA. 10+00

MATCH LINE STA. 15+00  
SEE ABOVE



MATCH LINE STA. 20+00  
SEE SHEET No.

MATCH LINE STA. 10+00  
SEE SHEET No.



MATCH LINE STA. 15+00  
SEE BELOW

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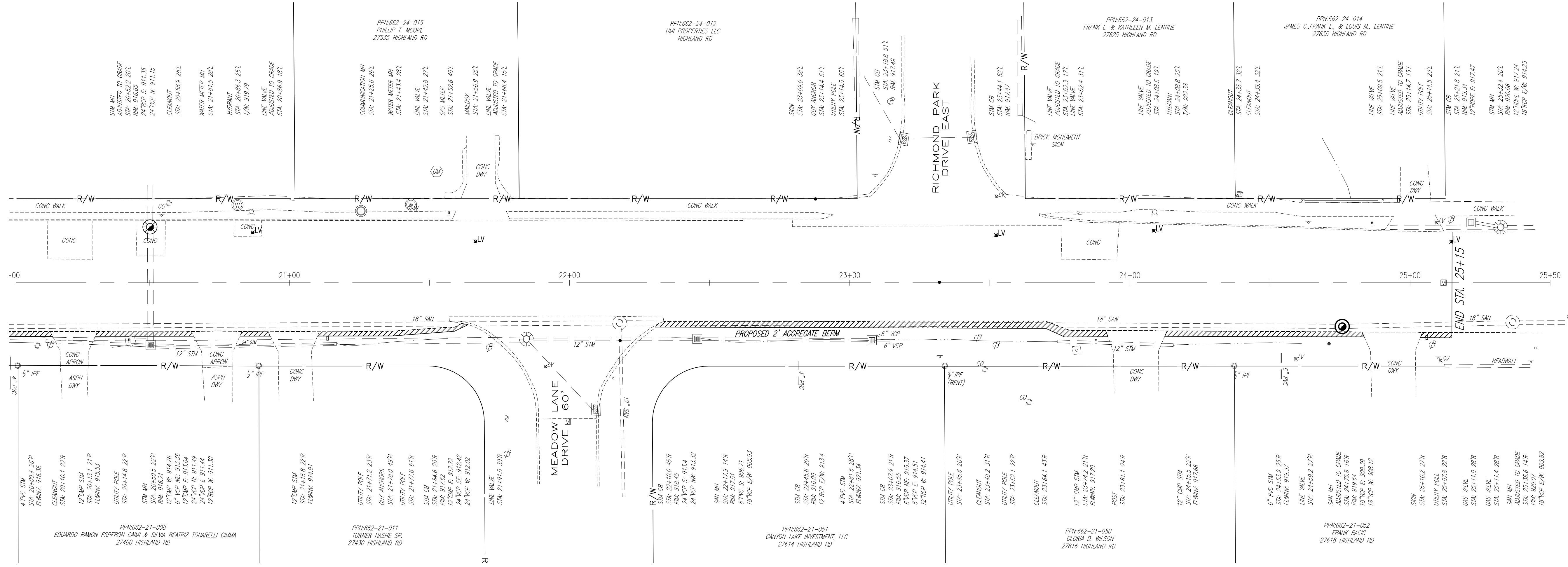
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Chk'd By: CHECK  
Horiz. Scale: 1"=20'  
Vert. Scale: -  
Date: JULY 2023  
Job No.: 17-160  
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REVISIONS	
No.	Date

CITY OF RICHMOND HEIGHTS  
2023 HIGHLAND ROAD  
RESURFACING (EAST OF RICHMOND)

STATION 10+00 TO 20+00

MATCH LINE STA. 20+00  
SEE SHEET No.



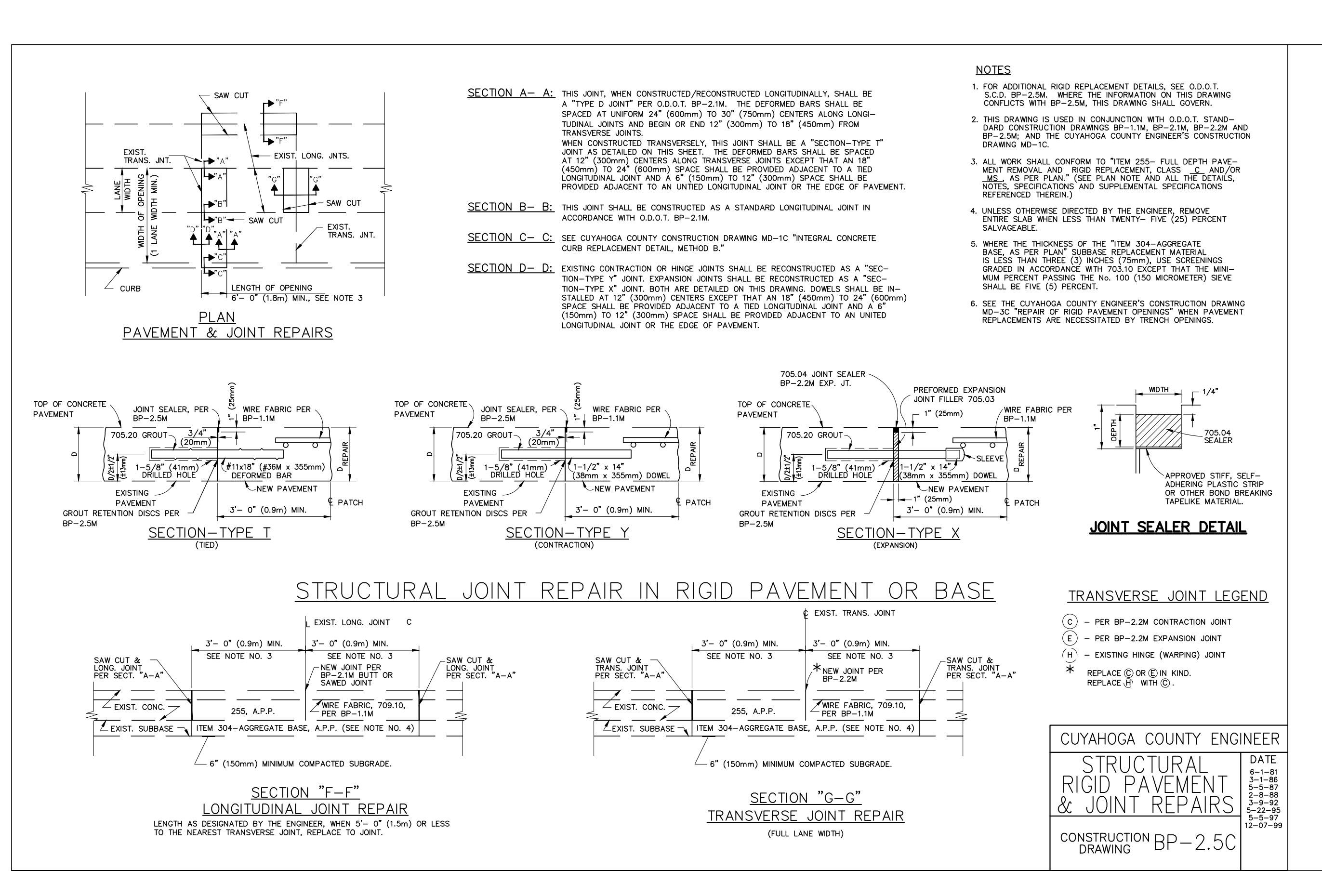
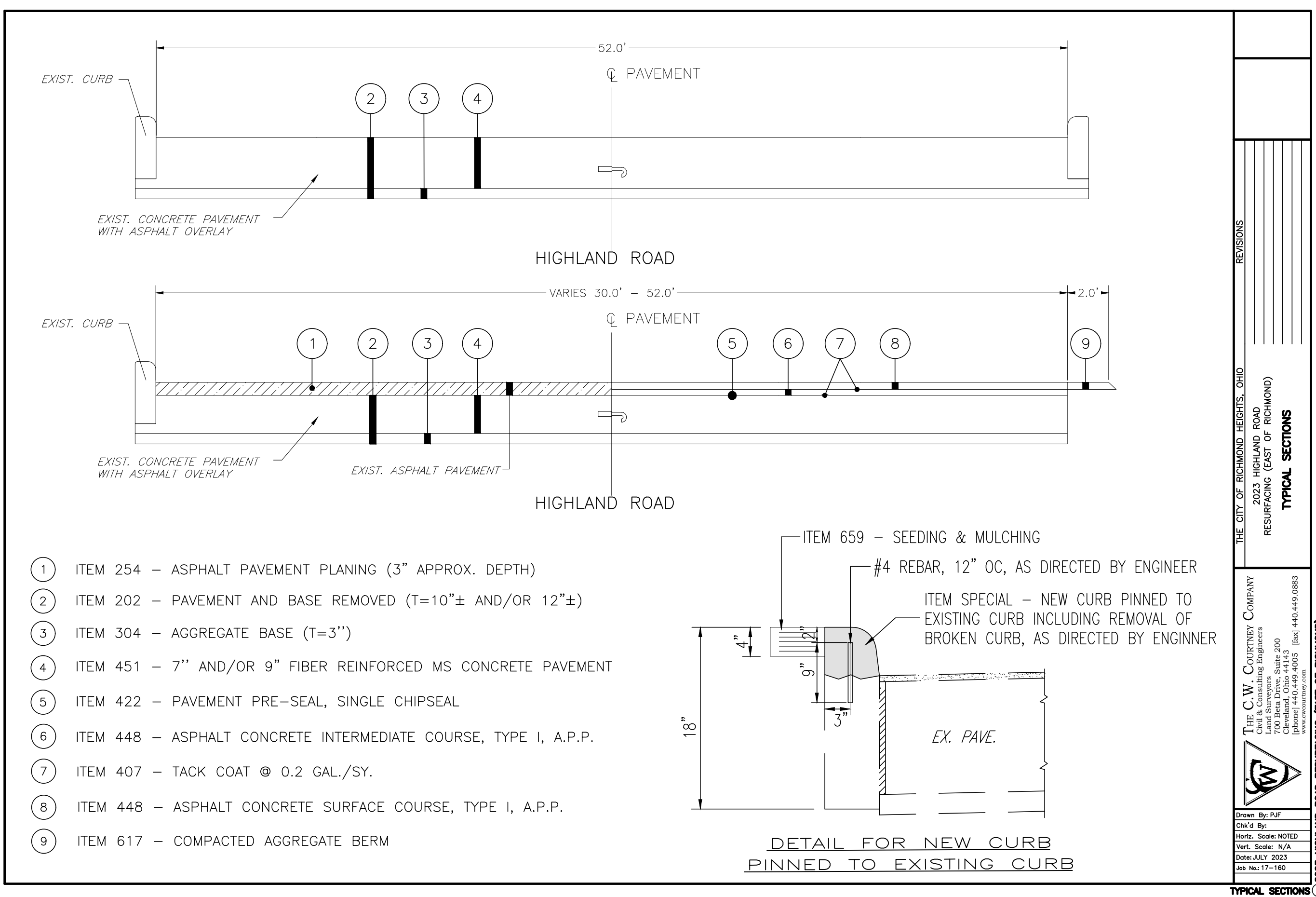
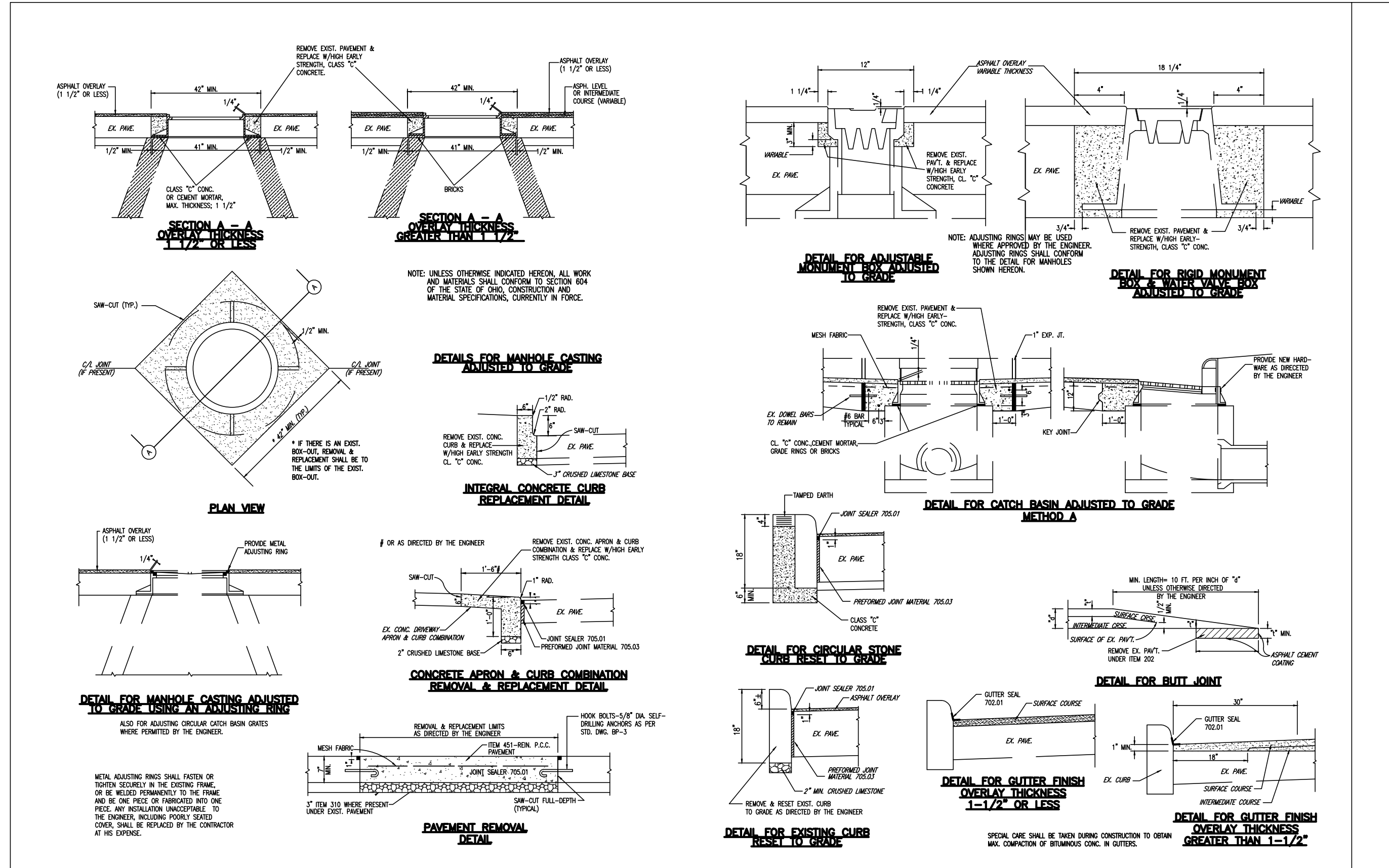
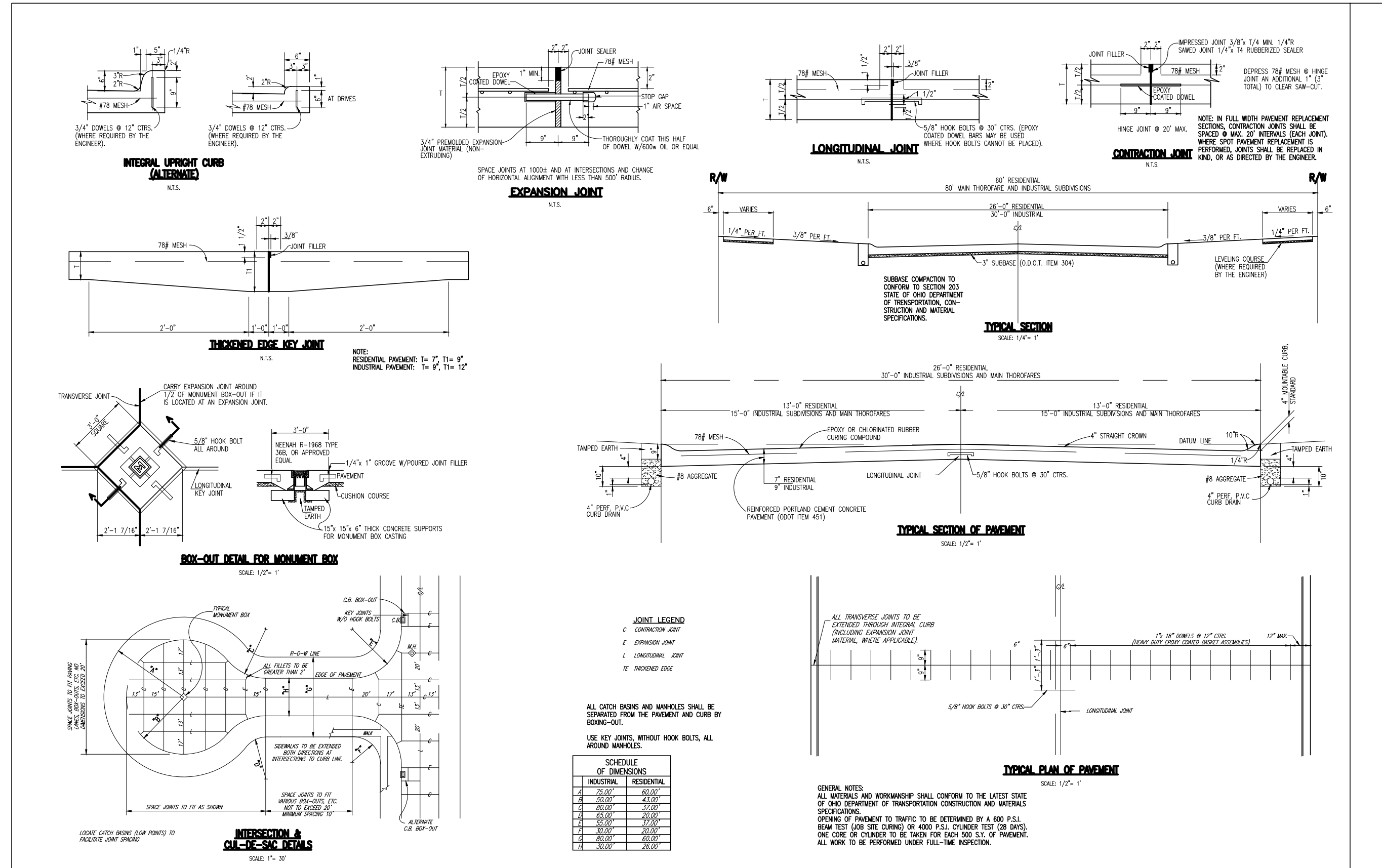
No.	Date	REVISIONS	Remarks

CITY OF RICHMOND HEIGHTS  
2023 HIGHLAND ROAD  
RESURFACING (EAST OF RICHMOND)  
STATION 20+00 TO CITY LINE

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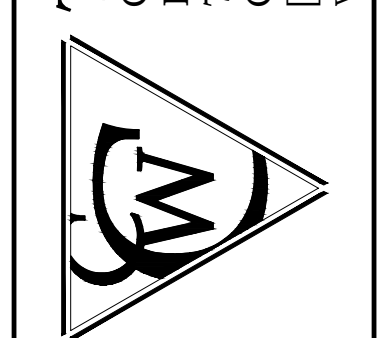


REVISIONS

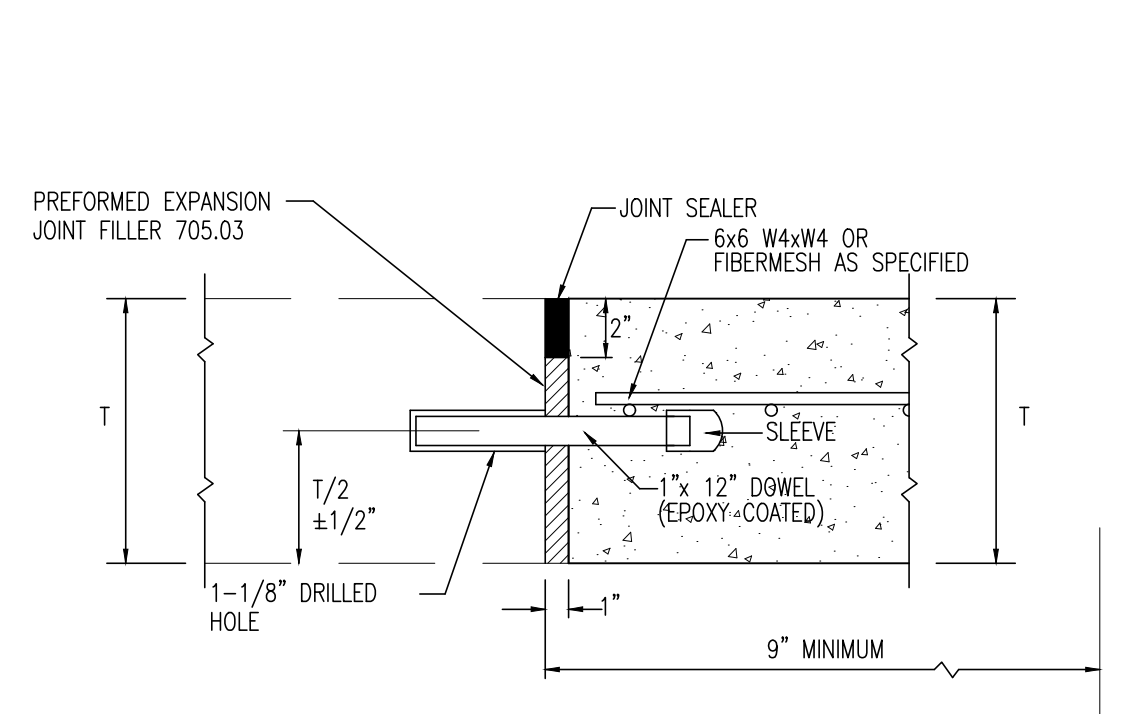
No.	Date	Remarks

THE CITY OF RICHMOND HEIGHTS, OHIO  
2023 HIGHLAND ROAD  
RESURFACING (EAST OF RICHMOND)  
PAVEMENT REPAIR DETAILS

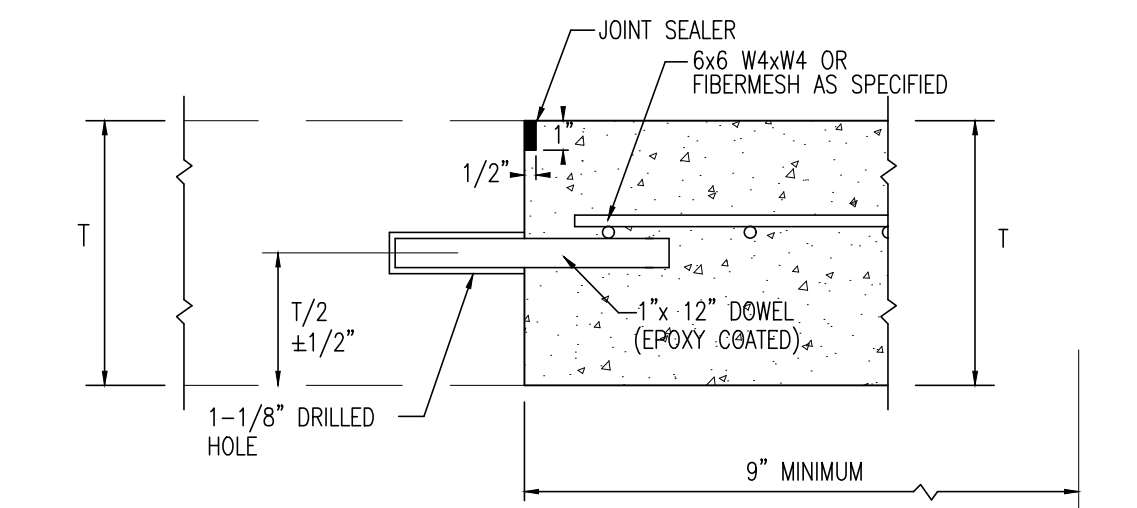
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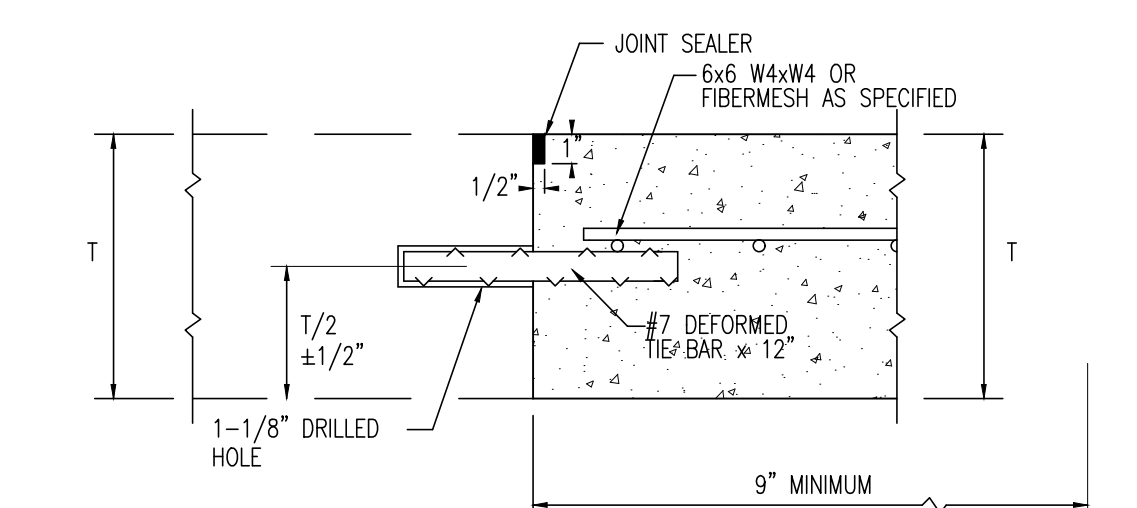
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Chk'd By: LGC  
Horiz. Scale: -  
Vert. Scale: -  
Date: JULY 2023  
Job No.: 17-160  
Sheet 5 of 8



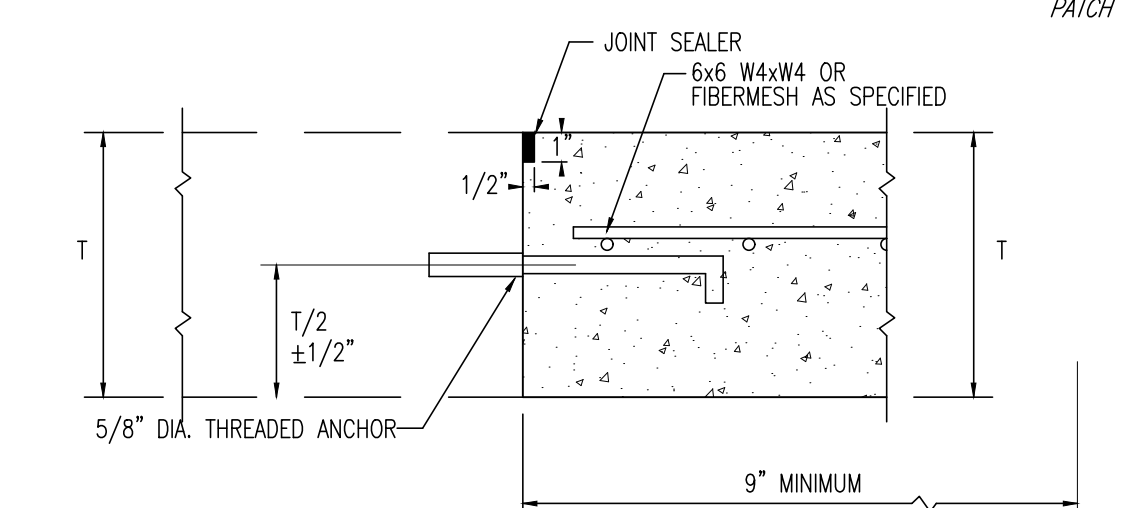
EXPANSION JOINT



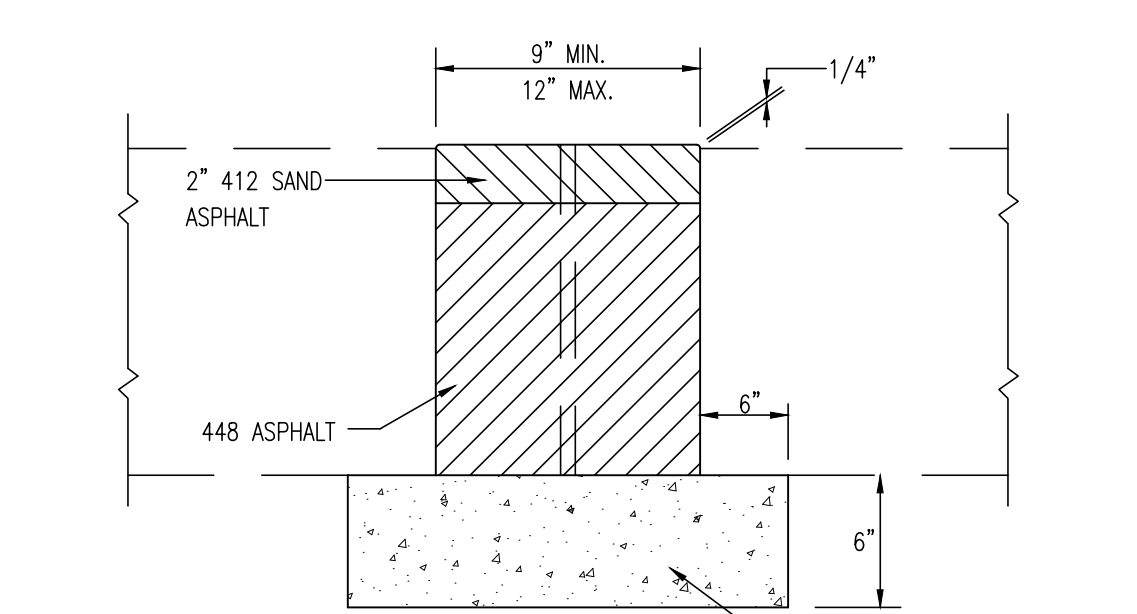
CONTRACTION JOINT



TIED JOINT

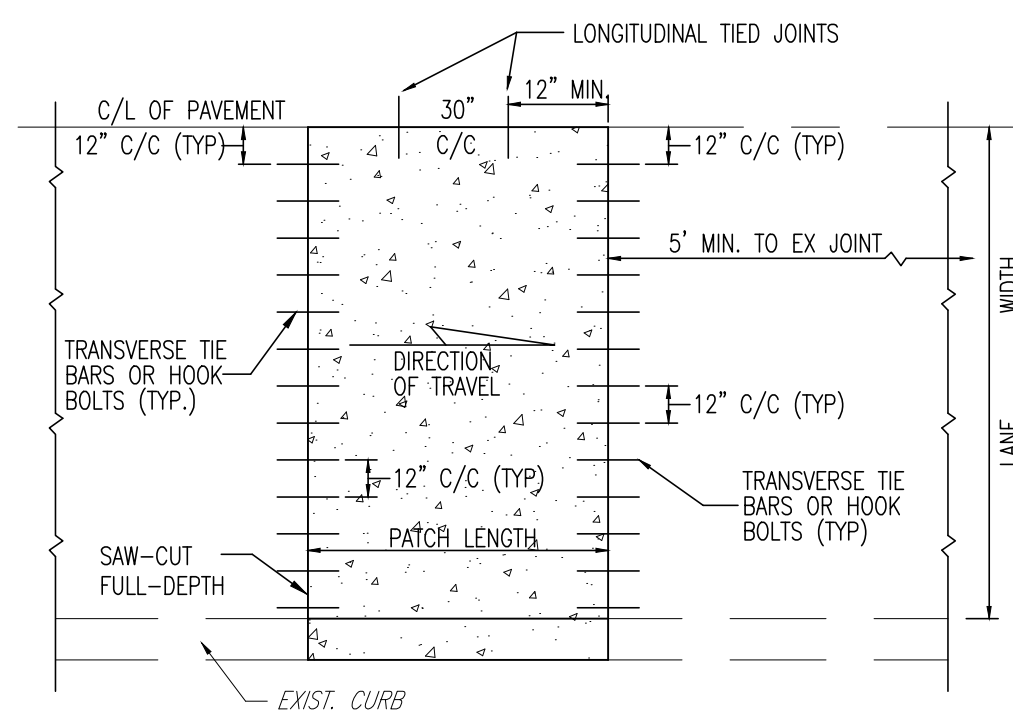


ALTERNATE TIED JOINT

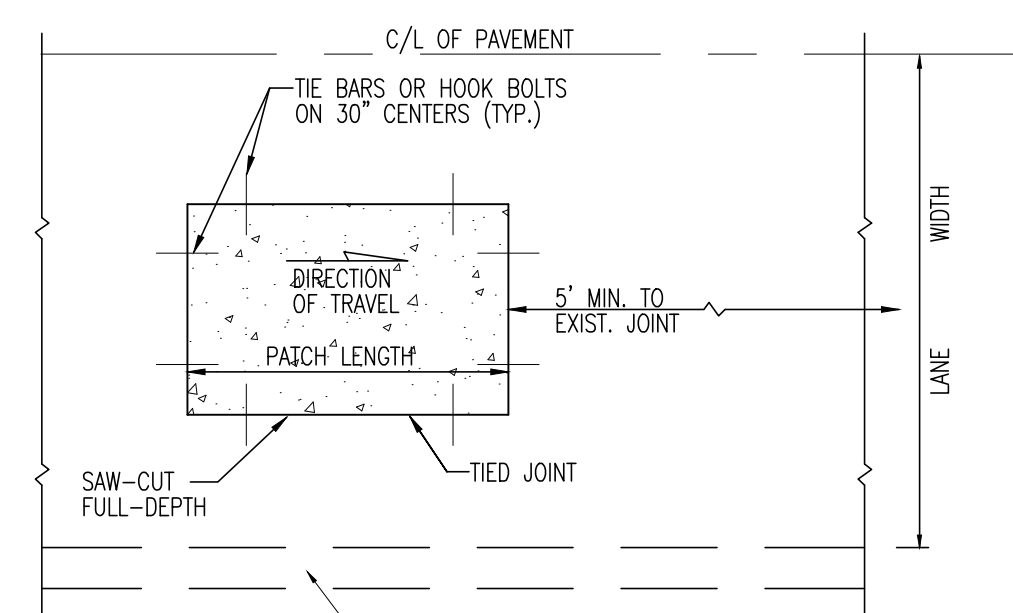


PRESSURE RELIEF JOINT

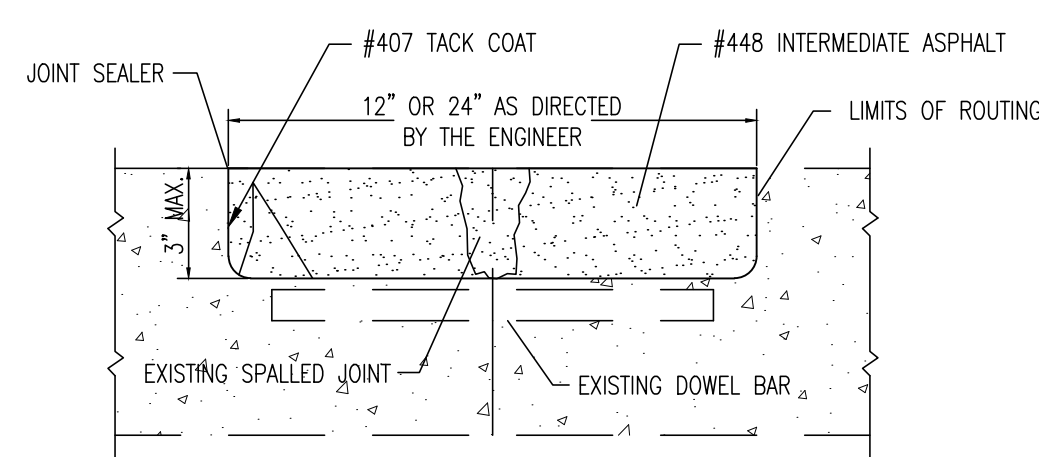
WHERE POSSIBLE, PRESSURE RELIEF JOINT SHALL BE LOCATED AT AN EXISTING EXPANSION JOINT



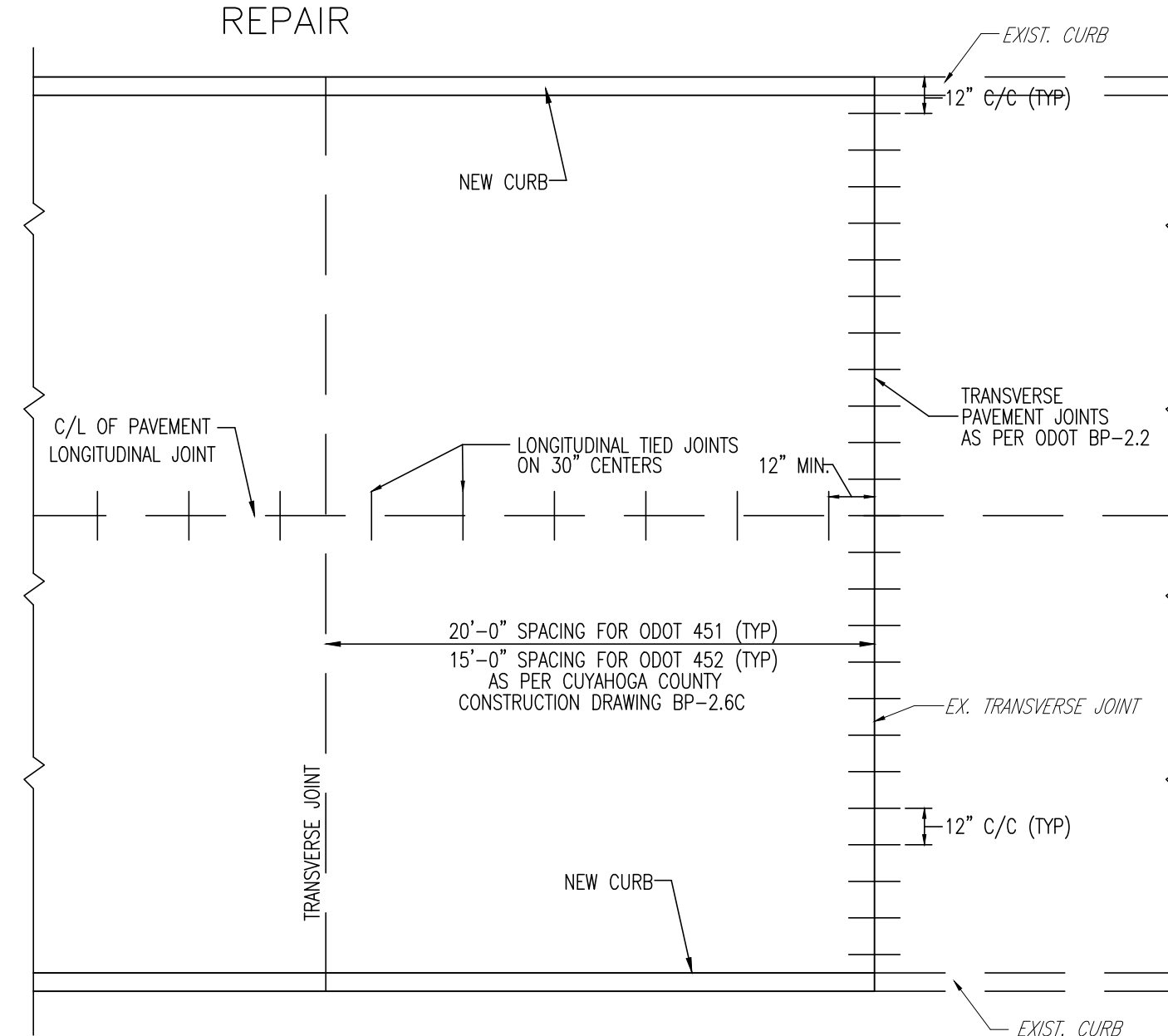
DETAIL MID-SLAB REPLACEMENT FULL WIDTH



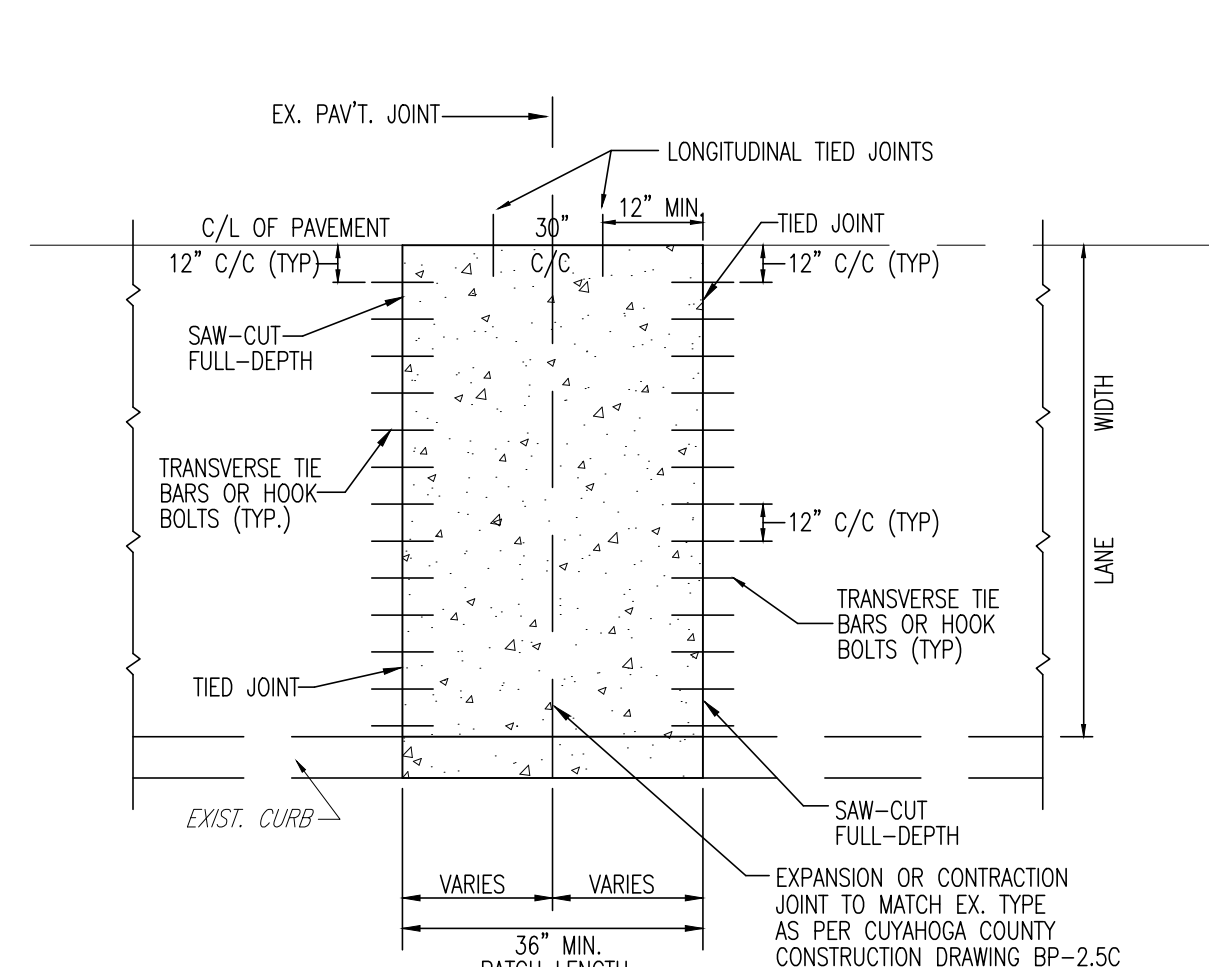
DETAIL MID-SLAB REPLACEMENT PARTIAL WIDTH



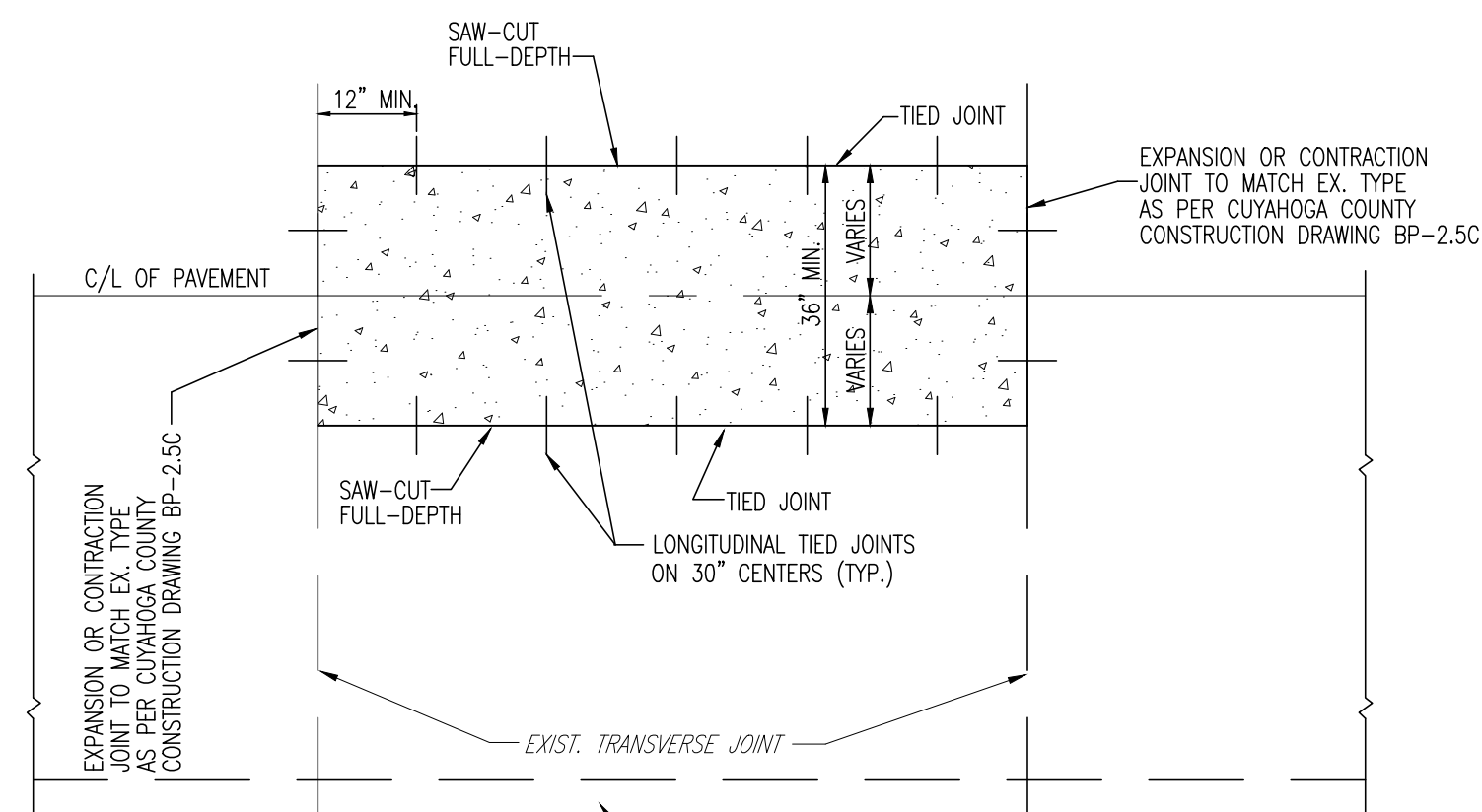
PARTIAL PAVEMENT REPAIR



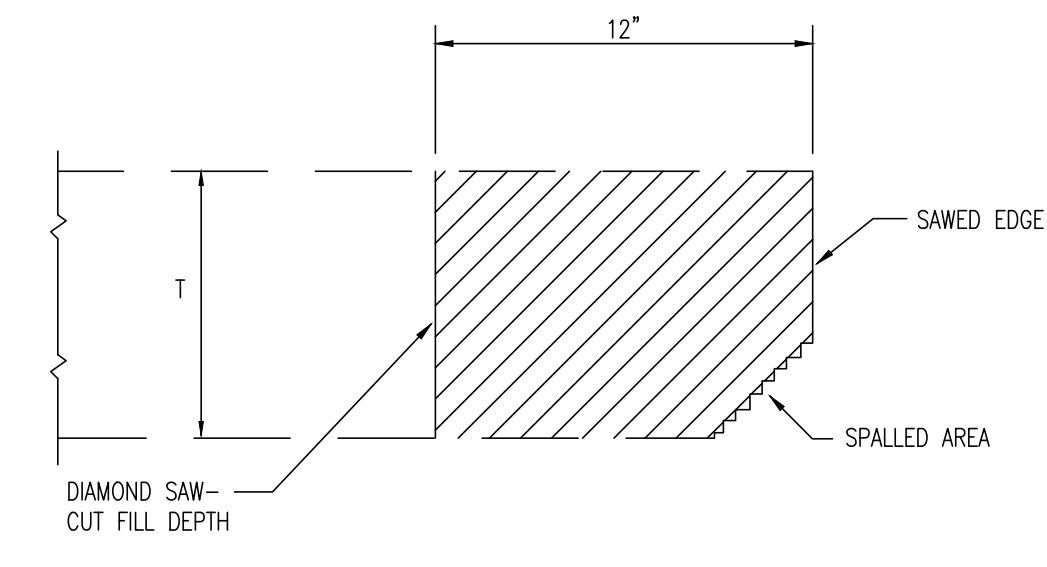
NEW FULL WIDTH CONCRETE PAVEMENT CONSTRUCTION



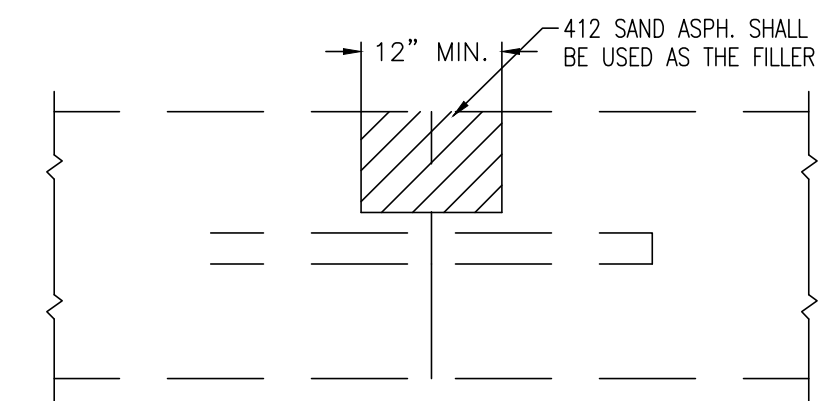
TRANSVERSE JOINT REPAIR



LONGITUDINAL JOINT REPAIR

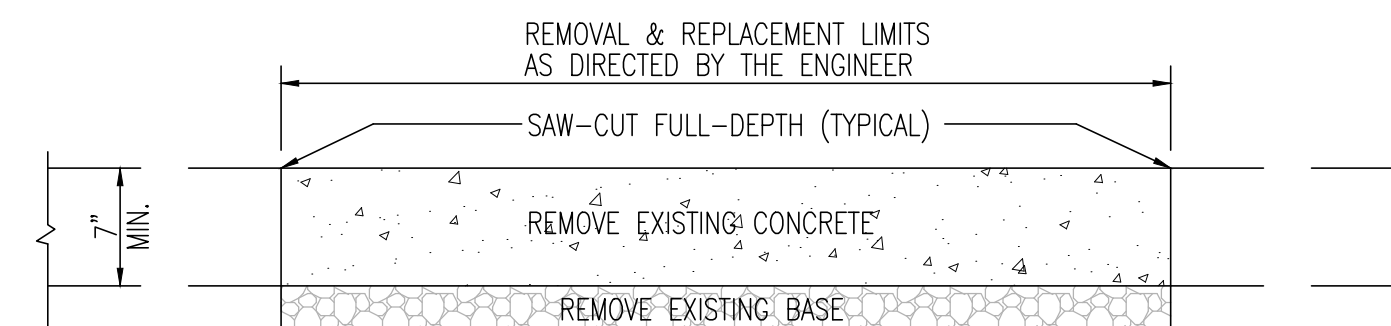


ADDITIONAL PAVEMENT REMOVAL



PARTIAL DEPTH JOINT OR CRACK REPAIR

NOTE: AC-20 CRACK FILLER SHALL NOT BE USED WHERE CRACK OR JOINT WIDTH EXCEEDS 1".



PAVEMENT REMOVAL DETAIL

NOTES

DOWELS ALL JOINTS SHALL BE CONSTRUCTED NORMAL TO THE CENTERLINE OF THE PAVEMENT LANE UNLESS OTHERWISE SPECIFIED.

ALL DOWEL HOLES SHALL BE DRILLED BY A MECHANICAL DEVICE THAT WILL ALLOW INDEPENDENT ADJUSTMENT OF ALL DRILL SHAFTS IN THE HORIZONTAL AND VERTICAL DIRECTION. THE DEVICE SHALL BE CAPABLE OF DRILLING HOLES IN A SKEWED JOINT TO THE PROPER DEPTH AND PARALLEL TO THE PAVEMENT SURFACE AND THE CENTERLINE OF THE PAVEMENT LANE. THE DEVICE SHALL ALSO BE CAPABLE OF DRILLING A MINIMUM OF TWO HOLES AT ONE TIME.

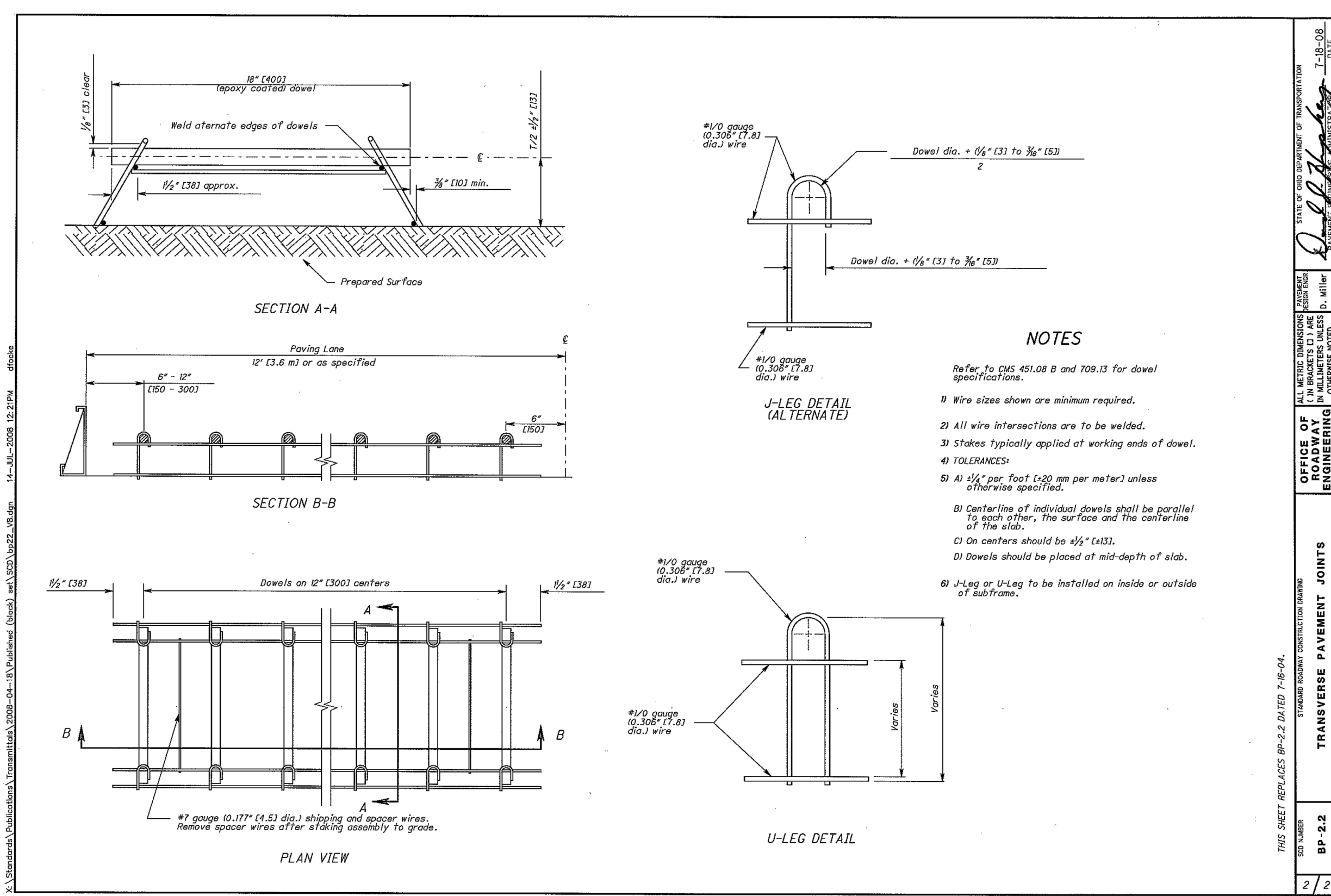
ALL SMOOTH DOWELS SHALL BE COATED WITH A "BOND BREAKING" MATERIAL AS SPECIFIED BY ODOT ITEM 451.08 AFTER THEY HAVE BEEN INSTALLED IN THE EXISTING PAVEMENT AND JUST PRIOR TO PLACING THE PATCH. ALL DOWELS SHALL BE PLACED PARALLEL WITH THE PAVEMENT SURFACE AND THE CENTERLINE OF THE PAVEMENT LANE.

ADDITIONAL PAVEMENT REMOVAL IF, AFTER THE SAWING AND REMOVAL OF THE PAVEMENT FROM THE AREA TO BE REPAIRED, THE FACE OF THE REMAINING PAVEMENT IS SPALLED OR DETERIORATED FOR A HEIGHT GREATER THAN ONE FOURTH (1/4) OF THE THICKNESS OF THE RIGID PAVEMENT, AN ADDITIONAL SAW-CUT SHALL BE MADE AS DIRECTED BY THE ENGINEER. THIS ADDITIONAL WORK SHALL BE MEASURED FOR ADDITIONAL PAYMENT FOR PAVEMENT REMOVAL.

LONGITUDINAL JOINT FOR PATCHES 6 FEET OR GREATER IN LENGTH, THE LONGITUDINAL JOINT SHALL BE CONSTRUCTED AS AN EXPANSION BOLT JOINT, WHERE THE FACE OF THE EXISTING PAVEMENT IS SOUND, OR AS A SAWED JOINT WHERE THE ENTIRE EXISTING JOINT IS BEING REPLACED, AS PER BP-3. SPACING OF TIE BARS OR HOOK BOLTS SHALL BE NO MORE THAN 30" NOR LESS THAN 24".

EXPANSION JOINT THE PREFORMED EXPANSION JOINT FILLER SHALL BE HELD RIGIDLY IN POSITION AND SHALL BE CONTINUOUS FOR THE FULL WIDTH AND DEPTH OF THE PATCH. TO ENSURE A PROPER FIT OF THE MATERIAL AROUND THE DOWELS, PROPER SIZE DOWEL HOLES SHALL BE FIELD PUNCHED OR DRILLED INTO THE PREFORMED EXPANSION JOINT FILLER AFTER THE DOWELS FOR THE JOINT HAVE BEEN INSTALLED.

REINFORCING MESH THE CLEARANCE FROM THE END OF THE WIRE FABRIC TO THE EDGE OF THE PAVEMENT OR NEW JOINTS SHALL BE 4" + OR - 2". FOR PATCHES LONGER THAN 6 FEET, THE FABRIC SHALL BE SUPPORTED ON BASKETS OR OTHER APPROVED SUPPORTED METHOD.



NOTES

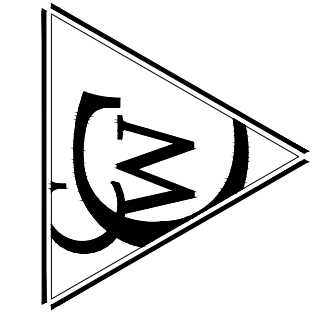
- 1) Refer to ODOT 451.08 B and 709.13 for dowel specifications.
- 2) Wire sizes shown are minimum required.
- 3) All wire intersections are to be welded.
- 4) Stitches typically applied at working ends of dowel.
- 5) TOLERANCES:
  - a) All 1/2" per foot (150 mm per meter) unless otherwise specified.
  - b) Centerline of individual dowels shall be parallel to each other, the surface and the centerline of the slab.
  - c) On centers should be 1/2" (12.5).
  - d) Dowels should be placed at mid-depth of slab.
- 6) J-Leg or U-Leg to be installed on inside or outside of subframe.

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THE CITY OF RICHMOND HEIGHTS, OHIO  
2023 HIGHLAND ROAD  
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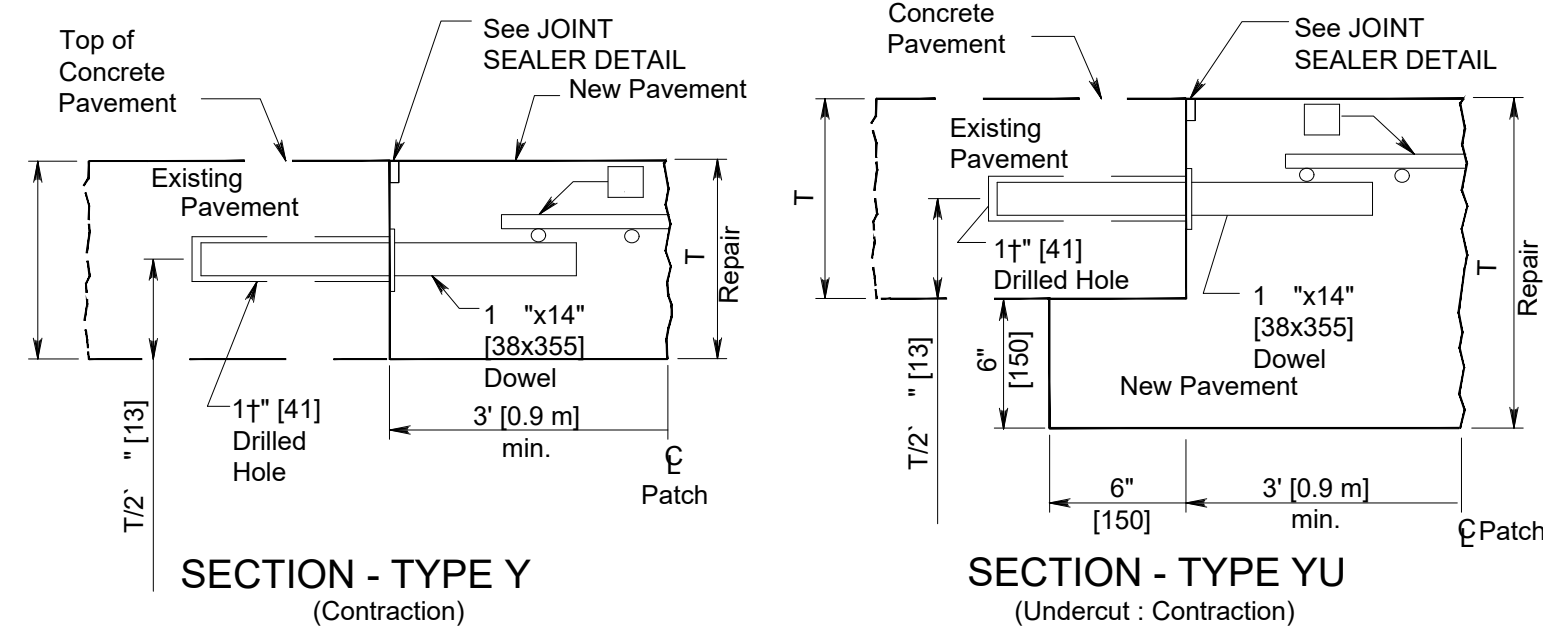
PAVEMENT REPAIR DETAILS

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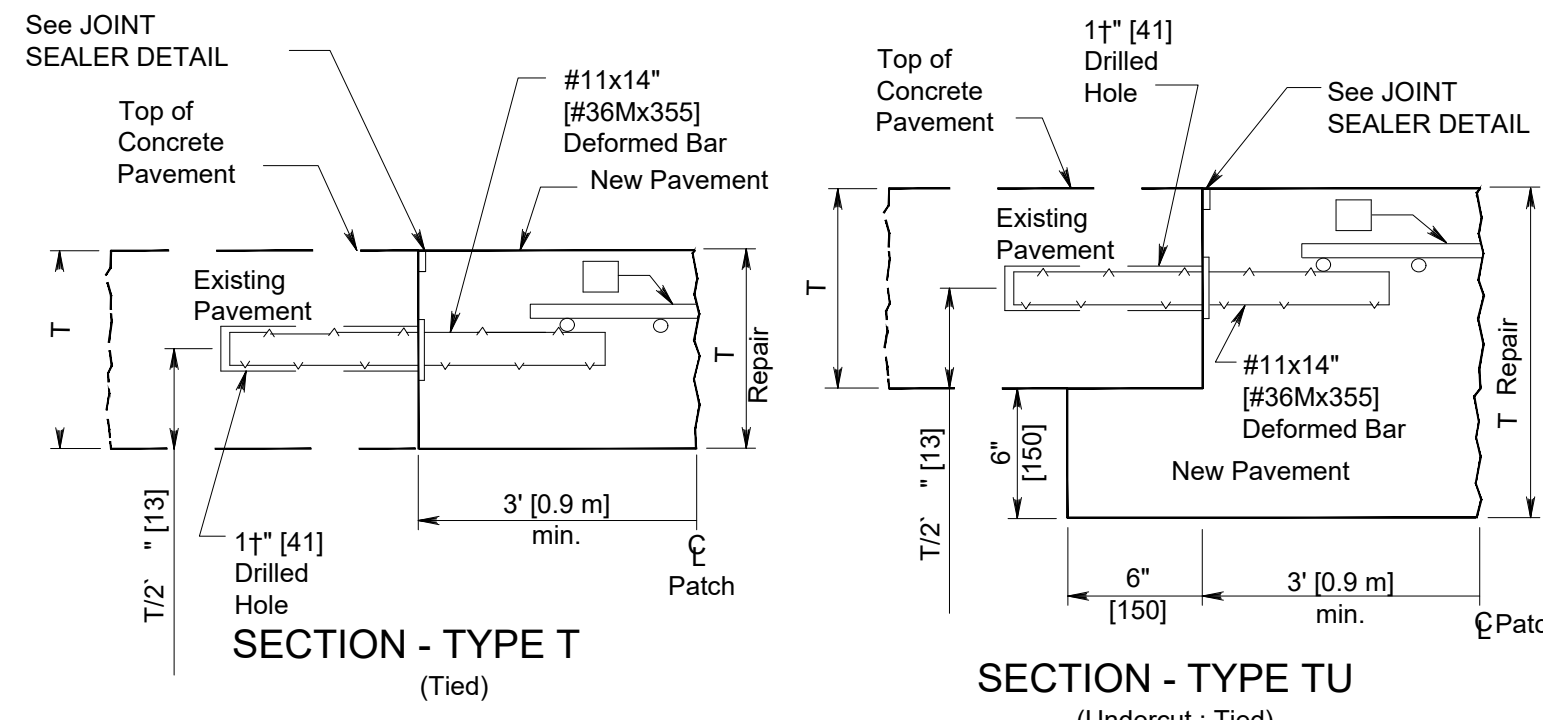


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Horiz. Scale: -  
Vert. Scale: -  
Date: JULY 2023  
Job No.: 17-160  
Sheet 6 of 8





### HOLE DRILLING DETAIL



### ADDITIONAL PAVEMENT REMOVALS

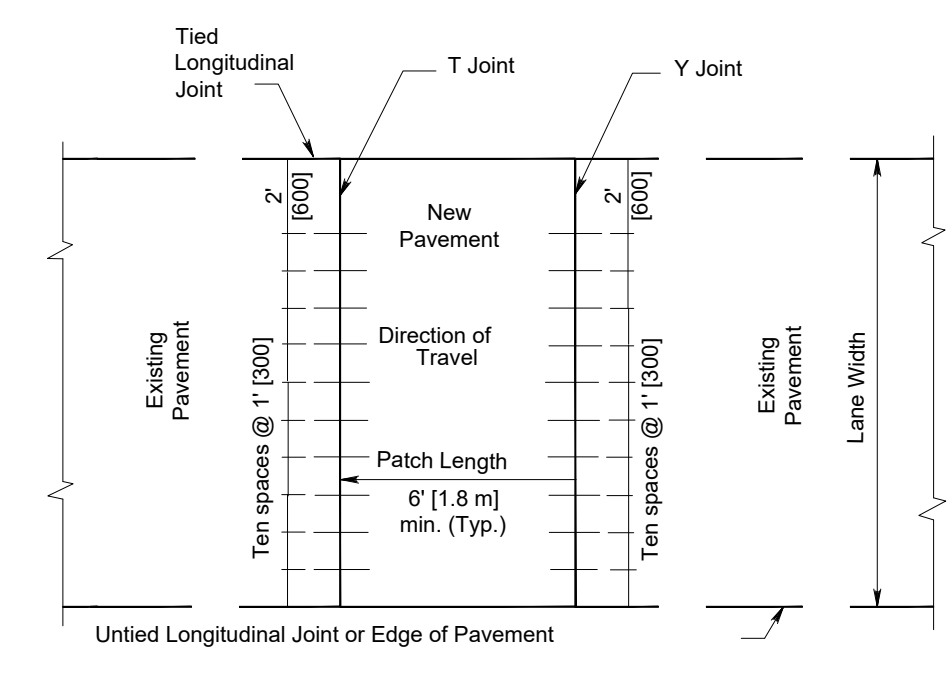
## NOTES

**GENERAL:** All joints shall be constructed normal to the centerline of the pavement lane unless otherwise specified in the plans.  
 All dowel holes shall be drilled by a mechanical device that will allow independent adjustment of all drill shafts in the horizontal and vertical direction. The device shall be capable of drilling a minimum of three holes at a time.  
 All smooth dowels shall be coated with a thin layer of oil or other "bond-breaking" material after they have been installed in the existing pavement and just prior to placing the patch. All dowels shall be placed parallel to the pavement surface and the centerline of the pavement lane.  
 This standard drawing is intended for use in repairing both concrete and composite pavements. For clarity, asphalt overlays are not shown.  
 When Prefabricated Edge Drains are used, they shall be placed after joint repairs are completed.

**TYPE N JOINT:** Joints referred to as Type N joints on the plan shall be constructed as contraction joints per SCD BP-2.2.

**ADDITIONAL PAVEMENT REMOVAL:** If, after the sawing and removal of the pavement from the area to be repaired, the face of the remaining pavement is spalled or deteriorated for a height greater than one-fourth (1/4) the thickness of the rigid pavement, an additional saw cut shall be made as shown and as directed by the Engineer. This additional work shall be measured for additional payment for full depth pavement sawing, rigid pavement removal and replacement.

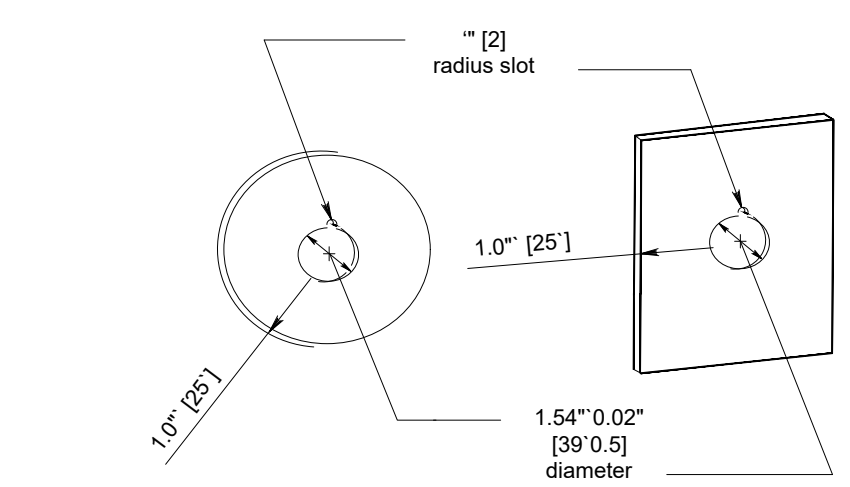
**LONGITUDINAL JOINT:** For patches 10' [3.0 m] or greater in length, the longitudinal joint shall be constructed per SCD BP-2.1.  
 The tie bars or hook bolts shall be spaced at no more than 30" [760] nor less than 24" [610] on center.



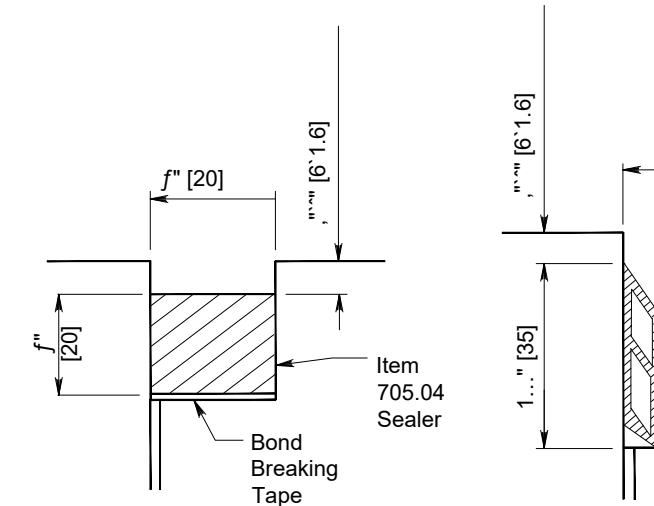
### TIE / DOWEL BAR PLACEMENT DETAIL

## LEGEND

- Bars shall be placed 2' [600] from the tied longitudinal joint and continue across with a 1' [300] spacing to the edge of pavement or an untied longitudinal joint. Where lane widths are between two tied longitudinal joints, begin bars 2' [600] from each tied longitudinal joint and continue across with a 1' [300] spacing.
- Reinforcement will be required for all repairs greater than 10' [3.0 m] in length or for repairs that will be opened to traffic within 24 hours of placement. The fabric shall consist of W8.5 or D8.5 [MW55 or MD55] longitudinal wires spaced 6" [150] c/c and W4 or D4 [MW26 or MD26] transverse wires spaced 12" [300] c/c. The clearance from the end of the wire fabric to the edge of pavement or new transverse joint shall be 4" 2" [100.5].
- Nylon or plastic grout retention discs shall be clear or opaque white in color.



### NYLON OR PLASTIC GROUT RETENTION DISCS FOR DOWEL/TIE BARS



### JOINT SEALER DETAIL

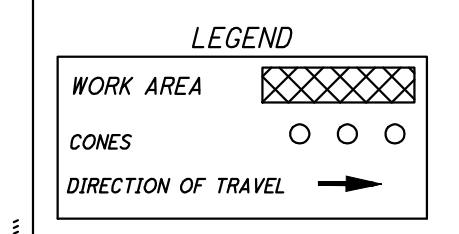
ODOT STANDARD DRAWING BP-2.5 RIGID REPLACEMENT 7-28-00

TABLE I (SIGN SPACING)

ROAD TYPE	DISTANCE BETWEEN SIGNS (FT)		
	A	B	C
Two Lane < 40 MPH	100	100	100
Two Lane 45-50 MPH	350	350	350
Two Lane 55-60 MPH	500	500	500

TABLE II

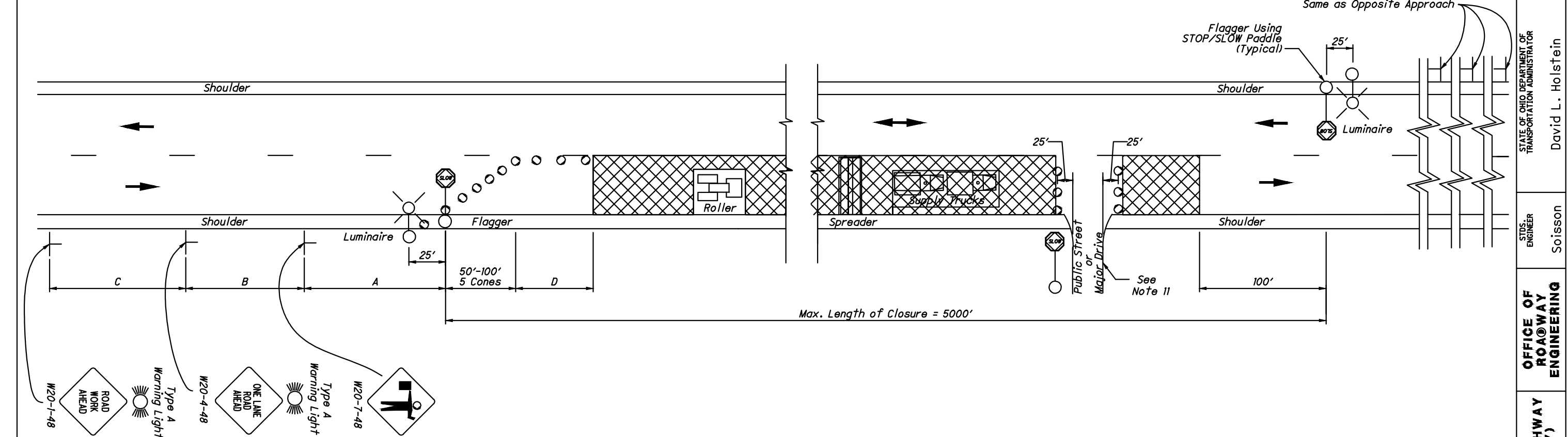
SPEED LIMIT (MPH)	BUFFER (0) (FT) MIN.
25	155
30	200
35	250
40	305
45	360
50	425
55	495
60	570



## NOTES:

- FLAGGERS**  
 1. Flaggers, one for each direction, shall be used to control traffic continuously for as long as a one lane operation is in effect. The flaggers shall be able to communicate with each other at all times.
- LENGTH OF CLOSURE**  
 2. It is required that the length of closure be kept to a minimum at all times, as directed by the Engineer, with a maximum allowable length of 5000'.  
 When the ambient temperature exceeds 80 degrees Fahrenheit the Engineer may increase the maximum allowable length of closure to allow for sufficient cooling of new pavement.
- SIGN LOCATION AND SPACING**  
 3A. The minimum spacing between work zone signs is shown in Table I. Maximum spacing should not be greater than 1.5 times the distances shown in Table I.  
 3B. Sign spacing should be adjusted to avoid conflict with existing signs. Minimum spacing to existing signs shall be 200' for speeds of 45 mph or less and a minimum of 400' for speeds of 50 mph or greater.  
 3C. The location of the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
- ADJUSTMENTS FOR SIGHT DISTANCE**  
 4. The location of the flagger station and the advance warning signs should be adjusted to provide for adequate sight distance for the existing vertical and horizontal roadway alignment.
- BASIC SIGNING**  
 5A. ROAD WORK AHEAD (W20-1) signs shall be provided on entrance ramps or roadways entering the work limits.  
 5B. END ROAD WORK (G20-2) signs are only required for lane closures of more than 1 day. If it is intended that these signs be placed on the mainline, on all exit ramps, and on roadways exiting the work limits.  
 5C. Overlapping of signing for adjacent projects should be avoided where the messages could be confusing. Any ROAD WORK AHEAD or END ROAD WORK sign which falls within the limits of another traffic control zone shall be omitted or covered during the period when both projects are active.
- SIGNING DETAILS**  
 6A. The Advisory Speed (W3-IP) plaque shall be used when specified in the plan.  
 6B. 36" warning signs may be used when the approach speed limit is 40 mph or less.

- FLASHING WARNING LIGHTS**  
 7. Type A flashing warning lights shown on the ROAD WORK AHEAD (W20-1) signs and on the LANE CLOSED AHEAD (W20-5) signs are required whenever a night lane closure is necessary.
- CONES**  
 8A. Cone spacing shall be as follows:  
 a) Spacing along the buffer shall be 40' center-to-center.  
 b) Spacing along the approach taper shall be 10' center-to-center.  
 8B. Cone sizes shall be as follows:  
 a) Cones used for daytime traffic control shall have a minimum height of 28".  
 b) Cones used for nighttime traffic control shall have a minimum height of 42".  
 8C. Provisions shall be made to stabilize the cones to prevent them from blowing over.  
 8D. A minimum of two cones shall be used to close the paved shoulder.  
 8E. (intentionally blank)  
 8F. (intentionally blank)
- AREA ILLUMINATION**  
 10A. Adequate area illumination of each flagger station shall be provided at night. Use of portable flood lighting is acceptable.  
 10B. To ensure the adequacy of floodlight placement and the elimination of glare, the Contractor and the Engineer shall drive through the worksite each night when the lighting is in place. Light placement and shielding shall be adjusted to the satisfaction of the Engineer.
- INTERSECTION / DRIVEWAY ACCESS**  
 11. Within the length of closure, provision shall be made to control traffic entering from intersecting streets and major drives as necessary to prevent wrong-way movements and to keep vehicles off of new pavement not ready for traffic. The Contractor shall:  
 a) Place across the closed lane, either three cones or barricades, and/or  
 b) Provide an additional flagger at every public street intersection and major driveway.  
 Cones placed across the closed lane shall be located 25' beyond the projected pavement edges of the driveway or cross highway. For barricades, see Standard Construction Drawing MT-101.60.  
 Existing STOP signs shall be relocated as necessary to assure proper location for the traffic conditions.  
 The method of control shall be subject to the approval of the Engineer.



THIS DRAWING REPLACES MT-97.11 DATED 01-18-2014. STATE OF OHIO DEPARTMENT OF TRANSPORTATION. CONSTRUCTION DIVISION. ENGINEER. SOISEN. OFFICE OF ENGINEERING. FLAGGER CLOSING 1 LANE OF A 2-LANE HIGHWAY FOR PAVING OPERATIONS (NON-FES ONLY). MT-97.11. DATE: 01-20-2017.

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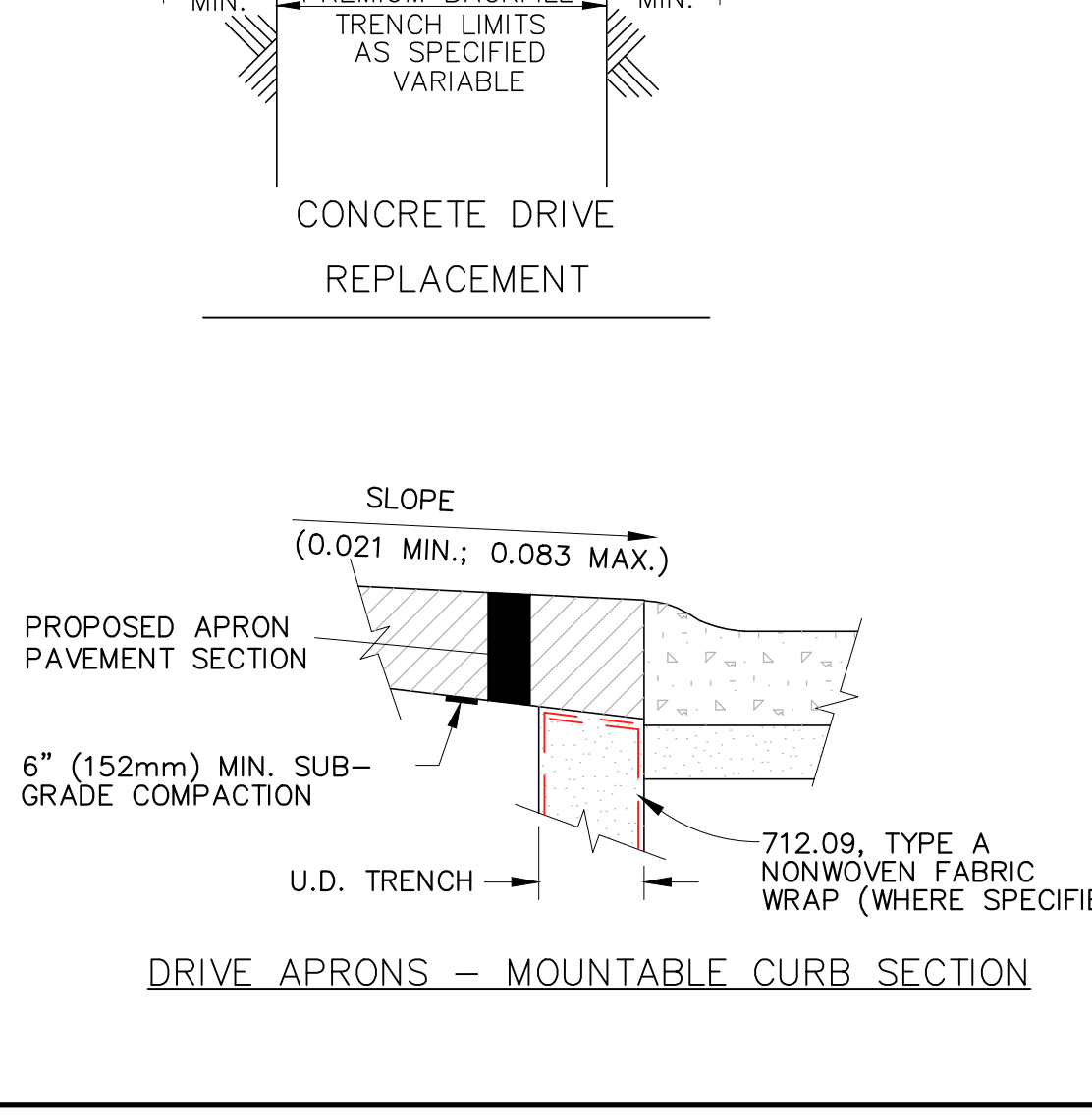
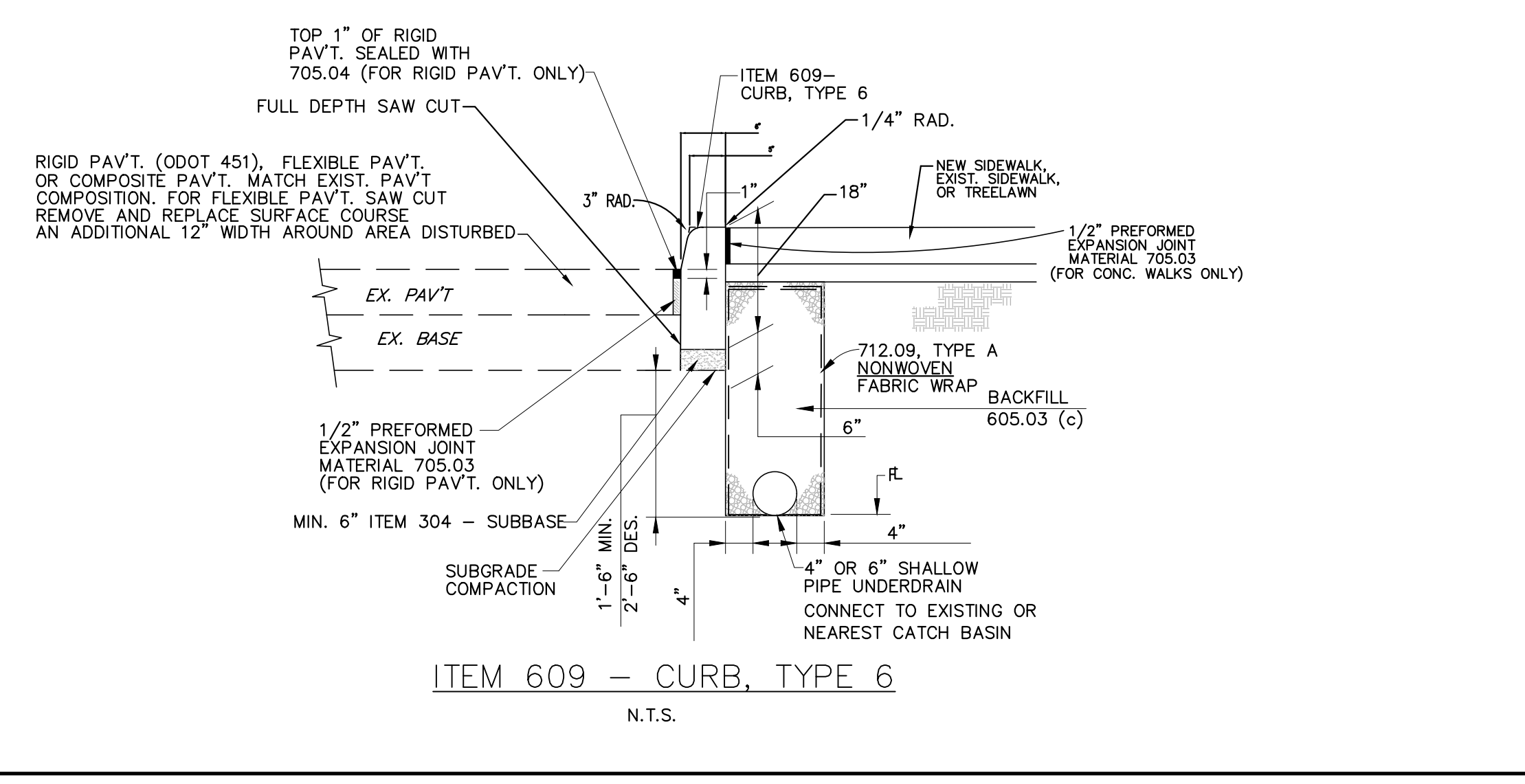
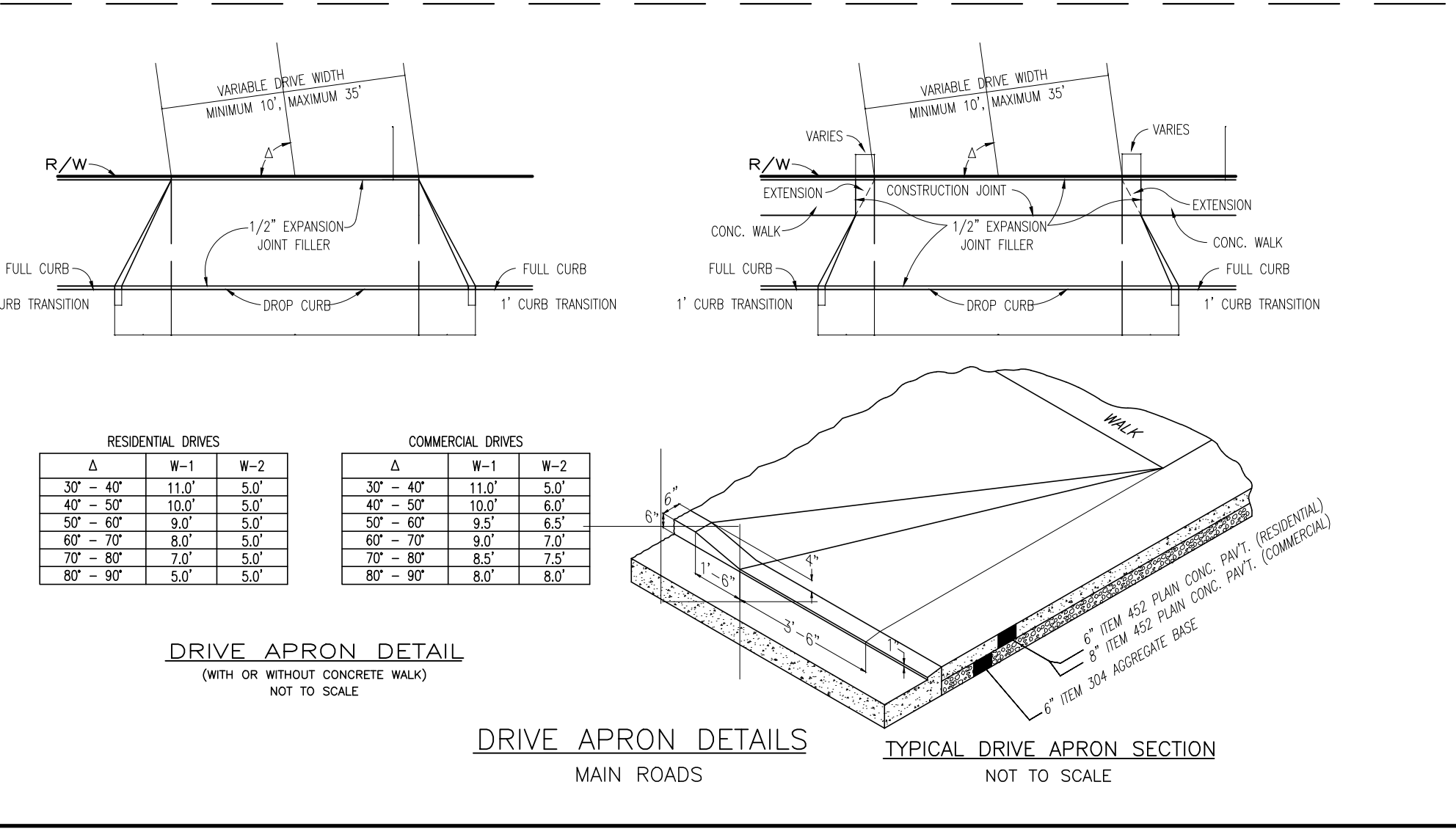
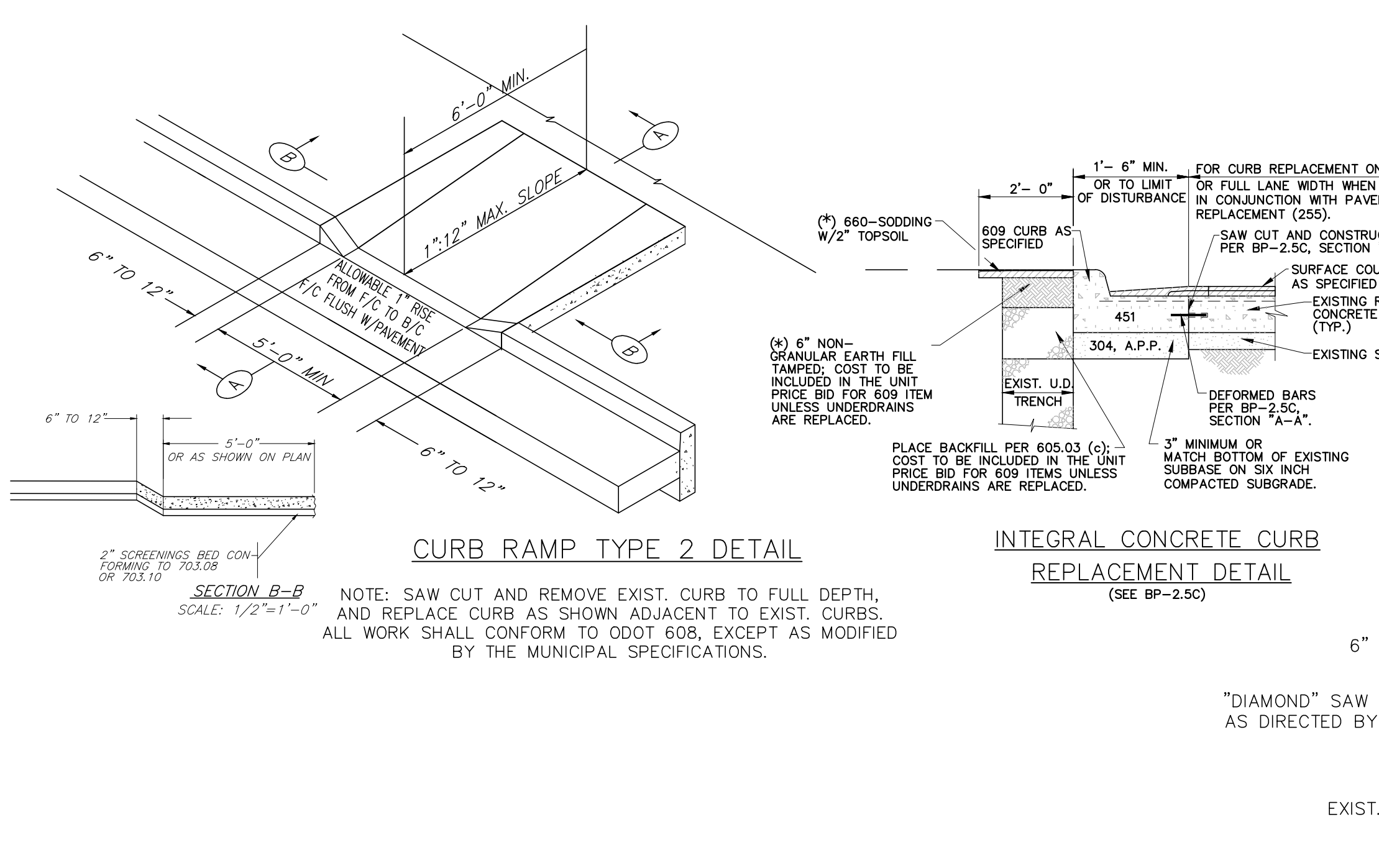
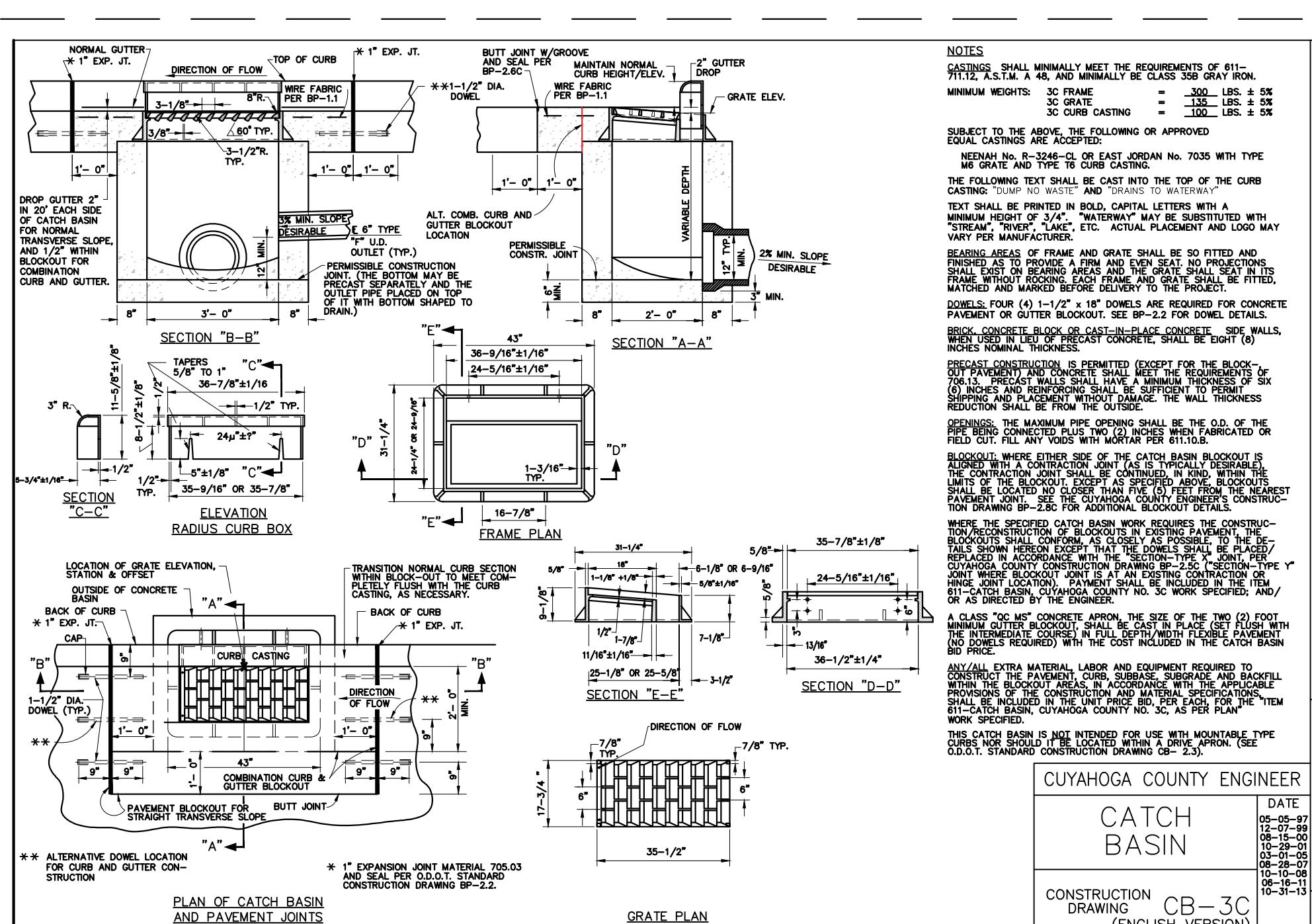
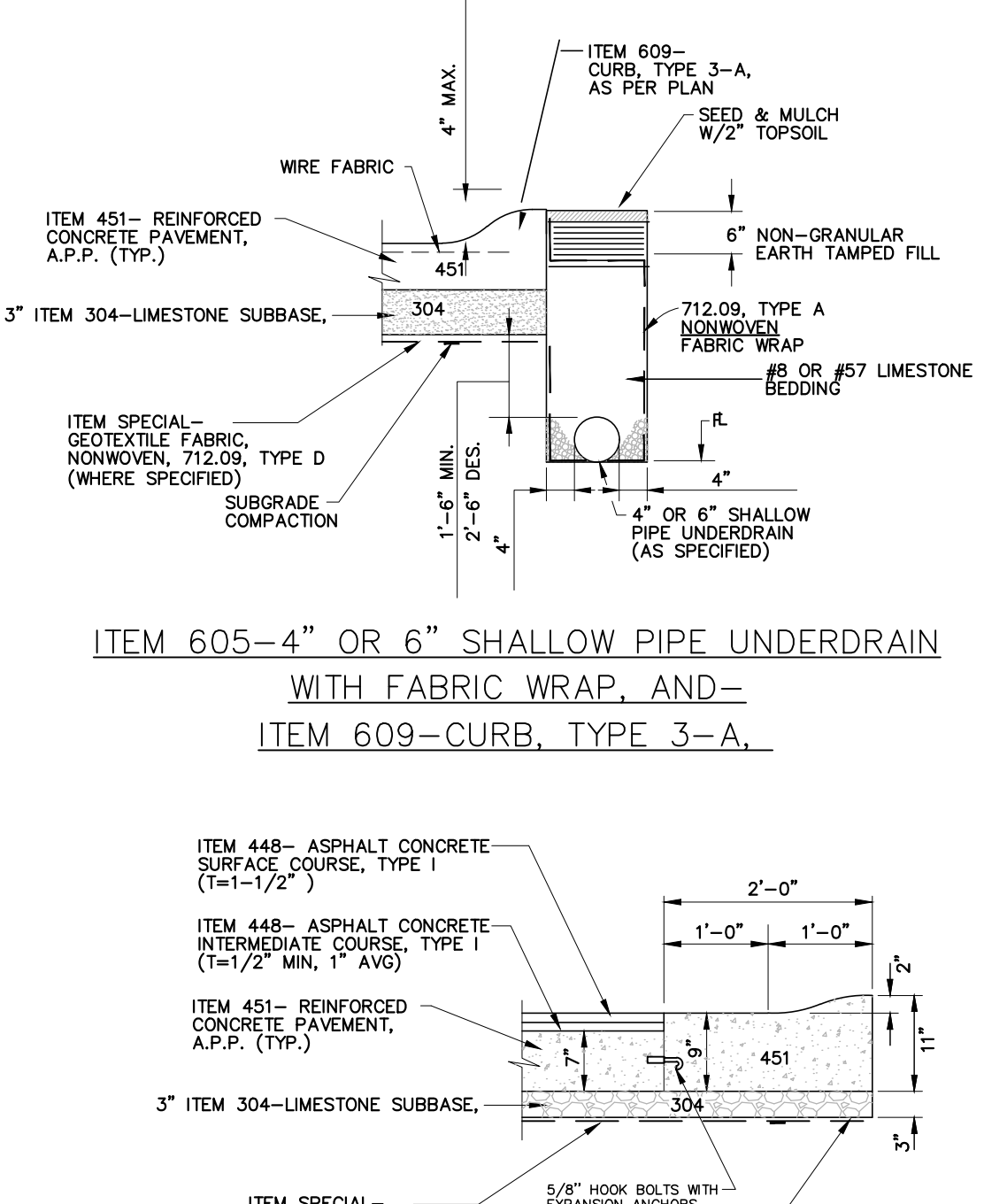
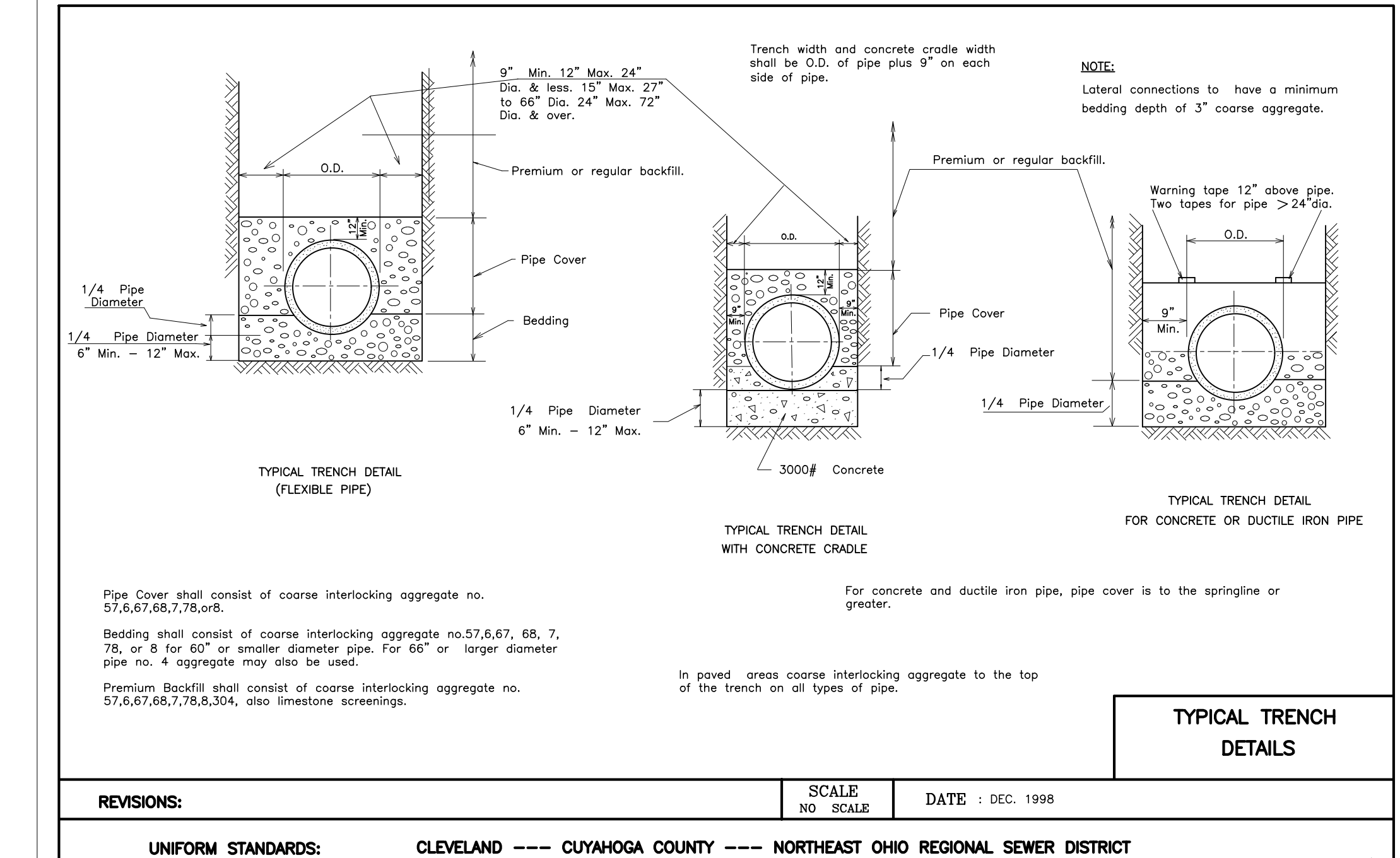
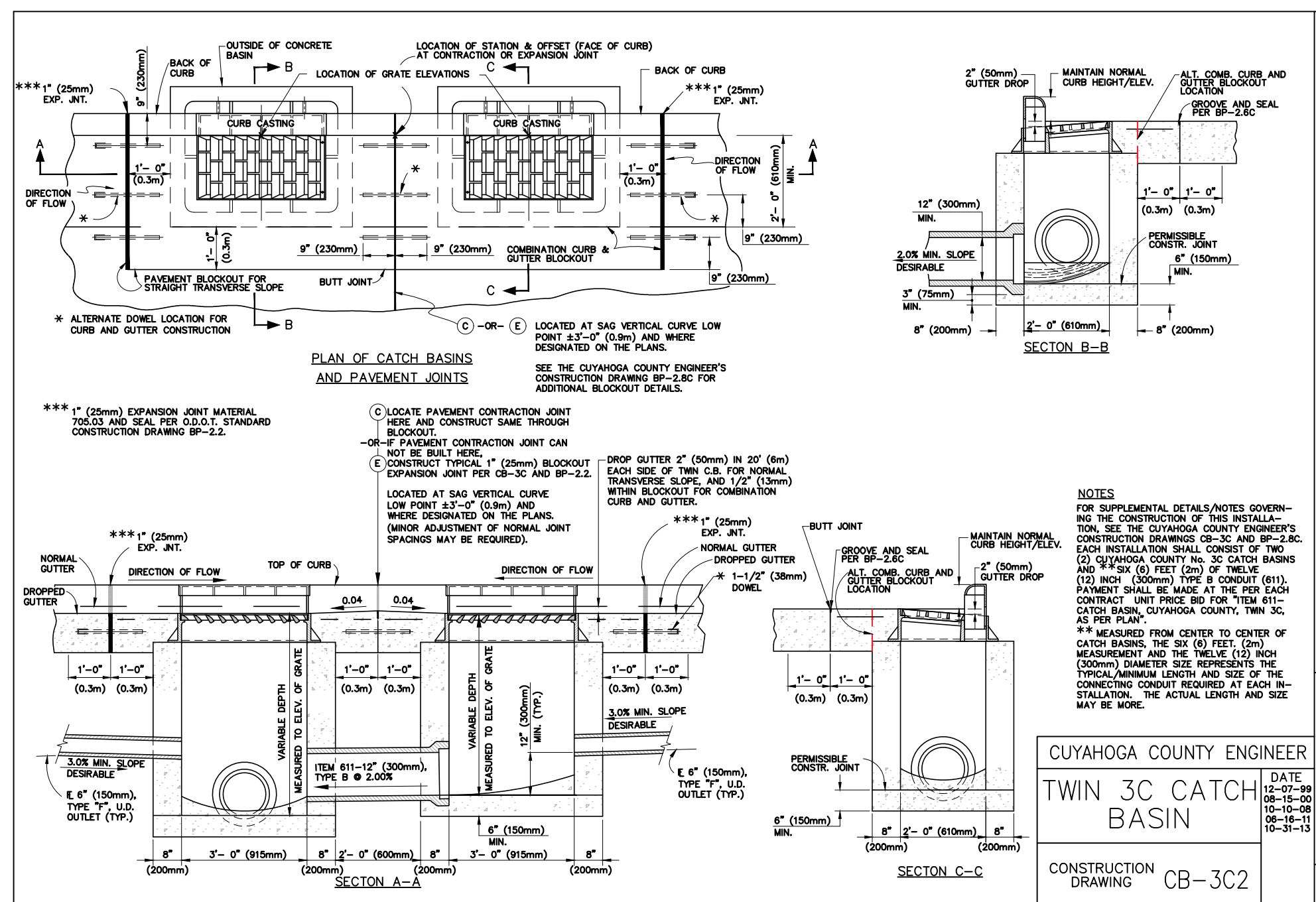
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THE CITY OF RICHMOND HEIGHTS, OHIO  
 2023 HIGHLAND ROAD RESURFACING (EAST OF RICHMOND)  
 PAVING AND MOT DETAILS

THE C.W. COURTNEY COMPANY  
 Civil & Consulting Engineers  
 Land Surveyors  
 700 Beta Drive, Suite 200  
 Cleveland, Ohio 44143-2384  
 [phone] 440.449.4005 [fax] 440.449.0883  
 www.cwcourtney.com

Drawn By: BRS  
 Chk'd By: LGC  
 Horiz. Scale: -  
 Vert. Scale: -  
 Date: JULY 2023  
 Job No.: 17-160  
 Sheet 7 of 8





REVISIONS

No.	Date	Remarks

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