CALC. BY S.J.S. DATE 1/93	LAKE COUNTY	OHIO	9A
CHKD. BY T.J.H. DATE 1/93	LAK-20-15.75	FHWA REGION 5	80

GENERAL NOTES

ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL

DESCRIPTION: THIS WORK SHALL CONSIST OF THE PLACEMENT OF A FLOWABLE MIXTURE OF PORTLAND CEMENT, FLY ASH AND SAND FOR BACKFILLING EXCAVATED, REMOVED OR PROPOSED CONDUITS, MANHOLES AND CATCH BASINS AT LOCATIONS AS SHOWN ON THE PLANS OR AS SPECIFIED. SEE THE REPAIR OF TRENCH PAVEMENT OPENING DETAIL ON SHEET 20. THE WORK SHALL BE IN ACCORDANCE WITH 603 AND 499 UNLESS OTHERWISE SPECIFIED HEREIN.

MATERIALS: MATERIALS SHALL BE:

A. CEMENT SHALL BE IN ACCORDANCE WITH 701.01 OR 701.04

B. FLY ASH SHALL MEET ASTM C-618.

C. FINE AGGREGATE SHALL BE NATURAL SAND CONSISTING OF MINERAL AGGREGATE PARTICLES. THE GRADATION OF THE SAND SHALL MEET THE REQUIREMENTS OF 703.05. THE SAND SHALL BE FINE ENOUGH TO STAY IN SUSPENSION IN THE MIXTURE TO THE EXTENT REQUIRED FOR PROPER FLOW. THE ENGINEER RESERVES THE RIGHT TO REJECT THE SAND IF A FLOWABLE MIXTURE CANNOT BE PRODUCED.

MORTAR MIX PROPORTIONING: THE INITIAL TRIAL MIXTURE SHALL CONSIST OF THE FOLLOWING QUANTITIES OF DRY MATERIALS PER CUBIC YARD:

	CLASS LSM-50
CEMENT	50 LBS.
FLY ASH	250 LBS.
SAND (SSD)*	2910 LBS.
WATER (TARGET)	500 LBS.

* SATURATED-SURFACE DRY

THESE QUANTITIES OF MATERIALS ARE EXPECTED TO YIELD APPROXIMATELY ONE (1) CUBIC YARD OF MORTAR OF THE PROPER CONSISTENCY. ADJUSTMENTS OF THE PROPORTIONS MAY BE MADE BY THE ENGINEER PROVIDING THE TOTAL ABSOLUTE VOLUME OF THE MATERIALS IS MAINTAINED.

MIX ADJUSTMENT: THE SUPPLIER SHALL MAKE ONE OR MORE ONE-CUBIC YARD TRIAL BATCHES AT DIFFERENT WATER CONTENTS TO INSURE A FLOWABLE MORTAR. MIXTURE IS TOO DRY WHEN CRACKS DEVELOP IN THE MORTAR AS IT FLOWS INTO PLACE.

TO EXPEDITE SETTLEMENT OF THE MORTAR, IT WILL BE NECESSARY FOR BLEED WATER TO APPEAR ON THE SURFACE IMMEDIATELY AFTER THE MORTAR IS STRUCK OFF. A DELAY IN BLEEDING INDICATES THERE ARE TOO MANY FINES IN THE MIXTURE, SO THE FLY ASH QUANTITY SHALL BE REDUCED IN INCREMENTS OF 50 LBS. UNTIL THE MIXTURE IS BLEEDING FREELY. APPROXIMATELY 60 LBS. OF SAND SHALL BE ADDED TO REPLACE EACH 50 LBS. INCREMENT OF FLY ASH TO MAINTAIN THE ORIGINAL YIELD.

PRIOR TO THE FIRST PLACEMENT, THE CONTRACTOR SHALL MAKE ONE OR MORE TRIAL BATCHES OF MORTAR OF THE SIZE TO BE HAULED TO THE JOB SITE AND SHALL CAST ONE OR MORE TEST SAMPLES EQUIVALENT TO THE APPROXIMATE DIMENSIONS OF THE TRENCH TO BE BACKFILLED (EITHER IN A FORM OR TRENCH). AMOUNT OF BLEEDING, SETTLEMENT RATE AND TIME REQUIRED TO SUPPORT PAVEMENT REPLACEMENT SHALL BE DETERMINED FROM THESE FULL-SIZE TESTS. THE CONTRACTOR SHALL FURNISH THE REQUIRED MATERIALS AND SAMPLES.

MIXING MORTAR: THE MORTAR SHALL BE DELIVERED TO THE SITE OF THE WORK AND DISCHARGE SHALL BE COMPLETED WITHIN 2.5 HOURS.

PLACING MORTAR: FLOWABLE MORTAR SHALL BE DISCHARGED FROM THE MIXER BY ANY REASONABLE MEANS INTO THE SPACE TO BE FILLED. SUFFICIENT MIXING CAPACITY OF MIXERS SHALL BE PROVIDED TO PERMIT THE MORTAR TO BE PLACED WITHOUT INTERRUPTIONS. THE FILL MATERIAL SHALL BE BROUGHT UP UNIFORMLY TO THE FILL LINE SHOWN ON THE PLANS (SEE DETAIL ON SHEET 20) OR AS DIRECTED BY THE ENGINEER. PLACING OF MATERIAL OVER LOW STRENGTH MORTAR BACKFILL MAY COMMENCE AS SOON AS THE SURFACE WATER IS GONE OR AS DIRECTED.

METHOD OF MEASUREMENT: THE NUMBER OF CUBIC YARDS OF LOW STRENGTH MORTAR WILL BE MEASURED BY CONVERSION OF THE TOTAL BATCH WEIGHTS. CONVERSION FACTOR WILL BE 3,650 POUNDS PER CUBIC YARD.

PAY LIMITS: PAY LIMITS FOR LOW STRENGTH MORTAR BACKFILL MATERIAL USED IN BACKFILL OF TRENCHES FOR ITEM 603 CONDUIT, AS PER PLAN OR ITEM 202 PIPE REMOVED, 24" AND UNDER, AS PER PLAN SHALL BE IN ACCORDANCE WITH THE REPAIR OF TRENCH PAVEMENT OPENING DETAIL ON SHEET 20. COST OF LOW STRENGTH MORTAR BACKFILL MATERIAL USED IN PLACE OF CLASS 'B' BEDDING, PREMIUM BACKFILL AND IN THE AREA OF THE REMOVED PIPE FOR ITEM 202 PIPE REMOVED, 24" AND UNDER, AS PER PLAN SHALL BE UNDER THE CUBIC YARD BASIS FOR ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50.

INCIDENTALS: THE COST FOR PLASTIC SHEETING USED FOR A TEMPORARY BOND BREAKER, ITS PLACEMENT AND REMOVAL, AND THE EXCAVATION OF THE TEMPORARY BACKFILL MATERIAL FOR TRENCH REPAIRS AS SHOWN IN THE DETAIL ON SHEET 20, SHALL BE INCLUDED IN THE UNIT PRICE BID FOR ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50.

BASIS OF PAYMENT: FOR THE VOLUME OF MORTAR FURNISHED AND PLACED, THE CONTRACTOR WILL BE PAID AT THE CONTRACT UNIT PRICE PER CUBIC YARD. THIS PAYMENT SHALL BE FULL COMPENSATION FOR PLACING THE LOW STRENGTH MORTAR AND FOR FURNISHING ALL MATERIALS, EQUIPMENT AND INCIDENTALS NECESSARY TO COMPLETE THIS ITEM, UNLESS INCLUDED UNDER OTHER ITEMS ON THE PLANS.

ITEM	DESCRIPTION	UNIT
SPECIAL	LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50	CU.YD.

ITEM 603 CONDUIT, AS PER PLAN

THIS WORK SHALL MEET THE REQUIREMENTS OF ITEM 603 WITH THE FOLLOWING EXCEPTIONS:

1. TRENCHES WITHIN THE PAVEMENT LIMITS SHALL BE BACKFILLED IN ACCORDANCE WITH THE REPAIR OF TRENCH PAVEMENT OPENING DETAIL ON SHEET 20.

2. THE GRANULAR BACKFILL SHALL BE PLACED TO A DEPTH OF 6" ABOVE THE TOP OF THE PIPE. ADEQUATE GRANULAR BACKFILL MATERIAL SHALL BE USED TO PREVENT THE PIPE FROM 'FLOATING' DURING PLACEMENT OF THE LOW STRENGTH MORTAR BACKFILL MATERIAL.

3. LOW STRENGTH MORTAR BACKFILL MATERIAL SHALL BE USED FROM A DEPTH OF 6" ABOVE THE TOP OF THE PIPE TO A DEPTH OF 12" BELOW THE EXISTING PAVEMENT SURFACE.

4. NO PIPE TRENCH MAY BE LEFT OPEN OVERNIGHT.

5. NO PIPE TRENCH MAY BE LEFT OPEN TO A DEPTH OF 12" FOR GREATER THAN 24 HOURS WITHOUT PLATING OR TEMPORARY BACKFILL. TEMPORARY BACKFILL MAY CONSIST OF PLACING PLASTIC SHEETING AT A DEPTH OF 12" BELOW THE EXISTING PAVEMENT SURFACE OVER THE LOW STRENGTH MORTAR BACKFILL MATERIAL TO SERVE AS A BOND BREAKER. LOW STRENGTH MORTAR BACKFILL MATERIAL MAY THEN BE PLACED LEVEL WITH THE PAVEMENT SURFACE TO ACT AS A TEMPORARY BACKFILL UNTIL PAVING OPERATIONS. SEE THE NOTE FOR ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50 FOR ASSOCIATED COSTS WITH THE TEMPORARY BACKFILL.

ITEM 604 MANHOLES AND CATCH BASINS, AS PER PLAN

THIS WORK SHALL MEET THE REQUIREMENTS OF ITEM 604 AND THE CORRESPONDING STANDARD CONSTRUCTION DRAWINGS AND DETAILS SHOWN IN THE PLANS WITH THE FOLLOWING EXCEPTIONS:

1. GRANULAR BACKFILL SHALL BE PLACED TO A DEPTH OF 6" ABOVE THE TOP OF THE UPPERMOST PIPE ENTERING OR EXITING THE STRUCTURE. THE GRANULAR BACKFILL SHALL BE ADEQUATE TO PREVENT THE STRUCTURE FROM 'FLOATING' DURING PLACEMENT OF THE LOW STRENGTH MORTAR BACKFILL MATERIAL.

2. LOW STRENGTH MORTAR BACKFILL MATERIAL SHALL BE USED TO BACKFILL AROUND THE STRUCTURE FROM A DEPTH OF 6" ABOVE THE TOP OF THE UPPERMOST PIPE TO 12" BELOW THE EXISTING PAVEMENT SURFACE OR AS DIRECTED BY THE ENGINEER. COST FOR THE MORTAR BACKFILL SHALL BE PAID FOR SEPARATELY UNDER ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50.

ITEM 202 PIPE REMOVED, 24" AND UNDER, AS PER PLAN AND CATCH BASIN REMOVED, AS PER PLAN

THIS WORK SHALL MEET THE REQUIREMENTS OF ITEM 202 WITH THE FOLLOWING EXCEPTIONS:

1. THE TRENCH RESULTING FROM THE REMOVAL OF EXISTING PIPE OR CATCH BASIN SHALL BE BACKFILLED TO A DEPTH OF 12" BELOW THE EXISTING PAVEMENT SURFACE WITH LOW STRENGTH MORTAR BACKFILL MATERIAL. (SEE THE REPAIR OF TRENCH PAVEMENT OPENING DETAIL ON SHEET 20.) COST FOR THE MORTAR BACKFILL SHALL BE PAID FOR SEPARATELY UNDER ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50.

2. NO PIPE TRENCH MAY BE LEFT OPEN OVERNIGHT.

3. NO PIPE TRENCH MAY BE LEFT OPEN TO A DEPTH OF 12" FOR GREATER THAN 24 HOURS WITHOUT PLATING OR TEMPORARY BACKFILL. TEMPORARY BACKFILL MAY CONSIST OF PLACING PLASTIC SHEETING AT A DEPTH OF 12" BELOW THE EXISTING PAVEMENT SURFACE OVER THE LOW STRENGTH MORTAR BACKFILL MATERIAL TO SERVE AS A BOND BREAKER. LOW STRENGTH MORTAR BACKFILL MATERIAL MAY THEN BE PLACED LEVEL WITH THE PAVEMENT SURFACE TO ACT AS A TEMPORARY BACKFILL UNTIL PAVING OPERATIONS. SEE THE NOTE FOR ITEM SPECIAL LOW STRENGTH MORTAR BACKFILL MATERIAL, CLASS LSM-50 FOR ASSOCIATED COSTS WITH THE TEMPORARY BACKFILL.

4. THE CASTINGS SHALL BE CAREFULLY REMOVED AND STORED WITHIN THE RIGHT-OF-WAY FOR SALVAGE BY THE CITY OF PAINESVILLE FORCES.

FIRE HYDRANT, REMOVED AND RESET

FIRE HYDRANTS SHALL BE REMOVED AND RESET AS SHOWN ON PLAN SHEET 21 AND IN THE DETAIL ON SHEET 20. ALL WATER MAINS, FIRE HYDRANTS AND APPURTENANCES SHALL BE INSTALLED IN ACCORDANCE WITH SUPPLEMENTAL SPECIFICATION 814 WATER MAINS AND SERVICE BRANCHES, EXCEPT AS MODIFIED HEREIN.

1. PIPE BEDDING

   A. AIR-COOLED BLAST FURNACE SLAG SHALL NOT BE USED FOR PIPE BEDDING.

   B. PIPE BEDDING SHALL EXTEND SIX (6) INCHES UNDER TO TWELVE (12) INCHES ABOVE THE PIPE.

2. PIPE JOINTS: MECHANICAL JOINTS SHALL BE USED ON ALL FITTINGS AND PIPE. ALL MECHANICAL JOINT BOLTS ARE TO BE CAPPED WITH ZINC ANODES.

3. THRUST BLOCKING AND TIE RODS: THRUST BLOCKING AND TIE RODS SHALL BE AS SHOWN IN THE DETAIL ON SHEET 20. THE COST FOR THIS IS TO BE INCLUDED UNDER ITEM 814 6" WATER MAIN, DUCTILE IRON PIPE, ANSI CLASS 52, MECHANICAL JOINTS AND FITTINGS, AS PER PLAN.

4. FIRE HYDRANT, REMOVED AND RESET, AS PER PLAN: THE CONTRACTOR SHALL CAREFULLY REMOVE AND RESET THE EXISTING FIRE HYDRANTS AS SHOWN IN THE DETAIL ON SHEET 20 AND AT THE LOCATION SHOWN ON PLAN SHEET 21. PRIOR TO EXCAVATING AROUND THE EXISTING HYDRANT, THE CONTRACTOR SHALL INSTALL TWO TIE RODS AS SHOWN IN THE DETAIL ON SHEET 20 TO PREVENT THE VALVE FROM BLOWING OFF. TIE RODS SHALL BE PAINTED WITH BITUMASTIC AND THE TOTAL LENGTH OF PIPE BEING TIED, INCLUDING THE TIE RODS, SHALL BE WRAPPED WITH A LAYER OF 8 MIL POLYETHYLENE. FOLLOWING THE TIE ROD INSTALLATION, THE FIRE HYDRANT CAN BE REMOVED AND RESET. THE HYDRANT AND 6" WATER MAIN SHALL BE REMOVED TO THE EXISTING GATE VALVE. THE HYDRANT SHALL BE THOROUGHLY CLEANED OF DIRT ON THE INSIDE. THE HYDRANT STANDPIPE AN BOTTOM SHALL BE WIRE BRUSHED CLEAN ON THE OUTSIDE, AND IF NECESSARY, HYDRANT STANDPIPE EXTENSIONS SHALL BE ADDED TO BRING THE HYDRANT UP TO THE HEIGHT SPECIFIED ON SHEET 20. THE STANDPIPE EXTENSION SHALL BE COMPATIBLE WITH THE EXISTING HYDRANT. COST FOR ALL OF THIS WORK SHALL BE INCLUDED IN ITEM 638 FIRE HYDRANT, REMOVED AND RESET, AS PER PLAN.

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