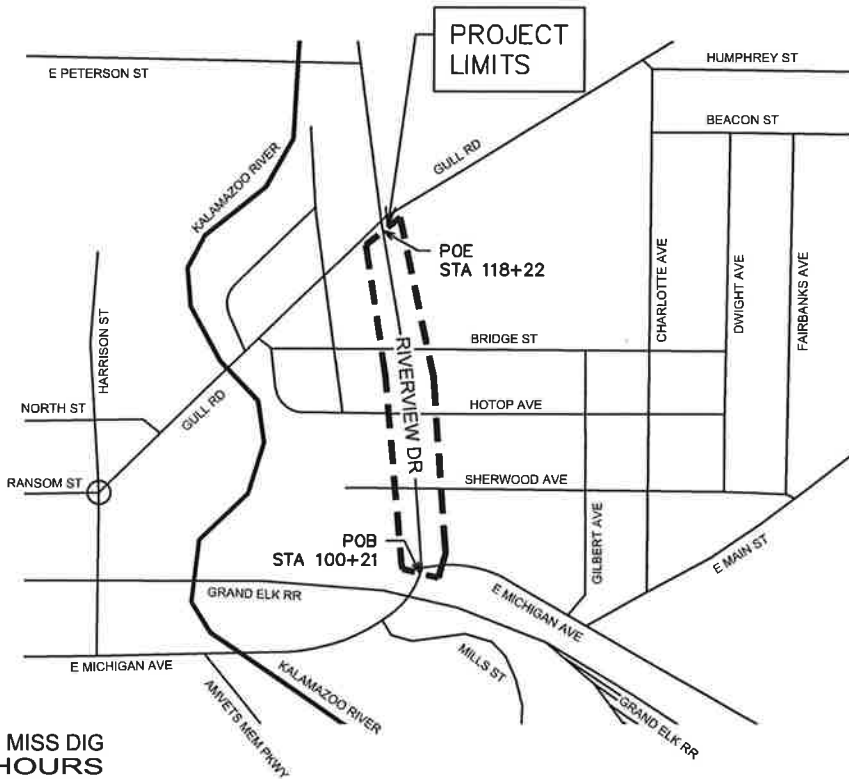


# CITY OF KALAMAZOO

## PLANS FOR

### RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

HRC JOB NO. 20230591



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THE IMPROVEMENTS COVERED BY THIS LOG PROJECT SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION'S (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION, AS AMENDED BY SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS.

PROJECT DESCRIPTION: MILL AND RESURFACE TOP 3" OF EXISTING HMA AND / OR CONCRETE SURFACE WITH HIGH STRESS HMA. ALSO INCLUDED IS THE REPAIRING OF FULL DEPTH PAVT AS DIRECTED BY THE ENGINEER (POST MILLING), REMOVAL AND REPLACEMENT OF SECTIONS OF CURB, GUTTER, AND DRIVEWAYS, AS NEEDED AND NOTED ON THE LOG SHEETS, AND THE REPLACEMENT OF PAVEMENT MARKINGS WITHIN THE PROJECT LIMITS.

PROJECT LENGTH: 0.35 MILES  
PROJECT DESCRIPTION: 3" MILL AND RESURFACE  
TRAFFIC DATA: AADT (2024) = 17,210 ; AADT (2044) = 19,020  
SPEED LIMIT: 35 MPH

PREPARED UNDER SUPERVISION OF

BARTLETT E. FRANKLIN, PE  
REGISTERED PROFESSIONAL ENGINEER

HUBBELL, ROTH & CLARK, INC.  
ORGANIZATION

1925 BRETON ROAD SE, SUITE 100  
GRAND RAPIDS, MICHIGAN 49506

ADDRESS



MUNICIPAL APPROVAL BY

ANTHONY LADD, PE  
REGISTERED PROFESSIONAL ENGINEER

CITY OF KALAMAZOO  
ORGANIZATION

PUBLIC WORKS DIVISION MANAGER

TITLE

HRC JOB NO.: 20230591



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICHIGAN 49506

Bartlett E. Franklin 11-2-23  
BARTLETT E FRANKLIN, P.E. DATE

ANTHONY LADD, P.E. DATE



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**LOG OF PROJECT**

**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**DESCRIPTION OF WORK**

THIS PROJECT INVOLVES MILLING AND RESURFACING APPROXIMATELY 0.35 MILES OF PAVEMENT AND CONCRETE ALONG RIVERVIEW DRIVE, INCLUDED IN THIS PROJECT IS THE REPAIRING OF FULL DEPTH PAVEMENT, ADJUSTING ALL AFFECTED STRUCTURES, REMOVAL AND REPLACEMENT OF VARIOUS SECTIONS OF CURB, GUTTER, AND DRIVE APPROACHES, AND THE PLACEMENT OF PAVEMENT MARKINGS THROUGHOUT THE PROJECT AND AN ENHANCED PEDESTRIAN CROSSING AT HOTOP AVE.

THE IMPROVEMENTS IN THIS PROPOSAL SHALL BE DONE IN ACCORDANCE WITH THE LATEST EDITION OF THE MICHIGAN DEPARTMENT OF TRANSPORTATION'S (MDOT) STANDARD SPECIFICATIONS FOR CONSTRUCTION, AASHTO'S GREEN BOOK AND GUIDE FOR DESIGN OF PAVEMENT STRUCTURES, MICHIGAN'S MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MMUTCD), THE CITY OF KALAMAZOO STANDARD DETAILS AND STREET DESIGN MANUAL, MDOT STANDARD AND SPECIAL DETAILS, THE NACTO URBAN STREET DESIGN GUIDE, AND THE SUPPLEMENTAL SPECIFICATIONS AND SPECIAL PROVISIONS, AS SPECIFIED IN THIS LOG OF PROJECT.

**MAINTAINING TRAFFIC**

MAINTENANCE OF TRAFFIC (MOT) SHALL BE DONE USING TRAFFIC REGULATORS, AS NEEDED FOR LOCAL DAY AND NIGHT TRAFFIC, PER THE SPECIAL PROVISION IN THIS LOG OF PROJECT.

CONTRACTOR SHALL NOTIFY AND COORDINATE WITH THE CITY OF KALAMAZOO'S METRO BUS SYSTEM FOR TEMPORARY CLOSURE OR RELOCATION OF BUS STOPS AND TO AVOID DISRUPTION OF SCHEDULED SERVICES.


**PUBLIC UTILITIES**

FOR PROTECTION OF UNDERGROUND UTILITIES AND IN CONFORMANCE WITH PUBLIC ACT 174, 2013, THE CONTRACTOR SHALL DIAL 1-800-482-7171, OR 811, A MINIMUM OF THREE (3) FULL WORKING DAYS, EXCLUDING SATURDAYS, SUNDAYS, AND HOLIDAYS, PRIOR TO BEGINNING EACH EXCAVATION. ALL "MISS DIG" PARTICIPATING MEMBERS WILL THUS BE ROUTINELY NOTIFIED. THIS DOES NOT RELIEVE THE CONTRACTOR OF THE RESPONSIBILITY OF NOTIFYING UTILITY OWNERS WHO MAY NOT BE A PART OF THE "MISS DIG" ALERT SYSTEM.

ONCE THE ENGINEER HAS DETERMINED LOCATIONS FOR FULL DEPTH PAVEMENT REPAIRS, THE CONTRACTOR SHALL CONDUCT A MISS DIG INVESTIGATION (AS OUTLINED IN THIS LOG SET AND SPECIAL PROVISIONS) AND COORDINATE WITH ANY UTILITY COMPANIES, WITHIN THE PROJECT LIMITS, TO AVOID DAMAGE OR DISRUPTION TO THEIR FACILITIES.

**SITE CLEANUP**

THE CONTRACTOR SHALL KEEP THE WORK SITE CLEAN OF TRASH AND OTHER DEBRIS. AT THE END OF EACH WORK DAY, THE PROJECT SHALL BE INSPECTED AND ALL TRASH REMOVED. NO PAYMENT SHALL BE MADE FOR THIS WORK.

 <b>HUBBELL, ROTH &amp; CLARK, INC</b> CONSULTING ENGINEERS SINCE 1915 1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO.
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**LOG OF PROJECT**

**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**LOG SHEETS**

THE MEASUREMENTS USED IN THIS PROJECT LOG ARE BASED ON FIELD REVIEW, SURVEY, AND AERIAL PHOTOGRAPHY.

THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS BEFORE THE START OF CONSTRUCTION. THE ENGINEER SHALL BE IMMEDIATELY NOTIFIED OF ANY DISCREPANCIES BETWEEN THE PLANS AND ACTUAL FIELD DIMENSIONS.

**SIDE STREETS**


THE PROPOSED WORK ON SIDE STREETS SHALL INCLUDE MILLING AND RESURFACING UP TO THE SIDE STREET SPRING POINT.

**STANDARD PLANS & SPECIAL DETAILS**

WHERE THE FOLLOWING ITEMS ARE CALLED OUT, THEY ARE TO BE CONSTRUCTED ACCORDING TO THE MDOT STANDARD PLAN OR SPECIAL DETAIL LISTED BELOW, UNLESS OTHERWISE INDICATED.

STANDARD PLANS	
PLAN TITLE:	PLAN NO.:
DRAINAGE STRUCTURES	R-01-G
DRIVEWAY OPENINGS & APPROACHES, AND CONCRETE SIDEWALK	R-29-I
CONCRETE CURB AND CONCRETE CURB & GUTTER	R-30-G
PAVEMENT ARROW & MESSAGE DETAILS	PAVE-900-G
TEMPORARY LONGITUDINAL LINE TYPES & PLACEMENT	PAVE-904-B
LONGITUDINAL LINE TYPES & PLACEMENT	PAVE-905-E
LEFT LANE TURN MARKINGS	PAVE-935-E
INTERSECTION, STOP BAR & CROSSWALK MARKINGS	PAVE-945-D
STANDARD SIGN INSTALLATIONS	SIGN-100-G
STEEL POSTS	SIGN-200-E

SPECIAL DETAIL PLANS	
PLAN TITLE:	PLAN NO.:
CONCRETE PAVEMENT REPAIR	R-44-G (DET 8)

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

MISCELLANEOUS QUANTITIES		
TOTAL	UNIT	DESCRIPTION
1	LSUM	Mobilization, Max
30	Ft	Curb and Gutter, Rem
75	Cyd	Excavation, Earth
26	Ea	Erosion Control, Inlet Protection, Fabric Drop
225	Syd	Aggregate Base, 12 inch
3	Ea	_Dr Structure Cover, Type Q, Modified
3	Ea	_Dr Structure Cover, Type S, Modified
29	Ea	Dr Structure Cover, Adj, Case 1
675	Ft	Pavt Joint and Crack Repr, Det 8
125	Ton	Hand Patching
9000	Ft	Asphalt Repr Mastic
44	Ft	Curb and Gutter, Conc, Det F4
300	Syd	_Surface Restoration, Modified
9	Ea	Gate Box, Adj, Case 1
1	Ea	_Gate Box, Reconstruct, Modified



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QUANTITIES - MISCELLANEOUS

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

MAINTENANCE OF TRAFFIC QUANTITIES		
TOTAL	UNIT	DESCRIPTION
510	Sft	Rem Spec Mrkg
20	Ea	Barricade, Type III, High Intensity, Double Sided, Lighted, Furn
20	Ea	Barricade, Type III, High Intensity, Double Sided, Lighted, Oper
100	Ea	Channelizing Device, 42 inch, Fluorescent, Furn
100	Ea	Channelizing Device, 42 inch, Fluorescent, Oper
4	Ea	Lighted Arrow, Type C, Furn
4	Ea	Lighted Arrow, Type C, Oper
1	LSUM	Ltg for Night Work
1	LSUM	Minor Traf Devices
5820	Ft	Pavt Mrkg, Longit, 6 inch or Less Width, Rem
3700	Ft	Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, White, Temp
7400	Ft	Pavt Mrkg, Wet Reflective, Type R, Tape, 4 inch, Yellow, Temp
100	Ea	Plastic Drum, Fluorescent, Furn
100	Ea	Plastic Drum, Fluorescent, Oper
20	Ea	Sign Cover
3	Ea	Sign, Portable, Changeable Message, NTCIP-Compliant, Furn
3	Ea	Sign, Portable, Changeable Message, NTCIP-Compliant, Oper
400	Sft	Sign, Type B, Temp, Prismatic, Furn
400	Sft	Sign, Type B, Temp, Prismatic, Oper
400	Sft	Sign, Type B, Temp, Prismatic, Spec, Furn
400	Sft	Sign, Type B, Temp, Prismatic, Spec, Oper
1	LSUM	Traf Regulator Control



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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

QUANTITIES - MAINTENANCE OF TRAFFIC

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

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LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

REMOVAL QUANTITIES		
TOTAL	UNIT	DESCRIPTION
100	Ft	Curb and Gutter, Rem
112	Syd	Pavt, Rem
10053	Syd	Cold Milling HMA and Conc Pavt, Modified

CONSTRUCTION QUANTITIES		
TOTAL	UNIT	DESCRIPTION
1825	Ton	HMA, 5EML, High Stress
130	Syd	Driveway, Nonreinf Conc, 6 inch
50	Ft	Curb and Gutter, Conc, Det B2
36	Ft	Curb and Gutter, Conc, Det F4



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QUANTITIES - REMOVAL AND CONSTRUCTION

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PAVEMENT MARKINGS QUANTITIES		
TOTAL	UNIT	DESCRIPTION
180	Ft	Pavt Mrkg, Ovly Cold Plastic, 6 inch, Crosswalk
180	Ft	Pavt Mrkg, Ovly Cold Plastic, 12 inch, Crosswalk
115	Ft	Pavt Mrkg, Ovly Cold Plastic, 24 inch, Stop Bar
3	Ea	Pavt Mrkg, Ovly Cold Plastic, Lt Turn Arrow Sym
6	Ea	Pavt Mrkg, Ovly Cold Plastic, Only
3	Ea	Pavt Mrkg, Ovly Cold Plastic, Thru Arrow Sym
375	Ft	Pavt Mrkg, Sprayable Thermopl, 6 inch, White
3800	Ft	Pavt Mrkg, Sprayable Thermopl, 6 inch, Yellow

SIGNAGE QUANTITIES		
TOTAL	UNIT	DESCRIPTION
288	Ft	Post, Steel, 3 pound
94	Sft	Sign, Type IIIB
256	Sft	Sign, Type VB
14	Ea	Reflective Panel for Permanent Sign Support, 6 foot

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LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**EX DRIVEWAY STATION TABLE**

THE FOLLOWING TABLE PROVIDES APPROXIMATE STATIONING FOR REMOVING AND REPLACING EX DRIVEWAYS ALONG RIVERVIEW DR. RECONSTRUCT EACH DRIVEWAY OPENING AND APPROACH PER THE CITY OF KALAMAZOO STREET DESIGN MANUAL AND THE MDOT R-29-I STANDARD PLAN FOR DRIVEWAY OPENINGS AND APPROACHES. RECONSTRUCTION MATERIAL SHALL BE IN-KIND WITH THE EXISTING OPENING AND / OR APPROACH, SEE TABLE. PAID FOR AS "PAVT, REM" AND "DRIVEWAY, NONREINF CONC, 6 INCH." STATIONS ARE APPROXIMATE CENTER OF DRIVEWAY LOCATIONS.

EX DRIVEWAY OPENING AND APPROACHES				
NUMBER	STATION	MATERIAL	AREA (SFT)	ST SIDE
01	102+53	CONC	146±	RIGHT
02	102+98	CONC	60±	LEFT
03	103+30	CONC	155±	LEFT
04	107+70	CONC	193±	RIGHT
05	109+63	SEED	144±	RIGHT
06	110+59	CONC	60±	RIGHT
07	113+79	CONC	153±	LEFT
08	114+39	CONC	92±	LEFT

**NOTES:**

1. DRIVEWAY PAY ITEMS SHALL INCLUDE PAYMENT FOR REMOVING AND REPLACING THE ADJACENT CURB AND GUTTER ASSOCIATED WITH DRIVEWAY REPLACEMENTS, PER MDOT STANDARD PLAN R-29-I.
2. CURB AND GUTTER DETAIL TYPE IS PROVIDED FOR REGISTERING A SIMILAR TYPE OF CURB AND GUTTER. CONTRACTOR SHALL FORM CURB AND GUTTER TO MATCH THE ADJACENT CURB AND GUTTER.
3. DRIVEWAY AT STA:109+63 - DO NOT REPLACE WITH CONCRETE, REGRADE TO MATCH EXISTING SIDEWALK AND REPLACE WITH NATIVE SEEDING. PAID FOR AS "PAVT, REM," AND "SURFACE RESTORATION, MODIFIED."
4. CURB AND GUTTER AT STA:109+48 - REMOVE DRIVEWAY APPROACH AS PART OF DRIVEWAY AT STA:109+63. CONSTRUCT CURB AND GUTTER AS TYPE B2, BUT FORM TO MATCH ADJACENT CURB AND GUTTER. PAID FOR AS "CURB AND GUTTER, CONC, DET B2."

**EX CONCRETE CURB AND GUTTER**

THE FOLLOWING TABLE PROVIDES APPROXIMATE STATIONING FOR REMOVING AND REPLACING EX CONCRETE CURB AND GUTTER ALONG RIVERVIEW DR. PAID FOR AS "CURB AND GUTTER, REM," "CURB AND GUTTER, CONC, DET B2," AND "CURB AND GUTTER, CONC, DET F4", RESPECTIVELY. STATIONS ARE APPROXIMATE BEGINNING OF CURB AND GUTTER.

EX CONCRETE CURB AND GUTTER				
NUMBER	STATION	LENGTH	ST SIDE	TYPE
01	109+48	30 FT±	RIGHT	DET B2
02	111+78	6 FT±	RIGHT	DET F4
03	112+86	10 FT±	LEFT	DET B2
04	113+91	12 FT±	RIGHT	DET F4
05	115+69	22 FT±	RIGHT	DET F4
06	118+01	6 FT±	RIGHT	DET F4



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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT  
  
TABLE - EX DRIVEWAYS AND CURB & GUTTER

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LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**EX CONCRETE PATCH TABLE**

THE FOLLOWING TABLE PROVIDES APPROXIMATE STATIONING FOR WHERE EX CONCRETE PATCHES ARE LOCATED ALONG RIVERVIEW DR FOR MILLING AND RESURFACING. MILLING OF EACH EX CONCRETE PATCH SHALL BE FULL DEPTH (3") MILLING AND SHALL BE INCLUDED AND PAID FOR AS "COLD MILLING HMA AND CONC PAVT, MODIFIED."

EX CONCRETE PATCHES			
NUMBER	STATION	AREA	ST SIDE
01	102+07	152 SFT±	LEFT
02	102+60	123 SFT±	LEFT
03	103+70	534 SFT±	LEFT
04	105+71	151 SFT±	LEFT
05	107+51	129 SFT±	LEFT
06	109+40	152 SFT±	LEFT
07	109+89	148 SFT±	RIGHT
08	110+29	275 SFT±	RIGHT
09	110+69	197 SFT±	RIGHT
10	110+70	57 SFT±	LEFT
11	110+98	203 SFT±	LEFT
12	110+99	37 SFT±	RIGHT
13	113+37	285 SFT±	LEFT
14	114+52	401 SFT±	RIGHT
15	114+89	166 SFT±	LEFT



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TABLE - EX CONCRETE PATCHES

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**EX SAN AND STM SEWER DR STRUCTURE REPLACE AND ADJUST TABLE**

THE FOLLOWING TABLE PROVIDES APPROXIMATE STATIONING AND OFFSETS FOR ADJUSTING EX SAN AND STM DR STRUCTURE COVERS ALONG RIVERVIEW DR. EACH EX COVER ADJUSTMENT SHALL BE PAID FOR AS "DR STRUCTURE COVER, ADJ, CASE 1." REPLACE EX SAN AND STM DR STRUCTURE COVERS, AS DIRECTED BY THE ENGINEER, AND SHALL BE PAID FOR AS "DR STRUCTURE COVER, TYPE \_\_, MODIFIED." ANY REPLACEMENT COVERS PROVIDED BY THE CITY OF KALAMAZOO SHALL BE CONSIDERED AS INCIDENTAL TO THE ADJUSTMENTS. EX CATCH BASIN COVERS SHALL NOT BE REPLACED, BUT ONLY BE ADJUSTED AND PAID FOR AS "DR STRUCTURE COVER, ADJ, CASE 1."

EX SAN AND STM DR COVER ADJUSTMENTS			
NUMBER	STATION	OFFSET	ST SIDE
SAN04	101+00	5 FT±	RIGHT
STM05	101+07	13 FT±	RIGHT
SAN06	101+18	23 FT±	RIGHT
CB07	101+47	23 FT±	LEFT
CB08	101+52	22 FT±	RIGHT
SAN09	102+75	10 FT±	LEFT
STM10	102+90	5 FT±	RIGHT
CB11	104+45	23 FT±	LEFT
SAN12	104+74	10 FT±	LEFT
STM14	104+85	38 FT±	RIGHT
STM15	104+89	5 FT±	LEFT
CB16	105+23	23 FT±	LEFT
CB17	105+23	22 FT±	RIGHT
SAN18	106+67	10 FT±	LEFT
CB19	108+37	23 FT±	RIGHT

EX SAN AND STM DR COVER ADJUSTMENTS			
NUMBER	STATION	OFFSET	ST SIDE
CB20	108+40	22 FT±	LEFT
SAN23	108+76	8 FT±	LEFT
STM24	108+85	5 FT±	RIGHT
CB25	111+68	22 FT±	RIGHT
STM27	112+03	5 FT±	RIGHT
SAN28	112+09	9 FT±	LEFT
SAN29	112+20	30 FT±	LEFT
STM30	112+23	6 FT±	RIGHT
CB32	112+53	23 FT±	LEFT
SAN33	113+71	11 FT±	RIGHT
STM35	115+55	22 FT±	LEFT
CB36	115+55	6 FT±	RIGHT
CB37	115+55	22 FT±	RIGHT
SAN38	117+90	8 FT±	LEFT



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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

TABLE - EX DR STRUCTURE

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

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LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**EX WATER MAIN GATE BOX COVER ADJUSTMENT TABLE**

THE FOLLOWING TABLE PROVIDES APPROXIMATE STATIONING AND OFFSETS FOR ADJUSTING EX WATER MAIN GATE BOX COVERS, ALONG RIVERVIEW DR. EACH EX COVER ADJUSTMENT SHALL BE PAID FOR AS "GATE BOX, ADJ, CASE 1."

EX GATE BOX ADJUSTMENTS			
NUMBER	STATION	OFFSET	ST SIDE
GA01	100+83	13 FT±	LEFT
GA02	100+86	38 FT±	RIGHT
GA03	100+88	23 FT±	LEFT
GA13	104+84	1 FT±	LEFT
GA21	108+59	17 FT±	LEFT

EX GATE BOX ADJUSTMENTS			
NUMBER	STATION	OFFSET	ST SIDE
GA22	108+71	38 FT±	LEFT
GA26	111+98	28 FT±	LEFT
GA31	112+27	35 FT±	LEFT
GA34	113+73	26 FT±	LEFT

**EX WATER MAIN GATE BOX RECONSTRUCT TABLE**

THE FOLLOWING TABLE PROVIDES APPROXIMATE STATIONING AND OFFSETS FOR RECONSTRUCTING EX WATER MAIN GATE BOX, ALONG RIVERVIEW DR. EACH RECONSTRUCT SHALL BE PAID FOR AS "GATE BOX, RECONSTRUCT, MODIFIED." ADDITIONAL EX GATE BOXES MAY BE RECONSTRUCTED AS DIRECTED BY THE ENGINEER.

EX GATE BOX RECONSTRUCT			
NUMBER	STATION	OFFSET	ST SIDE
GA39	116+86	11 FT±	LEFT



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TABLE - EX GATE BOX

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD


## PROJECT BEGINNING AND END

POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## EXISTING TYPICAL NOTES:

- 1. CONC CURB AND GUTTER -
  - 1.1. EX CONC GUTTER PANS ARE ASSUMED TO BE BELOW THE EX PAVT ALONG RIVERVIEW DR. CONTRACTOR SHALL CONFIRM GUTTER PANS EXIST BENEATH THE EX PAVT. IF GUTTER PANS ARE NOT FOUND, NOTIFY THE ENGINEER IMMEDIATELY.
- 2. COLD MILLING HMA AND CONC PAVT -
  - 2.1. CONC PATCHES EXIST ALONG RIVERVIEW DR, SEE "EX CONCRETE PATCHES" TABLE FOR LOCATIONS. EX CONC PATCHES SHALL BE MILLED IN CONJUNCTION WITH THE MILLING OF EX HMA PAVT, TO THE FULL 3" DEPTH, AND WITHIN THE MILLING LIMITS, AS SHOWN ON THE EX TYPICAL SECTIONS AND PER THE PROJECT SPECIAL PROVISIONS. (PAID FOR AS "COLD MILLING HMA AND CONC PAVT, MODIFIED.")
  - 2.2. FULL (3") DEPTH MILLING SHALL BE CONDUCTED ALONG RIVERVIEW DR AND UP TO THE IMMEDIATE SPRING POINTS ON THE SIDE STREETS THAT INTERSECT RIVERVIEW DR. THE MILLED MATERIALS WILL INCLUDE HMA AND CONC PAVT, WITH EACH MATERIAL DEPTH VARYING THROUGHOUT RIVERVIEW DR. SPECIFICATIONS OF THIS WORK ARE INCLUDED IN THE MILLING SPECIAL PROVISION. (PAID FOR AS "COLD MILLING HMA AND CONC PAVT, MODIFIED.")
  - 2.3. WHEN THE FULL (3") DEPTH MILLING DOES NOT MILL / REMOVE ALL EX HMA PAVT ABOVE THE EX CONC, THE CONTRACTOR SHALL REMOVE THE REMAINING HMA PAVT ABOVE THE EX CONC. THIS SHALL BE CONSIDERED INCIDENTAL TO THE "COLD MILLING HMA AND CONC PAVT, MODIFIED" PAY ITEM.
  - 2.4. REMOVE EX EXCESS PAVT ABOVE EX GUTTER PANS AS PART OF THE COLD MILLING. THIS REMOVAL SHALL BE INCLUDED AND PAID FOR AS "COLD MILLING HMA AND CONC PAVT, MODIFIED."

 <b>HUBBELL, ROTH &amp; CLARK, INC</b> CONSULTING ENGINEERS SINCE 1915 1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 12 OF 38
	DATE 11/06/2023	EXISTING TYPICALS - NOTES	

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**LOG OF PROJECT**

**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**PROJECT BEGINNING AND END**


POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

**EXISTING TYPICAL NOTES (CONT):**

3.0 FULL DEPTH PAVT REPAIR -

- 3.1 REPAIR LOCATIONS SHALL BE DETERMINED BY THE ENGINEER AFTER THE FULL (3") DEPTH MILLING.
- 3.2 REPAIR LENGTH IS ASSUMED TO EXTEND THE ENTIRE ROADWAY WIDTH.
- 3.3 REPAIR WIDTHS SHALL BE WIDE ENOUGH TO ALLOW THOROUGH VIBRATORY COMPACTION OF THE MATERIAL THAT LIES BENEATH THE PR WORK, INCLUDING SUBBASE, AGGREGATE BASE, HMA, ETC.
- 3.4 REPAIR DEPTHS AS SHOWN ON THE "FULL DEPTH PAVEMENT REPAIR DETAIL." EXCAVATION SHALL INCLUDE REMOVING SUBBASE TO THE REQUIRED DEPTH AND BE PAID FOR AS "EXCAVATION, EARTH."

 <b>HUBBELL, ROTH &amp; CLARK, INC</b> CONSULTING ENGINEERS SINCE 1915 1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 13 OF 38
	DATE 11/06/2023	EXISTING TYPICALS - NOTES	

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# LOG OF PROJECT

# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

HRC JOB NO. 20230591

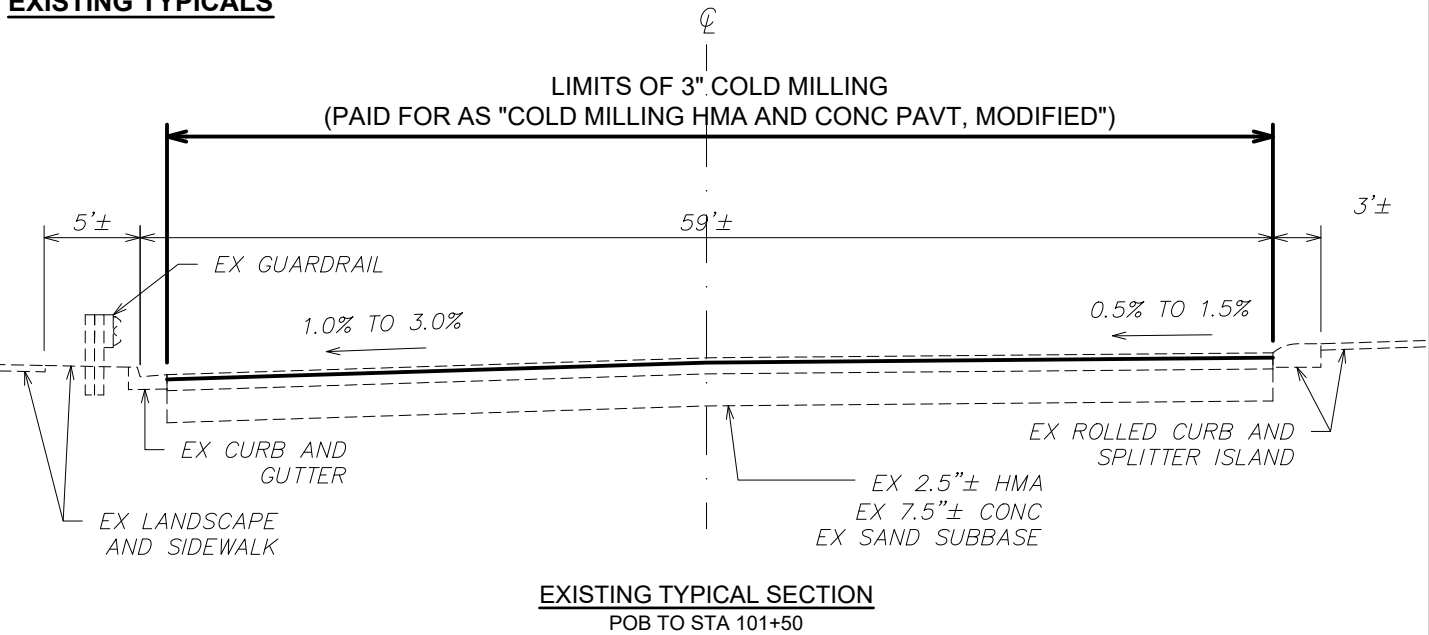
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## PROJECT BEGINNING AND END

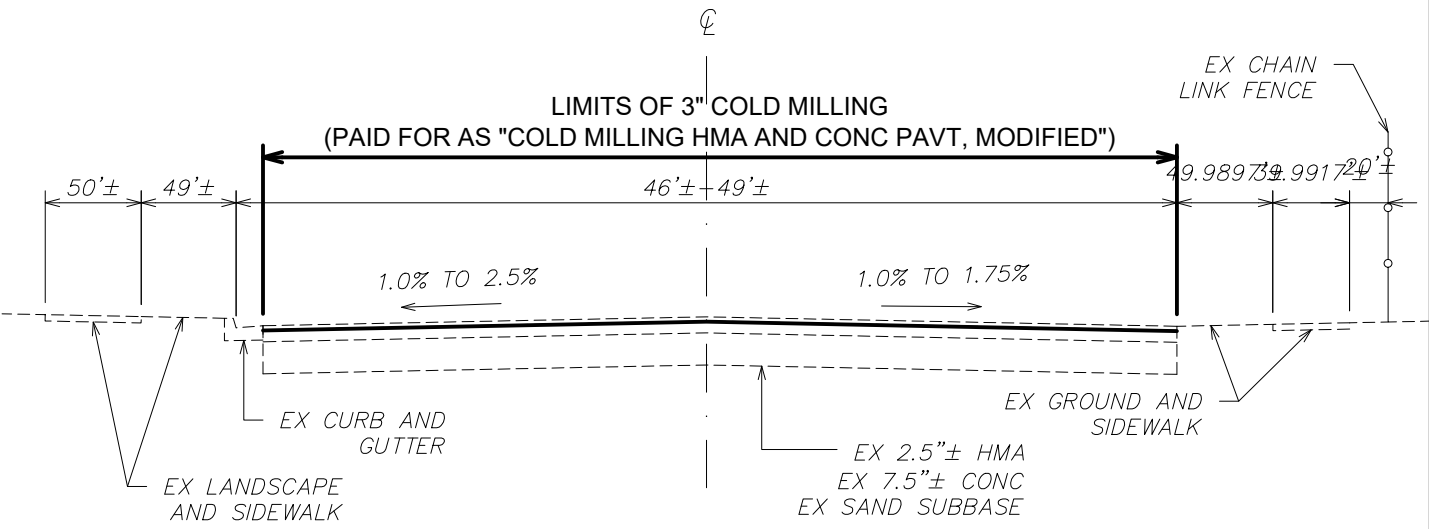
POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## EXISTING TYPICALS



EXISTING TYPICAL SECTION  
POB TO STA 101+50



EXISTING TYPICAL SECTION  
STA 101+50 TO STA 103+49

**HRC**  
**HUBBELL, ROTH & CLARK, INC**  
 CONSULTING ENGINEERS SINCE 1915  
 1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
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DATE  
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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

EXISTING TYPICALS

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

HRC JOB NO. 20230591

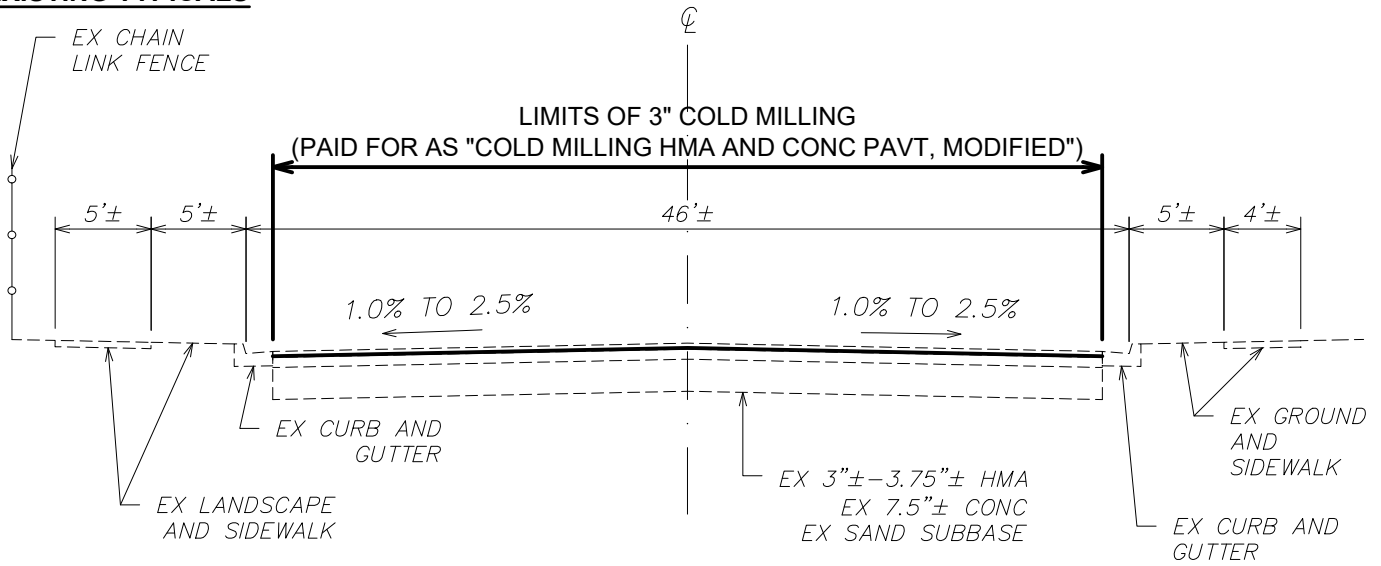
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## PROJECT BEGINNING AND END

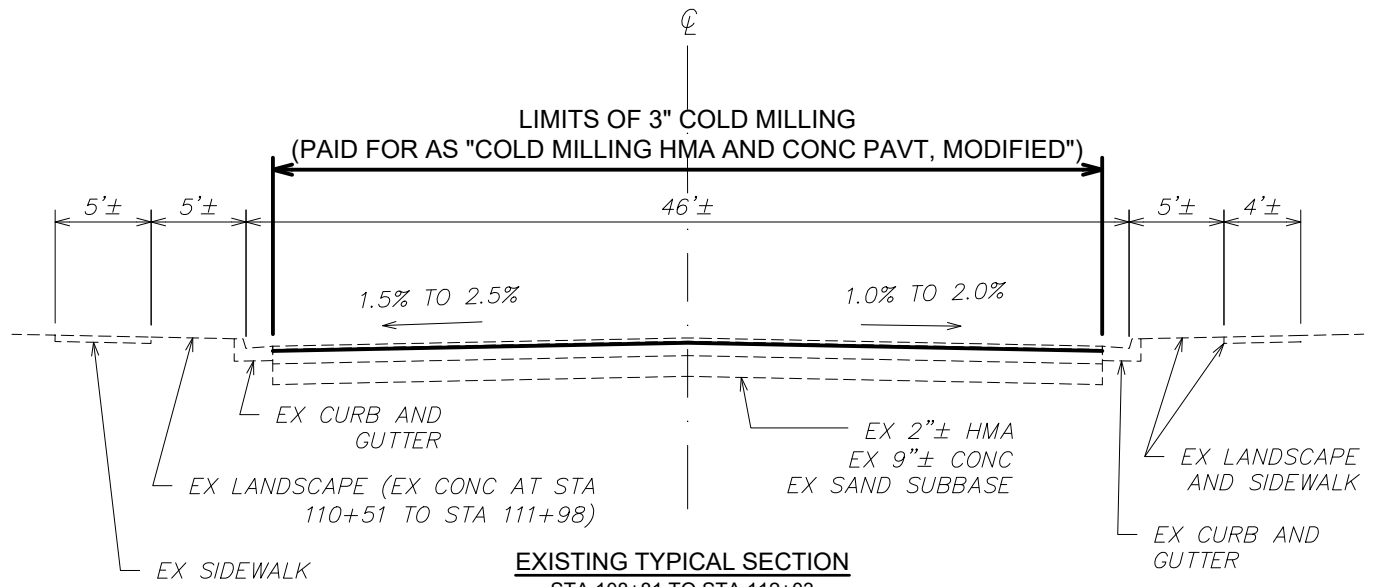
POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## EXISTING TYPICALS



EXISTING TYPICAL SECTION  
STA 103+49 TO STA 108+81



EXISTING TYPICAL SECTION  
STA 108+81 TO STA 112+03



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICH. 49506

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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

EXISTING TYPICALS

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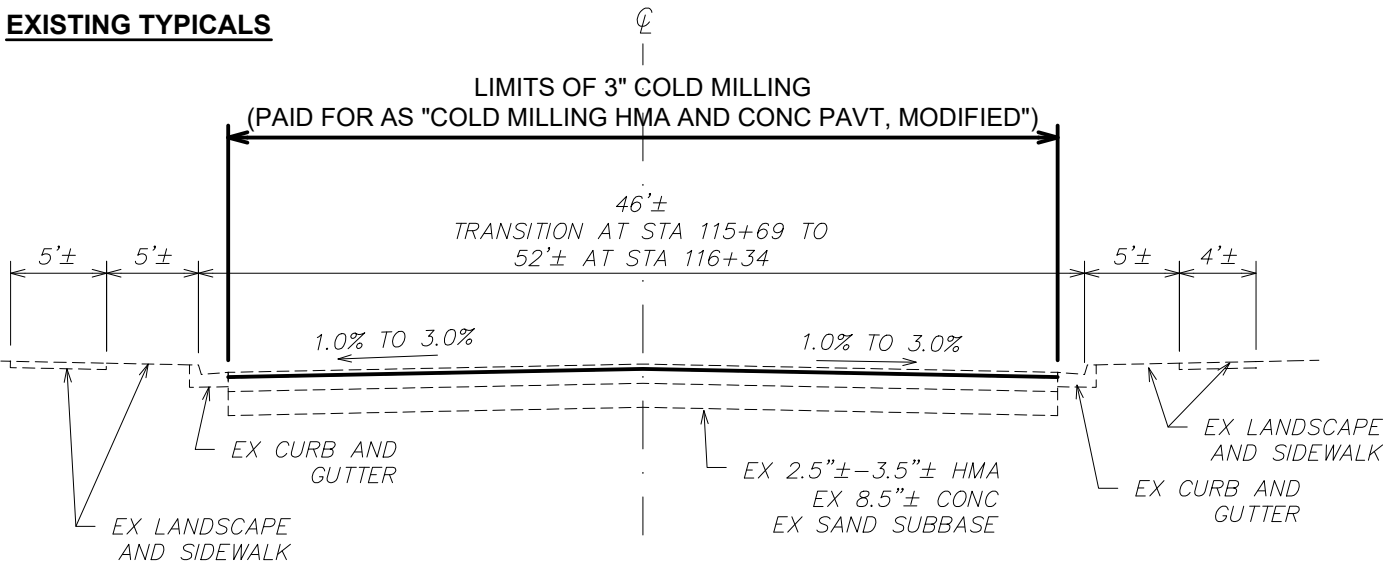
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## PROJECT BEGINNING AND END

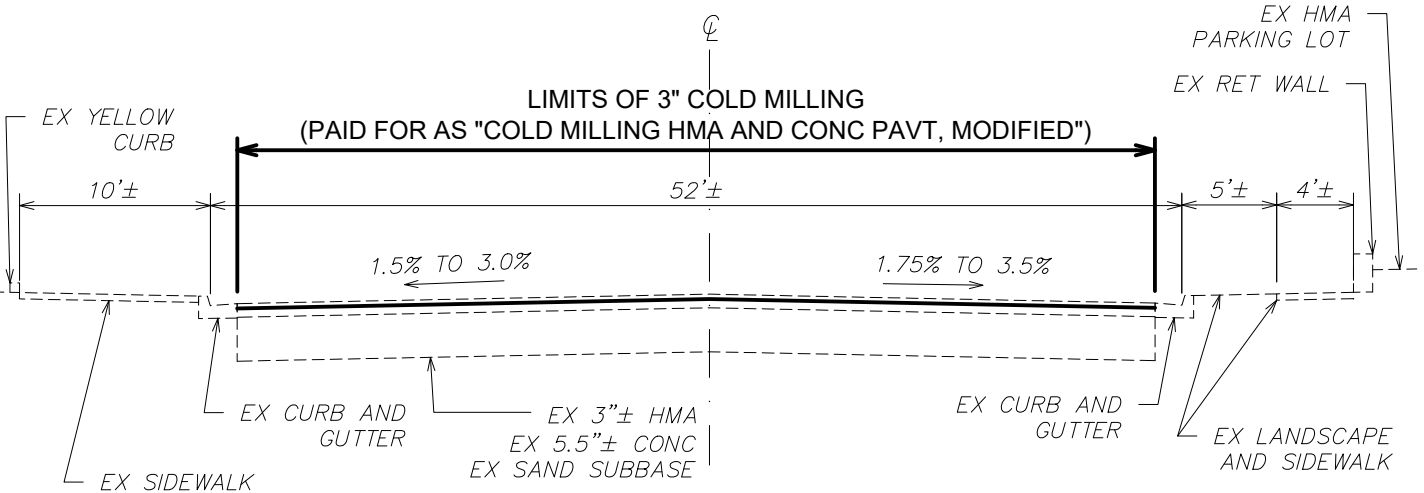
POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## EXISTING TYPICALS



**EXISTING TYPICAL SECTION**  
STA 112+03 TO STA 116+34



**EXISTING TYPICAL SECTION**  
STA 116+34 TO POE

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 CONSULTING ENGINEERS SINCE 1915  
 1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

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EXISTING TYPICALS

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**PROJECT BEGINNING AND END**

POINT OF BEGINNING (POB) STA: 100+21


POINT OF ENDING (POE) STA: 118+22

**PROPOSED TYPICAL NOTES:**

1. THE SHOWN CONC THICKNESS IS THE REMAINING THICKNESS AFTER THE FULL (3") DEPTH MILLING.
2. THE FULL DEPTH PAVEMENT REPAIR SHALL CONSIST OF 8.5" HMA (ONE LIFT: 2.5" HMA, 4EML, OVER TWO LIFTS: 3" HMA, 3EML PER SPECIAL DETAIL "CONCRETE PAVEMENT REPAIR": DETAIL 8, CASE V") OVER 12" AGG BASE, 21 AA, OVER COMPACTED SUBBASE, AS SHOWN ON THE "FULL DEPTH PAVEMENT REPAIR DETAIL."
3. THE FULL DEPTH PAVEMENT REPAIR LOCATIONS SHALL BE DETERMINED AFTER THE FULL (3") DEPTH MILLING. CONTRACTOR SHALL SET-UP AN ON-SITE MEETING AFTER THE MILLING, WITH THE CITY OF KALAMAZOO AND HRC REPRESENTATIVE, TO DISCUSS THE LOCATIONS. THIS MEETING SHALL BE INCLUDED IN THE PROJECT SCHEDULE AND SHALL BE CONSIDERED AS INCIDENTAL TO THE PAVEMENT REPAIR PAY ITEMS.

**PAVEMENT APPLICATION TABLE**

ITEM	RATE: LBS/ SYD	PERFORMANCE GRADE	REMARKS
HMA, 5EML, HIGH STRESS	165	70-28P	TOP COURSE
HMA, 5EML, HIGH STRESS	165	70-28P	LEVELING COURSE
"HAND PATCHING" HMA, 4EML	275	64-28	("CONCRETE PAVEMENT REPAIR" - DET 8) LEVELING COURSE
"HAND PATCHING" HMA, 3EML	330	58-22	("CONCRETE PAVEMENT REPAIR" - DET 8) BASE COURSE
"HAND PATCHING" HMA, 3EML	330	58-22	("CONCRETE PAVEMENT REPAIR" - DET 8) BASE COURSE

 <b>HUBBELL, ROTH &amp; CLARK, INC</b> CONSULTING ENGINEERS SINCE 1915 1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO.
	DATE 11/06/2023	PROPOSED TYPICALS - NOTES	17 OF 38

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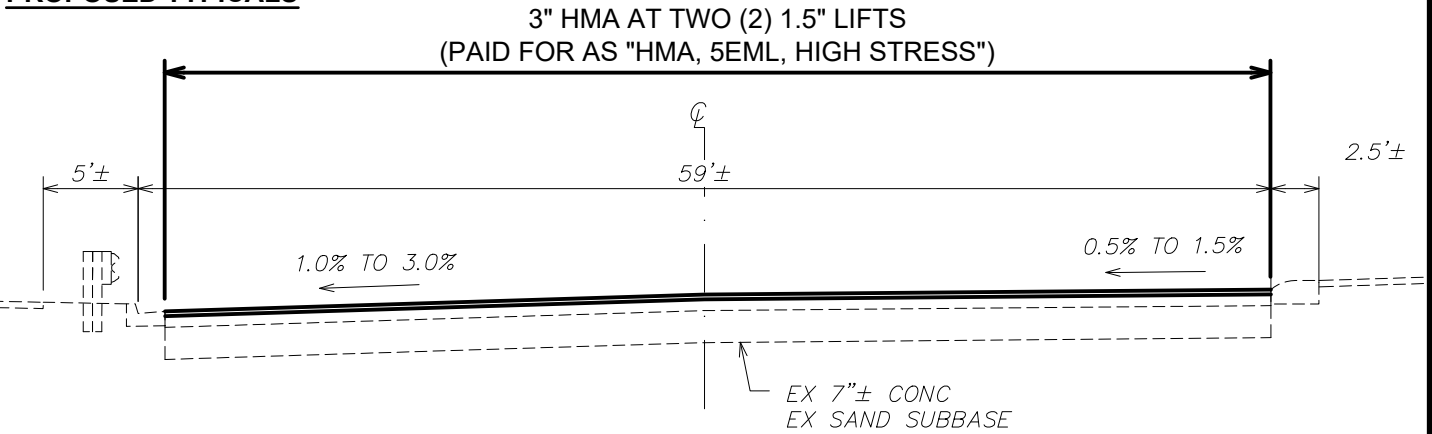
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## PROJECT BEGINNING AND END

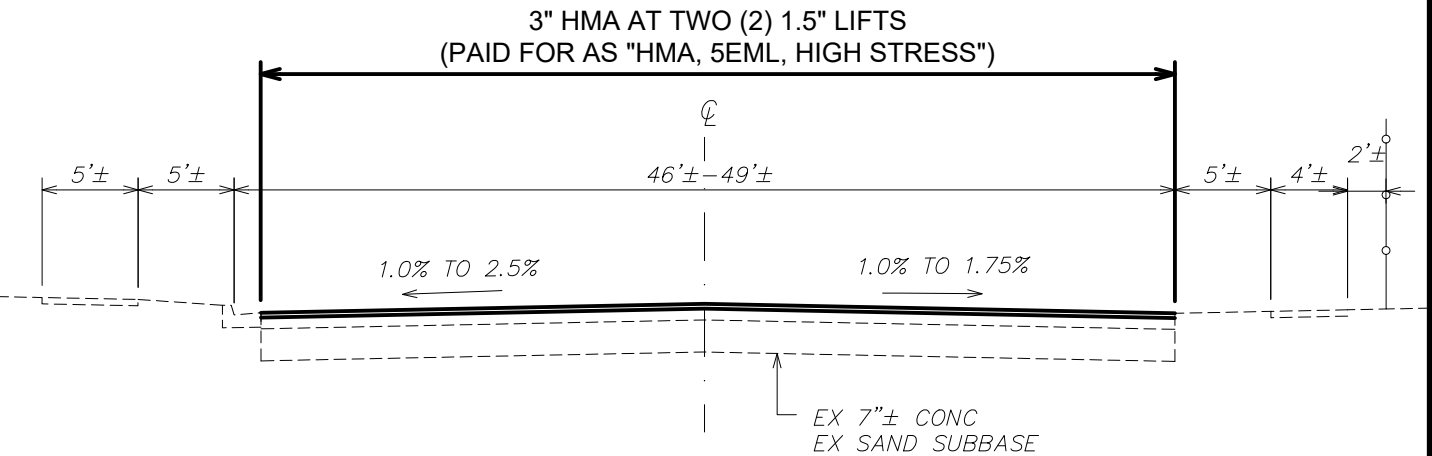
POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## PROPOSED TYPICALS



PROPOSED TYPICAL SECTION  
POB TO STA 101+50



PROPOSED TYPICAL SECTION  
STA 101+50 TO STA 103+49



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICH. 49506

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PROPOSED TYPICALS

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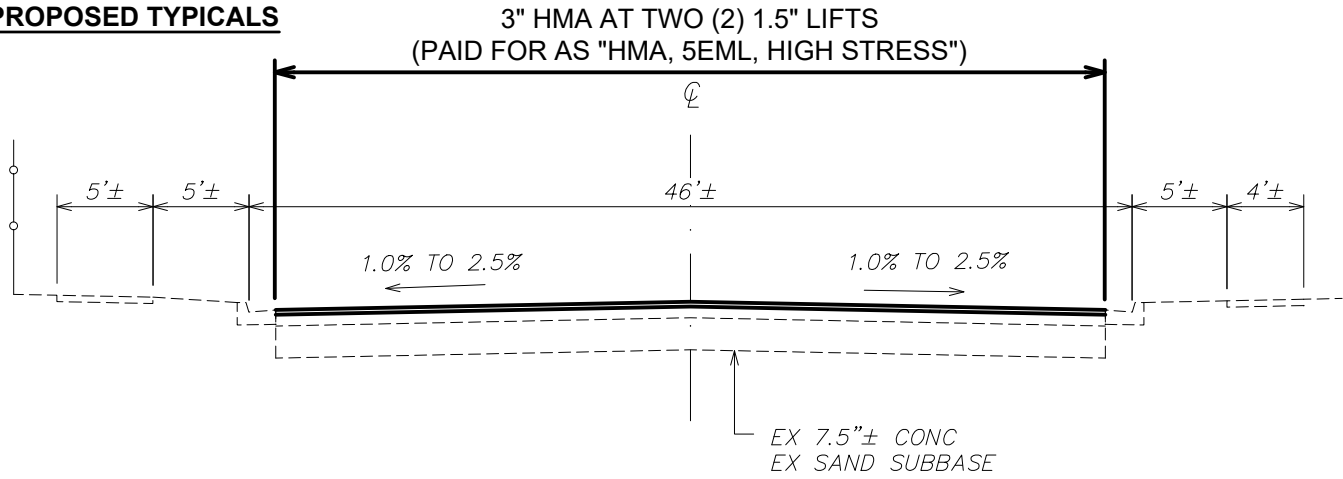
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## PROJECT BEGINNING AND END

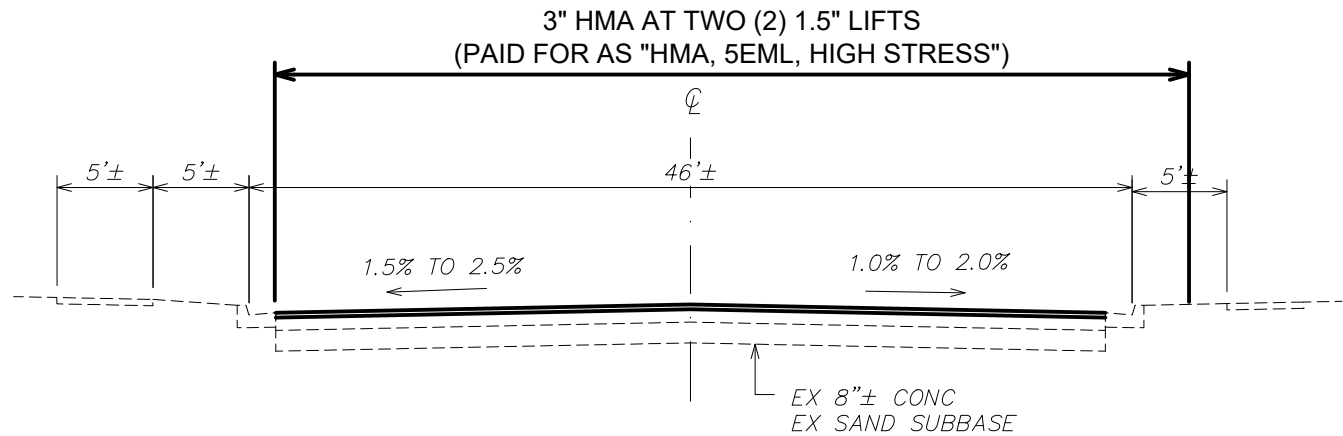
POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## PROPOSED TYPICALS



**PROPOSED TYPICAL SECTION**  
STA 103+49 TO STA 108+81



**PROPOSED TYPICAL SECTION**  
STA 108+81 TO STA 112+03



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICH. 49506

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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

PROPOSED TYPICALS

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

HRC JOB NO. 20230591

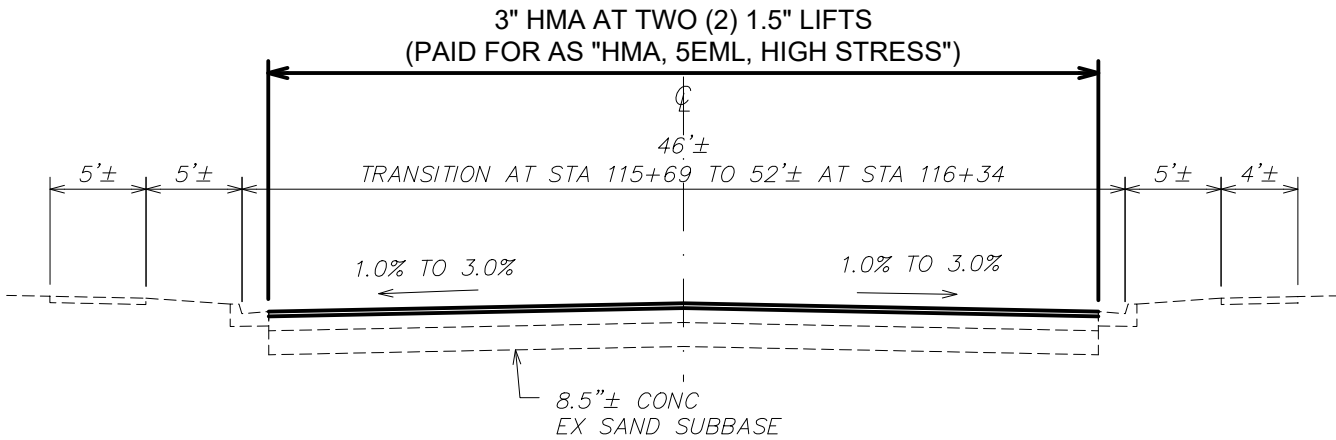
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## PROJECT BEGINNING AND END

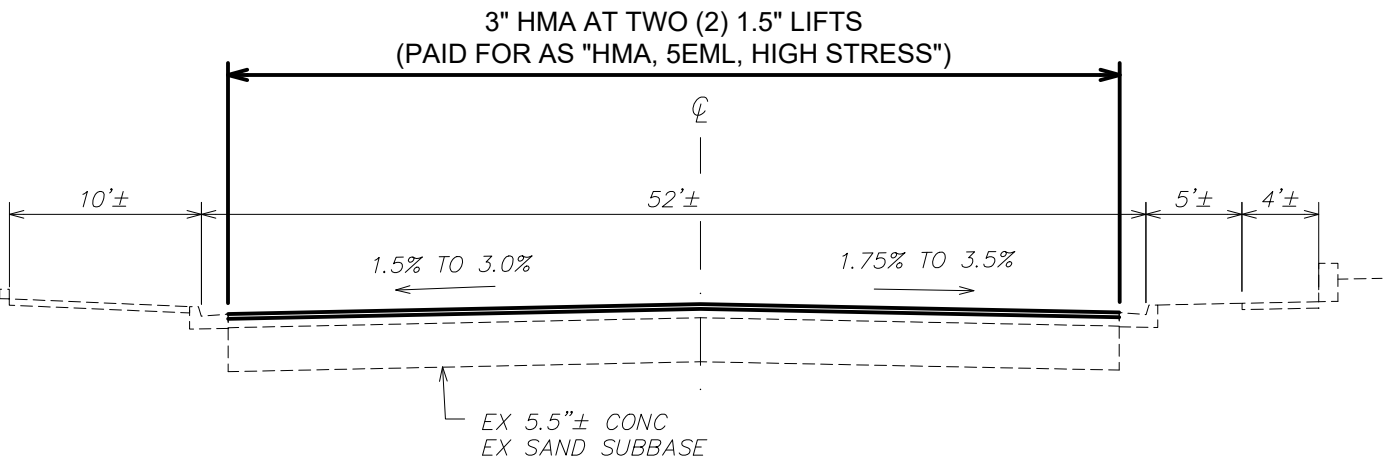
POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

## PROPOSED TYPICALS



PROPOSED TYPICAL SECTION  
STA 112+03 TO STA 116+34



PROPOSED TYPICAL SECTION  
STA 116+34 TO POE



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

PROPOSED TYPICALS

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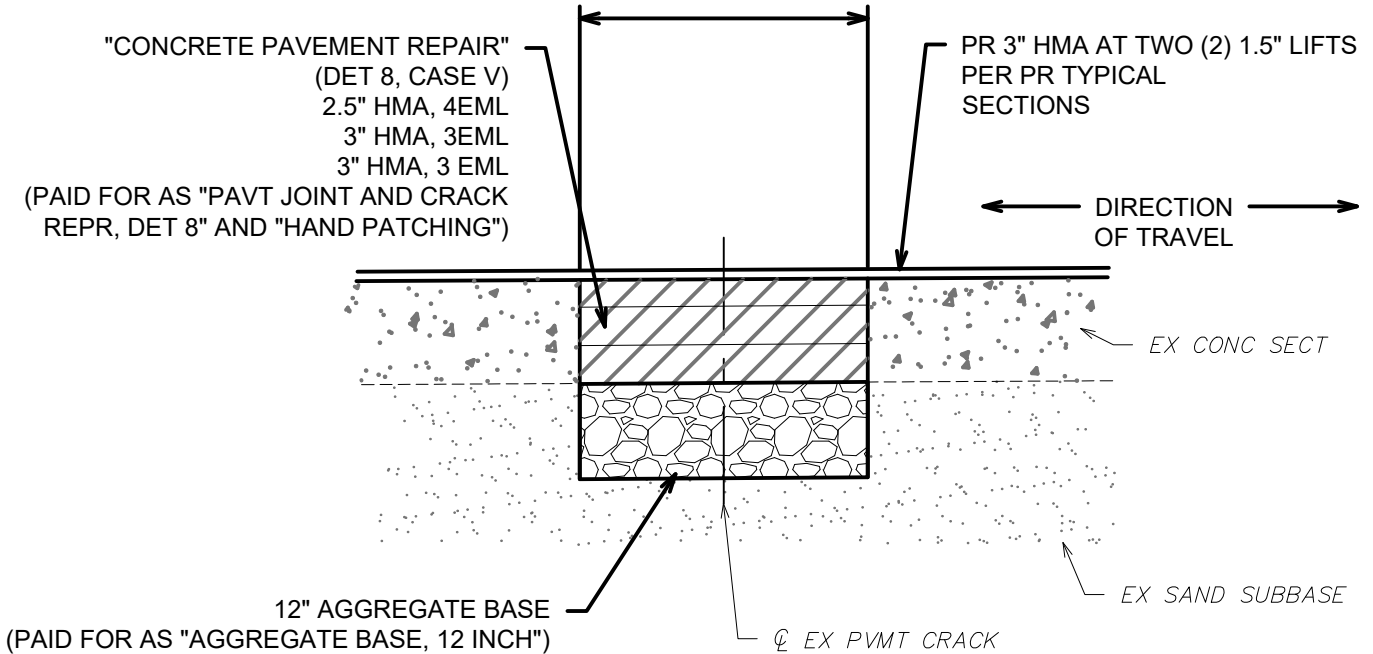
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## PROJECT BEGINNING AND END

POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

SEE SPECIAL DETAIL  
"CONCRETE PAVEMENT REPAIR"  
(DETAIL 8, CASE V)



FULL DEPTH PAVEMENT REPAIR DETAIL  
TO BE APPLIED AS DIRECTED BY ENGINEER

### NOTE:

THE REMOVAL OF 12" EXISTING SAND SUBBASE MATERIAL WILL BE NEEDED BEFORE INSTALLATION AND COMPACTION OF THE 12" AGGREGATE BASE. PAID FOR AS "EXCAVATION, EARTH."



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICH. 49506

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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

FULL DEPTH PAVEMENT REPAIR DETAIL

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**PROJECT BEGINNING AND END**

POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

**PAVEMENT MARKING TABLE**

THE FOLLOWING TABLE PROVIDES STATIONING FOR THE APPROXIMATE LOCATION OF PAVEMENT MARKING WORK ALONG RIVERVIEW DR.

THE CONTRACTOR SHALL INSTALL TEMPORARY PAVEMENT MARKING, "PAVT MRKG, WET REFLECTIVE, TYPE R, TAPE, 4 INCH, YELLOW, TEMP" AT THE TEMPORARY CENTERLINE FOLLOWING EACH NIGHT OF PAVING, IN ACCORDANCE WITH SECTION 812 OF THE 2020 MDOT STANDARD SPECIFICATION.


QUANTITIES FOR TEMPORARY TAPE TO BE PLACED ARE BASED ON 4 INCH STRIPS, 4 FOOT LONG, SPACED AT 25 FOOT INTERVALS CENTER TO CENTER. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO ENSURE THAT ALL TEMPORARY PAVEMENT MARKINGS ADHERE TO THE PAVEMENT SURFACE UNTIL PERMANENT MARKINGS ARE INSTALLED.

ALL PERMANENT MARKINGS, SHAPES, AND DIMENSIONS SHALL CONFORM TO THE MDOT PAVEMENT MARKING STANDARD PLANS AND SPECIAL DETAILS.

PROPOSED PAVEMENT MARKINGS SHALL BE AS OUTLINED ON THE PAVEMENT MARKING SHEETS. CONTRACTOR TO COORDINATE WITH THE CITY OF KALAMAZOO FOR VERIFICATION UTILIZING EXISTING PAVEMENT MARKING LOGS.

PROPOSED PAVEMENT MARKINGS THAT MATCH INTO EXISTING MARKINGS SHALL MATCH THE EXISTING PAVEMENT MARKING WIDTH, THROUGHOUT THE PROPOSED MARKING.

PAVEMENT MARKING - CENTERLINE		
BEG STA	END STA	DESCRIPTION
POB	100+23	DOUBLE YELLOW SOLID
101+49	104+47	DOUBLE YELLOW SOLID
105+83	108+47	DOUBLE YELLOW SOLID
108+47	108+53	SEE PED CROSSING DTL
108+53	109+07	DOUBLE YELLOW SOLID
109+07	109+13	SEE PED CROSSING DTL
109+13	POE	DOUBLE YELLOW SOLID

 <b>HUBBELL, ROTH &amp; CLARK, INC</b> CONSULTING ENGINEERS SINCE 1915 1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 22 OF 38
	DATE 11/06/2023	TABLE - PAVEMENT MARKINGS - CL	

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**RIVERVIEW DR 3" MILL AND RESURFACE PROJECT**

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**PROJECT BEGINNING AND END**


POINT OF BEGINNING (POB) STA: 100+21

POINT OF ENDING (POE) STA: 118+22

**PAVEMENT MARKING TABLE (CONTINUED)**

PAVEMENT MARKING - NORTHBOUND				
BEG STA	CL OFFSET	END STA	CL OFFSET	DESCRIPTION
POB	22'±	100+29	23'	SINGLE WHITE SOLID
100+22	0'	100+22	23'	2' WIDE, WHITE, STOP BAR
101+48	11'	POE	11'	SINGLE WHITE DASHED
117+40	11'	POE	22'	SINGLE WHITE SOLID
118+19	0'	118+19	36'	2' WIDE, WHITE, STOP BAR

PAVEMENT MARKING - SOUTHBOUND				
BEG STA	CL OFFSET	END STA	CL OFFSET	DESCRIPTION
POB	9.75'±	100+23	9.75'±	DOUBLE YELLOW SOLID
101+49	0'	101+49	23'	2' WIDE, WHITE, STOP BAR
101+49	11'	104+47	11'	SINGLE WHITE SOLID
101+79	16.5'			SOUTHBOUND WHITE ARROW
101+79	5.5'			EAST-TURN WHITE ARROW
102+34	16.5'			"ONLY" PAVEMENT MARKING
102+34	5.5'			"ONLY" PAVEMENT MARKING
102+84	16.5'			SOUTHBOUND WHITE ARROW
102+84	5.5'			EAST-TURN WHITE ARROW
103+39	16.5'			"ONLY" PAVEMENT MARKING
103+39	5.5'			"ONLY" PAVEMENT MARKING
103+89	16.5'			SOUTHBOUND WHITE ARROW
103+89	5.5'			EAST-TURN WHITE ARROW
104+44	16.5'			"ONLY" PAVEMENT MARKING
104+44	5.5'			"ONLY" PAVEMENT MARKING
104+47	11'	POE	11'	SINGLE WHITE DASHED

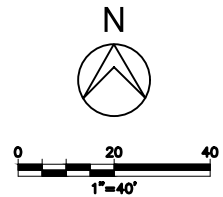
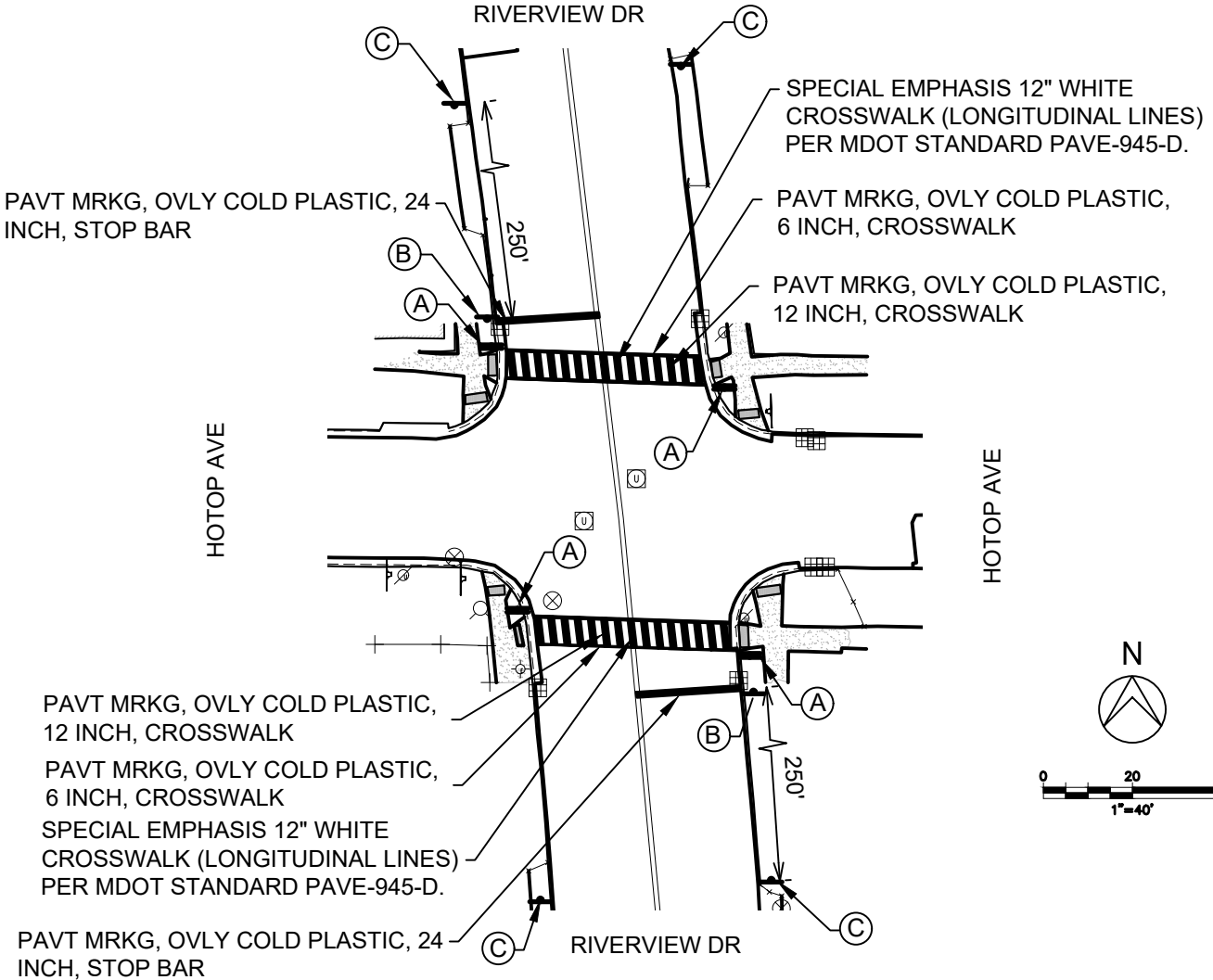
 <b>HUBBELL, ROTH &amp; CLARK, INC</b> CONSULTING ENGINEERS SINCE 1915 1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 23 OF 38
	DATE 11/06/2023	TABLE - PAVEMENT MARKINGS - DIRECTIONAL	

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

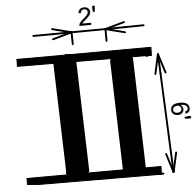
HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD



NOTE:

ADA RAMPS AND SIDEWALK WORK ARE NOT TO BE INCLUDED AS PART OF THIS PROJECT.



SPECIAL EMPHASIS CROSSWALK

<p>1925 BRETON ROAD, SE SUITE 100 GRAND RAPIDS, MICH. 49506</p>	HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 24 OF 38
	DATE 11/06/2023	ENHANCED PEDESTRIAN CROSSING DETAIL	



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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

HRC JOB NO. 20230591

LOCATED ALONG RIVERVIEW DR IN KALAMAZOO, MI, BETWEEN EAST MICHIGAN AVE AND GULL RD

**A**

NOTE: THESE SIGNS ARE DOUBLE SIDED.



PLACE SIGN, TYPE VB

W11-2 (48")  
16 SFT SIGN, TYPE VB  
32 FT 2- POST, STEEL, 3 POUND  
2- 6 FT REFLECTIVE PANEL FOR PERMANENT SIGN SUPPORT



PLACE SIGN, TYPE VB

W11-2 (48")  
16 SFT SIGN, TYPE VB  
32 FT 2- POST, STEEL, 3 POUND  
2- 6 FT REFLECTIVE PANEL FOR PERMANENT SIGN SUPPORT



PLACE SIGN, TYPE IIIB

W16-7PR (36" X 18")  
4.5 SFT SIGN, TYPE IIIB



PLACE SIGN, TYPE IIIB

W16-7PL (36" X 18")  
4.5 SFT SIGN, TYPE IIIB

**B**



PLACE SIGN, TYPE IIIB

R1-9 MOD (30"x10")  
2.1 SFT SIGN, TYPE IIIB



PLACE SIGN, TYPE IIIB

R1-5bL (30")  
9 SFT SIGN, TYPE IIIB  
16 FT 1-POST, STEEL, 3 POUND  
1- 6 FT REFLECTIVE PANEL FOR PERMANENT SIGN SUPPORT

**C**



PLACE SIGN, TYPE VB

W11-2 (48")  
16 SFT SIGN, TYPE VB  
32 FT 2- POST, STEEL, 3 POUND  
1-6 FT REFLECTIVE PANEL FOR PERMANENT SIGN SUPPORT



PLACE SIGN, TYPE IIIB

W16-9p (36"x18")  
4.5 SFT SIGN, TYPE IIIB

NOTE:  
W11-2, W16-7PL, W16-7PR, W16-9P  
SIGNS ARE TO BE FLUORESCENT  
YELLOW-GREEN.



1925 BRETON ROAD, SE SUITE 100  
GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591

DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

ENHANCED PEDESTRIAN CROSSING SIGNS

SHEET NO.

25 OF 38

# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

DocuSign Envelope ID: 48B1A4FF-085C-4E02-A578-CD7D9039649B



## BORING LOG TERMINOLOGY

UNIFIED SOIL CLASSIFICATION AND SYMBOL CHART		
COARSE-GRAINED SOIL (more than 50% of material is larger than No. 200 sieve size.)		
Clean Gravel (Less than 5% fines)		
GRAVEL More than 50% of coarse fraction larger than No. 4 sieve size		GW Well-graded gravel; gravel-sand mixtures, little or no fines
		GP Poorly-graded gravel; gravel-sand mixtures, little or no fines
Gravel with fines (More than 12% fines)		
		GM Silty gravel; gravel-sand-silt mixtures
		GC Clayey gravel; gravel-sand-clay mixtures
Clean Sand (Less than 5% fines)		
SAND 50% or more of coarse fraction smaller than No. 4 sieve size		SW Well-graded sand; sand-gravel mixtures, little or no fines
		SP Poorly graded sand; sand-gravel mixtures, little or no fines
Sand with fines (More than 12% fines)		
		SM Silty sand; sand-silt-gravel mixtures
		SC Clayey sand; sand-clay-gravel mixtures
FINE-GRAINED SOIL (50% or more of material is smaller than No. 200 sieve size)		
SILT AND CLAY Liquid limit less than 50%		ML Inorganic silt; sandy silt or gravelly silt with slight plasticity
		CL Inorganic clay of low plasticity; lean clay, sandy clay, gravelly clay
		OL Organic silt and organic clay of low plasticity
SILT AND CLAY Liquid limit 50% or greater		MH Inorganic silt of high plasticity, elastic silt
		CH Inorganic clay of high plasticity, fat clay
		OH Organic silt and organic clay of high plasticity
		PT Peat and other highly organic soil

OTHER MATERIAL SYMBOLS					
	Topsoil		Void		Sandstone
	Asphalt Concrete		Glacial Till		Siltstone
	Aggregate Base		Coal		Limestone
	Portland Cement Concrete		Shale		Fill

LABORATORY CLASSIFICATION CRITERIA	
GW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 4; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3
GP	Not meeting all gradation requirements for GW
GM	Atterberg limits below "A" line or PI less than 4
GC	Atterberg limits above "A" line with PI greater than 7
SW	$C_u = \frac{D_{60}}{D_{10}}$ greater than 6; $C_c = \frac{D_{30}^2}{D_{10} \times D_{60}}$ between 1 and 3
SP	Not meeting all gradation requirements for SW
SM	Atterberg limits below "A" line or PI less than 4
SC	Atterberg limits above "A" line with PI greater than 7

Determine percentages of sand and gravel from grain-size curve. Depending on percentage of fines (fraction smaller than No. 200 sieve size), coarse-grained soils are classified as follows:

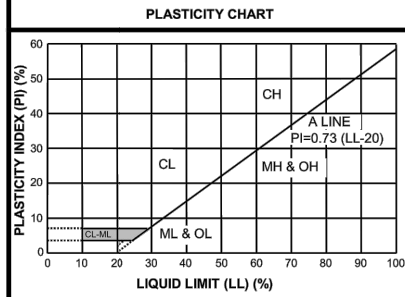
Less than 5 percent.....GW, GP, SW, SP  
 More than 12 percent.....GM, GC, SM, SC  
 5 to 12 percent.....Cases requiring dual symbols

- SP-SM or SW-SM (SAND with Silt or SAND with Silt and Gravel)
- SP-SC or SW-SC (SAND with Clay or SAND with Clay and Gravel)
- GP-GM or GW-GM (GRAVEL with Silt or GRAVEL with Silt and Sand)
- GP-GC or GW-GC (GRAVEL with Clay or GRAVEL with Clay and Sand)

If the fines are CL-ML:

- SC-SM (SILTY CLAYEY SAND or SILTY CLAYEY SAND with Gravel)
- SM-SC (CLAYEY SILTY SAND or CLAYEY SILTY SAND with Gravel)
- GC-GM (SILTY CLAYEY GRAVEL or SILTY CLAYEY GRAVEL with Sand)

PARTICLE SIZES	
Boulders	- Greater than 12 inches
Cobbles	- 3 inches to 12 inches
Gravel- Coarse	- 3/4 inches to 3 inches
Gravel- Fine	- No. 4 to 3/4 inches
Sand- Coarse	- No. 10 to No. 4
Sand- Medium	- No. 40 to No. 10
Sand- Fine	- No. 200 to No. 40
Silt and Clay	- Less than (0.074 mm)



**VISUAL MANUAL PROCEDURE**

When laboratory tests are not performed to confirm the classification of soils exhibiting borderline classifications, the two possible classifications would be separated with a slash, as follows:

For soils where it is difficult to distinguish if it is a coarse or fine-grained soil:

- SC/CL (CLAYEY SAND to SANDY LEAN CLAY)
- SM/ML (SILTY SAND to SANDY SILT)
- GC/CL (CLAYEY GRAVEL to GRAVELLY LEAN CLAY)
- GM/ML (SILTY GRAVEL to GRAVELLY SILT)

For soils where it is difficult to distinguish if it is sand or gravel, poorly or well-graded sand or gravel, silt or clay, or plastic or non-plastic silt or clay:

- SP/GP or SW/GW (SAND with Gravel to GRAVEL with Sand)
- SC/GC (CLAYEY SAND with Gravel to CLAYEY GRAVEL with Sand)
- SM/GM (SILTY SAND with Gravel to SILTY GRAVEL with Sand)
- SW/SP (SAND or SAND with Gravel)
- GP/GW (GRAVEL or GRAVEL with Sand)
- SC/SM (CLAYEY to SILTY SAND)
- GM/GC (SILTY to CLAYEY GRAVEL)
- CL/ML (SILTY CLAY)
- ML/CL (CLAYEY SILT)
- CH/MH (FAT CLAY to ELASTIC SILT)
- CL/CH (LEAN to FAT CLAY)
- MH/ML (ELASTIC SILT to SILT)

DRILLING AND SAMPLING ABBREVIATIONS	
2ST	- Shelby Tube - 2" O.D.
3ST	- Shelby Tube - 3" O.D.
AS	- Auger Sample
GS	- Grab Sample
LS	- Liner Sample
NR	- No Recovery
PM	- Pressuremeter
RC	- Rock Core diamond bit. NX size, except where noted
SB	- Split Barrel Sample 1-3/8" I.D., 2" O.D., except where noted
VS	- Vane Shear
WS	- Wash Sample

OTHER ABBREVIATIONS	
WOH	- Weight of Hammer
WOR	- Weight of Rods
SP	- Soil Probe
PID	- Photo Ionization Device
FID	- Flame Ionization Device

DEPOSITIONAL FEATURES	
Parting	- as much as 1/16 inch thick
Seam	- 1/16 inch to 1/2 inch thick
Layer	- 1/2 inch to 12 inches thick
Stratum	- greater than 12 inches thick
Pocket	- deposit of limited lateral extent
Lens	- lenticular deposit
Hardpan/Till	- an unstratified, consolidated or cemented mixture of clay, silt, sand and/or gravel, the size/shape of the constituents vary widely
Lacustrine	- soil deposited by lake water
Mottled	- soil irregularly marked with spots of different colors that vary in number and size
Varved	- alternating partings or seams of silt and/or clay
Occasional	- one or less per foot of thickness
Frequent	- more than one per foot of thickness
Interbedded	- strata of soil or beds of rock lying between or alternating with other strata of a different nature

**DESCRIPTION OF RELATIVE QUANTITIES**

The visual-manual procedure uses the following terms to describe the relative quantities of notable foreign materials, gravel, sand or fines:

Trace - particles are present but estimated to be less than 5%  
 Few - 5 to 10%  
 Little - 15 to 25%  
 Some - 30 to 45%  
 Mostly - 50 to 100%

CLASSIFICATION TERMINOLOGY AND CORRELATIONS			
<b>Cohesionless Soils</b>		<b>Cohesive Soils</b>	
<b>Relative Density</b>	<b>N<sub>60</sub> (N-Value) (Blows per foot)</b>	<b>Consistency</b>	<b>N<sub>60</sub> (N-Value) (Blows per foot)</b>
Very Loose	0 to 4	Very Soft	<2
Loose	5 to 10	Soft	2 - 4
Medium Dense	11 to 30	Medium	5 - 8
Dense	31 to 50	Stiff	9 - 15
Very Dense	51 to 80	Very Stiff	16 - 30
Extremely Dense	Over 81	Hard	> 30
		<b>Undrained Shear Strength (kips/ft<sup>2</sup>)</b>	
		< 0.25 or less	
		> 0.25 to 0.50	
		> 0.50 to 1.0	
		> 1.0 to 2.0	
		> 2.0 to 4.0	
		> 4.0 or greater	

Standard Penetration 'N-Value' = Blows per foot of a 140-pound hammer falling 30 inches on a 2-inch O.D. split barrel sampler, except where noted. N<sub>60</sub> values as reported on boring logs represent raw N-values corrected for hammer efficiency only.

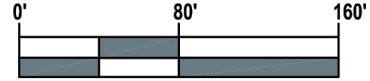
Revised 10/06/20

**HRC**  
**HUBBELL, ROTH & CLARK, INC**  
 CONSULTING ENGINEERS SINCE 1915

1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 26 OF 38
DATE 11/06/2023	BORE LEGEND	

# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591



GRAPHIC SCALE: 1" = 80'

## LEGEND

 APPROXIMATE BORING LOCATION

### NOTE:

1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO WITH AN IMAGE DATE OF 06-30-2022.



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591

DATE  
11/06/2023

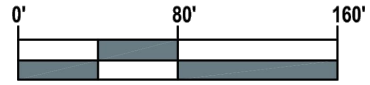
RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE LOCATIONS

SHEET NO.

27 OF 38

# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591



GRAPHIC SCALE: 1" = 80'

## LEGEND

 APPROXIMATE BORING LOCATION

### NOTE:

1. AERIAL IMAGE TAKEN FROM GOOGLE EARTH PRO WITH AN IMAGE DATE OF 06-30-2022.



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591

DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE LOCATIONS

SHEET NO.

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

DocuSign Envelope ID: 48B1A4FF-085C-4E02-A578-CD7D9039649B



## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B1  
 STREET: Riverview Drive  
 LANE: Northbound Right Turn Lane  
 OFFSET: 26 Feet East of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3	3	ASPHALT PAVEMENT	Intact - Layer Change at 1.5"
3	8 1/2	5 1/2	PORTLAND CEMENT CONCRETE	Intact - No Resteele Observed
8 1/2	36	27 1/2	FILL - Fine to Medium SAND with Silt - Brown - Moist (SP-SM)	
36	48	12	Fine to Medium SILTY SAND - Brown - Moist (SM)	
48	54	6	SILT - Brown (ML)	
54	60	6	Fine to Medium SAND - Brown - Moist (SP)	
End of Boring at 5 Feet				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

#### NOTES:

- The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

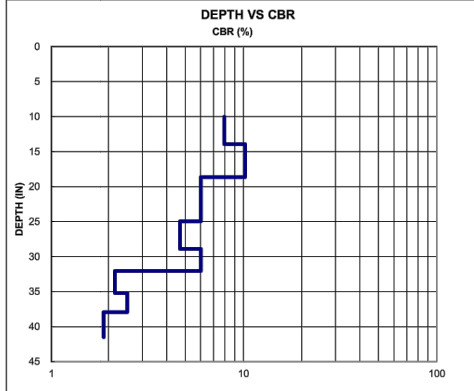
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 10 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	370								
8	470	100	13	2	13.9	7.9	Marginal	Subgrade	
6	530	60	10	2	16.3	10.2	Good	Subgrade	
6	590	60	10	2	18.7	10.2	Good	Subgrade	
5	670	80	16	2	21.8	6.0	Marginal	Subgrade	
5	750	80	16	2	25.0	6.0	Marginal	Subgrade	7.8
5	850	100	20	2	28.9	4.7	Poor	Subgrade	
5	930	80	16	2	32.0	6.0	Marginal	Subgrade	
2	1010	80	40	2	35.2	2.2	Very Poor	Subgrade	
2	1080	70	35	2	38.0	2.5	Very Poor	Subgrade	
2	1170	90	45	2	41.5	1.9	Very Poor	Subgrade	3.5

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



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Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/1 4- Sand DCP



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
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DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B1

SHEET NO.

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B2  
 STREET: Riverview Drive  
 LANE: Northbound Inside Lane  
 OFFSET: 5 Feet East of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3 1/2	3 1/2	ASPHALT PAVEMENT	Intact - Layer Change at 1.5"
3 1/2	12	8 1/2	PORTLAND CEMENT CONCRETE	Intact - Resteel Observed at 7.5"
12	72	60	FILL - Fine to Medium SAND with Silt - Brown - Moist (SP-SM)	
72	120	48	Fine to Coarse SAND - Occasional Silt Layers - Brown and Gray - Moist to Wet (SP)	Petroleum Odor Noted in Sample
120	192	72	Fine to Coarse SAND - Brown and Dark Brown - Wet (SP)	Petroleum Odor Noted in Sample
<b>End of Boring at 16 Feet</b>				

Depth to Groundwater From Ground Surface  
 Upon Completion: 7 Feet

#### NOTES:

- The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

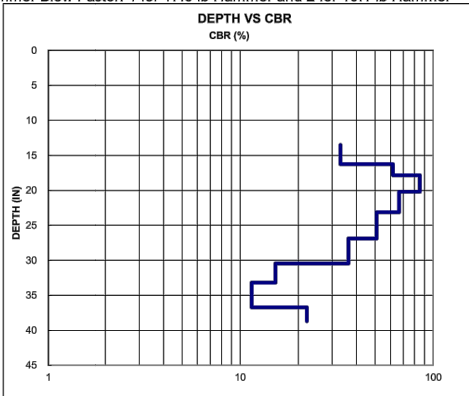
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 13.5 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	470	0							
10	540	70	7	1	16.3	33.0	Good	Subgrade	
10	580	40	4	1	17.8	61.8	Good	Subgrade	
10	610	30	3	1	19.0	85.3	Good	Subgrade	
10	640	30	3	1	20.2	85.3	Good	Subgrade	
20	715	75	4	1	23.1	66.4	Good	Subgrade	
20	810	95	5	1	26.9	51.0	Good	Subgrade	
14	900	90	6	1	30.4	36.3	Good	Subgrade	
5	970	70	14	1	33.2	15.2	Good	Subgrade	
5	1060	90	18	1	36.7	11.5	Good	Subgrade	
5	1110	50	10	1	38.7	22.2	Good	Subgrade	40.9

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



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Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
 CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14- Sand DCP



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591

DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B2

SHEET NO.

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B3  
 STREET: Riverview Drive  
 LANE: Southbound Inside Lane  
 OFFSET: 4 Feet West of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3 1/4	3 1/4	ASPHALT PAVEMENT	Intact - Layer Change at 1.75"
3 1/4	11 1/2	8 1/4	PORTLAND CEMENT CONCRETE	Intact - Re-steel Observed at 7.5"
11 1/2	54	42 1/2	FILL - Fine to Medium SILTY SAND - Occasional Silt Layers - Dark Brown - Moist (SM)	
54	66	12	Fine to Medium CLAYEY SAND - Frequent Clay and Topsoil Seams - Dark Brown - Moist (SC)	Loss-on-ignition = 3.9% at 56" - Petroleum Odor Noted in Sample
66	96	30	Fine to Medium SILTY to CLAYEY SAND - Brown and Gray - Moist to Wet (SM/SC)	
96	132	36	Fine to Medium SAND with Silt - Brown and Gray - Wet (SP-SM)	Petroleum Odor Noted in Sample
132	156	24	Fine to Coarse SAND with Gravel - Brown - Wet (SP)	
<b>End of Boring at 13 Feet</b>				

Depth to Groundwater From Ground Surface  
 Upon Completion: 7 Feet

#### NOTES:

- 1) The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- 2) HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

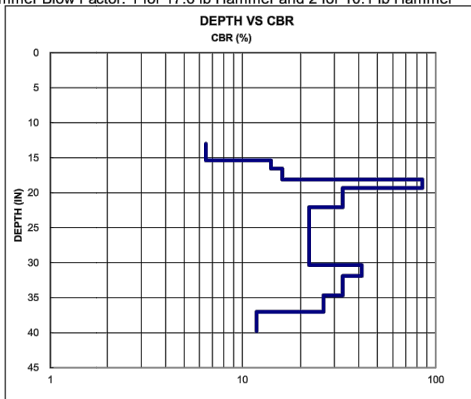
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 13 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	450	0							
2	510	60	30	1	15.4	6.5	Marginal	Subgrade	
2	540	30	15	1	16.5	14.1	Good	Subgrade	
3	580	40	13	1	18.1	16.0	Good	Subgrade	
10	610	30	3	1	19.3	85.3	Good	Subgrade	
10	680	70	7	1	22.1	33.0	Good	Subgrade	
7	750	70	10	1	24.8	22.2	Good	Subgrade	
7	820	70	10	1	27.6	22.2	Good	Subgrade	
7	890	70	10	1	30.3	22.2	Good	Subgrade	
7	930	40	6	1	31.9	41.5	Good	Subgrade	
10	1000	70	7	1	34.7	33.0	Good	Subgrade	
7	1060	60	9	1	37.0	26.3	Good	Subgrade	
4	1130	70	18	1	39.8	11.8	Good	Subgrade	25.5

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



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Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
 CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14- Sand DCP



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591

DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B3

SHEET NO.

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B4  
 STREET: Riverview Drive  
 LANE: Southbound Outside Lane  
 OFFSET: 19 Feet West of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	2 1/2	2 1/2	ASPHALT PAVEMENT	Vertical Cracks - Delaminated at Bottom
2 1/2	11	8 1/2	PORTLAND CEMENT CONCRETE	Deteriorated into Pieces above 8" - Re-steel Observed at 9.5"
11	26	15	FILL - Fine to Medium SAND with Silt - Dark Brown and Brown - Moist (SP-SM)	
26	48	22	Fine to Medium SAND with Silt - Brown - Moist (SP-SM)	
48	60	12	Fine to Medium SAND - Brown - Moist (SP)	
End of Boring at 5 Feet				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

#### NOTES:

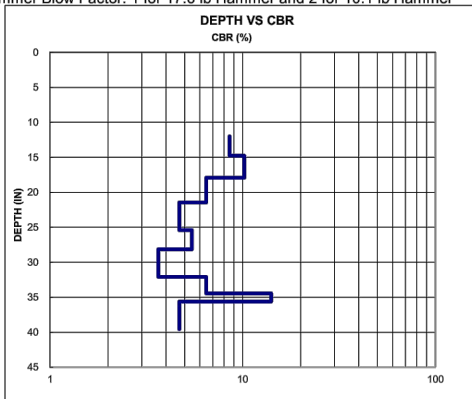
- The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

### DCP TEST RESULTS

No. of Blows	Pen. (mm)	Blow Set (mm)	12 inches		Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
			Pen./Blow (mm)	Blow Factor					
0	440	0							
6	510	70	12	2	14.8	8.6	Marginal	Subgrade	
8	590	80	10	2	17.9	10.2	Good	Subgrade	
6	680	90	15	2	21.4	6.5	Marginal	Subgrade	8.3
5	780	100	20	2	25.4	4.7	Poor	Subgrade	
4	850	70	18	2	28.1	5.4	Marginal	Subgrade	
4	950	100	25	2	32.1	3.7	Poor	Subgrade	4.5
4	1010	60	15	2	34.4	6.5	Marginal	Subgrade	
4	1040	30	8	2	35.6	14.1	Good	Subgrade	
5	1140	100	20	2	39.6	4.7	Poor	Subgrade	6.7

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



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Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
 CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/1 4- Sand DCP



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591

DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B4

SHEET NO.

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

DocuSign Envelope ID: 48B1A4FF-085C-4E02-A578-CD7D9039649B



## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B5  
 STREET: Riverview Drive  
 LANE: Northbound Outside Lane  
 OFFSET: 14 Feet East of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	2	2	ASPHALT PAVEMENT	Partially Deteriorated - Delaminated at Bottom
2	11	9	PORTLAND CEMENT CONCRETE	Horizontal Crack at 5.5" - Resteel Observed at 5.5"
11	24	13	FILL - Fine to Medium SILTY SAND - Dark Brown and Brown - Moist (SM)	
24	60	36	Fine to Medium SAND - Brown - Moist (SP)	
End of Boring at 5 Feet				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

NOTES:  
 1) The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.  
 2) HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

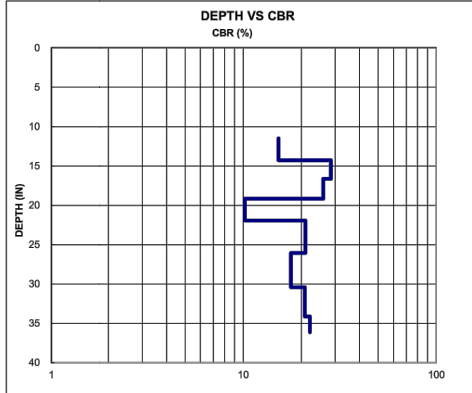
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 11.5 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	445	0							
10	515	70	7	2	14.3	15.2	Good	Subgrade	
15	575	60	4	2	16.6	28.4	Good	Subgrade	
15	640	65	4	2	19.2	26.0	Good	Subgrade	
7	710	70	10	2	21.9	10.2	Good	Subgrade	
20	815	105	5	2	26.1	21.0	Good	Subgrade	
18	925	110	6	2	30.4	17.7	Good	Subgrade	
18	1020	95	5	2	34.1	20.8	Good	Subgrade	
10	1070	50	5	2	36.1	22.2	Good	Subgrade	19.9

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
 CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14 - Sand DCP

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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B5

SHEET NO.

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B6  
 STREET: Riverview Drive  
 LANE: Northbound Inside Lane  
 OFFSET: 3 Feet East of Centerline  
 GROUND EL.: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3 1/2	3 1/2	ASPHALT PAVEMENT	Intact - Layer Change at 1.75" - Delaminated at Bottom
3 1/2	11	7 1/2	PORTLAND CEMENT CONCRETE	Intact - No Resteel Observed
11	30	19	FILL - Fine to Medium SILTY SAND - Occasional Topsoil Seams and Asphalt Pieces - Dark Brown - Moist (SM)	
30	54	24	FILL - Fine to Coarse SAND with Silt - Brown - Moist (SP-SM)	
54	60	6	Fine to Medium SAND - Brown - Moist (SP)	
End of Boring at 5 Feet				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

#### NOTES:

- The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

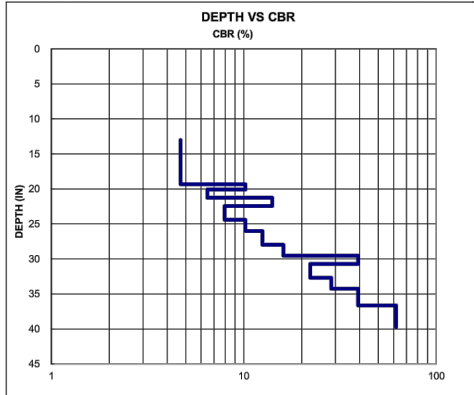
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 13 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	450	0							
1	490	40	40	1	14.6	4.7	Poor	Subgrade	
1	530	40	40	1	16.1	4.7	Poor	Subgrade	
1	570	40	40	1	17.7	4.7	Poor	Subgrade	
1	610	40	40	1	19.3	4.7	Poor	Subgrade	4.7
1	630	20	20	1	20.1	10.2	Good	Subgrade	
1	660	30	30	1	21.3	6.5	Marginal	Subgrade	
2	690	30	15	1	22.4	14.1	Good	Subgrade	
2	740	50	25	1	24.4	7.9	Marginal	Subgrade	
2	780	40	20	1	26.0	10.2	Good	Subgrade	
3	830	50	17	1	28.0	12.5	Good	Subgrade	
3	870	40	13	1	29.5	16.0	Good	Subgrade	
5	900	30	6	1	30.7	39.3	Good	Subgrade	
5	950	50	10	1	32.7	22.2	Good	Subgrade	
5	990	40	8	1	34.3	28.4	Good	Subgrade	
10	1050	60	6	1	36.6	39.3	Good	Subgrade	
10	1090	40	4	1	38.2	61.8	Good	Subgrade	
10	1130	40	4	1	39.8	61.8	Good	Subgrade	26.2

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



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Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14 - Sand DCP



1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B6

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

DocuSign Envelope ID: 48B1A4FF-085C-4E02-A578-CD7D9039649B



## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B7  
 STREET: Riverview Drive  
 LANE: Southbound Inside Lane  
 OFFSET: 5 Feet West of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3	3	ASPHALT PAVEMENT	Intact - Layer Change at 1.5" - Delaminated at Bottom
3	11 1/2	8 1/2	PORTLAND CEMENT CONCRETE	Intact - Resteel Observed at 6.75"
11 1/2	52	40 1/2	FILL - Fine to Medium SILTY SAND with Gravel - Dark Brown and Brown - Moist (SM)	
52	60	8	Fine to Medium SAND - Brown - Moist (SP)	
End of Boring at 5 Feet				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

#### NOTES:

- 1) The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- 2) HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

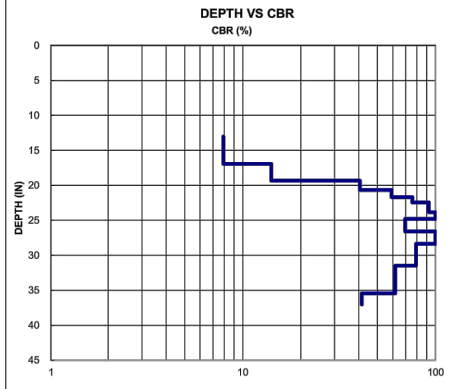
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 13 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	450	0		2					
8	550	100	13	2	16.9	7.9	Marginal	Subgrade	
8	610	60	8	2	19.3	14.1	Good	Subgrade	
12	645	35	3	2	20.7	40.5	Good	Subgrade	
12	670	25	2	2	21.7	59.0	Good	Subgrade	
12	690	20	2	2	22.4	75.8	Good	Subgrade	
25	725	35	1	2	23.8	92.2	Good	Subgrade	
25	750	25	1	2	24.8	100.0	Good	Subgrade	
25	795	45	2	2	26.6	69.6	Good	Subgrade	
25	820	25	1	2	27.6	100.0	Good	Subgrade	
16	840	20	1	2	28.4	100.0	Good	Subgrade	
25	920	80	3	1	31.5	79.4	Good	Subgrade	
25	1020	100	4	1	35.4	61.8	Good	Subgrade	
7	1060	40	6	1	37.0	41.5	Good	Subgrade	55.1

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
 CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14-Sand DCP

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 1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

HRC JOB NO.  
20230591  
 DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT  
 BORE - B7

SHEET NO.  
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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B8  
 STREET: Riverview Drive  
 LANE: Northbound Outside Lane  
 OFFSET: 16 Feet East of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3 3/4	3 3/4	ASPHALT PAVEMENT	Partially Deteriorated - Deteriorated Below 2"
3 3/4	11	7 1/4	PORTLAND CEMENT CONCRETE	Vertical Cracks - Resteel at 7" - Deteriorated into Pieces Below 7.5"
11	36	25	FILL - Fine to Medium SILTY SAND with Gravel - Brown - Moist (SM)	
36	60	24	Fine to Medium SAND - Brown - Moist (SP)	
End of Boring at 5 Feet				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

NOTES:  
 1) The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.  
 2) HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

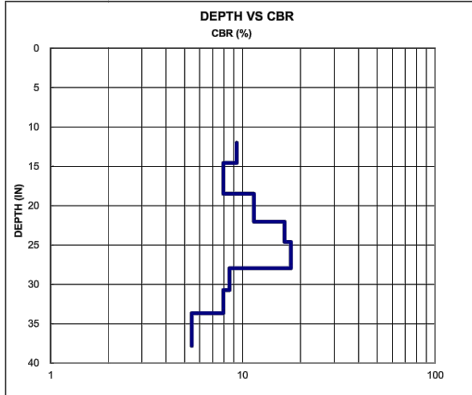
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 12 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	465	0							
3	530	65	22	1	14.6	9.3	Marginal	Subgrade	
4	630	100	25	1	18.5	7.9	Marginal	Subgrade	
5	720	90	18	1	22.0	11.5	Good	Subgrade	
5	785	65	13	1	24.6	16.5	Good	Subgrade	
7	870	85	12	1	27.9	17.8	Good	Subgrade	
3	940	70	23	1	30.7	8.6	Marginal	Subgrade	
3	1015	75	25	1	33.7	7.9	Marginal	Subgrade	
3	1120	105	35	1	37.8	5.4	Marginal	Subgrade	10.4

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14-Sand DCP

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RIVERVIEW DR 3" MILL AND RESURFACE PROJECT  
 BORE - B8

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B9  
 STREET: Riverview Drive  
 LANE: Southbound Outside Lane  
 OFFSET: 16 Feet West of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	2 1/2	2 1/2	ASPHALT PAVEMENT	Intact - Layer Change at 1.75"
2 1/2	10	7 1/2	PORTLAND CEMENT CONCRETE	Intact - Resteeel Observed at 5.5"
10	30	20	FILL - Fine to Medium SAND with Silt - Occasional Clay Layers - Dark Brown and Brown - Moist (SP-SM)	
30	48	18	FILL - Fine SAND - Brown - Moist (SP)	
48	60	12	FILL - Fine to Medium SILTY SAND - Occasional Topsoil Layers - Brown to Dark Brown - Moist (SM)	Loss-on-ignition = 3.5% at 58" (Test performed on a topsoil layer)
			<b>End of Boring at 5 Feet</b>	

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

#### NOTES:

- The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.

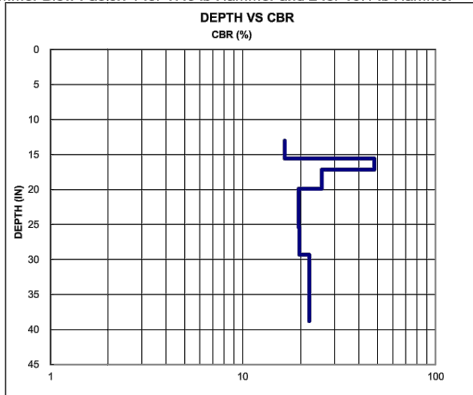
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 13 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	425	0							
10	490	65	7	2	15.6	16.5	Good	Subgrade	
16	530	40	3	2	17.1	48.1	Good	Subgrade	
16	600	70	4	2	19.9	25.7	Good	Subgrade	
25	740	140	6	2	25.4	19.5	Good	Subgrade	
18	840	100	6	2	29.3	19.7	Good	Subgrade	
20	940	100	5	2	33.3	22.2	Good	Subgrade	
8	980	40	5	2	34.9	22.2	Good	Subgrade	
10	1030	50	5	2	36.8	22.2	Good	Subgrade	
10	1080	50	5	2	38.8	22.2	Good	Subgrade	22.6

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness  
 CORE LOG DCP 1 meter rod (standard).XLS ver. 2/7/14-Sand DCP

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HRC JOB NO. 20230591	RIVERVIEW DR 3" MILL AND RESURFACE PROJECT	SHEET NO. 37 OF 38
DATE 11/06/2023	BORE - B9	

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# RIVERVIEW DR 3" MILL AND RESURFACE PROJECT / HRC JOB NO. 20230591

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## BORING DATA SHEET

PROJECT NAME: Riverview Drive Resurfacing  
 PROJECT NO.: 093806.00  
 LOCATION: Kalamazoo, Michigan  
 CLIENT: Hubbell, Roth & Clark, Inc.  
 DATE: 8/23/23  
 DRILLED BY: TMB / JWM  
 LOGGED BY: JWM / ZLM

BORING: B10  
 STREET: Riverview Drive  
 LANE: Northbound Outside Lane  
 OFFSET: 15 Feet East of Centerline  
 GROUND EL: Not Determined

### PAVEMENT AND SUBSURFACE CONDITIONS

Layer, in.		Layer Thickness, in.	Description	Comment
From	To			
0	3	3	ASPHALT PAVEMENT	Intact - Layer Change at 1.5" - Delaminated at Bottom
3	10 1/2	7 1/2	PORTLAND CEMENT CONCRETE	Intact - Resteel Observed at 5"
10 1/2	22	11 1/2	FILL - Fine to Medium SILTY SAND - Brown and Dark Brown - Moist (SM)	
22	36	14	FILL - CLAYEY SILT - Occasional Topsoil and Sand Layers - Dark Gray - Very Stiff (CL/ML)	LOI = 4.6% at 32" (See Note 3) HP = 2.25 KSF & MC = 23% at 32"
36	60	24	Fine to Medium SILTY SAND - Trace Organics - Gray - Moist (SM)	Loss-on-ignition = 3.0% at 54"
<b>End of Boring at 5 Feet</b>				

Depth to Groundwater From Ground Surface  
 Upon Completion: Not Encountered

#### NOTES:

- 1) The indicated stratification lines are approximate. In situ, the transition between materials may be gradual.
- 2) HP = Hand Penetrometer. KSF = Kips per Square Foot (Shear Strength). MC = Moisture Content.
- 3) LOI = Loss-on-ignition. Test performed on a topsoil layer.

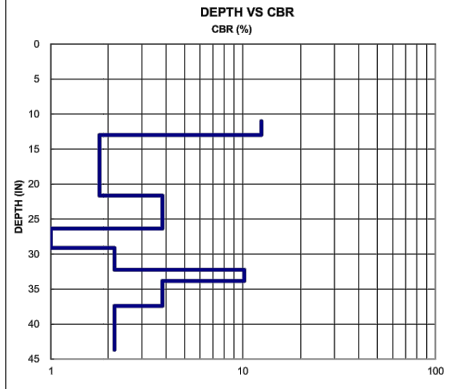
### DCP TEST RESULTS

Depth to start of test from ex. ground surface: 11 inches

No. of Blows	Pen. (mm)	Blow Set (mm)	Pen./Blow (mm)	Blow Factor	Depth from Surface (inches)	CBR (%)	Comment	Soil Type	Average CBR (%)
0	280	0							
3	330	50	17	1	13.0	12.5	Good	Subgrade	12.5
5	550	220	44	1	21.6	1.8	Very Poor	Subgrade	
4	670	120	30	1	26.4	3.8	Poor	Subgrade	
1	740	70	70	1	29.1	0.7	Very Poor	Subgrade	
2	820	80	40	1	32.3	2.2	Very Poor	Subgrade	
2	860	40	20	1	33.8	10.2	Good	Subgrade	
3	950	90	30	1	37.4	3.8	Poor	Subgrade	
2	1030	80	40	1	40.5	2.2	Very Poor	Subgrade	
2	1110	80	40	1	43.7	2.2	Very Poor	Subgrade	2.8

Hammer Blow Factor: 1 for 17.6 lb Hammer and 2 for 10.1 lb Hammer

\*CBR breaklines are based on blow counts performed prior to sampling. Depths are approximate.



Support Conditions	CBR Range for Aggregate Base Materials (%)	CBR Range for Subgrade Soils (%)
Good	>80	>10
Marginal	60 to 80	5 to 10
Poor	30 to 60	3 to 5
Very Poor	<30	<3



\*\*Core picture shows approximate thickness

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 CONSULTING ENGINEERS SINCE 1915

1925 BRETON ROAD, SE SUITE 100  
 GRAND RAPIDS, MICH. 49506

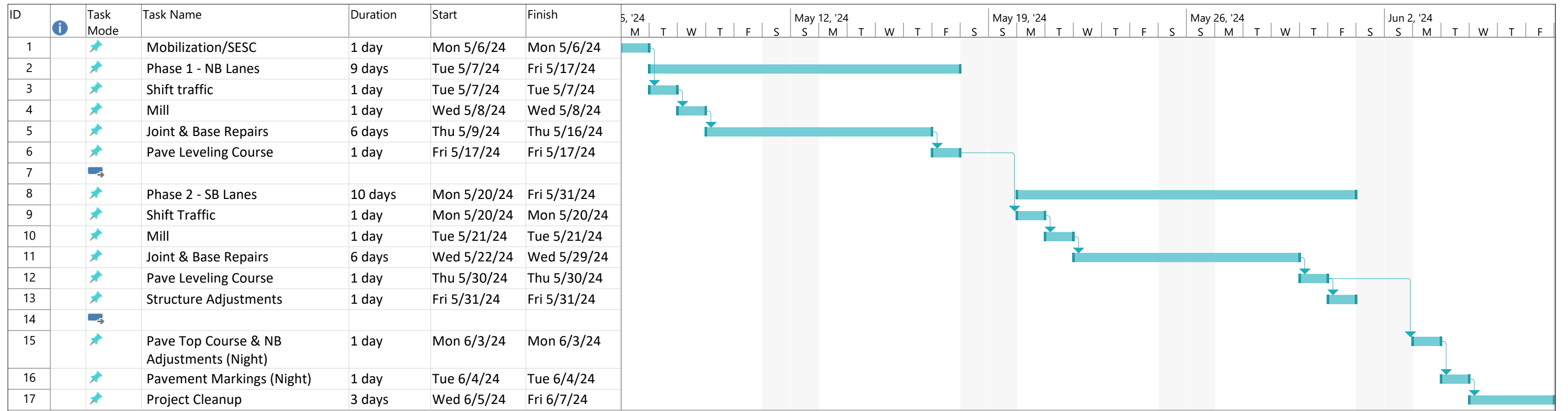
HRC JOB NO.  
20230591

DATE  
11/06/2023

RIVERVIEW DR 3" MILL AND RESURFACE PROJECT

BORE - B10

SHEET NO.  
38 OF 38



Project: Riverview_Construction Date: Thu 10/26/23	Task		Project Summary		Manual Task		Start-only		Deadline	
	Split		Inactive Task		Duration-only		Finish-only		Progress	
	Milestone		Inactive Milestone		Manual Summary Rollup		External Tasks		Manual Progress	
	Summary		Inactive Summary		Manual Summary		External Milestone			