KANSAS CITY AREA TRANSPORTATION AUTHORITY WITH
CITY OF KANSAS CITY, MISSOURI
KANSAS CITY STREETCAR AUTHORITY
PORT AUTHORITY OF KANSAS CITY, MO
KANSAS CITY STREETCAR

RIVERFRONT EXTENSION
FTA FAIN # MO-2022-002-00
KCATA PROJECT No.: 2021-SC-3P01
KCMO PROJECT No.: 89022015
ISSUED FOR BID
DECEMBER 2022
(T49N, R33W)

https://www.kcata.org/about_kcata/entries/current_opportunities

This work will be called Package 6 (Proj 6) and will be posted on KCATA’s website for a General Contractor bid.

These plans have been separated into different packets to assist potential subcontractors in reviewing their potential scopes of work.
<table>
<thead>
<tr>
<th>PC</th>
<th>Description</th>
<th>Sheet 1</th>
<th>Sheet 2</th>
<th>Sheet 3</th>
<th>Sheet 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>DESCRIPTION OF THE PROJECT</td>
<td>Sheet 1</td>
<td>Sheet 2</td>
<td>Sheet 3</td>
<td>Sheet 4</td>
</tr>
<tr>
<td>2</td>
<td>SHEET 1 - PLAN VIEW</td>
<td>Sheet 2</td>
<td>Sheet 3</td>
<td>Sheet 4</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>SHEET 2 - ELEVATION VIEW</td>
<td>Sheet 3</td>
<td>Sheet 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>SHEET 3 - FOUNDATION PLAN</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>SHEET 4 - DETAIL</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

INDEX OF DRAWINGS

SHEET 2

NOT FOR CONSTRUCTION

DATE: 12-23-2020

G011 3
<table>
<thead>
<tr>
<th>PK</th>
<th>Description</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
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</tr>
<tr>
<td>2</td>
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<td></td>
</tr>
<tr>
<td>3</td>
<td>Index</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>Sheet</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Legend</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Section</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>Detail</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>Figure</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>Annotation</td>
<td></td>
</tr>
</tbody>
</table>

**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

INDEX OF DRAWINGS

SHEET 3

NOT FOR CONSTRUCTION
<table>
<thead>
<tr>
<th>STANDBD AbbREviAtiONS</th>
<th>GENERAL AbbREviAtiONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
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<tr>
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**RideKC**

**City of Kansas City**

**Kansas City Streetcar - Riverfront Extension**

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**NOT FOR CONSTRUCTION**

**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

**STANDARD ABBREVIATIONS** SHEET 1 OF 2

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**G030**

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320838
### STANDARD SYMBOLS

#### EXISTING UTILITIES
- **ELEC DCS**
- **ELEC OVERHEAD**
- **ELEC OVERHEAD HIGH VOLTAGE**
- **ELEC UNDERGROUND**
- **ELEC UNDERGROUND HIGH VOLTAGE**
- **FIBER**
- **SANITARY PIPE**
- **STEAM PIPE**
- **STORM PIPES**
- **TELEPHONE LINE**
- **WATERLINE**

#### EXISTING TOPO
- **FENCE**
- **SANITARY MANHOLE**

#### PROPOSED TRAFFIC SIGNAL
- **TRAFFIC SIGNAL HEAD**
- **TRAFFIC SIGNAL HEAD WITH BACK PLATE**
- **PEDESTRIAN SIGNAL HEAD**
- **EXISTING SIGNAL HEAD**
- **MAST ARM POLE**
- **SIGNAL PED FEETAL**
- **COMBINED DCS POLE**
- **CONTROLLER**
- **FULL BOX**
- **EVIP DETECTION UNIT**
- **RADAR DETECTOR**
- **SHED/BUILDING**
- **SIGN ON MAST ARM**
- **CONDUIT (BORED)**
- **CONDUIT (TRENCHED)**
- **EXISTING PILE**
- **SIGNAL FACE NUMBER**

#### PROPOSED TRACK
- **EXISTING TRACK ALIGNMENT**
- **FUTURE TRACK ALIGNMENT**
- **TRACK ALIGNMENT AND TRACK SLAB**
- **RIGHT-HAND TURNOUT**
- **LEFT-HAND TURNOUT**
- **CURVATURE TURNOUT**
- **SANDCUT - Rounding**
- **STOP PLATFORM**

#### PROPOSED STRIPING
- **BROKEN LINE**
- **SOLID LINE**
- **DOUBLE SOLID LINE**
- **DOTTED LINE AND AUXILIARY LANE LINE**
- **SHARED LEFT TURN LANE**
- **MATCH LINE**
- **PAVEMENT MARKING ARROWS**
- **STOP LINE**
- **YIELD LINE**
- **CROSSWALK OR BIKE CROSSING LINES**
- **CROSSWALK LINES PARALLEL STYLE FOR TINTED CONCRETE CROSSWALKS**

#### PROPOSED DRAINAGE
- **DRAINAGE INLET**
- **DRAINAGE PIPE**
- **MANHOLE**
- **PROPOSED SANITARY SERV BY OTHERS**
- **PROPOSED STORM SERV BY OTHERS**

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**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

**STANDARD SYMBOLS**

**DATE 12-23-2022**

**NOT FOR CONSTRUCTION**

**G035 9**

**3225x7**
## Traction Power Abbreviations

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<thead>
<tr>
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</tr>
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<tr>
<td>A</td>
<td>Ampere</td>
</tr>
<tr>
<td>AM</td>
<td>American National Standards Institute</td>
</tr>
<tr>
<td>ANS</td>
<td>Annunciation</td>
</tr>
<tr>
<td>AP</td>
<td>Alternating current / AC breaker</td>
</tr>
<tr>
<td>AS</td>
<td>Ammeter switch</td>
</tr>
<tr>
<td>AT</td>
<td>Current transformer</td>
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<tr>
<td>AUX</td>
<td>Auxiliary</td>
</tr>
<tr>
<td>B</td>
<td>Balance</td>
</tr>
<tr>
<td>BLVD</td>
<td>Boulevard</td>
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<tr>
<td>C</td>
<td>Circuit breaker</td>
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<tr>
<td>CT</td>
<td>Current transformer</td>
</tr>
<tr>
<td>CUB</td>
<td>Cubicle</td>
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<tr>
<td>D</td>
<td>Direct current</td>
</tr>
<tr>
<td>DR</td>
<td>Disconnect switch</td>
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<tr>
<td>E</td>
<td>Outdoor lights</td>
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<tr>
<td>ETS</td>
<td>Emergency trip station</td>
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<tr>
<td>F</td>
<td>DC feeder breaker</td>
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<tr>
<td>FACP</td>
<td>Fire alarm control panel</td>
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<tr>
<td>FX</td>
<td>Fast Ethernet</td>
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<tr>
<td>G</td>
<td>Ground-fault interrupter</td>
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<tr>
<td>GL</td>
<td>Green light</td>
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<tr>
<td>GND</td>
<td>Ground ground</td>
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<tr>
<td>H</td>
<td>Hand hole</td>
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<tr>
<td>HMI</td>
<td>Human/machine interface</td>
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<tr>
<td>HK</td>
<td>Hot structure</td>
</tr>
<tr>
<td>HVAC</td>
<td>Heating, ventilating and air conditioning</td>
</tr>
<tr>
<td>HW</td>
<td>Hardware</td>
</tr>
<tr>
<td>I</td>
<td>Interior lights</td>
</tr>
<tr>
<td>INST</td>
<td>Instantaneous</td>
</tr>
<tr>
<td>I/O</td>
<td>Input/output</td>
</tr>
<tr>
<td>IOS</td>
<td>Insulated overlap</td>
</tr>
<tr>
<td>K</td>
<td>Mechanical key interlock</td>
</tr>
<tr>
<td>KOML</td>
<td>Thousands circular mile</td>
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<tr>
<td>KV</td>
<td>Kilovolt</td>
</tr>
<tr>
<td>KVA</td>
<td>Kilovolt amperes</td>
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<tr>
<td>KVAR</td>
<td>Kilovolt alternating current</td>
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<tr>
<td>KW</td>
<td>Kilowatt</td>
</tr>
</tbody>
</table>

### Notes:
1. See City of Kansas City Standard Plans for additional abbreviations.
GENERAL NOTES – RAILROAD

1. ANY SHADING SYSTEM THAT IMPACT THE RAILROAD OPERATIONS AND/OR SUPPORTS RAILROAD EQUIPMENT SHAL BE DESIGNED AND CONSTRUCTED FOR THE RAILROAD'S TEMPORARY SHADING REQUIREMENTS.

2. ALL EMBANKMENTS WITHIN THE RAILROAD RIGHT-OF-WAY ARE EMBLED IN THE PROJEC TO ENSURE THAT THE RAILROAD OPERATIONS WILL NOT BE ADVERSELY IMPACTED BY THE EMBANKMENT CONSTRUCTION.

3. EMBANKMENTS OVER THE RAILROAD RIGHT-OF-WAY SHALL BE DESIGNED TO CAUSE NO INTERFERENCE TO ALL RAILROAD OPERATIONS.

4. THE EMBANKMENT OF THE EXISTING RAILROAD PROFILE SHALL BE EMBLED BEFORE BEGINNING CONSTRUCTION. ALL ADJUSTMENTS SHALL BE BROUGHT TO THE ATTENTION OF THE RAILROAD PRIOR TO CONSTRUCTION.

5. THE EMBANKMENT EMBLATION PROJECT SHALL NOT CAUSE THE QUALITY AND/OR CHARACTERISTICS OF THE RAILROAD EMBANKMENTS AND/OR EMBLATION STRUCTURES.

6. THE CONTRACTOR IS REQUIRED TO PROVIDE VERIFICATION OF EMBANKMENT AND EMBLATION MATURE TO THE PROPERLY AUTHORIZED PERSONS APPROPRIATE TO THE EMBANKMENT AND EMBLATION MATURES.

7. TEMPORARY CONSTRUCTION CLEARANCES INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

8. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

9. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

10. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

11. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

12. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

13. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.

14. TEMPORARY CLEARANCE REQUIREMENTS INCLUDING EMBANKMENT CLEARANCES SHALL BE MAINTAINED WITHIN FIGURE 1 IN RAILROAD RAILROAD — TEMPORARY CLEARANCE MATURES FOR RAILROAD EMBANKMENT OPERATION.
CONCRETE NOTES:

1. UNLESS OTHERWISE NOTED, DESIGN, MATERIAL, AND WORKMANSHIP SHALL BE IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND THE CURRENT EDITION OF THE FOLLOWING STANDARDS:
   - MISSISSIPPI BUILDING CODE
   - ACI 239.COMMERCIAL LOW STRENGTH MATERIAL
   - ACI 318-05 HEAT CURED CONCRETE
   - ACI 318-05 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE
   - ACI 319 DESIGN AND CONSTRUCTION OF DRILLED PILES
   - ACI 325-05 DESIGN AND CONSTRUCTION OF PRECAST CONCRETE STRUCTURAL ELEMENTS
   - OTHER RECOMMENDED PRACTICE FOR PLACING REINFORCING STEEL

2. SHOULDER DRAWINGS, SHOWING ALL PAVEMENT DIMENSIONS AND LOCATIONS FOR PLACING OF THE REINFORCING STEEL AND ACCESSIBILITY, SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO ANY PAVEMENT WORK.

3. ALL CONCRETE SHALL BE NORMAL WEIGHT AND HAVE THE FOLLOWING MINIMUM STRENGTH UNLESS NOTED OTHERWISE:
   - FLOWABLE FILL CONCRETE, POLES: 153 PSI @ 29 DAYS
   - LEAN CONCRETE, FOR FILL: 1159 PSI @ 29 DAYS
   - CONCRETE PILES 3FT OR THEREIN: 4000 PSI @ 26 DAYS
   - ALL OTHER CONCRETE: 4000 PSI @ 26 DAYS

4. REINFORCING STEEL:
   - ALL REINFORCEMENT SHALL BE DETAINED BILLET STEEL, CONFORMING TO ASTM A615, GRADE 60, EXCEPT AS NOTED.
   - ALL BARS ARE TO BE IDENTIFIED AND NUMBERED.
   - ALL BARS ARE TO BE SECURED WITH WASHERS OR BOLTS.

5. SPACES:
   - ALL SPACES SHALL BE SHOWN ON THE DRAWINGS.
   - ALL SPACES SHALL BE IDENTIFIED.
   - ALL SPACES SHALL BE SHOWN ON THE DRAWINGS.

6. CONCRETE PAVEMENT IS REQUIRED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS.

7. GENERAL:
   - ALL EXPOSED CONCRETE EDGES SHALL HAVE A 1" X 1" CHAMFER, EXCEPT AS NOTED.
   - CONCRETE WORK SHALL BE IN ACCORDANCE WITH PROJECT SPECIFICATIONS FOR PLACING CONCRETE AND REINFORCING STEEL.
   - CONCRETE BASIS FOUNDATION SHOULd be STRENGTHENED WITH 4% SLOPE EXCEPT WHERE NOTED.
   - ALL REINFORCEMENT STEEL SHALL NOT BE CONNECTED TO POLES OR SURGE ARRESTERS AND ALL ADJACENT SURFACES SHALL BE ISOLATED FROM REINFORCING STEEL.

8. ELECTRICAL SPECIFICATIONS:
   - ALL CONCRETE SHALL BE NORMAL WEIGHT AND HAVE THE FOLLOWING MINIMUM STRENGTH UNLESS NOTED OTHERWISE:
   - FLOWABLE FILL CONCRETE, POLES: 153 PSI @ 29 DAYS
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    - ALL OTHER CONCRETE: 4000 PSI @ 26 DAYS

14. REINFORCING STEEL:
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    - ALL BARS ARE TO BE IDENTIFIED AND NUMBERED.
    - ALL BARS ARE TO BE SECURED WITH WASHERS OR BOLTS.
GENERAL NOTES:

1. ALL DIMENSIONS AND LOCATIONS OF EXISTING STRUCTURES AND SITE SURVEY SHOWN ON THE CONTRACT PLANS ARE APPROXIMATE. THE CONTRACTOR SHALL FIELD VERIFY DIMENSIONS PRIOR TO CONSTRUCTION.

2. EXPOSED CONDUIT RUNS ARE SHOWN APPROXIMATE ONLY. EXACT RUNS SHALL BE DETERMINED IN THE FIELD TO SUIT SITE CONDITIONS.

3. EXPOSED CONDUITS SHALL BE SUPPORTED AT APPROX. 6'-0" INTERVALS. MAXIMUM INTERVAL NOT TO EXCEED 10'-0", OR PER MANUFACTURER RECOMMENDATIONS.

4. AT EQUIPMENT ENCLOSURES, CONDUIT SHALL BE TERMINATED WITH 2-LOCKNUTS AND BUSHINGS OR GASKETED CONDUIT HUB PLATES OUTDOORS, EXCEPT WHERE ENCLOSURES ARE FURNISHED WITH INTEGRAL THREADED HUBS.

5. ALL EXISTING AND NEW EQUIPMENT/STRUCTURES/PIPING THAT ARE OPERATIONAL AND TO REMAIN SHALL BE PROTECTED FROM ANY DAMAGE, DUST, ETC. CAUSED BY CONSTRUCTION ACTIVITIES. ANY DISCREPANCIES NOTED SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF KCATA AND THE ACTIVITY CAUSING THE DISCREPANCY STOPPED. CORRECTIVE ACTIONS SHALL BE APPROVED BY KCATA PRIOR TO THE START OF CORRECTIVE WORK AND SHALL BE PERFORMED AT NO EXPENSE TO OWNER.

6. FENCING SHALL HAVE "DANGER HIGH VOLTAGE" SIGNAGE VISIBLE ON ALL SIDES AND ON GATE ENTRANCES.

SCOPE OF WORK:

1. TPSS BUILDING TO BE FURNISHED TO THE CONTRACTOR BY THE OWNER. CONTRACTOR SHALL COORDINATE WITH THE OWNER TO ACQUIRE TPSS BUILDING SHOP DRAWINGS AND FACTORY TEST RESULTS PRIOR TO CONSTRUCTION. REFER TO SPECIFICATION 01 31 27 - CONTRACT INTERFACES FOR DETAILS.

2. CONTRACTOR SHALL COORDINATE WITH THE OWNER PRIOR TO SITE PREPARATION AND CONSTRUCTION. CONTRACTOR RESPONSIBLE FOR DEVIATIONS TO SITE DESIGN BASED ON FINAL SHOP DRAWINGS. ALL DEVIATIONS SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL PRIOR TO CONSTRUCTION.

3. CONTRACTOR RESPONSIBLE FOR INSTALLATION OF ALL CABLES, DUCTBANKS, FOUNDATIONS, STRUCTURES, AND SITE FEATURES AS SHOWN IN THE CONTRACT PLANS.

4. CONTRACTOR RESPONSIBLE FOR TESTING AND COMMISSIONING OF TPSS; INCLUDING ALL INTERNAL EQUIPMENT WITHIN THE TPSS BUILDING AND ALL EXTERNAL EQUIPMENT AND CABLES.

5. CONTRACTOR SHALL FIELD VERIFY ALL EXISTING SITE FEATURES WITHIN AREA OF THE WORK PRIOR TO CONSTRUCTION, INCLUDING BUT NOT LIMITED TO:
   5.1. EXISTING EVERGY DUCTBANK AND MANHOLE
   5.2. ABOVE GROUND STEAMLINE AND FOUNDATIONS
   5.3. EXISTING UNDERGROUND UTILITIES

6. EVERGY COORDINATION (PRIOR AND DURING CONSTRUCTION):
   6.1. CONTRACTOR RESPONSIBLE FOR FURNISHING AND INSTALLATION OF SECTIONALIZING SWITCHGEAR VAULT. CONTRACTOR TO COORDINATE WITH EVERGY FOR LOCATION AND FURTHER INSTRUCTION.
   6.2. EVERGY TO FURNISH AND INSTALL SECTIONALIZER SWITCHGEAR.
   6.3. CONTRACTOR SHALL COORDINATE INSTALLATION OF EVERGY DUCTBANKS AND VAULT LOCATION WITH EVERGY PRIOR TO CONSTRUCTION AND SUBMIT DEVIATIONS TO THE ENGINEER FOR APPROVAL.
   6.4. CONTRACTOR TO COORDINATE CORE-DRILLING OF EVERGY MANHOLE FOR DUCTBANK INSTALLATION WITH EVERGY.
   6.5. EVERGY TO FURNISH AND INSTALL CABLES TO SECTIONALIZED SWITCHGEAR AND FROM SECTIONALIZED SWITCHGEAR TO TPSS.
DEMOLITION NOTES
1. REMOVE CONCRETE SIDEWALK
2. REMOVE TREE
3. REMOVE AND RELOCATE TRASH
4. REMOVE GRAVEL
5. RELOCATE ELECTRICAL BOX (SEE ELECTRICAL PLANS)
6. RELOCATE EXISTING UTILITY

REMOVAL LEGEND
- REMOVE CONCRETE SIDEWALK
- CLEAR AND GRUB

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
DEMOLITION PLAN
STA 139+50 TO STA 143+50
CONSTRUCTION NOTES

1. TIEOUT 41758
   INSTALL A 250' CONTINUOUS CURVED FOG PANELED EMBEDDED TURNOUT, SEE SHEET A010.

2. TIEOUT 41758
   INSTALL A 250' CONTINUOUS CURVED FOG PANELED EMBEDDED TURNOUT 85' IN CHAMBER, SEE SHEET A010.

3. SB STA 112+00
   INSTALL TRAIL CHAIN

4. SB STA 204+44.45
   INSTALL TRACK CHAIN

5. FIELD VERIFY EXISTING RAIL ELEVATION TO DETERMINE EXACT TIE-IN POINTS

GENERAL NOTES

1. SEE DISCIPLINE SPECIFIC DRAWINGS FOR DETAILED INFORMATION ON CIVIL, TRAFFIC, SYSTEMS, AND DRAINAGE STRUCTURES.

2. ALL ELEVATIONS AND DIMENSIONS GIVEN ARE IN FEET UNLESS OTHERWISE NOTED.

3. ALL CURVES ARE BASED ON ARC DEFINITION.

4. PROFILES DESIGNED TO FINAL TOP OR RAIL ELEVATION.

VERTICAL SCALE

HORIZONTAL SCALE

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
NORTHBOUND TRACK
PLAN AND PROFILE
STA 113+00 TO STA 117+00

NOT FOR CONSTRUCTION
GENERAL NOTES

1. SEE DISCIPLINE SPECIFIC DRAWINGS FOR DETAILED INFORMATION ON CIVIL, TRAFFIC, SYSTEMS, AND DRAINAGE STRUCTURES.

2. ALL ELEVATIONS AND DIMENSIONS GIVEN ARE IN FEET UNLESS OTHERWISE NOTED.

3. ALL CURVES ARE BASED ON ARC DEFINITION.

4. PROFILES DESIGNED TO FINAL TOP OF SOIL ELEVATION.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
SOUTHBOUND TRACK PROFILE
STA 223+00 TO STA 225+50

K107A 45
GENERAL NOTES

1. SEE DISCIPLINE SPECIFIC DRAWINGS FOR DETAILED INFORMATION ON CIVIL, TRAFFIC, SYSTEMS, AND DRAINAGE.

2. ALL ELEVATIONS AND DIMENSIONS GIVEN ARE IN FEET UNLESS OTHERWISE NOTED.

3. ALL CURVES ARE BASED ON ARC DEFINITION.

4. PROFILES DESIGNED TO FINAL TOP OF SOIL ELEVATION.
### Northbound Track

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### Cross Over Non-Revenue Track

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<th>Radius</th>
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### Southbound Connection Non-Revenue Track

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NOTES:
1. TRACK GAUGE IS MEASURED AT 7/" BELOW TOP OF RAIL AND FROM THE GAGE FACE TO GAGE FACE
2. SEE DETAIL A, SHEET 2001 FOR TRACK SLAB DETAILS, ALL TRACK SLAB CONCRETE SHALL BE FC = 4000 PSI
   WITH NON-METALLIC MIXTURE OR SUBSIDING 3/" PER CY, PER KANSAS CITY PUBLIC WORKS DEPARTMENT'S STANDARD
   SPECIFICATIONS AND DESIGN CRITERIA. SECTION 2208 PORTLAND CEMENT CONCRETE PAVEMENT.
3. ALL 115F REE RAIL SHALL HAVE 3/" CUT. UNLESS OTHERWISE SPECIFIED. 112 F TRAM RAIL SHALL HAVE 3/" CUT.
4. FOR BOUNDARIES AND SIDEWALK CURB REPLACEMENT LOCATIONS, SEE CIVIL PLANS.
5. REFER TO PROJECT GEOTECHNICAL REPORT FOR ENGINEERING RECOMMENDATIONS REGARDING UNDRAIBLE MATERIAL.
6. SUBGRADE REQUIRED TO MEET CONSTRUCTION REQUIREMENTS OUTLINED IN THE GEOTECHNICAL REPORT. PREPARE
   SUBGRADE PER GEOTECHNICAL RECOMMENDATIONS OR AS DIRECTED BY RESIDENT ENGINEER.
7. IF CONCRETE WIDTH OUTSIDE OF TRACK SLAB IS LESS THAN 3/" WIDE, FOUR CONCRETE MONolithically WITH
   TRACK SLAB.
8. TRAFFIC EDGE CROSS-SLOPE (TE) ARE ShOWN ON KST01 SERIES DRAWINGS AND SHALL BE FIELD ADJUSTED TO
   MINIMIZE FUTURE REPAIR. COORDINATE WITH ENGINEER FOR APPROVAL. CROSS-SLOPES ADJUSTED TO TRAVEL
   LANE NOT TO EXCEED 5% OR 25 IN MIXED TRAFFIC LANE WHERE ACCIDENT TO BUFFER LANE OR 1/".
   WITHOUT APPROVAL OF ENGINEER, TCE NOT TO EXCEED 12% IN SEMI-EXCLUSIVE AND EXCLUSIVE USE.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACK SLAB DETAILS

SHEET 4 OF 5

NOT FOR CONSTRUCTION

K904 68

32/100
NOTICE:
1. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR REVISION AND APPROVAL BY ENGINEER PRIOR TO MANUFACTURER'S TRANSITION RAIL.
2. CONCRETE DEPTH BELOW ELASTOMERIC GROUT RECOMMENDED, IN-FEED RAIL DEPTH AS NECESSARY TO ACHIEVE 7" DEPTH BELOW GROUT.
3. CONTRACTOR TO FOLLOW ELASTOMERIC GROUT MANUFACTURER'S RECOMMENDATION FOR INSTALLATION.
4. WHERE TRANSITION RAIL ASSEMBLY CONFLICTS WITH LIVE-LOAD SLENDER TIE FIELD IN CONFLICT WITH SPACE NO GREATER THAN 12" TO AVOID CONTACT, NO GAPS BETWEEN SLENDER TIES SHALL EXCEED 10'.
5. TRANSITION RAILS FOR THE GRACE BOARD-WALL EDGE MANUFACTURER'S PROPOSED EXPANSION JOINT WILL BE COVERED AT 3" FROM THE RADIUS OF 1/8" ON THE SLOTTING TRACE AND POSTED ON THE JOINT SEE SHEET 070 FOR DETAILS AND PROFILE PIERCING FOR STATIONARY.
NOTES:

1. THE SWITCH SHALL BE POWERED WITH ACCOMMODATION FOR POINT DETECTION AND MANUAL OVERRIDE. ON THE EVENT OF A POWER OR COMMUNICATION FAILURE, SWITCH MECHANISM AND EARTH BOX SHALL BE INSULATED FOR STANDING CURRENT. THE SWITCH CONSISTS OF DOUBLE ROLLER PIVOT SUPPORT RAILS FOR 2M AND 25M CONTINUOUSLY CURVED TURNOUT.

2. ALL JOINTS ARE TO BE FIELD HELD UNLESS NOTED OTHERWISE.

3. ALL DIMENSIONS ARE IN FEET AND INCHES.

4. TURNOUT TO BE FULLY INSULATED FOR ELECTRICAL ISOLATION PROVIDED THROUGH ENCAPSULATION PER MANUFACTURER AND MATERIAL SPECIFICATIONS. INSULATION SHALL SATISFY REQUIREMENTS FOR ELECTRICAL ISOLATION.

5. SWITCH MACHINE SHALL BE CENTERED BETWEEN TONGUE SWITCHES. NO GEOMETRY DIMENSIONS AND TOLERANCES HAVE BEEN S ITIFIED.

6. ALL RAIL RIGID RAIL SPACERS, EARTHED AS SEEN. RIGID RAIL SPACERS, AND TOLERANCES HAVE BEEN S ITIFIED.

7. TURNOUT RAILS TO BE CONNECTED TO OVERALL POWER NETWORK. PROVIDE POWER CONNECTIONS FOR SWITCH PLANTS AND POWER SPACES. PROVIDE POWER CONNECTIONS FOR SWITCH PLANTS AND POWER SPACES TO BE CONTINUED WITH APPROVED SHOP DRAWINGS. SWITCH PLANTS TO BE F/C RW ROLLER RIGID SPACER.

8. EARTHED MACHINE AND SWITCH METER BOXES SHALL BE DESIGNED FOR 5700 LOADING. REFER TO SYSTEM PLAN SHEET 2002 FOR SWITCH METER DETAILS.

9. FROG SHALL BE A FLANGE-BEARING ROLLERLESS MANGANESE FROG OR JN ACCORDANCE WITH THE SPECIFICATIONS.

10. SEE DRAWING 4 FOR USEFUL AND LEAD OFF.

11. TURNOUT MANUFACTURER'S ENCAPSULATION SHALL BE IN COMPLIANCE WITH U.S. INDUSTRY REQUIREMENTS.

12. THIS DRAWING PROVIDES THE BASIS OF DESIGN FOR BIDDING PURPOSES ONLY. FINAL TURNOUT DESIGN SHALL BE ACCORDING TO SHOP DRAWINGS SUBMITTED BY THE MANUFACTURER AND THE VENDOR.

13. VERIFY INSTALLATION REQUIREMENTS WITH THE MANUFACTURER PRIOR TO FABRICATING TURNOUT.

14. TURNOUT TO BE FULLY RESTRAINED WITH A MAXIMUM FLANGE WIDTH OF 2.5". SEE NOTE 14.

15. MANUFACTURER SHALL COMPLY WITH ALL APPROPRIATE IN-PLANT AND FABRICATION DRAWINGS AND SUBMIT A SAMPLE OF FINDINGS FOR REVIEW AND APPROVAL PRIOR TO FABRICATION OF TURNOUT.

16. ALL RAILS ARE HIGH STRENGTH HEAT-HARDENED TYPE. REFER TO DRAWING 4 FOR DETAIL.

17. ENCOURAGE TRANSITION BETWEEN STANDARD RAIL AND RESTRAINTS RAIL RIGID WITH ELASTOMERIC RIGID.

18. MAINTAIN 8" TRACK SLAB FOR BOTH TRACKS THROUGH THE TURNOUT.

19. "FROG" SHALL BE A FLANGE-BEARING ROLLERLESS MANGANESE FROG OR JN ACCORDANCE WITH THE SPECIFICATIONS.

20. SEE DRAWING 4 FOR USEFUL AND LEAD OFF.
NOTES:

1. THE SWITCH WILL BE POWERED WITH ACCOMMODATION FOR POINT DETECTION AND
   SIGNAL WORKING IN THE EVENT OF A POWER OR COMMUNICATION FAILURE.
   SWITCH MECHANISM IS FOR SIGNALING CIRCUIT. THE SWITCH CONSISTS OF SINGLE TONGUE TYPE CAMPBELL SWITCH
   POINTS FOR 25M TURNOUTS. MANUAL SWITCHES SHALL BE ABLE TO ACCOMMODATE
   A POWER SWITCH MACHINE.

2. ALL JOINTS AND CONNECTIONS TO BE FIELD REELED UNLESS NOTED OTHERWISE.

3. ALL DIMENSIONS ARE IN FEET AND INCHES.

4. TURNOUT TO BE FULLY INSULATED FOR ELECTRICAL ISOLATION PROVIDED
   THROUGH USE OF PURCHASED AND INSULATED SUPPLIES.
   SPECIFICATIONS ARE APPROVED BY ENGINEER. LOCATION SHALL SATISFY
   RESISTIVITY REQUIREMENTS FOR SPECIFICATIONS.

5. SWITCH MACHINE SHALL BE CENTERED BETWEEN TONGUE SWITCHES AFTER
   GEOMETRY CONDITIONS AND TOLERANCES HAVE BEEN SATISFIED.

6. ALL GUIDE RODS SHALL BE DRAILED AND SECURED TO TURNOUT AFTER GEOMETRY
   CONDITIONS AND TOLERANCES HAVE BEEN SATISFIED.

7. TURNOUT DRAINS TO BE CONNECTED TO OVERALL DRAINAGE NETWORK.
   PROVIDE FORESEEABLE CONNECTORS FREE SWIVEL LOCK SHAPES.
   PROVIDE FORESEEABLE CONNECTORS WHERE LOCK SHAPES ARE, WHERE
   LOCK SHAPES ARE, TO BE ESTABLISHED WITH APPROVED DRAINAGE.
   DRAINAGE HINGE TO BE PLACED BETWEEN 10-INCH GAGE.

8. ELECTRICAL MACHINE AND SWITCH WATER BOXES SHALL BE DESIGNED FOR
   MAXIMUM LOAD DURING REFER TO SYSTEM PLANS SHEET 1002 FOR SWITCH WATER BOX.

9. RIGHT-HAND TURNOUT SHOWN. LEFT-HAND IS SIMILAR IMAGE.

10. FROG SHALL BE A PLUNGING-RELEASED BOLTLESS MANUFACTURED FROG OF
    3M IN ACCORDANCE WITH THE SPECIFICATIONS.

11. SEE TRAJECTORY DRAWINGS FOR INSULATED JUNCTION LOCATION AND LAYOUT.

12. TURNOUT MANUFACTURING AND ENCLOSURE SHALL BE IN CONFORMITY WITH
    THE AMERICAN MEMBERS.

13. THIS DRAWING PROVIDES THE BASIS OF DESIGN FOR RIGGING PURPOSES ONLY.
    FINAL TURNOUT DESIGN SHALL BE ACCORDING TO SHOP DRAWINGS SUBMITTED
    BY THE SUPPLIER AND REVIEWED AND APPROVED BY THE ENGINEER.

14. VERIFY ALL REELED JOINT REQUIREMENTS WITH THE ENGINEER PRIOR TO
    FABRICATING TURNOUT.

15. TURNOUT TO BE FULLY RESTRAINED WITH MAXIMUM FLANGEWAY WIDTH OF 24-
    SEE NOTE 14.

16. MANUFACTURER SHALL CONDUCT AN ANALYSIS VERIFYING TRACK GAUGE
    AND FLANGEWAY WIDTH WHERE RESTRAINED AND SUBMIT A SUMMARY LIST OF
    FINDINGS AND RECOMMENDATIONS TO ENGINEER FOR REVIEW AND APPROVAL PRIOR
    TO EXECUTION OF TURNOUT.

17. ENSURE ALL INSULATED JOINTS ARE SECURED TO RAIL TRACK.

18. ENCLOSURE BETWEEN STANDARD OUT AND REELED RAIL BODY
    SHEET 1002 FOR FINGER RAIL DETAILS.

19. MAINTAIN ARCH TRUCK SIDE FOR STRAIGHT AND DIVERGING TRACK THROUGH
    THE TURNOUT.
### Turnout Test Element

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</table>

**Notes:**

1. All sections and dimensions shown will be confirmed with accuracy for point detection and final alignment.
2. All work on the railroad shall be field verified and approved by the consultant.
3. All work on the railroad shall be performed in accordance with the specifications and approved drawings.
4. All work on the railroad shall be performed in accordance with the specifications and approved drawings.
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8. All work on the railroad shall be performed in accordance with the specifications and approved drawings.
9. All work on the railroad shall be performed in accordance with the specifications and approved drawings.
10. The railroad shall be a flange-bearing, sealed boltless manganese frog or in accordance with the specifications.
11. The railroad shall be a flange-bearing, sealed boltless manganese frog or in accordance with the specifications.
12. The railroad shall be a flange-bearing, sealed boltless manganese frog or in accordance with the specifications.
13. The railroad shall be a flange-bearing, sealed boltless manganese frog or in accordance with the specifications.
14. The railroad shall be a flange-bearing, sealed boltless manganese frog or in accordance with the specifications.
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20. The railroad shall be a flange-bearing, sealed boltless manganese frog or in accordance with the specifications.

**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

**25M CONTINUOUSLY CURVED FROG TURNOUT WITH DIAMOND**

[Diagram of railroad turnout]

**NOT FOR CONSTRUCTION**

**DATE:** 10/23/2020

**ISSUER FOR:**

**DESIGNER:**

**CONTRACTOR:**

**ARCHITECT:**

**ENGINEER:**

**CONSTRUCTION MANAGER:**

**K910 74**
NOTES:
1. TRACE GAUGE IS MEASURED AT 8" BELOW TOP OF RAIL AND FROM THE GAUGE FACE TO RAIL GAUGE FACE.

2. WHERE MANHOLE CONCRETE WITH STEEL GAUGE TIES, ADJUST GAUGE TIES IN CONCRETE WITH SPACING NO GREATER THAN 1/8" TO AVOID CONFLICT, NO GAPS BETWEEN GAUGE TIES SHOULD EXIST TO.

3. FIT BOLT NUTS BETWEEN RAILS TO MAKE THE NUTS SURROUNDING MATERIAL LOOK CLEANER AFTER FINISHING. MATCHING THE MATERIAL USED IN THE SMALLEST TRANSVERSE OFFSET.

4. MANHOLE SHOWN IN DETAIL, BUT SAME REQUIREMENTS APPLY FOR INLETS OF DIFFERENT SHAPES AND MATERIALS.

5. COMMUNICATIONS EQUIPMENT TO BE VERIFIED BY CONTRACTOR IN THE FIELD.

6. ALL TRACE SLAB CONCRETE SHALL BE F.C. = 4500 PS WITH NON-METALLIC HARD-FEED CEMENT. 5 LBF PER FT. PER KNOX PUBLIC WORKS DEPARTMENT'S STANDARD SPECIFICATIONS AND DESIGN (KPSD) SECTION 2206 PORTLAND CEMENT CONCRETE PAVEMENT.

7. CONTROL JOINTS MAY BE PLACED AT MANHOLE TO CONTROL CRACKING.
NOTES:

1. TRACK GAUGE IS MEASURED AT 1/2" BELOW TOP OF RAIL AND FROM THE GAUGE FACE TO GAUGE FACE.

2. WHERE MANHOLE CONFLICTS WITH STEEL GAUGE TIE, ADJUST GAUGE TIE(S) IN CONFLICT.

3. CONFLICT SMALLER THAN 1/2" TO AVOID CONFLICT. NO GAPS BETWEEN GAUGE TIES.

4. MANHOLE SHOWN IN DETAIL, BUT GAUGE REQUIREMENTS APPLY FOR HOLEs OF DIFFERENT SIZES AND MATERIALS.

5. UTILITY LOCATIONS TO BE VERSIFIED BY CONTRACTOR IN THE FIELD.

6. ALL TRACK SLAB CONCRETE SHALL BE F/C = 5200 PSI WITH NON-METALLIC MICROFIBER DENSITY: 1 LB/FT3.

7. CONTROL JOINTS MAY BE PLACED AT MANHOLE TO CONTROL CRACKING.

8. IF MANHOLE IS BETWEEN 2" AND 6" OF RAIL BOIIT, GROUT BETWEEN MANHOLE AND RAIL PER DETAIL C.
NOTES:
1. CONTRACTOR TO SUBMIT ANGLE FRAME, GRATE, BOLT AND WELD SHOP DRAWINGS ONLY TO ENGINEER FOR REVIEW PRIOR TO INSTALLATION.
2. CONCRETE SURFACE SHALL BE GRADED TO MATCH TOP OF STEEL GRATING.
3. GRATES ARE TO BE SOLID TO FRAME WITH A MINIMUM OF ONE BOLT IN EVERY CORNER.
4. TRACK DRAIN ASSEMBLY MUST BE TRAFFIC RATED TO NO20 CAPACITY.
5. GRATES TO BE EITHER TYPE 2000 (OR EQUIVALENTS) CAST IN CONCRETE LABORATORY SHOWN, GRATES TO BE BICYCLE SAFE AND IF IN A CURB/VALVE, OPENINGS SHOULD BE PERPENDICULAR TO WALK PATH.
6. CONTRACTOR MAY SUBMIT PRE-ENGINEERED TRACK DRAIN FOR REVIEW AND APPROVAL AS AN ALTERNATIVE TO CAST IN PLACE TRACK DRAIN.
7. SEE PIPELINE PLAN FOR REQUIRED PIPE ELEVATION.
8. ALL TRACK SLAB CONCRETE SHALL BE 100 - 2000 PSI WITH MINIMUM REINFORCING 6"X6"X6"X6" PER CP 7 FOR PONDABLE WALL EQUIPMENT SPECIFICATIONS ARE DESIGN CRITERIA. SECTION 2209 FORM-FILL CONCRETE PLACEMENT. SEE SHEET K915-1 FOR TRACK SLAB REINFORCING AND SUBGRADE PREPARATION DETAILS.
9. ADJUST TRANSVERSE TRACK REINFORCING IN TRACK DRAIN TO MINIMIZE MAXIMUM SPACING OF 10" BETWEEN BARS. USE LONGITUDINAL BARS CONTINUOUSLY WHERE NOT IN CONFLICT WITH GRATING.
1. CONTRACTOR TO SUBMIT SHOP DRAWINGS FOR REVIEW AND APPROVAL BY ENGINEER PRIOR TO INSTALLATION.

2. DIMENSIONS AND MINIMUM CLEARANCES NOTED IN DETAIL ARE APPROXIMATE AND SHOULD BE MEASURED IN FINAL APPROVED SHOP DRAWINGS PRIOR TO INSTALLATION.

3. A MINIMUM OF 5" CONCRETE CUSHION REQUIRED BELOW ELECTRONIC CEMENT AND GROUT BOX.

4. ELECTRONIC CEMENT TO BE INSTALLED PER MANUFACTURER'S INSTALLATION INSTRUCTIONS.

5. INSTALL RESTRAINING RAIL INSULATED JOINTS PER SPECIAL TRACKWORK MANUFACTURER'S INSTALLATION INSTRUCTIONS.
NOTES:

1. Contractor shall consult with resident engineer on placement of joints prior to pouring slab. Refer to KCWD standard drawing J-1 for additional guidance.

2. Contractor shall avoid mid-block driveways and submit locations to engineer for approval prior to construction.

3. Track slab expansion joints shall align with roadway expansion joints when adjacent pavement is concrete. Spacing shown is the maximum allowed.

4. Joint sealant detail shall be used at end of each day's work or when an interruption long enough for the concrete to develop its initial set occurs or by either setting a second course to support dowel bars, using a precast concrete riser, and refusing the joints flared or at the joint. By flared expansion, joints are spaced to prevent the concrete from sitting on the dowel bars. A concrete riser may also be used to keep the concrete from setting in the dowel bars.

5. Expansion joints shall be installed at both ends of precast slab track slab. See details for locations.

6. New track slab concrete shall be 4" = 800 psi with a minimum of the following elements: 30% primary aggregate, 30% secondary aggregate, 30% filler, and 10% fine aggregate. See sheet 910 for details.

7. Joint sealant detail shall be used at end of each day's work or when an interruption long enough for the concrete to develop its initial set occurs or by either setting a second course to support dowel bars, using a precast concrete riser, and refusing the joints flared or at the joint. By flared expansion, joints are spaced to prevent the concrete from sitting on the dowel bars. A concrete riser may also be used to keep the concrete from setting in the dowel bars.

8. Expansion joints shall be installed at both ends of precast slab track slab. See details for locations.

9. New track slab concrete shall be 4" = 800 psi with a minimum of the following elements: 30% primary aggregate, 30% secondary aggregate, 30% filler, and 10% fine aggregate. See sheet 910 for details.

10. New track slab concrete shall be 4" = 800 psi with a minimum of the following elements: 30% primary aggregate, 30% secondary aggregate, 30% filler, and 10% fine aggregate. See sheet 910 for details.

11. Contractor may submit plan to use precast sleeper slab for engineer approval.

12. Final joint size and material to be added after 28 days of cure.
1. END OF LINE CURB STOP IS 8" WIDE, CENTERED ON TRACK CENTERLINE.

2. SEE SHEET E111 FOR TRACK GEOMETRY DETAILS.

3. SEE SHEETS K901-K905 FOR TRACK SLAB DETAILS.

4. ALL TRACK SLAB CONCRETE SHALL BE F'1'C-4500 PSI
   WITH NON-METALLIC MIDSPAN FIBER SIZING, 0.5% PER CY
   PER KCM PUBLIC WORKS DEPARTMENT STANDARD
   SPECIFICATIONS AND DESIGN SYSTEMS, SECTION 2228
   FURNISHING CEMENT CONCRETE Pavement. SEE SHEET K901
   DETAIL A FOR TRACK SLAB REINFORCING AND SUBGRADE
   PREPARATION DETAILS.

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NOTES:

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

END OF LINE CURB STOP

DATE: 12/23/2020

NOT FOR CONSTRUCTION
CONSTRUCTION NOTES

1. CONSTRUCT TYPE CS-1 CURB/CAPTER (SEE CS PAVING STD Dwg CD)
2. CONSTRUCT TYPE SC COMMERCIAL (SEE UC PAVING STD Dwg CD)
3. CONSTRUCT ADA CURB RAMP (SEE CML DETAILS)
4. SEE DRAINAGE PLANS
5. ADJUST MANHOLE TO MATCH FINISHED GRADE
6. CONSTRUCT COLORED CONCRETE CYCLE TRACK- GREEN
7. CONSTRUCT STREETCAR STOP (SEE PLATFORM PLANS)
8. SEE LANDSCAPE PLANS
9. CONSTRUCT TYPE C CURB (SEE UC PAVING STD Dwg C1)
10. CONSTRUCT 10" WML, PCP
11. CONSTRUCT COMMERCIAL DRIVEWAY (SEE RMG STD Dwg D1)
12. INSTALL TEMPORARY GRAVEL PAVING
13. PROTECT EXISTING UTILITY
14. TRAPEZOID DELINIERATOR TILE

LEGEND
- CONCRETE SIDEWALK
- GREEN CONCRETE CYCLE TRACK
- LANDSCAPE
- TRACK SLAB
- RML, PCP
- CONCRETE DRIVEWAY
- TEMPORARY GRAVEL PAVING

COORDINATE WORK IN THIS AREA WITH DEVELOPER
CONSTRUCTION NOTES

1. CONSTRUCT TYPE SC COMMERCIAL
   SIDEWALK (SEE KC PARKS
   STD Dwg SC)
2. CONSTRUCT TYPE C CURB (SEE
   KC PARKS STD Dwg CI)
3. CONSTRUCT WACG FULL DEPTH
4. ADJUST MANHOLE TO MATCH
   FINISHED GRADE
5. CONSTRUCT SP HOLE, PCP
6. RELOCATE EXISTING MANHOLE

LEGEND

- TRACK SLAB
- WACG FULL DEPTH
- CONCRETE
- SIDEWALK / TRAIL
- LANDSCAPE
- R-7MN, PCP

CIVIL PLAN
2ND STREET TO VMF

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
1. Construction of curb ramps features and changes should be made in accordance with the ADA Standards for Accessible Design issued by the Department of Justice. Curb ramp features shall be designed to the extent feasible to be consistent with the guidelines for accessible design published by the Department of Justice. Curb ramps shall be constructed in accordance with the guidelines for accessible design published by the Department of Justice.

2. Curb ramps shall be constructed to height and width limitations. The height of the curb ramp shall be limited to 3 inches at any point. The width of the curb ramp shall be limited to 60 inches at any point.

3. Curb ramps shall be constructed to provide a safe and level pathway for pedestrians. The slope of the curb ramp shall be limited to 1:12. The rise of the curb ramp shall be limited to 2 inches at any point.

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### Ductbank Reinforcement Table

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### Notes:

1. Where direct buried conduits intersect concrete encased ductbank, cover depth for concrete shall be adjusted to suit the installation as approved by the Engineer.
2. Provide detectable warning tape minimum 3” depth from surface.
3. Studs may be replaced by adding additional plastic duct spacers at intervals of 20” minimum spacing and connecting horizontal rebar to the spacers at the 20” minimum interval, provided no metal touches conduit. The spaces, which can accommodate the rebar connecting, joints shall be submitted for approval and approved prior to installation.
4. Ductbank Configuration may be adjusted as needed by the Contractor to avoid conflicts with existing utilities and/or other elements; the number and size of conduits shall not be changed without approval by the Engineer.
5. The ductbank longitudinal rebar shall overlap a minimum of 12 inches or utilize threaded rebar nipples; a minimum of four rebar or 50 percent of the longitudinal bars shall be epoxy embedded 3 inches into a void space.
NOTES:

1. BLOCKOUT FOR NEGATIVE RETURN MAY BE ON INSIDE OR OUTSIDE OF TRACKS.
2. EXCEPT FOR NEGATIVE RETURN CABLES TO TRAFFIC BAR ON REAR OF RAIL.
3. CONTRACTOR SHALL COMPLETE NEGATIVE RETURN CABLES, EXCEPT FOR TRAFFIC BAR ON REAR OF RAIL, ALTERNATIVELY, CONTRACTOR MAY PROVIDE A SUITABLE HANDRAIL WITH A 4" X 4" X 0.25" TRAFFIC BAR COVER.
4. REFER TO C008 FOR NEGATIVE RETURN RISER DETAILS.
5. CONTRACTOR SHALL LOCATE PENETRATION HOLES TO AVOID EXISTING PESTRESSES STEMS IN EXISTING PESTRESSES PANELS. (TEMS C408)

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER SUBSTATION (TPSS)
TYPICAL NEGATIVE RETURN TRACK BLOCKOUT AND TYPICAL CONDUIT STUB-UP DETAIL

NEGATIVE MANHOLE AND BUS BAR

SCALE NTS

SECTION A-A

SCALE NTS

ENGINEERED BY:

HNTB CORP.

ISSUED FOR:

RideKC STREETCAR
EXISTING
TPSS A3
(STA. 337+27)
13.2kV FROM LOCAL UTILITY

NEGATIVE RETURN
TO RAILS

TRANSFER TRIP
FROM OPTIC CABLE

DELTAHIRE ST.
(SOUTHBOUND)

13.2kV FROM LOCAL UTILITY

EXISTING
TPSS A4
(STA. 22+60)

NEGATIVE RETURN
TO RAILS

CURRENT TRANSFER TRIP:
FROM OPTIC CABLE

NEW
RIVERFRONT EXTENSION
TPSS D1 - SEE NOTE 5
(STA. 217+00)
13.2kV FROM LOCAL UTILITY

NEGATIVE RETURN
TO TPSS A4

CURRENT TRANSFER TRIP:
FROM OPTIC CABLE

NOTES:
1. SWITCHES ARE NORMALLY CLOSED (NC) UNLESS OTHERWISE NOTED.
2. CONFIGURE TRANSFER TRIP FUNCTION TO NEXT BREAKER WHEN ADJACENT TPSS IS BYPASSED FOR OPTIC OPTIC CONNECTION.
3. OCS POLE MOUNTED DISCONNECT SWITCH POSITION INDICATIONS SHALL BE MONITORED AND REPORTED TO SCADA AT LOCAL FIBER CASES. SEE COMMUNICATIONS PLANS FOR CABLE AND INTERFACE REQUIREMENTS.
4. THE SWITCH ONLY REQUIRED TO BE CLOSED WHEN D1 TPSS IS OUT OF SERVICE. THE SWITCH MUST BE CLOSED TO PERFORM MAINTENANCE ON EITHER SOUTHBOUND OR NORTHBOUND POWER SECTIONS BETWEEN EXISTING TPSS A4 AND NEW TPSS D1.
5. TIE RAIL AND INTERNAL EQUIPMENT ARE PROVIDED UNDER A SEPARATE CONTRACT. REFER TO SHEETS G043 AND SPECIFICATION 01 31 27 CONTRACT HANDLING FOR DETAILS.

GRAND BLVD.
(NORTHBOUND)

GRAND BLVD.
(SOUTHBOUND)

DELAWARE ST.
(SOUTHBOUND)

PROPOSED BYPASS SWITCH
EXISTING POLE 1516
SEE NOTES 3 AND 4

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

NEW VMF TRACK

CURRENT TRANSFER TRIP:
FROM OPTIC CABLE TO FUTURE TPSS

FUTURE TRANSFER TRIP:
FROM OPTIC CABLE TO FUTURE TPSS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

2-250 KCMIL
NEGATIVE RETURN
TO RAILS

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
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(SOUTHBOUND)

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(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)

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(SOUTHBOUND)

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)

RIVERFRONT DR.
(NORTHBOUND)

RIVERFRONT DR.
(SOUTHBOUND)
NOTES:
1. PROVIDE PREFABRICATED BUILDING AND EQUIPMENT UNDER THIS CONTRACT.
2. EQUIPMENT DIMENSIONS ARE APPROXIMATE. SUBMIT FINAL DIMENSIONS FOR APPROVAL.
3. NOT USED.
4. INSTALL RECTIFIER AND DC SWITCHGEAR 2" OFF OF REAR WALL. THERE SHALL BE NO GAP BEHIND THE AC SWITCHGEAR.
5. PROVIDE 1/4" GLASTIC ON INTERIOR OF DOOR AND INSULATE OVER PANIC BARS.
6. FOR ACCESS PADS AND STEPS REFER TO STRUCTURAL DRAWINGS.
7. A MOBILE WORKSTATION/CART SHALL BE PROVIDED. REFER TO SPECIFICATION 34 21 17 FOR DETAILS.
8. SEE SHEET J694 FOR FOUNDATION DETAILS.
9. INSTALL 2" X 1/4" CONTINUOUS GROUND BUSBAR AROUND ENTIRE TPSS - CONNECT EQUIPMENT GROUNDS DIRECTLY TO GROUND BUSBAR. BUSBAR SHALL BE CONNECTED TO ALL FRAME GROUND PADS.
10. EXTERIOR OF TPSS SHALL HAVE A BRICK FASCADE. SEE CONTRACT SPECIFICATIONS FOR DETAILS.
11. CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT AS PER SUPPLIER INSTRUCTIONS.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 11.
NOT FOR CONSTRUCTION

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 7.

NOTES:
1. EQUIPMENT DIMENSIONS ARE APPROXIMATE. SUBMIT FINAL DIMENSIONS FOR APPROVAL.
2. NOT USED.
3. SEE SHEET J694 FOR FOUNDATION DETAILS.
4. METERING EQUIPMENT AND SOCKET DETAILS SUBJECT TO APPROVAL OF UTILITY.
5. VENDOR SHALL SIZE EXTERIOR EQUIPMENT DOORS AND SUPPORTS FOR RECTIFIER AND TRANSFORMER TO ALLOW FOR REMOVAL FROM OUTSIDE THE TPSS.
6. EXTERIOR OF TPSS SHALL HAVE A BRICK FASCADE. SEE CONTRACT SPECIFICATIONS FOR DETAILS.
7. CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.

HD Engineering, Inc.
10450 Holmes Road
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Kansas City, MO 64131-3471
816-360-2700
Certificate of Authority: 000856

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER
TYPICAL PREFABRICATED TPSS - EXTERIOR ELEVATIONS
ELEVATION VIEW

DATE: 12-23-2022

THE HNTB COMPANIES
INFRASTRUCTURE SOLUTIONS
300 Apollo Drive
Chelmsford, MA 01824
Phone: 978-905-4000
Certificate of Authority: 001270

HDR Engineering Inc.
The HDR Companies
601 Walnut Street
Suite 3000
Kansas City, MO 64106
816-360-2700
Certificate of Authority: 005875

3228710
NOTES:

1. ALL DIMENSIONS ARE APPROXIMATE. SUBMIT FINAL DIMENSIONS FOR APPROVAL.
2. CONTRACTOR TO DETERMINE SIZE AND LOCATION OF TRANSFORMER AND RECTIFIER VENTILATION.
3. INSTALL 2" x 1/4" CONTINUOUS GROUND BUSBAR AROUND ENTIRE TPSS - CONNECT EQUIPMENT GROUNDS DIRECTLY TO GROUND BUSBAR.
4. INCOMING SWITCH, METERING EQUIPMENT, AND SOCKET DETAILS SUBJECT TO APPROVAL OF UTILITY.
5. REFER TO SPECIFICATIONS FOR COMMUNICATIONS RACK REQUIREMENTS.
6. PROVIDE 1/4" GLASTIC ON INTERIOR OF DOOR AND INSULATE OVER PANIC BARS.
7. INSTALL RECTIFIER AND DC SWITCHGEAR 2' OFF OF REAR WALL. THERE SHALL BE NO GAP BEHIND THE AC SWITCHGEAR.
8. CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.
9. A MOBILE WORKSTATION/CART SHALL BE PROVIDED. REFER TO SPECIFICATION 34 21 17 FOR DETAILS.
INSULATED BUSHING THROUGH WALL
TYP.

2KV INSULATED CABLE
REAR SWITCHGEAR DOOR, TYP.

EXTERIOR LIGHT, TYP.

UPPER GROUND BUSBAR
DC SWITCHGEAR
OPENING IN WALL

2" RTRC CONDUIT
TYP.

#2/0 AWG 2KV INSULATED CLASS H GROUND CABLE, TYP.
NEMA 2-HOLE LUGS
TYP.

SURGE ARRESTER ENCLOSURE WITH VIEWING WINDOW
FIBERGLASS SURGE ARRESTER ENCLOSURE WITH VIEWING WINDOW

DOOR LOCKS
TYP.

2" TRIC CONDUIT. TYP.
WITH CABLES TO DC FEEDER BUSBARS

URPER GROUND BUSBAR
DC SWITCHGEAR, TYP.

SIDES VIEW
SCALE: NOT TO SCALE

NOTES:
1. SECURE CABLES ALONG THE BRACKET.
2. PROVIDE ENOUGH SLACK IN CABLE FOR SURGE ARRESTER TO FALL AWAY FROM BRACKET.
3. PROVIDE FIBERGLASS ENCLOSURE WITH VIEWING WINDOW AND DOOR LOCKS.
4. SURGE ARRESTERS SHALL BE MOUNTED AT A MINIMUM OF 9'-6" ABOVE FINISHED GRADE.
5. CONTRACTOR SHALL MOUNT ALL EXTERIOR EQUIPMENT PER SUPPLIER INSTRUCTIONS.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE. SEE NOTE 5.

HDR Engineering, Inc.
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The HNTB COMPANIES
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300 Apollo Drive
Chelmsford, MA 01824
Phone: 978-905-4000

Certificate of Authority: 001270

TRACTION POWER
TYPICAL SURGER ARRESTER
INTERIOR ELEVATIONS

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
12-23-2022

NOT FOR CONSTRUCTION

SCALE: NOT TO SCALE
SECTION - EXTERIOR
SCALE: NOT TO SCALE
SECTION - INTERIOR
NOTES:
1. FOR TYPICAL TPSS LAYOUT, SEE SHEET J620 FOR DETAILS.
2. SEE SHEET J620 FOR SITE RACERWAY LAYOUT.
3. GROUND GRID CONDUCTORS SHALL BE BURIED A MINIMUM OF 2'-6" BELOW GRADE.
4. GROUND GRID MUST BE CONSTRUCTED ON NATIVE SOIL ONLY. A MINIMUM OF 6 INCHES OF NATIVE SOIL FREE FROM DEBRIS AND ROCK MUST COVER THE TOP OF THE ENTIRE GROUND GRID AREA.
5. THE MAXIMUM GROUNDING RESISTANCE SHALL NOT EXCEED 5 OHMS.
6. CONTINUOUS GROUND BUSBAR AROUND INTERIOR OF TPSS BLDG SHOWN. SEE SHEETS J620 THROUGH J622 FOR DETAILS. GROUND GRID SHALL BE CONNECTED TO ALL BUILDING GROUND PADS.
7. PROVIDE A MINIMUM OF 3' ASPHALT COVER OVER THE ENTIRE SITE. EXTEND THE ASPHALT COVER AT LEAST 6' BEYOND THE GROUND GRID LIMITS.
8. EVERY FENCE POST SHALL BE CONNECTED TO THE GROUND GRID PER DETAIL 11 ON SHEET J673. GATES SHALL BE CONNECTED TO THE GROUND GRID PER DETAIL 12 ON SHEET J673.
9. REFER TO CIVIL PLANS FOR DEMO, PROPERTY LINES, FENCING, CURBING, AND CONTINUATION OF DUCTBANKS.
10. EVERGY SWITCHGEAR WILL BE GROUNDED BY EVERGY WITH A LOCAL GROUND ROD.

LEGEND:
- 3/4" DIA. X 10'-0" LONG COPPERCLAD STEEL GROUND ROD
- GROUND TEST WELL WITH GROUND ROD (TYP.)
- #40 EQUIPMENT CONNECTION (TYP.)
- #40 BARE GROUND CONDUCTOR
- GROUND BUSBAR (SEE NOTE 6)
- FENCE POST WITH GROUND CONNECTION

NOTE 1:
FOR TYPICAL TPSS LAYOUT, SEE SHEET J620 FOR DETAILS.

NOTE 2:
SEE SHEET J620 FOR SITE RACERWAY LAYOUT.

NOTE 3:
GROUND GRID CONDUCTORS SHALL BE BURIED A MINIMUM OF 2'-6" BELOW GRADE.

NOTE 4:
GROUND GRID MUST BE CONSTRUCTED ON NATIVE SOIL ONLY. A MINIMUM OF 6 INCHES OF NATIVE SOIL FREE FROM DEBRIS AND ROCK MUST COVER THE TOP OF THE ENTIRE GROUND GRID AREA.

NOTE 5:
The maximum grounding resistance shall not exceed 5 ohms.

NOTE 6:
Continuous ground busbar around interior of TPSS BLDG shown. See sheets J620 through J622 for details. Ground grid shall be connected to all building ground pads.

NOTE 7:
Provide a minimum of 3' asphalt cover over the entire site. Extend the asphalt cover at least 6' beyond the ground grid limits.

NOTE 8:
Every fence post shall be connected to the ground grid per detail 11 on sheet J673. Gates shall be connected to the ground grid per detail 12 on sheet J673.

NOTE 9:
Refer to civil plans for demo, property lines, fencing, curbing, and continuation of ductbanks.

NOTE 10:
Evergy switchgear will be grounded by Evergy with a local ground rod.

Legend:
- 3/4" DIA. X 10'-0" LONG COPPERCLAD STEEL GROUND ROD
- Ground test well with ground rod (tYP.)
- #40 equipment connection (tYP.)
- #40 bare ground conductor
- Ground busbar (see note 6)
- Fence post with ground connection
DISCONNECT SWITCH FEATURES:

- (6) 2000 AMP DISCONNECT SWITCHES
- 1000VDC SWITCH & BUSBAR INSULATION RATING
- SINGLE POLE, SINGLE THROW, BOLTED PRESSURE TYPE SWITCHES
- NON-FUSIBLE
- NON-LOAD BREAK OPERATION
- 2000 AMP MAIN BUSBAR CAPACITY
- SILVER PLATED TERMINALS

1. NO-NC AUX. CONTACT FOR POSITION INDICATION
2. FRONT OPERATED WITH PADLOCK FEATURE
3. OPERATOR HANDLE AND DOOR ARE MECHANICALLY INTERLOCKED TO PREVENT DOOR OPENING WITH THE SWITCH IN THE CLOSED POSITION
4. OPERATOR HANDLE GROUNDED
5. NEMA 4X PAD MOUNTED FIBERGLASS ENCLOSURE: ANSI 61 GRAY EXTERIOR AND WHITE INTERIOR
6. CONTINUOUS STAINLESS STEEL HINGE
7. DOOR PERIMETER IS FULLY GASKETED
8. 3 POINT HANDLE IS PADLOCKABLE
9. APPROX. WT. - 1500 LBS

NOTES:

1. DIMENSIONS PROVIDED ARE TYPICAL. FINAL DIMENSIONS SHALL BE DETERMINED BY DISCONNECT SWITCH MANUFACTURER.
2. EACH DISCONNECT SWITCH POSITION STATUS INDICATIONS SHALL BE REPORTED TO THE SAS PLC. SEE SITE SPECIFIC CONDUCTOR SCHEDULE FOR CABLE REQUIREMENTS.
3. PAD-MOUNTED DISCONNECT SWITCHES FURNISHED AND INSTALLED BY THE CONTRACTOR.

SEE DETAIL A
SEE NOTE 2
NOTE 2

NOTES:
1. FOR COORDINATION PURPOSES ONLY. REFER TO VENDOR'S AC PANEL BOARD DRAWING FOR AC PANEL SCHEDULE.
2._ALL INTERNAL BUILDING WIRING AND FINAL BREAKER SIZES TO BE DETERMINED BY VENDOR (OWNER SUPPLIED) IN COORDINATION WITH THE CONTRACTOR (THIS CONTRACT).
3. SHOP DRAWINGS TO BE PROVIDED BY THE OWNER WHEN AVAILABLE.
4. DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED AND SHOP DRAWINGS SUPPLIED WHEN AVAILABLE.

AC PANEL ADP - PANEL SCHEDULE

AC PANEL ADP

LOAD DESCRIPTION

INTERIOR LIGHTS
INTERIOR RECEPTACLES
HVAC #1
BATTERY CHARGER
FIRE ALARM PANEL
EXIT LIGHTS/EMERGENCY LIGHT
SPARE
RECTIFIER TRANSFORMER
SPACE
SPACE
SPACE
SPACE
SPACE
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA
LOAD KVA

NOTE 2

FROM AUXILIARY POWER TRANSFORMER AT1

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:

1. FOR COORDINATION PURPOSES ONLY. REFER TO VENDOR'S AC PANELBOARD DRAWING FOR AC PANEL LAYOUT.

2. ALL INTERNAL BUILDING WIRING AND FINAL BREAKER SIZES TO BE DETERMINED BY VENDOR (OWNER SUPPLIED) IN COORDINATION WITH THE CONTRACTOR (THIS CONTRACT).

3. FOR THE DC DISTRIBUTION PANEL, AUXILIARY CONTACTS OF THE MAIN AND EACH BRANCH CIRCUIT BREAKER SHALL BE FACTORY WIRED TO A TERMINAL STRIP FOR CONNECTION TO THE ANNUNCIATOR AND SUPERVISORY CIRCUIT. TRIPPED OR OPEN CIRCUIT BREAKERS SHALL BE ANNUNCIATED.

4. SHOP DRAWINGS TO BE PROVIDED BY THE OWNER WHEN AVAILABLE.

5. DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED AND SHOP DRAWINGS SUPPLIED WHEN AVAILABLE.

125V DC PANEL 2W, 40 CIRCUIT

**DC PANEL DDP - PANEL SCHEDULE**

<table>
<thead>
<tr>
<th>LOAD DESCRIPTION</th>
<th>LOAD WATTS</th>
<th>CHG DQt. No.</th>
<th>SIZE AMPS</th>
<th>CB CKT. NO.</th>
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<td>2</td>
<td>20A</td>
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<td>DC Breaker Test Cabinet</td>
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<td>20A</td>
<td>4</td>
<td>20A</td>
<td>Switch-Position Lights</td>
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<td>6</td>
<td>20A</td>
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<td>20A</td>
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<td>ACX Breaker Test Cabinet</td>
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<td>20A</td>
<td>8</td>
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<td>DC Switchgear Negative BRM Cubicle</td>
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<td>Station Control Cabinet</td>
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<td>DC Panel DDP - Panel Schedule</td>
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**DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.**
NOTES:

1. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR.

2. EQUIPMENT CUBICLE LIGHTING AND HEATING TO BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

3. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER TRANSFORMER, RECTIFIER, ETC.) TO BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:

1. FINAL SCHEMATIC, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. STATION CONTROL CABINET AND SMOKE DETECTORS SHALL BE OWNER SUPPLIED BY BUILDING VENDOR VIA OWNER.

2. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:

1. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWING SUPPLIED BY BUILDING VENDOR VIA OWNER.

2. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER, TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER

TYPICAL TPSS HVAC AND VENTILATION SCHEMATIC

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

NOTES:

1. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWING SUPPLIED BY BUILDING VENDOR VIA OWNER.

2. EQUIPMENT SPECIFIC SCHEMATICS (AC SWITCHGEAR, DC SWITCHGEAR, RECTIFIER, TRANSFORMER, RECTIFIER, ETC.) SHALL BE PROPOSED BY VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

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AND GATE

INPUT #1  INPUT #2  OUTPUT
0     0     0
0     1     0
1     0     0
1     1     1

SIGNAL INVERSION

INPUT  OUTPUT
0     1
1     0

GREATER THAN COMPARATOR

INPUT  OUTPUT
SET POINT
IF THE INPUT VALUE IS GREATER THAN OR EQUAL TO THE SET POINT, THE OUTPUT BECOMES ACTIVE.

LESS THAN COMPARATOR

INPUT  OUTPUT
SET POINT
IF THE INPUT VALUE IS LESS THAN OR EQUAL TO THE SET POINT, THE OUTPUT BECOMES ACTIVE.

OR GATE

INPUT #1  INPUT #2  OUTPUT
0     0     0
0     1     1
1     0     1
1     1     1

SET OVER RESET OPERATOR

INPUT #1  INPUT #2  OUTPUT (LATCHED)
0     0     0
0     1     0
1     0     1
1     1     1

PREVIOUS STATE
OUTPUT CHANGES STATE ONLY UPON RISING EDGE OF INPUT SIGNAL.

EXCLUSIVE OR GATE

INPUT #1  INPUT #2  OUTPUT
0     0     0
0     1     1
1     0     1
1     1     0

COUNTER

INPUT #1  INPUT #2  OUTPUT
SET POINT
EACH TIME INPUT #1 IS PULSED HIGH THE COUNTER INCREMENTS AND THE OUTPUT REFLECTS THE COUNT VALUE. WHEN INPUT #2 IS PULSED HIGH THE COUNT VALUE IS RESET.

TIME DELAY

INPUT  TD  OUTPUT
A RISING EDGE ON THE INPUT STARTS THE TIMER. THE TIMER COUNTS AS LONG AS THE INPUT IS HIGH. IF THE TIMER EXPIRES WHILE THE INPUT IS HIGH THE OUTPUT BECOMES ACTIVE. A FALLING INPUT EDGE RESETS THE TIMER.

NOTES:
1. FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:
1. PLC OUTPUT ACTIVATES LOCKOUT RELAY 186 & 86X.
2. THIS SIGNAL IS ACTIVE LOW.
3. FLASHING BLUE LIGHT (NEW UNACKNOWLEDGED ALARMS)
   SOLID BLUE LIGHT (ACTIVE ACKNOWLEDGED ALARMS)
   BLUE LIGHT OFF (NO ACTIVE ALARMS).
4. FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC,
   AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED
   BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY
   BUILDING VENDOR VIA OWNER.

LOCAL / REMOTE LOGIC

SUBSTATION ALARM INPUTS
(SEE SCADA INTERFACE POINTS TABLE IN SPECIFICATIONS)

STATION TROUBLE RESET BUTTON

STATION TROUBLE BLUE LAMP (NOTE 3)

SUBSTATION ALARM LOGIC DIAGRAM

PLC FAIL

OR

AC LOCK OUT BOX
NOTE 1
NOTE 2

STATION TROUBLE BLUE LAMP (NOTE 3)

PLC FAIL

OR

DC LOCK OUT 186
NOTE 1
NOTE 2

SUBSTATION LOCKOUT AND ALARM LOGIC
**NOTES:**

1. WHEN CONDITIONS ARE MET OUTPUT IS PULSED ONCE.
2. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.
3. THE BREAKER OPEN OUTPUT LATCH IS SET WHEN ALL CONDITIONS ARE SATISFIED FOR BREAKER CLOSE AND IT IS RESET WHEN CONDITIONS ARE SATISFIED FOR BREAKER OPEN.
4. BREAKER GROUP ALARM IS A SUMMARY ALARM. AVAILABILITY OF THIS ALARM VARIES BY MFPR MANUFACTURER.
5. FOR COORDINATION ONLY, FINAL SCHMAMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

**DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.**
NOTES:

1. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.

2. THE BREAKER OPEN OUTPUT LATCH IS SET WHEN ALL CONDITIONS ARE SATISFIED FOR BREAKER CLOSE AND IT IS RESET WHEN CONDITIONS ARE SATISFIED FOR BREAKER OPEN.

3. BREAKER GROUP ALARM IS A SUMMARY ALARM. AVAILABILITY OF THIS ALARM VARIES BY MFPR MANUFACTURER.

4. FOR COORDINATION ONLY; FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DC FEEDER BREAKER 'TRIPPING' OPERATION

- LOCAL 'OPEN COMMAND
- 'OPEN COMMAND REMOTE
- IN REMOTE
- BREAKER IN CONNECT POSITION
- BREAKER IN TEST POSITION
- ACTUAL VOLTAGE VALUE
  - MINIMUM VOLTAGE SET POINT
  - MEASURED VOLTAGE VALUE
  - MAXIMUM VOLTAGE SET POINT
- TT ENABLED
- TT RECEIVE
- TT RECLOSE
- LOCK OUT 186
- BREAKER OPENED FEEDBACK

- AND
- OR
- COMP ≤ MINIMUM VOLTAGE SET POINT
- COMP ≥ MAXIMUM VOLTAGE SET POINT
- INTERNAL RECLOSE PULSE GENERATED (SEE BREAKER CLOSE LOGIC)

OUTPUT TO BREAKER TRIP CIRCUIT (NOTE 1)

BREAKER MECHANICAL CONDITIONS

- MAGNETIC OVERCURRENT (76)
  - SERIES TRIP
- OPEN (RECLOSE)
- TIME OVERCURRENT
  - RATE OF RISE (ROR)
  - INSTANTANEOUS OVERCURRENT (150)
- INTERNAL RECLOSE PULSE GENERATED (SEE BREAKER CLOSE LOGIC)

BREAKER OPEN LIGHT

BREAKER GROUP ALARM LIGHT

TO SYSTEM LOGIC

SEE NOTE 3

BREAKER OPENED

BREAKER CLOSED

LOSS OF 125 VDC CONTROL POWER

FEEDER BREAKER RELEASE HANDLE OPERATED

Physically Conditions

AND

FEEDER BREAKER OPEN

NOTES:

1. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.

2. THE BREAKER OPEN OUTPUT LATCH IS SET WHEN ALL CONDITIONS ARE SATISFIED FOR BREAKER CLOSE AND IT IS RESET WHEN CONDITIONS ARE SATISFIED FOR BREAKER OPEN.

3. BREAKER GROUP ALARM IS A SUMMARY ALARM. AVAILABILITY OF THIS ALARM VARIES BY MFPR MANUFACTURER.

4. FOR COORDINATION ONLY; FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.
DC FEEDER BREAKER 'CLOSING' OPERATION

- **NOTES:**
  1. WHEN CONDITIONS ARE MET OUTPUT IS PULSED ONCE.
  2. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.
  3. THE BREAKER OPEN OUTPUT LATCH IS SET WHEN ALL CONDITIONS ARE SATISFIED FOR BREAKER CLOSE AND IT IS RESET WHEN CONDITIONS ARE SATISFIED FOR BREAKER OPEN.
  4. THERE ARE 3 TEST PAUSE TIMERS: THE TIME USED DEPENDS ON THE CURRENT TEST CYCLE COUNT. IN THE EVENT THAT THE NUMBER OF TEST CYCLES IS SET GREATER THAN THREE AFTER THE THIRD TEST CYCLE THE SAME TIME IS USED.
  5. ALL TIMER DURATIONS ARE PROGRAMMABLE VIA THE FRONT DISPLAY.
  6. FOR COORDINATION ONLY, FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

- **NOTES:**
  1. WHEN CONDITIONS ARE MET OUTPUT IS PULSED ONCE.
  2. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.
  3. THE BREAKER OPEN OUTPUT LATCH IS SET WHEN ALL CONDITIONS ARE SATISFIED FOR BREAKER CLOSE AND IT IS RESET WHEN CONDITIONS ARE SATISFIED FOR BREAKER OPEN.
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- **NOTES:**
  1. WHEN CONDITIONS ARE MET OUTPUT IS PULSED ONCE.
  2. WHEN THE BREAKER IS CLOSED THIS OUTPUT IS SET HIGH.
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  4. THERE ARE 3 TEST PAUSE TIMERS: THE TIME USED DEPENDS ON THE CURRENT TEST CYCLE COUNT. IN THE EVENT THAT THE NUMBER OF TEST CYCLES IS SET GREATER THAN THREE AFTER THE THIRD TEST CYCLE THE SAME TIME IS USED.
  5. ALL TIMER DURATIONS ARE PROGRAMMABLE VIA THE FRONT DISPLAY.
  6. FOR COORDINATION ONLY, FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

**DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.**
NOTES:
1. FOR COORDINATION ONLY. FINAL SCHEMATICS, LOGIC, AND FUNCTIONAL REQUIREMENTS SHALL BE DEVELOPED BY THE VENDOR. SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.

NEGATIVE DISCONNECT SWITCH LOGIC

NEG DISC. SWITCH
IN CLOSED

NEG DISC. SWITCH
IN OPENED

NEGATIVE SWITCH CLOSED LIGHT

OUTPUT TO SAS PLC

NEGATIVE SWITCH OPENED LIGHT

OUTPUT TO SAS PLC

POSITIVE DISCONNECT SWITCH LOGIC

POS DISC. SWITCH
IN CLOSED

POS DISC. SWITCH
IN OPENED

POSITIVE SWITCH CLOSED LIGHT

OUTPUT TO SAS PLC

POSITIVE SWITCH OPENED LIGHT

OUTPUT TO SAS PLC
NOTES:

1. FOR COORDINATION PURPOSES.
2. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:
1. FOR COORDINATION PURPOSES.
2. SEE SHOP DRAWINGS SUPPLIED BY BUILDING VENDOR VIA OWNER.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:
1. CONTRACTOR SHALL CONFIGURE TRANSFER TRIP FUNCTION BETWEEN ADJACENT TPSS DC MULTIFUNCTION RELAYS USING THE COMMUNICATIONS SYSTEM FOR FIBER OPTIC CONNECTION. SEE SPECIFICATIONS FOR ADDITIONAL DETAILS.
2. PROVIDE ONE ENGINEERING LAPTOP PER THE SPECIFICATIONS (BY BUILDING VENDOR).
3. SHOP DRAWINGS SHALL BE PROVIDED BY THE BUILDING VENDOR VIA OWNER WHEN AVAILABLE.
NOTES:
1. GROUND CONDUCTOR "TEE" CONNECTIONS SHALL BE USED AT ALL GROUND GRID INTERSECTIONS AROUND THE PERIMETER OF THE GROUND GRID.
2. GROUND CONDUCTOR "CROSS" CONNECTIONS SHALL BE USED AT ALL GROUND GRID INTERSECTIONS WITHIN THE PERIMETER OF THE GROUND GRID.
3. CADWELD TYPE CONNECTIONS LISTED FOR REFERENCE ONLY AND DOES NOT PRECLUDE ANY OTHER MANUFACTURER.
4. DRILL AND TAP FOR 2-HOLE NEMA LUGS.
5. COMPRESSION TYPE GROUND CONNECTIONS ARE ACCEPTABLE WHERE NOT IN CONTACT WITH GROUND/EARTH, BURNDY OR APPROVED EQUAL.
6. PRE-DRILL COPPER BUSBAR FOR NEMA 2-HOLE LUGS.
7. FOR VINYL COATED FENCING, REMOVE COATING AND CLEAN SURFACE PRIOR TO MAKING GROUNDING CONNECTIONS. AFTER MAKING CONNECTIONS, COAT EXPOSED FENCE POST SURFACE AND CONNECTIONS WITH A ZINC RICH PAINT.

1/4" X 3" BARE COPPER BUSBAR

FLEXIBLE TINNED BRAID, BURNDY TYPE "BF"

EXOTHERMIC CONNECTION

#1/0 BARE COPPER CONDUCTOR

TO TP SS GROUND GRID

BURNDY TYPE GAR GROUND CONNECTOR

SEE NOTES 5 AND 7

#1/0 BARE COPPER CONDUCTOR TO STEEL PIPE OR FENCE POST CONNECTION

BURNDY TYPE GAR GROUND CONNECTOR

SEE NOTES 5 AND 7

#1/0 BARE COPPER CONDUCTOR TO 2-HOLE TERMINAL CONNECTION

TO TYPICAL GROUND BUSBAR

TYPICAL GROUND BUSBAR

GROUND CONDUCTOR TO STEEL PIPE CONNECTION

GROUND CONDUCTOR TP STEEL PIPE CONNECTION

GROUND CONDUCTOR TO GATE POST CONNECTION

GROUNDING MAT DETAIL

GROUNDING MAT DETAIL

GATE GROUNDING CONNECTION

FENCE POST GROUNDING CONNECTION

GROUND WELL DETAIL

GROUND WELL DETAIL

1/4" COPPER GROUND ROD

BUILDING FRAME GROUND GRID CONNECTION

#4/0 BARE COPPER CONDUCTOR, TYP.

TYPICAL GROUNDING DETAILS

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRACTION POWER

TYPICAL GROUNDING DETAILS

HDR Engineering, Inc.
10450 Holmes Road
Suite 600
Kansas City, MO 64131-3471
816-360-2700
Certificate of Authority: 000856

The HNTB COMPANIES
INFRASTRUCTURE SOLUTIONS
300 Apollo Drive
Chelmsford, MA 01824
Phone: 978-905-4000
Certificate of Authority: 001270
# TPSS D1 - CONDUCTOR SCHEDULE

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**NOTES:**
1. SEE SHEET J630 FOR TPSS D1 SITE RACERAY LAYOUT.
NOTES:
1. NOT USED.
2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.
4. THERE SHALL BE A MINIMUM OF 36 WINDOWS.
5. TOUCH WINDOW TO ACKNOWLEDGE ALARMS.

KANSAS CITY STREETCAR
TPSS A1

13:59
NOVEMBER 30 2010

ALARMS

WHITE TO INDICATED "NORMAL STATUS"

FLASHING RED FOR NEW ALARMS. SOLID RED FOR ACKNOWLEDGED ALARMS (NOTE 5)

SOLID YELLOW FOR NEW ALARMS BUT RESOLVED

SPARES FOR FUTURE ALARMS PROGRAMMABLE BY THE USER ON SCREEN

CONTROL ALARMS EVENTS NETWORK STATUS SETTINGS HELP

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:
1. NOT USED.
2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.

TRACTION POWER
TYPICAL TPSS HMI CONTROL SCREEN LAYOUT

NOTES:
1. NOT USED.
2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.
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NOTES:
1. NOT USED.
2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.

DRAWING FOR CONTRACTOR COORDINATION PURPOSES. TPSS SHALL BE OWNER SUPPLIED WHEN AVAILABLE.
NOTES:
1. NOT USED.
2. HEADER INFORMATION SHALL BE VIEWABLE AT ALL TIMES.
3. EXTEND GUI TO FULL DIMENSIONS OF HMI SCREEN.
NOTES:

1. VERIFY CONCRETE STUPE LOCATION AND PAD SIZE REQUIREMENTS WITH THE DISCONNECT SWITCH MANUFACTURER.

2. THE FOUNDATION PLAN IS SHOWN FOR A TYPICAL SIX DISCONNECT SWITCH ARRANGEMENT; PROVIDE FOUNDATION FOR OTHER SWITCH ARRANGEMENTS ACCORDINGLY.

3. SEE ELECTRICAL SITE PLANS FOR CONPLANS.

4. THE FOLLOWING DESIGN PARAMETERS ARE BASED ON THE SITE-RELATED REPORT WAUSAU CITY STREETCAR EXTENSION PROJ ECT DESIGNED BY SKIDMORE OWINGS & MERRILL INC.
   CITED JULY 31, 2021
   1.1. MIN. SOIL BEARING PRESSURE 1500 PSF
   1.2. FOOTING FRONT DEPTH 3'-0"
GENERAL NOTES

1. REFER TO DEMOLITION DRAWINGS FOR EXISTING STRUCTURES TO BE REMOVED.

2. EXISTING STRUCTURES SHALL NOT BE DISTURBED UNLESS NOTED.

3. THE STORM SEWER CONSTRUCTION SCHEDULED BY THESE PLANS SHALL COMPLY WITH THE STORM SEWER SPECIFICATIONS.

4. CONTRACTOR SHOULD ADJUST TO STEEPER PIPE SLOPE AS NECESSARY TO AVOID CONFLICT WITH EXISTING STRUCTURES OCCURRING AT STRUCTURE JOINTS.

5. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD. AT THE TIME OF CONSTRUCTION, THE CONTRACTOR SHALL REQUEST PRE-CONSTRUCTION FOR POTENTIAL UTILITY CONFLICT SPECIFICATION AT LEAST TWO WEEKS PRIOR TO START OF WORK.
GENERAL NOTES

1. REFER TO DEMOLITION DRAWINGS FOR EXISTING STRUCTURES TO BE REMOVED. EXISTING STRUCTURES SHALL NOT BE DISTURBED UNLESS NOTED.

2. THE STORM SEWER CONSTRUCTION REQUIREMENTS ON THESE PLANS SHALL COMPLY WITH THE PROJECT SPECIFICATIONS. THE CONTRACTOR SHALL FOLLOW THE CONTRACT DOCUMENTS AS REQUIRED.

3. REFER TO MISCELLANEOUS DRAINAGE DETAILS FOR ADDITIONAL DRAINAGE STRUCTURE INFORMATION INCLUDING EXAMPLE AND SEWER ARRANGEMENT DETAILS.

4. CONTRACTOR SHALL ADJUST TO STORM SEWER PIPE SLOPE AS NECESSARY TO AVOID CONFLICT TO EXISTING STRUCTURES OCCURRING AT STRUCTURE JOINTS.

5. UNDERGROUND UTILITY LOCATIONS SHOWN ARE APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD. AT THE TIME OF CONSTRUCTION, THE CONTRACTOR SHALL REQUEST DESIGN SUPPORT FOR POTENTIAL UTILITY CONFLICT RESOLUTION AT LEAST TWO WEEKS PRIOR TO START OF WORK.
GENERAL NOTES

1. REFER TO DEMOLITION DRAWINGS FOR EXISTING STRUCTURES TO BE REMOVED. EXISTING STRUCTURES SHALL NOT BE DISTURBED UNLESS NOTED.

2. THE STORM SEWER CONSTRUCTION COVERAGE BY THESE PLANS SHALL COMPLY WITH THE PROJECT SPECIFICATIONS AND REFERENCES THE CURRENT CITY STANDARDS AND SPECIFICATIONS OF THE PUBLIC WORKS DEPARTMENT, KANSAS CITY, MISSOURI.

3. REFER TO MISCELLANEOUS DRAINAGE DETAILS FOR ADDITIONAL DRAINAGE STRUCTURE INFORMATION INCLUDING SCALES AND SEWER ARRANGEMENT DETAILS.

4. CONTRACTOR SHOULD ADJUST TO HIGHER PIPE SLOPE AS NEEDED TO PREVENT CONNECT TO EXISTING STRUCTURES OCCURRING AT STRUCTURE JOINT.

5. UNDERGROUND UTILITY LOCATION SHOWN ARE APPROXIMATE AND SHOULD BE VERIFIED IN THE FIELD AT THE TIME OF CONSTRUCTION. THE CONTRACTOR SHALL REQUEST DESIGN SUPPORT FOR POTENTIAL UTILITY CONFLICT RESOLUTION AT LEAST TWO WEEKS PRIOR TO START OF WORK.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
DRAINAGE PLAN
STA 147+60 TO END

0 20 40 60
0 20 40 60
HORIZONTAL SCALE
VERTICAL SCALE

NOT FOR CONSTRUCTION
GENERAL NOTE:
1. SEE SHEET P203 FOR PLATFORM FINISHINGS SCHEDULE
2. SEE CIVIL DRAWINGS FOR SLOPE OF SIDEWALKS
KEYNOTES:
1. WALKWAYS/SIDEWALKS (REF: 0005)
2. PLATFORM (REF: P5302, P5303)
3. SHOWER BENCH
4. CANOPY
5. WATER (REF: P371)
6. FUTURE INTERACTIVE KIOSK/TICKET VENDING
7. LITTER RECEPTACLE (REF: 1/P203)
8. DECORATIVE RAILING (REF: E/2P203)
9. CONCRETE RAIL AS CAST FORM SURFACE - SMOOTH (REF: E/2/P203)
10. PROFILE GRACE OF TRACK
11. TYPE A SHELTER (REF: P302)
12. TYPE B SHELTER (REF: P310)
13. SEAT WALL WITH DECORATIVE RAILING (REF: E/2/P203)
14. LINEAR LED STAIR LIGHTING IN SEAT WALL (E/2/P204)

ELEVATION FACING NORTH

GENERAL NOTE:
1. SEE SHEET P203 FOR PLATFORM FINISHING SCHEDULE
2. SEE CIVIL DRAWINGS FOR SLOPE OF SIDEWALKS
CONSTRUCTION NOTES

KEY NOTES
1. LED LIGHT FIXTURE, SEE LIGHTING
2. CAST-IN-PLACE CONCRETE
3. HSS POST SEE STRUCTURAL
4. DRAIN PIPE
5. FRAME TYPE 1
6. GLASS TYPE 2
7. HSS BEAM
8. BENCH, SEE 1P362
9. CANOPY
10. WIND SCREEN, GLASS TYPE 1
11. PANEL, HARDWARE SYSTEM
12. FRAME TYPE 2
13. GLASS TYPE 1
14. GUTTER
15. CONTINUOUS EXTERIOR RATED LED LIGHT FIXTURE MOUNTED TO STRUCTURAL SUPPORT TO ILLUMINATE BACK OF GLASS PANEL
16. PANEL, HARDWARE SYSTEM
17. WT SEE STRUCTURAL
18. ALUMINUM SHEET

LEGEND
- DETECTABLE WARNING TILE
- PLATFORM
- POLYCARBONATE ROOF PANEL

GENERAL NOTES
1. FOR PLATFORM LOCATION AND DIMENSIONS SEE CIVIL.
2. FOR STRUCTURAL PLATFORM IMPROVEMENTS SEE STRUCTURAL.

"TYPE B" SHELTER ENLARGED ROOF PLAN - ADD ALTERNATE

"TYPE B" SHELTER ENLARGED FLOOR PLAN

"TYPE B" SHELTER ENLARGED RCP - ADD ALTERNATE
CONSTRUCTION NOTES

KEYNOTES
1. STEEL COLUMN
2. 16 GA PAINTED METAL
3. ACRYLIC PREM, COORDINATE FINAL DESIGN W/ ARCHITECT
4. RITA SIGN
5. VENT
6. ACCESS PANEL
7. 10" CLEAR ACRYLIC WINDOW FOR MAP DISPLAY

GENERAL NOTES
1. LCD SCREEN SIZE & TYPE TO BE DETERMINED BY STREETCAR AUTHORITY
2. FOR NEW MARKER/ROSS AND RELOCATED MAX SIGN LOCATIONS SEE SHEET P401
3. FINAL STATION NAMING TO BE DETERMINED BY OWNER
4. SEE P500 SIGNAGE LOCATION ELEVATIONS

KANSAS CITY STREETCAR - RIVERFRONT Extension
MARKER PLANS AND ELEVATIONS

FRONT ELEVATION
10' IN. 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2"

SIDE ELEVATION
10' IN. 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2"

VMS ATTACHMENT DETAIL
5" IN. 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2"

MARKER PLAN SECTION
10' IN. 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2"

MARKER PLAN SECTION
10' IN. 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2" 1/2"
"TYPE B" SHELTER LIGHTING PLAN

Lighting Fixture Schedule

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Lamp</th>
<th>Watt</th>
<th>Volt</th>
<th>Meets Code Requirement by Manufacturer</th>
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</thead>
<tbody>
<tr>
<td>1A</td>
<td></td>
<td></td>
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<td></td>
<td></td>
<td>12V</td>
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</tr>
<tr>
<td>1B</td>
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<td></td>
<td></td>
<td></td>
<td>12V</td>
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KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
ELECTRICAL LIGHTING PLANS AND FIXTURE SCHEDULE

NOT FOR CONSTRUCTION
GENERAL COMMUNICATION AND ELECTRICAL NOTES

1. Electrical work shown is preliminary and is meant to represent general location and equipment location, not exact dimensions. Placement, etc., is subject to change. Contractor shall provide all work required for a complete installation.

2. Coordinate all underground site work with existing and new utilities.

3. Coordinate removal of all items from site plan. Existing or new site shall not interfere with the existing or new utility and be protected during construction. Contractor is responsible for any damage.

4. Conducts crossing other utilities should have a 2 foot minimum vertical separation.

5. All conduit elbows shall be 90 degrees with minimum 56 inch radius.

6. Street crossings are to be made by boring and replace conduit perpendicular to the street being crossed, connecting boring with communication line where possible. Wherever any object is acceptable with street restoration.

7. All conduit under existing pavement to be bored or pulled with cable under installation.

8. Have all utilities marked before boring or pulling conduit. Conduit location may be adjusted to avoid conflicts with existing utilities.

9. Replace all utilities that cross or are in the existing electrode.

10. For every service connector, connect to the conduit with trace wire and pull wire. Ensure to install connections.

11. Conductor to install meter shall be under the install meter and connect service.

12. See discipline-specific drawings for detailed information on civil, structural, structures, systems, and electrical.

PLANT FORMS:

1. Communication conduits to be placed at a minimum of 4" depth. Power conduits to be placed at a minimum of 12" depth.

2. See communications details - splitting program for system connectivity in civil service sheet.

3. Provide 3 feet of cable length for each communications type (cable and fiber) in each communication pull box.

4. All conduits are made from pull box to device.

5. All conduits may be placed in the same trench as represented by a single line.

COMMENTS:

1. Submittals of all equipment must be reviewed and approved per specifications.

ELECTRICAL AND COMMUNICATION LEGEND / NOTES

1. SEE DRAWINGS FOR 10kV and 480V.

2. FIRE HAZARD DETECTION AND CONTROL SYSTEM AND SERVICES.

3. EQUIPMENT SPECIFICATIONS:

   - ELECTRIC POWER AND SERVICE
   - ELECTRICAL PANEL
   - ELECTRICAL PANEL CAPS
   - ELECTRICAL PANEL CONTAINERS
   - ELECTRICAL PANEL LINING
   - ELECTRICAL PANEL PARTS

4. ADDITIONAL SPECIFICATIONS:

   - ELECTRIC PANELS SPECIFICATIONS
   - SYSTEM SPECIFICATIONS
EQUIPMENT LIST

1. TIME CLOCK
2. [NOT USED]
3. POWER SURGE PROTECTOR DEVICE
4. GFCI SERVICE OUTLET
5. FIBER TERMINATION CASSETTE
6. SIGN CONTROLLER (2)
7. REMOTE REBOOT POWER STRIP
8. POWER OVER ETHERNET INJECTOR (2)
9. ETHERNET SWITCH
10. TIME MARK COMMERCIAL METERING
11. CABINET-FEEDER WITH LOAD CENTER AND LIGHTING CONTROLS
12. ITS ROADSIDE CABINET
13. SHELF WITH FULL OUT DRAWER
14. UNINTERRUPTIBLE POWER SUPPLY
15. UNINTERRUPTIBLE POWER SUPPLY BATTERY
16. CELLULAR DATA MODEM WITH ANTENNA
17. DIN RAIL
18. CAT6 POE SURGE PROTECTORS

GENERAL NOTES:
1. ALL ITEMS OF ALL EQUIPMENT MUST BE REVIEWED AND APPROVED PER SPECIFICATIONS.
2. SEE COMMUNICATION DETAILS - SPACING DIAGRAM FOR SYSTEM CONNECTIVITY.
3. LIGHTING CONTROLS AND LIGHTING POWER SUPPLIES WITHIN THIS CABINET ARE LIMITED TO LIGHTING DETAILED ON SHEETS P400 AND P401.
GENERAL NOTES:
1. SEE SHEET 2021 FOR TYPICAL POLE DETAIL.
2. CAMERA TO BE INSTALLED ON THE OCS POLE SIDE FACING THE STREETCAR STATION AREA.
3. OCS POLE DETAILS, POLE LENGTH, AND FOUNDATION SCHEDULE SHOWN ON DRAWINGS Y111 TO Y112.
4. FOR TYPICAL POLE DETAILS, SEE DRAWINGS Y211 TO Y213.
5. FOR POLE FOUNDATION DETAILS, SEE DRAWINGS Y301 TO Y309.
6. POLE SURFACES WITH HOLES [HOLE FOR CAMERA CABLE] SHALL BE TREATED WITH 2021.204 PR. PAINT TO MINIMIZE RUST.
SERVICE PANEL: SHELTER TYPICAL

LOCATION: PLATFORM CABINET
VOLTS: 24120
A.I.C. RATING: 10KA

SUPPLY FROM: UTILITY POLE OR PEDESTAL
PHASE: 1
MAIN TYPE: WC8

MOUNTING: FREE STANDING CABINET
WIRE: 3-N-1D
MAIN RATING: 10KA

ENCLOSURE: NEMA 3R
FIRE RATED SPD: YES
SERVICE ENTRANCE LABEL: YES

---

LCP LIGHTING CONTROL DIAGRAM

NOT TO SCALE

---

LUMINAIRE SCHEDULE

<table>
<thead>
<tr>
<th>DWE</th>
<th>MANUFACTURER AND SERIES</th>
<th>DESCRIPTION</th>
<th>WATTS (MAX)</th>
<th>VOLTAGE</th>
<th>COLOR TEMP (K)</th>
<th>CRIs (Ra)</th>
<th>LUMENS</th>
<th>MOUNTING TYPE</th>
<th>HEIGHT</th>
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<tr>
<td>L1</td>
<td>BEGA, 24 104 SERIES</td>
<td>WALL, RECESSD LINEAR PROFILE LED, 25 3/4&quot; LENGTH, DIFFUSE OPTICS, WET LOCATION RATED.</td>
<td>9.6</td>
<td>120</td>
<td>3000</td>
<td>70</td>
<td>420</td>
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<td>LA</td>
<td>ACCLAIM PTB SERIES</td>
<td>LED STRUCTURE ACCENT STRIP LIGHT</td>
<td>3.78W/FT</td>
<td>120</td>
<td>3000</td>
<td>70</td>
<td>1200FT</td>
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<tr>
<td>LB</td>
<td>ACCLAIM FLEXIS SERIES</td>
<td>EDGE ACCENT LIGHT</td>
<td>2.46W/FT</td>
<td>120</td>
<td>3000</td>
<td>70</td>
<td>2000FT</td>
<td>SEE NOTE 3</td>
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NOTES:
1. MOUNTED RECESSED WITHIN CONCRETE SEAT WALL SEE ARCHITECTURAL DETAIL ON SHEET P30.
2. MOUNTED ON TOP, BOTTOM AND SIDES OF SHELTER FRAME GLASS TO EDGE LIGHT THE GLASS PER ARCHITECTURAL DETAIL P30 SERIES SHEETS
3. MOUNTED ON TYPE A SHELTER FRAME CANOPY WITH ALUMINUM CHANNEL, SEE ARCHITECTURAL DETAILS P30 SERIES SHEETS
### SCHEDULE OF INSPECTION SERVICES

<table>
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<tr>
<th>Inspection Required</th>
<th>Frequency</th>
<th>Frequency</th>
<th>Section</th>
<th>Reference</th>
<th>Remarks</th>
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<th>Frequency</th>
<th>Section</th>
<th>Reference</th>
<th>Remarks</th>
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<td>Earthwork, Trenching and Sidewalk</td>
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**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

**INSPECTION - IBC 2018**

**DATE:** 12-23-2022

**ISSUED FOR:**

**NOT FOR CONSTRUCTION**

**PS002 198**
ELEVATION: STANDARD STOP SIGNAGE RIVER MARKET NORTH (SB)

<table>
<thead>
<tr>
<th>SIGN LOCATION</th>
<th>SIGN TYPE</th>
<th>SIGN MESSAGE</th>
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<tbody>
<tr>
<td>1</td>
<td>A1-A4</td>
<td>A1: RIVER MARKET NORTH  A2-A4: SEE DETAILS</td>
</tr>
<tr>
<td>2</td>
<td>B</td>
<td>&lt; RIVERFRONT  RIVER MARKET NORTH  RIVER MARKET NORTH  &lt; RIVERFRONT</td>
</tr>
<tr>
<td>3</td>
<td>E</td>
<td>SEE DETAIL</td>
</tr>
<tr>
<td>4</td>
<td>K</td>
<td>SEE DETAIL</td>
</tr>
<tr>
<td>5</td>
<td>J</td>
<td>SEE DETAIL</td>
</tr>
<tr>
<td>6</td>
<td>H</td>
<td>SEE DETAIL</td>
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<tr>
<td>7</td>
<td>J</td>
<td>SEE DETAIL</td>
</tr>
<tr>
<td>8</td>
<td>H</td>
<td>SEE DETAIL</td>
</tr>
</tbody>
</table>

NOTE: SIGN TYPE B IS ON BOTH SIDES OF THE "FRAME".

SIGN MESSAGE:

ELEVATION: STANDARD STOP SIGNAGE RIVER MARKET NORTH (SB)

GENERAL NOTES:
1. DO NOT SCALE DRAWINGS. IF DIMENSIONAL INFORMATION IS REQUIRED, NOTIFY ARCHITECT IMMEDIATELY FOR CLARIFICATION.
2. REFER TO DRAWINGS SERIES P500 AND SPECIFICATIONS SECTION 10-14-03 FOR COMPLETE INFORMATION.
3. ALL SPECIFIED MATERIAL AND METHODS SHALL BE REVIEWED FOR CONFORMITY WITH ADA GUIDELINES. NOTIFY ARCHITECT OF ANY ITEMS THAT DO NOT CONFORM PRIOR TO FABRICATION.
4. SIGN TYPE USE FOR ALL LOCATIONS SHOWN SHALL BE CONFIRMED TO AS-BUILT CONDITIONS AND CONFIRMED WITH THE OWNER PRIOR TO PRODUCTION.
5. MESSAGE TEXT FOR ALL LOCATIONS SHOWN SHALL BE CONFIRMED TO AS-BUILT CONDITIONS AND CONFIRMED WITH THE OWNER PRIOR TO PRODUCTION.
6. COORDINATE WITH ARCHITECTURAL DETAILING IN P200 AND P300 SERIES DRAWINGS.
GENERAL NOTES

1. DO NOT SCALE DRAWINGS. IF DIMENSIONAL INFORMATION IS REQUIRED & NOT FOUND, NOTIFY ARCHITECT IMMEDIATELY FOR CLARIFICATION.

2. REFER TO DRAWINGS (SERIES P500) AND SPECIFICATIONS (SECTION 10 14 03) FOR COMPLETE INFORMATION.

3. ALL SPECIFIED MATERIALS AND METHODS SHALL BE REVIEWED FOR CONFORMANCE WITH ADA GUIDELINES. NOTIFY ARCHITECT OF ANY ITEMS THAT DO NOT CONFORM PRIOR TO FABRICATION.

4. SIGN TYPE USE FOR ALL LOCATIONS SHOWN SHALL BE CONFIRMED TO AS-BUILT CONDITIONS AND CONFIRMED WITH THE OWNER PRIOR TO PRODUCTION.

5. MESSAGE TEXT FOR ALL LOCATIONS SHOWN SHALL BE CONFIRMED TO AS-BUILT CONDITIONS AND CONFIRMED WITH THE OWNER PRIOR TO PRODUCTION.

6. COORDINATE WITH ARCHITECTURAL DETAILING IN P200 AND P300 SERIES DRAWINGS.

NOTE: SIGN TYPE B IS ON BOTH SIDES OF THE FRAME.
GENERAL NOTES
1. DO NOT SCALE DRAWINGS, IF DIMENSIONAL INFORMATION IS REQUIRED & NOT FOUND, NOTIFY THE ARCHITECT IMMEDIATELY FOR CLARIFICATION.
2. ORIGINAL ADOBE ILLUSTRATOR ARTWORK SHALL BE PROVIDED TO MANUFACTURERS.
3. MESSAGE TEXT FOR ALL SIGN TYPES SHALL BE COORDINATED WITH THE OWNER PRIOR TO FABRICATION.
4. MESSAGE SCHEDULE (APPENDIX 10 14 06a), LOCATION PLANS (AG SERIES), SPECIFICATIONS (SECTION 10 14 03) AND DRAWING SHEETS (AG SERIES) SHALL BE COORDINATED FOR COMPLETE INFORMATION.
5. MESSAGE SCHEDULE (APPENDIX 10 14 06a), LOCATION PLANS (AG SERIES), SPECIFICATIONS (SECTION 10 14 03) AND DRAWING SHEETS (AG SERIES) SHALL BE CONFIRMED TO AS-BUILT CONDITIONS PRIOR TO PRODUCTION.
6. ALL SPECIFIED MATERIALS AND METHODS SHALL BE REVIEWED FOR CONFORMANCE WITH ADA GUIDELINES. NOTIFY THE ARCHITECT OF ANY ITEMS THAT DO NOT CONFORM PRIOR TO FABRICATION.
7. INITIAL INSERTS TO BE PROVIDED BY THE MANUFACTURER.

NOTE: ACTUAL FINAL MESSAGES TBD

SIGN TYPE A1-A4

SIGN TYPE B

SIGN TYPE C

SIGN TYPE D

SIGN TYPE E

NOTE: LETTERS ARE APPLIED TO BOTH SIDES OF EACH STEP. REFER TO MESSAGE SCHEDULE LOCATED ON P501 AND P502 FOR MESSAGES.
GENERAL NOTES
1. DO NOT SCALE DRAWINGS, IF DIMENSIONAL INFORMATION IS REQUIRED & NOT FOUND, NOTIFY THE ARCHITECT IMMEDIATELY FOR CLARIFICATION.
2. ORIGINAL ADOBE ILLUSTRATOR ARTWORK SHALL BE PROVIDED TO MANUFACTURERS.
3. MESSAGE TEXT FOR ALL SIGN TYPES SHALL BE COORDINATED WITH THE OWNER PRIOR TO FABRICATION.
4. LOCATION ELEVATIONS (SERIES 500) AND SPECIFICATIONS (SECTION 10 14 03) SHALL BE COORDINATED FOR COMPLETE INFORMATION.
5. ALL SPECIFIED MATERIALS AND METHODS SHALL BE REVIEWED FOR CONFORMANCE WITH ADA GUIDELINES. NOTIFY THE ARCHITECT OF ANY ITEMS THAT DO NOT CONFORM PRIOR TO FABRICATION.

NOTE: DETAIL EXCERPTED FROM DIMENSIONAL INNOVATIONS SHEET N293W-01-2.00 DATED 11/8/2019

COMPONENTS:
1. 2.5" CLEAR ACRYLIC
2. 4" CLEAR ACRYLIC
3. 1/16" CLEAR ACRYLIC

SIGN TYPE A1 - MARKER SIGN
- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL GRAPHIC TBD

SIGN TYPE A2 - MARKER SIGNS
- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL GRAPHIC TBD

SIGN TYPE A3
- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL APPROVAL OF MAP GRAPHICS WILL BE BY THE AUTHORITY.

SIGN TYPE A4
- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL APPROVAL OF MAP GRAPHICS WILL BE BY THE AUTHORITY.

SIGN TYPES OVERVIEW
KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

SCALE: 3" = 1'
SIGN TYPE A1: MARKER SIGN
SCALE: 1-1/2" = 1'
SIGN TYPE A2 - A4: MARKING
SCALE: 1/2" = 1'
SIGN TYPES A1 - A4: MOUNTING

NOTE: DETAIL EXCERPTED FROM DIMENSIONAL INNOVATIONS SHEET N293W-01-2.00 DATED 11/8/2019

COMPONENTS:
1. 2.5" CLEAR ACRYLIC
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SIGN TYPE A4
- MATERIAL: SCOTCHCAL DECAL
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- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL GRAPHIC TBD

SIGN TYPE A3
- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL APPROVAL OF MAP GRAPHICS WILL BE BY THE AUTHORITY.

SIGN TYPE A4
- MATERIAL: SCOTCHCAL DECAL
- NOTE: FINAL APPROVAL OF MAP GRAPHICS WILL BE BY THE AUTHORITY.
GENERAL NOTES

1. DO NOT SCALE DRAWINGS, IF DIMENSIONAL INFORMATION IS REQUIRED & NOT FOUND, NOTIFY ARCHITECT IMMEDIATELY FOR CLARIFICATION.

2. ORIGINAL ADOBE ILLUSTRATOR ARTWORK SHALL BE PROVIDED TO MANUFACTURERS.

3. MESSAGE TEXT FOR ALL SIGN TYPES SHALL BE COORDINATED WITH THE OWNER PRIOR TO FABRICATION.

4. LOCATION ELEVATIONS (SERIES 500) AND SPECIFICATIONS (SECTION 10 14 03) SHALL BE COORDINATED FOR COMPLETE INFORMATION.

5. ALL SPECIFIED MATERIALS AND METHODS SHALL BE REVIEWED FOR CONFORMANCE WITH ADA GUIDELINES. NOTIFY ARCHITECT OF ANY ITEMS THAT DO NOT CONFORM PRIOR TO FABRICATION.

NOTE: LETTERS ARE APPLIED TO BOTH SIDES OF EACH SIGN. REFER TO MESSAGE SCHEDULE FOR MESSAGES.

SIGN TYPE B: SHELTER SIGNS

SCALE: 1-1/2" = 1'

ATTACHMENT BRACKET ISOMETRIC VIEW

SIGN TYPE C

SCALE: 3/4" = 1'

SIGN TYPE D

SCALE: 3" = 1'

SIGN TYPE E

SCALE: 3/4" = 1'

NOTE: ACTUAL FINAL MESSAGES TBD

MATERIAL: SCOTCHCAL DECAL

NOTE: FINAL GRAPHIC TBD

MATERIAL: 3M DUSTED CRYSTAL GRAPHIC FILM, SECOND SURFACE

ALTERNATE LAYOUT:

- WHITE GRAPHIC FILM
- PRINT BACK OF SIGN SILVER

NOTE: ACTUAL FINAL MATERIAL TBD

- ATTACHMENT BRACKET ISOMETRIC VIEW
- ATTACHMENT BRACKET
- FLUSH VIEW
- ELEVATION
- PLAN VIEW

4'-2"

3'-2"

2'

1-1/2"

1-3/16"

1-3/4"

3'

2-3/8"

1-3/8"

3/4"

3/8"

3/16"

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7/16"
GENERAL NOTES
1. DO NOT SCALE DRAWINGS. IF DIMENSIONAL INFORMATION IS REQUIRED & NOT FOUND, NOTIFY ARCHITECT IMMEDIATELY FOR CLARIFICATION.
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3. MESSAGE TEXT FOR ALL SIGN TYPES SHALL BE COORDINATED WITH THE OWNER PRIOR TO FABRICATION.
4. MESSAGE SCHEDULE (APPENDIX 10 14 06a), LOCATION PLANS (AG SERIES), SPECIFICATIONS (SECTION 10 14 06) AND DRAWING SHEETS (AG SERIES) SHALL BE CONFIRMED TO AS-BUILT CONDITIONS PRIOR TO PRODUCTION.
5. ALL SPECIFIED MATERIALS AND METHODS SHALL BE REVIEWED FOR CONFORMANCE WITH ADA GUIDELINES. NOTIFY THE ARCHITECT OF ANY ITEMS THAT DO NOT CONFORM PRIOR TO FABRICATION.
6. INITIAL INSERTS TO BE PROVIDED BY THE MANUFACTURER.

NOTES:
MATERIAL: 1/8" ALUMINUM
PROCESS: DIRECT-PRINTED
GRAPHICS ON REFLECTIVE SHEET
HDR WILL PROVIDE DIGITAL ARTWORK FILES

SCALE: 3/4" = 1'
SIGN TYPE F
SCALE: 3" = 1'
SIGN TYPE G
SCALE: 3/4" = 1'
SIGN TYPE H
SCALE: 3" = 1'
SIGN TYPE J
SCALE: 3/4" = 1'
SIGN TYPE K
TRAFFIC SIGNAL GENERAL NOTES

GENERAL NOTES CONTINUED:

24) Jumper "fire" heads/phanes with 7c on small arm only. A maximum of two 2-conductor jumpers are allowed between three signal heads. Use separate 7c for each head on small arm regardless of phase.

PROJECT SPECIFIC NOTES:

1) All poles, mast arms and luminaire arms shall be City standard poles, to meet the KCMO specifications of all signalized intersections.

Traffic signal poles with mast arms extended over the proposed streetcar system will require a modified installation height, refer to sheet T201 for the various installation methods.

2) The Contractor shall connect fiber optic cable on all of the project intersections.

3) The Contractor shall coordinate with KCMO staff before installing, configuring and testing the communication equipment.

4) Refer to latest edition of T30008 and the project specific Technical Special Conditions for additional requirements.

5) Pedestrian pushbutton shall be Fromex Manhattan 2-wire pushbutton stations, otherwise approved.

6) Refer to Lighting sheets for specifications and additional details. Street lighting shown on signal plans are for reference only.

7) Controller shall be 2070 with ASC/3 software.

8) CCTV cameras shall be P/T, with 560 add on camera, refer to project specifications for details.

9) Vehicle detection shall be Wavetector Mobile Sign Bar detection system utilizing rail mount preassembled 16-inch track bar, or approved equal. Refer to specifications, perform walk-through of manufacturer/vendor confirm radar antennas placement. Refer to project specifications for details.

10) Pedestrian pushbutton shall be Fromex Manhattan 2-wire pushbutton station, or approved equal.

11) Fiber optic interface (PRI) in signal cabinet shall be Giga Ether, or approved equal. Refer to project specifications for details.

12) Traffic signal cabinet shall have key drop down shaft on front and back doors.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRAFFIC SIGNAL GENERAL NOTES

ISSUED FOR BID

DATE 12-23-2020

TRAFFIC SIGNAL GENERAL NOTES

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DATE 12-23-2020

TRAFFIC SIGNAL GENERAL NOTES

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRAFFIC SIGNAL GENERAL NOTES

ISSUED FOR BID

DATE 12-23-2020
TRAFFIC SIGNAL CONCRETE BASE DETAILS

TRAFFIC SIGNAL CONTROLLER PAD DETAILS

TYPE A BASE

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<tr>
<th>LOCATION</th>
<th>DESCRIPTION</th>
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<tbody>
<tr>
<td>Top View</td>
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<tr>
<td>Front View</td>
<td>Concrete base for traffic signal controller pad</td>
</tr>
<tr>
<td>Side View</td>
<td>Concrete base for traffic signal controller pad</td>
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KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
TRAFFIC SIGNAL SIGNAL DETAILS
SIGNAL CONCRETE BASE DETAILS

ISSUED FOR: 12-22-2022
DATE: 12-22-2022

NOT FOR CONSTRUCTION
The above ring and lid dimensions for Type 1 pull boxes are applicable if installed within a traveled way. If Type 1 pull boxes are installed within a grass area, the following ring (reversible) and lid dimensions can be used.

**TYPICAL SECTION**

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<tr>
<td>Dimensions in inches</td>
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NOTES

1. ALL PTZ CAMERAS SHOULD BE MOUNTED AT A 5' FT HEIGHT FROM THE PAVEMENT SURFACE.
PEDESTRIAN PUSHBUTTON POLE DETAILS
PUSHBUTTONS SHOWN NOT ACTUAL PUSHBUTTON

PIPE CAP

PEDESTRIAN PUSH BUTTON

EXTENSION JAN TO BE COMPATIBLE PRODUCT WITH SEC PUSH BUTTON STATION

STAINLESS STEEL STRAP (TOP)

FACE OF CURB

TOP OF CURB

PEDESTRIAN CURB

1/4" PREMILLED JOINT FILLER
### PERMANENT PAVEMENT MARKING - LONGITUDINAL LINES (THERMOPLASTIC/EPOXY)

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### PERMANENT PAVEMENT MARKING - LONGITUDINAL LINES (THERMOPLASTIC/EPOXY)

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<th>GREEN BIKE BOX PAINT (SF)</th>
<th>WORD (ONLY) (EA)</th>
<th>WORD (TRANSIT) (EA)</th>
<th>Word (Slow) (EA)</th>
<th>24&quot; WHITE CONTINENTAL CROSSWALK (LF)</th>
<th>24&quot; WHITE STOP BAR (LF)</th>
<th>24&quot; GREEN CONTINENTAL CROSSWALK (LF)</th>
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### CROSS STREETS

| 3RD | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 310 | 72 | 180 | 7 |
| 2ND | 0 | 0 | 4 | 4 | 0 | 0 | 0 | 310 | 72 | 180 | 7 |

### PROJECT TOTAL

<p>| 4 | 7 | 9 | 160 | 2 | 1 | 1 | 788 | 180 | 7 |</p>
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<th>SIGN NO.</th>
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<th>MUTCD CODE</th>
<th>PANEL LEGEND</th>
<th>ADDITIONAL NOTES</th>
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<tbody>
<tr>
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<td>199+81.21 / 35.90 RT</td>
<td>SB SC</td>
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<td>BIKE LANE</td>
<td>RELOCATE WEST STA 199+56.68 OFF. 36.34 FT</td>
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<td>&quot;ONE WAY&quot;</td>
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<td>NB SC</td>
<td>R3 17</td>
<td>&quot;FRONT STREET&quot;</td>
<td>&quot;BERKLEY PKWY&quot;</td>
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**SIGNS**

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<tr>
<th>SIGN NO.</th>
<th>STATION/OFFSET</th>
<th>ALIGNMENT</th>
<th>ROADWAY</th>
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<th>SIGN PANEL AREA (SF)</th>
<th>SIGN POST (EA)</th>
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<th>ADDITIONAL NOTES</th>
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<td>GRAND BLVD</td>
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**BLANK OUT SIGNS**

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<td>30&quot; x 30&quot;</td>
<td>1</td>
<td>&quot;NO RIGHT TURN&quot;</td>
<td>&quot;SAFERWAY SIGN&quot;</td>
</tr>
</tbody>
</table>
36.0° across sides 3.0° Radius, 0.8° Border, 0.6° Intake, Black on Yellow; Light Rail Symbol; Double Headed Arrow Custom - 39.0° 0°; "LOOK BOTH", C specified length; "WAYS", C; Table of letter and object lefts.

30.0° across sides 3.0° Radius, 0.8° Border, 0.6° Intake, Black on Yellow; Light Rail Symbol; Double Headed Arrow Custom - 39.0° 0°; "LOOK BOTH", C specified length; "WAYS", C; Table of letter and object lefts.

DO NOT FOLLOW STREETCAR

1.5° Radius, 0.6° Border, 0.4° Intake, Black on White; 'DO NOT', 2K "FOLLOW", 2K; "STREETCAR", 2K.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
SIGN PANEL DETAILS

DATE: 12-22-2022
S115 253
GENERAL NOTES
1. FOR GENERAL NOTES AND SYMBOL LEGEND, SEE SHEET 101.
2. REFER TO DETAIL DRAWINGS V007 & V055 FOR ADDITIONAL INFORMATION REGARDING INSTALLATION OF OCS POLES ON GRAND BOWERY BRIDGE.

KEYED NOTES
- EXISTING SIDE BOX STREET LIGHT POLE ON THE BRIDGE WILL BE REPLACED WITH AMERICAN ELECTRIC TYPE "P" LIGHT FIXTURE BY CITY OF KANSAS CITY, STREET LIGHTING DEPARTMENT.
- LOCATION OF OCS POLE.
<table>
<thead>
<tr>
<th>ID</th>
<th>Fixture Type</th>
<th>Watt</th>
<th>Street Light 1</th>
<th>Pole Type</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>L101</td>
<td>LED-Surface</td>
<td>150W</td>
<td>VOLT/EXPIRED</td>
<td>A120M</td>
<td></td>
</tr>
<tr>
<td>L103</td>
<td>LED-Pedestrian</td>
<td>150W</td>
<td>VOLT/EXPIRED</td>
<td>A120M</td>
<td></td>
</tr>
<tr>
<td>L108</td>
<td>LED-Pedestrian</td>
<td>150W</td>
<td>VOLT/EXPIRED</td>
<td>A120M</td>
<td></td>
</tr>
</tbody>
</table>

**Kansas City Streetcar - Riverfront Extension**

**Street Lighting Schedules**

*NOT FOR CONSTRUCTION*

**Date:** 12/23/2012

**Issued by:** DR

**RideKC STREETCAR**
303104


PLAN

MILLING NOTES
The new 8½" blockout will extend from gutter to gutter starting at the end of old and stopping at the edge of the existing joint. The milling shall be 1" deeper at noted end of each expansion joint. See plan for location of expansion joints.

OVERLAY NOTES
The new 8½" blockout will extend from gutter to gutter the full length of the bridge except at the expansion joints. The typical 8½" blockout will be the full length of the bridge except at the rail expansion joint locations.

Typical 8½ x 8½ Blockout Detail for Overlay
(No. 1 blockout on new rail)

Overlay Blockout Detail at Rail Expansion Joint Box
(No. 1 blockout on new rail)
84" BLOCKOUT FOR 112" TRAM RAIL.
CUT OUT AND REMOVE 2" FINGER
PLATES FOR 84" BLOCKOUT, TYP.

8"-23"
TPF
TPF
TIP
FINGER PL 2
TIP

1" X 1" BAR, TYP.

GIRDER A

6/17
TYP.

GUTTER LINE

8"-23"
TPF
TPF

GIRDER B

11'-8"

1" SLIDER PLATE, TYP.

GUTTER LINE

6/17
TYP.

GIRDER C

14" DIAMETER HOLE FOR PLUG HOLE.
GRIND TOP OF PLUG HOLE SMOOTH.

TPF

GIRDER D

PIER B

PLAN

NOTES:

FLOOR DIMENSIONS ARE BASED ON INSTALLATION AT 70°F. THE EXPANSION VSF AND OTHER
DIMENSIONS SHALL BE INCREASED OR DECREASED 3° FOR EACH 1°F FALL OR RISE IN
TEMPERATURE AT INSTALLATION.

MATERIALS FOR THE EXPANSION DEVICE SHALL BE ASTM A36 GRADE 50 STRUCTURAL STEEL.

STRUCTURAL STEEL FOR THE NEW BAR AND PLATE SHALL BE COATED WITH A MINIMUM OF
20 COATS OF THERMATIC ZINC PRIMER TO PROVIDE A TOTAL DRY FILM THICKNESS OF 4
MILS MINIMUM & MILS MAXIMUM, IN
GALVANIZED IN ACCORDANCE WITH ASTM A335.

PAYMENT FOR FURNISHING, INSTALLING, AND \nINSTALLING THE STRUCTURAL STEEL FOR THE MODIFICATIONS CAN REMOVE
OF THE EXISTING 3" FINGER PLATES WILL BE
CONSIDERED COMPLETELY COVERED BY THE
CONTRACT UNIT PRICE FOR FINGER JOINT MODIFICATIONS, PER EACH.

NOTES:

FOR SECTIONS 4-4 & B-B SEE ST106.
SECTION A-A @ PIERS 2, 5 & 8

PARTIAL PLAN OF EXISTING FINGER PLATE

SECTION B-B

DETAIL C

1. Hold new 1" plates to the existing 2" finger plates as shown.
2. Sliding area between new 1" plates.
3. C-102, 60° joint fill. Steel rods for slip joints to exist plate. Some top of plug holes shown. Refer to plan views for location of plug holes.

NOTES:

FOR LOCATION OF SECTION A-A AND B-B.

SEE ST104 AND ST105

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

BASE BID - 112TRAM JOINTS

FINGER JOINT
MODIFICATION DETAILS

Issued for Bid: 12-23-2022

NOT FOR CONSTRUCTION

ST106 286

303118
TYPICAL SECTION
THROUGH 112 RAIL
NOTES:
1. REFER TO TRACK 9902 AND 9903 FOR THE EXPANSION JOINT DETAILS AND LOCATIONS.
2. REFER TO PROJECT GEDONICAL REPORT FOR ENGINEERING RECOMMENDATIONS REGARDING MIXED MATERIALS. SUBMIT WITH EAVES BULK FILL MATERIAL FOR REVIEW AND APPROVAL BY ENGINEER.
3. SUBGRADE REQUIRED TO MEET COMPLIANCE REQUIREMENTS OUTLINED IN THE GEDONICAL REPORT.
4. SEE Figs. 9902 AND 9903 FOR TRACK SLAB DETAILS. ALL TRACK SLAB CONCRETE SHALL BE F.C. = 4000 PSI WITH IN-PLACE CEMENT 3 LEER CT.
5. SEE FIG. 9909 FOR GRAND BOULEVARD VIADUCT BRIDGE DETAILS.
6. SEE FIG. 9906 FOR ADDITIONAL DETAILS.
7. SEE EXISTING BRIDGE PLANS FOR DETAILS OF EXISTING ME WALLS AND MOMENT SLABS.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
APPROACH SLAB EXPANSION JOINT DRAIN DETAIL

Sheet 21 of 29

RideKC STREETCAR

Issued for OD

DATE: 12-23-2020

NOT FOR CONSTRUCTION

ST102

303123
CENTER THE HOLE FOR THE DRAIN PIPE HORIZONTALLY WITHIN THE PANEL AND NOT BELOW THE LOWER EDGE OF THE HOLE MUST BE A MIN OF 5” BELOW BOTTOM OF ELEVATION LINE AND THE MINIMUM FROM SIDES OF PANEL.

EXISTING MSE WALLS SEE EXISTING PLAN FOR FURTHER DETAIL. SENTINEL 3 MSE WALLS SIMILAR.

ELEVATION - FRONT FACING (LOOKING AHEAD)
NOTES:

ALL EXISTING STRUCTURE IS SHOWN DASHED. NEW CONSTRUCTION SHOWN IN HEAVY SOLID LINES.

TRACK GAUGE IS MEASURED AT 3'-0" BELOW TOP OF RAIL AND FROM THE GAUGE FACE TO GAUGE FACE.

REINFORCING STEEL SHALL BE ASTM A-615 GRADE 60 (EPoxy COATED).
### GENERAL NOTES:

- **Design Specification:**
  - 2020 AASHTO Bridge Design Specifications (TxDOT) for Girder Design.
  - AASHTO Standard Specifications for Highway Bridges, 14th Ed., 1998, are used where not specified.
  - TxDOT Design Standards are used for the Bridge Design.

- **Bridge Foundation:**
  - The Bridge Foundation shall be in accordance with TxDOT Bridge Design Specifications.

- **Construction:**
  - Construction shall be completed in accordance with the plans and specifications.
  - Each component of the Bridge shall be constructed in accordance with the plans and specifications.

- **Material Specification:**
  - Materials shall be in accordance with the plans and specifications.

- **Design:**
  - The design of the Bridge shall be in accordance with TxDOT Bridge Design Specifications.
  - The design of the Bridge shall be in accordance with the plans and specifications.

### ESTIMATED QUANTITIES FOR STEEL ON STEEL

<table>
<thead>
<tr>
<th>Item</th>
<th>Sheet</th>
<th>Quantity</th>
<th>Total</th>
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<tr>
<td>SLAB SHEAR</td>
<td></td>
<td>9,467</td>
<td>9,467</td>
</tr>
<tr>
<td>BOLTS</td>
<td></td>
<td>3,750</td>
<td>3,750</td>
</tr>
<tr>
<td>TIE PLATE</td>
<td></td>
<td>955</td>
<td>955</td>
</tr>
<tr>
<td>CONCRETE DRAIN SPANS</td>
<td></td>
<td>2,318</td>
<td>2,318</td>
</tr>
<tr>
<td>HANGAR BOX</td>
<td></td>
<td>243</td>
<td>243</td>
</tr>
<tr>
<td>FINGER JOINT</td>
<td></td>
<td>48</td>
<td>48</td>
</tr>
</tbody>
</table>

**Note:**
- The above list is not exhaustive and may require additional components.
- The quantities listed above are based on preliminary estimates and may be subject to change.
- The contractor shall be responsible for the accurate measurement of all materials used.

### DECK DETAILS:

- **Existing Deck:**
  - The existing deck shall be removed prior to the installation of the new deck.

- **New Deck:**
  - The new deck shall be constructed in accordance with the plans and specifications.

- **Deck Drainage:**
  - The deck drainage shall be in accordance with the plans and specifications.

### DECK DETAILS:

- **Existing Deck:**
  - The existing deck shall be removed prior to the installation of the new deck.

- **New Deck:**
  - The new deck shall be constructed in accordance with the plans and specifications.

- **Deck Drainage:**
  - The deck drainage shall be in accordance with the plans and specifications.
MILLING NOTES
MILL THE EXISTING DECK 1.5" DEEP FROM CENTER TO GUTTER STARTING AT THE END OF SLAB AND STARTING AT THE EDGE OF THE DECK REPLACEMENT LIMITS.
SEE ISSUE PLANS 2021-4121 FOR ADDITIONAL MILL JOINT AND MILL DETAIL.

OVERLAY NOTES
THE NEW 3.5" OVERLAY WILL EXTEND FROM CENTER TO GUTTER THE FULL LENGTH OF THE BRIDGE EXCEPT AT THE DECK REPLACEMENT LIMITS. THE TYPICAL 8.5" X 3.5" BLOCKOUT IN THE OVERLAY WILL BE THE FULL LENGTH OF THE BRIDGE EXCEPT AT THE DECK REPLACEMENT LIMITS.
CONTRACTOR TO REMOVE EXISTING STREET LIGHTS LOCATED AT THE BEARING OF THE BRIDGE AND REMOVE ALL EXISTING STEEL CONNECTED TO EXISTING STREET LIGHT. CONTRACTOR TO INSTALL NEW EXISTING STREET LIGHT AND RE-INSTALL THE EXISTING STREET LIGHTS AFTER THE BEARING IS RECONSTRUCTED ON THE BRIDGE.

OTHER LIGHTS OR BRIDGE MUST BE REMOVED DURABLY, EVEN AFTER THESE LIGHTS ARE REMOVED.

CONTRACTOR TO INSTALL NEW LIGHTS FOR THE STREET LIGHTS AND REMOVE AN EXISTING CONNECTED TO THE STREET LIGHT. CONTRACTOR TO ENSURE THE EXISTING STREET LIGHTS ARE INSTALLED PROPERLY AFTER INSTALLATION.
Bridge deck and barrier removal and reconstruction limits

Leave all transverse rebar embeded in the deck and leave a minimum of 3'-0" (1000mm) to be lapped to the new transverse rebar.

Leave all longitudinal rebar embeded in the deck and leave a minimum of 3'-0" (1000mm) to be lapped to the new longitudinal rebar.

Leave all transverse rebar embeded in the deck and leave a minimum of 3'-0" (1000mm) to be lapped to the new transverse rebar.

Leave all longitudinal rebar embeded in the deck and leave a minimum of 3'-0" (1000mm) to be lapped to the new longitudinal rebar.

Legend:
- Mill and Overlay
- Concrete and Precast Panel Removal

Notes:
- See concrete removal limits - Pier 12 for notes.
PIER B PLAN

NOTES:

Plan dimensions are based on installation of 60°F. The expansion gap and other dimensions shall be increased or decreased 0.1" for each 10°F fall or rise in temperature at installation.

Material for the expansion device shall be ASTM A109 Grade 50 structural steel.

Structural steel for the new bar and plate shall be coated with a minimum of two coats of priming zinc primer to provide a total dry film thickness of 4 mils minimum. A mils minimum, then clear galvanized in accordance with ASTM A123.

Payment for furnishing, coating, galingizing, and installing the structural steel for the modifications and removal of the existing 2" finger plates will be considered completely covered by the contract unit price for finger joint modifications.

Notes:

For sections 6-4 & 8-8 see ST303.
SECTION A-A @ PIERS 2, 5 & 8

SECTION B-B

DETAIL C

1. Reid new 1" Plates to existing 2" finger plates as shown.
2. Slotting area between new 1" plates.

SECTION OF BOX
THRU BRIDGE EXPANSION JOINT

TRACK EXPANSION JOINT DETAIL

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

BID ALTERNATE - 115RE JOINTS
FINGER JOINT
MODIFICATION DETAILS

NOT FOR CONSTRUCTION
CONCRETE BLOCKOUT DETAIL
AT RAIL JOINT
(Center Blockout on Rail)
(All New Sections of Slab)

MIDDLE REINFORCING

BOTTOM REINFORCING

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
BID ALTERNATE - 115RE JOINTS
SLAB REINFORCING - PIER 2

NOTE: See STS + "PLAN OF DECK EXPRESSION" for details to install the existing deck drain.
See ST12 "PLAN OF EXPANSION JOINTS" for details to install the existing deck drains.

See ST12 "PLAN OF EXPANSION JOINTS" for details to install the existing deck drains.
# Bill of Reinforcing Steel

## Floor 1

### Dimensions

<table>
<thead>
<tr>
<th>Location</th>
<th>Column</th>
<th>ETA</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>K</th>
<th>Length</th>
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<tr>
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</tbody>
</table>

### Notes

- The bill of reinforcing steel is subject to revision.
- Dimensions provided are for reference.
- Final measurements will be based on field verification.

## Floor 2

### Dimensions

<table>
<thead>
<tr>
<th>Location</th>
<th>Column</th>
<th>ETA</th>
<th>B</th>
<th>C</th>
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<th>F</th>
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<th>K</th>
<th>Length</th>
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</tr>
</tbody>
</table>

### Notes

- The bill of reinforcing steel is subject to revision.
- Dimensions provided are for reference.
- Final measurements will be based on field verification.

---

### KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

**BID ALTERNATE - N15F RE JONTS**

**REINFORCEMENT BAR LIST**

---

**Model No. 313**
<table>
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<tr>
<th>LOCATION</th>
<th>B</th>
<th>C</th>
<th>D</th>
<th>E</th>
<th>F</th>
<th>H</th>
<th>K</th>
<th>LENGTH</th>
<th>FACE</th>
<th>TOTAL</th>
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<tbody>
<tr>
<td></td>
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<td></td>
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</tr>
</tbody>
</table>

**Bill of Reinforcing Steel**

*Notes:*
- This drawing is not to scale. Refer to the dimensions provided.
- Not for Construction.
### Project Details

#### Inside Elevation at Pier 11

- **Concrete Barrier Rail Removal Lines**
- **Top of Rail**
- **Concrete Deck**
- **Light Post**

#### Inside Elevation at Pier 12

- **Concrete Barrier Rail Removal Line**
- **Top of Rail**
- **Concrete Deck**

### Notes

- **Barrier and Deck Removal Limits** may be different. Barrier limits are based on a 2.5-meter opening.
- See Barrier Rail details for reinforcing in light posts and intermediate posts.
- All dimensions are along outside fascia.
- Contractor shall salvage existing longitudinal tie rods unless length of 5'-11" is considered joint Sky.
- For bid of reinforcing steel, see accompanying tabulation.

### Specifications

**Kansas City Streetcar - Riverfront Extension**

**Bid Alternate - 115RE Joints**

**East Barrier Rail**

**Reconstruction Limits**

Piers 11 & 12

**ISSUED FOR BID**

**DATE 12-23-2022**
### Table: Conductor and Span Wire Specifications

<table>
<thead>
<tr>
<th>Conductor</th>
<th>Contact Wire</th>
<th>Span Wire</th>
<th>Bunch Rope</th>
<th>Solid Hanger Wire</th>
<th>Feed Tap Wire</th>
<th>Suppressor/Cap Feeder Cable</th>
<th>Flexible Hanger Wire</th>
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</thead>
<tbody>
<tr>
<td>SOG</td>
<td>300 KCMIL</td>
<td>1/4</td>
<td>8/7</td>
<td>28</td>
<td>1/0</td>
<td>11 MM</td>
<td>4 MM</td>
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<tr>
<td>MAT.</td>
<td>COPPER</td>
<td>GALVANIZED STEEL</td>
<td>GALVANIZED STEEL</td>
<td>GALVANIZED STEEL</td>
<td>PHYLLESTRAN</td>
<td></td>
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</tr>
<tr>
<td>MAX. POUND DESCRIPTION</td>
<td>SOLID GROOVED TROLLEY WIRE</td>
<td>7 WIRE STRAND</td>
<td>7 WIRE STRAND</td>
<td>7 WIRE STRAND</td>
<td>RORDED JACKET TO SYNTHETIC ROPE</td>
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<tr>
<td>TYPE</td>
<td>HARD DRAWN</td>
<td>SEAMLESS TUBE 2501</td>
<td>SEAMLESS TUBE 2501</td>
<td>SEAMLESS TUBE 2501</td>
<td>COPPER</td>
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<tr>
<td>STRAND DIAMETER (IN)</td>
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<tr>
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<tr>
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<td>INSULATION</td>
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</tr>
<tr>
<td>WEIGHT - 1000 FT (LBS)</td>
<td>1.063</td>
<td>1.121</td>
<td>1.255</td>
<td>1.273</td>
<td>1.273</td>
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<tr>
<td>BREAKING LOAD - 2,000 LBS</td>
<td>11,800</td>
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<td>11,200</td>
<td>15,400</td>
<td>26,700</td>
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<tr>
<td>MODULUS OF ELASTICITY (PSI)</td>
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<td>29 x 10^6</td>
<td>29 x 10^6</td>
<td>29 x 10^6</td>
<td>29 x 10^6</td>
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<tr>
<td>THERMAL COEFFICIENT (PPM/°F)</td>
<td>9.4 x 10^-6</td>
<td>6.7 x 10^-6</td>
<td>6.7 x 10^-6</td>
<td>6.7 x 10^-6</td>
<td>6.7 x 10^-6</td>
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<tr>
<td>NORMAL TENSION @ 60°F, NO WIND</td>
<td>2400</td>
<td>---</td>
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<tr>
<td>WEIGHT WITH 15° HORIZONTAL ICE UPRIGHT</td>
<td>1.760</td>
<td>0.200</td>
<td>0.712</td>
<td>0.819</td>
<td>1.142</td>
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<td></td>
</tr>
</tbody>
</table>

### Notes:
1. For general notes refer to drawing 0011, for symbols and abbreviations refer to drawing 0012.
2. Feeder cables and jumper wires to be insulated for 2,000 volts and to operate at 90°C.
3. Non-solid wire to be used for inclined pendulum hangers and curve pendulum hangers (full circles).
4. All guy wires shall conform to ASTM A475 and have a Class C coating of galvanizing.
5. All lengths of phyllitestran synthetic rope to have sealing cap to prevent water retention.

### Typical Section Diagram

- [Diagram of typical section]
NOTES:
1. VALUES SHOWN ARE CONSERVATIVE AND BASED ON INDUSTRY PRACTICE.
2. SAFE OPERATING ZONE ON PANTOGRAPH HEAD IS BASED ON VEHICLE ROLL OF 2" AND 55 MPH WIND WITH 10 MPH CUST BLOWOFF FOR A CONSTANT TENSIONED CONTACT WIRE WITH 24" LIP, TENSION:
3. BLOWOFF IS BASED ON A SPAN LENGTH OF 150 FEET, PEAK TYPICAL SPAN LENGTH BETWEEN 125 FEET.
4. MAXIMUM STAGE TO BE 6 INCHES, MAXIMUM MELDZARATE TO BE IN RESPONSE WITH A 3 INCH OFFSET AT FALLING FOR PANTOGRAPH AT MACEDONATE.
5. PANTOGRAPH CENTER IS LOCATED DIRECTLY OVER THE TRACK KRLS AND RIDE ALONG THE TRACK CENTER LINE.
6. ELECTRICAL AND MECHANICAL CLEARANCE TO BE ADHERED TO, IF UNABLE TO MEET REQUIREMENTS, TAKE MEASUREMENTS FROM THE ENGINEER.
NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING NO. 1010060, FOR SYMBOLS & ABBREVIATIONS REFER TO DRAWING NO. 1010060.

2. CROSS-CONTACT WIRE CLAMP TO BE POSITIONED AT A DISTANCE FROM THE POINT OF SWITCH AS INDICATED ON LAYOUT DRAWINGS, CONTRACTOR TO FURNISH ALL CROSS-CONTACT WIRE CLAMPS TO RIDE ON THE SAFE ZONE OF THE PANTOGRAPH.

3. SIGNAL INSTALLATION AND STAGGER OF CONTACT WIRE SHALL ENSURE THAT CONTACT WIRE REMAINS WITHIN THE SAFE ZONE OF THE PANTOGRAPH AT ALL LOCATIONS DURING NORMAL OPERATING CONDITIONS.

4. JUMPERS SHALL BE POSITIONED SO THAT MOVEMENT OF CONTACT WIRES WILL NOT RESULT IN TOUCHING OR THE CROSS CONTACT WIRE CLAMP.

5. PULLOVER STEADY ARM TO BE LOCATED AT REQUIRED STAGGER THAT IS REFERENCED FROM SUPERELEVATED TRACK CENTERLINE.

6. PULLOVER OFFSETS ARE SHOWN WITH ARROWS IN LAYOUT DRAWINGS AND SHOW DIAMOND AND DISTANCE AND DIRECTION OF CONTACT WIRE FROM CENTER OF TRACK TOWARDS OUTSIDE OR INSIDE OF CURVE. TRACK DIMENSIONS ARE IN INCHES.

7. FOR CROSS LEVEL TRACK, PULLOVERS AND STEADY ARMS TO BE OFFSET FROM PERPENDICULAR TRACK CENTERLINE.

8. STAGGER AND OFFSET VALUES VARY AND ARE INDICATED ON THE LAYOUT PLAN. TYPICAL OFFSET FOR PULLOVERS ON CURVES IS 8 INCHES AND FOR TANGENT STAGGERS IS 6 INCHES.

9. PULLOVER SPACING FOR CURVES IS SHOWN ON THE CURVE LAYOUT DRAWINGS AND SHALL NOT EXCEED A SPACING WHERE THE CONTACT WIRE EXCEEDS THE PANTOGRAPH SAFE OPERATING ZONE OF +/- 8 INCHES.

10. CROSS-CONTACT WIRE CLAMPS TO BE PLACED ON WIRE ACCORDING TO TEMPERATURE AND MOVEMENT OF WAVING WIRE REFER TO SHEET Y FOR POSITIONING TABLE.
### Vertical and Wind Loads

<table>
<thead>
<tr>
<th>SPAN</th>
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<tbody>
<tr>
<td>30</td>
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<table>
<thead>
<tr>
<th>VERTICAL LOAD (LB)</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC - 1</td>
</tr>
<tr>
<td>1.083</td>
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</table>

<table>
<thead>
<tr>
<th>WIND LOAD (MPH)</th>
</tr>
</thead>
<tbody>
<tr>
<td>32</td>
</tr>
<tr>
<td>58</td>
</tr>
<tr>
<td>84</td>
</tr>
<tr>
<td>110</td>
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</table>

<table>
<thead>
<tr>
<th>WIND LOAD (KNS)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
</tr>
<tr>
<td>3.2</td>
</tr>
<tr>
<td>4</td>
</tr>
<tr>
<td>5.3</td>
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<table>
<thead>
<tr>
<th>VERTICAL LOAD (IN)</th>
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<tbody>
<tr>
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</table>

### Wind and Vertical Loads

#### Operating Conditions

<table>
<thead>
<tr>
<th>OPERATING CONDITIONS</th>
<th>TEMP (°F)</th>
<th>WIND (MPH)</th>
<th>TOC (IN)</th>
<th>BLOW-OFF (IN)</th>
<th>BASIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>OC - 1</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>NORMAL</td>
</tr>
<tr>
<td>OC - 2</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>CONDUCTOR SAG</td>
</tr>
<tr>
<td>OC - 3</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>BLOW-OFF</td>
</tr>
<tr>
<td>OC - 4</td>
<td>250</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>PRE-TIE</td>
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<tr>
<td>OC - 5</td>
<td>250</td>
<td>0</td>
<td>0.3</td>
<td>3.56</td>
<td>ICE</td>
</tr>
<tr>
<td>OC - 6</td>
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<td>0</td>
<td>0</td>
<td>1.60</td>
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#### Non-Operating Conditions

<table>
<thead>
<tr>
<th>NON-OPERATING CONDITIONS</th>
<th>TEMP (°F)</th>
<th>WIND (MPH)</th>
<th>TOC (IN)</th>
<th>BLOW-OFF (IN)</th>
<th>BASIS</th>
</tr>
</thead>
<tbody>
<tr>
<td>NOC - 2</td>
<td>250</td>
<td>0</td>
<td>0.3</td>
<td>2.70</td>
<td>NOX</td>
</tr>
<tr>
<td>NOC - 3</td>
<td>250</td>
<td>0.3</td>
<td>0.5</td>
<td>2.70</td>
<td>STRUCTURAL/LOW FROST</td>
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<tr>
<td>NOC - 4</td>
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<td>0</td>
<td>0</td>
<td>2.70</td>
<td>LOW TEMP FROST/WIND</td>
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<tr>
<td>NOC - 5</td>
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<td>0.3</td>
<td>0.5</td>
<td>2.70</td>
<td>CONDUCTOR CLEARANCE</td>
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#### Loading Conditions

<table>
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<th>NON-OPERATING</th>
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<tr>
<td>CONSIDER</td>
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<td>2.70</td>
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<tr>
<td>ICE</td>
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<td>0.30</td>
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<tr>
<td>LOW TEMPERATURE</td>
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#### Radial Loads by Angle

<table>
<thead>
<tr>
<th>ANGLE &quot;a&quot; DEGREES</th>
<th>OPERATING</th>
<th>NON-OPERATING</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>2400</td>
<td>1</td>
</tr>
<tr>
<td>2</td>
<td>1900</td>
<td>1200</td>
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<td>3</td>
<td>1300</td>
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<td>4</td>
<td>800</td>
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<tr>
<td>5</td>
<td>550</td>
<td>300</td>
</tr>
<tr>
<td>6</td>
<td>375</td>
<td>225</td>
</tr>
<tr>
<td>7</td>
<td>275</td>
<td>225</td>
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<tr>
<td>8</td>
<td>240</td>
<td>225</td>
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<tr>
<td>9</td>
<td>280</td>
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<td>10</td>
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<td>11</td>
<td>400</td>
<td>290</td>
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<tr>
<td>12</td>
<td>570</td>
<td>360</td>
</tr>
<tr>
<td>13</td>
<td>755</td>
<td>480</td>
</tr>
<tr>
<td>14</td>
<td>935</td>
<td>580</td>
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<tr>
<td>15</td>
<td>1115</td>
<td>680</td>
</tr>
<tr>
<td>16</td>
<td>1300</td>
<td>780</td>
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</tbody>
</table>

#### Notes

1. For general notes refer to drawing D116, structural steel and concrete notes refer to drawing D117, and symbols. and abbreviations refer to drawing D117.
2. Tables provide loadings for various span lengths and are presented for reference. Tension and blow-off provided are based on 4 running span of 192 feet.
3. For NEC Code, in 1/96 or 1/01, a constant component of 0.5 FET shall be added to the resultant load between the vertical load and wind load.
4. Blowing is considered at mid-span.

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**Incoming Data:**

- Date: 12/31/20
- Source: RideKC Streetcar
- Issue Date: 12/31/20
- Description: Kansas City Streetcar - Riverfront Extension

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**Equipment:**

- Company: HNTB Corporation
- Project: Kansas City Streetcar - Riverfront Extension
- Contact: 1564466

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**Document Information:**

- Document Title: Overhead Contact System Technical Sheets Vertical and Radial Loads
- Document Type: Technical Sheet
- Document Code: VT-336
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- Document Status: NOT FOR CONSTRUCTION

---

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- D. D. Binnion

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**Checked By:**

- R. W. Hino
- J. M. Schmitt
- D. D. Binnion

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**Printed By:**

- C. D. Schmitt
- J. M. Schmitt
- D. D. Binnion

---

**Print Date:**

12/31/20
NOTES:
1. FOR GENERAL NOTES REFER TO DRAWING GS414, FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING GS321.
2. FOR PIER CAP ATTACHMENT DETAILS REFER TO DWG Y12.
3. PIER CAP WIDTH OF 4'-6" AND REINFORCEMENT SPACING, 'A', ARE BASED ON AS-BUILT DRAWINGS, GRAND BOULEVARD VIADUCT REPLACEMENT, LATEST REVISION DATE JANUARY. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE FIELD PRIOR TO FABRICATION OF THE PIER CAP ATTACHMENT ASSEMBLIES.
4. ANCHOR BOLTS SHALL BE ANCHORED INTO EXISTING A PED, USING CEMENTITIOUS CEMENT IN CORED HOLES. CEMENT SHALL BE 5000 PSI.
5. WHERE CHAIN PIPES INTERFERE WITH PLACEMENT OF OCS POLE BRACKETS, CONTRACTOR TO MOVE, ADJUST, OR CHANGE SUPPORTS OR CHAINS TO ALLOW BRACKET PLACEMENT.
6. WHERE ELECTRICAL, CONDUIT, AND JUNCTION BOXES INTERFERE WITH PLACEMENT OF OCS POLE BRACKETS, CONTRACTOR TO MOVE, ADJUST, OR CHANGE LOCATION OF CONDUIT AND BOXES TO ALLOW OCS POLE BRACKET PLACEMENT.
7. WHERE CHANGES TO CHAINS AND ELECTRICAL EQUIPMENT IS REQUIRED, CONTRACTOR SHALL PROPOSENEW ARRANGEMENTS TO THE ENGINEER FOR APPROVAL.
8. FOR POLE HEIGHTS REFER TO POLE & FOUNDATION SCHEDULE ON DRAWINGS Y111 AND Y112.
SOUTH APPROACH OCS TYPICAL STRUCTURE
VIEW FACING NORTH

NORTH APPROACH OCS TYPICAL STRUCTURE
VIEW FACING SOUTH

NOTES:
1. FOR GENERAL NOTES REFER TO DRAWING DS41, FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING DS33.
2. FOR POLE TYPE, LENGTH, AND OFFSET AT SPECIFIC LOCATIONS REFER TO POLE AND FOUNDATION SCHEDULE DRAWINGS Y111 TO Y112.
NOTES:
1. FOR GENERAL NOTES REFER TO DRAWING 0341, FOR STRUCTURAL STEEL AND CONCRETE NOTES REFER TO DRAWING 0342, FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING 0343.
2. ANCHOR BOLTS SHALL BE HIGH STRENGTH GALVANIZED STEEL, COMFORMING TO ASTM A325 GRADE 50, WITH THE EXCEPTION FOR FOUNDATIONS TE-16 AND PD-1, WHICH SHALL COMFORM TO ASTM A325 GRADE 50. ALL NUTS AND PLATE WASHERS SHALL BE HOT-DIPPED GALVANIZED STEEL COMFORMING TO ASTM A527 AND A554, RESPECTIVELY.
3. PROTECT ANCHOR BOLTS ABOVE TOP OF FOUNDATION FROM DAMAGE AND REMOVE CONCRETE FROM FOUNDATION CONSTRUCTION AND CONCRETE POOL, COAT BOLTS AND NUTS WITH GREASE FOR FACILITATION OF FUTURE CONCRETE REMOVAL.
4. CAP AND PROTECT THE CONDUITS DURING CONSTRUCTION.
5. GROUND ROUGH LOCATION AND ORIENTATION RELATIVE TO TRACK AND FOUNDATION IN VARY, THE CONTRACTOR SHALL TAKE CARE TO AVOID ANY UTILITIES BURIED ADJACENT TO THE FOUNDATION AND SHALL LOCATE GROUND ROUGH ACCORDINGLY IN STAKE. USING CARBON STEEL IN PLACE, ONLY GROUND ROUGH AND USE CARBON AS GROUNDING ELECTRODE.
6. GROUND RESISTANCE FOR THE POLE SHALL BE LESS THAN OR EQUAL 15 000 OHMS AT NIGHT.
7. FOR SPECIFIC FUNDATION TYPE AND EMBANKMENT, SEE FOUNDATION SCHEDULE DRAWING 0111 AND 0112.
8. CONCRETE SHALL HAVE A MINIMUM 28 DAY COMPRESSION STRENGTH OF 3000 PSI. CONCRETE SHALL HAVE A MAXIMUM 28 DAY COARSE AGGREGATE SIZE OF 1-1/2INCHES.
9. REINFORCING STEEL SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60. REINFORCING STEEL SHALL BE EPOXY COATED.
10. IF CONSTRUCTION OF PRECAST IS NOT POSSIBLE DUE TO UNDERGROUND RESTRICTIONS, CONTRACTOR MAY USE POST AND SHALL INFORM THE ENGINEER BEFORE DOING SO.
11. WHERE POLE FOUNDATIONS ARE IN LANDSCAPE AREAS, USE FOUNDATION FD-16 FOR ALL FIXED AND SEMI-FIXED AREAS, USE FOUNDATION FD-18.
12. FOR FOUNDATIONS FD-16, APPLY PRESSURES ON ALL EMBEDDED BOLTS THREADS AND NUTS SUCH THAT IT WILL PREVENT CONCRETE FROM SPREADING. FILL VOID BELOW BUIDLmann TO TOP OF CONCRETE WITH FLEXIBLE FILL. CONCRETE CONTROLLED LOW STRENGTH CONCRETE PER AC22B, COMPRESSION STRENGTH SHALL BE 10000 PSI.
13. SEAL ALL CONDUIT OPENINGS WITH DUCT PLUGS, DUCT SEAL, OR OTHER BONDING METHODS TO BE APPROVED BY THE ENGINEER.
14. FACE OF POLE TO FACE OF CURB DISTANCE TO BE NO LESS THAN 10" UNLESS DETERMINED OTHERWISER AT INDOOR POLE LOCATION DISTANCE MAY BE GREATER DEPENDANT ON LOCATION WHERE STATED.
15. DEPTH OF CARBON STEEL BELOW ROAD PAVING TO BE DETERMINED BY THE CONTRACTOR AT THE TIME OF INSTALLATION AND/OR BY DIRECTION OF THE ENGINEER.
16. FOUNDATION DESIGNATIONS HAVE AN ALPHABETICAL LETTER RECOMMENDING THE TYPE OF POLE AND ITS BOLTホール CIRCLE AS FOLLOWS:
A - POLE TYPE 1
B - POLE TYPE 2
C - POLE TYPE 3
D - POLE TYPE 4
E - POLE TYPE 5

FOUNDATION ANCHOR BOLT TABLE

<table>
<thead>
<tr>
<th>FD TYPE</th>
<th>VERTICAL REBAR</th>
<th>BOLT CIRCLE &quot;D&quot; (IN)</th>
<th>ANCHOR BOLT DIA. &quot;D&quot; (IN)</th>
<th>ANCHOR BOLT PROJECTION &quot;P&quot; (IN)</th>
<th>ANCHOR BOLT LENGTH &quot;L&quot; (IN)</th>
</tr>
</thead>
<tbody>
<tr>
<td>FD-16</td>
<td>#8</td>
<td>10</td>
<td>1.5</td>
<td>2</td>
<td>12</td>
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<tr>
<td>FD-17</td>
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<td>16</td>
<td>2</td>
<td>12</td>
<td>72</td>
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<tr>
<td>FD-18</td>
<td>#8</td>
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<td>1.5</td>
<td>2</td>
<td>12</td>
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<td>FD-19</td>
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<td>2.5</td>
<td>14</td>
<td>74</td>
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<td>FD-20</td>
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<td>23</td>
<td>2.5</td>
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<td>74</td>
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<tr>
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<td>10</td>
<td>74</td>
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<td>#8</td>
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<td>2</td>
<td>12</td>
<td>72</td>
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<td>FD-23</td>
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<td>2</td>
<td>12</td>
<td>72</td>
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<td>FD-24</td>
<td>#10</td>
<td>13</td>
<td>2.5</td>
<td>14</td>
<td>74</td>
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<td>FD-25</td>
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<td>1</td>
<td>10</td>
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<td>FD-26</td>
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<td>2.5</td>
<td>14</td>
<td>74</td>
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<td>#10</td>
<td>23</td>
<td>2.5</td>
<td>14</td>
<td>74</td>
</tr>
</tbody>
</table>

* ANCHOR BOLTS FOR FOUNDATIONS FD-16 AND FD-18 ARE TO BE COLOR CODED IN THE ANCHOR BOLTS ONLY. BOLTS FOR FOUNDATIONS FD-16 AND FD-18 ARE TO BE COLOR CODED IN THE ANCHOR BOLTS ONLY.
NOTES:

1. FOR GENERAL NOTES REFER TO DRAWINGS 000-1 FOR STRUCTURAL STEEL AND CONCRETE. NOTES REFER TO DRAWINGS 001 FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING GG.

2. FOR PIER CAP ATTACHMENT DETAILS REFER TO ONG YOY.

3. PIER CAP WIDTH OF 42" AND REINFORCEMENT SPACING "A", AND BASED ON ASSUMED DRAWINGS. GRAND BOULEVARD VIADUCT DESIGN. LATEST REVISION DATES 06/29/2020. CONTRACTOR SHALL VERIFY ALL DIMENSIONS IN THE HELD PLAN TO FABRICATION OF THE PIER CAP ATTACHMENT ASSEMBLIES.

4. ANCHOR BOLTS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS.

5. CONTRACTOR TO PROVIDE CONCRETE FOR REBAR LOCATIONS BEFORE DRILLING.

VIADUCT OCS TYPICAL STRUCTURE

EXISTING PIER
NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING 0001, FOR
   STRUCTURAL STEEL AND CONCRETE NOTES REFER TO DRAWING
   0001. FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING
   0001.

2. FOR POLE-ANCHOR BASE PLATE DETAILS REFER TO DRAWING
   Y11.

3. FOR FOUNDATION TYPE AND EMENDMENT LENGTH REFER TO
   POLE-AND-Foundation SCHEDULE ON DRAWING Y11 AND
   Y11.

4. SPOT CONCRETE AWAY FROM ANCHOR BOLTS FOR WATER
   PENETRATION.

5. FOR ADDITIONAL GROUNDING DETAIL REFER TO DRAWING Y12.

6. ANCHOR BOLTS, NUTS, AND FLAT WASHERS TO BE HOT-DIPPED
   GALVANIZED PER ASTM F1554 WITH A COATING THICKNESS OF
   0.005 INCHES.

---

A PLAN
SCALE: 1/" = 1'-0"

B SECTION
SCALE: 1/" = 1'-0"

---

#1 LOOP REINFORCEMENT

VERTICAL BAR (TYP)

FOUNDATION

3'-0" CLEAR

---

EMENDMENT PLATE
SCALE: 1/" = 1'-0"

A. PLAN
SCALE: 1/" = 1'-0"

B. SECTION
SCALE: 1/" = 1'-0"

---

1. HEAVY HEX NUTS
   AND WASHERS

2. POLE ANCHOR BOLT

---

FOUNDATION AND/OR BOLT TABLE

<table>
<thead>
<tr>
<th>FOUNDATION</th>
<th>ANCHOR BOLT</th>
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</thead>
<tbody>
<tr>
<td>BOLT TYPE</td>
<td>BOLT CIRCLE &quot;D&quot; (IN)</td>
</tr>
<tr>
<td>T0-4MX</td>
<td>15 15 1-1/2</td>
</tr>
<tr>
<td>T0-4HC</td>
<td>16 16 2</td>
</tr>
<tr>
<td>T0-4HC</td>
<td>20 20 2-1/2</td>
</tr>
<tr>
<td>T0-4HC</td>
<td>25 22 2-1/2</td>
</tr>
</tbody>
</table>

* ANCHOR BOLTS FOR FOUNDATIONS T0-4MX AND T0-4HC MUST CONFORM TO
ASTM F1554, GRD 104, THESE ANCHORS TO BE COLOR CODED IN THE ANCHOR
BODY, SUCH THAT THEY ARE DISTINGUISHABLE FROM ALL OTHER
ANCHORS.
Notes:
1. For general notes refer to drawing set. For structural and concrete notes refer to drawing notes. For symbols and abbreviations refer to drawing set.
2. Contact wire suspension assembly allocated separately and indicated on layout plans.
3. See of pole clamp dependent upon pole size.
4. Bracket arm guy wire at end of arm to be clamped to OCA pole at a minimum 1:4 slope.
5. Use Inside guy wire when bracket arm PIPE is greater than 12 feet long.
6. For bracket arm up to 20 feet long, use 2 inch schedule 80 pipe (BA-1A). For bracket arms between 20 feet and 25 feet long use 3 1/2 inch schedule 80 pipe (BA-1A).
7. Contractor to furnish pipe end cap for approval by KC Streetcar. Pipe end cap to fit over outside of pipe and be secured using a 1/4 inch square head set screw.
8. Contractor shall only use hot forged steel pipe clamps and pole clamps.
9. Maximum length of bracket arm BA-1A is 25 feet. For lengths over 25 feet, use BA-2 arm.
11. Bracket arm length is determined by contractor.
12. Mounting height of bracket arm to compensate Sag of contact wire. Contractor to determine final height.
13. Item numbers 11, 12, and 14 for BA-1A shall be used accordingly.

Bill of Material:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>NICE, SPAN, 5/8, EHS</td>
</tr>
<tr>
<td>2</td>
<td>PERFORM, SPAN, WIRE, 5/8</td>
</tr>
<tr>
<td>3</td>
<td>POLE CLAMP DETAL 1</td>
</tr>
<tr>
<td>4</td>
<td>THIMBLE, 3/8, STL, HDU</td>
</tr>
<tr>
<td>5</td>
<td>LOOP INSULATION</td>
</tr>
<tr>
<td>6</td>
<td>BRACKET FOR LOOP INSULATION</td>
</tr>
<tr>
<td>7</td>
<td>CLAMP LINK</td>
</tr>
<tr>
<td>8</td>
<td>PIPE, STEEL, 2 IN. TIGER, SCHEDULE 80</td>
</tr>
<tr>
<td>9</td>
<td>HIRE CLEAN TWO PIECE GUSSET</td>
</tr>
<tr>
<td>10</td>
<td>TURNBUCKLE, EYE &amp; EYE</td>
</tr>
<tr>
<td>11</td>
<td>END INSULATION, SCHEDULE 80 PIPE</td>
</tr>
<tr>
<td>12</td>
<td>BRACKET ARM POLE BOLTS</td>
</tr>
<tr>
<td>13</td>
<td>PIPE END CAP</td>
</tr>
<tr>
<td>14</td>
<td>NICE, SPAN, 3/4, LARMUHARMATIN</td>
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<tr>
<td>15</td>
<td>PERFORM, 3/4, SPAN WIRE</td>
</tr>
<tr>
<td>16</td>
<td>HIRE END CAP</td>
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Notes:
- Contractor may use parts listed above or approved equal with approval of the engineer.
<table>
<thead>
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<th>DESCRIPTION</th>
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<th>PART NUMBER</th>
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<tbody>
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<td>1</td>
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<td>ASW/AAF</td>
<td>-</td>
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<tr>
<td>2</td>
<td>PREFORM, END FITTING, 3/8&quot;</td>
<td>PREFORM</td>
<td>0312-1969</td>
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<td>3</td>
<td>CLAMP FOR POLE, MULTIPLE</td>
<td>SEE DRAWING</td>
<td>-</td>
</tr>
<tr>
<td>4</td>
<td>THIMBLE, 3/8&quot; STEEL, 64G</td>
<td>MAC</td>
<td>KMA-1634</td>
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<td>5</td>
<td>LOOP INSULATOR</td>
<td>MAC</td>
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<td>6</td>
<td>BRACKET FOR LOOP INSULATOR</td>
<td>MAC</td>
<td>KMA-51153</td>
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<tr>
<td>7</td>
<td>BRACKET</td>
<td>MAC</td>
<td>02021461</td>
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<td>8</td>
<td>PIPE STEEL, 5/8&quot;, SCHEDULE 80</td>
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<tr>
<td>9</td>
<td>PIPE CLAMP FOR 2&quot; PIPE</td>
<td>SEE DRAWING</td>
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<td>10</td>
<td>TUBE CLAMP FOR 2&quot; PIPE</td>
<td>MAC</td>
<td>021465-23</td>
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<td>MAC</td>
<td>021465-23</td>
</tr>
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<td>12</td>
<td>TUBE CLAMP FOR 2&quot; PIPE</td>
<td>MAC</td>
<td>021465-23</td>
</tr>
<tr>
<td>13</td>
<td>STEEL, 1/8&quot; STUD, 4 RIVETS</td>
<td>MAC</td>
<td>02021461</td>
</tr>
<tr>
<td>14</td>
<td>PREFORM, 1/8&quot; STUD WIRE</td>
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**NOTES:**

1. FOR GENERAL NOTES REFER TO DRAWING D-31, FOR STRUCTURAL STEEL AND CONCRETE NOTES REFER TO DRAWING D-11, FOR SYMBOLS AND ABBRIVIATIONS REFER TO DRAWING A-00.
2. ARRANGEMENTS SHOWN ARE TYPICAL AND CONSTRUCTION DRAWINGS MAY MAKE ALTERATIONS OR ADJUSTMENTS TO SUIT FIELD CONDITIONS.
3. BRACKET ARMS SHALL BE HORIZONTAL WITH RESPECT TO HORIZONTAL.
4. SHEAR WIRE (SUSPENDED FROM BRACKET ARM VARIES AND IS INDICATED ON LAYOUT PLAN).
5. MAXIMUM LENGTH OF BRACKET ARM TO START OF CURVE PITS IS 30 FEET.
4. DETAIL - HINGE MOUNTING ON POLE

5. DETAIL - POLE CLAMP

6. DETAIL - HINGE (ROUND POLE)

7. PLAN VIEW

**MAXIMUM LOAD ON BOLT NOT TO EXCEED 7,000 LBS.**

**TABLE 1**

<table>
<thead>
<tr>
<th>Size</th>
<th>A</th>
<th>D</th>
<th>C</th>
<th>T</th>
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<td>10&quot;</td>
<td>5/16&quot;</td>
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**NOTES:**

1. FOR GENERAL NOTES REFER TO DRAWING 249. FOR STRUCTURAL STEEL AND CONCRETE NUTS REFER TO DRAWING 305(1). FOR SYMBOLS AND ABREVIATIONS REFER TO DRAWING 249.

2. BEAM CLAMP ROD TO BE STEEL ASTM A36, GRADE 40 FORGED FOR BENDABLE CLAMPS SHALL BE CAST STEEL PER ASTM A193. ALL PARTS SHALL BE NOT DRIPED GALVANIZED PER ASTM A153 FOR ROD AND ASTM A666.

3. NUTS SHALL BE HEADD (CAP HEAD). CONFORMING TO ASTM A395 AND NOT DRIPED GALVANIZED PER ASTM A153 FOR ROD.

4. BOLTS AND NUTS TO BE GRADE 5, HOT DRIPED GALVANIZED TO ASTM A193 CLASS C.

5. USE WING MOUNTING FOR BRACKET ARMS BEING MODIFIED OR INSTALLED AT JOLIUS ON THE STAPLE SYSTEM WHERE THE ARM NEEDS TO HAVE AN ALONG TRACK MOVEMENT.
### Bill of Materials

<table>
<thead>
<tr>
<th>ITEM #</th>
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<th>TAKEOFF NUM.</th>
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<tr>
<td>1</td>
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<td>MAC</td>
<td>E4920-21</td>
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<td>SEE DRAWING 7134-1</td>
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</tr>
<tr>
<td>4</td>
<td>TUBE, 5/16&quot; STEEL</td>
<td>MAC</td>
<td>E4942-07</td>
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<tr>
<td>5</td>
<td>LOOP INSULATOR</td>
<td>MAC</td>
<td>E4946-97</td>
</tr>
<tr>
<td>6</td>
<td>SHackle FOR LOOP INSULATOR</td>
<td>MAC</td>
<td>E5012-65</td>
</tr>
<tr>
<td>7</td>
<td>CHAIN, INOX</td>
<td>MAC</td>
<td>E5020-01</td>
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<tr>
<td>8</td>
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<tr>
<td>9</td>
<td>PIPE, CLEVIS, TWO PIECE, G1&quot;</td>
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<td>CE5149-92</td>
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<td>IP5570-3500</td>
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<td>12</td>
<td>BRACKET ARM POLE SOCKET</td>
<td>SET DRAWING 7345</td>
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<td>13</td>
<td>1/8&quot; CLEVIS PIN WITH COTTER KEY</td>
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<td>-</td>
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<td>PIPE, CLEVIS, TWO PIECE, G5/8&quot;</td>
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<td>18</td>
<td>STEEL, HANGER</td>
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<td>19</td>
<td>PIPE END CAP</td>
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<td>E5880-02</td>
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<td>20</td>
<td>PIPE CONNECTOR WITH TONGUE</td>
<td>MAC</td>
<td>CE5880-32</td>
</tr>
<tr>
<td>21</td>
<td>WIRE, SPAN, 1/4&quot;</td>
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<td>E5880-02</td>
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<td>24</td>
<td>PREFORM, 1/4&quot;</td>
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<td>53050000</td>
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<td>25</td>
<td>SURFACE STRAIN INSULATOR</td>
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<td>53050000</td>
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### Notes

1. FOR GENERAL NOTES REFER TO DRAWING 7134-1 AND G1, FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING 7134-2.
2. ARRANGEMENTS SHOWN ARE TYPICAL AND CONSTRUCTION OPENING MAY NEED ALTERNATIONS OR ADJUSTMENTS TO SUIT FIELD CONDITIONS.
3. BRACKET ARMS SHALL BE HORIZONTAL WITH RESPECT TO HORIZON.
4. ASSEMBLY TYPE SUSPENDED FROM BRACKET ARM VARIES AND IS INDICATED ON LAYOUT PLANS.
5. FOR TYPICAL BRACKET ARM ASSEMBLY BOLT DETAIL REFER TO DRAWING 7345-1.
JUMPER ASSEMBLY - JRA-1

NOTES:
1. FOR GENERAL NOTES REFER TO DRAWING GD-1 FOR STRUCTURAL STEEL AND CONCRETE NOTES REFER TO DRAWING GD-2 FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING GD-3.
2. JUMPER CABLES ATTACHED TO SINGLE CONTACT WIRES SHALL BE INSULATED.
3. CONTACT WIRE CLAMPS TO BE TOP ENTRY.

<table>
<thead>
<tr>
<th>ITEM</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>SUPPLIER</th>
<th>PART NUMBER</th>
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<tr>
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<td>2</td>
<td>FEED TAP CLAMP EAR</td>
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<td>25454520</td>
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<tr>
<td>2</td>
<td>AE</td>
<td>300 KCMIL INSULATED FEEDER CABLE</td>
<td>JUKE V</td>
<td></td>
</tr>
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</table>
NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING COAL, FOR STRUCTURAL STEEL AND CONCRETE NOTES REFER TO DRAWING COAL FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING W/1.

2. COUNTERSINK BOLT HOLES SO THAT TOP OF SCREW IS FLUSH WITH TOP OF FIBERGLASS BOARD.

3. APPLY LIQUID A20 TO SCREW THREADS.

4. USE CROWN BOARD WHEN DECK RACK IS PIVOT TOP OF TROLLEY WIRE AND BOTTOM OF BRIDGE IS 12" OR LESS.

5. WHEN INSTALLED BELOW AN OVERHEAD BRIDGE, THE CONTRACTOR SHALL EXTEND COVER BOARD BEYOND THE EXTENT OF THE BRIDGE LIMITS IN THE AMOUNT OF TWICE THE ATM FOR SPECIFIC WIRE RUN THE BOARD IS BEING INSTALLED ON.
SURGE ARRESTER ASSEMBLY, SAA-1

PIECE NO. 1 (FOUNDATION REINFORCEMENT NOT SHOWN FOR CLARITY)

DESCRIPTION
ATTACH GROUND WIRE TO POLE SUPPLIED SEPARATE WITH MECHANICAL CONNECTOR
POLE AND ARRESTER GROUNDING DETAIL

BILL OF MATERIAL

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<tr>
<th>ITEM NO.</th>
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<th>PART NUMBER</th>
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<td>SKEW MOUNTED ARRESTER</td>
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<tr>
<td>2</td>
<td>1</td>
<td>3/4&quot; X 1/2&quot; X 32&quot; LG AST. ANG. 3-3/4 IN LONG</td>
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<td>-</td>
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<tr>
<td>3</td>
<td>1</td>
<td>NO. 2 AWG STRANDED INSULATED CABLE</td>
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<tr>
<td>4</td>
<td>1</td>
<td>1/2&quot; AND INSULATED COPPER WIRE 30'</td>
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<td>-</td>
</tr>
<tr>
<td>5</td>
<td>1</td>
<td>DUCT SCREW</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>6</td>
<td>1</td>
<td>CONDUIT CLAMP</td>
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<td>-</td>
</tr>
<tr>
<td>7</td>
<td>1</td>
<td>3/4&quot; X 1-1/4&quot; X 3/4&quot; LG, NO. 1</td>
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<td>FIRE CONDUCT, 24&quot; ABOVE GROUND</td>
<td>FIRE</td>
<td>107550</td>
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<td>COUPLING, 2-3/4&quot;</td>
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<td>10</td>
<td>1</td>
<td>FIRE CONDUCT ELBOW 90°</td>
<td>FIRE</td>
<td>-</td>
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<tr>
<td>11</td>
<td>1</td>
<td>GROUND ROD 24 X 1&quot;</td>
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<td>12</td>
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<td>3/4&quot; DRI-DRYLY THREADED ROD IN NUTS &amp; WASHERS</td>
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<tr>
<td>14</td>
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<td>STUD BOLT CONNECTOR</td>
<td>ELECTRIC MOTION CO.</td>
<td>643281</td>
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NOTE: CONTRACTOR MAY USE PRODUCTS LISTED ABOVE OR APPROVED EQUAL.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
OVERHEAD CONTACT SYSTEM
SWITCHING AND FEEDER ASSEMBLIES
SURGE ARRESTER DETAILS

NOT FOR CONSTRUCTION
NOTES:

1. FOR GENERAL NOTES REFER TO DRAWING G-C1, FOR STRUCTURAL STEEL, AND CONCRETE NOTES REFER TO DRAWING G-BG. FOR SYMBOLS AND APPLICATIONS, REFER TO DRAWING G-B2.

2. MINIMUM GROUND WIRE SIZE: 7/8" X 4/0 S/W PORTION COPPER WIRE WITH BARE COPPER SURFACE, RATED FOR 3,000 AMPERES.

3. POLE GROUND WIRE SHALL BE SEPARATE FROM ARRESTOR GROUND WIRE AND SEPARATELY CONNECTED TO RETURN GROUNDING CABLE. CABLE SHALL BE PROTECTED IN HEAVY WALL PRIOR TO CONSTRUCTION AS SHOWN.

4. ALL CONNECTIONS TO BE EXTERNALLY WELDED, JOURNALS TO BE FULLY INSULATED. CONDUCTOR PLATE TO HAVE SLIMCLAD LINING ATTACHED TO BASE METAL FOR WELDING GROUND WIRE. SURFACES OF WELD AND PLATE TO BE CLEANED AND COATED WITH ZINGLESS Putty.

5. EXACT POSITIONING OF GROUND ROADS MAY VARY DUE TO FIELD CONDITIONS.

6. IF GROUND RESISTANCE FROM POLE SUPPORT TO EARTH MEASURES 25 OHMS OR LESS (AT 60HZ), ONE GROUND WIRE IS TO BEafia FROM POLE BASE TO PIER PLATE.

7. CONTRACTOR TO VERIFY LOCATION OF REINFORCEMENT PRIOR TO INSTALLATION OF THREADED BOLTS.

8. PROVIDE ENOUGH ADJUSTMENT AT EXPANSION JOINTS (PIERS 5, 8, 11, AND 16) TO ACcommodate Bridge Deck Movements.

9. GROUNDING includes INSULATING GROUND WIRE AND GROUND RODS IN CASE OF AN ELECTRICAL FAILURE.

10. SUPPORT 9/0 X 4/0 S/W INSULATED GROUND CABLE TO THE CONCRETE FACE WITH WIRE CLIPS EVERY 2 FEET.

11. COORDINATE INSTALLATION OF SURGE ARRESTOR GROUND WIRE WITH OTHER CABLES AND WIRES AT PIER LOCATION FOR BEST RESULT.

12. ALL WIRING AND SUPPORT HARDWARE TO BE STAINLESS STEEL.
### Bill of Materials

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<th>ITEM NO.</th>
<th>DESCRIPTION</th>
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<td>STANDOFF BRACKET</td>
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<td>INSULATOR</td>
<td>PHILIPS</td>
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<td>SIE CRAWFORD VARS</td>
<td>FS222</td>
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<td>TERMINAL, MK 12</td>
<td>CROSBY</td>
<td>FS222</td>
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### Notes:
1. FOR GENERAL NOTES REFER TO DRAWING 0504, FOR STRUCTURAL, STEEL AND CONCRETE NOTES REFER TO DRAWING 0504, FOR SYMBOLS AND ABREVIATIONS REFER TO DRAWING 0504.
2. FEEDER CABLES SHALL BE SECURED TO THE INSULATORS WITH IN SOFT ANNEALED INSULATED WIRE, FOR CABLES SITTING ON TOP OF INSULATORS, THE BARE TOP GROOVE TIE SHALL BE USED. FOR CABLES ON CURVES SETTED ON THE BARE INSULATOR, THE LOOPED MIDDLE UNION SIDE GROOVE TIE SHALL BE USED.
NOTES:
1. FOR GENERAL NOTES REFER TO DRAWING GS41, FOR STRUCTURAL STEELS AND CONCRETE NOTES REFER TO DRAWING GS46, FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING CO96.
2. WHERE CLEARANCE RESTRICTIONS DON'T ALLOW THE USE OF MULTIPLE PREFORM, SUBSTITUTE WITH A STRANDWISE.

BILL OF MATERIALS

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<td>MCCLAIN</td>
<td>5291</td>
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<td>ENS</td>
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FIXED TERMINATION ASSEMBLY FXT-1
Code: #9

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
OVERHEAD CONTACT SYSTEM
TERMINATION ASSEMBLIES
FIXED TERMINATION ASSEMBLY

NOT FOR CONSTRUCTION

303206
1. For general notes refer to drawing GM-8, for structural steel, and concrete notes refer to drawing GM-9, for symbols and abbreviations refer to drawing GM-10.

2. Pole tags shall be reflective self-adhesive markers, black letters on white background, numbers to be 2-3/4 in. and text to be Helvetica medium.

3. Sidewall poles to have numbers facing the track and direction of traffic.

4. On this index in locations where there are 2 or more sets of numbers, each facing their respective tracks.

5. For pole numbers refer to the Pole Schedule on Drawings Y111 through Y112 and OCS layouts on Drawings Y124 through Y122, Numbers with a refer to numerical pole numbers for the innertrack extension.

6. For pole lengths and types, refer to the Pole Schedule on Drawings Y123 through Y122 and OCS layouts on Drawings Y124 through Y122.

7. The plate shall be engraved or cast with the following information: manufacturer's name, pole size, date manufactured, section modulus, and strength of steel. Pole tags shall be 1/8 thick, grade 304 stainless steel welded to pole butt all-around edges of tag with stainless steel weld, using R18 lettering shall be of sufficient depth by engraving or sufficient height if cast, so that the finish of the pole shall not obscure the lettering.

8. Base diameter of pole for pole tag shall not include corrosion collar dimension.

---

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

OVERHEAD CONTACT SYSTEM

MISCELLANEOUS

POLE NUMBERING DETAIL

DATE: 12/31/2022

NOT FOR CONSTRUCTION

Y081 376

HNTB Engineering Inc.,

3333 W. Broadmoor Drive,
Kansas City, MO 64114-2567

Phone: 816-474-2100
Fax: 816-474-2101

101451112-001-00
NOTES:
1. FOR GENERAL NOTES REFER TO DRAWINGS GMO-1 FOR STRUCTURAL STEEL AND CONCRETE NOTES REFER TO DRAWING COAL. FOR SYMBOLS AND ABREVIATIONS REFER TO DRAWING GSS.

2. USE PROTECTION BOARD WHEN DISTANCE BETWEEN TOP OF TROLLEY WIRE AND BOTTOM OF BRIDGE IS 17 OR LESS. REFER TO DRAWING Y006 FOR PROTECTION BOARD DETAILS.
NOTES:
1. FOR GENERAL NOTES REFER TO DRAWINGS 0001 AND OGP.
2. ALL CONTACT WIRE HEIGHTS ARE LISTED IN FEET.
3. TRACK AND BRIDGE ELEVATION OBTAINED FROM TRACK
PROFILE DRAWINGS.
4. IF CONTACT WIRE PROTECTION IS REQUIRED, REFER TO
DRAWING YMS FOR DETAIL.
5. USE PROTECTION BOARD WHERE DISTANCE BETWEEN TOP OF
TROLLEY WIRE AND BOTTOM OF BRIDGE IS 12' OR LESS.
REFER TO DRAWING YMS FOR PROTECTION BOARD DETAILS.
<table>
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<th>POLICY NO.</th>
<th>ALLOCATION</th>
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<th>STATION NB</th>
<th>OFFSET SB (FT)</th>
<th>OFFSET NB (FT)</th>
<th>EASTING</th>
<th>NORTHING</th>
<th>STRUCTURE TYPE</th>
<th>POLE LENGTH (FT)</th>
<th>POLE TYPE</th>
<th>POLE LENGTH (FT)</th>
<th>FOUNDATION TYPE</th>
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**NOTES:**

1. FOR GENERAL NOTES REFER TO DRAWING 00192, FOR STRUCTURAL, STEEL, AND CONCRETE NOTES REFER TO DRAWING 00193, 00195, AND 00196, FOR SYMBOLS AND ABBREVIATIONS REFER TO DRAWING 00191.

2. FOR POLICE DETAIL SEE DRAWINGS V212 TO V213.

3. FOR FOUNDATION DETAILS SEE DRAWINGS Y111 TO Y112.

4. FOR TRAFFIC SIGNALS, CONSULT AND MAIL SITE DETAILS AND SITE TRAFFIC SIGNALS, DRAWINGS.

5. FOR DISCONNECT SWITCH ARRANGEMENT SEE DRAWING Y214, FOR TRAFFIC SIGNALS UPHOLDING HAMPSHIRE ROYAL VINE, 2019.

6. FOR POLE NUMBER TAG DETAILS, SEE DRAWING V114.

7. FOR DIRECTION REFERENCES REFER TO BASE MOUNTING ARROWS SHOWN ON OCS LAYOUT PLANS.

1. For general notes, refer to drawing G321, for symbols and abbreviations, refer to drawing G323.

2. Pole is to be installed on pole by contractor.

3. For bridge attachment details, refer to drawings Y037 and Y038.

4. Contractor shall provide shoring for footing excavations on poles adjacent to MSE bridge approach.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

OCS LAYOUT PLAN
STA 128+00 TO STA 133+00

NOT FOR CONSTRUCTION

303222
NOTES:

1. FOR GENERAL NOTES, REFER TO DRAWING G01; FOR SYMBOLS AND ABBREVIATIONS, REFER TO DRAWING G02.

2. POLE B WILL BE INSTALLED ON POLE BY CONTRACTOR.

3. CONTRACTOR SHALL PROVIDE SHORING FOR FOOTING EXCAVATIONS ON POLES ADJACENT TO MSE BRIDGE APPROACH.
NOTES:
1. FOR GENERAL NOTES, REFERENCE DRAWING 2021-001 FOR SYMBOLS AND ABBREVIATIONS.
2. POLES WILL BE INSTALLED ON PILLAR BY CONTRACTOR.
NOTES:
1. FOR GENERAL NOTES, REFER TO DRAWING G001. FOR SYMBOLS AND ABBREVIATIONS, REFER TO DRAWING G035.
2. POLE WELLS WILL BE INSTALLED ON POLE BY CONTRACTOR.
NOTES:
1. FOR GENERAL NOTES, REFER TO DRAWING 0201, FOR SYMBOLS AND ABBREVIATIONS, REFER TO DRAWING 0203.
2. POLE ID WILL BE INSTALLED ON POLE BY CONTRACTOR.
3. FOR POLE ATTACHMENT ON BRIDGE DETAILS, REFER TO DRAWINGS 1937 AND 1938.
4. FOR POLE GROUNDING ON BRIDGE DETAIL, REFER TO DRAWING 0202.
NOTES:
1. FOR GENERAL NOTES, REFER TO DRAWING 0311, FOR SYMBOLS AND ABBREVIATIONS, REFER TO DRAWING 0322.
2. POLE ID WILL BE INSTALLED ON POLE BY CONTRACTOR.
3. FOR POLE ATTACHMENT ON BRIDGE DETAILS, REFER TO DRAWINGS Y037 AND Y038.
4. FOR POLE GROUNDING ON BRIDGE DETAIL, REFER TO DRAWING Y059.
NOTES:
1. FOR GENERAL NOTES, REFER TO DRAWING G201, FOR SYMBOLS AND ABBREVIATIONS, REFER TO DRAWING G202.
2. POLE ID WILL BE INSTALLED ON POLE BY CONTRACTOR.
3. FOR POLE ATTACHMENT ON BRIDGE DETAILS, REFER TO DRAWINGS Y007 AND Y008.
4. FOR POLE GROUNDING ON BRIDGE DETAIL, REFER TO DRAWING Y009.
### OCS Layout Plan

#### Notes:
1. For general notes, refer to drawing 0041. For symbols and abbreviations, refer to drawing 0032.
2. Pole EID will be installed on pole by contractor.
3. For pole attachment on bridge details, refer to drawings Y207 and Y208.
4. For pole grounding on bridge detail, refer to drawing Y099.
5. OCS poles and foundation installed in mainline VFM project will need to be removed if already constructed.
6. Existing bracket arm guy wire shall be transferred from existing pole Y1 to new pole R6G, as shown.

#### Pole Details

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#### Scale

0 20 40 60
1. Please discipline-specific drawings for detailed information on civil, traffic, structures, system, and drainage.

2. All stationing refers to southbound track centerline unless noted otherwise.

3. Lateral bands for splice vaults located to the side of the track shall be factory-made bands.

4. Contractor to coordinate final top elevation of all conduits, unless otherwise noted on plan sheets. All conduits to be laid a minimum of 5 feet per 100 feet towards splice vaults for positive drainage.

5. Fiber connections to traction power sites, traffic signal cabinets, train control cabinets, and station communication cabinets are shown in discipline-specific drawings.

6. Refer to demolition plans for additional details regarding protection of existing and new facilities.

KEYED NOTES

1. PROTECT-IN-PLACE EX. CONDUIT
2. PROTECT-IN-PLACE EX. VAULT
3. PK. TYPE 5 FIBER OPTIC SPICE VAULT
4. PK. CONDUIT PER SCHEDULE
5. PK. DMO CABLE PER SCHEDULE
6. PK. 30"x42" FIBER OPTIC SPICE VAULT
7. PK. NEW 48" ENCLOSURE
8. PK. CONDUIT ID PER SCHEDULE
9. SPICE VAULT ID PER SCHEDULE
10. INFRASTRUCTURE IS MOUNTED TO BRIDGE

LEGEND

- PK. VAULT
- PK. CONDUIT
- EX. CONDUIT

GENERAL NOTES

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

COMMUNICATIONS PLAN
STA 129+00 TO STA 133+00
**KEYED NOTES**

1. PROTECT-IN-PLACE EX. CONDUIT
2. PROTECT-IN-PLACE EX. VAULT
3. P/S TYPE 5 FIBER OPTIC SPLICE VAULT
4. P/S CONDUIT PER SCHEDULE
5. P/S SMOO CABLE PER SCHEDULE
6. P/S 30" x 48" FIBER OPTIC SPLICE VAULT
7. P/S NEW 48" ENCLOSURE
8. P/S CONDUIT ID PER SCHEDULE
9. SPLICE VAULT ID PER SCHEDULE

**GENERAL NOTES**

1. SEE DISCIPLINE-SPECIFIC DRAWINGS FOR DETAIL INFORMATION ON CIVIL, TRAFFIC, STRUCTURES, SYSTEM, AND DRAINAGE.
2. ALL STATIONING REFERS TO SOUTHBOUND TRACK CENTERLINE STATIONING UNLESS NOTED OTHERWISE.
3. LATERAL BENDS FOR SPLICE VAULTS LOCATED TO THE SIDE OF THE TRACK SHALL BE FACTORY-MADE BENDS.
4. CONTRACTORS TO COORDINATE FINAL TOP ELEVATION OF ALL CONDUITS. UNLESS NOTED OTHERWISE ON PLAN SHEETS, ALL CONDUITS TO BE LAYED AT MINIMUM OF 36" DEPTH PER 16 FEET TOWARDS SPLICE VAULTS FOR POSITIVE DRAINAGE.
5. FIRE PROTECTION TO TRAFFIC SIGNAL CABINETS, TRAM CONTROL CABINETS, AND STATION (COMMUNICATION) CABINETS ARE SHOWN ON DISCIPLINE-SPECIFIC DRAWINGS.
6. REFER TO SECTIONS OF FIRST SHEET FOR ADDITIONAL DETAIL REQUIREMENTS.

**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

COMMUNICATIONS PLAN
STA 133+00 TO STA 135+50
LIFT HANDLE WITH RECESSED PIN (TYP.)

DESCRIPTION COMMUNICATIONS LETTERING HEIGHT 1-1/4" (MIN.)

TYPICAL PRECAST MANHOLE TYPE 5

SECTION A

NOTES:
1. USE GRADE RINGS UP TO A MAXIMUM OF 30° 36', TO ACHIEVE FULL ELEVATION. EACH MANHOLE SHALL BE PROVIDED WITH AT LEAST ONE GRADE RING.
2. COVERS AND FRAMES SHALL BE DESIGNED FOR ASHTO HS-20 LOADING.
3. INSTALL PUMPS OR ELECTRICAL BOXES WITH MINIMUM DISTANCE FROM TOP OF PUMP OR BOX TO TOP OF MANHOLE.
4. MINIMUM DEPTH OF MANHOLE DOES NOT INCLUDE GRADE RINGS.
5. CONTRACTOR SHALL USE GRADE RINGS TO EXTEND MANHOLE OPENING UP TO FINISHED GRADE AND PLUMB WITH TOP OF TRACK SLAB.
6. SEE SHEET XXXX AND XXXX FOR DETAILS ON MANHOLE ADJACENT TO TRACK SLAB OR BETWEEN RAMS.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
SYSTEMWIDE ELECTRICAL
TYPICAL MANHOLE DETAILS

SECTION B

30" CAST IRON COVER

GRADE RING (SEE NOTE 5) (TYP.)

1 - "C" CHANNEL 24" LONG ON ALL BOTH ENDS

FILLING IRON ON BOTH ENDS

6'-4" DIA. TERM-4-DECTS ON BOTH ENDS

SECTIONS A & B

TABLE 1

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NOTES:
1. SEE TECHNICAL SPECIFICATION FOR DETAIL SPIKE VAULT REQUIREMENTS.
2. ADJUST CONDUIT ENTRY INTO THE SPIKE VAULT'S GASKET DEPTH OF SPIKE VAULT TO ASSURE THAT COVER IS PLUMB WITH PEACH GRADE.
3. SEE COMMUNICATION DUETEAM PLAN FOR FINAL LOCATION OF SPIKE VAULTS.
NOTES:

1. SEE CAD CONTROL EQUIPMENT LOCATION PLANS FOR LOCATION OF HANDHOLE AND SPICE VAULTS.

2. SEE CAD VIEW ORGANIZATION AND SCHEDULE FOR STATIONING LOCATIONS.

3. CONTRACTOR SHALL SEAL RACEWAYS WITH WATER PROOF SEALANT AFTER CABLE IS INSTALLED.

4. CONTRACTOR SHALL INSTALL DRAIN IN ALL BLOCKOUTS.

5. CONDUITS SHALL EXTEND INTO THE HANDHOLE A MINIMUM OF FROM THE INSIDE RAIL AND TERMINATE WITH BELL END FITTINGS.

6. ADJUST CONDUIT ENTRY TO THE HANDHOLE TO CREATE POSITIVE CONDUIT SHANANCE AND TO ENTER CENTER OF HANDHOLE.

7. ADJUST DEPTH OF HANDHOLE FOR FINISHED GRADE TO BE FLUSH WITH COVER.
NOTES:
1. Use PVC electrical conduit spacers to maintain a spacing of 2.5" clear between tractive electrification and 3.25" clear between signal conduits.
2. Labeling as shown in detail will be typical for all manholes.
3. Minimum dimensions for clearance to electric utility per utility requirements.
4. Call National One-Call Notification prior to excavation.
5. Mark excavate near all known or suspected utilities.

MANHOLE NO. LABEL - 3" HIGH BLACK STENCILED LETTERS 3" BELOW TOP ON BOTH STEEL VENTS

CONDUIT NUMBER 2" HIGH BLACK STENCILED LETTERS ABOVE EACH CONDUIT (TYP.)

LETTERING MUST CORRESPOND WITH LETTERING AT MANHOLE WHERE CONDUIT TERMINATES

SC-XXX

SC-XXX

SECTION A

SECTION B

TYPICAL CONDUIT STUB-UP DETAIL

ALL EXPOSED CONDUIT ELBOWS TO BE STUB-UP TO BE FTAR CONDUIT SEE PLAN FOR FINISHED ELEVATION

FTAR COUPLING

ALL RINGS GREATER THAN 1.5" TO BE FTAR ELBOWS MINIMAL IF TOP OF ELBOW IS EXPOSED ELBOW MUST BE FTAR

COUPLING PVC TO FTAR

PVC 3/4" 40 CONDUIT
GENERAL NOTES
1. ALL STRANDS SHOWN THIS SHEET RESIDE WITHIN THE BLUE BUFFER TUBE (STRANDS 1-12).
2. RINGS SHALL BE CONFIGURED AND GENERATED FROM VEHICLE MAINTENANCE FACILITY.
3. RINGS TO BE CONFIGURED AS RESILIENT ETHERNET PROTOCOL (REP) RINGS.
4. SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.
5. SHEET INCLUDED FOR REFERENCE, ALL WORK THIS SHEET IS PART OF THE MAIN STREET EXTENSION PROJECT.

KEYED NOTES
1. PR. LAYER 3 SWITCH IN ITS CABINET AT DR. MARTIN LUTHER KING JR. BLVD.
2. STRANDS PER KCWD VIA DR. MARTIN LUTHER KING JR. BLVD AND TROOST AVE. ADDITIONAL SPlicing MAY BE REQUIRED AT THE DIRECTION OF CHRI S LOKENY / KCWD.
3. LAYER 3 SWITCHES AT CITY HALL TO PATCH TO CONNECT TO EX. MULTIMODE FIBER CONNECTION TO THE VMF. PATCH AT THE DIRECTION OF CHRIS LOKENY / KCWD. ALL KC STREETCAR COMMUNICATIONS (STATIONS, TPSS) SHALL BE ROUTED TO THE VMF.
4. EX. MULTIMODE FIBER CONNECTION
GENERAL NOTES
1. ALL STRANDS SHOWN ON THIS SHEET RESIDE WITHIN THE BLUE BUFFER TUBE (STRANDS 1-12).
2. RINGS SHALL BE CONFIGURED AND GENERATED FROM VEHICLE MAINTENANCE FACILITY.
3. RINGS TO BE CONFIGURED AS RESISTENT Ethernet PROTOCOL (RED) RINGS.
4. SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.
5. SHEET IS INCORPORATED FOR REFERENCE. WORK THIS PROJECT IS LIMITED TO CONNECTIONS FOR STATIONS INDICATED WITH THE SYMBOL. ALL OTHER WORK BY THE MAIN STREET EXTENSION PROJECT.

KEYED NOTES
1. PR. LAYER 3 SWITCH AT OR. MARTIN LUTHER KING JR. BLVD
2. STRANDS PER KCMO VIA OR. MARTIN LUTHER KING JR. BLVD AND TROOST AVE. ADDITIONAL SPlicing MAY BE REQUIRED AT THE DIRECTION OF CHIPS LOCKET / KCMO.
3. 2-PR. LAYER 3 SWITCHES AT CITY HALL TO PATCH TO CONNECT TO EX. MULTIMODE FIBER CONNECTION TO THE VMF. PATCH AT THE DIRECTION OF CHIPS LOCKET / KCMO. ALL KC STREETCAR COMMUNICATIONS (STATIONS, TPSS) SHALL BE ROUTED TO THE VMF.
4. EX. MULTIMODE FIBER CONNECTION
GENERAL NOTES

1. ALL STRANDS SHOWN IN THIS SHEET RESIDE WITHIN THE BLUE BUFFER TUBE (STRANDS 1-12).
2. RINGS SHALL BE CONFIGURED AND GENERATED FROM VEHICLE MAINTENANCE FACILITY.
3. RINGS TO BE CONFIGURED AS RESILIENT ETHERNET PROTOCOL (REP) RINGS.
4. SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.
5. SHEET IS INCLUDED FOR REFERENCE. WORK THIS PROJECT IS LIMITED TO CONNECTIONS FOR CABINETS INDICATED WITH THE # SYMBOL. ALL OTHER WORK BY THE MAIN STREET EXTENSION PROJECT.

KEYED NOTES

1. EX. LAYER 3 SWITCH IN ITS CABINET AT DR. MARTIN LUTHER KING JR. BLVD
2. STRANDS PER KCMO VIA DR. MARTIN LUTHER KING JR. BLVD AND TRUOST AVE.
3. 2-EX. LAYER 3 SWITCHES AT CITY HALL PATCH TO CONNECT TO EX. MULTIMODE FIBER CONNECTION TO THE VMF. ALL KC STREETCAR COMMUNICATIONS (STATIONS, TPS) SHALL BE ROUTED TO THE VMF.
4. EX. MULTIMODE FIBER CONNECTION
GENERAL NOTES
1. ALL STRANDS SHOWN ON THIS SHEET RESIDE WITHIN THE ORANGE BUFFER TUBE (STRANDS 13-24).
2. RINGS SHALL BE CONFIGURED AND GENERATED FROM VEHICLE MAINTENANCE FACILITY.
3. RINGS TO BE CONFIGURED AS RESILIENT ETHERNET PROTOCOL (REP) RINGS.
4. SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.
5. SHEET IS INCLUDED FOR REFERENCE, WORK THIS PROJECT IS LIMITED TO CONNECTIONS FOR TPSS INDICATED WITH THE # SYMBOL. ALL OTHER WORK BY THE MAIN STREET EXTENSION PROJECT.

KEYED NOTES
1. EX. LAYER 3 SWITCH IN ITS CABINET AT DR. MARTIN LUTHER KING JR. BLVD
2. STRANDS PER KCWD VIA DR. MARTIN LUTHER KING JR. BLVD AND PROOST AVE.
3. 2-EX. LAYER 3 SWITCHES AT CITY HALL PATCH TO CONNECT TO EX. MULTIMODE FIBER CONNECTION TO THE VMF. ALL KC STREETCAR COMMUNICATIONS (STATIONS, TPSS) SHALL BE ROUTED TO THE VMF.
4. EX. MULTIMODE FIBER CONNECTION
TRAFFIC SIGNALS RING 1 - STRANDS 25-32

KEY: STRAND 25, 26 (BLUE, ORANGE)
      RETURN STRAND 27, 28 (GREEN, BROWN)
      REDUNDANT STRAND 29, 30, 31, 32 (SLATE, WHITE, RED, BLACK)

GENERAL NOTES
2. RING SHALL HANG OFF OR THE EXISTING KCWD FIBER-CONNECTED SIGNAL AT 3RD / GRAND.
3. SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.
GENERAL NOTES

BUFFER TYPE ASSIGNMENTS:
1. BLUE = STREETCAR
2. ORANGE = STREETCAR
3. GREEN = KCAD TRAFFIC SIGNALS
4. BROWN = KCAD TRAFFIC SIGNALS
5. SLATE = KCAD TRAFFIC SIGNALS
6. WHITE = KCAD TRAFFIC SIGNALS
7. RED = KCAD TRAFFIC SIGNALS
8. BLACK = KCAD TRAFFIC SIGNALS
9. YELLOW = KCAD TRAFFIC SIGNALS
10. WHITE = KCAD TRAFFIC SIGNALS
11. AQUA = KCAD

FULL CABLE FIBER SPICES SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
COMMUNICATIONS DETAILS
3RD ST SPICE
GENERAL NOTES

BUFFERS: 8 ASSIGNED:
1. BLUE = TRAFFIC
2. GREEN = TRAFFIC SIGNALS
3. BROWN = TRAFFIC SIGNALS
4. SLATE = TRAFFIC SIGNALS
5. WHITE = TRAFFIC SIGNALS
6. RED = TRAFFIC SIGNALS
7. BLACK = TRAFFIC SIGNALS
8. AQUA = TRAFFIC SIGNALS

FULL CABLE FIBER SPICES SHALL BE APPROVED BY THE ENGINEER PRIOR TO INSTALLATION.
SHEET CONTAINS INFORMATION IN COLOR AND IS TO BE REPRODUCED IN COLOR.

LEGEND

• PROPOSED FUSION SPICE
• EXISTING FUSION SPICE

SPICE VAL 1-13

SPICE INCLUSIONS

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
COMMUNICATIONS DETAILS
RIVERFRONT STATION SPICE

ISSUED FOR: 11/23/2020

NOT FOR CONSTRUCTION

3032L7
STRUCTURE MOUNTED CONDUIT - CONCRETE BRIDGE DECK WITH PRECAST PANELS

UNDERSIDE CONDUIT HANGER TRANSITION DETAIL

NOTE:

1. For installations on existing bridge decks using precast concrete panels, install conduit expansion joints located in area posted as shown in the detail.

2. See conduit hanger details for conduit hanger support mounting details.

3. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

4. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

5. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

6. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

7. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

8. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

9. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

10. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

11. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

12. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

13. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

14. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

15. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

16. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

17. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

18. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

19. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

20. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

21. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

22. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

23. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

24. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

25. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

26. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

27. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

28. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

29. Provide conduit for the pipe and conduit shown on the plans in accordance with the conduit documents.

30. Bend all external conduit mounted conduit throughout entire length of run and during the run by a gradual curve.

31. Provide a transition junction box for conduit access located outside the structure for future use. A box is not located on additional transition box for conduit access near the end.

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GENERAL NOTES:
1. INSTALL EXPANSION DEVICE AT ALL ENDS, NOT AT EACH END OF DEVICE MOUNTING AND INPORT OF ONE MOUNTING LOCATION.
2. INSTALLATION OF ONE MOUNTING DEVICE IS RECOMMENDED.
3. INSTALLATION OF ONE MOUNTING DEVICE IS RECOMMENDED.
4. INSTALL ONE MOUNTING DEVICE AT EACH END OF DEVICE MOUNTING AND INPORT OF ONE MOUNTING LOCATION.
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CONDUIT EXPANSION DEVICE DETAIL:

GENERAL NOTES:
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CONDUIT EXPANSION DEVICE DETAIL:

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

CONDUIT EXPANSION/DEFLECTION POINT

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*LOCK 58 IN ROUTE AND DELETE 1T IN ROUTE CHECK, SO CONCURRENT MOVE ON 58 AND 59 CAN TAKE PLACE*

*LOCK 1T IN ROUTE AND DELETE 1T IN ROUTE CHECK, SO CONCURRENT MOVE ON 14 AND 59 CAN TAKE PLACE*
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**KANSAS CITY STREETCAR - RIVERFRONT EXTENSION**

**TRAIN CONTROL**

ROUTE AND ASPECT CHART - 2ND & GRAND

---

**NOT FOR CONSTRUCTION**

---

**N605**

451
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</table>

**Note:** Proposed route routing will be for westbound moves. SB signal fleet to unoccupied SNT with ST/ST unoccupied. Once a train is occupied on the route, it will be requested to exit the SB track and then turnout is in reverse position.
NEGATIVE RETURN BONDING

NOTES:

1. JUMPERS NOT REQUIRED IF CONTINUOUS CAST BED PLATE IS USED.

2. SEAL OPENINGS AROUND CONDUIT ARE DRAIN PIPE WITH ELECTRONIC GASKET AT INSULATION LINER.

3. SEE TRACK DRAWINGS FOR ADDITIONAL PATWAY AND TRACK CONSTRUCTION DETAILS.

4. THE CONTRACTOR SHALL PROVIDE BONDING PLANS FOR EACH SWITCH POINT LOCATION FOR APPROVAL.

5. ARRANGEMENT SHOWN IS GENERAL AND IS PROVIDED TO SHOW VARIOUS ARRANGEMENTS OF TRACK CIRCUITS, BONDS AND RETURN RAIL CONFIGURATIONS.

6. ALL 500 ECUH CABLES ARE PREFERRED.

7. CROSS BONDING SHALL NOT BE COMBINED WITH NEGATIVE RETURN AT SUBSTATION.

SIGNAL BONDING

SIGNAL AND POWER BONDING KEY

1. 1-6 BOND STRAND (TRACK CIRCUIT JUMPER)

2. 3-500 ECUH

3. 2-250 ECUH

4. 2-500 ECUH

---

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION

TRAIN CONTROL

TURNOUT BONDING

NOT FOR CONSTRUCTION
NOTES:
1. This cabinet arrangement is intended as a guide for equipment arrangement only.
2. Cabinet basis of design is FHA FHA 41053E T4"X81"X30" Case with Electrical & Generator Plug. The entire equipment contained within this cabinet shall be chosen by the contractor to meet the functional needs of interlocking equipment and will be submitted to the TOK, prior to fabrication.
3. The equipment shown is for information only. The actual equipment installed shall be chosen by the contractor to meet the functional needs of interlocking equipment and will be submitted to the TOK, prior to fabrication.
4. The cabinet will be galvanized steel with a front and a back door for access to equipment located in each side. The back may be eliminated if it is shown that board mounting is desirable.
5. The dimensions of the cabinet are shown for reference only. The cabinet shall not be higher than 84 inches above the site parking level. Actual dimensions shall be shown on the cabinet design submitted to the engineer for approval.
6. The contractor shall provide all anchor bolts for the cabinet at the time of installation using a chemical type anchor design for the specific installation.
7. The designer shall utilize both sides of the rack for piping and for equipment mounting for devices such as power distribution circuit breakers, din rail mounted terminals, lighting and surge protection, etc.
8. 3/4" thick plywood backboard installed and finished with white latex enamel paint. The top 1/2" of board can be removed to be able to install one row of relays.
9. 5/8 backboard shall accommodate 19" rack frame mounted to internal case chassis. See technical specifications for additional guidance.
10. Sizing is typical, multiple size conductors may enter conduit risers.
NOTES:
1. CONTRACTOR SHALL INSTALL PRECAST FOUNDATIONS AS REQUIRED BY FIELD CONSTRAINTS.
2. INSTALL CONDUITS AS REQUIRED. REFER TO SYSTEM-WIDE ELECTRICAL PLANS FOR DETAILS.
3. SIZING OF CONDUITS PROVIDE IN THE FINAL DESIGN.
4. CASE SHALL BE APPROXIMATELY 6" ABOVE FINISHED GRADE.
5. FINISHED GRADE SHALL CONSIST OF PER

GROUND STUD
1/2" BARE OR
BUILT WITH 1/2" NUTS AND BOLTING TYP.

CONCRETE FOUNDATIONS
NOTE 1

EXOTHERMALLY CONNECTED TYP.

5'-0" MIN.

5'-0" MIN.

3/8" DJA X 10' GROUND ROB TYP.

SIDE VIEW A

TOP OF FINISHED GRADE

FRONT VIEW 1

NOTE 1

NOTE 2

NOTE 3

NOTE 4

NOTE 5

LIFTING LUG

TOP OF FINISHED GRADE
NOTES:

1. Saw cut grooves to be free of debris and water prior to wire installation and sealing.

2. Loop wire to be single conductor #10 wire, wrapping a 4.01 factor made loop part 64.370.013 or approved equal.

3. Wires between loop and tuning module must be twisted & taped for loop.

4. Tuning module to be sealed with system 5M sealant, wrapping a 4.01 factor 64.370.014 or approved equal after final testing.

5. Coordinate loop placement with signal station and stop bar placement. Sighting for loops to be done prior to conduit and junction box installation. Field verify loop placement with owner and engineer before saw cutting.

6. Position of the mailbox may be adjusted to accommodate equipment arrangement needs for any specific installation.

7. After system acceptance testing, the opening to be filled with non-combustible electrical insulated resin 2125 or approved equal.

8. All cables installed within manholes shall have section seal at entrance and exit points. Conduit seals shall protect conduit from being filled with re-enterable resin.
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NOTE: CABLE, CONDUIT, UNITS, AND QUANTITIES ARE ESTIMATES ONLY. CONTRACTOR SHALL VERIFY ACTUAL QUANTITIES AND UNITS.
CONSTRUCTION NOTES
1. Review cross sections for offset to northbound track centerline.
2. Proposed elevation along roadway crown represents the finished surface elevations.
3. If subgrade pavement and/or subgrade is present during milling, contractor will repair and reconstruct that section for roadway.

LEGEND
- WILL AND VARIABLE OVERLAY
- EXISTING TRACK SLAB
- PROPOSED TRACK SLAB
- CONCRETE
- SUBGRADE
- MAX. FULL DEPTH

KANSAS CITY STREETCAR - RIVERFRONT EXTENSION
MILL & OVERLAY
2ND STREET TO VMF

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