Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

(ROADWAY)

JOB SPECIAL PROVISIONS TABLE OF CONTENTS

(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

PRELIMINARY - NOT FOR CONSTRUCTION

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	THOUVENOT, WADE & MOERCHEN, INC. 720 Olive Street, Suite 200A St. Louis, MO 63101 Certificate of Authority: 001528 Consultant Phone: 314-241-6300
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J6S1718, J6S1718B, and J6S1718C ST. LOUIS COUNTY, MO DATE PREPARED: 02/12/2021
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Roadway) are authenticated by this seal: R-A. thru R-UU.	

JOB
SPECIAL PROVISION
(ROADWAY)

R-A. General - Federal JSP-09-02F

1.0 Description. The Federal Government is participating in the cost of construction of this project. All applicable Federal laws, and the regulations made pursuant to such laws, shall be observed by the contractor, and the work will be subject to the inspection of the appropriate Federal Agency in the same manner as provided in Sec 105.10 of the Missouri Standard Specifications for Highway Construction with all revisions applicable to this bid and contract.

1.1 This contract requires payment of the prevailing hourly rate of wages for each craft or type of work required to execute the contract as determined by the Missouri Department of Labor and Industrial Relations and requires adherence to a schedule of minimum wages as determined by the United States Department of Labor. For work performed anywhere on this project, the contractor and the contractor's subcontractors shall pay the higher of these two applicable wage rates. State Wage Rates, Information on the Required Federal Aid Provisions, and the current Federal Wage Rates are available on the Missouri Department of Transportation web page at www.modot.org under "Doing Business with MoDOT", "Contractor Resources". Effective Wage Rates will be posted 10 days prior to the applicable bid opening. These supplemental bidding documents have important legal consequences. It shall be conclusively presumed that they are in the bidder's possession, and they have been reviewed and used by the bidder in the preparation of any bid submitted on this project.

1.2 The following documents are available on the Missouri Department of Transportation web page at www.modot.org under "Doing Business with MoDOT"; "Standards and Specifications". The effective version shall be determined by the letting date of the project.

General Provisions & Supplemental Specifications

Supplemental Plans to July 2020 Missouri Standard Plans
For Highway Construction

These supplemental bidding documents contain all current revisions to the published versions and have important legal consequences. It shall be conclusively presumed that they are in the bidder's possession, and they have been reviewed and used by the bidder in the preparation of any bid submitted on this project.

R-B. Contract Liquidated Damages JSP-13-01B

1.0 Description. Liquidated Damages for failure or delay in completing the work on time for this contract shall be in accordance with Sec 108.8. The liquidated damages include separate amounts for road user costs and contract administrative costs incurred by the Commission.

2.0 Period of Performance. Prosecution of work is expected to begin on the date specified below in accordance with Sec 108.2. Regardless of when the work is begun on this contract, all

work shall be completed on or before the date specified below. Completion by this date shall be in accordance with the requirements of Sec 108.7.1.

Early Notice to Proceed (Demo work):	July 26, 2021
Notice to Proceed:	August 9, 2021
Completion Date:	July 1, 2023

2.1 Calendar Days. The count of calendar days will begin on the date the contractor starts any construction operations on the project.

Job Number	Calendar Days	Daily Road User Cost
J6S1718	N/A	$7,600
J6S1718B	N/A	$3,200
J6S1718C	N/A	$7,600

3.0 Liquidated Damages for Contract Administrative Costs. Should the contractor fail to complete the work on or before the completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged contract administrative liquidated damages in accordance with Sec 108.8 in the amount of **$2,500** per calendar day for each calendar day, or partial day thereof, that the work is not fully completed. For projects in combination, these damages will be charged in full for failure to complete one or more projects within the above specified completion date or calendar days.

4.0 Liquidated Damages for Road User Costs. Should the contractor fail to complete the work on or before the completion date specified in Section 2.0, or within the number of calendar days specified in Section 2.1, whichever occurs first, the contractor will be charged road user costs in accordance with Sec 108.8 in the amount specified in Section 2.1 for each calendar day, or partial day thereof, that the work is not fully completed. These damages are in addition to the contract administrative damages and any other damages as specified elsewhere in this contract.

R-C. Early Notice to Proceed (Demo Work) – Job J6S1718B Only

1.0 The requirement in Sec 103.5 of the Missouri Standard Specifications for Highway Construction that the contractor "shall return the prescribed copies of the contract and bond, properly executed, to the office of the Commission within 15 days after the unexecuted contract has been mailed to the bidder" is waived for this project.

1.1 Instead, the contractor shall return the prescribed copies of the contract and bond, properly executed, to the office of the Commission prior to the Notice to Proceed Date found in the Job Special Provisions or within 15 days after the project is awarded by the Missouri Highways and Transportation Commission, which ever date comes first.

1.2 All other provisions in Sec 103.5 et seq. of the Missouri Standard Specifications for Highway Construction shall remain in full force and effect, and shall continue to govern the contractor and its subcontractors.

R-D. Emergency Provisions and Incident Management JSP-90-11

1.0 The contractor shall have communication equipment on the construction site or immediate access to other communication systems to request assistance from the police or other emergency agencies for incident management. In case of traffic accidents or the need for police to direct or restore traffic flow through the job site, the contractor shall notify police or other emergency agencies immediately as needed. The area engineer's office shall also be notified when the contractor requests emergency assistance.

2.0 In addition to the 911 emergency telephone number for ambulance, fire or police services, the following agencies may also be notified for accident or emergency situation within the project limits.

<table>
<tr><td colspan="2">Missouri State Highway Patrol – Troop C Office
891 Technology Drive
Weldon Spring, MO 63304
(636) 300-2800</td></tr>
<tr><td colspan="2">St. Louis County Police Department
Central County Precinct (2nd)
1333 Ashby Road
St. Louis, MO 63132
(314) 615-0111</td></tr>
<tr><td colspan="2">MoDOT Transportation Management Center (TMC)
14301 S. Outer Forty Road
Chesterfield, MO 63017
(314) 275-1500</td></tr>
<tr><td colspan="2">City of Maplewood – J6S1718</td></tr>
<tr><td>Police</td><td>Fire / EMS</td></tr>
<tr><td>Maplewood Police Department
7601 Manchester Road
Maplewood, MO 63143
(314) 645-3000</td><td>Maplewood Fire Department
7601 Manchester Road
Maplewood, MO 63143
(314) 646-3666</td></tr>
<tr><td colspan="2">City of Brentwood – J6S1718B</td></tr>
<tr><td>Police</td><td>Fire / EMS</td></tr>
<tr><td>Brentwood Police Department
272 Hanley Industrial Court
Brentwood, MO 63144
(314) 644-7100</td><td>Brentwood Fire Department
8756 Eulalie Avenue
Brentwood, MO 63144
(314) 963-8612</td></tr>
<tr><td colspan="2">City of Rock Hill – J6S1718</td></tr>
<tr><td>Police</td><td>Fire / EMS</td></tr>
<tr><td>Rock Hill Police Department
827 N. Rock Hill Road
Rock Hill, MO 63119
(314) 962-6600</td><td>Rock Hill Fire Department
827 N. Rock Hill Road
Rock Hill, MO 63119
(314) 962-6254</td></tr>
<tr><td colspan="2">City of Glendale – J6S1718</td></tr>
<tr><td>Police</td><td>Fire / EMS</td></tr>
<tr><td>Glendale Police Department
424 N. Sappington Road
Glendale, MO 63122
(314) 965-0000</td><td>Glendale Fire Department
424 N. Sappington Road
Glendale, MO 63122
(314) 965-7097</td></tr>
<tr><td colspan="2">City of Warson Woods – J6S1718</td></tr>
<tr><td>Police</td><td>Fire / EMS</td></tr>
<tr><td>Warson Woods Police Department</td><td>Glendale Fire Department</td></tr>
</table>

10015 Manchester Road Warson Woods, MO 63122 (314) 965-1131	424 N. Sappington Road Glendale, MO 63122 (314) 965-7097
City of Kirkwood – J6S1718C	
Police	**Fire / EMS**
Kirkwood Police Department 131 W. Madison Avenue Kirkwood, MO 63122 (314) 822-5858	Kirkwood Fire / Rescue 137 W. Argonne Drive Kirkwood, MO 63122 (314) 822-5883

2.1 This list is not all inclusive. Notification of the need for wrecker or tow truck services will remain the responsibility of the appropriate police agency.

2.2 The contractor shall notify enforcement and emergency agencies before the start of construction to request their cooperation and to provide coordination of services when emergencies arise during the construction at the project site. When the contractor completes this notification with enforcement and emergency agencies, a report shall be furnished to the engineer on the status of incident management.

3.0 No direct pay will be made to the contractor to recover the cost of the communication equipment, labor, materials or time required to fulfill the above provisions.

R-E. Project Contact for Contractor/Bidder Questions JSP-96-05

All questions concerning this project during the bidding process shall be forwarded to the project contact listed below.

Stuart McNeil, PE, Project Contact
MoDOT St. Louis District
Project Manager
1590 Woodlake Drive
Chesterfield, MO 63017

Telephone Number: (314) 453-5042
E-mail: Stuart.McNeil@modot.mo.gov

All questions concerning the bid document preparation can be directed to the Central Office – Design at (573) 751-2876.

R-F. Liquidated Damages Specified JSP-93-28

JSP is still in development and is listed for placeholder purposes.

1.0 Description. If (description of work)_____ is not complete and open to traffic prior to _____ (date), the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delay, with its resulting cost to the traveling public. These damages are

not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of $_____ per day for each full day that (description of work) _____ is not complete and open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of excess closure time.

1.1 The said liquidated damages specified will be assessed regardless of whether it would otherwise be charged as liquidated damages under the Missouri Standard Specification for Highway Construction, as amended elsewhere in this contract.

R-G. Liquidated Damages for Winter Months JSP-04-17

1.0 Description. Revise Sec 108.8.1.3 (a) and (b) and substitute the following for the project:

(a) Liquidated damages will be assessed from December 15 to March 15
(b) Liquidated damages will be assessed for Saturdays, Sundays and Holidays.

R-H. Winter Months Requirements JSP-15-07A

1.0 Description. This project contains work which spans the winter months.

2.0 Work to be Completed. When the contractor ceases operations for the winter months, any paving operation performed by the contractor shall not result in a lane height differential between adjacent lanes.

3.0 Maintenance of Pavement Marking. Prior to ceasing operations for winter months, a permanent or temporary stripe shall be provided on any completed length to the point that the original stripe was obliterated or obscured by the contractor's operation. Temporary striped areas shall be re-striped with the remaining route upon performance of the final striping.

4.0 Winter Related Maintenance Activities. The contractor shall have the project in a condition as not to interfere with the plowing of snow. The contractor shall also provide a taper at the end of his paving that will not be damaged by the plowing of snow.

5.0 Basis of Payment. There will be no direct pay for compliance with this provision.

R-I. Contractor Quality Control NJSP-15-42

1.0 The contractor shall perform Quality Control (QC) testing in accordance with the specifications and as specified herein. The contractor shall submit a Quality Control Plan (QC Plan) to the engineer for approval that includes all items listed in Section 2.0, prior to beginning work.

2.0 Quality Control Plan.

(a) The name and contact information of the person in responsible charge of the QC testing.
(b) A list of the QC technicians who will perform testing on the project, including the fields in which they are certified to perform testing.

(c) A proposed independent third party testing firm for dispute resolution, including all contact information.
(d) A list of Hold Points, when specified by the engineer.
(e) The MoDOT Standard Inspection and Testing Plan (ITP). This shall be the version that is posted at the time of bid on the MoDOT website (www.modot.org/quality).

3.0 Quality Control Testing and Reporting. Testing shall be performed per the test method and frequency specified in the ITP. All personnel who perform sampling or testing shall be certified in the MoDOT Technician Certification Program for each test that they perform.

3.1 Reporting of Test Results. All QC test reports shall be submitted as soon as practical, but no later than the day following the test. Test data shall be immediately provided to the engineer upon request at any time, including prior to the submission of the test report. No payment will be made for the work performed until acceptable QC test results have been received by the engineer and confirmed by QA test results.

3.1.1 Test results shall be reported on electronic forms provided by MoDOT. Forms and Contractor Reporting Excel2Oracle Reports (CRE2O) can be found on the MoDOT website. All required forms, reports and material certifications shall be uploaded to a Microsoft SharePoint® site provided by MoDOT, and organized in the file structure established by MoDOT.

3.2 Non-Conformance Reporting. A Non-Conformance Report (NCR) shall be submitted by the contractor when the contractor proposes to incorporate material into the work that does not meet the testing requirements or for any work that does not comply with the contract terms or specifications.

3.2.1 Non-Conformance Reporting shall be submitted electronically on the Non-Conformance Report form provided on the MoDOT Website. The NCR shall be uploaded to the MoDOT SharePoint® site and an email notification sent to the engineer.

3.2.2 The contractor shall propose a resolution to the non-conforming material or work. Acceptance of a resolution by the engineer is required before closure of the non-conformance report.

4.0 Work Planning and Scheduling.

4.1 Two-week Schedule. Each week, the contractor shall submit to the engineer a schedule that outlines the planned project activities for the following two-week period. The two-week schedule shall detail all work and traffic control events planned for that period and any Hold Points specified by the engineer.

4.2 Weekly Meeting. When work is active, the contractor shall hold a weekly project meeting with the engineer to review the planned activities for the following week and to resolve any outstanding issues. Attendees shall include the engineer, the contractor superintendent or project manager and any foreman leading major activities. This meeting may be waived when, in the opinion of the engineer, a meeting is not necessary. Attendees may join the meeting in person, by phone or video conference.

4.3 Pre-Activity Meeting. A pre-activity meeting is required in advance of the start of each new activity, except when waived by the engineer. The purpose of this meeting is to review construction details of the new activity. At a minimum, the discussion topics shall include: safety

precautions, QC testing, traffic impacts, and any required Hold Points. Attendees shall include the engineer, the contractor superintendent and the foreman who will be leading the new activity. Pre-activity meetings may be held in conjunction with the weekly project meeting.

4.4 Hold Points. Hold Points are events that require approval by the engineer prior to continuation of work. Hold Points occur at definable stages of work when, in the opinion of the engineer, a review of the preceding work is necessary before continuation to the next stage.

4.4.1 A list of typical Hold Point events is available on the MoDOT website. Use of the Hold Point process will only be required for the project-specific list of Hold Points, if any, that the engineer submits to the contractor in advance of the work. The engineer may make changes to the Hold Point list at any time.

4.4.2 Prior to all Hold Point inspections, the contractor shall verify the work has been completed in accordance with the contract and specifications. If the engineer identifies any corrective actions needed during a Hold Point inspection, the corrections shall be completed prior to continuing work. The engineer may require a new Hold Point to be scheduled if the corrections require a follow-up inspection. Re-scheduling of Hold Points require a minimum 24-hour advance notification from the contractor unless otherwise allowed by the engineer.

5.0 Quality Assurance Testing and Inspection. MoDOT will perform quality assurance testing and inspection of the work, except as specified herein. The contractor shall utilize the inspection checklists provided in the ITP as a guide to minimize findings by MoDOT inspection staff. Submittal of completed checklists is not required, except as specified in 5.1.

5.1 Inspection and testing required in the production of concrete for the project shall be the responsibility of the contractor. Submittal of the 501 Concrete Plant Checklist is required.

6.0 Basis of Payment. No direct payment will be made for compliance with this provision.

R-J. MoDOT's Construction Workforce Requirements NJSP-15-17A

1.0 Description.

1.1 Projects utilizing federal funds include contract provisions for minority and female workforce utilization in the various trade crafts used to complete construction contracts. These federal contract workforce goals are described in the section labeled "Notice of Requirement for Affirmative Action to Ensure Equal Employment Opportunity". These goals are included in all MoDOT federal aid contracts and are under the authorization and enforcement of the U.S. Department of Labor (US DOL).

1.2 The Federal workforce requirement (Goals – TABLE 1) is authorized in 41 CFR Part 60-4 and Executive Order 11246 which set Equal Employment Opportunity goals with Affirmative Action requirements.

1.3 The required federal aid workforce provisions noted above, coupled with the following additional contract provisions, constitute MoDOT's Construction Workforce Program herein called Program.

1.4 This provision does not require pre-qualification nor is it a condition of award.

1.5 The Program does not eliminate or limit any actions the US DOL may take in relation to this contract's federal provisions.

1.6 The Program goals included in the contract are separate from any Disadvantaged Business Enterprise (DBE) or On-The-Job (OJT) training provision that may be included as contract provisions. DBE and OJT goals may or may not be included in a contract based on the individual size of contracts, type of contract work, anticipated length of contract, available and willing resources or other reasons.

1.7 Contractor, for the purpose of this provision, means the prime contractor and any and all subcontractors.

1.8 It is expected that the contractor recognizes the construction workforce goals for both minority and female workers in the project's county and make efforts to attain those goals, if possible, through the existing workforce makeup of the prime (including subcontractors) that will be on the project and/or through hiring opportunities that may arise for the project. However, it is not the intent of this provision to compel any contractor to displace existing workforce or move workers around to just meet the workforce goals.

1.9 If the contractor's existing Missouri construction workforce meets or exceeds the federal workforce goals established in Table 1, then the OJT goal (Training Provision) if included in the contract, does not be apply.

1.10 Contractor's Workforce Plan. The Contractor shall submit its Workforce Plan a minimum of 1 week before construction starts. One plan shall be submitted for the project that shall include the cumulative planned workforce of the prime and subcontractor(s). The contractor shall prepare the plan, for total minority and female utilization, regardless of the craft. The Engineer will provide the Contractor with comments regarding their Workforce Plan prior to the start of construction. Once work starts, all monthly reporting shall include the craft of each worker reported. If the contractor's plan includes project manager, direct project support roles, project testers or other project professionals, these designations should also be included in addition to the workers designated by craft such as laborer, operator, carpenter, ironworker and others.

1.11 The plan accepted by the engineer before the start of construction will be the effort expected of the prime contractor to maintain during the life of the project.

1.12 If the contractors planned project workforce plan (including OJT hours if included in the contract) is short of the goals included in Table 1, there is opportunity for the contractor to receive a reimbursement of $10.00 / hour for any new project minority and female hires needed through the remainder of the project. The reimbursement is applicable to work that qualifies for prevailing wage under the federal Davis-Bacon Act, 40 U.S.C. §§ 3141–3148, in accordance with an approved workforce plan. Any reimbursement must be pre-approved by the Engineer. The reimbursement is provided as a remedy to the contractor and as an aid in the long-term growth of experienced persons in the building of roads and bridges in Missouri. The contractor shall manage the plan through the life of the project as described in the plan or as modified, in coordination with the Engineer. The total amount available per project is not capped.

1.13 The Contractor's workforce plan may include existing construction support and professional services staff.

2.0 Forms and Documentation. The bidder must submit the following documents if awarded the contract:

Cumulative Workforce Utilization Reports. This report is contract specific. One report shall be submitted to the Engineer by the 15th of each month. The report will be used to report the total workforce compliance data for the prime contractor and all subcontractors retained by the contractor on the Commission's construction contract. The reporting shall include the workforce hours per each craft broken down by gender and ethnicity. Construction Support, testing and other professional services hours shall be included as these hours are part of the overall plan. The report will include the previous month's hours worked for the project. For projects less than 60 days in length, only one report with total hours worked by classification is required at substantial completion of construction.

3.0 Methods for Securing Workforce Participation and Good Faith Efforts.

***3.1** By submitting a bid, the Bidder agrees, as a material term of the contract, to carry out MoDOT's Construction Workforce Program by making good-faith efforts to utilize minority and female workers on the contractor's job sites to the fullest extent consistent with submitting the lowest bid to MoDOT. The Bidder shall agree that the Program is incorporated into this document and agree to follow the Program. If a bidder is unable to meet the workforce goals at the time of bid, it shall be required to objectively demonstrate to MoDOT that the goals have been met or demonstrate a good faith effort has been made with the level of effort submitted prior to the start of construction.*

3.2 The Engineer, through consultation with MoDOT's External Civil Rights (ECR's) Division, may determine that the contractor has demonstrated that good-faith efforts to secure minority and female participation have been made.

3.3 In evaluating good-faith efforts, the ECR's Division will take into consideration the affirmative actions listed in the Federal Provisions (including provisions of Executive Order 11246).

3.4 MoDOT's Program allows the contractor flexibility to implement a project specific workforce and improve the diversity of their existing workforce that can be utilized across various areas of the state to meet future MoDOT Program goals and Federal Provisions.

3.5 If the contractor's approved plan changes during the project and/or the available workforce changes from what is approved at any time, it is the contractor's responsibility to remedy, in coordination with MoDOT's ECR Division, the conditions as outlined and made available through this provision.

4.0 Compliance Determination. (Required with project closeout) All documentation and on-site information will be reviewed by MoDOT's ECR Division in making a determination of whether the contractor made sufficient good faith efforts to meet the compliance with MoDOT's Construction Workforce Program.

5.0 Liquidated Damages. If the contractor elects to not submit a workforce plan prior to work starting or fails to fulfill their workforce plan committed to prior to the start of construction, the contractor will be required to establish a good-faith effort determination, as to why either of these events occurred. MoDOT may sustain damages, the exact extent of which would be difficult or impossible to ascertain, as this impacts the cost of future road and bridge construction. Therefore,

in order to liquidate those damages, MoDOT shall be entitled, at its sole discretion, to deduct and withhold the following amounts: **The sum of one thousand five hundred ($1,500)**

6.0 Administrative Reconsideration. The contractor shall be offered the opportunity for administrative reconsideration upon written request related to findings and/or actions determined by MoDOT's ECR's Division. The Administrative Reconsideration Committee shall be composed of individuals not involved in the original MoDOT determination(s).

7.0 Available Pre-Apprentice Training Programs. The Commission has established a labor force recruiting program intended to assist contractors in identifying, interviewing and hiring qualified job applicants. MoDOT strongly encourages the hiring of individuals from the MoDOT funded pre-apprentice training programs.

8.0 Independent Third-Party Compliance Monitor (Monitor). MoDOT may utilize a monitor that will be responsible for tracking the project's workforce utilization for the information the contractor submits. The contractor and its subcontractors shall allow the monitor access to their reports, be available to answer the monitor's questions and allow the monitor to access to the site and to contractor and subcontractor employees. The monitor shall abide by the contractor's project site protocols.

9.0 Regional Diversity Council (Council). (Applicable to the Kansas City and St. Louis District regions only) The Council shall consist of local community leaders, leadership of local construction trades, MoDOT staff, Industry representation, and a representative(s) from the Federal Highway Administration. The Council will meet quarterly and evaluate the workforce activity per each project according to the following criteria:

a. Review monthly workforce reports.
b. Review progress toward the stated project workforce program.
c. Review findings of Administrative Reconsideration hearings.
d. Recommend *other* workforce actions to MoDOT.

10.0 Federal Workforce Goals.

Female Participation for Each Trade is 6.9% Statewide for Missouri.

Minority Participation for Each Trade is shown below in Table 1.

TABLE 1:

County	Goal (Percent)	County	Goal (Percent)
Adair	4	Linn	4
Andrew	3.2	Livingston	10
Atchison	10	McDonald	2.3
Audrain	4	Macon	4
Barry	2.3	Madison	11.4
Barton	2.3	Maries	11.4
Bates	10	Marion	3.1
Benton	10	Mercer	10

Bollinger	11.4	Miller	4
Boone	6.3	Mississippi	11.4
Buchanan	3.2	Moniteau	4
Butler	11.4	Monroe	4
Caldwell	10	Montgomery	11.4
Callaway	4	Morgan	4
Camden	4	New Madrid	26.5
Cape Girardeau	11.4	Newton	2.3
Carroll	10	Nodaway	10
Carter	11.4	Oregon	2.3
Cass	12.7	Osage	4
Cedar	2.3	Ozark	2.3
Chariton	4	Pemiscot	26.5
Christian	2	Perry	11.4
Clark	3.4	Pettis	10
Clay	12.7	Phelps	11.4
Clinton	10	Pike	3.1
Cole	4	Platte	12.7
Cooper	4	Polk	2.3
Crawford	11.4	Pulaski	2.3
Dade	2.3	Putnam	4
Dallas	2.3	Ralls	3.1
Daviess	10	Randolph	4
DeKalb	10	Ray	12.7
Dent	11.4	Reynolds	11.4
Douglas	2.3	Ripley	11.4
Dunklin	26.5	St. Charles	14.7
Franklin	14.7	St. Clair	2.3
Gasconade	11.4	St. Francois	11.4
Gentry	10	Ste. Genevieve	11.4
Greene	2	St. Louis City	14.7
Grundy	10	St. Louis County	14.7
Harrison	10	Saline	10
Henry	10	Schuyler	4
Hickory	2.3	Scotland	4
Holt	10	Scott	11.4
Howard	4	Shannon	2.3
Howell	2.3	Shelby	4
Iron	11.4	Stoddard	11.4

Jackson	12.7	Stone	2.3
Jasper	2.3	Sullivan	4
Jefferson	14.7	Taney	2.3
Johnson	10	Texas	2.3
Knox	4	Vernon	2.3
Laclede	2.3	Warren	11.4
Lafayette	10	Washington	11.4
Lawrence	2.3	Wayne	11.4
Lewis	3.1	Webster	2.3
Lincoln	11.4	Worth	10
		Wright	2.3

STANDARD FEDERAL EQUAL EMPLOYMENT OPPORTUNITY CONSTRUCTION CONTRACT SPECIFICATIONS (EXECUTIVE ORDER 11246)

This contractor and subcontractor shall abide by the requirements of 41 CFR 60-1.4(a), 60-300.5(a) and 60-741.5(a). These regulations prohibit discrimination against qualified individuals based on their status as protected veterans or individuals with disabilities, and prohibit discrimination against all individuals based on their race, color, religion, sex, sexual orientation, gender identity or national origin. Moreover, these regulations require that covered prime contractors and subcontractors take affirmative action to employ and advance in employment individuals without regard to race, color, religion, sex, sexual orientation, gender identity, national origin, disability or veteran status.

As used in these specifications:

"Minority" includes;

(i) Black (all person having origins in any of the Black African racial groups not of Hispanic origin);
(ii) Hispanic (all persons of Mexican, Puerto Rican, Cuban, Central or South American or other Spanish Culture or origin, regardless of race);
(iii) Asian and pacific islander (all persons having origins in any of the original peoples of the Far East, southeast Asia, the Indian Subcontinent, or the Pacific Islands; and
(iv) American Indian or Alaskan Native (all persons having origins in any of the original peoples of North American and maintaining identifiable tribal affiliations through membership and participation or community identification).

R-K. Notice to Bidders of Funding by Third Party JSP-18-02A – Job J6S1718B Only

1.0 Bidders are advised that the City of Brentwood is required to provide substantial funds for construction of Job No. J6S1718B.

2.0 Bidders acknowledge that their bids are made with knowledge of and subject to the condition of the City of Brentwood providing substantial funds prior to authorization of any award of a contract for this job by the Commission.

3.0 Bidders agree that they shall be estopped, both in law and equity, to assert any right to award of a contract for this job by the Commission should the City of Brentwood not provide substantial funds for any reason.

R-L. Notice to Bidders of Funding by Third Party JSP-18-02A – Job J6S1718C Only

1.0 Bidders are advised that the City of Kirkwood is required to provide substantial funds for construction of Job No. J6S1718C.

2.0 Bidders acknowledge that their bids are made with knowledge of and subject to the condition of the City of Kirkwood providing substantial funds prior to authorization of any award of a contract for this job by the Commission.

3.0 Bidders agree that they shall be estopped, both in law and equity, to assert any right to award of a contract for this job by the Commission should the City of Kirkwood not provide substantial funds for any reason.

R-M. Notice to Bidders of Third Party Concurrence in Award JSP-98-19 – Job J6S1718B Only

1.0 Bidders are advised that Commission is party to a contract with the City of Brentwood which provides that the City of Brentwood shall provide substantial funds for construction of Job No. J6S1718B by reason of which the City of Brentwood has the right to concur or not concur in Commission's award of a contract for this job.

2.0 Bidders acknowledge that their bids are made with knowledge of and subject to the condition of the City of Brentwood concurrence in and prior authorization of any award of a contract for this job by Commission.

3.0 Bidders agree that they shall be estopped, both in law and equity, to assert any right to award of a contract for this job by Commission should the City of Brentwood not concur in that award for any reason.

R-N. Notice to Bidders of Third Party Concurrence in Award JSP-98-19 – Job J6S1718C Only

1.0 Bidders are advised that Commission is party to a contract with the City of Kirkwood which provides that the City of Kirkwood shall provide substantial funds for construction of Job No. J6S1718C by reason of which the City of Kirkwood has the right to concur or not concur in Commission's award of a contract for this job.

2.0 Bidders acknowledge that their bids are made with knowledge of and subject to the condition of the City of Kirkwood concurrence in and prior authorization of any award of a contract for this job by Commission.

3.0 Bidders agree that they shall be estopped, both in law and equity, to assert any right to award of a contract for this job by Commission should the City of Kirkwood not concur in that award for any reason.

R-O. Site Restoration

1.0 Description. Restore to its original condition any disturbed area at sites including, but not limited to, guardrail, pull box, conduit, pole base installations, and work to ADA facilities. Restoration shall be accomplished by placing material equivalent to that of the adjacent undisturbed area. Disturbed unpaved areas shall be fertilized and either seeded and mulched or sodded as directed by the engineer. The engineer will have the final authority in determining the acceptability of the restoration work.

2.0 If the contractor elects and receives approval from the engineer for alternate trench and/or pull box locations, any areas of concrete slope protection, sidewalk, pavement, shoulders, islands and medians – as well as any similar improvements consisting of asphaltic concrete materials – removed in conjunction with their construction shall be replaced with improvements of similar composition and thickness. Removals shall be achieved by means of full depth saw cuts; the resulting subgrade compacted to minimum density requirements and topped with 4 inches of compacted aggregate base course prior to replacement of surface materials. Concrete materials, used in replacement, shall be approved by the engineer. A commercial asphalt mix may be used for replacement of asphaltic surfacing upon approval of the engineer.

2.1 Unless quantities and pay items for removal and subsequent replacement of improvements are contained in the plans for a specific location of removal work, no direct payment will be made for full depth saw cutting, and the removal and subsequent replacement of asphalt or concrete slope protection, sidewalk, pavement, shoulders, islands, medians, sod and the required dowel and tie bars removed and replaced by the contractor as a result of his election to
vary the location of conduit runs and pull boxes. This work will be considered as included in the various unit bid prices for conduit and pull boxes established in the contract, and no additional payment will be made.

2.2 Sidewalks and curb ramps that are disturbed as described in this provision shall be replaced to meet current ADA standards.

2.2.1 Seed and mulch will not be an acceptable means to reestablish grass in disturbed areas adjacent to ADA facilities constructed with this project. Any grassy areas around these facilities that have been disturbed by the contractor in order to construct ADA compliant facilities shall be replaced with sod. For locations where an existing ADA facility is removed and replaced on a new, accessible alignment, the old alignment shall have the subgrade appropriately prepared and sod shall be installed at the surface.

2.3 Areas that are used by the contractor for jobsite trailers, equipment and materials storage, or used for project staging areas that are disturbed shall be cleaned up and restored to a condition that is both acceptable to the engineer and, at a minimum, equivalent to the existing site condition.

3.0 Basis of Payment. The cost of restoration of disturbed areas will be incidental to the unit price of guardrail, pole base, conduit, pull box, and/or ADA facilities. No direct payment will be made for any materials or labor, which is performed under this provision

R-P. Property Owner Notification

1.0 Description. It shall be the contractor's responsibility to inform and notify the adjacent property owner 48 hours prior to starting any construction activities that may impact driveway access or occur along the frontage of the property owner's parcel. Notification shall be in written form and include the contractor's contact information, the Engineer's contact information, and an estimated schedule of work and the associated impacts.

2.0 Basis of Payment. No direct payment will be made to the contractor for the labor, equipment, material, or time required to comply with this provision.

R-Q. Damage to Existing Pavement, Shoulders, Side Roads and Entrances

1.0 Description. This work shall consist of repairing any damage to existing pavement, shoulders, side roads, and entrances caused by Contractor operations. This shall include, but is not limited to, damage caused by the traffic during Contractor operations within the project limits including the work zone signing.

2.0 Construction Requirements. Any cracking, gouging or other damage to the existing pavement, shoulders, side roads, or entrances from general construction shall be repaired within twenty-four (24) hours of the time of damage at the Contractor's expense. Repair of the damaged pavement, shoulders, side roads, or entrances shall be determined by the Engineer.

3.0 Method of Measurement. No measurement of damaged pavement or shoulder areas or damaged side roads or entrances as described above shall be made.

4.0 Basis of Payment. No payment will be made for repairs to existing pavement, shoulders, side roads or entrances damaged by Contractor operations.

R-R. ADA Compliance and Final Acceptance of Constructed Facilities JSP-10-01B

1.0 Description. The contractor shall comply with all laws pertaining to the Americans with Disabilities Act (ADA) during construction of pedestrian facilities on public rights of way for this project. An ADA Checklist is provided herein to be utilized by the contractor for verifying compliance with the ADA law. The contractor is expected to familiarize himself with the plans involving pedestrian facilities and the ADA Post Construction Checklist prior to performing the work.

2.0 ADA Checklist. The contractor can locate the ADA Checklist form on the Missouri Department of Transportation website:

www.modot.org/business/contractor_resources/forms

2.1 The ADA Checklist is intended to be a helpful tool for the contractor to use during the construction of the pedestrian facilities and a basis for the commission's acceptance of work. Prior to work being performed, the contractor shall bring to the engineer's attention any planned work that is in conflict with the design or with the requirement shown in the checklist. Situations may arise where the checklist may not fully address all requirements needed to construct a facility to the full requirements of current ADA law. In those situations, the contractor shall propose a

solution to the engineer that is compliant with current ADA law using the following hierarchy of resources: 2010 ADA Standards for Accessible Design, Draft Public Rights of Way Accessibility Guidelines (PROWAG) dated November 23, 2005, MoDOT's Engineering Policy Guidelines (EPG), or a solution approved by the U.S. Access Board.

2.2 It is encouraged that the contractor monitor the completed sections of the newly constructed pedestrian facilities in attempts to minimize negative impacts that his equipment, subcontractors or general public may have on the work. Completed facilities must comply with the requirements of ADA and the ADA Checklist or have documented reasons for the non-compliant items to remain.

3.0 Coordination of Construction.

3.1 Prior to construction and/or closure on an existing pedestrian path of travel, the contractor shall submit a schedule of work to be constructed, which includes location of work performed, the duration of time the contractor expects to impact the facility and an accessible signed pedestrian detour compliant with MUTCD Section 6D that will be used during each stage of construction. This plan shall be submitted to the engineer for review and approval at or prior to the pre-construction conference. Accessible signed detours shall be in place prior to any work being performed that has the effect of closing an existing pedestrian travel way.

3.2 When consultant survey is included in the contract, the contractor shall use their survey crews to verify that the intended design can be constructed to the full requirements as established in the 2010 ADA Standards. When 2010 ADA Standards do not give sufficient information to construct the contract work, the contractor shall refer to the PROWAG.

3.3 When consultant survey is not included in the contract, the contractor shall coordinate with the engineer, prior to construction, to determine if additional survey will be required to confirm the designs constructability.

4.0 Final Acceptance of Work. The contractor shall provide the completed ADA Checklist to the engineer at the semi-final inspection. ADA improvements require final inspection and compliance with the ADA requirements and the ADA Checklist. Each item listed in the checklist must receive either a "YES" or an "N/A" score. Any item receiving a "NO" will be deemed non-compliant and shall be corrected at the contractor's expense unless deemed otherwise by the engineer. Documentation must be provided about the location of any non-compliant items that are allowed to remain at the end of the construction project. Specific details of the non-compliant items, the ADA requirement that the work was not able to comply with, and the specific reasons that justify the exception are to be included with the completed ADA Checklist provided to the engineer.

4.1 Slope and grade measurements shall be made using a properly calibrated, 2 foot long, electronic digital level approved by the engineer.

5.0 Basis of Payment. The contractor will receive full pay of the contract unit cost for all sidewalk, ramp, curb ramp, median, island, approach work, cross walk striping, APS buttons, pedestrian heads, detectible warning systems and temporary traffic control measures that are completed during the current estimate period as approved by the engineer. Based upon completion of the ADA Checklist, the contractor shall complete any necessary adjustments to items deemed non-compliant as directed by the engineer.

5.1 No direct payment will be made to the contractor to recover the cost of equipment, labor, materials, or time required to fulfill the above provisions, unless specified elsewhere in the contract documents.

R-S. Right of Way Requirements

1.0 Description. The Right of Way has been cleared on this project. However, there are some special requirements and conditions that have been agreed to in the negotiation process that the contractor shall adhere to.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with applicable Standard Specifications. Please note that the list of special requirements below may not be all inclusive. The contractor shall consult the Right of Way Negotiator's Report for a full detail of any special requirements at each parcel.

2.1 Business Hours. A number of parcels within the project require minimal or no disruptions during business hours. If specific business hours are not listed or where multiple tenants share a building, it shall be the responsibility of the contractor to verify the proper business hours with each business/tenant to plan the construction work accordingly. Where listed, business hours included in this JSP are current as of the time of the project's advertisement for bidders. However, business hours are subject to change and actual business hours may vary slightly from those hours listed herein, and may be temporarily adjusted during different times of the year. It shall be the responsibility of the contractor to verify the accuracy of the noted business hours and provide as little disruption as possible during construction operations.

3.0 Locations.

3.1 Parcel 21 – Sunnen Products Company. The contractor shall notify the property owner five (5) business days prior to the beginning of any work that will block any portion of their entrance between the hours of 7:00 AM and 4:00 PM.

3.2 Parcel 37 – Billboard at NW corner of Hanley Road. Special requirements to be inserted.

3.3 Parcel 57 – LK2 Kaim Kisner Studio. Special requirements to be inserted.

3.4 Parcel 65 – K. Hall Designs. Special requirements to be inserted.

3.5 Parcel 73 – 8702 Manchester Road. The contractor will not park vehicles or equipment or store any materials on the asphalt parking lots within this property except for the vehicles, equipment and materials that are actively being used to construct the features directly adjacent to or within the parcel. These features include, but are not limited to, sidewalks, drainage features, utilities, and the reconstruction of entrances and parking lots as shown on the construction plans for Project J6S1718B.

The Contractor will only obstruct the use of a maximum of four (4) of the eight (8) parking spaces located within the Temporary Construction Easement at any given time, leaving at least four (4) of the eight (8) parking spaces available at all times during construction.

3.6 Parcel 80 – 8611 Manchester Road. This property is adjacent to Parcel 81, which has a building that will be demolished as a part of this project. It shall be the contractor's responsibility

to inform and notify the owner of Parcel 80, and the owners of all other properties adjacent to Parcel 81, two (2) weeks prior to starting any demolition activities. Notification shall be in written form and include the contractor's contact information, the Engineer's contact information, and an estimated schedule of work and the associated impacts.

3.7 Parcel 90 – St. Mary Magdalen Church and School. Temporary fencing shall be provided at the parking and school yard enclosure at this parcel during all periods of active construction operations. Refer to Job Special Provision "72-Inch Temporary Chain Link Fence" for additional details.

3.8 Parcel 112 – Carl's Drive-In / High School Drive.

3.8.1 During construction, the Contractor will maintain ingress and egress to the building (front and back) and parking lot (both driveways – Manchester and High School Drive will be completed in half sections, consisting of 4 phases). The Contractor will also be required to maintain at least one (1) westbound lane of traffic open on Manchester Road (Route 100) and also one (1) lane open on High School Drive during construction.

3.8.2 The Contractor will install the new parking stalls on the west side of the building on High School Drive prior to any work being done on the property, and the Contractor will not be permitted to close the new parking stalls during construction.

3.8.3 The temporary construction easement will only be used for active construction purposes. The Contractor will not be permitted to stage or store items not directly related to construction on the property. The easements will be not be used for storm sewer construction purposes, and the property will not be used for the installation of the storm sewer line.

3.8.4 Work Hours. The Contractor will only be allowed to work on the property during non-business hours on Tuesday through Saturday from 8 PM until 11 AM. The business is closed on Sundays and Mondays. During business hours, the Contractor will not impede access into and out of the parking lot, front access in and out of the restaurant for customers, or rear access in and out of the building for employees and vendors. The Contractor will also into and out of the parking lot and rear access in and out of the building for employees and vendors during non-business hours.

3.8.5 Notice Letters and Construction Timeline. The Contractor will provide a written letter with at least 3 days' notice as to when work will begin on the property. Once work begins on the property, the Contractor will only be allowed to work on the property for a maximum of 6 months, measured continuously from the start of construction at the property. The Contractor will send a second letter to the owners upon completion of the work. All notification letters for Parcel 112 will need to be sent to:

Drive-In Realty, LLC and
Carl's III, LLC
Attn: Michael G. Franklin
4328 Bridgeton Industrial Dr.
Bridgeton, MO 63044

3.9 Parcels 131 and 132 – Trainwreck Saloon. No work shall be performed on this parcel during business hours. Normal business hours are 11:00 AM to 10:00 PM Monday through Thursday, 11:00 AM to 11:30 PM Friday, 11:00 AM to 1:00 AM Saturday, and 11:00 AM to 12:00

AM Sunday. Additionally, the contractor shall stage their construction operations in a manner that will keep access to the business's front door (faces Manchester Road) at all times during business hours.

3.10 Parcel 147 – Stanford Place Apartment Homes. Special requirements to be inserted.

3.11 Parcel 158 – RSI Kitchen & Bath. The contractor shall construct all entrances on this parcel ½ at a time.

3.12 Parcel 168 – 9701 Manchester Road. The contractor shall construct the entrance for this parcel ½ at a time, with the western half to be constructed first.

3.13 Parcel 177 – 9804 Manchester Road. The contractor shall keep ADA access to the business open at all times during business hours.

3.14 Parcel 197 – Berry Road Crossing. The contractor shall perform all construction work in proximity to this parcel at night and after business hours so that all parking spaces can remain open.

3.15 Parcel 224 – Ameren Missouri Substation. The Contractor will maintain at least 10-foot-wide, 24-hour access to Ameren's facilities. The Contractor will also use extra precaution what conducting any activity adjacent to, over, under or near Ameren's underground or overhead electrical facilities and will take care to maintain proper support and stabilization for Ameren's underground electrical facilities to prevent damage of collapse due to undermining. The contractor will provide no less than twenty (20) feet radial clearance from all of Ameren's facilities, including towers, poles and overhead lines.

Except in the case of an emergency, the Contractor will provide Ameren with written notification at least forty-eight (48) hours in advance of any digging or trenching adjacent to Ameren's property. An Ameren field supervisor will be present during any digging or trenching operations. In the case of an emergency, the Contractor will notify Ameren of any digging of trenching by phone as soon as possible.

3.16 Parcel 231 – Marketplace at the Abbey. There are landscaped beds between the parking lot and Manchester Road. During construction, contractor will grade the landscaping rock back from within these beds and store it within the temporary construction easement. Upon completion of the work along the parcel frontage, the contractor shall install new weed barrier geotextile fabric and re-install the landscaping rock that had been previously graded back. During execution of this work, the contractor shall take care to not disturb the landscaping bushes located with the easement areas.

3.17 Parcel 245 – Dean Team Service Center. No work shall be performed on this parcel during business hours. Normal business hours are 9:00 AM to 8:00 PM Monday, Wednesday, and Friday and 9:00 AM to 6:00 PM Tuesday, Thursday, and Saturday. The business is closed on Sundays.

3.18 Parcel 246 – 10202-20 Manchester Road. The contractor shall remove and discard the existing light pole that is located at approximately Sta. 249+00. During execution of their work, the contractor shall take care to not disturb the existing business sign and pole located in between the two entrances. The contractor shall also be responsible for re-striping all parking lot striping lines that are disturbed during construction.

3.19 Parcel 256 – St. Agnes Home. Temporary fencing shall be provided along the frontage of the St. Agnes Home during all periods of active construction operations. Refer to Job Special Provision "72-Inch Temporary Chain Link Fence" for additional details.

3.20 Parcel 258 – 10400-14 Manchester Road. No work shall be performed on this parcel during business hours. Normal business hours are 9:00 AM to 7:00 PM Monday through Saturday. Additionally, the contractor shall stage their construction operations in a manner that will keep at least 10 of the 13 parking spaces open at all times during business hours.

3.21 Parcel 267 – Bopp Chapel. The contractor will keep the drive lane between the front building sidewalk and the temporary construction easement open and accessible at all times. The area will also be maintained free of construction traffic, equipment, and personnel, except for construction of the entrance driveway approach and sidewalk/ADA curb ramp tie-ins. Construction on the driveway approach will be performed half-at-a-time in order to maintain the drive lane open through the duration of the project.

3.22 Parcels 274 and 275 – Lou Fusz Toyota. Work within the easements on these parcels must be performed during non-business hours. Business hours for these parcels are defined as Monday through Saturday 10:00 AM to 7:00 PM and Sunday from 12:00 noon to 6:00 PM. Additionally, at least one driveway entrance shall remain open at all times.

4.0 Basis of Payment. No direct payment will be made to the contractor for the labor, equipment, material, or time required to comply with this provision.

R-T. Protection of Metrolink Facilities and Traffic

METRO RAILWAY REQUIREMENTS STANDARD OPERATING PROCEDURES

1.0 PURPOSE AND SCOPE. The purpose of the following requirements is to maintain a safe environment and efficient transit system for MetroLink customers, employees and Contractors when work is being performed on the MetroLink Right-of-Way (ROW). The following procedures must be followed and all requirements fulfilled before permission will be granted to any individual or group requesting access to the MetroLink Right-of-Way (ROW) to perform work. This includes all work on, under, above, or adjacent to the MetroLink Right-of-Way that has the potential to impact train operations. MetroLink Right-of-Way is defined as Metro owned property along MetroLink's Light Rail System, including main line tracks, yard track, shop tracks, and stations. Work performed on the Right-Of -Way outside of the alignment or area where trains operate that **will not** impact train operations, e.g. park and ride lots etc., is excluded from the scope detailed in the following procedures.

This procedure is applicable to Contractors and Metro Employees.

MetroLink Land Maps defining Metro property lines and a MetroLink Alignment Schematic are available from the Maintenance Of Way (MOW) Department upon request.

Contractor must request a St. Louis Metrolink Track Access Permit Package from Metrolink. This package will contain all the latest exhibits and Standard Operating Procedures (SOPs) necessary for this project as well as any fees associated with working within Metrolink limits.

Metro employees will not be used for flagging. All flagging work will need to be self-performed.

2.0 ATTACHMENTS/EXHIBITS

EXHIBIT A: MetroLink - Contractor Right-of-Way Temporary Work Permit
EXHIBIT B: Metro Permit Fee Schedule
EXHIBIT C: MetroLink Alignment Schematic (available upon request)
EXHIBIT D: Indemnification Agreement and Required Insurance Coverage
EXHIBIT E: Metro Personnel Right of Way Work Permit (For Metro Employees Only)
EXHIBIT F: MetroLink Rail Systems Department Employee Safety Standards (available upon request)
EXHIBIT G: Operations Rule Book (available upon request)

Note: See paragraph 7.0 for information on how to obtain Exhibits above.

3.0 DEFINITIONS

Flag Person is a Tier 2 qualified Contractor or Metro Employee that is assigned as a dedicated flagger to protect work crews, personnel, and equipment working on or near the tracks to ensure safe passage of trains as described in SOP 103.04. Contractor will be responsible for providing Tier 2 qualified flaggers.

Fouling a Track means placement of an individual, material or equipment in such proximity to the track that the individual, material or equipment could be struck by a moving train or on-track equipment, or in any case is within 8’ 6" from the centerline of nearest track.

Lookout is a Tier 2 qualified Metro employee who is qualified to provide warning to ROW workers of approaching trains or on-track equipment. Lookout should be equipped with the necessary equipment to warn ROW workers of approaching trains, as well as flagging equipment to be used if it is necessary to warn approaching trains. The Lookout’s sole duty is to look for approaching trains or on-track equipment and provide advanced warning to employees before arrival of the trains or on-track equipment. ***Contractor will be responsible for providing Tier 2 qualified flaggers.***

No Clearance Zone areas along the MetroLink Right of Way where there **is not** 8' 6" clearance from centerline of nearest track to nearest fixed object, e.g. wall, fence, bridge, steep embankment. Within these areas it **is not** possible for personnel to safely clear from fouling train movement. These areas are designated with reflective **No Clearance** signs on the right-of-way and by markings on the MetroLink Alignment Schematic.

Operating Right-of-Way (ROW) is the area within twenty (20) feet of the centerline of any track on the main line or yard.

Pilot is a Tier 3 qualified Metro employee assigned to facilitate track car or on-track equipment movement when the operator or driver is not qualified on the physical characteristics or rules of the portion of the alignment over which movement is to be made. The pilot will be responsible for the safe movement of on-track equipment for the work crew to which they are assigned.

Right-of-Way (ROW) is land, property and interests therein, acquired by the Agency.

Train Detection is a procedure by which a worker acquires ROW access safely by seeing approaching trains and leaving the track before the train arrives at the location at which they are working and which may be used only under certain conditions authorized by OCC.

4.0 GENERAL REQUIREMENTS FOR ACCESS TO METROLINK RIGHT-OF- WAY

All work within the "MetroLink ROW" is subject to the Metro approval. Work plans must be submitted for Metro Approval. MetroLink SOP 101.17 describes the work permit submittal requirements. Weekly track allocation meetings are held at the MetroLink Ewing Facility (Room M09) on Thursdays at 8:30am. A contractor representative must attend to discuss the following week's work. Metro SOP 101.23 describes the track allocation process.

4.1 To access the MetroLink ROW all Contractor and Metro Employees must have a minimum of Tier 1 Safety Training and each work group must be accompanied by at least one person that is Tier 2 qualified to serve as a flag person or lookout. For unforeseen work for short durations, MetroLink Operations may authorize unqualified persons access to the ROW if accompanied by a qualified Metro Lookout.

4.2 The work crew must have in their possession a copy of an approved work permit describing the work being performed. Contractor must also meet all additional requirements for ROW access described within this SOP and the referenced documents. Prior to the start of any proposed work the Contractor must submit a MetroLink - Contractor Right-of-Way Temporary Work Permit, and Metro Employees must submit a Metro Personnel Right of Way Work Permit. If Metro requires a detailed work plan, that plan must be approved prior to permit submittal. Once the work plan is approved, the permit can be submitted. For unforeseen work for short durations, MetroLink Operations can authorize access to the ROW without an approved work permit. Work permits are not required for LRV equipment maintenance performed on the mainline or in the yard & shops.

4.3 Operators of track cars or on-track equipment must be Tier 3 qualified, unless a qualified Metro Pilot accompanies them. In that situation, the Operator must be at a minimum, Tier 1 qualified.

4.4 A Metro Tier 3 qualified pilot must accompany Contractor track cars. The pilot is responsible to ensure the Contractor's track car and on-track equipment is operated in compliance with Metro operating and safety rules. The contractor requirement for the Metro pilot can be waived by Metro, if it has been determined that the Contractor's operator has sufficient experience with Metro operating and safety rules.

5.0 ROW SAFETY TRAINING QUALIFICATIONS

The following table summarizes the required ROW Safety Training necessary before any Contractor or Metro Employee will be allowed to perform any work on the ROW. Annual recertification is required for Tier 1, 2 &3 Training.

Work or Duties	**Training Required**
Any work within MetroLink Right-of-Way	Tier 1
Flagging to protect work crews, personnel and equipment in the Right-of-Way	Tier 1, and Tier 2
Operating a track car on MetroLink	Tier 1, Tier 2, and Tier 3

If Metro employees are not qualified at a minimum Tier 2 (Flagging and Radio Use), they must be escorted by another employee qualified to Tier 2.

The Safety Department will maintain a list of ROW Safety Trained qualified persons and their level of qualification (e.g. Tier 1, 2, or 3). An updated list will be kept on file in the Rail Dispatcher's Office. Dates, times and locations of Training class can be obtained by contacting Metro Safety Dept. or MetroLink Operations.

6.0 METRO REQUIREMENTS FOR CONTRACTOR

6.1 Contractor must, if requested by Metro, submit a detailed work plan to MetroLink Operations to be reviewed and approved by MetroLink Operations, Maintenance of Way, and Safety. After acceptance of the work plan, Contractor will obtain, through the procedure defined in this SOP, an approved **EXHIBIT A: MetroLink - Contractor Right-of-Way Temporary Work Permit** before any work can be performed and they must have their Metro approved Permit available at all times on the work site.

6.2 Contractor may be required to reimburse Metro for all expenses as defined in EXHIBIT B: Metro Permit Fee Schedule. **Metro reserves the right to waive fees at its sole discretion.**

6.3 Method of payment from Contractor to Metro will be determined by Metro. All Metro expenses for a particular Contractor shall then be accumulated under the associated permit number.

6.4 Contractor will complete annual required ROW Safety Training as described in **Section 5 – ROW SAFETY TRAINING QUALIFICATIONS**. Annual recertification is required for Tier 1,2 &3 Training.

6.5 Contractors will immediately stop any work that deviates from their approved Right-of-Way Temporary Work Permit or detailed work plan submitted. Metro should be contacted and must approve any alternate work procedures.

6.6 Contractor work activities can be terminated immediately by MetroLink Operations, Maintenance of Way or Safety, at any time without notice. Typical conditions under which this may occur include, but are not limited to:

a) Failure to comply with any of the requirements identified in this SOP or other documents referred to within.
b) Safety related reasons.
c) Operations schedule-related reasons.
d) If work in progress deviates from the written work proposal approved by the Metro.
e) Flag person(s) not available.
f) Contractors' work interferes with the constant, continuous use of the tracks, property and facilities of MetroLink system, its employees, its customers or other Contractors working within the right-of-way.
g) Accidents, injuries, near misses, or vehicle damage.
h) Metro rule violations

6.7 All on track equipment (including Hi-Rail Vehicles) must meet Federal Register 49 CFR, Part 214 standards, related to Roadway Maintenance Machine Safety. Contractor will be required to submit a list of qualified operators and which Roadway Maintenance Machines that they are qualified to operate on Metro. The Contractor will provide, for Metro approval, documentation of their training and qualification process.

6.8 Contractor must satisfy all safety requirements including, but not limited to, those found in Exhibit F: METROLINK RAIL SYSTEMS DEPARTMENT EMPLOYEE SAFETY STANDARDS dated January 1996 and Exhibit G: MetroLink Operations Rule Book. Copies are available upon request from the MOW Department.

6.9 Under no circumstances will Contractor access tracks with vehicles, equipment, or machinery, without explicit written permission of Metro. Each individual working on the ROW is responsible to supply their own personal protective equipment, including a reflective safety vest, hard hat, safety glasses, and work shoes with less than ½ inch heels (open toe or heel shoes are prohibited).

6.10 These requirements should be followed for excavations:

- Excavations to either side of tracks must be at least **twenty feet** from the centerline of track.
- Excavation under, between or within the track structure or the removal of ballast is prohibited unless approved by Metro.
- Under-track cable installations must be directionally bored using the following procedures.
- A minimum depth of 8 feet below top of ties shall be maintained at all times or 8 feet below flow line of ditch, whichever is greater, must be maintained to top of conduit(s).
- Conduit schedule Fiberglass Reinforced Epoxy (FRE) or equivalent is required.
- Excavations within 5 feet of either side of buried MetroLink signal, power, and communication cables must be performed by hand digging and with MOW personnel present at the dig site.
- When cable work is being performed parallel to MetroLink right-of-way, cables shall be laid at the same depth as MetroLink cables. The location of the cables shall be between MetroLink cables and the property line, **not** towards the track.
- If cable locates are required the Missouri One Call System, Inc. locate procedure for Missouri and Julie, Inc. procedures for Illinois must be followed.

Note: *Any deviation from these requirements will only be allowed with written consent from Metro.*

6.11 Over-track crossings will be considered on a case-by-case basis. All over-track crossings must comply with both National Electric Safety Code (NESC) clearances and any MetroLink requirements imposed.

6.12 Contractor shall only enter MetroLink Right-of-Way with an approved Work Permit, unless otherwise approved by MetroLink Operations.

6.13 Work performed by a Contractor on MetroLink Right-of-Way within 20 feet of the centerline of a main line or yard track will require a Temporary Restriction to be issued on the Daily Operating Clearance.

6.14 If the Contractor is performing work outside of 20 feet of the center line of any main line or yard, and it is possible for equipment e.g. boom, or hoisted equipment etc, to foul the operating ROW or has potential of making contact with the catenary, a temporary restriction will be required.

6.15 The temporary restriction will require a dedicated flag person to provide flag protection for the work crew(s). Speed Restriction Signs will need to be posted to identify the work zone to approaching trains. Refer to SOP 103.04 for more information on flagging requirements.

6.16 In the event that the Contractor disturbs, or modifies Metro's property in any manner, the Contractor must restore the property to the same condition it was in before the Contractor performed work. Such restoration must be to the satisfaction of the Superintendent of Operations and the Superintendent of Rail ROW Maintenance. Contractor will be billed for all work required to restore property to original condition.

6.17 Contractor must comply with all applicable federal, state, and local laws, regulations, and standards affecting their work.

6.18 As a limitation to any rights or licenses that may be granted to the Contractor, Metro reserves the right to use and maintain its entire property. This includes Metro's right to construct, maintain, repair, renew, use, operate, change, modify, or relocate railroad tracks, roadways, station platforms, signal, communication, fiber optics, power, or other wire lines, pipelines and other facilities upon, along or across any or all parts of its property. All or any of the above mentioned use and maintenance may be done at any time or times by Metro without liability to the Contractor or to any other party for compensation or damages.

6.19 The Contractor is required to comply with Metro's Exhibit D "Insurance Specifications for MetroLink Contractors"

6.20 Metro reserves the right to fully investigate all Contractor accidents, injuries, near misses, or vehicle damage and the Contractor and its employees agree to comply and assist Metro in all aspects of these investigations. This includes, but is not limited to, drug and alcohol testing, employee interviews, written reports, and requests for documentation.

Contractor employees who work on the MetroLink ROW will be required to comply with the Metro Drug and Alcohol Policy

7.0 CONTRACTORS PROCEDURE TO ACCESS METROLINK R.O.W.

7.1 Contractor will request a Right-of-Way Work Permit packet of information from:

Control Center Manager
MetroLink Operations
700 South Ewing
St. Louis, MO 63103
314-982-1400 X2851
rowworkpermits@metrostlouis.org
Fax 314-335-3429

7.2 MetroLink Operations will distribute SOP 101.17 with Exhibits A, B, and D to the Contractor. Contractor may request Exhibits C, F, and G. Exhibit E is for Metro employee use only.

7.3 Contractor then submits their Permit Application Fee and MetroLink Contractor Right-of-Way Temporary Work Permit (Exhibit A). All other required documents should be submitted a minimum of 14 days prior to their proposed start date. This may include a detailed work plan and project drawings, indemnification agreement and required insurance coverage as described in the Description of Insurance Specifications (Exhibit D).

7.4 MetroLink Operations distributes Permit and detailed work plan if required, to Real Estate, Risk Management and Safety Departments for approval and facilitates a pre-project planning meeting with Contractor(s).

7.5 MetroLink Operations contacts Contractor with approval, permit number and necessary requirements for Tier 1-3 safety training. Permit numbers are assigned by MetroLink Operations as described in SOP 101.23.

7.6 Contractor completes required safety training:

- Tier 1 Training: Persons working on or next to the MetroLink Right-of-Way.
- Tier 2 Training: Flagging and Radio Use.
- Tier 3 Training: Track Car Operation and Operating Rules

Notes:

1. Contractors are required to be trained at a minimum of Tier 1 to enter ROW. All work performed by the Contractor on the operating ROW must be protected by a qualified flagperson. An unqualified Contractor may be authorized to enter the alignment by Operations if escorted by a Metro Lookout.

2. Operators of track cars or on-track equipment on the MetroLink light rail system must be qualified to Tier 3, unless they are to be piloted by a qualified Metro Pilot (in this case, the Operator will be Tier 1 qualified at a minimum). A Metro Tier 3 qualified Pilot is required to direct the operation of Contractor's track cars and on-track equipment, unless otherwise approved by Metro.

3. Flaggers must be Metro Safety trained to a minimum of Tier 2. Work within the Metrolink Operating ROW (within 20ft of the centerline of an in service track) will require a restriction and flag protection per Metrolink SOP 101.17. ***Contractor will be responsible for providing Tier 2 qualified flaggers.***

4. Work within 10 feet of the overhead lines (catenary) or that otherwise could come in contact with the overhead lines requires de-energization of the lines. Exceptions must be approved by Metro. Refer to paragraph 8.0 below for Allowed Work Windows.

7.7 Contractor track cars must be piloted by a Metro Pilot qualified to Tier 3 of safety training. The pilot will communicate with OCC and control the movement of track cars or group of track cars assigned to a single work crew. The Metro Pilot will be responsible for the safe movement of the on track equipment or track cars. The Metro Pilot requirement may be waived by Metro if it is determined that the operator has sufficient training and experience on the MetroLink alignment to safely operate track cars and on-track equipment, and the Operator is Tier 3 qualified.

7.8 Contractor submits Right-of-Way Temporary Work Permit (Exhibit A) with permit number no later than **Wednesday 12 Noon,** prior to the week the work will be accomplished. Permit must be resubmitted every week during the length of the proposed project.

Note: *If there is a Metro recognized holiday on Thursday, the work permits are due on Tuesday 12 Noon.*

Note: *If the project proposal changes significantly, a new MetroLink Right-of-Way Temporary Work Permit (Exhibit A) must be submitted. A new Permit Number will be assigned after the Permit is approved.*

7.9 Contractor or a Metro Designee is required to attend weekly Track Allocation meetings held at the Metrolink Ewing Facility (Room MO9) on Thursdays at 8:30 am with MetroLink Operations and Maintenance of Way to respond to questions regarding proposed work. The Contractor's Metro Designee may represent the Contractor at this meeting if previously arranged. Metro SOP 101.23 describes the track allocation process.

All work requests are subject to Metro Approval

Note: *Scheduling of work activities is subject to availability of Maintenance of Way, Operations and Safety personnel, as well as the effect it will have on customer service based on the impact the proposed work has on service quality and train schedules.*

7.10 Metro Project Manager or MetroLink Operations will provide the Contractor with a copy of their approved temporary permit (Exhibit A), which must be available on the project site at all times during work activities to confirm permission to occupy MetroLink Right-of-Way.

7.11 Contractor must contact OCC and request permission prior to accessing the ROW. OCC has authority over all activity along the ROW at all times.

7.12 Once work is complete, and the work area is cleared of materials, equipment, tools, and personnel, the Contractor must contact OCC to confirm that they are clear of the ROW.

7.13 Metro provides Contractor an invoice for appropriate fees upon completion of the work or on a monthly basis as necessary.

7.14 Contractor submits payments to the Metro Accounts Receivable.

8.0 Allowed Work Windows

8.1 Work under a Restriction (Work performed within 20 feet of the track, but not requiring de-energization of overhead wire, without risk of falling debris onto track way)

- Work under a restriction is allowed from 7:30AM to 3:30PM. Other times may be approved by Metro
- Headway: Peak 6 minutes (M-F 5AM-10AM and 2PM-8PM)/ Off-Peak 10 minutes on each track.
- Work over Metro with potential of falling debris or other construction runoff will need to be performed after revenue service when trains are not operating. Additionally, it may be necessary to put track or overhead wire protection in place, to eliminate risk of damage or fouling by debris.

8.2 Work with Both Tracks Out of Service Nightly (After Revenue Service)

- Work with both tracks out of service is allowed nightly after revenue service 1:45AM-4:15AM nightly.
- If work is within 10 feet of the overhead power line or that has the potential to come in contact with the line, a power down of the overhead lines will be required. Allow twenty

(20) minutes each for a power down and a power up. Power UP/Power Down fee is $500 (for each power down/quantity as required).

- If there is potential of falling debris or runoff, it will be necessary to put track or overhead wire protection in place, to eliminate risk of damage or fouling by debris.

8.3 Work with One Track Out of Service (Single Track)

- With two (2) weeks' notice, Metro may remove one track from service and operate a single track beginning at 8:00pm nightly on non-special event night.
- With two (2) weeks' notice, Metro may remove one track from service and operate on a single track all day Saturday and Sunday on non-special event days.
- Limits of single track will be Ewing Yard Interlocking (MP12.8) to Tucker Interlocking (MP14.3)
- Operations of this single track requires MetroLink to operate a special schedule that ends Blue Line service at Forest Park-DeBaliviere Station. Delays of 10 minutes are expected during this operation.
- Operations of single track will need to be coordinated with other Metro maintenance and construction work. Operations is only able to support one single track daily.
- Special events include, but are not limited to: Cardinal Games, Mardi Gras, Race for the Cure, and Fair of St. Louis.
- Allow twenty (20) minutes each for a power down and power up.
- If there is potential of falling debris or runoff, it will be necessary to put track or overhead wire protection in place to eliminate risk of damage or fouling by debris.
- Allow one (1) hour at end of the outage for Metro test train, if required.

R-U. Coordination with Metro Transit

1.0 Description. The contractor shall be required to coordinate with Metro Transit where construction operations will involve work on or around existing transit stops. It is requested that the coordination begin prior to the project Preconstruction Conference to ensure minimal disruption in service on Metro's system.

2.0 Construction Requirements. All Metro Transit stops within the project limits shall remain open and operational throughout the duration of the project. In locations where the contractor's operations will involve work in proximity to a transit stop location, the contractor shall notify Metro Transit through the contacts listed below, not later than 72 hours prior to beginning work at that location. The contractor shall also take care to minimize exposure of transit users to construction hazards in proximity to all transit stops that are in service during work operations.

2.1 Project Contacts. The contractor shall notify the following contacts at Metro Transit coordinate scheduling throughout the project with them or their designated representative(s).

Ms. Natalie Siebert, Senior Planner Transit Operations
Office: (314) 982-1400 x1816
Cell: (314) 497-4916
Email: nmsiebert@MetroStLouis.org

Mr. Lance Peterson, Director of Service Planning
Office: (314) 982-1520
Cell: (314) 220-6756

Email: llpeterson@MetroStLouis.org

3.0 Temporary Facilities. In locations where the contractor's operations may affect a transit stop location, a temporary stop may be required. Signage of the temporary stop shall be in accordance with Specification Section 104.10.2, and placement shall be coordinated with Metro Transit. All temporary transit stops shall be located in proximity to the existing stop it is representing, accessible, clear and conspicuous to both the transit rider and facility operator, and be located where it is safe from hazards within the work area.

4.0 Permanent Facilities.

4.1 Bus Stops. Locations for proposed bus stops are identified in the contract plans. The contractor shall furnish a flush-mount anchor that is to be drilled into the concrete pad per manufacturer's recommendations. Metro Transit will install the new bus stop sign and post.

4.2 Bus Shelters. Locations for proposed bus shelters are identified in the contract plans. The contractor shall construct the concrete pad for the shelters. Shelters will be furnished and installed by Metro upon completion of the pads.

5.0 Basis of Payment. No direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

R-V. Pedestrian Underpass Construction Requirements (Roadway) – Job J6S1718B Only

1.0 Description. Work is to be performed in the location of the pedestrian underpass and adjoining segment of Rogers Parkway as depicted in the contract plans and in accordance with these special provisions.

2.0 Construction Requirements.

2.1 Compacting in Cut. The 12-inch over-excavation necessary for placement of the Rogers Parkway Trail shall be paid for as Compacting in Cut. All materials and work performed for this item shall be in accordance with Sec 203.5.8. Measurement for Compacting in Cut will be made in accordance with Sec 203.8.

2.1.1 Basis of Payment. Payment for the accepted quantity for compacting in cut will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
203-70.75	Station	Compacting in Cut

2.2 Soft Soil Remediation. Based on the geotechnical data, soft soils may be present in the area of the pedestrian underpass above an elevation of 433 feet. The contractor shall completely excavate soft soils within the limits depicted in the contract plans. The remediation shall extend to the bottom of the soft soils or to the depth required to satisfy global stability requirements as shown on the plans, whichever is greater. The contractor shall retain the services of a geotechnical engineer to verify soft soil has been removed. This excavated material shall be replaced with compacted Type 5 Aggregate Base material placed in no more that 6-inch thick lifts. The Type 5 Aggregate Base material shall be reinforced with Tensar BX 1200 or similar geogrid

approved by the engineer at 2-foot vertical spacings, with the first layer placed at the bottom of the over-excavation. Geogrid shall be installed and overlapped in accordance with the manufacturer's recommendations.

2.2.1 Excavation shall be in accordance with Sec 203, and placement of the aggregate base material shall be in accordance with Sec 304. Geogrid material shall be non-metallic type in accordance with Sec 1052.20.

2.2.2 Method of Measurement. Final measurement for soft soil remediation will be made to the nearest cubic yard.

2.2.3 Basis of Payment. Payment for the accepted quantity for soft soil remediation will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
203-99.07	CUYD	Soft Soil Remediation

2.3 Class 3 Excavation. Where proposed drainage structures are to be constructed within zones of other excavation types (e.g. Class A or excavation for modular block wall structures) and the bottom of structure elevation falls above the final elevation of excavation, no measurement or payment will be made for Class 3 Excavation. In these locations, appropriate fill material shall be placed up to the lower elevation of the bedding material required for placement of the drainage structure, and the Embankment Installation method depicted in Standard Plan 726.30. All materials and work performed for this item shall be in accordance with Sec 206.

2.3.1 Basis of Payment. Payment for Class 3 Excavation, in the locations accepted for payment, will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
206-30.00	CUYD	Class 3 Excavation

3.0 Basis of Payment. With the exception of the pay items listed above, no direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

R-W. Rogers Parkway Pavement – Job J6S1718B Only

1.0 Description. Concrete headers shall be provided along the perimeter of the Rogers Parkway Trail as shown in the contract plans. These headers shall be 12 inches wide at the surface and shall be constructed to the depth and dimensions as depicted in the contract plans.

2.0 Construction Requirements.

2.1 Type 5 Aggregate for Base (5 In. Thick). A 5-inch thick layer of Type 5 Aggregate Base shall be placed underneath the Rogers Parkway trail pavement as depicted in the contract plans. All materials and work performed for this item shall be in accordance with Sec 304.

2.1.1 Method of Measurement. Final measurement for the aggregate base will be made in accordance with Sec 304.5.

2.1.2 Basis of Payment. Payment for 5-Inch thick Type 5 Aggregate Base, in the locations accepted for payment, will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
304-99.05	SQYD	Type 5 Aggregate for Base (5 In. Thick)

2.3 12-Inch Concrete Header. Concrete headers shall be provided along the perimeter of the Rogers Parkway Trail. These headers shall be 12 inches wide at the surface and shall be constructed to the depth and dimensions as depicted in the contract plans.

2.3.1 All materials and work performed for this item shall be in accordance with Sec 502 and Great Rivers Greenway Trail Surfacing Standards. Concrete material shall be Class B with air entrainment.

2.3.2 Method of Measurement. Measurement will be made in accordance with Sec 502. All base rock and sub-base material below the concrete header shall be quantified and paid for as separate pay items associated with those items.

2.3.3 Basis of Payment. Payment for the accepted quantity for concrete headers will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
502-99.03	Linear Foot	12-Inch Concrete Header

3.0 Basis of Payment. With the exception of the pay items listed above, no direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

R-X. Permeable Interlocking Concrete Pavement – Job J6S1718B Only

1.0 Description. The pedestrian connection between Rogers Parkway/South Mary Avenue and Manchester Road shall consist of permeable interlocking concrete pavement (PICP) as depicted in the contract plans.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Metropolitan St. Louis Sewer District Standard Specifications for Sewers and Drainage Facilities (current edition).

2.1 Additional information on PICP may be found on MSD's website at the following location: https://msdprojectclear.org/what-we-do/stormwater-management/bmp-toolbox/stormwater-quality/permeable-pavement/permeable-interlocking-concrete-pavement/

3.0 Method of Measurement. Final measurement for the permeable interlocking concrete pavement will be made in accordance with Sec 608. No direct payment will be made for the PICP informational signs, posts, or mounting hardware that are to be furnished and installed in conjunction with the PICP installation.

4.0 Basis of Payment. Payment permeable interlocking concrete pavement, in the locations accepted for payment, will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
304-99.05	SQYD	ASTM No. 2 Aggregate, 12 In. Thick
304-99.05	SQYD	ASTM No. 57 Aggregate, 4 In. Thick
304-99.05	SQYD	ASTM No. 8 Bedding Course, 2 In. Thick
605-99.02	Each	Observation Well
605-99.03	LF	Perforated Underdrain Pipe, 4 In. Rigid, Schedule 40 PVC
605-99.03	LF	4 In. Rigid Pipe, Schedule 40 PVC
608-99.05	SQYD	Permeable Interlocking Concrete Pavement (3-1/8" Thick)
624-99.05	SQYD	MSD Type 4 Filter Fabric

R-Y. Pedestrian Underpass Storm Sewer Pipe and Structures – Job J6S1718B Only

1.0 Description. The contractor shall furnish and install storm sewer pipes and structures at all locations depicted in the contract plans.

2.0 Construction Requirements. The material furnished and installed by the contractor shall be in accordance with Sec 726 and Sec 731, and all applicable Metropolitan St. Louis Sewer District Standard Specifications for Sewers and Drainage Facilities (current edition), where required.

3.0 Pipe Culverts. Pipe culvert materials are identified in the contract plans. Exceptions for substitution of pipe culvert materials other than those identified shall not be permitted without approval of the engineer. Should the contractor propose a material type change for the pipe, the contractor shall be responsible for furnishing drainage calculations that have been approved, Signed and Sealed by a Professional Engineer who is licensed in the State of Missouri.

3.1 Method of Measurement. Measurement for the storm sewer pipe culverts will be made in accordance with Sec 724.4.

3.2 Basis of Payment. The storm sewer pipe culverts shall be paid for at the contract unit price for the items listed below and shall include all necessary equipment, materials, pipe collars, concrete headwalls, concrete toe walls and labor necessary for compliance with these provisions.

Item No.	Unit	Description
725-99.03	Linear Foot	6 In. Pipe Group B
726-99.03	Linear Foot	12 In. Class V Reinforced Concrete Pipe Culvert
726-99.03	Linear Foot	15 In. Class V Reinforced Concrete Pipe Culvert
726-99.03	Linear Foot	18 In. Class V Reinforced Concrete Pipe Culvert
726-99.03	Linear Foot	24 In. Class V Reinforced Concrete Pipe Culvert
726-99.03	Linear Foot	42 In. Class V Reinforced Concrete Pipe Culvert
726-99.03	Linear Foot	48 In. Class V Reinforced Concrete Pipe Culvert

4.0 Storm Sewer Drainage Structures. Storm sewer drainage structures, types, and locations are identified in the contract plans. Structures shall be in accordance with applicable Metropolitan St. Louis Sewer District Standard Specifications for Sewers and Drainage Facilities (current edition).

4.1 Method of Measurement. Measurement for the storm sewer drainage structures will be made in accordance with Sec 731.4.

4.2 Basis of Payment. The storm sewer drainage structures shall be paid for at the contract unit price for the items listed below and shall include all necessary equipment, materials, pipe collars, concrete headwalls, concrete toe walls and labor necessary for compliance with these provisions.

Item No.	Unit	Description
731-99.02	Each	72 In. Manhole with 42 In. Reducer
731-99.02	Each	96 In. Manhole with 42 In. Reducer
731-99.02	Each	Cast Iron Manhole Frame and Cover
731-99.02	Each	Precast Concrete 4-Way Area Inlet Top & Stone
731-99.02	Each	12 In. Drain Basin with Pedestrian Grate
731-99.02	Each	42 In. Area Inlet
731-99.02	Each	42 In. Grate Inlet with Side Intake
731-99.02	Each	42 In. Curb Inlet
731-99.02	Each	Double Curb Inlet

5.0 Basis of Payment. With the exception of the pay items listed above, no direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

R-Z. Pedestrian Underpass Sanitary Sewer Pipe and Structures – Job J6S1718B Only

1.0 Description. The contractor shall furnish and install sanitary sewer pipes and structures at all locations depicted in the contract plans.

2.0 Construction Requirements. The material furnished and installed by the contractor shall be in accordance with Sec 726 and Sec 731, and the Metropolitan St. Louis Sewer District Standard Specifications for Sewers and Drainage Facilities (current edition) where required.

2.1 Sanitary sewer pipe and drainage structure materials are identified in the contract plans. Exceptions for substitution of pipe and drainage structure materials other than those identified shall not be permitted without approval of the engineer. Should the contractor propose a material type change for these items, the contractor shall be responsible for furnishing drainage calculations that have been approved, Signed and Sealed by a Professional Engineer who is licensed in the State of Missouri.

2.2 Manhole frames and covers shall be lock type, sealing, watertight frames and covers, and shall be included in the cost of the manhole assembly.

3.0 Method of Measurement. Measurement for the sanitary sewer pipe and structures will be made in accordance with Sec 724.4 and Sec 731.4.

4.0 Basis of Payment. The sanitary sewer pipe and structures shall be paid for at the contract unit price for the items listed below and shall include all necessary equipment, materials, pipe

collars, concrete headwalls, concrete toe walls and labor necessary for compliance with these provisions.

Item No.	Unit	Description
502-99.07	CUYD	Class B Concrete (Concrete Encasement)
725-99.03	Linear Foot	8 In. C-900 Pipe
725-99.03	Linear Foot	10 In. C-900 Pipe
731-99.02	Each	48 In. Manhole with External Foulwater Drop

4.1 With the exception of the pay items listed above, no direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

R-AA. Hydrodynamic Separator – Job J6S1718B Only

1.0 Description. The hydrodynamic Separator shall consist of all work and materials required to furnish and install a hydrodynamic separator for treating stormwater.

2.0 Materials. The contractor shall furnish a hydrodynamic separating system that will meet or exceed the hydraulic and performance parameters set forth in the contract plans. The system shall be an off-line configuration and shall be a system approved by the Metropolitan St. Louis Sewer District (MSD).

2.1 The contractor shall submit shop drawings of the proposed hydrodynamic separator system, prepared and sealed by a professional engineer registered in Missouri, to MSD for approval prior to ordering or receiving the system components. The system shall include all materials required to install the hydrodynamic separating system, as shown in the contract plans.

3.0 Construction Requirements. The system shall be constructed and installed per the manufacturers recommendations. Connections to any existing infrastructure shall be in accordance with Sec 605.40.

4.0 Technical Assistance. The contractor shall obtain the services of a technical representative from the manufacturer to advise the engineer, if necessary. This advisor shall be a qualified representative, acceptable to the engineer. It will not be necessary for this representative to be present during the construction of the hydrodynamic separator, unless specifically requested by the engineer.

5.0 Method of Measurement. Measurement will be made per each.

6.0 Basis of Payment. The hydrodynamic separator shall be paid for at the contract unit price for the item listed below, and such payment shall include all construction, excavation, equipment, and materials necessary for the complete installation of the hydrodynamic separator system. Unless otherwise noted, no direct payment will be made for incidental items necessary to complete the work, including but not limited to, manholes, frame and covers, inlet and outlet pipes, excavation, subbase preparation, bedding, backfill, tools, or labor. The contract unit price and payment will be full compensation for providing a technical advisor as needed. Costs for any modifications to any existing infrastructure for the implementation of the proposed hydrodynamic separator system shall be borne by the contractor and considered incidental to the hydrodynamic separator system proposed.

Item No.	Unit	Description
731-99.02	Each	Hydrodynamic Separator, 48 in. Diameter

R-BB. Saw Cutting for Removal of Improvements

1.0 Description. Saw cutting will be necessary for removal of improvements in certain locations as depicted in the contract plans. A number of the locations and estimated saw cut lengths have been identified and quantified in the table for Removal of Improvements that has been included in the Schedule of Quantities. The list included within the Schedule of Quantities may not be all inclusive and the contractor's means and methods may require an alternate removal method be employed.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Sec 202.

2.1 Exception for Full Depth Pavement Repair Saw Cutting. This JSP does not apply to the perimeter and internal saw cutting required for full depth pavement repairs, which shall be governed by the requirements of Sec 613.

3.0 Method of Measurement. With the exception of full depth pavement repairs, no measurement shall be made for saw cutting.

4.0 Basis of Payment. With the exception of full depth pavement repairs, all saw cutting shall be considered incidental to and completely covered by the contract unit price for Item No. 202-20.10, "Removal of Improvements", per lump sum. No direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

R-CC. Demolition and Removal of Buildings – Job J6S1718B Only

1.0 Description. Three buildings within the City limits of Brentwood, MO shall be demolished, as indicated on the plans. All work shall be performed in accordance with Section 202, except as noted below.

1.1 Possession of Buildings. The Commission has possession of the buildings for Parcel 70 (8614 Manchester Rd), Parcel 71 (2702 Mary Ave.), and Parcel 81 (8615 Manchester Rd) as indicated on the plans.

1.2 The contractor's attention is directed to the fact that an asbestos survey was not completed for each parcel. The buildings will be surveyed, and if Asbestos Containing Materials (ACM) are identified, the contractor shall be required to remove them in accordance with Sec 202.40.

2.0 Early Notice To Proceed. The Commission will issue an early notice to proceed for the demolition work. The Commission reserves the right to designate the order of demolition work. The contractor shall not begin demolition on any building until the designated date in the notice to remove document. The contractor is further advised that removal of hazardous substances from the buildings may delay the issuance of the notice to remove and that the contractor is not to enter any properties nor conduct any demolition of any building until the hazardous material is removed.

2.1 The Commission does not warrant that the listings or depictions of hazardous materials in the bidding documents are complete or accurately reflect either all hazardous materials or their precise locations within or adjacent to the project limits.

3.0 Demolition Permit from City of Brentwood, MO.

3.1 No building shall be demolished unless Lisa Koerkenmeier, Director of Planning and Development for the City of Brentwood, MO, has issued a demolition permit. Application shall be made for a demolition permit before work is started. The Director of Planning and Development shall issue the permit only upon a finding that the work will conform to all of the applicable ordinances of the City.

3.2 The City has determined there shall be no demolition permit fee since it is a City project.

3.3 Upon issuance of a demolition permit by the City, the applicant shall provide the following items to the Department of Planning and Development at least seven (7) business days prior to the anticipated date of demolition of all principal structures:

3.3.1 Letters, in sufficient quantity as required by the Director of Planning and Development, typed on the demolition contractor's letterhead detailing the probable dates of demolition as stated on a weekly basis, i.e., demolition of this house will occur the week of January twelfth (12th) through sixteenth (16th).

3.3.2 Envelopes, in sufficient quantity as required by the Director of Planning and Development, containing the demolition contractor's return address, the address of the property owner receiving the demolition notice and sufficient postage to mail the demolition notice.

3.3.3 The Director of Planning and Development shall provide the demolition contractor a list of all properties within three hundred (300) feet of the principal structure to be demolished so that the demolition contractor can provide the items required.

4.0 Construction Requirements. Demolition of the buildings designated on the plans shall include complete removal and disposal of the existing building and foundation, landscaping, trees, curbs, parking stops, guardrail, drainage structures, inlets and pipes, and all existing pavement.

4.1 All utility service connections to these buildings, including but not limited to, drainage pipes, gas, water, sewer, telephone, cable and electric, shall be completely removed.

4.2 Parcel 70. Once demolition is complete, clean dirt fill capable of growing vegetation shall be placed throughout the property limits. The finished grade shall have a continuous, gentle slope that directs storm water away from adjacent occupied properties. Large areas of ponding that allow mosquitos to flourish are not allowed. The property shall be cleaned up and restored with seeding and mulching and to a condition that is both acceptable to the engineer and to the City of Brentwood.

4.3 Parcel 71. It is anticipated that MSD will begin construction improvements on this parcel for the CSO Mary Ave Project as soon as demolition is complete. The contractor shall coordinate with Craig Schluter at 314-713-6205 once demolition is substantially complete on this parcel. The contractor shall demobilize all equipment and any stored materials from the parcel once demolition activities cease.

4.4 Parcel 81. Once demolition is complete, clean dirt fill capable of growing vegetation shall be placed on the property limits. The finished grade shall have a continuous, gentle slope that directs storm water away from adjacent occupied properties. Large areas of ponding that allow mosquitos to flourish are not allowed. The property shall be cleaned up and restored with seeding and mulching and left in a condition that is both acceptable to the engineer and to the City of Brentwood.

5.0 Demolition Completion Date. All buildings shall be completely demolished and removed, and site restoration completed, no later than December 31, 2021.

6.0 Basis of Payment. Payment for compliance with this specification will be made in accordance with the contract unit bid price for the item 202-99.50 Demolition and Removal of Buildings and includes all labor, equipment, materials, and time required to comply with this provision.

R-DD. Optional Pavements JSP-06-06G

1.0 Description. This work shall consist of a pavement composed of either Portland cement concrete or asphaltic concrete constructed on a prepared subgrade. This work shall be performed in accordance with the standard specifications and as shown on the plans or established by the engineer.

2.0 The quantities shown reflect the total square yards of pavement surface designated for each pavement type as computed and shown on the plans.

2.1 No additional payment will be made for asphaltic concrete mix quantities to construct the required 1:1 slope along the edge of the pavement, or for tack applied between lifts of asphalt.

2.2 No additional payment will be made for aggregate base quantities outside the limits of the final surface area as computed and shown on the plans. When A2 shoulders are specified, payment for aggregate base will be as shown on the plans.

2.3 The grading shown on the plans was designed for the thicker pavement option. For projects with grading in the contract, there will be no adjustment of the earthwork quantities due to adjusting the roadway subgrade for optional pavements.

2.4 The contractor shall comply with Sections 401 through 403 for the asphalt option and Sections 501 and 502 for the concrete option.

2.5 Pavement options composed of Portland cement concrete shall have contrast pavement marking for intermittent markings (skips), dotted lines, and solid intersection lane lines. The pavement markings shall be in accordance with Section 620. No additional payment will be made for the contrast pavement markings.

3.0 Method of Measurement. The quantities of concrete pavement will be measured in accordance with Section 502.14. The quantities of asphaltic concrete pavement will be measured in accordance with Section 403.22.

4.0 Basis of Payment. The accepted quantity of the chosen option will be paid for by the contract unit bid price for Item 401-99.05, pavement, per square yard.

R-EE. Relocating Water Service Leads

1.0 Description. Where indicated on the plans or directed by the Engineer, existing water service leads, including privately-owned water valves, meters, and service leads which are connected to water mains, shall be adjusted to clear the proposed new improvement.

2.0 Construction Requirements. All adjustments shall be made in accordance with the prevailing plumbing code, rules, and regulations governing such work as prescribed by the Utility Company, County, or Municipality having jurisdiction over plumbing work.

2.1 All adjustments requiring the crossing of the state route shall be performed by boring or an other suitable method. No cutting of the pavement shall be allowed.

2.2 The adjustments are classified into ten (10) classes as follows:

Class 1 - The contractor shall adjust the existing water valves to the new grade.
Class 2 - The contractor shall relocate the existing water valve to near the right of way line.
Class 3 - The contractor shall adjust the existing water meter to the new grade.
Class 3A - The contractor shall adjust the existing water meter vault to the new grade.
Class 4 - The contractor shall relocate the existing water meter to privately owned property.
Class 5 - The contractor shall adjust the existing water service line to avoid interference with the storm sewer pipes.
Class 6 - The contractor shall adjust the existing water service line to avoid interference with grading operations.
Class 7 - The contractor shall reconnect the existing water service line to the relocated water main.
Class 8 - The contractor shall extend the existing service line to the relocated water main.
Class 9 - The contractor shall provide and install a new water valve and valve box near the right of way line.
Class 10 - The contractor shall adjust existing water service line to avoid future grading/storm sewer interference.

2.3 The service leads will be further broken down into four (4) categories: under 25mm dia. (1 in. dia.); 25mm dia. to less than 50mm dia. (1 in. dia. to less than 2 in. dia.); 50mm dia. to less than 75mm dia. (2 in. dia. to less than 3 in. dia.); and 75mm dia. (3 in. dia.) and above.

The Contractor's attention is directed to the fact that the adjustments of some of the water service leads on this project may be carried out by the respective owner(s), and that it may be necessary to underrun this item.

2.4 No additional payment shall be allowed for any claim for damages by the Contractor due to the necessity for underrunning the Items of Relocating Service Connections.

3.0 Method of Measurement.

4.0 Basis of Payment. Payment for adjusting water service leads will be made at the contract unit bid price each, which price shall constitute full payment for all necessary excavation,

backfilling, boring, furnishing all materials, including all necessary pipe and pipe fittings and all equipment, tools, labor, and work incidental thereto.

Item No.	Unit	Description
603-99.02	Each	Relocating Service Connections (Class 5) (3 In. or Less)

R-FF. 72-Inch Temporary Chain Link Fence

1.0 Description. The contractor shall provide temporary 72-inch chain link fence during construction at select parcels as denoted in the contract plans.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Sec 607. All temporary fencing shall be placed within the limits of the existing Right of Way or any Permanent or Temporary Construction Easements obtained for the project.

3.0 Locations.

3.1 Parcel 90 – St. Mary Magdalen Church and School. Temporary 6'-tall fencing shall be provided at the parking and school yard enclosure at this parcel during all periods of active construction operations. The temporary fencing shall not be driven into the parking lot surfacing, but shall instead be placed on skids. The skids shall be anchored such that they are resistant to movement. Temporary fencing panels shall have a bottom bar. There shall be a gap of no greater than 2 inches below the bottom bar and the ground, and a gap of no greater that 2 inches between panels.

3.1.1 Drive gates. Existing fence drive gates located on this parcel along Manchester Road shall be used in place as part of this project. The gates shall be able to be latched and secured by means of a dual lock system. The contractor shall furnish two separately keyed lock and key sets. One lock and key set being for the contractor and the second lock and key set shall be provided to the owner / manager of the church and school property. The gates shall be kept locked except when needed for property owner access or by the contractor with prior approval from the property owner. All hardware and locks shall be considered incidental to the cost of the gate and no direct payment will be made.

3.1.2 Removal of Temporary Fence. Upon completion of the work on Parcel 90, the contractor will provide the property owner with a 90-day notice letter stating that owner can now install new fence at owner's expense. The Contractor will return 90 days after date on the letter to remove the temporary fence.

3.2 Parcel 256 – St. Agnes Home. Temporary fencing shall be provided along the frontage of the St. Agnes Home during all periods of active construction operations. Fence posts shall be driven into the ground. The temporary fence shall be tied into the existing fence at the ends of all fencing runs, and there shall be a gap of no greater than 2 inches at any tie-in location.

4.0 Method of Measurement. Measurement will be made in accordance with Sec 607. The temporary 72-inch chain link fence shall be paid for only one time per parcel and no payment will be made for any relocation of the fencing within the parcel.

5.0 Basis of Payment. Payment for the accepted quantity for temporary 72-inch chain link fencing and gates will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
607-99.02	Each	Temporary Drive Gate
607-99.03	Linear Foot	72-Inch Temporary Chain Link Fence

R-GG. 7-Inch Concrete Curb Ramps

1.0 Description. ADA curb ramps shall be installed at the locations depicted in the contract plans.

2.0 Construction Requirements. Proposed curb ramp types have been identified in the plans for the contractor's information for estimating purposes. The contractor may be permitted to deviate from the curb ramp type shown at a given location, provided that the contractor-proposed change has been approved by the engineer, stays within the constraints of all Right of Way and easements, and the final product is compliant with current ADA standards. No additional payment will be made for any design work or additional labor, equipment, materials, and time associated with a contractor-proposed modification to the ADA curb ramps.

2.1 Thickness. The thickness of the concrete placed for the ADA curb ramps shall be no less than 7 inches.

2.2 All work performed for this item shall be in accordance with Sec 304, 608, and 609. All concrete curb ramps shall include 4 inches of Type 5 Aggregate Base underneath and any necessary integral curbing required for construction of an ADA-compliant ramp.

3.0 Method of Measurement. Measurement will be made per each ADA-compliant curb ramp installed by the contractor and accepted by the engineer. Base rock and integral curbing required for construction of the curb camps shall be considered incidental to the construction of the curb ramps and no measurement will be made for these items.

4.0 Basis of Payment. Payment for the accepted quantity for the ADA curb ramps will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
608-99.02	Each	7" Concrete Curb Ramp

R-HH. 10-Foot-Wide Concrete Sidewalk and Curb Ramps – Job J6S1718B Only

1.0 Description. Sidewalk and ADA curb ramps placed on the J6S1718B project shall consist of a 10-foot wide concrete sidewalk that will be designated as a shared-use path. Additional construction requirements are necessary for installation of this sidewalk and ADA curb ramps as noted below.

2.0 Construction Requirements. Proposed curb ramp types have been identified in the plans for the contractor's information for estimating purposes. The contractor may be permitted to

deviate from the curb ramp type shown at a given location, provided that the contractor-proposed change has been approved by the engineer, stays within the constraints of all Right of Way and easements, and the final product is compliant with current ADA standards. No additional payment will be made for any design work or additional labor, equipment, materials, and time associated with a contractor-proposed modification to the ADA curb ramps.

2.1 Control Joints. Lateral joints are to be constructed in accordance with Sec 608. No additional longitudinal joint in the center of the sidewalk is required.

2.2 Thicknesses. The thickness of the concrete sidewalk shall be no less than 4 inches and the thickness of the curb ramps shall be no less than 7 inches of concrete.

2.3 All work performed for this item shall be in accordance with Sec 304, 608, and 609. All 10-foot-wide concrete curb ramps shall include 4 inches of Type 5 Aggregate Base underneath and any necessary integral curbing required for construction of an ADA-compliant ramp.

3.0 Method of Measurement. Measurement of concrete sidewalk will be made in accordance with Sec 608. For curb ramps, measurement will be made per each ADA-compliant curb ramp installed by the contractor and accepted by the engineer. Base rock and integral curbing required for construction of the curb camps shall be considered incidental to the construction of the curb ramps and no measurement will be made for these items.

4.0 Basis of Payment. Payment for the accepted quantity for the 10-foot wide sidewalk and ADA curb ramps will be made in accordance with the contract unit bid price for the items listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
608-99.02	Each	7” Concrete Curb Ramp (10 FT)
608-99.05	SQYD	4-In. Concrete Sidewalk (10 FT)

R-II. Thickened Sidewalk Slab Over Box Culvert – Job J6S1718B Only

1.0 Description. The 10-foot wide shared use path along the south side of Manchester Road is to fit within the footprint of the existing box culvert located at Route 100 Station 62+25. A thickened concrete sidewalk slab shall be constructed above this existing box culvert at the location depicted in the contract plans.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Sec 608.

2.1 Excavation. The existing material above the top slab of the existing box culvert, including, but not limited to, slope protection, sidewalk, aggregate base, and earthen material shall be removed to the elevation of the top of the existing box culvert slab. The contractor shall take care to not disturb or damage the existing box culvert. Any damage to the existing box culvert that is a result of the contractor’s operations shall be repaired at the contractor’s expense.

2.2 Backfill. Upon removal of the existing material, the contractor shall backfill any remaining voids between the outside walls of existing the box culvert with 1-inch clean rock up to the elevation of the top of the existing box culvert slab. Two layers of roofing felt shall be used as a

bond breaker between the top of the existing box culvert and the bottom of the thickened sidewalk slab. No direct payment will be made for backfill material or bond breaker.

2.3 Sidewalk and Curb Concrete. Concrete material shall be the same material as specified for the shared use path and is to be placed during the same concrete pour as adjacent sections of the shared use path. Placement shall also include the 6-inch integral curb for the shared use path.

2.3.1 A transverse ½-inch preformed fiber joint shall be placed between the thickened sidewalk slab and the normal-depth segments of sidewalk and shall be considered incidental. The thickened sidewalk slab is approximately 12 inches thick. Variations in this thickness may occur, but no payment adjustment shall be made if a variation in the depth is found.

2.5 Fencing. A segment of fence will be placed along the shared use path in the vicinity of the existing box culvert. This fence shall be constructed as a continuous run of fencing at the limits depicted in the contract plans, however the contractor shall lay out the fence post locations such that they do not fall within the limits of the thickened sidewalk slab. Payment for the fence shall be paid for with the fencing pay item included in the contract and will not be included in the payment for the thickened sidewalk slab.

3.0 Method of Measurement. No measurement will be made for this item.

4.0 Basis of Payment. Payment for the accepted quantity for the thickened sidewalk slab to be placed over the existing box culvert will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
608-99.01	Lump Sum	Thickened Sidewalk Slab Over Box Culvert

R-JJ. Modified Curb

1.0 Description. There are a number of locations on the project where grade differentials require concrete curbs or retaining walls. In locations where this height is between 8 inches and 12 inches, a Modified Curb shall be used.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Sec 609.

2.1 Curb. The Modified Curb shall be embedded into the ground a minimum of 18 inches below the lowest exposed elevation of the face of the Modified Curb and shall be 6 inches wide. Forming will not be required for any underground portion of the Modified Curb. The face of the Modified Curb shall be tapered from the 6-inch width at the lowest exposed elevation to 5 inches wide at the top as depicted in the contract plans.

2.2 Reinforcement. Tie bars shall be #4 epoxy coated steel bars placed at 30 inch spacing (on center) longitudinally along the length of the Modified Curb. The tie bars shall be “L” shaped (MoDOT Standard Bar Bill Shape 19). Lengths of the vertical and horizontal legs shall vary depending on curb height and will be determined by the contractor. The minimum cover around the bar shall be no less than 2 inches.

3.0 Method of Measurement. Measurement will be made in accordance with Sec 609.

4.0 Basis of Payment. Payment for the accepted quantity for the Modified Curb will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
609-99.03	Linear Foot	Modified Curb

R-KK. Slurry and Residue Produced During Surface Treatment of PCCP and Bridge Decks – J6S1718B Only

1.0 Description. This work covers the requirements for controlling residue or slurry produced by milling, grinding, planing, grooving or other methods of surface treatments on new or existing PCCP and bridge decks in addition to Section 622.

2.0 Construction Requirements. The following shall be considered the minimum requirements for performing this work within the project limits.

2.1 The contractor shall submit to the Engineer for approval in writing prior to the pre-construction meeting, the best management practices (BMP's) to be used to protect the environment, including the method of disposal of the residue whether on right of way or off-site.

2.2 When slurry is dispersed on the right of way, BMP's shall be installed to keep slurry or residue from entering paved ditches or structures discharging within the areas restricted by Section 622.303.8.6, from entering any waterways or from leaving the right of way.

2.3 Upon approval of the contractor's BMP and residue disposal plan and prior to the contractor beginning surface treatment operations, the Engineer will identify slurry or residue "no discharge zones".

2.4 Operations may be suspended by the Engineer during periods of rainfall or during freezing temperatures.

3.0 Basis of Payment. No direct payment for slurry or residue control requirements for BMP's will be made. Compliance with this specification along with the cost of all materials, labor and equipment necessary for the surface treatment work shall be included in and completely covered by the unit price bid for each of the items of work for surface treatment included in contract.

R-LL. Parking Blocks

1.0 Description. The contractor shall provide precast concrete parking blocks/wheel stops for the parking spaces adjacent to the right of way as indicated in the contract plans. Rubberized or plastic composite parking blocks will not be acceptable.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Sec 703 and 1036. Parking blocks shall be precast concrete with longitudinal reinforcement. The parking blocks must fit within the parking space and shall be a minimum of 6

feet in length, no shorter than 6 inches in height, and a minimum of 8 inches wide at the base. The sides shall be tapered such that the base of the parking block is wider than the top. Water relief slots are to be provided at the base of the block to allow for water to pass underneath.

Parking blocks should fit flush to the ground and be placed near the nose of the parking space, centered between the painted stripes, and oriented perpendicular to the width of the parking space. One parking block shall be provided for each identified parking space requiring a parking block. The parking blocks shall be secured to the parking surface by means of no less than two vertical pins or rebars that pass through the middle block, one located neat each end. The tops of these pins or rebars are to be flush with the top surface of the parking block once installed.

3.0 Method of Measurement. Measurement will be made per each installed parking block.

4.0 Basis of Payment. Payment for the accepted quantity for parking blocks will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
620-99.02	Each	Parking Block

R-MM. Precast Concrete Modular Block Wall – Job J6S1718B Only

1.0 Description. This work shall consist of furnishing and constructing precast concrete modular block walls with or without soil reinforcement in accordance with these specifications, as shown on the plans or as directed by the engineer.

2.0 Materials. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Concrete	501
Select Granular Backfill for Structural Systems	1010
Geotextile	1011
Miscellaneous Drainage Material	1013
Reinforcing Steel for Concrete	1036
Resin Anchor Systems	1039
Mechanically Stabilized Earth Wall System Components	1052

2.1 Concrete used in the production of the precast modular block units shall be first-purpose, fresh concrete. It shall not consist of returned, reconstituted, surplus or waste concrete.
2.2 The unit fill shall consist of a granular backfill in accordance with Gradation D or E of Sec 1005.

2.3 Class B or B-1 concrete shall be used for cast-in-place concrete leveling pads used for the wall system.

2.4 Reinforcement shall be either Grade 60 deformed bars or an equivalent steel welded wire reinforcement.

2.5 Joint material shall be used in accordance with the wall manufacturer's recommendations.

3.0 Design Requirements.

3.1 The precast concrete modular block wall shall be designed and constructed to have a vertical face (zero batter). All units shall be wet-cast precast modular retaining wall units conforming to ASTM C1776. All units for the project shall be obtained from the same manufacturer. system patent holder/licensor and shall document compliance with the published quality control standards of the proprietary precast modular block system licensor for the previous three (3) years or the total time the manufacturer has been licensed, whichever is less. The manufacturer shall be licensed and authorized to produce the retaining wall units by the precast modular block and shall be from one of the pre-approved wall systems:

- Redi-Rock Wall, Redi-Rock International, LLC
- Stone Strong, Stone Strong, LLC
- Recon Retaining Walls, Recon Wall Systems, Inc.
- or approved alternate

3.2 The contractor shall submit six complete sets of the manufacturer's design plans, details, and computations for each individual wall structure to the engineer. All submitted information shall be clear and complete, and thoroughly checked before the information is submitted. All submitted information shall be legible and of sufficient contrast to be suitable for archiving in accordance with MoDOT's current practice for archiving. Submitted information determined to be unsuitable for archiving purposes will be returned for corrective action.

3.3 The contractor will be solely responsible for the content of the design plans, details, and computations that are submitted, and for the performance of the wall system. The contractor shall be solely responsible for ensuring that the information submitted by the manufacturer is in accordance with all contract plans and specifications and with the wall system used. Completed design plans shall contain all material, fabrication and construction requirements for erecting the wall system complete in place. The completed design plans shall show the longitudinal and lateral layout of the drainage systems used for the wall system. The contractor shall be responsible for the internal and external stability of the structure including compound stability. Overall global stability has been evaluated by the geotechnical engineer as described in the contract plans. The contractor shall be responsible for overall global stability for any wall sections that deviate from the overall global stability cases that vary from those described in the contract plans.

3.4 All design plans, details, and computations submitted for distribution shall be signed, sealed, and stamped in accordance with the laws relating to architects and professional engineers (Chapter 327, RSMo).

3.5 Precast concrete modular block walls shall be designed in accordance with the AASHTO specifications shown on the plans and in accordance with additional publications or specifications referenced within the AASHTO specifications. The seismic performance category, angle of internal friction for the selected granular backfill for structural systems and other design requirements shown on the plans shall be incorporated into the design of the wall system.

3.6 Design shall also include specialized placement of the wall reinforcement, blocks, control joints, and all other necessary design elements to accommodate sanitary sewer and stormwater drainage structures, pipes and other utility appurtenances that are to be placed within the reinforcement and excavation limits of the retaining walls.

4.0 Construction Requirements.

4.1 Unit Fill. The contractor shall use a unit fill to fill the voids of the blocks for the wall system. This unit fill shall extend a minimum distance of 12 inches beyond the extreme back face of the wall system. Each course of the wall system shall have the unit fill in place before the next course of the wall system is placed.

4.2 Drainage Requirements. A drainage system shall be provided at the base of the wall as shown on the contract plans. The drainage system shall consist of a perforated pipe wrapped in a Class 2 geotextile to prevent clogging of the perforations. The pipe shall be placed in such a manner that water drains freely from the pipe. When the wall length is such that the slope of the pipe becomes excessive in the engineer's judgment, lateral drain pipes shall be installed underneath the concrete leveling pad.

4.3 Foundation Preparation. The foundation for the wall system shall be graded level for a width equal to or exceeding the length of the reinforcing strips, or as shown on the plans. Prior to wall construction, the foundation, if not on rock, shall be compacted as directed by the engineer. Any foundation soils found to be unsuitable shall be removed and replaced, as directed by the engineer.

4.4 Geotechnical Engineer. The contractor shall retain a geotechnical engineer to observe excavations to determine if unsuitable existing fill has been removed. This work will be considered completely covered by the contract unit price for Precast Concrete Modular Block Wall.

4.5 Leveling Pad. An unreinforced cast-in-place concrete leveling pad shall be provided at the foundation level for each base unit of the wall system. The leveling pad shall be built to the elevations shown on the plans and shall not be raised in elevation to allow for the use of a particular wall system. The leveling pad shall be built a minimum width of 12 inches and a minimum depth of 6 inches. The concrete on the leveling pad shall be cured a minimum of 12 hours before any of the wall system blocks are placed.

4.6 Select Granular Backfill for Structural Systems Placement.

4.6.1 Select granular backfill for structural systems shall be placed concurrently with the placement of the retained backfill. The placement of the select granular backfill for structural systems shall closely follow the erection of each course of the wall system and shall be placed in such a manner to avoid any damage or disturbance to the wall material or any misalignment of the facing elements of the wall system. Any wall system material that becomes damaged or disturbed during the installation of the wall system shall be removed, replaced, or corrected at the contractor's expense, as directed by the engineer. Whenever placement of the select granular backfill for structural systems results in the wall facing system being misaligned or distorted outside the limits of this specification, the contractor shall correct the misalignment or distortion as directed by the engineer.

4.6.2 The select granular backfill for structural systems shall be compacted in accordance with Sec 203, with the following exceptions:

a) The minimum density shall be no less than 95 percent of maximum density, determined in accordance with AASHTO T 99.

b) When the material used contains more than 30 percent retained on the ¾ inch sieve, a method of compaction consisting of at least four passes by a heavy roller shall be used.

c) The moisture content of the material prior to and during compaction shall be uniformly distributed throughout each layer. The placement moisture content shall be no lower than three percentage points less than the optimum moisture content and shall be no more than the optimum moisture content.

d) Compaction within 3 feet of the back face of the wall system shall be achieved by at least three passes of a lightweight mechanical tamper, roller, or vibratory system.

e) The contractor shall ensure that runoff within the wall system construction site is directed away from the wall facing during construction, and that runoff from adjacent areas of the general construction site is directed such that runoff does not enter the wall system construction site.

f) Class 1 geotextile material shall be placed between the select granular backfill for structural systems, and the retained backfill and over the top of the select granular backfill for structural systems to prevent piping of in-situ soil into the wall system.

g) Tamping-type (sheep's foot) rollers shall not be used for compaction of the select granular backfill for structural systems.

4.6.3 The select granular backfill for structural systems shall be initially placed parallel to the wall system, and at the rear and middle of the soil reinforcement strips, and then moved toward the facing elements of the wall system. Construction equipment shall at no time come in direct contact with the soil reinforcement strips. Each course or layer shall be compacted up to or slightly above the location of the next connection for the reinforcement strips prior to placing the next layer of reinforcement strips as designated in the erection sequence provided by the manufacturer of the wall system.

4.7 Construction Tolerances.

4.7.1 Wall systems shall be built in accordance with the dimensions and elevations specified on the plans and in accordance with the requirements of the system manufacturer. Alignments shall be maintained within the following dimensional tolerances:

Dimensional Item	Dimensional Tolerance
Adjacent Face Panel / Block Joint Gaps	± 1/4 inch
Vertical and Horizontal Alignment of Facing Elements	± 1/16 inch per foot
Soil Reinforcement Strip Elevations	± 1 inch

4.7.2 Vertical alignments shall be measured along a theoretical vertical line established from the top of the wall system to the base of the wall system.

4.8 Pipe Encasement for Utility Appurtenances. Any encasement required for the utility appurtenances in proximity to the Rogers Parkway and precast concrete modular block walls as identified in this JSP or in the contract plans, in particular the sanitary sewer line crossing at Walls

1 and 2, shall be considered incidental to and included in the cost of the precast concrete modular block wall.

4.9 Technical Assistance. The contractor shall be responsible for having a technical advisor from the wall system manufacturer available for assistance during the installation of the wall system.

5.0 Method of Measurement.

5.1 Measurement of precast concrete modular block walls will be made to the nearest square foot. The quantity to be paid will be measured from the "Top of Wall" line to the "Theoretical Top of Leveling Pad" line shown on the plans. No adjustments in the measured quantity will be permitted for additional wall area required to meet the minimum wall elevations shown on the plans for any particular wall system.

5.2 Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity.

5.3 No measurement will be made for required excavation for placement of the leveling pad for the wall system. All other excavation required for the construction of the wall system will be included in roadway items.

6.0 Basis of Payment. Payment for the accepted quantity for precast concrete modular block walls will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time as required to comply with this provision.

Item No.	Unit	Description
720-99.04	SQFT	Precast Concrete Modular Block Wall

R-NN. <u>Re-construct Wall In Place</u>

1.0 Description. This work shall consist of the removal of portions of existing retaining walls and reconstructing in kind as shown on the plans. Existing retaining walls consist of mortared stone walls, brick walls and small block retaining walls. The contractor shall evaluate each wall to be reconstructed in place and shall make a determination as to whether any existing wall materials are suitable for re-use for reconstruction. As required, this item shall also include temporary storage of salvaged material. The contractor shall exercise extreme care to protect the portions of the retaining walls that are to remain and components which will be reconstructed. Should the contractor deem wall materials as unsuitable for re-use, they shall be properly disposed of off-site.

2.0 Construction Requirements. This work shall consist of reconstructing portions of the retaining wall with stone, brick, or masonry units laid in mortar, or block and in conformity with the lines and grades shown on the plans or established by the Engineer. Removal and reconstruction of underground portions of the walls as well as any excavation, footings, bedding, backfill, reinforcement, mortars/adhesives, and other necessary components shall be considered incidental to the cost of this item.

2.1 In general, the wall shall be laid with face joints to match the existing joint thickness. Exposed faces of the existing wall stones and bricks shall be exposed faces on the rebuilt or relocated wall stones or bricks. All stone or bricks shall be thoroughly wetted and laid upon their natural beds with joints approximately horizontal and vertical. Each stone or brick shall be settled into place in a full bed of mortar where required. Mortar for joints shall meet the requirements of Sec 1066.

2.2 Materials. Materials shall consist of existing sound and durable stones, bricks or blocks salvaged from removal operations for existing retaining walls. Material that is to be salvaged from existing structures shall be removed without damage, in sections which may be readily handled or transported, and shall be palletized at an accessible point. Walls shall be constructed in kind and reconstructed walls shall match the look and color of the undisturbed section of the walls.

3.0 Method of Measurement. Measurement for reconstructing retaining walls will be made to the nearest square foot. The quantity to be paid will be measured along the vertical face of reconstructed wall in view.

4.0 Basis of Payment. Payment for the accepted quantity for reconstructing walls in place will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time as required to comply with this provision.

Item No.	Unit	Description
720-99.04	SQFT	Re-construct Wall In Place

R-OO. Small Block Wall

1.0 Description. This work shall consist of furnishing and constructing precast small block gravity retaining walls without soil reinforcement in accordance with these specifications, as shown on the plans or as directed by the engineer.

2.0 Materials. All material shall be in accordance with Division 1000, Material Details, and specifically as follows:

Item	Section
Concrete	501
Select Granular Backfill for Structural Systems	1010
Geotextile	1011
Miscellaneous Drainage Material	1013
Resin Anchor Systems	1039
Small Block Wall Systems – Concrete Blocks	1052.40

2.1 The unit fill shall consist of a granular backfill in accordance with Gradation D or E of Sec 1005.

2.2 Class B or B-1 concrete shall be used for cast-in-place concrete leveling pads used for the wall system.

3.0 Design Requirements.

3.1 Only the small block wall systems shown in the bridge prequalified products listing will be allowed for use by the contractor. The bridge prequalified products list may be obtained through Bridge or MoDOT's web site. Any deviations from the prequalified wall system details previously submitted to Bridge shall be specifically outlined in the cover letter submitted with the design plans, details and computations.

3.2 The contractor shall submit six complete sets of the manufacturer's design plans, details, and computations for each individual wall structure to the engineer. All submitted information shall be clear and complete, and thoroughly checked before the information is submitted. All submitted information shall be legible and of sufficient contrast to be suitable for archiving in accordance with MoDOT's current practice for archiving. Submitted information determined to be unsuitable for archiving purposes will be returned for corrective action.

3.3 The contractor will be solely responsible for the content of the design plans, details, and computations that are submitted, and for the performance of the wall system. The contractor shall be solely responsible for ensuring that the information submitted by the manufacturer is in accordance with all contract plans and specifications and with the wall system used. Completed design plans shall contain all material, fabrication and construction requirements for erecting the wall system complete in place. The completed design plans shall show the longitudinal and lateral layout of the drainage systems used for the wall system. The contractor shall be responsible for the internal and external stability of the structure including compound stability and overall global stability.

3.4 All design plans, details, and computations submitted for distribution shall be signed, sealed, and stamped in accordance with the laws relating to architects and professional engineers (Chapter 327, RSMo).

3.5 Small block walls shall be designed in accordance with the AASHTO specifications shown on the plans and in accordance with additional publications or specifications referenced within the AASHTO specifications. The seismic performance category, angle of internal friction for the selected granular backfill for structural systems and other design requirements shown on the plans shall be incorporated into the design of the wall system.

4.0 Construction Requirements.

4.1 Unit Fill. The contractor shall use a unit fill to fill the voids of the blocks for the wall system. This unit fill shall extend a minimum distance of 12 inches beyond the extreme back face of the wall system. Each course of the wall system shall have the unit fill in place before the next course of the wall system is placed.

4.2 Precast Top Cap. Precast top cap units shall be used. The top cap units shall be permanently attached utilizing either a resin anchor system or an equivalent detail approved by the Engineer.

4.3 Drainage Requirements. A drainage system shall be provided at the base of the wall. The drainage system shall consist of a perforated pipe wrapped in a Class 2 geotextile to prevent clogging of the perforations. The pipe shall be placed in such a manner that water drains freely from the pipe. When the wall length is such that the slope of the pipe becomes excessive in the engineer's judgment, lateral drain pipes shall be installed underneath the concrete leveling pad.

4.4 Foundation Preparation. The foundation for the wall system shall be graded level as shown on the plans. Prior to wall construction, the foundation, if not on rock, shall be compacted as directed by the engineer. Any foundation soils found to be unsuitable shall be removed and replaced, as directed by the engineer.

4.5 Geotechnical Engineer. The contractor shall retain a geotechnical engineer to observe excavations to determine if unsuitable existing fill must be removed. This work will be considered completely covered by the contract unit price for Small Block Wall.

4.6 Leveling Pad. An unreinforced cast-in-place concrete leveling pad shall be provided at the foundation level for each base unit of the wall system. The leveling pad shall be built to the elevations shown on the plans and shall not be raised in elevation to allow for the use of a particular wall system. The leveling pad shall be built a minimum width of 12 inches and a minimum depth of 6 inches. The concrete on the leveling pad shall be cured a minimum of 12 hours before any of the wall system modules are placed.

4.7 Select Granular Backfill for Structural Systems Placement.

4.7.1 Select granular backfill for structural systems shall be placed concurrently with the placement of the retained backfill. The placement of the select granular backfill for structural systems shall closely follow the erection of each course of the wall system and shall be placed in such a manner to avoid any damage or disturbance to the wall material or any misalignment of the facing elements of the wall system. Any wall system material that becomes damaged or disturbed during the installation of the wall system shall be removed, replaced, or corrected at the contractor's expense, as directed by the engineer. Whenever placement of the select granular backfill for structural systems results in the wall facing system being misaligned or distorted outside the limits of this specification, the contractor shall correct the misalignment or distortion as directed by the engineer.

4.7.2 The select granular backfill for structural systems shall be compacted in accordance with Sec 203, with the following exceptions:

a) The minimum density shall be no less than 95 percent of maximum density, determined in accordance with AASHTO T 99.

b) When the material used contains more than 30 percent retained on the ¾ inch sieve, a method of compaction consisting of at least four passes by a heavy roller shall be used.

c) The moisture content of the material prior to and during compaction shall be uniformly distributed throughout each layer. The placement moisture content shall be no lower than three percentage points less than the optimum moisture content and shall be no more than the optimum moisture content.

d) Compaction within 3 feet of the back face of the wall system shall be achieved by at least three passes of a lightweight mechanical tamper, roller, or vibratory system.

e) The contractor shall ensure that runoff within the wall system construction site is directed away from the wall facing during construction, and that runoff from adjacent areas of the general construction site is directed such that runoff does not enter the wall system construction site.

f) Class 1 geotextile material shall be placed between the select granular backfill for structural systems, and the retained backfill and over the top of the select granular backfill for structural systems to prevent piping of in-situ soil into the wall system.

g) Tamping-type (sheep's foot) rollers shall not be used for compaction of the select granular backfill for structural systems.

4.8 Construction Tolerances.

4.8.1 Wall systems shall be built in accordance with the dimensions and elevations specified on the plans and in accordance with the requirements of the system manufacturer. Alignments shall be maintained within the following dimensional tolerances:

Dimensional Item	Dimensional Tolerance
Final Joint Gaps Between Adjacent Block Units	± 1/4 inch
Vertical and Horizontal Alignment of Facing Elements	± 1/16 inch per foot

4.8.2 Vertical alignments shall be measured along a theoretical vertical line established from the top of the wall system to the base of the wall system. For walls that have a built-in setback, the alignment shall be measured along the theoretical vertical line and the straight line that describes the horizontal setback.

4.9 Technical Assistance. The contractor shall be responsible for having a technical advisor from the wall system manufacturer available for assistance during the installation of the wall system.

5.0 Method of Measurement.

5.1 Measurement of small block walls will be made to the nearest square foot. The quantity to be paid will be measured from "Top of Wall Line" to the "Theoretical Top of Leveling Pad Line" shown on the plans. No adjustments in the measured quantity will be permitted for additional wall area required to meet the minimum wall elevations shown on the plans for any particular wall system.

5.2 Final measurement will not be made except for authorized changes during construction or where appreciable errors are found in the contract quantity. The revision or correction will be computed and added to or deducted from the contract quantity.

5.3 No measurement will be made for required excavation for placement of the leveling pad for the wall system. All other excavation required for the construction of the wall system will be included in roadway items.

6.0 Basis of Payment. Payment for the accepted quantity for small block walls will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time as required to comply with this provision.

Item No.	Unit	Description
720-99.04	SQFT	Small Block Wall

R-PP. Kirkwood Vertical Gateway Monument – Job J6S1718C Only

JSP is currently under development.

R-QQ. Guidance for Temporary and Permanent Seeding

1.0 Description. The contractor shall provide temporary seeding and permanent seeding at the locations as directed by the engineer.

2.0 Construction Requirements. All work performed for these items shall be in accordance with Sec 805 and 806 and materials shall be in accordance with those outlined in the "Seeding and Sodding" JSP.

3.0 Locations.

3.1 Temporary Seed and Mulch. This project is expected to be performed in more than one construction season. As such, there may be erodible areas that will require protection during off-season periods. Temporary seeding and mulching shall be provided in accordance with Sec 806.50.

3.2 Permanent Seed and Mulch. Due to the urban nature of this corridor, sodding is the preferred method for re-establishment of turf growth. There may, however, be locations where sodding is less practical, such as on the slopes near bridges. All areas where seed and mulch will be applied in lieu of sodding shall be approved by the engineer.

4.0 Method of Measurement. Measurement will be made in accordance with Sec 805 for permanent seeding and Sec 806 for temporary seeding.

5.0 Basis of Payment. Basis of payment information for permanent seeding can be found in the "Seeding and Sodding" JSP. Payment for the accepted quantity for temporary seed and mulch will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
806-10.17	Acre	Temporary Seeding and Mulching

R-RR. Remove and Relocate Existing Light Pole on Private Property

1.0 Description. This work shall consist of removing existing light poles and luminaires and relocating them to locations within private property. Installation details shall be as required by the engineer.

2.0 Construction Requirements. This work shall be in accordance with Sec 901. Light poles and luminaires are to be carefully removed and relocated. Light pole bases or foundations may be removed and replaced with new foundations at the new pole locations as required. The contractor shall verify all materials with the engineer prior to ordering.

2.1 Care shall be taken by the contractor to not damage any of the existing lighting components that are to be relocated. Should any items be damaged by the contractor's handling or negligence, they shall be replaced in kind at the contractor's cost.

2.2 Lighting shall be maintained as operational during the normal hours of use throughout the duration of construction. Any disruption to lighting service within the normal lighting times shall be supplemented with temporary lighting at the contractor's cost, and shall remain in place until normal lighting operation period can be restored.

2.3 Light Pole Foundation. The pole foundation that is compatible with the relocated pole shall be provided by the contractor, with the design being the responsibility of the contractor. The contractor shall provide shop drawings as required by the engineer prior to installation.

2.4 Mounting Hardware and Wiring. The contractor shall be responsible for providing all mounting hardware and wiring required for installing each relocated light pole and luminaire to the new light pole footing. Payment for this hardware shall be considered incidental to and included in the pay item listed below.

2.5 Test Period. Upon completion of the light pole relocation work, the relocated light pole assemblies shall be subject to the 15-day test period requirements as defined in Sec 901.

3.0 Method of Measurement. Measurement will be made for each fully installed relocated light pole assembly, which includes removal of the existing.

4.0 Basis of Payment. Payment for the accepted quantity for the relocated light poles will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
901-99.02	Each	Remove and Relocate Existing Light Pole on Private Property

R-SS. Ornamental Lighting – Job J6S1718B Only

1.0 Description. This work shall consist of furnishing materials, labor, and equipment required to install ornamental luminaries in conjunction with ornamental pedestrian fencing. Installation details shall be in accordance with the plans and the manufacturer's recommendations. This work shall conform with applicable portions of Sec 901 of the Standard Specifications, as herein modified.

2.0 Materials.

2.1 Luminaire. The ornamental luminaire shall be a "Solitaire" PT/SRS1H2/LED/BL-P as manufactured by KIM Lighting or an approved equal, fitted with a LED Luminaire having a white light output of 3000k. The fixture finish shall be black in color.

2.2 Mounting Adapter. Luminaires shall be provided with an adapter housing, if required, to ensure proper mating of luminaires with light poles. The adapter housing shall be attached to the poles and fit inside the luminaire to ensure a proper and tight installation. Adapter materials and

coatings shall meet the requirements of section 2.1 above, except that only exposed adapter surfaces shall be black in color.

2.3 Photometrics. The luminaire shall be constructed to reduce the amount of veiling luminance. Prior to ordering luminaires, the contractor shall submit computer lighting calculations demonstrating a neutral effect on the veiling luminance conditions existing with the roadway luminaires already in place. These calculations shall indicate that the installation of the ornamental luminaires do not increase the maximum veiling luminance to average pavement luminance above existing conditions. The calculations shall indicate a graphical representation of each bridge and roadway configuration with all input values at the pavement elevation on a grid no larger than 10 feet along the roadway and 6 feet across the roadway in accordance with IES recommendations. The calculations shall indicate the overall statistics showing average, maximum, minimum, average to minimum ratio, veiling luminance ratio and any other pertinent information as may be required by the engineer.

3.0 Construction Requirements. Luminaires shall be installed in accordance with the manufacturer's recommendations. The contractor shall verify all materials with the engineer prior to ordering.

3.1 Light Pole Foundation. The pole foundation shall be provided per the manufacturer's recommendations, with the design being the responsibility of the contractor. The contractor shall provide shop drawings as required by the engineer prior to installation.

3.2 Light Pole. Light poles shall be 14'-0" Era Round Aluminum Non-Tapered Pole, Pole Catalog Number HAS14-5188, coated black in color, as manufactured by Kim Lighting or an approved equal.

3.3 Mounting Hardware. The contractor shall be responsible for providing all mounting hardware required for assembling each ornamental light pole, footing, and luminaire. Payment for this hardware shall be considered incidental to and included in the pay item listed below.

4.0 Method of Measurement. Luminaires, light poles, and foundations shall be installed in accordance with the manufacturer's recommendations. For the basis of this contract, the ornamental light pole and luminaire, including the footing and any hardware required for its assembly, shall be considered as a single unit at each installation location. Measurement will be made for each fully completed ornamental lighting assembly.

5.0 Basis of Payment. Payment for the accepted quantity for the ornamental lighting will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
901-99.02	Each	Ornamental Light Pole and Luminaire – Brentwood Streetscaping

R-TT. Ornamental Lighting – Job J6S1718C Only

1.0 Description. This work shall consist of furnishing and installing ornamental lighting for the Kirkwood streetscape enhancements. Installation details shall be in accordance with the plans and the manufacturer's recommendations.

2.0 Construction Requirements. This work shall be in accordance with Sec 901. Luminaires, poles, and foundations shall be installed in accordance with the manufacturer's recommendations. The contractor shall verify all materials with the engineer prior to ordering.

2.1 Luminaire. The ornamental luminaire shall be a GAR/GAT/GLC Generation Series LED Part Number GAR-080-LED-E1-5-CCA-BK as manufactured by McGraw-Edison or an approved equal, fitted with a LED Luminaire having a white light output of 4000K.

2.2 Light Pole. Light poles shall be 14'-0" Washington (Straight Non-tapered Fluted Aluminum) Part Number 5D01AS-E-140050504UW-PD-DBL as manufactured by Valmont or an approved equal.

2.3 Light Pole Foundation. The pole foundation shall be provided per the manufacturer's recommendations, with the design being the responsibility of the contractor. The contractor shall provide shop drawings as required by the engineer prior to installation.

2.4 Mounting Hardware. The contractor shall be responsible for providing all mounting hardware required for assembling each ornamental light pole, footing, and luminaire. Payment for this hardware shall be considered incidental to and included in the pay item listed below.

3.0 Method of Measurement. Luminaires, light poles, and foundations shall be installed in accordance with the manufacturer's recommendations. For the basis of this contract, the ornamental light pole and luminaire, including the footing and any hardware required for its assembly, shall be considered as a single unit at each installation location. Measurement will be made for each fully completed ornamental lighting assembly.

4.0 Basis of Payment. Payment for the accepted quantity for the ornamental lighting will be made in accordance with the contract unit bid price for the item listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
901-99.02	Each	Ornamental Light Pole and Luminaire – Kirkwood Streetscaping

R-UU. Supplemental Revisions JSP-18-01P

(To be inserted by Central Office – Currently available version is shown for information only)

Stormwater Compliance Requirements

1.0 Description. This provision requires the contractor to provide a Water Pollution Control Manager (WPCM) for any project that includes land disturbance on the project site and the total area of land disturbance, both on the project site, and all Off-site support areas, is one (1) acre or more. Regardless of the area of Off-site disturbance, if no land disturbance occurs on the project site, these provisions do not apply. When a WPCM is required, all sections within this provision shall be applicable, including assessment of specified Liquidated Damages for failure to correct Stormwater Deficiencies, as specified herein. This provision is in addition to any other stormwater, environmental, and land disturbance requirements specified elsewhere in the contract.

1.1 Definitions. The project site is defined as all areas designated on the plans, including temporary and permanent easements. The project site is equivalent to the "permitted site", as defined in MoDOT's State Operating Permit. An Off-site area is defined as any location off the project site the contractor utilizes for a dedicated project support function, such as, but not limited to, staging area, plant site, borrow area, or waste area.

1.2 Reporting of Off-Site Land Disturbance. If the project includes any planned land disturbance on the project site, prior to the start of work, the contractor shall submit a written report to the engineer that discloses all Off-site support areas where land disturbance is planned, the total acreage of anticipated land disturbance on those sites, and the land disturbance permit number(s). Upon request by the engineer, the contractor shall submit a copy of its land disturbance permit(s) for Off-site locations. Based on the total acreage of land disturbance, both on and Off-site, the engineer shall determine if these Stormwater Compliance Requirements shall apply. The Contractor shall immediately report any changes to the planned area of Off-site land disturbance. The Contractor is responsible for obtaining its own separate land disturbance permit for Off-site areas.

2.0 Water Pollution Control Manager (WPCM). The Contractor shall designate a competent person to serve as the Water Pollution Control Manager (WPCM) for projects meeting the description in Section 1.0. The Contractor shall ensure the WPCM completes all duties listed in Section 2.1.

2.1 Duties of the WPCM:

(a) Be familiar with the stormwater requirements including the current MoDOT State Operating Permit for construction stormwater discharges/land disturbance activities; MoDOT's statewide Stormwater Pollution Prevention Plan (SWPPP); the Corps of Engineers Section 404 Permit, when applicable; the project specific SWPPP, the Project's Erosion & Sediment Control Plan; all applicable special provisions, specifications, and standard drawings; and this provision;

(b) Successfully complete the MoDOT Stormwater Training Course within the last 4 years. The MoDOT Stormwater Training is a free online course available at MoDOT.org;

(c) Attend the Pre-Activity Meeting for Grading and Land Disturbance and all subsequent Weekly Meetings in which grading activities are discussed;

(d) Oversee and ensure all work is performed in accordance with the Project-specific SWPPP and all updates thereto, or as designated by the Engineer;

(e) Review the project site for compliance with the Project SWPPP, as needed, from the start of any grading operations until final stabilization is achieved, and take necessary actions to correct any known deficiencies to prevent pollution of the waters of the state or adjacent property owners prior to the engineer's weekly inspections;

(f) Review and acknowledge receipt of each MoDOT Inspection Report (Land Disturbance Inspection Record) for the Project within forty eight (48) hours of receiving the report and ensure that all Stormwater Deficiencies noted on the report are corrected as soon as possible, but no later than stated in Section 5.0.

3.0 Pre-Activity Meeting for Grading/Land Disturbance and Required Hold Point. A Pre-Activity meeting for grading/land disturbance shall be held prior to the start of any land disturbance operations. No land disturbance operations shall commence prior to the Pre-Activity meeting except work necessary to install perimeter controls and entrances. Discussion items at the pre-activity meeting shall include a review of the Project SWPPP, the planned order of grading operations, proposed areas of initial disturbance, identification of all necessary BMPs that shall be installed prior to commencement of grading operations, and any issues relating to compliance with the Stormwater requirements that could arise in the course of construction activity at the project.

3.1 Hold Point. Following the pre-activity meeting for grading/land disturbance and subsequent installation of the initial BMPs identified at the pre-activity meeting, a Hold Point shall occur prior to the start of any land disturbance operations to allow the engineer and WPCM the time needed to perform an on-site review of the installation of the BMPs to ensure compliance with the SWPPP is met. Land disturbance operations shall not begin until authorization is given by the engineer.

4.0 Inspection Reports. Weekly and post run-off inspections will be performed by the engineer and each Inspection Report (Land Disturbance Inspection Record) will be entered into a web-based Stormwater Compliance database. The WPCM will be granted access to this database and shall promptly review all reports, including any noted deficiencies, and shall acknowledge receipt of the report as required in Section 2.1 (f.).

5.0 Stormwater Deficiency Corrections. All stormwater deficiencies identified in the Inspection Report shall be corrected by the contractor within 7 days of the inspection date or any extended period granted by the engineer when weather or field conditions prohibit the corrective work. If the contractor does not initiate corrective measures within 5 calendar days of the inspection date or any extended period granted by the engineer, all work shall cease on the project except for work to correct these deficiencies, unless otherwise allowed by the engineer. All impact costs related to this halting of work, including, but not limited to stand-by time for equipment, shall be borne by the Contractor. Work shall not resume until the engineer approves the corrective work.

5.1 Liquidated Damages. If the Contractor fails to complete the correction of all Stormwater Deficiencies listed on the MoDOT Inspection Report within the specified time limit, the Commission will be damaged in various ways, including but not limited to, potential liability, required mitigation, environmental clean-up, fines and penalties. These damages are not reasonably capable of being computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of $2,000 per day for failure to correct one or more of the Stormwater Deficiencies listed on the Inspection Report within the specified time limit. In addition to the stipulated damages, the stoppage of work shall remain in effect until all corrections are complete.

6.0 Basis of Payment. No direct payment will be made for compliance with this provision.

COVID-19 Safety

1.0 Description. The coronavirus disease 2019 or COVID-19 has reached a pandemic stage across the United States, including the State of Missouri. To reduce the impact of COVID-19 outbreak conditions on businesses, workers, customers and the public, the contractor shall be aware of all COVID-19 guidance from the Center for Disease Control (CDC) and other government health mandates. The contractor shall conduct all operations in conformance with

these safety directives. The guidance may change during the project construction and the contractor shall change and adapt their operation and safety protocols accordingly.

2.0 Safety Plan. The contractor shall include these procedures in the project safety plan as called for in the contract documents and revise the safety plan as needed.

3.0 Essential Work. In accordance with any state or local Stay at Home Order, care for the infrastructure has been deemed essential and MoDOT is moving forward with construction projects, this project is considered essential and the contractor and their employees, subcontractors and suppliers are considered essential business and performing essential functions.

4.0 Basis of Payment. Compliance with regulations and laws pertaining to COVID-19 is covered under Sec 107 of the Missouri Standard Specifications for Highway Construction. No direct payment will be made for compliance with this provision.

Anti-Discrimination Against Israel Certification

By signing this contract the Company certifies it is not currently engaged in and shall not, for the duration of the contract, engage in a boycott of goods or services from the State of Israel, companies doing business in or with Israel or authorized by, licensed by, or organized under the laws of the State of Israel, or persons or entities doing business in the State of Israel as defined by Section 34.600 RSMo. This certification shall not apply to contracts with a total potential value of less than One Hundred Thousand Dollars ($100,000) or to contractors with fewer than ten (10) employees.

Delete Sec 413.10.5.5 and substitute with the following:

413.10.5.5 Weather Limitations and Calendar Restrictions. Micro-surfacing shall not be placed when the air or surface temperature is below 50 F; or when the forecasted low temperature for the next 48 hours, as reported by the National Weather Service, is below 40 F; or after October 1 of each calendar year. Temperatures shall be obtained in accordance with MoDOT Test Method TM 20. Micro-surfacing may be placed on a damp surface but shall not be placed on a wet surface with free standing water.

Delete Sec 413.30.2.3 and substitute with the following:

413.30.2.3 Reclaimed Asphalt. No reclaimed asphalt pavement or reclaimed asphalt shingles are allowed.

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"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	HDR Engineering *401 South 18th St.* *Suite 300* *St. Louis, MO 63103* Certificate of Authority: 000856 Consultant Phone:314-425-8300
	JOB NUMBER: J6S1718 ST. LOUIS COUNTY, MO DATE PREPARED: 02/12/2021
Date: DRAFT	
Only the following items of the Job Special Provisions (Bridge) are authenticated by this seal: A, B, C	

A. CONSTRUCTION REQUIREMENTS

1.0 Description. This provision contains general construction requirements for this project.

2.0 Construction Requirements. Plans and shop drawings for the existing structures are included in the contract with the bridge electronic deliverables zip file for informational purposes only.

2.1 In order to assure the least traffic interference, the work shall be scheduled so that a lane closure is for the absolute minimum amount of time required to complete the work. A lane shall not be closed until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

2.2 Qualified special mortar shall be a qualified rapid set concrete patching material in accordance with Sec 704. A qualified rapid set concrete patching material will not be permitted for repairing concrete deck (half-soling), deck repair with void tube replacement, full depth repair, modified deck repair and substructure repair (formed) unless a note on the bridge plans specifies that a qualified special mortar may be used.

2.3 Provisions shall be made to prevent any debris and materials from falling into the streams. Any debris and materials that falls below the bridge outside the limits mentioned previously and if determined necessary by the engineer, the debris shall be removed as approved by the engineer at the contractor's expense.

2.4 Any damage sustained to the remaining structure as a result of the contractor's operations shall be repaired or the material replaced as approved by the Engineer at the contractor's expense.

2.5 Provisions shall be made to prevent damage to any existing utilities. Any damage sustained to the utilities as a result of the Contractor's operations shall be the responsibility of the contractor. All costs of repair and disruption of service shall be as determined by the utility owners and as approved by the Engineer.

2.6 A washer shall be required under head and nut when any reaming is performed for bolt installation.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

B. DYNAMIC PILE TESTING

1.0 General.

1.1 Scope of Work. Scope of work shall include furnishing all labor, equipment and analysis associated with dynamic testing of driven piles as specified in this special provision.

1.2 Performance and Design Requirements. Performance and design conditions for dynamic testing of driven piles shall be in accordance with section 4.0 of this special provision.

1.3 Approved Manufacturers. For the following hardware and software components, only the listed manufacturer is recognized as providing the level of quality required. If the contractor wants to propose a non-listed manufacturer that is considered to provide an equivalent level of quality, this manufacturer shall be identified and supporting documentation provided. Acceptance of the manufacturer as a substitute will be at the discretion of the engineer.

Component	Product	Manufacturer
Pile Driving Modeling - Wave Equation Software	**GRLWEAP**	**Pile Dynamics, Inc.**
Pile Driving Monitoring - Hardware & Software	Pile Driving Analyzer - Model PAK	Pile Dynamics, Inc.
Pile Driving Analysis – Signal Matching Software	**CAPWAP**	**Pile Dynamics, Inc.**

1.4 Test Requirements. Dynamic pile testing shall be conducted in accordance with the standard test method indicated below.

Standard Test Method	Designation	Conducted By
High-Strain Dynamic Testing of Piles	ASTM D 4945	Contractor

1.5 Qualifications. The contractor shall perform dynamic pile testing utilizing the services of an independent dynamic pile testing consultant and qualified personnel. An engineer with a minimum of 3 years dynamic pile testing and analysis experience or who has achieved Basic or better certification under the High-Strain Dynamic Pile Testing Examination and Certification process of the Pile Driving Contractors Association and Foundation QA shall perform pile driving monitoring. An engineer with a minimum of 5 years dynamic pile testing and analysis experience or who has achieved Advanced or better certification under the High-Strain Dynamic Pile Testing Examination and Certification process of the Pile Driving Contractors Association and Foundation QA shall perform pile driving modeling and pile driving analyses.

2.0 Execution.

2.1 Pile Driving Modeling. The contractor shall perform preconstruction wave equation analyses and prepare a summary report of the results. The wave equation analyses shall be used to assess the ability of all proposed pile driving systems to install piles to the required capacity and the desired penetration depth within allowable driving stresses. The report shall include a drivability graph relating pile capacity, blow count and driving stresses to depth. The report shall include a bearing graph relating the pile capacity to the pile driving resistance. The bearing graph shall indicate blow count versus capacity and stroke. The report shall also contain a constant capacity analysis or inspectors chart to assist the engineer in determining the required driving resistance at other field observed strokes. The contractor shall perform wave equation analyses in accordance with section 4.0 of this special provision. Acceptability of the wave equation report and the adequacy of analyses will be determined by the engineer.

2.1.1 Approval by the engineer of the proposed pile driving system will be based upon the wave equation analyses indicating that the proposed system can develop the specified pile capacity at a pile driving rate of 2 to 10 blows per inch at the end of driving, and within allowable driving stresses per *AASHTO LRFD Bridge Construction Specifications*, Section 4.4.1. The contractor shall provide preliminary pile driving criteria based on wave equation analyses and any anticipated capacity changes after driving, set-up or relaxation, subject to revision based upon dynamic pile testing field measurements

2.1.2 If any changes or modifications are made to the approved pile driving system, additional wave equation analyses in accordance with section 2.1 of this special provision shall be required.

2.2 High-Strain Dynamic Pile Testing.

2.2.1 The contractor shall perform dynamic pile testing at the locations and frequency required in accordance with section 4.0 of this special provision.

2.2.2 Dynamic pile testing involves monitoring the response of a pile subjected to heavy impact applied by the pile hammer at the pile head. The testing shall provide information on the driving stresses, pile capacity, structural integrity and hammer efficiency.

2.2.3 The contractor shall engage an independent dynamic pile testing consultant and qualified personnel in accordance with section 1.5 of this special provision. Prior to testing, the engineer will review and approve the proposed independent dynamic pile testing consultant, the experience and qualifications of assigned personnel, details of the method of testing, a list of equipment, and the method of analysis of test results. The contractor shall provide all available details of the subsurface conditions, pile dimensions and properties, and pile driving systems to the independent dynamic pile testing consultant.

2.2.4 All field testing and measurements shall be made in the presence of the engineer.

2.3 Field Testing.

2.3.1 Equipment. Dynamic pile testing field measurements shall be carried out using approved equipment, software and recording equipment. The data collected at the end of initial driving shall be analyzed using approved signal matching techniques and software.

2.3.2 Monitoring during driving. During pile driving, piles shall be instrumented and monitored with testing equipment satisfying the requirements of section 1.3 of this special provision.

2.3.2.1 The contractor shall install two sets of strain transducers and accelerometers near the top of each pile to be tested, and shall use a compatible measuring and recording system to record the data during driving.

2.3.2.2 The equipment required to be attached to the pile shall be appropriately positioned and fixed to the approval of the engineer.

2.3.2.3 The hammer and all site equipment used shall be capable of delivering an impact force sufficient to mobilize the specified pile capacity indicated in section 4.0 of this special provision without damaging the pile.

2.3.2.4 The testing equipment shall monitor pile stresses during driving to prevent pile damage and ensure pile integrity and capacity. If the testing equipment indicates overstressing or damage to the pile, the contractor shall immediately discontinue driving and notify the engineer.

2.3.2.5 If the testing equipment determines that pile stresses during driving exceed acceptable levels, a new pile driving system, modifications to existing system or new pile installation procedures shall be proposed by the contractor. Approval by the engineer of any proposed changes to the pile driving system or pile installation procedures will be based upon the results of additional wave equation analyses in accordance with section 2.1.2 of this special provision.

2.3.3 Preparation of the Pile Head. The preparation of the pile head for the application of dynamic test load shall involve, where appropriate, trimming the head, cleaning, and building up the pile using materials that shall, at the time of testing, safely withstand the impact stresses. The impact surface shall be flat and at right angles to the pile axis.

2.3.4 Dynamic Measurement and Analysis. Monitoring of pile driving shall begin when pile driving begins. The data shall be recorded and processed immediately in the field by the pile driving monitoring equipment and software. Unless monitoring indicates that additional driving will damage the pile, pile driving and monitoring shall continue until both the specified pile tip elevation and the specified pile capacity are reached. For each pile tested, pile driving analysis using signal matching techniques shall be performed for a selected blow at the end of driving to determine the relative capacities from end bearing and skin friction along the pile.

2.3.4.1 The engineer may request use of pile driving monitoring equipment and software on additional piles if inconclusive results are obtained or unusual driving conditions are encountered.

2.3.4.2 Pile bearing capacity and integrity shall be evaluated based on the standard procedure used in practice.

2.3.4.3 Tabular records of the dynamic pile testing field measurements obtained at the end of initial driving shall be immediately provided to the engineer by the contractor.

2.3.5 Results.

2.3.5.1 Preliminary Reports. The contractor shall prepare a preliminary report for each pile tested for review by the engineer. Each report shall contain tabular as well as graphical presentation of the dynamic test results versus depth. Each report shall also indicate the pile driving criteria for the additional piles to be installed at the substructure unit of the pile tested. Each preliminary report shall include the following:

(a) The maximum force applied to the pile head.

(b) The maximum pile head velocity.

(c) The maximum energy imparted to the pile.

(d) The assumed soil damping factor and wave speed.

(e) Static capacity estimate.

(f) The maximum compressive and tensile forces in the pile .

(g) Pile integrity.

(h) Blows per inch.

(i) Stroke.

(j) Summary results of pile driving analysis from selected blow analyzed using signal matching techniques and software.

2.3.5.2 Summary Report. The contractor shall prepare a summary report of all piles tested for review by the engineer. The report shall include the results of hammer performance, pile driving stresses, and pile capacity during initial driving for all piles tested. The report shall also include the following:

(a) Date of testing and date of pile installation.

(b) Pile identification number and location.

(c) All information given in preliminary reports as follows:

(1) Length of pile below commencing surface.

(2) Total length of pile, including projection above commencing surface at time of test.

(3) Length of pile from instrumentation position to tip.

(d) Hammer type, drop, and other relevant details.

(e) Blow selected for signal matching analysis.

(f) Maximum compressive and tensile stresses, stroke, and capacity versus penetration depth.

(g) Temporary compression.

(h) Pile integrity and location of damage, if any.

(i) Force/velocity versus time trace.

(j) Force/velocity match curve.

(k) Resistance distribution along the pile.

(l) Detailed graphical and tabular results from blow analyzed using signal matching techniques and software.

3.0 Schedule of Contract Submittals.

Item Number	Submittal Item	Type	Calendar Days	Event/Date	Liquidated Damages Apply
1	Proposed independent dynamic pile testing consultant, and a listing of assigned personnel and their experience and qualifications.	DOCS	45 Before	Start of Pile Driving Monitoring	No
2	Details of the components, method of testing, pile driving equipment and materials to be used, and the results of wave equations analyses.	DOCS	15 Before	Start of Pile Driving Monitoring	No
3	Two copies of each Preliminary Report as defined in section 2.3.5.1 of this special provision	DOCS	3 After	Completion of Each Field Test	No
4	Four copies of the Summary Report as defined in section 2.3.5.2 of this special provision	DOCS	7 After	Completion of All Field Tests	No

4.0 High-Strain Dynamic Pile Testing Specification.

Item	Requirement
Wave Equation Analysis	Minimum of 1 and sufficient additional analyses as needed to define performance for all combinations of piles, driving systems and subsurface conditions anticipated.
Dynamic Testing Pile Capacity	Nominal Axial Pile Compressive Resistance or 2.25 times the Design Bearing shown on the plans or as required by engineer
End of Initial Driving Test Frequency	As shown in the contract plans
Pile Driving Analyses using Signal Matching Techniques	For each End of Initial Driving Test

5.0 Method of Measurement. Dynamic pile testing will be measured per each.

6.0 Basis of Payment. Payment for the above described work, including all material, equipment, tools, labor and any other incidental work necessary to complete this item, will be considered completely covered by the contract unit price for “Dynamic Pile Testing”.

C. HYDROPHILIC WATERSTOP

1.0 Description. This work shall consist of fabricating and installing hydrophilic waterstops between the raised sidewalks and roadway surface of Bridge A48441 as shown on the plans.

2.0 Materials. Waterstops shall be made of hydrophilic, non-bentonite composition manufactured solely for the purpose of preventing water from traveling through construction joints. Volumetric expansion shall be limited to 3 times maximum.

3.0 Approved Products. The following are approved manufacturer products:

a) Sika (Hydrotite CJ)

b) Adeka (Ultra Seal USA)

c) DeNeef (Swellseal WA)

d) Approved Equal

4.0 Construction Requirements. Hydrophilic waterstops shall be installed per manufacturer’s recommendations.

5.0 Method of Measurement. No measurement shall be made.

4.0 Basis of Payment. Payment for the above described work, including all material, equipment, labor and any other incidental work necessary to complete this item, will be included in the contract unit price for Sidewalk (Bridges) per square foot.

PRELIMINARY - NOT FOR CONSTRUCTION

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

(DRAINAGE)
JOB SPECIAL PROVISIONS TABLE OF CONTENTS
(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

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	CIVIL DESIGN, INC. *5220 Oakland Avenue* *St. Louis, MO 63110* Certificate of Authority: 006804 Consultant Phone: 314-863-5570
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J6S1718, J6S1718B, and J6S1718C ST. LOUIS COUNTY, MO DATE PREPARED: 02/12/2021
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Drainage) are authenticated by this seal: D-A. thru D-E.	

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

JOB
SPECIAL PROVISION
(DRAINAGE)

D-A. Adjusting Manholes, Inlets, Valves and Pull Boxes

1.0 Height Adjustment. Regardless of type or size, the manholes, inlets, valves and pull boxes shown in the plans require adjustment to match the new grade of pavement. The existing manholes shall be adjusted and installed according to standard plan 731.00U. Adjusting rings shall not exceed 12 inches in height.

2.0 Concrete Collars. Damaged concrete collars on manholes shall be replaced as directed by the engineer. The replacement concrete collars shall be 4 inches deep and 18 inches wide around the manhole.

3.0 The contractor is advised that the Metropolitan St. Louis Sewer District, MoDOT, St Louis City -Water Division, and St. Louis City Traffic/Lighting Division have manholes, valves and/or and pull boxes located within the project limits that will require adjustments. The Contractor shall adjust these facilities to grade as necessary. The Contractor shall contact the respective utility regarding any questions regarding the adjustment of these facilities.

3.1 The contractor shall notify the engineer if manholes, valves or pull boxes belonging to utilities other than those listed above are encountered that will require adjustment. The contractor shall coordinate work with the affected utility to ensure that the completed facilities meet ADA requirements.

4.0 Basis of Payment. All costs associated with compliance with this special provision for all material, equipment, and labor shall be completely covered by the contract unit price for:

Item Number	Type	Description
604-99.02	Each	Adjusting Manholes, Inlets, Valves and Pull Boxes

5.0 Pull boxes not owned by MoDOT or the municipality or specified as required work by the Contractor may require adjustment due to work in the contract. The Contractor shall contact the respective utility owners regarding any questions about the adjustment of these facilities. The Contractor shall contact the respective utility owner, at least 3 weeks prior to adjustment of these facilities to allow the utility owner to make necessary adjustments. The Contractor shall coordinate with the respective utility owners for scheduling and providing the necessary grade requirements for each adjustment. Payment for all necessary work required for the coordination for the scheduling, grade requirements and adjustments of these utility facilities shall be at no direct pay.

Contractor shall directly contact Utility companies to verify location of facilities and status of relocation/adjustment work. The contractor shall coordinate construction activities with Utility Companies and take measures to ensure the integrity of the existing facilities are not disturbed until such time as the Utility Companies have completed the adjustment work.

The Commission cannot warrant the information above which was provided by the utility owners.

D-B. MSD As-Built Submittals (18MSD-00549)

1.0 Description. Metropolitan St. Louis Sewer District (MSD) requires as-built drawings of the constructed drainage facilities to be submitted for their records. The contractor shall perform all work necessary to produce and submit the final as-built drainage plans to MSD, per MSD's as-built submittal requirements. The contractor shall submit the MSD as-builts for 18MSD-00549 and subsequent revisions after all drainage structures related to the project have been constructed or adjusted.

1.1 The contractor shall provide a copy of the as-built drainage plans to the MoDOT engineer at the time of the MSD submittal.

2.0 Basis of Payment. No direct payment will be made for this item and shall be considered incidental to the following:

Item Number	Type	Description
627-40.00	Lump Sum	Contractor Furnished Surveying and Staking

D-C. Culvert Clean Out

1.0 Description. This work shall consist of removal of debris and silt from existing drop inlets, and manholes and the connecting inlet and outlet pipe at locations designated on the plans or by the Engineer.

2.0 Construction Requirements. The designated drop inlet/manhole and inlet/outlet outlet pipe shall be cleaned by a method and process approved by the Engineer. All debris and silt shall be removed from the drop inlet prior to cleanout of the outlet pipe. Removed material shall be properly disposed of by the contractor off the right of way. The entire outlet pipe from the drop inlet to the next drainage structure downstream shall be cleaned out. Upon completion of the cleanout, the drop inlet and pipe shall be thoroughly flushed with water.

3.0 Method of Measurement. Measurement for culvert cleanout will be made per each.

4.0 Basis of Payment. The accepted quantity of culvert cleanout will be paid for at the contract unit price for:

Item Number	Type	Description
206-35.00	Each	Culvert Cleanout

Payment will be considered full compensation for all labor, equipment, and material necessary to clean out the designated culverts and drop inlets and manholes.

D-D. MSD Drainage Structures

1.0 Description. Metropolitan St. Louis Sewer District (MSD) standard drainage structures will be used on this project at the locations specified on the plans. Contractor shall follow the

Metropolitan St. Louis Sewer District Standard Specifications for Sewers and Drainage Facilities (current edition) for standard details.

2.0 Basis of Payment. Payment for work associated with these drainage structures will include all assemblies necessary to build and install the entire structure, including all materials, equipment, labor and work will be made under the bid items for MSD drainage structures included in the contract.

The accepted quantity for drainage structures will be paid for at the contract unit price for:

Item Number	Type	Description
731-99.02	Each	Precast Manhole 48”
731-99.02	Each	Precast Manhole 60”
731-99.02	Each	Precast Manhole 72”
731-99.02	Each	Area Inlet 58”x58”
731-99.02	Each	Single Street Inlet 54”x48”
731-99.02	Each	Single Street Inlet Trapped 54”x48”
731-99.02	Each	Double Street Inlet 108”x52”
731-99.02	Each	Double Street Inlet Trapped 108”x52”
731-99.02	Each	2-Grate Inlet 48”x48”
731-99.02	Each	2-Grate Inlet with Side Intake 48”x48”
731-99.02	Each	2-Grate Inlet with Side Intake Trapped 48”x48”

D-E. ADA Compliant Grate

JSP is still under development

(LANDSCAPE ARCHITECTURE)
JOB SPECIAL PROVISIONS TABLE OF CONTENTS

(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

PRELIMINARY - NOT FOR CONSTRUCTION

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
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	PLANNING DESIGN STUDIO *P.O. Box 179279* *St. Louis, MO 63117* Certificate of Authority: 001845 Consultant Phone: 314-241-3600
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	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Landscape Architecture) are authenticated by this seal: L-M. thru L-R.	

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

JOB
SPECIAL PROVISION
(LANDSCAPE ARCHITECTURE)

L-A. Aesthetic Requirements of Precast Concrete Modular Block Walls – Job J6S1718B Only

1.0 Description. This work shall consist of furnishing and constructing precast concrete modular block walls, with or without geosynthetic reinforcement, based on the following aesthetic and general requirements.

1.1 Administrative Requirements.

1.1.1 Preconstruction Meeting. As directed by the Owner, the Contractor shall schedule a preconstruction meeting at the project site prior to commencement of retaining wall construction. Participation in the preconstruction meeting shall be required of the Contractor, Retaining Wall Design Engineer, any sub-contractors performing work around the retaining walls, and the Resident Engineer. The Contractor shall provide notification to all parties at least 10 calendar days prior to the meeting.

1.1.2 Preconstruction Meeting Agenda:

1.1.2.1 The Retaining Wall Design Engineer shall explain all aspects of the retaining wall construction drawings.

1.1.2.2 The Retaining Wall Design Engineer shall explain the required bearing capacity of soil below the retaining wall structure and the shear strength of in-situ soils assumed in the retaining wall design to the Resident Engineer.

1.1.2.3 The Retaining Wall Design Engineer shall explain the required shear strength of fill soil in the reinforced, retained and foundation zones of the retaining wall.

1.1.2.4 The Retaining Wall Design Engineer shall explain any measures required for coordination of the installation of utilities or other obstructions in the reinforced or retained fill zones of the retaining wall.

1.1.2.5 The Retaining Wall Installation Contractor shall explain all excavation needs, site access and material staging area requirements to the Contractor.

1.2 Delivery, Storage and Handling.

1.2.1 The Retaining Wall Installation Contractor shall inspect the materials upon delivery to ensure that the proper type, grade and color of materials have been delivered.

1.2.2 The Retaining Wall Installation Contractor shall store and handle all materials in accordance with the manufacturer's recommendations as specified herein and in a manner that prevents deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, UV exposure or other causes. Damaged materials shall not be incorporated into the work.

1.2.3 Precast modular blocks shall be stored in an area with positive drainage away from the blocks. Be careful to protect the block from mud and excessive chipping and breakage. Precast modular blocks shall not be stacked more than three (3) units high in the storage area.

1.0 Precast Modular Block Retaining Wall Units.

2.1 Each concrete block shall be cast in a single continuous pour without cold joints.

2.2 Without field cutting or special modification, the precast modular block units shall be capable of achieving a minimum radius of 14 ft - 6 in (4.42 m).

2.3 The precast modular block unit face texture shall be selected by the owner from the available range of textures available from the precast modular block manufacturer. Each textured block facing unit shall have a unique texture pattern that repeats with a maximum frequency of once in any 15 square feet (1.4 square meters) of wall face. Anticipated texture to be Ledgestone.

2.4 The block color shall be selected by the owner from the available range of colors available from the precast modular block manufacturer. Anticipated color to be Rosemary.

2.5 All precast modular block units shall be sound and free of cracks or other defects that would interfere with the proper installation of the unit, impair the strength or performance of the constructed wall. PMB units to be used in exposed wall construction shall not exhibit chips or cracks in the exposed face or faces of the unit that are not otherwise permitted. Chips smaller than 1.5” (38 mm) in its largest dimension and cracks not wider than 0.012” (0.3 mm) and not longer than 25% of the nominal height of the PMB unit shall be permitted. PMB units with bug holes in the exposed architectural face smaller than 0.75” (19 mm) in its largest dimension shall be permitted. Bug holes, water marks, and color variation on non-architectural faces are acceptable. PMB units that exhibit cracks that are continuous through any solid element of the PMB unit shall not be incorporated in the work regardless of the width or length of the crack.

3.0 Precast Modular Block Wall System Installation.

3.0.1 The precast modular block structure shall be constructed in accordance with the construction drawings, these specifications and the recommendations of the retaining wall system component manufacturers. Where conflicts exist between the manufacturer’s recommendations and these specifications, these specifications shall prevail.

3.0.2 Drainage components. Pipe, geotextile and drainage aggregate shall be installed as shown on the construction shop drawings.

3.0.3 Precast Modular Block Installation.

3.0.3.1 The first course of block units shall be placed with the front face edges tightly abutted together on the prepared leveling pad at the locations and elevations shown on the construction drawings. Contractor shall take special care to ensure that the bottom course of block units are in full contact with the leveling pad, are set level and true and are properly aligned according to the locations shown on the construction drawings.

3.0.3.2 The elevation of retained soil fill shall not be less than 1 block course (18 inches (457 mm)) below the elevation of the reinforced backfill throughout the construction of the retaining wall.

3.0.3.3 If included as part of the precast modular block wall design, cap units shall be secured with an adhesive in accordance with the precast modular block manufacturer's recommendation.

3.1 Wall Infill and Reinforced Backfill Placement.

3.1.1 Compactive effort within 3 feet of the back of the precast modular blocks should be accomplished with walk-behind compactors. To avoid damage to the installed blocks, heavy equipment should not be operated within 3 feet of the back of the precast modular blocks.

3.1.2 At the end of each work day, the Retaining Wall Installation Contractor shall grade the surface of the last lift of the granular wall infill to a 3% ± 1% slope away from the precast modular block wall face and compact it.

3.1.3 The Contractor shall protect the precast modular block wall structure against surface water runoff at all times through the use of berms, diversion ditches, silt fence, or any other necessary measures to prevent soil staining of the wall face, scour of the retaining wall foundation or erosion of the reinforced backfill or wall infill.

3.2 Obstructions in the Infill and Reinforced Fill Zone.

3.2.1 The Retaining Wall Installation Contractor shall make all required allowances for obstructions behind and through the wall face in accordance with the approved construction shop drawings.

3.2.2 Should unplanned obstructions become apparent for which the approved construction shop drawings do not account, the affected portion of the wall shall not be constructed until the Retaining Wall Design Engineer can appropriately address the required procedures for construction of the wall section in question.

3.3 Completion.

3.3.1 For walls supporting unpaved areas, a minimum of 12" (300 mm) of compacted, low-permeability fill shall be placed over the granular wall infill zone of the precast modular block retaining wall structure. The adjacent retained soil shall be graded to prevent ponding of water behind the completed retaining wall.

3.3.2 For retaining walls with crest slopes of 5H:1V or steeper, silt fence shall be installed along the wall crest immediately following construction. The silt fence shall be located 3' to 4' (0.9 m to 1.2 m) behind the uppermost precast modular block unit. The crest slope above the wall shall be immediately seeded to establish vegetation. The Contractor shall ensure that the seeded slope receives adequate irrigation and erosion protection to support germination and growth.

L-B. Pedestrian Underpass Phenolic Panel System – Job J6S1718B Only

1.0 Description. This section includes the exterior solid phenolic cladding panel system and accessories as required for a complete drained and back-ventilated system for the pedestrian underpass tunnel.

2.0 References.

2.1 ASTM International (ASTM).

2.1.1 ASTM B 117 - Standard Practice for Operating Salt Spray (Fog) Apparatus.

2.1.2 ASTM D 635 - Standard Test Method for Small Scale Burning.

2.1.3 ASTM D 1929 - Standard Test Method for Ignition Temperature.

2.0.1.4 ASTM D 2244 - Standard Practice for Calculation of Color Tolerances and Color Differences from Instrumentally Measured Color Coordinates.

2.1.5 ASTM D 2247 - Standard Practice for Testing Water Resistance of Coatings in 100% Relative Humidity.

2.1.6 ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials.

2.1.7 ASTM E 119 - Standard Test Method for Fire Rated or Fire Resistive Construction.

2.1.8 ASTM E 330 - Standard Test Method for Structural Performance of Exterior Windows, Curtain Walls, and Doors Under the Influence of Wind Loads.

2.2 International Organization for Standardization (ISO).

2.2.1 ISO 105 A02-93 - Tests for Color Fastness -- Part A02: Grey scale for assessing change in color.

2.2.2 ISO 178 - Determination of Flexural Properties.

2.2.3 ISO 527-3 - Determination of Tensile Properties.

2.2.4 ISO 846 - Evaluation of the Action of Organisms.

2.3 National Fire Protection Association (NFPA):

2.3.1 NFPA 268 - Standard Test Method for Determining Ignitibility of Exterior Wall Assemblies Using a Radiant Heat Energy Source.

2.3.2 NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Non-Load-Bearing Wall Assemblies Containing Combustible Components.

3.0 Submittals.

3.1 Product Data. Manufacturer's data sheets on each product to be used, including:

3.1.1 Preparation instructions and recommendations.

3.1.2 Storage and handling requirements and recommendations.

3.1.3 Installation methods.

3.2 Shop Drawings. Submit plan, section, elevation and perspective drawings necessary to describe and convey the layout, profiles and product components, including edge conditions, panel joints, fixture location, anchorage, accessories, finish colors, patterns and textures

3.3 Code Compliance. Documents showing product compliance with local building code shall be submitted. These documents shall include, but not be limited to, appropriate Evaluation Reports and/or test reports supporting the use of the product. Alternate materials must be approved by the engineer of record prior to the bid date.

3.4 Engineering Calculations. Submit engineering calculations as required by the local building code, showing that the installed panels and attachments system meets the wind load requirements for the project.

3.5 Selection Samples. For each finish product specified, two complete sets of color chips representing manufacturer's full range of available colors and patterns. Please note that samples are only representative for color and pattern and not for thickness or edge finish. Metallic colors may also show a slight fluctuation in appearance due to the metal flake orientation from batch to batch

3.6 Verification Samples. For each finish product specified, two samples a minimum of 3.5 inches by 3.5 inches (89 mm by 89 mm) representing actual product, color, and patterns. Sample edges may vary from field panel edges.

3.7 Operation and Maintenance Data. Submit operation, maintenance, and cleaning information for products covered under this section.

4.0 Quality Assurance.

4.1 Manufacturer Qualifications. All panel products specified in this section will be supplied by a single manufacturer with a minimum of 25 years' experience.

4.1.1 Products covered under the Work listed in this section are to be manufactured in an ISO 9001 certified facility.

4.1.2 Products covered under the work listed in this section are to be manufactured in an ISO 14001 Certified facility.

4.2 Installer Qualifications. All products listed in this section are to be installed by an installing firm who can prove 3 years in business and exemplary workmanship. Installing firm must have evidence of installing wall panel systems and is suitable for the execution of the work.

4.3 Mock-Up. Provide a mock-up for evaluation of the product and application workmanship. Mock-up shall include 2-3 panels in order to observe joints and fastening methods.

4.3.1 Do not proceed with remaining work until workmanship, color, and sheen are approved by Engineer.

4.3.2 Pre-Installation Meetings. Conduct pre-installation conference to verify project requirements, substrate conditions, manufacturer's installation instructions and manufacturer's warranty requirements.

5.0 Delivery, Storage, and Handling.

5.1 Delivery.

5.1.1 During transportation, use stable, flat pallets that are at least the same dimension as the sheets.

5.1.2 Materials shall be packaged to minimize or eliminate the possibility of damage during shipping. Items such as wooden side boards, wooden lid, and spacers or protective sheeting between panels shall be used to protect the panels from surface and/or edge damage.

5.2 Storage.

5.2.1 Store products in an enclosed area protected from direct sunlight, moisture and heat. Maintain a consistent temperature and humidity.

5.2.2 Store products in manufacturer's and/or fabricators unopened packaging until ready for installation.

5.2.3 Stack panels using protective dividers to avoid damage to decorative surface.

5.2.4 For horizontal storage, store sheets on pallets of equal or greater size as the sheets with a protective layer between the pallet and sheet and on top of the uppermost sheet.

5.2.5 Do not store sheets, or fabricated panels vertically.

5.3 Handling.

5.3.1 Remove protective film within 24 hours of the panels being removed from the pallet.

5.3.2 When moving sheets, lift evenly to avoid dragging panels across each other and scratching the decorative surface.

5.3.3 Remove all labels and stickers immediately after installation.

6.0 Project Conditions.

6.1 Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

6.2 Field Measurements. Verify actual measurements/openings by field measurements performed by the installer prior to release for fabrication. Recorded measurements to be indicated on shop drawings based on field measurements provided by the installer. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

7.0 Warranty.

7.1 Warranty. At project closeout, provide manufacturer's limited warranty documentation and material data property sheet.

8.0 Method of Measurement.

8.1 The Engineer will measure the square footage of wall panels installed.

9.0 Basis of Payment. Payment for the accepted quantity of Pedestrian Underpass Phenolic Panel System will be made in accordance with the contract unit bid price for the items listed below and includes all labor, materials, incidental items, equipment and supervision required to design, prepare shop drawings, manufacture, fabricate furnish and install.

Item No.	Unit	Description
703-99.04	SQFT	Pedestrian Underpass Wall Panel
703-99.04	SQFT	Pedestrian Underpass Wave Panel

10.0 Manufacturers.

10.1 Acceptable Manufacturer. Trespa International B.V.; P.O. Box 110, 6000 AC Weert Wetering 20, 6002 SM Weert The Netherlands; www.trespa.com or approved equal.

10.2 Acceptable Manufacturer's Representative. Local Trespa representative is R-S Products, Inc., P.O. Box 356, Ballwin, Mo. 63122-0356. Contact Allison Boss (636-448-5440); (aboss@rsstl.com) or Scott Brumbach (636-262-4320); (sjbrumbach@rsstl.com) or approved equal.

10.3 National office -Trespa North America, Ltd.; 350 5th Ave Suite 4610 New York, New York 10118. ASD. Toll Free Tel: (800) 4-TRESPA. Tel: (858) 679-2090. Fax: (858) 679-9568. Email: info.northamerica@trespa.com. Web: http://www.trespa.com/na or approve equal.

11.0 Wall Panels.

11.1 Solid Phenolic Wall Panels. Trespa Meteon by Trespa International B. V. as represented by Trespa North America, LTD. Or approved equal.

11.1.1 Material. Solid panel manufactured using a combination of high pressure and temperature to create a flat panel created from thermosetting resins, homogenously reinforced with natural fibers and an integrated decorative surface or printed décor.

11.1.2 Panel Size: 8’x6’’

11.1.3 Panel Thickness: 10mm (3/8”)

11.1.4 Panel Type: Single sided decorative, or double sided decorative, or Varitop, or Duocolor.

11.1.5 Panel Decor: Unicolor. As selected by the Engineer from manufacturer's standard decor palette, see Standard Delivery Program North America.

11.1.6 Panel Core: Fire retardant (FR) black core.

11.1.7 Physical Properties.

11.1.7.1 Modulus of Elasticity. 1,300,000 psi (9000 N/mm2) minimum, ISO 178.

11.1.7.2 Tensile Strength. 10,100 psi (70 N/mm2) minimum, ISO 527-2.

11.1.7.3 Flexural Strength. 14,500psi (120 N/mm2) minimum, ISO 178.

11.1.7.4 Thermal Conductivity. 2.1 BTU/inch/ft2.hr.°F, EN 12524.

11.1.7.5 Structural Performance (ASTM E330):

11.1.7.5.1 Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 15 pounds per square foot (psf). Wind load testing shall be done in accordance with this standard to obtain the following results:

11.1.7.5.2 Normal to the plane of the wall, the maximum panel deflection shall not exceed L/175.

11.1.7.5.3 Normal to the plane of the wall between supports, deflection of the aluminum sub-framing members shall not exceed L/175 or 3/4 inch, whichever is less.

11.1.7.5.3.1 At 1-1/2 times design pressure, permanent deflection of framing members shall not exceed L/100 of span length and components shall not experience failure or gross permanent distortion.
11.1.7.5.3.2 If system tests are not available, mockups shall be constructed, and tests performed under the direction of an independent third party laboratory which show compliance to the minimum standards listed above.

11.1.7.6 Fire Performance.

11.1.7.6.1 Flame Spread. Class A, Less than 25, ASTM E 84.

11.1.7.6.2 Smoke Development. Less than 450, ASTM E 84.

11.1.7.6.3 Ignition Temperature. Greater than 650 degree F (350 degree C) above ambient, ASTM D1929.

11.1.7.6.4 Burning Classification. CC1 or CC2, ASTM D635.

11.1.7.6.5 When required for compliance with local building codes, the wall cladding assembly shall show no degradation of the rating of Fire-Resistant Assemblies, ASTM E119.

11.1.7.6.6 When required for compliance with local building codes, the wall cladding assembly including cladding and non-cladding elements such as, but not limited to, specific weather resistive barriers and/or exterior insulation materials, shall meet the performance requirements of NFPA 285. Performance shall be determined by actual testing in accordance with NFPA 285 or through an equivalency analysis provided by a recognized fire protection expert.

11.1.7.6.7 When required for compliance with local building codes, the wall cladding assembly shall not ignite when exposed to a radiant heat energy source, NFPA 268.

11.1.7.7 Finish Performance. Electron Beam Cure resin in conformance with the following general requirements:

11.1.7.7.1 Decor. As selected by the Engineer from manufacturer's standard decors or a custom color to be matched by the panel supplier.

11.1.7.7.2 Humidity Resistance. No formation of blisters when subjected to condensing water fog at 100% relative humidity and 100 degree F (38 degree C) for 3000 hours, ASTM D 2247.

11.1.7.7.3 Salt Spray Resistance. Corrosion creepage from scribe line (1/16 inch (1.6 mm) max.) and minimum blister rating of 8 within the test specimen field, ASTM B117.

11.1.7.7.4 Weather Exposure. Tested to two standards using a Xenon Arc Light and water to simulate weather exposure.

11.1.7.7.4.1 Florida test cycle of 3000 hours=10 years (vertical application).

11.1.7.7.4.2 EN 438-2:29 Western European test cycle of 1000 hours=10 years (vertical application)

11.1.7.7.5 Color Stability. The decorative surface comply with, classification, 4 - 5 measured with the grey scale according to ISO 105 A02-93 according to test method EN 438-2:29.

11.1.7.7.6 Microbial Characteristics. Will not support micro-organic growth (ISO 846).

11.1.7.8 Mounting Systems.

11.1.7.8.1 TS210 - Concealed fastening over fixed depth aluminum sub-framing.

11.1.7.8.2 Other installation systems - Include test documentation showing compliance with the performance criteria set forth in the specification and in accordance with the local building code.

11.1.7.9 Aluminum Sub Structure. Aluminum sub-structure designed to withstand structural loading due to wind load and the dead load of the panel, painted as required to conceal behind the open joinery of the attachment system.

11.1.7.9.1 Extrusions, including corner closures, joint closures and vent screens, formed members, sheet, and plate shall conform with the recommendations of the manufacturer.

11.1.7.10 Extruded Aluminum Trim. Black.

11.1.7.11 Fasteners (Concealed/Exposed). Fasteners shall be non-corrosive and as recommended by panel manufacturer. Exposed fasteners shall be colored to match panels where required by the Engineer.

12.0 Fabrication.

12.1 Panels. Solid phenolic wall panels with no voids, air spaces or foamed insulation in the core material.

12.2 Accessory items in accordance with manufacturer's recommendations and approved submittals.

12.3 Panel Weight. 8 mm (2.4 lb/ft2), 10 mm (3 lb/ ft2), 13 mm (3.8 lb/ ft2).

12.4 Panel Bow. = 2 mm / m (= 0.079 inch/39.38 inches).

12.5 Panel Dimensions. Field fabrication shall be allowed where necessary but shall be kept to a minimum. All fabrication shall be done under controlled shop conditions when possible.

12.6 Appearance. Panel lines, breaks, and angles shall be sharp, true, and surfaces free from warp and buckle.

13.0 Examination.

13.1 Do not begin installation until substrates have been properly prepared.

13.2 Surfaces to receive panels shall be even, smooth, dry, and free from defects detrimental to the installation of the panel system. Notify Contractor in writing of conditions detrimental to proper and timely completion of the work.

13.3 Confirm exterior sheathing is plumb and level, with no deflection greater than 1/4 inch (6 mm) in 20 feet (6096 mm).

13.4 If substrate preparation is the responsibility of another installer, notify Engineer of unsatisfactory preparation before proceeding.

13.5 Do not proceed with installation until unsatisfactory conditions have been corrected.

14.0 Preparation.

14.1 Clean surfaces thoroughly prior to installation.

14.2 Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

15.0 Installation.

15.1 Install solid phenolic wall panels and sub-frame system in accordance with manufacturer's instructions.

15.2 Install solid phenolic wall panels plumb and level and accurately spaced in accordance with manufacturer's recommendations and approved submittals and drawings.

15.3 Anchor panels and sub-framing securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary movement and structural support.

15.4 Fasten solid phenolic wall panels with fasteners approved for use with supporting substrate.

15.5 Do not install panels or component parts which are observed to be defective or damaged including, but not limited to: warped, bowed, abraded, scratched, and broken members.

15.6 Do not cut or trim component parts during installation in a manner that would damage the finish, decrease the strength, or result in visual imperfection or a failure in performance. Return component parts with require alteration to the shop for re-fabrication or replacement.

15.7 Install profiles and trim with fasteners appropriate for use with adjoining construction as indicated on the Contract Drawings and as recommended by manufacturer.

16.0 Adjusting and Cleaning.

16.1 Remove masking or panel protection as soon as possible after installation. Any masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor to remove.

16.2 Adjust final panel installation so that all joints are true and even throughout the installation. Panels out of plane shall be adjusted with the surrounding panels to minimize any imperfection.

16.3 Repair panels with minor damage. Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor.

16.4 Clean finished surfaces as recommended by panel manufacturer. After installation cleaning, cleaning during construction shall become the responsibility of the General Contractor.

L-C. Pedestrian Underpass Lighting – Job J6S1718B Only

1.0 Description. This section includes furnishing all materials and labor required for the installation of lighting, controllers, wiring, conduit and other related accessories for the lighting of the pedestrian underpass. The work includes:

1.1 Bollard luminaries at pedestrian underpass.

1.2 Interior luminaries at pedestrian underpass.

2.0 References.

2.1 ANSI/NFPA 70 National Electrical Code.

3.0 Project Record Documents.

3.1 Accurately record actual locations of each luminaire.

4.0 Qualifications.

4.1 Manufacturer: Company specializing in manufacturing products specified in this Section with minimum three years documented experience.

5.0 Regulatory Requirements.

5.1 Conform to requirements of ANSI/NFPA 70.

5.2 Furnish products listed and classified by Underwriters Laboratories, Inc. or other testing firm acceptable to authority having jurisdiction as suitable for purpose specified and shown.

6.0 Delivery, Storage, and Handling.

6.1 Accept products on site. Inspect for damage.

7.0 Warranties.

7.1 Provide 5-year warranty on all LED fixtures.

8.0 Products.

8.1 Luminaires.

8.1.1 Furnish the following products as indicated on Drawings.

8.1.2 Twin Fixture and Pole Assembly: Altitude ALT 1 by Kim Lighting, represented by LEC & Company. 314.298.7500, www.lecwb.com or equal.

8.1.2.1 Model Numbers: Kim ALT1-28L-40-3K7-5W-UNV-A34-XX-7PR-HDL-SW7PR (Fixtures) and Kim PRA14-4125-TWIN ALT1 FIXTURES AT 180-XX (14' Pole)

8.1.3 Interior Luminaries: Pursuit-Bidirectional by Architectural Area Lighting, represented by LEC & Company. 314.298.7500, www.lecwb.com or equal.

8.1.4 Model Number: AAL RN-ID-88'-250LM/FT-3K8-AS-AS-DL-UNV-W-EMFX-SWP-XXX-SWUSB

8.1.5 LED Lamps.

8.1.5.1 Per fixture Led color temperature binning +/- 275K from specified fixture color temperature.

8.1.5.2 Minimum 70CRI.

8.1.5.3 LEDs meet or exceed LM79 standard.

8.1.6 Luminaire to be IP66 rated.

8.2 Foundations and Bases.

8.2.1 Concrete, as indicated on plans, provide reinforcing as indicated on plans, or as recommended by the manufacturer.

8.3 LED Drivers.

8.3.1 UL listed.

8.3.2 Minimum .9 power factor.

8.3.3 Less than 20% THD.

8.3.4 Minimum 9kV surge suppression protection.

8.3.5 Voltage: Match luminaire voltage.

8.4 Provide a disconnecting means for each circuit at the fixture.

9.0 Examination.

9.1 Examine each luminaire to determine suitability for lamps specified.

10.0 Installation.

10.1 Install in accordance with manufacturers' instructions.

10.2 Install lamps in each luminaire.

10.3 Bond luminaires and metal accessories to branch circuit equipment grounding conductor.

11.0 Field Quality Control.

11.1 Operate each luminaire after installation and connection. Inspect for improper connections and operation.

12.0 Adjusting.

12.1 Aim and adjust luminaires to provide illumination levels and distribution as directed. This work will be completed at night after hours. Contractor shall provide all labor to aim fixtures as directed by the Engineer.

12.2 Relamp luminaires which have failed lamps at Date of Substantial Completion.

13.0 Cleaning.

13.1 Clean electrical parts to remove conductive and deleterious materials.

13.2 Remove dirt and debris from enclosure.

13.3 Clean photometric control surfaces as recommended by manufacturer.

13.4 Clean finishes and touch up damage.

14.0 Method of Measurement. Measurement shall be made in accordance with Sec 901.

14.1 Basis of Payment. Payment for the accepted quantity of light fixtures installed will be made in accordance with the contract unit bid price for the items listed below and includes all labor, materials, incidental items, equipment, meters, panels, boxes, connections, accessories and supervision required to design, prepare shop drawings, manufacture, fabricate, furnish and install.

Item No.	Unit	Description

901-99.02	EA	F1-LED Twin Fixture and Pole Assembly at Underpass
901-99.02	EA	F2-LED Underpass Up/Down Fixture, 4 Foot Length
901-99.02	EA	F2-LED Underpass Up/Down Fixture, 8 Foot Length

L-D. Pedestrian Underpass Interior Paint – Job J6S1718B Only

1.0 Description. This work shall consist of all labor and materials necessary for providing and installing acrylic-based primer and finish coating for the interior of the pedestrian underpass.

2.0 Submittals.

2.1 Product Data. Submit manufacturer's product data and installation instructions for each material and product used. Include manufacturer's Material Safety Data Sheets.

3.0 References.

3.1 ASTM D 412 Tensile Strength

3.2 ASTM D 522 Mandrel Bend Flexibility

3.3 ASTM D 2247 Moisture Resistance

3.4 ASTM D 3273 Mold Resistance

3.5 ASTM D 4541 Direct Tensile Bond

3.6 ASTM D 6904 Resistance to Wind Driven Rain

3.7 ASTM E 84 Flame Spread and Smoke Developed

3.8 ASTM E 96 Water Vapor Permeability

3.9 South Coast Air Quality Management District (SCAQMD) Rule 1113

3.10 U.S. Environmental Protection Agency (USEPA) EPA Method 24 VOC

3.11 NCHRP National Cooperative Highway Research Program

3.12 NCHRP 244 Chloride Ion Penetration Reduction

4.0 Quality Assurance.

4.1 Manufacturer's Qualifications. The manufacturer shall be a company with at least thirty-five years of experience in manufacturing specialty coatings and regularly engaged in the manufacture and marketing of products specified herein. The manufacturer shall have an ISO 9001:2008 certified quality system and ISO 14001:2004 certified environmental management system.

4.2 Installer's Qualifications. The contractor shall be qualified to perform the work specified by reason of experience. Contractor shall have at least 5 years experience in commercial coating

application and shall have completed at least 3 projects of similar size and complexity. Contractor shall provide proof before commencement of work that he/she will maintain and supervise a qualified crew of applicators through the duration of the work. When requested Contractor shall provide a list of the last three comparable jobs including the name, location, and start and finish dates for the work.

4.3 Mock-ups. The contractor shall install a mock-up using proposed application means and methods to a wall area of at least 25 sq. ft. (2.32 sq.m.) for evaluation and approval by the design professional, building owner, or owner's representative/quality assurance agent.

4.4 Field Quality Control Tests.

4.4.1 Conduct tests in accordance with ASTM D4541 on mock-up to verify adhesion of installed primer and top coat to prepared substrate. Test at least 3 specimens and report results to design professional, building owner, or owner's representative/quality assurance agent. Mock-up size shall be 3 feet by 3 feet.

4.4.2 Conduct tests during coating installation as directed by design professional, building owner, or owner's representative/quality assurance agent to verify adhesion throughout the course of the installation.

5.0 Delivery, Storage and Handling.

5.1 Deliver products in original packaging, labeled with product identification, manufacturer, batch number, and shelf life.

5.2 Store products in a dry area with temperature maintained between 50 and 85 degrees F (10 and 29 degrees C). Protect from direct sunlight. Protect from freezing. Protect from extreme heat (>90 degrees F [32 degrees C]).

5.3 Handle products in accordance with manufacturer's printed instructions.

6.0 Warranty.

6.1 Provide manufacturer's standard limited warranty.

7.0 Materials.

7.1 Concrete and stucco substrate primer. Acrylic-based, tinted, high-pH compatible primer/sealer.

7.1.1 80805 StoPrime Hot, as manufactured by Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120, Atlanta, Georgia 30331 or equal.

7.1.2 Performance and Physical Properties: Meet or exceed the following values for material cured at 73 degrees F (23 degrees C) and 50 percent relative humidity (unless otherwise specified).

7.1.2.1 Application. Spray, roller, or brush.

7.1.2.2 Working time. 10-20 minutes, depending on ambient conditions.

7.1.2.3 Adhesion to concrete. 680 psi (4.69 MPa), ASTM D 4541

7.1.2.4 Flame Spread Index. 0, ASTM E 84,

7.1.2.5 Smoke Developed. 10, ASTM E 84

7.1.2.6 Water vapor transmission. 30 perms (1720 ng/Pa.s.sq.m.), tested at 3 dry mils applied in one coat, ASTM E 96, wet cup method.

7.1.2.7 VOC. < 100 g/L, EPA 24, complies with SCAQMD Rule 1113

7.2 Concrete masonry substrate primer. Acrylic-based based, masonry block-filler/primer. Single component acrylic-based primer, containing acrylic polymer, and fine mineral fillers. Product shall comply with the following:

7.3 80804 StoPrime as manufactured by Sto Corp., 3800 Camp Creek Parkway, Building 1400, Suite 120, Atlanta, Georgia 30331

7.4 Performance and Physical Properties. Meet or exceed the following values for material cured at 73 degrees F (23 degrees C) and 50 percent relative humidity (unless otherwise specified).

7.4.1 Application. Spray, roller, or brush.

7.4.2 Working Time. 10-20 minutes.

7.4.3 Flame Spread. < 25, ASTM E 84

7.4.4 Smoke Developed. < 450, ASTM E 84

7.4.5 VOC: <100 g/L, EPA 24, Complies with SCAQMD Rule 1113

7.5 Finish Coating. Single component acrylic-based coating, containing acrylic polymer, and colored pigments. Product shall comply with the following:

7.5.1 80648 StoColor Acryl Plus, as manufactured by Sto Corp.

7.5.2 Performance and Physical Properties. Meet or exceed the following values for material cured at 73 degrees F (23 degrees C) and 50 percent relative humidity (unless otherwise specified).

7.5.2.1 Working Time. 10-30 minutes, depending on ambient conditions.

7.5.2.2 Application. Spray, roller, or brush.

7.5.2.3 Resistance to wind-driven rain. No water penetration, weight gain less than 0.02 lbs. (0.01 kg), ASTM D 6904

7.5.3 Tensile Strength. 386 psi (2.7 MPa), minimum at break, ASTM D 412

7.5.4 Elongation at Break. 306% minimum, ASTM D 412

7.5.5 Flexibility Mandrel Bend Elongation. No cracking (% elongation greater than 32) at -14 degrees F (-26 degrees C), ASTM D 522.

7.5.6 Moisture Resistance. No adhesion loss, discoloration, blistering, cracking, flaking, ASTM D 2247, 14 day exposure.

7.5.7 Mold Resistance. No Mold Growth at 90 days, ASTM D 3273

7.5.8 Adhesion to Concrete. 320 psi (2.20 MPa), ASTM D 4541

7.5.9 Water Vapor Permeability. 25 perms (1434 ng/Pa.s.sq.m.), tested at 10 dry mils applied in one coat, ASTM E 96, wet cup method.

7.5.10 Carbon Dioxide Diffusion Resistance Coefficient. 1,400,000, EN-1062

7.5.11 Carbon Dioxide Diffusion Resistance. 200 m

7.5.12 VOC. <50 g/L, EPA 24, Complies with SCAQMD Rule 1113

7.5.13 Chloride Ion Penetration Reduction. 90.7%, NCHRP-244, Phase 1 method.

7.5.14 Solids Content. 53%, by volume.

7.6 Color to be Sto Custom Color match from sample to be provided by Engineer.

8.0 Installation.

8.1 Surface Preparation.

8.1.1 All surfaces must be clean, dry, sound, and free of frost and contamination such as mildew, dirt, grease, oils, salts, efflorescence and any other contamination that may affect adhesion.

8.1.2 Coordinate installation with adjacent work to ensure proper sequence of construction. Protect adjacent areas and landscaping from contact due to mixing, handling, and installation of materials.

8.2 Mixing.

8.2.1 Mix Sto products in accordance with published literature for the product. Mix for approximately 3 minutes using a slow-speed drill and paddle to a uniform consistency. Avoid entrapping air in the liquid during mixing.

8.3 Application.

8.3.1 Apply primer to prepared substrate in accordance with written instructions presented on the Sto Product Bulletin for the primer product being used.

8.3.2 Apply two coats of StoCoat Acryl Plus at 8--10 wet mils, per coat, by brush, roller, or appropriate spray equipment. Apply first coat directly to primed substrate and allow to dry

completely before applying second coat. Final thickness of StoCoat Acryl Plus shall be 4.2 – 5.3 dry mils, per coat.

8.4 Protection.

8.4.1 Provide protection of installed materials from water infiltration into or behind them.

8.4.2 Provide protection of installed materials from dust, dirt, precipitation, freezing and continuous high humidity until they are fully dry.

8.4.3 Provide coping and/or flashing at sills, projecting features, deck attachments, roof/wall intersections, parapets and similar construction details to prevent water entry into wall assembly or into and behind the finish system. Seal penetrations through the finished wall surface with backer rod and sealant or other appropriate means to provide a watertight condition.

9.0 Method of Measurement. The Engineer will measure the square footage of the interior tunnel surface painted.

10.0 Basis of Payment. Payment for the accepted quantity of Pedestrian Underpass Interior Paint will be made in accordance with the contract unit bid price for the item listed below and includes all labor, materials, incidental items, equipment, accessories and supervision required to design, prepare shop drawings, manufacture, fabricate, furnish and install.

Item No.	Unit	Description
703-99.04	SQFT	Pedestrian Underpass Interior Paint

L-E. Pedestrian Underpass Cast Stone Masonry – Job J6S1718B Only

1.0 Description. This section includes the manufacture, delivery, and installation of Architectural Cast Stone as shown on the drawings and as described in this specification. Contractor shall furnish and install the Cast Stone covered by this specification. Any changes to the materials described in this specification will require prior approval from the City of Brentwood before ordering of the materials.

2.0 Reference Standards.

2.1 ASTM C 150 / C 150M - Standard Specification for Portland Cement.

2.2 ASTM C 1116 / C 1116M - Standard Specification for Fiber-Reinforced Concrete.
2.3 ASTM C 1364 - Standard Specification for Architectural Cast Stone.

2.4 Cast Stone Institute Standard Specification (www.caststone.org).

3.0 Definitions.

3.1 Cast Stone - A refined architectural concrete building unit manufactured to simulate natural cut stone, used in masonry applications.

3.2 Dry Cast – manufactured from zero slump concrete.

3.3 Vibrant Dry Tamp (VDT) casting method: Vibratory ramming of earth moist, zero-slump concrete against a rigid mold until it is densely compacted.

3.4 Machine casting method: Manufactured from earth moist, zero-slump concrete compacted by machinery using vibration and pressure against a mold until it becomes densely consolidated.

3.5 Wet Cast – Manufactured from measurable slump concrete.

3.6 Wet casting method. Manufactured from measurable slump concrete and vibrated into a mold until it becomes densely consolidated.

4.0 Submittals.

4.1 Product Data. Submit manufacturer's product data.

4.2 Shop Drawings. Submit manufacturer's shop drawings including profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, annotation of components, and their locations in project as indicated on the Drawings.

4.3 Shop Tickets. Submit manufacturer's shop tickets including profiles, cross sections, modular unit lengths, reinforcement, exposed faces, and annotation of components proposed for use in project according to cross sections as indicated on the Drawings.

4.4 Catalog Cuts. Submit manufacturer's catalog cuts showing page and product numbers of units proposed for use in project.

4.5 Verification Samples. Submit pieces of actual cast stone components, 12 inches (305 mm) square, illustrating range of color and texture to be anticipated in components furnished for project.

4.6 Test Results. Submit manufacturer's test results of cast stone components made previously by manufacturer using materials from same sources proposed for use in project.

5.0 Quality Assurance.

5.1 Manufacturer Qualifications. A Cast Stone Institute Certified Producer, with a minimum of 10 years of experience in producing cast stone of types required for project.

5.1.1 Plant shall have adequate capacity to furnish quality, sizes, and quantity of cast stone required without delaying progress of the Work.

5.1.2 Products previously produced by plant and exposed to weather shall exhibit satisfactory appearance.

5.2 Standards. Unless otherwise specified in this section, cast stone shall comply with the following:

5.2.1 ASTM C 1364.

5.2.2 Cast Stone Institute Standard Specification.

5.3 Mock-ups. Provide full-size cast stone components for installation in mock-up of exterior wall. Approved mock-ups will become standard for appearance and workmanship.

5.3.1 Mock-ups can remain as part of the completed Work if deemed acceptable by the Engineer.

5.3.2 Mock-up shall include tunnel and typical adjoining retaining wall material.

6.0 Delivery, Storage, and Handling.

6.1 Delivery.

6.1.1 Deliver cast stone components secured to shipping pallets and protected from damage and discoloration.

6.1.2 Protect corners from damage.

6.1.3 Number each piece individually to match shop drawings and schedules.

6.2 Storage.

6.2.1 Store cast stone components and installation materials in accordance with manufacturer's instructions.

6.2.2 Store cast stone components on pallets with nonstaining, waterproof covers.

6.2.3 Ventilate under covers to prevent condensation.

6.2.4 Prevent contact with dirt.

6.3 Handling. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.

7.0 Scheduling.

7.1 Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the Work.

8.0 Manufacturer.

8.1 Continental Cast Stone or approved equal.

8.1.1 Website: www.continentalcaststone.com,

8.1.2 E-Mail info@continentalcaststone.com

9.0 Cast Stone Masonry.

9.1 Cast Stone.

9.1.1 Compressive Strength. ASTM C 1364.

9.1.2 Absorption, Cold Water. ASTM C 1364.

9.1.3 Linear Shrinkage. ASTM C 1364.

9.2 Surface Texture. ASTM C 1364.

9.3 Color and Finish.

9.3.1 Continental Cast Stone Color to be selected from manufacturer's standard colors.

9.4 Permissible Variation in Color

9.4.1 Total Color Difference. ASTM C 1364, 6 units.

9.4.2 Hue Difference. ASTM C 1364, 2 units.

10.0 Cast Stone Materials.

10.1 Portland Cement. ASTM C 150, Type I; white or gray as required to match specified color.

10.2 Coarse Aggregate. ASTM C 1364; granite, quartz, or limestone.

10.3 Fine Aggregate. ASTM C 1364, natural or manufactured sands.

10.4 Coloring Pigments. ASTM C 1364, inorganic iron oxides.

10.5 Chemical Admixtures. ASTM C 1364.

10.6 Water. Potable.

10.7 Reinforcement. Where required by ASTM C 1364, epoxy-coated steel.

10.8 Fiber Reinforcement. ASTM C 1116, fibrous nylon.

11.0 Mortar Materials.

11.1 Mortar. Per Cast Stone Institute Standard Specification.

12.0 Accessories.

12.1 Anchors. Non-corrosive type, sized for conditions. Type 304 stainless steel.

12.2 Sealants. Type N.

12.3 Cleaner.

12.3.1 Manufacturer's standard-strength, general-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces.

12.3.2 Approved for intended use by cast stone masonry manufacturer and approved by cleaner manufacturer for use on cast stone and adjacent masonry materials.

13.0 Fabrication.

13.1 Shapes. Unless otherwise indicated on the Drawings, provide:

13.1.1 Suitable wash on exterior sills, copings, projecting courses, and components with exposed top surfaces.

13.1.2 Drips on projecting components, wherever possible.

13.2 Reinforcement.

13.2.1 As required to withstand handling and structural stresses.

13.2.2 Comply with ASTM C 1364.

13.2.3 Minimum of 0.25 percent of cross-sectional area of panels which exceed 24 inches (600 mm) in width.

13.2.4 Minimum Reinforcing Cover: Twice diameter of reinforcing bars.

13.2.5 Units less than 24 inches in either transverse or longitudinal direction may be unreinforced in that direction if structural conditions allow.

13.3 Curing.

13.3.1 Cure cast stone components with a direct-fired steam generator at a minimum temperature of 105 degrees F (41 degrees C) for a minimum of 6 hours, within 12 hours of fabrication.

13.3.2 Cure cast stone components in presence of carbon monoxide and carbon dioxide to promote carbonation at surface, to minimize efflorescence.

13.4 Finishing. Remove blemishes from exposed surfaces before packaging for shipment.

13.5 Manufacturing Tolerances. Manufacture cast stone components within tolerances in accordance with Cast Stone Institute Standard Specification.\

14.0 Source Quality Control.

14.1 Sampling and Testing. ASTM C 1364.

15.0 Examination.

15.1 Examine construction to receive cast stone masonry. Notify Engineer if construction is not acceptable. Do not begin installation until unacceptable conditions have been corrected.

15.2 Visual Inspection.

15.2.1 Visually inspect cast stone components for fit and finish in accordance with ASTM C 1364 before installation.

15.2.2 Do not install unacceptable components.

16.0 Installation.

16.1 General. Install cast stone masonry in conjunction with pedestrian underpass structure, phenolic panel system and aesthetic retaining walls.

16.2 Setting.

16.2.1 Drench cast stone components with clear, running water immediately before installation.

16.2.2 Do not use pry bars or other equipment in a manner that could damage cast stone components.

16.2.3 Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

16.2.4 Set cast stone components in a full bed of mortar, unless otherwise indicated on the Drawings.

16.2.5 Fill vertical joints with mortar.

16.2.6 Make joints 3/8 inch (9 mm), unless otherwise indicated on the Drawings.

16.2.7 Leave head joints in copings and similar components open for sealant.

16.2.8 Rake mortar joints 3/4 inch (19 mm) for pointing.

16.2.9 Sponge face of each stone to remove excess mortar.

16.2.10 Tuck point joints to a slight concave profile.

16.3 Sealant Joints.

16.3.1 Prime ends of cast stone components, insert properly sized foam backing rod, and install required sealant using sealant gun.

16.3.2 Provide sealant joints at following locations and as indicated on the Drawings.

16.3.3 Cast stone components with exposed tops.

16.3.4 Joints at relieving angles.

16.3.5 Control and expansion joints.

17.0 Setting Tolerances.

17.1 Tolerances. Comply with Cast Stone Institute Standard Specification.

17.1.1 Variation from Plumb. Do not exceed 1/8 inch in 5 feet (3 mm in 1.5 m) or 1/4 inch in 20 feet (6 mm in 6 m) or more.

17.1.2 Variation from Level. Do not exceed 1/8 inch in 5 feet (3 mm in 1.5 m), 1/4 inch in 20 feet (6 mm in 6 m), or 3/8 inch (9 mm) maximum.

17.1.3 Variation in Joint Width. Do not vary joint width more than 1/8 inch (3 mm) or 1/4 of nominal joint width, whichever is greater.

17.1.4 Variation in Plane Between Adjacent Surfaces. Do not exceed 1/8-inch (3-mm) difference between planes of adjacent components or adjacent surfaces indicated to be flush with components.

18.0 Repair.

18.1 Surface Repair.

18.1.1 Repair chipping and other surface damage noticeable when viewed in direct daylight at 20 feet (6 m).

18.1.2 Repair with matching touchup material provided by manufacturer and in accordance with manufacturer's instructions.

18.1.3 Repair methods and results to be approved by Engineer.

19.0 Field Quality Control.

19.1 Inspection and Acceptance. Cast Stone Institute Standard Specification.

20.0 Cleaning.

20.1 In-Progress Cleaning.

20.1.1 Clean cast stone components as work progresses.

20.1.2 Remove mortar fins and smears before tooling joints.

20.2 Final Cleaning.

20.2.1 Clean exposed cast stone, after mortar is thoroughly set and cured.

20.2.2 Cleaner.

20.2.2.1 Wet surfaces with water before applying cleaner.

20.2.2.2 Apply cleaner to cast stone in accordance with cleaner manufacturer's instructions.

20.2.2.3 Remove cleaner promptly by rinsing thoroughly with clear water.

21.0 Water Repellant.

21.1 Apply silane or siloxane water repellant for weatherproofing cast stone masonry in accordance with manufacturer's instructions.

21.2 Apply water repellant after pointing, repair, cleaning, inspection, and acceptance are completed.

22.0 Protection.

22.1 Protect installed cast stone masonry from splashing and other damage during construction.

23.0 Method of Measurement. Measurement shall be made in accordance with Sec 703.

24.0 Basis of Payment.

24.1 Payment for the accepted quantity of Pedestrian Underpass Cast Stone Masonry will be made in accordance with the contract unit bid price for the items listed below includes all labor, materials, incidental items, equipment, fasteners, anchors, accessories and supervision required to design, prepare shop drawings, manufacture, fabricate, furnish and install.

Item No.	Unit	Description
703-99.04	EA	Pedestrian Underpass Cast Stone Masonry Column
703-99.04	SQFT	Pedestrian Underpass Cast Stone Masonry Facade
703-99.04	LF	Pedestrian Underpass Cast Stone Masonry Coping

L-F. Concrete Pavers – Job J6S1718B Only

1.0 Description. Concrete pavers shall be provided as the finished surface of the Rogers Parkway Trail as depicted on the plans. The pavers shall be constructed to the depth and dimensions as depicted in the contract plans. Concrete Unit Paver work includes paver units, sand bed, sand joints, sand-lock spray, sealer and edging.

2.0 References.

2.1 American Society for Testing and Materials.

2.1.1 ASTM C33 - Standard Specification for Concrete Aggregates.

2.1.2 ASTM C936-96 - Standard Specification for Solid Concrete Interlocking Paving Units.

3.0 Submittals.

3.1 Samples. Submit two (2) samples of each paver size, illustrating style, size, color range and surface texture of units being provided.

3.2 Manufacturer's Installation Instructions. Submit substrate requirements, and installation methods.

3.3 Product information for: Sealer and Sand Lok Admixture.

4.0 Qualifications.

4.1 Installer. Company specializing in performing work of this section with minimum three years documented experience.

5.0 Mockup.

5.1 Construct mockup of each pavement pattern, (approximately 100 sq.ft)., including setting bed, pavers, edging, joint sealers, control joint, expansion joint, and accessories to pattern indicated. Accepted mockup may be incorporated into part of work. Locate mock-up as directed by Engineer.

6.0 Products.

6.1 Any changes to the materials described in this specification will require prior approval from the City of Brentwood before ordering of the materials.

6.2 Pavers shall conform to the following.

6.2.1 Type. ASTM C936-96, Hydraulically pressed concrete of 8,000 psi minimum, 28 day compressive strength.

6.2.2 Air Entrained. 5 to 7%; Moisture Content: 7%; Moisture Absorption: 5% Max. (per ASTM C-140)

6.2.3 Nominal Size. 7.28” X 4.7” to 5.4” X 2.36” (see drawings) Color: Color blend to be selected from manufacturer's color blends.

6.2.4 Permeable Pavers at Pedestrian Underpass shall be Hollandstone (size 4” x 8” x 3 1/8”) or approved equal. Color: Bethany Ledge Blend

6.2.5 Sand for Setting Bed and Joint Filler. Concrete sand conforming to ASTM C33. The bedding sand should be sharp, washed, and free from foreign material. Masonry mortar sand should not be used. Clean river or bank sand containing a maximum of 30 percent particle size of No. 10 (2 mm) sieve.

6.2.6 Edging. Concrete Trail Edge.

6.2.7 Sealer. A “Clear Surface Sealer” - deep penetrating single coat siloxane-based sealer, recommended for long term durability and stain resistance.

6.2.8 Sand – Lock Admixture shall be manufactured to reduce movement of sand used as paver joint filler and recommend for this application and location.

7.0 Execution.

7.1 All materials and work performed for this item shall be in accordance with Sec 608 and installation shall be performed in accordance with the manufacturer’s guidelines.

7.2 Verify that substrate is level or to correct gradient, smooth, capable of supporting pavers and imposed loads, and ready to receive work of this section.

7.3 The surfaces indicated to receive pavers shall be reviewed by Owner with paver installer for compliance with requirements for installation tolerances and other conditions affecting performance of concrete pavers. Proceed only after all unsatisfactory conditions have been corrected.

7.4 Verify gradients and elevations of substrate are correct.

8.0 Preparation.

8.1 Treat soil with herbicide to retard plant growth.

9.0 Construction of Sand Bedding Course.

9.1 The sand bedding course material shall be evenly spread over the area to be paved and screeded to a level that will produce the required one-inch thickness when the paving stones have been placed and vibrated. Do not use sand to compensate for uneven elevations or an improperly compacted base. Screed sand with a straight, true strike board.

9.2 Once screeded and leveled, this sand laying course shall not be disturbed in any way.

10.0 Installation.

10.1 General. Do not use unit pavers with chips, cracks, voids, discoloration, and other defects that might be visible or cause staining in finished work.

10.2 Cut unit pavers with motor-driven masonry saw equipment to provide clean, sharp, unchipped edges. Cut units to provide pattern indicated and to fit adjoining work neatly. Use full units without cutting, where possible. No cuts should result with a paver less than one-third of the original dimension. Hammer cutting is not acceptable.

10.3 Paving stones shall be laid in patterns as noted on the drawings. The joint between the stones shall be approximately 1/16 – 1/8” wide. String lines shall be used to hold all patterns true.

10.4 The gaps at the edge of the paved surface shall be filled with the standard edge pieces or with stones cut to fit. Stones shall be cut to a straight, even surface, without cracks or chips.

10.5 Paving stones shall be vibrated into the sand laying course using a vibrator capable of 3,000 to 5,000 pounds compaction force with the surface clean and joints open.

10.6 After first vibration, sand containing at least 3%-1/8” particles, shall be brushed over the surface and vibrated into the joints with additional passes of the plate vibrator so as to completely fill the joints. Do not vibrate or tamp unrestrained edges.

10.7 After final vibrating, the surface shall be true to grade and shall not vary by more than ¼ inch when tested with a 10-foot straight edge at any location on the surface.

10.8 Sand - Lock shall be installed per manufactures recommendations but not on permeable pavement.

10.9 Upon completion of work covered in this section, the contractor shall clean all work areas by removing all debris, surplus material and equipment from the site.

11.0 Repair.

11.1 Apply surface sealer to all unit paver areas at the manufacturer's recommended rate for maximum penetration with single coat application.

12.0 Protection.

12.1 Provide final protection and maintain condition in a manner required to ensure unit paver work is without damage or deterioration at time of substantial completion.

13.0 Method of Measurement. Measurement shall be made in accordance with Sec 608. All base rock and earthwork below the concrete pavers shall be quantified and paid for as separate pay items associated with those items.

14.0 Basis of Payment. Payment for the accepted quantity of Concrete Pavers and Sand Setting Bed shall be completely covered by the contract unit price for Item No. 608-99.05, "Concrete Pavers". No direct payment will be made for any labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
608-99.05	SQYD	Rogers Parkway Concrete Pavers

L-G. Irrigation – Job J6S1718B Only

1.0 Description. The contractor shall furnish and install a landscape irrigation system as indicated on the drawings which includes the design of a point of connection, a water meter, backflow prevention devices, valves, piping, and quick coupler valves. The system shall be in accordance with the following design criteria:

1.1 The irrigation system shall be designed for winterization procedures. Provide blowout points near point-of-connection, with strategically placed isolation valves.

1.2 Valves: Gate valves shall be provided to allow shutting down various sections of the system independent of the entire system. Valves shall be installed in green plastic gate valve boxes or approved equal. Boxes to be set at finish grade with tops of quick coupler valves 2-inches below top of box cover.

1.3 Backflow Prevention: All backflow prevention devices must comply with requirements set forth by the local health department and city water departments. Prevent any back siphonage after sectional valves are closed. All backflow prevention devices shall be enclosed with a "Lok Box" Model #2.

1.4 Quick Coupling Valves: Provide quick couplers as shown on the drawings. Quick coupler valves shall be installed in green plastic gate valve boxes or approved equal. Boxes to be set at finish grade with tops of quick coupler valves 2-inches below top of box cover.

2.0 Submittals. Prepare and submit the items listed below.

2.1 Product Data. Submit a complete material list prior to performing any work. Catalog data and full descriptive literature must be submitted for every product used.

2.2 As-Built Drawings. Record accurately on one set of contract drawings, or previously submitted shop drawings, all changes in the work constituting departures from the original contract drawings. The changes and dimensions shall be recorded in a legible and workmanlike manner to the satisfaction of the Engineer. Submit record drawings prior to final inspection of work. Dimensions shall be from three permanent points of reference (buildings, monuments, sidewalks, curbs, pavements, etc.) Data to be shown on record drawings shall be recorded day to day as the project is being installed. Show locations and depths of the point of connection, routing of main and lateral lines (dimension maximum 100 feet along routing), quick coupling valves, all related equipment (backflow prevention devices, quick coupler valves, etc.).

2.3 Equipment. Supply the following equipment as part of this work item: Three couplers and matching hose swivels, one valve box cover key or wrench, one 5-foot tee wrench for operating gate valves, if necessary. The above equipment shall be turned over to the Engineer at final inspection.

3.0 Materials.

3.1 PVC Pipe. Provide clean, dry and covered location for storage of all pipe during installation. Pipe shall be 2” Class 200 PVC.

3.2 Valves. Manufacturer’s standard, of type and size indicated. Isolation valves: Harvard - quarter turn, brass, threaded, line-sized ball-valves, or Nibco bronze, threaded, line-sized gate-valves. Manual Shut-Off Valves shall be cast bronze globe valves.

3.3 Backflow Preventer. 2” FEBCO Model 860 Backflow prevention device shall be enclosed with a “Lok Box” Model #2, or approved equal.

3.4 Valve Box with Cover. Rainbird, or approved equal.

3.5 Sleeves. Sleeves shall be twice the nominal size of the pipe to be carried within, unless noted differently. Under walks, paving and where indicated on drawings, install Schedule 40 PVC (ASTM D-1785) for sleeves 4” diameter and smaller. Sleeves 6” and larger shall be Class 200 PVC. Tape ends of sleeves and mark sleeve locations with above grade stakes with appropriate annotation, i.e.. “irrigation sleeves”. Stakes shall be protected. Do not backfill over sleeve locations behind back of curbs or along walk edges, until work has been completed. PROVIDE TWO SPARE EMPTY 4” SLEEVES UNDER PEDESTRIAN UNDERPASS, CAP AND MARK AS SPARES.

3.6 Water Supply. Supply shall be as indicated on the drawings including a water meter installed per local codes.

3.7 Trenching and Backfilling. Excavate straight and true with bottom uniformly sloped to low points. Excavate trenches to a depth of 3 inches below invert of pipe, unless otherwise indicated. Provide following minimum cover over top of installed piping: Main line pipe, 24” and Lateral piping, 18” minimum. Backfill with clean material from excavation. Remove organic material as well as rocks and debris larger than 1-inch diameter. Place acceptable backfill material in 6-inch lifts, compacting each lift. Backfilling of trenches containing plastic pipe shall be done when pipe is cool to avoid excessive contraction in cold weather. Such backfilling can be done in early

morning hours or the pipe may be water cooled prior to backfilling procedures. Where pipe is pulled into the ground, slit-domes shall be compacted to original grade after pulling.

4.0 Execution

4.1 Installation. Unless otherwise indicated, comply with requirements of Uniform Plumbing Code, and requirements of the Local Plumbing Code. Install piping, valves, meter and backflow preventor in accordance with manufacturer's written instructions. Install control valve boxes parallel or perpendicular to any adjacent site item such as curbs, walks, walls, etc. Locate valve boxes in landscape beds whenever possible. Install control valves in valve box, arranged for easy adjustment and removal.

4.2 Testing. Notify Engineer in writing when testing will be conducted. Conduct tests in presence of Owner's Representative for approval. Test water piping and valves before backfilling trenches, to a hydrostatic pressure of not less than 100 psi. Piping may be tested in sections to expedite the work. Remove and repair piping, connections, valves that do not pass hydrostatic testing.

5.0 Method of Measurement.

5.1 This item will not be measured. The Engineer will verify entire irrigation has been installed, is operational, and all submittals have been provided.

6.0 Basis of Payment.

6.1 Basis of payment. Payment for the above includes all labor, materials, incidental items, equipment, accessories, and supervision required to design, prepare shop drawings and as-built drawings, manufacture, fabricate, furnish and install.

Item No.	Unit	Description
808-99.01	Lump Sum	Irrigation System

L-H. Protection of Existing Trees

1.0 Description. This work shall consist of all labor and materials necessary to protect all existing trees by the Contractor throughout the entire duration of the grading and construction of the project.

2.0 General Requirements. All trees within the project limits or Contractor's working area shall have protection zones and shall not be damaged by Contractor's activities.

2.1 Definitions.

2.1.1 Diameter at Breast Height (DBH) shall mean the diameter of the tree as measured 4.5 feet above adjacent grade.

2.1.2 Critical Root Zone (CRZ) shall mean the area of soil extending from the tree trunk outward a distance of one foot for every one inch of trunk diameter at DBH. As an example, a tree having a caliper of twelve (12) inches at DBH will have a CRZ extending 12' from the tree trunk in all directions.

2.1.3 Unless approved first by the Owner, a tree protection zone shall, at a minimum, encompass the critical root zone and shall be established around each tree and any vegetation to be preserved.

2.2 The following activities shall be prohibited within the tree protection zones: stockpiling of any type, including construction material, debris, soil, and mulch; altering soils, including grade changes, surface treatment, and compaction due to vehicle, equipment, and foot traffic; trenching for utility installation or repair and irrigation system installation; and attaching anything to trunks or use of equipment that causes injury to any tree to remain.

2.3 Pruning to provide clearance for structures, vehicular traffic, and construction equipment shall be performed under the direction and supervision of a licensed arborist under the direction of the Owner and shall conform to all International Society of Arboriculture tree pruning standards.

2.4 Trees must be maintained in good health throughout construction. Maintenance may include watering the root protection zone and/or washing foliage dirtied by construction activities.

3.0 Damage.

3.1 Contractor shall be responsible for any trees damaged by construction activity that are not otherwise designated for removal and shall pay the Owner as liquidated damages and not as a penalty, the sum of two hundred fifty dollars ($250) for each damaging event. The total amount payable to the Owner as liquidated damages may be deducted from any sums due or to become due to Contractor from Owner.

3.2 If a tree designated to remain is removed or irreversibly damaged, the contractor shall be required to remove the remaining tree and stump at no expense to the Owner, replace the tree with a new 3 inch caliper tree of the same species, as approved by the Owner, and shall pay an additional penalty to the Owner of one hundred dollars ($100) for every inch over 3 inches of the damaged tree's caliper.

3.3 Contractor shall submit an incident report to the Owner and payment shall be deducted from sums due to the Contractor.

4.0 Root Pruning. When construction activities must encroach into the CRZ, Contractor shall notify the Owner before proceeding with any such work.

4.1 Tree roots shall be pruned in such a fashion as to allow for completion of construction. The contractor shall employ a licensed arborist to supervise root pruning that conforms to all International Society of Arboriculture tree pruning standards.

5.0 Basis of Payment. No direct payment will be made for tree protection but shall be considered incidental to the contract.

L-I. Soil Preparation – Job J6S1718B Only

1.0 Description. Soil preparation as described below will be completed in all areas where Sod will be established.

2.0 Work. Soil Preparation Work includes:

2.1 Verify prepared soil base is ready to receive the Work of this section.

2.2 Prepare sub-soil to eliminate uneven areas and low spots. Maintain lines, levels, profiles and contours. Make changes in grade gradual. Blend slopes into level areas.

2.3 Remove foreign materials, weeds and undesirable plants and their roots. Remove contaminated sub-soil.

3.0 Basis of Payment. No direct payment will be made for soil prep but shall be considered incidental to the contract.

L-J. Turf Grass Seed Mixture "A" – Job J6S1718B Only

1.0 Description. Turf Grass Seeding includes any required herbicide treatment, seedbed preparation seeding and turf establishment period maintenance.

1.1 Contractor Qualifications. Contractor must have a minimum 3 years of successful turf grass seeding experience.

2.0 Work.

2.1 Herbicide Treatment. If area to be seeded has active growing weeds, the Contractor to apply herbicide treatment consisting of a 2% solution of glyphosate to the area to be seeded in accordance with manufacturer's recommendations and in accordance with applicable regulations. Wait 7 to 10 days before proceeding.

2.2 Prepare seed bed by scarifying and finish grading operations.

2.3 Fertilizer Application. After dragging and before seeding, Contractor to fertilizer with a commercial product recommended for grass seeding with fifty percent of the elements derived from organic sources; which when applied will supply the quantity of actual Nitrogen (N), available phosphoric acid (P2O5), soluble potash (K2O). At least 35% of the total Nitrogen shall be water-insoluable Nitrogen. Materials may be accepted on the basis of bag label analysis, or suppliers certification, or laboratory sample test. Application rates for initial seeding fertilizer application shall be:

2.3.1 1.5 pound of actual Nitrogen (N) per 1000 square feet

2.3.2 1.5 pound of actual available phosphoric acid (P2O5) per 1000 square feet

2.3.3 1.0 pound of actual soluble potash (K2O) per 1000 square feet.

2.4 Seeding. Seed grass seed mix with a turf-type disk seeder that cuts the seed directly into the soil to ensure firm contact between the seed and soil. Seeding shall be done in two directions with half the seeding rate installed in each direction.

2.4.1 Seed Mix shall consist of the following:

2.4.1.1 90% improved varieties of Turf Type Tall Fescue

2.4.1.2 10% Bluegrass seed mixture shall be Tag Certified.

2.4.2 Seed varieties and tag shall be approved by Engineer prior to installation. The seed blend of Turf Type Tall Fescue and Bluegrass shall have at least three improved varieties of Fescue and one variety of improved Bluegrass.

2.4.3 Seed Certification.

2.4.3.1 Pure Seed. Greater than 98%

2.4.3.2 Other Crop. Less than 0.5%

2.4.3.3 Inert Matter. Less than 2%

2.4.3.4 Weed Seed. Less than 0.3%

2.4.3.5 Germination Rate. Greater than 85%

2.4.4 Dragging. Following the seeding, drag the area to further work the seed into the seedbed and to cover the seed with a light layer of soil. Lighting roll the area as needed.

2.4.5 Mulching. A cover mulch consisting of wood/cellulose fiber with tacking agent shall be applied by hydro-mulching. The Cover Mulch shall be Terra Mulch Jet Spray with FiberMax with Tacking Agent 3 or functional equivalent.

2.4.6 Watering. The seeded area should be watered lighting daily to keep the soil moist until the seed has germinated and the seedlings plants have emerged. As seedlings become more established, decrease the frequency of watering and lengthen the time period of watering to provide deeper penetration of the water into the soil and developing root system.

2.5 Turf Establishment Maintenance. Contractor is responsible for maintenance during a turf establishment period lasting until grass is well establish and exhibits a vigorous growing condition and at least through three (3) maintenance mowings. Contractor to immediately reseed any bare spot areas. Mow grass at a 3" height and do not cut more than 1/3 of the grass blade at any mowing. Do not mow when grass is wet. If mowing causes clogging or any matting of grass, rake the lawn of clippings to remove.

2.6 Maintenance Fertilizer Application. Contractor to apply a second maintenance fertilizer application after third mowing. Contractor is responsible not to burn or damage the lawn grasses or other plantings. Application rates for initial seeding fertilizer application shall be:

2.6.1 1.0 pound of actual Nitrogen (N) per 1000 square feet

2.6.2 1.0 pound of actual available phosphoric acid (P_2O_5) per 1000 square feet

2.6.3 1.0 pound of actual soluble potash (K_2O) per 1000 square feet

3.0 Measurement and Payment.

3.1 The Engineer will measure the square footage of area to be seeded.

4.0 Basis of Payment. Payment for the accepted quantity of Turf Grass Seeding will be made in accordance with the contract unit price for the item listed below and includes all labor, materials, incidental items, equipment, accessories and supervision required to design, prepare shop drawings, manufacture, fabricate, furnish and install.

Item No.	Unit	Description
805-10.00A	ACRE	Turf Grass Seeding

L-K. Turf Grass Sodding – Job J6S1718B Only

1.0 Description. This Section Includes:

1.1 Fertilizing.

1.2 Sod installation.

1.3 Maintenance.

2.0 Definitions.

2.1 Weeds. Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, and Brome Grass.

3.0 Quality Assurance.

3.1 Sod. Root development capable of supporting its own weight without tearing, when suspended vertically by holding upper two corners.

4.0 Qualifications.

4.1 Sod Producer. Company specializing in manufacturing Products specified in this section with minimum three years documented experience.

4.2 Installer. Company specializing in performing work of this section with minimum three years documented experience, approved by sod producer.

5.0 Delivery, Storage, and Handling.

5.1 Deliver sod on pallets. Protect exposed roots from dehydration. Place sod in shaded areas, where feasible.

5.2 Do not deliver more sod than can be laid within 24 hours.

6.0 Maintenance Service.

6.1 The maintenance of sodded turf area shall be the Contractor's responsibility until final acceptance by the Owner. The first mowing will not be attempted until the sod is securely in place, uniform in appearance, and the turf blades have reached a height of 4 inches.

7.0 Warranty.

7.1 Contractor shall warrant that all sodded lawns planted under this Contract will be healthy and in a condition of greater than 80 percent active growth one (1) year from date of Substantial Completion. Any delay in completion of sodding operations which extends the planting into more than one planting season shall extend the Warranty Period correspondingly.

8.0 Materials.

8.1 Sod.

8.1.1 Sod shall be an improved variety of turf type fescue. Submit seed mix for approval.

8.1.2 Sod shall be nursery grown, of high quality, and free of disease nematodes, and soil-borne insects. Sod shall be free of noxious weeds, including but not limited to Common Bermuda Grass, Quack Grass, Johnson Grass, Poison Ivy, Yellow Nutsedge, Nibblewill, Canadian or Russian Thistle, Bindweed, Bentgrass, Wild Garlic, Ground Ivy, Perennial Sorel, Wild Violet, and Bromegrass. Sod shall be considered free of other weed types if less than 5 weed plants are found per 100 square feet of area.

8.1.3 All sod should have two full seasons' growth before harvesting. Sod with less than two seasons' growth is subject to rejection.

8.1.4 All sod shall be stripped at a uniform solid thickness of approximately one-inch, plus or minus ¼". Measurement for thickness shall exclude top growth and thatch and shall be determined at the time of field cutting. Sod thatch, uncompressed shall not exceed ½".

8.1.5 Root development shall be such that standard size pieces will support their own weight and retain their shape, when suspended vertically from a firm grasp on the uppermost 10% of area, or when rolled and unrolled three times.

8.1.6 Before stripping, the sod shall be mowed uniformly at a height of 2 to 2-1/2 inches.

8.1.7 Sod shall not be harvested or transplanted when moisture content (excessively dry or wet) may adversely affect survival of the sod.

8.1.8 Sod shall be harvested, delivered and installed within a period of 24 hours. Sod not transplanted within this period shall be inspected and subject to rejection.

8.1.9 Sod shall be a 90% : 10%, turf-type Fescue/Kentucky Bluegrass blend, containing a mixture of equal parts by weight of three improved varieties of the turf-type Fescue.

9.0 Accessories.

9.1 Fertilizer. Commercial grade; recommended for grass, with fifty percent of elements derived from organic sources; of proportion necessary to eliminate deficiencies of topsoil to the following proportions: nitrogen 20 percent, phosphoric acid 20 percent, soluble potash 20 percent.

9.2 Water. Clean, fresh and free of substances or matter capable of inhibiting vigorous growth of grass.

9.3 Wood Pegs. Softwood, sufficient size and length to anchor sod on slope.

9.4 Herbicide. As recommended by sod installer and approved by Owner's Representative.

10.0 Harvesting Sod.

10.1 Machine cut sod and load on pallets in accordance with TPI standards.

10.2 Cut sod in area not exceeding one sq.yd., with minimum ½ inch and maximum 1-inch topsoil base.

11.0 Source Quality Control.

11.1 Analyze to ascertain percentage of nitrogen, phosphorus, potash, soluble salt content, organic matter content, and pH value.

11.2 Provide recommendation for fertilizer and lime application rates for specified sod grass species.

12.0 Preparation of subsoil.

12.1 Turf areas shall be tilled to a minimum depth of 6 inches. 4 inches of topsoil, per Sec. 804, shall be spread evenly over all areas to receive sod.

13.0 Fertilizing.

13.1 Prepare the sod bed by uniformly applying 12 pounds of 12N-12P-12K slow release fertilizer per 1,000 square feet of turf grass area to be planted. The fertilizer shall be thoroughly incorporated into the top six inches of soil with a mechanical tiller, or other approved method. Sod bed shall be in a firm, but uncompacted condition with a firm texture prior to laying of sod.

13.2 Apply fertilizer after smooth raking of topsoil and prior to installation of sod.

13.3 Apply fertilizer no more than 48 hours before laying sod.

13.3 Lightly water soil to aid dissipation of fertilizer.

14.0 Laying Sod.

14.1 Sod areas indicated on drawings, or as defined in related specifications sections.

14.2 The sodding operation shall not commence until site conditions are satisfactory. Sodding shall not be done when the ground is excessively wet, frozen, or untillable.

14.3 All areas to be sodded shall be fine graded before sodding and be free of deleterious materials, including weeds, existing grasses, tree branches, stones greater than one-inch diameter, concentrations of crushed rock, mortar and other debris. Grades for the flow lines of

swales and ditches, shall be carefully established. Sod shall be placed so that it is level and even with the thatch surface of the sod.

14.4 Sod shall be installed in tightly abutted parallel rows with the lateral joints staggered at a minimum distance equal to the width of the sod slab. Voids between sod strips will not be accepted. Any netting used to hold the sod in place during transportation shall be removed before laid.

14.5 For sloping surfaces, sod shall be laid beginning at the base of the slope, with staggered joints and at right angles to the flow of water. Sod placed on 3:1 slopes or steeper, and in ditch flow lines, shall be staked with 6 stakes per square yard or roll of sod. Stakes shall be wood, ½" by 1" by 12" and shall be driven into the ground, leaving approximately ½" of the top above the sod line. Stakes should be set sufficiently in the ground to permit mowing.

14.6 The sod shall be watered immediately after installation. Prevent sod from drying during progress of work. After sodding is completed in any one section, the entire area shall be thoroughly irrigated to at least one-inch depth below the new sod pad. Subsequent watering should maintain moisture to a depth of at least 4 inches.

14.7 All sodded areas should be staked.

15.0 Maintenance.

15.1 Maintenance shall begin immediately after planting. The sod shall be protected and maintained by watering, mowing, fertilizing and replanting for as long as it is necessary to establish a uniform stand of grass. Any sod not surviving prior to its first mowing shall be replaced with new sod from the same source. Mowing of the sod will be the responsibility of the Contractor until final acceptance by the Owner.

15.2 Mow grass at regular intervals to maintain at maximum height of 2-1/2 inches. Do not cut more than 1/3 of grass blade at each mowing.

15.3 The maintenance of the sodded turf area shall be the Contractor's responsibility until final acceptance by the Owner.

15.4 Immediately replace sod on areas showing deterioration or bare spots.

15.5 Protect sodded areas with warning signs during maintenance period.

16.0 Inspections.

16.1 The Contractor shall notify the Owner's Representative for final inspection. The request shall be in written form and received at least ten (10) calendar days before the anticipated date of inspection.

16.2 Based on the sole judgment of the Owner's Representative, he shall certify in writing as to the satisfaction and substantial completion of the project.

17.0 Method of Measurement. Measurement shall be made in accordance with Sec 803.

18.0 Basis of Payment.

18.1 Basis of payment: Payment for the accepted quantity of sod will be made in accordance with the contract unit bid price for the item listed below and includes all labor, materials, incidental items, equipment, accessories and supervision required to design, prepare shop drawings, manufacture, fabricate, furnish and install.

18.2 No direct payment will be made for topsoil to be installed as part of the sod. Topsoil shall be considered incidental to the contract.

Item No.	Unit	Description
803-10.00A	SQYD	Turf Sodding

L-L. Landscape Planting – Job J6S1718B Only

1.0 Description. Landscape plantings will be installed in compliance with Section 808. This section describes further requirements associated with landscape development including trees, shrubs and grass plants, and hardwood mulch.

2.0 References.

2.1 American National Standards Institute.

2.1.1 ANSI A300 - Tree Care Operations - Tree, Shrub and Other Woody Plant Maintenance - Standard Practices. (Most current versions)

2.1.2 ANSI Z60.1 - Nursery Stock. (2004)

3.0 Definitions.

3.1 Weeds. Include Dandelion, Jimsonweed, Quackgrass, Horsetail, Morning Glory, Rush Grass, Mustard, Lambsquarter, Chickweed, Cress, Crabgrass, Canadian Thistle, Nutgrass, Poison Oak, Blackberry, Tansy Ragwort, Bermuda Grass, Johnson Grass, Poison Ivy, Nut Sedge, Nimble Will, Bindweed, Bent Grass, Wild Garlic, Perennial Sorrel, Brome Grass and any plant life not specified.

3.2 Plants. Living trees, plants, and ground cover specified in this Section, and described in ANSI Z60.1.

4.0 Quality Assurance.

4.1 Tree Pruning. ANSI A300 Pruning Standards for Woody Plants.

5.0 Qualifications.

5.1 Nursery. Company specializing in growing and cultivating plants with three years' documented experience.

5.2 Installer. Company specializing in installing and planting plants with five years' documented experience.

6.0 Schedule.

6.1 Tree, Shrub and Ground Cover Plantings will only be planted in planting season listed below. Contractor should schedule other work to meet these time frames.

6.1.1 Spring. March 1 until April 30

6.1.2 Fall. September 15 until November 30.

6.2 Planting season for Native Grass Plugs and Perennial/Native Grass Quart Container shall be from March 1 to March 31.

6.3 Planting season for Sod is from March 15 to May 31 and from September 1 to October 31.

6.4 Notify Engineer a minimum of 48 hours prior to installing phases of the work for in field plant placement verification for no more than a total of two such meetings. Some minor location adjustment may occur.

7.0 Delivery, Storage, and Handling.

7.1 Handle plants from bottom of ball. Protect plant roots and tops from sun or drying winds until final planting. Plants with cracked, broken or loosely wrapped balls will be rejected.

7.2 Deliver fertilizer in waterproof bags showing weight, chemical analysis, and name of manufacturer.

7.3 Deliver and install plant life materials within a 72-hour period. Keep plant containers and root balls moist throughout planting process. Proof of moisture must be found within top two inches of soil.

7.4 Plant material damaged as a result of delivery, storage or handling will be rejected and replaced at no cost to the project.

7.5 Spray deciduous plants in foliage with an anti-desiccant immediately after digging to prevent dehydration. Dig, pack, transport and handle plants with care to ensure protection against injury. Protect all plants from drying out. If plants cannot be planted immediately upon delivery, properly protect them with soil, wet peat moss, or in a manner acceptable to the Engineer. Water heeled-in plantings daily. Only use anti-desiccant if forecast during planting and for two (2) weeks afterward is for temperatures over 80 degrees Fahrenheit.

7.6 Cover plants transported on open vehicles with a protective covering to prevent wind burn.

8.0 Environmental Requirements.

8.1 Do not install plant life when ambient temperatures may drop below 35 degrees F or rise above 90 degrees F for greater than 24 hours. Do not install plant life when wind velocity exceeds 30 mph.

9.0 Trees, Plants, and Ground Cover.

9.1 Planting Stock.

9.1.1 Species. In accordance with Standardized Plant Names, official code of American Joint Committee on Horticulture Nomenclature.

9.1.2 Plants. No. 1 Grade conforming to "American Standard for Nursery Stock" of American Association of Nurserymen (AAN); well-branched, vigorous and balanced root and top growth; free from disease, injurious insects, mechanical wounds, broken branches, decay and other defects.

9.1.3 Trees. Furnish with reasonably straight trunks, free of disease and pest damage with well-balanced tops, and single leader. No trees with co-dominant leaders will be accepted.

9.2 Trees, Plants, and Ground Cover.

9.2.1 Species and size identifiable in plant schedule, grown in climatic conditions similar to those in locality of the Work.

9.2.2 Species with a "Y" shaped trunk or no main leader may be rejected if this is not true to species.

10.0 Mulch Materials.

10.1 Hardwood Bark Mulch Material. Composted, shredded hardwood bark, dark brown in color, free of weeds and other organic matter and matter detrimental to plant life.

10.2 Filter Fabric (placed under gravel mulch) shall be a nonwoven needlepunched geotextile made of 100% polypropylene staple filament, made drainage and separation applications.

10.2.1 Weight. 7.0 oz./SY

10.2.2 Tensile Strength. 180LBs. (ASTM D-4632)

10.2.3 Permittivity. 1.0 Sec-1

11.0 Erosion Control Blanket.

11.1 Erosion Control Blanket; Double Net Coconut Blanket - 100% coconut fiber matrix stitched with biodegradable thread between natural jute netting, meeting the following criteria:

11.1.1 Top Netting. 100% biodegradable leno woven natural jute top netting (approximate weight: 9.3 lbs. per 1000 sq. ft.).

11.1.2 Matrix Material. 100% coconut fiber (0.50 lbs per SY)

11.1.3 Bottom Netting. 100% biodegradable natural jute fiber (approximate weight: 7.7 lbs. per 1000 sq. ft.)

11.1.4 Stitching Biodegradable thread on 1.5" centers

11.1.5 Standard Roll. Width = 6.67'; Length = 108'; Weight = 52 lbs.; Area = 80 SY

12.0 Filter Fabric.

12.1 Filter fabric shall be a Nonwoven geotextile fabric that complies with Section 1011, for use as a Separation Geotextile - meeting AASHTO Class 1 criteria.

13.0 Accessories.

13.1 20-Gallon Slow Release Tree Water Bag – submit manufactures information for approval.

14.0 Fertilizers.

14.1 Fertilizer for Sod establishment areas is described under JSP K Soil Preparation.

14.2 Fertilizer for Trees and Shrubs plantings shall be a slow release fertilizer spike (in the range of 15-10-9) specially formulated for use on newly planted trees and shrubs. Spikes shall be used per manufactures recommendations and set just beyond the circumference of the root ball and never closer than 24” to the trunk.

15.0 Soil Materials.

15.1 Topsoil.

15.1.1 For landscape planting beds and all other areas, topsoil to be provided and installed by Contractor.

15.1.2 Topsoil shall be friable, free of weeds and other materials deleterious to plant growth and rocks larger than ½ inch diameter. If indicated by soil tests, supplement on-site topsoil with compost as specified.

15.1.3 Acceptable sources for imported topsoil include, but are not limited to, the following:

15.1.3.1 Fick Supply Company, Wildwood, MO 636-532-4978

15.1.3.2 Kirkwood Material Supply, Kirkwood, MO 314-822-9644

15.1.3.3 Brentwood Material Company, St. Louis, MO 314-968-0184

15.1.4 Topsoil shall be medium textured soil with the following neutral to medium acid pH ranges:

15.1.4.1 Topsoil for planting beds – 6.0 to 7.5 pH

15.1.5 Add pH modifiers to topsoil as required to meet the above pH ranges based on soil test results.

15.1.6 Amending on-site soil with soil amendment materials to produce an acceptable soil media is an acceptable option to importing topsoil, providing above criteria is met.

15.2 Peat Moss. Shredded, loose, sphagnum moss; free of lumps, roots, inorganic material or acidic materials; minimum of 85 percent organic material measured by oven dry weight, pH range of 4 to 5; moisture content of 30 percent.

15.3 Plant Soil Mix.

15.3.1 Planting Beds. 25% Peat Moss and 75% Topsoil

15.3.2 Tree Pits. 50% Existing Soil and 50% Topsoil

16.0 Examination.

16.1 Verify the location of all utilities prior to beginning work to avoid conflicts during digging.

16.2 Verify that a required water source is available, in proper location, and ready for use. Verify the location of all utilities to avoid conflict during digging.

17.0 Planting.

17.1 Excavate planting pit as shown on the drawings. Set plants vertical, where possible. Remove non-biodegradable root containers. Set plants in pits or beds, partly filled with prepared plant mix, at minimum depth as indicated on Drawings under each plant. Backfill and compact soil in shallow lifts. Saturate soil with water when pit or bed is half full of soil and again when full. Soil should be brought to grades shown on drawings. Install Fertilizer spikes around planting.

18.0 Installation of Accessories.

18.1 Wrap deciduous shade and flowering tree trunks and place guying system. Maintain guys throughout planting process.

18.2 Install one 20-Gallon Slow Release Tree Water Bag per tree planting.

19.0 Tree Pruning.

19.1 When pruning of newly installed trees is required, lightly prune trees in accordance with ANSI A300 Maintenance Pruning Type: Crown Cleaning. Refer to Section 01450 for pruning of existing trees.

20.0 Field Quality Control.

20.1 Plants will be rejected when ball of earth surrounding roots has been disturbed or damaged prior to or during planting.

21.0 Contractor Care of Plants.

21.1 Per paragraph 808.4.1, the Contractor is responsible for the proper care of all plants until Final Inspection and Acceptance.

21.2 This JSP defines the Contractors responsibilities in the “proper care” of all plants (from date of planting until the following August 31st date) as being:

21.2.1 Straighten trees to plumb and re-guy as required.

21.2.2 Water Trees by filling the Tree Water Bags at least:

21.2.2.1 Once a week during May and September.

21.2.2.2 Twice a week during June, July and August.

21.2.3 Water Sod Areas at least:

21.2.3.1 Weekly to provide a minimum ½" water per week during May and September.

21.2.3.2 2 times a week providing a min. ½" water per watering during June, July & August.

21.2.4 Contractor will coordinate their responsible care of plants with the project owner's maintenance, that will include mowing of the sodded lawn areas.

22.0 Plant Material Warranty.

22.1 Contractor to furnish 12-month warranty after Final Inspection and Acceptance for all landscape plantings including trees, shrubs, grass plugs, perennial and groundcover. If dormancy of plants requires verification of viability during the next growing season, the Warranty Period for those plants will commence following such verification. For any delay in completion of planting operations that extends the planting into more than one planting season, the Warranty Period shall begin whenever Substantial Completion Acceptance is granted. Any plants that are 25 percent or more dead shall be considered dead and shall be replaced at no charge. A tree shall be considered dead when the main leader has died back or 25 percent or more of the crown is dead. Contractor shall not be held responsible for failures due to neglect by Engineer, vandalism, or other actions beyond the Contractor's control, during Warranty Period. Report such occurrences to Owner in writing within 10 calendar days of observation.

23.0 Method of Measurement. This item will not be measured for payment.

24.0 Basis of Payment. The accepted quantity of plants shall be paid for at the contract unit prices for the items listed below and shall include all necessary equipment, materials and labor necessary for compliance with these provisions.

Item No.	Unit	Description
808-99.02	Each	Silver Linden
808-02.03	Each	River Birch
808-03.03	Each	Eastern Redbud
808-01.07	Each	Skyline Honey-Locust
808-99.02	Each	Kousa Dogwood
808-99.02	Each	Grey Owl Juniper
808-05.20	Each	Gro-Low Sumac
808-05.04	Each	New Jersey Tea
808-99.02	Each	Yellow Twig Dogwood
808-99.02	Each	Blue Grama 'Blond Ambition'
808-99.02	Each	Feather Reed Grass
808-99.02	Each	Little Bluestem
808-99.02	Each	Prairie Dropseed
808-99.02	Each	Heath Aster
808-99.02	Each	Threadleaf Coreopsis
808-99.02	Each	Woodland Phlox

808-99.02	Each	Black-Eyed Susan

L-M. Ornamental Fencing

1.0 Description. This work shall consist of furnishing and erecting ornamental fencing as shown on the plans or as directed by the engineer. Work shall include all tools, equipment, and labor necessary for installation.

2.0 Construction Requirements.

2.1 Materials. All material shall be in accordance with Sec 1043 Fence Material. Contractor shall submit detail drawing of each type of product including over dimensions and options.

2.1.1 Ornamental Fence. Shall be 48" high fence.

2.1.1.1 Steel for fence assembly components shall conform to ASTM A653/A653M, with a minimum yield strength of 45,000 psi. All steel shall be hot-dip galvanized and powder coated finish. Color to be black.

2.1.1.2 Steel material for pickets shall be 5/8" square, 18 gauge. All rails shall be steel channel 1 ¼"x 15/16", 14 gauge. All posts shall be 2" square, 16 gauge.

2.1.2 Barrier Wall Fence. Shall be 1'-6" high bridge fence.

2.1.2.1 Steel for fence assembly components shall conform to ASTM A653/A653M, with a minimum yield strength of 45,000 psi. All steel shall be hot-dip galvanized and powder coated finish. Color to be black.

2.1.2.2 Steel material for pickets shall be 1" square, 18 gauge. All rails shall be steel channel 1 3/8" x 1 1/2", "U" Channels, 14 gauge. All posts shall be 2" square, 16 gauge. Pickets should be inserted in the holes in the rails, pre-punched prior to installation.

2.1.2.3 Mounting. Mounting methods will be as shown on drawings.

2.2 Delivery. Products should be delivered to the project site in manufacturer's original, unopened containers and packaging, and the packages are to be examined upon delivery to ensure all products are complete and undamaged.

2.3 Storage and Handling. Store products in a protected, dry area in manufacturer's unopened containers and packaging. Care shall be taken to protect product's finish from damage during handling, staging, and installation.

2.4 Coordination. Coordinate with bridge work and site work to insure proper installation. Field verification of fence dimensions shall be conducted prior to fencing installation.

2.5 Fence Installation.

2.5.1 Proceed with installation only after any unsatisfactory conditions have been corrected. Comply with manufacturer's installation instructions unless more stringent requirements are instructed by the engineer.

2.5.2 All fencing shall be installed level, plumb, true, and securely mounted as indicated on Drawings. All posts and pickets shall be installed plumb and vertical.

3.0 Method of Measurement. Measurement shall be made in accordance with Sec 607.10.4.

3.1 Acceptance for ornamental fencing installation shall be given by the engineer, upon satisfactory completion of each section or area indicated on the drawings or as otherwise specified.

4.0 Basis of Payment. Payment for the accepted quantity of ornamental fencing will be made in accordance with the contract unit bid prices for the items listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
607-99.03	Linear Foot	4'-0" High Fence
607-99.03	Linear Foot	1'-6" High Fence

L-N. Site Furnishings – Job J6S1718B Only

1.0 Description. Contractor shall coordinate installation of site furnishings selected by the City of Brentwood. All locations for site furnishings shall be approved by the engineer prior to installation. Work shall include all tools, equipment, and labor necessary for installation.

2.0 Construction Requirements.

2.1 Materials. All material shall be in accordance with Division 1000, Material Details, and manufacturer's requirements. Contractor shall furnish the engineer with detail drawings of each type of product including over dimensions and options as well as all maintenance manuals for all site furnishings.

2.2 Benches. Benches shall have cast aluminum legs and steel supports and shall be powder coated, textured black. The bench should be a minimum of 72" in length with the seat approximately 17" to 18" above finished grade and shall have the capacity to support a minimum of 200 lbs./linear foot. Benches shall be surface mounted and have a minimum of 0.40" pre-drilled holes to receive anchor bolts. Bench slats shall be of recycled plastic and a cedar color.

2.3 Waste/Recycling Receptacles. Receptacles shall be manufactured of steel panels, which are galvanized finished and powder coated black, and shall include an option for use of a City logo on the receptacles. The receptacles should be a minimum of 47" high x 40" wide x 30" depth. Two reusable plastic liners for an overall capacity of 70 gallons for waste and recycling material shall be furnished. Receptacles are to be surface mounted per manufacturer's guidelines.

2.4 Banner Pole. Banner poles shall be 14'-0" aluminum sign posts with a black, power coat finish. Poles shall be mounted on a footing per pole manufacturer's guidelines.

2.5 Street Signs. Street sign poles shall be a 7'-0" aluminum sign posts with a black, power coat finish. Poles shall be mounted on a footing per pole manufacturer's guidelines.

2.6 Regulatory and Warning Signs. Sign poles shall be a 14'-0" aluminum sign posts with a black, power coat finish. Poles shall be mounted on a footing per pole manufacturer's guidelines. Sign backing shall be 3M black vinyl film to be applied per manufacturer specifications to rear surface.

2.7 Delivery, Storage and Handling. Products shall be delivered to site in manufacturer's original, unopened containers and packaging. Upon delivery, packages shall be examined to ensure all products are complete and undamaged. Products shall be stored in a protected, dry area in manufacturer's unopened containers and packaging. The contractor shall take care to protect product's finish from damage during handling and installation.

3.0 Method of Measurement. This item will not be measured for payment.

4.0 Basis of Payment. Payment for the accepted quantity of site furnishings will be made in accordance with the contract unit bid prices for the items listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
608-99.02	Each	Bench
608-99.02	Each	Waste/Recycling Receptacle
608-99.02	Each	Banner Pole
608-99.02	Each	Street Signs
608-99.02	Each	Regulatory Signs

L-O. Decorative Concrete Paving (Route 100 Mainline)

1.0 Description. The contractor shall install stamped, colored decorative concrete paving at the locations along mainline Route 100 as depicted in the contract plans.

2.0 Construction Requirements.

2.1 Materials. All material shall be in accordance with Sec 608.2. The contractor shall provide all material certifications for concrete coloring pigment, including manufacturer technical and safety data for each product. The contractor shall also supply samples of all concrete color and texture for prior review and approval by the engineer prior to construction of the mockup.

2.1.1 Color Pigment. Color pigment shall be added to concrete mixture according to manufacturer's written instructions and to result in hardened concrete color consistent with approved mockup. Color shall be Soloman Color 775 Sedona, as manufactured by Soloman Colors, or approved equal.

2.1.2 Stamped Concrete Pattern. Pattern used shall be Bomanite Pattern: Granite Setts or approved equal. Polyethylene/plastic sheeting used in the stamping process shall be of sufficient thickness to adequately transfer the design while resisting tearing or breakage.

2.2 Mockup. A mockup or test patch of the decorative concrete shall be constructed by the contractor to demonstrate aesthetic effects and set quality standards for materials and execution. The location of the mockup shall be approved by the engineer and shall be of sufficient size for review and approval with the minimum acceptable size being 5'x5' square.

2.3 Subgrade and Baserock. Subgrade preparation shall be in accordance with Sec 209. Baserock material shall be Type 5 Aggregate Base in accordance with Sec 304 and shall be of the thickness identified in the contract plans. All deficient areas of subgrade and baserock shall be corrected prior to placement of the decorative concrete paving. No direct payment will be made for preparation of the subgrade or for Type 5 Aggregate Base.

2.4 Joints. Joints and saw cuts shall be placed in a manner similar to the adjacent concrete sidewalk. Joint filler material shall be in accordance with Sec 1057.

2.5 Concrete Protection And Curing.

2.5.1 Curing Compound. Curing compound shall be a clear compound in accordance with Sec 1055 that will not react with or otherwise change the color of the concrete pigment.

2.5.2 Protection. The contractor shall take care to not damage the decorative concrete paving once it has been placed. Traffic shall be excluded for a minimum of 14 days after placement. When construction traffic is permitted, maintain decorative concrete pavement as clean as possible by removing surface stains and spillage of materials as they occur, and maintain free of stains, discoloration, dirt, and other foreign material. The contractor shall replace any damaged sections of decorative concrete pavement at their cost.

3.0 Method of Measurement. Measurement shall be made in accordance with Sec 608.4 to the nearest 1/10 square yard.

4.0 Basis Of Payment. Approved locations of decorative concrete paving shall be paid for at the contract unit price for the item listed below and shall include all necessary equipment, materials and labor necessary for compliance with these provisions.

Item No.	Unit	Description
608-99.05	SQYD	Decorative Concrete Paving

L-P. Seeding and Sodding (Route 100 Mainline)

1.0 Description. The contractor shall perform finish grading and preparation of areas along mainline Route 100 as shown on the plans to be seeded and sodded. Upon completion of grading work, the contractor shall place seeing and sodding at the locations identified on the contract plans. Work shall include all tools, equipment, and labor necessary for the placing and finishing of seed and sod.

2.0 Construction Requirements.

2.1 Materials. All materials shall be in accordance with Sec 803 and Sec 805. The contractor shall submit product data for each type of product, to include a certification for each mixture for turfgrass sod and grass seed.

2.1.1 Grass Seed. Seed shall be fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances.

2.1.1.1 Quality. Seed shall be of the grass species as listed below for solar exposure, with not less than 85 percent germination, not less than 95 percent pure seed, and not more than 0.5 percent weed seed.

2.1.1.2 Seed Species. Seed shall be rated for sun and partial shade and proportioned by weight as follows: 20 percent Kentucky bluegrass (Poa pratensis) and 80 percent Jaguar turf type fescue (Festuca arundinacea 'Jaguar').

2.1.2 Turfgrass Sod. The contractor shall furnish viable sod of uniform density, color, and texture that is strongly rooted and capable of vigorous growth and development when planted.

2.1.2.1 Sod Species. Sod shall be rated for sun and partial shade and proportioned by weight as follows: 20 percent Kentucky bluegrass (Poa pratensis) and 80 percent Jaguar turf type fescue (Festuca arundinacea 'Jaguar').

2.1.3 Fertilizers. Fertilizer shall be commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition: 1 lb/1000 sq. ft. of actual nitrogen, 4 percent phosphorous, and 2 percent potassium, by weight.

2.1.3.2 Slow-Release Fertilizer. Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.

2.1.4 Straw Mulch. Mulching of all seeded areas shall be in accordance with Sec 802.

2.3 Delivery, Storage and Handling.

2.3.1 Seed and Other Packaged Materials. Packaged materials shall be delivered in original, unopened containers along with all proper materials certifications in accordance with Sec 805.5.

2.3.2 Sod. Harvest, deliver, store, and handle sod according to requirements in "Specifications for Turfgrass Sod Materials" and "Specifications for Turfgrass Sod Transplanting and Installation" sections in Turfgrass Producers International (TPI) "Guideline Specifications to Turfgrass Sodding." Deliver sod within 24 hours of harvesting and in time for planting promptly. Protect sod from breakage and drying.

2.4 Turf Area Preparation. Preparation of planting area for soil placement shall be in accordance with Sec 801 and planting soil mix shall be in accordance with the "Planting Soil, Fertilizer, and Landscaping Mulch" JSP. The engineer shall accept all area of finish grading prior to planting.

2.4.1 Prepared area should be moistened before planting if soil is dry. The area should be watered thoroughly and the surface allowed to dry before planting, taking care to not create muddy soil.

2.5 Seeding. Seed shall be applied in accordance with Sec 805.3.. Seed that is wet, moldy, or otherwise damaged shall not be used. Care shall also be taken to not seed against existing trees, and the extent of seed shall be limited to the outside edge of all planting saucers and landscape mulch beds.

2.5.1 Seed shall be applied at a total rate of 8 lb./1000 SQFT.

2.5.2 All seeded areas shall be protected with vegetative mulch in accordance with Sec 802.

2.6 Sodding. Sod shall be place in accordance with Sec 803.3. Sod shall not be placed if dormant or if ground is frozen or muddy.

2.7 Turf Maintenance. Maintain and establish turf by watering, fertilizing, weeding, mowing, trimming, replanting, and performing other operations as required to establish healthy, viable turf. Roll, regrade, and replant bare or eroded areas and re-mulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation.

2.7.1 Mow turf as soon as top growth is tall enough to cut. Repeat mowing to maintain specified height without cutting more than one-third of grass height. Remove no more than one-third of grass-leaf growth in initial or subsequent mowings.

3.0 Method of Measurement. Measurement shall be made in accordance with Sec 803.5 and Sec 805.7.

3.1 Acceptance for Seeding and Sodding installation shall be in accordance with Sec 803.4 and Sec 805.4. Acceptance shall be given by the engineer, upon satisfactory completion of each section or area indicated on the drawings or as otherwise specified.

4.0 Basis of Payment. Seeding and sodding shall be paid for at the contract unit prices for the items listed below and shall include all necessary equipment, materials and labor necessary for compliance with these provisions.

Item No.	Unit	Description
803-99.05A	SQYD	Sodding
805-99.19	Acre	Seeding

L-Q. Planting Soil, Fertilizer, and Landscaping Mulch (Route 100 Mainline)

1.0 Description. The contractor shall perform finish grading and preparation of areas along mainline Route 100 as shown on plans, for curbed planting beds, tree pits with grates, and open tree wells. Work shall include all tools, equipment, and labor necessary for the mixing, placing, finish grading and compacting of Topsoil and Planting Soil Mix.

2.0 Construction Requirements.

2.1 Materials. All material shall be in accordance with Sec 804. The contractor shall submit one (1/2) c.f. sample of approved topsoil mix and planting soil mix for testing.

2.1.1 Soil Mixes.

2.1.1.1 Planting Soil Mix shall conform to the following mix requirements: Three (3) parts approved topsoil, one (1) part natural organic matter, and one (1) part sand as described below.

2.1.2 Topsoil.

2.1.2.1 Topsoil is preferred to be from off-site sources and shall conform to the following requirements:

2.1.2.1.1 Fertile, friable, natural loam, surface soil, reasonably free of subsoil, clay clumps, brush weeds and other litter, and free of roots, stumps, stone larger than 1 inch in any dimension, and other extraneous or toxic matter harmful to plant growth.

2.1.2.1.2 Approved topsoil must contain at least 2% natural organic matter by weight, when dried and tested in accordance with current methods of the Association of Official Agricultural Chemists.

2.1.2.1.3 Soil acidity range shall be between pH 6.0 – 7.0 inclusive.

2.1.2.1.4 Soil fertility shall be rated high in natural nutrients based on the coordinated ratings in pounds per acre as established by the Natural Soil and Fertilizer Research Committee.

2.1.2.2 Natural Organic Matter.

2.1.2.2.1 Peat Moss. Shall be Type 1 sphagnum peat moss; finely divided with a pH of 3.1 – 5.0.

2.1.2.2.2 Sedge Peat. Shall be pulverized, decomposed type of peat with pH reading of 4.5 or higher, water absorbing capacity of 1100-2000%, and a moisture content approximately 30%. There should be approximately 4 cubic feet or 6 bushels per 100 pounds of peat.

2.1.2.2.3 Leaf Mold. Shall be thoroughly shredded, well-composted leaf material, free of trash.

2.1.2.2.4 Pine Bark. Shall be potting grade pine bark with no particle size larger than ½ inch and less than 10% wood fiber.

2.1.2.3 Sand. Sand shall be fine, clean masonry sand.

2.1.3 Fertilizer.

2.1.3.1 Planting Tablets. Tightly compressed chip-type, long-lasting, slow-release, commercial-grade planting fertilizer in tablet form. Tablets shall break down with soil bacteria, converting nutrients into a form that can be absorbed by plant roots. Tablets size shall be 10-grams with a nutrient composition of 20% nitrogen, 10% phosphorous, and 5% potassium by weight, plus micronutrients.

2.1.4 Landscaping Mulch. Shall be natural color organic mulch consisting of shredded hardwood. Mulch shall range between 3 inches maximum to ½ inch minimum size.

2.2 Placement.

2.2.1 After excavation and filling topsoil to the sub-grade is completed and approved, the contractor shall place approved topsoil and planting soil mix to a minimum compacted depth as follows:

2.2.1.1 Groundcover, Grass and Shrub Planting Beds shall receive planting soil unit as per planting details and specifications.

2.2.1.2 Individual Shrubs and Canopy and Flowering Trees shall receive planting soil mix as per planting details and planting specifications.

2.2.2 Use approved topsoil and planting soil mix in relatively dry state, and place during dry weather. Approved topsoil or planting soil mix shall not be placed while in a frozen or muddy condition, when the subgrade is excessively wet, or in a condition that may otherwise be detrimental to proper grading or proposed sodding or seeding.

2.2.3 The approved topsoil and amended soil mix shall be loosely placed in horizontal layers so that the successive lifts will blend together. The maximum thickness per lift of compacted fill shall not exceed six (6) inches.

2.3 Planting Area Mulching.

2.3.1 Install weed-control barriers before mulching according to manufacturer's written instructions. Mulch backfilled surfaces of planting areas and other areas indicated. Completely cover area to be mulched, overlapping edges a minimum of 6 inches and secure seams with galvanized pins.

2.3.2 Trees in Turf Areas. Apply organic mulch ring of 3-inch average thickness, with 36-inch radius around trunks or stems. Do not place mulch within 6-inches of trunks or stems.

2.3.3 Organic Mulch in Planting Areas. Apply 3-inch average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 3-inches of trunks or stems.

2.4 Clean-Up. After the approved topsoil and planting soil mix has been spread and the final grades approved, it shall be cleared of all grade stakes, surface trash and other objects that would hinder maintenance. Paved areas over which hauling operations are conducted shall be kept clean, and any soil that is spilled upon the surface shall be promptly removed.

2.4.1 The wheels of all vehicles shall be kept clean to avoid tracking soil on the surfacing of roads, walks or other paved areas.

3.0 Method of Measurement. Measurement shall be made in accordance with Sec 801, 802.4 and 804.4.

3.1 Acceptance for Planting Soil installation shall be given by the engineer, upon satisfactory completion of each section or area indicated on the drawings or as otherwise specified.

4.0 Basis of Payment. Approved topsoil and planting soil mixes, fertilizer, and landscaping mulch shall be paid for at the contract unit prices for the items listed below and shall include all necessary equipment, materials and labor necessary for compliance with these provisions.

Item No.	Unit	Description
804-10.00	CUYD	Topsoil
804-99.07A	CUYD	Planting Soil Mix

805-99.19	Acre	Fertilizers
804-99.05A	SQYD	Landscaping Mulch

L-R. Landscape Plants (Route 100 Mainline)

1.0 Description. The contractor shall furnish and install landscape edgings and plants at the locations along mainline Route 100 depicted in the contract plans. Work shall include all tools, equipment, and labor necessary for the installation of trees, shrubs, plants, and steel edging.

2.0 Construction Requirements.

2.1 Materials. All material shall be in accordance with Sec 808. The contractor shall submit product data for each type of product, and include a list of plant material sources.

2.1.1 Landscape Plants. Landscape plants furnished shall be in accordance with Sec 808.2.1.

2.1.2 Landscape Edging. Landscape edging shall be standard commercial-steel edging, fabricated in sections of standard lengths, with loops stamped from or welded to face of sections to receive stakes. The size shall be 3/16-inch-thick x 5 ½" inches deep, and the finish shall be manufacturer's standard paint.

2.2 Planting Area Establishment. The planting area for soil placement and mix planting soil shall be prepared according to Section 804 for Planting Soil, with manufactured planting soil placed over exposed subgrade.

2.3 Excavation. Planting pits shall be excavated with sides sloping inward at a 45-degree angle, and the sides of the planting pit should be scarified if smeared or smoothed during excavation. Excavations with vertical sides will not be acceptable. The perimeter of bottom shall be trimmed, leaving center area of bottom raised slightly to support root ball and assist in drainage away from center. The base should not be further disturbed. The root ball should sit on undisturbed base soil to prevent settling.

2.3.1 Planting Pits and Trenches shall be excavated to the dimensions as shown on the drawings. Excavations shall be approximately three times as wide as the ball diameter but should not be deeper than the depth of the root ball, measured from the root flare to the bottom of the root ball. Excavations shall be at least 12 inches wider than root spread and deep enough to accommodate vertical roots for bare-root stock. Excavations shall be approximately three times as wide as the ball diameter.

2.4 Tree and Shrub Planting.

2.4.1 Roots. At time of planting, the root flare shall be visible at top of root ball in accordance with ANSI Z60.1. If root flare is not visible, soil shall be removed in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, the root ball shall still meet size requirements. Stem girdling roots and kinked roots shall be removed prior to planting. Any injured roots are to be removed by cutting cleanly, and are not to

be broken. After root pruning, the plant shall be set plumb and in center of planting pit or trench with root flare even with adjacent finish grades and backfilled with planting soil mix. Trees shall be backfilled with excavated soil.

2.4.2. Balled and Burlapped Stock. Once some backfill has been placed around root ball to stabilize plant, the burlap, rope, and wire baskets can be cut from tops of root balls and from sides and carefully removed, but should not be removed from under root balls. Planting stock shall not be used if root ball is cracked or broken before or during planting operation.

2.4.3 Container Grown Stock. Root balls shall carefully be removed from the container without damaging root ball or plant. Backfill shall be placed around the root ball in layers and tamped. When the planting pit is approximately one-half filled, the pit shall be watered thoroughly and planting tablets may be added. They should be equally distributed around the planting pit and placed about one inch from root tips. Tablets shall not be placed in the bottom of the hole. Upon placement of planting tablets, the backfilling process may be completed.

2.4.4 All trees and shrubs shall be thoroughly watered after planting is complete.

2.4.4 Slopes. When planting on slopes, the plant shall be set so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the downhill side will be above the surrounding soil. Enough soil shall be applied to cover the downhill side of the root ball.

2.5 Tree and Shrub Pruning. Pruning may be performed to remove only injured, dying, or dead branches from trees and shrubs. Tree leaders shall not be cut. Pruning shall be performed in accordance with standard professional horticultural and arboricultural practices and shall retain the natural character of the plant. Pruning shall not be performed for shape. Pruning paint shall not be applied to any wounds.

2.6 Ground Cover and Plant Planting. Plants other than trees and shrubs shall be laid out in even rows with triangular spacing as indicated in the contract plans. Holes shall be dug large enough to allow spreading of roots and planting soil shall be used as backfill, with a slight saucer indentation left around plants to hold water. All plants shall be thoroughly watered upon completion of planting. Care shall be taken to not cover plant crowns with wet soil. Plants shall also be protected from hot sun and wind; however, any such protection shall be removed if plants show evidence of recovery from transplanting shock.

2.7 Edging Installation.

2.7.1 Steel Edging. Steel edging shall be installed according to manufacturer's written instructions, and anchored with steel stakes spaced approximately 30 inches apart, driven below top elevation of edging.

2.7.2 Shovel-Cut Edging. Mulched areas shall be separated from turf areas, curbs, and paving with a 45-degree, 4- to 6-inch deep, shovel-cut edge as indicated on contract plans.

2.8 Plant Maintenance. The contractor shall be responsible for care and maintenance of all plantings in accordance with Sec 808.4.

3.0 Method of Measurement. This item will not be measured for payment.

3.1 Acceptance for landscape plant installation shall be in accordance with Sec 808.4.3. Acceptance shall be given by the engineer, upon satisfactory completion of each section or area indicated on the drawings or as otherwise specified.

4.0 Basis of Payment. The accepted quantity of plants and landscape edging shall be paid for at the contract unit prices for the items listed below and shall include all necessary equipment materials and labor necessary for compliance with these provisions.

Item No.	Unit	Description
808-99.03	Linear Foot	Landscape Edging
808-01.06	Each	Ginkgo
808-01.19	Each	Black Gum
808-99.02	Each	Japanese Zelkova
808-99.02	Each	Autumn Brilliance Serviceberry
808-99.02	Each	Spartan Juniper
808-99.02	Each	Andorra Creeping Juniper
808-99.02	Each	Redtwig Dogwood
808-05.04	Each	Redosier Dogwood
808-99.02	Each	Russian Sage
808-99.02	Each	Creeping Liriope
808-99.02	Each	Tom Thumb Cotoneaster
808-99.02	Each	Gro-Low Fragrant Sumac
808-99.02	Each	Daylily
808-99.02	Each	New England Aster
808-99.02	Each	White Coneflower
808-99.02	Each	Dwarfed Winged Burning Bush
808-99.02	Each	Crimson Pygmy Barberry
808-99.02	Each	Shamrock Inkberry
808-99.02	Each	Wintergreen Boxwood
808-99.02	Each	Elijah Blue Fescue

PRELIMINARY - NOT FOR CONSTRUCTION

Job No.: J6S1718B
Route: 100
County: St. Louis

(STRUCTURAL – PEDESTRIAN UNDERPASS)
JOB SPECIAL PROVISIONS TABLE OF CONTENTS

(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	THOUVENOT, WADE & MOERCHEN, INC. *720 Olive Street, Suite 200A* *St. Louis, MO 63101* Certificate of Authority: 001528 Consultant Phone: 314-241-6300
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J6S1718B ST. LOUIS COUNTY, MO DATE PREPARED: 02/12/2021
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Structural – Pedestrian Underpass) are authenticated by this seal: S-A. thru S-G.	

Job No.: J6S1718B
Route: 100
County: St. Louis

JOB
SPECIAL PROVISION
(STRUCTURAL – PEDESTRIAN UNDERPASS)

S-A. Pedestrian Underpass (Structural) Construction Requirements

1.0 Description. This provision contains general construction requirements for this project.

2.0 Construction Requirements.

2.1 In order to assure the least traffic interference, the work shall be scheduled so that a lane closure is for the absolute minimum amount of time required to complete the work. A lane shall not be closed until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

2.2 Provisions shall be made to prevent damage to any existing utilities. Any damage sustained to the utilities as a result of the contractor's operations shall be the responsibility of the contractor. All costs of repair and disruption of service shall be as determined by the utility owners and as approved by the engineer.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

S-B. Pre-Engineered Precast Concrete Structures

1.0 Description. This work shall consist of, but not limited to, constructing structures using precast units, wing walls and headwalls. Wing walls and headwalls may be precast units or cast-in-place.

2.0 Material. Materials shall be in accordance with the Specifications and specifically as follows:

Item	Section
Backfill	206
Class B-1 Concrete	501
Flowable Backfill	621
Hot or Cold Weather Concreting	703
Gradation E Coarse Aggregate	1005
Curing	1026
Reinforcing Steel	1036
Mortar and Non-Metallic Expansion Mortar	1066

2.1 Concrete and Reinforcing Steel. Concrete shall be Class B-1 with Gradation E coarse aggregate. Reinforcing steel in three-sided or arch units shall be welded steel wire fabric or Grade 60 (420) deformed bars. Reinforcing steel in the footings, pedestals, wing walls and headwalls shall be Grade 60 (420) deformed bars.

2.2 Steel. Bolts and threaded rods used in connections of wing walls to three-sided or arch units and hooked bolts used in connections of attached headwalls to three-sided or arch units shall be in accordance with ASTM A 307. Connection plates and plate washers used in connections of wing walls to three-sided or arch units shall be in accordance with AASHTO M 270 Grade 36 (250). Nuts used in connections of wing walls to three-sided or arch units shall be in accordance with AASHTO M 292 Grade 2H. Inserts for all connections and all steel used for connections of detached headwalls to three-sided or arch units shall be in accordance with ASTM A 240 Type 304. Except for Type 304, all steel shall be galvanized after fabrication in accordance with Sec 1080.

3.0 Manufacture.

3.1 Lifting devices or holes will be permitted in precast units. No more than four holes shall be cast in each unit. Drilled holes will not be allowed. Cast holes shall be tapered. Lifting devices used in lifting holes shall have sufficient bearing to avoid damage resulting from concentration of stresses around the lifting holes.

3.2 Ends of three-sided and arch units shall be of such design and shall be so formed that when erected, shall make a continuous line with a smooth interior free of irregularities. Ends of three-sided and arch units shall be normal to the walls and centerline, except where beveled ends are specified. Surfaces of three-sided and arch units shall be smooth form or troweled.

3.3 Precast units shall be stored in such a manner to prevent cracking or damage. Units shall not be moved until the concrete compressive strength has reached a minimum of 2500 psi (17 MPa). Units shall not be stored in an upright position until the concrete compressive strength has reached a minimum of 4000 psi (28 MPa).

3.4 Precast units shall be clearly marked with waterproof paint. The following information shall be shown fill face of the north headwall.

(a) Unit clear span and rise.

(b) Date of manufacture.

(c) Name or trademark of the manufacturer.

(d) Design earth cover.

3.5 Permissible variations shall be in accordance with AASHTO M 259.

4.0 Testing.

4.1 Concrete compressive strength shall be determined from compression tests made on cylinders. When the cylinder test strengths are less than the design concrete strength, then the concrete compressive strength shall be determined from compression tests made on cores. For cylinder testing, a minimum of four cylinders shall be taken during each production run. For core testing, one core shall be cut from three-sided and arch units selected at random from each group of 15 units or less of a particular size and production run. One core shall be cut from each group of four or fewer wing wall units. For each continuous production run, each group of 15 three-sided or arch units of a single size, fraction thereof or four wing wall units shall be considered

separately for the purpose of testing and acceptance. A production run shall be considered continuous if not interrupted for more than 3 days.

4.2 Cylinders shall be made and tested in accordance with ASTM C 39. Cores shall be obtained and tested for compressive strength in accordance with ASTM C 42. Requirements for lime curing will be waived.

4.2.1 The compressive strength of the concrete in each group of units, as defined above, will be acceptable when the core test strength is equal to or greater than the design concrete strength. The manufacturer shall perform random selection and testing of the cores as approved by the engineer.

4.2.2 If the compressive strength of the core tested is less than the design concrete strength, the unit from which that core was taken, may be recored. If the compressive strength of the recore is equal to or greater than the design concrete strength, the compressive strength of the concrete in that group of units will be acceptable.

4.2.3 If the compressive strength of a recore is less than the design concrete strength, the unit from which that core was taken will be rejected. Two units from the remainder of the group shall be selected at random. One core shall be taken from each. If the compressive strengths of both cores are equal to or greater than the design concrete strength, the remainder of the units in that group will be acceptable. If the compressive strength of either of the two cores tested is less than the design concrete strength, the remainder of the units in the group will be rejected. However, at the recommendation of the manufacturer, each remaining unit in the remainder of the group may be cored and accepted individually. The units will be rejected which have cores with less than the design concrete strength.

4.2.4 Core holes shall be plugged and cured by the manufacturer in such a manner that the units shall meet all the test requirements of these specifications.

4.3 The manufacturer shall furnish all facilities, equipment and personnel necessary to conduct the required testing.

5.0 Rejection.

5.1 Precast units will also be rejected due to the following conditions:

(a) Fractures or cracks completely through the wall, except for a single end crack which does not exceed one-half the thickness of the wall.

(b) Defects that indicates proportioning, mixing or molding which are not in accordance with this specification.

(c) Honeycombed or open textured concrete.

(d) Damaged unit ends, where such damage prevents making a satisfactory joint.

5.2 Units may be repaired due to imperfections in manufacture, handling damage or construction. Repair procedures shall be submitted to the engineer for approval. Repairs will be acceptable when determined that repairs are sound, properly finished and cured and repaired units are in accordance with the requirements herein.

6.0 Construction Requirements.

6.1 Footings. Footings shall be cast-in-place and constructed in accordance with grades shown on the structure plans. Footings shall be given a smooth float finish. A minimum 3-inch (75 mm) deep keyway shall be formed in the footings supporting three-sided and arch units. Keyways shall have 3 inches (75 mm) of clear between keyway edges and both faces of three-sided and arch units. Footing concrete shall reach an initial compressive strength of 2000 psi (14 MPa) before placement of units or before construction of cast in place wing walls. Surfaces shall not vary from the grades shown on the structure plans more than ¼ inch in 10 feet (6 mm in 3 m) when tested with a 10-foot (3 m) straightedge.

6.2 Special care shall be taken in setting units to the true line and grade. Three-sided, arch and wing wall units shall be set on 6 x 6 inches (150 x 150 mm) masonite or steel shims. A minimum gap of 1/2 inch (13 mm) shall be provided between footings and the base of units. Footing keyways shall be completely filled with an approved non-shrink grout.

6.3 Joints Between Precast Units.

6.3.1 Butt joints shall be covered with a plastic joint compound in accordance with Sec 733 and a Type III external sealing band in accordance with ASTM C 877. Surfaces shall be free of dirt before joint material is applied. The entire joint shall be continuously covered. Joints between three-sided or arch units and wing walls and joints between three-sided or arch units and headwalls, shall be covered with the same method used for butt joints.

6.3.2 Sealing bands shall be kept in the proper location over joints and care shall be taken to prevent damage during backfilling operations.

6.3.3 Keyway joints shall be fabricated with a minimum 4 x 1-1/2 inches (100 x 40 mm) keyway. Keyway joints shall be sealed with an approved plastic joint compound or a tubular joint seal in accordance with Sec 733.

6.4 Lift Holes. Lift holes shall be filled prior to backfilling in accordance with Sec 733.

6.5 Backfilling.

6.5.1 Backfill shall be placed and compacted in accordance with Sec 206 and the manufacturer's recommendation.

6.5.2 Operation of equipment over the structure shall be in accordance with the manufacturer's recommendations.

7.0 Method of Measurement. No measurement will be made for precast concrete structures, but each will be considered a lump sum unit.

8.0 Basis of Payment. Payment for accepted precast concrete structures for the above described work, including all material, equipment, labor and any other incidental work necessary to complete this item in place, will be considered completely covered by the contract lump sum price for "PRECAST CONCRETE STRUCTURE".

S-C. Design of Pre-Engineered Structures for Grade Separations

1.0 Design Parameters. This provision contains general design parameters for pre-engineered precast concrete structures.

2.0 Location and Layout. The structure shall be designed in accordance with the details shown on the structure plans. Flat-topped three-sided units will not be allowed.

2.1 Horizontal and Vertical Alignments. Roadways above and below the structure shall be constructed to the profile grade and horizontal alignment shown on the roadway plans.

2.2 Typical Roadway Sections. Roadway sections above and below the structure shall provide, as applicable the same pavements, shoulders, curbs, medians and sidewalks shown on the roadway plans in the typical sections for these locations.

2.3 Traffic Barrier. Traffic barrier shall be installed as shown on the roadway plans.

3.0 Design.

3.1 The structure shall be designed in accordance with the design specifications and for the design loadings and additional parameters shown on the structure plans, except as modified herein.

3.2 Minimum design concrete compressive strength shall be 4,000 psi (28 MPa).

3.3 Hydrostatic pressure shall be considered when using flowable backfill.

3.4 Horizontal pressures shall be increased for sloping backfill and live load surcharge.

3.5 Minimum reinforcing steel cover shall be 2 inches (50 mm) for pedestals, collars, wingwalls and headwalls.

3.6 Reinforcing steel splicing and spacing requirements shall be in accordance with the design specifications shown on the structure plans and the manufacturer's recommendation.

3.7 Minimum fill over the structure shall be the greater of 12 inches (300 mm) or total depth of the pavement and pavement bases shown on the roadway plans.

3.8 Top of headwalls shall be 6 inches (150 mm) above the roadway fill.

3.9 The structure shall be designed for a 75-year design life.

3.10 Anchors and anchoring methods shall take into account the weight and seismic requirements of "Pedestrian Underpass Cast Stone Masonry" and "Pedestrian Underpass Phenolic Panel System". Refer to the Job Special Provisions for these items.

4.0 Submittals.

4.1 The contractor shall submit to the engineer for approval the following items signed, sealed and stamped by a registered professional engineer in the state of Missouri in accordance with Authentication of Certain Documents in Sec 107:

4.1.1 Three copies of design computations. Design computations that are computer-generated shall be accompanied by longhand examples of the design methodology that completely addresses all components of the structure.

4.1.2 Five sets of shop drawings. Shop drawings shall be of sufficient detail and clarity to provide a permanent record of the structure for future reference. Shop drawings shall include the county and structure number on each sheet. Shop drawings shall include all details, dimensions and quantities necessary to construct the structure and shall include, but not be limited to, the following information:

(a) Structure clear span and rise.

(b) Three-sided or arch unit details showing all concrete dimensions and reinforcing steel requirements. The details shall show the location of units tied to the centerline of the roadway.

(c) Wing wall and headwall details when required showing all concrete dimensions, reinforcing steel and anchorage details. Wing wall plan, elevation and section views shall be provided. Headwall elevation and section views shall be provided.

(d) Structure backfill type and limits.

(e) Manufacturer's instructions, construction drawings and assembly drawings.

(f) Anchors and anchoring methods for both the Pedestrian Underpass Phenolic Panel System and the Pedestrian Underpass Cast Stone Masonry.

4.2 The contractor shall submit computations electronically in Adobe Acrobat format.

4.3 The contractor shall submit shop drawings electronically in Adobe Acrobat format.

4.4 Construction or manufacture of any component of the structure shall not begin until written approval of computations and shop drawings have been received from the engineer.

4.5 During construction, the contractor shall submit to the engineer construction change recommendations to resolve unexpected subsurface conditions or any other constructability issue. Construction of any required modification shall not begin until written approval of the construction change recommendations have been received from the engineer.

4.6 After construction, the contractor shall submit final shop drawings electronically in Adobe Acrobat format. Final shop drawings shall include construction changes made to shop drawings during construction.

4.7 Shop drawings shall be in accordance with Specifications of Computer Deliverable Contract Plans in the MoDOT Engineering Policy Guide.

5.0 Method of Measurement. No measurement will be made.

6.0 Basis of Payment. Payment for the above described work will be considered completely covered by the contract unit price for other items included in the contract.

S-D. Vertical Drain for Three-Sided Structure

1.0 Description. This work shall consist of furnishing and installing a vertical drain system consisting of drain core, geotextile fabric, perforated and unperforated drain pipe, couplers, porous backfill, as shown on the plans or as directed by the engineer.

2.0 Material. Materials shall be in accordance with the Specifications and specifically as follows:

Item	Section
Geotextile	1011 (Subsurface Drainage Geotextile)
Geocomposite Drainage Material	1012 (Vertical Drain at End Bents)
Miscellaneous Drainage Material	1013
Porous Backfill	1009 Grade 4

3.0 Construction Requirements.

3.1 The contractor shall install the vertical drain system in accordance with the manufacturer's recommendations.

3.2 If the core of the drain is not perforated, modifications shall be made to the core to provide adequate drainage into the drain pipe as approved by the engineer.

3.3 Vertical and horizontal joints shall be constructed to form an uninterrupted drain face after compaction is completed. All joints shall have an overlap of geotextile to prevent any intrusion of fill material into the drain. Horizontal joints shall be designed to drain downward. Any cracks or openings in the drain adjacent to the fill will be cause for rejection of the drain, and the drain shall be replaced by the contractor, at the contractor’s expense.

3.4 The backfill material shall be placed and compacted in accordance with Sec 206. The backfill shall be placed in such a manner as to prevent damage to the vertical drain system. The backfill material shall be as approved by the engineer.

4.0 Method of Measurement. The work provided herein will not be measured for payment, but will be considered completely paid for as a system, per each.

5.0 Basis of Payment. The accepted vertical drain system, complete in place, will be paid for at the contract price for “VERTICAL DRAIN FOR THREE-SIDED STRUCTURE”, Pay Item No. 715-99.02. No direct payment will be made for excavation, backfilling, compaction, drain pipe or other material and work.

S-E. Waterproofing Membrane for Three-Sided Structure

1.0 Description. This work shall consist of furnishing and placing a membrane waterproofing system on the top slab and sidewalls, or portions thereof, for three-sided structures as shown on the plans or as directed by the engineer.

2.0 Materials. The materials used in the waterproofing system shall consist of the following.

2.1 Cold-applied, self-adhering rubberized asphalt/polyethylene membrane sheet with the following properties:

Physical Properties	
Thickness ASTM D 1777 or D 3767	60 mils (1.500 mm) min.
Width	36 inches (914 mm) min.
Tensile Strength, Film ASTM D 882	500 lb./in² (34.5 MPa) min.
Pliability [180° bend over 1 inch (25 mm) mandrel @ -20°F (-29°C)] ASTM S 146 (Modified) or D1970	No Effect
Puncture Resistance-Membrane ASTM E 154	40 lb. (178 N) min.
Permeability (Perms) ASTM E 96, Method B	0.1 max.
Water Absorption (% by Weight) ASTM D 570	0.2 max.
Peel Strength ASTM D 903	9 lb./in (1576 N/m) min.

2.2 Ancillary Materials: Adhesives, Conditioners, Primers, Mastic, Two-Part Liquid Membranes, and Sealing Tapes as required by the manufacturer of the membrane and film for use with the respective membrane waterproofing system.

3.0 Construction.

3.1 The areas requiring waterproofing shall be prepared and the waterproofing shall be installed in accordance with the manufacturer's instructions. The Contractor shall not install any part of a membrane waterproofing system in wet conditions, or if the ambient or concrete surface temperature is below 40° (4° C), unless allowed by the Engineer.

3.2 Surfaces to be waterproofed shall be smooth and free from projections which might damage the membrane sheet. Projections or depressions on the surface that may cause damage to the membrane shall be removed or filled as directed by the Engineer. The surface shall be power washed and cleaned of dust, dirt, grease, and loose particles, and shall be dry before the waterproofing is applied.

3.3 The Contractor shall uniformly apply primer to the entire area to be waterproofed, at the rate stated in the manufacturer's instructions, by brush, or roller. The Contractor shall brush out primer that tends to puddle in low spots to allow complete drying. The primer shall be cured according to the manufacturer's instructions. Primed areas shall not stand uncovered overnight. If membrane sheets are not placed over primer within the time recommended by the manufacturer, the Contractor shall recoat the surfaces at no additional cost.

3.4 The installation of the membrane sheet to primed surfaces shall be such that all joints are shingled to shed water by commencing from the lowest elevation of the buried structure's top slab and progress towards the highest elevation. The membrane sheets shall be overlapped as required by the manufacturer. The Contractor shall seal with mastic any laps that were not thoroughly sealed. The membrane shall be smooth and free of wrinkles and there shall be no depressions in horizontal surfaces of the finished waterproofing. After placement, exposed edges of membrane sheets shall be sealed with a troweled bead of a manufacturer's recommended mastic, or two-part liquid membrane, or with sealing tape.

3.5 Sealing bands at joints between precast segments shall be installed prior to the waterproofing system being applied. Where the waterproofing system and sealing band overlap, the installation shall be planned such that water will not be trapped or directed underneath the membrane or sealing band.

3.6 Care shall be taken to protect and to prevent damage to the waterproofing system prior to and during backfilling operations. The waterproofing system shall be removed as required for the installation of slab mounted guardrails and other appurtenances. After the installation is complete, the system shall be repaired and sealed against water intrusion according to the manufacturer's instructions and to the satisfaction of the Engineer.

3.7 Lift holes shall be filled with a polyethylene plug. The plug shall not project beyond the inside surface after installation nor project above the outside surface to the extent that may cause damage to the membrane. When metal lifting inserts are used, their sockets shall be filled with mastic or mortar compatible with the membrane.

4.0 Method of Measurement. The waterproofing system will not be measured for payment.

5.0 Basis of Payment. This will work will be paid for at the contract lump sum price unit price for "WATERPROOFING MEMBRANE FOR THREE-SIDED STRUCTURE".

S-F. Dewatering

1.0 Description. This provision covers dewatering the site as necessary to provide a suitable condition for the construction of the structures, as approved by the engineer. This work shall include dewatering for the underpass and adjacent retaining walls for both stages of construction. This work shall be done in accordance with Sec 206 and this specification.

2.0 Construction Requirements. Dewatering shall provide a dry work area suitable to construct the structures within specifications, as approved by the engineer. Typical dewatering methods consist of, but are not limited to, construction of cofferdams, seal courses, over excavation, well point systems, dewatering and drainage diversion. Any dewatering method utilized shall conform to all environmental laws and regulations.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for dewatering will be made regardless of which dewatering means is utilized. No payment will be made if the work area is not maintained in a dewatered state, as approved by the engineer. The lump sum payment for dewatering will be full compensation and no time extensions will be made regardless of which means and methods are utilized by the contractor.

S-G. Temporary Shoring

1.0 Description. This work shall consist of installing temporary shoring as required in accordance with Sec 206, the underpass plans and this special provision to retain the fill during stage construction.

2.0 Construction Requirements. The responsibility for the design and construction of the temporary shoring shall rest solely with the contractor. The design and plans for the temporary shoring shall be signed and sealed by a Registered Professional Engineer registered in the State of Missouri. The design shall insure that the temporary shoring is braced or substantially secured

to prevent soil movement during construction of the underpass. Temporary shoring shall not be removed until it is no longer needed for staged construction. The temporary shoring shall become the property of the contractor.

3.0 Method of Measurement. No measurement will be made.

4.0 Basis of Payment. Payment for the above described work, including all material, equipment, labor and any other incidental work necessary to complete this item, will be considered completely covered by the contract lump sum price for “Temporary Shoring”.

PRELIMINARY - NOT FOR CONSTRUCTION

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

(TRAFFIC, SIGNALS & SIGNING)
JOB SPECIAL PROVISIONS TABLE OF CONTENTS
(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

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	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J6S1718, J6S1718B, and J6S1718C ST. LOUIS COUNTY, MO DATE PREPARED: 02/12/2021
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Traffic, Signals & Signing) are authenticated by this seal: T-A. thru T-R.	

Job No.: J6S1718, J6S1718B, and J6S1718C
Route: 100
County: St. Louis

JOB
SPECIAL PROVISION
TRAFFIC, SIGNALS & SIGNING

T-A. Work Zone Traffic Management Plan (WZTMP)

1.0 Description. Work zone traffic management shall be in accordance with applicable portions of Division 100 and Division 600 of the Standard Specifications, and specifically as follows.

1.1 Work Zone Specialist (WZS). The Traffic Management Plan shall name an individual, either employed by the contractor or hired by the contractor, to act as the Work Zone Specialist (WZS) throughout the entirety of the project. The (WZS) will have no job duties other than traffic control. The WZS shall be in direct charge of the temporary traffic control pre-activity meeting and traffic control items such as; setup, communications, reviews, and reporting of all daily work zones on the project. Any change in personnel for the WZS shall be submitted in written form to the engineer. The WZS shall be trained and certified as a Traffic Control Supervisor from an organization such as ATSSA or equivalent and will be directly involved with daily traffic management and traffic management planning. It will be the responsibility of the WZS to coordinate daily traffic management with the contractor's traffic control crews, inspector or engineer and the ST. Louis Traffic Management Center (TMC). The WZS shall be required to be on the project daily and remain on the project until all work zones have been removed for the day. The WZS shall be on site before the first work zone sign is placed for the day and until the last traffic control device is taken down for the day. The WZS shall remain on site the entire time daily/nightly lane drops are in use. The WZS shall maintain daily contact with the engineer or inspector on the project.

1.2 Work Zone Set Up. The WZS shall direct the configuration and placement of each work zone daily and ensures work zones are set up and maintained in accordance with the EPG. The WZS shall conduct a daily meeting with the set up crew to determine which traffic control devices are required, their locations and set up and take down times.

1.3 Work Zone Communication. The WZS shall notify the TMC before the first work zone sign is set up and after the last traffic control item is taken down at the end of each work day or night. The WZS shall also to notify the inspector of any work zone cancellation for the day. Notification of cancellations shall be made prior to 3:00 pm for nighttime work zones, as well as for daytime work zones the following day. The WZS shall also notify the inspector or engineer 2 weeks before any new lane closures or detours are put into place.

1.4 Work Zone Reviews. Once the traffic control has been placed for the day, the WZS shall review the work zone to ensure all devices are legible and clean, installed in the correct location with the correct spacing and convey the correct message. The WZS shall approve the work zone before any work can begin. The WZS shall also review the job site hourly to determine if any traffic control devices need to be added, reconfigured or cleaned. If the engineer or inspector notifies the WZS of any safety or traffic related concerns in the work zone, the engineer or inspector will communicate the type of deficiency as per Sec 616.4.2.5.2. This communication will be verbal and documented in writing via the DWR for that day. The DWR entry will include the time of verbal communication. The WZS will also document the deficiency in their daily report. For Category 1 deficiencies, the written documentation will include the time of notification and the time of correction. Any liquidated damages assessed shall be placed on the next Engineer's estimate as per 1.7 of this section.

1.5 Work Zone Reporting. After the WZS has conducted the daily initial review of the work zone, the WZS shall record the findings. Thereafter, the WZS shall conduct reviews on an hourly bases and subsequently record findings, required corrections and times the corrections were completed. Copies of the WZS review documentation shall be furnished to the Engineer within 24 hours.

1.6 Maintaining Work Zones and Work Zone Reviews. The WZS shall maintain work zones on a daily basis to ensure safety to the traveling public and the workers; this includes long term work zones that have devices and/or roadway conditions that need to be maintained. If the engineer or inspector notifies the WZS of any safety or traffic delay concerns in the work zone, the WZS shall promptly inspect and work to provide a solution to correct the situation in accordance with Sec. 616.4.2.5. Missing, damaged or over-turned traffic control devices shall typically be corrected without the need for direction by the engineer. The WZS is responsible to assure all traffic control devices are maintained in accordance with EPG standards. The WZS is responsible to ensure the work zone is operated within the hours specified by the engineer and will not deviate from the specified hours without prior approval of the engineer. The WZS is responsible to manage work zone delay in accordance with project special provisions. The WZS and engineer shall submit one joint weekly technical review of work zone operations identifying any concerns present and the corrective actions taken. Reviews may be subjected to unannounced inspections by the engineer to corroborate the validity of the ratings. The engineer and WZS will be notified of the results.

1.6.1 Work zone signs and bases shall be removed from both inside and outside shoulders of the roadway when not in use and the end of each work shift. This includes signs and bases used for daily or nightly lane closures.

1.7 Work Zone Conflict Resolution. Any conflict resolution shall be in accordance with Sec 616.4. Failure to make corrections on time may result in the engineer suspending work. The suspension will be non-excusable and non-compensable regardless of whether road user costs are being charged for closures.

2.0 Traffic Management Schedule.

2.1 Traffic management schedules shall be submitted to the engineer for review prior to the start of work and prior to any revisions to the traffic management schedule. The traffic management schedule shall include the proposed traffic control measures, the hours traffic control will be in place, and work hours.

2.2 The contractor shall request permission at least two working days prior to lane closures or shifting traffic onto detours, and 14 calendar days prior to the imposition of height, width or weight restrictions. This is to ensure closures do not conflict with other work within the zone of influence and the work zone information on the MoDOT's website can remain real-time. In accordance with Management of Traffic (MOT) procedures, the contractor shall submit lane closures for the following week to the engineer by 3:00pm on Monday.

2.3 The engineer shall be notified as soon as practical of any postponement due to weather, material or other circumstances.

2.4 In order to ensure minimal traffic interference, the contractor shall schedule lane closures for the absolute minimum amount of time required to complete the work. Lanes shall not be closed

until material is available for continuous construction and the contractor is prepared to diligently pursue the work until the closed lane is opened to traffic.

2.5 Traffic Congestion. The contractor shall, upon approval of the engineer, take proactive measures to reduce traffic congestion in the work zone. The contractor shall immediately implement appropriate mitigation strategies whenever traffic congestion reaches an excess of **10 minutes** to prevent congestion from escalating beyond this delay threshold. If disruption of the traffic flow occurs and traffic is backed up in queues equal to or greater than the delay time threshold listed above then the contractor shall immediately review the construction operations which contributed directly to disruption of the traffic flow and make adjustments to the operations to prevent the queues from reoccurring. Traffic delays may be monitored by physical presence on site or by utilizing real-time travel data through the work zone that generate text and/or email notifications where available. The engineer monitoring the work zone may also notify the contractor of delays that require prompt mitigation. The contractor may work with the engineer to determine what other alternative solutions or time periods would be acceptable. The contractor may refer to the Work Zone Analysis Spreadsheet found in the electronic deliverables under the MoDOT Online Plans Room for detailed information on traffic delays.

2.5.1 Traffic Safety.

2.5.1.1 Where traffic queues routinely extend to within 1000 feet of the ROAD WORK AHEAD, or similar, sign on a divided highway or to within 500 feet of the ROAD WORK AHEAD, or similar, sign on an undivided highway, the contractor shall extend the advance warning area, as approved by the engineer.

2.5.1.2 When a traffic queue extends to within 1000 feet of the ROAD WORK AHEAD, or similar, sign on a divided highway or to within 500 feet of the ROAD WORK AHEAD, or similar, sign on an undivided highway due to non-recurring congestion, the contractor shall deploy a means of providing advance warning of the traffic congestion, as approved by the engineer. The warning location shall be no less than 1000 feet and no more than 0.5 mile in advance of the end of the traffic queue on divided highways and no less than 500 feet and no more than 0.5 mile in advance of the end of the traffic queue on undivided highways.

3.0 Work Hour Restrictions.

3.1 There are six major holiday periods shown below. All lanes shall be scheduled to be open to traffic during these holiday periods, from 12:00 noon on the last working day proceeding the holiday until 9:00 a.m. on the first working day subsequent to the holiday.

Memorial Day
Labor Day
Thanksgiving
Christmas
New Year's Day

3.1.1 Independence Day. The lane restrictions specified in Section 3.1 shall also apply to Independence Day, except that the restricted periods shall be as follows:

12:00 noon July 2, 2021 – 6:00 a.m. July 6, 2021
12:00 noon July 1, 2022 – 6:00 a.m. July 5, 2022
12:00 noon June 30, 2023 – 6:00 a.m. July 5, 2023

3.2 The contractor shall not perform any construction operation on the roadway, including the hauling of material within the project limits, during restricted periods, holiday periods or other special events specified in the contract documents. Any work requiring a temporary reduction the the number of through lanes of traffic shall be completed during the following hours:

Insert allowable work hours here.

3.3 The contractor shall be aware that traffic volume data indicates construction operations on the roadbed between the following hours will likely result in traffic queues greater than 15 minutes:

Insert work hour restrictions here.

Based on this, the contractors operations will be restricted accordingly unless it can be successfully demonstrated the operations can be performed without a 15 minute queue in traffic. It shall be the responsibility of the engineer to determine if the above work hours may be modified. Working hours for evenings, weekends and holidays will be determined by the engineer.

3.4 The contractor shall not alter the start time, ending time, or a reduction in the number of through lanes of traffic or ramp closures without advance notification and approval by the engineer. The only work zone operation approved to begin 30 minutes prior to a reduction in through traffic lanes or ramp closures is the installation of traffic control signs. Should lane or ramp closures be placed or remain in place, prior to the approved starting time or after the approved ending time, the Commission, the traveling public, and state and local police and governmental authorities will be damaged in various ways, including but not limited to, increased construction administration cost, potential liability, traffic and traffic flow regulation cost, traffic congestion and motorist delays, with a resulting cost to the traveling public. These damages are not easily computed or quantified. Therefore, the contractor will be charged with liquidated damages specified in the amount of **$1000 per 15 minute increment** for each 15 minutes that the temporary lane or ramp closures are in place and not open to traffic in excess of the limitation as specified elsewhere in this special provision. It shall be the responsibility of the engineer to determine the quantity of unapproved closure time.

3.4.1 The said liquidated damages specified will be assessed regardless if it would otherwise be charged as liquidated damages under the Missouri Standard Specification for Highway Construction.

4.0 Detours and Lane Closures.

4.1 The contractor shall provide changeable message signs (CMS) notifying motorists of future traffic disruption and possible traffic delays one week before traffic is shifted to a detour or prior to lane closures. The CMS shall be installed at a location as approved or directed by the engineer. The CMS shall be capable of communication with the Transportation Management Center (TMC), if applicable, prior to installation on right of way. All messages planned for use in the work zone shall be approved and authorized by the engineer or its designee prior to deployment. Permanent dynamic message signs (DMS) owned and operated by MoDOT may also be used to provide warning and information for the work zone. Permanent DMS shall be operated by the TMC, and any messages planned for use on DMS shall be approved and authorized by the TMC at least 72 hours in advance of the work.

4.2 At least one lane of traffic in each direction shall be maintained at all times except for brief intervals of time required when the movement of the contractor's equipment will seriously hinder the safe movement of traffic. Periods during which the contractor will be allowed to interrupt traffic will be designated by the engineer.

5.0 Basis of Payment. No direct payment will be made to the contractor to recover the cost of equipment, labor, materials or time required to fulfill the above provisions, unless specified elsewhere in the contract documents. All authorized changes in the traffic control plan shall be provided for as specified in Sec 616.

T-B. Temporary Traffic Control

1.0 Description. All work necessary to maintain safe and efficient traffic flow through the work areas shall be provided by the contractor. This will include furnishing, relocating, and removing temporary traffic control devices, truck mounted attenuators and equipment, and the removal and relocation or covering and uncovering of existing signs and other traffic control devices in accordance with the contract documents or as directed by the engineer.

2.0 Work requirements. Work shall be in accordance with Sec 616, Sec 612, and the contract plans.

3.0 Method of Measurement. The quantities shown on the plans shall be considered an estimate and may be subject to change based on field conditions. This work will not be measured for payment, but will be considered a lump sum unit. Multiple use of the typical traffic control applications shall be considered included in the lump sum unit. Any Value Engineering proposals to the temporary traffic control will not be paid for through value engineering but will be covered under Temporary Traffic Control, lump sum.

4.0 Basis of Payment.

4.1 Partial payments will be made as follows:

a) The first partial payment will be made when five percent of the original contract amount is earned. This payment will be the lesser of 50 percent of the contract price for the item of temporary traffic control or 5 percent of the original contract price.

b) The second partial payment will be made when 50 percent of the original contract amount is earned. This payment will be the lesser of 25 percent of the original contract price for the item of temporary traffic control or 2.5 percent of the original contract price.

c) The third partial payment will be made when 75 percent of the original contract amount is earned. This payment will be the lesser of 20 percent of the original contract price for the item of temporary traffic control or 2 percent of the original contract price.

d) When the engineer has accepted the contract for maintenance in accordance with Sec 105, the remaining contract price for the item of temporary traffic control will be paid.

e) The above partial payment schedule may be adjusted by the engineer if proof of invoices submitted by the contractor demonstrate additional temporary traffic control costs were incurred earlier than the above proposed schedule. The total payment for temporary

traffic control will not exceed the bid amount for Temporary Traffic Control, lump sum, unless covered by a cost change order as referenced in the following Section 4.3.

4.1.1 For the purposes of this provision, the term "original contract price" will be construed as the total dollar value of the construction items (excluding temporary traffic control) of the original contract.

4.2 Payment for Temporary Traffic Control shall be made and considered completely covered by the contract unit price bid for:

Item No.	Unit	Description
616-99.01	L.S.	Temporary Traffic Control

No direct payment will be made for the following:

a) Incidental items necessary to complete the work, unless specifically provided as a pay item in the contract.

b) Installing, operating, maintaining, cleaning, repairing, removing or replacing traffic control devices.

c) Covering and uncovering existing signs and other traffic control devices.

d) Relocating temporary traffic control devices, including permanent traffic control devices temporarily relocated, unless specifically included as a pay item in the contract.

e) Providing channelizers.

f) Worker apparel.

g) Flaggers, pilot vehicles, and appurtenances at flagging stations.

h) Furnishing, installing, operating, maintaining, and removing construction-related vehicle and equipment lighting.

i) Construction and removal of temporary equipment crossovers, including restoring pre-existing crossovers.

j) Removing existing pavement markings, installing temporary pavement markings, and removing and relocating temporary pavement markings as necessary for staging operations.

k) Installing "Drive Smart" and "Point of Presence" signs.

4.3 Any additional work deemed necessary by the engineer that requires temporary traffic control and is not covered by the contract plans will be included in the cost change order for the additional work. However, if the added work is required in a stage where temporary traffic control is already in place, no additional traffic control pay will be allowed in this case.

T-C. Traffic Signal Maintenance and Programming

1.0 Description. Traffic signal maintenance and timing for this project shall be in accordance with Section 902 of the Standard Specifications, and specifically as follows.

2.0 Qualified Traffic Engineer

2.1 The Contractor shall have an experienced traffic engineer with a Professional Engineer's (PE) license in Missouri as well as a Professional Traffic Operations Engineer (PTOE) certification (hereafter referred to as "Contractor's traffic engineer") with the noted experience defined below. The Engineer shall approve the traffic engineer prior to them being hired.

2.2 Experience. Any proposed Contractor traffic engineer shall be able to demonstrate personal successful previous experience in the following tasks:

2.2.1 Response. The Contractor's traffic engineer shall have the ability to be on site within one (1) hour of being requested.

2.2.2 Corridor Management: Time/space diagram manipulation in order to successfully adjust offsets and splits for rapidly changing traffic demands.

2.2.3 Controller Programming: Ability to program by hand and by software Phase, TBC, and Coordination levels of any Commission-owned Advanced Traffic Signal Controller.

2.2.4 Intersection Programming: Implementation of adjusted and/or new timing plans as a result of changing traffic demand.

2.2.5 Signal Software: Use and understanding of TransCore traffic control software.

2.3 The Contractor shall submit the names(s) of proposed traffic engineer(s) and the name(s) of all other personnel on their proposed staff along with detailed experience in all tasks outlined in Paragraph 2.2 above. The Engineer reserves the right to reject any Contractor traffic engineer, before the start of work, who does not have sufficient experience or, at any point during the project, which does not satisfy the requirements set forth within this Job Special Provision. A list of potential traffic engineers shall be submitted for review to the Commission prior to bid.

2.4 VPN Access. The Commission operates the noted signals through a central signal system which is capable of remote adjustments to controller programming.

2.4.1 The approved contractor's traffic engineer and any staff assigned to manage the traffic signals during the project is encouraged to apply for VPN (Virtual Private Network) access with the Engineer once the project is awarded. If approved, the Engineer will assign a unique IP address to the Contractor's traffic engineering staff, which will allow for remote access to the Commission's central signal control system as appropriate and the ability to interface with the noted signals on this project.

3.0 Existing Traffic Signals and Communication System

3.1 The Contractor shall notify the Engineer three (3) weeks prior to the date of bridge closure and detour implementation. The contractor shall meet with the Engineer's representatives to

discuss their traffic mitigation plan at least one (1) week before the date of the first closure and as needed between construction stages. The traffic mitigation plan should at a minimum include:

- Proposed Timing Plan changes and any models
- Anticipated locations of concern
- A map in electronic format displaying the locations and names of the signals as detailed in Paragraphs 3.2 and 3.3 below.
- Other traffic mitigation efforts

3.2 Once the bridge closure has been implemented by the Contractor, the Contractor shall then be solely responsible for the following signals' controller programming until completion of all closures necessary to complete the Contractor's work. Maintenance at these locations for items other than controller programming issues or incidents caused by controller programming or other construction done by the Contractor shall remain with the Commission. If any part of an existing traffic signal or its controller within the limits of this project has otherwise been modified or adjusted by the Contractor, or the Contractor makes any roadway changes to reduce the traffic capacity through a signalized intersection within the limits of the project, or the Contractor begins work at an intersection with signals already in operation, the Contractor shall then be solely responsible for that signal's controller programming and all signal maintenance as specified in 902.2 and 902.3, except for power costs, until Final Acceptance of the project.

Commission Signals:

- List signals here

3.3 The Engineer shall provide to the Contactor with two (2) weeks' notice an electronic report on the existing phasing and timing of each traffic signal which may be the Contractor's responsibility to program. The Engineer shall be available to the Contractor before any changes are made to a signal or controller to answer any questions about the report. In lieu of the report, the Contractor's traffic engineer may obtain this information from the Commission's central signal control system. Once the Contractor has modified a signal or controller for any reason, the Contractor shall be solely responsible for the existing timing plans and all subsequent timing changes.

3.4 The Contractor shall notify the Engineer of the changes no later than (1) working day after changes are programmed if unable to provide advance notice as specified in 902.2.

3.5 The Contractor shall be solely responsible for maintaining the coordination at any affected signal to the satisfaction of the Engineer until completion of work as set forth in section 3.2 of this provision. Maintenance of coordination may include the synchronization of the affected controller's internal time clocks to the second using an atomic clock, or other means approved by the Engineer. If time clock synchronization is used, the Contractor shall verify all affected controllers are synchronized at least one (1) time per week with a report to the Engineer
This report will be in the form of a documentation record as spelled out in the Work Zone Traffic Management Plan.

4.0 Existing Traffic Signal Maintenance and Response

4.1 The Contractor shall respond to any signal timing complaints or malfunction complaints for those locations detailed in Section 3.0 of this provision and as specified in Section 902.21.1.
Response time shall be one (1) hour for complaints received by the contractor between 6 AM and 6 PM on non-holiday weekdays, and two (2) hours for all other times. For some cases (due to

travel times or other extenuating circumstances) additional time may be acceptable within reason, but must be approved by the Engineer. These timeframes will replace the '24 hour' response time in Section 105.14 for any signal-related incidents, where the entire cost of the work, if performed by Commission personnel or a third party, will be computed as described in Section 108.9 and deducted from the payments due the Contractor.

4.2 The Contractor must supply a contact name and phone number who will be responsible for receiving signal timing complaints for the Engineer. These complaints may be forwarded directly to the Contractor by someone other than the Engineer, including but not limited to the Commission's Customer Service Representatives, and will not relieve the Contractor from properly responding based on the response times of this Provision. The Contractor shall respond to the Engineer within 12 hours of the complaint as to the remedy. The Contractor shall submit to the Engineer a weekly report of complaints received and remedies performed throughout the duration of the project.

5.0 Original Signal Controller Programming and Acceptance

5.1 The Contractor will be responsible for restoring the original signal controller programming at existing intersections and coordination plans for each intersection immediately upon bridge reopening. The Engineer shall preserve and house the original controller files and provide the Contractor with access to those files in order to perform the restoration of the original plans. Normal plan restoration can be done by a manual command in the signal control system or a preprogrammed time-of-day command change. For any locations rendered offline at the time of re-opening, these locations shall be returned to normal operation by hand. The contractor will be relieved of signal programming maintenance at an existing restored intersection once 48 consecutive hours have passed without a programming malfunction, including restoring normal signal programming to the satisfaction of the Commission.

6.0 Post Project Report

6.1 The Contractor shall submit to the Engineer a post project report, four to six weeks after the final signal adjustments have been completed. The report shall include at a minimum an observation report, summary of timing changes and locations, summary of complaints, and any other pertinent information regarding the contractor's efforts for managing these signal corridors in one electronic document.

7.0 Deliverables

7.1 All deliverables mentioned in this provision shall be submitted to the Engineer in a timely manner to the satisfaction of the Engineer prior to receiving full compensation for this work.

- Experience submittal
- Preliminary Traffic Mitigation Plan
- Notification of Detour Implementation
- Time Base Reports, As Needed
- Complaint Resolutions
- Notification of Restoration to Normal Operations
- Post Project Report

8.0 Construction Requirements. Construction requirements shall conform to Sections 902, 1061 and 1092.

9.0 Method of Measurement. Method of measurement shall conform to Section 902.

10.0 Basis of Payment. Payment will be considered full compensation for all Contractor services, installation, and labor to complete the described work:

Item Number	Description	Unit
616-99.01	Traffic Signal Maintenance and Programming	Lump Sum

T-D. NTCIP Compliant Changeable Message Sign (Contractor Furnished and Retained)

1.0 Description. All solar powered changeable message signs, hereinafter referred to as a CMS, shall be in accordance with these specifications.

2.0 Material. Each CMS shall consist of an all LED (light emitting diode) matrix message board, solar/battery power supply and a user-operated interface, as specified, all mounted on a heavy duty, towable trailer.

2.1 Each CMS shall be either Full Matrix or Character Matrix, and have the following minimum characteristics:

(a) Full Matrix - Each CMS shall be the Full Matrix type with the capability of providing one, two, and three lines of individual changeable characters with minimum heights of 52 (1300), 28 (700), and 18 (450) inches (mm), respectively. Full Matrix signs shall be capable of both static and dynamic graphics, and full display sized messages.

(b) Character Matrix (Three Line) – Each CMS shall consist of a minimum of three lines containing eight individual changeable characters per line. Each character shall be a minimum of 12 inches wide and 18 inches (450 mm) high.

(c) Sign firmware shall comply with the current FHWA and DOT (Department of Transportation) NTCIP standards and support all NTCIP mandatory objects.

(d) The sign controller shall be remotely accessible by the MoDOT St Louis District Transportation Management Center (TMC) through the Commission's ATMS (Advanced Traffic Management System) software, currently TransSuite provided by TransCore. The contractor will be responsible for ensuring the CMS is added to the ATMS software.

(e) The CMS shall have a cellular data modem compatible with the district's current cellular IP (packet data) service provider and be capable of allowing the MoDOT St Louis District TMC ATMS software to have full control of the NTCIP compliant CMS controller remotely. Modem shall by capable of being programmed with a static IP.

(f) The sign shall have a GPS unit that can assist in locating the sign's position when polled by the TMC. The GPS unit must be remotely accessible by the TMC and be part of or work with the provided communication modem.

(g) Physical access to the onboard computer shall be protected by a padlock or other locking handle mechanism. Electronic access to the onboard computer shall be protected by a username and password.

2.2 Full matrix CMS and character matrix CMS shall meet the following:

(a) The overall sign dimensions shall not be less than 72 inches (1800 mm) high x 126 inches (3150 mm) wide.

(b) The CMS shall be legible up to a distance of 650 feet (200 m) for both day and night operations and shall be visible for ½-mile (800 m) with 18 inch (450 mm) characters.

(c) When fully raised in the display position, the bottom of the CMS board shall be at least a height of 7 feet (2100 mm) from the ground and shall be able to rotate a complete 360 degrees atop the lift mechanism. A sight tube, used to aim the CMS board to oncoming traffic, shall be installed on the CMS board or mast. The CMS shall have an electrical hydraulic lifting mechanism that includes a manual lifting and lowering relief mechanism as a backup. It also must be able to be locked into various viewing angles as determined best for the motorists by the CMS operator.

(d) All LED displays and control circuitry shall be operational from -20 F (6 C) to 120 F (50 C). The LED's shall have a rated life of 100,000 hours. The LED's shall be ITE amber in color on a flat black background.

(e) The CMS face shall be constructed that if an individual panel or pixel fails the rest of the face shall continue to display the message.

(f) All costs and coordination needed for testing to verify modem communication, sign NTCIP compliance, remote GPS status polling, ability to control the sign via the St Louis District's ATMS software provided by TransCore shall be the sole responsibility of the Contractor. Full integration into TransCore's ATMS shall be completed at least 5 business days prior to use of the CMS in the project. TransCore contact information will be provided to the contractor by contacting MoDOT's Gateway Guide staff at 314-275-1526 or via email at ggtech@modot.mo.gov with details of the request. No other support shall be provided by MoDOT other than TransCore contact information. Information provided shall include, at a minimum, CMS make and model, IP address, and proposed locations and messages.

(g) The Contractor shall be responsible for all monthly cellular service fees for the duration of the project.

(h) The unit shall be able to withstand a 65-mph (105-kmph) maximum road wind speed. The trailer shall be able to support the fully extended CMS board in an 80-mph (130-kmph) wind load.

(i) Solar charging system shall allow for total autonomy of 24/7/365 continuous operation.

(j) All exterior surfaces except the sign face shall be cleaned, primed, and finished with two coats of Highway Safety Orange and the sign interior itself shall be cleaned and finished with one coat of corrosion inhibiting primer and two coats of flat black. The sign face shall be covered with a rigid translucent material to prevent damage to the sign face caused by the environment.

3.0 Construction Requirements. Prior to placing a CMS on a project, the engineer shall verify proposed CMS location is void of conflict with another DMS or CMS locations presently

established. If a conflict is present, the engineer shall contact the Traffic Management Center (TMC) at 314-275-1526 to mitigate. If no conflict is present, engineer shall provide Traffic Management Center (TMC) with the Job Number, Route, County, specific CMS location, and a CMS identification number that is permanently affixed to the CMS. The engineer and contractor shall verify the message displayed on board is compliant with CMS messaging policies. The contractor shall place the CMS 6 feet [2 meters] off of the right edge of shoulder at the location shown on the plans or as directed by the engineer. The CMS shall be placed so that the right side of the unit is advanced approximately 3 degrees ahead with the direction of traffic. CMS shall not be located in medians. CMS shall be delineated with a minimum of five non-metallic channelizing devices. Installation, including location and placement, shall be approved by the engineer. If needed, the contractor shall relocate the CMS as directed by the engineer.

3.1 When not in use, the CMS shall be stored no closer than 30 feet [10 meters] to the edge of pavement carrying traffic, unless it is in a properly protected area or an off-site storage area or as otherwise directed by the engineer.

4.0 Basis of Payment. All expenses incurred by the contractor in integrating, maintaining, relocating, operating and protecting the changeable message signs as outlined above shall be paid for at the contract unit price for Item 616-99.02 NTCIP Compliant Changeable Message Sign, Contractor Furnished and Retained, per Each.

4.1 Cost for channelizers shall be included in the contract unit price for CMS.

4.2 Cost for cellular phone hookup and monthly usage fee for the duration of the project shall be included in the contract unit price for CMS.

Item Number	Unit	Description
616-99.02	Each	NTCIP Compliant Changeable Message Sign (Contractor Furnished and Retained)

T-E. Disposition of Existing MoDOT Assets

1.0 Existing assets shall be removed and delivered to a designated MoDOT facility as described herein. Existing assets, including signal cabinet assemblies and ITS facilities shall be removed by the contractor, tagged with the time and date of removal and intersection name, and transported to the Missouri Department of Transportation's maintenance lot located at 2309a Barrett Station Road, Ballwin, Missouri 63021 within 48 hours. The contractor shall notify the following MoDOT signal shop Supervisors 24 hours prior to each delivery:

Ron Mize, Cell 314-565-6727, Office 314-205-7320

Dennis Hixson, Cell 314-565-6726, Office 314-205-7319.

All other existing signal and lighting equipment to be removed as shown on plans or as directed by Engineer shall be removed and disposed of by the contractor.

2.0 The contractor shall exercise reasonable care in the handling of existing assets and the signal cabinet assemblies during removal and transportation. Should any of the equipment be damaged by the contractor's negligence, it shall be replaced at the contractor's expense. All other

equipment removed from the intersections shall become the property of the contractor and be removed from MoDOT right-of-way.

3.0 The contractor shall restore those areas disturbed by the equipment removal or installation according to specifications herein. This work will be considered included in the unit contract price for Removal of Improvements.

T-F. Coordination with ITS Staff and Utility Locates

1.0 Description. Any work that will impact the existing communications network must be coordinated with the Commission's St. Louis District ITS staff. This includes but not limited to removal and replacement of any existing communications equipment, adding new devices and changes to power sources or disconnects. Minor modifications to the existing communications network can have significant impacts on the system and operation of other ITS and traffic signal systems.

1.1 MoDOT is a member of MO-One-Call System. Prior to any excavation or work within MoDOT Right-Of-way, the contractor must contact MO-One Call at 1-800-DIG-RITE and request for Utility Locates within noted project limits. If the scope of work contains modification, addition and/or expansion of existing underground MoDOT ITS, lighting, or signal facilities, the contractor must notify the MoDOT Utilities Locate staff prior to any work, in order for MoDOT to update MoDOT utility location records with Missouri One Call.

2.0 Contact. Initial contact must be made at least seven calendar days before work that may impact the existing communications network commences. Contact the ITS staff via an email at SLITS@modot.mo.gov. The engineer shall be notified prior to making contact with ITS staff. For MoDOT Utility location updates, the contractor must contact MoDOT TMC at 314-275-1500 and ask for Utility Locate Section at least seven calendar days before performing any work.

3.0 The ITS and network devices located within the project limits are a crucial part of the traffic operation system for this area. It is imperative that the downtime be kept to a minimum when adding, removing, or modifying any existing ITS and network devices. This may require the contractor to perform work that will affect existing network devices during nighttime and/or weekend hours, at the discretion of the Engineer. Allowable timeframes for this work will be subject to the need for ITS devices in the area to be used to manage other traffic impacting workzones.

4.0 Basis of Payment. No direct payment shall be made for compliance with this provision.

T-G. Coordination with MoDOT Signal Shop for Cabinet Entry

1.0 Description. Commission-furnished color-coded pad locks have been placed on all of MoDOT's signal cabinets in addition to the key used to unlock the door handle. To gain access to the appropriate cabinets during the project all contractors shall coordinate with MoDOT's signal shop to obtain the proper keys and locks..

1.0.1 Keys & Locks. Red locks & keys are provided when a contractor has modified the signal cabinet and MoDOT staff shall not have access to the cabinet until it is accepted for maintenance. The blue keys are provided for entry into the cabinet where MoDOT's Signal Shop group deems

the access to be minor in nature (entry to the cabinet to make a simple network switch connection, for example).

1.0.2 Completion of Project. At the completion of the project all keys and pad locks distributed to contractor during the project shall be returned to the Signal Shop supervisor or their representative and keys shall not be reproduced.

2.0 Contact. Initial contact must be made at least seven calendar days before work begins, preferably when the project has the notice to proceed or during the pre-construction meeting, if applicable. MoDOT's Signal Shop supervisors shall be notified prior to work beginning. Contact the signal shop via email at **sltrs@modot.mo.gov** to coordinate which padlocks are to be used.

3.0 Basis of Payment. No direct payment shall be made for compliance with this provision.

T-H. Rectangular Rapid Flashing Beacon

1.0 Description. This work shall consist of furnishing and installing a Solar-Powered Rectangular Rapid Flashing Beacon (RRFB) assembly at the locations as shown in the plans. The installation shall comply with the latest version of the Manual of Uniform Traffic Control Devices, with the specifications as detailed on the plans, and with all manufacturers' recommendations.

2.0 Material. The RRFB assembly shall include all equipment and material necessary for the installation of two (2) solar powered units. This equipment includes, but is not limited to, 15' Signal Post (powder coated black), "Type C" concrete base, signs, pushbutton, beacon, solar panel, control box, battery, wiring, mounting hardware and all additional equipment necessary for the installation of two solar powered units. All advanced signing associated with the crossing will be paid for separately per contract plans.

3.0 Method of Measurement. Measurement shall not be made for the work involved for furnishing and installing the two RRFB assemblies, but shall be considered a lump sum unit.

4.0 Basis of Payment. All costs involved with the labor, materials including powder coating, equipment, and tools necessary for this work as required by the manufacturer, will be paid for at the contract unit price for:

902-99.02 Rectangular Rapid Flashing Beacon, per each.

T-I. Video Detection System

1.0 Description. If video is provided by the Contractor to enable any needed detection, this work shall consist of furnishing, installing and placing into operation a vehicle detection system that detects vehicles by processing video images and providing detection outputs to a traffic signal controller.

2.0 System Requirements. Delete Secs. 902.13.4 and 1092.4.7.7 in their entirety and substitute the following:

902.13.4 Video Detection System. The system shall include all equipment shown on the plans and described in these specifications, plus any incidental items necessary for the

satisfactory operation and maintenance of the system. All original identifying information from the packaging of each installed camera shall be placed in the signal cabinet. Up to date reference manuals or user guides are required in pdf format. The video detection system shall be installed per the manufacturer's recommendations. The installer shall be certified by the video detection system's manufacturer to install the system. All coaxial cable runs (if used) shall be continuous without splice from the cabinet to the camera. If requested by the engineer, a factory certified representative from the supplier shall be available for on-site assistance for a minimum of one day during installation.

902.13.4.1 Camera. The bottom of the video camera shall be mounted a minimum of 30 feet (9.0 m) above the pavement**,** unless otherwise indicated on the plans or approved by the Engineer.

902.13.4.2 Extra Service Outlet. A separate grounded 120 VAC service outlet shall be provided in the controller cabinet for supplying power to the parts of the video detection system requiring AC power. Use of the grounded service outlet located on the cabinet door will not be permitted.

1092.4.7.7.1 System Requirements. The video detection system shall provide flexible detection zone placement at any location and at any orientation within the combined field of view of the image processors. Preferred presence detector zone configurations shall be a box, lines or similar placed across lanes of traffic or lines placed parallel with lanes of traffic. Detection zones shall be capable of overlapping**,** and be configurable to be directional in order to prevent vehicles that approach from all but 1 direction from activating the detection zone.

1092.4.7.7.1.1 The detection zones shall be created by drawing the detection zones on the video image. A graphical user interface shall be built into the video detection system and displayed on a video monitor or computer. It shall be possible to edit previously defined detector configurations to fine-tune detection zone placement.

1092.4.7.7.1.2 When a vehicle is detected by crossing a detection zone, there shall be a visual change on the video display, such as a flashing symbol or a change in color or intensity to verify proper operation of the video detection system.

1092.4.7.7.1.3 Overall performance of the video detection system shall be comparable to inductive loops. Using camera optics and in the absence of occlusion, the video detection system shall be able to detect vehicle presence with 98% accuracy under normal day and night conditions with only slight deterioration in performance under adverse weather conditions, including fog, snow and rain. When visibility exceeds the capabilities of the camera, the video detection system shall default to placing a call on all detectors. Supportive documentation is required to meet this specification.

1092.4.7.7.1.4 The video detection system shall be capable of being programmed via remote communication through the Commission's Ethernet network via serial connection or Ethernet connection. It shall provide at a minimum 2 frames per second moving image and real time detection displays to a remote computer using supplied video detection system software through the Commission's network for all cameras. All components, existing cabinet wiring changes, and/or modules needed to communicate through the Commission's network other than Commission furnished communication gear shall be included as part of the video detection system. If provided with an IP address by the Commission, the contractor will

program and connect the video detection system into the Commission supplied communication gear before project acceptance.

1092.4.7.7.1.5 The video system must integrate/be compatible with an Advanced Transportation Signal Controller (ATC). This applies not only to the existing controller brand but any other signal controller that meets ATC requirements.

1092.4.7.7.1.6 The system must be able to be accessed and configured remotely by users with a rudimentary understanding of video systems/signal controllers. Any and all software to interface the video system is to be included.

1092.4.7.7.1.7 In addition to presence detection, the video detection system shall be capable of performing at a minimum the following calculations in real time and store all values for each camera view for any visible lane without the addition of another device:

a) Speed
b) Volume
c) Lane Occupancy
d) Vehicle Classification
e) Other available performance measures

1092.4.7.7.1.8 For speed calculations thru movements are required. Turning movement measurements are desired but not required. For volume measurements/calculations both mainline thru and all turning movements are required. All values are to be assigned to detector channels within the controller.
If this requirement cannot be met all values must be able to be exported thru an excel spreadsheet. Other performance measures must be clearly defined. In all cases all performances measures must be ultimately available in an easily usable, exportable format.

1092.4.7.7.2 Video Detection System Components. The video detection system will be defined as the complete assembly of all required equipment and components for detection of vehicles. Each video detection system shall consist of the video camera(s), lightning arrester for video cabling, processor unit(s), control device (track ball or keypad; no mouse allowed), software and license for system control via a computer (if applicable), communication components, and a color monitor. All camera views shall be obtainable without requiring the disconnection and reconnection of cables within the system.

1092.4.7.7.2.1 Video Detection System Software. The video detection system shall include software that detects vehicles in multiple lanes using only the video image. Detection zones shall be defined using a video monitor and control device to place the zones on a video image, which may include a laptop computer. A minimum of 12 detection zones per camera shall be available.

1092.4.7.7.2.2 Video Detection System Connections. All bus connections in the video detection system shall be corrosion resistant. Serial communications to a computer shall be through an RS-232/RS-422 serial port through a subminiature “D” connector with a computer running supplied system software. The port shall have the capability to access detection system data as well as the real-time imagery needed to show detector actuations. The processor shall have a RJ-45 plug using Ethernet 10/100 protocols.

1092.4.7.7.2.2.1 The equipment shall be provided with either a NEMA TS1 or NEMA TS2 interface as shown on the plans.

1092.4.7.7.2.2.1.1 For TS1 systems, the video detection system shall be equipped with a TS1 detector interface for a minimum of 16 detector outputs, or 32 detector outputs if required by Job Special Provisions. Logic output levels shall be compatible with the TS1. A subminiature "D" connector on the video detection system shall be used for interfacing to these outputs.

1092.4.7.7.2.2.1.2 For TS2 systems, the video detection system shall be equipped with a TS2 Type 1 detector interface, where detector information is transmitted serially via an RS-485 data path. A 15-pin subminiature "D" connector, meeting the requirements of the TS2 standard, shall be used for the serial detector output. A minimum of 16 detector outputs is required, with the capability of expansion to 32 outputs if required by Job Special Provisions.

1092.4.7.7.2.2.1.3 The contractor shall be responsible for any changes or additions to either an existing or new cabinet in order to provide a properly functional video detection system and monitor display. This may include, but is not limited to, additional SDLC connectors, a MMU (malfunction management unit), shelf relocation and component reorganization. No direct pay for any changes or additions. All required connections will be considered part of the video detection system installation.

1092.4.7.7.2.2.2 The video detection system shall be provided for either single camera or multiple camera installations as shown on the plans. Multiple camera installations shall be configured so that failure of 1 camera or control module shall not affect the operation of the remaining cameras or control modules.

1092.4.7.7.2.2.2.1 All video detection systems shall have a RS-170 (NTSC) video input to process another synchronous video source in real-time. The video detection system shall have at least 1 RS-170 (NTSC) video output.

1092.4.7.7.2.2.2.2 The video detection system shall be capable of providing the connection of a local surveillance camera or other non-detection video source. The video from the auxiliary input shall not be processed for video detection. The video detection system shall have an RS-170 (NTSC) composite video output, which may correspond to any of the video inputs, as selected remotely via RS-232 or locally by front panel switch. Multiple video inputs shall be routed into external video switchers (mounted to the monitor if provided).

1092.4.7.7.2.2.2.3 The video detection system shall be able to turn any detection zone in the default detector pattern on or off by internal time base control. The video detection system shall also be capable of switching to any detector pattern at the request of the user by either a menu selection with the control device or through a computer.

1092.4.7.7.2.3 Monitor. The monitor shall be a LCD active matrix with a minimum 7” diagonal screen color monitor, an NTSC-M system and BNC video in-out connections built into the housing. The unit shall be compact and lightweight, securely mounted to the cabinet shelving, have low power consumption, constructed to operate under extreme temperature conditions, and run on AC power. AC adaptor shall be included. The monitor shall be installed to automatically power on when the cabinet door is opened and automatically power off when the cabinet door is closed. A manual on/off switch shall be provided. If the video detection system is installed in a 332 or 336 cabinet or NEMA cabinet housing a master controller or in

one that does not have shelf space, the screen size will be 5” diagonal with all other noted provisions unchanged.

1092.4.7.7.2.4 Video Camera and Housing. The video detection system supplier shall furnish the video camera for traffic detection. The camera shall produce a color video image of vehicles during daylight hours, with an optional production of black and white images during nighttime hours. The video shall produce a clear image for scenes with a luminance from a minimum range of 0.18 to 929 foot-candles (2.0 to 10,000 lux).

1092.4.7.7.2.4.1 The camera shall provide a minimum resolution of 430 lines horizontal (TVL) and 350 lines vertical under NTSC operation.

1092.4.7.7.2.4.2 The camera shall include an electronic shutter or auto iris control based on average scene luminance and shall be equipped with an auto iris lens.

1092.4.7.7.2.4.3 The camera shall have a variable focal length. The maximum aperture of the lens shall not be smaller than f1.8 and the minimum aperture shall not be larger than f300. The camera shall have a horizontal field of view ranging from a minimum angle of view between 5 degrees and 10 degrees wide to a maximum angle of at least 45 degrees. The adjustments for focus and focal length shall be made without opening up the camera housing.

1092.4.7.7.2.4.4 The camera shall be contained in an enclosure that is waterproof and dust-tight to NEMA-4 specifications. A minimum 5W heater shall be incorporated in the camera to prevent the formation of condensation and to assure proper operation of the lens' iris mechanism. The heater shall not interfere with the operation of the image sensor electronics, and it shall not cause interference with the video signal. The enclosure shall allow the camera to be rotated in the field during installation.

1092.4.7.7.2.4.5 The housing shall be equipped with a sun shield that prevents sunlight from directly entering the lens. The sun shield shall include a provision for water diversion to prevent water from flowing in the camera field of view, and shall be able to slide forward and back.

1092.4.7.7.2.4.6 The total weight of the enclosure, camera, lens, housing, sun shield and mounting bracket shall be less than 10 pounds (4.5 kg).

1092.4.7.7.2.5 Cable. Coaxial cable, if used, shall be a 75 ohm, precision video cable with 20 AWG (0.50 mm2) solid bare copper conductor, maximum of 10.1 ohms/m Nom. D.C.R., solid polyethylene insulating dielectric, 96% minimum tinned copper double-braided shield with a black polyethylene outer covering. The signal attenuation shall not exceed 0.8 dB per 100 feet (30 m) at 10 MHz. Nominal outside diameter shall be 0.305 inches (7.7 mm). The cable shall be in accordance with Belden Type 8281, West Penn P806 or approved equal.

1092.4.7.7.2.5.1 Seventy-five ohm BNC plug connectors shall be used with coaxial cable, if used. The supplier of the video detection system shall approve the coaxial cable, BNC connectors and crimping tool, and provide a 10% extra quantity of the needed BNC connectors with the system. The manufacturer's instructions shall be followed.

1092.4.7.7.2.5.2 Multi-conductor cable shall be per the manufacturer's recommendation and in accordance with Sec 1061.

1092.4.7.7.2.5.3 Twisted pair cable shall meet recommendations of the video detection system manufacturer. Pairs shall be untinned, with an overall shield. Individually shielded pairs will not be allowed.

1092.4.7.7.2.6 Maintenance and Support. The supplier shall maintain an ongoing program of technical support and software updates for the video detection system following expiration of the warranty period. The supplier shall maintain an adequate inventory of parts to support maintenance and repair of the video detection system.

1092.4.7.7.2.7 Warranty of Video Detection System. The video detection system shall be warranted to be free of defects in material and workmanship for a minimum of two years, with the cameras being warranted for the same for two years. During the warranty period, technical support from factory certified personnel or factory certified installers shall be available from the supplier. Ongoing software support by the supplier shall include updates for the processor unit and computer software and shall be provided at no cost during the warranty period. The update of the processor unit software to be National Transportation Communications for ITS Protocol (NTCIP) compliant shall be included.

1092.4.7.7.2.8 Training of Video Detection System. A minimum of one day (6 hours) of training shall be provided in the operation, setup and maintenance of the video detection system. Please contact the engineer to set up said training.

3.0 Construction Requirements. Construction requirements shall conform to Sec 902.

4.0 Method of Measurement. Method of measurement shall conform to Sec 902.

5.0 Basis of Payment. Accepted video detection systems will be made at the contract unit price per each. Payment will be considered full compensation for all labor, equipment and material to complete the described work.

5.1 No direct payment will be made for programming the video detection system and its local intersection controller.

T-J. ATC Traffic Signal Controller

1.0 Description. The Commission's St. Louis District is utilizing TransCore's TransSuite software as their Advanced Traffic Management System (ATMS), therefore all signal controllers must be able to interface with their TCS program.

2.0 Material. All traffic signal controllers purchased and installed on this project shall be selected from the list below and match the cabinet type and connections indicated on the D-37C sheet for each intersection(s). The controllers on the list below are the only controllers that are tested, fully functional, and approved with the version of TransSuite that the St. Louis District is currently operating (TransSuite version 19.4):

Controller/Firmware Type	Firmware Supported	Cabinet Type (Match in field)
Econolite Cobalt	32.65.10 or newer	NEMA TS2 Type 1 or 2
Econolite ASC/3	2.66	NEMA TS2 Type 1 or 2
McCain Omni EX	1.11	NEMA TS2 Type 1 or 2

Intelight X3	MaxTime 2.1.1	NEMA TS2 Type 1 or 2

3.0 Construction Requirements. Contractor shall ensure that the signal controller as noted above is programmed to be compatible with the previously mentioned version of TransSuite TCS system.

4.0 Acceptance Testing. All controllers shall be tested per the Commission's specifications. Programming and testing should be done prior to any installation and approved by the Commission's engineer or representative. The contractor shall provide a copy of the signal programming to the engineer via an USB Flash drive.

5.0 Documentation. Contractor shall provide the engineer with an electronic copy of the manufacturer's signal controller manual or link to the website where the manual can be downloaded in .pdf format.

6.0 Basis of Payment. Measurement and payment for work covered by this specification shall include all equipment, tools and materials necessary and shall be paid at the contract unit price as follows:

Item No.	Type	Description
902-99.02	Each	ATC Traffic Signal Controller

T-K. Network Connected Signal Monitor

1.0 Description. The Commission's signal cabinet shall have a flashing yellow arrow compatible monitor installed with an internal RJ-45 plug for 10/100 Ethernet communication that is connected to the Commission's computer network through Commission furnished Ethernet switch and allow a remote user running the monitor's software to interface with any specific monitor.

2.0 Performance.

2.1 Inputs. If video detection is used, inputs into controller shall be via SDLC port. Signal cabinet to be TS2 Type 2 setup with 3 ea. SDLC connectors and the monitor to be a Malfunction Management Unit (MMU).

2.2 Status and Event Logging. Monitor shall be able to remotely communicate, at a minimum, active status, current faults, and event logs for at least the previous 7 days.

2.3 Flashing Yellow Arrow. Monitor shall be capable of operating a flashing yellow arrow for left turns by utilizing unused yellow channels on the pedestrian load switches.

2.4 Software and Configuration. Software needed to communicate to any network-enabled monitor shall be provided to the Commission for an unlimited number of users.

3.0 Construction Requirements.

3.1 Requirements. Construction requirements shall conform to Sections 902 and 1092.

3.2 Setup and Training. A minimum of one day of training shall be provided in the operation, setup communication and maintenance of the monitors.

3.3 Acceptance Testing. Contractor shall demonstrate that all network-connected monitors are remotely communicating and individually addressable via supplied software and Commission furnished devices from the Commission's St. Louis Traffic Management Center in order to satisfy the requirements of this provision. No direct payment will be made for this testing.

4.0 Method of Measurement. Method of measurement shall conform to Sec 902.

5.0 Basis of Payment. No direct payment will be made for the software. Payment will be considered full compensation for all labor, equipment, and material to complete the described work other than Commission furnished devices needed to complete the network connections. Payment will be made as follows:

Item No.	Type	Description
902-99.02	Each	Network Connected Signal Monitor

T-L. 12-Position Backpanel Flashing Yellow Arrow (Oakland, Sappington, and Sylvan Intersections)

1.0 Definition. This work will include modifying the cabinets to provide new Special and Standard Overlaps to accommodate Flashing Yellow Arrow installation and programming as detailed on the plan sheets. The installation, cabinet modification, and programming of 3-section permissive only FYA and 4-section protected/permissive FYA signal heads and new FYA signs will vary by intersection. There are four categories for the cabinet modifications:

- One-approach modification
- Two-approach modification
- Three-approach modification
- Four-approach modification

The contractor shall refer to the plans for more details.

1.1 Default Load Switch Assignment – 12 position cabinets

1.1.1 Description. The contractor shall apply 12-compact Flashing Yellow Arrow installation method on all 12-position traffic signal cabinets. The NEMA Load Switch assignment for 12-compact FYA installation method is as follows:

12-Position Cabinet FYA NEMA Load Switch Assignments											
1	2	3	4	5	6	7	8	9	10	11	12
OLA FYA	PHASE 2	OLB FYA	PHASE 4	OLC FYA	PHASE 6	OLD FYA	PHASE 8	PHASE 2 PED / PHASE 1 LEFT	PHASE 4 PED / PHASE 3 LEFT	PHASE 6 PED / PHASE 5 LEFT	PHASE 8 PED / PHASE 7 LEFT

1.2.2 Wiring. The contractor shall use following color code for the installation of Flashing Yellow Arrow:

If separate 7-conductor cable is present for the existing left turn signal head:

- Red Wire = Load Switch 1, 3, 5, or 7 Red output = 4-section Red Left Arrow
- Orange Wire = Load Switch 1, 3, 5, or 7 Yellow output = 4-section Steady Yellow Arrow
- Black/White Wire = Load Switch 1, 3, 5, or 7 Green output = 4-section Flashing Yellow Arrow
- Green Wire = Load Switch 9, 10, 11, or 12 Yellow output = 4-section Green Arrow

If no separate 7-conductor cable is present for the existing, permissive only, left turn signal head:

- Black Wire = Load Switch 1, 3, 5, or 7 Red output = 3-section Red Left Arrow
- Blue Wire = Load Switch 1, 3, 5, or 7 Yellow output = 3-section Steady Yellow Arrow
- Black/White Wire = Load Switch 1, 3, 5, or 7 Green Output = 3-section Flashing Yellow Arrow

If existing cabinet wiring does not allow the described color code to be met, the contractor shall tag all wires with assigned phases and direction used for the successful completion of the installation of Flashing Yellow Arrow.

1.2.3 Signal Monitor programming. The contractor shall use 12 channel programming mode for the signal monitor.

1.2.4 The contractor shall notify the engineer 24 hours after any successful modification to the load switch assignment, wiring, Controller and MMU programming described in this document.

T-M. MoDOT TS2 Type 1 Cabinet Assembly

1.0 Description. The cabinet assembly shall meet, as a minimum, all applicable sections of the latest revisions as found in the NEMA TS2 Standard Publication and sections 902 and 1092 of the Missouri Standard Specifications for Highway Construction manual. Where differences occur, this specification shall govern.

2.0 Materials.

2.1 Cabinet. The cabinet shall be constructed from aluminum with a minimum thickness of 0.125 inches. The cabinet shall be designed and manufactured with materials that will allow rigid mounting, whether intended for pole, base or pedestal mounting. All mounting points where the cabinet is bolted to the foundation shall be reinforced at the factory by welding in an additional layer of material equal to the thickness of the material that the cabinet is constructed from. Triangular gussets are also required when the base plate and cabinet walls are welded together vs. continuous rolled material. A rain channel shall be incorporated into the design of the main door opening to prevent liquids from entering the enclosure. All external hardware shall be stainless steel. Unless otherwise specified, the cabinet exterior shall be supplied with a natural aluminum finish. Unless otherwise specified**,** the interior of the cabinet shall be white. Sufficient care shall be taken in handling to ensure that scratches are minimized. All surfaces shall be free from weld flash. Welds shall be smooth, neatly formed, free from cracks, blowholes and other irregularities. All sharp edges shall be ground smooth. The cabinet shall be equipped with (2) lifting brackets for installation and removal purposes.

2.2 Cabinet Doors. The cabinet shall include front and rear doors of NEMA type 3R construction with rain tight gaskets. A stiffener plate shall be welded across the inside of the main door to prevent flexing. Doors shall include a mechanism capable of holding the door open at approximately 90 and 165 degrees under windy conditions. Manual placement of the mechanism shall not be required by field personnel. Only the main door shall have ventilation louvers. A plaque designation “Traffic Control” shall be affix to each main cabinet door.

2.3 Door Alarm. The front and rear doors shall be equipped with switches wired to the traffic signal controller alarm with 1 input for logging and reporting of a door open condition.

2.4 Shelves. No less than (2) shelves shall be provided and each shall have the ability to be independently removed, relocated, and adjusted. The front edge of each shelf shall have holes predrilled at a spacing of no greater than 8 inches to accommodate tie-wrapping to secure cables/harnesses.

2.5 Mounting Rails. A minimum of one set of vertical "C" channels shall be mounted on each interior wall of the cabinet for the purpose of mounting the cabinet components. The channels shall accommodate spring mounted nuts or studs. All mounting rails shall extend to within 7 inches of the top and bottom of the cabinet.

2.6 Pull-out Drawer. The cabinet shall be equipped with a pull-out drawer/shelf assembly. A 1½ inch deep drawer shall be provided in the cabinet, mounted directly beneath the controller support shelf. The drawer shall have a hinged top cover and shall be capable of accommodating one complete set of cabinet prints and manuals. This drawer shall support 50 pounds in weight when fully extended. The drawer shall open and close smoothly. The drawer dimensions shall make maximum use of available depth offered by the controller shelf and be a minimum of 18 inches wide.

2.7 Police Door. The police door shall contain only (1) switch used for flash/auto operations. The ability to turn field indications off from the police panel will not be permitted.

2.8 Lighting. The cabinet shall include no less than (3) field replaceable LED light assemblies along the top and sides of the cabinet. The LED panels shall be controlled by a manually activated toggle switch on the tech panel.

2.9 Fans/Ventilation. The components of the system as well as the CFM requirements shall be in compliance with the MoDOT 902 & 1092 specifications.

2.10 Heater. The cabinet shall be supplied with a 200 Watt fan heater with thermostat control that is designed to protect electronics from the effects of low temperatures such as corrosion, freezing or condensation, which can damage critical components within a control enclosure. Housing shall be constructed of aluminum. Overall dimensions including mounting areas shall be approximately: 4inch depth, 4inch width, 5.50inch height.

2.11 Switch Guards. All switches shall include switch guards. All switches shall be clearly labeled.

2.12 Receptacles and power strip(s). One 8-outlet IP-addressable power strip shall be provided and Commission-furnished. The installation of the power strip shall be included in the cost of the cabinet assembly. The main door tech panel shall contain a 15 amp duplex GFI receptacle. A separate grounded service outlet shall be provided in the controller cabinet for supplying power

to the video detection monitor. The monitor shall be installed to automatically power on when the cabinet door is opened and automatically power off when the cabinet door is closed. The use of the grounded service outlet located on the cabinet door will not be permitted for this function. A manual on/off switch shall also be provided and mounted to the main door tech panel.

2.13 16-Position Back Panel Wiring. All new signal cabinets shall have a 16-position load switch back panel and conform to the following specifications. Regardless of the number of phases specified on the plans, all load switch positions shall be completely wired for use. The load switch back panel shall be configured for NEMA Configuration “A” or “G” as designated on the signal plans. Vehicle phases, overlaps (including FYA configurations), and pedestrian phases shall be wired such that it must work with a Type 16 MMU. The cabinet shall include both a DT panel and a CTB (SDLC) panel with 6 harnesses.

2.14 Intersections with Video Detection. For intersections with video detection, the cabinet shall be wired to automatically power on the video monitor when the cabinet door is open.

2.15 Load Switch. The front of the load switch shall be provided with (3) indicators to show the input signal from the controller to the load switch and (3) indicators to show the output to the field devices. The full complement of load switches shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

2.16 SDLC. All connection points shall be protected by a BIU 15 pin surge suppressor used for the protection of any devices on Port 1 Synchronous Data Link Control (SDLC). Each cabinet shall be provided with a SDLC hub assembly and (6) SDLC cables unless otherwise noted on the order form. All mechanical connections shall be soldered.

2.17 Surge Protection. Surge protection shall be a modular plug in type product as listed in the MoDOT Traffic APL.

2.18 AC line filter. The AC line filter shall protect equipment from malfunctions due to conducted interference coming into the equipment from line, especially line to ground (common mode) noise and transients. Overall dimensions including mounting areas shall be approximately: 4.17inch width and 3.53inch height.

2.19 Signal Buss Relay. The relay shall be a direct “drop-in” replacement for existing mercury displacement relays. The relay shall be a single pole solid state or hybrid relay. Overall dimensions including mounting areas shall be approximately: 2.5inch depth, 2inch width, 5 inch height.

2.20 Field Wiring termination. All field wires shall be attached to the back panel terminal strips via a mechanical copper lug, which can accommodate wire sizes from 14AWG - 6AWG. Lugs shall be provided for all field outputs to maximize the cabinet design.

2.21 Flash Transfer Relays. The full complement of relays shall be supplied with each cabinet to allow for maximum phase utilization for which the cabinet is designed.

2.22 Cabinet Wiring Prints. Paper cabinet prints as well as electronic media shall be provided with each cabinet. (4) paper copies shall be provided (22” X 34”) and (1) electronic copy in pdf and dgn format. All flash program wiring configurations shall be represented on the cabinet print (Red, Amber, No Flash, FYA, Ped, FYA & Ped).

2.23 Generator Attachment. A generator plug shall be installed on each cabinet unless otherwise noted. The access door shall be hinged, lockable and watertight. The plug shall conform to the (NEMA L5-30 configuration). An automatic transfer switch shall be provided which will switch power to/from "line", "UPS" or "generator" when power from one of the sources has been lost or gained. The unit shall be rated for 30 amps and shall contain either a LCD display or indicator lights that validate the following: Line in, Line out, UPS in, UPS out and "from" generator. The unit shall contain a main breaker (on/off switch), a UPS bypass breaker (switch) and a Generator breaker (switch). To minimize the impact of the presence of the auto transfer switch, the dimensions shall be no greater than 12" wide X 6" deep X 4" high. The unit shall be constructed of either aluminum or stainless steel.

3.0 Testing.

3.1 Each controller and cabinet assembly shall be tested as a complete entity under signal load in accordance with Missouri Standard Specifications Section 902 for a minimum of 30 days after installation.

3.2 Each assembly shall be delivered with a signed document detailing the cabinet final tests performed. The cabinet shall be assembled and tested by the controller manufacturer or authorized local distributor to ensure proper component integration and operation.

4.0 Warranty and Training.

4.1 If a Controller and/or Malfunction Management Unit are ordered with a cabinet assembly, the Controller and Malfunction Management Unit shall be warranted by the manufacturer against mechanical and electrical defects for a period of 2 years from date of shipment. The manufacturer's warranty shall be supplied in writing with each cabinet and controller. Second party extended warranties are not acceptable.

4.2 The cabinet assembly and all other components shall be warranted for a period of one year from date of shipment. Any defects shall be corrected by the manufacturer or supplier at no cost to the owner.

4.3 MoDOT may require training on the maintenance and operation of NEMA TS2 cabinet assemblies. Maintenance and operation personnel shall be trained on troubleshooting, maintenance and repair of cabinets and all serviceable equipment. Training shall include field level troubleshooting and bench repair. This training shall be for a minimum of sixteen hours over two days. Training shall be conducted at a time and location mutually agreeable by the contractor and the signal shop traffic supervisor or as directed by MoDOT.

5.0 Method of Measurement. Method of measurement shall conform to Sections 902 and 1092 of the Standard Specifications.

6.0 Basis of Payment. Payment included with cost of pay item 902-42.83 (Controller Assembly Housing, NEMA TS2 Controller) paid per each. Payment will be considered full compensation for all labor, equipment and material to complete the described work as shown on the plans. No additional payment will be made to provide conformance.

T-N. Audible Pedestrian Pushbuttons and Signing

1.0 Description. Audible pedestrian pushbuttons and signing will be required for all pedestrian indications at all the intersections.

2.0 Installation. Audible signals should be installed as part of a pushbutton assembly.

3.0 Equipment.

3.1 Walk Indications. Accessible pedestrian signals shall have both audible and vibrotactile walk indications.

3.2 Vibrotactile. Vibrotactile walk indications shall be provided by a tactile arrow on the pushbutton that vibrates during the walk interval. Tactile arrow shall be located on the pushbutton that vibrates during the walk interval. Tactile arrow shall be located on the pushbutton, have high visual contrast (light on dark or dark on light), and shall be aligned parallel to the direction of travel on the associated crosswalk.

3.3 Audible. Accessible pedestrian signals shall have an audible walk indication during the walk interval only. The audible walk indication shall be audible from the beginning of the associated crosswalk.

3.4 Pushbutton signage. In addition to standard pedestrian sign requirements, all pushbuttons for the locations mentioned in 1.0 shall have additional signage to indicate crosswalk direction by use of a tactile arrow and the name of the street containing the crosswalk served by the audible pedestrian signal. The sign shall be located immediately above the push button mechanism and parallel to the crosswalk controlled by the button. The street name shall be the name of the street or reasonable abbreviation whose crosswalk is controlled by the push button. Signage shall comply with ADA Accessibility Guidelines (ADAAG) 703.2 specifications for Braille and raised print.

3.4.1 Arrow. Signs shall include a tactile arrow aligned parallel to the crosswalk direction. The arrow shall be raised 0.8 mm (.03 inch) minimum and shall be 4 mm (1.5 in) minimum in length. The arrowhead shall be open at 45 degrees to the shaft and shall be 33 percent of the length of the shaft. Stroke width shall be 10 percent minimum and 15 percent maximum of arrow length. The arrow shall contrast with the background.

3.4.2 Street Name. Accessible pedestrian signals (APS) shall include street name information aligned parallel to the crosswalk direction and shall comply with Revised Draft Guidelines for Accessible Public Rights-of-Way R409.3 or shall provide street name information in audible format.

4.0 Performance.

4.1 Audible Locator Tone. Locator tone that tells the pedestrian that the intersection is equipped with APS and where it is. Pushbutton locator tones shall have duration of 0.15 seconds or less, and shall repeat at 1-second intervals. Pushbutton locator tones shall be intensity responsive to ambient sound, and be audible 6 to 12 feet from the pushbutton, or to the building line. The locator tone shall operate during the DON'T WALK and flashing DON'T WALK intervals only and shall be deactivated when the pedestrian signal is not operative.

4.2 Verbal Wait Message. Acknowledge tone that tells the pedestrian that they have placed a call and informational message that tells the pedestrian to "Wait to cross" street name at intersecting street name.

4.3 Verbal Walk Message. The verbal messages shall provide a clear message that the walk interval is in effect, as well as to which crossing it applies. If available, the audio tone feature will not be used. The verbal message that is provided at regular intervals throughout the timing of the walk interval shall be the term "walk sign," which will be followed by the name of the street to be crossed.

4.4 Volume. Automatic volume adjustment in response to ambient traffic sound level will be provided up to a maximum volume of 100 dB. The units shall be responsive to ambient noise level changes up to no more than 5 dB louder than ambient sound. Tone or voice volume measured at 36 inches from the unit shall be 2dB minimum and 5dB maximum above ambient noise level. At installation, signal system is to be adjusted to be audible at no more than 5 to 12 feet from the system.

5.0 Documentation and Support.

5.1 Operation and Maintenance Manuals. Two copies of the operation and maintenance manuals for each station shall be included.

5.2 USB with Audible Messages. The Contractor shall provide two copies of USB data card to the Engineer that contains files for the manufacturer's audible messages for complete operation of all APS signals at all stations.

6.0 Construction Requirements. Construction requirements shall conform to Sec 902, 1061, and 1092.

7.0 Method of Measurement. Method of measurement shall conform to Sec 902.

8.0 Payment. Payment for the audible signals will be for each unit per bid item, 902-99.02, "Audible Pedestrian Pushbutton and Signing", per each. This will include all wiring, power adaptors, and installation hardware needed. Payment for signing will be included in the pay item for audible pedestrian pushbutton.

T-O. St. Louis County Owned Signals

1.0 Description. St. Louis County (County) owns the traffic signals located at the intersection of Route 100 (Manchester Rd.) and Brentwood Blvd. Loop detectors for those signals are located in the intersection approach pavement to be milled. In addition, the project requires the contractor to remove existing and install new pedestrian pushbuttons at this intersection; at a pedestrian accessible location per the project plans.

2.0 Construction Requirements.

2.1 Loop Detectors. Existing loop detectors shall be disconnected before milling near the detection area. Replacement loop detectors shall be as shown in the plans and meet St. Louis County standards. The contractor shall let the engineer know two weeks prior to milling each ramp to allow time for coordination with the County. Replacement loop detectors shall be installed

within 5 calendar days of the removal of the existing detectors. If the detection is not installed and operational within 5 days, liquidated damages of $1000 per day will be assessed for each day the detection is not fully operational.

2.2 Pedestrian Pushbuttons. The contractor shall exercise care in removing existing and installing new pushbuttons. Should any new or existing pushbuttons be rendered inactive due to the contractor's negligence, they shall be replaced at the contractor's expense. The contractor shall be responsible for securing any permit which may be needed from County. The contractor shall also coordinate this work, along with returning any existing pedestrian signal equipment as directed by the County, with the below contact at least two weeks before commencing any work on the County's signal facilities.

2.3 Contact. The contractor shall reach out to the following contact to coordinate all work on St. Louis County's signal facilities at least two weeks prior to commencing any work. The contractor shall also notify the engineer when making contact with the County.

Scott Halter
St. Louis County Dept. of Transportation
Traffic Signals
314-615-0202

3.0 Basis of Payment. Payment for removal and installation of in-pavement loop detectors and pedestrian signals will be made with the standard pay items included in the contract. No direct pay will be made for compliance with this provision.

T-P. Traffic Signal Enhancements at Hanley Road – Job J6S1718B Only

1.0 Description. The traffic signal replacement at the intersection of Route 100 (Manchester Road) and Hanley Road includes certain aesthetic signal enhancements that are to be constructed at the locations identified in the contract plans. These enhancements shall be added in accordance with MoDOT Standards.

2.0 Construction Requirements. All materials and work performed for this item shall be in accordance with Sec 902 (MoDOT) for the enhancements. St. Louis County Specification Section 904 shall apply to all underlying signal materials that are to receive the enhancements.

3.0 Method of Measurement. Measurement will be made in accordance with Sec 902.

4.0 Basis of Payment. Payment for the accepted quantities for the traffic signal enhancements at Hanley Road will be made in accordance with the contract unit bid prices for the items listed below and includes all labor, equipment, materials, and time required to comply with this provision.

Item No.	Unit	Description
902-99.02	Each	Illuminated Street Name Sign
902-99.02	Each	Black Powder Coated Mast Arm & Signal Post
902-99.02	Each	Black Powder Coated Pedestrian Post

T-Q. Removal and Delivery of Existing Signs JSP-12-01B

1.0 Description. All Commission-owned signs removed from the project shall remain the property of the Commission and shall be disassembled and delivered as specified herein.

2.0 Disassembly and Delivery. All Commission-owned signs, not to include abandoned billboard signs, designated for removal in the plans, and any other signs designated by the engineer, shall be removed by the contractor and delivered to the address below. The contractor shall call the phone number listed below 48 hours prior to delivery and make arrangements for delivery during normal business hours.

MoDOT Barrett Station Operations Complex
2309 Barrett Station Road
Ballwin, MO 63021
Phone: (314) 205-7310

2.1 Signs shall be removed from sign supports and structures prior to delivery. Sign supports and structures shall become the property of the Contractor and removed from the project. Any oversized sign panels shall be disassembled or cut into widths of 8-feet or less with no restriction on length. Signs shall be stacked neatly in bins provided by MoDOT at the delivery site.

3.0 Basis of Payment. All costs associated with removing, disassembling, storing, and transporting of signs shall be considered as completely covered by the contract unit price for Item No. 202-20.10, “Removal of Improvements”, per lump sum.

T-R. Miscellaneous Preformed Pavement Markings

1.0 Description. This work shall consist of installing bike lane symbols and arrows and accessible parking symbols as shown in the plans.

2.0 Materials. The contractor’s work shall consist of furnishing and placing thermoplastic markings for the bike lane symbols and arrows as shown in the plans and in accordance with Section 620 of the Standard Specifications.

3.0 Basis of Payment. Payment for furnishing and installing the bike lane symbols and arrows shall include all materials, equipment, tools, labor, and work incidental thereto, and shall be considered to be completely covered by the contract unit prices for:

620-99.02, Bike Lane Arrow , Preformed Thermoplastic Pavement Marking, per each.

620-99.02, Bike Lane Bike, Preformed Thermoplastic Pavement Marking, per each.

620-99.02, Shared Use Sharrow, Preformed Thermoplastic Pavement marking, per each.

620-99.02, Accessible Parking Symbol, Preformed Thermoplastic Pavement marking, per each.

(UTILITIES)
JOB SPECIAL PROVISIONS TABLE OF CONTENTS
(Job Special Provisions shall prevail over General Special Provisions whenever in conflict therewith.)

"THIS MEDIA SHOULD NOT BE CONSIDERED A CERTIFIED DOCUMENT."	**MISSOURI HIGHWAYS AND TRANSPORTATION COMMISSION** 105 W. CAPITOL AVE. JEFFERSON CITY, MO 65102 Phone 1-888-275-6636
	Kivindyo Engineering Services, LLC *1310 Papin Street, Suite 103* *St, Louis, MO 63103* Certificate of Authority: 011893 Consultant Phone: 314-623-8942
	If a seal is present on this sheet, JSP's have been electronically sealed and dated.
	JOB NUMBER: J6S1718, J6S1718B, and J6S1718C ST. LOUIS COUNTY, MO DATE PREPARED: 02/12/2021
	ADDENDUM DATE:
Only the following items of the Job Special Provisions (Utilities) are authenticated by this seal: U-A.	

JOB
SPECIAL PROVISION
UTILITIES

U-A. Utilities

1.0 For informational purposes only, the following is a list of names, addresses, and telephone numbers of the known utility companies in the area of the construction work for this improvement:

Utility Name	**Known Required Adjustment**	**Type**
Shaun Talley **Ameren-Missouri (Distribution)** 12121 Dorsett Road, Bldg W Maryland Heights, MO 63043 Telephone: (314) 344-9501 Email: STalley@ameren.com	Yes	Power
Tim Mueth **Ameren-Missouri (Distribution)** 9823 Mackenzie Rd St Louis, MO 63123 Telephone: (314) 992-9713 Email: tmueth@ameren.com	Yes	Power
Jim Lashley **AT&T (Distribution)** 12851Manchester Rd. Des Peres, MO 63131 Telephone: (636) 402-7027 Email: jl4728@att.com	Yes	Communication
Elvis Brown **Charter** 101 Northwest Plaza St Ann, MO 63074 Telephone: (314) 386-1627 Email: elvis.brown@charter.com	Yes	Communication
Eric Thies **Extenet** 3030 Warrenville Rd. Lisle, IL 60532 Telephone: (331) 231-6032 Email: ethies@extenetsystems.com	No	Communication
John DeBroeck **Fidelity Link** 64 N. Clark St. Sullivan, MO 63080	Yes	Communication

Telephone: (800) 392-8070 Email: john.debroeck@fidelitycommunications.com		
Rick McKinley **Kirkwood Electric** 212 S. Taylor Ave. Kirkwood, MO 63122 Telephone: (314) 984-5925 Email:mckinlrj@kirkwoodmo.org	Yes	Power
Clarence Patterson **Kirkwood Water** 212 S. Taylor Ave. Kirkwood, MO 63122 Telephone: (314) 822-5810 Email:patterca@kirkwoodmo.org	Yes	Water
Matthew Schnieder **Missouri American Water** 727 Craig Road Creve Coeur, MO 63131 Telephone: (314) 996-2352 Email: matthew.schneider@amwater.com	Yes	Water
Jeremy Phillips **MCI (Verizon)** 500 Technology Drive Weldon Springs, MO 63304 Telephone: (636) 399-1023 Email: jeremy.phillips@verizon.com	Yes	Communication
Dave Still **MetroLink** 700 S. Ewing Ave. St. Louis, MO 63103 Telephone: (314) 982-1400 x 2878 Email: dstill@metrostlouis.org	Yes	Communication
Brian Langenbacher **Spire Energy** 4118 Shrewsbury Ave. Shrewsbury, MO 63119 Telephone: (314) 768-7767 Email: Richard.Frock@spireenergy.com	Yes	Gas

1.1 The existence and approximate location of utility facilities known to exist, as shown on the plans, are based upon the best information available to the Commission at this time. This information is provided by the Commission "as-is" and the Commission expressly disclaims any representation or warranty as to the completeness, accuracy, or suitability of the information for any use. Reliance upon this information is done at the risk and peril of the user, and the Commission shall not be liable for any damages that may arise from any error in the information. It is, therefore, the responsibility of the contractor to verify the above listing information indicating existence, location and status of any facility. Such verification includes direct contact with the listed utilities.

1.2 The contractor agrees that any effects of the presence of the utilities, their relocation, contractor's coordination of work with the utilities and any delay in utility relocation shall not be compensable as a suspension of work, extra work, a change in the work, as a differing site condition or otherwise including but, without limitation, delay, impact, incidental or consequential damages. The contractor's sole remedy for the effects of the presence of utilities, delay in their relocation or any other effects shall be an excusable delay as provided in Section 105.7.3. The contractor waives, for itself, its subcontractors and suppliers the compensability of the presence of utilities, delay in their relocation and any cost to the contractor, its subcontractors and suppliers in any claim or action arising out of or in relation to the work under the contract.

1.3 The contractor shall be solely responsible and liable for incidental and consequential damage to any utility facilities or interruption of the service caused by it or its subcontractors operation. The contractor shall hold and save harmless the Commission from damages to any utility facilities interruption of service by it or it's subcontractor's operation.

2.0 It shall be noted by the contractor that MoDOT is a member of Missouri One Call (800 Dig Rite). Some work on this project may be in the vicinity of MoDOT utility facilities, which includes but is not limited to traffic signal cables, highway lighting circuits, ITS cables, cathodic protection cables, etc. Prior to beginning work, the contractor shall request locates from Missouri One Call. The contractor shall also complete the Notice of Intent to Perform Work form located at the Missouri Department of Transportation website:

http://www.modot.mo.gov/asp/intentToWork.shtml

The contractor shall submit the form over the web (preferred method) or by fax to the numbers on the printed form. The notice must be submitted a minimum of 2 and a maximum of 10 working days prior to excavation just as Missouri One Call requires.

NOTE: The remainder of this JSP is still under development.