

FORT BEND GRAND PARKWAY TOLL ROAD AUTHORITY

SPECIAL PROVISION TO ITEM 8

PROSECUTION AND PROGRESS

For this project, Item 8 of the Texas Department of Transportation Standard Specifications is hereby amended with respect to the articles cited below and no other articles or requirements of this Item are waived or changed hereby.

Article 8.1, Prosecution of Work, is revised by removing the first three sentences and replacing as follows:

8.1 Prosecution of Work. Prior to beginning construction operations, a preconstruction conference between the Contractor and the Engineer will be conducted. Prior to the preconstruction conference, The Contractor shall submit to the Engineer a preliminary CPM progress schedule which details the first 100 days of the contract in accordance with the requirements of Article 8.2, Progress Schedules. Within 30 calendar days following the preconstruction conference, the contractor shall submit the final version of the Contract Schedule. If the contractor fails to submit the initial schedule within the 30 days, the Engineer may withhold \$1,000 per day until an initial (baseline) schedule that complies with the specifications is submitted. The engineer will review the schedule within 7 days, and determine if the schedule is acceptable. If the schedule is not acceptable, the contractor will have 7 days to make the necessary changes. If the contractor fails to submit the revised and corrected initial schedule within the 30 days, the Engineer may withhold \$1,000 per day until an initial schedule that complies with the specifications is submitted.

Article 8.2B, Construction Contracts, is revised to read in its entirety as follows:

8.2B Construction Contracts. The Contractor must furnish a Critical Path Method schedule. Each schedule submittal must be accompanied by an electronic backup copy of the schedule. Schedules must be submitted at least monthly and must accompany each pay application. The schedule shall include all planned work activities and sequences. The initial schedule must utilize all of the contract time allowed in the contract. The schedule should incorporate major material procurements including preparation of shop drawings, submittals, fabrication and delivery of long lead items, known utility relocations, and other activities that may affect the completion of the Contract in the progress schedule. Each activity will be assigned a dollar value, the sum of which shall be equal to the adjusted contract value. The schedule activities must generally have durations shorter than one month and the work divided into discrete increments to allow easy identification of the specific task and simplify the updating process.

The Contractor may use Phoenix CPM Scheduling Software or Primavera P6. Schedules prepared and submitted in any other format will not be accepted.

The Engineer may require the Contractor to develop more detailed schedules for certain phases of the project such as major traffic changes, work requiring lane closures, or recovery schedules if the project falls behind schedule etc.

The contractor must provide a person proficient in CPM analysis to create and maintain the project schedule and be available when requested to meet with the Owner's Representative.

The CPM schedule must generally comply with construction industry standards as presented in "CPM in Construction" by James J. O'Brien or the AGC Guide to "Construction Planning and Scheduling". The schedule must have a clearly identifiable Critical Path. The Critical Path is defined as the longest path. It is the Fort Bend Grand Parkway Toll Road Authority's (the Authority) intention to conduct regular schedule update and review meetings with the Contractor to identify potential conflicts and opportunities on the project. The schedules submitted throughout the project will be essential elements in any delay claim.

The project schedule shall include but is not limited to the following:

- Begin the project schedule on the start date of contract time or start of compensable work on the project, whichever occurs first;
- Show the sequence and interdependence of activities required for complete performance of the work;
- Ensure all work sequences are logical and show a coordinated plan of the work;
- Show a predecessor and successor for each activity
- Clearly and accurately identify the critical path as the longest continuous path
- Provide a legend for all abbreviations and include the schedule filename, run date, data date, project start date, and project completion date in the title block of each schedule submittal;
- Through the use of calendars, incorporate seasonal weather conditions into the schedule for work (e.g., earthwork, concrete paving, structures, asphalt, drainage, etc.) that may be influenced by temperature or precipitation. Also, incorporate non work periods such as holidays, weekends, or other non-work days as identified in the Contract;
- No constraints or negative lags will be allowed.
- Show submittal and procurement periods.

For each activity on the project schedule provide:

- A logical activity number utilizing an alphanumeric designation system tied to the sequence of work and traffic control plans;
- A concise description of the work represented by the activity;
- An activity duration in days;
- The estimated quantity of work;

- Plan and incorporate resources, such as crews and heavy equipment, for each activity. Accurately represent the planned labor and equipment hours necessary to achieve the estimated productivity rates;
- Code the activities so that organized plots of the schedule may be produced;

The project schedule will be maintained for use by both the contractor and the Engineer. It will become an as-built record of the daily progress achieved on the project. In order to maintain an accurate as-built record of each activity, the actual start dates and finish dates must be recorded contemporaneously as they occur. If continuous progress of an activity is interrupted for any reason except non-work periods, such as holidays, weekends, or interference from temperature or precipitation, then the activity will be broken into a subsequent activity (or activities, based on the number of interruptions) similarly numbered with successive alpha character as necessary. The original duration of the subsequent activity will be that of the remaining duration of the original activity. Relationships of the subsequent activity will match those of the original activity so that the integrity of the project schedule logic is maintained. Once established the original durations and actual dates of all activities will remain unchanged.

Revisions to the schedule may be made as necessary. The project schedule shall be revised when changes in construction phasing and sequencing, changes in Traffic Control Plan, or other changes that cause deviation from the original project schedule occur. Any revisions to the schedule must be listed in the monthly updated narrative with the purpose of the revision and description of the impact on the schedule's critical path and project completion date.

The cut-off day for recording monthly progress will be established by the Project Engineer. Submit the updated schedule no later than the 1st work day of the following month.

A monthly update narrative will be included in the monthly schedule update. This narrative should include but is not limited to the following:

- The status of the project completion date, listing reasons why any change may have occurred;
- List all activities that have been added, deleted, or otherwise changed in the schedule with explanations for the modifications and description of the impacts each has on the project schedule;
- Any revisions that may have been performed to the schedule, providing the purpose of the revision and description of the impact to the project critical path and completion dates; and
- The status of the critical path, explaining reasons for any changes in critical path, impacts to the critical path that occurred during the period represented, or identifying any potential impacts that may occur in the next 3 months, including but not limited to material deliveries, utility and right way clearances, or other potential impacts.

No direct compensation will be made for fulfilling these requirements, as this work is considered subsidiary to the Item 500-2001, Mobilization. If the contractor does not submit the monthly schedule update by the 1st workday of the following month, the Engineer may withhold \$1,000 per day until an updated schedule that complies with the specifications is submitted.

Any amounts withheld by the Engineer for failure to comply with any part of Article 8.2 may be deducted from the Contract Amount by the Engineer at his discretion.

Article 8.3, Computation of Contract Time for Completion, is revised to read in its entirety as follows:

8.3 Computation of Contract Time for Completion. Time is of the essence of this Contract. All references to days are references to calendar days unless expressly stated otherwise. Calculation of Contract Time will commence on the Notice to Proceed date and run continuously for the duration of the contract.

The Contractor must achieve Substantial Completion within the contract duration specified.

The Contractor must achieve Final Completion no more than the number of days specified by the Engineer from the date of Substantial Completion.

Work shall begin on the date fixed in the Contract requisition. It shall be prosecuted regularly and without interruption until completion. The entire work shall be finished and fully completed to the satisfaction of the Engineer in **FOUR HUNDRED FIFTY-SEVEN (457) CALENDAR DAYS.**

Article 8.5, Failure to Complete Work on Time, is revised to read in its entirety as follows:

8.5 Failure to Complete Work on Time. Failing to achieve Substantial Completion within the days specified by the Engineer, the Contractor will be assessed liquidated damages of \$5,000 per day which will be withheld from any amount owed the Contractor. Failing to achieve Final Completion within the days specified by the Engineer the Contractor will be assessed liquidated damages of \$1,500 per day which will be withheld from any amount owed the Contractor. If the amount owed the Contractor is insufficient to withhold the amount, the Contractor shall pay the difference to the Authority.

The Project, of which the Work forms an essential part, is to be operated as a controlled access toll road project, and delay in completion of the Work of this Contract will cause delay in opening the Project to traffic and will cause losses to the Authority, including, but not limited to, lost revenue, interest on monies borrowed, increased administrative, legal and engineering costs, and other tangible and intangible losses. The liquidated damages set forth above are to cover partially such losses and expenses.

The Engineer may waive the collection of liquidated damages if the Work in its entirety, or any portion of the Work for which a date of completion is stipulated, has been substantially completed within the prescribed time of completion therefore.

If the Contractor fails to complete the Work within the time fixed by the Contract, or extensions thereof, and if the Engineer shall, nevertheless, permit the Contractor to continue and complete same, such permission shall neither modify nor waive any liability of the Contractor for damages arising from non-completion of the Work within the said time, but all such liabilities shall continue in full force against the Contractor

Item 8 is supplemented by the addition of the following Article:

8.11 Extension of Time - Control of the contract duration, completion date, and contract amount are essential elements of this contract and shall only be adjusted in writing by Change Order. A Change Order amending the contract duration and the contract completion date or the contract amount shall only be considered after the Contractor has made such a request in a timely manner accompanied by proper documentation supporting such a request. The contract duration, completion date, and amount may not be adjusted by any other means.

Reasons for adjustment. The Engineer will consider adjustment of the contract duration, completion date, and contract amount for any changed condition or event which in the sole opinion of the Engineer is beyond the control of the Contractor; could not have been reasonably foreseen; and impacts the longest path on the properly prepared and submitted CPM schedule for the project.

Longest Path. Extensions of time will be granted only to the extent the changed conditions impact the longest path of the properly prepared CPM schedule. No extension of time will be granted for any change that does not impact the longest path, nor will any extension of time be granted for that portion of any delay event that is absorbed by float within the schedule.

Delays affecting activities not on the longest path by definition can not affect the completion date of the project and will not be considered as a reason to adjust the contract duration or the contract completion date but may be considered for cost impacts. In cases of non-critical delays the Contractor must provide timely documentation of the condition giving rise to the non-critical delay and documentation on the how the delay is causing the cost impact. All notice requirements contained in this provision pertain equally to critical as well as non-critical impacts without exception.

Timely notice of any impact is an essential element of this contract. The Contractor must provide the Engineer with notice of any delay which may impact the project completion date or impact cost within 7 calendar days from the commencement of the delay, or 7 calendar days from the date the Contractor should have reasonably been aware of the delay. Initial notice of the delay must be in writing and must generally describe the event or condition causing the delay and must specifically identify the schedule activities by activity ID and description which are being impacted, and generally the types and amounts of cost per day being incurred. The Contractor's initial notice shall also provide a brief explanation of why an alternative construction sequence eliminating or minimizing the delay is not possible or practical. This initial notice may be a letter containing all of the elements described above. The Engineer may request an immediate schedule review meeting with the Contractor upon notice of any delay to review the current CPM schedule and consider all possible alternatives.

FAILURE TO PROVIDE WRITTEN NOTICE WITHIN 7 CALENDAR DAYS OF THE COMMENCEMENT OF ANY DELAY MAY RESULT IN THE DENIAL OF ANY REQUEST FOR AN ADJUSTMENT TO THE CONTRACT DURATION, COMPLETION DATE, OR CONTRACT AMOUNT RESULTING FROM THAT DELAY.

The Impact of the Delay will be evaluated using the Time Impact Analysis method. A Time Impact Analysis consists of the following steps:

Step 1. Establish the status of the project immediately prior to the delay event or impact, or as near as practical prior to the commencement of the delay.

Step 2. Using the schedule produced in Step 1, add an activity to the schedule for the delay event with an estimated duration, or the actual duration of the delay event in the case of delay

which has ended. Logically connect the added activity representing the delay event to the appropriate predecessor and successor activities to determine the impact to the completion date.

Step 3. Track the effects of the impact on the schedule during the occurrence by progressing the schedule monthly including the delay activity included in Step 2.

Step 4. Immediately after the conclusion of the delay event, or as near as practical after the delay event has ended, establish the status of the project and provide details identifying any mitigating actions or circumstances used to keep the project ongoing during the impact period.

Submit Step 1 and 2 with the Notice of Potential Time Impact. Incorporate Step 3 into schedule updates until impact is complete. Submit Step 4 with the Final Documentation, no later than 10 days after the completion of the impact.

Determine the time impact by comparing the status of the work prior to the impact (Step 1) to the prediction of the effect of the impact (Step 2), and to the actual effects of the impact once it is complete (step 4). All four steps of the Time Impact Analysis shall be completed before consideration of a Contract time extension or adjustment of milestone date will be provided.

Final Documentation. After the delay event or condition has ended the Contractor has 10 days to prepare and submit the final documentation of the impact of the delay including all cost impacts. An additional 30 days to prepare the final statement of impacts may be granted by the Engineer if requested by the Contractor in writing prior to the conclusion of the initial 10 day period. This documentation shall include a concise Time Impact Analysis Statement prepared using the submitted CPM schedules and a statement of all additional costs incurred as a result of the delay event or condition with backup documentation to support the claimed cost.

FAILURE TO PROVIDE WRITTEN DOCUMENTATION OF THE TIME AND COST IMPACT OF ANY DELAY WITHIN 10 DAYS OF THE CONCLUSION OF ANY DELAY MAY RESULT IN THE SUBSEQUENT DENIAL OF ANY REQUEST FOR AN ADJUSTMENT TO THE CONTRACT COMPLETION DATE OR COST IMPACTS.

END OF SPECIAL PROVISION

FORT BEND GRAND PARKWAY TOLL ROAD AUTHORITY
SPECIAL PROVISION TO ITEM 9
MEASUREMENT AND PAYMENT

For the project, Item 9, "Measurement and Payment", of the Standard Specifications, is hereby modified with respect to the clauses cited below and no other clauses or requirements of this Item are waived or changed hereby.

Article 9.5 A. Labor is revised to read in its entirety as follows:

The Contractor will receive an additional 15% as compensation based on the total wages paid said laborers and foremen. For cost of premiums on public-liability and workers compensation insurance, social security and unemployment insurance taxes, an amount equal to 55 percent of the sum of the labor cost, excluding the 15 percent compensation provided above, will be paid to the Contractor.

Article 9.5 C. Materials is revised to read in its entirety as follows:

The Contractor will receive the actual cost, including freight charges, of the materials used on such work to which cost will be added a sum equal to 15 percent thereof as compensation.

Article 9.6, Progress Payments. The first paragraph is voided and replaced by the following:

Once each month on a set day agreed to at the beginning of the contract, the Contractor shall provide the Engineer with his monthly estimate for quantities installed during the preceding month and the value thereof at the Contract unit prices.

In addition to the above, an estimate shall be made and included for acceptable structural steel, concrete members or units, and certain other structural components, and the Contractor shall furnish an affidavit that the material is stored in a bonded facility approved by the Fort Bend Grand Parkway Toll Road Authority (FBGPTRA). The estimate shall be made and included for 75 percent of the invoice material cost and invoice freight cost of materials involved after the Contractor has furnished the engineer with a copy of the paid invoices. Only materials requiring approved shop drawings, or where shop drawings are permitted due to quantities of units or because of stage construction, which are completely constructed and/or fabricated on the Contractor's order for a specific project, and on which an approved Test Report has been issued are eligible.

The Contractor shall submit, with each request for partial payment, an updated and current backup copy of the CPM Schedule per the Special Specification for CPM Schedules, 1310. No request for payment will be processed without the appropriate schedule update.

Article 9.8 Final Payment. The following paragraphs are added:

The Contractor shall after completion of his contract submit his final estimate for quantities installed during the construction period and the value thereof at the Contract unit prices.

The Engineer shall approve and submit the final estimate to the Commissioners' Court and the County shall at such time or within thirty (30) days from and after the date of said estimate as the County may elect, pay the entire sum so found to be due after audit and approval by the County Auditor, after deducting therefrom all previous payments and all amounts to be kept and all amounts to be retained under the provisions of the Contract. All prior partial estimates and payments shall be subject to correction in the final estimate and payment. It is mutually agreed between the parties to the Contract that no estimate or payment made under the Contract, except the final payment, shall exclude any claim of the County or shall constitute conclusive evidence of acceptable performance of the Contract either wholly or in part by the County; and no payments shall be construed to be an acceptance of any defective work or improper materials, or a release from any claims for damages. The Contractor hereby further agrees that the payment of the final amount due under the Contract and adjustment and payment of the bill rendered for any work done in accordance with any alterations to the Contract on a Change In Contract form shall release the County and the Engineer from any and all claims or liability on account of work performed under the Contract or alterations thereof. The Contractor agrees to examine the final estimate and, if he finds it correct, to execute thereon his release in full of all claims due by Fort Bend County, and to certify under oath to the payment by him of all claims against him for labor, materials, and supplies furnished by the Contractor by all persons and firms in the performance of the Contract.

Item 9 is supplemented by the addition of the following Articles:

Article 9.10 Tax Exemptions. The bidder obligates himself, if awarded the Contract, to use reasonable diligence to obtain for the FBGPTRA any and all exemptions from State or Federal excise or other tax if required to pay such taxes or if such taxes are paid, to assist the FBGPTRA in any necessary way to obtain refund of such taxes so paid and to execute any required documents necessary to obtain refunds or to assert such exemptions.

Article 9.11 Electronic Wire Transfers. If the Contractor requests in writing to the Engineer, the Authority will make payments via electronic wire transfer.

SPECIAL PROVISION

100---002

Preparing Right of Way

For this project, Item 100, "Preparing Right of Way," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 100.4. Payment. The second paragraph is voided and replaced by the following:

Total payment of this Item will not exceed 10% of the original contract amount until final acceptance. The remainder will be paid on the estimate after the final acceptance under Article 5.8, "Final Acceptance."

SPECIAL PROVISION**132---005****Embankment**

For this project, Item 132, "Embankment," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 132.2. Materials is supplemented with the following:

- **Type E.** Cement stabilized material consisting of Type C select backfill meeting the requirements of Article 423.2.C.2. Table 2. Select Backfill Gradation Limits and hydraulic cement meeting the requirements of DMS-4600, "Hydraulic Cement," and the Department's Hydraulic Cement Quality Monitoring Program (HCQMP). Sources not on the HCQMP will require testing and approval before use.

Article 132.2. Materials. The last paragraph is voided and not replaced.

Article 132.3.C. Embankment Adjacent to Culverts and Bridges is voided and replaced by the following:

Article 132.3.C. Embankment Adjacent to Culverts and Bridges. Except as noted below, in Article 132.3.D, compact embankments adjacent to culverts, under bridge approach slabs, and adjacent to abutments where using Wide Flange Terminal Anchorage systems but not cement stabilized embankment, in accordance with Item 400, "Excavation and Backfill for Structures."

Article 132.3.D. Compaction Methods. The first paragraph is supplemented by the following:

When cement stabilized backfill embankment, reinforced volume embankment, retaining wall foundation improvements, or embankment foundation improvements are shown on the plans, compact each layer to the required density, in accordance with Article 276.4.C, "Compaction."

Article 132.3. Construction is supplemented with the following:

G. Cement Stabilized Backfill Embankment (CSBE). Provide Type E material for cement stabilized backfill embankment. Place CSBE for embankments, retaining wall foundation improvements, embankment foundation improvements and backfill material placed between the reinforced volume of retaining walls in accordance with the requirements of Article 423.2.C.4, "Cement Stabilized Backfill" at the locations shown on the plans or as directed.

Article 132.5. Payment. The first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Embankment (Final)," "Embankment (Original)," or "Embankment (Vehicle)," of the compaction method and type specified. Where Cement Stabilized Backfill Embankment (CSBE) is shown on the plans, it will be paid for at the unit price bid for "Embankment (Final) (CSBE)", "Embankment (Final)(CSBE)(Retaining Wall Foundation Improvement)," "Embankment (Final)(CSBE)(Embankment Foundation Improvement)," or "Embankment (Final)(CSBE) (Reinforced Volume of Retaining Walls) of the compaction method and type shown on the plans. When the embankment adjacent to the cement stabilized reinforced volume is not cement stabilized, the cement stabilized reinforced volume will be paid as "Embankment (Final)" of the compaction method and type shown on the plans. This price is full compensation for all cement, cement treatment and stabilization, furnishing embankment, hauling, placing, compacting, curing, finishing, and reworking; disposal of waste material; and equipment, labor, tools, and incidentals.

SPECIAL PROVISION

132---007

Embankment

For this project, Item 132, "Embankment," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 132.3 Construction, Section D. Compaction Methods. The first paragraph, last sentence, is replaced by the following:

Compact embankments in accordance with Section 132.3.D.1, "Ordinary Compaction," or Section 132.3.D.2, "Density Control," as shown on the plans. Section 132.3.D.3, "Density Control by Computer-Generated (CG) Curve," may be used by the contractor as an option for density control.

Article 132.3 Construction, Section D. Compaction Methods, is supplemented by the following:

- 3. Density Control by Computer-Generated (CG) Curve.** At the Contractor's discretion, a CG curve may be used for density control. The option to use a CG curve for density control is not available for soils with a PI greater than 35; follow the requirements of Section 132.3.D.2, "Density Control."

Compact each layer to the required density using equipment complying with Item 210, "Rolling." Determine the maximum lift thickness based on the ability of the compacting operation and equipment to meet the required density. Do not exceed layer thickness of 12 in. loose or 10 in. compacted material, unless otherwise approved. Maintain a level layer with consistent thickness to ensure uniform compaction.

When using this method, provide CG field moisture-density curves and CG Tex-114-E moisture-density curves based on the input parameters specified in Table 3 for each source and type of material or when directed by the Engineer. The CG field dry density (D_{fcg}) must be greater than or equal to the CG Tex-114-E maximum dry density (D_{acg}). The Engineer will obtain independent soil samples and use Tex-114-E to determine the maximum dry density (D_a) and optimum moisture content (W_{opt}) each time a new curve is submitted. Provide access to the computer program used to generate the curve, when directed.

Table 3
Computer Generated Lab and Field Compaction Curve Input Criteria

Input Variables	Test Method
Liquid Limit, %	Tex-104-E
Plasticity index (PI), %	Tex-106-E
Soil gradation	Tex-110-E, Tex-111-E
Soil classification	Tex-142-E
Compaction roller brand, type, and model	N/A
Loose lift thickness, in.	N/A
Soil specific gravity	Use 2.65 for soil type SC. Use 2.68 for soil type CL. Use 2.69 for soil type CH.

Provide a compaction control report showing all input and output parameters and CG compaction curves, including:

- CG Tex-114-E laboratory maximum dry density (D_{acg})
- CG Tex-114-E laboratory optimum moisture content (W_{optcg})
- CG field maximum dry density (D_{fcg})
- CG field optimum moisture content ($W_{f_{optcg}}$)
- Graph of CG laboratory and field compaction curves and the “Zero Air Voids Line”
- Minimum number of roller passes to achieve the required density and moisture content.

Meet the requirements for field maximum dry density (D_{fcg}) and field optimum moisture content ($W_{f_{optcg}}$) specified in Table 4, unless otherwise shown on the plans. Use only the roller specified as an input parameter for the CG curve to meet density requirements.

Table 4
Field Density Control Requirements

Description	Density	Moisture Content
	Tex-115-E	
$PI \leq 15$	$\geq 98\% D_{fcg}$	$\geq W_{f_{optcg}}$
$15 < PI \leq 35$	$\geq 98\% D_{fcg}$ and $\leq 102\% D_{fcg}$	$\geq W_{f_{optcg}}$

Each layer is subject to testing by the Engineer for density and moisture content. During compaction, the moisture content of the soil should be above CG optimum moisture content but should not exceed the value shown on the moisture-density curve, above optimum, required to achieve 98% dry density.

When the CG field maximum dry density (D_{fcg}) is not achieved, perform the following steps in order:

- Verify that construction controls including lift soil properties, minimum number and uniformity of compactor passes, lift thickness, and moisture content are correct.
- If needed, rework the lift with the corrected controls using the original CG curve.
- Generate a new CG field compaction curve based on actual in-place soil properties and rework the lift.

- Rework the material using non-CG Tex-114-E moisture-density curve.

When required, remove small areas of the layer to allow for density tests. Replace the removed material and recompact at no additional expense to the Department. Proof-roll in accordance with Item 216, "Proof Rolling," when shown on the plans or as directed. Correct soft spots as directed.

Article 132.3 Construction, Section E. Maintenance of Moisture and Reworking. The first sentence is replaced by the following:

Maintain the density and moisture content once all requirements in Table 2 or 4 are met.

SPECIAL PROVISION**161---006****Compost**

For this project, Item 161, "Compost," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 161.2. Materials. Table 1 and following two paragraphs are voided and replaced by the following:

Table 1
Physical Requirements for Compost

Property	Test Method	Requirement
Particle Size	TMECC' 02.02-B, "Sample Sieving for Aggregate Size Classification"	95% passing 5/8 in. 70% passing 3/8 in.
Heavy Metals Content	TMECC 04.06, "Heavy Metals and Hazardous Elements": 04.06-As, Arsenic 04.06-Cd, Cadmium 04.06-Cu, Copper 04.06-Pb, Lead 04.06-Hg, Mercury 04.06-Mo, Molybdenum 04.06-Ni, Nickel 04.06-Se, Selenium 04.06-Zn, Zinc	Pass
Salinity	TMECC 04.10-A, "1:5 Slurry Method, Mass Basis"	5.0 dS/m Max ²
pH	TMECC 04.11-A, "1:5 Slurry pH"	5.5-8.5
Maturity	TMECC 05.05-A, "% Emergence and Relative Seedling Vigor"	> 80%
Organic Matter Content	TMECC 05.07-A, "Loss-On-Ignition Organic Matter Method"	25-65% (dry mass)
Stability	TMECC 05.08-B, "Carbon Dioxide Evolution Rate"	≤ 8
Fecal Coliform	TMECC 07.01-B, "Fecal Coliforms"	1,000 MPN/g Max

1. "Test Methods for the Examination of Composting and Compost," published by the United States Department of Agriculture and the USCC.

2. A soluble salt content up to 10.0 dS/m for compost used in compost-manufactured topsoil will be acceptable.

Maintain compost in designated stockpiles at the producer's site. The Department reserves the right to sample compost at the jobsite. Material may be tested to verify compliance with this Specification by an STA-certified lab. Make payment to the STA-certified lab approved by the Department. Submit lab invoices for passing tests to the Department for reimbursement. Maintain a complete record of all test reports for the previous and current calendar year.

SPECIAL PROVISION

164---004

Seeding for Erosion Control

Item 164, "Seeding for Erosion Control," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 164.2.D. Cellulose Fiber Mulch is voided and replaced by the following:

Use only bonded fiber matrix that are on the approved list published in "Field Performance of Erosion Control Products," available from the Maintenance Division. Use material of the class and type as shown on the plans and provide a copy of the manufacturer's label for the selected product.

Article 164.3. Construction. The following is added after the first sentence:

Use approved equipment to vertically track the seedbed as shown on the plans or as directed by the Engineer.

Article 164.3.C. Cellulose Fiber Mulch Seeding is voided and replaced by the following:

- C. Bonded Fiber Matrix Seeding.** Plant seed according to Section 164.3.A, "Broadcast Seeding". Immediately after planting the seed or seed mixture, apply the bonded fiber matrix uniformly over the seeded area using suitable equipment. Applications should be made in accordance to the Product Installation Sheet published in "Field Performance of Erosion Control Products" available from the Maintenance Division.

Article 164.5. Payment is voided and replaced by the following:

The work performed and the materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Broadcast Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Broadcast Seeding (Temp)" of warm or cool season specified, "Straw or Hay Mulch Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Straw or Hay Mulch Seeding (Temp)" of warm or cool season specified, "Bonded Fiber Matrix Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Bonded Fiber Matrix Seeding (Temp)" of warm or cool season specified, "Drill Seeding (Perm)" of the rural or urban seed mixture and sandy or clay soil specified, "Drill Seeding (Temp)" of warm or cool season specified, and "Straw or Hay Mulching." This price is full compensation for furnishing materials, including water for hydro-seeding and hydro-mulching operations, mowing, labor, equipment, tools, supplies, and incidentals. Fertilizer will not be paid for directly but will be subsidiary to this Item. Water for irrigating the seeded area, when specified, will be paid for under Item 168, "Vegetative Watering."

SPECIAL PROVISION

166---001

Fertilizer

Item 166, "Fertilizer," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 166.2. Materials is voided and replaced by the following:

Use a complete fertilizer containing nitrogen (N), phosphoric acid (P), and potash (K) nutrients unless otherwise specified on the plans. At least 50% of the nitrogen component must be a slow-release sulfur coated urea. Ensure that fertilizer is in an acceptable condition for distribution in containers labeled with the analysis. Fertilizer is subject to testing by the Texas A&M Feed and Fertilizer Control Service in accordance with the Texas Fertilizer Law.

Article 166.3. Construction is voided and replaced by the following:

Deliver and apply the complete fertilizer uniformly at a rate equal to 60 lb. of nitrogen per acre or at the analysis and rate specified on the plans.

Apply fertilizer as a dry material and do not mix with water to form a slurry.

Incorporate fertilizer during seedbed preparation as specified in the plans.

SPECIAL PROVISION

260---003

Lime Treatment (Road-Mixed)

For this project, Item 260, "Lime Treatment (Road-Mixed)," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 260.2. Materials, Section A. Lime. The first two sentences are voided and replaced by the following:

Furnish lime that meets the requirements of DMS-6350 "Lime and Lime Slurry," and DMS-6330, "Prequalification of Lime Sources." Use hydrated lime, commercial lime slurry, quicklime, or carbide lime slurry as shown on the plans.

Article 260.3. Equipment, Section B. Slurry Equipment. The last sentence of the second paragraph is voided and replaced by the following:

Equip the distributor truck with a sampling device in accordance with Tex-600-J, Part I, when using commercial lime slurry or carbide lime slurry.

Article 260.4. Construction, Section C. Application of Lime, Section 2. Slurry Placement. The first paragraph is voided and replaced with the following:

Provide slurry free of objectionable materials, at or above the minimum dry solids content, and with a uniform consistency that will allow ease of handling and uniform application. Deliver commercial lime slurry or carbide lime slurry to the jobsite, or use hydrated lime or quicklime to prepare lime slurry at the jobsite or other approved location, as specified. When dry quicklime is applied as a slurry, use 80 percent of the amount shown on the plans.

Article 260.4. Construction, Section D. Mixing. The third paragraph is voided and replaced with the following:

After mixing, the Engineer may sample the mixture at roadway moisture and test in accordance with Tex-101-E, Part III, to determine compliance with the gradation requirements in Table 1.

Article 260.5. Measurement, Section A. Lime is supplemented by the following:

4. Carbide Lime Slurry. Lime slurry will be measured by the ton (dry weight) as calculated from the minimum percent dry solids content of the slurry, multiplied by the weight of the slurry in tons delivered.

Article 260.6. Payment. The first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid in accordance with Section 260.6.A, "Lime," and Section 260.6.B, "Lime Treatment."

Article 260.6. Payment, Section A. Lime. The first sentence is voided and replaced by the following:

A. Lime. Lime will be paid for at the unit price bid for "Lime" of one of the following types:

- Hydrated Lime (Dry),
- Hydrated Lime (Slurry),
- Commercial Lime Slurry,
- Quicklime (Dry),
- Quicklime (Slurry), or
- Carbide Lime Slurry.

Article 260.6. Payment, Section B. Lime Treatment is voided and replaced by the following:

B. Lime Treatment. Lime treatment will be paid for at the unit price bid for "Lime Treatment (Existing Material)," "Lime Treatment (New Base)," or "Lime Treatment (Mixing Existing Material and New Base)," for the depth specified. No payment will be made for thickness or width exceeding that shown on the plans. This price is full compensation for shaping existing material, loosening, mixing, pulverizing, spreading, applying lime, compacting, finishing, curing, curing materials, blading, shaping and maintaining shape, replacing mixture, disposing of loosened materials, processing, hauling, preparing secondary subgrade, water, equipment, labor, tools, and incidentals.

SPECIAL PROVISION

360---007

Concrete Pavement

For this project, Item 360, "Concrete Pavement," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 360.3. Equipment, Section E. Curing Equipment. The third sentence is voided and replaced by the following:

Provide curing equipment that is independent of all other equipment when required to meet the requirements of Article 360.4.I, "Curing."

Article 360.4. Construction, Section H. Spreading and Finishing, Section 2. Maintenance of Surface Moisture. The first and second sentences are voided and replaced by the following:

Prevent surface drying of the pavement before application of the curing system by means that may include water fogging, the use of wind screens and the use of evaporation retardants.

Article 360.4. Construction, Section H. Spreading and Finishing, Section 3. Surface Texturing is voided and replaced by the following:

Complete final texturing before the concrete has attained its initial set. Drag the carpet longitudinally along the pavement surface with the carpet contact surface area adjusted to provide a satisfactory coarsely textured surface. Prevent the carpet from getting plugged with grout. Do not perform carpet dragging operations while there is excessive bleed water.

A metal-tine texture finish is required for all areas with a posted speed limit in excess of 45 mph. A metal-tine texture finish is required unless otherwise shown on the plans for areas with a posted speed limit less than 45 mph. Immediately following the carpet drag, apply a single coat of evaporation retardant at a rate recommended by the manufacturer. Provide the metal-tine finish immediately after the concrete surface has set enough for consistent tining. Operate the metal-tine device to obtain grooves spaced at 1 in., approximately 3/16 in. deep, with a minimum depth of 1/8 in., and approximately 1/12 in. wide. Do not overlap a previously tined area. Use manual methods to achieve similar results on ramps and other irregular sections of pavements. Repair damage to the edge of the slab and joints immediately after texturing. Do not tine pavement that will be overlaid or that is scheduled for blanket diamond grinding or shot blasting.

When carpet drag is the only surface texture required by the plans, ensure that adequate and consistent micro-texture is achieved by applying sufficient weight to the carpet and keeping the carpet from getting plugged with grout, as directed by the Engineer. Target a carpet drag texture of .04 in., as measured by Tex 436-A. Correct any location with a texture less than .03 in. by

diamond grinding or shot blasting. The Engineer will determine the test locations at points located transversely to the direction of traffic in the outside wheel path.

Article 360. 4. Construction, Section I. Curing. The first sentence is voided and replaced by the following:

Keep the concrete pavement surface from drying as described in Section 360.4.H.2, "Maintenance of Surface Moisture," until the curing material has been applied.

Article 360. 4. Construction, Section I. Curing, Section 1. Membrane Curing. The first paragraph is voided and replaced by the following:

Spray the concrete surface uniformly with 2 coats of membrane curing compound at an individual application rate of not more than 180 sq. ft. per gallon. Do not allow the concrete surface to dry before applying the curing compound. Use a towel or absorptive fabric to remove any standing pools of bleed water that may be present on the surface before applying the curing compound. Apply the first coat within 10 min. after completing texturing operations. Apply the second coat within 30 min. after completing texturing operations.

SPECIAL PROVISION

368---001

Concrete Pavement Terminals

For this project, Item 368, "Concrete Pavement Terminals," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 368.5. Payment. The second paragraph is voided and replaced with the following:

This price is full compensation for excavation, disposal of waste material, backfilling, 12 in. cement treatment, hydraulic cement concrete (sleeper slab and support slab) underneath the concrete pavement, joint material, reinforcing steel, wide-flange beams, equipment, materials, labor, tools and incidentals.

The last sentence of the third paragraph is voided.

SPECIAL PROVISION

400---004

Excavation and Backfill for Structures

For this project, Item 400, "Excavation and Backfill for Structures," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 400.5. Payment, Section E. Cutting and Restoring Pavement. The first sentence is voided and replaced by the following:

Cutting and restoring pavement will be paid for at the unit price bid for "Cutting and Restoring Pavement" of the type specified.

SPECIAL PROVISION

416---001

Drilled Shaft Foundations

For this project, Item 416, "Drilled Shaft Foundations," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 416.5. Payment, Section A. Drilled Shaft is voided and replaced by the following.

A. Drilled Shaft. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Drilled Shaft" or "Drilled Shaft (Non-reinforced)" or "Drilled Shaft (Sign Mounts)" or "Drilled Shaft (High Mast Pole)" or "Drilled Shaft (Roadway Illumination Pole)" or "Drilled Shaft (Traffic Signal Pole)" of the specified diameter, subject to the limitations for overruns authorized by the Engineer given in Section 416.5.A.1, "Overrun."

Article 416.5. Payment, Section A. Drilled Shaft, Section 2. Maximum Plan Length Shaft is supplemented by the following.

- For roadway illumination poles, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any roadway illumination pole included in the contract.
- For traffic signal poles, the maximum plan length shaft is the maximum length shaft, regardless of diameter, for any traffic signal pole included in the contract.

SPECIAL PROVISION

420---002

Concrete Structures

For this project, Item 420, "Concrete Structures," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 420.4. Construction, Section I, "Finish of Bridge Slabs". The tenth paragraph is supplemented with the following:

For bridge approach slabs the carpet drag, burlap drag, or broom finish may be applied either longitudinally or transversely.

Article 420.4. Construction, Section I, "Finish of Bridge Slabs". The first sentence of the fourteenth paragraph is voided and replaced by the following:

Unless noted otherwise, saw-cut grooves in the hardened concrete of bridge slabs, bridge approach slabs, and direct-traffic culverts to produce the final texturing after completion of the required curing period.

Article 420.4. Construction, Section I, "Finish of Bridge Slabs". The fourteenth paragraph is amended by the following:

When saw-cut grooves are not required in the plans, provide either a carpet drag or broom finish for micro-texture. In this case insure that an adequate and consistent micro-texture is achieved by applying sufficient weight to the carpet and keeping the carpet or broom from getting plugged with grout. For surfaces that do not have adequate texture, the Engineer may require corrective action including diamond grinding or shot blasting.

Article 420.4. Construction, Section J. Curing Concrete. The first sentence of the fourth paragraph is voided and replaced by the following:

For upper surfaces of bridge slabs, bridge approach slabs, median and sidewalk slabs, and culvert top slabs constructed using Class S concrete, apply interim curing using a Type 1-D curing compound before the water sheen disappears but no more than 45 minutes after application of the evaporation retardant. Do not allow the concrete surface to dry before applying the interim cure, and do not place the interim cure over standing water.

Article 420.6 Payment. The pay adjustment formula given in the sixth bullet of the fourth paragraph is voided and replaced by the following:

$$A = Bp[-5.37(Sa/Ss)^2 + 11.69(Sa/Ss) - 5.32]$$

Where:

A = Amount to be paid

Sa = Actual strength from cylinders or cores

Ss = Specified design strength

Bp = Unit bid price

SPECIAL PROVISION

425---001

Precast Prestressed Concrete Structural Members

For this project, Item 425, "Precast Prestressed Concrete Structural Members," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 425.2. Materials is supplemented by the following:

For bridges with Type Tx28, Tx34, Tx40, Tx46, Tx54, Tx62 and/or Tx70 prestressed concrete girders, the contractor can submit an alternate design for approval using other TxDOT prestressed concrete girder shapes . Alternate designs must be signed, sealed, and dated by a Licensed Professional Engineer and submitted to the Engineer for review and approval. Use the same live load as the original design and adhere to the current versions of the AASHTO LRFD Bridge Design Specifications and the TxDOT LRFD Bridge Design Manual. Alternate bridge designs can differ from the original design only by type of girder used. Do not raise the roadway grade or lower the structure bottom chord elevation to accommodate the alternate girders. No other changes to the original geometry, including bent locations, are allowed. Substructure re-design may be necessary to accommodate the alternate girders.

Article 425.5. Payment is supplemented by the following:

No additional compensation will be made for alternate designs or for any increase in quantities required to accommodate alternate designs, including quantities paid for under other Items.

SPECIAL PROVISION

428---001

Concrete Surface Treatment

For this project, Item 428, "Concrete Surface Treatment," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 428.3. Construction, Section B. Surface Treatment Class II. The second paragraph is voided and replaced by the following:

- Clean the concrete surfaces using shot or abrasive blasting, unless otherwise restricted, followed by vacuuming and air-blasting as needed, to remove all visible curing compound, oils, and any other contaminants that retard or prevent penetration of the mixture before treatment application. Completely remove all spent abrasive media. Demonstrate the method of cleaning to the Engineer.

Do not damage the concrete surface to the point that the coarse aggregate is exposed. Acceptance of the entire cleaned surface by the Engineer is required before the application of the treatment material.

SPECIAL PROVISION

434---003

Elastomeric Bridge Bearings

For this project, Item 434, "Elastomeric Bridge Bearings," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 434.1. Description. The third bullet is voided and replaced by the following:

- **Sliding Elastomeric Bearings.** Consisting of a steel top (sole) plate with a stainless steel facing (upper component) bearing on a lower component. The lower component may be either a layer of polytetrafluoroethylene (PTFE) bonded to a preformed fabric pad or a layer of PTFE recessed and bonded to a steel plate that is vulcanized to the top of a laminated elastomeric bearing pad with or without special components (steel guide bars and bottom plate).

Article 434.2. Materials, Section A. Plain and Laminated Elastomeric Bearings, Section 1. Elastomer. The fifth paragraph is voided and replaced by the following:

Plain sample bearings must measure 9 in. × 19 in. × 1 in. with 70-durometer hardness. Laminated sample bearings must measure 9 in. × 14 in. × 1-1/2 in. with the following number of steel laminates:

- 50 durometer--3 steel laminates,
- 60 durometer--2 steel laminates, and
- 70 durometer--2 steel laminates.

Article 434.2. Materials, Section A. Plain and Laminated Elastomeric Bearings is supplemented by the following:

5. **Coatings.** Provide coating materials as required in accordance with Item 445, "Galvanizing," and Item 446, "Cleaning and Painting Steel."

Article 434.2. Materials, Section B. Sliding Elastomeric Bearings, Section 1. Lower Component, Section b. PTFE. The second sentence is voided and not replaced.

Article 434.2. Materials, Section B. Sliding Elastomeric Bearings, Section 1. Lower Component is supplemented by the following:

- Laminated Elastomeric Bearing Pad.** Furnish laminated elastomeric bearing pads produced by a manufacturer prequalified by the Construction Division. Provide elastomer for laminated elastomeric bearing pads in accordance with Section 434.2.A.1, "Elastomer." Provide steel laminates for laminated elastomeric bearing pads in accordance with Section 434.2.A.2, "Steel Laminates." Provide steel plates for laminated elastomeric bearing pads in accordance with Section 434.2.A.3, "Steel Top Plates."

Article 434.2. Materials, Section B. Sliding Elastomeric Bearings is supplemented by the following:

4. **Coatings.** Provide coating materials as required in accordance with Item 445, "Galvanizing," and Item 446, "Cleaning and Painting Steel."

Article 434.3. Construction, Section A. Plain and Laminated Elastomeric Bearings, Section 4. Field Methods. The second paragraph is voided and replaced by the following:

Field-weld as required in accordance with Item 448, "Structural Field Welding." Do not damage the elastomer when welding near bearings. Replace bearings damaged by field welding at the Contractor's expense.

Article 434.3 Construction, Section B. Sliding Elastomeric Bearings is voided and replaced by the following:

B. Sliding Elastomeric Bearings. Before fabrication of sliding elastomeric bearings, prepare and submit clear and legible shop drawings for the complete assembly in accordance with the plans and Section 441.3.A.6.b(2), "Non-Bridge Structures." Provide a bearing layout with the shop drawings.

Attach the stainless steel sheet to the steel top (sole) plate by continuous fillet-welding around the edges with an approved welding electrode. Do not extend the weld above the sliding surface. Protect the sliding surface from weld spatter. Provide the finished stainless steel surface flat to a tolerance of 1/32 in. After attachment to the steel plate, polish the stainless steel sheet to a bright mirror finish less than 20 micro-in. rms, and solvent-clean to remove traces of polishing compound.

For lower components with laminated elastomeric bearing pads, fabricate the laminated elastomeric bearing pads according to Section 434.3.A, "Plain and Laminated Elastomeric Bearings." Vulcanize the laminated elastomeric bearing pad to the PTFE faced steel plate. Machine the steel plate recessed surface flat to a tolerance of 1/32 in. and within 1/32 in. of required depth. Bond the PTFE material to the steel plate recessed surface with an approved adhesive. Fit the PTFE material into the recessed surface with not more than 1/32-in. gaps around the perimeter.

For lower components with preformed fabric pads, provide preformed fabric pads within the following tolerances from plan dimension:

- length and width: +1/4 in., -0 in., and
- thickness: +/-5%.

Bond the PTFE material to the preformed fabric pad using approved adhesive methods or by vulcanizing through an appropriate polychloroprene interlayer.

Perform required welding in accordance with Item 441, "Steel Structures." Manufacture guide bars when required so that adjacent top and bottom bar surfaces are parallel to within 1/16 in. in the assembled position. The tolerance for diameter of anchor bolt holes is +1/8 in., -0 in. The maximum deviation for flatness of steel top (sole) plates, except at stainless steel attached surfaces, is 1/16 in. in any 24 in.

1. **Markings.** Mark the bearing type on the surface of each sliding elastomeric bearing. The marking must remain legible until placement in the structure. Permanently mark the laminated elastomeric bearing pad with the information specified in Section 434.3.A.1, "Markings."
2. **Testing and Acceptance.** For lower components with laminated elastomeric bearing pads, test a minimum of 10% of the sliding elastomeric bearing assemblies to an average compressive strength of 2,250 psi or a stress approved by the Engineer. Provide calibrated equipment per ASTM E 4 for this compression testing. No tested sliding elastomeric bearing may show visible damage to the PTFE or stainless steel surfaces nor evidence of bond failure between the:
 - PTFE faced steel plate and laminated elastomeric bearing pad,
 - steel laminates and elastomer within the laminated elastomeric bearing pad, and
 - steel plate and PTFE.

Perform check tests if necessary on the steel, laminated elastomeric bearing pads, preformed fabric pads, or PTFE material to verify the properties required under Section 434.2.B, "Sliding Elastomeric Bearings."

Bearings represented by test specimens passing the requirements of this Item will be approved for use in the structure subject to on-site inspection by the Engineer for visible defects.

- a. **Lower Component.** Manufacture 1 additional bearing lower component for testing purposes. After bearings have been manufactured for a project, notify the Construction Division, which will sample a bearing lower component at random from the lot. The Construction Division will perform a 90° peel test (adhesion test) to ensure that the sample meets a minimum required peel strength of:
 - 20 lb. per inch between the PTFE material and steel plate when tested per Tex 601-J, and
 - 25 lb. per inch between the PTFE material and preformed fabric pad when tested per ASTM D 429, Method B.

The Construction Division will also determine adhesion between the PTFE faced steel plate and laminated elastomeric bearing pad per Tex-601-J.

- b. **Documentation.** Furnish copies of certified mill test reports for the steel top (sole) plate, stainless steel, PTFE faced steel plate, and any required steel special components. Provide a manufacturer's certification that the preformed fabric pad and PTFE material meet the requirements of this Item. Furnish certified laboratory test results on the elastomer properties of each batch or lot of compound for laminated elastomeric bearing pads.
3. **Storage.** Store sliding elastomeric bearings horizontally in a dry, sheltered area. Provide moisture- and dust-resistant wrapping maintained in good condition until installation. Lift bearings only from the undersides. Protect bearings from damage, dirt, oil, grease, and other foreign substances.

- 4. Field Methods.** Provide concrete surfaces for bearing areas under sliding elastomeric bearings in accordance with Section 420.4.H, "Treatment and Finishing of Horizontal Surfaces Other Than Bridge Slabs."

Field-weld as required in accordance with Item 448, "Structural Field Welding." Avoid damage to the laminated elastomeric bearing pad or preformed fabric pad when welding near bearings. Bearings damaged by field welding will be replaced by the Contractor at the Contractor's expense.

Article 434.5. Payment, Section B. Sliding Elastomeric Bearings is voided and replaced by the following:

B. Sliding Elastomeric Bearings. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Sliding Elastomeric Bearing" of the type specified. This price is full compensation for the stainless steel faced top plate, the PTFE faced steel plate vulcanized to the top of a laminated elastomeric bearing pad or the PTFE faced preformed fabric pad, the steel special components, the anchor bolts required to connect the bearing between superstructure and substructure; installation; and tools, equipment, labor, and incidentals.

SPECIAL PROVISION

442---016

Metal for Structures

For this project, Item 442, "Metal for Structures," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 442.2, "Materials," Section A, "Structural Steel," Section 1, "Bridge Structures." The third sentence is voided and not replaced.

Article 442.5, "Payment," is voided and replaced by the following:

442.5. Payment. The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Structural Steel" of the type (Rolled Beam, Plate Girder, Tub Girder, Box Girder, Railroad Through-Girder, Railroad Deck-Girder, Miscellaneous Bridge, Miscellaneous Non-Bridge) specified. This price is full compensation for materials, fabrication, transportation, erection, paint, painting, galvanizing, equipment, tools, labor, and incidentals.

SPECIAL PROVISION

450---001

Railing

For this project, Item 450, "Railing," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 450.2. Materials is supplemented with the following:

Where epoxy anchors are allowed or required, provide an approved Type III, Class C epoxy in accordance with DMS-6100, "Epoxies and Adhesives," for installing drilled and epoxied rail anchorage reinforcement or rail anchor bolts. Use other materials if shown in the plans. Provide only dual cartridge epoxy systems mixed with a static mixing nozzle supplied by the epoxy adhesive manufacturer and dispensed with a tool supplied by the epoxy adhesive manufacturer. Do not use bulk epoxies. Drill and install anchorage reinforcement or anchor bolts to the embedment depth shown in the plans or the depth recommended by the manufacturer, whichever is deeper. No additional payment will be made for providing embedment deeper than shown in the plans. If no resistance or embedment depth is specified in the plans, select an embedment depth capable of developing the yield strength of the steel anchor.

Article 450.3. Construction, Section B. Concrete Railing. The last paragraph is voided and replaced by the following:

Obtain approval to slipform railing. Slipforming equipment must be approved. Do not slipform railing with cast-in-place anchor bolts unless noted otherwise. Provide additional reinforcing, at Contractor's expense, as needed to prevent movement of the reinforcement cage. Clear cover and epoxy coating requirements for additional reinforcement are the same as shown for the rail reinforcement. The rail reinforcing cage may be tack welded to the rail anchorage reinforcement provided the rail and anchorage reinforcement are not epoxy coated and weld locations measured along the rail are no closer than 3 ft. If epoxy coated reinforcement is required for the railing proposed to be slipformed, tie all bar intersections. Provide a wire line to maintain vertical and horizontal alignment of the slipform machine. Attach a grade line gauge or pointer to the machine so a continuous comparison can be made between the rail being placed and the established grade line. Rails or supports at the required grade are allowed instead of sensor controls. Prior to placing concrete, make one or more passes with the slipform over the rail segment to ensure proper operation and maintenance of grades and clearances. Provide slipformed rail within a vertical and horizontal alignment tolerance of $\pm 1/4$ in. in 10 ft. Construct rail with a smooth and uniform appearance. Consolidate concrete so it is free of honeycomb. Provide concrete with a consistency that will maintain the shape of the rail without support. Minimize starting and stopping of the slipform operation by ensuring a continuous supply of concrete.

Do not exceed the manufacturer's recommended speed for the slipform machine. If slipforming causes movement of the reinforcement such that plan clearances are not achieved, stop slipforming and take remedial action. Remove and replace unsatisfactory slipformed rail at the Contractor's expense.

Install epoxy adhesive anchorages in accordance with the manufacturer's instructions including hole size, drilling equipment and method, hole cleaning equipment and method, mixing and dispensing epoxy, and anchor insertion. Do not alter the manufacturer's mixing nozzle or dispenser. Anchorage bars or bolts must be clean and free of grease, oil, or any other foreign material. Do not weld to an anchor bar or anchor bolt that is anchored with epoxy adhesive. Do not expose rail to traffic until epoxy adhesive has cured.

Article 450.3. Construction, Section C. Tests is supplemented with the following:

The Engineer will select three anchor bars or bolts of the first day's production to be tested after the epoxy has cured. Test the bars or bolts in the presence of the Engineer in accordance with ASTM E 1512, using a restrained test, to evaluate the epoxy adhesive's bond strength. Verify that the anchor bars or bolts develop the required pullout resistance in the plans or 75 percent of the yield strength of the bars or bolts, whichever is less, without a bond failure of the epoxy. The Engineer may require additional tests during production. If any of the tests do not meet the required test load, perform corrective measures to provide adequate capacity. Repair damage from testing.

Article 450.5. Payment is voided and replaced with the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Railing" of the type specified. This price will be full compensation for furnishing, preparing, and placing concrete, expansion joint material, reinforcing steel, structural steel, aluminum, cast steel, pipe, anchor bolts or bars, testing of epoxy anchors, and all other materials required in the finished railing; removal and disposal of salvageable materials; and hardware, paint and painting of metal railing, galvanizing, equipment, labor, tools, and incidentals.

SPECIAL PROVISION

462---014

CONCRETE BOX CULVERTS AND STORM DRAINS

For this project, Item 462, "Concrete Box Culverts and Storm Drains," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 462.2. Materials, Section A. General. The last two paragraphs are voided and replaced by the following:

Furnish concrete for machine-made precast boxes in accordance with ASTM C 1577 except as noted herein. Furnish concrete component materials for machine-made precast boxes in accordance with the following:

- **Cement.** Furnish cement conforming to DMS-4600, "Hydraulic Cement."
- **Supplementary Cementing Materials (SCM).** Furnish SCM conforming to Item 421, "Hydraulic Cement Concrete."
- **Chemical Admixtures.** Furnish admixtures conforming to DMS-4640, "Chemical Admixtures for Concrete," unless otherwise approved by the Engineer. Do not use calcium chloride.
- **Water.** Furnish water conforming to Item 421, "Hydraulic Cement Concrete."
- **Fine and Coarse Aggregate.** Furnish aggregates conforming to Item 421, "Hydraulic Cement Concrete," except the requirement for gradation will not apply.

When sulfate-resistant concrete is required, use mix design Options 1, 2, 3, or 4 given in Section 421.4.A.6, "Mix Design Options," for machine-made precast boxes using Type I/II, II, V, IP, or IS cement. Do not use Class C fly ash in sulfate-resistant concrete.

Article 462.2. Materials, Section B. Fabrication, 3. Machine-Made Precast. The first sentence is voided and replaced by the following:

Furnish machine-made precast boxes in accordance with ASTM C 1577 except as noted herein.

Article 462.2. Materials, Section C. Testing, 2. Formed Precast is voided and replaced by the following:

Make, cure, and test compressive test specimens in accordance with Tex-704-I.

Article 462.2. Materials, Section C. Testing, 3. Machine-Made Precast. The first paragraph is voided and replaced by the following:

Make compressive test specimens in accordance with ASTM C 497. Make a minimum of 4 test specimens for each day's production run and each mix design. Cure test specimens in the same

manner and for the same duration as the boxes they represent until tested. Test a set of compressive strength specimens, consisting of 2 per set, in accordance with ASTM C 39.

Article 462.2. Materials, Section E. Marking. The first paragraph is voided and replaced by the following:

Mark precast boxes with the following:

- name or trademark of the producer;
- ASTM designation (for machine made boxes);
- date of manufacture;
- box size;
- minimum and maximum fill heights;
- designation “SR” for boxes meeting sulfate-resistant concrete plan requirements (when applicable); and
- match marks for proper installation, when required, under Section 462.2.F, “Tolerances.”

Article 462.3 Construction, Section C. Jointing. The first paragraph is voided and replaced by the following:

Unless otherwise shown on the plans, use any of the jointing materials in accordance with the jointing requirements specified in Item 464, “Reinforced Concrete Pipe” except when rubber gasket joints are selected, they shall meet the requirements of ASTM C 1677 for design of the joints and permissible variations in dimensions.

SPECIAL PROVISION

464---003

Reinforced Concrete Pipe

For this project, Item 464, "Reinforced Concrete Pipe," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 464.2. Materials, Section A. Fabrication is voided and replaced by the following:

Fabrication plants must be approved by the Construction Division in accordance with DMS-7310, "Reinforced Concrete Pipe Fabrication and Plant Qualification" before furnishing precast reinforced concrete pipe for Department projects. The Construction Division maintains a list of approved reinforced concrete pipe plants.

Furnish material and fabricate reinforced concrete pipe in accordance with DMS-7310, "Reinforced Concrete Pipe Fabrication and Plant Qualification."

Article 464.2. Materials, Section B. Design. 1. General. Table 2 is voided and replaced with the following:

**Table 2
Arch Pipe**

Design Size	Equivalent Diameter (in.)	Rise (in.)	Span (in.)
1	18	13-1/2	22
2	21	15-1/2	26
3	24	18	28-1/2
4	30	22-1/2	36-1/4
5	36	26-5/8	43-3/4
6	42	31-5/16	51-1/8
7	48	36	58-1/2
8	54	40	65
9	60	45	73
10	72	54	88

Article 464.2. Materials, Section C. Physical Test Requirements is voided and not replaced.

Article 464.2. Materials, Section D. Markings. The first paragraph is voided and replaced with the following:

Furnish each section of reinforced concrete pipe marked with the following information specified in DMS-7310, "Reinforced Concrete Pipe Fabrication and Plant Qualification":

- class or D-Load of pipe,
- ASTM designation,
- date of manufacturer,
- name or trademark of manufacturer and plant location,
- designated manufacturer's approval marking,
- pipe to be used for jacking and boring (when applicable), and
- pipe meeting sulfate-resistant concrete plan requirements (when applicable).

Article 464.2. Materials, Section E. Inspection is voided and replaced with the following:

Provide access for inspection of the finished pipe at the project site before and during installation.

Article 464.2. Materials, Section F. Causes for Rejection is voided and replaced by the following:

Individual sections of pipe may be rejected for any of the conditions stated in the annex of DMS-7310, "Reinforced Concrete Pipe Fabrication and Plant Qualification."

Article 464.2. Materials, Section G. Repairs is voided and replaced by the following:

Make repairs if necessary as stated in the annex of DMS-7310, "Reinforced Concrete Pipe Fabrication and Plant Qualification."

Article 464.2. Materials, Section H. Rejections is voided and not replaced.

SPECIAL PROVISION

465---001

Manholes and Inlets

For this project, Item 465, "Manholes and Inlets," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 465.2, Materials. The second paragraph is voided and replaced by the following:

Precast manholes, inlets, risers, and appurtenances are acceptable unless otherwise shown. Alternate designs for precast items must be acceptable to the Engineer and must conform to functional dimensions and dimensions for plan wall, slab and edge beam thicknesses, and reinforcing steel areas. Alternate designs must be designed and sealed by a licensed professional engineer.

FORT BEND GRAND PARKWAY TOLL ROAD AUTHORITY
SPECIAL PROVISION to ITEM 500
Mobilization

For this project, Item 500, "Mobilization," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 500.1. Description is supplemented by the following:

Work for this Item includes submissions required by the Contract.

Article 500.3. Payment, Section A is voided and replaced by the following:

A. Payment will be made upon presentation of a paid invoice for the payment, performance, or retainage bonds, and required insurance. The combined payment for bonds and insurance will be no more than 10% of the mobilization lump sum or 1% of the total Contract amount, whichever is less.

Article 500.3. Payment, Section C is voided and replaced by the following:

When 1% of the adjusted Contract amount for construction Items is earned, 50% of the mobilization lump sum bid or 5% of the total Contract amount, whichever is less, will be paid. Previous payments under this Item will be deducted from this amount. However, payment will not be made until all work under Item 9200, Megapixel Robotic Webcamera, is complete and fully operational..

Article 500.3. Payment, Section F is voided and replaced by the following:

F. Upon final acceptance, 97% of the mobilization lump sum bid will be paid. Previous payments under this Item will be deducted from this amount.

Article 500.3. Payment is supplemented by the following:

G. Payment for the remainder of the lump sum bid for "Mobilization" will be made after all submittals are received, final quantities have been determined and when any separate vegetative establishment and maintenance, test and performance periods provided for in the Contract have been successfully completed.

SPECIAL PROVISION

502---033

Barricades, Signs, and Traffic Handling

For this project, Item 502, "Barricades, Signs, and Traffic Handling," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 502.4. Payment, Section C. Maximum Total Payment Prior to Acceptance is voided and replaced by the following:

C. Maximum Total Payment Prior to Acceptance. The total payment for this Item will not exceed 10% of the total Contract amount before final acceptance in accordance with Article 5.8, "Final Acceptance." The remaining balance will be paid in accordance with Section 502.4.E, "Balance Due."

SPECIAL PROVISION

506---013

Temporary Erosion, Sedimentation, and Environmental Controls

For this project, Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 506.2. Materials. Section I. Sandbags. Table 1 is replaced with the following:

**Table 1
Sand Gradation**

Sieve #	Retained (% by Weight)
4	MAXIMUM 3%
100	MINIMUM 80%
200	MINIMUM 95%

Article 506.4 Construction, B. General, 2. Maintenance, is voided and replaced by the following:

B. General.

- 2. Maintenance.** Perform maintenance in accordance with the plans and the TPDES General Permit. Correct ineffective control measures. Implement additional controls as directed.

An Inspector will perform a regularly scheduled SWP3 inspection once a month. Make corrections as soon as possible before the next anticipated rain event or within 7 calendar days after being able to enter the site to work on each control device. A control device site being "too wet to work" during the entire 7 calendar day time period is the only acceptable reason for not accomplishing the corrections within the 7 calendar day time limit. Provide documentation on the Department's inspection form developed from the Department's inspections or through other approved methods.

If maintenance corrections are not made within this timeframe, work on the project may be suspended by the Engineer. Time charges will continue until SWP3 is brought into compliance and documentation of corrective action is provided. This in no way releases the contractor of liability for noncompliance.

SPECIAL PROVISION

512---002

Portable Concrete Traffic Barrier

For this project, Item 512, "Portable Concrete Traffic Barrier," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 512.2. Materials. The first paragraph is supplemented by the following:

For precast concrete traffic barrier,

- Furnish the class of concrete shown on the plans. Air-entrained concrete will not be required, unless otherwise shown on the plans.
- Use a minimum of 25% Class F fly ash with mix design Option 1 from Section 421.4.A.6, "Mix Design Options."
- Do not use mix design Options 6, 7, or 8 from Section 421.4.A.6., "Mix Design Options."

Article 512.3. Construction. The second sentence of the first paragraph is voided and replaced by the following:

Multi-project fabrication plants as defined in Item 424, "Precast Concrete Structures (Fabrication)" that produce concrete traffic barrier, except temporary barrier furnished and retained by the Contractor, must be approved in accordance with DMS-7350, "Qualification Procedure for Multi-Project Fabrication Plants of Precast Concrete Traffic Barrier."

SPECIAL PROVISION

514---002

Permanent Concrete Traffic Barrier

For this project, Item 514, "Permanent Concrete Traffic Barrier," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 514.2. Materials is supplemented by the following:

For precast concrete traffic barrier,

- Air-entrained concrete will not be required in precast concrete traffic barrier, unless otherwise shown on the plans.
- Use a minimum of 25% Class F fly ash with mix design Option 1 from Section 421.4.A.6, "Mix Design Options."
- Do not use mix design Options 6, 7, or 8 from Section 421.4.A.6., "Mix Design Options."

SPECIAL PROVISION

540---023

Metal Beam Guard Fence

For this project, Item 540, "Metal Beam Guard Fence," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 540.2. Materials, Section A. Metal Beam Rail Elements. The third paragraph is replaced by the following:

Furnish metal beam rail elements from a manufacturer on the Department's approved Material Producer List, entitled "Metal Beam Guard Fence Rail Element Manufacturers."

Article 540.2. Materials, Section B. Posts, Section 2. Steel Posts is voided and replaced by the following:

- 2. Steel Posts.** Provide rolled sections conforming to the material requirements of ASTM A 36. Drill or punch posts for standard rail attachment as shown on the plans. Galvanize in accordance with Item 445, "Galvanizing." Low fill culvert posts may be fabricated as galvanized "blanks" with the hole to accept the rail and the final height field fabricated. Treat all exposed post surfaces caused by the field fabrication in accordance with Section 445.3.D. "Repairs."

Article 540.2. Materials, Section B. Posts, Table 1, Rail Element Requirements. The section entitled "Markings" is voided and replaced by the following:

Markings	Permanently mark each metal beam rail element with the information required in AASHTO M 180. Permanently mark all curved sections of metal beam rail element, in addition, with the radius of the curved section in the format "R=xx ft." These additional markings (die-imprinted) must be on the back of the metal beam rail section away from traffic and visible after erection.
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Article 540.2. Materials, Section B. Posts is supplemented by the following:

3. Composite Posts. Meet the requirements of DMS-7210, "Composite Material Posts and Blocks for Metal Beam Guard Fence."

Article 540.2. Materials is supplemented by the following:

H. Terminal Anchor Posts. Furnish new terminal anchor posts from steel conforming to the material requirements of ASTM A 36. Fabricate posts in accordance with Item 441, "Steel Structures." Galvanize terminal anchor posts after fabrication in accordance with Item 445, "Galvanizing."

I. Driveway Terminal Anchor Posts. Furnish new terminal anchor posts from steel conforming to the material requirements of ASTM A 36. Fabricate posts in accordance with Item 441, "Steel Structures." Galvanize terminal anchor posts after fabrication in accordance with Item 445, "Galvanizing."

Article 540.3. Construction, Section B. Rail Elements is supplemented by the following:

Short Radius. Special rail fabrication will be required at installations having a curvature of less than 150 ft. radius. The required radius shall be as shown on the plans. Short radius metal beam guard fence requires the placement of controlled release terminal (CRT) posts of the quantity shown on the plans.

Article 540.3. Construction is supplemented by the following:

G. Driveway Terminal Anchor Posts. Embed terminal anchor posts in concrete unless otherwise shown on the plans.

Article 540.4. Measurement is supplement by the following:

D. Short Radius. Measurement will be by the foot to the nearest whole foot along the face of the rail in place, from beginning of radius (and first CRT post) to the end of radius.

E. Driveway Terminal Anchor Section. Measurement will be by each section, complete in place, consisting of a driveway terminal anchor post and one 6 ft. section of rail element.

Article 540.5. Payment. The first paragraph is voided and replaced by the following:

540.5. Payment. The work performed and material furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Metal W-Beam Guard Fence" of the post type specified, "Metal Thrie-Beam Guard Fence" of the post type specified, "Terminal Anchor Section," "Metal Beam Guard Fence Transition" of the type specified, "Metal W-Beam Guard Fence Adjustment," "Metal Thrie-Beam Guard Fence Adjustment," "Terminal Anchor Section Adjustment," "Transition Adjustment," "Short Radius," or "Driveway Terminal Anchor Section." When weathering steel is required, Type IV will be specified.

Article 540.5. Payment, Section C. Transition is voided and replaced by the following:

C. Transition. The price bid for “Metal Beam Guard Fence Transition” is full compensation for furnishing nested sections of thrie-beam; nested sections of W-beam; thrie-beam-to-W-beam transitional rail piece, posts, concrete, curb, and connections to W-beam guard fence and bridge rails; thrie-beam terminal connectors and terminal connectors; excavation and backfilling; and equipment, labor, tools, and incidentals.

Article 540.5. Payment is supplemented by the following:

E. Short Radius. The price bid for “Short Radius” is full compensation for furnishing special rail fabricated metal beam guard fence, controlled release terminal (CRT) posts, materials, hauling, erection, blocks, driving posts, excavating, backfilling, equipment, labor, tools, and incidentals.

F. Driveway Terminal Anchor Section. The price bid for “Driveway Terminal Anchor Section ” is full compensation for furnishing the rail element, driveway anchor assembly, driveway terminal anchor post, and foundations; installing the rail element anchor assembly and the driveway terminal anchor post and foundations; excavation and backfilling; and equipment, labor, tools, and incidentals.

SPECIAL PROVISION

544---001

Guardrail End Treatments

For this project, Item 544, "Guardrail End Treatments," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 544.5 Payment. The first sentence is voided and replaced by the following:

The work performed and the materials furnished in accordance with this Item and measured as provided for under "Measurement" will be paid for at the unit price bid for "Guardrail End Treatment (Install,)" of the post and type specified where applicable, "Guardrail End Treatment (Move and Reset), or "Guardrail End Treatment (Remove)."

SPECIAL PROVISION

610---010

Roadway Illumination Assemblies

For this project, Item 610, "Roadway Illumination Assemblies," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 610.2. Materials. The fourth paragraph is voided and replaced by the following:

Do not provide shop drawings for complete assemblies that are fabricated in accordance with this Item and the details shown on the plans. Electronically submit shop drawings for optional designs, aluminum pole designs, and special designs. For instructions on submitting electronic shop drawings refer to the "Guide to Electronic Shop Drawing Submittal" located online at:

http://www.txdot.gov/business/contractors_consultants/bridge/shop_drawings.htm

SPECIAL PROVISION

620---001

Electrical Conductors

For this project, Item 620, "Electrical Conductors," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 620.2 Materials. The fourth and fifth paragraphs are void and replaced by the following:

Use white insulation for grounded (neutral) conductors, except that grounded conductors AWG No. 4 and larger may be black with white tape marking at every accessible location. Do not use white insulation or marking for any other conductor except control wiring specifically shown on the plans.

Ensure that insulated grounding conductors are green except that insulated grounding conductors AWG No. 4 and larger may be black with green tape marking at every accessible location. Do not use green insulation or marking for any other conductor except control wiring specifically shown on the plans.

SPECIAL PROVISION

624---014

Ground Boxes

For this project, Item 624, "Ground Boxes," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 624.1. Description is voided and replaced by the following:

Construct, furnish, and install ground boxes complete with lids. Remove existing ground boxes.

Article 624.2 Construction and Materials. The first paragraph is voided and replaced by the following:

Provide new materials that comply with the details shown on the plans and meet the following requirements:

- Construct cast-in-place concrete ground boxes and aprons in accordance with Item 420, "Concrete Structures," and Item 440, "Reinforcing Steel."
- Provide fabricated precast polymer concrete ground boxes, and precast concrete ground boxes that comply with DMS-11070, "Ground Boxes."
- Construct a concrete apron, when shown on the plans, in accordance with Item 432, "Riprap," and Item 440, "Reinforcing Steel."

Article 624.2. Construction and Materials is supplemented by the following:

Remove existing ground boxes to at least 6 in. below the conduit level. Uncover conduit to a sufficient distance so that 90 degree bends can be removed and conduit reconnected. Clean the conduit in accordance with Item 618, "Conduit" and pull, splice, or terminate new conductors as indicated in the plans. Cleaning of conduit is subsidiary to this Item. Pulling, splicing, or terminating conductors will be paid under Item 620, "Electrical Conductors." Backfill area to ground level with acceptable material upon completing adjacent work related to conduit and conductors.

Article 624.3. Measurement is voided and replaced by the following:

This Item will be measured by each ground box complete in place or by each ground box removed.

Article 624.4. Payment is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Ground Boxes" of the types and sizes specified and for "Remove Existing Ground Boxes." This price is full compensation for excavating and backfilling; constructing, furnishing, installing, and removing the ground boxes and concrete aprons when required; and equipment, labor, materials, tools, and incidentals.

SPECIAL PROVISION

628---003

Electrical Services

For this project, Item 628, "Electrical Services," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 628.5. Payment, A. Installation is voided and replaced by the following:

A. Installation. Except as provided for in the following paragraph, this price is full compensation for paying all fees, permits, and other costs; making arrangements with the utility company for all work and materials provided by the utility company; furnishing, installing, and connecting all components including poles, service supports, foundations, anchor bolts, riprap, enclosures, switches, breakers, conduit (from the service equipment including the elbow below ground), fittings, conductors (from the service equipment including the elbow below ground), brackets, bolts, hangers, and hardware; and equipment, labor, tools, and incidentals.

Costs for utility-owned power line extensions, connection charges, meter charges, and other charges will be paid for by the Department. The Department will reimburse the contractor the amount billed by the utility plus an additional 5% of the invoice cost will be paid for labor, equipment, administrative costs, superintendence, and profit.

SPECIAL PROVISION

636---014

Aluminum Signs

For this project, Item 636, "Aluminum Signs," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 636.1. Description is voided and replaced by the following:

- **Installation.** Furnish, fabricate, and erect signs. Sign supports are provided for under other Items.
- **Replacement.** Replace existing signs on existing sign supports.
- **Refurbishing.** Refurbish existing signs on existing sign supports.

Article 636.2. Materials, Section A. Sign Blanks is voided and replaced by the following:

- A. Sign Blanks.** Furnish sign blank substrates in accordance with DMS-7110, "Aluminum Sign Blanks" or DMS-8305, "Fiberglass Sign Substrate," and in accordance with the types shown on the plans. Use single-piece sheet-aluminum substrates for Type A (small) signs. Use either extruded aluminum or fiberglass substrates for Type G (ground-mounted) or Type O (overhead-mounted) signs as shown on the plans.

Article 636.2. Materials, Section B. Sign Face Reflectorization is supplemented by the following:

Ensure that sign legend, symbols, borders, and background exhibit uniform color, appearance, and retroreflectivity when viewed both day and night.

Article 636.2. Materials, Section C. Sign Messages. The last two bullets are voided and replaced by the following:

- Fabricate non-reflective black film legend from materials meeting DMS-8300.
- Furnish direct-applied route markers and other attachments within the parent sign face, unless otherwise specified in the plans.

Article 636.2. Materials, Section D. Hardware is supplemented by the following:

Furnish sign hardware for fiberglass signs in accordance with the fiberglass substrate manufacturer's recommendations.

Article 636.3. Construction, Section A. Fabrication, Part 1. Sign Blanks. The first paragraph is voided and replaced by the following:

Furnish sign blanks to the sizes and shapes shown on the plans and that are free of buckles, warps, burrs, dents, cockles, or other defects. Do not splice individual extruded aluminum or fiberglass panels.

Article 636.3. Construction, Section A. Fabrication, Part 2. Sheeting Application is voided and replaced by the following:

2. Sheeting Application. Apply sheeting to sign blanks in conformance with the sheeting manufacturer's recommended procedures. Meet the fabrication requirements of DMS-8300, Section 8300.7.F, "Sign Fabrication" for white, orientation non-compliant sheeting listed on the Department's Material Producer List entitled "Sign Face Materials." Clean and prepare the outside surface of extruded aluminum or fiberglass flanges in the same manner as the sign panel face.

Minimize the number of splices in the sheeting. Overlap the lap-splices by at least 1/4 in. Use butt splices for Type C microprismatic, Type D, and Type E reflective sheeting. Provide a 1-ft. minimum dimension for any piece of sheeting. Do not splice sheeting for signs fabricated with transparent screen inks or colored transparent films.

Article 636.3. Construction, Section A. Fabrication, Part 3. Sign Assembly. The first paragraph is voided and replaced by the following:

3. Sign Assembly. Assemble extruded aluminum signs in accordance with the details shown on the plans. Assemble fiberglass signs in accordance with the fiberglass manufacturer's recommendations located on the Department's Material Producer List entitled "Fiberglass Sign Substrates." Sign face surface variation must not exceed 1/8 in. per foot. Surface misalignment between panels in multi-panel signs must not exceed 1/16 in. at any point.

Article 636.3. Construction, Section B. Storage and Handling. The last paragraph is voided and replaced by the following:

Store all finished signs off the ground and in a vertical position until erected. Store finished sheet-aluminum substrate signs in a weatherproof building. Extruded aluminum and fiberglass substrate signs may be stored outside.

Article 636.3. Construction, Section E. Replacement is supplemented by the following:

Mounting hardware for fiberglass signs will be per the fiberglass substrate manufacturer's recommendations.

Article 636.3. Construction, Section H. Documentation is added.

H. Documentation. Provide a notarized original of the Signing Material Statement (Form 2273) with the proper attachments for verification of compliance.

Article 636.5. Payment. The first paragraph is voided and replaced by the following:

The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Aluminum Signs," "Fiberglass Signs," "Signs," "Replacing Existing Aluminum Signs," "Replacing Existing Fiberglass Signs," "Refurbishing Aluminum Signs," or "Refurbishing Fiberglass Signs," of the type specified.

Article 636.5. Payment, Section B. Replacement is voided and replaced by the following:

B. Replacement. This price is full compensation for: furnishing and installing new aluminum or fiberglass signs and hardware; removal of existing signs; fabrication of sign panels; treatment of sign panels required before application of the background materials; application of the background materials and messages to the sign panels; furnishing and fabricating frames, wind beams, stiffeners, or required joint backing strips; furnishing bolts, rivets, screws, fasteners, clamps, brackets, and sign support connections; assembling and erecting the signs; preparing and cleaning the signs; salvaging and disposing of unsalvageable material; and equipment, materials, labor, tools, and incidentals.

SPECIAL PROVISION

672---034

Raised Pavement Markers

For this project, Item 672, "Raised Pavement Markers," of the Standard Specifications, is hereby amended with respect to the clauses cited below, and no other clauses or requirements of this Item are waived or changed hereby.

Article 672.2. Materials, Section B. Adhesives is supplemented by the following:

- The Contractor may propose alternate adhesive materials for consideration and approval by the Engineer.

Article 672.3. Construction. The sixth paragraph is voided and replaced by the following:

Use the following adhesive materials for placement jiggle bar tile, reflectorized pavement markers, and traffic buttons unless otherwise shown on the plans:

- standard or flexible bituminous adhesive for applications on bituminous pavements.
- epoxy adhesive or flexible bituminous adhesive for applications on hydraulic cement concrete pavements.

Use epoxy adhesive for plowable reflectorized pavement markers.

Article 672.3. Construction is supplemented by the following:

Provide a 30-day performance period that begins the day following written acceptance for each separate location. The date of written acceptance will be the last calendar day of each month for the RPMs installed that month for the completed separate project locations. This written acceptance does not constitute final acceptance.

Replace all missing, broken or non-reflective RPMs. Visual evaluations will be used for these determinations. Upon request, the Engineer will allow a Contractor representative to accompany the Engineer on these evaluations.

The Engineer may exclude RPMs from the replacement provisions of the performance, provided the Engineer determines that the failure is a result of causes other than defective material or inadequate installation procedures. Examples of outside causes are extreme wear at intersections, damage by snow or ice removal, and pavement failure.

Replace all missing or non-reflective RPMs identified during the performance period within 30 days after notification. The end of the performance period does not relieve the Contractor from the performance deficiencies requiring corrective action identified during the performance period.

Article 672.5. Payment is supplemented by the following:

No additional payment will be made for replacement of RPMs failing to meet the performance requirements.

SPECIAL SPECIFICATION

3061

Fast Track Concrete Pavement

1. **Description.** Construct fast track concrete pavement, on a prepared subgrade, in accordance with the typical sections shown on the plans. Use fast track concrete pavement on small pavement areas, or leave-outs as shown on the plans for both continuously reinforced and jointed concrete pavements.
2. **Materials.**
 - A. **Hydraulic Cement Concrete.** Unless otherwise shown on the plans or approved by the Engineer, provide Class HES concrete conforming to Item 421, "Hydraulic Cement Concrete," with a minimum average flexural strength of 425 psi in 16 hours. Test in accordance with Tex-448-A.
 - B. **Reinforcing Steel.** Provide reinforcing steel in accordance with Section 360.2.B, "Reinforcing Steel."
 - C. **Curing Materials.** Provide curing materials in accordance with Section 420.2.H, "Curing Materials." Provide insulating blankets for curing concrete pavement with a minimum thermal resistance (R) rating of 0.5 hour-square foot F/BTU. Use insulating blankets that are free from tears and are in good condition.
 - D. **Epoxy.** Provide epoxy in accordance with Section 360.2.D, "Epoxy."
 - E. **Evaporation Retardant.** Provide evaporation retardants in accordance with Section 360.2.E, "Evaporation Retardant."
 - F. **Joint Sealants and Fillers.** Provide joint sealants and fillers in accordance to Section 360.2.F, "Joint Sealants and Fillers."
3. **Equipment.** Provide equipment in accordance with Article 360.3, "Equipment."
4. **Construction.** Obtain approval for adjustments to plan grade-line to maintain thickness over minor subgrade or base high spots while maintaining clearances and drainage. Maintain subgrade or base in a smooth, clean, compacted condition in conformity with the required section and established grade until the pavement concrete is placed. Keep subgrade or base damp with water sufficiently in advance of placing pavement concrete. Adequately light the active work area for all nighttime operations. Provide and maintain tools and materials to perform testing.
 - A. **Paving and Quality Control Plan.** Submit a paving and quality control plan in accordance to Section 360.4.A, "Paving and Quality Control Plan."

- B. Job-Control Testing.** Perform job-control testing in accordance to Section 360.4.B, "Job-Control Testing."
- C. Reinforcing Steel and Joint Assemblies.** Provide reinforcing steel and joint assemblies in accordance to Section 360.4.C, "Reinforcing Steel and Joint Assemblies."
- D. Joints.** Provide joints in accordance to Section 360.4.D, "Joints."
- E. Placing and Removing Forms.** When needed, place and remove forms in accordance to Section 360.4.E except, do not remove forms until at least 6 hours after concrete has been placed. The time for the form removal may be extended, by the Engineer, if weather or other conditions make it advisable.
- F. Concrete Delivery.** Deliver concrete in accordance with Section 360.4.F, "Concrete Delivery."
- G. Concrete Placement.** Place concrete in accordance with Section 360.4.G, "Concrete Placement."
- H. Spreading and Finishing.** Spread and finish concrete in accordance with Section 360.4.H, "Spreading and Finishing."
- I. Curing.** Keep the concrete pavement surface from drying by water fogging or with the use of evaporation retardants until curing material has been applied. Maintain curing and promptly repair damage to curing materials on exposed surfaces of concrete pavement until opening to traffic or until directed.
 - 1. Wet Mat Curing.** Provide wet mat curing unless otherwise shown on the plans or as directed by the Engineer. Cure the pavement in accordance to Section 420.4.J.2.a, "Wet Mats." If the air temperature is below 65°F and insulating blanket is used, then apply membrane curing in lieu of wet mat curing.
 - 2. Membrane Curing.** As approved, provide membrane curing in accordance to Section 360.4.I.1, "Membrane Curing."
 - 3. Asphalt Curing.** As approved, provide asphalt curing in accordance to Section 360.4.I.2, "Asphalt Curing."
- J. Sawing Joints.** Saw joints in accordance to Section 360.4.J, "Sawing Joints."
- K. Protection of Pavement and Opening to Traffic.**
 - 1. Protection of Pavement.** Protect pavements in accordance to Section 360.4.K.1, "Protection of Pavement." When air temperature is below 65°F, cover the pavement with insulating blankets in accordance to Table 1 unless otherwise directed.

**Table 1
Insulating Blanket Curing**

Ambient Air Temperature	Opening Time, Hr				
	8	16	24	36	48
<50°F	Yes	Yes	Yes	Yes	No
50°F-65°F	Yes	Yes	Yes	No	No

2. **Opening Pavements to Traffic.** Close pavement to all traffic, including Contractor vehicles, until the concrete is at least 8 hours old. This time may be extended, by the Engineer, if weather or other conditions make is advisable.

The pavement may be opened to traffic after the concrete has been cured for at least 8 hours and has obtained a minimum a flexural strength of 275 psi or as directed by the Engineer. Determine the flexural strength in accordance with Tex-448-A, "Flexural Strength of Concrete Using Simple Beam Third-Point Loading" using concrete beams cured at the job site under the same conditions as the pavement, or in accordance with Tex-426-A, "Estimating Concrete Strength by the Maturity Method". Opening the pavement does not relieve the Contractor from the responsibility for the work in accordance with Item 7, "Legal Relations and Responsibilities to the Public." Seal all joints and clean the pavement before opening the pavement to traffic.

3. **Emergency Opening to Traffic.** When directed in writing, open the pavement to traffic before the minimum requirements specified above have been attained. Remove all obstructing materials, place stable material against the pavement edges, and perform other work involved in providing for the safety of traffic as required for emergency opening.
- L. **Pavement Thickness.** Verify pavement thickness in accordance to Section 360.4.L, "Pavement Thickness."
- M. **Ride Quality.** Unless otherwise shown on the plans, measure ride quality in accordance with Item 585, "Ride Quality for Pavement Surfaces."
5. **Measurement.** Measure pavement in accordance to Article 360.5, "Measurement."
6. **Payment.** These prices are full compensation for materials, equipment, labor, tools, and incidentals.
 - A. **Fast Track Concrete Pavement.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the adjusted unit price bid for "Fast Track Concrete Pavement" of the type and depth specified as adjusted in accordance with Section 6.B, "Deficient Pavement Thickness."

Excavation and embankment required by this Item in the preparation of the subgrade and for the completion of the shoulders and slopes will be measured and paid for in accordance with the provisions of Item 110, "Excavation," or Item 132, "Embankment," with the provisions that yardage will be measured and paid for once only regardless of the manipulation involved; or, where shown on the plans, such work will be measured and paid for in accordance with the provisions of Item 150, "Blading." Measurement of subgrade excavation for payment will be limited to a total width of the pavement plus 1 foot on each side. Payment under excavation items will not be allowed within the areas designated for "Blading."

Sprinkling and rolling, required for the compaction of the rough subgrade in advance of fine-grading is subsidiary to this Item. Maintenance of a moist condition of the subgrade or base in advance of fine-grading and concrete is subsidiary work, as provided above.

- B. Deficient Pavement Thickness.** Where the average thickness of pavement is deficient in thickness by more than 0.2 in. but not more than 0.75 in., payment will be made using the adjusted factor as specified in Table 2 applied to the bid price for deficient area for each unit as defined under Section 360.4.L.3, "Pavement Units for Payment Adjustments."

Table 2
Deficient Thickness Price Adjustment Factor

Deficiency in Thickness Determined by Cores (in.)	Proportional Part of Contract Price Allowed (adjustment factor)
Not Deficient	1.00
Over 0.00 through 0.20	1.00
Over 0.20 through 0.30	0.80
Over 0.30 through 0.40	0.72
Over 0.40 through 0.50	0.68
Over 0.50 through 0.75	0.57

- C. Curb.** Work performed and furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Curb" of the type specified.

SPECIAL SPECIFICATION

5049

Biodegradable Erosion Control Logs

1. **Description.** Furnish, install, maintain, and remove biodegradable erosion control logs as shown on the plans or as directed.
2. **Materials.**
 - A. **Core Material.** Furnish core material that is biodegradable or recyclable. Except where specifically called out in plans, material may be compost, mulch, aspen excelsior wood fibers, chipped site vegetation, agricultural rice or wheat straw, coconut fiber, 100% recyclable fibers, or any other acceptable material. No more than 5% of the material is permitted to escape from the containment mesh. Furnish compost, meeting the requirements of Item 161, "Compost."
 - B. **Containment Mesh.** Furnish containment mesh that is 100% biodegradable, photodegradable or recyclable such as burlap, twine, UV photodegradable plastic, polyester, or any other acceptable material.
 - i. Furnish biodegradable or photodegradable containment mesh when log will remain in place as part of a vegetative system.
 - ii. Furnish recyclable containment mesh for temporary installations.
 - C. **Size.** Furnish biodegradable erosion control logs with diameters shown on the plans or as directed. Stuff containment mesh densely so logs do not deform.
3. **Construction.** Install biodegradable erosion control logs near the downstream perimeter of a disturbed area to intercept sediment from sheet flow. Incorporate the biodegradable erosion control logs into the erosion control measures used to control sediment in areas of higher flow. Install, align, and locate the biodegradable erosion control logs as specified below, as shown on the plans, or as directed.
 - A. **Anchoring.** Secure biodegradable erosion control logs in a method adequate to prevent displacement as a result of normal rain events and to the satisfaction of the Engineer and such that flow is not allowed under the logs.
 - B. **Maintenance.** Inspect and maintain the biodegradable erosion control logs in good condition (including staking, anchoring, etc.). Maintain the integrity of the control, including keeping the biodegradable erosion control logs free of accumulated silt, debris, etc., until permanent erosion control features are in place, or the disturbed area has been adequately stabilized. Perform in accordance with Section 506.4.C, "Installation, Maintenance and Removal Work." Stabilize the areas damaged by the removal process using appropriate methods as approved.

Repair or replace damaged biodegradable erosion control logs as required and as directed. Temporarily remove and replace biodegradable erosion control logs as required to facilitate work. Remove sediment and debris when accumulation affects the performance of the devices, after a rain, and when directed. Dispose of sediment and debris at an approved site in a manner that will not contribute to additional siltation.

C. Removal. Remove biodegradable erosion control logs when directed.

4. **Measurement.** This Item will be measured by the linear foot along the centerline of the top of the control logs.
5. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Biodegradable Erosion Control Logs," of the size specified. This price is full compensation for furnishing, placing, maintaining, temporarily removing and replacing as required to facilitate construction operations, and removing of the biodegradable erosion control logs and for all other materials, labor, tools, equipment, and incidentals.

Removing accumulated sediment deposits, as described under "Maintenance," will be measured and paid for under Item 506, "Temporary Erosion, Sedimentation, and Environmental Controls."

Stabilization (as described under "Maintenance") will be measured and paid for under the various pertinent bid items.

SPECIAL SPECIFICATION**6062****Portable Changeable Message Signs**

1. **Description.** Provide during construction operations, portable changeable message signs meeting the requirements of this specification for use in traffic control during the work and maintain and operate the units during the work. The units provided remain the property of the Contractor during and after completion of the project.
2. **Materials.** Provide self-contained units, in a new-like and acceptable condition as determined by the Engineer, including message board, power supply and trailer.

Provide a message board capable of providing 3 lines of legend with each line containing at least 50 columns of 7 lamps. Use matrix lamps providing a minimum service life of 10,000 hours.

Provide a lamp matrix capable of selecting from at least 31 pre-stored messages with the capability to alternately show or sequentially flash up to 3 of the stored messages. Keyboard programmable message capabilities are not permitted. Ensure the messages displayed are readily legible from a distance of 750 ft. in bright sunlight. Use solid state sign electronics with appropriate controls for selecting messages, varying the message on time, and manual and automatic dimming of lamps for nighttime operation, all without the use of special tools. Enclose controls in a lockable fixture to prevent unauthorized manipulation. Provide suitable cooling fans for heat dissipation from any thermally-sensitive areas of the unit. Ensure the rear of the message board has a left and right chevron and arrow indication interconnected with the sign's variable message electronics.

Minimum Luminance Requirements. All PCMS units shall meet the following luminance requirements measured at the character level in candela as is published in Report 4940-2, "Photometric Requirements for Portable Changeable Message Signs," conducted by the Texas Transportation Institute. Luminance will be tested in accordance with Tex-880.

- Minimum Daytime Character Luminance of 4000cd/m² with a contrast ratio of 5.
- Minimum Nighttime Character Luminance of 30/cd/m².

Equip trailers with heavy duty axles and hitches, safety chains, 12 volt running lights (stop and clearance), leveling jacks, and four ply rated tires specially designed to adequately support the message board and generator in either fixed position or travel position. Use a sign panel support capable of positioning the sign to a height of 7 ft. from the ground to the bottom of the sign panel, and capable of rotating the panel 180 degrees about the vertical axis. Design the trailer to provide an adequate vandalproof and weatherproof housing for the generator and whatever additional power supply and electronic equipment is needed for operating the sign panel.

Provide a power supply consisting of a heavy duty diesel driven generator capable of supplying continuous power for the sign operation over extended time periods. Ensure the fuel supply is adequate to permit operation for at least 24 hours without refueling.

Provide the entire sign housing with a heavy duty wire guard cage or other approved protective material which can be removed for sign maintenance. Shock mount the sign assembly and electronics to reduce the transmission of vibration to these items from the power supply. For all exterior metal surfaces of the trailer, power supply housing, supports and signs, clean, prime with zinc chromate, and finish with 2 coats of federal yellow enamel paint except use flat black for the sign face assembly.

Unless otherwise specified on the plans, pre-program the sign electronics to display the following messages:

- | | |
|-------------------------------|---------------------------|
| 1. Ramp Closed Ahead | 17. Road Closed Ahead |
| 2. Shoulder Drop-Off | 18. Shoulder Use OK |
| 3. Detour Ahead | 19. Left 2 Lanes Closed |
| 4. Two-Way Traffic Ahead | 20. Right 2 Lanes Closed |
| 5. Form One Line Left | 21. All Traffic Exit |
| 6. Form One Line Right | 22. Caution Slow Traffic |
| 7. Form Two Lines Right | 23. Road Repairs Ahead |
| 8. Form Two Lines Left | 24. Detour Next 2 Exits |
| 9. Center Lane Closed Ahead | 25. Detour Next Exit |
| 10. Left Lane Closed Ahead | 26. End Shoulder Use |
| 11. Right Lane Closed Ahead | 27. Right lanes Must Exit |
| 12. Caution-Vehicles Crossing | 28. Left Lanes Must Exit |
| 13. Max. Speed XX MPH | 29. Left 3 Lanes Closed |
| 14. Merge Right | 30. Right 3 Lanes Closed |
| 15. Merge Left | 31. Center Lane Closed |
| 16. Freeway Closed Ahead | |

3. Construction.

A. General. Use the portable changeable message sign units designated under this Item in conjunction with handling traffic through work areas. Locate these units for the various stages of construction as indicated under the provisions for traffic handling provided in the contract, shown by plan details or as directed.

B. Maintaining Sign Units. Store the traffic control devices described in this specification, when not in use, in an approved secure storage area.

Assumer responsibility for maintenance operations required to keep the unit in proper working order.

Keep the unit in good repair at all times. Expedite any repairs necessitated by malfunction of or damage to the unit. Maintenance includes periodically cleaning the units and repairing damage to the protective coating of the units.

4. **Measurement and Payment.** The work performed and equipment furnished in accordance with this Item will not be measured or paid for directly, but is considered subsidiary to Item 502, "Barricades, Signs and Traffic Handling."

SPECIAL SPECIFICATION

6986

Longitudinal Prefabricated Pavement Markings (PPM) with Warranty

1. **Description.** Furnish and place longitudinal PPM as shown on the plans. Provide a manufacturer's warranty bond for a 6 year period. The Department will allow a Contractor provided warranty bond in lieu of the manufacturer's bond if all conditions of the manufacturer's warranty including the requirements of this Item are met. In such case, the Contractor is responsible for meeting the warranty requirements. Use the form provided by the Department. The Department will allow substitution of a contractor's bond with a manufacturer's bond after execution of the Contract prior to final acceptance.
2. **Materials.** Use pavement markings that meet the requirements of Type B in DMS-8240, "Permanent Prefabricated Pavement Markings," and that are shown on the Material Producer List (MPL) entitled "Pavement Markings (Permanent, Prefabricated)" maintained by the Department.
3. **Equipment.** Provide equipment as required or directed according to the following (The provider of the warranty bond is responsible for providing equipment during the warranty period unless otherwise shown on the plans.):
 - A. **Preparation and Application.** Use equipment designed for the pavement preparation and application of the type of PPM material selected.
 - B. **Colorimeter.** Provide a colorimeter using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle meeting the requirements of ASTM E 1347, E 1348, or E 1349.
 - C. **Retroreflectometer.** Unless otherwise shown on the plans, provide a portable or mobile retroreflectometer meeting the following requirements.
 1. **Portable Retroreflectometer.** Provide a portable retroreflectometer that meets the requirements of ASTM E 1710.
 2. **Mobile Retroreflectometer.** Provide a mobile retroreflectometer that:
 - is approved by the Construction Division (CST) and certified by the Texas Transportation Institute Mobile Retroreflectometer Certification Program for project evaluation of retroreflectivity
 - is calibrated daily, before measuring retroreflectivity on any pavement stripe, with a portable retroreflectometer meeting the following requirements: ASTM E 1710, entrance angle of 88.76°, observation angle of 1.05°, and an accuracy of ±15%;

- requires no traffic control when retroreflectivity measurements are taken and is capable of taking continuous readings at or near posted speeds

Furnish mobile retroreflectivity measurements in compliance with Special Specification , “Mobile Retroreflectivity Data Collection for Pavement Markings” unless otherwise approved by the Engineer. The Engineer may require an occasional field comparison check with a portable retroreflectometer meeting the requirements listed above to insure accuracy.

4. Construction.

- A. General.** Prepare the pavement surface using controlled techniques that minimize pavement damage and hazards to the traveling public. Apply the PPM materials, according to the manufacturer’s recommendations, using widths, colors, shapes, and at locations as shown on the plans.

Obtain approval for the sequence of work and estimated daily production. Use traffic control as shown on the plans or as approved. Establish guides to mark the lateral location of pavement markings as shown on the plans or as directed, and have guide locations verified. Use material for guides that will not leave a permanent mark on the roadway. Apply markings in alignment with the guides and without deviating for the alignment more than 1 in. per 200 ft. of roadway or more than 2 in. maximum. Remove all applied markings that are not in alignment or sequence as stated in the plans or as stated in the specifications at the Contractor’s expense and in accordance with Item 677, “Eliminating Existing Pavement Markings and Markers,” except for measurement and payment.

- B. Initial Performance Requirements.** Meet Article 5, “Performance Requirements” initially, after installation.

The Engineer will conduct visual performance evaluations of PPM. For markings that do not meet the Engineer’s visual performance evaluation, the Contractor may present test results for color (using a colorimeter), retroreflectivity (using a retroreflectometer in accordance with this Item), and durability (in accordance with ASTM D 913) for the Engineer’s use in making acceptance or rejection decisions.

For PPM not meeting performance requirements, repair or replace until reevaluation shows the PPM meet the performance requirements as approved by the Engineer.

- C. Written Acceptance.** The Department will provide written acceptance after the Contractor meets the initial performance requirements. This written acceptance (see attached sample form) will include the date, location, length, and type of PPM.

5. Performance Requirements.

- A. Color.** Provide PPM consisting of pigments blended to provide color conforming to highway colors as shown in Table 1.

**Table 1
Color Requirements**

Federal 595 Color		Chromaticity Coordinates								Brightness (Y)
		1		2		3		4		
		x	y	x	y	X	y	x	y	
White	17855	.290	.315	.310	.295	.350	.340	.330	.360	60 min
Yellow	33538	.470	.455	.510	.489	.490	.432	.537	.462	30 min
Black										5 max

- B. Retroreflectivity.** Provide PPM for longitudinal markings meeting the minimum retroreflectivity values listed in Table 2.

**Table 2
Minimum Retroreflectivity Requirements**

Color	Retroreflectivity, mcd/m ² /lx, Min
White	120
Yellow	120

- C. Durability.** Provide PPM that do not lose more than 5% of the striping material in a 1,000- ft. section of continuous stripe or broken stripe (25 broken stripes). Pavement markings must remain in the proper alignment and location.
- D. Performance Evaluation Procedures.** Provide traffic control and conduct evaluations of color, retroreflectivity, and durability as required or directed.

- Color.** Measure color using 45°/0° geometry CIE, D65 Illuminant, 2° standard observation angle in accordance with ASTM E 1347, E 1348, or E 1349.
- Retroreflectivity.** Unless otherwise shown on the plans, conduct retroreflectivity evaluations of pavement markings with either a portable or mobile retroreflectometer. Make all measurements in the direction of traffic flow, except for broken centerline on 2-way roadways, where measurements will be made in both directions.

If using a portable retroreflectometer, take a minimum of 1 measurement every mile on each series of markings (i.e., edgeline, center skipline, each line of a double line, etc.), at locations approved by the Engineer. If more than 1 measurement is taken, average the measurements. For all markings measured in both directions, take a minimum of 1 measurement in each direction. If the measurement taken on a specific series of markings within each mile segment falls below the minimum retroreflectivity values, take a minimum of 5 more measurements at locations determined by the Engineer within that mile segment for that series of marking. If the average of these 5 measurements falls below the minimum retroreflectivity requirements, that mile segment of the applied markings does not meet the performance requirement.

If using a mobile retroreflectometer, review the results to determine deficient sections and deficient areas of interest. These areas do not meet the performance requirements.

3. **Durability.** Measure durability in accordance with ASTM D 913 for marking material loss and visual inspection for alignment and location. Conduct evaluations at locations approved by the Engineer.

6. **Warranty Requirements.**

Each warranty period is for 6 yr. and starts the day after written acceptance.

The marking warrantor is responsible for meeting Article 5, "Performance Requirements" for the duration of the warranty period.

During the warranty period, the Engineer will conduct periodic visual performance evaluations of PPM. For retroreflectivity the Engineer will use Tex-828-B, "Determining Functional Characteristics of Pavement Markings." The warrantor may be present during these evaluations. For areas, which, in the opinion of the Engineer, have a questionable visual evaluation, the warrantor may replace the PPM or may conduct a performance evaluation for the performance requirement in question, according to Section 5.D, "Performance Evaluation Procedures." Conduct retroreflectivity evaluations according to Section 5.D.2, "Retroreflectivity," using either portable or mobile retroreflectometer unless otherwise shown on the plans. The warrantor is responsible for traffic control when conducting performance evaluations.

The warrantor will replace PPM that fails to meet the color, retroreflectivity, or durability performance requirements during the warranty period. Replace PPM that fails to meet the performance requirements within 30 days of notification.

All replacement PPM must meet the materials and performance requirements of this specification, under the following conditions to complete the warranty period:

If the longitudinal PPM fails to meet the performance requirements in Article 5 in Years 1 through 4, use materials meeting Type B requirements of specification DMS-8240.

If the longitudinal PPM fails to meet the performance requirements in Article 5 in Years 5 or 6, use materials that meet DMS-8240 (Type A or B) or on the MPL entitled "Pavement Markings (Multipolymer)," to meet the performance requirements of Article 5.

The end of the warranty period does not relieve the warrantor from the performance deficiencies requiring corrective action identified during the warranty period.

The Engineer may exclude PPM from the replacement provisions of the warranty period, provided the Engineer determines that the failure is a result of outside causes rather than defective material. Examples of outside causes are extreme wear at intersections, damage by snow or ice removal, and premature pavement failure.

Provide a contact person, address and telephone number for notification of needed PPM replacement.

7. **Measurement.** This Item will be measured by the foot or by any other unit shown on the plans. Each stripe will be measured separately.

This is a plans quantity measurement Item. The quantity to be paid is the quantity shown in the proposal unless modified by Article 9.2, "Plans Quantity Measurement." Additional measurements or calculations will be made if adjustments of quantities are required.

8. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Longitudinal Prefabricated Pavement Markings (PPM) with Warranty" of the color, shape and width, specified as applicable, at the time of project acceptance. This price is full compensation for materials, application of longitudinal PPM, testing, warranty work, equipment, labor, tools, and incidentals.

WARRANTY BOND	CONTRACT NO.	
	COUNTY	
	BOND NO	

KNOW ALL PERSONS BY THESE PRESENTS: That we, _____, manufacturer of or Contractor for prefabricated pavement markings, as Principal, and _____, as Surety, are held and firmly bound unto the State of Texas, as Obligee, in the penal sum of _____ Dollars \$ _____, lawful money of the United States, well and truly to be paid to the State of Texas, and we bind ourselves, our heirs, successors, executors, and administrators jointly and severally, firmly by these presents.

Whereas, the above bounden Principal has provided prefabricated pavement markings to _____ for the foregoing contract entered into between _____ and the Obligee, attached hereto; and

Whereas, the Principal is required to protect the Obligee against any defects resulting from faulty prefabricated pavement markings installed under said contract for a period of 6 years beginning the day after written acceptance.

Now, therefore, the condition of this obligation is such that if the above bounden principal, its heirs, successors, executors, and administrators shall promptly and faithfully carry out and perform the warranty as provided in said contract, and shall, within thirty days of due notice, replace any installed prefabricated pavement markings that may fail to meet Obligee's performance evaluation as provided for in the Contract during the period specified above or shall pay over, make good, and reimburse to the said Obligee all loss and damage that said Obligee may sustain by reason of failure or default of said Principal so to do, then this obligation shall be null and void, otherwise it shall remain in full force and effect.

Provided further that the end of a warranty period shall not relieve Principal from its obligation to correct deficiencies requiring corrective action, so long as those deficiencies are identified during the warranty period.

WITNESS our hand this _____ day of _____ 20 _____.

(Warrantor Name)

* By: _____
(Warrantor Officer)

**SURETY (Print Firm Name and Seal)

By: _____
(Title)

* By: _____
(Warrantor Officer)

**SURETY (Print Firm Name and Seal)

By: _____
(Title)

**SURETY (Print Firm Name and Seal)

By: _____
(Title)

* Attach a Power of Attorney showing that the officer of the warrantor has authority to sign this obligation.

** Attach a Power of Attorney showing that the surety officer or Attorney-In-Fact has authority to sign this obligation; the Power of Attorney and bond must be impressed with the corporate seal. The surety must be a US

Treasury listed company and provide notification information.

SPECIAL SPECIFICATION

8094

Mobile Retroreflectivity Data Collection for Pavement Markings

1. **Description.** Furnish mobile retroreflectivity data collection (MRDC) for pavement markings on roadways as shown in the plans or as designated by the Engineer. Conduct MRDC on dry pavement only.
2. **Equipment and Personnel.**
 - A. **Mobile Retroreflectometer.** Provide a self-propelled, mobile retroreflectometer certified by the Texas Transportation Institute (TTI) Mobile Retroreflectometer Certification Program.
 - B. **Portable Retroreflectometer.** Provide a portable retroreflectometer that uses 30-meter geometry meeting the requirements described in ASTM E 1710. Maintain, service, and calibrate all portable retroreflectometers according to the manufacturer's instructions.
 - C. **Operating Personnel for Mobile Retroreflectometer.** Provide all personnel required to operate the mobile retroreflectometer and portable retroreflectometer. Ensure MRDC system operator has a current certification from the TTI Mobile Retroreflectometer Certification Program to conduct MRDC with the certified mobile retroreflectometer provided.
 - D. **Additional Personnel.** Provide any other personnel necessary to compile, evaluate, and submit MRDC.
 - E. **Safety Equipment.** Supply and operate all required safety equipment to perform this service.
3. **MRDC Documentation.** Document all MRDC by county and roadway or as directed by the Engineer. Submit all data to the Department no later than three working days after the day the data is collected. Submit all raw data collected in addition to all other data submitted. Provide data files in Microsoft Excel format or a format approved by the Engineer. Provide a high-quality DVD showing the markings as they are measured. The data file and video must contain the following information:
 - A. **Preliminary Documentation Sample.** Submit a sample data file, video, and map of MRDC data in the required format ten working days prior to beginning any work. The format must meet specification and be approved by the Engineer before any work may begin.
 - B. **Initial Documentation Review and Approval.** The Department will review documentation submitted for the first day of MRDC, and if it does not meet specification requirements, will not allow further MRDC until deficiencies are

corrected. The Department will inform the contractor no later than three working days after submittal if the first day of MRDC does not meet specification requirements. Time charges will continue unless otherwise directed by the Engineer.

C. Data File. Provide data files with the following:

- date;
- district number;
- county;
- route number with reference markers or other reference information provided by the Engineer to indicate the location of beginning and end data collection points on that roadway;
- cardinal direction;
- line type (single solid, single broken, double solid, etc.);
- line color;
- file name corresponding to video;
- data for each centerline listed separately;
- average reading taken for each 0.1 mi. interval or interval designated by the Engineer;
- accurate GPS coordinates (within 20 feet) for each interval;
- color-coding for each interval indicating passing or failing, unless otherwise directed by the Engineer (Passing and failing thresholds will be provided by the Engineer);
- graphical representation of the MRDC (y-axis showing retroreflectivity and x-axis showing intervals) corresponding with each data file;
- distance in miles driven while measuring the pavement markings;
- event codes (pre-approved by the Engineer) indicating problems with measurement;
- portable retroreflectometer field check average reading and corresponding mobile average reading for that interval when applicable; and
- upper validation threshold (may be included separately with the raw data but must be clearly identified with the data collected using that threshold).

D. Map in Electronic Format. Provide a map in an electronic format approved by the Engineer with each MRDC submission that includes the following information:

- date;
- district number;
- county;
- color-coded one mile intervals (or interval length designated by the Engineer) for passing and failing retroreflectivity values or retroreflectivity threshold values provided by the Engineer; and
- percentage of passing and failing intervals, if required by the Engineer.

E. Video. Provide a high-quality DVD with the following information:

- labeled with date and corresponding data file name;
- district number;
- county;
- route number with reference markers or other designated reference information to indicate the location of beginning and end collection points on that roadway; and
- retroreflectivity values presented on the same screen with the following information:
 - date;
 - location;
 - starting and ending mileage;
 - total miles;
 - retroreflectivity readings; and
 - upper validation thresholds (may be included separately with the raw data but must be clearly identified with the data collected using that threshold).

F. Field Comparison Checks with a Portable Retroreflectometer. Take a set of field comparison readings with the portable retroreflectometer at least once every four hours while conducting MRDC or at the frequency designated by the Engineer. Take a minimum of twenty readings, spread out over the interval measured. List the average portable retroreflectometer reading next to the mobile average reading for that interval with the reported MRDC data. Request approval from the Engineer to take field comparison readings on a separate roadway, when measuring a roadway where portable retroreflectometer readings are difficult to take. Take the off-location field comparison readings at no additional cost. Submit the portable retroreflectometer printout of all the readings taken for the field comparison check with the corresponding MRDC data submitted. The mobile average reading must be within +/-15% of the portable average reading. The Engineer may require new MRDC for some or all of the pavement markings measured in a four hour interval prior to a field comparison check not meeting the +/-15% range. Provide the new MRDC at no extra cost to the Department. The Engineer may take readings with a Department portable retroreflectometer to ensure accuracy at any time. The Department's Construction Division will take comparison readings and serve as the referee if there is a significant difference between the Engineer's portable readings and the Contractor's mobile and handheld readings. For best results, take field comparison readings on a fairly flat and straight roadway when possible.

G. Periodic Field Checks at Pre-Measured Locations. When requested by the Engineer, measure with the mobile unit and report to the Engineer immediately after measurement the average retroreflectivity values for a designated pre-measured test location. The Engineer will have taken measurements at the test location within ten days of the test. The test location will not include pavement markings less than thirty days old. If the

measured averages do not fall within +/-15 % of the pre-measured averages, further calibration and comparison measurements may be required before any further MRDC. Submit the results of the field check with the MRDC report for that day.

4. **Final Report.** Submit a final report in the format specified by the Engineer to the Department's Traffic Engineering representative within one calendar week after the service is complete. The final report must contain a list of all problems encountered (pre-approved event codes) and the locations where problems occurred during MRDC.
5. **Measurement.** When mobile retroreflectivity data collection for pavement markings is specified on the plans to be a pay item, measurement will be by the mile driven while measuring pavement markings.
6. **Payment.** Unless otherwise specified on the plans, the work performed, materials furnished, equipment, labor, tools, and incidentals will not be paid for directly, but will be considered subsidiary to bid items of the Contract. When mobile retroreflectivity data collection for pavement markings is specified on the plans to be a pay item, the work performed in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit price bid for "Mobile Retroreflectivity Data Collection." This price is full compensation for providing summaries of readings to the Engineer, equipment calibration and prequalification, equipment, labor, tools, and incidentals.

FORT BEND GRAND PARKWAY TOLL ROAD AUTHORITY

SPECIAL SPECIFICATION

9200

Megapixel Robotic WebCamera

1. **Description.** Construct an outdoor robotic monitoring camera, including certified installation services; 16 months of tech support, maintenance and software upgrades; 16 months of operation; and 16 months of archiving time-lapse service. This item will include the 50' timber pole and temporary electrical service. The camera and electrical service shall be installed on the timber pole.
2. **Materials**
 - A. **Manufacturer**
 - 1) EarthCam, Inc.
800.EarthCam (327.8422) toll free
201.488.1111 voice
201.488.1119 fax
84 Kennedy Street,
Hackensack, NJ 07601.
www.EarthCam.net
 - B. **System Requirements**
 - 1) The indoor/outdoor camera system shall consist of a tamper and impact resistant enclosure with integrated camera and heavy-duty robotic pedestal to be mounted on a 40 foot (minimum camera mounting height) fixed pole (to be provided by Contractor - not provided by manufacturer).
 - 2) The camera shall take high-resolution 8 Megapixel digital images every 15 minutes and provide live video.
 - 3) The camera shall upload both images and video over a RJ-45 hardwired connection to a DSL or cable modem. A wireless cellular modem or wireless point-to-point system shall not be permitted
 - 4) The content shall be sent to a secure, password protected website with an Interface and Online Software features provided by the Vendor as a Managed Service.
 - 5) The system will operate on 120VAC (230VAC Available) voltage and have a maximum power consumption of 35W.
 - C. **Equipment**
 - 1) Camera: Integrated 8 Megapixel high-definition camera and lens assembly consisting of a charge coupled device (CCD) camera with a remotely controlled focal length lens with the following features:
 - a. Imager: 1/2.5" CCD 8 Megapixel.
 - b. Resolution: 3,264 x 2,488 Pixels = 8 Megapixels.
 - c. Panoramic Resolution: 29,376 x 9,792 = 288 Megapixels.
 - d. Lens: Zoom 6mm – 72mm capable of 12x Optical, 4x Digital.
 - e. Video Compression: AVI (Motion JPEG).

- f. Auto Features: ISO, Shutter, White Balance and Focus.
- 2) Camera Enclosure:
 - a. Built-in aluminum and epoxy powder painted weatherproof standard IP66/IP67.
 - b. Body constructed from extruded aluminum and die-cast aluminum end-cover plates.
 - c. Weatherproof feature is maintained by 2 EPDM-rubber end gaskets between cover plates and 3 cable glands.
- 3) Pan and Tilt Robotic Base: High-performance outdoor pan/tilt designed to provide steady images in windy environments with the following features:
 - a. Pan Range: 360° continuous pan.
 - b. Tilt Range: +30° to -90° from level.
 - c. Motor Type: Stepper.
- 4) Overall System:
 - a. Camera Enclosure Dimension: 6.9" (175mm) W x 6.6" (168mm) H x 19.4" (493mm) L.
 - b. Pan/Tilt Unit Dimensions: 7.0" (178mm) W x 10.5" (274mm) H x 6.4" (163mm) D.
 - c. Operational Temperature: -10°F to +120°F (-23°C to + 49°C).
 - d. Camera Enclosure Weight: 13lb (5.9kg).
 - e. Pan/Tilt Unit Weight: 12lb (5.4kg).
- 5) Data Connection: Provide one of the following:
 - a. In areas with cellular coverage, operate cameras via built-in cellular data connection provided and maintained by the system vendor.
 - b. In areas without cellular coverage, operate cameras via an RJ-45 Ethernet data connection over broadband or satellite Internet access provided and maintained by the Contractor.

D. Interface and Online Software

- 1) Remote Access: Contractor's System Vendor shall provide an internet based interface and online software as a managed service, to allow the viewing of all high-definition digital still images captured and live video stored, from any location with internet access via a secure password protected website.
 - a. Maintain images on the System Vendor's website for reference available at all times during the life of the project and for not less than 60 days after completion.
- 2) Online Interface Features:
 - a. Software delivered by vendor as a managed service.
 - b. Displays company logo and project name.
 - c. Capable of viewing live video.
 - d. Picture in Picture to control and view live video, while viewing high definition images.
 - e. Robotic pan, tilt and zoom control of robotic camera system.
 - f. Featuring high-definition panoramic images with a panoramic image comparison tool.
 - g. Calendar based navigation system for selecting specific images and panoramas.
 - h. Multifunction image browsing.

- i. Pan, tilt and zoom control capability within a high-definition image.
- j. Onscreen button for wiper control to allow remote cleaning of the viewing window.
- k. A multiview screen to view all of the cameras on a project at the same time.
- l. Graphical mark-up tools for detailing and creating overlays on images.
- m. Graphical weather applet displaying ten points of local weather data and 48-hour forecast.
- n. Remote solar monitoring screen displaying the DC amperage output of solar panels.
- o. Remote battery monitoring screen displaying battery voltage, temperature and status.
- p. Remote cellular monitoring screen displaying connectivity, network traffic and modem temperature.
- q. Remote wireless radio monitoring screen displaying connectivity, network traffic and Google Map features including wireless radio locations.
- r. Share image tools: save, print, email and post to message board or mobile devices.
- s. Automated progress reports in Power Point, Open Office and PDF formats.
- t. Map, aerial and satellite view by Google.
- u. Time lapse features include – Instant time lapse play back by day, week, month or year.
- v. Machine to machine self-healing technology that automates maintenance of camera up to 288 times daily.
- w. Account security features include – Four levels of password protection, IP address block / permission and SSL protection of the user login password.
- x. All Images are the copyright of the client and protected on secure servers owned and operated by the system vendor.

E. Treated Timber Pole

- 1) The contractor shall furnish and install a 50' treated timber pole in accordance with Item 627. The treated timber pole shall provide a 40' minimum camera mounting height. The contractor may propose pole options other than treated timber to be reviewed and approved by the Fort Grand Parkway Toll Road Authority.
- 2) The treated timber pole will not be paid for directly and shall be considered subsidiary to Item 9200, including all work performed, materials furnished, equipment, labor, tools, and incidentals.
- 3) The proposed camera, and any related equipment cabinets, and the temporary electrical service shall be installed on the treated timber pole.

F. Electrical Service

- 1) The contractor shall furnish and install a temporary electrical service in accordance with Item 628. The temporary electrical service shall be in accordance with the TxDOT Electrical Details standard plan sheets and shall be TY D (120/240) 060 (NS) GS (N) TP (O) or approved equal.

- 2) The electrical service will not be paid for directly and shall be considered subsidiary to Item 9200, including all work performed, materials furnished, equipment, labor, tools, and incidentals.
- 3) The temporary electrical service will be used to power the camera during construction and shall be installed on the treated timber pole.
- 4) Electric usage charges and any service or connection fees related to the installation and connection of the temporary service shall be paid by the contractor during the 16 month duration of this item and shall be subsidiary to Item 9200.
- 5) The Fort Bend County Toll Road Authority will pay for any required electrical line extensions required to install the temporary service in the desired location.

2. Construction

A. Preparation

- 1) Unpack camera system components and save packing materials (box and foam) for future shipment of camera system including associated appurtenances and mounting equipment to Owner or Manufacturer as required.

B. Installation

1) General:

- a. Engage the manufacturer to provide Certified Installation Services. Install camera system in accordance with manufacturer's printed instructions, State and Municipality codes and requirements and approved submittals.
- b. Install units plumb and level and at proper angle to provide maximum field of view of on-site operations.
- c. Securely and rigidly anchor products in place.
- d. Connect cameras to power.

- 2) Position camera so that field of view of approximately 51° horizontal and 39° vertical covers intended area of site with a clear area for the robotic unit to pan and tilt.

- a. Install camera at elevation that will provide uncompromised visual coverage.
- b. Install camera so that position of sun or manmade light sources will not come into direct contact with field of view of camera at any time during construction.

C. Field Quality Control

- 1) Pre-installation Testing: Test camera on-site at ground level prior to mounting unit in its intended elevated position.
 - a. Contact System Vendor not less than 24 hours in advance of installation for testing.
 - b. Connect unit.
 - c. After 30 minutes, contact System Vendor and require System Vendor to remotely confirm camera is operating properly.
 - d. Install cameras in approved locations.

D. Cleaning

- 1) Clean installed items using methods and materials recommended in writing by manufacturer.
- 2) Clean camera system components, including camera-housing windows, lenses, and monitor screens.

E. Instruction

- 1) Engage a factory-authorized service representative by phone to instruct Contractor's personnel in procedures to adjust and maintain camera equipment.
 - a. Instruct personnel on procedures and schedules for troubleshooting and maintaining equipment.
 - b. Explain methods of determining optimum alignment and adjustment of components.

F. Operation, Termination, and Removal

- 1) **Maintenance:** Maintain camera equipment in good operating condition on a 24-hour basis until removal.
- 2) **Termination and Removal:** Removal of camera system when instructed by the owner.
 - a. Camera system including associated appurtenances and mounting equipment are property of Owner.

3. **Measurement.** All cameras satisfactorily installed and operational will be measured by the each, which includes a sixteen (16) month operational period.
4. **Payment.** The work performed and materials furnished in accordance with this Item and measured as provided under "Measurement" will be paid for at the unit bid price for "Megapixel Robotic Camera".

This price is full compensation for furnishing the labor, materials, tools, equipment, timber pole, temporary electrical service, electrical usage and connection fees, and incidentals necessary to install and operate the camera, complete in place, as required by the manufacturer. Also, this price includes 16 months of time-laspe edited DVD movie, certified installation services; 16 months tech support, maintenance and software upgrades; and 16 months of operation. Camera pole and new electrical services will not be paid for directly but will be considered incidental to this item.

FORT BEND GRAND PARKWAY TOLL ROAD AUTHORITY

SPECIAL SPECIFICATION

9300

Optional Union Pacific Railroad Bridge Plans

1. **Description.** Furnish and install all materials, equipment, and labor shown on the plans and in accordance with the documents listed under “Construction Methods” below.
2. **Materials.** Install the materials designated on the plans. Furnish materials designated in accordance with all material requirements in the documents listed under “Construction Methods.”
3. **Construction Methods.** Perform work in a manner consistent with the following Specifications, Addendums and Standards necessary to perform the work:
 - A. Union Pacific Railroad General Conditions and Specifications
 - B. Union Pacific Railroad Fire Prevention Plan
 - C. Union Pacific Railroad Fire Risk Assessment
 - D. Union Pacific Railroad Bridge Construction Mile Post 27.75 Glidden Subdivision Special Conditions
 - E. Union Pacific Railroad Smoking Policy
 - F. Union Pacific Railroad Temporary Shoring Guidelines

The above documents can be found on the Civcast website (www.civcastusa.com) in the project’s “Docs” tab.

4. **Measurement.** This Item will be measured as follows and as explicitly detailed in the plans:

ITEM NO.	UNIT	ITEM DESCRIPTION
1	LOT	Structural Steel (Incl. Bearing Assemblies and Anchor Rods) and Fasteners for One 79’-10” Welded Deck Plate Girder Span Complete
2	CY	4000 PSI Concrete for Substructure
3	CY	5000 PSI Concrete for Deck Slab
4	LB	Reinforcing Steel

5	LOT	Concrete and Reinforcing Steel for Slope Protection Repair
6	LOT	Sonic Log Testing Pipes
7	LOT	4000 PSI Non-Shrink Grout
8	LOT	Preformed Joint Filler
9	LOT	HILTI CS-2130 Gray Caulk (or Approved Alternate)
10	SF	Roofing Felt
11	GAL	Thoroc Epoxy Adhesive 24 LPL
12	SF	Clean and Paint Structural Steel (System II) (TxDOT Bid Item 442-2002)

- 5. Payment.** The work performed with this Item and measured as provided under “Measurement” will be paid for at the unit price bid for the various items of work. These prices shall be full compensation for furnishing all labor, tools, equipment and incidentals necessary to satisfactorily complete the work as detailed on the plans.