

Administration

The Contractor has the responsibility for management and performance of the Work. CDOT will perform all Quality Assurance testing and Verification on the project.

Work Breakdown Structure (WBS)

The Contractor shall submit to CDOT an Initial Schedule for Acceptance, including a detailed, organized hierarchical division of the Work Breakdown Structure (WBS) for completing each element of the Work.

The following list represents the minimum levels of the WBS that all cost and schedule information shall roll-up to. However, further detail may be provided by the Contractor to ensure a clear understanding of the Contract. The Contractor shall submit its Initial Schedule broken down to the WBS Activities and proposed Work segments.

The Accepted WBS shall be the basis for organizing all Work under the Contract, and shall be used to structure the Contract Schedules, and other cost control systems.

The WBS Breakdown of Design and Construction Components shall include:

- Field Office (Special)
- Field Laboratory (Class 2)
- Sanitary Facility
- Mobilization
- Highway Design and Construction
 - Roadway Design
 - Stormwater Design
 - Culverts
 - Removals
 - Utilities
 - Earthwork
 - Geotechnical and Roadway Pavements
 - Guardrail
 - Signing, Pavement Marking, Lighting, and ITS
 - Maintenance of Traffic
 - Water Quality / Environmental Management
 - Public Information
- Bridge Design and Construction
 - Removals
 - Bridge Design

Bridges (substructure and superstructure)
Contract Modification Orders

The Contractor shall prepare and submit to CDOT the following CPM schedules with appropriate Methods Statements as described later in this section:

- Initial Schedule
- Project Schedule
- Monthly Progress Schedule

Each of the CPM schedules shall be cost loaded for the WBS provided above.

Allocation of Contract Price

Contractor shall allocate the Contract Price among the WBS Activities such that all roadway activities and each structure have a price allocation that accurately indicates the cost of each activity. Actual monthly payments to Contractor shall be based on the determination of physical progress considering labor, materials equipment resources utilized, design hours, or other physical units acceptable to the CDOT Project Engineer. Such progress payments to the Contractor shall be able to be computed accurately from the updates of the WBS schedule. The Contractor's allocation of the Contract Price shall be approved by the CDOT Project Engineer. Each of the activities shall be allocated a cost and a physical unit that will allow objective determination of activity completion. The cost of Traffic Control, Water Quality / Environmental Management, and Public Information will be paid by straight line calculation through the life of the project. The cost of Public Information shall not exceed 2 percent of the Contract Price. The cost of Mobilization shall not exceed 5 percent of the Contract Price.

Requests for unbalanced costs will be rejected if the Department determines that any of the allocated costs are materially unbalanced to the potential detriment of the Department. Unbalanced costs are defined in subsection 102.07 of the Standard Specifications for Road and Bridge Construction.

Work Activities

The WBS breakdown shall show the work activities broken down to level four by the Contractor for roadway activities and by structure location into enough subcomponents to accurately track production on the project. Monthly payment to the Contractor shall be based on the percent completed with dollar value attached for each of the WBS work activities, as a percentage of the Contract Price. The project is level one, the WBS Breakdown of Design and Construction Components are level two, roadway components and structures are level three, and work activities are level four.

Methods Statement

A Methods Statement shall be prepared for each of the level four work activities listed in the schedule, for any critical path items in the schedule, and for any feature not listed in the schedule that the Contractor considers a controlling factor for timely completion. The Methods Statement shall be completed in accordance with subsection 108.03 of the Standard Specifications for Road and Bridge Construction.

Cost Management

Progress Payment Calculations

CDOT will base progress payments on a mutually agreed estimate of percent complete of the work not on measured quantities. The Contractor shall progress the activities identified on the Project Schedule for determining the Monthly Progress Schedule. The accepted Monthly Progress Schedule will determine the amount of the Contractor's progress payments, based on the work activities identified by the Contractor. Percent complete shall be calculated using project scheduling software meeting the requirements of this section, where progress is measured based on physical percent of work that is complete considering labor, materials, equipment resources used, design hours, or other physical units acceptable to CDOT. Such progress payments to the Contractor shall be able to be computed accurately from the updates of the WBS schedule.

Partial payment for stored materials shall only be made per subsection 109.07 of the Standard Specifications for Road and Bridge Construction.

The Contractor's invoice shall not include a request for payment for documented nonconforming work. The payment to the Contractor will be the amount shown on the Contractor's approved invoice as modified for appropriate price reductions for nonconforming work, if any, retainage, incentive/disincentive payments, and any deductions.

Invoice Submittals

The Contractor shall submit invoices to CDOT each month for review within three Working Days following prior month's end. Each monthly invoice shall be submitted in draft form for review in a Progress Status Meeting on a date mutually agreeable to the Contractor and CDOT. Draft monthly invoice submittals shall be transmitted with at least one paper copy and one electronic copy.

The Contractor shall submit to CDOT for Approval a final monthly invoice within five Days after each Progress Status Meeting, as defined below. Final invoice submittals shall include one paper copy and one electronic copy.

Invoice Documents

The invoice documents shall include:

1. Invoice Cover Sheet.

The cover sheet shall indicate the following information:

- A. Project number and title.
- B. Invoice number (numbered consecutively starting with “1”).
- C. Period covered by the invoice (specific calendar dates).
- D. Total earned to date for the Project as a whole and for each Work activity. The breakdown is required because retainage will be calculated and withheld on each work segment, and partially released upon achievement of completion of each Work segment.
- E. Date that invoice was signed.

2. Updated Monthly Progress Schedule.

No invoice shall be approved nor payment made if there is not a current Accepted Monthly Progress Schedule in place. The status date of the Monthly Progress Schedule, coinciding with the payment invoice date, is the last date of each month. The data date for use in calculating the monthly progress schedule shall be the first Calendar Day of the following month.

The Contractor shall make all corrections to the Monthly Progress Schedule requested by CDOT and resubmit the Monthly Progress Schedule within seven Days. If the Contractor does not agree with the CDOT comments, the Contractor shall provide written notice of disagreement within seven Days from the receipt of the comments. If necessary, the item(s) in disagreement shall be resolved in a meeting held for that purpose.

3. Job Progress Narrative Report in accordance with Section 108.03(c)(3) of the Standard Specifications for Road and Bridge Construction

No invoice will be reviewed or processed until all invoice documents are received by CDOT.

Progress Status Meetings

A Progress Status Meeting shall be conducted each time a draft monthly invoice submittal is made. The meeting shall be used to verify, address and finalize the following:

1. Actual start dates.
2. Actual and planned Completion Deadlines.
3. Earned value of Work that has been accepted in-place.
4. Activity percent complete.
5. Incorporation of approved Change Orders.
6. Status of outstanding Nonconforming Work.
7. Completion of Value Engineering Change Proposals, if any.
8. Work performance.
9. Job Progress Narrative Report (Section 108.03(c)(3) of the Standard Specifications for Road and Bridge Construction).
10. Critical Path(s).

Following the Progress Status Meeting, and upon approval of the final monthly invoice, payment shall be Approved within seven Days.

WBS Activities and Schedule Modifications

When it becomes necessary to add, combine, eliminate, or modify Contract specified WBS Activities to reflect modifications to the Work, such changes shall be Approved by CDOT in accordance with the Contract and consequently reflected in subsequent schedule submittals under the Contract Modification Orders WBS component.

Schedule Management

Schedule Definitions

Contract Schedules

Contract Schedules shall include the Initial Schedule, Project Schedule, and Monthly Progress Schedule. These schedules are defined below or in the Project Special Provision, Revision to Section 108, Project Schedule, later in this section.

1. Initial Schedule
See Project Special Provision, Revision to Section 108, Project Schedule, later in this section.
2. Project Schedule
See Project Special Provision, Revision to Section 108, Project Schedule, later in this section.

3. Monthly Progress Schedule

The Approved Project Schedule shall be used as the basis to establish the Monthly Progress Schedule. It shall be updated every month to show the actual progress of Work and the earned value of Work accomplished, including Approved Change Orders and Work Orders.

The Monthly Progress Schedule shall be cost loaded to WBS Level V and when summarized for the aggregate costs of WBS Level V Activities, shall equal the WBS Level IV prices set forth in the Proposal Documents and Approved Change Orders. In addition, The Monthly Progress Schedule shall include WBS Level VI detail for the upcoming three months of design and construction on the Project, except that cost loading to WBS Level VI is not required for the three month look-ahead.

Schedule Requirements

1. CPM Requirements

- A. The critical path shall be determined according to CPM principles and shall be highlighted in RED on all schedules to distinguish critical Activities from other Activities. A diamond, flag, or other symbol shall highlight milestones.
- B. The CPM shall have all major procurement Activities identified for any item with more than 90 days lead time for delivery. This shall include shop drawing submittal and approval, lead times for the fabrication and delivery of materials and equipment, and installation of materials and equipment.

Execution

Monthly Progress Schedule

The Monthly Progress Schedule shall be submitted each month to CDOT for Acceptance, concurrent with the invoice submittal as required herein. The Monthly Progress Schedule shall include all information current as of the status date.

For the three month look-ahead portion of the Monthly Progress Schedule which establishes the WBS Level VI Activities, the Contractor shall provide sufficient detail to convey a schedule that provides weekly schedule control and shall specifically identify:

- 1. Completion Deadlines, if any, phasing of design, construction, testing, and staging of the Work as specified shall be prominently identified. Particular attention shall be given to release for construction dates, site availability, construction staging, and maintenance and protection of traffic requirements of the Contract.

All correspondence shall include the Project name, Contract name and number, along with the specific subject of the letter. All replies shall refer specifically to prior correspondence to which it relates.

The Contractor shall make available, when requested by CDOT, copies of its logs indicating CDOT's outstanding items.

The Contractor shall submit the software platform and/or system to be used for the Contractor's DCS to CDOT for Acceptance within 15 Days following NTP1. Although no direct link between the Contractor's DCS and CDOT is required, the Contractor shall provide access to the DCS and software training for CDOT personnel.

Field Facilities

The Contractor shall provide all office space and equipment as required for the Project.

The Contractor shall make available a fully operational Field Office within 15 Days following NTP1 and a Field Laboratory at least 30 Days prior to beginning any Construction Activities. CDOT shall return possession of each to the Contractor no later than 45 Days after Final Acceptance of the Project.

The Contractor shall secure sites, obtain all site permits, install, set up, and provide utility services, and maintain the facilities as part of the Work. The Contractor shall consult with CDOT on the availability of suitable local sites.

The Contractor shall provide:

- 1 Each Field Office Class (Special)
- 1 Each Field Laboratory Class 2
- 2 Each Sanitary Facilities for CDOT staff use next to the field office and field laboratory.

All field facilities shall conform to CDOT Standard Specifications and Standard Plans in effect at the time of bidding and revised by Project Special Provision, Revision of Section 620, Field Facilities later in this section.

Field Office

The Contractor shall provide a field office as defined in Project Special Provision, Revision to Section 620, Field Facilities provided later in this section, at a location to be determined by the Contractor and Approved by CDOT. The field office shall have a minimum of twelve parking spaces, all contained within the security fence or approved equivalent.

Field Laboratory

The Contractor shall provide a field laboratory, class 2, per CDOT M&S Standards, at a location to be determined by the Contractor and Accepted by CDOT. It shall provide a minimum of four parking spaces, all contained within the security fence. The field laboratory shall be provided to CDOT at least 30 Days, to allow for lab inspection, calibration and certification, prior to commencement of any field Activities involving earthwork of any type, analysis of mix designs, or planned placement of concrete or HMA.

Computer and Network Requirements

See Project Special Provision, Revision of Section 620, Field Facilities, later in this section.

Additional Requirements

Project Directory

The Contractor shall maintain and furnish to CDOT a project directory listing the names, addresses and telephone (office, home, cellular, facsimile and beeper) numbers of the Key Personnel and critical support staff of the Contractor and each Subcontractor. The project directory shall be submitted to CDOT within 30 Days following the first NTP1. The Contractor shall update the Project Directory quarterly for the duration of the Work.

Working Conditions

All Work under this Contract shall comply with the requirements and standards specified by the Williams-Steiger Occupational Safety and Health Act of 1970, 29 U.S.C. §651, et seq., Public Law 91-596, as well as other applicable Federal, State, and local laws. The Contractor shall not require any laborer or mechanic to work in surroundings or under working conditions that are unsanitary, hazardous, or dangerous to his/her health and safety.

Deliverables

At a minimum, the Contractor shall submit the following to CDOT for review, Approval and/or Acceptance:

Deliverable	Acceptance or Approval	Schedule
Work Breakdown Structure	Acceptance	Within fifteen Working Days following NTP1.
Invoice Format	Approval	Within 20 Days of NTP1.
Draft monthly invoices	Acceptance	Within three Working Days following prior month's end
Final monthly invoices	Approval	Within five Days following progress status meeting
Monthly invoice format changes	Approval	At least fifteen Days prior to first invoice
Initial Schedule	Acceptance	Within fifteen Working Days following NTP1
Project Schedule	Approval	Within 45 Days following CDOT Acceptance of Initial Schedule
Monthly Progress Schedule	Acceptance	(same as monthly invoices)
Project directory	(none)	Within 30 Days of NTP1

All deliverables shall also conform to the requirements of Section 3, Quality Management.

REVISION OF SECTION 108
PROJECT SCHEDULE

Section 108 of the Standard Specifications is hereby revised for this project as follows:

Subsection 108.03 shall include the following:

CDOT will review schedule submittals; such review shall not constitute an Approval of the Contractor's construction means, methods, sequencing, or its ability to complete the Work in a timely manner.

Subsection 108.03 (c) delete the first sentence of the second paragraph and replace with the following:

Subsection 108.03(c) shall include the following:

When the Contractor uses Primavera Scheduling software, one licensed copy of the Primavera software shall be provided to CDOT. If other scheduling software is Approved by CDOT, the Contractor shall provide one licensed copy of that software to CDOT. Software shall be installed on the laptop computer to be provided under Project Special Provision, Revision to Section 620, Field Facilities

Subsection 108.03 (c) shall include the following:

Changes in logic and/or durations shall not be made without first providing written notification to CDOT for the Contractor's need to change. Consideration will be given for Contractor changes as they are determined to be reasonable by narrative explanation. Acceptance or rejection of such changes is without liability. Logic or Duration changes to simply accommodate a perception of still being on-schedule will not be Accepted.

A revision of the Schedule may include a Recovery Schedule. At the discretion of CDOT, when the most current Accepted Schedule Update no longer represents the actual prosecution and progress of the work, CDOT shall require a Recovery Schedule. If it is determined that a Recovery Schedule is required, it shall be provided to CDOT for review within 15 calendar days of written notification. The Recovery Schedule shall include the original Contract work and all Approved Change Order work. CDOT's review of the Recovery Schedule will not exceed seven calendar days. Revisions required as a result of CDOT's review shall be submitted within seven calendar days. When Accepted by CDOT in writing, the Recovery Schedule shall become the Project Schedule. All cost related to performing the work in the Recovery Schedule will not be paid for separately, but shall be included in the work. Failure to provide the required schedule information at the required times will result in denial of the relative portion of

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progress payments until such time that the schedule information is submitted in the correct format at the sole option of CDOT.

The following requirements have been defined to create consistency across all project schedules for purpose of analysis.

- (1) Dependencies between activities shall be indicated so that it may be established as to the effect the progress of any one activity would have on the Schedule. Dependencies shall make use of Finish-to-Start (FS), Start-to-Start (SS), or Finish-to-Finish logic ties. Use of Start-to-Finish (SF) logic ties shall not be allowed without written justification and Acceptance prior to implementation. Leads or lags will not be used when the creation of an activity will perform the same function (e.g., concrete cure time). Dependencies shall not make use of negative lags. The use of any lead or lag shall require a written explanation by the Contractor in a narrative.
- (2) All activities, except Notice-to-Proceed and Final Completion, are required to have at least one predecessor and one successor.
- (3) Date and time constraints, other than those required by the contract, will not be allowed unless Accepted by CDOT.
- (4) Define at least two (2) calendars for the schedule. Calendar 1 for workdays, is to reflect Saturdays, Sundays, and all Holidays as non-workdays; and that Calendar 2 for calendar days, is to reflect Saturdays, Sundays, and Holidays as workdays.
- (5) The schedule should be broken down into logical areas of work.
- (6) Summary Activities
 - i. The Contractor shall include special activities that are a Summary of a chain of activities. The start of the activity will be the start date of the first activity in the chain and the finish date will be the finish date of the last activity in the chain.
 - ii. Included in the Summary area should be a Summary activity designated as Contract Time. The summary activity shall have Notice-to-Proceed as its predecessor, with a SS 0 relationship; and Contractual Substantial Completion as its successor, with a FF 0 relationship. Calendar 2 shall be

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- iii. used for all Summary activities. The duration of this activity must not exceed the contract time.
 - iv. The purpose of these Summary activities is to provide monitoring of the contract time and Area progress.
- (7) Tasks related to the submittal/procurement of material or equipment shall be included as separate activities in the project schedule.
- (8) The Contractor's original network diagram submittal shall become the Project Schedule once it is Accepted by CDOT. The Project Schedule shall be duplicated and utilized as the Schedule Update and shown graphically over the Project Schedule.
- (9) The following logic relationships will be required in any precedence diagram method used:
- i. All logical relationships shall be Finish-to-Start (FS), with the following exceptions:
 - at the start or origin, activities may be start to start (SS)
 - at a milestone or at the conclusion of the network, activities may be Finish-to-Finish (FF)
 - use in Summary activities
 - ii. Lag factor use should be limited. When used, they should be identified as a functional activity (i.e., concrete curing).
 - iii. Accepted Schedules shall only contain Contract Required Early Start and/or Early Finish Constraints.
 - iv. The retained logic mode is required for schedule calculations.

Any deviations / change from these logic specifications require written request to be reviewed for Acceptance from CDOT prior to implementation, to prevent manipulations to give false results.

Use of float suppression techniques, such as preferential sequencing (arranging critical path through activities more susceptible to CDOT caused delay):

- a. Special lead/lag logic restraints,
- b. Zero total or free float constraints,
- c. Imposing constraint dates other than as required by the contract,

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shall be cause for rejection of the Project Schedule or its Updates. The use of Resource Leveling or similar software features used for the purpose of artificially adjusting activity durations to consume float and influence the critical path is expressly prohibited.

Definitions of Float (or Slack):

- a. Free Float is the length of time the start of an activity can be delayed without delaying the start of a successor activity.
- b. Total Float is the length of time along a given network path that the actual start and finish of an activity or activities can be delayed without delaying the project completion date.
- c. Project Float is the length of time between the Contractor's Early Completion or Substantial Completion and the Contract Completion Date.
- d. Project Float is for the benefit of the Project and for the mutual use of CDOT and the Contractor.

Negative float will not be a basis for requesting time extensions. Any extension of time will be addressed in accordance with the Section 108.08, Determination and Extension of Contract Time. Scheduled completion dates that extend beyond the contract or phase completion dates (evidenced by negative float) may be used in computation for assessment of payment withholdings. The use of this computation is not to be construed as a means of acceleration.

In Subsection 108.03 (c), delete subsection (1) and replace with the following:

The Initial Schedule is defined as the initial Project schedule for the purpose of initiating Work on the Project. It shall be a CPM schedule with Activity detail for the first six months following NTP1 and shall be cost loaded to WBS Level V. The Initial Schedule shall conform to the Accepted WBS and include all Contractor defined WBS Level IV and V Activities. In addition, the Initial Schedule shall include WBS Level IV Activities that describe the time period after the first six months following NTP1 and through the completion of the Project. The Accepted Initial Schedule shall provide an intermediate schedule during the production of the Project Schedule and shall establish a payment schedule for the first six months following NTP1.

In Subsection 108.03 (c) (2), delete the first and second paragraphs and replace with the following:

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The Project Schedule is defined as the Contractor's original plan for the Project from NTP1 through Final Acceptance. It shall be a detailed CPM schedule with Work Activities and Completion Deadlines included for the full term of the Project. The Project Schedule shall be developed from the Initial Schedule and shall conform to the Accepted WBS and include all Contractor defined WBS Level IV and V Activities. The Project Schedule shall not change after Approval. The Project Schedule shall be cost loaded to WBS Level V, and when summarized for the aggregate costs of WBS Level V Activities, shall equal the WBS Level IV prices set forth in the Proposal Documents.

CDOT's review of the Project Schedule will not exceed seven calendar days. Revisions required as a result of CDOT's review shall be submitted within seven calendar days. Work shall not continue beyond the first three months following NTP1 until the Project Schedule is Accepted in writing, unless otherwise approved by CDOT.

Subsection 108.03 (c) (2) Project Schedule shall include the following:

The schedules shall include all activities required for contract completion. The Project Schedule shall be submitted to CDOT for Acceptance.

- a. Within seven calendar days after receipt of the complete Project Schedule, CDOT will communicate in writing, its comments and concerns to the Contractor. Within seven calendar days, the Contractor shall adjust the Schedule to incorporate comments from CDOT and re-submit.
- b. Upon CDOT receipt and Acceptance of revisions to the Project Schedule, it shall become part of the Contract Documents. Payment to the Contractor shall be withheld until such schedule, satisfactory in form and substance to CDOT, has been Accepted.

Subsection 108.03 (c) (3) Schedule Updates shall include the following:

A Monthly Progress Schedule shall accompany the monthly Application for Payment, reflecting physical progress since previous month's submittal.

The Contractor shall submit one plotted copy of the Monthly Progress Schedule, at least 24 inches wide and long enough to show the full Time Scaled Logic Diagram, and the following columns: Task ID, Description, Duration, Total Slack, Percent Complete, Early Start and Finish, Late Start and Finish, Actual Start, and Actual Finish dates.

The Schedule Update shall show the actual status of all activities, including those in

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progress, completed, or not started, by the use of Actual start and Actual finish dates. For all Activities that have a Contractor remaining duration equal to zero days, the Activity shall be shown as 100% complete. Any percentage less than 100% shall have a remaining duration in whole 1 day increments. In addition, Activities having a remaining duration of zero cannot be claimed as less than 100% complete.

Actual Start and Finish dates shall not be automatically updated by default mechanisms that may be included in the CPM scheduling software system. Actual Start and Actual Finish dates on the CPM schedule shall match the dates of actual work accomplished in the field and not on projected completion dates.

Upon Engineer request, the Contractor shall provide a computer generated report using a recognized schedule comparison software listing ALL changes made between the previous schedule and current updated schedule. The report will identify the name of the previous schedule and name of the current schedule being compared.

The Contractor shall use and conform to the current Accepted Project Schedule.

REVISION OF SECTION 620
FIELD FACILITIES

Section 620 of the Standard Specifications is hereby revised for this project as follows:

Subsection 620.02 shall include the following:

Field Office (Special) for this project shall consist of a modular office trailer as follows:

- The Field Office (Special) shall provide a minimum floor space of 2000 square feet, six private offices, two bathrooms (men and women), open office space suitable for conducting meetings, and storage closet as described below.
- Water and Sewer Connections: The Contractor shall provide the field office with city water and sewer connections.
- Windows: Sufficient windows to provide for cross ventilation and locking. All windows shall have steel mesh installed for security.
- Doors: The closet door shall be of solid wood with dead bolt lock. The two outside doors shall be steel security with double cylinder (dual key) dead bolt locks.
- Reinforced decks and steps shall be installed at each outer door. ADA compliant access shall be provided at one exterior door.
- Desks: Twelve 72 Inch x 36 Inch desks with six drawers and a center pen drawer. The top of the desks shall be free of all scratches, chips, and dents.
- Furniture/Office Items to be included in Field Office (Special):
 - Twelve ergonomic padded adjustable chairs with rollers
 - Four 96 Inch x 36 Inch worktables
 - Twenty folding chairs
 - Two 72 Inch x 48 Inch cork bulletin boards
 - One 72 Inch x 36 Inch cork bulletin board
 - Two 36 Inch x 24 Inch cork bulletin boards
 - Six book cases, minimum 48 Inch high x 36 Inch wide x 24 Inch deep
 - Two four-drawer, legal size filing cabinets
 - Two dry erase writing boards 72 Inch x 48 Inch
 - Fire Extinguisher: Two 20# dry chemical

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- Water Supply: Drinking water, dispensed from an acceptable cooling device both hot and cold.
- Heating and Air Conditioning: Adequate capacity air conditioning and heating, connected to ducting and thermostat controlled. Filters to be supplied and changed by the Contractor.
- Electrical: A minimum of eighteen 4 FT double 40 watt tube fluorescent light fixtures located over desks and conference tables and twenty eight duplex outlets. One duplex outlet will be located in the closet. Circuit breaker box will be located in the closet in a safe, accessible location.
- Network (Ethernet Cat5) Outlets. Twenty eight outlets colocated with the electrical duplex outlets. These outlets will connect CDOT and consultant staff to the High Speed Internet described later in this section.
- Closet: 30 square feet with two shelves (minimum 12 Inch depth) fitted on each wall. The closet shall be equipped with closet light with switch, and duplex outlet(s) for powering the computer networking equipment described later in this section which shall be located in the closet.

As an alternative to providing a Field Office (Special) in accordance with this specification, suitable office space may be provided, if approved by CDOT.

The Contractor shall maintain all furnished equipment in good working condition and shall replace or repair any nonfunctional equipment within five Working Days.

Electrical Grounding:

Proper grounding is important to protect occupants using computer equipment and phones in the event of electrical storms and also for the protection of the equipment itself.

If the site will have more than one field trailer housing CDOT computers, the trailers shall set together and share a common electrical ground and allow computer cabling to be installed without spanning driveways.

The field office shall be equipped with a facsimile machine, copy machine, and telephone service and conform to the following:

In subsection 620.02, delete item (1) and replace with following:

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Facsimile Machine: The Contractor shall provide all details to CDOT for approval, prior to installation of the facsimile machine. The facsimile machine shall print on plain paper and shall be capable of sending documents of all sizes up to and including 11"x17". It must be able to perform sequential broadcast, polling and delayed transmissions with a minimum ten-page memory. The Contractor shall install and maintain the fax machine in the Engineer's field office. Should the fax machine require repair and be out of service for more than twenty-four hours, a replacement shall be provided and installed by contractor within twenty-four hours. The Contractor shall provide a roll around stand for the fax machine, including a stock of printer paper and toner.

In subsection 620.02, delete item (2) and replace with the following:

The Contractor shall provide a dry, desk top copy machine with a stationary platen, by a reputable manufacturer (such as Canon, Minolta, Panasonic, Ricoh, Toshiba, or equal), as approved by CDOT.

The copy machine shall be capable of making at least 15 copies per minute. Maximum size of original shall be 11" by 17" and a copy paper size shall be 5-1/2" by 8-1/2" to 11" by 17" with standard intermediate sizes and shall have an automated document feeder capable of feeding a stack of up to 25 originals ranging in size from 5-1/2" by 8-1/2" to 11" by 17". The copy machine shall have two standard paper cassettes accommodating paper sizes of 5-1/2" by 8-1/2" to 11" by 17". Each cassette shall accept 250 sheets for a total of 500 sheets of paper capacity. The copy machine shall have a single sheet bypass for manual copying onto special stock not in paper cassettes and shall be capable of using paper sizes of 5-1/2" by 8-1/2" to 11" by 17".

The copy machine shall have an automatic exposure control to automatically control exposure level for each original with a manual light/dark exposure control and shall be capable of copying original documents of both sheets and bound documents. The copy machine shall be capable of making 1 to 99 continuous copies and shall be capable of copying onto light weight paper of 16# or onto heavier paper of 32#. The copy machine shall be capable of zoom magnification/reduction from 70% to 150% in 1% increments. The copy machine shall have sorting capabilities. A plastic dust cover for the copy machine shall be provided.

The Contractor shall provide paper, supplies, parts, and repairs for the copy machine. Additional toner cartridges for the copier shall be provided and replaced by the Contractor as required and directed by CDOT.

The Contractor shall also provide a roll-around stand for the copy machine.

Copy/Fax/Scanner/Network Printer units that create PDF files and rely on connectivity across the CDOT IP network violate CDOT cyber security policies and are not permitted to be installed on the CDOT network.

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REVISION OF SECTION 620
FIELD FACILITIES

In subsection 620.02, delete item (3) and replace with the following:

Telephones & Cabling:

Telephone lines shall be of type full business (1FB).

Three lines shall be provided as described below. In addition, the Contractor shall provide up to ten cellular phones for use by CDOT within 15 Days following NTP1 until 45 calendar days after Final Acceptance.

Of the type full business (1FB) lines:

One line shall be dedicated for the facsimile machine and shall be located in the office trailer. If DSL is available, this line will also carry the single High Speed DSL line (see High Speed Internet section below for more information). When ordering the DSL, specify that it is to be located on the fax 1FB.

One line shall serve as the office phone and shall be located in the field office.

One line shall serve as the field laboratory phone and shall be located in the lab.

Order phone lines through the Telco provider's (Qwest, CenturyTel, etc.) business office to optimize cost efficiencies with regard to basic, local and long distance plans and charges.

All phones shall be speakerphones.

At the discretion of CDOT and dependent on the number of phone circuits installed, the type of phones may be of the multi-line type to fully utilize the phone service.

Cabling of phones shall be industry standard.

Labeling shall be completed on all wall jacks, ports, and phones with the actual phone numbers. This cabling shall be performed by the Telco or other certified technicians, past the demark to the wall jacks. The phone wall jacks will be located by CDOT.

The Contractor shall be responsible for maintaining all phones and circuits in good operating condition at all times during this project.

High Speed Internet:

Note: The contractor shall contact the CDOT Regional Network Analyst (Mike Vencius 719-546-5737) for the most recent specifications of required network equipment (see Network Equipment section below) and of high-speed provider restrictions and limitations.

The contractor shall provide the field location with a high-speed internet connection and equipment. Important note: High Speed Internet access can be difficult to achieve in rural areas. It is strongly recommended that site selection for the trailer be made with

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consideration of the availability of High Speed Internet access. If none is available, CDOT shall be notified immediately in case site relocation is necessary.

The preferred type of High Speed Connection shall be DSL type. The throughput shall be a minimum of 1.5 Mbps download /896 Kbps upload or better speed. IP addressing shall be DHCP.

If DSL is not available, Cable or wDSL (Wireless DSL) may suffice if above specified throughput speeds are achieved and approved by CDOT.

Satellite type broadband and cellular Aircards ARE NOT acceptable internet connection methods.

A UPS (battery Backup) with a minimum rating of 750va (volt amp) shall be provided to protect the DSL router and other network equipment.

Network Equipment:

If there are multiple trailers or buildings on at the field location, the Contractor shall provide the cabling and surge suppression equipment necessary.

The contractor shall also provide additional equipment needed for CDOT network security. Note that this equipment is in addition to the DSL modem provided by the internet provider.

If CDOT computers will reside in more than one trailer, as with a field laboratory, then fiber and transceivers, or cat 5e copper cabling with surge suppressors will need to be purchased and installed as per CDOT IT. Contact the CDOT Regional Network Analyst for current specifications for this network equipment. Procuring this equipment may take time, so haste in contacting the CDOT Regional Network Analyst is recommended. It is not unusual for this equipment to take over a month to procure due to back orders.

If Cisco network equipment is deemed required by CDOT IT, then the current cost of this specialized equipment is approximately \$800.00 to \$1300.00 depending on site requirements. If Cisco equipment is not needed, the cost will be determined on whether additional buildings need to be connected. The cost then may range from \$100 to \$500. If No Cisco equipment is needed and no additional buildings need to be connected and if Wifi is available, there may be no additional cost for Network Equipment.

Important Cyber Security issue: At project conclusion, all network equipment shall be returned to the CDOT Regional Network Analyst for removal of CDOT confidential data and network configuration.

Computer Accessories: CDOT has restrictions and limitations with regard to the type of equipment permitted to be connected and supported on its computers and network. Due to the constantly changing nature of the computer field, contact the CDOT Regional

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Network Analyst for the latest recommendations and cautions before purchasing any requested equipment such as printers, scanners, cameras, etc.

It is imperative that any accessories be compatible with the CDOT standard computer operating system: **Windows 7 64 bit**.

Warning: Some devices will only work on Windows 32 bit and not the required 64 bit version,

All equipment shall be new with warranties.

Miscellaneous Equipment: The Contractor shall provide and maintain:

One HP Color Laserjet 5550n printer capable of printing 11" x 17" or equivalent HP product, as approved by CDOT. The printer shall have two standard paper cassettes accommodating paper sizes of 5-1/2" by 8-1/2" to 11" by 17". Each cassette shall accept 250 sheets for a total of 500 sheets of paper capacity.

Four Canon Powershot SX150 IS (with 4GB SD card) digital cameras capable of recording HD video or equivalent.

One Epson GT-20000 Flatbed Scanner capable of color scanning 11" x 17" or equivalent.

One laptop computer, 15.6 Inch screen, Windows 7 64bit, i7 processor, 750GB hard drive, to connect with HP Color Laserjet 5550n printer and/or copy machine. The Contractor shall provide the latest antivirus/malware software for use on this computer.

Contractor shall provide and maintain stock of printer paper and toner for provided printer.

All equipment listed under miscellaneous will be returned to the Contractor at end of the project.

Subsection 620.06 shall include the following:

The Field Office and Field Laboratory shall be provided with all-weather surfacing and all-weather access, and a securely fenced and lighted yard with adequate area to accommodate state and consultant vehicles and state employee parking (minimum twelve vehicles). The location of the field facilities shall be approved by CDOT. Acceptable all-weather surfacing shall be concrete or asphalt paving, and shall be approved by CDOT. The yard in which field facilities are located shall be fenced with a

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permanent 72” chain-link fence, and must be fenced separately from the Contractor’s field office and yard.

The Field Office (Special) shall be for the exclusive use of Department and Consultant personnel.

Field facilities shall be fully functional for CDOT’s use from NTP1 until 45 calendar days after Final Acceptance or until CDOT requests removal in writing, whichever time is less.

Subsection 620.07 shall include the following:

The Contractor shall provide cleaning service on a weekly basis for both the Field Office (Special) and Field Lab (Class 2).

The Contractor shall provide CDOT with a Security System for the Field Office (Special) and Field Lab (Class 2). This system shall be monitored 24 hours per day and shall include Police and CDOT employee notification. The Contractor shall install and maintain the system and pay all monthly service fees. The Security System and Insurance shall be provided at all times that the Office and Lab are on the project.

The Contractor shall provide insurance for full replacement of all contents of the Field Office (Special) and Field Laboratory (Class 2) due to theft, fire, or any other cause. Proof of insurance shall be provided to CDOT (coverage amount shall be a minimum of \$100,000). The Contractor shall replace all equipment damaged or stolen within seven Days. If loss or damage is caused by CDOT personnel, the Contractor shall replace the facilities within seven Days, except that CDOT shall be responsible for costs incurred. Insurance shall be provided at all times that the office or laboratory is on the project.

Subsection 620.08 shall include the following:

All costs included in this specification, as well as all incidental costs, to include water and sewer connection, shall be included in the original contract price for the pay items listed below.