

Administration

The Contractor has the responsibility for management and performance of the Work. CDOT shall have the right to visit the Site and observe the Work for the purposes of determining whether the Work is proceeding in conformance with the requirements of the Contract Documents.

Scope Management

Work Breakdown Structure (WBS)

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

The following Table, as well as Exhibit A (Work Breakdown Structure) represents Levels I-VI, the minimum levels of the WBS that all cost and schedule information shall roll-up. However, further detail may be provided by the Contractor for Levels V and VI to ensure a clear understanding of the Contract. The Contractor shall submit its Preliminary Baseline Schedule broken down to the WBS level V 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 shall conform to the following levels:

TABLE

Level I:	DESIGN-BUILD PROGRAM
<u>Program Level – CDOT use only: The summary of all program components</u>	
Level II:	MAJOR PROGRAM ELEMENTS
<u>Major Program Elements:</u>	
<ul style="list-style-type: none"> □ Breakdown of all major program elements (i.e., Right-of-Way Acquisition, Procurement, Construction, Design/Build Contract, etc.) 	
Level III:	CONTRACT COMPONENTS
<u>Design/Build Contract Components: (this is the Contractor's highest level)</u>	
<ul style="list-style-type: none"> □ Breakdown of Major Components of the Contract: <ul style="list-style-type: none"> • Project Management • Utilities • Design • Geotechnical and Pavements • Earthwork • Drainage • Bridges and Minor Structures • Walls • Environmental Management • Signing, Pavement Marking, Signals, Lighting, ITS • Maintenance of Traffic • Maintenance During Construction 	
Level IV:	CONTRACT SUBCOMPONENTS
<u>Design-Build Contract Subcomponents:</u>	
<ul style="list-style-type: none"> □ Breakdown of all major subcomponents of the Contract □ The Contractor to define certain Activities at this level (work areas) □ Basis for Price Proposal 	
Level V:	CONTRACT SUBCOMPONENTS AND WORK ACTIVITIES
<u>Breakdown of the Contract Sub-components and Work Activities:</u>	
<ul style="list-style-type: none"> □ Minor subcomponents (bridge substructures & superstructures, etc.) □ The Contractor to define certain Activities at this level (work areas, phases, etc.) □ Basis for progress payments 	
<u>Schedules - The following CPM schedules shall be cost loaded to this level:</u>	
<ul style="list-style-type: none"> □ Preliminary Baseline Schedule □ Original Baseline Schedule (or Revised Baseline Schedule, if applicable) □ Current Baseline Schedule □ Monthly Progress Schedule □ 	

Level VI:	WORK SUB-ACTIVITIES
<u>Breakdown defined by the Contractor:</u>	
<input type="checkbox"/> The Contractor to define all Activities at this level	
<u>Schedules</u> - No specific Contract schedules are required at this level. However, level VI Activities are required as a component of the Monthly Progress Schedule.	

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 Approved Original Baseline Schedule, the Current Baseline Schedule or the Approved Revised Baseline Schedule, if applicable, for determining the Monthly Progress Schedule. The Accepted Monthly Progress Schedule will determine the amount of the Contractor’s progress payments. Percent complete shall be calculated using project scheduling software meeting the requirements of this section, where progress is measured based on percent complete/Days remaining.

Partial payment for stored materials shall only be made as allowed in the Contract. The Contractor’s invoice shall not include a request for payment for Nonconforming Work documented by the Contractor’s Quality Manager or CDOT.

The payment to the Contractor will be in the amount shown on the Contractor’s Approved invoice less retainage and any deductions.

Invoice Submittals

The Contractor shall submit invoices to CDOT each month. Each monthly invoice shall be submitted in draft form for review within three Working Days following prior month’s end. Draft invoice submittals shall include one paper copy (color) and one electronic copy (CD).

The Contractor shall submit to CDOT for Approval each final monthly invoice within three Working Days of each progress status meeting. Final invoice submittals shall include one paper copy (color) and one electronic copy (CD).

Invoice Content

Invoice Documents

The requirements for the supporting documents to be included with the invoice form shall be finalized by the Contractor in consultation with CDOT within twenty Working Days after the first NTP. The Contractor shall provide an invoice format in compliance

with the criteria outlined below. Once the invoice format has been Approved by CDOT, the format shall not change unless subsequently Approved by CDOT.

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 segment. The breakdown is required because retainage will be calculated and withheld on each Work segment, and partially released upon achievement of Segment Completion of each Work segment.
- E. Nonconforming Work and amount withheld identified
- F. Authorized signature and title of signatory.
- G. Date that invoice was signed.

2. Monthly Progress Report.

The monthly progress report shall include the following:

- A. Brief narrative description of Activity and progress for each Work segment and the Project as a whole, including design and construction. Identify start date and completion dates on Work segment(s), areas, and Activities.
- B. Update of progress with respect to Utilities.
- C. Identify any Completion Deadlines achieved during the period.
- D. Summary of quality program efforts, including result of design reviews.
- E. Identify problems/issues that arose during the period and remaining issues to be resolved.
- F. Summarize resolution of problems/issues raised in previous monthly progress reports or resolved during the period.
- G. Summary of Project accidents (frequency and severity) and corrective actions taken.
- H. Identify critical schedule issues and proposed resolution.
- I. Discuss schedule variations from Milestone Completion Deadlines that have slipped or improved.
- J. Identify requested and/or required CDOT actions for the next period.

The format and detail level required for submittal of the monthly progress report shall be established by CDOT, in consultation with the Contractor within twenty Working Days after NTP. The monthly progress report shall be on Contractor letterhead in 8-1/2 inch by 11 inch format.

3. Updated Monthly Progress Schedule.

No invoice shall be Approved nor payment made if there is not a current Accepted Monthly Progress Schedule and Current Baseline 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 Working 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. If the Contractor does not agree with CDOT's comments, the Contractor shall provide written notice of disagreement within five Working Days from the receipt of the comments. The items in disagreement shall be resolved in a meeting held for that purpose, if necessary.

4. Monthly Report of Personnel Hours.

The Contractor shall report the total monthly labor hours for construction, maintenance, and non-construction personnel by classification of management, engineering, and other technical personnel used on the Project.

5. Certification by Contractor's Quality Manager.

The Contractor shall submit a certificate signed by its quality manager certifying that:

- A. All Contract Work, including that of designers, Subcontractors, Suppliers, and fabricators has been checked and/or inspected by the Contractor's quality program staff and that all Work, except as specifically noted in the certification, conforms to the requirements of the Contract Documents.
- B. The Quality Management Plan, and all of the measures and procedures provided therein, are functioning properly and are being followed.

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

Progress Status Meetings

The Contractor shall schedule and hold a progress status meeting approximately eight Working Days following prior month's end or five Working Days after the receipt of the draft payment submittal, whichever occurs earliest. The progress status meeting shall address and finalize the following:

1. Actual start dates.

2. Actual and planned Completion Deadlines.
3. Earned value of Work that has been Accepted and reported in-place, based on installed quantities and stored materials.
4. Activity percent complete.
5. Incorporation of Approved Change Orders.
6. Verification of Unit Price items, if any.
7. Interest incurred.
8. Status of outstanding Nonconforming Work and Warranties.
9. Completion of Value Engineering Change Proposals.
10. Work performance.
11. Critical Path(s) and analysis of potential performance areas.

Following the progress status meeting, and upon Approval of the final monthly invoice, payment shall be issued within seven Working Days.

Schedule Management

General

The Work specified in this subsection includes preparing, progressing, revising, and submitting of Contract Schedules.

The Contract Schedules shall represent a practical plan to complete the Work within the Completion Deadlines and convey the intent in the manner of the prosecution and progress of the Work.

The Contract Schedules shall include the planned execution of the Work in accordance with the Contract Documents. The Contract Schedules shall include involvement and coordination with other contractors, Utility Owners, Governmental Persons, engineers, architects, Subcontractors, and suppliers in the development of the Original Baseline Schedule, Revised Baseline Schedule, and updating of subsequent Monthly Progress Schedules.

The Contract Schedules shall represent the requirements of the Contract Documents and the Work shall be executed in the sequence and duration indicated in the Contract Schedules.

All Contract Schedule submittals are subject to review, Acceptance and/or Approval by CDOT.

All Contract Schedules shall be developed consistent with the Accepted WBS and the Completion Deadlines.

Schedule and Term Definitions

Contract Schedules

Contract Schedules shall include the Preliminary Baseline Schedule, Original Baseline Schedule, Current Baseline Schedule, Revised Baseline Schedule, Monthly Progress Schedule, Recovery Schedule, and the As-Built Schedule.

1. Preliminary Baseline Schedule

The Preliminary Baseline 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 three months following NTP and shall be cost loaded to WBS Level V. The Preliminary Baseline Schedule shall conform to the Accepted WBS and include all Contractor defined WBS Level IV and V Activities.

2. Original Baseline Schedule

The Original Baseline Schedule is defined as the Contractor's original plan for the Project from NTP 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 Original Baseline Schedule shall be developed from the Preliminary Baseline Schedule and shall conform to the Accepted WBS and include all Contractor defined WBS Level IV and V Activities. The Original Baseline Schedule shall not change after Approval.

The Original Baseline 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.

3. Current Baseline Schedule

The Current Baseline Schedule is defined as the Original Baseline Schedule with cost and schedule changes from Approved Change Orders and Work Orders incorporated. It shall be updated monthly with only Approved cost and schedule changes. This schedule will not show progress but shall maintain the original data date from the Original baseline Schedule as a baseline. The Current

Baseline Schedule shall be submitted to CDOT for Acceptance with each monthly invoice.

The Current Baseline 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.

4. Revised Baseline Schedule

The Revised Baseline Schedule is defined as the Contractor's plan for the Project which is current with progress to date. This schedule shall reflect the planned execution of the Work for the remainder of the Project along with a respread of the remaining resources and quantities to represent the estimate to complete. The Revised Baseline Schedule shall include all Approved Change Orders, Work Orders, and Completion Deadlines. A Revised Baseline Schedule must be Approved by CDOT; such Approval shall only apply to the scheduled Work that is planned after the schedule's data date.

The Revised Baseline Schedule shall be prepared by the Contractor when requested by CDOT. The Contractor may request that CDOT review a Revised Baseline Schedule at any time. However, such review will be undertaken if CDOT agrees with the need for that review.

The Revised Baseline 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.

5. Monthly Progress Schedule

The Approved Original Baseline Schedule, Current Baseline Schedule or the Revised Baseline Schedule if one has been Approved, 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.

6. Float

Float is defined as the amount of time between the early start date and the late start date, or the early finish date and the late finish date, for each and every Activity in the schedule. Float shall be for the benefit of all parties to the Contract and not for the exclusive benefit of the Contractor. Suppression or consumption of Float by extended Activity duration, dummy Activities, or preferential sequencing shall not be allowed. Critical Activities shall be defined as Activities with a total Float less than ten Days.

Schedule and Software Requirements

1. Scheduling Software

Scheduling software shall be in conformance with Section 108.03(c) of the Standard Specifications for Road and Bridge Construction.

2. General Scheduling Constraints

- A. All Contract Schedules shall be in the same master data file, including: design, submittals, procurement, and construction schedules. These Work Activity schedules shall all tie together logically to present a total Critical Path analysis in the same master data file.
- B. The only constraints allowed to be included in the schedule are the Contract Deadlines. No intermediate completion constraints or start constraints shall be allowed unless they are included in the Contract. Unless Approved by CDOT, all Activities must have at least one predecessor and one successor, except for the first NTP (no predecessor) and Project Acceptance (no successor).
- C. All Activities that start or complete out of sequence shall be re-scheduled (logic corrected) to reflect the actual sequence of events.
- D. Actual start and completion dates shall be accurately input. Prior to changing or correcting any previous actual dates identified in the Contract schedules, a narrative shall be written to CDOT requesting Approval to change such a date.
- E. If any logic is changed after the Approval of the Original Baseline Schedule or Revised Baseline Schedule, if one exists, a narrative by Activity code shall accompany the Monthly Progress Schedule stating the reason the logic changed and the benefit to CDOT. If CDOT does not agree with the reason for the logic change, the Monthly Progress Schedule will not be Accepted.
- F. All Activity identification codes for a specific Activity description created in any Contract Schedule shall remain unchanged and connected to its original Activity description through Final Acceptance. An Activity

description may only be changed to clarify an Activity's original scope.

3. 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.
- C. The CPM shall be sufficiently detailed to accurately depict all the Work. Activity durations shall be an estimate in Working Days of the time required to perform each Activity. No individual Activity will have a duration exceeding 30 Working Days. Activities with durations of less than five Working Days shall be held to the absolute minimum. For an equipment or material fabrication item whose duration exceeds 30 Working Days, several Activities, none exceeding 30 Working Days, shall be used. Each Activity shall have a detailed description.
- D. Contract Completion Deadline dates shall be shown on the CPM. These dates shall be input as finish constraint dates and shall agree with such dates specified in the Contract.

4. Schedule Output Format

The Contractor shall submit Contract Schedules, charts, and graphs in Adobe PDF format on CD along with the monthly progress reports. Contract Schedules shall also be submitted on printouts on 11-inch by 17-inch color, portrait format unless otherwise required herein or as requested by CDOT.

Execution

WBS Activities and Schedule Modifications

When it becomes necessary to add, combine, eliminate or modify Contract specified WBS Level IV or V Activities to reflect modifications to the Work, such changes shall be made through a Change Order that has been Approved by CDOT in accordance with the Contract and consequently reflected in subsequent schedule submittals. Alternately, if a proposed addition, combination, elimination, or modification of WBS Level IV or V Activities would not be the subject of a Change Order, then the consequent realignment of funds between Level V schedule Activities may be Approved by CDOT in accordance with the Contract and thereafter reflected in the required schedule submittals.

Preliminary Baseline Schedule

The Contractor shall submit the Preliminary Baseline Schedule to CDOT for Acceptance within fifteen Working Days following NTP. The Preliminary Baseline Schedule shall be in accordance with the Contract requirements at the time of the NTP, consistent with the Accepted WBS, and be cost loaded to WBS Level V Activities for the first six months following NTP. The breakdown of Activities to WBS Level V shall be in accordance with the Accepted WBS and include Contractor defined detail necessary to provide measurable schedule progress. The Accepted Preliminary Baseline Schedule shall provide an intermediate schedule during the production of the Original Baseline Schedule and shall establish a payment schedule for the first six months following NTP.

Original Baseline Schedule

The Original Baseline Schedule shall show the sequence and interdependence of Activities required for complete performance of the Work beginning with the date of NTP, and concluding with the date of Final Acceptance and shall comply with the following:

1. The actual number of Activities in the schedule shall be sufficient to assure adequate planning of the Work and to permit monitoring and evaluation of progress and the analysis of time impacts. Activity durations shall be expressed in Working Days. The Work calendar shall clearly identify Holidays and other non-Working Days as well as special events as described herein.
2. The Contractor shall schedule deliverables made for review by CDOT in a manner that distributes reviews across time to avoid concentration of review work in any one discipline. Each review shall be shown separately and logically tied to the appropriate Activity on the schedule.
3. Provide a graphic representation of all Activities necessary to complete the Work.

4. Identify all Work Activities that are critical in ensuring the timely achievement of Completion Deadlines.
5. Identify all associated dates with respect to the work of other project contractors that are critical in ensuring the timely, orderly, and efficient completion of the Work.
6. Identify all Completion Deadlines set forth in the Contract.

Not later than 90 Days after issuance of NTP, the Contractor shall submit to CDOT for Approval the final Original Baseline Schedule. Once Approved, this schedule shall become the Original Baseline Schedule against which all progress and revisions shall be measured.

The Original Baseline Schedule will be reviewed by CDOT for purposes of determining:

1. Compliance with applicable provisions of the Contract Documents; and
2. The logic of the proposed CPM Schedule is sound and consistently developed and demonstrates a logical sequencing and interdependence of Activities required for the timely and orderly achievement of all Work Activities and Milestones and segments, including completion of the Work within the Completion Deadlines.

Upon Approval by CDOT, the Original Baseline Schedule shall be employed as the basis for the Monthly Progress Schedule by the Contractor in its scheduling and performance of the Work.

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.
2. Procurement, fabrication, preparation of mock-ups and prototypes, delivery, installation, and testing of materials and equipment, including factory testing and

demonstration testing, and any long lead time (over 90 Days) orders for material and equipment.

3. Interface coordination and dependencies with proceeding, concurrent, and follow on contractors.
4. Work to be performed by other contractors and agencies that may affect the schedule.

Prior to the progress status meeting, the Contractor shall obtain from the design team, Subcontractors, suppliers, and field staff the necessary information as required to accurately reflect progress to date.

Recovery Schedule

If the Work is lagging the late start cost curve in the Current Baseline Schedule for a period which exceeds the greater of (a) fifteen Days in the aggregate or (b) that number of Days in the aggregate which equals 5% of the days remaining until the Project Completion Deadline, then the Contractor, within fourteen Days after Contractor first becomes aware of such schedule delay, shall prepare and submit to CDOT for review and Approval a Recovery Schedule demonstrating the Contractors program and proposed plan to regain lost schedule progress and to achieve Project Completion and Final Acceptance of the Project by the deadlines specified in Exhibit B of the Contract. CDOT will notify the Contractor within fourteen Days after receipt of each such Recovery Schedule whether the schedule is Approved or describing changes which CDOT believes should be made to the schedule. The Contractor shall incorporate and fully include the Recovery Schedule (including CDOT's comments) into the next scheduled Monthly Progress Schedule (or, if the next scheduled Monthly Progress Schedule is due within seven Days of Approval of the Recovery Schedule, then the Recovery Schedule shall be incorporated into the subsequent Monthly Progress Schedule), and shall concurrently provide to CDOT a Revised Baseline Schedule.

Document Management

The Contractor shall establish and maintain its own Document Control System (DCS) to store and record the large quantity of correspondence, drawings, progress reports, technical reports, specifications, Contract Documents, deliverables, calculations, and administrative documents generated under the Contract. Document Control, storage, and retrieval methods shall include the use of both hard copies and electronic records. The Contractor's DCS shall handle all Project documents.

All correspondence of the Contractor to and from CDOT and its representatives with respect to the Contract shall be serialized, and the Contractor shall maintain separate incoming and outgoing correspondence logs. At a minimum, a serialization similar to the following is required:

Computer and Network Requirements

See attached Project Special Provision Revision of Section 620 Field Facilities.

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 NTP. 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 NTP.
Invoice Format	Approval	Within 20 Days of First NTP.
Draft monthly invoices	Acceptance	Within three Working Days following prior month's end
Final monthly invoices	Approval	Within three Working Days following progress status meeting
Monthly invoice format changes	Approval	At least fifteen Days prior to first invoice
Preliminary Baseline Schedule	Acceptance	Within fifteen Working Days following NTP
Original Baseline Schedule	Approval	Within 45 Days following NTP
Current Baseline Schedule	Acceptance	(same as monthly invoices)
Revised Baseline Schedule	Approval	Upon CDOT's or Contactor's request
Monthly Progress Schedule	Acceptance	(same as monthly invoices)
Project directory	(none)	Within 30 Days of NTP

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

**PROJECT SPECIAL PROVISIONS
REVISION OF SECTION 620
FIELD FACILITIES**

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 two field trailers, where one Trailer will serve as the office and the other will serve as the lab, the two trailers will set together and share a common electrical ground so computer cabling can installed without spanning driveways.

Telephones & Cabling:

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

The number of line to be determined by the CDOT project Manager.

Of these lines:

One line will be dedicated for the facsimile machine and is to 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 for more information). When ordering the DSL, specify that it is to be located on the fax 1FB.

One line will serve the office phone and will be located in the office trailer.

If a Lab trailer exists, one line will serve the Lab 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 will be speakerphones.

At the discretion of the CDOT project Manager 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 must be industry standard.

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

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

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**REVISION OF SECTION 620
FIELD FACILITIES**

High Speed Internet:

Note: The contractor shall contact CDOT Regional Network Analyst (Mike Vencius 719-546-5737) for 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 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 consideration of the availability of High Speed Internet access. If none is available, the CDOT project manager will be notified immediately in case site relocation is necessary.

The type of High Speed Connection shall preferably be of 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.

As a last resort Aircards for each computer perhaps augmented with a cellular signal booster equipment may suffice.

Note that satellite type broadband will NOT work for CDOT purposes.

Network Equipment:

If there are multiple trailers or buildings on site the contractor will need to provide the cabling and surge suppression equipment necessary. The cost could be as low as under \$100 or as High as \$800 depending on the situation.

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 MAT lab, then fiber will need to 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.

Contact CDOT Regional Network Analyst (Mike Vencius 719-546-5737).

Note current cost of this specialized equipment is approximately \$800.00 to \$1300.00 depending on site requirements.

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**REVISION OF SECTION 620
FIELD FACILITIES**

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

Facsimile Machine: The Project Engineer must approve this 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 is to be provided and installed by contractor within twenty-four hours. The Contractor shall provide a roll around stand for the fax machine paper and supplies.

Contractor will provide and maintain stock of printer paper and toner.

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

For Example: 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.

All printers and copiers shall be able to produce 11x17 copies and prints.

All equipment is to be new with warranties.

Contractor will provide and maintain stock of printer paper and toner for any provided printers, scanners, and fax machines.