



STATE OF CONNECTICUT
DEPARTMENT OF TRANSPORTATION



2800 BERLIN TURNPIKE, P.O. BOX 317546
NEWINGTON, CONNECTICUT 06131-7546
Phone: (860) 594-3129

Subject: Project No. 63-643 & 93-180
F.A.P. No. TBD
Hartford: New Britain – Hartford Busway.

July 8, 2011


NOTICE TO CONTRACTORS:

This is to notify all concerned and especially the prospective bidders that the bid opening for the subject project was previously postponed to July 20, 2011 at 2:00 P.M. in the Conference Room of the Department of Transportation Administration Building, 2800 Berlin Turnpike, Newington, Connecticut.

The Department has established a general mailbox to receive contractor questions. Please send all future questions to DOTContracts@ct.gov.

Addendum No. 2 is attached

This Addendum is necessary to add, revise and delete Special Provisions, Contract Items, Plan Sheets and to answer questions on the subject project.


For: Gregory D. Straka
Contracts Manager
Division of Contracts Administration

JULY 5, 2011
NEW BRITAIN – HARTFORD BUSWAY
FEDERAL AID PROJECT NOS. 7063(009) & CT – T.B.D.
STATE PROJECT NOS. 63-643 & 93-180
TOWNS OF HARTFORD, WEST HARTFORD, AND NEWINGTON

ADDENDUM NO. 2

SPECIAL PROVISIONS
NEW SPECIAL PROVISIONS

The following Special Provisions are hereby added to the Contract:

- ITEM NO. 0924004A – CONCRETE DRIVEWAY RAMPS
- ITEM NO. 0950040A – CONSERVATION SEEDING FOR SLOPES

REVISED SPECIAL PROVISIONS

The following Special Provisions are hereby deleted in their entirety and replaced with the attached like-named Special Provisions:

- NOTICE TO CONTRACTOR – GENERAL PERMIT FOR STORMWATER DISCHARGE
- NOTICE TO CONTRACTOR – INVASIVE PLANT SPECIES
- NOTICE TO CONTRACTOR – CLEANING OF CATCH BASINS, PIPES, AND OUTLETS
- NOTICE TO CONTRACTOR – TIME WAITING PERIODS
- NOTICE TO CONTRACTOR – AMTRAK SPECIFICATIONS
- NOTICE TO CONTRACTOR – STAGING AND STORAGE AREAS
- ITEM NO. 0203321A – GEOTECHNICAL MONITORING AND TESTING
- ITEM NO. 0728020A – STONE BALLAST
- ITEM NO. 0914023A – ORNAMENTAL PICKET FENCE (6' HIGH) (STRUCTURE)
- ITEM NO. 0950043A – WETLAND GRASS ESTABLISHMENT
- ITEM NO. 0952051A – CONTROL AND REMOVAL OF INVASIVE VEGETATION
- ITEM NO. 0969064A – CONSTRUCTION FIELD OFFICE, LARGE

CONTRACT ITEMS**REVISED CONTRACT ITEMS**

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
0205004	ROCK IN TRENCH EXCAVATION 0' – 10' DEEP	628 C.Y.	712 C.Y.
0205005	TRENCH EXCAVATION 0' – 15' DEEP	12,855 C.Y.	13,155 C.Y.
0205006	ROCK IN TRENCH EXCAVATION 0' – 15' DEEP	315 C.Y.	355 C.Y.
0206004	DITCH EXCAVATION	21,735 C.Y.	21,480 C.Y.
0213013	GRANULAR FILL	6,572 C.Y.	6,576 C.Y.
0651001	BEDDING MATERIAL	2,760 C.Y.	2,775 C.Y.
0651015	24" R. C. PIPE	4,902 L.F.	5,026 L.F.
0703012	MODIFIED RIPRAP	4,304 C.Y.	4,312 C.Y.
0714026A	TEMPORARY SHEET PILING (RAILROAD)	107,089 S.F.	107,229 S.F.
0755010	GEOTEXTILE (SEPARATION – MEDIUM SURVIVABILITY)	17,800 S.Y.	19,050 S.Y.
0913021A	6' CHAIN LINK FENCE	17,177 L.F.	17,455 L.F.
0944002	FURNISHING AND PLACING TOPSOIL	17,075 S.Y.	18,325 S.Y.
0950005	TURF ESTABLISHMENT	40,253 S.Y.	41,503 S.Y.
0950038	EROSION CONTROL MATTING TYPE F	2,150 S.Y.	1,825 S.Y.

DELETED CONTRACT ITEMS

<u>ITEM NO.</u>	<u>DESCRIPTION</u>	<u>ORIGINAL QUANTITY</u>	<u>REVISED QUANTITY</u>
0507000	REMOVE CATCH BASIN	4 EA.	0 EA.
0507004	REMOVE CATCH BASIN/MANHOLE	21 EA.	0 EA.

PLANS

NEW PLANS

The following Plan Sheets are hereby added to the Contract:

VOLUME	SUBSET	SHEET NO.
1	2	01.02.005.A2
2	9	02.09.013-1.A2, 02.09.013-2.A2, 02.09.013-3.A2
3	3	03.03.007-1.A2, 03.03.007-2.A2
	4	03.04.003-1.A2
8	9	08.09.006-1.A2
17	5	17.05.002-1.A2
	12	17.12.002-1.A2
	20	17.20.002-1.A2, 17.20.002-2.A2

REVISED PLANS

The following Plan Sheets are hereby deleted and replaced with the like-numbered Plan Sheets:

VOLUME	SUBSET	SHEET NO.
1	8	01.08.003-1.A2, 01.08.018.A2, 01.02.030.A2, 01.08.032.A2
2	4	02.04.002.A2
3	3	03.03.001.A2, 03.03.002.A2, 03.03.003.A2, 03.03.004.A2
	4	03.04.001.A2
5	10	05.10.005.A2, 05.10.006.A2
	12	05.12.009.A2, 05.12.010.A2, 05.12.011.A2, 05.12.012.A2
7	2	07.02.035.A2, 07.02.036.A2
8	6	08.06.001.A2
	9	08.09.006.A2, 08.09.014.A2
	12	08.12.001.A2, 08.12.005.A2, 08.12.006.A2
	14	08.14.006.A2
	15	08.15.006.A2
10	2	10.02.076.A2
17	5	17.05.001.A2
	11	17.11.001.A2

	12	17.12.001.A2
	19	17.19.002.A2
19	2	19.02.005.A2, 19.02.006.A2, 19.02.009.A2, 19.02.010.A2, 19.02.011.A2, 19.02.012.A2, 19.02.013.A2, 19.02.023.A2
20	6	20.06.004.A2, 20.06.010.A2, 20.06.011.A2, 20.06.012.A2, 20.06.014.A2, 20.06.016.A2, 20.06.017.A2, 20.06.022.A2
	8	20.08.002.A2, 20.08.007.A2, 20.08.008.A2
	9	20.09.005.A2, 20.09.006.A2, 20.09.007.A2, 20.09.009.A2, 20.09.019.A2
	10	20.10.001.A2, 20.10.003.A2, 20.10.004.A2, 20.10.005.A2, 20.10.007.A2, 20.10.008.A2, 20.10.010.A2
21	8	21.08.002.A2
	13	21.13.005.A2
22	4	22.04.002.A2
	7	22.07.001.A2, 22.07.004.A2
	9	22.09.005.A2
	16	22.16.004.A2
23	4	23.04.001.A2
	5	23.05.002.A2
	12	23.12.004.A2
24	12	24.12.003.A2
25	13	25.13.004.A2
26	3	26.03.002.A2
	4	26.04.001.A2
	6	26.06.001.A2, 26.06.004.A2
	7	26.07.005.A2
	11	26.11.003.A2
27	12	27.12.004.A2

DELETED PLANS

The following Plan Sheets are hereby deleted in their entirety:

VOLUME	SUBSET	SHEET NO.
1	2	01.02.004.A1
17	5	17.05.002-1.A1

12	17.12.002
20	17.20.002

QUESTIONS & ANSWERS

Q. I am looking for the noise barrier details on the above referenced project. In the specification it states to look at the drawings and the drawings on-line (see attached) do not show any aesthetic details or requirements. What section should I download for these details? I have also looked at RW102 but could not find nb details.

A. The Special Provision for Item Nos. 0916111A – Noise Barrier Wall (Structure) and 0916126A - Noise Barrier Wall will be revised as part of a forthcoming addendum to provide the details required for this work. The Contract drawings depict the location and height of the proposed noise barrier walls.

Q. Provide the special provisions for items 0904906A - Metal Bridge Rail Protective Fence - Type A and 0904907A - Metal Bridge Rail Protective Fence - Type B. Both were not included in the initial bid package.

A. The Special Provision for Item Nos. 0904906A - Metal Bridge Rail Protective Fence – Type A and 0904907A - Metal Bridge Rail Protective Fence - Type B was inadvertently omitted from the Contract Documents and will be included in a forthcoming addendum.

Q. Details for electrical services appear on the following plan sheets
 ELE-005 21.13.005
 ELE-J04 22.16.004
 ELE-L04 23.12.004
 ELE-F03 24.12.003
 ELE-K04 25.13.004
 ELE-P03 26.11.003
 ELE-S04 27.12.004
 Can you please advise which bid items correspond to these services?

A. The referenced details are components of seven Major Lump Sum Items, as follows: Details contained on Sheet No. 21.13.005 correspond to Item No. 0947021A - Busway Station (Site No. 1), Cedar Street Station. Details contained on Sheet No. 22.16.004 correspond to Item No. 0947022A - Busway Station (Site No. 2) Newington Junction Station. Details contained on Sheet No. 23.12.004 correspond to Item No. 0947023A - Busway Station (Site No. 3) Elmwood Station. Details contained on Sheet No. 24.12.003 correspond to Item No. 0947024A – Busway Station (Site No. 4) Flatbush Avenue Station. Details contained on Sheet No. 25.13.004 correspond to Item No. 0947025A - Busway Station (Site No. 5) New Park Avenue Station. Details contained on Sheet No. 26.11.003 correspond to Item No. 0947026A - Busway Station (Site No. 6) Parkville

Station. Details contained on Sheet No. 27.12.004 correspond to Item No. 0947027A - Busway Station (Site No. 7) Sigourney Street Station.

- Q.** There is an electrical service detail on plan sheet MDS-06 01.09.006 entitled "Service entrance and cabinet Type I. As there is no Type I service in the bid items, please advise if this is supposed to be the Type V service, which is in the bid items.
- A.** The Type I item is no longer needed and will be deleted from the contract plans in a forthcoming addendum.
- Q.** Could you provide me with list of consultants on this project?
- A.** In accordance with Article 1.02.04 of Form 816, information and inquiries concerning any and all omissions, errors and/or discrepancies that are discovered within or among the plans, specifications, and bidding documents or the interpretation of contract documents, must be transmitted in writing to the manager of contracts, Connecticut Department of Transportation, P.O. Box 317546, Newington, Connecticut 06131-7546.
- Q.** Please advise where I can find Subset 14.15. It does not seem to be on your FTP site?
- A.** This subset is part of a forthcoming addendum.
- Q.** There is a fixture schedule on page MDS-EO1. Please advise which bid item these fixtures pertain to. Thanks?
- A.** This fixture schedule is a legend to describe components of seven Major Lump Sum Items, Item No. 0947021A - Busway Station (Site No. 1) Cedar Station, Item No. 0947022A - Busway Station (Site No. 2) Newington Junction Station, Item No. 0947023A - Busway Station (Site No. 3) Elmwood Station, Item No. 0947024A - Busway Station (Site No. 4) Flatbush Avenue Station, Item No. 0947025A - Busway Station (Site No. 5) New Park Avenue Station, Item No. 0947026A - Busway Station (Site No. 6) Parkville Station, and Item No. 0947027A - Busway Station (Site No. 7) Sigourney Station. Please refer to the electrical site illumination details and sheets (included within subsets 20.11, 21.13, 22.16, 23.12, 24.12, 25.13, 26.11 and 27.12) and Specification Section 260000 for specific information.

The Detailed Estimate Sheets do not reflect these changes.

The Bid Proposal Form has been revised to reflect these changes.

There will be no change in the number of calendar days due to this Addendum.

The foregoing is hereby made a part of the contract.

ITEM # 0924004A – CONCRETE DRIVEWAY RAMPS

Section 9.24 is amended as follows:

9.24.04—Method of Measurement: This work will be measured for payment as follows:

1. **Concrete Driveway Ramps:** This work will be measured for payment by the actual number of square yards of completed and accepted concrete driveway ramp.
2. **Excavation:** Excavation below the finished grade of each ramp, backfilling and disposal of surplus material will not be measured for payment; but the cost shall be included in the Contract price for Concrete Driveway Ramps. Excavation above the finished grade of each ramp will be classified and paid for in accordance with Section 2.02.
3. **Granular Fill Base:** This work will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway Ramps.
4. **Reinforcement:** This material will not be measured for payment, but the cost shall be included in the Contract price for Concrete Driveway Ramps.

9.24.05—Basis of Payment: This work will be paid for at the Contract unit price per square yard for "Concrete Driveway Ramps," complete in place, which price shall include all excavation as specified above, backfill, disposal of surplus materials, and all materials, equipment, tools and labor incidental thereto.

Pay Item	Pay Unit
Concrete Driveway Ramps	s.y.

ITEM #0950040A – CONSERVATION SEEDING FOR SLOPES

Description: The work included in this item shall consist of providing an accepted stand of established conservation grasses by furnishing and placing seed as shown on the environmental permit plates, construction plans, or as directed by an Environmental Scientist from the Connecticut Department of Transportation's Office of Environmental Planning (OEP) within the wetland creation areas, habitat enhancement areas, and/or designated environmentally sensitive areas. Seeding shall be applied to all constructed slopes associated with the created wetlands, and/or specific areas designated by OEP.

Materials: All approved seed mixtures shall be obtained in sufficient quantities to meet the pure live seed (PLS) application rates as required by the seed analysis of the mixture.

The Contractor shall submit the Form for Affidavit-Seed (Official Stationery of Supplier) for the proposed seed mix to the Engineer a minimum of 10-days prior to the seeding date for the area(s) in order to verify that the seed mix is compliant with the specification. The seed mixture shall be delivered to the project in sealed containers/bags and inspected by the Engineer prior to seeding the specified site. Application of fertilizer, where necessary, will be directed by the Environmental Scientist based on a soil analysis of the area to be seeded. The following mix shall be used for this item.

Conservation Mix (for slopes):

In order to preserve and enhance the diversity of native species, it is necessary that the source for seed mixtures used in created wetlands and/or designated environmentally sensitive areas be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland. One approved seed mixture is detailed. Other proposed mixtures must be submitted to OEP and approved by the Environmental Scientist prior to use. The materials certification for any proposed mixture that is different from that described below must be submitted a minimum of ten (10) days prior to delivery on site. This certification must match both the previously approved substitute mixture and the seed tags on the bags that are to be removed upon delivery. No seeding shall occur if all three items do not match.

<u>Pounds (lbs) of PLS per acre</u>	<u>Scientific Name</u>	<u>Common Name</u>
30	<i>Festuca rubra</i>	Creeping red fescue
20	<i>Lolium multiflorum</i>	Annual Rye-grass
15	<i>Panicum clandestinum</i>	Deer Tongue
10	<i>Chamaecrista fasciculata</i>	Partridge Pea
15	<i>Schizachyrium scoparium</i>	Little Bluestem
10	<i>Bouteloua curtipendula</i>	Side-oats Gramma-grass

Construction Methods: Construction Methods shall be those established as agronomically acceptable and feasible as determined by the OEP. Rate of application shall be 100 lbs PLS per

acre. Where seed is not obtained based on PLS quantities, the actual application rate of approved and delivered seed mixture will be determined by calculating the amount of PLS from the information provided on the seed tags at delivery. The PLS formula will be used to determine the desired application rate to obtain a stand of even seed growth for each seed type to be applied within the seeded area(s). The rate of application will be increased based on the actual percentage of PLS for each species delivered to the site so that each species is seeded at 100 % PLS. The PLS formula is as follows:

$$(\text{Germination Percentage} \times \text{Purity Percentage}) / 100 = \text{Percentage PLS}$$

The Engineer shall determine and verify the actual application rate based on the PLS formula for the areas to be seeded with conservation mix.

The seed shall be temporarily stabilized with hay or cellulose fiber mulch. The application rate for hay mulch and fiber mulch shall be 3500 lbs per acre. Unless directed by OEP, absolutely no mowing shall be conducted within the areas that are seeded with conservation mix.

With the exception of wetland creation sites, all areas to receive conservation seed mix shall be seeded during the spring, fall, or as directed by the OEP. Spring seeding must be performed between March 15th and June 15th. Fall seeding must be performed between August 15th and October 15th. Specifically for wetland creation sites, the area shall be seeded during the fall seeding season immediately following construction of the site in accordance with the Item # 0949007A – Wetland Creation. At the direction of the Environmental Scientist, partial seeding of a site may be required in order to stabilize slopes that are finished prior to completion of the entire creation site.

Method of Measurement: This work will be measured for payment by the number of square yards of surface area of accepted established conservation grasses as specified or by the number of square yards surface area of seeding actually covered and as specified.

Basis of Payment: This work will be paid for at the contract unit price per square yard for “Conservation Seeding for Slopes,” which price shall include all materials, maintenance, equipment, tools, labor, and work incidental thereto. Partial payment of up to 50% may be made for work completed, but not accepted. Full payment shall not be made until the area has been accepted by the Environmental Scientists.

Pay Item	Pay Unit
Conservation Seeding for Slopes	S.Y.

NOTICE TO CONTRACTOR - GENERAL PERMIT FOR STORMWATER DISCHARGE

This Notice is provided to summarize the requirements of the Connecticut Department of Environmental Protection's General Permit for the Discharge of Stormwater and Dewatering Wastewaters associated with Construction Activities (Permit) issued on April 9, 2010. When construction activities will result in the disturbance of a total of 1 acre or more of land regardless of phasing, the Connecticut Department of Transportation (Department) will incorporate a Stormwater Registration (Registration) and Stormwater Pollution Control Plan (SWPCP) as part of the Contract documents in order to insure compliance with all conditions of this Permit. The Permit's 'Construction activities' means activities including but not limited to clearing and grubbing, grading, excavation, and dewatering.

The Registration and SWPCP addresses pollution caused by soil erosion and sedimentation during construction as well as the long term post-maintenance use of the facility after construction is completed. The Contractor and all subcontractors will be required to sign a certified statement to comply with all applicable conditions of the Registration and SWPCP. There will be no additional payment for the Contractor to sign the certification statement and no additional payment for the Contractor to comply with the conditions of the Registration and SWPCP.

The District Engineer is responsible to sign the Registration and will be the permittee for all Department construction projects. For all local town/municipal projects, the District Engineer is not responsible to sign the Registration as the local town or municipality will be the signed permittee.

If the Contractor requires a modification to the SWPCP, it shall be in accordance with the 2002 Connecticut Guidelines for Soil Erosion and Sediment Control and the 2004 Connecticut Stormwater Quality Manual or as revised or amended. The Department shall approve or reject the modification to the SWPCP and notify the Contractor in writing as to any revisions or additional information required for approval within 30 days of the date of the Contractor's submission. No damage for delays will be granted to the Contractor based on time taken by the Department to review the Contractor's proposal, or to apply for or secure the Permit amendment, modification or revision as per Section 1.10 - Environmental Compliance, of the Standard Specifications for Roads, Bridges, and Incidental Construction Form 816 and any Supplements thereto. At no time shall the Contractor proceed with the proposed Permit amendment, modification, or revision unless the Engineer approves, in writing, the Contractor's request.

At a minimum, the Contractor along with qualified personnel (provided by the permittee) shall inspect the site for non stabilized areas, structural control measures, and locations where vehicles enter or exit the site at least once every seven calendar days and within twenty four hours of the end of a storm that is 0.1 inches or greater. If a potential source of pollution is identified, pollution preventive measures shall be implemented within twenty four hours and the SWPCP must be amended within three calendar days.

In order for the Contractor to meet the requirements set forth in the SWPCP, the Contractor shall comply with additional erosion and sedimentation control provisions included in the project.

Erosion and Sedimentation Control Provisions:

Unless specifically outlined in the Contract Plans and/or SWPCP, the Contractor is not allowed to disturb more than two (2) acres of erodible material per discharge point at any one time regardless of phasing. If the Contractor elects to deviate from the Contract Plans and/or SWPCP to disturb more than two (2) acres of erodible material per discharge point at any one time regardless of phasing, the Contractor must provide a sequenced staging plan outlining the proposed disturbed activities. In all cases, the Contractor must meet the following conditions:

- a. If the area of disturbance is maintained less than two (2) acres per discharge point, the Contractor may disturb additional areas if and only if the previously disturbed areas are temporarily or permanently stabilized using acceptable measures such as the standard controls which are provided in the SWPCP or as shown on the Contract Plans.
- If the construction activities create an area of disturbance to be at least two (2) acres per discharge point but no more than five (5) acres per discharge point, the Contractor must submit to the Engineer a revised SWPCP for review and approval. The SWPCP must include locations of the temporary sedimentation trap/temporary sedimentation basin per discharge point with a capacity to contain 134 cubic yards per acre of material. The Contractor shall design and construct the temporary sedimentation trap/temporary sedimentation basin in accordance with the 2002 Connecticut Guidelines for Soil and Sediment Control. The Contractor shall provide an inspection and maintenance plan for the temporary sedimentation trap/temporary sedimentation basin as part of the amended SWPCP.
- If the area of disturbance has a potential to reach more than five (5) acres per discharge point, the Contractor must submit to the Engineer a revised SWPCP for review and approval. The SWPCP must include locations of the engineered sedimentation basin per discharge point with a capacity to contain 134 cubic yards per acre of material. The Contractor shall design and construct the engineered sedimentation basin in accordance with the 2004 Connecticut Stormwater Quality Manual. The Contractor shall provide an inspection and maintenance plan for the engineered sedimentation basin as part of the amended SWPCP.

The permittee shall amend the SWPCP whenever there is a change in Contractors or subcontractors at the site, or a change in design, construction, operation, or maintenance at the site which has the potential for the discharge of pollutants. In all cases as described above, the amended SWPCP shall adhere to and comply with Section 1.10 - Environmental Compliance, of the Standard Specifications for Roads, Bridges and Incidental Construction Form 816 and any Supplements thereto. No additional payment will be made for any Permit amendment, modification, or revision which alters the Contract Plans, SWPCP, and/or estimated quantities as a result of the Department's approval of the modifications to the Contract by the Contractor. Changes or variations to the Contract Plans and/or SWPCP by the Contractor shall not result in any additional cost to the State.

NOTICE TO CONTRACTOR – INVASIVE PLANT SPECIES

Invasive Plant Species Not Permitted In the Wetland Mitigation Area: Only plant materials native and indigenous to the region shall be used within the Wetland Mitigation Areas. Species not specified in the Mitigation Plan shall not be used without written approval from the Connecticut Department of Transportation Office of Environmental Planning (OEP). Plant species on the following list and those detailed in Appendix D of the Army Corps of Engineers New England District Compensatory Mitigation Guidance shall not be used in and within 100 feet of the Mitigation Sites. All woody debris stockpiled in accordance with the special provision for "Clearing and Grubbing" must be free from the invasive species on the list.

a. Herbs:

<i>Aegopodium podagraria</i>	Goutweed or Bishop's weed
<i>Aira caryophylla</i>	Silver hairgrass
<i>Alliaria petiolata</i>	Garlic mustard
<i>Allium vineale</i>	Field garlic
<i>Ampelopsis brevipedunculata</i>	Porcelain berry
<i>Anthoxanthum odoratum</i>	Sweet vernal grass
<i>Anthriscus sylvestris</i>	Chervil
<i>Arctium minus</i>	Common burdock
<i>Asparagus officinalis</i>	Asparagus
<i>Barbarea vulgaris</i>	Yellow rocket
<i>Bassia scoparia (Kochia scoparia)</i>	Summer cypress
<i>Bromus tectorum</i>	Drooping brome-grass
<i>Butomus umbellatus</i>	Flowering rush
<i>Cabomba caroliniana</i>	Fanwort
<i>Callitriche stagnalis</i>	Water-starwort
<i>Calystegia sepium</i>	Japanese bindweed
<i>Cardamine impatiens</i>	Bushy rock-cress
<i>Cardamine pratensis</i>	Cuckoo-flower
<i>Carex kobomugi</i>	Japanese sedge
<i>Centaurea stoebe ssp. micranthos</i> (<i>C. biebersteinii</i>)	Spotted knapweed
<i>Chelidonium majus</i>	Celandine
<i>Cirsium arvense</i>	Canada-thistle
<i>Cirsium palustre</i>	Marsh thistle
<i>Commelina communis</i>	Asiatic day-flower
<i>Cynanchum louiseae (Vincetoxicum nigrum)</i>	Black swallow-wort
<i>Cynanchum rossicum (Vincetoxicum rossicum)</i>	Black swallow-wort
<i>Cyperus esculentus</i>	Yellow nutsedge
<i>Dactylis glomerata</i>	Orchard-grass
<i>Datura stramonium</i>	Jimsonweed
<i>Echinochloa crus-galli</i>	Barnyard grass

<i>Egeria densa</i>	Giant waterweed
<i>Eichhornia crassipes</i>	Water hyacinth
<i>Eleusine indica</i>	Goosegrass
<i>Elsholtzia ciliata</i>	Elsholtzia
<i>Elymus repens</i> (<i>Elytrigia repens</i>)	Quack-grass
<i>Epilobium hirsutum</i>	Hairy willow-herb
<i>Euphorbia cyparissias</i>	Cypress spurge
<i>Euphorbia esula</i>	Leafy spurge
<i>Fallopia baldschuanica</i>	
(<i>Polygonum baldschuanicum</i> , <i>P. aubertii</i>)	Silver lace-vine
<i>Fallopia japonica</i> (<i>Polygonum cuspidatum</i>)	Japanese knotweed
<i>Fallopia sachalinensis</i>	
(<i>Polygonum sachalinense</i>)	Giant knotweed
<i>Festuca trachyphylla</i> (<i>F. ovina</i> , <i>F. brevipila</i>)	Sheep fescue
<i>Ficaria verna</i> (<i>Ranunculus ficaria</i>)	Lesser celandine
<i>Froelichia gracilis</i>	Slender snake cotton
<i>Geranium ibericum</i>	Nepalese crane's-bill
<i>Geranium sibiricum</i>	Siberian crane's-bill
<i>Geranium thunbergii</i>	Thunberg's geranium
<i>Glaucium flavum</i>	Sea- or horned poppy
<i>Glechoma hederacea</i>	Gill-over-the-ground
<i>Glyceria maxima</i>	Sweet reedgrass
<i>Hemerocallis fulva</i>	Tiger-lily
<i>Heracleum mantegazzianum</i>	Giant hogweed
<i>Hesperis matronalis</i>	Dame's rocket
<i>Hydrilla verticillata</i>	Hydrilla
<i>Hydrocharis morsus-ranae</i>	European frog-bit
<i>Hylotelephium telephium</i> (<i>Sedum telephium</i>)	Live-forever or Orpine
<i>Hypericum perforatum</i>	St. John's wort
<i>Impatiens glandulifera</i>	Ornamental jewelweed
<i>Iris pseudacorus</i>	Yellow iris
<i>Lamium</i> spp. (all)	Dead nettle
<i>Lepidium latifolium</i>	Tall pepperwort
<i>Leptochloa panicea</i>	Hair fescue
<i>Lotus corniculatus</i>	Birdsfoot trefoil
<i>Luzula luzuloides</i>	Oakforest woodrush
<i>Lychnis flos-cuculi</i>	Ragged robin
<i>Lysimachia nummularia</i>	Moneywort
<i>Lysimachia vulgaris</i>	Garden loosestrife
<i>Lythrum salicaria</i>	Purple loosestrife
<i>Malva neglecta</i>	Cheeses or common malva
<i>Marsilea quadrifolia</i>	Water shamrock or Eurasian water clover
<i>Mentha arvensis</i>	Field-mint
<i>Microstegium vimineum</i>	Japanese stilt-grass
<i>Miscanthus sinensis</i>	Eulalia

<i>Myosotis scorpioides</i>	True forget-me-not
<i>Myosoton aquaticum</i>	Giant chickweed
<i>Myriophyllum aquaticum</i>	Parrot feather
<i>Myriophyllum heterophyllum</i>	Variable water-milfoil
<i>Myriophyllum spicatum</i>	Eurasian water-milfoil
<i>Najas minor</i>	Lesser naiad
<i>Nasturtium microphyllum</i> (<i>Rorippa microphylla</i>)	One-row yellow cress
<i>Nasturtium officinale</i> (<i>Rorippa nasturtium-aquaticum</i>)	Watercress
<i>Nymphoides peltata</i>	Yellow floating heart
<i>Onopordum acanthium</i>	Scotch thistle
<i>Ornithogalum umbellatum</i>	Star of Bethlehem
<i>Pastinaca sativa</i>	Wild parsnip
<i>Persicaria maculosa</i> (<i>Polygonum persicaria</i>)	Lady's thumb
<i>Persicaria perfoliata</i> (<i>Polygonum perfoliatum</i>)	Mile-a-minute vine
<i>Persicaria posumbu</i> (<i>Polygonum caespitosum</i>)	Cespitose knotweed
<i>Phalaris arundinacea</i>	Reed canary-grass
<i>Phragmites australis</i>	Reed grass, Phragmites
<i>Pistia stratiotes</i>	Water lettuce
<i>Poa compressa</i>	Canada bluegrass
<i>Poa pratensis</i>	Kentucky bluegrass
<i>Poa trivialis</i>	Rough bluegrass
<i>Potamogeton crispus</i>	Curly pondweed
<i>Puccinellia maritima</i> (<i>P. americana</i>)	Seaside alkali-grass
<i>Pueraria montana</i>	Kudzu
<i>Ranunculus repens</i>	Creeping buttercup
<i>Rorippa sylvestris</i>	Creeping yellow cress
<i>Rumex acetosella</i>	Sheep-sorrel
<i>Rumex obtusifolius</i>	Bitter dock
<i>Salvinia molesta</i>	Salvinia
<i>Securigera varia</i> (<i>Coronilla varia</i>)	Crown vetch
<i>Senecio jacobaea</i>	Tansy ragwort
<i>Setaria pumila</i> (<i>S. lutescens</i> , <i>S. glauca</i>)	Yellow foxtail or yellow bristlegrass
<i>Silphium perfoliatum</i>	Cup plant
<i>Solanum dulcamara</i>	Bittersweet nightshade
<i>Stellaria graminea</i>	Common stitchwort
<i>Tanacetum vulgare</i>	Tansy
<i>Thymus pulegioides</i>	Wild thyme
<i>Trapa natans</i>	Water-chestnut
<i>Tussilago farfara</i>	Coltsfoot
<i>Typha angustifolia</i>	Narrow-leaved cattail
<i>Typha latifolia</i> ²⁹	Common or Broad-leaved cattail
<i>Typha X glauca</i>	Hybrid cattail
<i>Valeriana officinalis</i>	Garden heliotrope

Verbascum thapsus
Veronica beccabunga
Xanthium strumarium

Common mullein
 European speedwell
 Common cocklebur

b. Woody Plants:

Acer ginnala
Acer platanoides
Acer pseudoplatanus
Actinidia arguta
Ailanthus altissima
Alnus glutinosa
Amorpha fruticosa
Berberis thunbergii
Berberis vulgaris
Catalpa speciosa
Celastrus orbiculatus
Cytisus scoparius
Elaeagnus angustifolia
Elaeagnus umbellata
Euonymus alata
Euonymus hederaceus (E. fortunei)
Frangula alnus (Rhamnus frangula)
Humulus japonicus
Hypericum prolificum
Ligustrum obtusifolium
Ligustrum ovalifolium
Ligustrum sinense
Ligustrum vulgare
Lonicera japonica
Lonicera maackii
Lonicera morrowii
Lonicera tatarica
Lonicera X bella
Lonicera xylosteum
Morus alba
Paulownia tomentosa
Phellodendron amurense (P. japonicum)
Populus alba
Rhamnus cathartica
Ribes rubrum (R. sativum)
Robinia pseudoacacia
Rosa multiflora
Rosa rugosa

Amur maple
 Norway maple
 Sycamore maple
 Kiwi vine
 Tree-of-heaven
 European alder
 False indigo
 Japanese barberry
 Common barberry
 Western catalpa
 Oriental bittersweet
 Scotch broom
 Russian olive
 Autumn olive
 Winged euonymus
 Climbing euonymus
 European buckthorn
 Japanese hops
 Shrubby St. John's wort
 Japanese privet
 California privet
 Chinese privet
 Common/hedge privet
 Japanese honeysuckle
 Amur honeysuckle
 Morrow's honeysuckle
 Tatarian honeysuckle
 Morrow's X Tatarian honeysuckle
 European fly-honeysuckle
 White mulberry
 Princess tree or empress tree
 Corktree
 Silver poplar
 Common buckthorn
 Garden red currant
 Black locust
 Multiflora rose
 Rugosa rose

<i>Rubus phoenicolasius</i>	Wineberry
<i>Salix purpurea</i>	Basket or purple-osier willow
<i>Sorbus aucuparia</i>	European mountain-ash
<i>Taxus cuspidata</i>	Japanese yew
<i>Ulmus pumila</i>	Siberian elm
<i>Wisteria floribunda</i>	Wisteria

¹Scientific names are those used primarily in National Wetland Plant List (http://wetland_plants.usace.army.mil/) and secondarily in USDA PLANTS database (<http://plants.usda.gov/>).

²*Typha* spp. are native species which provide good water quality renovation and other functions/values. However, they are aggressive colonizers which, given the opportunity, will preclude establishment of other native species. They are included in this list as species not to be planted, not because they are undesirable in an established wetland, but to provide opportunities for other species to become established. It is likely they will eventually move in without human assistance.

NOTICE TO CONTRACTOR – CLEANING OF CATCH BASINS, PIPES AND OUTLETS

All existing and proposed drainage structures and drainage pipes (including outlets) within the project limits shall be routinely inspected and cleaned throughout the project duration and at post construction.

The cleaning of drainage structures or drainage pipes in non-regulated areas must be reported under the Department of Transportation's (Department) MS4 Permit requirements. In addition, the cleaning of outfalls or areas within the Department's right-of-way which is located in a regulated area must be reported under the Department's General Maintenance Permit.

Prior to the commencement of any work associated with the cleaning of catch basins, pipes and outlets, the Contractor and Inspector shall meet with the District Drainage Engineer for the purpose of reviewing the requirements and restrictions specified in the MS4 Permit and General Maintenance Permit and report all activities at each location and establish reporting protocols to the District Drainage Engineer that will be adhered to during construction.

NOTICE TO CONTRACTOR – TIME WAITING PERIODS

Installation of pavement subbase and bituminous concrete pavement shall not begin until the assigned time waiting periods are complete and the contractor has been given notice to proceed by the Engineer. Time waiting periods apply to the following areas:

Station 418+90 to Station 419+50 – Wait 6 months after placement of fill

Station 419+50 to Station 420+00 – Wait 1 month after placement of fill

Construction vehicles and storage are permitted within these areas during the wait periods.

NOTICE TO CONTRACTOR – STORAGE AND STAGING AREAS

The Contractor is hereby notified that there is to be no staging and or storing of material and or equipment within the 100-year floodplain, floodway, stream channel encroachment line, gore areas or areas with natural resources impacts without review and written approval by the Office of Environmental Planning (OEP) or by the District Environmental Coordinator (DEC). If staging and or storing of material and or equipment is allowed within these regulated areas, the Contractor must provide a flood contingency plan to the DEC, and or OEP for review and approval. All other areas will be reviewed and approved by the Engineer.

No surplus material due to construction activities is to be disposed of on Department property.

The Contractor's attention is directed to the fact that only limited stockpiling and storage within the project are available for use. It may be required that the Contractor, according to his means and methods, make arrangements to have available for his use sufficient storage and staging areas outside of the limits of the project.

In all cases, the Contractor shall adhere to and comply with Section 1.10 - Environmental Compliance, of the Standard Specifications for Roads, Bridges and Incidental Construction Form 816 and any Supplements thereto.

NOTICE TO CONTRACTOR – AMTRAK SPECIFICATIONS

The Contractor is hereby notified that the following Amtrak specifications and requirements included herewith are applicable and are hereby made part of this contract. These procedures must be allowed by the contractor when working on Amtrak right of way. **The Contractors are advised that Amtrak is continuously updating their specifications and forms. It is the responsibility of the contractors to verify with Amtrak that the latest version is being used.**

Section	rev. #	Date	Title
01141A	3	02/03/2006	Safety and Protection of Railroad Traffic and Property.
01142A	1	12/15/2005	Submission Documentation Required for Amtrak Review and Approval of Plans for Bridge Erection, Demolition and Other Crane/Hoisting Operations over Railroad Right-of-Way
01520A	1	08/07/2001	Requirements for Temporary Protection Shields for Demolition and Construction of Overhead Bridges and other Structures
02261A	3	06/20/2008	Requirements for Temporary Sheeting and Shoring to Support Amtrak Tracks
E-47-		12/1/2006	National Railroad Passenger Corporation Temporary Permit to Enter Upon Property C.E.-17
EP3003	0	01/25/2001	Blasting Procedures
EP3005	1	10/30/2002	Pipeline Occupancy (specification 02081 0 Pipeline Occupancy)
EP3006	0	3/26/2002	Design and Construction of Criteria for Overhead Bridges
EP3014	1	02/28/2002	Maintenance and Protection of Railroad Traffic During Contractor Operations
EP3016	0	04/25/2001	Storm Water Discharge and Discharge from Adjacent Property onto Amtrak Right-of-Way.
200	1	12/31/2003	Ballast – Specification for Purchase Main Line Track

ITEM # 0203321A – GEOTECHNICAL MONITORING AND TESTING

Description: Work under this item shall consist of furnishing equipment, geotechnical monitoring and testing of embankment and subsurface conditions during construction to verify or modify the theoretical consolidations predicted in the geotechnical report. This work shall also consist of furnishing equipment and monitoring of designated structures, utilities and railroad facilities during construction to assess effects of adjacent and/or surrounding construction operations.

This work includes surveying, furnishing, installing, protecting, reading, reporting, maintaining and removing instrumentation as part of a Geotechnical Monitoring and Testing Program required for evaluation of ground movements and vibrations during construction and their effects on adjacent structures, utilities, and railroad facilities. The purpose of this program is to provide data which will be the basis of:

- A. Evaluation of installed Temporary Earth Retaining Systems and required modifications of such systems, if and as necessary;
- B. Evaluation of effects of construction operations on adjacent structures, utilities and railroad facilities. Construction operations to be monitored include, but are not limited to, sheet pile installation, pile driving, wick drain installation, demolition, excavation, dewatering, preload fill placement, pipe jacking operations, and new construction;
- C. Evaluation of settlements, both magnitude and rate and other characteristics of embankment fills, in conjunction with the required time waiting periods, construction schedule and sequence of related construction.

Work under this item shall also include, but not necessarily be limited to the following:

- A. Provide a Land Surveyor, Licensed in the State of Connecticut, for layout and subsequent verification of all instrument locations and elevations, and certification of Deformation Monitoring Point (DMP) and Settlement Platform monitoring data. Provide elevation and location measurements of established points and devices to measure vertical and horizontal movements throughout construction.
- B. Provide a qualified vibration specialist with a minimum of five (5) years of similar experience to be responsible for seismograph installation, reading, and reporting. The vibration specialist is to be a geophysicist, seismologist, or geotechnical engineer with not less than two years' experience in the application and use of vibration monitoring devices. The vibration specialist shall submit evidence of satisfactorily monitored construction operations by recording, interpreting, and reporting maximum peak particle velocities for not less than five construction projects of similar size and magnitude to this project in the last five years. Include references and contact information for each project cited.

- C. At least six (6) weeks prior to installation of any geotechnical instrumentation, the Contractor shall submit the names, qualifications and experience record of the personnel or subcontractor(s) who will install the geotechnical instrumentation.
- D. Provide and install all geotechnical instrumentation, including all labor, materials, tools, and equipment necessary to install, protect, maintain and remove instrumentation. At least six (6) weeks prior to installation of any geotechnical instrumentation, the Contractor shall submit manufacturer's product data or catalog cuts and manufacturer's recommended installation and monitoring procedures for said instrumentation. Instrumentation shall be available at least four (4) weeks in advance of construction of an area in which it is to be installed and shall be securely stored where it will not suffer physical damage or damage arising from excessive moisture, extremes of temperature or other adverse conditions.
- E. All instrumentations installation shall be performed in the presence of the Engineer, who may also read and record data following installation during the course of the work. No instrumentation installation, or similar activities, shall be conducted unless the State's instrumentation representative is present at the installation location to record pertinent data and observe the work. Work completed without the Engineer present will not be accepted.
- F. Within one (1) week following geotechnical instrumentation installation, the Contractor shall submit to the Engineer as-built drawings and installation records for all instrumentation. This submission shall include, but not be limited to:
1. Date of installation;
 2. Name of personnel and organization responsible for installation;
 3. Surveyed instrumentation plan locations. Locations shall be referenced to the station and offset and the coordinate grid system shown on the Drawings;
 4. Details of each installation: elevations, sizes, dimensions, materials, backfill, locations of the various components of the installations relative to ground surface, and ground surface elevation;
 5. Records indicating procedures used to verify proper functioning of geotechnical instrumentation following installation.
- G. Initial readings shall be obtained for each instrument before construction commences.
- H. Monitor and report instrumentation data as specified herein. All submittals and reports shall be prepared and stamped by the Contractor's Geotechnical Instrumentation Engineer.

- I. Provide access and lighting timely for the Engineer to inspect all instrumentation and to obtain confirmation readings. Supply to the Engineer readout devices and any necessary cables, connections, accessories and software required to monitor all instrumentation.
- J. Performance and the extent of supplemental monitoring is at the discretion of the Engineer. The supplemental monitoring by the Engineer does not relieve the Contractor of responsibility for the instrumentation and monitoring activities described in these Special Provisions.
- K. The Contractor may install, monitor, and interpret data from additional instrumentation that the Contractor deems necessary to ensure the safety of personnel and the work, at no additional cost to the State. In the event the Contractor installs instrumentation in addition to that required herein, the Contractor shall coordinate with the Engineer to ensure compatibility of the collected data, and shall implement recommendations developed from interpretations of the monitoring program data.
- L. Perform all railroad track monitoring in accordance with applicable Amtrak specifications.

Materials: Products and materials shall be in accordance with the following:

A. General:

- 1. All materials and equipment shall be approved by the Engineer.
- 2. Materials, designs and construction shall provide robust, corrosion and vibration resistant instruments.
- 3. Equipment shall be obtained from the manufacturers specified herein. Where a particular manufacturer is not specified, the Contractor shall select a manufacturer regularly engaged in producing monitoring instrumentation of the type specified herein.
- 4. All instrumentation hardware, protective covers, readout equipment, and other equipment and materials necessary to conduct the monitoring program shall be purchased or rented by the Contractor. Prior to installation, all materials and equipment shall be available for inspection by the Engineer to ensure compliance with the intent of these specifications.

B. Deformation Monitoring Points: Deformation monitoring points (DMP's) will be used to monitor vertical and horizontal deformation of various facilities at selected locations shown on the plans or as directed by the Engineer. The following types of DMP's shall be used to monitor deformation:

- 1. Railroad DMP's, hereafter referred to as "DMP Type 1", shall be installed into a railroad tie as follows:

- a. In wood ties, the DMP shall consist of a 2" long masonry nail with an identification tag. The nail shall be manufactured from hardened, zinc-plated steel. The nail shall have ribbed threads along its shank and a conical point. It shall also have an indent in the center of its head to receive a surveyor's rod. The identification tag shall be metallic and have a punched number for identification.
 - b. In concrete or steel ties, the DMP shall be marked with paint.
2. Structure and Sheet Pile DMP's, hereafter referred to as "DMP Type 2", shall typically be installed into the vertical surface of a permanent structure or sheet piling wall as follows:
- a. In permanent structures, the DMP shall consist of a 1/4" diameter stainless steel bolt with an internal hex. The bolt shall be installed in an expansion anchor for masonry or wood structures.
 - b. In sheet pile walls, the DMP shall consist of a 3/4" diameter stainless steel bolt and nut, installed in and tack welded to an L6x6x1/2 clip angle. The clip angle shall be welded or attached with two 3/4" diameter bolts to the sheet piling wall.
3. Utility DMP's, hereafter referred to as "DMP Type 3", shall consist of a 1/2" x 1'-0" long steel rod installed in a 3" steel sleeve pipe, with flush mounted protective casing and lid as shown on the Plans. The rod shall have a rounded (convex) top and shall be punch marked at its center.
- C. Seismographs: Provide portable seismographs for monitoring the velocities of ground vibrations and air overpressure levels resulting from construction activities. Seismographs shall be of the following model or an approved equal:
1. SSU 2000DK as manufactured by Geosonics Inc., Warrandale, PA,
 2. Blastmate II as manufactured by InstanTel Inc., Kanata (Ottawa), Ontario, Canada,
 3. VMS-500 as manufactured by Thomas Instruments, Inc., Spofford, NH,
 4. NC53IO/D as manufactured by Nomis Inc., Birmingham, AL.

The seismograph shall have the following minimum features:

1. Seismic range: 0.01 to 8 inches per second with an accuracy of 5% and no more than a 3 db roll off at the low frequency end.
2. Flat frequency response: 2 to 200 Hertz.
3. Three component sensor.

4. Two power sources: Internal rechargeable battery and charger and 115 volts AC. Battery must be capable of supplying power to monitor vibrations continuously for up to 24 hours.
5. Capable of internal dynamic calibration.
6. Direct writing to printer and to thumb drive or CD ROM. Instruments must be capable of producing strip chart recordings of readings on site within one hour of obtaining the readings. Provide computer software to perform frequency analyses of data obtained on magnetic disks.
7. Continuous monitoring mode must be capable of recording peak velocities.
8. Sound level frequency response: flat within +3db from 2 to 200 Hz.

D. Settlement Platforms: Settlement platforms shall consist of the following:

1. The 2-inch diameter black steel pipe shall conform to ASTM A-120.
2. Pipe couplings of each riser section shall consist of 2" diameter threaded standard black iron pipe couplings, one per riser section, conforming to ASTM A53 or higher grade steel.
3. The pipe flange used to connect the riser to the platform base steel plate shall consist of 2" diameter threaded standard black iron flange conforming to ASTM A53 or higher grade steel.
4. The steel cap at the top of the riser shall consist of a 2-inch diameter threaded standard black iron cap conforming to ASTM A53 or higher grade steel.
5. The settlement platform base shall consist of 3/4" thick marine grade plywood of any species or 1/4" thick minimum steel plate suitable for welding conforming to ASTM A36.
6. Bolts, nuts, and washers shall conform to ASTM A-307.
7. Steel plate washer shall conform to ASTM A36 or higher.
8. Compacted sand for the settlement platform bedding or level pad material shall conform to Subsection M.05.02 of the Standard Specifications.

E. Piezometers: Piezometers shall consist of the following:

1. Provide vibrating wire piezometers, signal cable, readout unit, software, and protective pipe for signal cable, as manufactured by Slope Indicator Co., Seattle, WA or approved equal.

2. Signal cable shall be model 50613524 as manufactured by Slope Indicator Co. or acceptable equivalent, of sufficient length to extend to the terminal boxes at the readout locations indicated on the plans.
3. Readout unit shall be Datamate MP, model 57710999, as manufactured by Slope Indicator Co. or acceptable equivalent. Readout unit shall be capable of obtaining both the vibrating wire and thermistor readings. Readout unit shall include a battery charger and shall be maintained in working condition for the duration of the monitoring period.
4. Protective pipe shall be Schedule 40 PVC conforming to the requirements of Subarticle M.08.01-27.
5. Filter sand shall conform to ASTM C778, 20-30 sand.
6. Granular bentonite shall be Enviroplug Medium, as manufactured by Wyo-Ben, Inc., Billings, MT, or Holeplug, as manufactured by Baroid Division, Petroleum Services, Inc., Houston, TX, or approved equal.
7. Special grout Type A shall include uniform sized fine ground or powdered non-drilling mud grade bentonite, for use in sealing and grouting well casings. A polymer based thixotropic additive may be added to the mix if recommended by the manufacturer. Special grout Type A shall have a mixed specific gravity, prior to placement within the piezometer borehole, between 1.03 and 1.10.
8. PVC protective pipe shall be protected by a flush mounted road box or a locking steel standpipe.

F. Borros Anchors: Borros Anchors shall consist of the following:

1. Model 1950 Borros Type Anchor as manufactured Geokon, Lebanon, New Hampshire, or approved equal.
2. ¼-inch and 1-inch pipes shall be Standard IPS Pipe.
3. Filter sand shall conform to ASTM C778, 20-30 sand.

G. Tiltmeters: Tiltmeters shall be provided as follows:

1. Tilt of vertical or horizontal surfaces shall be measured by use of in-place tiltmeters as manufactured by Geokon, Slope Indicator or approved equal. The tiltmeters shall include thermistors to provide unit temperature at the time of each reading to allow compensation of temperature effects including thermoelastic movements. Tiltmeters shall be uni-axial and have a minimum resolution of 10 arc seconds and a minimum full-scale range of 610 degrees.

2. Portable readout units shall digitally display both movement (tilt) and temperature data from the tiltmeters and shall be obtained from the same manufacturer as the tiltmeters. The readout units shall be maintained and calibrated as per the manufacturer's recommendations. Tilt meters shall be installed per the manufacturer's recommendations.

Construction Methods:

- A. Instrumentation Layout: Locations and types of instruments to be installed shall be as shown on the Plans, described within this specification or as approved by the Engineer. The Engineer reserves the right to modify the instrument layout as is deemed necessary to monitor the impact of the Contractor's approved proposed method of construction. The instrumentation shall be arranged so that monitoring can continue until completion without interruption. Adequate access for maintenance and reading of the instrumentation shall be provided.
- B. Submittals:
 1. Working Drawings: Submit Working Drawings of instrumentation location layout and details at least 30 calendar days before installation. The location of all individual monitoring instruments, including DMPs and settlement platforms, must be shown and labeled. Indicate methods of installation and maintenance for instrumentation systems.
 2. Documentation:
 - a. Submit manufacturer's catalogs and printed installation instructions for instruments furnished to the Engineer.
 - b. Within 24 hours of completion of equipment installation, submit three copies of installation notes, initial readings, and monitoring data taken immediately after installation to the Engineer.
 3. Certification:
 - a. Submit certification of equipment manufacturers' supervision, installation crews, and monitoring personnel at least 30 calendar days prior to installation.
 - b. Submit certification of equipment calibration.

4. Monitoring Documentation:

- a. Unless otherwise provided by the Engineer, submit proposed forms to be used for recording observations, monitoring and reporting data. Submit a sample showing proposed format for recording of readings, calculations and plots.
- b. Submit the following within 12 hours after monitoring any instrument:
 - (1) A copy of the data sheet containing a cumulative history of all readings, including weather conditions at time of each reading.
 - (2) A copy of the plot of measured value versus time, which also includes a time history of construction activity likely to influence such readings (e.g., depth of excavation, presence of heavy equipment).
- c. Submit weekly a brief narrative of instrumentation activity for the preceding week, in a format approved by the Engineer.
- d. Maintain records relating to problems encountered, delays, unusual aspects of the installation, and details of any events that may have a bearing on instrument behavior. These records should be submitted along with instrumentation data in Section J – Data Reduction, Processing, Plotting, and Reporting, as described herein.

C. Installation Requirements – General:

1. Installation procedures acceptable to the Engineer shall be developed for each type of instrumentation. All instrumentation shall be installed in the presence of the Engineer.
2. All instruments shall be securely fixed such that they are capable of resisting movement, vandalism and adverse climatic conditions at surface locations.
3. Experience of Personnel
 - a. Employ a specialized vibration monitoring firm with personnel experienced with seismographs of the type specified in this Section, to supervise instrument installation and to be responsible for reduction and interpretation of instrumentation monitoring data.
 - b. Employ a Land Surveyor licensed in the State of Connecticut to establish the horizontal and vertical location of all DMP's and Settlement Platforms.

4. Tolerances

- a. Establish the initial plan coordinates of each instrument installation to 0.1 feet or less.
 - b. Establish the initial elevation of DMP's and Settlement Platforms to 0.01 feet. Record the subsequent elevation of settlement reference points to 0.01 feet. Achieve level circuit closure with an error of closure of 0.1 feet or less.
5. To enable the Engineer to perform supplemental monitoring of instrumentation activities, the Contractor shall:
- a. Make instrument locations available to the Engineer as required.
 - b. Coordinate activities to minimize interference.
 - c. Remove obstructions from line of sight when requested by the Engineer.
 - d. Regulate traffic during instrument surveying operations.
 - e. Temporarily cease activities that create hazards to instrument monitoring or surveying personnel.
 - f. Provide site benchmark and reference point information.

The performance of and the extent of supplemental monitoring is at the discretion of the Engineer, and any supplemental monitoring performed by the Engineer does not relieve the Contractor of responsibility for the instrumentation and monitoring activities described in these Special Provisions.

6. In addition to the instrumentation specified herein, the Contractor shall install, monitor, and interpret data from instrumentation that the Contractor deems necessary to ensure the safety of personnel and the Work, at no additional cost to the State. Data shall be reported to the Engineer as specified herein under Section J – Data Reduction, Processing, Plotting, and Reporting. In the event the Contractor installs instrumentation in addition to that required herein, the Contractor shall:
- a. Coordinate with the Engineer to ensure compatibility of collected data.
 - b. Interpret data resulting from both the Engineer's and the Contractor's monitoring programs.
 - c. Implement recommendations developed from interpretations of monitoring program data.

D. Responsibilities of the Contractor:

1. The Contractor shall furnish components of instrumentation that are to be installed during construction and portable readout units for the Contractor's use, and shall install said components of instrumentation. The Contractor shall protect and maintain installed instruments, repair damaged instruments, and replace inoperative instruments.
2. Comply with all Amtrak requirements, including additional monitoring.
3. Collect, reduce, process, plot, and report data to the Engineer.
4. Provide access to the Engineer for data collection upon request. Coordinate with the Engineer to verify the consistency of collected data. Implement remedial measures based on interpretations of monitoring program data.
5. Disclosure of Instrumentation Data:
 - a. Do not disclose instrumentation monitoring data to third parties and do not publish instrument monitoring data without the prior approval of the Engineer.
 - b. Be responsible for interpretation of instrumentation data as input to evaluating excavation performance and controlling settlements to prevent damage to structures, facilities and utilities.
 - c. Independently, the Engineer may also interpret the instrument monitoring data and will make these interpretations available to the Contractor.
6. Determine exact location of the instruments to be installed in the field with approval of the Engineer.
7. Access to Instruments: Provide and facilitate access to each instrument for the Engineer at all times. Access includes ladders, working platforms and other necessary facilities, and the removal thereof.

E. Monitoring Schedule:

1. All equipment and installation accessories required for operating the instrumentation system and recording of measurements shall be by the Contractor and shall be available at least 4 weeks in advance of construction of the area in which they are to be installed and shall be securely stored where they will not suffer physical damage or damage arising from excessive moisture, extreme temperatures or other adverse conditions.

2. The Contractor shall provide and maintain adequate lighting and provide a safe means of access to all instruments to allow installation, repair, and reading of instruments at times selected by the Engineer.
3. If, in the opinion of the Engineer, there appears to be excessive movement, the monitoring points shall be surveyed as often as deemed necessary by the Engineer.
4. Background vibrations shall be monitored a minimum of two weeks prior to any pile driving activity, sheet pile installation, excavation, soil compaction, demolition or other construction activity that produces significant ground vibrations to establish the threshold for activating the warning system.
5. The Contractor is responsible for scheduling all monitoring and testing in accordance with Table 1 below.
6. Deformation monitoring points (DMP's) shall be installed and initial reading made at least 2 weeks prior to active construction in the areas being monitored.

F. Installation of Instruments:

Install the equipment according to the manufacturers' recommendations. Testing shall be undertaken as necessary to ensure satisfactory functioning of the equipment at each stage of the installation. In particular, adequate precautions shall be taken to protect the instruments from harmful effects of weather. Instruments found to be malfunctioning at any time shall be replaced as soon as possible but within no more than one week.

1. Installation of Deformation Monitoring Points

- a. Deformation monitoring points (DMP's) shall be installed at the locations shown on the Plans or where directed by the Engineer.
- b. Installation shall utilize means and methods that avoid or minimize damage to building materials in general and in particular to those that are part of landmarks. Holes for DMP Type 2 anchors shall be drilled, wherever possible, into horizontal mortar joints rather than into solid or hollow block materials. Drilled holes shall be located to avoid significant architectural design features of structures.
- c. All DMP's shall have a permanent label on a fixed metallic tag visible at all times.
- d. All DMP's shall be installed as indicated in these Specifications at locations indicated on the drawings, but shall be located so that there shall be no overhead interference with a survey rod either due to structure protrusions, wires, or other obstructions.

- e. After installation of a DMP, determine the planimetric locations and elevation as follows:

For a DMP to be monitored for elevation only, determine the planimetric locations to an accuracy of +0.1 ft,

- (1) and the elevation to an accuracy at 60.01 feet at 95% level of confidence.
- (2) For a DMP that is to be monitored for both elevation and planimetric locations, determine the planimetric locations to an accuracy of 60.03 feet and the elevation to an accuracy of 60.01 feet at 95% level of confidence.

2. Installation of Seismographs

- a. Furnish, maintain, and operate not less than two vibration monitors at the site whenever vibration producing activities are in progress.
- b. The contractor's vibration specialist shall install, calibrate and maintain the vibration monitoring instruments in accordance with the instrument manufacturer's recommendations. Any instrument showing indication of damage, malfunction, or erratic functioning shall be immediately replaced with a calibrated, functioning instrument.
- c. Monitoring of vibrations by seismographs shall be performed at all facilities and structures as indicated on the Plans and within these specifications, and also at other facilities and structures that may be affected by construction activities where the Contractor deems it necessary to monitor vibration levels. As a minimum, vibration monitoring during construction activities shall be conducted under the following conditions:
 - (1) Construction activities are being conducted within 50 feet of the limits of the railroad tracks, as indicated on the plans. Vibration monitors are to be installed at the ground surface immediately adjacent to the tracks at the point closest to the construction activity.
 - (2) Construction activities are being conducted within 75 feet of freshly placed (less than seven days old) cast-in-place concrete. Vibration monitors are to be installed at the ground surface immediately adjacent to the freshly placed concrete closest to the construction activity.
 - (3) Construction activities are being conducted within 75 feet of utilities. Vibration monitors are to be installed at the ground surface immediately above the utilities closest to the construction activity.

- d. At each facility or structure, geophones shall be placed as appropriate on the ground at points between three and six feet from the faces of structures, on the structures, on the floor slab or footings near the closest exterior face of the buildings, and adjacent to railroad ties. The exact location of the seismographs shall be reviewed and approved by the Engineer.
 - e. Geophones shall be firmly mounted on the surface slab of concrete or asphalt, firmly set in undisturbed soil, or rigidly attached to the structure of buildings and shall be left in place for a time adequate to achieve the monitoring schedule specified herein.
 - f. Monitoring of sound (air overpressure) levels shall be performed by pointing the seismograph microphone toward the sound source. The microphone location shall be approved by the Engineer and shall not exceed 100 ft from the seismograph.
 - g. The Contractor shall immediately notify the Engineer any time that the measured peak particle velocity exceeds 80 percent of the maximum allowable peak particle velocity per Table 2 below.
 - h. If the measured vibrations exceed the maximum allowable peak particle velocity per Table 2, the Contractor shall immediately halt the vibration producing activity and revise the construction methods, procedures, or equipment as required to reduce vibrations to within the specified limits.
 - i. The vibration specialist shall set the trigger levels and range on instruments to record vibrations from 50 percent to 150 percent of the criteria indicated in Table 2.
3. Installation of Settlement Platforms
- a. The platforms shall be established after clearing and grubbing, prior to fill placement and grading, and shall be placed on firm ground.
 - b. The settlement platform base shall be placed on a 6-inch thick bed of sand compacted level at the grades indicated on the plans.
 - c. Sufficient pipe shall be furnished for each platform to reach at least 4 feet above the fill at all times during fill placement, or 2 feet above the top surface of the final fill height. The riser pipes shall be plumb within 1% of vertical. Riser pipes shall be permanently marked with file cuts to show heights above the platforms.
 - d. The settlement platforms shall be protected to prevent disturbance during placement of all fill. Risers shall be painted and/or flagged for high visibility.

4. Installation of Borros Anchors

- a. Advance a 4-inch diameter cased rotary wash borehole to three feet above the anchor tip elevation. Clean casing to the bottom to remove all loose material.
- b. The upper Borros Anchor tip elevation shall be installed at a depth of 3 to 5 feet below the top of varved clay stratum.
- c. Securely attach the ¼" pipe to the anchor and tighten the 1" pipe to the greased left-hand thread of the anchor. Additional pipe sections are added as the complete assembly is lowered into the borehole. The anchor is then driven or pushed with the 1" pipe to the anchor tip elevation.
- d. The 1" pipe is then secured in position. Advance the anchor prongs by clamping the 1" pipe and advancing the ¼" pipe hydraulically by the drilling machine or driven by hand for approximately 7-inches relative to the 1" pipe.
- e. Detach the 1" pipe from the anchor by turning the pipe in a clockwise direction for at least 15 complete revolutions.
- f. The 1" pipe can then be raised high enough to clear the ¼" inner pipe, to its final position, and capped.
- g. Withdraw casing from the borehole and backfill the annular space around the 1" pipe with sand.
- h. When filling operations require extension of the instrument, sections of 1" and ¼" pipe shall be added to maintain the top of the pipe between 1ft and 5ft above the surface of the fill. The materials surrounding the 1" pipe must be hand placed to avoid damaging the installation.
- i. As the pipe riser is extended to accommodate additional fill, it shall be monitored after each new riser is placed.
- j. The 1" pipe should be capped at all times except when readings or extensions are being accomplished.

5. Installation of Peizometers

- a. The Contractor shall install the vibrating wire piezometers at the locations and elevations shown on the Contract Drawings.
- b. The piezometers shall be installed in 4-inch diameter cased, rotary wash borings drilled without the use of bentonitic drilling mud.

- c. A split-spoon sample shall be taken at the piezometer elevation and submitted to the Engineer. Installation procedures shall be such that all steps in the procedure can be quality assured. Volumes of each increment of backfilling with sand and granular bentonite shall be small enough such that no bridging occurs, and the depth to the top of each increment shall be checked after placement.
 - d. Prior to insertion of the piezometer in the borehole, the piezometer and cavity between the filter and diaphragm shall be saturated with clean water and a reading shall be taken of the vibrating wire transducer, thermistor, and corresponding barometric pressure. Saturation shall be maintained throughout the installation.
 - e. After insertion of the piezometer a check shall be made to ensure that the piezometer reading agrees with the water head, and the elevation of the diaphragm shall be recorded.
 - f. The depth to the top of the granular bentonite shall be checked.
 - g. The protective PVC pipe extending from the ground surface shall be protected with a flush mount road box.
 - h. After completion of installation a post installation acceptance test shall be performed to verify that the piezometer functions correctly.
 - i. After completion of installation, the as-built location in horizontal position shall be determined to an accuracy of 1 foot, and the elevation of the piezometer diaphragm to an accuracy of 0.01 feet.
 - j. The signal cable shall be placed inside protective PVC pipe extending from the ground surface at the piezometer location to the readout location.
6. Installation of Tilt Meters
- a. Tilt meters shall be securely fixed at locations and positions shown on the contract drawings, or as directed by the Engineers, such that they are capable of resisting disturbance from forces and pressures, from vandalism, and from adverse climactic conditions.
 - b. The Contractor shall take all necessary steps to protect the tilt meters. Tilt meters that are found to be defective, damaged, or malfunctioning shall be replaced as soon as possible at no additional cost to the State.
 - c. Establish the initial coordinates and elevation of each tilt meter to within 10 arc seconds. Three such baseline readings shall be taken at intervals of not less than 4 hours and not more than 24 hours. Additional baseline readings may be required by the Engineer if differences other than those due to temperature effects or instrument resolution/accuracy are noted between the three baseline readings.

G. Maintenance of Instrumentation

1. Prevent damage to the instruments and ancillary equipment during handling, installation and subsequent operation. Maintain all the instruments required for long term monitoring in a satisfactory working order for the duration of the monitoring program. Should an instrument become damaged or become nonfunctional, it shall be the Contractor's responsibility to replace, within one week, the damaged instrument to the satisfaction of the Engineer at no additional cost to the State.
2. Ensure that all instruments in use have been correctly calibrated. Carry out periodic checks to confirm the validity of calibration of equipment in accordance with the manufacturer's instructions and carry out any adjustments that are found necessary. Suspect readings shall be repeated.
3. Keep records of all calibration certificates and, when necessary, send equipment off-site for re-calibration by an independent accredited testing laboratory.
4. Record the location of all instrumentation on as-installed Working Drawings. As-installed drawings shall include the routing of all cables. Hidden electrical instrumentation shall be identifiable by color codes and/or tagged cables. The reference coding shall also be recorded on the as-installed drawings.
5. Ensure that electrical instrumentation is not adversely affected by other temporary or permanent electrical services.

H. Instrument Reading and Records

1. Instruments shall be read as soon as possible after installation to establish datum readings which shall be established from a minimum of two independent reading operations giving consistent results. The method of reading shall be as specified by the manufacturer. Installed locations and elevations for DMP's and settlement plates (base and riser top) shall be provided within one week of installation.
2. Monitoring Schedule
 - a. Monitor instrumentation in accordance with the schedule, location and spacing shown in Table 1.
 - b. Monitor instrumentation more frequently if readings indicate significant anomalous or sudden unanticipated changes.
 - c. Monitor instrumentation more frequently as directed by the Engineer.
3. In the event of any change in circumstances, for example the construction of other structures nearby, the program of readings shall recommence.

4. Readings shall, whenever possible, be taken by the same personnel. Should the personnel be replaced for any reason, a series of duplicate readings shall be carried out by the outgoing and replacement persons. DMP readings shall be taken at the same general time of day.

I. Limiting Instrumentation Readings

1. Implement remedial action if instrumentation readings exceed values shown in Table 2.
2. The Contractor shall take all necessary steps so that the limiting value is not exceeded. The Contractor may be directed to suspend activities in the affected area with the exception of those actions necessary to avoid exceeding the limiting value.
3. If the limiting value is reached, the Contractor shall:
 - a. Meet with the Engineer to discuss response actions.
 - b. Implement the reviewed plan of action.

J. Data Reduction, Processing, Plotting and Reporting

The Contractor's instrumentation personnel and surveyors shall collect, reduce, process, plot, and report data for the Contractor's monitoring program.

Each week the Contractor shall submit to the engineer a weekly data report together with all new data on CD-ROM, as specified herein. The weekly data report shall be bound and indexed and shall include:

1. A section for each type of instrument. This section shall include: a brief description of the cumulative changes in instrument readings, a brief description of the changes in readings from the previous weekly data report, a table summarizing instrument's actual readings, and if any Response Values have been reached. Raw and reduced data collected during the week, on summary tables (8½-inch x 11-inch sheets of paper). Plots of data versus time and including key construction activities and other events that could influence changes in the data shall be shown. Plots of like instruments shall be done at the same scale to facilitate graphical comparison.
2. A description of work being performed during the week by the Contractor and any possible activity in the area that may have an effect on instrument readings.
3. For the Seismographs, the report shall include the following information:
 - a. The recorded maximum peak particle velocity and the associated frequency and the date and time for each event recorded.

- b. The type and location of the vibration producing activity, location of monitoring instruments, and the closest distance from the vibration producing activity to the monitoring instrument.
4. For the Settlement Platforms, the report shall include the following information:
 - a. Elevation of the reference point at the settlement platform riser pipe.
 - b. Elevation of the ground surface adjacent to the settlement platform riser pipe.
 - c. Date and time of elevation survey.

K. Damage to Instrumentation

1. The Contractor shall protect all instruments, readout units and appurtenant fixtures, leads, connections, and other components of instrumentation systems from damage due to construction operations, weather, traffic, and vandalism.
2. If an instrument is damaged or inoperative, the Contractor's instrumentation personnel shall repair or replace the damaged or inoperative instrument within 72 hours, at no additional cost to the State. The Engineer will be the sole judge of whether repair or replacement is required. The Engineer may impose a work stoppage in the vicinity of the damaged or inoperative instrument until it is again operational, at no additional cost to the State.
3. The Contractor shall repair or replace, without additional cost to the Department, any of the readout devices used for the Contractor's monitoring program which become damaged, inoperative, or, in the judgment of the Engineer, unreliable.

L. Removal of Instruments

1. Prior to completion of the Contract, the Contractor shall remove all instrumentation installed under this Contract. Protect and maintain all instrumentation until such time as written approval authorizing removal of instrumentation has been received from the Engineer.
2. Settlement Platform risers shall be removed within the top 4 feet of the finished grade. The lower riser and base section shall remain.
3. All instruments or portions thereof removed by the Contractor shall become the property of the Contractor.
4. Instrumentation readout and calibration equipment purchased under this Contract shall become the property of the Contractor.

Method of Measurement: The work covered under this item will be paid for on a lump sum basis and will not be measured for payment.

Basis of Payment: This work will be paid for at the contract lump sum price for “Geotechnical Monitoring and Testing”, which price shall include but not be limited to the following: furnishing equipment, materials and hardware; installation of instruments and recording equipment; setup and calibration of instruments; monitoring, collecting and interpreting data; maintenance of instruments; and removal of all instruments including tools, power, and telephone for the geotechnical monitoring devices, and incidentals thereto.

Pay Item	Pay Unit
Geotechnical Monitoring and Testing	l.s.

TABLE 1 – MONITORING SCHEDULE

INSTRUMENT	SCHEDULE AND DETAILS
All Instruments	Two confirmatory readings shall be taken immediately after installation. Following the confirmatory readings, one reading shall be taken each workday until, as determined by the Engineer, repeatability indicates that any data changes resulting from the installation process have ceased. Once the readings have normalized, one formal initial reading shall be taken. An additional baseline reading shall be taken immediately prior to any construction at or near the associated facility. Thereafter, reading frequency shall follow the schedule below.

Deformation Monitoring Points

Frequency (general):

- A. Weekly when construction activities (e.g. driving/extracting piles/sheeting, or installation of Wick Drains) are performed at a distance greater than 100 feet from a monitoring point.
- B. Daily, at the beginning and end of every shift of work, when construction activities are performed at a distance less than 100 feet and greater than 30 feet from a monitoring point.
- C. Before and after each pile, sheet, or wick drain is installed/extracted within 30 feet of a monitoring point.
- D. Readings will continue to be taken until after active construction in area has ceased, backfilling of any excavation is completed, and the Engineer determines no further readings are necessary for a particular area.

Railroad: DMP Type 1, installed as shown on the Plans, shall be monitored for vertical movement. If, in the opinion of the Engineer and in accordance with Amtrak’s allowable deviations, there appears to be excessive movement, Railroad DMP’s shall be surveyed as often as deemed necessary by the Engineer. See Table 3 for Amtrak’s allowable deviations.

Bridges and Other Existing Structures: DMP Type 2 shall be installed on existing bridge structures at the ground surface at every 20 ft on all exposed faces, or as shown on Plans. These points shall be monitored for horizontal and vertical movements.

Pipe Jacking: DMP Type 3, installed as shown on Plans, shall be monitored for vertical movement.

RW Site 4: DMP Type 2 shall be installed in pairs, on the east and south vertical faces of the existing building as shown on Plans. Each pair should consist of a DMP at the ground surface and one at approximately 8 ft height from the ground surface. These points shall be monitored for horizontal and vertical movements.

TABLE 1 – MONITORING SCHEDULE (CONTINUED)

INSTRUMENT	SCHEDULE AND DETAILS
<p>Deformation Monitoring Points (Continued)</p>	<p>RW Sites 7, 9, 11, & 13: DMP Type 1 shall be installed every 30 ft on the ties of the closest railroad track, and companion DMP Type 2 at the top of any temporary earth support system at the same spacing and coincidental locations for all construction involving excavation in Amtrak Zones 2 and 3, as defined by Amtrak MW-1000. DMP Type 1 shall be monitored for vertical movement and Type 2 shall be monitored for vertical and horizontal movement. At RW Site 13, two (2) additional DMP Type 2 (one on either side of wall) shall be installed at each existing utility that crosses the wall.</p> <p>Construction activities may cause settlement of tracks at other locations; therefore, Amtrak may insist on increased monitoring throughout the project limits.</p>
<p>Seismographs</p>	<p>Continuous during pile driving, sheet pile/soldier pile driving, soil compaction, excavation or any other construction activity causing ground vibrations as determined by Engineer. One seismograph should be provided and operated by the Contractor for each construction operation listed above.</p> <p>Bridges: One (1) seismograph shall be installed adjacent to existing bridge structures on the ground closest to the construction operation.</p> <p>Pipe Jacking Locations: One (1) seismograph shall be installed on a railroad track tie closest to the end of jacked pipe, along the centerline of pipe jacking alignment, during all active pipe jacking operations and during sheet pile/soldier beam driving for jacking and receiving pits.</p> <p>RW Site 3: One (1) seismograph shall be installed at the railroad track tie closest to pile driving during pile installation for the wall foundation.</p>

TABLE 1 – MONITORING SCHEDULE (CONTINUED)

INSTRUMENT	SCHEDULE AND DETAILS
	<p>RW Sites 7, 9, 11, & 13: One (1) seismograph shall be installed at the railroad track tie closest to sheet pile or soldier beam driving during installation of temporary earth support structures. At RW Site 13, two (2) additional seismographs (one on either side of the wall) shall be installed at each existing utility that crosses the wall.</p> <p>Exact locations shall be approved by the engineer.</p>
Settlement Platforms	<p>Perform elevation vertical survey prior to placing fill, each day during fill placement, and two times a week during the preload waiting period or as directed by the Engineer.</p>
All Instruments near Preload Fill	<p>All instruments shall be read on any day on which more than 6-inches of fill is placed within 50 feet from any instrument.</p> <p>All instruments within 50 feet of filled areas shall be read weekly until the Engineer has determined that the preload period has ended.</p> <p>Read DMPs (Railroad, Utility, Structure) weekly until completion of all construction activities. Frequency of readings may be reduced to bi-weekly or monthly as determined by the Engineer.</p>

TABLE 2 – LIMITING INSTRUMENTATION READINGS

INSTRUMENT	LIMITING VALUE
Deformation monitoring points	
Type 1	0.04 ft
Type 2	0.04 ft
Type 3	0.10 ft
Seismograph (see Notes below)	
At Railroad	
10 – 30 Hz	0.3 in/sec
30 – 60 Hz	0.3 – 0.5 in/sec
Adjacent to Freshly Placed Concrete	
0 to 2 hours after pour	1.0 in/sec
2 to 24 hours after pour	0.5 in/sec
24 hours to 7 days after pour	2.0 in/sec
At Existing Bridges and Walls	2.0 in/sec
At Existing Buildings	1.0 in/sec
Above Buried Utilities	2.0 in/sec

Notes:

1. The peak particle velocities given above are the mean resultant vector sum of particle velocities in three mutually perpendicular directions at any instant in time.
2. Monitor limits at railroad in accordance with Amtrak requirements.
3. Where a range of limiting values is given, the lower value applies to 30 Hz, the upper value to 60 Hz, with linear interpolation between.

TABLE 3 – AMTRAK ALLOWABLE DEVIATIONS

TRACK CLASS	MAX. PASSENGER SPEED (MPH)	CROSS LEVEL (INCHES) The Difference in Cross Level Between Any Two Points Less Than		DEVIATION FROM PROFILE 31' CHORD INCHES		DEVIATION FROM HORIZONTAL ALIGNMENT INCHES	DEVIATION FROM HORIZONTAL ALIGNMENT INCHES
		10'	62'	31' CHORD	62' CHORD	31' CHORD	62' CHORD
MAINTENANCE LIMITS							
1	15	1	2 1/4	2 5/8	2 1/4	N/A	3 3/4
2	30	1	1 5/8	2 1/4	2	N/A	2 1/4
3	60	1	1	1 1/2	1 5/8	N/A	1 1/4
4	80	1	1	1 1/8	1 1/2	N/A	1
5	90	1	1	3/4	1	N/A	1/2
6	110	3/4	1	3/4	3/4	3/8	1/2
7	125	3/4	1	3/4	3/4	3/8	3/8
8	160	3/4	1	1/2	3/4	3/8	3/8
9	200	3/4	1	3/8	1/2	3/8	3/8
1/2 MAINTENANCE LIMITS							
1	15	1/2	1 1/8	1 5/16	1 1/8	N/A	1 7/8
2	30	1/2	13/16	1 1/8	1	N/A	1 1/8
3	60	1/2	1/2	3/4	13/16	N/A	5/8
4	80	1/2	1/2	9/16	3/4	N/A	1/2
5	90	1/2	1/2	3/8	1/2	N/A	1/4
6	110	3/8	1/2	3/8	3/8	3/16	1/4
7	125	3/8	1/2	3/8	3/8	3/16	3/16
8	160	3/8	1/2	1/4	3/8	3/16	3/16
9	200	3/8	1/2	3/16	1/4	3/16	3/16

ITEM #0728020A - STONE BALLAST

Description: This Section specifies the material requirements for ballast to be furnished and placed by the Contractor in accordance with the Plans and Specifications. This Section also includes furnishing all labor, materials and equipment necessary and incidental to placing ballast as directed by the Engineer.

Materials: The Contractor shall submit, under the provisions of this Section, the following information:

Compliance: Supplier's certification that the material delivered to the site is in compliance with the Specifications.

Samples: Submit as one representative sample and one sample of each new source of supply as requested by Engineer. Samples of not less than 150 lbs should be submitted.

References: The Contractor shall comply with provisions of Codes, Specifications, Standards, and recommended practices of the most recent edition and addenda thereto of:

AREMA: American Railway Engineering and Maintenance of Way Association, Manual for Railway Engineering

ASTM International (formerly American Society for Testing and Materials)
MW 1000; ASTM Tests, C 88, C 117, C 127, C 136, C 142, C535, and E11.

AASHTO: American Association of State Highway and Transportation Officials
Amtrak Specification 200 (Ballast – Specification for purchase main line track)

Ballast Requirements: Testing and inspection shall conform to the Amtrak Specification 200 (Ballast – Specification for purchase main line track).

Material not meeting the Specifications shall not be used in the work.

Ballast shall be granite, traprock, or quartzite, free from injurious amounts of deleterious substances, and conforming to all requirements of Amtrak Specification 200 (Ballast – Specification for purchase main line track).

The Contractor shall be responsible for assuring ballast cleanliness.. When ballast is of such a nature that it is not produced or quarried in a clean and acceptable manner, a suitable washing facility shall be provided at the quarry or crusher plant. This suitable washing facility shall consist of a high pressure spray over the ballast as it passes on the belt. A quality control plan along with washing procedures must be submitted with Contractor's quotation. The QC plan and washing procedures will be subject to approval by the Engineer.

Prepared ballast shall be handled in such a manner that it is kept clean and free from segregation. It shall be only loaded into cars which are in good order, tight enough to prevent leakage and waste of material, and clean and free from rubbish or any substance which would foul the ballast.

The quality of stone for ballast from any quarry or new strata opened up, including its soundness, resistance to abrasion, chemical composition, absorption, impedance, hardness and weight per cubic foot, shall be determined prior to its acceptance at a testing laboratory selected by the purchaser. Each stratum or portion of quarry containing a variation of quality of stone shall be tested separately and not averaged. Quality tests and gradation tests shall subsequently be made from time to time as deemed necessary by the purchaser to control the quality and size of ballast furnished by the producer.

Sufficient visual observations, determinations of deleterious substances and analyses of gradation shall be made by the producer prior to shipment to assure compliance with these specifications.

The Contractor shall provide certified results of tests required by specifications. The Engineer reserves the right to witness the performance of tests. If the Contractor desires to use its own testing facilities to make the aforementioned tests, the Engineer's concurrence must be received.

The Contractor shall certify that ballast delivered to the Railroad is typical of that upon which specified tests have been made.

The selection of samples is as important as the laboratory testing, and care must be taken that the samples obtained show the true nature and conditions of the material to be examined.

Samples of all ballast and samples of stone at quarries for test to determine the acceptability of the source, as well as samples for quality control, shall be selected by a representative of the purchaser. The owner of the quarry or producer may submit samples for inspection or preliminary testing if such action is approved by the Engineer.

Samples of the finished product for gradation and other required tests shall be taken from each 1,000 tons of prepared ballast unless otherwise ordered by the Engineer. Samples shall be representative (full belt) and shall weigh not less than 100 pounds. Where the acceptability of stone from a quarry is to be determined, a 150 pound sample consisting of pieces of approximately 6 by 6 by 4 inches should also be furnished. Method of sampling shall be furnished to the Engineer for approval.

If material prior to, during or after being loaded, does not conform to specifications, Inspector shall notify Contractor to stop operations until all faults have been corrected. Disposal and/or removal of defective material shall be done without cost to the Railroad.

As it is impractical to inspect all ballast at quarry, the Engineer reserves the right to reject any car of ballast that does not conform to specifications upon arrival at unloading site.

No ballast shall be unloaded unless it has been approved by the Engineer or agency authorized by the Railroad to test and approve ballast.

Should ballast that does not meet specifications be unloaded prior to the Engineer's approval, then payment will not be made to Contractor. Contractor must remove all defective material from site without cost to the Railroad.

Defective material arriving at site for unloading shall be rejected by the Engineer and disposed of at expense (including all freight and switching costs) of Contractor.

Construction Methods: Do not place ballast until the Engineer has approved the subgrade upon which the ballast is to be placed.

The Contractor shall place stone ballast to the limits and depths, and to the grade, shown on the Plans, or as directed by the Engineer. Unless otherwise indicated or directed, ballast shall be placed to 1'-7" below top of rail elevation. Ballast above that elevation will be placed by Amtrak.

The ballast layer shall be thoroughly compacted until the surface is true and unyielding, displaying no deformation or movement under the compaction equipment. Compact ballast to 100-percent maximum density by vibratory compaction equipment specifically manufactured for compaction purposes, or self-propelled pneumatic-tired roller. Self-propelled, pneumatic-tired roller shall have a gross weight of 10- to 15-tons. Vibratory compactor shall have a weight of not less than 10-tons and be capable of applying a dynamic load of not less than 18,000-pounds at 1,300- to 1,500-cpm. .

Leave top of ballast bed flat and level to within plus or minus 1-inch across a 12-foot wide platform centered on the track centerline. After installation of ballast layer, refrain from driving vehicles on the ballast layer that would foul ballast or cause center-binding of ties. Replace any ballast that has become fouled by mud or fine materials at no cost to ConnDOT or Amtrak.

Method of Measurement: All aggregate required for this work shall be weighed on scale furnished by and at the expense of the Contractor, except as otherwise permitted herein. The scales shall be of a type satisfactory to the Engineer and shall be calibrated and sealed, at the expense of the Contractor, as often as the Engineer may require. All weighing shall be done in the presence of a representative of the Engineer.

If material is shipped by rail, ballast shall be ordered and payment based upon net ton in carload lots. Adjustments to compensation shall be made for deficiencies in plan depth and cross section as specified herein.

Cars shall be weighed and such weights shall be forwarded with car numbers to the Engineer.

If weighing cars is impractical, weight per cubic yard shall be obtained by weighing sample cubic yard volumes at such intervals as the Engineer may designate. Weight per cubic yard obtained by such tests, amount of cubic yards loaded in each car and car number shall be furnished to the Engineer, and shall be used in calculating weight per car until additional tests are made.

If material is shipped by rail, the car weights may be accepted but scales shall be provided as specified above if the Engineer so directs.

Measurements shall be subject to the following provisions:

Determination of Thickness: The thickness shall be as indicated on the plans, or as ordered by the Engineer and within a tolerance of minus three-quarters of an inch ($-\frac{3}{4}$ "") to plus one-half inch ($+\frac{1}{2}$ "").

Measurements to determine the thickness will be taken by the Engineer at intervals of 500 feet or less, and shall be considered representative of the lane.

If a thickness measurement is taken and found deficient, the Engineer will take such additional measurements as he considers necessary to determine the longitudinal limits of the deficiency.

The Engineer may waive an occasional measurement outside the tolerances if in his judgment it is not representative of true conditions and providing that:

- (a) Other thickness measurements taken nearby for the course are within acceptable limits;
- (b) proper controls have been exercised by the Contractor; and
- (c) if there would be no impairment to the serviceability of the complete construction.

No adjustment of the quantity accepted for payment will be made where the thickness does not exceed the allowable plus or minus tolerances.

Where the thickness exceeds that indicated on the plans by more than the prescribed tolerance, that material which is in excess of the total planned depth, plus the tolerance, will not be included for payment.

Areas represented by measurements deficient in thickness in excess of the allowable minus deviation shall be corrected at the Contractor's expense, or with written permission of the Engineer, the deficient areas may remain, and payment will be made at an equitable adjusted price based on weight per cubic yard.

An adjustment in quantity will be made in the materials placed beyond the horizontal limits indicated on the plans by deducting the computed weight of that material extending more than three inches beyond the horizontal plan dimensions.

Basis of Payment: This work will be paid for at the contract unit price per ton for “Stone Ballast”, complete in place, which price shall include all materials, tools, equipment and work incidental thereto.

Pay Item	Pay Unit
Stone Ballast	ton

ITEM #0914023A – ORNAMENTAL PICKET FENCE (6’ HIGH)
(STRUCTURE)

Description: Work under this item shall consist of furnishing and installing an ornamental metal fence of the height specified on the plans on top of the retaining walls, where indicated on the plans or as directed by the Engineer. This includes furnishing, fabricating, transporting and erecting the fence system.

Materials: The fence shall be made of hot-rolled structural quality steel with a hot-dipped galvanized coating. Posts, channel rails, pickets, post caps, rail supports, brackets and post anchorage plates shall be of standard industry accepted quality and dimensions for the chosen post and rail system. All components shall have a polyester resin powder coating applied by electrostatic spray process.

Pickets shall be square tubular members in accordance with ASTM A513, 45,000 psi tensile strength, 60,000 psi yield strength with a minimum wall thickness of 8 gauge. Picket shall be attached to the rails with 1/4” industrial drive rivets (#4). “U” channel rails shall be formed from hot-rolled structural steel having no pockets or shelves to hold water or moisture and shall have a minimum wall thickness of 11 gauge (0.120”). Rails shall be punched to receive pickets and attach to rail brackets with industrial drive rivets.

Posts shall be square tubular members, ASTM A500, hot-rolled structural quality steel, 45,000 psi tensile strength, 60,000 psi yield strength. The posts shall have a minimum wall thickness of 12 gauge, weighing 4.286 lb/ft.

The rail attachment brackets shall be cast malleable iron, ASTM A47, Grade 32510, galvanized in accordance with ASTM B695. Bracket to fully encapsulate rail end for complete security that is aesthetically pleasing.

Post Caps shall be formed steel, cast or malleable iron, weathertight closure cap. Provide one standard post cap with set screw for each post.

Anchor plates shall be ASTM A-36 steel. Anchor bolts shall be stainless steel and conforms to the requirements of ASTM F593, Group 1 (ANSI Type 304); washers shall be stainless and conform to the requirements of ASTM A167, Type 302 through 305. Molded pads shall be manufactured from new un-vulcanized elastomer and unused synthetic fibers, with a weight proportion of fiber content equal to approximately one-half of the total weight of the pad. Non-shrink grout shall conform to the requirements of the State of Connecticut, Form 816 Article M.03. Preset anchorage wire struts shall be cold-drawn carbon steel conforming to ASTM A510, Grade 1030. Ferrules shall conform to ASTM 108, grade 12L14, after fabrication the preset anchorages shall be hot-dip galvanized in accordance with ASTM A153. The bolts shall be “free running” in the ferrules after galvanization.

The fence system shall be hot dipped galvanized in accordance with ASTM A123. After all steel components have been galvanized, clean and prepare the surface of all components to assure complete adhesion of finish coat. Apply 2.5 mil (0.0635mm) thickness of polyester resin based powder coating by electrostatic spray process. Bake finish for 20 minutes at 450 degrees Fahrenheit metal temperature. The color shall be black.

The Contractor shall submit shop drawings in accordance with the State of Connecticut, Form 816, Article 1.05.02.

Construction Methods: Posts shall have a maximum spacing of 8' on center and shall be set vertical. Posts shall be welded to anchor plates as shown on the plans. Preset anchorages shall be installed with a template; drilling and grouting of anchor bolts will not be allowed.

Method of Measurement: This work will be measured for payment by the number of linear feet of completed and accepted Ornamental Metal Fence (6' High) (Structure) measured from the end of retaining wall.

Basis of Payment: This work will be paid for at the contract unit price per linear foot for "Ornamental Metal Fence (6' High) (Structure)" complete in place, which price shall include all fence materials including fence, post caps, component parts, anchorages, non-shrink grout, neoprene pads, equipment, tools and labor incidental thereto. Payment will be made under:

Pay Item	Pay Unit
Ornamental Metal Fence (6' High) (Structure)	l.f.

ITEM #0950043A - WETLAND GRASS ESTABLISHMENT

Description: The work included in this item shall consist of providing an accepted stand of established wetland grasses by furnishing and placing seed as shown on the plans, permits, or as directed by the Environmental Scientist from the Connecticut Department of Transportation's Office of Environmental Planning within the Wetland Mitigation Areas or other areas when required.

Materials: All approved seed mixtures shall be obtained in sufficient quantities to meet the pure live seed (PLS) application rates as determined by the seed analysis of the mixture. Application of fertilizer will be directed by the Environmental Scientist based on a soil analysis of the wetland area to be seeded. The following mixes shall be used for this item.

Wetland Seed Mixes: In order to preserve and enhance the diversity of native wetland species, it is necessary that the source for wetland seed mixtures for use in wetland mitigation areas shall be locally obtained within the Northeast USA including New England, New York, Pennsylvania, New Jersey, Delaware, or Maryland. Two approved seed mixtures are detailed below. Other proposed mixtures must be submitted to OEP and approved by the Environmental Scientist prior to use. The materials certification for any proposed mixture that is different from that described below must be submitted a minimum of ten (10) days prior to delivery on site. This certification must match both the previously approved substitute mixture and the seed tags on the bags that are to be removed upon delivery. No seeding shall occur if all three items do not match.

Wetland Seed Mixture: (NEWP) New England WetMix, New England Wetland Plants, Inc. 800 Main Street Amherst, MA 01002, or equal. Rate shall be 1 pound (.45kg) PLS per 2500 sq.ft. (232 sq.m.)

<u>scientific name</u>	<u>common name</u>
<i>Alisima plantago-aquatica</i>	Water plantain
<i>Aster umbellatus</i>	Flat-top Aster
<i>Bidens cernua</i>	Nodding Bur Marigold
<i>Carex comosa</i>	Bearded sedge
<i>Carex crinita</i>	Fringed sedge
<i>Carex lupulina</i>	Hop sedge
<i>Carex lurida</i>	Lurid sedge
<i>Carex vulpinoides</i>	Fox sedge
<i>Eupatorium maculatum</i>	Spotted Joe-pye weed
<i>Eupatorium perfoliatum</i>	Boneset
<i>Juncus effusus</i>	Soft rush
<i>Penthorum sedoides</i>	Ditch Stonecrop
<i>Scirpus acutus</i>	Hard-stem bulrush
<i>Scirpus atrovirens</i>	Green bulrush
<i>Scirpus cyperinus</i>	Wool grass
<i>Solidago graminifolia</i>	Grass-leaved goldenrod
<i>Verbena hastata</i>	Blue vervain

Wetland Seed Mixture: (BRN) Wetland Seed Mix, Blackledge River Nursery, 155 Jerry Daniels Road, Marlborough, CT, 06447, or equal. Rate shall be 1 pound (.45kg) PLS per 2500 sq.ft. (232 sq.m.)

<u>scientific name</u>	<u>common name</u>
<i>Alisma plantago-aquatica</i>	Water Plantain
<i>Asclepias incarnata</i>	Swamp Milkweed
<i>Aster novae-angliae</i>	New England Aster
<i>Carex comosa</i>	Bristly Sedge
<i>Carex crinita</i>	Fringed Sedge
<i>Carex intumescens</i>	Bladder Sedge
<i>Carex lupulina</i>	Hop Sedge
<i>Carex lurida</i>	Lurid Sedge
<i>Carex scoparia</i>	Broom Sedge
<i>Carex stricta</i>	Tussock Sedge
<i>Carex tribuloides</i>	Blunt Broom Sedge
<i>Carex vesicaria</i>	Inflated Sedge
<i>Carex vulpinoidea</i>	Fox Sedge
<i>Eupatoriadelphis maculatus</i>	Joe Pye Weed
<i>Eupatorium perfoliatum</i>	Boneset
<i>Glyceria canadensis</i>	Canada Manna Grass
<i>Glyceria striata</i>	Fowl Mannagrass
<i>Hibiscus moscheutos</i>	Rose-mallow
<i>Iris versicolor</i>	Blue flag iris
<i>Juncus acuminatus</i>	Sharp-fruited Rush
<i>Juncus brevicaudatus</i>	Narrow-panniced Rush
<i>Juncus canadensis</i>	Canada Rush
<i>Juncus effusus</i>	Soft Rush
<i>Lobelia cardinalis</i>	Cardinal Flower
<i>Lysimachia terrestris</i>	Swamp Candle
<i>Mimulus ringens</i>	Monkey Flower
<i>Rhynchospora capitellata</i>	Brownish Beak Rush
<i>Sagittaria latifolia</i>	Broad-leaved Arrowhead
<i>Scirpus atrovirens</i>	Green Bulrush
<i>Scirpus cyperinus</i>	Wool Grass
<i>Scirpus expansus</i>	Woodland Bulrush
<i>Scirpus hattorianus</i>	Green Bulrush
<i>Scirpus validus</i>	Soft-stem Bulrush
<i>Spirea tomentosa</i>	Steeplebush
<i>Triadenum virginicum</i>	Marsh St. John's Wort
<i>Verbena hastata</i>	Blue Vervain

Construction Methods: Construction methods shall be those established as agronomically acceptable and feasible and which the Environmental Scientist approves. Seeding shall occur during the fall season immediately following construction of the wetland site. Fall seeding must occur from August 15th to October 15th. Seeding shall be applied to all areas that will not be continuously inundated constructed wetland areas. The total area of constructed wetland shall determine the amount of seed to be spread based on 1 pound (.45 kg) PLS per 2500 square feet (232 sq.m.). If seed is purchased in bulk rather than by PLS, the rate of application must be adjusted to meet the required PLS seeding rate. This seeding rate shall be increased by the appropriate percentage as determined by the following formula based off of the information provided on the seed tags at delivery.

$(\text{Germination Percentage} \times \text{Purity Percentage}) / 100 = \text{Percentage PLS}$

The Engineer shall verify that the seed is applied at a rate that will allow for 100 percent PLS.

Method of Measurement: This work will be measured for payment by the number of square feet (square meters) of surface area of accepted established wetland plants as specified or by the number of square feet (square meters) surface area of seeding actually covered as specified.

Basis of Payment: This work will be paid for at the contract unit price per square foot (square meter) for "Wetland Grass Establishment," which price shall include all materials maintenance, equipment, tools, labor, and work incidental thereto. Partial payment of up to 50% may be made for work completed, but not accepted. Full payment shall not be made until the area has been accepted by the Environmental Scientist.

Pay Item	Pay Unit
Wetland Grass Establishment	s.f. (sq.m)

ITEM #0952051A – CONTROL AND REMOVAL OF INVASIVE VEGETATION

Description: This work shall include all materials, labor and equipment necessary for the identification, eradication, removal, and disposal of unwanted vegetation in locations either indicated on the plan sheets or as directed by an Environmental Scientist from the Connecticut Department of Transportation's Office of Environmental Planning (OEP). While any and all invasive species, including those listed on the website for the Connecticut Invasive Plant Working Group's (CIPWG) Invasive Plants Council (<http://www.hort.uconn.edu/cipwg/IPC.html>), may be subject to eradication at the direction of the Environmental Scientist, the following species must always be eradicated, tree-of-heaven (*Ailanthus altissima*), Russian and autumn olive (*Elaeagnus angustifolia* and *E. umbellata*), smooth buckthorn (*Rhamnus cathartica*) and glossy buckthorn (*Frangula alnus*), multiflora rose (*Rosa multiflora*), Japanese barberry (*Berberis thunbergii*), winged euonymus (*Euonymus alata*), shrub honeysuckles (*Lonicera maackii*, *L. morrowii*, *L. tartarica*, *L. X bella*, *L. xylosteum*), privet (*Ligustrum obtusifolium*, *L. ovalifolium*, *L. sinense*, *L. vulgare*), Oriental bittersweet (*Celastrus orbiculatus*), Japanese knotweed (*Polygonum cuspidatum*), common reed (*Phragmites australis*), and reed canary grass (*Phalaris arundinacea*). If project-specific invasive species additional to those listed above need to be removed, the Environmental Scientist will give appropriate direction.

All vegetation designated for removal shall be eradicated in its entirety in accordance with the methods submitted by the Contractor and approved by the Environmental Scientist. Some work will be completed within areas where desirable species are present and will remain. The Contractor will be responsible for protection of desirable species that are to remain.

Materials: Mechanical removal shall consist of either manual labor, utilizing a weed wrench or other approved machine, or some other approved method that will enable removal of all root pieces and other parts of the target species while minimizing soil disturbance and avoiding any spread of invasive plant material. Where large infestations of invasive/unwanted vegetation are present and identified on the plans, removal via over-excavation of such vegetation and the underlying soils may be required.

All herbicides shall be registered for the species being treated and shall be formulated as applicable for target-species foliar treatment, cut surface or injection applications. Where work in or immediately adjacent to wetlands is necessary, the product label(s) for any chemical/adjutant formulation applied must indicate that the formulation is approved for aquatic environments.

Construction Methods: Upon receiving a Notice to Proceed, the Contractor will delineate all areas designated for invasive species removal and identify those species slated for removal. The Contractor will be responsible for maintaining this delineation throughout the life of the contract. Following delineation and species identification, the Contractor shall request a meeting, a minimum of 10 days in advance, to conduct a field review with the Environmental Scientist. As part of this request, the Contractor shall provide a list of the invasive species identified on site

during the initial delineation. During the field review, the Contractor and the Environmental Scientist will review the delineated area and the invasive species required to be removed. At this time, the Environmental Scientist may designate areas for removal that are additional to those shown on the plans.

While the Environmental Scientist will review the Contractor's delineation and removal plan, the Contractor must be competent to identify invasive vegetation and prepare a plan for its eradication without assistance.

Following the field review, the Contractor shall submit a schedule of operations and an outline of construction methodologies for the required control and removal of invasive vegetation specific to each species identified during the field review. This information shall be submitted to the Environmental Scientist for review and approval at least 10 days prior to the expected start of work

The Contractor will not be allowed to begin construction activities in the designated removal areas until all schedules, outlines, and methodologies are approved in writing by the Environmental Scientist. This schedule must take into consideration the time period required between herbicide application and the physical removal of the target species wherever such removal is to occur. No removal work can occur for a minimum of two weeks after herbicide application. In all cases, the submitted schedule shall consider mechanical methods for removal before proposing herbicide application.

The schedule and outline shall include:

- 1) The type(s) of invasive species identified in the designated area(s);
- 2) Species specific treatment methods describing a full course of treatment for each species to achieve eradication. These methods must show:
 - a. Removal methods planned (e.g. pulling, cutting, spraying, etc);
 - b. Types and concentrations of any herbicides to be used, including any adjuvants; and
 - c. Schedules showing dates and types of initial, intermediate and final treatments;
- 3) Any construction activities planned in designated removal area(s) during the eradication period;
- 4) Disposal methods, including:
 - a. Onsite methods and locations; and
 - b. Requests for off-site disposal locations;
- 5) Proof of DEP licensure for herbicide application;
- 6) A description of safety equipment required; and
- 7) Procedures for handling chemical spills.

The Contractor shall also:

- a. Maintain the labels for herbicides being used in his/her possession;
- b. Provide OEP with a 10 day work notice prior to proceeding so that the Environmental Scientist can schedule to be present when appropriate;
- c. Conduct all herbicide formulations and applications, including the addition of appropriate surfactants and other adjuvants, in strict conformance with the manufacturer's recommendation and per requirements of regulatory agencies; and
- d. Maintain a written record of herbicide application, including the formulation, concentration, area treated, and date for each application, to be provided by the commercial applicator and submitted to the Environmental Scientist following each treatment.

A "treatment period" for each designated area will be derived from the schedule submitted by the Contractor and determined by the following:

- 1) The first treatment date of the earliest treatable vegetation; and
- 2) The last treatment date of the latest treatable vegetation

It is anticipated that many species will require more than one season to obtain complete eradication. The treatment period must take into consideration those species that will require follow up treatments and more than one season for complete eradication. Upon completion of the treatment period, the Contractor shall notify the Environmental Scientist in writing of the status of eradication. If the eradication has not been successful, the Contractor shall also submit additional treatment plans. If the Contractor believes that eradication has been achieved, the Contractor shall request a site inspection by the Environmental Scientist for concurrence. If the Environmental Scientist concurs that eradication has been achieved, the area will be subject to a one (1) year warranty starting on the first day following the inspection by the Environmental Scientist. During this period the Contractor will be responsible for any further occurrences of the invasive species inside the delineated area.

Flush cut brush and trees shall not be more than 2 inches (50mm) above the ground line. Flush cutting shall be performed in a controlled manner that will prevent the spread of parts or seeds of invasive species. Brush hogging or any other clearing method that may promote the spread of invasive plant material is also not permissible.

Remove all twining vines in treetops to the greatest extent possible without damaging the branches of the supporting desired vegetation. Cut and remove vines overtopping tree canopies. Climbing spikes will not be permitted for aerial work.

Prune out any branches on non-treatment plants that are damaged during removal of vegetation. All corrective pruning shall conform to the National Arborists Association Pruning Standards.

The site must be monitored by the Contractor and any new or regrowth treated prior to beginning installation of any landscape plantings.

Processing and disposal of unwanted vegetation shall be done in a controlled manner so as not to spread invasive seed or plant parts within the surrounding areas. All cut invasive vegetation shall be separated from clearing and grubbing operations and all other cleared material. Invasive plant materials may be buried on site within the Department ROW provided that they are under a minimum of 10 feet (3.0 m) of cover on all sides for Japanese knotweed and 3 feet (1 m) of cover on all sides for all other species and/or removed from the site and disposed of at the approved location(s) identified in the Contractor's submitted schedule and outline of construction methodologies.

No equipment or vehicles other than that required to complete the work will be permitted in the areas designated for invasive vegetation removal. Any equipment used to process invasive materials, such as chippers and transport vehicles, must be cleaned prior to further use. Processing equipment must also be cleaned prior to further transport.

Broadcast or uncontrolled spray application will not be permitted, and care must be taken to avoid contacting non-target species and/or deterring the recolonization of native species following application.

Wherever removal operations result in exposed soils, disturbed areas must be vegetatively stabilized with the appropriate seed mix and protected with hay, cellulose fiber mulch, or erosion control matting. The application rate for hay mulch and fiber mulch shall be 3500 lbs per acre (3920 kg/hectare).

Method of Measurement: The control and removal of invasive vegetation will be measured by the number of square yards (square meters) of invasive and unwanted vegetation identified and eradicated as required above, including any required re-treatment of any regrowth or new growth. The area for removal will be delineated prior to treatment and measured for payment. After a review of the delineated areas, the Environmental Scientist may designate additional areas for removal that are not shown on the plans. These additional areas will be delineated, measured for payment, and included as part of the contract work. The Contractor will be responsible for removal and eradication of all plant material deemed as invasive or unwanted within the delineated area(s) for the duration of the project or until relieved of responsibility of the removal item, and the delineation shall remain in place until this time. Where excavation is required for removal, this work shall be covered under the contract Item "Earth Excavation". All other vegetation removed shall be included in the Item "Clearing and Grubbing" in accordance with Section 2.01.

Basis of Payment: This work will be paid for at the contract unit price per square yard (square meter) for "Control and Removal of Invasive Vegetation". This payment shall include all labor, materials, tools and equipment necessary for delineation of the invasive area(s); maintenance of the delineation throughout the project; species identification; and cutting, treating, re-treating, removal, and on or off-site disposal of designated invasive plant material. Off-site disposal of residue shall include the loading, transport, dumping, and fees associated with legal off-site disposal.

- Upon approval of the required schedules, the Contractor will receive a payment equal to 10% of all areas delineated.
- Upon initial treatment as it is described in the schedule of operations, the Contractor will receive a payment equal to 30% of all areas receiving initial treatment.
- Upon successful completion of the treatment period as determined during the site review by the Environmental Scientist, the Contractor will receive a payment equal to 30% of all areas receiving final treatment.
- Upon successful completion of the 1 year warranty period covering all treated areas on the project, the contractor will receive a payment equal to 30% of the areas treated.

Vegetative stabilization of disturbed areas shall be paid for under the respective contract Items: “Turf Establishment”, “Wetland Grass Establishment”, and/or “Conservation Seeding for Slopes”.

Removal by excavation shall be paid for under the contract Item “Earth Excavation”.

Pay Item	Pay Unit
Control and Removal of Invasive Vegetation	s.y. (s.m.)

ITEM # 0969064A - CONSTRUCTION FIELD OFFICE, LARGE

Description: Under the item included in the bid document, adequate weatherproof office quarters will be provided by the Contractor for the duration of the work, and if required, for a maximum of ninety days thereafter for the exclusive use of ConnDOT forces and others who may be engaged to augment ConnDOT forces with relation to the contract. The office quarters shall be located convenient to the work site and installed in accordance with Article 1.08.02, this office shall be separated from any office occupied by the Contractor. Ownership and liability of the office quarters shall remain with the Contractor.

Materials: Materials shall be in like new condition for the purpose intended and shall be approved by the Engineer.

Office Requirements: The Contractor shall furnish the office quarters and equipment as described below.

	Description:
2,000 SF	Sq. Ft. of floor space with a minimum ceiling height of 7 ft. and shall be partitioned as shown on building floor plan as provided by the Engineer.
2 EA	Minimum number of exterior entrances.
20 EA	Minimum number of parking spaces.

Office layout: The office shall have a minimum square footage as indicated in the table above, and shall be partitioned as shown on building floor plan as provided by the Engineer. The underside of the office shall be fully skirted to the ground.

Lavatory Facilities: The Contractor shall furnish a minimum of two (2) separate lavatories and toilet facilities (“men” and “women”), in separately enclosed rooms that are properly ventilated and comply with applicable sanitary codes. The Contractor shall provide each lavatory with hot and cold running water and flush-type toilets. He shall also supply lavatory and sanitary supplies as required.

Windows and Entrances: The windows shall be of a type that will open and close conveniently, shall be sufficient in number and size to provide adequate light and ventilation, and shall be fitted with locking devices, blinds and screens. The entrances shall be secure, screened, and fitted with a lock for which four keys shall be furnished. All keys to the construction field office shall be furnished to the Department and will be kept in their possession while State personnel are using the office. Any access to the entrance ways shall meet applicable building codes and be slip resistant, with appropriate handrails.

Lighting: The Contractor shall equip the office interior with electric lighting that provides a minimum illumination level of 100 foot-candles at desk level height, and electric outlets for each desk and drafting table. The Contractor shall also provide exterior lighting that provides a minimum illumination level of 2 foot-candles throughout the parking area and for a minimum distance of 10 ft. on each side of the field office.

The Contractor shall provide the following additional equipment, facilities, and/or services at the Field Office on this project to include at least the following to the satisfaction of the Engineer:

Parking Facility: Adequate parking spaces with adequate illumination on a paved surface, with surface drainage if needed. If paved parking does not exist adjacent to the field office, the Contractor shall provide a parking area of sufficient size to accommodate the number of vehicles indicated in the table above. Construction of the parking area and driveway, if necessary, will consist of a minimum of 6 inches of processed aggregate base graded to drain. The base material will be extended to the office entrance.

Field Office Security: Physical Barrier Devices - This shall consist of physical means to prevent entry, such as: 1) All windows shall be barred or security screens installed; 2) All field office doors shall be equipped with dead bolt locks and regular day operated door locks; and 3) Other devices as directed by the Engineer to suit existing conditions.

Electric Service: The field office shall be equipped with an electric service panel to serve the electrical requirements of the field office, including: lighting, general outlets, computer outlets, calculators etc., and meet the following minimum specifications:

- A. 120/240 volt, 1 phase, 3 wire.
- B. Ampacity necessary to serve all equipment. Service shall be a minimum 100 amp dedicated to the construction field office.
- C. The electrical panel shall include a main circuit breaker and branch circuit breakers of the size and quantity required.
- D. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed at each computer workstation location.
- E. Additional 120 volt, single phase, 20 amp, isolated ground dedicated power circuit with dual NEMA 5-20 receptacles will be installed, for use by the Telephone Company.
- F. Additional 120-volt circuits and duplex outlets as required meeting National Electric Code requirements.
- G. One exterior (outside) wall mounted GFI receptacle, duplex, isolated ground, 120 volt, straight blade.
- H. After work is complete and prior to energizing, the State's ConnDOT electrical inspector, must be contacted at 860-594-2240. (Do Not Call Local Town Officials)
- I. Prior to field office removal the ConnDOT Data Communications office must be notified to deactivate the communications equipment.

Heating, Ventilation and Air Conditioning (HVAC): The field office shall be equipped with sufficient heating, air conditioning and ventilation equipment to maintain a temperature range of 68°-80° Fahrenheit within the field office.

The Following Furnishings and Equipment Shall Be Provided In The Applicable Field Office Type:

Qty	Description:
10 EA	Office desks (2.5 ft x 5 ft) with drawers, locks, and matching desk chairs that have

Qty	Description:
	pneumatic seat height adjustment and dual wheel casters on the base.
1 EA	Standard secretarial desk and matching desk chair that have pneumatic seat height adjustment and dual wheel casters on the base.
20 EA	Office Chairs.
4 EA	Fire resistant cabinets (legal size/4 drawer), locking.
2 EA	Non-fire resistant cabinets (legal size/4 drawer), locking.
1 EA	Conference Table, 44in x 20 ft (nominal)
20 EA	Conference table chairs, medium back padded, swiveling with casters
1 EA	Storage racks to hold 3 ft x 5 ft display charts.
1 EA	USPS approved mail slot bin - legal size, for exterior use. Must be weatherproof and lockable.
2 EA	Drafting type tables (3 ft x 6 ft) self supported; and matching drafters stool that have pneumatic seat height adjustment, seat back and dual wheel casters on the base.
2 EA	Flat file (4/drawers).
11 EA	Personal computer tables (10 - 4 ft x 2.5 ft; 1- 3 ft x 2.5 ft)
1 EA	Hot and cold water dispensing unit and supply of cups and bottled water shall be supplied by the Contractor for the duration of the project.
2 EA	Electronic office type printing calculators capable of addition, subtraction, multiplication and division with memory and a supply of printing paper.
1 EA	Business telephone system for three incoming lines, including 11 hand sets with voice mail, paging and intercom capability. One set shall be secretarial style.
1 EA	"POD" style conference room telephone. (I.e. Polycom VoiceStation 300 Conference, or equal)
1 EA	Multifunction color copier/scanner/facsimile/printer machine with auto document feeder and sorter/stapler. All supplies, paper and maintenance shall be provided by the Contractor. Specified below under <u>Computer Hardware and Software</u> .
12 EA	Computer systems as specified below under <u>Computer Hardware and Software</u> . All supplies and maintenance shall be provided by the Contractor.
3 EA	Black and White laser printer as specified below under <u>Computer Hardware and Software</u> . All supplies, paper and maintenance shall be provided by the Contractor.
1 EA	Color Laser printer as specified below under <u>Computer Hardware and Software</u> . All supplies, paper and maintenance shall be provided by the Contractor.
1 EA	SMART Board 885ix interactive whiteboard system with speakers (includes an interactive white board and projector) or equivalent. Including all necessary software and installation accessories as needed
3 EA	Digital Camera as specified below under <u>Computer Hardware and Software</u> . All supplies and maintenance shall be provided by the Contractor.
1 EA	Heavy Duty Stapler, capable of 160 sheets, minimum
1 EA	Heavy Duty 3 hole punch
1 EA	Wastebaskets - 30 gal., including plastic waste bags.
12 EA	Wastebaskets - 5 gal., including plastic waste bags.
2 EA	Recycling Bins (1-paper, 1-cans)
1 EA	Cross-cut paper shredder, commercial grade

Qty	Description:
2 EA	Wall Clocks
1 EA	First Aid Kit
3 EA	Tables 3 ft x 6 ft
2 EA	Electric pencil sharpeners.
* EA	Fire extinguishers - provide and install type and number to meet applicable State and local codes for size of office indicated, including a fire extinguisher suitable for use on a computer terminal fire.
6 EA	Interior partitions - 6 ft x 6 ft, soundproof type, portable and freestanding.
2 EA	Vertical plan racks for 2 sets of 2 ft x 3 ft plans for each rack..
1 EA	Double door supply cabinet with 4 shelves and a lock - 6 ft x 4 ft.
1 EA	Easel/chalkboard.
12 EA	Open bookcases - 3 shelves - 3 ft long.
1 EA	Infrared Thermometer, including certified calibration, case, cleaning wipes.
1 EA	Concrete Curing Box as specified below under <u>Concrete Testing Equipment</u> .
1 EA	Concrete Air Meter as specified below under <u>Concrete Testing Equipment</u> .
1 EA	Concrete Slump Cone as specified below under <u>Concrete Testing Equipment</u> .
1 EA	Set of the following building and fire codes, consistent with the Contract Documents, to remain the property of the Engineer at the conclusion of the Contract: <ul style="list-style-type: none"> • International Building Code with the State Building Code, including the latest Connecticut Supplement. • International Plumbing Code • International Mechanical Code • NFPA 70 National Electric Code • ICC/ANSI A117.1 • The Fire Safety Code, including latest Connecticut Supplement • Internation Fire Safety Code • NFPA 1 Uniform Fire Code • NFPA 101 Life Safety Code • "Americans with Disabilities Act Accessibility Guidelines"
1 EA	Set of the following Means books, updated throughout the duration of the Contract, to remain the property of the Engineer at the conclusion of the Contract: <ul style="list-style-type: none"> • "Building Construction Cost Data" • "Heavy Construction Cost Data" • "Electrical Construction Cost Data" • "Plumbing Construction Cost Data" • "Mechanical Construction Cost Data"
1 EA	The latest version of Primavera Contractor software (deluxe version or equivalent, capable of servicing 2000 or more activities) with associated data pack, including Oracle technical support for the duration of the Contract, licensed to ConnDOT. The software is to remain the property of the Engineer at the conclusion of the Contract.

With the exceptions noted above, the furnishings and equipment required herein shall remain the property of the Contractor. Any supplies required to maintain or operate the above listed equipment or furnishings shall be provided by the Contractor for the duration of the project.

Telephone Service: This shall consist of four (4) telephone lines: three (3) lines for phone/voice service and one (1) line dedicated for the facsimile machine. The Contractor shall provide unlimited local and long-distance telephone service.

Data Communications Facility Wiring: Contractor shall install a Category 5e 468B patch panel in a central wiring location and Cat 5e cable from the patch panel to each PC station, terminating in a (category 5e 468B) wall or surface mount data jack. The central wiring location shall also house either the data circuit with appropriate power requirements or a category 5 cable run to the location of the installed data circuit. All wiring shall be verified 568 compliant for length, wiremapping, crosstalk (NEXT) and attenuation, with a report provided. The central wiring location will be determined by the ConnDOT Data Center staff in coordination with the designated field office personnel as soon as the facility is in place. The ConnDOT Project Engineer will provide the Contractor with a copy of the current PC specifications, approved printer list and data wiring schematic as soon as possible after the contract is awarded.

Contractor to run a CAT 5e LAN cable a minimum length of 25 feet for each computer to LAN switch area leaving an additional 10 feet of cable length on each side with terminated RJ45 connectors. Each run / jack shall be clearly labeled with an identifying Jack Number.

The installation of a data communication circuit between the field office and the ConnDOT Data Communication Center in Newington will be coordinated between the ConnDOT District staff, ConnDOT Office of Information Systems and the local phone company. The ConnDOT District staff will coordinate the installation of the data communication service with ConnDOT PC Support once the field office phone number is issued. The Contractor shall provide the field office telephone number(s) to the ConnDOT Project Engineer as soon as possible to facilitate data line and computer installations.

Computer Hardware and Software:

The ConnDOT Project Engineer will provide the Contractor with a copy of the current PC specifications, approved printer list and data wiring schematic as soon as possible after the contract is awarded.

Before ordering the computer hardware and software, the Contractor must submit a copy of their proposed PC specifications and the type of printer to the ConnDOT Project Engineer for review by the ConnDOT Data Center. If the specification meets or exceeds the minimum specifications listed below, then the Contractor will be notified that the order may be placed.

Before any equipment is delivered to the Data Center, arrangements must be made a minimum of 24 hours in advance by contacting 860-594-3500. All software, hardware and licenses listed below shall be clearly labeled, specifying the (1) Project No., (2) Contractor Name, (3) Project

Engineer's Name and (4) Project Engineer's Phone No., and shall be delivered to the ConnDOT Data Center, 2710 Berlin Turnpike, Newington, CT, where it will be configured and prepared for field installation. Installation will then be coordinated with ConnDOT field personnel and the computer system specified will be stationed in the Department's project field office.

The computer system furnished shall have all software and hardware necessary for the complete installation of the latest versions of the software listed, and therefore supplements the minimum specifications below. The Engineer reserves the right to expand or relax the specification to adapt to the software and hardware limitations and availability, the compatibility with current agency systems, and to provide the Department with a computer system that can handle the needs of the project. This requirement is to ensure that the rapid changing environment that computer systems have experienced does not leave the needs of the project orphan to what has been specified. There will not be any price adjustment due to the change in the minimum system requirements.

The Contractor shall provide the Engineer with a licensed copy registered in the Department's name of the latest versions of the software listed and maintain customer support services offered by each software producer for the duration of the Contract. The Contractor shall deliver to the Engineer all supporting documentation for the software and hardware including any instructions or manuals. The Contractor shall provide original backup media for the software.

The Contractor shall provide the computer system with all required supplies, maintenance and repairs (including labor and parts) throughout the Contract life.

Once the Contract has been completed, the computer will remain the property of the Contractor. Prior to the return of any computer(s) to the Contractor, field personnel will coordinate with the Data Center personnel for the removal of Department owned equipment, software, data, and associated equipment.

A) Computer – Minimum Specification:

- Processor – Intel® Core 2 Duo Processor (2.00 GHz, 800 MHz FSB 2MB L2 Cache)
- Memory – 2 GB DIMM DDR2 667MHz.
- Monitor – 24.0 inch LCD color monitor.
- Graphics – Intel Graphics Media Accelerator 3100. or equivalent.
- Hard Drive – 160 GB Ultra ATA hard drive (Western Digital, IBM or Seagate).
- Floppy Drive – 3.5 inch 1.44MB diskette drive.
- Optical Drive – CD-RW/DVD-RW Combo.
- Multimedia Package – Integrated Sound Blaster Compatible AC97 Sound and speakers.
- Case – Small Form or Mid Tower, capable of vertical or horizontal orientation.
- Integrated Network Adapter – comparable to 3COM PCI 10/100 twisted pair Ethernet.
- Keyboard – 104+ Keyboard.
- Mouse – Optical 2-button mouse with scroll wheel.
- Operating System – Windows XP Professional Service Pack 2; Windows Vista Capable.
- Application Software – MS Office 2007 Professional Edition.

Additional Software (Latest Releases, including subscription services for the life of the Contract.–

- Norton Anti-Virus and CD/DVD burning software (ROXIO or NERO),
- Adobe Acrobat Standard
- See exceptions noted above for Primavera Contractor and other additional software

Resource or Driver CD/DVD – CD/DVD with all drivers and resource information so that computer can be restored to original prior to shipment back to the contractor.
Uninterrupted power supply – APC Back-UPS 500VA.

Note A1: All hardware components must be installed before delivery. All software documentation and CD-ROMs/DVD for Microsoft Windows XP Professional, Microsoft Office 2007 Professional Edition, and other software required software must be provided. Computer Brands are limited to Dell, Gateway and HP brands only. No other brands will be accepted. The ConnDOT Project Engineer will provide the Contractor with a copy of the current PC specifications and approved printer list as soon as possible after the contract is awarded.

Note A2: As of June 30, 2008, Microsoft will no longer distribute Windows XP for retail sale, although the date for specific computer manufacturers may be different. Please consult your manufacturer for details. The Department still requires Windows XP on all PCs. Microsoft has stated that any PCs that are purchased with either Windows Vista Business, or Vista Ultimate are automatically entitled to “downgrade rights”, which allow the PC to be rolled back to Windows XP. Please consult the specific manufacturer for details on downgrading new PCs to Microsoft Windows XP after June 30, 2008.

B) Laser Printer – Minimum Specification:

Print speed – 35 ppm.
Resolution – 1,200 x 1,200 dpi.
Paper size – Up to 216 mm x 355 mm (8.5 in x 14 in).
RAM – 128 MB.
Print Drivers – Must support HP PCL6 and HP PCL5e.
Printer cable – 1.8 m (6 ft).
Capable of automatic duplex printing (two-sided)

Note B1: Laser printer brands ~~are~~ is limited to Hewlett-Packard only. The ConnDOT Project Engineer will provide the Contractor with a copy of the current PC specifications and approved printer list as soon as possible after the contract is awarded.

C) Color Laser Printer – Minimum Specification:

Print speed – 17 ppm.
Resolution – 600 x 600 dpi.
Paper size – Up to 216 mm x 355 mm (8.5 in x 14 in).
RAM – 64MB.

Print Drivers – Must support HP PCL6 and HP PCL5e.
Printer cable – 1.8 m (6 ft).
Capable of duplex printing (two-sided)

Note C1: Color Laser printer brands is limited to Hewlett-Packard only. The ConnDOT Project Engineer will provide the Contractor with a copy of the current PC specifications and approved printer list as soon as possible after the contract is awarded.

D) Multifunction color copier/scanner/facsimile – Minimum Specification:

Copy speed – 20 ppm.
Resolution – 600 x 600 dpi.
Paper size – Up to 12 in x 18 in
Print Drivers – Must support HP PCL6 and HP PCL5e.
Printer cable – 1.8 m (6 ft).
Capable of duplex printing (two-sided)

Note D1: Multifunction brands are limited to Savin only. The ConnDOT Project Engineer will provide the Contractor with a copy of the current PC specifications and approved printer list as soon as possible after the contract is awarded.

E) Digital Camera – Minimum Specification:

Optical – 5 mega pixel, with 3x optical zoom.
Memory – 2 GB.
Features – Date/time stamp feature.
Connectivity – USB cable or memory card reader.
Software – Must be compatible with Windows XP and Vista.
Power – Rechargeable battery and charger.

The Contractor is responsible for service and repairs to all computer hardware. All repairs must be performed with-in 48 hours. If the repairs require more than a 48 hours then a replacement must be provided. All supplies, paper and maintenance for the computers, laptops, printers, copiers, and fax machines shall be provided by the Contractor.

Concrete Testing Equipment: If the Contract includes items that require compressive strength cylinders for concrete, in accordance with the Schedule of Minimum Testing Requirements for Sampling Materials for Test, the Contractor shall provide the following. All testing equipment will remain the property of the Contractor at the completion of the project.

- A) Concrete Cylinder Curing Box – meeting the requirements of Section 6.12 of the Standard Specifications.
- B) Air Meter – The air meter provided shall be in good working order and will meet the requirements of AASHTO T 152.

- C) Slump Cone Mold – Slump cone, base plate, and tamping rod shall be provided in like-new condition and meet the requirements of AASHTO T119, Standard Test Method for Slump of Hydraulic-Cement Concrete.

Insurance Policy: The Contractor shall provide a separate insurance policy, with no deductible, in the minimum amount of forty thousand dollars (\$40,000.00) in order to insure all State-owned data equipment and supplies used in the office against all losses. The Contractor shall be named insured on that policy, and the Department shall be an additional named insured on the policy. These losses shall include, but not be limited to: theft, fire, and physical damage. The Department will be responsible for all maintenance costs of Department owned computer hardware. In the event of loss, the Contractor shall provide replacement equipment in accordance with current Department equipment specifications, within seven days of notice of the loss. If the Contractor is unable to provide the required replacement equipment within seven days, the Department may provide replacement equipment and deduct the cost of the equipment from monies due or which may become due the Contractor under the contract or under any other contract. The Contractor's financial liability under this paragraph shall be limited to the amount of the insurance coverage required by this paragraph. If the cost of equipment replacement required by this paragraph should exceed the required amount of the insurance coverage, the Department will reimburse the Contractor for replacement costs exceeding the amount of the required coverage.

Maintenance: During the occupancy by the Department, the Contractor shall maintain all facilities and furnishings provided under the above requirements, and shall maintain and keep the office quarters clean through the use of weekly professional cleaning to include, but not limited to, washing & waxing floors, cleaning restrooms, removal of trash, etc. Exterior areas shall be mowed and clean of debris. A trash receptacle (dumpster) with weekly pickup (trash removal) shall be provided. Snow removal, sanding and salting of all parking, walkway, and entrance ways areas shall be accomplished during a storm if on a workday during work hours, immediately after a storm and prior to the start of a workday. If snow removal, salting and sanding are not completed by the specified time, the State will provide the service and all costs incurred will be deducted from the next payment estimate.

Method of Measurement: The furnishing and maintenance of the construction field office will be measured for payment by the number of calendar months that the office is in place and in operation, measured to the nearest month.

There will not be any price adjustment due to any change in the minimum computer system requirements.

Basis of Payment: The furnishing and maintenance of the construction field office will be paid at the listed unit price per month for the respective item "Construction Field Office, Large", which price shall include all material, equipment, labor, utility services and work incidental thereto.

The cost of providing the parking area, external illumination, trash removal and snow and ice removal shall be included in the monthly unit price bid for the respective item "Construction Field Office, Large".

The State will be responsible for payment of data communication user fees and for toll calls by State personnel.

<u>Pay Item</u>	<u>Pay Unit</u>
Construction Field Office, Large	Month