INDIANA DEPARTMENT OF TRANSPORTATION
Driving Indiana's Economic Growth

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Michael R. Pence, Governor
Karl B. Browning, Commissioner

AGENDA

September 18, 2014 Standards Committee Meeting

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MEMORANDUM

September 4, 2014

TO: Standards Committee

FROM: Scott Trammell, Secretary

RE: Agenda for the September 18, 2014 Standards Committee Meeting

A Standards Committee meeting is scheduled for 09:00 a.m. on September 18, 2014 in the N955 Bay Window Conference Room. Please enter meeting through the double doors directly in front of the conference room.

The following items are listed for consideration:

A. GENERAL BUSINESS ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. *Approval of the Minutes from the July 17, 2014 meeting*

2. *Standards Committee schedule of meetings, items submittals and distributions for the year of 2015.* (Mr. Trammell, pg 03)

B. CONCEPTUAL PROPOSAL ITEMS

OLD BUSINESS

(No items on this agenda)

NEW BUSINESS

1. Reinstatement of pay item "Pile, Steel Pipe, Reinforced Concrete, Epoxy Coated..." in 701.15 and subdivision of Standard drawing 701-BPIL-01. (Mr. Koch, pg 04)

C. STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS PROPOSED ITEMS

OLD BUSINESS

Item No. 01 5/15/2014 (2014 SS)	Ms. Gottschalk	pg 06
SECTION 628	FIELD OFFICE, FIELD LABORATORY, COMPUTER SYSTEM~~S~~, *COMPUTER SYSTEM EQUIPMENT* OFFICE MACHINES AND COMMUNICATIONS	

NEW BUSINESS

Item No. 01 09/18/2014 (2014 SS)	Mr. Pankow	pg 22
101.59	Substantial Completion	

Item No. 02 09/18/2014 (2014 SS)	Mr. Pankow	pg 25
602.03(b)	Cast-in-Place Concrete Barrier and Concrete Glare Screen	
602.05	Method of Measurement	
602.06	Basis of Payment	

Recurring Special Provision:

~~626-R-165~~	~~MODIFIED SECTION CONCRETE MEDIAN BARRIER~~

Item No. 03 09/18/2014 (2014 SS)	Mr. Pankow	pg 30

Recurring Special Provision:

731-B-205	MSE RETAINING WALL REQUIREMENTS

cc: Committee Members
FHWA
ICA

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Mr. Trammell
Date: 9/18/14

GENERAL BUSINESS ITEM

2. STANDARDS COMMITTEE SCHEDULE OF MEETINGS, ITEMS SUBMITTALS AND DISTRIBUTIONS FOR THE YEAR OF 2015

Std Comm Mtg Date	Agenda Items Due [1]	Agenda Distributed & Published	First Draft Minutes Distributed	Comments Due for Draft Minutes	Final Draft Minutes Distributed	Approved Minutes Published
	(-24 days)	(-17days)	(+6 days)	(+13 days)	(+21 days)	(+35-42 days)
18-Dec-14	24-Nov-14	1-Dec-14	24-Dec-14	31-Dec-14	8-Jan-15	22-Jan-15
15-Jan-15	22-Dec-14	29-Dec-14	21-Jan-15	28-Jan-15	5-Feb-15	26-Feb-15
19-Feb-15	26-Jan-15	2-Feb-15	25-Feb-15	4-Mar-15	12-Mar-15	26-Mar-15
19-Mar-15	23-Feb-15	2-Mar-15	25-Mar-15	1-Apr-15	9-Apr-15	23-Apr-15
16-Apr-15	23-Mar-15	30-Mar-15	22-Apr-15	29-Apr-15	7-May-15	28-May-15
21-May-15	27-Apr-15	4-May-15	27-May-15	3-Jun-15	11-Jun-15	25-Jun-15
18-Jun-15	26-May-15	1-Jun-15	24-Jun-15	1-Jul-15	9-Jul-15	23-Jul-15
16-Jul-15	22-Jun-15	29-Jun-15	22-Jul-15	29-Jul-15	6-Aug-15	27-Aug-15
20-Aug-15	27-Jul-15	3-Aug-15	26-Aug-15	2-Sep-15	10-Sep-15	24-Sep-15
17-Sep-15	24-Aug-15	31-Aug-15	23-Sep-15	30-Sep-15	8-Oct-15	22-Oct-15
15-Oct-15	21-Sep-15	28-Sep-15	21-Oct-15	28-Oct-15	5-Nov-15	25-Nov-15
19-Nov-15	26-Oct-15	2-Nov-15	24-Nov-15	2-Dec-15	10-Dec-15	23-Dec-15
17-Dec-15	23-Nov-15	30-Nov-15	23-Dec-15	30-Dec-15	7-Jan-16	28-Jan-16

[1] Agenda items must be submitted by the due date shown, and be accompanied by a Proposal sheet.

2. The *May 21* meeting is the last opportunity for approval of items to be included in September lettings.

3. Shaded dates are exceptions to regular schedule.

CONCEPTUAL PROPOSAL ITEM

1. REINSTATEMENT OF PAY ITEM "PILE, STEEL PIPE, REINFORCED CONCRETE, EPOXY COATED..." IN 701.15 AND SUBDIVISION OF STANDARD DRAWING 701-BPIL-01

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: At locations where installed shell piles will be exposed to the elements, chapter 408 of the Design Manual requires reinforced epoxy coated shell piles. The 2010 Standard Specification revision eliminated the term 'reinforced concrete' from the pay item "Pile, Reinforced Concrete, Steel Shell Encased, Epoxy Coated, thickness, diameter" but allowed "Pile, Steel H, Reinforced Concrete Encased, HP size" to remain.

The lack of an item is causing the omission of reinforcing where epoxy coated shell piles are required. For example the 2008 SS contains the same or very similar language of the current 701.02 & 701.09. Prior to 2010 contractors bid/priced the work only when INDOT included the item in the "list of item". With the term 'reinforced' eliminated from the epoxy shell pile item contractors are bidding/providing the later. The current reinforced H pile item further clouds the issue.

- Standard Specification 701.02 provides the material references for reinforcing bars.
- Standard specification 701.09 provides the limits of pile epoxy and reinforcement.
- From 701.09:

  The limits of the epoxy coated steel pipe portion of the pile, and the limits of the reinforced concrete shall be as shown on the plans.

- Standard Drawing 701-BPIL-01 is titled "Reinforced-Concrete Encasement for Piles" and depicts to limits epoxy coated reinforced shell piles & reinforced concrete encased H Piles.
- Standard Specification 701.14 states reinforcing bars … will not be measured for payment.
- SS 701.15 includes the cost of "plain and epoxy coated reinforcing bars" in the cost of the piles.

PROPOSED SOLUTION:

- Reinstate "Pile, Steel Pipe, Reinforced Concrete, Epoxy Coated, …"
- Subdivide 701-BPIL-01: Two standard drawings referencing the item names in the title box.
  - Pile, Steel Pipe, Reinforced Concrete, Epoxy Coated
  - Pile, Steel H, Reinforced Concrete Encased

APPLICABLE STANDARD SPECIFICATIONS: 701

APPLICABLE STANDARD DRAWINGS: 701-BPIL-01

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CONCEPTUAL PROPOSAL ITEM

1. REINSTATEMENT OF PAY ITEM "PILE, STEEL PIPE, REINFORCED CONCRETE, EPOXY COATED..." IN 701.15 AND SUBDIVISION OF STANDARD DRAWING 701-BPIL-01

(CONTINUED)

APPLICABLE DESIGN MANUAL SECTION: 408

APPLICABLE SECTION OF GIFE:

APPLICABLE RECURRING SPECIAL PROVISIONS:

PAY ITEMS AFFECTED:

Pile, Steel Pipe, Epoxy Coated, _____, _____ .....LFT
pipe wall thickness diameter

Submitted By: Michael Koch

Title: Area Engineer

Organization: INDOT

Phone Number: 574-612-2224

Date: Sept 2, 2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

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OLD BUSINESS ITEM

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Spec is out of date with current standards, Microsoft retired XP as a operating system and will not cont. to service it.

PROPOSED SOLUTION: Bring 628 spec to current minimum standards

APPLICABLE STANDARD SPECIFICATIONS: 628

APPLICABLE STANDARD DRAWINGS: N\A

APPLICABLE DESIGN MANUAL SECTION: N\A

APPLICABLE SECTION OF GIFE: N\A

APPLICABLE RECURRING SPECIAL PROVISIONS: 628-C-586

PAY ITEMS AFFECTED: Mobile Laptop Computer System, Mobile Internet Service, Field Office, Field Office Computer System, Additional,Field Laboratory

Submitted By: Michelle Gottschalk

Title: Director Construction Technical Support

Organization: Construction Management

Phone Number: 317-232-7758

Date: 4-17-2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: SiteManager Operations Group

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REVISION TO STANDARD SPECIFICATIONS (OLD BUSINESS ITEM)

SECTION 628 - FIELD OFFICE, FIELD LABORATORY, COMPUTER SYSTEMS, OFFICE MACHINES AND COMMUNICATIONS

(Note: Proposed changes shown to Section 628 specifications (2014 Standard Specifications)

Currently active RSPs:

628-C-236 Hands-Free Kits for Cell Phones

628-C-586 Field Office Computer Equipment

The Standard Specifications are revised as follows:

SECTION 628, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 628 – FIELD OFFICE, FIELD LABORATORY, COMPUTER SYSTEM~~S~~, *COMPUTER SYSTEM EQUIPMENT*, OFFICE MACHINES AND COMMUNICATIONS

628.01 Description

This work shall consist of providing the specified facilities, equipment, supplies and services in accordance with 105.03.

628.02 Field Office and Laboratory Requirements

When specified, the Contractor shall provide a field office, computer systems, *computer system equipment*, office machines, field laboratory, services, equipment and supplies for the Department's exclusive use in accordance with the minimum requirements listed below.

All equipment shall be covered by normal manufacturer's warranties. All cellular telephone units, computer systems, office machines and associated equipment provided by the Contractor will remain the property of the Contractor and will be returned to the Contractor upon completion of the contract.

(a) Field Office

The field office shall be located as mutually agreed by the Engineer and the Contractor. If a building exists within the limits of the right-of-way that is acceptable as a field office and the building is scheduled to be removed under the terms of the contract, the building may be equipped and furnished as the field office. A building within the right-of-way that is furnished under this specification shall be removed prior to the date of the last work and other acceptable facilities for the field office shall then be provided.

The field office may be a permanent building or a trailer and shall be of the type shown on the Schedule of Pay Items. The building or trailer furnished for the field office shall be in accordance with all applicable State and local codes and applicable IOSHA/OSHA requirements.

The field office shall be complete and ready for use by the Department, including all utility connections ~~and specified computer systems~~, office machines, internet service, equipment and supplies, prior to the start of work. If the Contractor is unable to provide

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the permanent field office prior to the start of the work, the Engineer shall be notified in writing and the Contractor and the Engineer will agree on temporary field office arrangements prior to the start of work. A temporary field office will not be accepted by the Department for more than two months, at which time a permanent field office shall be ready for the Department's use.

The field office shall at a minimum be the size listed below for the type field office specified.

1. Type A – 400 sq ft
2. Type B – 550 sq ft
3. Type C – 650 sq ft.

Minimum dimensions shall be 8 ft wide and 7 ft in height, from floor to ceiling. For a trailer, the calculation of minimum area will be based on the exterior box dimensions.

The office shall have a solid and level floor with no holes, a weatherproof roof and shall be dust-proof, and wind-tight. The field office shall have at least two doors for ingress and egress and shall have a minimum of six windows for a type A field office and eight windows for a type B or C field office, not including any windows in the doors.

Each door shall have a satisfactory lock. At least one door must always be able to be unlocked and opened from inside the field office. If a padlock is used to secure a door, it shall be a high security type which is invulnerable to bolt cutters, hacksaws, hammers, or prybars. The padlock shall be mounted in such a manner that locking and unlocking the door is satisfactorily convenient. Installation of additional hardware to protect the lock or use of multiple padlocks on a door will not be allowed. However, additional hardware to receive the padlock will be acceptable. The Contractor shall furnish the number of keys to the office as directed by the Engineer. The Department will maintain a list of all Department personnel who are given keys.

Windows shall be hinged or sliding and have a minimum area of 5 sq ft each. Windows shall be provided with satisfactory locks and screens. Windows, including windows in the doors, shall be provided with shades, blinds, or other approved coverings.

The field office shall have heating and air-conditioning equipment capable of maintaining a uniform temperature between 68°F and 80°F.

The field office shall have a minimum 100 amp, 120/240 volt electrical service, shall have sufficient receptacles to satisfactorily accommodate all required electrical equipment without the use of extension cords or splitters and shall be provided with satisfactory office type lighting.

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The field office shall include a minimum of one separately lockable storage area ~~suitable to store a nuclear density/moisture gauge~~. The storage area shall have a minimum storage volume of 63 cu ft with a minimum floor area of 9 sq ft.

If the field office is a trailer, the trailer shall be securely supported by adequate blocking. The blocking shall provide a foundation to prevent settlement. The trailer shall be secured to the ground with a trailer tie down system that is in accordance with all State and local requirements. Each trailer shall be furnished with steps meeting IOSHA/OSHA requirements at each doorway.

The field office location shall be selected in order to provide satisfactory parking and trash disposal facilities for Department use. Parking spaces shall be either paved or surfaced with compacted aggregate, size No. 53, or other acceptable materials suitable for all-weather usage.

(b) Field Office Equipment and Supplies

The following minimum equipment and supplies shall be furnished for each field office of the type specified.

Office Type	**A**	**B**	**C**
Bloodborne Pathogen Kit	1	1	1
Broom and Dust Pan	1	1	1
Calculators	1	2	2
Carbon Monoxide Detector	1	1	1
Chairs	4	8	12
Cleaning Supplies	Yes	Yes	Yes
Drafting Stools	1	1	1
Drafting Tables	1	1	1
Bottled Drinking Water	Yes	Yes	Yes
File Cabinet Drawers	4	8	12
Fire Extinguishers	1	2	2
First-Aid Kit	1	1	1
Folding Office Tables	1	2	2
Microwave Oven	1	1	1
Office Desks & Office Chairs	2	4	4
Paper Shredder	1	1	1
Pencil Sharpener	1	1	1
Refrigerator/Freezer	1	1	1
Shelving	16 lft	20 lft	24 lft
Six-hook Coat Rack	1	1	1
Smoke Detector	1	1	2
Telephones Lines	2	2	2
Telephones	2	2	3
Toilet Facilities	Yes	Yes	Yes

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Voice Mail	1	1	1
Waste Paper Baskets	2	4	4

The office and the equipment shall be furnished in a condition satisfactory to the Department.

Adequate quantities of basic hygiene and office cleaning supplies shall be provided. These supplies shall include, but are not limited to, hand soap, hand sanitizer, paper towels, toilet paper, window cleaner, all-surface cleaner, toilet disinfectant, toilet brush and a toilet plunger.

~~Potable~~*Bottled* drinking water *with a dispenser* ~~with~~ *having* both hot and cold water capabilities shall be furnished. Drinking cups and paper towels shall be provided.

Fire extinguishers shall be five-pound, Class ABC or higher rated and shall be maintained in a fully charged and operable condition and shall meet all IOSHA/OSHA requirements.

First-aid kits shall meet the requirements of ANSI Z308.1 current at the time of letting.

Shelving shall have a minimum width of 10 in.

At least one telephone shall be a cordless phone having a frequency of at least 900 MHz.

The telephone voice mail system shall be capable of providing both a minimum one minute outgoing message and 30 minutes total recording time for incoming messages. It shall have a remote operation feature, which may be used to retrieve, replay, erase, and save messages. An answering machine meeting these requirements may be substituted for the voice mail system.

Filing cabinets shall at a minimum be fire resistant steel filing cabinets with a class D or higher classification established by UL or Safe Manufacturers National Association. Cabinet drawers shall have a filing depth of 25 in. All cabinets shall have a lock and at least four drawers shall be fireproof.

Office desktops shall be at least 48 in. wide and 25 in. deep. All desks shall contain at least two drawers, one of which shall be provided with a lock.

Folding office tables shall be a minimum size of 30 by 60 in.

Office chairs shall be height adjustable and equipped with castors. Other required chairs may be stackable or folding chairs.

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Drafting tables shall contain a tilt top work table for drafting purposes. Dimensions shall be at least 30 by 60 in. The drafting stool shall be proportional to each drafting table.

Supplies to be furnished shall include all items required for proper operation of the required equipment. This includes, but is not limited to, operating manuals and paper supplies.

Calculators shall be electric powered, have a printer and a minimum 12-digit capacity.

The *paper* shredder shall have a minimum capacity of 12 sheets *of* ~~(~~20 lb paper~~)~~, shall be capable of shredding paper clips and staples and shall include a five-gallon capacity waste basket.

The microwave oven shall have a minimum 1 cu ft capacity with a minimum 1,100 watts and shall have digital controls.

The field office and all equipment and supplies shall be maintained and replenished in a satisfactory manner during the term of the contract or until released by the Engineer. If the field office or required equipment and supplies are not maintained by the Contractor, the Engineer may withhold partial payments until the field office is operational to the Department's satisfaction.

(c) ~~Field Office~~ Computer System *and Computer System Equipment*

When specified in the Schedule of Pay Items, ~~T~~the Contractor shall provide ~~one field office~~ computer system *and computer system equipment in accordance with the minimum requirements listed below* for the Department's exclusive use for each field office ~~specified. The Contractor has the option to provide either a desktop or a laptop computer system in accordance with the minimum requirements listed below.~~

1. ~~Field Office Desktop~~ Computer System

a. Laptop Computer
~~a~~*b*. Processor – Intel or AMD compatible, 2.0 GHz
~~b~~*c*. Memory – ~~1.0~~*4.0* GB, ~~533~~*1333* MHz
~~c~~*d*. Hard Drive – ~~60~~*250* GB, 5,400 rpm
~~d~~*e*. ~~Optical Drive~~ *Module Bay Device* – 24X CD-RW drive
~~e~~*f*. Ports – Two USB 2.0 compliant ports
~~f~~*g*. Network/Wireless – Ethernet or wireless card to be compatible with the selected internet and office network connections
~~g~~*h*. Graphics – Integrated graphics card
~~h~~*j*. ~~Monitor – 22 in. widescreen digital flat panel~~

~~i. Keyboard – USB enhanced multimedia keyboard~~
~~j. Mouse – USB 2-button scroll mouse.~~
k. Display – 15 in. WX GA LCD panel
l. Battery – Nine cell lithium ion
m. Miscellaneous – One compatible port replicator with AC adapter, one additional AC adapter, one DC adapter and one padded carrying case.

The initial condition of the computer system shall be nearly pristine. All owner installed e-mail accounts, games, spyware, online services, applications, network or other profiles previously set up on the system shall be removed prior to placement in the field office. If the system was provided for a previous Department contract, all software not specified shall be removed prior to placement in the current field office.

The Contractor shall provide a minimum 900 J, six outlet surge protector for each computer system specified in the contract.

2. ~~Field Office Laptop~~ Computer System *Equipment*

~~a. Processor – Intel or AMD compatible, 2.0 GHz~~
~~b. Memory – 1.0 GB, 533 MHz~~
~~c. Hard Drive – 60GB, 5,400 rpm~~
~~d. Module Bay Device – 24X CD-RW drive~~
~~e. Ports – Two USB 2.0 compliant ports~~
~~f. Network/Wireless – Ethernet or wireless card to be compatible with the selected internet and office network connections~~
~~g. Graphics – Integrated graphics card~~
~~h. Display – 15 " XWGA LCD panel~~
~~i. Battery – Nine cell lithium ion~~
~~j~~*a*. External Monitor – 22 in. widescreen digital flat panel *with VGA and DVI connections*
~~k~~*b*. External Keyboard – USB enhanced multimedia keyboard
~~l~~*c*. External Mouse – *Optical* USB 2-button scroll mouse
~~m. Miscellaneous – One compatible port replicator with AC adapter, one additional AC adapter, one DC adapter and one padded carrying case.~~

3. Computer Software

The Contractor shall provide software for the computer system in accordance with the minimum requirements listed below.

a. Operating System Software – Windows ~~XP~~7 Professional.
b. Productivity Software – Microsoft Office 200~~3~~7 Small Business and Adobe Acrobat Professional *X*.

c. Security Software – McAfee Virus Scan Plus.

All software shall include the most current updates and patches at the time the computer system is provided to the Department. The Contractor shall provide for installation of updates and patches for the operating system, productivity and security software during the term of use of the computer system by the Department. Updates and patches shall be provided by an automatic update method.

The Department may install and maintain proprietary software on the computer in order to run the Department's construction management programs.

4. Miscellaneous Computer Requirements

~~The initial condition of the computer system shall be nearly pristine. All owner installed e-mail accounts, games, spyware, online services, applications, network or other profiles previously set up on the system shall be removed prior to placement in the field office. If the system was provided for a previous Department contract, all software not specified shall be removed prior to placement in the current field office.~~ *(Note: this statement moved to (c)1; applies only to the computer system)*

~~The Contractor shall provide an uninterruptible power supply, UPS, minimum 120 VA, 100 Watts and full time surge suppression for each field office computer system specified in the contract.~~ *(Note: revised statement moved to (c)1; applies only to the computer system)*

The Contractor shall provide all cables, connections and software required to connect the ~~field office~~ computer system *provided by the Contractor or by the Department* to the printer and the scanner.

~~When more than one computer system is specified for a field office, t~~*T*he Contractor shall provide either an Ethernet or wireless office network to enable all computer systems in the field office to access the field office internet service, the printer and the scanner.

~~The Contractor shall provide appropriate dust covers for all field office desktop computer systems.~~

The Contractor shall provide all manuals necessary for operation of the computer system*, computer system equipment* and software with the system and shall include all documentation normally furnished with the equipment and software when purchased.

The Department will be utilizing the computer system to run or access Department provided construction management software applications. These applications are known to run on Intel and AMD compatible equipment when using the Windows ~~XP~~*7* Professional operating system. If the Department experiences problems running these applications due to hardware or software compatibility, the Contractor shall replace the

equipment to ensure compatibility to the satisfaction of the Engineer within five business days.

The computer system shall be maintained in good working order. If a portion of the system becomes defective, inoperable, damaged, or stolen, that portion shall be repaired or replaced within five business days after the Contractor is notified by the Engineer. If the computer system and related accessories are not maintained by the Contractor as required, the Engineer may withhold partial payments until the computer system is operational to the Department's satisfaction.

(d) Field Office Internet Service

The Contractor shall provide broadband internet service for the field office. Broadband internet service shall be capable of a minimum average upload speed of ~~350 Kbps~~*6 Mbps and minimum download speed of 25 Mbps*, unless otherwise approved by the Engineer.

(e) Field Office Machines

The Contractor shall provide a fully operational copier, printer, *and* document scanner ~~and fax machine~~ for the Department's exclusive use in the field office in accordance with the minimum requirements listed herein.

In lieu of separate copier, printer, *and* scanner ~~and fax machines~~, the Contractor may provide an all-in-one unit that meets all the requirements for any combination of the individual machines being provided. Separate machines shall be provided for those machine functions that are not included in an all-in-one type machine.

1. Copier

The copier shall be capable of using plain paper and of making full size, black and white copies of letter, legal and ledger US paper size original documents. The copier shall be capable of reducing and increasing copy sizes. The copier shall have a self-feeding paper tray, an automatic document feeder and be capable of producing at least ~~12~~*20* copies per minute.

2. Printer

The printer shall be compatible with the computer system provided by the Contractor *or by the Department* for use by the Department in the field office. The printer shall be capable of printing single-sided, black and white letter, legal and ledger US paper size documents at a rate of 20 pages per minute and capable of automatic duplex printing. More than one printer may be used to meet this requirement.

All printers shall be set to accommodate wireless printing from the Department's iPads using AirPrint™ technology. *(Note: statement was amended on the November 22, 2013 Standards Committee meeting and shown revised)*

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3. Document Scanner

The document scanner shall be compatible with the computer system provided by the Contractor *or the Department* for use by the Department in the field office. The scanner shall be capable of scanning letter and legal size documents and shall have an automatic document feeder and be capable of *200 to* 600 dpi black and white resolution, *preset to 200 dpi*. *(Note: statement was amended on the November 22, 2013 Standards Committee meeting)*

~~**4. Fax Machine**~~

~~The fax machine shall be connected to one of the required telephone service lines in the field office. The machine shall have an automatic document feeder with a 10-page capacity and be capable of faxing letter and legal size sheets. It shall be able to automatically dial 40 preprogrammed fax numbers and have the capability to program at least two groups of numbers. The machine shall have a 2 MB memory, shall be equipped with a telephone handset and be capable of automatic redial.~~

~~5~~4. Miscellaneous Office Machine Requirements

The Contractor shall provide letter, legal and ledger size paper, ink cartridges and toner as required by the Engineer for the operation of each piece of equipment provided.

If any office machine becomes defective, inoperable, damaged, or stolen, that machine shall be repaired or replaced within five business days after the Contractor is notified by the Engineer. If any of the office machines are not maintained by the Contractor as required, the Engineer may withhold partial payments until the machine is operational to the Department's satisfaction.

(f) Field Laboratory

The field laboratory shall be located as mutually agreed by the Engineer and the Contractor. The laboratory shall consist of an acceptable building or trailer in accordance with 628.02(a) in which the Department will house and use equipment to perform testing procedures for the contract.

The following equipment and supplies shall be furnished for each field laboratory of the type specified. The equipment and supplies shall meet the requirements of 628.02(a) as applicable.

Laboratory Type	**A**	**B**	**C**
Bloodborne Pathogen Kit	1	1	1
Broom and Dust Pan	1	1	1
Carbon Monoxide Detector	1	1	1
Chairs	2	2	2
Cleaning Supplies	Yes	Yes	Yes
Bottled Drinking Water	Yes	Yes	Yes
File Cabinet Drawers	4	4	4

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Fire Extinguishers	1	2	2
First-Aid Kit	1	1	1
Folding Office Tables	1	1	1
Office Desks & Office Chairs	1	1	1
Shelving	16 lft	20 lft	24 lft
Six-hook Coat Rack	1	1	1
Smoke Detector	1	1	2
Telephones Lines	1	1	1
Telephones	1	1	1
Toilet Facilities	Yes	Yes	Yes
Voice Mail	1	1	1
Waste Paper Baskets	2	2	2

If a field office is provided that is large enough to include the required space for the laboratory, the Engineer may agree to accept the field office for use as both office and laboratory, in which case the equipment and supplies listed for the laboratory will not be required.

If the field laboratory is a separate structure that is located directly adjacent to the field office, the toilet facilities, drinking water, telephones, voice mail/answering machine, telephone lines and cleaning supplies will not be required.

628.03 ~~Additional Computer Systems and~~ Mobile Internet Service

When specified, the Contractor shall provide ~~the following computer systems and~~ *mobile* internet service~~s~~ for the Department's exclusive use.

~~**(a) Additional Field Office Computer System**~~

~~The additional field office computer system shall be either a desktop or laptop computer system in accordance with 628.02(c)1 or 628.02(c)2 except that the monitor for a desktop system may be a 19 in. flat panel and the external monitor for a laptop system will not be required. The requirements of 628.02(c)3 and 628.02(c)4 shall apply to each additional field office computer.~~

~~**(b) Mobile Laptop Computer System**~~

~~The mobile laptop computer system shall be in accordance with 628.02(c)2 except that the external monitor, integrated graphics card, external keyboard and port replicator with AC adapter will not be required. Mobile laptop computers will be used by the Department for contracts that do not include a field office. The requirements of 628.02(c)3 and 628.02(c)4 shall apply to each mobile laptop computer except that those requirements specifically for a field office computer will not apply.~~

~~**(c) Mobile Internet Service**~~

The mobile broadband internet service access card will be used by the Department in a laptop computer provided by either the Contractor or the Department.

The card shall connect to the laptop via a type II PC card slot, an express card slot or a USB 2.0 compliant port. The card and service shall be capable of a minimum ~~average upload speed of 350 Kbps~~*3G speed*. The internet service rate plan shall include unlimited data and time usage with no roaming charge for national domestic use. All software necessary for the operation of the card shall be provided to the Engineer.

The Contractor shall not purchase any card or enter into any service agreement until authorized by the Engineer. The Engineer will provide a minimum of 10 business days notice prior to the date the card will be required.

628.04 Cellular Telephones

The Contractor shall provide cellular telephone equipment and services, as specified below, for use by the Department on the contract.

Each cellular telephone unit shall have a service coverage area that includes the project limits. Each cellular telephone unit shall include a belt clip system, a 120V AC charger, ~~and~~ a 12V DC mobile charger*, and a hands-free kit consisting of a speaker and a microphone enabling the user to operate the unit with minimal need for the use of their hands. The hands-free kit may be either wired or wireless.* *(Note: amended on the November 22, 2013 Standards Committee meeting; shown in RSP 628-C-236 HANDS-FREE KITS FOR CELL PHONES; Basis for Use: Required for all contracts with 628 Cellular Telephone pay items.)*

All equipment shall be covered by normal manufacturer's warranties. All cellular telephone units and associated equipment will remain the property of the Contractor and will be returned to the Contractor upon completion of the contract.

Cellular telephone units shall meet the following minimum requirements:

(a) Type A

1. internet ready device with minimum 3.5 in. display, measured diagonally
2. cellular telephone anytime minutes per month as shown in the Schedule of Pay Items
3. unlimited nights and weekends service
4. voice mail and caller ID
5. protective case to prevent damage to the unit
6. rear facing camera with a minimum 4 MP resolution
7. minimum 720p video capture
8. 2GB or higher data plan per unit
9. internal memory of 8GB or higher
10. USB port for computer connection.

(b) Type B

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1. *a* cellular telephone *with* anytime minutes per month as shown in the Schedule of Pay Items
2. unlimited nights and weekends service
3. voice mail and caller ID
4. build-in camera with a minimum 3.2 MP resolution.

The Department will be responsible for damage or loss of the units beyond that covered by normal manufacturer's warranties, while in use by the Department. The Contractor shall provide replacement cellular telephone units, batteries, chargers, and equipment within one business day of notification of need for the item.

The Contractor shall not enter into any agreement with any service provider or purchase any cellular telephone units for use by the Department until authorized by the Engineer. The Engineer will notify the Contractor a minimum of 10 business days prior to the need for the units.

628.05 Method of Measurement

Field office and field laboratory will be measured by the month for the specified type. Partial months will be rounded up to the next 1/2 or whole month. The Department will provide two weeks advanced notice prior to when the facility will be vacated.

If a field laboratory is specified and is included in the same space as the field office, the field laboratory will not be measured for payment.

Computer system and computer system equipment will be measured by the number of units specified.

Cellular telephones will be measured by the number of units required for the type specified.

~~Additional field office computer system, mobile laptop computer system, m~~*M*obile internet service, and cellular telephone service will be measured by the month for each system or service provided. Partial months will be rounded up to the next 1/2 or whole month. The Department will provide two weeks advanced notice prior to when mobile internet service and cellular telephone service will no longer be required.

628.06 Basis of Payment

Field office and field laboratory will be paid for at the contract unit price per month, complete in place until released.

Computer system and computer system equipment will be paid for at the contract unit price per each for the units provided.

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~~Additional field office computer system, mobile laptop computer system and m~~*M*obile internet service will be paid by the month for each system or service provided.

Cellular telephone units will be paid for at the contract unit price per each per each type specified. Cellular telephone service will be paid for at the contract unit price per month per each phone. Monthly charges for cellular telephone minutes and data in excess of those specified in the contract will be paid for by the dollar amount for the invoiced price per each occurrence as cellular telephone, additional charges.

Payment will be made under:

Pay Item	**Pay Unit Symbol**
Cellular Telephone Service, _____ anytime minutes	MOS
Cellular Telephone, _____ type	EACH
Cellular Telephone, Additional Data	DOL
Cellular Telephone, Additional Minutes	DOL
Computer System Equipment	*EACH*
Computer System	*EACH*
Field Laboratory, _____ type	MOS
~~Field Office Computer System, Additional, _____ Each qty~~	~~MOS~~
Field Office, _____ type	MOS
Mobile Internet Service, _____ Each qty	MOS
~~Mobile Laptop Computer System, _____ Each qty~~	~~MOS~~

The cost of all heating, cooling, electrical service, telephone service and other miscellaneous utility bills required for the field office or field laboratory shall be included in the cost of the field office or the field laboratory.

If a field office smaller than the specified type is approved by the Engineer, a new unit price will be established for the smaller field office. The new unit price will be equal to the original contract unit price multiplied by the smaller floor area and divided by the specified floor area.

If a temporary field office is provided in accordance with 628.02, payment will be 65% of the unit price during the time the temporary field office is in use by the Department.

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The cost of all materials and labor necessary to setup, secure, maintain and remove the field office *or the field laboratory*, including all required equipment and supplies and any material required to provide parking, shall be included in the cost of the ~~field office~~*respective pay items*.

All costs necessary to provide *and maintain* the ~~field office~~ computer system, computer system *equipment*, including the required software, manuals, ~~peripherals and related equipment,~~ technical support and miscellaneous computer requirements shall be included in the cost of the ~~field office~~ *computer system or computer system equipment*.

All costs necessary to establish, install and maintain field office internet service, *both wireless and Ethernet*, *field office network,* including any required hardware, software, fees, monthly charges, setup, installation and technical support shall be included in the cost of the field office.

All costs necessary to provide the copier, printer, *and* document scanner ~~and fax machine~~, including setup, installation, all required connections to computers ~~systems~~, technical support and miscellaneous office machine requirements shall be included in the cost of the field office.

~~All costs necessary to establish and maintain a field office network when one or more additional field office computer systems are specified shall be included in the cost of the field office.~~

~~All cost necessary to provide an additional field office computer system, including the required software, manuals, peripherals and related equipment and technical support shall be included in the cost of the additional field office computer~~.

~~All costs necessary to provide the mobile laptop computer system, including the required software, manuals, peripherals and related equipment, technical support and miscellaneous computer requirements shall be included in the cost of the mobile laptop computer.~~

All costs necessary to establish, install and maintain mobile internet service, including required hardware, software, fees, monthly charges, setup, installation and technical support shall be included in the cost of mobile internet service.

The Contractor shall provide a copy of the detailed invoice from the service provider for each cellular telephone unit each month.

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COMMENTS AND ACTION (OLD BUSINESS ITEM)

SECTION 628 - FIELD OFFICE, FIELD LABORATORY, COMPUTER SYSTEMS, OFFICE MACHINES AND COMMUNICATIONS

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval: _____	Action: _____ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: SECTION 628 pg 470 thru 482. Recurring Special Provision affected: 628-C-236 HANDS-FREE KITS FOR CELL PHONES 628-C-586 FIELD OFFICE COMPUTER EQUIPMENT Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications _____ Revise Pay Items List _____ Create RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Revise RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective _____ Letting _____ GIFE Update

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STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Standard Specification 101.59, Substantial Completion, needs further explanation in regards to lane restrictions and maintenance to erosion and sediment control devices. Also, the specification needs to include additional items to the minimum criteria for substantial completion.

PROPOSED SOLUTION: Expand the definition of substantial completion to state that no lanes restrictions will occur except for erosion and sediment control maintenance. Also, incorporate sidewalks, curbs, and drainage features to the minimum criteria for substantial completion.

APPLICABLE STANDARD SPECIFICATIONS: 101.59

APPLICABLE STANDARD DRAWINGS: NA

APPLICABLE DESIGN MANUAL SECTION: NA

APPLICABLE SECTION OF GIFE: NA

APPLICABLE RECURRING SPECIAL PROVISIONS: NA

PAY ITEMS AFFECTED: NA

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT Construction Management

Phone Number: (317) 232-5502

Date: 8/29/2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Mark Fligor, Nathan Butts, Jim Keefer, Joe Jones, Don Leonard, Jon Kruger, Joe Novak

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REVISION TO STANDARD SPECIFICATIONS

SECTION 101 - DEFINITIONS AND TERMS
101.59 SUBSTANTIAL COMPLETION

The Standard Specifications are revised as follows:

SECTION 101, BEGIN LINE 431, DELETE AND INSERT AS FOLLOWS:

101.59 Substantial Completion

The date, as determined by the Department, when the construction of a project is sufficiently completed in accordance with the plans and specifications, as modified by any approved change orders, so that it can be used for its intended purpose. In order for a project to be used for its intended purpose, *all lanes shall be or have the ability to be opened to traffic without further need for them to be restricted for any purpose except for the placement or maintenance of permanent erosion and sediment control or the maintenance or removal of temporary erosion and sediment control.* ~~a~~*A*s a minimum, all of the following criteria must be met: All lanes of the road or bridge shall be completed through its final roadway surface, including shoulders, with all the *sidewalks, curbs, drainage features,* markings, permanent safety appurtenances, ~~permanent erosion control features,~~ lighting, traffic signals, and signing as shown in the contract documents~~, so that they may be opened to unrestricted traffic~~.

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COMMENTS AND ACTION

101.59 SUBSTANTIAL COMPLETION

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval: _____	Action: _____ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: 101.59 pg 10. Recurring Special Provision affected: NONE Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications _____ Revise Pay Items List _____ Create RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Revise RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective _____ Letting _____ GIFE Update

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STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: Recurring Special Provision 626-R-165 contains language for the construction of modified section concrete median barriers. The language contained in the RSP is the same as the language found in Standard Specifications section 602 - Concrete Barrier. Further, the pay items shown in the RSP are standard pay items found in 602, 702 and 703. There are also no existing 626 pay items with regard to concrete barriers.

PROPOSED SOLUTION: Remove RSP 626-R-165 and incorporate the relevant language into 602 and create a pay item for modified concrete barrier sections. This revision should also help eliminate the need for various unique pay items currently in use.

APPLICABLE STANDARD SPECIFICATIONS: 602

APPLICABLE STANDARD DRAWINGS: E 602-CCMB-01 thru -04

APPLICABLE DESIGN MANUAL SECTION: 17-4.05

APPLICABLE SECTION OF GIFE: N/A

APPLICABLE RECURRING SPECIAL PROVISIONS: 626-R-165

PAY ITEMS AFFECTED:

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT - Construction Management

Phone Number: 317-232-5502

Date: August 25, 2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT: Ad-hoc

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REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

SECTION 602 - CONCRETE BARRIER
602.03(B) CAST-IN-PLACE CONCRETE BARRIER AND CONCRETE GLARE SCREEN
602.05 METHOD OF MEASUREMENT
602.06 BASIS OF PAYMENT

The Standard Specifications are revised as follows:

SECTION 602, AFTER LINE 62, INSERT AS FOLLOWS:

When shown on the plans, cast-in-place modified concrete barrier sections shall be in accordance with the above requirements and the concrete shall be class A in accordance with 702.02.

SECTION 602, BEGIN LINE 95, INSERT AS FOLLOWS:

the linear foot along the centerline of the glare screen. *Class A concrete for cast-in-place modified concrete barriers will be measured by the cubic yard for the modified barrier section. No deductions will be made for reinforcing bars or joints. Reinforcing bars for cast-in-place modified concrete barriers will be measured in accordance with 703.07.*

SECTION 602, BEGIN LINE 99, INSERT AS FOLLOWS:

complete in place. *Class A concrete for cast-in-place modified concrete barriers will be paid for at the contract unit price per cubic yard. Reinforcing bars for cast-in-place modified concrete barriers will be paid for in accordance with 703.08.* Barrier delineators used on concrete barrier will be paid for at the contract unit price per each, complete in place.

SECTION 602, AFTER LINE 110, INSERT AS FOLLOWS:

Concrete Barrier, Modified Section.....CYS

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REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

626-R-165 MODIFIED SECTION CONCRETE MEDIAN BARRIER (PROPOSED TO DELETE)

626-R-165 MODIFIED SECTION CONCRETE MEDIAN BARRIER

(Revised 05-23-13)

The Standard Specifications are revised as follows:

SECTION 626, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 626 – ~~BLANK~~ *MODIFIED SECTION CONCRETE MEDIAN BARRIER*

626.01 Description

This work shall consist of the construction of concrete median barrier with a modified section in accordance with the details shown on the plans or as directed.

626.02 Materials

Materials shall be in accordance with the following:

Barrier Delineators.....926.02(c)
Concrete, Class A.....702
Penetrating Sealer.....709, 909.09
Reinforcing Bars 910.01

626.03 Construction Requirements

The modified section concrete median barrier shall be constructed in accordance with the applicable requirements of 706.03 or by means of an approved slip-form machine. Finishing shall be in accordance with 702.21. If slip-form construction is used, an approved brush finish will be permitted. All exposed surfaces of the modified section concrete median barrier shall be sealed in accordance with the applicable requirements of 709. The type, size, and location of joints and preformed joint filler shall be as shown on the plans. The modified section concrete median barrier shall be reflectorized with barrier delineators as shown on the plans. The color of the reflector of the barrier delineators shall match the color of the adjacent pavement traffic marking.

626.04 Method of Measurement

Class A concrete will be measured by the cubic yard. Reinforcing bars will be measured by the pound. Barrier delineators will be measured per each.

626.05 Basis of Payment

Concrete will be paid for at the contract unit price per cubic yard for concrete, class A. Reinforcing bars will be paid for at the contract unit price per pound. Barrier delineators will be paid for at the contract unit price per each, complete in place and accepted.

Payment will be made under:

Pay Item ***Pay Unit Symbol***

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REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISIONS

626-R-165 MODIFIED SECTION CONCRETE MEDIAN BARRIER (PROPOSED TO DELETE)

Barrier Delineator ..... *EACH*
Concrete, Class A ..... *CYS*
Reinforcing Bars ..... *LB*

The cost of all barrier delineators damaged during installation or placement, all excavation, backfilling, joints, surface sealing, and necessary incidentals shall be included in the cost of the pay items in this section.

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COMMENTS AND ACTION

602.03(B) CAST-IN-PLACE CONCRETE BARRIER AND CONCRETE GLARE SCREEN
602.05 METHOD OF MEASUREMENT
602.06 BASIS OF PAYMENT
626-R-165 MODIFIED SECTION CONCRETE MEDIAN BARRIER

DISCUSSION:

Motion: Second: Ayes: Nays: FHWA Approval: _____	Action: _____ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: 602.03 pg 387; 602.05 and 602.06 pg 388. Recurring Special Provision affected: 626-R-165 MODIFIED SECTION CONCRETE MEDIAN BARRIER Standard Drawing affected: NONE Design Manual Sections affected: NONE GIFE Sections cross-references: NONE	_____ 2016 Standard Specifications _____ Revise Pay Items List _____ Create RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Revise RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective _____ Letting _____ GIFE Update

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STANDARD SPECIFICATIONS, SPECIAL PROVISIONS AND STANDARD DRAWINGS

REVISION TO STANDARD SPECIFICATIONS AND SPECIAL PROVISION

PROPOSAL TO STANDARDS COMMITTEE

PROBLEM(S) ENCOUNTERED: There is a need to clarify responsibility for MSE wall design parameters. In addition there is some confusion regarding whether geotextiles used in conjunction with MSE wall backfill material separation is to be measured and paid for directly.

PROPOSED SOLUTION: External and global stability have been added to the list of design parameters for which the Contractor is responsible. Because the materials used to backfill MSE walls are selected by the Contractor, and the need for geotextile is dependent on the backfill materials used, there will be no direct measurement or payment for geotextiles used in conjunction with MSE wall construction.

APPLICABLE STANDARD SPECIFICATIONS: 731.03, 731.11, 731.12, 731.13, 735.09

APPLICABLE STANDARD DRAWINGS: N/A

APPLICABLE DESIGN MANUAL SECTION: 410-5.0

APPLICABLE SECTION OF GIFE: 29.3

APPLICABLE RECURRING SPECIAL PROVISIONS: 731-B-205

PAY ITEMS AFFECTED: N/A

Submitted By: Greg Pankow

Title: State Construction Engineer

Organization: INDOT - Construction Management

Phone Number: 317-232-5502

Date: September 03, 2014

APPLICABLE SUB-COMMITTEE ENDORSEMENT:

REVISION TO STANDARD SPECIFICATION AND SPECIAL PROVISION
731-B-205 MSE RETAINING WALL REQUIREMENTS

731-B-205 MSE RETAINING WALL REQUIREMENTS

(Revised xx-xx-14)

The Standard Specifications are revised as follows:

SECTION 211, BEGIN LINE 111, DELETE AND INSERT AS FOLLOWS:

(c) Type 3

Structure backfill in accordance with 904.05, except only nominal size aggregates 1 in., 1/2 in., No. 4 or No. 30, and coarse aggregate No. 5, No. 8, No. 9, No. 11, or No. 12 shall be stone ~~or ACBF~~. *ACBF meeting the size requirements for coarse aggregate No. 5 or No. 8 may also be used.*

SECTION 731, BEGIN LINE 60, INSERT AS FOLLOWS:

731.03 Design Criteria

The internal stability shall be the responsibility of the Contractor. The design by the Engineer will consider the external stability of the wall mass including the applied bearing pressure, overturning, sliding, and stability of temporary construction slopes. *The Contractor shall verify and include as part of design submittal the external stability and global stability ensuring the design requirement is satisfied in accordance with the AASHTO LRFD Bridge Design Specifications.* The design for internal stability shall be in accordance with the AASHTO LRFD Bridge Design Specifications and the requirements specified herein. *The design submittal shall include connection strength design. Each design case shall present maximum tension capacity, soil overburden pressure, and horizontal pressure at each reinforcement level, pullout capacity at each reinforcement level, the length of embedment in the resisting zone, L_e, and the total length of reinforcement at each level.*

The value of the pullout resistance factor, F, used in design calculations shall be obtained from the AASHTO LRFD Bridge Design Specifications figure 11.10.6.3.2-1.*

SECTION 731, BEGIN LINE 80, DELETE AND INSERT AS FOLLOWS:

The material used as backfill in the reinforced backfill zone shall be assumed to have a unit weight of at least 120 lb/cu ft unless lightweight fill has been specified. The φ~~,~~ angle for the internal design of the reinforced backfill shall be ~~assumed~~ 34°. The φ angle of the backfill behind the reinforced portion of the MSE volume shall be ~~assumed~~ 30° *for design.* The φ angle ~~for the internal design~~ of the foundation soils shall be ~~assumed~~ *obtained from the geotechnical report and shall not exceed* 30° *for design.* For the external design parameters, such as but not limited to, bearing capacity, sliding, overturning, eccentricity, and global stability, the actual soil strength parameters used shall be obtained from the geotechnical report.

The coefficient of uniformity, c_u, of the reinforced backfill for all designs using the ribbed steel strips curve from AASHTO LRFD Bridge Design Specifications figure 11.10.6.3.2-1 shall be 4.0.

SECTION 731, AFTER LINE 134, DELETE AND INSERT AS FOLLOWS:

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(d) Other Criteria

1. Traffic Load Considerations

Traffic load shall be considered as live load surcharge. The load factor of traffic load shall be 1.75 in accordance with AASHTO LRFD Bridge Design Specifications table 3.4.1-1.

2. Traffic Impact Considerations

Where traffic barriers are constructed above an MSE wall or reinforced backfill envelope, the MSE wall supporting traffic shall include computations showing that the Extreme Event II limit state due to traffic impact has been met.

Loadings for MSE wall design for the Extreme Event II limit state shall be in accordance with the following table:

Maximum Nominal Tension Rupture and Pullout Impact Loads		
Layer	*Tension Impact Load*	*Pullout Impact Load*
First Top Layer	*2,300 lbs/ft*	*1,300 lbs/ft*
Second Top Layer	*600 lbs/ft*	*600 lbs/ft*

The Extreme Event II design for the top two layers shall be separately prepared and compared with the routine internal stability design.

3. Tributary Area – Design Basis

For internal stability analysis of MSE walls, each layer of reinforcement is assigned a tributary area, A_{trib} in accordance with FHWA publication no. FHWA-NHI-10-025, Design and Construction of Mechanically Stabilized Earth Walls and Reinforced Soil Slopes Volume II and as follows:

$$A_{trib} = (w_p)(S_{vt})$$

where:

w_p *= the wall system concrete panel width of the precast facing element, and*

S_{vt} *= the vertical tributary spacing of the reinforcement based on the location of the reinforcement above and below the level of the reinforcement under consideration.*

For a wall system with steel reinforcement, within each tributary area, the factored reinforcement tensile resistance, T_r, and the factored pullout resistance, P_{rr}, shall be no less than the maximum factored tension load, T_{max}. If the calculated minimum number of strips is a decimal number, the minimum number required shall be rounded up to the next whole number.

731.04 Submittals

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REVISION TO STANDARD SPECIFICATION AND SPECIAL PROVISION

731-B-205 MSE RETAINING WALL REQUIREMENTS

The Contractor shall submit working drawings ~~and design calculations~~ in accordance with 105.02. *The Contractor shall submit design calculations in accordance with 105.02 and the following additional requirements. In case of discrepancy, the requirements listed below supersede those listed in 105.02. Design calculations shall show the complete design of the MSE wall. Calculations may be in either longhand or computer-printout format and must follow a systematic and logical methodology. A summary sheet that shows design assumptions and their source, controlling parameters and load cases, and other pertinent input and output information shall be attached to the calculations package.* Wall construction operations shall not begin until the Contractor receives written notice that the working drawings are approved.

SECTION 731, BEGIN LINE 208, INSERT AS FOLLOWS:

Fly Ash 901.02
Geotextile *918.02*
Joint Spacers and Joint Covering .....901.10(b)

SECTION 731, BEGIN LINE 239, DELETE AND INSERT AS FOLLOWS:

731.07 Foundation Preparation

(a) General

~~The~~*Prior to wall construction, the* foundation for the structure shall be graded ~~level~~ for a width equal to or exceeding the length of the ground reinforcement or as shown on the plans. ~~Prior to wall construction, t~~*T*he foundation, if not in rock, shall *then* be compacted in accordance with 203. *After the foundation has been compacted, the resulting grade of the foundation shall be 1 in. per foot sloped from the back of the foundation downward toward the leveling pad. The portion of the foundation beneath the leveling pad shall not be sloped.* The ~~base of the wall excavation~~*foundation* shall be proofrolled ~~with approved compacting equipment~~*in accordance with 203.26.* If unsuitable foundation material is encountered, it shall be removed and replaced with B borrow in accordance with 211.02 and compacted in accordance with 211.04.

(b) Leveling Pad Foundation

After proofrolling has been completed and all unsuitable foundation material has been removed and replaced, compaction of the portion of the foundation beneath the leveling pad will be verified by dynamic cone penetrometer, DCP, testing in accordance with ITM 509.

A DCP measurement is defined as the number of blows per 6 in. increment for a total penetration of 30 in. The minimum number of blows of the DCP for each 6 in. increment is five blows per each 6 in. increment in order for the foundation material beneath the MSE leveling pad to be considered acceptable. There will be five sets of DCP readings at each measurement location.

The frequency of DCP measurements is one DCP measurement for every 50 ft of linear MSE wall or five DCP measurements per end bent. If, on an end bent, an MSE

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wingwall is more than 1.5 times the length of the MSE abutment wall, that MSE wingwall will be considered a linear MSE wall for DCP measurement purposes.

Unsuitable areas shall be removed, replaced, and compacted in accordance with 203 and 211. DCP verification of the level of compaction beneath the leveling pad will not be required if the foundation is in an embankment section that is constructed in accordance with 203.

An unreinforced concrete leveling pad shall be provided at each foundation level as shown on the plans. The leveling pad shall be cured in accordance with 702.22 for a minimum of 12 h before placement of concrete face panels.

SECTION 731, BEGIN LINE 348, INSERT AS FOLLOWS:

~~The work shall also include B borrow backfilling above a theoretical 1:1 slope behind the ground reinforcement as shown on the plans.~~

~~*When structure backfill type 3 coarse aggregate No. 5, No. 8, No. 9, or No. 11 are used in the reinforced backfill zone, geotextiles shall be installed vertically between the interface of the reinforced backfill zone and the backfill behind the reinforced portion of the MSE volume or the retained soil. If the same material is used for both the reinforced backfill zone and the backfill area behind the reinforced backfill zone, geotextiles will not be required to be placed vertically between the interface. Geotextiles shall instead be required between the backfill area behind the reinforced backfill zone and the native soil. Geotextiles shall also be installed horizontally across the top of the reinforced backfill zone.*~~

MSE wall backfill shall consist of structure backfill type 3 in the reinforced backfill zone and structure backfill type 3 or B borrow in the non-reinforced backfill zone as shown on the plans.

If coarse aggregate No. 5, No. 8, No. 9, or No. 11 is used in the reinforced backfill zone and the Contractor elects to use a different material in the non-reinforced backfill zone, geotextiles shall be installed at the interface between the reinforced and non-reinforced backfill zones. If the Contractor elects to use coarse aggregate No. 5, No. 8, No. 9, or No. 11 in both the reinforced and non-reinforced backfill zones, geotextiles shall be installed along the interface between the non-reinforced backfill zone and native soil. In addition, geotextiles shall be installed over the top of the No. 5, No. 8, No. 9, or No. 11 aggregate used in the reinforced or non-reinforced backfill zones.

SECTION 731, BEGIN LINE 389, DELETE AND INSERT AS FOLLOWS:

Concrete leveling pad will be measured by the linear foot. Common excavation will be measured by the cubic yard in accordance with 203.27(a) to the neat lines shown on the plans. Structure backfill and B borrow will be measured in accordance with 211.09. Unsuitable foundation materials, if found, will be measured in accordance with 211.09. Geotextile ~~shall be measured in accordance with 616.12, except as otherwise~~

~~specified herein~~ *used in conjunction with MSE wall construction will not be measured for payment*. Underdrains for MSE walls and components of the internal drainage system will be measured in accordance with 718.09. ~~Geotextile materials used as joint covering will not be measured.~~*If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the removal, replacement, and compaction of the new material will be measured in accordance with 203 and 211.*

~~*Geotextile materials used as joint covering will not be measured.*~~ Precast or cast-in-place concrete coping will not be measured.

SECTION 731, AFTER LINE 399, DELETE AND INSERT AS FOLLOWS:

731.13 Basis of Payment

The accepted quantities of concrete face panels will be paid for at the contract unit price per square foot. Wall erection will be paid for at the contract unit price per square foot. Concrete leveling pad, complete and in place, will be paid for at the contract unit price per linear foot for leveling pad. Common excavation will be paid for in accordance with 203.28. Structure backfill and B borrow will be paid for in accordance with 211.10, *except that structure backfill used in the non-reinforced backfill zone will be paid for as B borrow*. Unsuitable foundation materials, if found, will be paid for in accordance with 211.10. ~~Geotextile will be paid for in accordance with 616.13, except as otherwise specified herein.~~ Underdrains for MSE walls and components of an internal drainage system will be paid for in accordance with 718.10.

SECTION 731, AFTER LINE 432, INSERT AS FOLLOWS:

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the cost of removal, replacement, and compaction of new material will be paid for in accordance with 203 and 211.

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad that is constructed on an embankment section that is constructed under the same contract, the cost of removal, replacement, and compaction of new material shall be included in the cost of the leveling pad.

The cost for geotextile used in MSE wall construction shall be included in the cost of the pay items in this section.

SECTION 735, BEGIN LINE 44, DELETE AND INSERT AS FOLLOWS:

735.04 Submittals

The Contractor shall submit working drawings ~~and design calculations~~ in accordance with 105.02. *The Contractor shall submit design calculations in accordance with 105.02 and the following additional requirements. In case of discrepancy, the requirements listed below supersede those listed in 105.02. Design calculations shall show the complete design of the temporary wire-faced wall. Calculations may be in either longhand or computer-printout format and must follow a systematic and logical*

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methodology. A summary sheet that shows design assumptions and their source, controlling parameters and load cases, and other pertinent input and output information shall be attached to the calculations package. Wall construction operations shall not begin until the Contractor receives written notice that the working drawings are approved.

SECTION 735, BEGIN LINE 121, DELETE AND INSERT AS FOLLOWS:

Common excavation will be measured in accordance with 203.27. Structure backfill and B borrow will be measured in accordance with 211.09. Unsuitable foundation materials, if found, will be measured in accordance with 211.09. ~~Geotextile materials will not be measured.~~ *If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the removal, replacement, and compaction of the new material will be measured in accordance with 203 and 211.*

Geotextile materials will not be measured. Drainage of the backfill including piping, aggregates, and incidentals will not be measured.

SECTION 735, BEGIN LINE 143, INSERT AS FOLLOWS:

The cost of all MSE retaining wall components including wire-facing elements, concrete face panels, ground reinforcing, tie strips, fasteners, soil retention materials, repair or replacement of wire-facing elements damaged or removed due to backfill placement, and incidentals shall be included in the cost of temporary wire-facing.

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad in a section constructed on original ground or in a cut section, the cost of removal, replacement, and compaction of new material will be paid for in accordance with 203 and 211.

If unsuitable foundation material is encountered in the portion of the foundation beneath the leveling pad that is constructed on an embankment section that is constructed under the same contract, the cost of removal, replacement, and compaction of new material shall be included in the cost of the leveling pad.

The cost of geotextiles shall be included in the cost of the pay items of this section.

SECTION 910, BEGIN LINE 454, DELETE AND INSERT AS FOLLOWS:

2. Clevis Connector

Clevis connectors, if used, shall be attached to the alignment templates using the bars provided with the forms. The vertical and horizontal alignment of the connectors shall be ±1/8 in. The holes inside the loops shall be free of all concrete and debris, loose or otherwise.

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The clevis connector shall be fabricated of cold-drawn steel wire in accordance with ASTM A 1064. Loops shall be galvanized in accordance with ASTM A 153 class B-3, ASTM A 123, coating grade 55~~, or ASTM B 695 class 55~~.

A type A certification in accordance with 916 shall be furnished for the clevis connector. The results of the tension, bend, and coating adhesion tests, and measurements of coating thickness and average weight of the coating, shall be included on the certification for the clevis connector.

3. Connector Bar

The connector bar, if used, shall be fabricated of cold-drawn steel wire in accordance with ASTM A 1064, and galvanized, if so shown on the plans, in accordance with ASTM A 123, coating grade 55~~, or ASTM B 695 class 55~~.

A type A certification in accordance with 916 shall be furnished for the connector bars. The results of the coating adhesion test and the measurements of coating thickness, average weight of the coating, and coating flexibility, shall be included on the certification for the connector bar.

SECTION 910, BEGIN LINE 502, DELETE AND INSERT AS FOLLOWS:

Ground-reinforcement units shall be hot rolled from bars to the required shape and dimensions. Physical and mechanical properties of the units shall be in accordance with ASTM A 572, grade 65. Tie strips shall be shop fabricated with hot-rolled steel in accordance with the minimum requirements of ASTM A 1011, grade 50. Galvanization for ground-reinforcing units and tie strips shall be in accordance with ASTM A 123, coating grade 85~~ or ASTM B 695, class 80~~, *for strip-type reinforcements or ASTM A 641, class 5 or class C, for bar mat or grid-type reinforcements*. All ground-reinforcement units and tie strips will be inspected to ensure that they are true to size and free from defects which can impair their strength and durability.

A type A certification in accordance with 916 shall be furnished for ground reinforcement prior to use of the materials. The results of the yield strength, coating thickness, and coating adhesion tests shall be shown on the certification.

(c) Fasteners

Fasteners shall consist of 1/2 in. diameter, bolts, nuts, and washers and shall otherwise be in accordance with 910.02(g)1 with the exception that the hardware shall be coated in accordance with ASTM A 153, class C~~ or ASTM B 695, class 55~~.

The supplier shall provide a certificate of compliance with all requirements for high strength bolts, nuts, and washers used in the assembly of MSE retaining walls. The certification, in addition to complying with the applicable requirements of 916, shall include the lot number and heat number on the shipping package and indicate when or where all testing was performed.

AGENDA

COMMENTS AND ACTION

731-B-205 MSE RETAINING WALL REQUIREMENTS

AGENDA

Motion: Second: Ayes: Nays: FHWA Approval: _____	Action: _____ Passed as Submitted _____ Passed as Revised _____ Withdrawn
Standard Specifications Sections affected: SECTION 731 pg 692 thru 702; SECTION 735 pg 712 thru 713. Recurring Special Provision affected: 731-B-205 MSE RETAINING WALL REQUIREMENTS Standard Drawing affected: NONE Design Manual Sections affected: 410-5.0 GIFE Sections cross-references: 29.3	_____ 2016 Standard Specifications _____ Revise Pay Items List _____ Create RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Revise RSP (No._____) Effective _____ Letting RSP Sunset Date: _____ _____ Standard Drawing Effective _____ _____ Create RPD (No. _____) Effective _____ Letting _____ GIFE Update