REVISION TO 1999 STANDARD SPECIFICATIONS

SECTION 201, BEGIN LINE 13, DELETE AND INSERT AS FOLLOWS:

201.02 General. Right-of-way lines and construction ~~lines~~ *limits* will be established. ~~, and~~
~~trees~~ *Trees,* shrubs, plants, *seeded or sodded shoulders, slopes* ~~and~~ *or* other things to remain will be designated. All such designated
items *and vegetation* shall be preserved. *All areas outside the construction limits shall remain in their original condition.* ~~Any~~ *All* damage to natural terrain, ~~or to~~ vegetation, ~~or~~ objects designated to remain*, or areas outside the construction limits which have subsequently eroded or been damaged,* shall be repaired~~,~~ *or* replaced~~, or otherwise compensated for, as determined, with no additional payment~~ *in accordance with 621.10.1.* Tree wound dressing required for cut or scarred
surfaces of trees or shrubs selected for retention shall be in accordance with 914.09(c).

SECTION 201, AFTER LINE 143, INSERT AS FOLLOWS:

Except as permitted in 621, the cost of repair or replacement of terrain, vegetation, objects designated to remain, or areas outside the construction limits which have been damaged by the Contractor or have subsequently eroded, shall be included in the cost of clearing right of way.

SECTION 202, BEGIN LINE 228, DELETE AND INSERT AS FOLLOWS:

Surface milling shall be performed with a power operated planing machine or grinder, ~~capable of accurately~~ *equipped with automatic control devices to* establish~~ing~~ profile grades by referencing from either the
existing pavement or from independent grade control. *Automatic control devices are not required on surface milling equipment used for notches and public road approaches.* The equipment shall have a positive
means of controlling cross slope elevations, have an effective means for removing excess material from the surface which prevents airborne dust escaping from the operation, and produce a finished surface that provides a good bond to the new overlay. Sufficient
cutting teeth shall be on the cutting drum to produce cuttings such that 90% of the conglomerate particles pass a 50 mm (2 in.) sieve. The roadway shall be cleaned with a broom before opening to traffic, and shall have a surface finish that does not vary longitudinally more than 6 mm (1/4 in.) from a ~~3.05 m (10 ft)~~ *4.9 m (16 ft)* straightedge. If the milling

SECTION 202, BEGIN LINE 403, DELETE AND INSERT AS FOLLOWS:

(q) maintain accurate records of all operations. Submit reports, including a completed Notification for UST and an UST System Closure Site Assessment Report, to IDEM's UST Branch within 30 days after closure. ~~A copy~~ *Two copies* of these forms shall be provided to the Engineer with verification
that the documents were submitted to IDEM;

SECTION 202, BEGIN LINE 570, DELETE AND INSERT AS FOLLOWS:

B borrow required for backfilling basements or depressions left by demolition will not be paid for separately but will be included in the cost of the removal item. B borrow required for backfill*ing* ~~and for replacement of excavated material~~ *of removed contaminated soils or tanks* will be
paid for in accordance with 211.10.

SECTION 202, BEGIN LINE 597, DELETE AND INSERT AS FOLLOWS:

When directed, portions of the present structure contiguous to the areas shown on the plans or non-contiguous portions of the same character as the planned removal shall be removed. Such additional portland cement concrete acceptably removed will be paid for as measured in its original position, at *twice* the contract unit price per cubic meter (cubic yard) for class A concrete in superstructures, class A concrete in substructures, class C concrete in superstructures, or ~~$427.00~~ *$854.00* per cubic meter (~~$326.00~~ *$652.00* per cubic yard),
whichever is lowest.

SECTION 202, AFTER LINE 618, INSERT AS FOLLOWS:

Before the Contractor can be paid for any item related to an UST removal in accordance with 202, a detailed explanation of how costs were calculated for those items shown in the Schedule of Pay Items that are related to the UST removal shall be submitted to the Engineer. Such documentation shall include, but is not limited to, a portion of the mobilization and demobilization, a portion of the field office, a portion of the B borrow for backfill of the UST excavation, a portion of the surface removal over the UST, including sawing, and soil borings and laboratory analysis under the testing for waste item. The explanation shall show the type of pavement removed. Contaminated soil removal shall be broken down into equipment cost, labor, and mobilization of equipment used. Transportation of the regulated materials shall be broken down into loading, hauling, and mileage costs.

SECTION 202, BEGIN LINE 675, INSERT AS FOLLOWS:

The costs of removal and disposal of buildings, foundations, debris and unsuitable material, guide posts, delineator posts, temporary road material, existing asphalt patches, the filling of abandoned wells; terminating utilities; sealing floor drains where necessary; breaking basement floors; furnishing and erecting all barricades, fences, and other safety measures necessary for adequate protection of the sites; and backfill of basements or depressions left by demolition shall be included in the costs of the pay items *of this section*. All fence

SECTION 203, BEGIN LINE 43, DELETE AND INSERT AS FOLLOWS:

203.08 Borrow or Disposal. Borrow shall consist of approved material required for the construction of embankments or for other portions of the work and shall be obtained from approved locations and sources outside the right-of-way. Borrow material shall be free of substances that will form ~~putrescent or~~ deleterious deposits, or produce toxic concentrations or combinations that may be harmful to human, animal, plant or aquatic life, or otherwise impair the designated uses of the stream or area. Unless otherwise designated in the contract, arrangements shall be made for obtaining borrow. Borrow, as designated herein, shall not include material excavated beyond the right-of-way limits at intersecting public roads, private and commercial drive approaches, nor material furnished as B borrow.

The proposed disposal site(s) for excavated material shall be identified before such material is disposed of within or outside the right-of-way. An inspection shall be conducted to determine if wetlands are present on the site. This inspection shall be in accordance with the Federal Manual for Identifying and Delineating Jurisdictional Wetland.

If the Contractor elects to use the site, all required permits shall be obtained. The Contractor shall develop and construct all mitigation measures and fulfill all requirements detailed by such permits.

Before borrow or disposal operations are begun, ~~a borrow pit plan or a disposal operations plan shall be submitted~~ *the Contractor shall submit operation plans* for approval. Such plan*s* shall include the following:

(a) a detailed sketch showing the limits ~~of excavation for the borrow pit~~ relative to property and right-of-way lines*;*

(b) ~~all slopes shall be designated.~~ *the grade of all slopes;*

(c) an erosion control plan ~~which includes measures to keep sediment from entering streams. It shall show diversion channels, dikes, sediment traps, or other measures which may be used for this purpose;~~ *in accordance with the requirements of 327 IAC 15-5;*

(d) the ~~fine~~ *encasement, finished* grading, ~~encasement,~~ and seeding procedures ~~which shall be performed on the pit when work is completed.~~*; and*

(e) archaeological clearance.

Notice shall be given in advance of opening borrow areas so that cross section elevations and measurements of the ground surface after stripping may be taken and the borrow material may be tested before being used.

~~The borrow pit limits, except when borrow is to be obtained from a commercial source, shall be identified and have a qualified archaeologist perform a record check and an intensive field survey to determine if any significant archaeological sites are within the borrow pit limits.~~ *Except when a commercial source is utilized, a qualified archaeologist shall perform a record check and field survey of borrow or disposal limits to determine if any significant archaeological sites are within the limits.* Results of the record check and survey shall be furnished in writing prior to the excavation of any material. If any archaeological sites are identified, the archaeologist ~~will~~ *shall* establish the limits of the site along with a reasonable border. The site shall not be disturbed unless the archaeological site is cleared by established procedures and written authorization to enter the site has been issued. Under no circumstances shall an employee of the Contractor or the State of Indiana share in the ownership or profit from the sale of any archaeological artifacts that may be salvaged. No extension of completion time will be granted due to any delays in securing approval of a borrow ~~pit~~ *or disposal area.*

Unless written permission is granted, there shall be no excavation in a borrow ~~pit~~ *area* below the elevation of the adjacent properties within 45 m (150 ft) of the nearest right-of-way line of an existing highway, county road, or city street; the nearest right-of-way line of a proposed highway, county road, or city street; or adjacent property lines. If the properties adjacent to the borrow ~~pit~~ *area* are privately owned, the setback limit of 45 m (150 ft) may be lessened if written approval or permission is granted by the owner of the adjacent property, the excavation is in accordance with local zoning laws and requirements, and if lessening the limit is in the best interest of the State. Such minimum distance shall not be closer than 15 m (50 ft) to an adjacent property line. All excavated slopes of a *borrow* ~~pit~~ *area* shall not be steeper than 3:1 down to 0.6 m (2 ft) below the ground water elevation. All excavated slopes 0.6 m (2 ft) below the ground water elevation shall not be steeper than 2:1.

~~Good top~~ *Top* soil from the borrow ~~pit~~ *or disposal* area shall be ~~saved~~ *stockpiled* for use in restoring the ~~excavated~~ *disturbed* area~~, or similar material from another source may be substituted in order to place a 150 mm (6 in.)~~. *A* minimum encasement *of 150 mm (6 in.) shall be placed* on the 3:1 or flatter slopes. Final restoration of borrow or waste disposal areas shall include grading, seeding, ~~and/~~or other necessary treatments that will blend the area into the surrounding landscape. Restored areas within 45 m (150 ft) of the nearest right-of-way line shall be well drained. Areas beyond 45 m (150 ft) shall be drained unless the landowner desires other treatment of the borrow ~~pit~~ area. ~~No payment will be made for restoring areas as set out herein, the cost thereof to be included in the contract unit price for borrow. Drainage, location, or use of the~~ *Construction of borrow* ~~pit~~ *or disposal areas* shall be in accordance with existing laws, regulations, and ordinances. Under no conditions shall borrow sites detract from the appearance of the natural topographical features nor increase the potential hazard to a vehicle that has inadvertently left the highway.

If granulated slag, dunes sand, or other granular material*,* which is not suitable for the growth of vegetation is used, such material shall not be placed within 0.3 m (1 ft) of the required finished surfaces of shoulders and fill slopes. Additional material required to complete the embankment, such as sandy loam, sandy clay loam, clay loam, clay, or other materials suitable for the growth of vegetation and free from clods, debris, and stones, shall be furnished at the contract price for borrow.

~~With written permission and as directed, additional~~ *Additional* fill material may be secured from within the permanent or temporary right-of-way in lieu of borrow or B borrow either from vertical or horizontal extensions, or both, beyond the lines and elevations of roadway and drainage excavation as shown on the contract plans *when authorized in writing.* ~~This work shall not be performed until written approval has been obtained and the conditions and basis of payment in accordance with the specifications and proposal have been accepted.~~ If ~~the~~ additional material has been obtained without ~~this~~ written approval, ~~such~~ *the* material will be classified, either as to source or use, to the best advantage of the Department.

203.09 General Requirements. The excavation and embankments for the roadway, intersections, and entrances shall be finished to reasonably smooth and uniform surfaces. ~~No~~ *Excavated* materials shall *not* be wasted without permission. Excavation operations shall be conducted so that material outside of the limits of slopes will not be disturbed. Prior to beginning excavation, grading, and embankment operations in any area, all necessary clearing and grubbing in that area shall have been performed in accordance with 201. *The area of the exposed materials shall be limited by the Contractor's capacity to adequately maintain permanent and temporary erosion and sediment control features.*

The Engineer will direct the Contractor to stabilize an area if the disturbed ground has been or will be left bare and unworked for fifteen consecutive calendar days. Once directed, the Contractor shall stabilize these areas within ten calendar days. These methods shall be installed in accordance with 621 or as otherwise directed.

All spongy and yielding material which does not readily compact, and all vegetation shall be removed from within slope-stake limits and to such depths as ~~ordered~~ *directed*. Soft or unstable materials which are encountered where the proposed embankment will be placed, shall be removed. If ground water is encountered, backfilling shall be accomplished using B borrow in accordance with 211.02~~(b)~~ to an elevation at least 0.6 m (2 ft) above the ground water level. Compaction of the B borrow placed above the free water level shall be accomplished using heavy vibratory equipment. If groundwater is not encountered during the removal operation, the backfill shall be placed in accordance with the following paragraph. None of the removed materials shall be used in embankment, except if approved, they may be used if aerated such that proper compaction can be achieved.

After the embankment area has been cleared and before embankment is placed, all pronounced depressions left in the original ground ~~surface by removal of objectionable material from within embankment limits~~ shall be refilled with suitable material ~~well~~ *and* compacted ~~to the same density as required for all other embankment~~ *in accordance with 203*. The upper 150 mm (6 in.) of the original ground shall be compacted with a roller weighing no less than 9.1 Mg (10 t), or with other approved compacting equipment. Proofrolling of the natural ground surface shall be performed in accordance with 203.26 within all areas where new fill will be placed.

If the original ground cannot be compacted to the required density because of unstable soils, ~~if a~~ high water table, ~~condition results in a yielding foundation,~~ or ~~if~~ other ~~similar~~ conditions ~~exist~~, the use of ~~a~~ stabilizing ~~mat made~~ *materials consisting* of B borrow in accordance with 211.02~~(b)~~ *or chemical modification in accordance with 215* ~~to cross the area is acceptable~~ *may be used*. The ~~mat~~ *materials* shall be ~~a minimum of~~ 0.3 m ~~(1 ft) thick, a maximum of~~ *to* 0.6 m (*1 to* 2 ft) thick, and shall be extended so as to daylight at the toe of slope. ~~Where~~ B borrow*,* ~~is~~ *when* exposed, ~~it~~ shall be capped with 150 mm (6 in.) of *coarse aggregate* No. 2 ~~aggregate to prevent erosion~~.

When ~~it is anticipated that the use of a 0.6 m (2 ft) mat does~~ *B borrow or chemical modification will* not satisfactorily stabilize an area, *written approval is required prior to the use of alternate methods.* ~~or when~~ *When* preliminary exploration indicates ~~removal of~~ *the need to remove* more than 1.2 m (4 ft) ~~of unsuitable material will result in excavating 191~~ *or 200* m^3 (250 cu yd) *of unsuitable material*, *approval is needed.* ~~or more, or when it is anticipated that the use of a geotextile in conjunction with a B borrow mat will be needed to stabilize an area, the proposed treatment will require approval prior to use.~~

~~Payment for excavation of these unsuitable materials shall be in accordance with 203.28, and payment for B borrow shall be in accordance with 211.09 and 211.10.~~

Frozen materials, stumps, roots, all or parts of trees, brush, weeds, sod, or other perishable materials shall not be ~~placed in~~ *incorporated in the* embankment. ~~Stones~~ *Rocks* greater than 150 mm (6 in.) in any dimension shall not be left within ~~200 mm (8 in.)~~ *150 mm (6 in.)* of the finished subgrade. The original ground surface, or the surface of any lift in place shall not be frozen and shall be free ~~from objectionable quantities~~ of snow, ice, or mud.

The ~~roadway~~ *embankment* shall be kept ~~well~~ drained at all times by keeping the center higher than the sides and uniformly graded. ~~If necessary, temporary drainage ditches shall be provided as directed.~~

Each embankment lift shall extend transversely over the entire area and shall be kept smooth. If a dragline or similar equipment deposits material in large ~~unit~~ masses onto *the* embankment, the material ~~so cast~~ shall be ~~moved from its place of deposit and~~ spread out in ~~layers as specified herein for~~ uniform lifts.

The use of hydraulic methods to construct embankments will be permitted only when authorized in writing. Only B borrow shall be placed below the free water level. Backfill at structures shall be compacted in accordance with 211.04.

If the same or similar material is being used in the upper lifts of embankment as shall be used in *the* subbase at that location, these lifts shall be placed in smooth uniform layers for the full width of the embankment.

When grading operations are performed ~~after~~ *in non*-daylight hours, ~~sufficient~~ artificial lighting shall be provided and maintained, ~~with no additional payment,~~ to permit ~~proper~~ *the* construction and inspection *of the operations*.

~~Grading operations shall be kept well in advance of paving operations in order to take advantage of maximum time for settlement.~~

All slopes which are *to be* graded and not ~~immediately~~ stabilized with other erosion control measures shall be roughened as described herein, until permanent erosion control measures are placed. Roughening shall take place each day after work is performed on the slopes, or as directed, to reestablish the roughening.

The soil *slopes* shall be roughened ~~on slopes using implements which may safely operate on the slope~~ to create a series of ridges and depressions ~~which run across the slope on the contour~~ *parallel to the roadway* ~~and make~~ *making* grooves at least 25 mm (1 in.) deep and not more than ~~405~~ *400* mm (15 in.) apart. *When directed, slopes shall be stabilized using temporary seeding according to 621.*

~~Except as herein provided, sufficient~~ *Sufficient* quantities of ~~available excavation~~ *excavated materials* suitable for the growth of vegetation shall be preserved from within the planned excavation area and used for the encasement of cut, fill, and shoulder slopes which are *deemed* not suitable for the growth of vegetation. The depth of encasement shall be 150 mm (6 in.) or more, as directed, measured perpendicular to the face of the slope. No additional compensation will be allowed for this work except payment will be made for the class of excavation involved for authorized undercutting of back slopes. Encasement of rock embankment and cut slopes will not be required unless otherwise directed.

Material suitable for the growth of vegetation shall be as approved~~. It~~ *and* may consist of sandy loam, sandy clay loam, clay loam, clay, ~~or other suitable material~~ *and shall be* free from clods, debris, and stones. The material placed on backslopes of cut sections ~~may~~ *shall* be placed in accordance with ~~203.25~~ *203.21*.

If sufficient excavation *materials* suitable for the encasement of cut, fill, and shoulder slopes ~~is~~ *are* not available, ~~suitable~~ borrow material shall be furnished ~~at the contract unit price for borrow~~. The source of the borrow material for encasement shall be ~~approved~~ *in accordance with 203.08.* Payment *for borrow* will be made in accordance with 203.28. If the contract does not contain a pay item for borrow, a change order will be executed for payment of borrow. Suitable portions of common excavation may be preserved or borrow material may be furnished for encasement provided all suitable excavation is used constructively.

203.10 Disposal of Excavated Material ~~(~~Except Waterway and Peat Excavation~~)~~. Excavation material shall be used for the construction of embankments, shoulders, special fill, or other places as may be specified or directed, depending on the nature of the material. Excavated material that is suitable for embankment construction *that is not required for the maintenance of traffic* shall be placed in the embankment before placing any borrow material, ~~except for the quantity required for the maintenance of traffic,~~ unless otherwise authorized in writing. ~~No material shall be wasted without authority.~~

If more material is excavated from within required cut slopelines than is needed to construct embankments or special fills, the excess may be used to widen embankments, flatten fill-slopes, or be used otherwise as directed. ~~Any~~ *All* excess excavated material that cannot be used constructively within the project limits shall be disposed of off the right-of-way in accordance with 201.03 *and 203.08*.

Excavation obtained from the right-of-way and planned to be used in fills may be wasted and replaced with borrow with no additional payment only after written permission is obtained. ~~Permission may be granted after receipt of a written request and after it has been determined that granting the request would not be to the disadvantage of the Department.~~ All required samples of the borrow or the excavation materials involved shall be furnished with no additional payment.

SECTION 203, BEGIN LINE 266, DELETE AND INSERT AS FOLLOWS:

203.12 Disposal of Peat. All material removed as peat excavation, removed or displaced by machine operation, or displaced by the advancing backfilling material shall be uniformly spread between the toes of fill slopes and the swamp ditches or beyond, or otherwise disposed of ~~as specified or directed~~ *in accordance with 203.08.*

SECTION 203, BEGIN LINE 439, DELETE AND INSERT AS FOLLOWS:

203.16 Peat Deposit Treatment. If ~~pavement~~ *construction* is specified at a location where a peat deposit is to be treated, the deposit shall be treated ~~as far~~ ahead of paving operations ~~as practicable~~ to ~~take advantage of~~ *obtain* maximum settlement. If ~~approved~~ settlement has not been obtained when paving *operations* ~~is complete up to~~ *are at* the limits of any peat deposit treatment, a gap in the pavement shall be left as directed. ~~Such a gap shall be paved later if approved settlement is obtained prior to or at the time paving operations are complete on the remainder of the contract but, if not, the pavement originally planned for the location of such a gap shall become an exception to the contract. If any such gap is subsequently paved, payment will be made at the contract unit price for pavement~~. *Gaps not constructed as part of the project will become an exception to the contract.*

~~Necessary blasting shall be with 40%, 50%, or 60% straight nitroglycerine or gelatine dynamite as directed.~~

Treatment shall be by ~~one of~~ the following methods ~~or any combination thereof as shown on the plans, or as directed, or both~~.

SECTION 203, BEGIN LINE 479, DELETE AS FOLLOWS:

If water is not present, the space previously occupied by the removed material shall be backfilled with common excavation, borrow, or both, and placed in accordance with ~~the applicable provisions of~~ 203.

SECTION 203, BEGIN LINE 483, DELETE AS FOLLOWS:

If water is present, the backfill shall be with material in accordance with 211.02~~(b)~~. Placement of this material shall follow as closely behind the removal of the

SECTION 203, BEGIN LINE 491, DELETE AS FOLLOWS:

If additional fill is needed to bring the embankment to its final required grade, it may be common excavation or borrow. Further placing of the granular material above the end-dumped material may be authorized. This additional fill shall be placed and compacted in accordance with ~~applicable provisions of~~ 203 but shall not be placed for at least 14 days after the end-dumped material is placed and compacted. This period may be shortened or lengthened with written approval, depending on the settlement that has been obtained.

SECTION 203, BEGIN LINE 511, DELETE AND INSERT AS FOLLOWS:

operations stopped until the two operations are in balance. If conditions permit, draglines shall be operated from mats in front of the advancing excavation. If blasting is required to aid displacement, it shall be ~~done~~ *completed* as extra work in accordance with 104.03.

Backfilling shall be ~~done~~ in accordance with 203.16(b) for end-dumped material except, when required, a temporary surcharge shall be maintained at the head of the backfilling. The top of the surcharge shall be constructed and maintained to a width equal

SECTION 203, BEGIN LINE 656, DELETE AS FOLLOWS:

(3 mph) during these passes. The number of passes will be adjusted upward if necessary to obtain 95% of maximum dry density, in accordance with AASHTO T 99 ~~except as modified in 203.24~~. No additional compensation will be allowed for additional passes as

SECTION 203, BEGIN LINE 760, DELETE AS FOLLOWS:

percentage points of optimum moisture content. Maximum density and optimum moisture content shall be determined in accordance with AASHTO T 99~~, as modified in 203.24,~~ using method A for soil and method C for granular materials.

SECTION 203, BEGIN LINE 801, DELETE AND INSERT AS FOLLOWS:

(b) Field. The field density determination shall be made in accordance with AASHTO T 191, ~~T 205,~~ *T 310,* or T 272 except as follows:

SECTION 203, BEGIN LINE 844, DELETE AND INSERT AS FOLLOWS:

203.26 Proofrolling. When proofrolling is specified, the work shall be performed with a pneumatic tire roller in accordance with ~~408.03(d)3~~ *409.03(d)*, ~~except the minimum tire size shall be 9:00 by 20~~. *Other approved equipment such as a fully legally loaded tri-axle dump truck may be substituted for the pneumatic tire roller.* There shall be one or two complete coverages as directed. Roller marks, irregularities, or failures shall be corrected.

SECTION 203, BEGIN LINE 961, DELETE AS FOLLOWS:

(g) Measurement of ~~Subgrade~~ *Embankment Foundation Soils* Treatment. ~~The work of~~ *Mechanical treatment of embankment foundation soils* ~~stabilizing subgrade treatment areas~~ will be measured by the square meter (square yard) ~~or hectare (acre) from the limits of the area so treated.~~ *Chemical treatment of embankment foundation soils will be measured in accordance with 215.10.*

SECTION 203, BEGIN LINE 990, DELETE AND INSERT AS FOLLOWS:

~~Excavation for the removal of unsuitable material will be paid for at the contract unit price per cubic meter (cubic yard) for embankment, unless otherwise specified.~~

If the class of excavation is linear grading, additional borrow and the excavation of and disposal of unsuitable material not included as pay items will be paid for as follows:

If the total quantity exceeds 3800 m^3 (5,000 cu yd) at a given location, it will be paid for at ~~$5.23~~ *$10.46* per m^3 (~~$4.00~~ *$8.00* per cu yd). If the total quantity exceeds 765 m^3 (1,000 cu yd), but does not exceed 3800 m^3 (5,000 cu yd) at a given location, it will be paid for at ~~$7.85~~ *$15.69* per m^3 (~~$6.00~~ *$12.00* per cu yd). If the total quantity does not exceed 765 m^3 (1,000 cu yd) at a given location, it will be paid for at ~~$10.46~~ *$19.61* per m^3 (~~$8.00~~ *$15.00* per cu yd).

Linear grading includes only such grading within the construction limits. All grading the Contractor is directed to perform outside the construction limits, except for the Contractor's convenience, will be paid for in accordance with 104.03 or 109.03 unless such grading is shown on the plans or in the Contract Information book.

Existing concrete building foundations, concrete walls, concrete columns, or concrete steps not visible and not shown on the plans within the limits of the planned excavation will be paid for at ~~three~~ *10* times the contract unit price per cubic meter (cubic yard) for common or unclassified excavation, whichever is set out as a pay item. *Unless a waste area is established within the contract limits, the minimum pay for this work will be $104.60 per m³ ($80.00 cu yd).*

~~If it is directed that an area be excavated for the purpose of removal of unsuitable material, such excavation and disposal will be paid for at the contract unit price for the class of excavation involved.~~

Excavation and disposal of unsuitable material will be paid for at the contract unit price for the class of excavation involved. If no such pay item is included in the contract and embankment is included as a pay item, the excavation and disposal will be paid for at the contract unit price for embankment, unless otherwise directed.

If there is no pay item for rock excavation and such is encountered, it will be paid for at ~~three~~ *10* times the contract unit price per cubic meter (cubic yard) for common excavation *or $130.80 per m³ ($100.00 per cu yd) for quantities less than 76 m³ (100 cu yd) or $104.60 per m³ ($80.00 per cu yd) for quantities greater than 76 m³ (100 cu yd) but less than 159 m³ (200 cu yd), whichever is greater*.

If there is no pay item for common excavation and if such is encountered, it will be paid for at the contract unit price per cubic meter (cubic yard) for borrow.

If the contract includes a pay item for waterway excavation, and if class Y excavation is encountered and there is no pay item for such, the class Y excavation will be paid for at ~~three~~ *10* times the contract unit price per cubic meter (cubic yard) for waterway excavation*, or $130.80 per m³ ($100.00 cu yd), whichever is greater*.

If the contract does not include a pay item for waterway excavation and such is encountered, ~~such excavation within the right-of-way limits will be paid for at the contract unit price per cubic meter (cubic yard) for common excavation. If there is no pay item for common excavation, the pay item for unclassified excavation will be used~~ *pay will be determined in accordance with 104.03*.

If excavation is necessary to investigate or to seal sinkholes, or to explore underground drainage, the accepted quantity involved at each location will be paid for as follows. The first 8 m³ (10 cu yd) or fraction thereof will be paid for at ~~five~~ *10* times the contract unit price for the class of excavation encountered. The next 30 m³ (40 cu yd) or fraction thereof will be paid for at ~~three~~ *seven* times the contract unit price for the class of excavation involved. Additional quantities will be paid for at *three times* the contract unit price per cubic meter (cubic yard) for the class of excavation involved.

Material overlying the peat deposits which is excavated and used in embankment will be considered as common excavation and will be paid for as such. Excavation for standard side ditches or other side ditches which are constructed through peat areas at locations shown on the plans, or where directed, will be paid for at the contract unit price per cubic meter (cubic yard) for common excavation.

Mechanical treatment of embankment foundation soils will be paid for by the square meter (square yard) as embankment foundation soils treatment.

Cased test holes and exploratory drilling will be paid for at the contract unit price per meter (linear foot).

If there is no pay item for borrow, the costs of identifying the borrow pit, the archeological investigation, all required permits, and the opening and closing of the borrow pit will be included in an extra work order developed in accordance with 109.05 and paid for as borrow pit.

If the contract documents do not identify excess excavation nor require removal of any items from the site, the costs of identifying a waste area, archeological investigation, all required permits, and the opening and closing of the waste area will be included in an extra work order developed in accordance with 109.05 and paid for as waste area.

If a type of excavation for which no pay item exists is required and the new type of excavation requires the Contractor to use equipment not otherwise being used on the contract, all costs involved in determining the type of equipment necessary to complete the work and making this equipment available for the project will be included in an extra work order developed in accordance with 109.05 and paid for as additional mobilization and demobilization.

If a type of excavation for which no pay item exists is required and the new type of excavation requires additional traffic control not shown on the plans or results in traffic control being required for an additional period of time, all costs involved in providing the additional traffic control will be included in an extra work order developed in accordance with 109.05 and paid for as additional maintaining of traffic.

Payment will be made under:

Pay Item	**Metric Pay Unit Symbol (English Pay Unit Symbol)**
Borrow	m3 (CYS)
Breaking Pavement	m2 (SYS)
Cased Test Holes	m (LFT)
Embankment	m3 (CYS)
Embankment Foundation Soils Treatment	*m2 (SYS)*
Excavation, Common	m3 (CYS)
Excavation, Peat	m3 (CYS)
Excavation, Rock	m3 (CYS)
Excavation, Unclassified	m3 (CYS)
Excavation, Waterway	m3 (CYS)
Excavation, Y	m3 (CYS)
Exploratory Cores	m (LFT)
Exploratory Drilling	m (LFT)
Linear Grading	STA
~~Subgrade Treatment~~	~~m2 (SYS)~~
Water for Shale	kL (kGAL)

If embankment is specified as a pay item, borrow and common excavation, unless otherwise specified, will not be paid for directly. The costs thereof shall be included in the cost of embankment. Such price shall be full compensation for preparation of the natural ground on which the embankment is to be placed~~, removal and satisfactory disposal of unsuitable materials;~~ and excavating, hauling, placing, spreading, and compaction of materials in accordance with 203.23. The costs of labor, equipment, tools,

SECTION 203, AFTER LINE 1092, INSERT AS FOLLOWS:

Cost for providing additional lighting for grading operations shall be included in the cost of other pay items in this section.

No payment will be made for the construction or restoration of borrow or disposal sites.

No payment will be made for the inspection of disposal sites for wetland identification, obtaining of permits, the development and construction of all mitigation measures, or the fulfillment of permit requirements.

SECTION 204, LINE 11, DELETE AS FOLLOWS:

B Borrow .....211.02~~(b)~~

SECTION 205, DELETE LINES 1 THROUGH 250.

SECTION 205, AFTER LINE 251 INSERT AS FOLLOWS:

SECTION 205 -- TEMPORARY EROSION AND SEDIMENT CONTROL

205.01 Description. *This work shall consist of furnishing, installing, maintaining, and removing temporary erosion and sediment control measures in accordance with 105.03.*

MATERIALS

260 ***205.02 Materials.*** *Materials shall be in accordance with the following:*

Coarse Aggregate, Class F or ~~higher~~ Higher 904
Geotextile for Silt Fence.....913.20
Geotextile Under Riprap.....913.18
Metal End Section.....908.06
Pipe Drains.....715.02(d)
Revetment Riprap 904
Stakes.....914.09(b)

270 *Straw bales shall be a minimum of 350 mm by 450 mm by 900 mm (14 in. by 18 in. by 36 in.) and shall not weigh less than 16 kg (35 lb). Bales shall be bound with wire or nylon twine.*

205.03 Control Measures. *Adjustments of the erosion and sediment control measures shall be made where appropriate to meet field conditions. These measures shall be constructed as soon as practical and shall be maintained in accordance with the following.*

(a) Silt Fence. *The manufacturer's recommendations shall be followed with regard to shipping, handling, storage, installation, and protection from direct sunlight. The geotextile will be rejected if it has defects, tears, punctures, flaws, deterioration, or damage incurred during manufacture, transportation, storage, or installation. Each roll shall be labeled or tagged to provide product identification.*

The post spacing shall be as recommended by the manufacturer. The spacing of the posts shall be adjusted such that the posts are located at the low points along the fence line. Joints in fabric shall be avoided at low points along the fence line. At joints, the overlap shall be nailed or similarly fastened to the nearest post with a lath.

The original copies of all necessary current manufacturer's installation manuals shall be provided prior to installation.

(b) Temporary Mulching*. Mulching shall be in accordance with 621.05(c) except that the rate of application shall be 5.5 Mg/ha (2.5 ton/acre).*

(c) Check Dams*. Check dams shall be constructed with revetment riprap or straw bales as shown on the plans.*

1. Revetment Riprap. *Revetment riprap shall be in accordance with 616 unless otherwise specified.*

2. Straw Bales. *Straw bales shall be embedded and staked as shown on the plans. Adjacent bales shall be chinked to eliminate gaps between the bales. Bales shall be placed such that the bindings are parallel to and not in contact with the ground.*

(d) Interceptor Ditches*. Interceptor ditches shall be constructed and graded to drain.*

(e) Sediment Traps. *Revetment riprap shall be used in construction of sediment traps in accordance with 616, unless otherwise specified.*

(f) Sediment Basins. *Embankment construction shall be in accordance with 203. Revetment riprap used for overflow protection shall be in accordance with 616, unless otherwise specified. A manufactured perforated riser may be used when called for on the plans, or as directed.*

(g) Ditch Inlet Protection. *Ditch inlet protection shall be constructed as shown on the plans.*

(h) Slope Drains. *Slope drain pipes shall be lengthened as required by the construction of the embankment.*

*(i) **Temporary Seeding.** Temporary seeding shall be in accordance with 621.06.*

*(j) **Vegetative Filter Strips.** Designated vegetative filter strips shall not be disturbed.*

*(k) **Splashpads.** Splashpads shall be constructed with revetment riprap in accordance with 616.*

*(l) **Deck and Curb Inlet Protection.** All deck and curb drains shall have sediment control measures when the structure or road is to be used for hauling operations.*

*(m) **Detention Ponds**. Excavation shall be in accordance with 203.*

*(n) **Retention Ponds**. Excavation shall be in accordance with 203. The soil used in the liner shall be in accordance with AASHTO M 145, classification A-6 or A-7.*

The sides and bottom of the retention pond shall be lined with a soil liner of 600 mm (2 ft) minimum thickness. The soil in the liner shall be compacted to 95 percent of the maximum dry density in accordance with 203.23. The Contractor may use an alternate lining system. Details of the proposed pond lining system shall be submitted to the Department's Geotechnical Section for approval. These details shall include all necessary information such as liner thickness, smooth surface versus textured surface, thickness and type of proposed soil cover, joint construction, material used in the liner, and manufacturer of the liner.

***205.04 Maintenance.** Temporary erosion and sediment control measures shall be inspected after rain activities. The temporary protection measures shall be returned to good working condition as directed. Sediment shall be removed and disposed of in accordance with 201.03 and 203.08.*

***205.05 Removal.** Temporary erosion and sediment control measures shall remain in place until directed to be removed. The Contractor shall remove and dispose of all excess silt accumulations, dress the area, and vegetate all bare areas in accordance with the contract requirements. Use or disposal of riprap and straw bales shall be as directed.*

***205.06 Method of Measurement.** Silt fence and straw bale check dams will be measured by the meter (linear foot). Sediment basins will be measured by the units installed complete in place. Revetment riprap check dams, sediment traps, and splashpads will be measured by the megagram (ton). Measurement of sediment traps will include the riprap and the No. 8 filter stone. Temporary mulching will be measured by the megagram (ton). Temporary seeding will be measured in accordance with 621.12. Removal of sediment will be measured by the cubic meter (cubic yard). Revetment riprap will be measured in accordance with 616.11. Slope drains will be measured in accordance with 715.11. Ditch inlet protection will be measured per each unit installed.*

Interceptor ditches, curb inlet protection, and deck inlet protection will not be measured for payment.

Excavation for detention and retention ponds will be measured as common excavation in accordance with 203.27. Retention pond liners will not be measured for payment.

205.07 Basis of Payment. *The accepted quantities of silt fence will be paid for at the contract unit price per meter (linear foot), complete in place. Temporary mulching will be paid for by the megagram (ton). Temporary seeding will be paid for in accordance with 621.13. Sediment basins will be paid for at the contract unit price per each unit installed. Check dams, revetment riprap; sediment traps; and splashpads will be paid for by the megagram (ton). Check dams, straw bales will be paid for by the meter (linear feet). Revetment riprap will be paid for in accordance with 616.12. Slope drains will be paid for in accordance with 715.12. Removal of sediment will be paid for at the contract unit price per cubic meter (cubic yard). Ditch inlet protection will be paid for at the contract unit price per each unit installed.*

The accepted quantities of excavation for detention or retention ponds will be paid for as common excavation in accordance with 203.28. Retention pond liners will be paid for as a lump sum.

Payment will be made under:

Pay Item	***Pay Unit***
Liner for Retention Pond	*LS*
Sediment, Remove	*m3 (CYS)*
Splashpad, Riprap	*Mg (TON)*
Temporary Check Dams, Revetment Riprap	*Mg (TON)*
Temporary Check Dams, Straw Bales	*m (LFT)*
Temporary Ditch Inlet Protection	*EACH*
Temporary Mulching	*Mg (TON)*
Temporary Sediment Basin	*EACH*
Temporary Sediment Trap	*Mg (TON)*
Temporary Silt Fence	*m (LFT)*
Temporary Slope Drain	*m (LFT)*

The cost of geotextile fabric shall be included in the cost of the sediment trap.

The cost of geotextile fabric, trenching, backfilling, posts, fencing, and all necessary incidentals shall be included in the cost of silt fence.

The cost for stakes, trenching, backfilling, posts and all necessary incidentals shall be included in the cost of temporary check dams, straw bales.

The cost of deck and curb inlet protection and interceptor ditches shall be included in the cost of other pay items in this section.

Payment for slope drain will include the standard metal end section, anchors, and all incidentals necessary to perform the work.

SECTION 206, BEGIN LINE 46, DELETE AND INSERT AS FOLLOWS:

(b) Excavation for Foundations of Traffic Support Structures. If class X material as defined in 206.02(a) is encountered within the limits of foundation excavation for traffic support structures, overhead sign structure foundations, *strain pole,* or high mast lighting foundations, the foundation shall be ~~re~~located as directed. ~~If it is determined that the foundation cannot be relocated, it shall be installed at the location as shown on the plans.~~

If ~~the~~ class X material ~~encountered is~~ in accordance with ~~the definition 1 of~~ 206.02(a)*1 is encountered*, the ~~rock~~ *material* shall be excavated to allow the foundation to be embedded a distance
that is equal to 1/2 of the remaining depth of the foundation before ~~rock~~ *the material* was encountered*,*
except for overhead sign structures, strain poles, and highmast lighting foundations. ~~If the total length of the anchor bolts cannot be used, they shall be cut off. A steel plate measuring 150 mm by 150 mm by 13 mm (6 in. by 6 in. by 1/2 in.), shall be welded to the bottom of the bolts. The plate shall have a hole cut which allows the bolt to pass through it and the plate and bolt shall be completely welded together around the circumference of the bolt on both sides of the plate. No butt welding is allowed. The length of the bolts shall allow the plate to be covered by 75 mm to 100 mm (3 in. to 4 in.) of concrete at the bottom of the foundation.~~

Overhead sign structure foundations, strain poles, and highmast lighting foundations shall be excavated to allow the foundation to be embedded as shown on the plans or as directed.

If ~~the~~ class X material ~~encountered is~~ in accordance with ~~the definitions 2, 3, or 4 of~~ 206.02(a)*2, 206.02(a)3, or 206.02(a)4 is encountered,* the material shall be removed to the total depth of the foundation as shown on the plans.

SECTION 206, DELETE LINES 125 THROUGH 130.

SECTION 206, BEGIN LINE 135, DELETE AND INSERT AS FOLLOWS:

material adjacent to these piers provided such waste does not obstruct the waterway. If usable excavated material is wasted without authority, the quantity so wasted will be deducted from the quantities of common excavation, borrow, or B borrow, depending on the nature of the waste and ~~the use to which it should have been put~~ *its use*.

~~If it is necessary to dispose~~ *Disposal* of surplus or unsuitable material*, including class X excavation,* outside the right-of-way~~, it~~ shall be ~~done~~ in accordance with 201.03 *and 203.08*. ~~No direct compensation will be paid for disposing of excavated materials, the cost thereof to be included in the various pay items of the contract.~~

SECTION 206, BEGIN LINE 221, DELETE AND INSERT AS FOLLOWS:

Except as otherwise provided herein, cofferdams shall be dewatered *and sediment controlled in accordance with 108.03.* ~~Pumping from the interior of a cofferdam shall not carry away any of the concrete ingredients.~~ ~~No pumping~~ *Pumping* will *not* be permitted for 24 h after concrete placement, unless otherwise approved.

SECTION 206, BEGIN LINE 243, INSERT AS FOLLOWS:

Class X material encountered *and removed* during the excavation of foundations for traffic support structures will be measured to the *foundation* neat lines as shown on the plans below the surface of class X material.

SECTION 206, AFTER LINE 249, INSERT AS FOLLOWS:

Extended excavation for footings will be measured to include the entire depth needed for the deeper footing and the entire width needed to comply with OSHA or IOSHA requirements.

Additional excavation required for a culvert when the culvert is placed at an elevation that is at least 0.3 m (1 ft) below the elevation shown on the plans shall be measured to include the entire width needed to comply with OSHA or IOSHA requirements.

SECTION 206, BEGIN LINE 269, DELETE AND INSERT AS FOLLOWS:

~~Except as otherwise provided herein, if~~ *If* class X excavation is encountered *at locations other than sign foundations, traffic signal foundations, and highway illumination foundations,* and there is no contract unit price for class X excavation, payment will be made at a unit price per cubic meter (cubic yard) ~~which is~~ *as follows:*

1. *$1300.00 per m^3 ($1000.00 per cu yd) if the quantity of class X excavation is less than or equal to 1 cubic meter (1 cubic yard) per foundation.*

2. *When the quantity of class X excavation is greater than 1 cubic meter (1 cubic yard) per foundation, payment will be made at* the lesser of ~~two~~ *four* times the contract unit price for wet excavation or ~~eight~~ *ten* times the contract unit price for dry excavation. ~~If such unit price exceeds the lowest among the contract unit price for class B concrete in footings, the contract unit price for class B concrete above footings, the contract unit price for class C concrete in superstructure, or $262.00 per m^3 ($200.00 per cu yd), the payment for class X excavation will be made at the lowest contract unit price.~~

If class X excavation is encountered at locations for sign foundations, traffic signal foundations, and highway illumination foundations and there is no contract unit price for class X excavation, payment will be made as follows:

1. *$660.00 if the quantity of class X excavation is less than or equal to 1 cubic meter ($500.00 if the quantity of class X excavation is less than or equal to 1 cubic yard) per foundation.*

2. *$660.00 per m^3 ($500.00 per cu yd) for all quantities over 1 cubic meter (1 cubic yard).*

In addition to the payment for class X excavation at sign foundations, traffic signal foundations, and highway illumination foundations when there is no contract unit price for class X excavation, a mobilization and demobilization payment for class X excavation will be paid in the amount of $1500.00 per occurrence. Multiple mobilization and demobilization payments will be paid if all project foundation locations are not made available for excavation in a reasonable time frame while the equipment is on the project. The cost of this work will be included in an extra work order developed in accordance with 109.05 and paid as class X excavation and a mobilization and demobilization for class X excavation.

If class X excavation is encountered in foundation excavation unclassified and there is no pay item shown in the Schedule of Pay Items, payment will be made at ~~four~~ *eight* times the contract unit price per cubic meter (cubic yard) for foundation excavation unclassified~~, but not higher than the lower of the contract unit prices for class B concrete above footings or class C concrete in superstructure~~.

SECTION 206, BEGIN LINE 301, DELETE AND INSERT AS FOLLOWS:

1. For footings or portions thereof lowered not more than 0.3 m (1 ft), the factor will be ~~1.25~~ *2.0*.

2. For footings or portions thereof lowered more than 0.3 m (1 ft) and not more than 0.6 m (2 ft), the factor will be ~~1.50~~ *2.5*.

3. For footings or portions thereof lowered more than 0.6 m (2 ft) and not more than 0.9 m (3 ft), the factor will be ~~1.75~~ *3.5*.

4. For footings or portions thereof lowered more than 0.9 m (3 ft) and not more than 1.2 m (4 ft), the factor will be ~~2.00~~ *5.0*.

SECTION 206, DELETE LINES 317 THROUGH 321.

SECTION 206, AFTER LINE 329, INSERT AS FOLLOWS:

If a borrow pit is required and borrow is not specified as a pay item, payment will be made in accordance with 203.28.

If a waste area is required and the contract documents do not identify excess excavation nor require removal of any items, payment will be made in accordance with 203.28.

Except for sign foundations, traffic signal foundations, and highway illumination foundations, if a type of excavation for which no pay item exists is required and the new type of excavation requires the Contractor to use equipment not otherwise being used on the contract, payment will be in accordance with 203.28.

If a type of excavation for which no pay item exists is required and the new type of excavation requires additional traffic control not shown on the plans or results in traffic control being required for an additional period of time, payment will be in accordance with 203.28.

SECTION 206, AFTER LINE 345, INSERT AS FOLLOWS:

The cost for disposing of surplus or unsuitable excavated materials outside the right-of-way shall be included in the various pay items in this section.

SECTION 206, BEGIN LINE 358, INSERT AS FOLLOWS:

If a culvert is lowered, relocated, or material of such nature is encountered that additional excavation is necessary over and above that required at the originally planned location, the additional excavation will not be paid for if it is 8 m^3 (10 cu yd) or less. Additional excavation in excess of 8 m^3 (10 cu yd) will be paid for at three times the contract unit price for the class of excavation involved. *However, if the culvert is placed at a depth that is equal to or greater than 0.3 m (1 ft) deeper than the elevation shown on the plans, the additional excavation in excess of 8 m^3 (10 cu yd) will be paid at five times the contract unit price for the class of excavation involved.*

SECTION 206, BEGIN LINE 426, DELETE AND INSERT AS FOLLOWS:

(c) Traffic Structure Supports. ~~If~~ *The cost of excavation for traffic structure supports, except for* class X material *in accordance with 206.02(a)1,* ~~is encountered during the excavation of foundations for traffic support structures, the cost of such material~~ shall be included in the cost of the foundation material.

SECTION 206, DELETE LINES 429 THROUGH 433.

SECTION 207, DELETE LINES 1 THROUGH 154.

SECTION 207, AFTER LINE 155, INSERT AS FOLLOWS:

SECTION 207 -- SUBGRADE

207.01 Description. This work shall consist of the construction of the subgrade in accordance with 105.03.

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MATERIALS

207.02 Materials. Materials shall be in accordance with the following.

Chemical Modifiers
Fly Ash, Class C 901.02
Lime ..... 913.04(b)
Portland Cement, type I ..... 901.01(b)
Coarse Aggregate, Class D or Higher, Size No. 11, 12,
170 *53, or 73 ..... 904*

Recycled concrete pavement meeting the requirements of coarse aggregate size No. 53 may be used when crushed stone size No. 53 is specified.

CONSTRUCTION REQUIREMENTS

207.03 General Requirements. The subgrade shall be treated by chemical modification in accordance with 215, excavation and replacement, or compaction in accordance with AASHTO T 99.

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Soils containing greater than 3% by dry weight calcium, magnesium carbonate or organic material, or with a maximum dry density of less than 1600 kg/m³ (100 pcf), or with liquid limit of greater than 50, will not be permitted within the specified thickness of the subgrade. Density shall be determined in accordance with AASHTO T 99 and loss of ignition shall be determined in accordance with AASHTO T 267. Liquid limits shall be determined in accordance with AASHTO T 89.

Coal encountered within the specified thickness of the subgrade shall be excavated if directed, and disposed of in accordance with 202.05. Coal or coal blossoms that are allowed to remain shall be mixed thoroughly with subgrade soils and compacted in accordance with 207.04.

All rock greater than 150 mm (6 in.) encountered shall be removed or broken off at least 150 mm (6 in.) below the subgrade surface. Holes or depressions resulting from the removal of unsuitable material shall be filled with an acceptable material and compacted to conform with the surrounding subgrade.

During subgrade preparation, adequate drainage shall be provided at all times to prevent water from standing on the subgrade.

Even though the subgrade has been previously accepted, the condition of the subgrade at the time paving material is placed shall be in accordance with 105.03 and 207.04. Just prior to placing the base course on the subgrade, proofrolling in accordance with 203.26 shall be completed. Undue distortion of the subgrade shall be avoided. If limits of the work make mechanical preparation of the subgrade impractical, appropriate hand methods may be used.

The grade and cross section of the subgrade shall be finished within a tolerance of 13 mm (1/2 in.) from a true subgrade. It is permissible to finish within this tolerance by blading or other mechanical means without the use of side forms. If these methods do not finish within this tolerance, side forms shall be used.

207.04 Subgrade Treatments. *Subgrade materials shall be compacted to 100 percent of maximum dry density in accordance with 203.23.*

When conditions are encountered below the specified subgrade treatment depth that prevent achieving the specified subgrade compaction, such conditions shall be treated as directed.

Within each of the following subgrade treatment types, for at-grade, cut, and cut-to-fill transitions, the Contractor shall choose from the applicable options for each type.

Type A. 400 mm (16 in.) chemical soil modification, or 300 mm (12 in.) of the subgrade excavated and replaced with coarse aggregate No. 53. Where granular soils classified in accordance with AASHTO M 145 as A-1, A-2, or A-3 exist, the subgrade may be treated by 600 mm (24 in.) compacted to density and moisture requirements.

Type B. *200 mm (8 in.) chemical soil modification, or 150 mm (6 in.) of the subgrade excavated and replaced with coarse aggregate No. 53. Where granular soils classified in accordance with AASHTO M 145 as A-1, A-2, or A-3 exist, the subgrade may be treated by 300 mm (12 in.) compacted to density and moisture requirements.*

Type C. *600 mm (24 in.) compacted to the density and moisture requirements, or 300 mm (12 in.) of subgrade excavated and replaced with coarse aggregate No. 53, or 400 mm (16 in.) chemical soil modification.*

Type D. *300 mm (12 in.) compacted to the density and moisture requirements, or 150 mm (6 in.) of subgrade excavated and replaced with coarse aggregate No. 53, or 200 mm (8 in.) chemical soil modification.*

Type E. *150 mm (6 in.) compacted to the density and moisture requirements, or 150 mm (6 in.) of subgrade excavated and replaced with coarse aggregate No. 53 and compacted in accordance with 301.06.*

When the Contractor elects coarse aggregate No. 53 replacement as the subgrade treatment, the aggregate surface shall be primed in accordance with 405 if HMA pavement is to be placed directly on the coarse aggregate No. 53.

207.05 Fill and Cut Sections.

(a) Fill Sections. *In sections equal to or greater than 600 mm (24 in.) in height, the top 600 mm (24 in.) shall be compacted to 100% of maximum dry density in accordance with 203.23 as the fill is constructed. The Contractor may substitute 400 mm (16 in.) of chemical soil modification, or 300 mm (12 in.) of coarse aggregate No. 53. Fill sections less than 600 mm (24 in.) in height will be treated in accordance with 207.04.*

(b) Cut Sections. *Where density and moisture controls are used, the top lifts shall be removed, and the bottom 150 mm (6 in.) compacted in-place to comply with the specified density and moisture requirements. Removal of the upper lifts may be waived and only the upper 150 mm (6 in.) treated when it is determined, through testing in accordance with 203.24, that the lower lifts comply with the specified density and moisture requirements.*

In sections where shale, shale and soft rock mixtures, or soft rock are encountered, these materials shall be undercut 150 mm (6 in.) below the subgrade elevation and replaced with coarse aggregate No. 53 or No. 73 and compacted in accordance with 301.06. All irregularities and holes shall be graded to provide positive drainage. Where necessary, finishing to subgrade elevation shall be accomplished using No. 11 or No. 12 crushed stone.

207.06 Method of Measurement. *Subgrade treatment will be measured by the square meter (square yard) per type. Prime coat materials will not be measured.*

207.07 Basis of Payment. *The accepted quantities of subgrade treatment, will be paid for at the contract unit price per square meter (square yard) per type, complete in place.*

Payment will be made under:

Pay Item	*Metric Pay Unit Symbol (English Pay Unit Symbol)*
Subgrade Treatment, Type ____ ……	*m2 (SYS)*

The cost of subgrade treatments including testing, sampling, aggregates, prime coat, modifiers, water, or the excavation required for the methods chosen by the Contractor shall be included in the cost of the pay item for subgrade treatment.

No payment will be made for subgrade treatment in fill sections.

No direct payment will be made for subgrade treatment on the bottom 150 mm (6 in.) below the undercut, or on the top 150 mm (6 in.) in those cut sections where it is determined that undercutting is not necessary. Where conditions exist below the specified subgrade compaction depth that prevent achieving the specified compaction, payment for correcting such conditions will be made based on the directed method of treatment.

No additional payment will be made in the fill section if the Contractor elects to provide chemical soil modification or compacted aggregate No. 53.

SECTION 209, BEGIN LINE 16, DELETE AND INSERT AS FOLLOWS:

~~Stones which measure more than 150 mm (6 in.) in any dimension shall not be left within 200 mm (8 in.) of the proposed subgrade for subsequent rigid type base or pavement. However, they may be left at subgrade elevation for other types, if not otherwise shown on the plans.~~ *All rock greater than 150 mm (6 in.) encountered shall be removed or broken off at least 150 mm (6 in.) below the subgrade surface. Holes or depressions resulting from the removal of unsuitable material shall be filled with an acceptable material and compacted to conform with the surrounding subgrade.*

SECTION 210, BEGIN LINE 16, INSERT AS FOLLOWS:

Weeds, brush, and stumps shall be cut close to the ground. Disposal shall be in accordance with 201.03 *and 203.08*.

SECTION 211, DELETE LINES 1 THROUGH 161:

SECTION 211, AFTER LINE 162, INSERT AS FOLLOWS:

SECTION 211 – B BORROW FILL AND BACKFILL

211.01 Description. *This work shall consist of backfilling excavated or displaced peat deposits; filling up to designated elevations of spaces excavated for structures and not occupied by permanent work; constructing bridge approach embankment; and filling over structures and over arches between spandrel walls, all with special material.*

MATERIALS

211.02 Materials. *Materials shall be in accordance with the following.*

B-Borrow	*As Defined **
Geotextile	*913.18*
Structure Backfill	*904*

** The material used for special filling shall be of acceptable quality, free from large or frozen lumps, wood, or other extraneous matter and shall be known as B borrow. It shall consist of suitable sand, gravel, crushed stone, ACBF, GBF, or other approved material. The material shall contain no more than 10% passing the 75 μm (No. 200) sieve and shall be otherwise suitably graded. The use of an essentially one-size material will not be permitted unless approved.*

The Contractor has the option of either providing B borrow or structure backfill from a established CAPP source, or supplying the material from another source. The Contractor has the following options for supplying B borrow or structure backfill from a local site:

(a) the establishment of a CAPP Producer Yard at the local site in accordance with 917; or

(b) use a CAPP Certified Aggregate Technician or a consultant on the Department's list of approved Geotechnical Consultants For Gradation Control Testing.

The frequency of gradation control testing shall be one test per 2000 Mg (2000 t) based on production samples into a stockpile or by over the scales measurement, with a minimum of two tests per contract (one in the beginning and one near the mid-point). The sampling and testing of these materials shall be in accordance with applicable requirements of 904 for fine and coarse aggregates. The Contractor shall advise, in writing, the Engineer and the District Materials and Testing Engineer of the plan to measure the material.

When structure backfill is specified, the Contractor may substitute flowable backfill in accordance with 213. However, flowable backfill shall not be placed into or through standing water, unless approved in writing.

211.03 General Requirements. If B borrow or structure backfill is obtained from borrow pits, the items of obtaining the pits, their locations, depths, drainage, and final finish shall be in accordance with 203.

Unless otherwise specified, if excavated material complies with 211.02 and if B borrow or structure backfill is required for special filling, the excavated material shall be used as such. If there is a surplus of this material, such surplus shall be used in embankment. The provisions of 203.19 shall apply to placing this material at structures. All surplus in excess of the directed or specified use on the right-of-way shall be disposed of in accordance with 201.03.

If fill or backfill as described in this specification is within embankment limits, and if it is not required that the entire fill or backfill be of B borrow and placed as such, then that portion above free-water level shall be placed in accordance with applicable provisions of 203 and compacted to the required density.

If borrow is required outside the specified limits of B borrow, material in accordance with the specifications for B borrow may be furnished at the contract unit price for borrow; however, the quantity of borrow measured for payment outside the limits of structure backfill will not exceed the theoretical quantity of B borrow furnished.

Unless otherwise specified, all spaces excavated for and not occupied by bridge abutments and piers, if within embankment limits, shall be backfilled to the original ground line with B borrow, and placed in accordance with 211.04.

Where B borrow or structure backfill is required as backfill at culverts, retaining walls, sewers, manholes, catch basins, and other miscellaneous structures, it shall be compacted in accordance with 211.04.

211.04 Mechanical Compaction. Where B borrow or structure backfill is to be compacted by mechanical compaction, it shall, unless otherwise specified, be placed in accordance with the applicable provisions of 203.23 except, if mechanical tamps or vibrators are used, the material shall be deposited in approximately 150 mm (6 in.) lifts, loose measurement, and each lift compacted to density requirements.

211.05 Embankment for Bridges. When special filling is required, the embankment for bridges shall be constructed using B borrow within the specified limits shown on the plans. All embankment construction details specifically set out in this specification for embankment for bridges shall be considered in accordance with the applicable requirements of 203.

At the time B borrow is being placed for approach embankment, a well compacted watertight dam shall be constructed in level lifts, the details of which are shown on the plans. Except as hereinafter specified for material to be used in constructing the enclosing dam, and for growing vegetation, and unless otherwise provided, the material for constructing bridge approach embankment shall be B borrow compacted by mechanical methods. If approach embankment or shoulders are

constructed of material not suitable for growing seed or sod, and if one or both of these is required, then such areas shall, unless otherwise specified, be covered with a layer of clay, loam, or other approved material. This layer shall be approximately 0.3 m (1 ft) thick after being compacted into place.

211.06 B Borrow Around Bents. *When specified, B borrow shall be placed around all bents falling within the limits of the approach grade as shown on the plans. Before placing, the surface of the ground on which it is to be placed shall be scarified or plowed as directed. The embankment slope shall be 2:1 on the sides and beneath the structure, and shall be 6:1 from the end of the bridge down to the average ground line, or it may be required to complete the approaches back to the existing grade. An enclosing dam and provisions for growing vegetation shall be constructed in accordance with 211.05.*

211.07 Aggregate For End Bent Backfill. *When specified, coarse aggregate shall be placed behind end bents as shown on the plans. The material shall be deposited in lifts not to exceed 300 mm (12 in.) loose measurement, and each lift shall be mechanically compacted using a hand held vibratory plate compactor having a plate width of 425 mm (17 in.) or larger that delivers 13.3 to 40 kN (3000 to 9000 lb) per blow. Each lift shall be compacted with two passes of the compactor.*

Prior to placing the aggregate, a geotextile shall be installed in accordance with 616.10.

211.08 Spandrel Filling. *Unless otherwise specified, spandrel fills for arch structures shall be composed of B borrow. The fill shall be carried up symmetrically in lifts from haunch to crown and simultaneously over all piers, abutments, and arch rings. Compaction shall be in accordance with 211.04.*

211.09 Method of Measurement. *B borrow, structure backfill, and aggregate for end bent backfill will be measured by the cubic meter (cubic yard) as computed from the neat line limits shown on the plans, or as adjusted. If cubic meters (cubic yards) are set out as the pay unit for B borrow or structure backfill in the Schedule of Pay Items and if neat line limits are not specified for measurement of volume for the material, measurement will be made by the cubic meter (cubic yard) at the loading point in truck beds which have been measured, stenciled, and approved. The B borrow may be weighed and converted to cubic meters (cubic yards) by assuming the mass per cubic meter (weight per cubic foot) to be 90% of the maximum wet density in accordance with AASHTO T 99. The material may be cross sectioned in its original position and again after excavation is complete, and the volume computed by the average end area method. If B borrow is used for backfill in areas where unsuitable material is present or peat excavation has been performed, unless otherwise directed, the B borrow will be cross sectioned, and the volume will be computed by the average end area method.*

If the material is to be paid for by the megagram (ton), it will be weighed in accordance with 109.01(b).

If the material comes from a wet source such as below water or a washing plant, and weighing is involved in the method of measurement, there shall be a 12 h drainage period prior to the weighing.

Geotextile will be measured in accordance with 616.11.

211.10 Basis of Payment. *The accepted quantities of B borrow will be paid for at the contract unit price per cubic meter (cubic yard) or per megagram (ton) as specified, complete in place.*

Structure backfill will be paid for at the contract unit price per cubic meter (cubic yard), based on the neat line limits shown on the plans or as adjusted for authorized changes, provided the material comes from outside the permanent right-of-way. If the schedule of pay items does not contain a pay item for structure backfill and it is required to backfill pipes or culverts within the project limits, a change order will be generated to establish a unit price.

B borrow material placed outside the neat lines will be paid for as borrow when such B borrow eliminates required borrow material. Otherwise, no payment will be made for backfill material placed outside the neat lines.

If material which is in accordance with the requirements for B borrow is obtained within the excavation limits of the project and is used as such, it will be paid for at the contract unit price for the class of excavation involved. No further payment will be made.

Aggregate for end bent backfill will be paid for at the contract unit price per cubic meter (cubic yard), based on the neat line limits shown on the plans or as adjusted by authorized changes.

Geotextile will be paid for in accordance with 616.12.

Flowable backfill which is substituted for structure backfill will be paid for as structure backfill.

If topsoil, loam, or other suitable material in accordance with 211.05 is used for expediting the growth of seed or sod, it will be paid for at the contract unit price per cubic meter (cubic yard) for borrow, unless otherwise provided.

Payment will be made under:

Pay Item	*Metric Pay Unit Symbol (English Pay Unit Symbol)*
Aggregate For End Bent Backfill	*m3 (CYS)*
B Borrow	*m3 (CYS)*
	Mg (TON)
Structure Backfill	*m3 (CYS)*

The cost of disposal of excavated material shall be included in the cost of the pay items in this section.

SECTION 213, DELETE LINES 1 THROUGH 112.

SECTION 213, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 213 -- FLOWABLE BACKFILL

213.01 Description. *This work shall consist of placing flowable backfill in trenches for pipe structures, culverts, utility cuts and other work extending under pavement locations, to fill cavities beneath slopewalls and other locations in accordance with 105.03.*

MATERIALS

213.02 Materials. *Materials shall be in accordance with the following:*

Concrete Admixtures.....912.03
Fine Aggregate.....904*
Fly Ash.....901.02
Portland Cement.....901.01(b)
Water.....913.01
** Except that steel furnace slag shall not be used*

If fly ash is used as a filler and not as a pozzolan, the fly ash shall be in accordance with 904.

The supplier may elect to use gradations in accordance with 904 or may propose the use of alternate gradations. The alternate gradation and proposed tolerances of material passing each sieve shall be included in the flowable backfill mix design.

213.03 Flowable Backfill Mix Design. *The Contractor shall submit a flowable backfill mix design, FBMD, to the Engineer and arrange a trial batch. The FBMD will be approved based on compliance with 213.04. The FBMD shall be submitted in a format acceptable to the Engineer and shall include the following:*

a) a list of all ingredients
b) the source of all materials
c) the gradation of the aggregates
d) the batch mass (weight)
e) the names of all admixtures
f) the admixture dosage rates and manufacturer's recommended range

FBMD's which were used on contracts in the current or previous calendar year, may be submitted to the District Materials and Tests Engineer for approval. Effective January 1, 2004, all FBMD's shall meet the requirements of 213.05

After the completion of the trial batch and all test results have been reviewed for compliance with the specifications, a mixture number will be assigned by the Engineer.

Mix design changes will not be allowed after the FBMD approval, except for adjustments to compensate for routine moisture fluctuations. All other changes require a new FBMD.

213.04 Flowable Backfill Mix Criteria. *The FBMD shall produce a workable mixture with the following properties:*

Minimum Unconfined Compressive Strength
at 28-days ..... 350 kPa (50 psi)
Maximum Unconfined Compressive Strength
at 28-days ..... 1050 kPa (150 psi)
Minimum Fill Spread Diameter .....200 mm (8 in.)

213.05 Flowable Backfill Trial Batch. *A trial batch shall be produced by the Contractor and tested by the District Materials and Tests Engineer to verify that the FBMD meets the flowable backfill mix criteria. The flowable backfill shall be batched within the proportioning tolerances of 508.02(b). The Engineer will determine and provide the Contractor with test results for the unconfined compressive strength test and the flowable backfill spread diameter. The trial batch shall be of sufficient quantity to allow the Contractor and the Engineer to perform all required tests from the same batch. Trial batch flowable backfill shall not be used for more than one test.*

Compressive strength testing shall be conducted in accordance with ITM 588. Flow testing shall be conducted in accordance with ASTM D 6103.

The Contractor shall determine the penetration resistance of the flowable backfill produced during the trial batch in accordance with ITM 213 at one, three, seven, and fourteen days. The results shall be submitted to the Engineer.

FBMD's which were used on contracts in the current or previous calendar year, may be submitted to the District Materials and Tests Engineer for approval.

213.06 Mixing Equipment. *The mixing equipment shall be in accordance with the applicable requirements of 702 or 722, except that in lieu of the calibration requirements of 722.11, the mixer operator shall make delivery in a properly calibrated continuous mixer.*

CONSTRUCTION REQUIREMENTS

213.07 Placement. *The flowable backfill shall not be placed on frozen ground. Flowable backfill shall be protected from freezing until the material has set.*

The diameter of the flowable backfill spread shall be at least 200 mm (8 in.) at time of placement.

The flowable backfill shall be brought up uniformly to the fill line as shown on the plans or as directed.

The flowable backfill shall not be subject to load nor disturbed by construction activities until penetration resistance testing in accordance with ITM 213 has been completed. The minimum penetration resistance shall be as follows:

For PCCP ..... 500 kPa (70 psi)

For all Other Applications ..... 8000 kPa (1200 psi)

213.08 Method of Measurement. *Flowable backfill will be measured by the cubic meter (cubic yard) as computed from the neat line limits shown on the plans, or as adjusted. If neat line limits are not shown on the plans, the volume in cubic meters (cubic yards) of flowable backfill furnished and placed will be computed from the nominal volume of each batch and a count of the batches. Unused and wasted flowable backfill will be estimated and deducted. Drilled holes will be measured by the number of holes drilled.*

213.09 Basis of Payment. *The accepted quantities of flowable backfill will be paid for at the contract unit price per cubic meter (cubic yard) furnished and placed. Holes drilled in the pavement will be paid for at the contract unit price per each.*

Payment will be made under:

Pay Item	*Metric Pay Unit Symbol (English Pay Unit Symbol)*
Drilled Hole for Flowable Backfill	*EACH*
Flowable Backfill	*m3 (CYS)*

The cost of material placed outside the neat line limits, material placed outside the adjusted limits, and unused or wasted flowable backfill shall be included in the cost of this work.

SECTION 214, BEGIN LINE 1, DELETE AND INSERT AS FOLLOWS:

SECTION 214 – ~~*Blank*~~ *GEOGRID*

214.01 Description. *This work shall consist of furnishing and installing geogrid as shown on the plans and in accordance with 105.03.*

MATERIALS

214.02 Materials. *Materials shall be in accordance with 913.21.*

CONSTRUCTION REQUIREMENTS

214.03 Foundation Preparation. *The embankment foundation shall be cleared and grubbed in accordance with 201 and excavated using lightweight equipment to minimize disturbance of the embankment foundation soils. Construction activities using equipment which cause pumping and rutting of the embankment foundation soils shall be prevented where possible or otherwise minimized. Fine grading may be waived where impractical. However, when very soft soil is encountered, the embankment foundation shall be cleared of all trash and rubbish materials without disturbing the vegetation cover. The embankment foundation shall be subject to approval prior to placement of geogrid. Proofrolling of the embankment foundation will not be required.*

214.04 Geogrid Placement. *The geogrid shall be installed in accordance with the manufacturer's recommendations with excess geogrid being removed. The Contractor may turn the excess portion of the geogrid into the fill layer as an alternative to removal, provided an acceptable installation is obtained. The geogrid shall be kept taut during placement of the initial lift of backfill. Installation may require the use of stakes to hold the geogrid in place.*

The geogrid material supplier shall provide a qualified manufacturer's representative on the contract site at the start of the work to assist the Contractor. The representative shall also be available during construction when required by the Engineer or Contractor. A copy of the manual for the installation shall be furnished to the Engineer.

Geogrid shall be overlapped a minimum of 0.6 m (2.0 ft) side to side and end to end for Type I and only end-to-end for Type II. The geogrids shall be overlapped 1 m (3.0 ft) in areas where foundation conditions cannot support foot traffic or where 0.6 m (2.0 ft) is found to be inadequate during fill placement. Overlaps shall be oriented, or shingled, to prevent advancing fill from lifting the geogrid. Overlaps shall be further secured to prevent separation during fill placement. Damaged geogrid shall be patched. Patching shall include placement of a minimum of 1 m (3.0 ft) of overlapped geogrid beyond the damaged area. If the damaged portion extends for more than 50 percent of the roll in the width direction, the entire width shall be replaced.

Geogrid shall be covered with fill within three calendar days after placement. Only that amount of geogrid required for pending work shall be placed to minimize exposure of the geogrid.

214.05 Fill Placement. *Construction vehicles shall not be permitted on the geogrid. The placement of the fill shall proceed forward along the roadway centerline and outward to the embankment edges and compacted in accordance with 203.23. The Engineer may waive density requirements for the first lift if the fill is determined to be too soft to support compaction equipment.*

214.06 Method of Measurement. *Geogrid will be measured by the square meter (square yard), for the type specified. The quantity will be computed based on the total area of geogrid shown on the plans, exclusive of the area of overlaps. The portion of geogrid cut off or turned up into the backfill layer will not be measured for payment.*

214.07 Basis of Payment. *The accepted quantities of geogrid will be paid for at the contract unit price per square meter (square yard) per type of geogrid.*

Payment will be made under:

Pay Item	***Metric Pay Unit Symbol (English Pay Unit Symbol)***
Geogrid_____ type	*..... m2 (SYS)*

The costs of furnishing the materials, manufacturer's representative, all labor and equipment required for furnishing and placing the geogrid, all work necessary to establish grades, geogrid splices, overlaps, stakes or pins, supplemental product test data, and patching or replacement of damaged geogrid shall be included in the cost of this work.

SECTION 215, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 215 -- CHEMICAL MODIFICATION OF SOILS

215.01 Description. *This work shall consist of the modification of soils by uniformly mixing dry portland cement, fly ash, lime, or a combination of the materials with soil to aid in achieving the workability of soils having an excessive moisture content.*

MATERIALS

215.02 Materials. *Materials shall be in accordance with the following:*

Fly Ash, Class C	*901.02*
Lime	*913.04(b)*
Portland Cement, Type I	*901.01(b)*
Water	*913.01*

CONSTRUCTION REQUIREMENTS

215.03 Testing and Mix Design. *The Contractor shall be responsible for all tests required to determine the optimum chemical modifier content for modification of the soils. The modifier selection, laboratory testing, and mix design shall be performed in accordance with criteria contained in the Department's guidelines, Soil Modification or Stabilization by an approved geotechnical consultant.*

The quantities for hydrated lime, quicklime, or portland cement shall be based on 4.0 ± 0.5% by dry unit mass (weight) of the soils. The quantities for lime by-products shall be based on 5.0 ± 1.0% by dry unit mass (weight) of the soils. The quantities for fly ash shall be based on 12.0 ± 2.0% by dry unit mass (weight) of the soils.

Test results, recommendations, and type A certifications for all chemical modifiers shall be submitted to the Engineer prior to use. Test results, recommendations, and type A certifications for fly ash, lime by-products, or any combination of chemical modifiers shall also be submitted to the Materials and Tests Division for approval at least five days prior to use.

The quantity of chemical modifier may be adjusted for different soil types. However, the source or type of chemical modifier shall not be changed during the progress of the work without approval. A change in source or type shall require a new mix design.

215.04 Storage and Handling*. The chemical modifier shall be stored and handled in accordance with the manufacturer's recommendations.*

215.05 Weather Limitations. *The chemical soil modification shall be performed when the soil has a minimum temperature of 7°C (45°F), measured 100 mm (4 in.) below the surface, and with the air temperature rising. The chemical modifier shall not be mixed with frozen soils or with soil containing frost.*

215.06 Preparation of Soils. *The soils shall be prepared in accordance with 207.03. All aggregates which are larger than approximately 75 mm (3 in.) encountered before or after mixing the soils and chemical modifiers shall be removed.*

215.07 Spreading of Chemical Modifiers. *The soil shall be scarified or disked to the specified depth prior to distribution of the chemical modifier. The chemical modifier shall be distributed uniformly by a cyclone, screw-type, or pressure manifold type distributor. The chemical modifier shall not be applied when wind conditions create problems in adjacent areas or create a hazard to traffic on any adjacent roadway. The spreading of the chemical modifier shall be limited to an amount which can be incorporated into the soil within the same work day. If weather causes stoppage of work or exposes the chemical modifier to washing or blowing, additional chemical modifier may be spread when the work resumes.*

215.08 Mixing. *The chemical modifier, soil, and water when necessary, shall be thoroughly mixed by rotary speed mixers or a disc harrow. The mixing shall continue until a homogenous layer of the required thickness has been obtained. One hundred percent of the material, exclusive of rock particles, shall pass a 25 mm (1 in.) sieve and at least 60% shall pass a 4.75 mm (No. 4) sieve. The loose thickness of a single chemical modified layer shall not exceed 200 mm (8 in.) if a disc harrow is used and 400 mm (16 in.) if a rotary speed mixer is used.*

215.09 Compaction. *Compaction of the mixture shall begin as soon as practicable after mixing. Compaction after mixing shall be as follows:*

(a) Cement modified soils shall be compacted within 30 min.

(b) Fly ash modified soils shall be compacted within 4 h.

(c) Lime modified soils shall be compacted within 3 days.

Compactive efforts shall be in accordance with 203 or 207.03 as applicable.

Maximum dry densities will be determined in accordance with AASHTO T 272 at the same time and location as each in-place density test is performed when in-place densities do not meet AASHTO T 99. The field in-place dry density shall be in accordance with AASHTO T 191 or AASHTO T 310.

The moisture content of the mixture shall be between the optimum moisture and the optimum moisture plus 2.0%. Aeration or drying by further mixing, or the addition of water and further mixing, may be required to obtain the optimum moisture content.

Construction traffic shall not be on the treated soils within 72 h of compaction.

215.10 Method of Measurement. *The accepted quantity of chemically modified soils will be measured by the square meter (square yard), complete in place. All excavation required to modify the soils below the specified depth will be measured in accordance with 203.27(b).*

215.11 Basis of Payment. *The accepted quantity of chemically modified soils will be paid for by the square meter (square yard), complete in place. All excavation required to modify the soils below the specified depth will be paid for in accordance with 203.28.*

Adjustment of materials for chemical modification that exceeds the limits of 215.03 will be included in an extra work order developed in accordance with 109.05 for materials only and paid for as chemical modifier adjustments. If mix design test results show that hydrated lime, quicklime, lime by-products, or fly ash are not appropriate, a price adjustment will be made for the use of cement and will be included in an extra work order developed in accordance with 109.05 and will be paid for as chemical modifier adjustments.

Payment will be made under:

Pay Item	*Metric Pay Unit Symbol (English Pay Unit Symbol)*
Chemical Modification, Soils	*m2 (SYS)*

The costs of performing the laboratory tests, providing an approved geotechnical consultant, scarification of the subgrade, spreading and mixing of the chemical modifier and soil, compaction of the resultant mixture, shaping the subgrade, work required due to adjustments of modifier proportioning, additional modification required due to weather conditions, correction of deficient areas, water required for the modification process, modified subgrade trimming, and all operations needed to meet the requirements of this specification shall be included in the costs of the pay item.

SECTION 216, BEGIN LINE 1, INSERT AS FOLLOWS:

SECTION 216 –CELLULAR CONCRETE FILL, CCF

216.01 Description. *This work shall consist of furnishing and placing a light weight, low absorbability cellular concrete fill in accordance with 105.03.*

MATERIALS

216.02 Materials. *Materials shall be in accordance with the following:*

Cement	*901.01(b)*
Fly Ash	*901.02*
Water	*913.01*

An admixture in accordance with 912.03 may be used as recommended by the CCF manufacturer.

A foam liquid concentrate in accordance with ASTM C 796 shall be used to produce the CCF properties in accordance with 216.04. The concentrate shall be chosen from those shown on the Department's list of approved CCF Manufacturers/Installers.

CONSTRUCTION REQUIREMENTS

216.03 Mix Design. *A mix design prepared in accordance with the geotechnical report shall be submitted to the Materials and Tests Division for approval at least five work days before the CCF operations begin. A cellular concrete manufacturer shall be chosen from those shown on the Department's list of approved CCF Manufacturers/Installers.*

216.04 Properties and Tests. *The CCF shall be in accordance with the manufacturer's recommendations and the minimum physical properties as follows:*

PROPERTIES	*CLASS II*	*CLASS III*	*CLASS IV*
Cast Density Mix	*480 kg/m³ (810 lb/cyd)*	*580 kg/m³ (972 lb/cyd)*	*670 kg/m³ (1134 lb/cyd)*
*Minimum Compressive Strength, ASTM C 495 **	*375 kPa (40 psi)*	*550 kPa (80 psi)*	*825 kPa (120 psi)*
Freeze-thaw resistance minimum at relative E = 70%, ASTM C 666 Modified		*80 Cycles*	*300 Cycles*
*Water Absorption Maximum ***	*20%*	*16%*	*14%*
Shear Modulus, G, ASTM D 4015	*172,000 kPa (25,000 psi)*	*231,000 kPa (34,000 psi)*	
Young Modulus, E, ASTM D 4015	*469,000 kPa (67,000 psi)*	*772,000 kPa (102,000 psi)*	

** Specimens shall not be oven dried for the compressive strength test.*

*** Percentage after 120 days. Long term total immersion as a percent of cast density in accordance with ASTM C 796.*

(a) CCF Cast Density. *The density shall be monitored at the point of placement at hourly intervals during placement. Adjustments shall be made as necessary to maintain the specified cast density, ± 10%. If two consecutive test results are failing, operations shall cease and corrective action taken before placement of the CCF resumes.*

(b) Foam Density. *Foam density shall be tested twice during each 24 h period for each mixer. The foam density shall be within 10% of the target provided in the approved mix design.*

216.05 Storage and Handling. *Protection of the material during and after placement shall be in accordance with the manufacturer's recommendations.*

216.06 Weather Limitations. *CCF shall be placed when the ambient temperature is 0°C (32°F) or above. CCF shall not be placed on frozen subsoil. The installation procedure shall not begin if a temperature of less than 0°C (32°F) is expected within a 10 h time period from the completion of the CCF placement, unless recommended by the manufacturer.*

216.07 Preparation of Subgrade. *The subgrade shall be prepared in accordance with 207. All standing water shall be removed prior to placement of CCF.*

216.08 Installation. *CCF shall be proportioned, mixed, and placed in lifts as recommended by the manufacturer. Transit mixers will not be acceptable for mixing the CCF. The CCF shall not be subjected to load nor disturbed by construction activities until a minimum compressive strength of 175 kPa (25 psi) has been achieved.*

The final surface finish shall be within ± 30 mm (0.1 ft) of the plan elevation.

216.09 Lots. *Lots will be defined as 250 m^3 (300 cyd) of CCF placed. A partial lot equal to or less than 50 m^3 (60 cyd) shall be included in the previous lot. A partial lot greater than 50 m^3 (60 cyd) but less than 250 m^3 (300 cyd), will be considered a full lot.*

216.10 Testing. *Acceptance of the work will be based on successful test results for compressive strength. The Contractor shall cast four specimens for each lot. Testing of the specimens will be in accordance with ASTM C 495, except test specimens shall be covered immediately after casting. The specimens shall be moist cured for 26 days and then air cured for two days prior to the compressive strength testing. The specimens shall not be oven dried. Test specimens will become the property of the Department after curing and will be tested at 28 days.*

216.11 Method of Measurement. *CCF will be measured by the cubic meter (cubic yard) for each class as computed from the neat line limits shown on the plans, or as adjusted.*

216.12 Basis of Payment. *CCF will be paid for at the contract unit price per cubic meter (cubic yard) of the class specified.*

Payment will be made under:

Pay Item	***Metric Pay Unit Symbol (English Pay Unit Symbol)***
Cellular Concrete Fill _____ class	*……m3 (CYS)*

Water, curing, molds, equipment, materials, and other incidentals necessary for finishing CCF specimens shall be included in the cost of CCF.

No payment will be made for replacement of damaged CCF.