2101 CLEARING AND GRUBBING

2101.1 DESCRIPTION
This work consists of removing and disposing of the trees, brush, stumps, roots, and other plant life, including dead and decayed matter, within the construction area, unless otherwise designated to remain by the contract or as directed by the Engineer.

2101.2 (BLANK)

2101.3 CONSTRUCTION REQUIREMENTS
The Engineer will establish the right-of-way lines and construction limits confining the clearing and grubbing operations. The Engineer will designate those trees, brush, and other vegetation for preservation and those for removal. Remove and dispose of the trees, brush, stumps, and roots from the limits designated for clearing and grubbing.

Salvage topsoil in accordance with 2105, “Excavation and Embankment.”

Protect the items designated to remain in accordance with 1712, “Protection and Restoration of Property,” and 2572, “Protection and Restoration of Vegetation,” place temporary fence, and perform clearing and grubbing operations in a manner that will not damage or jeopardize the surrounding plant life and property.

Prune branches for the following reasons:

(1) For pedestrian, vehicle, and infrastructure clearance;
(2) To reduce risk of branch failure;
(3) To improve a site line and sign visibility; and
(4) To maintain tree health in accordance with 2571.3, “Plant Installation and Establishment, Construction Requirements.”

A Clearing and Grubbing Operations
Cut off, remove, and dispose of the trees, brush, stumps, and roots from designated areas within the construction limits as a clearing and grubbing operation. Perform clearing and grubbing on the project to construct the proposed improvements, including the clearing and grubbing of designated areas outside those construction limits as shown on the plans or as designated by the Engineer and in accordance with the following:

(1) Within the right-of-way, remove trees, brush, stumps, and other items that can be viewed from the traveled way as directed by the Engineer, and
(2) Within 15 ft [5 m] of the construction limits outside of structures, remove trees, stumps, roots, brush, and branches to protect and maintain the completed improvements as directed by the Engineer.

B Clearing Operations
Cut off, remove, and dispose of trees and brush in the areas identified as a clearing operation on the plans or as directed by the Engineer. If the contract does not require grubbing or if the Engineer directs the Contractor not to perform grubbing, cut off at a point within 6 in [150 mm] of the ground.

C Grubbing Operations
Remove and dispose of the brush, stumps, roots, and other remains in the areas designated as a grubbing operation on the plans, or as directed by the Engineer. Completely remove stumps in accordance with 2104.3.C, “Removal Operations,” unless otherwise approved by the Engineer. If the Engineer approves of a stump to remain, cut the stump no greater than 6 in [150 mm] above the ground, and flush with or below the ground surface if directed by the Engineer.
Fill depressions resulting from the grubbing operations with suitable material in accordance with 2105.2.B, “Borrow Material,” and compact the material as approved by the Engineer, except in those areas to be excavated as part of the work.

D Disposal Limitations

Dispose of trees, brush, stumps, roots, and other debris or byproducts by chipping, tub grinding, or marketing. The Contractor may chip the wood through a chipping machine or tub grinding, and use or dispose of the chips as approved by the Engineer within the construction limits. Provide to the Engineer an Emerald Ash Borer compliance agreement with the Minnesota Department of Agriculture. Dispose of ash, pine, elm, and oak wilt infected trees in accordance with proper forestry disposal standards that prevent spreading insects and disease pests.

D.1 Marketable Trees

The Contractor may make marketable trees designated for removal to wood-using industries, biofuel industries, or both. Do not market any part of an ash tree from a quarantined area to wood-using industries or individuals without an Emerald Ash Borer compliance agreement with Minnesota Department of Agriculture.

The Department defines marketable trees as all trees except for the following:

(1) Elm trees,
(2) Oak wilt infected oak trees, and
(3) Ash trees that have a diameter of 6 in [150 mm] or more when measured at a point 24 in [600 mm] above the ground surface.

D.2 Elm, Oak Wilt Infected Oak Trees and Ash

D.2.a Elm Trees

Dispose of elm trees, brush, stumps, roots, and debris by chipping or tub grinding and using the mulch within the construction limits for erosion control, construction of exit pads or landscaping purposes.

D.2.b Oak Wilt Infected Oak Trees

Dispose of stumps, roots, and debris from oak wilt infected oak trees by chipping or tub grinding and using the mulch within the construction limits for erosion control, construction of exit pads or landscaping purposes.

D.2.c Disposal Deadlines and Locations

Dispose of elm and oak wilt infected oak trees in accordance with the following:

(1) Within 20 calendar days of notification or of clearing and grubbing, whichever comes first, when performing the cutting operations between April 1 and September 15;
(2) By April 1 when performing cutting operations between September 15 and March 31,
(3) Within the right of way by tub grinding or chipping and using the mulch within the construction limits for erosion control, construction exit pads, or landscaping purposes; and
(4) Off the right of way provided the tree logs are processed by debarking or made into wood chip mulch to prevent the spread of Dutch elm disease and oak wilt.

D.3 Pine

Dispose of all non-marketable pine trees, brush, stumps, roots, and slash debris by chipping, tub grinding, or debarking within 20 calendar days of being cleared during the growing season to prevent the infestation and spread of pine bark beetles.

D.4 Ash Trees (Fraxinus species)

Do not market ash trees to the wood-using industries or individuals without having an Emerald Ash Borer compliance agreement with the Minnesota Department of Agriculture. Do not make ash or non-coniferous species with bark attached available to the public for use as firewood from the quarantined area. Do not transport entire ash trees, limbs, branches, logs, chips, ash lumber with bark, stumps, and roots outside of a quarantined county without fulfilling the requirements of an Emerald Ash Borer compliance agreement with the Minnesota Department of Agriculture.
Agriculture. Contact the Minnesota Department of Agriculture to speak with a regulatory official and visit the Minnesota Department of Agriculture Emerald Ash Borer website to determine the quarantine area.

D.4 Ash Tree Disposal and Locations
Dispose of ash trees in accordance with the following:
(1) The Emerald Ash Borer compliance agreement, and
(2) Use the ash wood chips within the construction limits for erosion control, construction exit pads, or landscaping purposes.

D.5 Burning not allowed...............................................................................................................2104.3

D.6 Burying not allowed...............................................................................................................2104.3

2101.4 METHOD OF MEASUREMENT
The Engineer will measure clearing and grubbing by area, lump sum, or individual unit as required by the contract. The Engineer will measure tree diameter by measuring the circumference of the tree at 4.5 ft above the ground and dividing the circumference by 3.14, or by measuring the diameter or the tree stump after removal.

A Qualifying Trees and Stumps
The Engineer will only measure trees for payment having a diameter greater than 4 in [100 mm] at a point measured 24 in [600 mm] above the ground surface.

The Engineer will only measure stumps for payment having a diameter greater than 4 in [100 mm] when measured at one of the following points:
(1) 2 ft [600 mm] above the ground surface for a tree cleared under the contract, or
(2) The point of cutoff for an existing stump not cleared under the contract.

The Engineer will not measure for the removal and disposal of stumps and brush with a diameter equal to or less than 4 in [100 mm] at the point of cutoff.

B Area Basis
If the contract specifies the unit as a hectare, the Engineer will determine quantities by measuring, to the nearest 0.05 acre [0.02 ha], all areas cleared and all areas grubbed within the limits as shown on the plans or staked by the Engineer. The Engineer will make all measurements horizontally to points 10 ft [3.0 m] outside the trunks of qualifying trees or stumps on the perimeter of the area being measured. The Engineer will measure separate areas less than 0.05 acre [0.02 ha] as 0.05 acre [0.02 ha].

If isolated trees or stumps require removal outside the areas designated for clearing or grubbing by the hectare, and no unit price is provided in the contract for clearing and grubbing individual trees or stumps, the Department will pay based on the following:
(1) The Engineer will consider each isolated qualifying tree less than 40 in [1 m] in diameter when measured at a point 2 ft [600 mm] above the ground surface, and each isolated qualifying stump measuring less than 40 in [1 m] at the point of cutoff as 0.05 acre [0.02 ha].
(2) The Engineer will consider each isolated tree or stump at least 40 in [1 m] in diameter when measured at the points described in (1) above as 0.1 acre [0.04 ha].

C Individual Unit Basis
When the contract specifies “tree” as the unit, the Engineer will count the number of qualifying trees cleared and the number of qualifying stumps grubbed to determine the quantity.

D Lump Sum Basis
The Engineer will not measure an individual area, tree, or stump if the contract specifies clearing and grubbing as a lump sum item.
2101.5 BASIS OF PAYMENT
The contract unit prices for the accepted quantities of clearing and grubbing includes the cost for removal and disposal; securing outside disposal sites in accordance with 2104.3.D, “Disposal of Materials and Debris;” bringing in a tub grinder if necessary; securing an Emerald Ash Borer compliance agreement with the Minnesota Department of Agriculture; and performing the required treatment for disposing of elm, oak wilt infected oaks, pine, ash, and marketable trees.

The contract lump sum price for Clearing and Grubbing, regardless of the sizes of the trees and stumps, includes the cost of all clearing and grubbing required by the contract.

The Department will include the costs for removing and disposing of brush and stumps with a diameter equal to or less than 4 in [100 mm] at the point of cutoff in the contract unit prices of other relevant pay items.

The Department will not pay for pruning except as specified in 2572.5, “Protection and Restoration of Vegetation, Basis of Payment.”

If the contract does not specify a pay item for clearing and grubbing, the Department will pay for clearing and grubbing of qualifying trees and stumps as specified in 2101.4, “Clearing and Grubbing, Method of Measurement,” as extra work in accordance with 1402, “Contract Revisions.”

The Department will pay for clearing and grubbing items on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2101.501</td>
<td>Clearing</td>
<td>acre [hectare]</td>
</tr>
<tr>
<td>2101.502</td>
<td>Clearing</td>
<td>tree</td>
</tr>
<tr>
<td>2101.506</td>
<td>Grubbing</td>
<td>acre [hectare]</td>
</tr>
<tr>
<td>2101.507</td>
<td>Grubbing</td>
<td>tree</td>
</tr>
<tr>
<td>2101.511</td>
<td>Clearing and Grubbing</td>
<td>lump sum</td>
</tr>
</tbody>
</table>

2102 PAVEMENT MARKING REMOVAL

2102.1 DESCRIPTION
This work consists of removing temporary and permanent pavement markings, except for removable preformed plastic pavement markings, that conflict with revised traffic patterns.

2102.2 MATERIALS — (BLANK)

2102.3 CONSTRUCTION REQUIREMENTS
Before making a change in traffic pattern, remove conflicting pavement markings as required by the contract and as directed by the Engineer without damaging the pavement structure or surface texture. If determined by the Engineer, repair damaged areas as directed by the Engineer at no additional cost to the Department.

Control or restrict operations to avoid exposing traffic to hazardous conditions in accordance with 1701, “Laws to be Observed,” 1707, “Public Convenience and Safety,” and 1717, “Air, Land, and Water Pollution.” Remove expended materials or agents used in the pavement marking removal process from the pavement surface as the work progresses. Dispose of removed marking material in accordance with 1701, “Laws to be Observed,” and 1717, “Air, Land, and Water Pollution.”

Removed pavement marking material shall become the property of the Contractor.

2102.4 METHOD OF MEASUREMENT
The Engineer will measure Pavement Marking Removal by area or length of the original markings as removed.
The Engineer will measure removal areas on the basis of nominal widths and actual lengths as originally applied and still visible at the time of pavement marking removal. The Engineer will enclose irregularly shaped markings within rectangular boundaries of least dimension as determined by the Engineer.

The Engineer will measure removal length by the actual length of each 4 in [100 mm] wide pavement marking removed. The Engineer will measure longitudinal pavement marking removal quantities greater than 4 in [100 mm] wide based on a ratio of actual pavement marking width relative to 4 in [100 mm]. The Engineer will not include the gap between the broken lines in the removal length measurement.

The Department will include the cost of removing removable preformed pavement marking tape with the relevant contract unit prices in accordance with 2581, “Removable Preformed Pavement Marking Tape.”

2102.5 BASIS OF PAYMENT

The contract unit price for Pavement Marking Removal includes the cost of obliterating the markings as required by the contract and for restoring the original pavement texture as directed by the Engineer.

Unless the contract requires otherwise, the Department will pay for the removal of markings of all types under a single contract item.

The Department will pay for pavement marking removal on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2102.501</td>
<td>Pavement Marking Removal</td>
<td>square foot [square meter]</td>
</tr>
<tr>
<td>2102.502</td>
<td>Pavement Marking Removal</td>
<td>linear foot [linear meter]</td>
</tr>
</tbody>
</table>

2103 BUILDING REMOVAL

2103.1 DESCRIPTION

This work consists of removing unsalvageable and vacated buildings from the right-of-way, making sewer and water service disconnections, and removing sidewalks, driveways, or miscellaneous structures, unless otherwise required by the contract.

2103.2 BLANK

2103.3 REMOVAL REQUIREMENTS

A General

Perform building removals as required by the contract. The contract will provide a general description and the street addresses or references to a survey station for the buildings and miscellaneous items requiring removal.

Remove buildings, including all fixtures except those owned by public or private utilities by demolition before removal from the right-of-way.

The Contractor is responsible for any damage caused to adjacent property during the building removal process.

The Department assumes no responsibility for the condition of any buildings at any time, and no guarantee is made or implied that any building will remain in the condition the bidder finds it at the time of examination before preparing the Proposal.

B Removal

Remove buildings and structures, including steps, basement floors and walls, floor slabs, and footings from the right-of-way. If the building rests on a concrete surface slab, remove the entire slab and related footings.
C Utilities ....................................................................................................................................... 1507

C.1 Disconnection of Sewer and Water Services
Locate, expose, cut off, and plug all sewer and water service connections at the sewer and water mains.
Plug all sewers leading from the building using watertight plugs at no additional cost to the Department.

Abandon wells in accordance with 2104, “Removing Pavement and Miscellaneous Structures.”

C.2 Other Utilities
The utility owners will disconnect telephone, electric power, other wire services, and gas service pipes outside the buildings. The utility owners will also remove utility-owned fixtures in accordance with 1507, “Utility Property and Service.”

D Disposal of Materials and Debris
Dispose of the demolished building in accordance with 2104.3.D, “Disposal of Materials and Debris,” at a demolition landfill permitted by the Minnesota Pollution Control Agency, except the Contractor may recycle parts of the building as approved by the Engineer. Do not dispose of buildings at permit-by-rule landfills, transfer stations, or waste storage facilities.

E Filling Basement Excavations
If the building was removed by another contract, fill all basement excavations and other excavations previously made as required by the contract. Fill the excavation to the level of the existing ground surface using backfill that matches the existing soil conditions. Provide the fill material from sources outside the right-of-way in accordance with 1405, “Use of Materials Found on the Project.” Compact the fill in accordance with the quality compaction requirements in 2105, “Excavation and Embankment.”

If the building removal is included with the grading in this contract, remove the foundations in accordance with 2103.3.B, “Removal,” and fill basement excavations in accordance with 2105.3.H, “Finishing Operations.”

2103.4 METHOD OF MEASUREMENT

A Building Removal
The Engineer will measure all buildings listed for removal as a single lump sum.

B Basement Excavation Fill
The Engineer will measure the volume of fill provided by the Contractor by the volume of the basements below the ground surface as required by the contract.

C Disconnection of Sewer and Water Services
The Engineer will measure each sewer and water service connection cut off and plugged at the main.

2103.5 BASIS OF PAYMENT
The contract unit price for the Disconnect Sewer Service and Disconnect Water Service includes the cost of the restoration of street and property surfaces.

The Department will pay for building removal based on the following schedule:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2103.501</td>
<td>Building Removal</td>
<td>lump sum</td>
</tr>
<tr>
<td>2103.505</td>
<td>Disconnect Sewer Service</td>
<td>each</td>
</tr>
<tr>
<td>2103.507</td>
<td>Disconnect Water Service</td>
<td>each</td>
</tr>
<tr>
<td>2103.511</td>
<td>Basement Excavation Fill</td>
<td>cubic yard [cubic meter]</td>
</tr>
</tbody>
</table>
2104 REMOVING PAVEMENT AND MISCELLANEOUS STRUCTURES

2104.1 DESCRIPTION
This work consists of removing and disposing of pavement, sewers, culverts, guardrails, abandoned structures, and other obstructions on the right-of-way, except as specified in 2442, “Removal of Existing Bridges,” and 2103, “Building Removal.” This work also consists of salvaging material and backfilling trenches, holes, and depressions.

2104.2 MATERIALS — (BLANK)

2104.3 CONSTRUCTION REQUIREMENTS

A General
Remove and dispose of structures and obstructions as required by the contract.

B Salvage Operations
Remove, dismantle, and store salvaged materials to allow re-use.

When salvaging guardrail and fences, coil the wire and cable, pull posts from the ground, and remove nails and staples from posts and boards.

Stockpile materials designated for salvage by the Department on the right-of-way at locations approved by the Engineer. Remove, dismantle, and clean materials as required by the contract before stockpiling.

C Removal Operations

C.1 Removing Portion of Structure
Do not damage existing structures to be retained for use during the removal operations. Ensure a length of at least 40 bar diameters from the face of the cut for existing reinforcement bars for concrete structures left in place.

C.2 Pavements and Sidewalks
Saw the existing concrete pavement or sidewalks or bituminous pavement at the locations as shown on the plans and as staked by the Engineer to establish a neat line for extending the new work.

C.3 Concrete and Masonry Structures
Remove concrete and masonry structures to the excavation limits as shown on the plans.

Remove septic tanks, cisterns, and cesspools.

Rebuild and reconnect live sewers after removing related manholes, catch basins, and drop inlets. Provide a by-pass and maintain the service during the removal operations.

Use concrete or masonry plugs to plug pipes draining into abandoned basements, manholes, or similar structures.

C.4 Timber Structures and Underground Tanks
Remove timber structures and underground tanks meeting the requirements of applicable laws and regulations.

C.5 Wells and Holes
Refer to Minnesota Rules, Chapter 4725, “Wells and Borings,” for the definition of “wells” and “borings.” Construct and seal most wells and borings meeting the requirements of Minnesota Rules, Chapter 4725, “Wells and Borings.”

Seal wells and borings taken out of service meeting the requirements of Minnesota Rule Chapter 4725, “Wells and Borings.” Protect wells and borings until permanently meeting the requirements of Minnesota Rule
Chapter 4725, “Wells and Borings,” during the work to prevent surface drainage from entering the opening. Cut and remove casing in the well or boring to the elevation as shown on the plans or as directed by the Engineer after sealing. Submit one copy of the sealing record to the Minnesota Department of Health and one copy to the Engineer within 30 calendar days after sealing a well or boring.

C.6 Miscellaneous Items
When removing railroad tracks, remove rails, ties, paving, crossings, track encasements, and other appurtenances.

D Disposal of Materials and Debris

D.1 Disposal Plan
Provide the Engineer with information and documentation substantiating proper disposal arrangements and operations. The Department will not pay for removal before acceptance of the initial disposal plan or, if required, a modified disposal plan.

D.2 Disposal within Right-of-Way
Do not dispose material or debris within the right-of-way, except for wood ashes.

The Contractor may burn untreated wood within the right-of-way, after obtaining the required burning permits. Conduct burning operations under the constant care of a competent caretaker in accordance with 1506.2, “Competent Individual,” and in accordance with the requirements of the permit.

The Contractor may incorporate the ashes from a burning operation into the soil on the proposed backslope or dispose off the right-of-way.

D.3 Disposal outside Right-of-Way
Dispose of materials and debris, resulting from removal or demolition operations having no specific disposal provisions, outside the right-of-way.

Assume full responsibility for acceptable disposition of the material and for damages resulting from the disposal operations.

The Engineer may not give final acceptance of the work:

(1) Unless disposal is made at a publicly controlled dumping site, or
(2) Until the disposal areas are in acceptable condition with respect to the Contractor's obligations.

E Backfilling Depressions
Backfill depressions with material in accordance with 2105, “Excavation and Embankment.”

2104.4 METHOD OF MEASUREMENT

A Area
The Engineer will measure pavements, sidewalks, surfacing, and other uniform thickness items by area without specifying the thickness.

The Engineer will classify pavement removal by kind of paving material when the material is comprised entirely of portland cement concrete (remove concrete pavement) or entirely of bituminous-aggregate mixtures (remove bituminous pavement). If the pavement is comprised of a combination of different paving materials, such as a concrete base or pavement overlaid with bituminous surfacing, the Engineer will measure the removal of the entire structure as the unclassified item of “remove pavement.” Regardless of classification, the Engineer will include the removal of integrant curb removed as a part of pavement removal.

The Engineer will separately measure the removal of pavement as part of the excavation of trenches for installation of drainage structures or utility items as the pay item for remove trench pavement. Remove trench pavement will include the removal of paving courses including unclassified materials.
**B  Length**
The Engineer will measure the length along the longitudinal centerline of the structure, parallel to the base or foundation supporting the structure, and from end to end of the removed structure. The Engineer will measure pipe from center to center of junction fittings, catch basins, or manholes. The Engineer will include the length of aprons removed as shown on the plans with the pipe measurements.

The Engineer will measure sawing of concrete and bituminous pavements by length along the saw cut lines as staked by the Engineer, if included as contract items.

**C  Volume**
The Engineer will determine the volume of concrete or masonry structures by taking measurements on the in-place structure as it is being uncovered and removed, except if otherwise established.

**D  Number (Complete Unit)**
The Engineer will measure contract items with a contract “each” price by counting the number of individual units removed, salvaged, or abandoned, including all appurtenances.

**E  Lump Sum**
The Engineer will measure portions of completed work.

**2104.5 BASIS OF PAYMENT**
The contract unit prices for Remove, Salvage, or Abandon includes the cost of the following:

1. Removing the material or portions of the material as specified by the contract,
2. Disposing of the materials removed,
3. Salvaging of parts as specified by the contract,
4. Backfilling depressions and other restoration work as specified by the contract,
5. Performing well abandonment procedures, and
6. Other work of a special nature as specified in the contract or imposed by laws, ordinances, and regulations.

The contract unit prices for sawing only includes sawing of concrete and bituminous pavements using a saw. Use of any other method, approved by the Engineer, at the option of the Contractor, will be at no additional cost to the Department. The Department will include the cost of sawing with other relevant contract pay items if the contract does not include a contract pay item for sawing.

The contract unit price for fence removal includes the cost of removing abandoned fences. The Department will include the cost of removal of abandoned fences with other relevant contract pay items, if the contract does not include a contract item for fence removal.

For salvage items, the Department will only pay for units removed in a condition acceptable for re-use. The Department will include the cost of the necessary removal of damaged or deteriorated units with other relevant removal contract items or as extra work in accordance with 1402, “Contract Revisions.”

If the Contractor’s negligence damages materials designated for salvage, the Department will deduct from any moneys due or becoming due the Contractor an amount equal to 60 percent of the current delivered price of new material of the same type and size as that damaged and equal to the quantity of material so damaged. The damaged material shall then become the property of the Contractor.

The Department will pay for the removal of the ends of old box culverts preparatory to extending the structure by the cubic yard [cubic meter] or by each unit.

The Department will pay for backfilling depressions resulting from the removal of structures as embankment construction.
The Department will pay for removing pavement and miscellaneous structures on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2104.501</td>
<td>Remove*</td>
<td>linear foot [meter]</td>
</tr>
<tr>
<td>2104.503</td>
<td>Remove*</td>
<td>square foot [square meter]</td>
</tr>
<tr>
<td>2104.505</td>
<td>Remove*</td>
<td>[square yard]</td>
</tr>
<tr>
<td>2104.507</td>
<td>Remove*</td>
<td>cubic yard [cubic meter]</td>
</tr>
<tr>
<td>2104.509</td>
<td>Remove*</td>
<td>each</td>
</tr>
<tr>
<td>2104.510</td>
<td>Remove*</td>
<td>lump sum</td>
</tr>
<tr>
<td>2104.511</td>
<td>Sawing Concrete Pavement</td>
<td>linear foot [meter]</td>
</tr>
<tr>
<td>2104.513</td>
<td>Sawing Bituminous Pavement</td>
<td>linear foot [meter]</td>
</tr>
<tr>
<td>2104.521</td>
<td>Salvage*</td>
<td>linear foot [meter]</td>
</tr>
<tr>
<td>2104.523</td>
<td>Salvage*</td>
<td>each</td>
</tr>
<tr>
<td>2104.525</td>
<td>Abandon*</td>
<td>each</td>
</tr>
</tbody>
</table>

* Specify item name, such as: culvert pipe, sewer pipe, drain pipe, curb and gutter, curb, sidewalk, fence, concrete or masonry structures, railway track, manholes or catch basins, integrant curb, concrete pavement, bituminous pavement, pavement, trench pavement, guardrail, water well, etc.

2105 EXCAVATION AND EMBANKMENT
SEE 2014 MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION

2111 TEST ROLLING
SEE 2014 MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION

2112 SUBGRADE PREPARATION
SEE 2014 MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION

2118 AGGREGATE SURFACING
SEE 2014 MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION

2123 EQUIPMENT RENTAL

2123.1 DESCRIPTION
This work consists of providing laborers and operating equipment for work required by the contract, directed by the Engineer, and paid by the Department.

2123.2 GENERAL REQUIREMENTS
Provide equipment as approved by the Engineer.

Provide equipment with rubber tires or smooth street plates when operating on bituminous or concrete surfaces.

Provide towing equipment with sufficient power to tow equipment required by the contract and not damage the work.

2123.3 SPECIFIC REQUIREMENTS
Provide rental equipment in accordance with the following specific requirements regarding type, size, capacity, power, or dimensions.
A  Motor Grader
Provide a self-propelled motor grader with the following characteristics:

(1) Pneumatic-tired wheels,
(2) Power-assisted controls
(3) A mass of at least 19,000 lb [8,600 kg],
(4) Moldboard at least 12 ft [3.6 m] long with a suitable cutting edge, and
(5) A suitable scarifier.

B  Dozer
Provide a crawler-type tractor with at least 75 hp [56 kw] at the tow bar and power assisted controls, equipped with an angle or fixed dozer blade at least 90 in [2.3 m] wide. When providing an angle blade, ensure that the blade will adjust to an angle of 90 degrees with the direction of travel of the tractor.

The Department will consider the dozer blade and tractor as a single unit.

C  Scraper
Provide scrapers meeting the following characteristics:

(1) Carryall type scrapers mounted on pneumatic-tired wheels, or
(2) Rotary type scrapers towed by a tractor of suitable size, and
(3) Having a volumetric capacity as required by the contract that shall correspond with the manufacturer’s rated heaped capacity.

D  Dragline
Provide a full-revolving type dragline equipped with a bucket of at least the size required by the contract.

Provide 1 cu. yd [0.75 cu. m] draglines with at least a 45 ft [13.7 m] boom and a working radius of at least 35 ft [10.6 m].

Provide 2½ cu. yd [1.9 cu. m] draglines with at least an 80 ft [24.3 m] boom and a working radius of at least 60 ft [18.2 m].

Provide draglines in other sizes with the boom length and working radius as required by the contract.

For swamp work, provide one set of mats for each dragline. Provide mats each with a length at least equal to twice the distance between the outside edges of the crawler treads. Ensure the combined width of all the mats equals at least twice the bearing length of the crawler treads.

E  Power Shovel
Provide a full-revolving, crawler-type power shovel with a bucket in the size recommended by the manufacturer. Provide the shovel in the size required by the contract in accordance with the bucket capacity.

F  Tractor
Provide a crawler type tractor with the power at the draw-bar as required by the contract. Measure the power in horsepower [kilowatts].

G  Pneumatic-Tired Roller
Provide pneumatic-tired rollers meeting the following characteristics:

(1) Compacting width of at least 5 ft [1.5 m],
(2) Constructed to allow the gross mass to vary, as directed by the Engineer, from 100 lb per in to 250 lb per in [1,700 kg per m to 4,400 kg per m] of rolling width,
(3) Tires arranged to obtain compaction over the full compacting width with each pass of the roller, and
(4) Self-propelled or provided with suitable tractive equipment, unless otherwise required by the contract.

If a single tractive unit propels more than one roller, the Engineer will count the combination as a single roller unit.

**H  Tamping Roller**
Provide a tamping roller meeting the following characteristics:

1. Consists of two sections, each with a drum at least 48 in [1.2 m] in diameter; and
2. A gross mass and number of pads as approved by the Engineer.

**I  (Blank)**

**J  Steel-Wheeled Roller**
Provide a self-propelled steel-wheeled roller meeting the following characteristics:

1. A total mass of at least 8 tons [7.3 tonnes] unless otherwise required by the contract,
2. Capable of reversing without backlash,
3. Equipped with spray attachments for moistening rolls on both the front and back, and
4. Either tandem type or three-wheeled type, unless otherwise required by the contract.

If using vibratory rollers, use rollers that produce 250 lb per in [45 kN per m] of width.

**K  Truck**
Provide a truck meeting the following characteristics:

1. A manufacturer’s rated capacity of at least 1.5 ton [1.3 metric ton],
2. A volumetric capacity of at least 5 cubic yards [3.6 cubic meters],
3. A power-operated hoist,
4. A end dump type metal dump box, and
5. A rear axle equipped with dual wheels and tires at least 8 in [200 mm] wide in accordance with the manufacturer’s designated size.

**L  Rotary Tiller**
Provide a rotary tiller at least 54 in [1,370 mm] wide and adjustable to depths up to 9 in [225 mm].

**M  Front End Loader**
Provide a crawler type or rubber-tired front end loader meeting the following characteristics:

1. Equipped with a power-operated loader bucket with the minimum struck capacity required by the contract,
2. Capable of excavating at least 10 in [250 mm] deep below the bottom of the treads or tires, and
3. Capable of loading the excavated material on the trucks used for hauling.

**N  Disk Harrow**
Provide a disk harrow of sufficient size and mass to manipulate the soils to 12 in [300 mm] deep as approved by the Engineer.

**2123.4 METHOD OF MEASUREMENT**

**A  Equipment Hours**
The Engineer will measure rental of each unit of equipment by the number of hours of actual working time and necessary traveling time within the project.
B Common Laborer Hire
The Engineer will measure common laborer hire by the hours of actual working time and necessary
classifying time within the project.

2123.5 BASIS OF PAYMENT
The contract price per hour for equipment rental includes the cost of the use and operation of equipment,
the operators and any tractive equipment and required accessories. The contract price per hour is subject to the
requirements of this section for additional compensation if the Contractor is obligated to pay overtime wages for
work performed on Sundays, holidays, or during overtime periods.

The contract price per hour for Common Laborers includes the cost of hand tools used by laborers. The
contract price per hour is subject to the requirements of this section for additional compensation if the Contractor is
obliged to pay overtime wages for work on Sundays, holidays, or during overtime periods.

The Department will only compensate the Contractor in addition to the Contract price per hour for
equipment rental or common laborer hire for work performed during overtime periods or on Sundays or holidays if
the work is directly by the Engineer. If the Engineer directs the use of equipment or common laborers during
overtime periods or on Sundays or holidays, the Department will pay the Contractor only the increased wages that
the Contractor is obligated to pay under the terms of wage agreements. The Department will pay the increased
wages to the Contractor by increasing the contract price per hour for the equipment or common laborers used by an
amount equal to the difference between the normal hourly wage for straight time work and the overtime hourly wage
actually paid the laborers for operating the equipment or performing the labor, based on the Contractor’s payroll.

The contract price per hour for equipment rental includes the cost of supervision by the Contractor
necessary to accomplish the work, as directed by the Engineer.

The Department will provide payment for equipment rental on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.:</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2123.501</td>
<td>Common Laborers</td>
<td>hour</td>
</tr>
<tr>
<td>2123.503</td>
<td>Motor Grader</td>
<td>hour</td>
</tr>
<tr>
<td>2123.506</td>
<td>___ cubic yard [cubic meter] Dragline</td>
<td>hour</td>
</tr>
<tr>
<td>2123.507</td>
<td>___ cubic yard [cubic meter] Shovel</td>
<td>hour</td>
</tr>
<tr>
<td>2123.508</td>
<td>___ cubic yard [cubic meter] Scraper</td>
<td>hour</td>
</tr>
<tr>
<td>2123.509</td>
<td>Dozer</td>
<td>hour</td>
</tr>
<tr>
<td>2123.510</td>
<td>___ cubic yard [cubic meter] Truck</td>
<td>hour</td>
</tr>
<tr>
<td>2123.511</td>
<td>___ horsepower [kilowatt] Tractor</td>
<td>hour</td>
</tr>
<tr>
<td>2123.512</td>
<td>Rotary Tiller</td>
<td>hour</td>
</tr>
<tr>
<td>2123.513</td>
<td>Disk Harrow</td>
<td>hour</td>
</tr>
<tr>
<td>2123.514</td>
<td>___ cubic yard [cubic meter] Front End Loader</td>
<td>hour</td>
</tr>
<tr>
<td>2123.521</td>
<td>Pneumatic-Tired Roller</td>
<td>hour</td>
</tr>
<tr>
<td>2123.522</td>
<td>Pneumatic-Tired Roller (Tractor Drawn)</td>
<td>hour</td>
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<tr>
<td>2123.523</td>
<td>Pneumatic-Tired Roller (Self Propelled)</td>
<td>hour</td>
</tr>
<tr>
<td>2123.524</td>
<td>Tamping Roller</td>
<td>hour</td>
</tr>
<tr>
<td>2123.525</td>
<td>___ ton [metric ton] Steel-Wheeled Roller</td>
<td>hour</td>
</tr>
</tbody>
</table>

2130 APPLICATION OF WATER FOR DUST CONTROL

2130.1 DESCRIPTION
This work consists of providing and applying water to control dust created by the traveling public within
the project as directed by the Engineer.

2130.2 MATERIALS
Provide reasonably clean water.
2130.3 CONSTRUCTION REQUIREMENTS
Use a water supply and equipment capable of applying the quantity of water required to abate dust and avoid unwarranted loss of water through evaporation, absorption, or drainage. Apply the water at the time and in the quantity approved by the Engineer.

2130.4 METHOD OF MEASUREMENT
The Engineer will measure water for payment by volume. The Engineer may deduct payment for water wasted if the Contractor fails to coordinate the water application with other operations as directed by the Engineer.

2130.5 BASIS OF PAYMENT
The contract unit price for Water includes the cost of providing, transporting, and applying the water as directed by the Engineer. The Department will only pay for water applied for dust control for the project as approved by the Engineer.

The Department considers the cost of water used for the following as included in the contract unit prices for the relevant contract pay items:

1. Water used for sprinkling,
2. Water used in the construction of concrete pavements,
3. Water used in the production or curing of concrete,
4. Water used to maintain plant life,
5. Water used in compacting soil and aggregate, and
6. Water used for dust control on Contractor-selected haul roads, detours, or work sites outside of the project, and
7. Water applied for dust control or pavement cleaning caused by the Contractor’s equipment and operations, including abatement of nuisance dust for adjacent landowners and dust conditions detrimental to the safety of the traveling public, as directed by the Engineer.

The Department will pay for water applied to aggregate surfaces for dust control caused by the traveling public on portions of the project open to traffic as directed or approved by the Engineer at a unit price of $20 per 1,000 gal [$5.45 per cu. m] in the absence of the Contract Pay Item 2130.501.

The Department will pay for application of water for dust control on the basis of the following schedule:

<table>
<thead>
<tr>
<th>Item No.:</th>
<th>Item:</th>
<th>Unit:</th>
</tr>
</thead>
<tbody>
<tr>
<td>2130.501</td>
<td>Water</td>
<td>MGal [cubic meter]</td>
</tr>
</tbody>
</table>

2131 APPLICATION OF CALCIUM CHLORIDE
SEE 2014 MATERIALS LAB SUPPLEMENTAL SPECIFICATIONS FOR CONSTRUCTION