

Recurring Special Provisions

Division 600 – Incidental Construction

City of Fort Wayne

Public Works

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DIVISION 600 – INCIDENTAL CONSTRUCTION

SECTION 601 – GUARDRAIL

601.01 Description

This work shall consist of the fabrication, assembly, and installation of guardrail, guardrail transitions, and guardrail end treatments, in accordance with these requirements, and as shown on the plans. This work may also consist of the extension of existing guardrail with new guardrail, the removal of existing guardrail, or adjusting the height of existing guardrail.

The work for the wood rub rail shall consist of constructing a 2 in. by 12 in. pressure treated board along the back side of the guardrail posts, in accordance with Section 911.02.

10

MATERIALS

601.02 Materials

Materials shall be in accordance with the following:

	Alternate Material Blockouts.....	926.03
	Guardrail Posts	910.10
	Rail Accessories, Fittings, and Hardware	910.11
	Steel Thrie-Beam Rail	910.09
	Steel W-Beam Rail	910.09
20	Timber Posts and Blockouts	911.02(f)
	Treated Lumber.....	911.02
	Hardware.....	911.02, ASTM A307, and F2329

CONSTRUCTION REQUIREMENTS

601.03 General Requirements

90 W-beam guardrail shall be installed as shown on the plans with the W-beam rail element splice at the post. MGS W-beam guardrail shall be installed as shown on the plans with the W-beam rail element splice at midspan. MGS W-beam guardrail

installed with half or quarter post spacing shall be spliced as shown on the plans.

The nested W-beam guardrail element shall consist of two rail elements, one set inside the other. The length of nested guardrail placed over a culvert shall not be spliced.

The wood rub rail shall be the contractor's responsibility to install a 2 in. by 12 in. pressure treated board flush with the top side of the guardrail posts. The contractor shall use a galvanized carriage bolt within two inches of top and bottom of board and one in the center of the board, at each post. The carriage bolt shall be fastened securely to the posts using a flat washer, lock washer, and nut on the backside of the guardrail post. The pressure treated board or boards shall be in accordance with INDOT 911.02 and all galvanized hardware shall be in accordance with ASTM A307 and F2329.

601.13 Method of Measurement

Guardrail, guardrail with rub rail, shop curved guardrail, adjusting guardrail height, guardrail removal, and resetting guardrail will be measured by the linear foot along the top of the rail element, complete in place. Nested guardrail will be measured per each 100 lft run placed. Modified posts for nested guardrail will be measured per each, complete in place. MGS structure top-mounted posts will be measured per each, complete in place. Long span MGS W-beam guardrail will be measured per each for the type specified and corresponding run length between outermost CRT posts.

250 Guardrail transitions, W-beam and MGS W-beam guardrail cable terminal anchors, and guardrail end treatments will be measured per each, complete in place. Guardrail buried end treatments type II will be measured per each. Impact attenuators and resetting impact attenuators will be measured per each for the type and width and test level, complete in place. The curved W-beam guardrail connector system and the curved W-beam guardrail terminal system will be measured per each for the type specified. Grading at guardrail end treatments, the reflectorization of guardrail end treatments, and concrete used in anchoring guardrail end treatments will not be measured for payment.

Wood rub rail installation will be measured by the number of linear feet installed.

601.14 Basis of Payment

290 Where existing guardrail height is adjusted, such work will be paid for at the contract unit price per linear foot. The cost of removal, all necessary storage, new adjustable post brackets, attachment of rail section, and miscellaneous nuts and bolts as required shall be included in the cost of adjust guardrail height.

Wood rub rail will be paid for at the contract unit price per linear foot, complete in place.

Payment will be made under:

Pay Item	Pay Unit Symbol
Guardrail Connector System, W-Beam, Curved, _____	EACH
type	
Guardrail End Treatment, _____	EACH
type	
Guardrail Height Transition, MGS	EACH
Guardrail Height Transition, VH, ____ ft ____ in. Spacing	EACH
Guardrail Transition, _____	EACH
type	
Guardrail Transition, MGS, _____	EACH
type	
Guardrail, Adjust Height	LFT
Guardrail, MGS W-Beam, ____ ft ____ in. Spacing	LFT
Guardrail, MGS W-Beam, Cable Terminal Anchor	EACH
310 Guardrail, MGS W-Beam, Double Faced,	
____ ft ____ in. Spacing	LFT
Guardrail, MGS W-Beam, Shop Curved,	
____ ft ____ in. Spacing	LFT
Guardrail, MGS, Long Span, _____	EACH
Type	
Guardrail, MGS, Structure Top-Mounted Posts	EACH
Guardrail, Remove	LFT
Guardrail, Reset	LFT
Guardrail, Terminal System, W-Beam Curved, _____	EACH
type	
320 Guardrail, Thrie-Beam	LFT
Guardrail, Thrie-Beam, Double Faced	LFT
Guardrail, W-Beam, ____ ft ____ in. Spacing	LFT
Guardrail, W-Beam, Cable Terminal Anchor	EACH

	Guardrail, W-Beam, Double Faced, _____ ft _____ in. Spacing	LFT
	Guardrail, W-Beam, Nested	EACH
	Guardrail, W-Beam, Shop Curved, _____ ft _____ in. Spacing	LFT
330	Guardrail, WR-Beam	LFT
	Impact Attenuator, _____, _____ type-width test level	EACH
	Impact Attenuator, Reset, _____, _____ type-width test level	EACH
	Modified Posts, Nested Guardrail	EACH
	Wood Rub Rail (2"x12" Attached to Guardrail Posts)	LFT

340 For W-beam guardrail, the substitution of 6 ft posts for 7 ft posts where conditions will not allow the use of the longer post will be at the same contract unit price of the longer post.

The substitution of W 6 x 8.5 for W 6 x 9 steel posts, in MGS W-beam guardrail, will be at the same contract unit price for heavier post.

The cost of resetting guardrail shall include the removal, necessary storage, resetting and replacement of damaged or missing parts and new posts as required.

The cost of reflectorization of impact attenuators and guardrail end treatments shall be included in the respective pay items.

350 The cost of all grading required for the guardrail buried end treatment shall be included in the cost of guardrail end treatment, type II.

The cost of earthwork, grading, and transition panel if required, and PCC pad shall be included in the cost of impact attenuator.

The cost of excavation, concrete footings, reinforcement, and structural steel tubing required for modified posts, nested guardrail, shall be included in the cost of the pay item.

360 The cost of all materials, including replacing damaged or missing parts, labor, and necessary incidentals required to reset impact attenuators, will be included in the cost of impact attenuator, reset.

Where guardrail transition type TGB is used with bridge railing type TR, the cost of eliminating the thrie-beam terminal connector and driving the posts to the height above ground shown on the plans shall be included in the cost of the guardrail transition.

The cost of all labor, materials, equipment, and all incidental work shall be included in the cost of the wood rub rail.

601.15 Guardrail End Treatment, OS Reset

Description

This work shall consist of removing, storing, and reinstalling existing guardrail end treatments in accordance with 105.03.

Materials

Materials shall be in accordance with 601.02.

Construction Requirements

This work shall consist of the removal of existing guardrail end treatments, and if necessary, storing it, and then re-erecting it where shown on the plans or as directed.

Resetting of guardrail end treatments shall be supervised or performed at all times by an installed trained and certified by the unit's manufacturer and shall be in accordance with the manufacturer's recommendations. The installer shall be included on the Department's list of Qualified Guardrail End Treatment and Impact Attenuator Installers prior to the start of work.

Method of Measurement

Resetting guardrail end treatments will be measured per each for the type specified, complete in place.

Grading at guardrail end treatments and concrete used in anchoring guardrail end treatments will not be measured for payment.

Basis of Payment

The accepted quantities for resetting guardrail end treatments will be paid for at the contract unit price per each assembly, complete in place.

Payment will be made under:

Pay Item	Pay Unit Symbol
Guardrail End Treatment, OS Reset	EACH

The cost of resetting guardrail end treatments shall include the removal, necessary storage, resetting and replacement of damaged or missing parts and new posts as required.

SECTION 604 – SIDEWALKS, CURB RAMPS, STEPS, AND HANDRAILS

MATERIALS

604.02 Materials

10 Materials shall be in accordance with the following:

Coarse Aggregate, Class D or Higher, Size No. 53 ..	904
Concrete, Class A	702
Detectable Warning Surfaces.....	905.05
Fine Aggregate, Size No. 23, No. 24, or No. 15.....	904
Joint Filler	906.01
Joint Sealing Materials.....	906.02
Reinforcing Bars	910.01
Silica Sand	ASTM C 778

20

Hand railing shall be aluminum pipe in accordance with ASTM B 221, alloy 6063, temper T52 or galvanized steel pipe in accordance with ASTM A 53, grade B, all as specified.

The detectable warning surface in concrete curb ramps shall be selected from the ~~Department's~~ City's list of approved Detectable Warning Surfaces in accordance with 905.05.

30

~~The mortar bed material shall be high-strength mortar in accordance with ASTM C 387. Part of the mix water shall be replaced with a Type II polymer modifier meeting the requirements of ASTM C 1438. The proportioning of water and polymer modifier shall be as recommended by the manufacturer of the polymer modifier.~~

~~A type C certification in accordance with 916 shall be furnished for the masonry mortar and polymer modifier prior to use of the material.~~

~~A type C certification in accordance with 916 for the silica sand shall be furnished prior to use of the material.~~

40

CONSTRUCTION REQUIREMENTS

604.03 Portland Cement Concrete Sidewalks, Curbface Sidewalks and Curb Ramps

(a) General Requirements

The location of curb ramps shall take precedence over the location of drainage structures and signal, utility, or light poles, unless those items have existed before the ramp locations have been proposed. Drainage structures and poles shall not be located within the limits of the curb ramp, if at all possible, exclusive of flared sides. Poles located within a sidewalk shall not reduce the clear width to less than 4.0 ft. Crosswalk markings shall be located such that the curb ramps and curb ramp clear spaces are contained within the markings unless otherwise specified. The flared sides need not fall within the crosswalk lines. The normal gutter flow line shall be maintained throughout the curb ramp area, and appropriate drainage structures shall be used, as needed, to intercept the flow prior to the curb ramp area. Positive drainage shall also be provided to carry water away from the intersection of the curb ramp and the gutter line.

70 (b) Excavation

Excavation shall be made to the required depth and to a width that will enable the installation and bracing of the forms. The foundation shall be shaped and compacted to a firm even surface in accordance with the section shown on the plans. All soft and yielding material shall be removed and replaced with acceptable material. Two (2) inches of bed course material shall be placed as a leveling course before the concrete is poured.

(c) Finishing

90 Immediately after striking off, the grade, running slopes and cross slopes shall be checked by an approved method either using a mechanical four (4) foot level, or a four (4) foot level and straightedge that completely spans the surface. ~~2-ft level and a long handled straightedge of light construction that can completely span the surface.~~ The level and straightedge shall be laid parallel and perpendicular to the grade or running slope at intervals of no more than 2 ft on curb ramps and 10 ft along sidewalks. All high spots shall be removed and depressions filled with fresh concrete and then leveled. Checking and leveling shall continue until the surface has the required grade, running slope and cross slope and is free of voids.

The surface shall be finished with an approved ~~wooden~~ float. No plastering of the surface will be allowed. The final surface shall be free from porous spots caused by the disturbance of coarse aggregate particles. Curb ramp surfaces shall be coarse broomed transverse to the running slope as shown on the plans.

All exposed edges shall be finished with a 1/4 in. radius.

(f) Joints

The type and location of joints and the size of preformed joint filler shall be as shown on the plans.

All concrete joints shall be finished with a 1/4 in. radius.

110

Preformed 1/2 in. joint filler shall be placed around all appurtenances, such as manholes and utility poles which extend into and through the sidewalk, and between the sidewalk and any fixed structure, such as a building or bridge. The preformed joint filler shall extend for the full depth of the sidewalk or curb ramp, and shall be flush with the surface of the adjacent concrete. Flexible joint filler can be used around manholes, poles, water valve boxes, and along walls in order to get a better seal between the concrete and those items.

(g) Detectable Warning Surfaces

~~2. Cast Surfaces~~

~~Cast iron surfaces shall be installed in accordance with the manufacturer's recommendations. When required, cutting of the cast iron shall be in accordance with the manufacturer's recommendations. Cut edges shall be ground to a smooth shape consistent with the manufactured edges.~~

604.05 Reconstructed PCC Sidewalk, Curbface Sidewalk and Curb Ramp

Where existing concrete sidewalk or curbface sidewalk is to be reconstructed, all disintegrated concrete, brick, stone, or other material shall be completely removed and replaced with new concrete sidewalk in accordance with 604.03.

170

Such sidewalk or curbface sidewalk shall be constructed to a minimum depth of 4 in. unless another depth is designated, and to the width of the adjoining walk, or to a width of no less than 48 in. from the back face of curb, or to such other width as directed.

The removal of concrete sidewalk or curbface sidewalk shall be to uniform lines as directed. The sidewalk or curbface sidewalk to be removed shall be cut in a straight line with an approved power driven concrete saw. The sawing shall be such that the portion of sidewalk to remain in place shall not be damaged. All portions which are damaged or removed back of the established line shall be replaced.

180

Unless otherwise directed, sidewalk or curbface sidewalk which must be removed shall be removed between tool marks or joints. At locations where the sidewalk and curb are adjacent and the curb is deteriorated, the curb shall also be replaced ~~as directed.~~ if noted on the plans or if directed by the Project Manager.

The new sidewalk or curbface sidewalk shall have a joint pattern similar to the surrounding sidewalk. Sidewalk or curbface sidewalk placed at drives shall be 6 in. thick, or the same depth of the existing drive, whichever is greater.

190 Where existing curb ramp is to be reconstructed for placement of detectable warning surfaces, all concrete, brick, stone, or other material shall be completely removed and replaced in accordance with 604.03.

604.06 Re-Laid Sidewalk

NOT USED BY CITY OF FORT WAYNE

604.07 HMA Sidewalk and Trail

(a) **Excavation and Forms**

Excavation and forms, when required, shall be in accordance with 604.03(b) and 604.03(c).

(b) **Bed Course**

Bed course material shall be coarse aggregate No. 53 and shall be placed in lifts not exceeding 4 in. in depth. Each lift shall be thoroughly compacted and laid to the specific depth noted on the plans.

210

(c) **Placing HMA Sidewalk and Trail**

HMA sidewalk material shall be placed on a compacted bed course in one or more courses. The mixture shall consist of HMA base, intermediate, or surface, type B in accordance with 402, except the 9.5 mm surface gradation can go above or below the PCS control point in accordance with 401.05. A MAF in accordance with 402.05 will not apply. Aggregate requirements of 904.03(d) do not apply. Compaction shall be accomplished by means of a hand operated or power roller of an acceptable type and weight in accordance with 402.15. In areas inaccessible to the roller, hand tamping will be allowed. In any case, the HMA sidewalk and trail material shall be uniformly compacted. The grade and cross slope shall be checked with a \pm 4ft or approved other level in accordance with 604.03(e).

220

~~If the finished compacted surface is too open or remains sticky, the surface shall be given a coating of fine aggregate, well broomed over the surface, leaving no excess.~~

604.10 Method of Measurement

260 Concrete sidewalk, ~~curbface sidewalk~~, reconstructed concrete sidewalk, reconstructed curbface sidewalk and concrete bench pad ~~re-laid concrete sidewalk~~ will be measured by the square yard of finished surface. HMA for sidewalk and trail will be measured by the ton of mixture placed. Bed course material will be measured by the ton.

Concrete curb ramps will be measured by the square yard and will include the ramp, turning space, flared side, and setback. Turning spaces shared by more than one curb ramp will be measured only once. Detectable warning surfaces and retrofitted detectable warning surfaces will be measured by the quantity of each put in place, or can also be measured by the square yard, whichever is noted on the bid tab.

604.11 Basis of Payment

The accepted quantities of concrete sidewalk, reconstructed concrete sidewalk, and concrete bench pad will be paid for at the contract unit price per square yard for sidewalk, concrete. Curbface Sidewalk and reconstructed curbface sidewalk will be paid for at the contract unit price per square yard for curbface sidewalk, concrete. HMA for sidewalk trail will be paid for at the contract unit price per ton, complete in place. Bed course material will be paid for at the contract unit price per ton. Concrete steps will be paid for at the contract unit price per cubic yard for steps, concrete. Reconstructed sidewalk and re-laid sidewalk will be paid for at the contract unit price per square yard for sidewalk ~~or reconstruct or sidewalk, re-lay~~. Detectable warning surfaces and retrofitted detectable warning surfaces will be paid for at the contract unit price per the quantity of each put in place or measured by the square yard.

300 Reinforcing bars, if used, will be paid for in accordance with 703.08. Curb, if directed to be replaced, will be paid for in accordance with 605.10.

Sidewalk Trench Drain Payment will be paid under each unit placed.

Payment will be made under:

Pay Item	Pay Unit Symbol
Bed Course Material	TON
Curb Ramp, Concrete	SYS
Detectable Warning Surfaces	EA

	SYS
	Detectable Warning Surfaces, Retrofit	EA
	SYS
310	Hand Rail, _____.....	LFT
	type	
	HMA for Sidewalk and Trail	TON
	Sidewalk, Concrete.....	SYS
	Sidewalk, Concrete, Reconstruct	SYS
	Sidewalk, Concrete, Re-Lay.....	SYS
	Steps, Concrete.....	CYS
	Trail, Asphalt	TON
	Trail Bench Pad, Concrete.....	SYS
	Curbface Sidewalk, Concrete.....	SYS
	Curbface Sidewalk, Concrete, Reconstruct	SYS
	Sidewalk Trench Drain	EACH

320 The cost of the ramp, including border, turning space, flared side, return curb, and setback shall be included in the cost of the curb ramp.

 The cost of excavation, backfill, joint material, and necessary incidentals shall be included in the cost of the pay items in this section.

 The removal and disposal of concrete sidewalk which is unsuitable for re-laying and which has not been damaged due to negligence will be paid for in accordance with 202.14. ~~Concrete sidewalk which is specified to be re-laid or to remain in place and which is damaged shall be removed and disposed of and replaced with no additional payment.~~

330 If directed, concrete sidewalk or curbface sidewalk shall be constructed to a depth greater than that shown on the plans. Such additional thickness will be converted into the equivalent square yards quantity of concrete sidewalk of the thickness shown on the plans and will be paid for as such.

~~The cost of furnishing and applying sand to finished compacted surfaces shall be included in the cost of HMA for sidewalk.~~

The cost of all labor, materials, equipment and all incidental work shall be included in the cost of the pay item for Sidewalk Trench Drain.

604.11 Sidewalk, Trip Hazard Elimination, 0.25” to 2”

Description

The City is requesting bids/quotations for elimination of sidewalk vertical separations throughout the city per the specifications below. The Contractor shall horizontally saw cut all sidewalk joint deflections (also known as vertical separations or trip hazards) over 0.25” high up to and including 2” high in designated work areas. This is in accordance with FWR Section 600 - Concrete

Materials

Materials for this job shall consist of diamond tip cutting blades, a dry HEPA rated dust abatement system or for wet cuts grinding may be acceptable by approved rotating cutting drum

Construction Requirements

- 1) Contractor must repair all sidewalk vertical separations (trip hazards) over 0.25” high up to and including 2” high in the designated work areas.
- 2) Corrections, also known as joint cuts, shall be made horizontally with equipment designed for that purpose to eliminate trip hazards. Joint cuts shall be made to provide a maximum slope of 1:8 (vertical:horizontal). The cutting equipment must be able to cut flush to ground and capable of working at any angle to perform trip hazard removal in hard-to-reach areas, around obstacles (signs, posts, benches, etc), on narrow walkways, next to fences, and along retaining walls or buildings.
- 3) Pulverization of the concrete is NOT allowed as it causes micro-cracks and weakens the concrete panel. Also, the contractor’s trip hazard repairs may not leave ridges or grooves that could hold water and prevent drainage of rain water or irrigation.
- 4) Panel lifting or “Slab Jacking” is NOT acceptable or allowed as it separates adjoining panels at control joints with a vertical cutting process that results in seasonal vertical separations.
- 5) Joint cuts shall not leave ridges or grooves in the sidewalk that could inhibit or prevent drainage. Joint deflections shall be removed completely, from one end of the raised sidewalk to the other, leaving zero vertical deflection between adjacent slabs, in either direction. Any panels inspected and deemed not to be at a zero point of differential will be repaired to the required specifications or they will not be paid for.
- 6) Joint cuts shall have a uniform appearance and texture. The finished surface shall have a coefficient of friction of at least 0.6. Contractor must guarantee that the

removed trip hazard will have a uniform appearance and texture and show via previous testing that the technique used yields the specified coefficient of friction.

7) Contractor must repair each sidewalk trip hazard without damage or visible markings to adjacent slab(s) or curb(s).

8) Contractor may not use any type of “fill” material that deteriorates or breaks apart over time.

9) Contractor must not cause any damage to vegetation, landscaping, retaining walls, curbs, sprinklers, utility covers, or other objects adjacent to the sidewalk. If the contractor and/or contractor’s equipment does cause damage to above, the City must be notified immediately. Anything disturbed by the joint cutting operations shall be restored or repaired to the satisfaction of the City, at the Contractor’s sole expense.

10) Contractor must completely and immediately clean up all debris after each hazard is repaired. All cutting shall be done in a manner that minimizes dust by utilizing a dry HEPA rated dust abatement system, as approved by the City. Upon completion of a cut, the area shall be thoroughly cleaned to the satisfaction of the City. Power washing and/or water-cooling is not allowed as it creates slurry that contaminates storm drains and soils. All debris must be removed immediately and properly disposed of.

11) Contractor must provide proof that all concrete and debris is recycled in a proper, environmentally safe manner.

12) Sidewalk repair equipment and all other items incidental to the work shall not be left or stored on the sidewalk or on adjoining private property while not in use.

13) All Contractor vehicles and/or trailers deployed to the work site(s) must be permanently labeled with the approved company name and contact information. A single point of vendor contact is required when working in residential areas.

14) Contractor must provide a written Safety Plan and provide an employee safety manual that is specific to this type of work that adheres to current OSHA standards.

Other items;

Contractor to provide a list of field supervisory personnel and their experience with horizontally cutting concrete in accordance with the City specification. At least one of the field supervisors listed must be at the site and be responsible for all work at all times when horizontally cutting concrete operations are in progress.

Contractor shall schedule their operations so as to cause a minimum of interruption, interference, or disturbance to the operations of the adjacent properties, and

shall allow access by pedestrians, emergency vehicles, and delivery/service vehicles at all times.

Contractor shall submit monthly a detailed invoice setting forth the services performed in accordance with the City data requirements using a formula for saw cutting calculations.

Contractor must have a data collection solution that records the details of the work in the field with the ability transmit the data electronically at any time from the field. The recording device must be able to record sizes of hazards, GPS coordinates, hazard locations plotted to a map, address, and be able to provide this data in an electronic format for the City to integrate into a GIS system.

Contractor must log all work items completed on a daily basis including the names of field technicians and the work locations.

All invoices must show the cut quantity by day per work area. Invoice must also be capable of listing the depth, size, length, width, address location, descriptions, and cutting calculations.

Contractor must guarantee the corrections of sidewalk trip hazards (vertical separations) will remain within the 1/4" high vertical separation limit for a period of three (3) years. If the trip hazard correction is found to be out of specification within three years, the Contractor will cut the sidewalk again to resolve or credit the City back for the full amount of the original correction. Guarantee does not apply to prior repairs where individual slabs have been replaced, ground, or lifted via slab jacking.

Contractor must be able to respond to any emergency work within 48 hours of notification. Contractor must be able to respond to City generated work orders for sidewalk/drive remediation work within 5 working days.

Contractor must provide a Safety Plan per the Manual of Standard Specifications or must provide an employee safety manual that is specific to this type of work.

Contractor must have an OSHA-30 certified Supervisor onsite during the correction process.

Contractor Technicians performing sidewalk corrections need to be OSHA-10 certified.

Method of Payment

The pay quantity for this item shall be the number of cuts per joint on the sidewalk at the time of billing.

Basis of Payment

Trip Hazard Elimination will be paid under a EACH for the number of cuts made per every concrete joint made in the sidewalk from a length of 3-7' in length.

Pay Item	Pay Unit Symbol
Trip Hazard Elimination, 0.25" to 2".....	EA

The cost of all labor, equipment, materials and all incidental work shall be included in the cost of the pay item.

SECTION 605 – CURBING

MATERIALS

20 **605.03 Precast Cement Concrete Curbing**

(a) Installation

30 The curb shall be set in accordance with the line and grade required. The face and top of the curb shall be checked with a 4 ft to 10 ft straightedge. Portions showing irregularities of 1/4 in. or more shall be removed and replaced with no additional payment. All spaces under the curbing shall be filled with a two (2) inch bed course material. The bed course material shall be coarse aggregate No. 53 and shall be thoroughly tamped.

(c) Backfilling

50 After the curb has set, any remaining excavated areas shall be filled with approved material. This material shall be placed and thoroughly tamped in layers not exceeding 6 12 in. in depth.

605.04 Cast in Place Cement Concrete Curbing

(c) Proportioning and Placing

80 The face and top of the curb, integral curb, and gutter shall be checked with a 4 ft to 10 ft straightedge. Portions showing irregularities of 1/4 in. or more shall be removed and replaced.

Consolidation of concrete placed in the forms shall be by vibration or other acceptable methods. Forms shall be left in place for a maximum of 24 h or until the concrete has set sufficiently so that they can be removed without injury to the curbing. Upon removal of the forms, the exposed curbing face shall be rubbed immediately to a uniform surface. Rubbing shall be accomplished by the use of water and a carborundum brick. For the purpose of matching adjacent concrete finishes or for other reasons, other

90 methods of finishing may be allowed. No plastering will be allowed.

(d) Curing

110 Immediately upon completion of the rubbing, the curbing shall be moistened and kept moist for three days, or cured by the use of membrane forming material. The method and details of curing shall be subject to approval.

(e) Backfilling

After the concrete has set sufficiently, the spaces in front and back of the curb shall be refilled with suitable material to the required elevations in layers of not more than 6 12 in. and be tamped thoroughly.

140 **605.06 Concrete Center Curbing**

The subgrade shall be prepared the same as for the adjoining pavement. If subbase is provided for the adjoining pavement, it shall be carried through for the full width of the curb and at the same thickness as that for the pavement.

The temperature limitations of 502.11 shall apply to placing the concrete. The surface shall be troweled smooth with a metal trowel. Curing shall be in accordance with 504.04.

150 Forms shall be removed within 24 h after the concrete has been placed. Plane surfaces and exposed sides of the curb shall be checked with a 4 ft to 10 ft straightedge. Portions showing irregularities of 1/4 in. or more shall be removed and replaced in compliance with these specifications.

605.10 Basis of Payment

260 The accepted quantities of curb work will be paid for at the contract unit price per linear foot for curb; curb and gutter; curb, reset; or center curb, of the type specified. Variable width center curb will be paid for at the contract unit price per square yard for center curb, of the width specified. Bed course material will be paid for at the contract unit price per ton, complete in place.

Curb turnout will be paid for at the contract unit price per linear foot of the type of curb specified. Combined curb and gutter will be paid for at the contract unit price per linear foot for curb and gutter of the type specified.

270 Payment will be made under:

Pay Item	Pay Unit Symbol
Bed Course Material	TON
Center Curb, _____	SYS
type	LFT
Curb and Gutter, _____	LFT
type	
Curb, _____	LFT
type	
Curb, Remove	LFT
Curb, Reset, _____	LFT
type	

The cost of tack coat, reinforcing bars or welded wire reinforcement for curb, curb and gutter, or center curb shall be included in the cost of the pay items. The cost of replacement curb portions for those which show irregularities or 1/4 in. or more shall be included in the cost of curb.

The cost of backfilling will not be paid for separately, unless otherwise specified on the Bid Tab.

605 FWR01 –CURB, CONCRETE - TYPE III MODIFIED

Description

Contractor shall provide all labor, materials, equipment, and incidentals as shown, specified, and required to furnish and install Portland Cement Concrete (PCCP) curbs for the project in accordance with FWR Section 605.

Materials

Materials shall be Concrete, Class A in accordance with INDOT Standard Specifications latest edition, Section 502 for PCCP and 702 for Concrete, Class A.

Construction Requirements

The Work shall consist of the construction of PCCP curbs in conformance with the lines and grades shown on the Drawings or established by the Engineer/Project

Manager. Install per Detail #4 and #11 on Sheet C-501-01 of Superior Street Urban Trail Drawings.

Method of Measurement

Concrete curb will be measured by the linear foot along the front face of the section at the finished grade elevation of the type specified.

Basis of Payment

The accepted quantities of concrete curb will be paid for at the contract unit price per linear foot, complete in place.

Payment will be made under:

Pay Item	Pay Unit Symbol
FWU06 - CURB, CONCRETE, TYPE "III", MODIFIED (12" WIDE) (INCLUDES CONCRETE/ASPHALT PATCHING).....	LFT
FWU07 - CURB, CONCRETE, TYPE "III", MODIFIED (6" WIDE BANDING - POURED FLUSH).....	LFT

Concrete, excavation, forms, furnishing and installing materials, labor, equipment, cleanup, and all other operations necessary for installation of concrete curb shall be included in the cost of the pay item.

605 FWR06 – Curb, Concrete Type III, With Asphalt/Concrete Patching

626.01 Placement

This item shall consist of a uniform 2 inch depth of 9.5mm Type B asphalt surface over 8 inches of Portland cement base, over properly prepared sub-base, to match existing lines and grades of existing adjacent pavements.

626.10 Basis of Payment

The accepted quantities of curb work will be paid for by the linear foot of curb placed, which includes asphalt/concrete patching, sawing, excavation, labor, materials, and all incidental required to complete said work, unless otherwise stipulated.

Payment will be made under:

Pay Items Pay Unit Symbol

CURB, CONCRETE TYPE III,

INCLUDE ASPHALT/CONCRETE PATCHING LF

SECTION 606 – PAVEMENT CORRUGATIONS

NOT USED BY THE CITY OF FORT WAYNE

SECTION 610 – APPROACHES AND CROSSOVERS

610.06 Basis of Payment

Payment will be made under:

90	Pay Item	Pay Unit Symbol
	HMA for Approaches, Type _*	TON
	PCCP for Approaches, _____	SYS
	thickness	

* Mixture type in accordance with 402.04.

The cost of excavation, backfilling, shaping, leveling, forming, compaction, placing, and all necessary incidentals shall be included in the cost of the pay items in this section.

100 The cost for curbing placed monolithically with the PCCP on approaches shall be included in the cost of PCCP for approaches.

SECTION 611 – MAILBOX INSTALLATIONS

CONSTRUCTION REQUIREMENTS

611.03 Mailbox Assembly

20 Existing mailboxes and assemblies shall be removed without damage from the highway City right-of-way. Mailboxes, which must remain in service between removal and erection of the new assembly, shall be securely mounted to an empty 55 gal. metal Drum, or approved equal by the Project Manager. The temporary assembly shall be located where it is accessible for mail delivery but placed as far as possible from the traveled roadway. The apparent owner of the existing mailbox shall be contacted and allowed to take possession of the existing mailbox and assembly. If the owner refuses to take possession, the existing mailbox and assemblies shall be removed.

30 Mailbox assemblies shall be furnished and installed as shown on the plans. ~~Alternate mailbox assemblies which have been crash tested and approved in accordance with NCHRP 350 requirements may be considered upon receipt of a written request.~~ Alternate mailbox assemblies approved for use shall be furnished and installed in conformance with the manufacturer’s recommendations.

40 Mailboxes complying with the requirements of the United States Postal Service, including markings and sizes, shall be furnished and installed with the mailbox assembly. The mailbox shall be of comparable size to the existing mailbox previously removed from the highway City right-of-way. The markings shall include “approved by U.S. Postmaster” stamped on the mailbox by the manufacturer and the address number, box number, or house number, in 2 in. or larger reflective material placed on the side of the mailbox in view of motorists in the nearest travel lane.

611.04 Method of Measurement

50 Mailbox assemblies will be measured by the number of units of the type installed. Resetting of mailbox assemblies will be measured by the number of units of the type reinstalled.

611.05 Basis of Payment

Mailbox assemblies will be paid for at the contract unit price per each per type, complete in place. Resetting of mailbox assemblies will be paid for at the contract unit price per each per type, complete in place.

Payment will be made under:

	Pay Item	Pay Unit Symbol
60	Mailbox Assembly, Double.....	EACH
	Mailbox Assembly, Single	EACH

Mailbox Assembly, Reset, Double..... EACH
Mailbox Assembly, Reset, Single EACH

The cost of wood or pipe posts, support hardware, mailbox, and removal of existing mailbox and its assembly shall be included in the cost of the mailbox assembly.

70 The cost of all materials, labor, equipment and incidentals required to remove and reset the existing mailboxes shall be included in the cost of mailbox assembly, reset.

SECTION 612 – UNDERSEALING

NOT USED BY THE CITY OF FORT WAYNE

SECTION 616 – RIPRAP AND SLOPEWALL

616.13 Basis of Payment

170 The accepted quantities of dumped, revetment, class 1, and class 2 riprap obtained from outside the right-of-way will be paid for at the contract unit price per ton. Dumped, revetment, class 1, and class 2 riprap obtained from within the project limits will be paid for at the contract unit price per square yard ton. Uniform riprap will be paid for at the contract unit price per ton. Grouted riprap will be paid for at the contact unit price per square yard of the specified depth. Precast concrete riprap, and concrete slopewall will be paid for at the contract unit price per square yard, all complete in place. If slag is used as dumped riprap and payment will be made per ton, the pay quantity will be adjusted in accordance with 904.01.

SECTION 617 –PERMANENT & REMOVABLE BOLLARDS

617.01 Description

This work shall consist of installing either permanent or removable bollards in accordance with 105.03.

MATERIALS

617.02 Materials

10 Removable bollard materials shall be in accordance with the following:

Bollard Post	ASTM A513 Type 1
Bollard Ground Sleeve	ASTM A513 Type 5
Stainless Steel Plate – Ground Sleeve Top & Lid	ASTM A240
Concrete, Class A.....	702

20 Removable bollards supplied should be free from surface blemishes and defects where exposed to view in the finished installation

After fabrication all units are prepared by removing scale and slag through the sand blasting process.

All surfaces are primed with rust & corrosion resistant, zinc rich primer w/ 5,000 hour salt spray performance. 2.4.2 Standard finish, TGIC Polyester outdoor finish RAL1028 Yellow. TGIC Polyester powder definition; meets decorative and functional requirements for gloss retention, physical properties, chemical resistance and weatherability.

30 Acceptable manufacturer for removable bollards is TrafficGuard, Inc. Round Post Lock Removable Bollards (RPL3) or approved Engineer equal.

Permanent bollard materials shall be in accordance with the following:

Bollard Steel Post	ASTM A513 Type 1
Stainless Steel Anchor Pin or Rod.....	ASTM A240
Smooth Wall PVC	907.16
Concrete, Class A.....	702

40 Permanent bollards supplied should be free from surface blemishes and defects where exposed to view in the finished installation

Steel posts will be 3-in diameter post painted yellow with rustproof paint. The post shall have a dome cap.

CONSTRUCTION REQUIREMENTS

617.03 Bollard Installation

50 Comply with removable bollard manufacturer provided instructions and drawings.

Removable bollard ground sleeves should be installed with the top of the sleeve set flush with the finished surface. The permanent bollard PVC pipe sleeve will be set at 1-in above the finished grade

Ensure that a minimum of a 3 inch gravel base is put down prior to installation to ensure drainage of the bollard.

Permeant bollard posts will be set into 3-1/2-in diameter vinyl sleeves that are anchored with a pin or rod into 4,000 psi concrete. These post will be set 30-inches into the PVC pipe sleeve and will be between 42 to 48-inches in height above the finished grade. The concrete base will be a minimum diameter of 10-inches.

60 Bollard should not be inserted into the ground sleeve until it is leveled and fully cured. For the removable bollard, attach bollard per manufacturer instructions.

If touch up painting in the field, be careful not to paint moving parts which may restrict the bollard’s proper function.

617.04 Method of Measurement

Bollard installation will be measured by the number of units of the type installed.

70

617.05 Basis of Payment

Bollard installation will be paid for at the contract unit price per each per type, complete in place.

Payment will be made under:

	Pay Item	Pay Unit Symbol
80	Removable Bollard.....	EACH
	Permanent Bollard.....	EACH

The cost of excavation, gravel base, PVC pipe sleeve, steel anchor pin/rod and concrete to set bollard shall be included in the cost of the bollard installation.

SECTION 618 – TRAIL AMENITIES

618.01 Description

This work shall consist of installing trail amenities such as steel ornamental fencing, wood rail fencing and benches in accordance with 105.03.

MATERIALS

618.02 Materials

10 Trail steel ornamental fencing materials shall be in accordance with the following:

Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy Coated (Galvannealed) by the Hot-Dip Process.	ASTM A653/A653M
Practice for Operating Salt-Spray (Fog) Apparatus.	ASTM B117
Method for Specular Gloss	ASTM D523
Test Method for Evaluating Degree of Blistering in Paint.	ASTM D714
Practice for Conducting Tests on Paint and Related Coatings and Materials using Filtered Open-Flame Carbon-Arc Light and Water Exposure Apparatus	ASTM D822
Test Method for Evaluation of Painted or Coated Specimens Subjected to Corrosive Environments.	ASTM D1654.
Test Method for Calculation of Color Differences from Instrumentally Measured Color Coordinates.	ASTM D2244
Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact)	ASTM D2794
Test Method for Measuring Adhesion by Tape Test.	ASTM D3359
Ornamental Fences Employing Galvanized Steel Tubular Pickets.	ASTM F2408

20 Steel material for fence panels and posts shall conform to the requirements of ASTM A653/A653M, with a minimum yield strength of 45,000 psi (310 MPa) and a minimum zinc (hot-dip galvanized) coating weight of 0.60 oz/ft² (184 g/m²), Coating Designation G-60.

30 Material for pickets shall be 3/4" square x 18 Ga. tubing. The rails shall be steel channel, 1.5" x 1.4375" x 14 Ga. Picket holes in the rail shall be spaced (specify 4.675" o.c. for standard picket space or 3.500" o.c. for 3" air space). Fence posts and gate posts shall meet the minimum size requirements of Table 1.

Table 1 – Minimum Sizes for Posts		
Fence Posts	Panel Height	
2-1/2" x 16 Ga.	Up to & Including 6' Height	
Gate Leaf	Gate Height	
	Up to & Including 4'	Over 4' Up to & Including 6'
Up to 4'	2-1/2" x 14 Ga.	3" x 12 Ga.
4'1" to 6'	3" x 12 Ga.	3" x 12 Ga.
6'1" to 8'	3" x 12 Ga.	4" x 12 Ga.

- 40 Pickets, rails and posts shall be pre-cut to specified lengths. Rails shall be pre-punched to accept pickets.

Pickets shall be inserted into the pre-punched holes in the rails and shall be aligned to standard spacing using a specially calibrated alignment fixture. The aligned pickets and rails shall be joined at each picket-to-rail intersection fusion welding process, thus completing the rigid panel assembly.

- 50 The manufactured panels and posts shall be subjected to an inline electrode position coating (E-Coat) process consisting of a multi-stage pretreatment/wash, followed by a duplex application of an epoxy primer and an acrylic topcoat. The minimum cumulative coating thickness of epoxy and acrylic shall be 2 mils (0.058 mm). The color shall be black. The coated panels and posts shall be capable of meeting the performance requirements for each quality characteristic shown in Table 2 (Note: The requirements in Table 2 meet or exceed the coating performance criteria of ASTM F2408).

Table 2 – Coating Performance Requirements		
Quality Characteristics	ASTM Test Method	Performance Requirements
Adhesion	D3359 – Method B	Adhesion (Retention of Coating) over 90% of test area (Tape and knife test).
Corrosion Resistance	B117, D714 & D1654	Corrosion Resistance over 1,500 hours (Scribed per D1654; failure mode is accumulation of 1/8" coating loss from scribe or medium #8 blisters).
Impact Resistance	D2794	Impact Resistance over 60 inch lb. (Forward impact using 0.625" ball).
Weathering Resistance	D822 D2244, D523 (60° Method)	Weathering Resistance over 1,000 hours (Failure mode is 60% loss of gloss or color variance of more than 3 delta-E color units).

- 60 The manufactured fence system shall be capable of meeting the vertical load, horizontal load, and infill performance requirements for Commercial weight fences under ASTM F2408.

Acceptable manufacturer for steel ornamental fencing is Ameristar Montage Plus – Majestic Style 42-inches 3-Rail or 54-inches 4-Rail or approved Engineer equal.

- 70 Trail wood rail fences shall be in accordance with the following:

- Posts shall be 4' x 4' treated lumber
- Rails shall be 2' x 6' treated lumber
- Lag bolts shall be ½" x 6 ½" galvanized

80 Park benches shall be in accordance with the following:

- Benches are 6-foot black benches, rib pattern & surface mount.
- Heat fused poly—vinyl coating, finished on inner—metal structure, to an approximate 3/16" thickness.
- Framework assemblies are finished with powder coating; electrostatically applied and oven cured according to powder manufacturer's specifications.
- Fasteners are stainless steel to resist corrosion.
- BENCH LEG: Low profile seat legs are constructed of 319 cast aluminum. The leg thickness is 1 1/2" and the foot pads are 5 1/8" long x 2 3/8" wide. The overall height is 21". Bench leg thickness is 1 1/2" and the foot pads are 5 1/8" long x 2 3/8" wide. The overall height is 33 1/2".
- BENCH SEAT: Expanded metal seat uses fabricated 3/4" #9 steel mesh. Rib uses 10 gage and perforated uses 12 gage sheet steel. The frame/mounting brackets are 10 gage sheet steel. The ends of the low profile use a 1/2" diameter steel rod to add support on the 4' and 6' low profile benches. All other benches use 1/4" x 1 1/4" steel flat bar for support at the rolled sides.
- Courtyard 6' bench ground requirements are 27 3/4" x 75 1/8". The bench seat is 72 1/8" long x 25 3/4" wide and 16 5/8" to the top of the lowest part in the bench's seat. Low profile 6' bench ground requirements are 30 3/8" x 75 1/8". The bench seat is 72 1/8" long x 30 3/8" wide and 16 3/8" to the top of the bench's seat.
- The Memorial Plaque consists of 304 brushed stainless steel.

Acceptable manufacturer for park benches is Wabash Valley Memorial Park Bench Model SP410R or approved Engineer equal.

CONSTRUCTION REQUIREMENTS

618.03 Installation of Trail Steel Ornamental Fencing

All new installation shall be laid out by the contractor in accordance with the construction plans.

Comply with manufacturer's instructions and details.

Install concrete footers per spacing as shown on the plans with properly extended modular block reinforcing per manufacturer's recommendation. Concrete footers must be placed to minimum depth of 36".

Fence panels are to be attached to posts with hardware supplied by the Contractor.

Follow manufacturer's recommendation for hardware placement and cleaning. Perform touch up painting according to manufacturer's recommendations.

618.04 Installation of Trail Wood Rail Fencing

All new installation shall be laid out by the contractor in accordance with the construction plans.

Posts shall be securely embedded into the ground to meet the proper alignment and elevations. Posts shall be embedded in concrete as shown on the Detailed Drawings.

Posts and rails shall be held in proper positions by secure bracing until such time as the concrete has set sufficiently to hold the posts. Materials shall not be installed on posts, or stress placed on bracing until the concrete has set sufficiently to withstand the stress.

The complete fence shall be plumb and in straight alignment as shown on the detailed drawings or as directed by Engineer.

618.05 Installation of Trail Benches

Comply with manufacturer's instructions and details.

Install bench on top of trail concrete pad (Section 604). Benches are to be attached to concrete pad with hardware supplied by the Contractor.

Follow manufacturer's recommendation for hardware placement and cleaning. Perform touch up painting according to manufacturer's recommendations.

618.06 Method of Measurement

Trail steel ornamental fencing and wood rail fencing will be measured by the linear feet installed and measured in the field.

Bench installation will be measured by the number of units of the type installed.

618.07 Basis of Payment

Trail steel ornamental fencing and wood rail fencing will be paid for at the contract unit price per linear foot installed.

Trail bench installation will be paid for at the contract unit price per each per type, complete in place

Payment will be made under:

Pay Item	Pay Unit Symbol
Trail Steel Ornamental Fencing	LFT
Trail Wood Rail Fencing	LFT
Trail Bench	EACH

The cost of all labor, materials and equipment required to construction the trail fencing including excavation, gravel base, hardware and concrete shall be included in the cost of the installation.

The cost of all labor, materials and equipment required to install trail benches including hardware shall be included in the cost of the installation

SECTION 620 Brick Pavers

620.01 Description

This work shall consist of removing existing brick road within the limits of the contract, and using it in reconstruction of the road in accordance with these specifications or as directed.

620.02 Materials

Approved materials will be existing salvaged bricks removed and cleaned from this contract and previously salvaged bricks that have been stock piled at City facilities.

620.03 Construction Requirements

Existing Brick is to be salvaged, cleaned and stored in stockpiles outside the construction limits and adjacent thereto, or it may be incorporated directly into the work without stockpiling if conditions allow. The contractor shall furnish all labor, material, and supervision necessary to construct this item as shown on the drawings. Existing brick salvaged from the roadway shall be placed from one end until it runs out. Each row shall consist of only one type of brick pavers. After all salvaged brick are exhausted, the contractor shall be responsible for loading and transporting salvaged brick pavers from the City's Storage Facility where bricks are stockpiled. The contractor shall clean brick properly before placing. Brick pavers, Polymeric sand shall be swept in to the brick joints to complete full depth of the pavers to the satisfaction of the Project Manager.

The quantities removed, if available, shall be sufficient to complete the item of work or certain portions thereof for which it is intended. The depth of excavation shall be as directed.

620.04 Method of Measurement

The Completed Road will be measured by the square yard in its original position.

620.05 Basis of Payment

The accepted quantities of salvaged road material for the use shown on the Schedule of Pay Items will be paid for at the contract unit price per cubic yard, complete in place.

Payment will be made under:

Pay Items	Pay Unit Symbol
------------------	------------------------

Reset Brick Pavement, Utilizing Existing Brick _____	SYS
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The cost of removal of the material, storage, incorporating it into the work, and necessary incidentals shall be included in the cost of the pay item.

SECTION 622 – PLANTING TREES, SHRUBS, AND VINES

622.17 Grass and Weed Control

Weeding and mowing of grass in and around all group plantings, beds, and individual trees and shrubs shall be performed until final acceptance. The grass and weed control areas shall be the areas within 2 ft of the outer limits of all group plantings and shrub beds and within 2 ft of the outer limits of the mulch area of individual shrubs. For the care of individual trees, the area shall extend to a perimeter centered from the point itself to 2 ft beyond the stub stakes of the guy wires or 2 ft beyond the mulched area. In general, these areas shall be in accordance with the plans.

All working areas until final restoration shall be maintained by the contractor in accordance with city ordinances – i.e. No grass or weeds taller than 9 inches.

SECTION 623-VEGETATIVE INSTALLATION AND MANAGEMENT

In INDOT section 900 and 300, anything referencing section 621 (Seeding and Sodding) or 622 (Planting Trees, Shrubs, Vines) shall be changed to Reference 623 Vegetative Installation and Management related items.

623.01 Description

The work covered by these Specifications consist of providing all plants, labor, equipment, supplies, materials, transportation, handling and storage, and performance of all operations required for the construction of the landscaping improvements as provided for in this Section.

Landscape planting is inclusive, but not limited to finished grading, incidentals, supplying and spreading of soil, plant layout, seeding or sodding, water, ground cover plantings or installations, shrub or tree plantings, landscape edges, maintenance period and warranty, and all other necessary services for completing the planting operation. Equipment or motorized vehicles shall not be stationed or driven onto finished landscaped areas unless approved by Public Works Representative.

(a) Reference & Regulatory Requirements

The publications listed below are referred to in the text by designation only. The Contractor shall comply with all Federal, State and local laws, ordinances, rules and regulations applicable to the work, and safety practices. Nothing in the Specifications shall be construed to permit work not conforming to the regulations and codes set forth which include, but are not limited to the following:

1. American National Standards Institute (ANSI)
2. Indiana Department of Environmental Management (IDEM)
 - a. Indiana's Spill Rule: 327 IAC 2-6.1-7 Reportable spills; responsibilities.
3. Manual On Uniform Traffic Control Devices (MUTCD)
4. Office of the Indiana State Chemist (OISC)
 - a. Indiana Pesticide Use and Application Law. 1975
5. Occupational Safety and Health Administration (OSHA)
6. United States Environmental Protection Agency (U.S. EPA)
 - a. Federal Insecticide, Fungicide and Rodenticide Act of 1947

(b) Submittals

1. Seed Mixture
 - a. Product Data: certification labels, etc.
2. Hyrdoseed Mixtures
3. Fertilizer Product Data
4. Seed Supplier Certification
5. Sod Supply Information

a. Packaging information

623.02 Construction Requirements

Contractors shall be responsible for and follow all MUTCD, OSHA and ANSI requirements for safety and personal protective clothing in the work zone.

The Contractor shall be responsible for the location, installation and maintenance of erosion and sediment control devices for the project. Erosion and sediment control shall be in accordance with Section 205 on Stormwater Management's standards and specifications. Contractor shall also comply with 327 IAC 15-5 Stormwater Run-Off Associated with Construction Activity" permit, as specified in the construction documents. The Contractor shall also follow the Indiana Storm Water Quality Manual. Contractor shall minimize granular deposits on the street surfaces and sidewalks open to the public. Excess material shall be removed at the end of each workday by approved methods such as a street sweeper.

It shall be the Contractor's responsibility to maintain all vegetation across the entire project area. This may include but is not limited to weeds or grasses. Vegetation shall not exceed 9 inches in height. Mechanical and/or hand maintenance shall be done as needed to maintain vegetative height below 9 inches throughout the duration of the entire project or until final acceptance.

Contractor shall have a supervisor or foreman onsite at all times who has knowledge of the scope of the work in order to ensure the work flow is being performed properly. A site visit to go over scope of work for each project may be required. The supervisor or foreman performing the work shall be onsite during this time to understand the scope of work being performed.

Unnecessary site visits by the Public Works Representative requested by the contractor may result in a deduction from the project cost of up to \$200 per visit.

Contractor shall supply cell phone numbers, and daytime office numbers of supervisors handling the contract onsite. They shall return all calls within 24 hours of the Project Manager/Engineer placing the call.

Contractor shall call in all locates for each location when digging or stump grinding occurs. Any damage to underground utilities is the responsibility of the Contractor. The Contractor shall notify the Project Manager/Engineer a minimum of 24 hours prior to any work being done and at the final completion of the project or work. Contractor shall notify the Project Manager/Engineer of any obstructions of public or private infrastructures within 48 hours prior to any work being done.

- a. This includes but is not limited to: energized power lines, street lights, cable wires, etc. Contractor shall provide the appropriate number of workers for each location in order to perform the work in a timely uninterrupted manner.

Contractor shall assess site for potential hazards prior to work to ensure a safe working environment for themselves and general public. The Contractor shall block and identify their work zone with cones, barricades or signage in order to prevent pedestrian or vehicular traffic from entering the work area. Contractor shall wear proper personal protective equipment (PPE) that is required by the manufacturer to operate commercial or residential equipment and the application of herbicides (ex: ANSI Z-87.1 approved safety glasses).

Contractor shall adhere to ANSI (American National Standards Institute) A-300 (Tree Care Operations), Z-133, which are the Safety Requirements for Arboricultural Operations and any other Federal or State laws required for the project. The Contractor shall follow all OSHA laws and regulations required for tree care operations. Mandatory first aid kits shall be located on site near the work area. (OSHA 1910.266 App A)

- a. Line clearance tree trimming operations shall follow OSHA's 3 qualification levels for line-clearance tree trimmers. (See OSHA 1910.269(r))
 - i. Unqualified individuals must maintain the minimum approach distances (MAD) of at least ten (10) feet from overhead power lines. (See OSHA 1910.333(c)(3)(i).

The Contractor shall supply their own barricades, signs, cones and flags if the project requires such items. The Contractor shall follow MUTCD, City and State standards or laws on traffic control if lane restrictions are necessary, the Contractor shall notify the Project Manager/Engineer immediately. Contractor shall park equipment in a safe location inside the right-of-way at all times so that it is not obstructive to the view or flow of pedestrian or vehicular traffic.

Contracts within the right of way: the contractor shall use traffic cones and signage to safely identify truck and trailer or work zone. The Contractor shall yield equipment operations if pedestrian or vehicular traffic is within the identified work area. The Contractor is required to disengage or stop cutting apparatus until pedestrian traffic has exceeded this parameter.

During any operation, Contractor shall take every precaution to avoid residual damage to surrounding property, automobiles and motorists, utilities, infrastructure, pedestrians and plant material. If damage occurs due to Contractor negligence, inability or error, repair and/or replacement of all damaged material and/or all other associated costs will be the sole responsibility of the Contractor. Any equipment operated in a way that is detrimental to public safety or intently causing damage to city, private, or public property may result in termination of contract.

If, at any time, in the opinion of the Project Manager/Engineer, the work is not properly lighted, barricaded, or safe in respect to public travel, persons on or about the work site, the Project Manager/Engineer shall have the right to order such safeguards to be erected and such precautions to be taken as he/she deems advisable, and the Contractor shall promptly comply with such orders.

The Contractor must act and respond in a professional manner to any public questions or complaints that may arise on site. The Contractor shall maintain written documentation of all claims and information shall include but is not limited to contact information (first/last name, phone number) of those present, approximate time, and brief description of issue. The Contractor shall immediately inform the Project Manager/Engineer of any complaints, claims, property damage, personal injuries, emergency situations or any other similar occurrences.

Contractor shall provide Public Works Representative with any licenses and certifications that are required by State or Federal agencies to perform specialized work. This shall include but is not limited to pesticide license and line clearance certification. Failure to provide the requested documentation may result in disqualification of bid. All certifications and licenses shall be current at the time of the contract award and shall remain current and up to date throughout the contract.

The Contractor shall be responsible for all property damage, including damage resulting from chemicals, caused by any operation. The Contractor shall resolve, in an expeditious manner, all claims arising from their work at no extra cost to the City.

(a) Quality Assurance

Contractor shall have all required items listed in the Bid packet. The Contractor shall provide necessary precautions at all time for the protection of the public, employees and surrounding areas as outlined by federal, state and local regulations. These include, but are not limited to: OSHA, USDA, EPA, INDOT, IDEM, and the City of Fort Wayne.

Contractor shall follow all MUTCD, City and State standards or laws on traffic control if lane restrictions are required. Contractor shall supply all permits. City permits shall be obtained from City of Fort Wayne Public Works Office.

Contractor shall follow the required Warranty Period for plant, shrub or seed replacement and maintenance.

Contractor must submit for approval, proposed seed mixture if not stated in planting plans. Submission of manufacturer's certificates of purity and guarantees of germination in accordance with Indiana Seed Law may be required. All planting material shall meet or exceed the specifications of Federal, State and Local laws requiring inspection for disease and insect control.

Contractor shall provide proof of all certificates or licenses that may be required during the project. The contractor shall provide the project engineer certifications.

All equipment shall be suitable for the project and in good operational condition. It shall be operated by a qualified and trained personnel according to ANSI, the manufacturer's instructions, and OSHA published standards. Equipment must have all required safety devices in place and in operation as required by the manufacturer, OSHA, federal, state and local regulations.

Pesticides used on site shall be registered within the State and have a current EPA registration number. Applications of pesticides shall be done by a licensed applicator or registered technician and follow all Office of Indiana State Chemist (OISC) laws and regulations. Applications of all pesticides must be in strict accordance with the label.

(b) Herbicide Application Requirements, Restrictions and Guidelines

1) Herbicide License Requirements

Herbicides shall be applied by a State of Indiana Licensed Applicator or Registered Technician working under the direct supervision of a licensed applicator. Licensed applicator shall have appropriate herbicide category based on site conditions (*ie Category 5 aquatic pest management for wetland, standing or running water and riprap applications*). Contractor must provide copies of all current licenses/certifications to the Public Works Representative prior to the start of any work being done.

2) Herbicide Application Restrictions and Guidelines

The Contractor shall provide all necessary herbicide materials and equipment which shall comply with applicable Federal, State and local laws regarding application, storage, and handling. Contractor shall have AND wear the appropriate personal protective equipment and clothing as specified on the herbicide manufacturer's label. Contractor must have portable emergency kits and eye wash facilities at the project site. Foliar application equipment shall be calibrated prior to application and in accordance with manufacturer's recommendations.

Contractor shall apply pesticides according to manufacturer's label/instructions and maintain current Safety Data Sheet (SDS) on site at all times for all pesticides utilized. Contractor shall not apply a pesticide in a manner that allows it to drift from the target site in which it causes harm to a non-target area, see Indiana Pesticide Drift Rule (357 IAC 1-12) for full definitions. The Contractor shall avoid off target damage; all damage incurred is the responsibility of the Contractor. If in doubt of application area, contact Public Works Representative.

Herbicide application will be prohibited if plants show physical signs of stress due to environmental conditions such as drought, flooding, nor prior to or immediately following heavy frost. Herbicide application will be restricted during certain adverse weather conditions such as rain, wind, ice, or snow. Environmental conditions will be determined by Public Works Representative.

The Contractor shall only use herbicides labeled for aquatic use when applications are in or adjacent to standing water, flowing water, or high ground water. This shall include but is not limited to wetlands, ponds, or drainages containing water.

The Contractor is responsible for the proper disposal of all excess materials and mixtures in accordance with Federal, State and local laws, regulations and guidelines. The Contractor is responsible for adhering to any and all other requirements or laws not mentioned above by OISC, OSHA and the EPA.

The Contractor shall maintain a daily written or digital record of all spray applications performed in accordance with the current OISC requirements. Daily records shall include the following data on all herbicide applications and must be given to the Public Works Representative after the completion of the initial treatment and any follow up treatments, Contractor may use chart in appendix D or an approved alternative.

Herbicide brand name	Date, Applicator name, License number
Manufacturer	Air temperature
EPA registration number	Wind speed and direction
Rate of herbicide (oz/gal)	Sun exposure
Total mixture use (gallons)	

3) Mixing and Storing Herbicides

Herbicides shall be stored in a well ventilated, cool, dry area where food and drinks are never stored or prepared. Herbicides should not be stored for any length of time below 40 degrees F. Herbicides shall be stored in an area that has an impermeable surface in order to prevent leaks from reaching the soil. All herbicides shall be inaccessible to the public in a locked container except when they are being removed or used. All herbicide containers shall be labeled to indicate the following:

- a. Herbicide Brand
- b. Active Ingredient

- c. Ratio of mixture
- d. EPA Registration Number

Extreme caution shall be used when mixing herbicides. Contractor/Applicator shall read the label before mixing or using any herbicides.

Contractor/Applicator shall establish a mixing area, which should be preferably either in an industrial sink near the storage site or in an area near the treatment site where damage from small spills would be minimal. Mixing on-site should have relatively few desirable species, not be susceptible to runoff, or be visited by the public. This area should also provide easy access for containment and clean –up of spills.

(c) Spill Response Guidelines

Contractors shall immediately notify the Project Manager/Engineer in the event of a spill.

Contractor must have the appropriate clean-up equipment or spill kits available for use at all times where chemicals are stored, handled, mixed and loaded. Spill kits should include items such as: absorbent pads or dry absorbent, empty bags and shovels.

Contractor must contain and confine the spill, if possible, to prevent additional spilled material from entering waterways or other undesirable areas. Contractor must follow the appropriate protocol IDEM lists for major/minor spills from spill response, notifications and clean up as defined by Indiana Spill Rule 327 IAC 2-6.1-6.

IDEM Emergency Response Hotline: (888)-233-7745.

Minor spills that involve much smaller quantities of hazardous materials shall be treated with just as much caution in terms of personal exposure. For more information see Indiana’s Spill Rule: 327 IAC 2-6.1-7 Reportable spills; responsibilities.

Safety precautions and clean up protocol information is usually listed on the herbicide label, SDS sheet or by calling the herbicide manufacture.

(d) Safety

Contractor shall follow all MUTCD, City and State standards or laws on traffic control if lane restrictions are required. Permits shall be obtained from City of Fort Wayne Public Works Office. Contractor shall park truck and trailer in a safe location that is not obstructive to the view or flow of pedestrian or vehicular traffic. Contractor shall use traffic cones to safely identify truck and trailer.

Contractor shall wear proper personal protective equipment (PPE) that is required by equipment manufacturer to operate equipment (ex: ANSI approved safety glasses). All equipment shall be suitable for the project and in good operational condition. It shall be operated by a qualified and trained personnel according to ANSI, the manufacturer's instructions, and OSHA published standards. Equipment must have all required safety devices in place and in operation as required by the manufacturer, OSHA, federal, state and local regulations.

The Contractor is required to disengage or stop cutting apparatus until pedestrian and vehicular traffic has exceeded the manufacturers recommended distance. Excessive clippings shall not be directed towards pedestrian or vehicular traffic. Excessive clippings shall not be left in curb and channel, roadway, or sidewalk.

Any equipment operated in a way that is detrimental to public safety or intently causing damage to city, private, or public property will result in termination of contract.

(e) Equipment

The Contractor shall have the appropriate commercial equipment; kept in good operating condition. Contractor shall perform a thorough inspection of all equipment before beginning work on City property. This shall include but is not limited to: factory installed safety features, brakes, belts, blades, fluids, accumulated grass, tires, attachments and strings.

If equipment malfunction occurs, the contractor is responsible for the immediate containment and clean-up of any liquid spill (i.e. herbicides, lubricants, oils, etc.). Project Manager/Engineer shall be notified immediately. All vehicles, equipment, and supplies may be stored at a staging area approved by the Project Manager/Engineer.

623.03 VEGATATIVE MOBILIZATION AND DEMOBILIZATION

(a) Description

This item shall consist of all work necessary for the movement of personnel and equipment to and from the project site and for the establishment and removal of all vegetation for the project.

Limitations - For the purpose of payment, the mobilization portion of this item will be limited to 50% of the Unit Cost. The remainder of the item will be considered demobilization. The exact amount will be a portion of the lump sum price which is an even percentage of the bid item, and the balance of the lump sum price will be paid when the contract has been completed and accepted.

(b) Measurement

No measurement will be made.

(c) Basis of Payment

This work will be paid for at the contract lump sum price for vegetative mobilization and demobilization, operations and all work incidentals thereto. This will be paid as a percentage of the progression of the job.

When no price for vegetative mobilization and demobilization is asked for on the proposal form, the cost of the work described above shall be included in the general cost of the contract, with no direct payment for the work.

Payment will be made under:

PAY ITEM	PAY UNIT
Vegetative Mobilization and Demobilization.....	Lump Sum

623.04 PLANTING PLAN

(a) General

Work under this section consists of providing all operations pertaining to furnishing, transporting, and installation of plant material, tree stabilization, and landscape edgings.

PROJECT CONDITIONS

1. Field Measurements: Verify actual grade elevations, service and utility locations, irrigation system components, and dimensions of plantings and construction contiguous with new plantings by field measurements before proceeding with planting work.
2. Interruption of Existing Services or Utilities: Do not interrupt services or utilities to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary services or utilities according to requirements indicated:
 - a. Notify Construction Manager no fewer than two days in advance of proposed interruption of each service or utility.
 - b. Do not proceed with interruption of services or utilities without Construction Manager's written permission.
3. Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with maintenance periods to provide required maintenance from date of Substantial Completion.

Spring Planting: March 15th – June 30th.

Fall Planting: August 15th – Freeze up.
4. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions and warranty requirements.

5. Coordination with Turf Areas (Lawns): Plant trees, shrubs, and other plants after finish grades are established and before planting turf areas unless otherwise indicated.

- a. When planting trees, shrubs, and other plants after planting turf areas, protect turf areas, and promptly repair damage caused by planting operations.

(b) Materials

1. DELIVERY, STORAGE, AND HANDLING

a. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

b. Bulk Materials:

- i. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants.

- ii. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

c. Deliver bare-root stock plants freshly dug. Immediately after digging up bare-root stock, pack root system in wet straw, hay, or other suitable material to keep root system moist until planting.

d. Do not prune trees and shrubs before delivery. Protect bark, branches, and root systems from sun scald, drying, wind burn, sweating, whipping, and other handling and tying damage. Do not bend or bind-tie trees or shrubs in such a manner as to destroy their natural shape. Provide protective covering of plants during shipping and delivery. Do not drop plants during delivery and handling.

e. Handle planting stock by root ball.

f. Store bulbs, corms, and tubers in a dry place at 60 to 65 deg F (16 to 18 deg C) until planting.

g. Deliver plants after preparations for planting have been completed, and install immediately. If planting is delayed more than six hours after delivery, set plants and trees in their appropriate aspect (sun, filtered sun, or shade), protect from weather and mechanical damage, and keep roots moist.

- i. Heel-in bare-root stock. Soak roots that are in dry condition in water for two hours. Reject dried-out plants.

- ii. Set balled stock on ground and cover ball with soil, peat moss, sawdust, or other acceptable material.

- iii. Do not remove container-grown stock from containers before time of planting.

- iv. Water root systems of plants stored on-site deeply and thoroughly with a fine-mist spray. Water as often as necessary to maintain root systems in a moist, but not overly-wet condition.

2. PLANT MATERIAL

General: Furnish nursery-grown plants true to genus, species, variety, cultivar, stem form, shearing, and other features indicated in Plant Schedule or

Plant Legend shown on Drawings and complying with ANSI Z60.1; and with healthy root systems developed by transplanting or root pruning. Provide well-shaped, fully branched, healthy, vigorous stock, densely foliated when in leaf and free of disease, pests, eggs, larvae, and defects such as knots, sun scald, injuries, abrasions, and disfigurement.

- a. Trees with damaged, crooked, or multiple leaders; tight vertical branches where bark is squeezed between two branches or between branch and trunk ("included bark"); crossing trunks; cut-off limbs more than 3/4 inch (19 mm) in diameter; or with stem girdling roots will be rejected.
- b. Collected Stock: Do not use plants harvested from the wild, from native stands, from an established landscape planting, or not grown in a nursery unless otherwise indicated.
- c. Provide plants of sizes, grades, and ball or container sizes complying with ANSI Z60.1 for types and form of plants required. Plants of a larger size may be used if acceptable to Landscape Architect, with a proportionate increase in size of roots or balls.
- d. Root-Ball Depth: Furnish trees and shrubs with root balls measured from top of root ball, which shall begin at root flare according to ANSI Z60.1. Root flare shall be visible before planting.
- e. Labeling: Label at least one plant of each variety, size, and caliper with a securely attached, waterproof tag bearing legible designation of common name and full scientific name, including genus and species. Include nomenclature for hybrid, variety, or cultivar, if applicable for the plant as shown on Drawings.
- f. If formal arrangements or consecutive order of plants is shown on Drawings, select stock for uniform height and spread, and number the labels to assure symmetry in planting.

3. WEED-CONTROL BARRIERS

- a. Nonwoven Geotextile Filter Fabric: Polypropylene or polyester fabric, 3 oz./sq. yd. (101g/sq. m) minimum, composed of fibers formed into a stable network so that fibers retain their relative position. Fabric shall be inert to biological degradation and resist naturally-encountered chemicals, alkalis, and acids.
- b. Composite Fabric: Woven, needle-punched polypropylene substrate bonded to a nonwoven polypropylene fabric, 4.8 oz./sq. yd. (162 g/sq. m).

4. TREE STABILIZATION MATERIALS

- a. Stakes and Guys
 - i. Upright and Guy Stakes: Rough-sawn, sound, new hardwood free of knots, holes, cross grain, and other defects, 2-by-2-inch nominal (38-by-38-mm actual) by length indicated, pointed at one end.

5. MISCELLANEOUS PRODUCTS

- a. Antidesiccant: Water-insoluble emulsion, permeable moisture retarder, film forming, for trees and shrubs. Deliver in original, sealed, and fully labeled containers and mix according to manufacturer's written instructions.
- b. Planter Drainage Gravel: Washed, sound crushed stone or gravel complying with ASTM D 448 for Size No. 8.
- c. Planter Filter Fabric: Woven geotextile manufactured for separation applications and made of polypropylene, polyolefin, or polyester fibers or combination of them.
- d. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb (0.45 kg) of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb (0.45 kg) of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material.

(c) Construction Requirements

1. EXAMINATION

- a. Examine areas to receive plants for compliance with requirements and conditions affecting installation and performance.
 - i. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area.
 - ii. Do not mix or place soils and soil amendments in frozen, wet, or muddy conditions.
 - iii. Suspend soil spreading, grading, and tilling operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results.
 - iv. Uniformly moisten excessively dry soil that is not workable and which is too dusty.
 - v. Proceed with installation only after unsatisfactory conditions have been corrected.
 - vi. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Landscape Architect and replace with new planting soil.

2. PREPARATION

- a. Protect structures, utilities, sidewalks, pavements, and other facilities and turf areas and existing plants from damage caused by planting operations.
- b. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.
- c. Lay out individual tree and shrub locations and areas for multiple plantings. Stake locations, outline areas, adjust locations when requested, and obtain Landscape Architect's acceptance of layout before excavating or planting. Make minor adjustments as required.

- d. Apply antidesiccant to trees and shrubs using power spray to provide an adequate film over trunks (before wrapping), branches, stems, twigs, and foliage to protect during digging, handling, and transportation.
 - i. If deciduous trees or shrubs are moved in full leaf, spray with antidesiccant at nursery before moving and again two weeks after planting.
 - ii. Wrap trees and shrubs with burlap fabric over trunks, branches, stems, twigs, and foliage to protect from wind and other damage during digging, handling, and transportation.

3. PLANTING BED ESTABLISHMENT

- a. Loosen subgrade of planting beds to a minimum depth of 6 inches. Remove stones larger than 1-1/2 inches in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.
 - i. Apply soil amendments and fertilizer on surface, and thoroughly blend planting soil mix.
 - a) Delay mixing fertilizer with planting soil if planting will not proceed within a few days.
 - ii. Spread planting soil mix to a depth of 8 inches but not less than required to meet finish grades after natural settlement. Do not spread if planting soil or subgrade is frozen, muddy, or excessively wet.
 - a) Spread approximately one-half the thickness of planting soil mix over loosened subgrade. Mix thoroughly into top 4 inches of subgrade. Spread remainder of planting soil mix.
- b. Finish Grading: Grade planting beds to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.
- c. Restore planting beds if eroded or otherwise disturbed after finish grading and before planting.

4. TREE AND SHRUB EXCAVATION

- a. Pits and Trenches: Excavate circular pits with sides sloped inward. Trim base leaving center area raised slightly to support root ball and assist in drainage. Do not further disturb base. Scarify sides of plant pit smeared or smoothed during excavation.
 - i. Excavate approximately three times as wide as ball diameter for balled and burlapped stock.
 - ii. Excavate at least 20 inches for trees and 10 inches for shrubs, wider than root spread.
- b. Tree Grate Wells: Excavate entire area under tree grate to a depth no greater than the height of the rootball plus 6 inches to allow for pea gravel and tree grate. Remove stone and other construction debris. Base of excavated area shall remain as existing soil or will need to be recompacted to support the rootball. Scarify sides of plant pit smeared or smoothed during excavation.
- c. Obstructions: Notify Landscape Architect if unexpected rock or obstructions detrimental to trees or shrubs are encountered in excavations.

- i. Hardpan Layer: Drill 6-inch diameter holes into free-draining strata or to a depth of 10 feet, whichever is less, and backfill with free-draining material.
- d. Drainage: Notify Landscape Architect if subsoil conditions evidence unexpected water seepage or retention in tree or shrub pits.
 - i. Fill excavations with water and allow to percolate away before positioning trees and shrubs.

5. TREE, SHRUB, AND VINE PLANTING IN PITS OR BEDS

- a. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- b. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- c. Set balled and burlapped stock plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.
 - i. Use a mix of 50% topsoil and 50% soil excavated from planting pit for backfill.
 - ii. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - iii. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - iv. Continue backfilling process. Water again after placing and tamping final layer of soil.
- d. Set container-grown stock plumb and in center of planting pit or trench with root flare 1 inch (25 mm) above adjacent finish grades.
 - i. Use a mix of 50% topsoil and 50% soil excavated from planting pit for backfill.
 - ii. Carefully remove root ball from container without damaging root ball or plant.
 - iii. Backfill around root ball in layers, tamping to settle soil and eliminate voids and air pockets. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - iv. Continue backfilling process. Water again after placing and tamping final layer of soil.
- e. When planting on slopes, set the plant so the root flare on the uphill side is flush with the surrounding soil on the slope; the edge of the root ball on the

downhill side will be above the surrounding soil. Apply enough soil to cover the downhill side of the root ball.

6. TREE, SHRUB, AND VINE PLANTING IN TREE GRATES

- a. Before planting, verify that root flare is visible at top of root ball according to ANSI Z60.1. If root flare is not visible, remove soil in a level manner from the root ball to where the top-most root emerges from the trunk. After soil removal to expose the root flare, verify that root ball still meets size requirements.
- b. Remove stem girdling roots and kinked roots. Remove injured roots by cutting cleanly; do not break.
- c. Set balled and burlapped stock plumb and in center of tree grate well with root flare 6 inches below adjacent finished sidewalk grade.
 - i. Use imported topsoil for backfill.
 - ii. After placing some backfill around root ball to stabilize plant, carefully cut and remove burlap, rope, and wire baskets from tops of root balls and from sides, but do not remove from under root balls. Remove pallets, if any, before setting. Do not use planting stock if root ball is cracked or broken before or during planting operation.
 - iii. Backfill around root ball in 6 inch layers, tamping to settle soil and eliminate voids and air pockets. Do not over compact. When planting pit is approximately one-half filled, water thoroughly before placing remainder of backfill. Repeat watering until no more water is absorbed.
 - iv. Continue backfilling process until soil fills the tree grate well completely and is 1 inch below the root flare. Water again after placing and tamping final layer of soil.
 - v. Continue backfilling process. Water again after placing and tamping final layer of soil.
 - vi. Install weed barrier fabric over backfilled soil turning edges up 1 inch on all sides and at trunk. Overlap seams 6 inches.
 - vii. Install 4 inches of clean, washed pea gravel on top of the weed barrier fabric.
 - viii. Install the tree grates so that the seam runs parallel with the street. The grates shall be flush with adjacent sidewalk.

7. TREE, SHRUB, AND VINE PRUNING

- a. Remove only dead, dying, or broken branches. Do not prune for shape.
- b. Prune, thin, and shape trees, shrubs, and vines according to standard professional horticultural and arboricultural practices. Unless otherwise indicated by Landscape Architect, do not cut tree leaders; remove only injured, dying, or dead branches from trees and shrubs.
- c. Prune to retain natural character.
- d. Do not apply pruning paint to wounds.

8. TREE STABILIZATION

- a. Do not stake or guy trees unless specifically required by the Contract Documents, or in the event that the Contractor feels that staking is the only alternative way to keep particular trees plumb.
 - i. The Owner's Representative shall have the authority to require that trees are staked or to reject staking as an alternative way to stabilize the tree.
 - ii. Trees that required heavily modified root balls to meet the root quality standards may become unstable. The Owner's Representative may choose to reject these trees rather than utilize staking to temporarily support the tree.
- b. Trees that are guyed shall have their guys and stakes removed after one full growing season or at other times as required by the Owner's Representative. Removal of these support systems shall be at no cost to the owner. Failure to remove the support system may result in rejection at the end of warranty final inspection.
- c. Tree guying shall utilize the tree staking and guying materials specified. Plants shall stand plumb after staking or guying.
 - i. Stakes shall be driven to sufficient depth to hold the tree rigid.

9. PRE-EMERGENT HERBICIDE

- a. Apply pre-emergent herbicide granules to planting areas, per manufacturer's recommendations, immediately prior to mulching.

10. GROUND COVER AND PLANT PLANTING

- a. Set out and space ground cover and plants other than trees, shrubs, and vines as indicated in even rows with triangular spacing.
- b. Use planting soil for backfill.
- c. Dig holes large enough to allow spreading of roots.
- d. For rooted cutting plants supplied in flats, plant each in a manner that will minimally disturb the root system but to a depth not less than two nodes.
- e. Work soil around roots to eliminate air pockets and leave a slight saucer indentation around plants to hold water.
- f. Water thoroughly after planting, taking care not to cover plant crowns with wet soil.
- g. Protect plants from hot sun and wind; remove protection if plants show evidence of recovery from transplanting shock.

11. PLANTING AREA MULCHING

- a. Mulch backfilled surfaces of planting areas and other areas indicated.
 - i. Trees and Tree-like Shrubs in Turf Areas: Apply organic mulch ring of 3-inch (75-mm) average thickness, with 24-inch (600-mm) radius around trunks or stems. Do not place mulch within 2 inches of trunks or stems.
 - ii. Organic Mulch in Planting Areas: Apply 3-inch (75-mm) average thickness of organic mulch over whole surface of planting area, and finish level with adjacent finish grades. Do not place mulch within 2 inches (75 mm) of trunks or stems.

12. EDGING INSTALLATION

Shovel-Cut Edging: Separate mulched areas from turf areas with a 45-degree, 4- to 6-inch- (100- to 150-mm-) deep, shovel-cut edge.

13. PESTICIDE APPLICATION

- a. Apply pesticides and other chemical products and biological control agents in accordance with authorities having jurisdiction and manufacturer's written recommendations. Coordinate applications with Owner's operations and others in proximity to the Work. Notify Owner before each application is performed.
- b. Pre-Emergent Herbicides (Selective and Non-Selective): Apply to tree, shrub, and ground-cover areas in accordance with manufacturer's written recommendations. Do not apply to seeded areas.
- c. Post-Emergent Herbicides (Selective and Non-Selective): Apply only as necessary to treat already-germinated weeds and in accordance with manufacturer's written recommendations.

14. CLEANUP AND PROTECTION

- a. During planting, keep adjacent paving and construction clean and work area in an orderly condition.
- b. Protect plants from damage due to landscape operations and operations of other contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair, or replace damaged plantings.
- c. After installation and before Substantial Completion, remove nursery tags, nursery stakes, tie tape, labels, wire, burlap, and other debris from plant material, planting areas, and Project site.

15. DISPOSAL

Remove surplus soil and waste material including excess subsoil, unsuitable soil, trash, and debris and legally dispose of them off Owner's property.

16. PLANT MAINTENANCE

- a. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, restoring planting saucers, adjusting and repairing tree-stabilization devices, resetting to proper grades or vertical position, and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and shrubs free of insects and disease.
- b. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace mulch materials damaged or lost in areas of subsidence.
- c. Apply treatments as required to keep plant materials, planted areas, and soils free of pests and pathogens or disease. Use integrated pest management practices whenever possible to minimize the use of pesticides and reduce hazards. Treatments include physical controls such as hosing off foliage, mechanical controls such as traps, and biological control agents.

17. MAINTENANCE SERVICE

- a. Initial Maintenance Service for Trees and Shrubs: Provide maintenance by skilled employees of landscape Installer. Maintain as specified above. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
 - i. Maintenance Period: 12 months from date of Substantial Completion.
- b. Initial Maintenance Service for Ground Cover and Other Plants: Provide maintenance by skilled employees of landscape Installer. Maintain as specified above. Begin maintenance immediately after plants are installed and continue until plantings are acceptably healthy and well established but for not less than maintenance period below.
 - i. Maintenance Period: 12 months from date of Substantial Completion.

18. FINAL ACCEPTANCE

When plantings have been maintained and established after the 12 month maintenance period. Plantings shall be healthy, well-rooted, fully branched, evenly-colored, free of weeds and pests. If more than 25% of the plant is unhealthy or dead, the plant shall be replaced under warranty.

- a. Warranty: Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship, or growth within specified warranty period.
 - i. Failures include, but are not limited to, the following:
 - a) Death and unsatisfactory growth, except for defects resulting from abuse, lack of adequate maintenance, or neglect by Owner, or incidents that are beyond Contractor's control.
 - b) Structural failures including plantings falling or blowing over.
 - c) Faulty performance of tree stabilization and/or tree grates.
- b. Warranty Periods from Date of Substantial Completion:
 - i. Trees: 2 years.
 - ii. Shrubs, Vines, and Ornamental Grasses: 12 months.
 - iii. Ground Covers, Biennials, Perennials, Bulbs and Other Plants: 12 months.
 - iv. Include the following remedial actions as a minimum:
 - a) Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
 - b) Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
- c. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.
- d. Provide extended warranty for period equal to original warranty period, for replaced plant material.

(d) Method of Measurement

The measurement of plantings shall be per each plant. This shall include all materials, transportation, installation, and maintenance. Prices for material shall include delivery. No additional delivery charges will be allowed.

(e) Basis of Payment

Plantings will be paid for at the contract unit price per cubic yard for the type specified.

Payment will be made under:

Pay Items	Units
4" caliper B&B tree.....	EA
3" caliper B&B tree.....	EA
2" caliper B&B tree.....	EA
1.5" caliper B&B tree.....	EA
6' min. height evergreen tree.....	EA
8' min. height evergreen tree.....	EA
10' min. height evergreen tree.....	EA
15' min. height evergreen tree.....	EA
5 gallon container shrub.....	EA
3 gallon container shrub.....	EA
2 gallon container shrub.....	EA
2 gallon herbaceous plant.....	EA
1 gallon herbaceous plant.....	EA
1 quart herbaceous plant.....	EA
Plug-sized herbaceous plant.....	EA
Bulb.....	EA

623.05 TOPSOIL

(a) Description

Work under this section consists of providing all operations pertaining to furnishing, transporting, and spreading of topsoil.

(b) Materials

- 1) Brown topsoil shall be used unless otherwise specified by the project plans or by the Project Manager/Engineer. Brown topsoil shall be classified as a clay loam soil based on the soil textural classification provided by USDA-NRCS. Topsoil shall contain the following; 25-40% clay, 25-40% silt, and 20-40% sand. The pH value shall be between 6.2 to 7.6 and have organic matter content value of 2% to 5%. Testing for pH value shall be performed in accordance with AASHTO T 289.

Brown topsoil shall consist of loose friable soil, free of refuse, stumps, large roots, rocks over 1.0 inch in diameter, brush, weeds, sticks, litter or other material which would be detrimental to the proper development of vegetative growth. It shall be capable of supporting normal vegetation as demonstrated by the growth of healthy vegetation on it. It shall not be taken from a source known to contain any of the noxious weeds defined as such in the Indiana State Seed Law, IC 15-4-1. The topsoil shall be inspected and tested by the Project Manager/Engineer before approval will be granted for its use. The Contractor shall furnish soil analysis test reports if requested.

- 2) Agricultural limestone: May be added to topsoil upon approval, in order to raise the pH to meet specification requirements. The addition of agriculture limestone shall be determined based on tests performed by a laboratory approved by the Office of Geotechnical Services.

Topsoil shall not be worked when frozen or when moisture exceeds soil infiltration capacity. If requested the contractor shall submit samples of the topsoil for approval and analysis at the expense of the contractor.

(c) Construction Requirements

All hard surface construction shall be completed prior to topsoil placement. Prior to placing material, the contractor must clear site of all rocks, sticks, stumps, soil fragments and clods larger than one and a half inches in diameter, and all other foreign material or irregularities.

Areas that topsoil is to be incorporated shall be tilled or disc to a depth of four to eight inches before placing material. On slopes steeper than 3:1, depth of cultivation may be reduced as directed by the Project Manager/Engineer.

Contractor shall apply an even and uniform layer of topsoil layer that settles to the depth specified by the project plans or by the Project Manager/Engineer. The top soil shall then be spread to a sufficient depth to produce the thickness specified after it has been compacted lightly with an approved roller, tamping device, or other method. It shall be in accordance with the finished grade and cross section shown on the plans or as otherwise designated by the Project Manager/Engineer. Soil shall not be spread when the ground is frozen, excessively wet, or otherwise in a condition detrimental to the work.

Contractor shall clean up any debris or soil that has been spilled or accidentally blown into areas other than the specified work area. This may include but is not limited to: the roadway, the curb, sidewalk, trail, driveway, and yard. Soil shall not cover or smother landscaped plants/vegetation. Soil shall be kept 6.0-10.0 inches

away from the base of trees and shrubs. Contractor shall not place soil on trunk or trunk flare of trees.

1) Blown/Slung Topsoil

When required or when applicable, topsoil shall be blown or applied using a slinger truck for efficiency purposes.

a) Application: Contractor shall spread soil by machine, uniformly across the landscaped area or project area. If machine equipment is unable to access landscape/project area, other methods shall be approved by the Public Works Representative. Contractor shall follow all other soil requirements for this application method.

(d) Method of Measurement

The measurement of topsoil shall be per cubic yard or tons as noted. This shall include all cultivating, materials, and transportation. Prices for material shall include delivery. No additional delivery charges will be allowed.

(e) Basis of Payment

Topsoil will be paid for at the contract unit price per cubic yard for the type specified.

Payment will be made under:

Pay Items	Units
Topsoil.....	CYS
Topsoil.....	TONS

623.06 HARDWOOD MULCH

(a) General

Mulching is the application of a uniform layer of organic material over areas to reduce certain environmental factors including but not limited to weed suppression, soil moisture management, and prevention of soil erosion. Mulch shall consist of shredded hardwood mulch as specified by the project plans. Material shall be uniform in size, color, quality and overall appearance.

(b) Materials

Hardwood mulch shall be double shredded hardwood. It shall range in size, from three (3) inches maximum length, (1/2) inch minimum. Mulch shall be natural in color and shall not be colored or dyed unless specified by the project specifications or by the Project Manager/Engineer. Mulch shall be free of weeds and invasive plant species parts or seeds listed in Indiana Seed Law (IC 15-15-1). Mulch shall also be free of sawdust, dirt, twigs, excessive bark, litter, rocks or any other debris.

(c) Construction Requirements

Mulch shall not cover or smother landscaped plants/vegetation. Contractor shall apply and spread a layer that settles to a uniform depth indicated by the project plans or Project Manager/Engineer. Mulch shall be kept (6.0-10.0) inches away from the base of trees and shrubs. Contractor shall not place mulch on trunk or trunk flare of trees. Contractor shall clean up any debris or mulch that has been spilled or accidentally blown into areas other than the specified work area. This may include but is not limited to: the roadway, the curb, sidewalk, trail, driveway, and yard.

Contractor shall clean up any debris or mulch that has been spilled or accidentally blown into areas other than the specified work area. This may include but is not limited to: the roadway, the curb, sidewalk, trail, driveway, and yard. Mulch shall not cover or smother landscaped plants/vegetation.

1) Blown Hardwood Mulch

Mulch shall be applied using a mulch blowing truck for efficiency purposes.

a) Application: Contractor shall spread mulch by machine, uniformly across the landscaped area or project area. If machine equipment is unable to access landscape/project area, other methods shall be approved by the Public Works Representative. Contractor shall follow all other hardwood mulch requirements for this application method.

(d) Method of Measurement

The measurement of hardwood mulch shall be per cubic yard. This shall include all cultivating, materials, and transportation.

(e) Basis of Payment

Hardwood mulch will be paid for at the contract unit price per cubic yard for the type specified. Payment will be made under:

Pay Items	Units
Hardwood Mulch.....	CYS

623.07 SEEDING

(a) Description

Contractor shall perform all operations under this section which shall consist of all labor, equipment, and materials necessary to complete the specified task.

The Contractor shall handle all seed in a manner that will insure protection from moisture, heat, or other conditions that would jeopardize viability or cause germination before installation.

Turf Grass and Native seed in the quantities and varieties required shall be furnished full-tagged and delivered in properly designated packages or bags as directed. Seeds shall be in accordance with the following requirements. Seeds shall contain none of the prohibited noxious weeds listed in 360 IAC 1-1-5 or any that are listed in the Acts of the General Assembly of the State. Restricted noxious weed seed listed in 360 IAC 1-1-6 shall not exceed 0.25% by weight in accordance with IC 15-15-1-32.

To seed at times other than the ones listed below, requires approval by Engineer/Project Manager.

(a) Regular Seeding Season

- Spring-March 1-June 1
- Fall- August 15-October 30
- Optimum seeding time is September to mid-October
- Summer seeding between June and August 15 are at the contractor's risk. Dry and hot weather difficulties are the responsibility of the Contractor.

(b) Materials

1) Seed Types

PARK MIX

The intended use for this mix is to establish a durable turf that tolerates common roadside pollutants, sidewalk salt, moderate use, and frequent mowing management. This mix is typically planted in park strips near residential housing or park areas. Seeding rate is 6 lbs. per 1,000 sq. ft. The contractor shall use Park Mix or approved proprietary equivalent. All seed must follow set seed requirements by law for the State of Indiana pertaining to but not limited to noxious weeds, germination, and testing requirements.

- 40% 'IQ' Perennial Ryegrass
- 30% 'Boreal' Creeping Red Fescue
- 30% 'Appalachian' Kentucky Bluegrass

NO-MOW MIX

The intended use for this mix is to establish a durable turf that tolerates common roadside pollutants, road salt, and mown twice a year. This mix is typically utilized on gradual slopes, level ground, or areas that infrequent mowing is tolerated. Seeding rate is 6 lbs. per 1,000 sq. ft. The contractor shall use Links Mix or approved proprietary equivalent. All seed must follow set seed requirements by law for the State of Indiana pertaining to but not limited to noxious weeds, germination, and testing requirements.

- 25% 'Jetty' Hard Fescue
- 25% 'Heathlands' Chewings Fescue
- 25% 'Marco Polo' Sheeps Fescue
- 25% 'Orbit' Creeping Red Fescue

INDIANA ROADSIDE MIX

The intended use for this mix is to establish a durable turf that tolerates common roadside pollutants, road salt, and a monthly mowing management schedule. This mix is typically used along non-residential and non-curb areas. Seeding rate is 4 lbs. per 1,000 sq. ft. The contractor shall use IN DOT R seed mix, IN Roadside Mix or approved proprietary equivalent. All seed must follow set seed requirements by law for the State of Indiana pertaining to but not limited to noxious weeds, germination, and testing requirements.

- 55% 'Kentucky 31' Tall Fescue
- 38% 'IQ' Perennial Ryegrass
- 6% 'Orbit' Creeping Red Fescue

SOD OVERSEED MIX

The intended use for this mix is aid in establishment of installed sod. This mix is only to be utilized as an over seeding to establishing sod, and is not intended as an alternative to other seed mixes. Seeding rate is 3 lbs. per 1,000 sq. ft. The contractor shall use Execu-Turf Premium Sod Blend or approved proprietary equivalent. All seed must follow set seed requirements by law for the State of Indiana pertaining to but not limited to noxious weeds, germination, and testing requirements.

- 20% 'Jackpot' Kentucky Bluegrass
- 20% 'Beyond' Kentucky Bluegrass
- 20% 'Arrowhead' Kentucky Bluegrass
- 20% 'Midnight' Kentucky Bluegrass
- 20% 'Impact' Kentucky Bluegrass

TEMPORARY SEED

Temporary seed shall be addressed in areas that remain inactive for more than 15 days, or as agreed to by the Contractor and the Engineer/Project Manager. The area will be considered inactive when no meaningful work toward accomplishing a pay item has been performed at a site of disturbed soil. Temporary seed will be approved for use by visual inspection of the Engineer/Project Manager. Temporary seed may be purchased from any commercial source provided the seed's package is clearly marked and labeled by the manufacturer as to its content and weight. Stabilization methods shall be as shown in the SWQCP. It shall be used for surface stabilization and temporary ground cover. It is not intended to be used as permanent seed mixture. This mixture shall not be used to satisfy the requirements of the warranty bond. Temporary seed and ground cover shall be used in accordance with the requirements below. **When installing Native seed, seed oats shall be the only cover crop used.**

- A. Special Projects (High Visibility)-At the discretion of the Engineer/Project Manager, the specified Park Mix or approved equivalent shall be used.

Park Mix	Application Rate, PLS
40% 'IQ' Perennial Ryegrass	3lbs/acre
30% 'Boreal' Creeping Red Fescue	
30% 'Appalachian' Kentucky Bluegrass	

- B. Spring Cover Crop (March 15th-May 15th)

Common Name	Botanical Name	Application Rate, PLS	
Common Oat (Seed Oats)	<i>Avena sativa</i>	Slope >4:1 = 32lbs/acre	Slope < 4:1= 64lbs/acre
Annual Rye	<i>Lolium multiflour</i>	Slope > 4:1= 15 lbs/acre	Slope < 4:1= 15lbs/acre

- C. Summer Cover Crop (May 15th-September 15th)

Common Name	Botanical Name	Application Rate, PLS	
Common Oat (Seed Oats)	<i>Avena sativa</i>	Slope >4:1 = 32lbs/acre	Slope < 4:1= 64lbs/acre

- D. Fall Cover Crop (Sept. 15th- October 31st)

Common Name	Botanical Name	Application Rate, PLS	
Common Oat (Seed Oats)	<i>Avena sativa</i>	Flat= 64lbs/acre	Slope < 4:1= 64lbs/acre
Annual Rye	<i>Lolium multiflour</i>	Flat= 15 lbs/acre	Slope < 4:1= 15lbs/acre

- E. Winter Cover Crop (Nov. 1st- March 15th)

Common Name	Botanical Name	Application Rate, PLS	
Winter Wheat	<i>Triticum sp.</i>	Flat= 64lbs/acre	Slope < 4:1= 64lbs/acre
Annual Rye	<i>Lolium multiflour</i>	Flat= 11 lbs/acre	Slope < 4:1= 15lbs/acre

WETLAND MIXTURE

This seed mixture is intended for specific areas that are seasonally or regularly inundated with water for extended periods of time. It acts as a naturally occurring filtration system and slows immediate flooding within a given area. This seed mixture will be determined by the Right of Way Manager. This seed mixture will

be designed based on site specific soil type, soil moisture, sun exposure, and desired plant community of the project. If certain species in this mix are unavailable, substitutions may be allowed when approved by the Right of Way Manager.

NATIVE FLOODPLAIN MIXTURE

This seed mixture is intended for areas that require natural habitat restoration below the 100 year floodplain in conjunction with IDNR Construction in a Floodway permit and Floodway Habitat Mitigation. If certain species in this mix are unavailable, substitutions may be allowed with prior approval of the Project Manager. This mix quantity shall be measured in pure live seed, PLS, pounds per acre. Fertilizer shall not be applied with this seed mixture.

NATIVE FLOODPLAIN SEED MIX		
GRAMINOIDS		
Botanical Name	Common Name	Oz/Acre
<i>Carex frankii</i>	Frank's Sedge	3
<i>Carex granularis</i>	Meadow Sedge	1
<i>Carex lupulina</i>	Common Hop Sedge	2
<i>Carex muskingumensis</i>	Palm Sedge	1
<i>Carex grayi</i>	Burr Sedge	2.5
<i>Carex normalis</i>	Spreading Oval Sedge	0.5
<i>Carex vulpinoidea</i>	Pointed Oval Sedge	1
<i>Elymus riparius</i>	Riverbank Wild Rye	16
<i>Elymus virginicus</i>	Virginia Wild Rye	48
<i>Glyceria striata</i>	Fowl Manna Grass	2
<i>Leersia oryzoides</i>	Rice Cut Grass	2
<i>Panicum virgatum</i>	Switch Grass	1
<i>Scirpus atrovirens</i>	Dark Green Rush	1
Total		81

FORBS		
Botanical Name	Common Name	Oz/Acre
<i>Asclepias incarnata</i>	Swamp Milkweed	1
<i>Asclepias syriaca</i>	Common Milkweed	2
<i>Bidens cernua</i>	Nodding Beggarstick	2
<i>Helenium autumnale</i>	Autumn Sneezeweed	3
<i>Heliopsis helianthoides</i>	False Sunflower	2
<i>Lobelia siphilitica</i>	Great Blue Lobelia	0.5
<i>Lycopus americanus</i>	Water Horehound	1
<i>Mimulus ringens</i>	Monkey Flower	0.5
<i>Rudbeckia laciniata</i>	Green-Headed Coneflower	1
<i>Senna hebecarpa</i>	Wild Senna	2
<i>Silphium perfoliatum</i>	Cupplant	3
<i>Solidago gigantea</i>	Late Goldenrod	1.5
<i>Symphyotrichum novae-angliae</i>	New Englad Aster	1
<i>Symphyotrichum puniceum</i>	Swamp Aster	2
<i>Verbena hastata</i>	Blue Vervain	2
<i>Verbesina alternifolia</i>	Wingstem	2
Total		26.5
COVER CROP		
Botanical Name	Common Name	Oz/Acre
<i>Avena sativa</i>	Annual Seed Oats	512

2) Fertilizer

Fertilizer shall be of standard commercial types supplied separately or in mixtures and furnished in moisture-proof containers. Each container shall be marked with manufacture's label of the contents and percentages of ingredients contained therein. Fertilizer shall be of a 19-19-19 analysis or approved equal uniform in composition, free flowing, and suitable for application with approved equipment. Tests will not be required, but fertilizer standards shall be governed by the rulings of the Indiana State Seed Commissioner. Any fertilizer, which becomes unsuitable for use, for whatever reason, will not be accepted.

3) Straw Mulch

Contractor shall mulch all seeded areas within 24 hours with weed free straw mulch that has been approved by the North American Weed Free Forage Certification Program and/or Indiana Crop Improvement Association, or an approved equivalent. It shall be dry, clean, and mildew-free. Contractor shall mulch evenly across the seeded area leaving no excessive bare spots or mulch greater than a depth of ½". The straw mulch shall cover approximately 75% of seeded area. Once mulch has been applied, all areas seeded should be firmly pressed into soil using a cultipacker or equivalent equipment.

4) Wood Cellulose Fiber (Hydro Mulch)

Wood cellulose fiber mulch shall be made from wood chip particles manufactured particularly for discharging uniformly on the ground surface when disbursed by a hydraulic water sprayer. It shall remain in uniform suspension in water under agitation and blend with grass seed, and fertilizer when allowed, to form homogeneous slurry. The mulch fibers shall intertwine physically to form a strong moisture holding mat on the ground surface. The mulch shall be heat processed so as to contain no germination or growth inhibiting factors. It shall be non-toxic and colored green. The percent of moisture content shall be determined below, except material containing more than 15% will be rejected. The ash content shall not exceed 1.5%. One hundred grams of oven dried material saturated in water, drained, and weighed shall hold a minimum of 1,000 grams of water.

Wood / Cellulose Fiber Blend Hydraulic Mulch (HM) with Tackifier - HM shall be 100% biodegradable, made in the United States and composed of 100% recycled processed wood fibers, cellulose fibers and wetting agents (including high-viscosity colloidal polysaccharides). Wood Fiber / Cellulose Fiber Blend with Tackifier (such as Second Nature® Wood Fiber Blend PLUS or approved equivalent) shall be pre-packaged by the Manufacturer to assure both material performance and compliance. Do not apply if moisture has exceeded the infiltration capacity of the soil or substrates. Do not apply if excessive precipitation is anticipated within 24-48 hours.

The percent of moisture shall be determined at the time the mulching material is weighed. Facilities shall be provided for weighing in accordance with 109.01(b). Arrangements shall be made in advance so that the percent of moisture will be determined at the time of weighing and that the weight of the material will be checked. Moisture content of the mulch will be determined on the basis of air dry weight as follows:

$$\text{Moisture Content \%} = \frac{\text{Wet Weight of sample} - \text{Air Dry Weight of sample}}{\text{Air Dry Weight of Sample}} \times 100$$

The gross, or wet, weight of mulching material furnished and placed will be paid for if the moisture content does not exceed 10%. If the moisture content exceeds 10%, the weight to be paid for will be the gross, or wet, weight minus the weight of excess moisture computed as follows:

$$\text{Weight to be paid for} = G \times \frac{100}{(100 + M)}$$

G = Gross, or wet, weight of mulching material

M = Moisture content, %, in the mulching material to the nearest 0.5%.

Mulching material which contains more than 50% moisture will be rejected. Wood cellulose fiber mulch containing more than 15% moisture will be rejected.

5) Erosion Control Blanket

The Contractor shall use an erosion control blanket specified in project plans or by the Project Manager/Engineer that meets soil stabilization requirements based on slope, inundation and rate of drainage flow. On slopes steeper than 3:1, or when specified, the following methods or an approved equal shall be used. Erosion control blanket shall be anchored by 11 gauge U-shaped staples. Staple length shall be determined by soil type. Staple installation and staple pattern shall follow manufacturer's recommendation based on site slopes, soil types, and water flow.

a. EroNet S75 Erosion Control- Soils that are level to nearly level or equal to or less than 3:1

i. The short-term single net erosion control blanket shall be a machine produced mat of 100% agricultural straw with a functional longevity of up to 12 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top side with a lightweight photodegradable polypropylene

netting having an approximate 0.50 x 0.50 in. (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

b. EroNet S150 Erosion Control Blanket- Soils that are level to nearly level or equal to or less than 2:1.

i. The short-term double net erosion control blanket shall be a machine produced mat of 100% agricultural straw with a functional longevity of up to 12 months. (NOTE: functional longevity may vary depending upon climatic conditions, soil, geographical location, and elevation). The blanket shall be of consistent thickness with the straw evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with a lightweight photodegradable polypropylene netting having an approximate 0.50 x 0.50 in. (1.27 x 1.27 cm) mesh. The blanket shall be sewn together on 1.50 inch (3.81 cm) centers with degradable thread. The blanket shall be manufactured with a colored thread stitched along both outer edges (approximately 2-5 inches [5-12.5 cm] from the edge) as an overlap guide for adjacent mats.

c. VMAX C350 Turf Reinforcement Mat -Soils that are on slopes equal to or great than 1:1 or experience rapid and significant inundation.

i. The composite turf reinforcement mat (C-TRM) shall be a machine-produced mat of 100% coconut fiber matrix incorporated into permanent three-dimensional turf reinforcement matting. The matrix shall be evenly distributed across the entire width of the matting and stitch bonded between super heavy duty UV-stabilized nettings with 0.50 x 0.50 in. (1.27 x 1.27 cm) openings, an ultra heavy duty UV-stabilized, dramatically corrugated (crimped) intermediate netting with 0.5 x 0.5 in. (1.27 x 1.27 cm) openings, and covered by a super heavy duty UV-stabilized nettings with 0.50 x 0.50 in. (1.27 x 1.27 cm) openings. The middle corrugated netting shall form prominent closely spaced ridges across the entire width of the mat. The three nettings shall be stitched together on 1.50 in. (3.81 cm) centers with UV-stabilized polypropylene thread to form permanent three-dimensional turf reinforcement matting. All mats shall be manufactured with colored thread stitched along both outer edges as an overlap guide for adjacent mats.

d. Erosion Control Blanket Anchor

i. A 6" u-shape sod staple or an approved alternative shall be used in soils that are considered to be Clay or loam. A 8" u-shape sod staple or an approved alternative shall be used in soils considered to be sand. Other

anchor types shall be approved by Project Manager/Engineer prior to installation.

6) Water

- a. Water used for plant establishment shall be from a clean water source, not a free flowing system such as a drainage ditch, river, or creek. Water shall be free of impurities, debris, excessive silt, sand, or clay. Water shall contain no pollutants, excessive salts, or excessive sodium that are detrimental to plant health and growth.
- b. The contractor may also apply for a temporary water meter through City Utilities. An online application is available at:

<https://eforms.acfw.net/iFiller/iFiller.jsp?fref=8ec7098186e9419c403c12f817ffff09>

(c) Construction Requirements

1) Seed

Turf Seed

Turf seeding shall be done at the time designated by the Project Manager/Engineer; the recommended seeding dates are from March 1st to June 1st and from August 15th to October 30th. Seeding during any other time shall be considered as a temporary seeding; unless specified by Engineer/Project Manager. All seeded areas shall be straw mulched within 24 hours after seeding. No seed shall be installed during high winds or if the soil infiltration capacity has been exceeded and surface ponding is observed. Seed shall be installed on a firm seedbed and applied at the specified seeding rate. Should the Engineer or Project Manager determine that the site conditions are not suitable for planting, the Contractor shall postpone work until site conditions improve.

Turf seed germination occurs from 14 to 21 days after initial installation. If seeding area has less than 85% vegetative cover 30 days after initial installation the contractor shall amend with additional seed. Prior to amending the seeding areas the soil surface shall be lightly scarified, then seed applied at specified seeding rate, and firmly pressed into soil for soil seed contact. If seed amending is to occur past September 30th, then contractor shall amend areas the following approved seeding start date. Turf grass conditions will not be accepted if there is a poor or thin stand; improper application of sod, dead grass or sod, improper fertilizer application, and the presence of persistent weeds established in turf areas.

The Contractor shall guarantee a good stand of turf in seeded areas by watering, regrading, and reseeding eroded areas and otherwise maintaining all seeded areas until final acceptance. Any areas which do not show a uniform stand or have bare spots shall be reseeded at the Contractor's expense with the same seed mixture as originally used thereon and such reseeding shall be

repeated until all affected areas are covered with a uniform stand of turf.

Turf seed will be considered expired 15 months after the date it was tested. Expired seed shall not be installed.

Native Seed

Native seed mixtures are intended for areas that require natural habitat restoration or natural enhancement. This may include but is not limited to pond edges, wetlands, prairie, woodland, and riparian areas. The seed mixtures will be determined by the Project Manager and will be designed based on site specific soil type, soil moisture, sun exposure, and desired plant community of the project. Native seed shall be purchased from lots for which test results are provided. If certain species in this mix are unavailable, substitutions may be allowed with prior approval by the Project Manager. Native seeding shall be done at the time designated by the Engineer/Project Manager; the recommended seeding dates are prior to June 30th.

The Contractor shall use only native seed mixtures that DO NOT contain hybrids or cultivars of species specified. The Contractor shall use local genotype seed whenever possible due to its adaptation to local soil and climate. The Contractor shall use native seed source identified through the Indiana Crop Improvement Association, Yellow Tag Certification Program (www.indianacrop.org). If specified species are not available through the Yellow Tag Certification Program, seed lots may be used if seed origin, NOT production origin, is within a radius of 350 miles from Fort Wayne, Indiana and is approved by the Project Manager prior to installation. The Contractor shall provide written documentation from the Indiana Seed Commissioner that all seed lots meet Indiana Seed Laws prior to installation. Each bag or container of seed shall have a printed tag or label providing all of the information required by IC 15-15-1-32. Seed from bags with no labels, illegible labels, or with labels not giving all of the required information will not be accepted. The seed supplier shall provide certification that lists the seed lots used in the mixture and shall indicate that the seed mixture supplied meets the contract requirements for the specific contract that the particular seed mixture is supplied. Also, as part of the certification, the seed supplier shall provide a copy of the State Seed Commissioner's letter for the seed mixture that shows that each seed lot has been tested and found to be satisfactory. The specific test results for each seed lot shall also be attached to certification.

The Contractor shall ensure that seed amounts be specified as PLS (pure live seed). Actual amounts used on the project will vary with the actual percent of PLS of the seed lot. The Contractor shall provide documentation from seed vendor for each seed mixture stating the botanical and common name, percentage by weight of each species and proof of PLS testing and adjustment of

the seed weights to provide the amount of pure live seed specified.

The Contractor shall provide seed tests per seed lot of each species used and must follow the State of Indiana seed law requirements for native seeds (<https://www.oisc.purdue.edu/index.html>). The Contractor shall supply seed shipped, stored, and handled in a manner that will insure protection from moisture, heat, or other conditions that would jeopardize viability or cause germination before installation. The Contractor shall apply all native seed mixes with seed oats (*Avena sativa*) as a cover crop. The Contractor shall not use winter rye, grain rye, or winter wheat as a cover crop, under any circumstances. These plants produce toxins that inhibit native seed germination.

Fertilizer or lime shall NOT be applied when installing native seed under any circumstances. No seed shall be installed during high winds or if the soil infiltration capacity has been exceeded and surface ponding is observed. Seed shall be installed on a firm seedbed and applied at the specified seeding rate. Should the Engineer or Project Manager determine that the site conditions are not suitable for planting, the Contractor shall postpone work until site conditions improve.

Native seed will be considered expired 12 months after the date it was tested. Expired seed shall not be installed.

2) Application

Soil Preparation

The area to be seeded shall be made smooth and uniform and shall be in accordance with the finished grade and cross section shown on the plans or as otherwise designated by the Project Manager/Engineer. All hard surface construction shall be completed prior to soil preparation.

Areas that topsoil is to be incorporated shall be tilled or disc to a depth of four to eight inches before placing material. On slopes steeper than 3:1, depth of cultivation may be reduced as directed by the Project Manager/Engineer. Prior to placing material, the contractor must clear site of all rocks, sticks, stumps, soil fragments and clods larger than one and a half inches in diameter, and all other foreign material or irregularities, which may prevent or interfere with all seeding operations(i.e. erosion control blankets).

If as a result of rain, erosion occurs, ruts or depressions exist; the soil shall be worked again until level and smooth. In addition as a result of rain, a crust forms on soil surface, or if eroded places, ruts or

depressions exist, the contractor shall rework the soil until it is smooth. Areas that are reworked shall be re-seeded.

The contractor shall incorporate specified fertilizer prior to the addition of topsoil. The application of new topsoil will then be applied. The contractor shall provide 3 inches of topsoil for entire area to be seeded. The topsoil shall be spread to a sufficient even depth specified in accordance with the finished grade and cross section shown on the plans or as otherwise designated by the Project Manager/Engineer. The top soil shall then be spread to a sufficient depth to produce the thickness specified after it has been compacted lightly with an approved roller, tamping device, or other method.

3) Fertilizer

Fertilizer shall be of standard commercial types supplied separately or in mixtures and furnished in moisture-proof containers. Each container shall be marked with manufacture's label of the contents and percentages of ingredients contained therein.

The contractor shall incorporate fertilizer during the soil preparation into the top 4" inches. The fertilizer shall be applied at the rate of 5 lbs per 1,000 sq. feet. Fertilizer shall be of a 19-19-19 analysis or approved equal uniform in composition, free flowing, and suitable for application with approved equipment. Tests will not be required, but fertilizer standards shall be governed by the rulings of the Indiana State Seed Commissioner. Any fertilizer, which becomes unsuitable for use, for whatever reason, will not be accepted.

If directed by the Project Manger/Engineer or is required, another fertilizer application of a 19-19-19 analysis or approved equal shall be done as a top dressing between September 15th through October 15th at a rate of 5 lbs per 1,000 sq.ft.

4) Application Methods

a. Hydraulic Method

All hydroseeding shall comply with manufacturer's installation instructions and recommendations. It shall contain a tack additive to help prevent erosion of topsoil, mulch, and seed material. Wood cellulose fiber may be used where mulched seeding is specified. Wood cellulose fiber mulch shall be placed at the rate of 1 ton/ac within 24 h after seeding operations have been completed. Application shall be by hydraulic mulching and consist of mixing wood cellulose fiber mulch

and grass seed with water. It shall be mixed in standard hydraulic mulching equipment to form a homogeneous slurry. The slurry shall be sprayed, under pressure, uniformly over the soil surface. The hydraulic mulching equipment shall contain a continuous agitation system that keeps all materials in uniform suspension throughout the mixing and distribution cycles.

If hydraulic mulch is installed on or after May 1 and on or before August 15, the contractor is responsible to irrigate hydraulic mulch area. The contractor shall irrigate four to seven days after initial installation and continue to irrigate, as needed, until uniform emergence has occurred and turf is approximately two inches in height.

b. Mechanical Methods

An approved mechanical method which shall place the seed in direct contact with the soil may be used. This may include a broadcast seeder, drill seeder or cultipacker seeder. Broadcast seeding is preferred over drill seeding on graded, bare soil sites. The Contractor shall calibrate all seeding equipment, whether broadcast or drilled, to deliver the seed at the rates and proportions specified in the plans. The Contractor shall acquire bulk weight per acre from the seed vendor for calibration. The Contractor shall calibrate or check calibrations at least twice a day to ensure seed is being applied at proper rate per acre. Seed shall be applied uniformly over the entire project area. Following the seeding, the Contractor shall then press seed into the surface using a cultipacker, roller, or other approved equipment.

For drill seeding native seed, the Contractor may use a rangeland type no-till drill designed to plant native grasses and forbs in bare soils. Acceptable drills are manufactured by Truax, Great Plains, and John Deere, Inc. Where determined by the Engineer/Project Manager, cultipacking or rolling before seeding may be required by the Contractor to prevent seed placement depths exceeding $\frac{1}{4}$ inch. The Contractor shall NOT substitute Hydro-seeding for drill seeding.

c. Hand Method

In places inaccessible to mechanical equipment, or where the area to be seeded is small, a hand operated seeder or other approved equipment may be used. Rates shall be twice that of other methods and the application shall be applied with a minimum of two passes over the areas to be seeded in order to assure uniform coverage of all seeded surfaces.

5) Erosion Control Blanket Installation

a. Slope Installation (See Figure 1&2)

- i. Prepare soil before installing Rolled Erosion Control Products (RECPs), including any necessary application of lime, fertilizer and seed.
- ii. Begin at the top of the slope by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
- iii. Roll the RECPs down or horizontally across the slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations.
- iv. The edges of parallel RECPs must be stapled with an approximately 2 in.-5 in. (5-12.5 cm) overlap depending on the RECP type.
- v. Consecutive RECPs spliced down the slope must be end-over-end (shingle style) with an approximate 3 in. (7.5 cm) overlap. Staple through overlapped area, approximately 12 in. (30 cm) apart across entire RECPs width.*

NOTE: In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.

b. Bioswale Installation (See Figure 1&3)

- i. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed.
- ii. Begin at the top of the channel by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
- iii. Roll center RECPs in direction of water flow in bottom of channel. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.

- iv. Place consecutive RECPs end-over-end (shingle style) with a 4 in.-6 in. (10-15 cm) overlap. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center to secure RECPs.
- v. Full-length edge of RECPs at top of side slopes must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.
- vi. Adjacent RECPs must be overlapped approximately 2 in.- 5 in. (5-12.5 cm) (depending on RECP type) and stapled.*
- vii. In high flow channel applications a staple check slot is recommended at 30 to 40 ft (9-12 m) intervals. Use a double row of staples staggered 4 in. (10 cm) apart and 4 in. (10 cm) on center over entire width of the channel.
- viii. The terminal end of the RECPs must be anchored with a row of staples/stakes approximately 12 in. (30 cm) apart in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench. Backfill and compact the trench after stapling.

NOTE: In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.

c. Streambank Installation (See Figure 1&4)

- i. For easier installation, lower normal water level before installation to allow bottom trenching.
- ii. Prepare soil before installing RECPs, including any necessary application of lime, fertilizer and seed.
- iii. Begin at the top of the shoreline by anchoring the RECPs in a 6 in. (15 cm) deep x 6 in. (15 cm) wide trench with approximately 12 in. (30 cm) of RECPs extended beyond the upslope portion of the trench. Anchor the RECPs with a row of staples/stakes approximately 12 in. (30 cm) apart in the bottom of the trench. Backfill and compact the trench after stapling. Apply seed to the compacted soil and fold the remaining 12 in. (30 cm) portion of RECPs back over the seed and compacted soil. Secure RECPs over compacted soil with a row of staples/stakes spaced approximately 12 in. (30 cm) apart across the width of the RECPs.
- iv. Roll RECPs either down the shoreline for long banks (top to bottom) or horizontally across the shoreline slope. RECPs will unroll with appropriate side against the soil surface. All RECPs must be securely fastened to soil surface by placing staples/stakes in appropriate locations as shown in the staple pattern guide.
- v. The edges of all horizontal and vertical seams must be stapled with an approximately 2 in.-5 in. (5-12.5 cm) overlap. In streambank applications, seam overlaps should be shingled in the predominant flow direction.

- vi. The edges of the RECPs at or below normal water level must be anchored by placing the RECPs in a 12 in. (30 cm) deep x 6 in. (15 cm) wide anchor trench. Anchor the RECPs with a row of staples/stakes spaced approximately 12 in. (30 cm) apart in the trench. Backfill and compact the trench after stapling (stone or soil may be used as backfill). For installation at or below normal water level.

NOTE: In adverse soil conditions longer staples/stakes or earth anchors may be necessary to properly secure the RECPs.

6) Maintenance

a. General

The Contractor shall protect seeded areas from damage from equipment or traffic which may cause damage to the newly seeded surface. Areas that are damaged shall be repaired by re-grading, re-seeding, as directed by the Project Manager/Engineer, at no additional cost to the City. The Contractor shall otherwise maintain seeded areas in a satisfactory condition until Final Acceptance of the Work. The seed/sod shall be maintained for 30 consecutive days, excluding the winter dormant periods between November 15 and April 15. Re-seeding of bare spots shall be done as many times as necessary until an acceptable stand of turf is established.

Mowing of seeded areas shall be the Contractor's responsibility until final acceptance of the project. No mowing shall remove more than one-third of the grass blade length. Heavy mowing, resulting in grass piles shall be mowed twice or piles shall be removed. Mowing maintenance shall occur when vegetation exceeds 6 inches in height for the residential, sod and temporary seed mixtures. Mowing maintenance shall occur when vegetation exceeds 12 inches in height for no-mow and roadside mixtures. The contractor shall maintain an established vegetative minimum height of six inches. Vegetation shall NOT be cut below a six inch height. Mow maintenance shall be done as needed to maintain the vegetative height of six to eight inches during first growing season or until project is complete.

b. Watering

The Contractor shall be responsible for the watering during the maintenance period. Water shall not exceed the infiltration capacity of the soil during application. Excessive irrigation or puddling of seedbed will create poor root develop and cause erosion issues. Irrigation shall be applied by a wide fan spray nozzle with medium size droplets and shall not dislodge seed or seedlings. Irrigation shall not be applied in winds excess of 10 mph, temperatures exceeding 85°, or between 11:30am and

5:00pm. The ideal time for irrigation is 4:00 am to 9:00 am; this reduces disease, sun scaled, and evaporation. Water used for plant establishment shall be from a clean water source, not a free flowing system such as a drainage ditch, river, or creek. Water shall be free of impurities, debris, excessive silt, sand, or clay. Water shall contain no pollutants, excessive salts, or excessive sodium that are detrimental to plant health and growth.

The contractor may also apply for a temporary water meter through City Utilities. An online application is available at:

<https://eforms.acfw.net/iFiller/iFiller.jsp?fref=8ec7098186e9419c403c12f817ffff09>

c. Clean-Up

As seeding operations proceed, all rope, wire, burlap, empty containers, rocks, clods, and all other debris shall not be allowed to accumulate and shall be removed daily. Debris shall not be burned. The Contractor shall keep the work area as tidy as possible at all times. Any soil, peat, seeding materials, manure, or similar items which have been brought onto paved areas by work operations, shall be removed promptly by sweeping, and, if necessary, by washing, keeping the area clean. Other excess soil shall be disposed of off-site. All ground areas disturbed as a result of planting operations shall be restored to their original condition or to the desired new appearance.

7) Warranty Bond

Permanent seeding that requires a warranty bond to meet requirements shall be warranted against failure resulting from lack of germination or method of application. The seeding shall be warranted to germinate and shall be free of obvious erosion occurrences. The intent of the warranty bond shall be to enable the final acceptance of the contract and payment of the retainage. All seeding which has significantly failed to attain approximately 90% germination shall be replaced with no additional payment. A properly executed maintenance bond with a surety shall be provided prior to the completion of the work. A warranty shall be made, with no additional payment, to replace all seeding in areas which has not effectively performed useful service as specified, as well as for the repair of designated erosion areas caused by seeding failure. Such warranty shall be in writing with proper execution of the maintenance bond with a proper surety. The warranty shall be equivalent to 1 1/2 times the cost of the seeding work completed after October 15 with a minimum bond amount of \$25,000. All requirements for seeding work will still apply during the warranty period unless otherwise directed.

For the terms of the warranty, a reseeding unit shall be defined as an area equal to or larger than 2,000 sq ft in size. An erosion unit may be of an area of significance as determined.

The warranty shall cover work completed from October 16 through January 31. The Department will determine if the Contractor shall be released from the warranty. This determination will be made within 10 calendar days after documented request for inspection is made by the Contractor. Such determination will not be made prior to April 1. All replacement work shall be finished prior to June 15 with no additional payment. The Project Manager/Engineer will certify in writing as to the completion of the work and will make proper notification for the releasing of the bond.

If the Contractor does not complete the necessary repairs before June 15, and there are no justifiable reasons for the Department to grant an extension, the Contractor shall forfeit the bond for the seeding work only. If a bond is forfeited, the Contractor will be required to explain to the Department why the Contractor's experience reduction factors do not warrant an increase.

(d) Method of Measurement

Seed mixtures will be paid for at the contract unit price per pound for the class and type specified. Mulched seeding will be paid for at the contract unit price per square yard for the class and type specified, complete in place. Fertilizer will be measured by the pound per 1,000 square feet. Water will be measured by the gallon. Clearing and grubbing will be paid for at the contract unit price per acre respectively for each of the pay items shown below.

(e) Basis of Payment

Payment for all seeding includes payment for the thirty day establishment period. Upon Final Acceptance, the remainder of the contract will be paid. If areas are damaged or have insufficient coverage, they must be repaired or replaced as requested by the Project Manager/Engineer.

a. Area Basis-The work to be measured will be the number of acres and fractions thereof acceptably cleared and grubbed within the limits shown on the plans or staked for clearing and grubbing. Areas not shown on the plans or not staked for clearing and grubbing will not be measured for payment.

b. Lump Sum Basis- If clearing and grubbing is specified as a lump sum pay item, no measurement of area will be made.

Payment will be made under:

Pay Items	Units
Seed.....	LBS
Hydro Seed.....	LBS
Fertilizer.....	LBS
Mulching Material.....	CYS
Mulched Seeding.....	SYS
Clearing and Grubbing.....	ACRE/LUMP SUM
Scalping.....	ACRE
Clearing Right-of-Way.....	LUMP SUM
Water.....	GAL

The cost of preparing seed beds, sowing, raking, and all other necessary incidentals shall be included in the cost of seed mixtures. The cost of furnishing and placing fertilizer, seed mixtures, and mulching material, in addition to the incidentals listed above for seed mixtures shall be included in the cost of mulched seeding.

The cost of furnishing, hauling, and placing the material, including material used as tie-down, repair of areas for which mulch fails to stay in place, all labor, equipment, and necessary incidentals shall be included in the cost of mulching material. Water will be paid for only when ordered after the 30 day period.

623.08 SOD

(a) Description

1) Contractor shall perform all operations under this section which will include installation, cultivating and maintenance of sod.

2) Submittals

Sod: Contactor shall provide sales receipt or certificate describing sod blend.

3) To seed or sod at times other than the ones listed below, requires approval by Engineer/Project Manager.

i. Regular Sodding Season

- Spring-March 1-May1
- Fall-October 1-November
- Summer sodding between June and August 15 are at the contractor’s risk. Dry and hot weather difficulties are the responsibility of the Contractor.

(b) Materials

1) Sod shall consist of fibrous, well rooted variety or blend of Kentucky bluegrass, fescue, or other approved grass cut to a height of 2 to 3 inches. Edges of sod shall be cut cleanly, to a uniform minimum thickness of ¾ inch or more. It shall be a uniform width of no less than 16 inches and no less than 3 feet in length. Sod

shall be free from all debris and weeds in accordance with Indiana State Seed Law, IC 15-4-1.

2) Nursery sod shall meet applicable requirements as set out above and shall be a variety or blend of Kentucky bluegrass or fescue. It shall comply with nursery inspections and plant quarantine regulations of the states of origin and destination as well as with Federal regulations governing interstate movement of nursery stock.

3) Sod shall show no signs of leaf discoloration, desiccation of leaves or roots, or excessively dry soil and shall have vibrant healthy appearance. It shall be grown specifically for sod purposes. Sod shall be free of disease, chlorotic conditions, weeds, or infestations.

4) Sod placed in areas with grades steeper than 1% and on slopes 3:1 shall be secured with sod staples. Sod staples shall be at least 6 inches in length.

5) The contractor may apply for a temporary water meter through City Utilities. This would be at the expense of the Contractor. An online application is available at:

<https://eforms.acfw.net/iFiller/iFiller.jsp?fref=8ec7098186e9419c403c12f817ffff09>

(c) Construction Requirements

1) Soil Bed Preparation

The area to be sodded shall be smooth, uniform, and shall be in accordance with the required grades and cross sections shown on the drawings or as directed by the Project Manager/Engineer. In areas that will receive topsoil, Contractor shall scarify and till to a depth of 2 inches. All areas shall be raked and cleared of stones 1 inch in diameter or larger; all other irregularities that might interfere with the placement or maintenance of sod shall be removed from the site. This may include but is not limited to: clods, clumps, trash or sticks. This work shall be approved by the Project Manager/Engineer prior to the placement of topsoil.

2) Top Soil Placement in Sod Areas

Following the grading and cultivation of all areas to be sodded, place a uniform layer of topsoil. Topsoil shall be evenly spread on all designated areas to finish depth of 4 inches. Prior to sod installation, soil surface shall be lightly irrigated if soils are dry or air temperatures are excessively high. Soil shall not be spread when the ground is frozen, excessively wet, or otherwise in a condition detrimental to the work.

3) Sod Placement

i. General

- a. Sod shall be installed within 32 hrs. after cutting and shall be protected from moisture loss, exposure to wind, sun, and high temperatures. During the months of June, July and August, sod shall be installed within 24 hours after cutting. It shall be cut utilizing sharp blades

mechanized equipment designed for cutting sod. It shall be cut so as to leave a full intact root mass with uniform thickness as specified by the project plans. Sod shall be cut in straight lines and to the specified uniform width and length. Sod strips shall be handled with care to minimize root structure damage, tearing or excessive stretching. Sod that is dry or without soil firmly attached to the roots shall be removed from the project site.

- b. Winter sodding will be allowed when the temperature is above 35°F. No frozen sod shall be laid and no sod shall be laid on frozen soil. To prevent sod damage at lower air temperatures, sod shall not be handled, walked on, or driven on if a hard frost has occurred over night.
- c. The contractor shall fill any gaps of sod shrinkage overwinter with approved soil and add Sod Overseed mix to entire sod area.

ii. Placement

- a. Surfaces prepared for sod shall be of sufficient depth below unseated areas that newly laid sod shall be in accordance with the surrounding surface.
- b. Sod strips shall be laid adjacent to previous strip so that all edges are in contact not overlapping with another sod strip and staggered from strips above or below. Areas to be installed shall have clean, straight edges and cut exactly perpendicular to the soil surface.
- c. Where curves are necessary, the sod shall be cut to provide edges in full contact with adjacent sod. There shall be no gaps between adjacent pieces of sod. The contractor shall use weed-free soil to fill in any seams and exposed edges to prevent desiccation of sod.
- d. Sod placed in areas with grades steeper than 1% and on slopes 3:1 shall be secured with sod staples. Sod staples shall be at least 6 inches in length and be placed no more than 2ft apart in each strip. Staples are to be driven flush with sod. On sloping terrain (3:1 or steeper), where erosion may be a problem, sod should be installed perpendicular to slope when possible with staggered joints and secured by staples. Staples are to be driven flush with sod. Sod in swales shall be stapled.

iii. Finishing

- a. Areas where sod is placed shall be immediately tamped or rolled lightly to provide uniform contact with soil. Contractor is responsible for have adequate water available on site prior to and during the installation.

- b. Contractor shall provide new topsoil as required to fill low spots, and cracks between sod strips to meet new finish grade.
- c. Contractor shall water sod immediately after transplanting to prevent drying. The amount of watering shall be sufficient enough to saturate the sod and the upper few inches of the underlying soil.

4) Maintenance

i. General

- a. Sod shall be maintained until sod roots have established in new topsoil and for a minimum of four weeks from the time it is laid and upon approval from the Project Manager/Engineer.

ii. Watering

- a. Water used for plant establishment shall be from a clean water source, not a free flowing system such as a drainage ditch, river, or creek. Water shall be free of impurities, debris, excessive silt, sand, or clay. Water shall contain no pollutants, excessive salts, or excessive sodium that are detrimental to plant health and growth. During periods of ample rainfall, watering may be modified to simulate the above schedule.
- b. The Contractor shall be responsible for the watering during the maintenance period. Water shall not exceed the infiltration capacity of the soil during application. Excessive irrigation or puddling of seedbed will create poor root develop and cause erosion issues. Irrigation shall be applied by a wide fan spray nozzle with medium size droplets and shall not dislodge seed or seedlings. Irrigation shall not be applied in winds excess of 10 mph, temperatures exceeding 85°, or between 11:30am and 5:00pm. The ideal time for irrigation is 4:00 am to 9:00 am; this reduces disease, sun scaled, and evaporation.

iii. Clean-Up

- a. As seeding operations proceed, all rope, wire, burlap, empty containers, rocks, clods, and all other debris shall not be allowed to accumulate and shall be removed daily. The Contractor shall keep the work area as tidy as possible at all times.
- b. Any soil, peat, seeding materials, manure, or similar items which have been brought onto paved areas by work operations, shall be removed promptly by sweeping, and, if necessary, by washing, keeping the area clean. Other excess soil shall be disposed of off-site.
- c. All ground areas disturbed as a result of planting operations shall be restored to their original condition or to the desired new appearance.

5) Final Acceptance

When Sod has been maintained and established after the 4 to 8 week maintenance period. It shall be healthy, well-rooted, even-colored, free of weeds, open joints, bare areas and surface irregularities.

(d) Method of Measurement

Sod shall be measured per 1,000 square feet. The measurement of sod shall include all cultivating, materials, and fertilizer, if required. Clearing and grubbing will be paid for at the contract unit price per acre respectively for each of the pay items shown below. The measurement of water shall be gallons and fertilizer shall be measured in pounds.

(e) Basis of Payment

Sodding will be paid for at the contract unit price per square foot, complete in place. The cost of fertilizer, water, excavation of earth bed, disposal of surplus material, and all necessary incidentals shall be included in the cost of sodding or nursery sodding.

- 1) Area Basis-The work to be measured will be the number of acres and fractions thereof acceptably cleared and grubbed within the limits shown on the plans or staked for clearing and grubbing. Areas not shown on the plans or not staked for clearing and grubbing will not be measured for payment.
- 2) Lump Sum Basis- If clearing and grubbing is specified as a lump sum pay item, no measurement of area will be made.

Payment will be made under:

Pay Items	Units
Sod.....	1,000 S.F
Fertilizer.....	LBS
Clearing and Grubbing.....	ACRE/LUMP
SUM	
Scalping.....	ACRE
Clearing Right-of-Way.....	LUMP SUM
Water.....	GAL

623.09 GLOSSARY OF TERMS

Reference the following for terminology

Appendix A. –

American National Standards for Nursery Stock, ANSI Z60.1, latest edition.

American Nursery and Landscape Association, 1250 I Street N.W., Suite 500, Washington, D.C., 20005.

ANSI A300- American National Standard Institute's accepted industry standards for tree care practices operations.

ANSI Z133- American National Standard Institute's accepted industry safety standards for tree care operations.

ANSI Z87.1- American National Standard Institute's accepted industry face and eye protection standards for tree care operations.

Basal Treatment- An application to the stems and root flare of woody vegetation from (12"-18") to the natural grade of soil.

Brush- Woody stems that are less than (4") inches in diameter.

Cambium- The layer of dividing meristematic cells beneath the bark giving rise to xylem and phloem, which account for a tree's growth in diameter.

City- refers to the municipal government of Fort Wayne, Indiana.

Clearing- The physical cutting and/or removal of vegetation.

Climbing Spurs- A piece of climbing equipment with sharp metal spikes used assist tree care professionals in climbing trees being removed or pruned.

Cut-Stump Treatment- An application of herbicide to cut vegetation covering the cambium layer, bark and root flare of the stump.

Debris-Vegetative and non-vegetative materials such as: branches, bottles, wires, or other residual materials from clearing operations.

Diameter at Breast Height (DBH) - Diameter of trees or brush measured at chest level, approximately four and half feet above the natural grade.

Drift- The movement of airborne particles by wind away from the intended target area.

EPA- Environmental Protection Agency regulates pesticides through several federal laws.

Foliar Treatment- An application to the leaves or foliage of the vegetation, but not to the point of runoff.

Hazard Vegetation- Vegetation that poses a risk to public or Contractor safety and impedes movement along public corridors. Hazard vegetation may obscure visibility, signs and vehicular movement.

Herbicide- chemicals used to control, suppress or kill unwanted vegetation.

IDEM- Indiana Department of Environmental Management implements federal and state regulations to protect human health and the environment while allowing environmentally sound operations of industrial, agricultural, commercial and governmental activities vital to a prosperous economy.

Invasive Vegetation- A plant species that displaces desired species, native or non-native.

Lateral Branch- Secondary or subordinate branch that is capable of sustaining the vegetation's natural growth patterns and processes.

Low Volume Application- A spray application of less than 20 gallons per acre.

Manual on Uniform Traffic Control Devices (MUTCD)- is a compilation of national standards for all traffic control devices, including road markings, highway signs, and traffic signals.

OISC- The Office of Indiana State Chemist who is in charge with administering several agricultural laws involving seeds, fertilizers, animal feeds and pesticides.

OSHA- Occupational Safety and Health Administration ensure safe and healthful working conditions for working men and women by setting and enforcing specific standards.

Pesticide- As defined by OISC-Chapter 4: IC 15-16-4-30: Any substance or mixture of substances intended for: preventing; destroying; repelling; or mitigating a pest and any substance or mixture of substances intended for use as a: plant regulator; defoliant; or desiccant.

Raising- The selective pruning of vegetation to provide vertical clearance.

Reduction Cut- Reduces the length of a branch or stem back to a live lateral branch large enough to assume apical dominance- this is typically at least one third the diameter of the cut stem.

Resprouts- Multiple suckering stems that vigorously elongate from an area that has been removed and/or pruned.

Sap Flow- The movement of fluid through roots, stems, and branches of plants.

Selective Pruning- The chosen removal of certain parts of the vegetation.

Standard- Industry accepted definitions and principles.

Vegetation- Above ground leafy plant growth. This shall include but not limited to trees, shrubs, grasses, vines, and forbs.

Appendix A: Preferred Herbicides

Herbicide Brand	Active Ingredient	EPA Registration #	Application Type
Pathfinder II	Triclopyr	62719-176	Cut-Stump
Garlon 4 Ultra	Triclopyr	62719-527	Cut-Stump or Foliar
Garlon 3A (Aquatic)	Triclopyr	62719-37	Cut-Stump or Foliar
Rodeo	Glyphosate	62719-324	Cut-Stump or Foliar
Accord XRT II	Glyphosate	62719-556	Cut-Stump or Foliar
