CITY OF MADISON, INDIANA
DESIGN STANDARDS AND SPECIFICATIONS MANUAL

Adopted: August 4, 2023

THE CITY OF MADISON, INDIANA
101 West Main Street
Madison, Indiana 47250
Phone: (812) 265-8300

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CITY ATTORNEY
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Chapter 1. General Construction Specifications

1.1 General Information

The procedures included in this **Design Standards and Specifications Manual** are intended to be a guide for Property Owners, Developers, and Contractors preparing to construct or alter new and / or existing utilities within the City of Madison in public right-of-way or existing utility easements adjacent to public right-of-way. It is not intended to be a comprehensive list of all the requirements for development, but a summary of the steps to be taken and the procedures which must be implemented to obtain approvals for excavation permits. The documents attached as Appendices to this manual are subject to revision and modification by the City's Board of Public Works and Safety, at their discretion, and in consultation with the City's Director of Planning, Utility Manager, and the City Attorney.

Please contact the City of Madison Director of Planning with any questions or suggestions regarding the information included in this manual:

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Requests for waivers of these standards and specifications, other than substituting equivalent or better materials and methods, shall be approved by the Board of Public Works and Safety.

1.2 Permit Requirements

Before any excavation or construction may take place within the public right-of-way (street, alley, treerow, sidewalk, driveway approaches), an application must be made online through the City's permitting portal ***(https://madisonin.viewpointcloud.com/categories/1094)***. The City's Office of Planning, Preservation, and Design shall, upon request of any person, firm, public utility, or corporation, issue a permit as set forth in the ordinance. A sample copy of the permit application along with a copy of the City's Ordinance governing Excavation Permits are included in the attached **APPENDIX A.** Sketches of the proposed work shall be furnished with the application as needed. In the event of an emergency, notification will be given to the City of Madison at the time repair crews are dispatched. If work is required outside business hours, the City of Madison shall be contacted the following business day no later than 8:00 A.M. Permits must be kept on-site when excavation work is being performed. If proper permit documentation is not on site, a Stop Work Order may be issued and violators may be subject to fines and license suspension. Excavation permits will be open for a period of 90 days from the time of purchase. Extensions may be obtained by contacting the City of Madison. If a road closure is required a request for road closure shall be presented to the Board of Public Works and Safety at a regularly scheduled meeting.

1.3 Bond and Insurance Requirements

Each person or entity to perform work within City right-of-way or adjacent utility easement must file a performance bond as follows:

A. For an individual, partnership, public utility, association or corporation shall provide a bond in the amount of $10,000 from a reputable surety company shall be provided to the City's Office of Planning, Preservation, and Design;

B. If the individual, partnership, public utility, association, or corporation which obtains an Excavation Permit does not perform proper surface restoration, the City may seek relief from that entity's bonding company and perform the necessary restoration activities itself.

C. An individual, partnership, public utility, association or corporation shall provide evidence of having public liability and property damage insurance in the total sum of $10,000. Such insurance shall provide that the City is additionally insured under its provisions.

1.4 Excavation Work Completion

Once excavation work (inclusive of surface restoration) is complete the permit holder shall be responsible for the work to meet or exceed the requirements set forth in the City's ***Design Standards and Specifications Manual*** for a period of one (1) year. Work performed under an approved Excavation Permit shall be inspected by a representative of the City of Madison (or a designated third party representative of the City) to insure full compliance with the City's standards and provisions. Anyone found in violation of these conditions or found to be performing excavation work without a valid permit shall be subject to a fine in the amount not to exceed $2,500.00.

1.5 Time Restrictions on Work Hours

Adjacent properties shall have access to the abutting street between the hours of 6:00 PM and 8:00 AM unless notice has been given to the property owner and occupant at least 5 days prior to work.

1.6 Traffic Control

It is the sole responsibility of the Contractor to make sure that barricades are placed at the excavation site when not in attendance or where the safety of the public is of concern while work is proceeding. Barricades shall meet the requirements of the latest version of the *Indiana Manual on Uniform Traffic Control Devices*. Contractor shall provide lighting of barricades on construction sites. In cases where excavation activities occur within a sidewalk, it is the sole responsibility of the Contractor to insure that full ADA access is provided and maintained around their construction area.

1.7 Street Repair / Street Patching

A. General

Finished elevation of repairs should provide a smooth driving surface matching the existing grades unless directed otherwise by the City of Madison. In general, the minimum size of street repair/patching will be a 4' X 4' section; smaller sections will require the approval of the City of Madison. No more than 200 linear feet of trench shall be open at one time.

B. Pavement Excavation

All excavations shall be saw-cut with straight, neat, vertical edges and square corners. Saw cuts shall be made to a minimum of 2" depth. The cut shall be completed with a mechanical device starting from the center of the cut. When cutting asphalt over brick or concrete the saw cut shall be the full depth of the asphalt.

Openings shall be made so that there is no section of adjacent existing pavement with a dimension of less than 24 inches unless prior approval is obtained from the City of Madison. Patches shall have a minimum width of no less than the depth of excavation unless a trench box is utilized. Cuts in concrete streets shall be taken out to an adjacent joint. Any variation and / or deviation from the above shall require prior approval from the City of Madison.

Methods used in removal of pavement material shall not cause damage to adjacent pavement.

Where existing pavement contains reinforcing steel, the steel shall not be cut with pneumatic hammers, but shall be cut by sawing or torching.

The Contractor shall adhere to the requirements set forth in the City's Standard Excavation Specification included in the attached **APPENDIX B**.

C. Backfilling in Areas Subject to Vehicular Traffic

Backfilling shall be done in accordance with the City's Standard Backfill, Fills, and Embankment Specification (included in the attached **APPENDIX C**) and the current Indiana Department of Transportation Standard Specifications. The excavation shall be filled with the appropriate specified material to a depth no more than 8" below the top surface of existing pavement. The fill shall be clean and free from large or frozen lumps, wood, or any other extraneous / foreign material. It shall consist of suitable sand, crushed stone, or other pre-approved material (pea gravel is not an approved backfill material). The fill material shall be placed in layers, as specified, not to exceed thirty (30) inches, loose measurement, and each layer compacted thoroughly by approved mechanical means. Each lift shall be compacted in accordance with the City's Standard Backfill, Fills, and Embankment Specification.

D. Repair of Concrete Pavement

At a minimum, Concrete Pavement materials and repairs shall comply with the City's Standard Restoration of Surfaces (included in the attached **APPENDIX D**) and Standard Roadways and Parking Areas Specification included in the attached **APPENDIX E**.

Additional requirements for concrete pavement repairs include:

1. Concrete finish shall be perpendicular to the centerline of the road, with a rough broom finish.
2. Depth required is equal to the existing depth of pavement or 8" poured monolithically, whichever is greater, over a minimum of 6" compacted aggregate base or flowable mortar.

3. If the excavation exceeds twelve (12) feet in length and no original joints were provided, then contraction joints must be constructed so that joint spacing does not exceed twelve (12) feet.
4. Concrete streets will be doweled to existing concrete with 5/8" diameter x 11" steel stock with cut threads and expansion type sleeves. Anchor bolts shall be placed along all sides of the removed area and spaced 3 feet on center on the traverse side and 5 feet on center on the longitudinal side with a minimum of 2 anchor bolts on each side.

E. Repair of Asphalt Pavement

At a minimum, Asphalt Pavement materials and repairs shall comply with the City's Standard Restoration of Surfaces (included in the attached **APPENDIX D**) and Standard Roadways and Parking Areas Specification included in the attached **APPENDIX E**.

Additional requirements for asphalt pavement repairs include:

- <u>For Asphalt Surfaces for Cuts 20' X 20' and over:</u>

1. Minimum thickness of 1.5" (9.5 mm) HMA surface or match existing pavement thickness and materials (whichever is greater), placed and compacted in accordance with latest INDOT Standard Specifications.
2. 4.5" (minimum) (25 mm) HMA base or 6" class A concrete base is required under asphalt surface.
3. Tack coat must be used between asphalt surface and concrete base, as well as the sides of existing pavement surrounding the cut.

- <u>Asphalt Surfaces for Cuts under 20' X 20':</u>

1. If street has been paved within the last three years, use specifications for Asphalt Surfaces for Cuts 20' X 20' and over provided above.
2. Concrete pavement that has been overlaid with asphalt shall be considered as asphalt pavement for repair.

F. Repair of Aggregate Pavement

At a minimum, Aggregate surface materials and repairs shall comply with the City's Standard Roadways and Parking Areas Specification included in the attached **APPENDIX E**. Aggregate surface shall be placed where existing alley roadbed are white rock or other stone material. The depth of the compacted material shall be minimum 6 inches.

G. Temporary Street Repair/Patch

At a minimum, temporary street repairs shall comply with the City's Standard Restoration of Surfaces specification included in **APPENDIX D**. Between November 1 and April 1, when permanent restoration cannot be completed within 10 working days **AND** if hot mix asphalt is not available, use of an INDOT approved "high performance cold patch" or equal may be used.

Existing pavement shall be initially saw cut to a 5” minimum depth to obtain straight lines perpendicular form the curb edge and neat edge for paving. Edges of broken pavement shall be squared off and trimmed to neat straight lines. Temporary pavement material is to be 6-1/2” thick high performance cold patch mixture #1 or #2, placed in maximum 4” lifts to be compacted with a mechanical tamp. The use of temporary steel street plates must be requested in written form and accompanied with a repair schedule. Final repair shall be made by removing the temporary patch and repairing as per material requirements. Final repairs shall be made by May 15.

1.8 Material Specifications

Raw materials required for backfill and surface restoration shall comply with the requirements set forth in the City’s Standard Specification for Backfill, Fills, and Embankments (included within the attached **APPENDIX C**) and Standard Specification for Roadways and Parking Areas included in the attached **APPENDIX E**.

1.9 Sidewalks, Curbing, Ramps, and Driveways

At a minimum, sidewalks, curbing, access ramps, and driveway restorations shall comply with the requirements set forth in the City’s Standard Roadways and Parking Areas Specification included in the attached **APPENDIX E**. Driveway – Curb Cut Permits are required and application shall be made online through the City’s permitting portal located at *(https://madisonin.viewpointcloud.com/categories/1094)***.** Additional requirements are outlined as follows:

A. Sidewalks

Sidewalks shall be placed so that the edge away from the street is on the street right-of-way line or shall be in alignment with existing adjacent sidewalk. Any variation from this guideline will require specific approval from the City. New sidewalks shall be five feet (5’) wide, four inches (4”) thick with medium broom finish. Concrete shall be well troweled to prevent spalling and other defects. Sidewalks shall be installed with tooled construction joints, minimum, 1/3 depth of concrete, on 5' centers with an approved expansion joint to be installed every 50' and where new sidewalk abuts existing sidewalk, or other fixed objects, such as curbs, drainage structures, water meters, etc.

Sidewalks less than five feet (5’) in width shall require prior approval from the City. In no case may sidewalks placed within the public right-of-way have a width less than four feet (4’), in compliance with the Americans with Disabilities Act. In general, sidewalks to be replaced shall match the width of existing sidewalk. Sidewalks placed though driveway sections shall be 6” thick through the driveway section. Sidewalks placed adjacent to parking lots, or other large paved surfaces, shall have 6” curbing placed between the sidewalk and parking lot (except at entrances and exits) to prevent traffic flow onto the sidewalk and tree row areas. Sidewalks shall be replaced in whole sections. Under no circumstances will the replacement of a partial section be allowed.

B. Curbing

New curbing will be monolithic combined curb and gutter. Concrete shall have a light broom finish. When matching to existing, care must be taken to transition the last 2 linear feet of curbing to the existing conditions. Replacement or curb to connect to existing shall match existing type.

C. Curb Ramps

Curb ramps will be installed per Indiana Department of Transportation Specifications at repair locations. Ramps should have a rough broom finish and remain unpainted. All curb ramps shall meet or exceed current ADA standards. INDOT curb ramps Type B, E, and F shall not be used on new construction unless field conditions warrant their use.

D. Driveway Approaches

Residential Driveways

1. Residential driveways shall be concrete and shall have the matching type of existing curbing (if any) with a 20’ maximum width at the right-of-way line, and 3’ apron wings, for a maximum 26’ width. Driveway aprons shall not be doweled to existing curb, when driveway is not placed monolithically with curbing.
2. The portion in the right-of-way, including where it is part of the sidewalk, shall be a minimum of 6” thick
3. In areas where no curbing exists along the street, no curbing shall be placed in the radii (or wings) of the driveway within the public right-of-way.

Commercial and Industrial Driveways

1. Commercial driveways shall be concrete; the width shall be 12’ to 15’ for one-way traffic and 24’ to 30’ for two-way traffic. The City shall be provided with site plans showing elevations and water drainage areas for two hundred feet (200’) in all directions. Site plans should also detail all existing intersections located within one hundred feet (100’) of the proposed drives. Entrances will not be allowed within 40’ of the intersection. Driveway aprons shall not be doweled to existing curb, when driveway is not placed monolithically with curbing.
2. The portion of the driveway in the public right-of-way, including the sidewalk section shall be a minimum 6” thick.
3. In areas where no curbing exists along the street, no curbing shall be placed in the radii (or wings) of the driveway section in the public right-of-way. This rule does not apply when curbing is placed along the street as part of the commercial or industrial development.

E. Utility Strip/Tree Row

If trees are present, tree rows should be restored with a minimum four inches (4”) of topsoil matching adjacent elevations and should have seed and straw or sod as specified. Once

the tree has been removed, the stump shall either be removed or be ground a minimum of eight inches (8") below the surface grade. The disturbed area is to be filled with suitable topsoil.

Trees/shrubs shall be a minimum of 15' away from manholes, 10' away from valves, 10' away from inlets, and 10' away from all other structures within the right of way or utility easements.

1.10 Work in Highway, Railroad or Utility Right-of-Ways

The Contractor shall obtain and prepare all necessary permits from highway, railroad and utility authorities for proposed construction and operations relative to the scope of the work. The Contractor shall comply with all codes and regulations of the agencies involved when working on their property. Required permits, codes, repair specifications and regulations regarding work within the right-of-way boundaries and utility easements of the City of Madison are described in Chapter 1 of these standards and specifications.

1.11 Typical Detail Drawings

Typical detail drawings associated with excavations, backfill, and surface restoration are included in **APPENDIX F**.

Chapter 2. Temporary Erosion and Stormwater Runoff Control

2.1 General Information

The procedures included in this **Design Standards and Specifications Manual** are intended to be a guide for Property Owners, Developers, and Contractors preparing to work under open Excavation Permits within the City of Madison in public right-of-way or existing utility easements adjacent to public right-of-way. It is not intended to be a comprehensive list of all the requirements for Temporary Erosion Control, but a summary of the steps to be taken and the procedures which must be implemented. The documents attached as appendices to this manual are subject to revision and modification by the City's Board of Public Works and Safety, at their discretion, and in consultation with the City's Director of Planning, Utility Manager, and the City Attorney.

2.2 Purpose

The purpose of this Chapter is to ensure the proper design and construction of temporary erosion control devices to minimize the impact of construction excavations on neighboring properties and public sewers, and to maintain public health and safety. Stormwater runoff shall be managed to prevent loss or damage of property associated with Excavation Permit work activities.

2.3 Use and Protection of Sewers

Only a portion of the City of Madison is currently served by dedicated storm sewers. Under **NO** circumstance will combined sewers be utilized for additional collection of stormwater runoff. All runoff must be contained / controlled onsite except where city approved discharge points are available.

2.4 Description of Work

A. The Contractor shall provide all labor, tools, equipment, and material necessary to furnish and install, in proper operating condition, all temporary erosion and sediment controls as specified herein for the duration of onsite construction activities.

B. Surface and / or groundwater controls may necessitate the use of temporary diversion ditches, cofferdams, and / or dewatering by the use of pumping. Discharge water must filter through an approved erosion control measure prior to leaving the project site or entering another waterway.

C. Contractor shall comply with all requirements of the Construction Stormwater General Permit, local jurisdictional or regulating authority.

D. If required, Contractor shall comply with and follow a Stormwater Pollution Prevention Plan (for all construction sites in excess of 1 acre) and / or guidelines and specific stormwater quality measures established by the Indiana Storm Water Quality Manual, latest edition.

2.5 Products

A. All products shall be in accordance with the Indiana Storm Water Quality Manual (latest edition), INDOT Standard Specifications (latest edition), and / or any local jurisdictional requirements.

1. Silt Fences

    a. 2 x 2 inch hardwood posts (or steel fence posts) shall be used for anchoring.

    b. Fabric shall be buried a minimum of 8-inches. Fabric shall be a minimum of 18-inches above ground level (30-inches maximum).

    c. Fence fabric shall be either woven or non-woven, geotextile fabric with a minimum 85% filtering efficiency. Where applicable, 14-guage, 6-inch mesh wire fence shall be used.

    d. The fence fabric shall contain UV inhibitors and stabilizers to insure a six-month minimum life at temperatures between 0 and 120 degrees F.

    e. Silt fend shall have the following minimum material properties: grab strength of 90 lbs and elongation at 45 lbs of 50% max per ASTM D4632; apparent opening size of No. 20 sieve per ASTM D4751; permittivity of 0.01 sec-1 per ASTM D4491; UV resistance of 70% per 500 hours per ASTM D4533.

2. Filter Rock / Fiber Roll

    a. Filter socks / fiber rolls shall consist of a fabric sock or a non-biodegradable netting matrix filled with acceptable permeable material.

    b. Permeable material shall be straw, wood / excelsior fiber, or coconut fiber.

    c. Socks / rolls shall be a pre-manufactured product.

    d. 2 x 2 inch hardwood posts (or steel posts) shall be used for anchoring.

3. Rock Check Dams

    a. Rock check dams shall be constructed of INDOT Reventment Riprap; INDOT No. 5 aggregate; and geotextile fabric.

    b. Geotextile fabric for rock check dams shall have the following properties: minimum grab tensile strength of 200 lbs and grab elongation greater than 50% per ASTM D4632; minimum CBR puncture strength of 500 lbs per ASTM D6241; minimum trapezoid tering strength of 80 lbs per ASTM D4533; apparent opening size (AOS) of less than 80 sieve, for soils greater than 40% passing the No. 200 sieve per ASTM D4751; permittivity of 1.2 sec-1 per ASTM D4491; and UV resistance of 70% per 500 hours per ASTM D4533.

4. Traversable Check Dams

    a. Traversable check dams shall be constructed of filter socks or fiber rolls.

    b. 2 x 2 inch hardwood posts (or steel posts) shall be utilized for anchoring.

    c. If undercutting is identified, Contractor shall install compacted INDOT #5 or #8 stone.

5. Temporary Erosion Control Blankets

    a. Temporary erosion control blankets design permissible shear stress shall be minimum of 2.10 pounds per square foot and design permissible velocity shall be a minimum of 8.00 feet per second for unvegetated conditions.

6. Permanent Turf Reinforcement Mats

    a. Permanent turf reinforcement mats design permissible shear stress shall be a minimum of 4.0 pounds per square foot and design permissible velocity shall be a minimum of 12.5 feet per second, both for vegetated and unvegetated conditions.

7. Dewatering Filter Bags

    a. Dewatering bags shall be either single-usage or reusable. Bags shall be constructed of a non-woven geotextile, non-biodegradable material able to handle varying flow rates. Material shall be 8 oz per square yard and have the following material properties: tensile strength of 205 lbs; elongation of 50% per ASTM D4632; trapezoidal test of 85 lbs per ASTM D4533; CBR puncture strength of 535 lbs per ASTM D6241; apparent opening size (AOS) of 80 sieve per ASTM D4751; permittivity of 1.35 sec-1 per ASTM D4491; and a UV resistance of 70% per 500 hours per ASTM D4533.

8. Concrete Washout

    a. Concrete washout shall be constructed of sandbags and polyethylene lining (2 layers – 10 millimeters thick minimum).

b. Concrete washout area shall be clearly marked by a 1 x 1 foot white sign with red text lettering reading “Concrete Washout Area”.

9. Inlet Protection

2.6 Execution

A. General Installation

1. All temporary erosion and sediment controls shall be installed in accordance with the manufacturer’s written instructions.
2. Prior to commencement of onsite excavation activities, all erosion control measures shall be installed to control erosion and prevent sediment-laden water from exiting the site. This shall include, but not be limited to, the installations of silt fences, check dams, inlet protection, concrete washout, and all other items that are needed to control sediment from leaving the project site.
3. Erosion control measures shall be inspected no less than once per week and after every rainfall event and shall be maintained on a bi-weekly basis during construction. Both temporary and final seeding is required. Should any areas outside of the project area remain inactive for period of 7 days or more, they shall be seeded with a temporary vegetative cover such as oats, wheat, or rye.

B. Silt Fences

1. Silt fences shall be installed by the Contractor to retain sediment from disturbed areas.
2. Fence shall approximately follow the contour of the land to avoid channelization and be located at least ten (10) feet from toe of slope to provide a broad, shallow sediment pool.
3. Access to the area shall be provided for sediment clean-out.
4. A maximum of eight (8) foot spacing shall be used if support wire is provided, or six (6) foot spacing if no supporting wire is used.
5. The fence shall be installed per the manufacturer’s recommendations to ensure acceptable performance.
6. When the work area has been re-established with approximately 70% density of permanent vegetation, the silt fence may be removed.

C. Filter Sock / Fiber Roll

1. Filter socks / fiber rolls shall be installed by the Contractor to retain sediment from disturbed areas.
2. Socks / rolls shall approximately follow the contour of the land to avoid channelization and be located at least ten (10) feet from the toe of slope to provide a broad, shallow sediment pool.

3. Socks / rolls shall be installed per Manufacturer's recommendations.

4. If more than one sock or roll is placed in a row, the product should be overlapped not abutted.

5. The products should be anchored by driving a wooden or metal post through the barrier and into the underlying soil material. Posts should be spaced no more than five (5) feet apart and driven through the middle of the product. The posts should be driven a minimum of 18 inches deep and should be flush with the top of the product.

D. Rock Check Dams

1. Rock check dams shall be installed as specified herein.

2. Rock check dams shall be used below construction activities within a channel.

3. Rock check dams shall be spaced such that the top of the downstream check dam is at the same elevation as the toe of the adjacent upstream check dam.

E. Traversable Check Dams

1. Check dams shall be installed as specified herein.

2. Check dams shall be placed perpendicular to the flow of water.

3. Check dam ends shall be positioned such that the storm water flows over a low point and does not flow around the ends.

4. Check dams shall be spaced such that the top of the downstream check dam is at the same elevation as the toe of the adjacent upstream check dam.

F. Temporary Erosion Control Blankets

1. Temporary erosion control blankets shall be installed for ALL construction activities within storm conveyances, including roadside swales.

2. The blankets shall also be installed for all slopes steeper than 4:1.

3. Installation shall be per Manufacturer's recommendations, which includes all mat anchoring, staple requirements and patterns and mat overlaps. Note that longer anchors my be required where soft soils are encountered. Heavy duty anchor fasteners may be required in channels with hard soils to ensure adequate anchoring is provided.

G. Permanent Turf Reinforcement Mats

1. Permanent Turf Reinforcement Mats shall be installed as specified herein.

2. Installation shall be per Manufacturer's recommendation, which includes all mat anchoring, staple requirements and patterns, and mat overlaps. Note, longer anchors may be required in soft soils. Hard soils may require heavy duty anchor pins or rebar to ensure minimum anchor depths are attained.

H. Dewatering Filter Bags

1. Dewatering Filter Bags, where utilized, shall be securely connected to the end of the discharge hose. Dewatering bags shall be installed per Manufacturer's requirements. General instructions are provided herein: Lay bag flat in designated area; Securely fasten bag to pump discharge hose with the use of wire, clamps, or another securing device; Contractor may place the bag on aggregate or straw bales to improve performance; Pump into the bag and monitor to ensure pump is working and filtering effectively at rates and levels the bag can handle; The bag will be filled when it stops filtering or no longer able to pass water at a reasonable rate. When the dewatering process is complete or the bag is full, remove the hose and allow bag to dry. Remove the bag and material in a upland area or per specified project requirements.

I. Concrete Washout

1. Concrete washout shall be a self-contained sturdy containment system constructed of leak proof materials which is sized to prevent the discharge and / or overflow of concrete wash water.
2. Concrete washout shall be designed and placed to divert run-off away from the washout.
3. Concrete washout areas shall be identified for the site and clearly posted.

J. Inlet Protection

1. Inlet protection shall be provided in areas where work activities directly impact open inlets or other storm sewer structures.
2. Inlet protection shall be provided in accordance with the details provided in Appendix F to these design standards and specifications.

K. Field Quality Control

1. The Contractor shall prevent any wind-borne soil particles, which could create a health and / or visibility hazard from leaving the disposal sites. The Contractor shall apply an approved dust preventative, as necessary, to avoid and eliminate a health and / or visibility hazard due to wind-borne soil particles.
2. Construction operations shall be carried out in such a manner and sequence that erosion and air and water pollution will be minimized and held within acceptable limits. It is important that material excavated from this project be contained.

3. Temporary seeding shall be applied immediately after grading activities at the rates identified below:

Temporary Seeding Recommendations			
Seed Species *	**Rate/Acre**	**Planting Depth**	**Optimum Dates ****
Wheat or Rye	150 lbs.	1 to 1-1/2 in.	9/15 to 10/30
Spring Oats	100 lbs.	1 in.	3/1 to 4/15
Annual Ryegrass	40 lbs.	1/4 in.	3/1 to 5/1 8/1 to 9/1
German Millet	40 lbs.	1 to 2 in.	5/1 to 6/1
Sudan grass	35 lbs.	1 to 2 in.	5/1 to 7/30
*Perennial species may be used as a temporary cover, especially if the area to be seeded will remain idle for more than a year. **Seeding done outside the optimum dates increases the changes of seeding failure.			

4. The following Erosion Control Schedule shall be used, as needed, for all open Excavation Permits:

Erosion Control Schedule		
CONTROL MEASURE	**MAINTENANCE**	**INSTALLATION SEQUENCE**
Silt Fence / Filter Sock / Fiber Roll	Weekly, after Storm Events and as Needed	Prior to Clearing and Grading
Existing Inlet/Drain Pipe Protection	Weekly, after Storm Events and As Needed	Prior to Clearing and Grading
Rock and/or Traversable Check Dam	Weekly, after Storm Events and As Needed	Prior to Clearing and Grading
Tree Protection	Weekly, after Storm Events and as Needed	Along with Rough Grading
Temporary Seeding	Water as Needed	After Rough Grading and/or Within 7 Days of Inactivity
Permanent Seeding	Water as Needed	After Finish Grading and/or Within 7 Days of Inactivity
Temporary Erosion Control Matting	Weekly, after Storm Events and as Needed	After Finish Grading, immediately after work within a channel
Permanent Erosion Control Matting	Weekly, after Storm Events and as needed	After Finish Grading, immediately after work within a channel
Inlet Protection	Weekly, after Storm Events and as Needed	Prior to Clearing and Grading for Existing Inlets and After Each New Inlet is Placed

Erosion Control Schedule		
CONTROL MEASURE	**MAINTENANCE**	**INSTALLATION SEQUENCE**
Concrete Washout	Maintain to provide adequate holding and capacity with a minimum freeboard of 12 inches.	Prior to concrete installations
Seed, Sod and Landscape Around Inlets Completed	Water as Needed	After Finish Grading Around Finished Inlets
Removal of Inlet Protection	N/A	After All Areas Draining to These Areas Have 70% Density of Permanent Vegetation or permanent stabilization has been installed.
Removal of Silt Fence / Fiber Roll / Filter Sock	N/A	After All Areas Draining to These Areas Have 70% Density of Permanent Vegetation or permanent stabilization has been installed.
Removal Rock and/or Traversable Check Dam	N/A	After All Areas Draining to These Areas Have 70% Density of Permanent Vegetation or permanent stabilization has been installed.

APPENDIX A

SAMPLE EXCAVATION PERMIT APPLICATION AND GOVERNING CITY ORDINANCE

MADISON Indiana
Planning, Preservation and Design

101 W Main St
Madison, IN 47250
(812) 265-8324

Application for an Excavation Permit

Application Fee: $2.50

Purpose: Application is hereby made for permission to excavate in a public right-of-way of the city.

APPLICANT/CONTRACTOR INFORMATION (If private property owner, use section below.)

Date: _____

Applicant Name: _____

Mailing Street Address: _____

City: _____ State: _____ Zip: _____

Phone (Preferred): _____ Email: _____

Client Type for whom the work is being completed (check all that apply):

- ☐ City Government
- ☐ County Government
- ☐ State Government
- ☐ Private Entity/Person
- ☐ Other: _____

If work was ordered by a private entity/person, please complete section below. Otherwise, skip to Location of the Excavation.

PROPERTY OWNER INFORMATION

Date: _____

Applicant Name: _____

Mailing Street Address: _____

City: _____ State: _____ Zip: _____

Phone (Preferred): _____ Email: _____

LOCATION OF THE EXCAVATION

Street Address: _____

Intersecting Street (if applicable): _____

Parcel ID (can be obtained from the office): _____

811 Confirmation #: _____

EXCAVATION DETAILS

General Location of the excavation (check all that apply):

- ☐ Within the street
- ☐ Alley
- ☐ Road bore
- ☐ Within the right-of-way grass
- ☐ Street curb or street gutter
- ☐ Sidewalk

Type of work requiring the excavation (check all that apply):

- ☐ Gas
- ☐ Water
- ☐ Sewer
- ☐ Cable/Internet
- ☐ Electric
- ☐ Other: _____

Please provide the purpose, size, and description of the excavation:_____

_____

_____

_____

Expected Start Date: _____ Expected End Date: _____

Contractor Name: _____ Contractor Phone #: _____

Type of surface being excavated (check all that apply):

- ☐ Asphalt
- ☐ Concrete
- ☐ Stone
- ☐ Grass
- ☐ Other: _____

TRAFFIC INFORMATION

Will this work require equipment in travel lanes?	☐ Yes	☐ No
Will this work require parking or sidewalk restrictions?	☐ Yes	☐ No
Will this work require a partial or total road closure?	☐ Yes	☐ No
Will this work be in the city right-of-way, but not affect traffic?	☐ Yes	☐ No
Was this work already completed under an emergency?	☐ Yes	☐ No

BOND INFORMATION

Bond Number: _____

Name of company: _____

Bond Amount: _____

I certify that the information provided in this application is true and accurate to the best of my ability. I understand that I must abide by the standards established by the City of Madison for right-of-way cuts, excavation, and backfill. I understand that any project in the right-of-way, or any other public place, must conform to ADA specifications and guidelines. I acknowledge that it is my responsibility to assure that the finished work product of this project will meet those specifications and guidelines.

_____ _____

Date Signature of Applicant

COMPLETED BY OFFICE

Application Accepted on: _____ Application Accepted by: _____

Application Approved on: _____ Planning Department: _____

Street Department: _____ Utility Department: _____

Documentation Review (Completed by Planning Office)

____ Application is complete

____ Proof of Bond

____ Proof of public liability insurance

____ Proof of property damage insurance

EXHIBIT A

CHAPTER 98: STREETS AND SIDEWALKS

Section

GENERAL PROVISIONS

§ 98.01 OBSTRUCTIONS.

(A) No person or persons, firm, or corporation, shall make or cause to be made any obstruction upon or about any sidewalk, street, alley, park, or other public place of the city, or interrupt the free use or passage of the same, or suffer to remain upon any sidewalk immediately adjacent to the premises occupied by such person or persons, firm, or corporation, any obstruction for a period longer than three hours. No person or persons, firm, or corporation, shall provide or cause to be provided any seating area or accommodation upon or about any sidewalk except by means of a bench, unless such person or persons, firm, or corporation shall be serving food or beverages pursuant to a permit issued by the Jefferson County Health Department, in which such case seating providing the use of a table may be permitted. If the use of outdoor seating is permitted, the person or persons, firm, or corporation must clear a pathway of at least 36 inches on the sidewalk. However, a portion of the sidewalk not to exceed one-third the width, may be used by the occupant of the premises immediately adjacent thereto, for the stacking or grounding of boxes, wood, barrels, coal or other fuel, lumber, brick, stone, or other materials or articles, for a necessary and reasonable time, after which same shall be

removed from the sidewalk by such occupant. Further, all necessary materials used in the repair or construction, or made by the removal or tearing away of any building, may be placed upon the sidewalk and not to exceed one-third of the street immediately adjacent to such premises, when a permit has been issued granting the right to make such repair, construction, removal, or the like of the building contemplated on such premises but only for the time specified in the permit and no longer. If scaffolding is required for repair or construction, the person or persons, firm, or corporation shall make a request to the City Building Inspector and he or she shall approve, deny, or suggest modifications to said request. Anyone who disagrees with the City Building Inspector's decision shall appeal to the Board of Public Works and Safety in writing.

(B) Whenever the excavation, construction, or repair of any building, lot, street, sidewalk, or public way interferes with normal pedestrian or vehicular traffic thereon, an alternative route shall be provided by the business, company, or persons causing such interference in accordance to rules established by the Building Inspector.

('66 Code, § 130.03) (Ord., passed 5-4-05; Am. Ord. 1998-11, passed 9-8-98; Am. Ord. 2014-14, passed 9-2-14) Penalty, see § 10.99

§ 98.02 OPENINGS IN SIDEWALKS.

No person or persons, firm, or corporation, shall keep, cause to be kept, or suffer any opening in any sidewalk, alley, street, or other walk used by the public, to be or remain open so as to endanger the safety of passers-by, except when such opening is being repaired, cleaned out, or used in the storing of articles, and then only when someone in charge is present.

('66 Code, § 130.09) (Ord., passed 5-9-05) Penalty, see § 10.99

§ 98.03 REMOVAL OF SNOW AND ICE.

(A) It is the duty of every owner, lessee, or occupant of any premises abutting or bordering upon any street in the city, to remove, or cause to be removed, all snow and ice from the sidewalk in front of such premises to the full paved width of the sidewalk within eight hours after such snow or ice shall have fallen or accumulated thereon.

('66 Code, § 130.12) Penalty, see § 10.99

§ 98.04 HEAVY TRUCKS, LOADS.

(A) No person or persons, firm, or corporation, shall haul or drag, or cause to be hauled or dragged, upon any street or alley of the city any stone, timber, or other heavy substance, in such a way or manner as to break or otherwise injure the surface of such street or alley; or drive or tow any vehicle in such a way or manner as to break or otherwise injure the

surface of such street or alley; or otherwise injure or cause to be injured in any manner, any street, alley, park, sewer, drain, or bridge, belonging to the city.

(B) Further, no person shall take or cause to be taken from any street, alley, sidewalk, gutter, cemetery, park, or other public place of the city, any sand, clay, gravel, stone, brick, or other earth or material, without express permission from the authorities having charge of same; or sprinkle, throw, or deposit such sand, clay, gravel, stone, brick, or other earth or material, in, upon, or over any street, alley, sidewalk, gutter, park, sewer, or drain, of the city, without express permission from the authorities having charge of same.

('66 Code, § 131.04) (Ord., passed 5-9-05) Penalty, see § 10.99

§ 98.05 DEBRIS IN STREETS.

(A) No person, persons, firm, or corporation, shall place glass of any kind, nails, tacks, domestic ashes, or any other refuse matter destructive of or injurious to automobile tires, horses, or other animals, in the streets and alleys of the city, except in the proper containers provided. For the purpose of this section, the term "DOMESTIC ASHES" shall mean the ashes made or created in the stoves and furnaces in the homes of city residents.

(B) No person or persons shall leave the scene of any automobile accident in the streets and alleys of the city without having first removed as far as possible the fragments of any broken glass or other refuse made incident thereto of destructive nature to automobile tires or injurious to horses or other animals.

('66 Code, § 131.05) (Ord., passed 6-10-27) Penalty, see § 10.99

§ 98.06 DRIVEWAYS.

No person, firm, public utility or corporation or the agents thereof, shall locate any driveway adjacent to the streets or alleys in the right-of-ways of the city, without first making application for and obtaining a permit to do so from the Office of Planning, Preservation and Design of the city, and by making a minimum deposit as hereinafter provided in cash or approved surety bond with the Clerk-Treasurer of the city for the satisfactory performance of the work in the street or alley in accordance with the specifications outlined in this section.

(A) Application.

(1) Within the city limits, no one shall place a driveway adjacent to a city right-of-way without first obtaining a permit from the Office of Planning, Preservation and Design.

(2) The form of such permit shall be determined by the Office of Planning, Preservation and Design. Forms shall be available at the Office of Planning, Preservation and Design or online.

(3) Applicants for a permit for any driveway adjacent to a right-of-way shall submit a sketch or drawing or otherwise clearly communicate the location and design, and the traffic control plan.

(4) Permits issued shall be valid for a period of no more than 90 days until work commences, and all work shall be performed within an additional 90 day period. Permit must be posted and visible at the job site.

(B) Driveway conditions.

(1) In the city, no one shall:

(a) Make any alteration within a public right of way, block a city street gutter or;

(b) Construct a new driveway for the purpose of driving on and off a city street, without first obtaining the approval and written permission of the Office of Planning, Preservation and Design of the city for such driveway. A permit fee of $25 shall be imposed for each driveway permit (residential or commercial) issued. Inspections shall be done by an employee of the City of Madison or third party as directed by the Mayor.

(2) The following specifications apply to all that portion of the driveway which falls within the right-of-way of the city street:

(a) All efforts shall be made to locate all driveways off of local streets, rather than arterial or collector streets. No driveway shall be placed within 50 feet of an intersecting public street. No driveway shall be placed closer than ten feet to another driveway as measured at the right-of-way line. All driveways shall be perpendicular to the street they are connecting to from the connection point to the right-of-way line.

(b) All new residential driveways shall meet the street with a minimum radius of ten feet. The minimum radius for driveways intended for commercial traffic or high volumes of vehicle traffic shall be 25 feet. That portion of the driveway which falls within the right-of-way of the city street shall have a minimum width of ten feet as measured at the right-of-way for residential driveways, or a minimum width of 20 feet as measured at the right-of-way for commercial or high traffic driveways.

(c) If the new driveway is to cross a drainage or roadside ditch, or for any other reason it is deemed necessary that a culvert is required to be placed in the public right-of-way, such culvert shall be no less than 12 inches in diameter and 20 feet in length. Larger diameter and length culverts may be required by the Inspector, if drainage conditions so warrant. In order to prevent impeding normal drainage, culverts for new driveways are never in any case to be smaller than the closest upstream culvert.

(d) In the construction of the new driveway, the portion which falls inside the city street right-of-way is to be composed of hard surface material of the same character as the material of the connecting street and/or sidewalk or better surface.

(e) Traffic control and safety is the responsibility of the contractor. If additional traffic control is deemed necessary by the Inspector, the contractor may be required to utilize Indiana Department of Transportation Maintenance of Traffic requirements.

(f) City sidewalks are not to be used as driveways, nor are they to be driven upon. Existing city sidewalks are not to be used as portions of the new driveway. In the construction of the new driveway, the existing city sidewalk is not to be covered over or crossed by the new driveway material: but must be removed and the new driveway surface material must be placed flush with the remaining sidewalk surface, or, if not placed flush with the sidewalk surface, then sloping ramps must be placed in the sidewalk on each side of the drive so that there is a smooth continuation from sidewalk to driveway to sidewalk which is accessible to the handicapped.

(g) This section shall apply to any widening or reconstruction of any existing drive. This section shall not apply to the surfacing or resurfacing of existing driveways.

(C) Warranty. The applicant shall be entitled to a return of their cash bond or the release of their surety bond once the Inspector has determined that the work done as contemplated by the permit has been satisfactorily completed and the applicant has complied with all the terms and conditions of this section. If no such determination is made within 90 days of the date the bond is submitted to the city, any cash bond shall be forfeited and paid into the Local Road and Street Fund of the city and/or the city shall take appropriate action to collect any surety bond whose proceeds shall be paid into the same fund.

(D) Enforcement. Anyone found in violation of these conditions or found performing work in the right-of-way without a valid permit, shall be subject to a fine of not to exceed $2,500, along with being responsible for the cost of any and all repairs and the liability thereof, court costs and attorney's fees. Each day the applicant does not obtain the necessary permit may also be treated as a separate violation. Each and every occurrence may be treated as a separate violation.

(Ord. 2002-7, passed 6-18-02; Am. Ord. 2002-11, passed 10-8-02)

RIGHT OF WAY EXCAVATIONS

§ 98.20 PERMIT REQUIRED; FEE.

(A) No person, firm, or corporation shall excavate in a street, alley, sidewalk or any public right of way of the city for any purpose whatsoever without first obtaining a permit from the Office of Planning, Preservation and Design. Permit must be posted and visible at the job site. ('66 Code, § 92.01)

(B) The Office of Planning, Preservation and Design shall, upon request of any person, firm, or corporation, issue a permit upon the payment of a permit fee of $25.00 and a proper showing that the applicant is bonded by a reputable surety company in the penal sum of no less than $10,000. The bond shall be conditioned to the effect that the person, firm or corporation shall replace the surface of the street, alley, sidewalk or other surface in the public right of way in the timeframe specified within the provisions. Such repair will

be inspected and approved to insure full compliance with the provisions of the City of Madison. The prescribed procedure and standards to fill such excavation shall be established by the Board of Public Works and Safety. Inspections shall be done by an employee of the City of Madison or third party as directed by the Mayor. Repairs, including backfill and right of way surface, to be warranted for up to one year by the contractor. That the person, firm, or corporation will promptly pay and discharge, on demand, all damages which may be incurred to any city water main or other city property by reason of such excavation; that the person, firm, or corporation shall offer satisfactory evidence of having public liability and property damage insurance in the total sum of $10,000, which insurance shall pay all damages or claims of damage accruing to persons or property caused by the negligence of the person, firm, or corporation in making, maintaining, or refilling the excavation; and that the applicant further makes satisfactory showing of having all employees employed by the person, firm, or corporation protected under the provisions of the State Workers Compensation Law.

(C) Enforcement. Anyone found in violation of these conditions or found performing work in the right-of-way without a valid permit, shall be subject to a fine of not to exceed $2,500, along with being responsible for the cost of any and all repairs and the liability thereof, court costs and attorney's fees. Each day the applicant does not obtain the necessary permit may also be treated as a separate violation. Each and every occurrence may be treated as a separate violation.

(D) Permits issued shall be valid for a period of no more than 90 days until work commences, and all work shall be performed within an additional 90 day period unless extended by the Board of Public Works and Safety. Permit must be posted and visible at the job site.

('66 Code, § 92.02) (Ord., passed 3-6-53) Penalty, see § 10.99

§ 98.21 PLUMBING INSTALLATIONS.

Any person, firm, or corporation making any installation of plumbing shall report, within ten days from the installation, all outlets for the domestic or commercial use of water on the premises involved.

('66 Code, § 92.03) (Ord., passed 3-6-53) Penalty, see § 10.99

§ 98.22 (RESERVED).

APPENDIX B

STANDARD SPECIFICATION FOR EXCAVATION

EXCAVATION

PART 1 GENERAL

1.01 Description

A. The Contractor shall make all earth excavations required, to the widths and depths necessary for proper construction (and only to such widths and depths), for constructing according to the plans, all structures included in this contract. Earth shall mean all kinds of materials, wet and/or dry, excavated, or which are to be excavated, including rock, shale, hardpan, muck, quicksand, etc., unless provisions are made elsewhere in the contract documents for specified soil types.

B. Excavation shall include clearing the site for the work; the loosening, loading, removing, transporting, and disposing of all materials, wet or dry, necessary to be removed for purposes of construction; all sheeting and bracing; all draining, dewatering and pumping; backfilling of trenches, excavations and pits; earth borrow; the supporting of the excavations and structures (new and existing) above and below ground; the handling of water; and all incidental work.

C. Prior to commencing construction operations, the Contractor shall make all the provisions necessary to assure the protection of all existing improvements, both public and private. He shall protect trees, shrubs, plantings and grassed areas and shall make provisions for maintaining public travel in an acceptable manner.

PART 2 EXECUTION

2.01 Clearing

Preparatory to excavation, the site of all open cut excavations, embankments and fills shall be first cleared of obstructions and existing facilities (except those which must remain temporarily or permanently in service). On all public or private property where grants or easements have been obtained, and on the property of the Owner, the Contractor shall remove and keep separate the topsoil, and shall carefully replace it after the backfilling is completed.

2.02 Pavement Cutting

Prior to excavating paved areas all excavation edges falling within the pavement shall be saw cut in a neat straight manner. Cutting shall be performed with a saw designed specifically for this purpose. The cut shall penetrate the entire pavement thickness where possible. If the existing pavement is more than 6 inches thick then a cut of not less than 6 inch depth shall be made. Sawing equipment shall be submitted to the City for approval before initial use. When the approved cutting equipment makes a cut more than 1" wide the cutting shall precede the excavation no more than one block or 400 feet which ever is less. If pavement cuts (those less than 1 inch wide) are made in streets which are reopened to traffic prior to excavation then the cuts shall be thoroughly filled with sand and maintained full until the excavation is performed.

2.03 Protection of Existing Improvements

A. Before any excavation is started, adequate protection shall be provided for all lawns, trees, shrubs, landscape work, fences, sidewalks, hydrants, utility poles, street, alley and driveway paving, curbs, storm sewers, ditches, headwalls, catch basins, surface inlets and all other improvements that are to remain in place. Such protection shall be provided as long as necessary to prevent damage from the Contractor's operations. Shrubs, bushes, small trees and flowers, which have to be removed to permit excavation for the project, shall be protected and replanted or replaced when the backfill is complete unless otherwise directed by the City.

B. The Contractor shall exercise every precaution to prevent damage to property within and outside the immediate vicinity of the work. He shall remove all debris and rock from the site and restore the ground surfaces, replace or repair all driveways, buildings, fences, retaining walls, culverts, drains, paving, sidewalks, etc., which are removed or damaged during construction.

C. Repair, restoration or replacement of any improvements damaged or removed outside of the work to be performed shall be the obligation of the Contractor at no additional cost to the Owner.

2.04 Protection of Trees and Shrubs

A. No existing trees or shrubs in street Rights-of-Way and easements shall be damaged or destroyed. Where branches of trees or shrubs interfere with the Contractor's operations, they shall be protected by tying back wherever possible. No limbs or branches shall be cut. If his operations will not permit saving certain trees, the Contractor shall be wholly responsible for satisfying all claims for restoration or restitution resulting from their damage or removal.

B. If small trees and shrubs are moved or pruned to permit more working space, pruning shall be done in accordance with HGB083 (1984), U.S. Department of Agriculture, "Pruning Shade Trees and Repairing Their Injuries." However, the Contractor shall obtain, in writing, the property owner's permission to move or prune trees or shrubs on his property.

C. Trees and shrubs damaged by the Contractor's operation shall be repaired in accordance with said HGB083 (1984).

D. Payment for protecting trees and shrubs shall be the obligation of the Contractor at no additional cost to the Owner.

2.05 Maintenance of Public Travel

A. The CONTRACTOR shall carry out the WORK in a manner which will cause a minimum of interruption to traffic, and may close to through travel not more than two (2) consecutive blocks, including the cross street intersected. Where traffic must cross open trenches, the CONTRACTOR shall provide suitable bridges to street intersections and driveways. The CONTRACTOR shall post suitable signs indicating that a street is closed and necessary detour signs for the proper

maintenance of traffic. Prior to closing of any streets the CONTRACTOR shall notify responsible municipal authorities.

B. The CONTRACTOR shall plan construction activities to minimize impact to traffic. Local traffic access must be maintained at all times. To maintain traffic movement, appropriate traffic control devices shall be used. Such traffic control devices shall comply with the latest edition of the Indiana Manual on Uniform Traffic Control Devices. The CONTRACTOR shall follow the requirements of the INDOTSS Traffic Control Plans when no other plan is submitted for review.

C. The Local Highway Department shall be notified no less than five (5) calendar days prior to any construction activities occurring within the right-of-way.

2.06 Utility Interruption

A. The CONTRACTOR shall proceed with caution in the excavation and preparation of the trench or pit so that the exact location of underground structures may be determined. Prior to proceeding with trench excavation the CONTRACTOR shall contact all utility companies in the area to aid in locating their underground services.

B. The CONTRACTOR shall take all reasonable precautions against damage to existing utilities. However, in the event of a break in an existing water main, gas main, sewer or underground cable, he shall immediately notify the responsible official of the organization operating the utility interrupted. The CONTRACTOR shall lend all possible assistance in restoring services and shall assume all costs, charges, or claims connected with the interruption and repair of such services.

2.07 Construction in Easements

A. In easements across private property, the CONTRACTOR shall confine all operations in the easement area and shall be responsible and liable for all damage outside of the easement area. Trees, fences, shrubbery or other types of surface improvements located in easements will require protection during construction. Precautions shall be taken by adequate sheeting or other approved method to prevent any cave-in or subsidence beyond the easement limits or damage to improvements within the easement. In general, the easement area is intended to provide reasonable access and working area for efficient operation by the CONTRACTOR. Where easement space for efficient operation is not provided, the CONTRACTOR shall be responsible for organizing his operations to perform within the restrictions shown on the plans. When requested, the OWNER shall furnish the CONTRACTOR a copy of the construction easements. Anytime the CONTRACTOR has to work outside of the easement area, he must obtain written permission from the property owner and furnish the CITY with a copy.

2.08 Drainage

A. The Contractor shall make provisions for handling all flows in existing creeks, ditches, sewers and trenches by pipes, flumes or other approved methods at all times when his operations would, in any way, interfere with the natural

functioning of said creeks, ditches, sewers and drains. The Contractor shall at all times during construction provide and maintain sufficient equipment for the disposal of all water which enters the excavation, both in open cut trenches and in tunnels, to render such excavation firm and dry, until the structures to be built thereon are completed.

B. Pipe underdrains, well point systems, deep well pumps or other suitable equipment and methods shall be used to keep all excavations firm and dry, at no additional cost to the Owner unless otherwise provided in the Proposal.

2.09 Disposal of Unsuitable Materials

A. Excavated materials which are either surplus and not required or are unsuitable for backfilling shall be removed from the site of operations as soon as excavated. All excavated materials so removed shall be disposed of, at no additional cost to the Owner, on privately owned property for which the Contractor has made prior arrangements. The Contractor is responsible for the restoration of areas within Public Rights-of-Way bordering properties for which the Contractor has a dump permit or release.

B. The Contractor is to provide the City with a copy of the said permit, stating the condition in which the Property Owner will accept the spoil materials.

2.10 Storage of Suitable Materials

A. Excavated materials suitable and required for immediate backfill, shall be stored in neat piles adjacent to the excavation in a manner so as to interfere as little as possible with traffic, but shall not be placed at such heights above or closeness to the sidewalls of the excavation to endanger such operations due to slides or cave-ins. Fire hydrants under pressure, valve pit covers, valve boxes, curb stop boxes, or other utility controls within Right-of-Ways shall be left unobstructed and accessible until the WORK is completed.

B. Excavated materials suitable for use as backfill, fill and embankments but not needed immediately shall be transported to a location approved by the City and stored at the contractors expense. Storage shall be on the owners property provided the site offers sufficient room without hindering the Work or the normal operation of the Owner's facilities. All weather access must be maintained to all operating facilities on the site at no additional expense to the Owner. Gutters and catch basins shall be kept clear or other satisfactory provisions made for drainage. Natural watercourses shall not be obstructed.

2.11 Open Cut Excavation

A. Open cut excavation, either in earth or rock, shall be safely supported and of sufficient width and depth (and only to such width and depth) to provide adequate room for the construction or installation of the work to the lines, grades and dimensions shown on the Plans.

2.12 Trench Dimensions

A. The bottom width of the trench at and below the top of the pipe and inside the sheeting and bracing, if used, shall not exceed the recommendations as contained in the applicable ASTM Standard for the pipe being used.

B. Trench sheeting and bracing or a trench shield or box shall be used as required by the rules and regulations of OSHA. The bottom of the trench shall still meet the above standards.

C. If the trench widths are exceeded without the written permission of the City, the pipe shall be installed with a concrete cradle or with concrete encasement or other ASTM approved methods as approved by the City and at no additional cost to the Owner.

2.13 Excavations With Sloping Sides, Limited

A. The Contractor may, at his option, where working conditions and right of way permit (as determined by the City), excavate pipe line trenches and pits for structures with sloping sides, but with the following limitations:

1. In general, only braces and vertical trenches will be permitted in traveled streets, alleys, narrow easements and for pit excavations more than 10 feet deep.

2. Where pipe line trenches with sloping sides are permitted, the slopes shall not extend below the top of the pipe, and trench excavations below this point shall be made with near-vertical sides with widths not exceeding those specified herein before.

3. Slopes shall conform to all OSHA regulations.

4. When pit excavations with sloping sides are permitted, the Contractor shall assume full responsibility for all costs incurred to backfill the larger excavation in accordance with the Contract Documents including furnishing materials if adequate quantities of suitable materials are not available from those excavated on the site.

2.14 Sheeting and Bracing

A. The Contractor shall furnish, place and maintain adequate sheeting and bracing as may be required to support the sides of the excavation and prevent any movements of earth which could, in any way; diminish the width of the excavation to less than that necessary for proper construction; cause damage to the pipe or structure being constructed or to adjacent structures, utilities, pavements or walks; cause injury to workmen or others through movement of the adjacent earth banks; or to otherwise damage or delay the work.

1. Materials: Sheeting may be of wood or steel and shall be of adequate strength for the excavation, subject to the approval of the City, who shall have the right to order the Contractor to furnish heavier sheeting than that

being used or proposed to be used by the Contractor, at no additional cost to the Owner.

2. Additional Supports: If the City is of the opinion that sufficient or proper supports have not been provided at any location, he may order additional supports installed at the expense of the Contractor, and the compliance with such orders shall not relieve or release the Contractor from his responsibility for adequately supporting the sides of the excavation.

3. Methods: Wherever possible, the sheeting and bracing shall be driven ahead of the excavation to avoid loss of material from behind the sheeting. If it is necessary to excavate below the sheeting, care shall be taken to avoid trimming behind the face along which the sheeting will be driven. Care shall be taken to prevent voids outside the sheeting; but, if voids develop, they shall be immediately filled with selected sandy materials and compacted by flushing and jetting with water or as directed by the City. Where drop inlets or stacks are constructed, the excavation shall be offset, as required, without additional compensation.

4. Left in Place: The City may order sheeting and bracing to be left in place at locations other than shown by the Plans. Sheeting left in place may be ordered to be cut off at any specified elevation, but in no case shall it be left in the ground above an elevation eighteen (18) inches below the existing or proposed surface of the ground. All voids created by the cutting off of the sheeting to be left in place shall be immediately filled with selected sandy materials and compacted by flushing and jetting with water or as directed by the City. Sheeting and bracing left in place in open cut trenches as shown on the Plans or as ordered by the City shall be paid for only in accordance with applicable provisions of the Contract Documents.

   If the Contractor elects not to remove certain sheeting and bracing, he will not be paid additionally for such sheeting and bracing left in place.

5. Not Left In Place: All sheeting and bracing not to be left in place shall be carefully removed (after the backfill is complete) so as not to endanger the pipes and other structures. All voids created by withdrawal of the sheeting shall be immediately filled with selected sandy materials and compacted by flushing and jetting with water or as approved by the City.

6. All sheeting and shoring is to be done in accordance with the Occupational Safety and Health Standards 40 CFR Part 1926 Subpart P, Excavation.

2.15 Earth Excavation

A. Earth materials shall be excavated so that the open cuts conform with the lines, grades and dimensions shown on the drawings.

1. Unsuitable Foundation: When the bottom of the excavation is unsuitable as a foundation, it shall be excavated below grade and then refilled with

concrete or crushed stone to the grade as the City may direct. The crushed stone refill shall be mechanically compacted in six (6) inch layers or as directed by the City. Such authorized work shall be paid for as set forth under the appropriate Item of the Proposal or the Change Order. This provision shall not relieve the Contractor of his obligation to dewater the excavation at no additional expense to the Owner.

2. Unauthorized Excavation: Unauthorized excavation below grade shall be filled with crushed stone or concrete and compacted as ordered and directed by the City at no additional cost to the Owner.

3. Excavated Earth For Backfill: Excavated earth materials may be used for backfill subject to the approval of the City, and the Contract Documents. Such material may be used only where its class is allowed. For example: Excavated material conforming to "Class II" description may be used where "Class II" material is required. When the Contract provides a unit price payment for classified backfill or fill material, excavated materials may qualify for such payment only if it is transported to another location for installation or temporary storage. The Contractor shall not transport the material solely to qualify it for such payments.

2.16 Rock Excavation

A. Rock shall be defined as follows: Boulders measuring one-half (½) cubic yard or more in volume; rock material in ledges, bedded deposits, unstratified masses and conglomerate deposits so firmly cemented that they possess the characteristics of solid rock that cannot be removed without systematic drilling and blasting; and concrete and masonry structures, except sidewalks and paving. Pockets or seams of earth or clay less than four (4) inches in thickness, occurring below or between solid ledges of rock, shall be considered rock.

B. When rock is encountered in open cut excavation, it shall be removed by drilling, blasting, digging or other approved methods so that open cut trenches conform with the lines, grades and dimensions shown on the Plans as specified herein or in the Detailed Specifications as follows:

1. Explosives: The Contractor shall comply with all Federal, State and Local laws, rules, regulations, insurance and ordinances governing the transportation, storage, use and permits for explosives.

2. Description: Solid rock excavation shall consist of the necessary excavation and satisfactory disposal of all rock in place which can not be removed from its original position without the use of explosives, or with a modern power shovel of not less than three-quarter (3/4) cubic yard capacity, properly used, having adequate power and in good running condition, or other equivalent powered equipment. The excavation shall also include all loose stone or boulders necessary to be removed which have a volume of one-half (½) cubic yard or more. Boulders of less than one-half (½) cubic yard in volume shall not be classed as rock excavation.

3. Safety Precautions: When blasting is required for the removal of rock, every precaution shall be used for the protection of persons and private and public property. Each blast shall be well covered with mats or other suitable means to confine the rock fragments within the excavation. At the discretion of the City, he may order an evaluation survey of properties within the blasting zone. Only the minimum amounts of explosives shall be used; no excessive charges will be permitted. Except with written permission and approval of the City, no blasting of rock will be permitted at nights or on Sundays.

4. Blasting Methods:

   a. The method of blasting will be as determined by the Contractor, subject to the approval of the City prior to construction. Blasting shall be performed at a safe distance ahead of the installation of the pipe and structures to prevent damage to them as the work progresses. Blasting of rock for property service connections, T-branches, Y-branches, and stubs shall be performed at the same time as the pipe trench blasting. The rock at the ends of all pipes, branches, stubs and property service connections, shall be shattered by continuing the drilling and blasting operations six (6) feet beyond the end of the pipe, branch, stub or property service connection.

   b. Sufficient dynamite shall be used to shatter the rock for future excavation, as may be determined and ordered by the City.

   c. The blasting of rock under existing paving prior to uncovering the rock will be permitted, provided, the Contractor assumes full responsibility for all damage to the existing paving; however, the Owner reserves the right to require the uncovering of rock prior to blasting if blasting without uncovering proves unsatisfactory.

   d. If the Contractor chooses to blast rock under paving without uncovering the rock, he shall immediately repair humps in the paving which create a traffic hazard, as determined by the City; and, all distortions outside the limits of the trench caused by this method of blasting shall later be removed and replaced as part of the paving restoration, as directed by the City. The Contractor is fully responsible for all damages that occur.

5. Repairs of Damage: In case injury occurs to any portion of the work, or to the material surrounding or supporting the same, through blasting the Contractor at his own expense shall remove such injured work and shall rebuild said work and shall replace the material surrounding or supporting the same, or shall furnish such material and perform such work of repairs or replacements as are necessary for satisfactory restoration. Any damage whatever to any existing structure due to blasting shall be promptly, completely and satisfactorily repaired by the Contractor at his own expense.

2.17 Boring and Jacking

A. Construction of the pipeline by boring and jacking methods will be permitted unless otherwise specified on the plans.

1. **Backstop**: The backstop shall be of sufficient strength and positioned to support the thrust of the boring equipment without incurring any vertical or horizontal displacement during such boring operations.

2. **Guide Rails**: The guide rails for the boring equipment may be of either timber or steel. They shall be laid accurately to line and grade and maintained in this position until completion of the boring operations.

3. **Casing Pipe**: Steel casing pipe shall be new, conform to ASTM A 139 and shall be of the size (diameter) shown on the plans. The lengths of pipe shall be welded as they are installed. Where lengths of casing pipe are joined during the boring operations, care shall be taken to insure that the proper line and grade is maintained.

B. The minimum wall thickness for casing pipes under highways, railroads and streams shall be 0.375 inches. Steel shall be Grade B under railroads and Grade A at all other locations.

2.18 Removal of Water

A. The Contractor shall at all times during construction provide and maintain ample means and devices with which to promptly remove and properly dispose of all water and sewage entering the excavations or other parts of the work and shall keep said excavations dry until the structures to be built therein are completed or connections to existing structures are completed. No masonry shall be laid in water nor shall water be allowed to rise over masonry, until the concrete and mortar have attained a sufficient and satisfactory set. In no event shall concrete be placed in water, nor shall water be allowed in the excavation, which may set up unequal pressures in the concrete, until the concrete has set at least twenty-four (24) hours and any danger of flotation has been removed.

B. In order to provide a dry foundation, the Contractor, if required by the Citys, shall pre-drain all wet material (except hardpan or rock) by lowering the ground water to a depth of at least one (1) foot below the deepest point of subgrade. The work of pre-draining shall be done by the use of a well point system, or by any other method approved by the City that will permit the construction work to be carried on under dry foundation conditions. All discharge water shall be piped to the nearest point of disposal in order to prevent such water from again entering the excavation. Any method or system that may be used to lower the ground water shall be kept in operation continuously unless otherwise permitted. The City's approval of the proposed system shall not relieve the Contractor from the responsibility of providing and maintaining dry excavations as required.

C. The Contractor shall dispose of water from the work in a suitable manner without damage to adjacent property or piping. No water shall be drained into work built or under construction unless the consent of the Citys is first obtained.

D. All removal and handling of water required to maintain dry trenches or other excavations for the construction of sewers, water mains, or other structures in the dry, shall be at the expense of the Contractor. This includes providing material, tools, and labor to transport such water to an acceptable outlet. Prior to bidding, the Contractor shall visit the project area to determine what drainage system is available to accept water.

E. The Contractor shall be responsible to provide all equipment and labor to maintain bypass pumping during connections to existing structures. The Contractor shall maintain adequate pumping capacity at all times to prevent any spills, overflows, or discharges from the existing sanitary system.

APPENDIX C

STANDARD SPECIFICATION FOR BACKFILL, FILLS, AND EMBANKMENTS

BACKFILL, FILLS AND EMBANKMENTS

PART 1 GENERAL

1.01 Description

A. All trenches or excavations shall be backfilled to the original surface of the ground or such other grades as shown or directed. In general the backfilling shall be carried along as speedily as possible and as soon as the concrete, mortar, and/or other masonry work and pipe joints have sufficient strength to resist the imposed load without damage.

1.02 Backfill Materials

A. The following materials shall be used for backfill in accordance with and in the manner indicated by the requirements specified herein.

Class I - Angular, 6 to 40 mm (1/4 to 1 ½ inch), graded stone such as crushed stone.

Class II - Coarse sands and gravel with maximum particle size of 40 mm (1 ½ inch), including various grades of sands and gravel containing small percentages of fines, generally granular and non-cohesive, either wet or dry. Soil types GW, GP, SW and SP are included in this class.

Class III - Fine sand and clayey gravel including fine sands, sand-clay mixtures and gravel-clay mixtures. Soil types GM, GC, SM and SC are included in this class.

Class IV - Silt, silty clays and clays, including inorganic clays and silts of medium to high plasticity and liquid limits. Soil types MH, ML, CH and CL are included in this class. These materials are not recommended for bedding. This class shall also include any excavated material free from rock (3 inches and larger), concrete, roots, stumps, rubbish, frozen material and other similar articles whose presence in the backfill would cause excessive settlement.

Flowable Fill Controlled low strength material (CLSM).

PART 2 PRODUCTS

2.01 Backfill of Trench Excavations for Pipes and Conduits

A. Bedding and Backfill materials samples shall be submitted to the City prior to start of construction. Approved samples shall be kept at the City's field office. Materials differing significantly from these samples shall not be used without written authorization from the City.

PART 3 EXECUTION

3.01 Backfill Above Pipe

A. Method A - Backfill in Areas Not Subject to Vehicular Traffic

1. For purposes of this specification, trenches shall be considered subject to vehicular traffic if all or any portion of the excavation is located within five (5) feet of a roadway or alley which is routinely traveled by powered vehicles. In the event of any question regarding the susceptibility of an area to traffic, the City's decision shall govern.

2. The trench between the pipe bedding and the ground surface shall be backfilled with Class I, II or III materials, as described above, deposited with mechanical equipment in such a manner that it will "flow" onto the bedding and not free fall. The Contractor shall consolidate the backfill by the back and forth travel of a suitable roller, wheeled device or other similar heavy equipment until no further settlement is obtained. Heavy equipment shall not be used until there is a cover of not less than three (3) feet over the pipes. To assist in promoting maximum settlement, the surface of the trench shall be left in a slightly rounded condition. Periodical dressing of the backfill in the trench to promote the drainage and safety conditions shall be made during the course of the contract as required or ordered by the City.

B. Method B - Backfill in Areas Subject to Vehicular Traffic (Mechanical Compaction)

1. The trench between the pipe bedding and the surface, which are located in areas subject to or possibly subject to vehicular traffic, shall be backfilled with Class I or II materials, deposited in uniform horizontal layers of two (2) feet +/- six (6) inches. Each layer shall be thoroughly compacted by mechanical tamping utilizing a crane mounted hydraulic vibratory compactors. Each layer shall be thoroughly compacted before the next succeeding layer is placed. This procedure shall be followed where trench walls remain stable during compaction. If in the opinion of the City and/or his representative (inspector), the trench walls become unstable during compaction, then the City and/or his representative (inspector) may authorize the Contractor to push from the back of the trench the Class I or II material into the trench the full depth, not to exceed twenty (20) lineal feet horizontally along the trench bottom and compact using the vibratory compactor in two (2) foot diagonal lifts.

2. The crane mounted vibratory compactors shall be capable of producing 1900 cycles per minute and have a compaction plate with the minimum dimensions of twenty-three by thirty-one (23 x 31) inches. The compactor shall be similar to those as manufactured by Allied, Ho-Pac, or equal.

3. When Class I or II materials do not contain sufficient moisture to obtain proper compaction, in the opinion of the City and/or his representative, it

shall be moistened or wetted to within +/- 2% optimum moisture content and as directed by the City and/or his representative.

4. Granular backfill materials shall terminate at a point below finished grade sufficient to allow placement of the permanent surface materials. For portions of the surface subject to vehicular traffic, the remaining trench shall be filled with compacted aggregate base material, shaped, graded and compacted with a ten (10) ton roller. Where the permanent surface is asphalt or concrete the aggregate base thickness shall be the specified thickness of the pavement material plus six (6) inches. Where temporary cold mixed asphalt pavement is specified the compacted aggregate materials shall be stopped at required grade to accommodate the temporary pavement. Where the permanent surface is compacted aggregate the layer shall be eight (8) inches thick. In either case, the Contractor shall maintain the surface daily until the permanent pavement is placed.

5. For portions of the trench surface not subject to traffic the backfill material shall end eight (8) inches below the finished grade. This eight (8) inch depth shall be filled with good top soil and seeded in accordance with these Specifications. Existing top soil and sod may be used if properly separated and preserved.

6. The compacted aggregate base materials shall conform with the Indiana State Highway Department Standard Specifications, latest edition, for compacted Aggregate Base. In the event that suitable aggregate material, which conforms to the above specification is obtainable from the trench excavations and can be satisfactorily segregated, the Contractor may elect to use the material in lieu of purchased materials.

7. Density testing of the above backfilled trenches shall be the responsibility of the Contractor and shall be performed at no additional cost to the Owner. Testing shall be performed by an approved commercial testing laboratory. All backfill placed under this Method B shall be tested in accordance with AASHTO T99. Density testing shall be performed immediately prior to permanent pavement replacement and after the upper level of the compacted aggregate base or temporary pavement is removed to allow paving. When backfill has been placed using vibratory compaction, testing shall be made at the exposed surface one (1) time per location and not less than one (1) test per four hundred (400) feet. All test locations shall be determined by the City. Should the results of the density test show a compaction of less than ninety-five percent (95%) Standard Proctor Density, the area(s) represented by such test shall be immediately recompacted to achieve the specified density and at no additional cost to the Owner.

C. Method C - Backfill in Areas Subject to Vehicular Traffic (Jetting and Watersoaking)

1. In lieu of the Mechanical Compaction described in Method B above, the Contractor may compact the Class I or II materials by jetting and watersoaking in the manner described below. Except for compaction procedures of the Class I or II materials, all provisions of Method B described above shall apply to this Method C. The trench compaction shall be started at the point of lowest elevation of the trench and work up along the trench. Jetting and watersoaking shall not begin until the trench has been backfilled to within eight (8) inches of the finished surface. Jetting and water soaking is not allowed when the groundwater table is above the spring line of the pipe.

2. The holes through which water is injected into the backfill shall be centered over the trench backfill and at longitudinal intervals of not more than six (6) feet. Additional holes shall be provided if deemed necessary by the City to secure adequate settlement. All holes shall be jetted and shall be carried to a point one (1) foot above the top of the pipe. Drilling the holes by means of augers or other mechanical means will not be permitted. Care shall be taken in jetting so as to prevent contact with, or any disturbance of the pipe.

3. The water shall be injected at a pressure and rate just sufficient to sink the holes at a moderate rate. After a hole has been jetted to the required depth, the water shall continue to be injected until it begins to overflow the surface. The Contractor shall, at his own expense, bore test holes at such locations as the City may designate in order to determine the effectiveness of the water soaking. An approved soil auger shall be used for boring test holes. As soon as the jetting and watersoaking has been completed, all holes shall be filled with soil and compacted. Surface depressions resulting from backfill subsidence caused by jetting and watersoaking shall be filled and recompacted by tamping or rolling to the satisfaction of the City.

4. The Contractor shall provide all piping, fittings, etc., necessary to deliver the water along the site of the work and shall arrange with the Water Company for making the necessary taps and metering. All expenses incurred for installing the pipe and hose together with the cost of the water used shall be borne by the Contractor.

D. Method D – Backfill in Areas Subject to Vehicular Traffic (Flowable Fill)

1. In lieu of the mechanical compaction and jetting described in Methods B and C above, the Contractor may use controlled, low strength flowable mortar.

2. The flowable fill mix shall contain for every cubic yard of batch material, no more than 50 lbs. of Portland Cement, no more than 500 lbs. of Type F fly ash, no more than 500 lbs. of water, no more than 2850 lbs. of sand, and no more than 10% total air.

3. The compressive strength of the flowable fill shall not exceed 100 psi @ 28 days.

4. Standards: ASTM D4832
ASTM D6023

3.02 Temporary Surfaces Subject to Traffic

A. The Contractor shall open streets to traffic immediately after completing the backfill operation. He shall accomplish this by installing the compacted aggregate base immediately after granular backfill. When temporary asphalt pavement is required this shall also be installed immediately. The use of class II backfill as a temporary surface is specifically prohibited. When using Method C backfilling, the Contractor may elect to delay the jetting operation until just prior to installing the permanent pavement. This shall not relieve the Contractor from the responsibility of maintaining the temporary surface in accordance with these specifications.

3.03 Maintaining Trench Surfaces

A. All surface settlement of the backfill along trenches located beneath streets, roads, alleys, driveways and parking lots which are subject to traffic shall be kept filled level with or slightly above the original paved surface at all times with compacted aggregate base material until the permanent pavement is satisfactorily restored. When temporary asphalt pavement is used, depressions and "pot holes" shall be promptly filled with the temporary asphalt material. Special attention shall be given by the Contractor to the timely and proper maintenance, leveling and grading of the surface of all backfilled trenches, especially those subject to traffic and especially following rains. The surface of streets, roads and alleys shall be maintained smooth and free of ruts and water trapping depressions by periodic power blading, scarifying; and/or filling settled areas, ruts, pockets, or holes with compacted aggregate base material or temporary asphalt where used.

B. As a dust preventive, the Contractor shall apply, at his expense, calcium chloride over the surface of the compacted aggregate base in such amounts and at such times as are necessary to avoid or eliminate dust complaints from nearby residents. In event of any question regarding the existence or nonexistence of a dust nuisance, the City's decision on the matter will govern. The material used shall be Regular Flake Calcium Chloride having a minimum chemical content of Calcium Chloride of seventy-seven percent (77%). Unless otherwise specified or ordered by the City, the rate of application shall be one and one half (1 ½) pounds per square yard of surface covered.

C. Wherever surface settlement is not important, unless otherwise specified or directed, the backfill shall be neatly rounded over the trench to a sufficient height to allow for settlement to grade after consolidation. Just prior to the completion of all work under the contract, any surface settlement below original ground surface shall be refilled in a satisfactory manner, and reseeded as specified if required.

3.04 Backfill Around Structures

A. For purposes of this specification, structures shall include but not be limited to footings, foundations, basements, grade beams, vaults, capsules, manholes, ducts, tanks, bridges, inlets, headwalls, anchors, and etc. Items specifically excluded from this definition of "structures" are pipe, conduits and their appurtenances except those listed herein.

B. The material for backfill around structures shall meet the requirements of Class I, II or III backfill materials, as defined on page 1 under the paragraph entitled "Backfill Materials". Material removed from the project site may be used provided it meets this criteria. Materials classified as Class IV, clay balls, debris, topsoil, frozen or excessively wet or dry materials, weak soils or muck and other similar detrimental materials will not be put in place as backfill around structures.

C. All excavations shall be backfilled to the original surface of the ground or such other grade as shown on the plans or directed by the CITY. The backfilling shall be carried along as speedily as possible and as soon as the concrete, mortar and/or other masonry work and pipe joints have sufficient strength to resist the imposed load without damage. All appurtenances and attachments to structure walls shall be made and any wall coatings shall be in place and cured prior to backfilling at that elevation.

D. Prior to backfilling, all formwork and construction debris will be removed. Any frozen or wet subsoil will be thawed or dried and compacted or removed prior to receiving backfill. During cold seasons, grades receiving backfill will be protected from frost during the work progress.

E. Begin backfill at the lowest elevation in the excavation. Place backfill in even, level layers. The thickness of the layer shall not exceed 75% of the compaction equipment manufacturer's rating for the equipment used when compacting the type of soil being placed for backfill, i.e. Class I, II and/or III.

F. Density tests will be made by the contractor, as directed by the City, at no additional cost to the Owner. The tests are to be performed as described below and will be required as necessary to determine that uniform compaction throughout the depth of the lift has been achieved. Where backfill is required on both sides of structure or around the entire structure, backfill and compaction shall be done simultaneously on both sides or around the structure.

G. The compaction equipment used for compacting backfill around structures shall be submitted for approval of the City. In general, the equipment will be approved for use upon demonstration that it is capable of compacting the soil to the required density without damaging adjacent structures and appurtenances. Tread mounted equipment shall not be considered effective compacting equipment.

H. The Contractor shall provide, when necessary, equipment and materials to moisten or aerate excessively wet or dry backfill to maintain optimum moisture content (+/- 2%) for the soil type being placed.

I. Rainfall and/or groundwater trapped in the excavation during backfill operations shall be pumped out by the Contractor. Excessively wet soil or soil which has eroded into the excavation shall be removed or excavated and recompacted prior to placing additional backfill material.

J. The in-place density obtained by the backfill operations will be measured by an City approved independent testing laboratory obtained and paid for by the Contractor at no additional cost to the Owner. The percent compaction will be determined by dividing the density measurement by the maximum density for the soil type being tested. The maximum density will be determined by the standard proctor test, AASHTOT 99 for consistency. Test reports shall indicate the location and elevation of the test. Density testing shall be made at frequent intervals along the backfill layer, at the surface and at mid-depth as determined by the City. All backfill shall be compacted to at least 95% of maximum density and the top two feet of backfill under areas subject to vehicular traffic shall be compacted to 98% of maximum density.

K. Openings in structures to receive pipe shall be temporarily plugged or bulkheaded during backfill operations. Backfill shall proceed to an elevation level with the invert of the pipe. The pipe shall then be bedded and backfilled in accordance with the applicable Detailed Specification and Workmanship and Materials Specifications. Backfill of pipe not in areas subject to vehicular traffic shall be with Class I, II or III materials and in areas subject to vehicular traffic with Class I or II materials only.

3.05 General Fill Areas

A. In areas where general site fill material is required and is not addressed in other parts of this section, Class IV material shall be acceptable. For general fill areas, fill materials shall be spread in layers not to exceed 8 inches when in a loose condition and be compacted to the satisfaction of the City by grading equipment.

APPENDIX D

STANDARD SPECIFICATION FOR RESTORATION OF SURFACES

RESTORATION OF SURFACES

PART 1 GENERAL

1.01 Description

A. Restoration of surfaces shall include the removal of the existing surface, the disposal of the surplus material and the construction of new surfaces and adjusting all new and existing structures for proper grade prior to paving as indicated on the plans and/or as specified in these Specifications.

1.02 Restoration of Paved Surfaces

A. Restoration

1. After all excavations within the limits of paved surfaces have been properly backfilled, compacted and repaired in accordance with Appendix B “Excavation”, Appendix C “Backfill Fills and Embankments”, and Appendix E “Roadways and Parking Areas”, of these Specifications, the paved surfaces shall be restored to a condition as good as or better than existed prior to the beginning of the work, in accordance with the following specifications.

2. State Paved Surfaces: Highways, streets and roads constructed and/or maintained by the Indiana Department of Transportation (INDOT), which are wholly or partially removed, damaged or disturbed by the Contractor's operations shall be restored to a condition as good as or better than existed prior to the beginning of the work. Such restoration shall be performed in accordance with the pertinent specifications and standards of the Indiana Department of Transportation, as applicable.

3. Other Paved Surfaces: Streets, alleys, sidewalks, driveways, curbs and gutters, not constructed or maintained by the Indiana Department of Transportation, but paved with asphalt, concrete, cinders, crushed stone, waterbound macadam, oil-bound macadam, or heterogenous paving materials, which are wholly or partially removed, damaged, or disturbed by the Contractor's operations, shall be restored with like or better materials, acceptable to the City, to a condition as good as or better than existed prior to the beginning of the work, so that movement of traffic, both vehicular and pedestrian, through the restored way shall be as free, safe and unimpeded as before.

B. Temporary Surface

Temporary trench surfaces shall be installed and maintained in accordance with Appendix C Backfill, Fills and Embankments of this specification. This temporary surface shall be maintained by the Contractor until the permanent pavement is placed. Before placing permanent pavement, all or parts of the temporary surface shall be removed, as necessary, and hauled from the site of the work.

PART 2 EXECUTION

2.01 Temporary Pavement Replacement

A. Trench surfaces of highly traveled streets and roads may be designated to receive a temporary pavement replacement of cold mixed bituminous pavement. This temporary pavement shall be of the thickness specified or shown on the plans and shall be surface mixture Class A or B prepared and placed in accordance with Section 403 - Cold Mixed Asphalt, CMA, Pavement of the latest edition of the INDOT Standard Specifications. Prime and tack coats shall not be required. All temporary pavement shall be maintained by the Contractor to proper grade so as not to impede the safe flow of traffic until the permanent pavement replacement is made.

2.02 Permanent Paving

A. Permanent paved surfaces shall be restored in accordance with Appendix E, “Roadways and Parking Areas” and the following requirements, unless otherwise set forth in the plans, the Special Provisions or Detailed Specifications; however, in all cases, the methods and materials of restoration shall meet the requirements of the INDOT, as applicable. All permanent cut / road repairs shall be installed level to existing pavement with no more than a 1/8” rise per foot of width of repair and a maximum rise over the cut width of no more than a 1/4".

2.03 Double Chip and Seal

A. This work shall consist of two applications of bituminous material, each followed by an application of cover aggregate in accordance with these specifications.

B. Grade and roll the sub-base prior to application.

C. The first application shall consist of applying a liquid sealing asphalt at the rate of 0.63 – 0.68 gallons per square yard followed by application of aggregate (Size No. 8 or 9) at the rate of forty (32) pounds per square yard and rolled to seat the stone in the asphalt.

D. The second application shall consist of applying liquid sealing asphalt at the rate of 0.41 – 0.46 gallons per square yard then chipped with aggregate (Size No. 11) at the rate of twenty (22) pounds per square yard.

E. All work shall be in accordance with Section 404 “Seal Coat” Type 6 or 7 of the INDOT Standard Specifications.

2.04 Restoration of Ground Surfaces

A. All ground surfaces in public Rights-of-Way, easements and on private property that have been damaged or destroyed by the Contractor's operations shall be restored in accordance with the following specifications. All surplus material, rock, trees, shrubs, concrete pipe, asphalt, crushed stone, etc., not to be used in

the Contractor's restoration operations shall be removed from the site and disposed of in an acceptable manner.

All work, either sodding or seeding and mulching, shall be in accordance with “Seeding and Sodding”.

2.05 Clean Up

A. Before final acceptance of the work, the Contractor shall satisfactorily clean all areas within the limits of his operations including the street surfaces, walks, gutters, fences, lawns, private property and structures, leaving them in as neat, clean and usable condition as originally found. He shall remove all machinery, tools, surplus materials, temporary buildings and other structures from the site of work. He shall also remove all organic matter and materials containing organic matter from all areas and places used by him during construction. All pipes, manholes, inlets, etc., shall be cleared of all scaffolding, sedimentation, debris, rubbish and dirt.

B. Where the Contractor's operations have resulted in filling existing ditches, clogging existing culverts, damaging existing bridges, ground surfaces, sidewalks, driveways, etc., the Contractor shall re-ditch, clean culverts, repair or replace bridges, ground surfaces, sidewalks, driveways, etc. so as to return them to a condition as good as or better than existed prior to the beginning of his operations.

C. The Contractor's cleanup operations, which include repair, restoration or replacement of ground surfaces and existing improvements and the removal of rock, shall be performed continuously during the construction operations.

APPENDIX E

STANDARD SPECIFICATION FOR ROADWAYS AND PARKING AREAS

ROADWAYS AND PARKING AREAS

PART 1 GENERAL

1.01 Scope

A. The Contractor shall furnish all materials, equipment and labor to construct and/or reconstruct new and existing roadway, alley, driveway, parking area and other pavement areas including those removed or damaged as a result of construction. These include access roads, approaches and entrances.

B. The Contractor shall furnish all materials and labor necessary to install a compacted aggregate base for all traffic areas to receive subsequent hard surface pavements (concrete or hot mix asphalt) and those areas to receive just the compacted aggregate pavement as specified and as ordered by the City.

C. The Contractor shall be responsible for any damage to drives, roads, sidewalks, culverts, and other structures whether existing and/or new as constructed as part of the Contractor's work. Any repairs made due to damage caused by the Contractor shall be at his expense. This includes pavements for shoulders.

D. The Contractor shall keep all pavements completely clean from mud, loose aggregate and other debris and objectionable materials by the end of each workday.

E. Note: If local standards, specifications or other regulations require a higher strength/depth pavement section, this will supersede what is specified in these Workmanship and Materials Specifications, unless specifically noted otherwise in the specifications.

1.02 Product Handling

A. The Contractor shall store and protect miscellaneous items on the Project site so it does not interfere with other property owners or the general public.

1.03 Submittals Required Prior to the Commencement of Work

A. The Contractor shall submit copies of current materials certificates signed by the material producer and the Contractor certifying that each pavement material item complies with, or exceeds, the specified requirements.

B. The Contractor shall submit hot mix asphalt mix designs for this item.

C. The Contractor shall submit concrete mix designs for this item.

D. A paving joint plan shall be submitted for concrete pavements.

1.04 Related Specifications

A. Comply with applicable portions of the following Specifications:

Appendix B Excavation
Appendix C Backfill, Fills and Embankments

PART 2 PRODUCT

2.01 Pavement Materials

A. Hot Mix Asphalt (HMA) Pavement

The Indiana Department of Transportation (INDOT) Standard Specifications, Section 402, shall apply with the exceptions as noted herein. The current version of the INDOT Specifications, Recurring Special Provisions, and Supplemental Specifications are applicable.

1. Description: This work shall consist of one or more courses of HMA base, intermediate, surface mixtures or other miscellaneous HMA material, produced from an INDOT Certified HMA producer, in accordance with Indiana Test Method (ITM) 583.

2. Design Mix Formula and Mixture Type: The design mix formula, prepared in accordance with 402.04, shall be based on the following table and as may be amended from time to time:

Mixture Type	Type B	Type C	Type D
Design ESAL	<3,000,000	3,000,000 to <10,000,000	≥10,000,000
Surface	4.75, 9.5, 12.5* mm	4.75, 9.5, 12.5* mm	4.75, 9.5, 12.5* mm
Surface - PG Binder	64-22	70-22	70-22
Intermediate	9.5, 12.5,19.0, 25.0 mm	9.5, 12.5,19.0, 25.0 mm	9.5, 12.5,19.0, 25.0 mm
Intermediate - PG Binder	64-22	64-22	70-22
Base	25.0 mm	25.0 mm	25.0 mm
Base - PG Binder	64-22	64-22	64-22

**Surface 12.5 mm ≥ 195 lbs/sq.yd. min.*

3. Recycled Asphalt Pavement: (RAP): Recycled asphalt pavement, up to 25%, may be used as a substitute for a portion of the new material required to produce HMA mixtures. See INDOT SS 402.08

4. Acceptance of Mixtures: Acceptance shall be based on 402.09. The Type D Certification shall include the PG Binder Grade sent to the project.

B. A tack coat per Section 406 in accordance with the latest INDOTSS shall be applied on a clean surface before placing the surface course. All HMA or concrete

pavements shall be tacked at a rate of no less than as shown in the table below prior to placement of subsequent HMA mixtures.

Surface Type	Application Rate*(gal./sq yd)
New Asphalt	0.05 to 0.08
Existing Asphalt	0.06 to 0.11
Milled Asphalt	0.06 to 0.12
PCCP	0.05 to 0.08
* The asphalt material shall not be diluted.	

If a prime coat is required on new and existing compacted aggregated bases, all compacted aggregate bases shall be primed in accordance with INDOT SS 405 Prime Coat, at a rate of no less than 0.50 to 0.75 gal./sq. yd.

C. Concrete Pavement

1. Concrete pavements shall comply with Section 502, "Portland Cement Concrete Pavement, PCCP" in accordance with the latest INDOTSS. Compressive strengths shall be no less than 4,000 psi and as per Section 502.04 Concrete Mix Criteria. Cold weather (below 45 degrees F) placement will not be permitted without an approved plan for cold weather concrete work and at the approval of the City.

D. Compacted Aggregate Base

1. Compacted aggregate base meeting the requirements of Section 301, "Aggregate Base" in accordance with the latest INDOTSS shall be provided. Aggregate shall meet the requirements for No. 53 coarse aggregate in Article 904, "Aggregates" of the INDOTSS.

2. All aggregates shall be crushed limestone unless otherwise approved by the City. Crushed slag may be used on a case by case basis.

E. Geotextiles and Geogrids

1. Woven and non-woven geotextile fabrics and HDPE geogrids per INDOTSS Section 918, "Miscellaneous", may be used as a separation layer between unstable soils and the placement of compacted aggregate base (subbase) materials. Supportive documentation shall be required and submitted to the City for approval prior to their use.

F. Hydrated Lime (Quick Lime)

1. The Contractor may elect to submit an alternate plan for stabilizing the subgrade by use of hydrated lime per INDOTSS Section 215, "Chemical Modification of Soils". In such a case a licensed geotechnical City or professional geologist will be required to outline the proposed method and process.

PART 3 EXECUTION

3.01 Installation

A. The placement of all pavement materials shall be in accordance with the latest INDOTSS. All road cuts shall be saw-cut in a uniform, straight line prior to removal of the pavement. If, after saw-cutting, the exposed pavement becomes cracked as a result of construction loads, additional saw-cutting and removal or milling will be required. The thickness of all pavements to be placed under this specification shall be no less than existing pavement thickness found. The thickness of pavements and base materials shown herein is intended for those areas where a minimum thickness is not specified.

B. New construction and driveways and parking areas disturbed by construction shall be constructed and restored to the original or better condition. Unless noted otherwise, it is not the intent to repave entire drives and parking areas in the project area, but rather to repave and repair the trench width and any areas damaged during construction, so long as they are completed in a uniform and neat manner. No irregular, jagged or raveled patch repairs are permitted. The existing pavement shall be saw cut along that portion to be removed. If local standards or specifications require thicker pavement sections, then the local standards and/or specifications shall be followed.

1. Hot Mix Asphalt Pavement

a. Asphalt drives and parking areas outside of the public right-of-way shall consist of no less than a 1 ½ inches HMA surface, Type B on 3 ½ inches of HMA base, Type B on 6 inches of compacted aggregate, #53 in accordance with the INDOTSS.

b. Local asphalt pavements, including roads, drives and parking areas within the public right-of-way shall consist of no less than 1 ½ inches HMA surface, Type B on 4 inches of HMA Base, Type B on 8 inches of compacted aggregate, #53 base in accordance with the INDOTSS,.

c. Collector asphalt pavements, including major municipal streets, drives and parking areas within the public rights-of-way, shall consist of no less than 1 ½ inches of HMA surface, Type B on 2 ½ inches of HMA Intermediate, Type B on 4 inches of HMA Base, Type B on 8 inches of compacted aggregate, #53 in accordance with the INDOTSS.

d. Arterial asphalt pavements, including major municipal streets, drives and parking areas within the public rights-of-way, shall consist of no less than 1 ½ inches of HMA surface, Type B on 2 ½ inches of HMA Intermediate, Type B on 6 inches of HMA Base, Type B on 8 inches of compacted aggregate, #53 in accordance with the INDOTSS, unless specified otherwise in the Detailed Specifications.

e. HMA pavements shall be prepared, placed, compacted, and finished in accordance with Section 402, “Hot Mix Asphalt, HMA, Pavement”. The Contractor's particular attention is directed to the requirement of cutting or sawing of pavement removal areas to neat, straight lines prior to actual pavement removal. This requirement applies to all sewer trenches, service line trenches and force main trenches.

f. The existing pavement shall be saw cut along that portion to be removed.

2. Compacted Aggregate Surfaces and Bases

a. Unless noted otherwise, all road repairs shall consist of no less than 8 inches of compacted aggregate, #53 base. During construction, all pavement crossings shall be filled with compacted surfaces and bases and maintained to minimize the development of objectionable pavement depressions.

b. The surface course material shall be deposited and spread uniformly upon the prepared subgrade, in a single layer no less than six (6) inches in thickness measured after compacting. The material shall be free of lumps of clay and shall be of uniform mixture and density when placed. Portions of the layer in which the aggregates become segregated in spreading shall be removed and replaced with satisfactory material. Material shall not contain free water or frost, and shall not be placed in snow or on soft or frozen subgrade.

c. Compacted aggregated base shall be shaped, graded and compacted using vibratory rollers and compactors. The Contractor shall maintain the compacted aggregate base until the temporary or a permanent pavement is placed.

d. After being uniformly spread, the surfacing material shall be harrowed with a spike tooth harrow and floated with a road drag or grader until the surface is free from waves or irregularities. Harrowing and floating shall be continued until the surface has the required grade, line and cross section as shown on the plans, except that the harrowing shall not be carried on at such time or to such extent that the fine material will be separated from the coarse material. If the surfacing material is not thoroughly compacted by traffic before final acceptance or placement of hot asphaltic concrete pavement, then it shall be accomplished by means of suitable roller and wetting or drying to obtain maximum density.

e. Compacted aggregate base is to be placed as a base for the permanent pavement replacement for streets maintained by the Owner. All existing paved streets, roads, alleys, driveways, etc., cut for sewers and pipelines will require an 8-inch compacted aggregate base as part of the pavement replacement.

f. Additional aggregate required in trenches to maintain safe traffic flow, before placement of pavement shall be at the Contractor's expense. All excess aggregate removed to fit the placement of pavement shall be hauled from the site. When the trenches are prepared for replacement of a permanent pavement and the top portion of the compacted aggregate base is cut away, a full 8" of compacted aggregate base shall be remaining.

g. Compacted aggregate used for construction traffic shall be removed and the subgrade removed and re-compacted. Additional compacted aggregate shall be added to meet the lines and grades required for the pavement section.

3. Areas Receiving Pavement

a. Additional aggregate shall be required in all trenches in order to maintain safe traffic flow before placement of final pavements and shall be at the Contractor's expense. All excess aggregate removed to fit the placement of pavement shall be removed from the project area. When the trenches are prepared for replacement of a permanent pavement and the top portion of the compacted aggregate base is cut away, a full 8" of compacted aggregate base shall be remaining.

b. The surface of the compacted aggregate surface course shall be graded to the required elevations and cross sections as shown and/or as established by the City. All soft spots and/or unstable or unsatisfactory base material shall be removed and replaced with suitable material to provide a satisfactory base beneath all areas to be paved. The newly placed or previously placed base material shall be scarified, brought to optimum moisture condition and thoroughly compacted ahead of the paving operations.

4. Concrete Pavements

a. Concrete surfaces shall be repaired as indicated on the drawings. Concrete pavements shall comply with Section 502, "Portland Cement Concrete Pavement, PCCP" in accordance with the latest INDOTSS. A broom or tined finish is required.

b. The minimum pavement thickness shall be 6 inches. For urban and commercial areas, the minimum thickness shall be 8 inches in low volume truck areas and 9 inches when the amount of truck traffic exceeds 10 %. Also, concrete pavements that need to be removed shall be removed to the nearest existing pavement joint.

c. A paving joint plan shall be submitted to the City for approval prior to placing the concrete pavement.

5. Curb and Gutter

a. All permanent restoration of street curb and gutter shall be of the same type and thickness as the existing curb and gutter. The grade of the restored curb and gutter shall conform to the grade of the existing adjacent curb and gutter. Curbs and gutter shall be saw cut at approximately 10-ft. intervals but shall match adjacent joints in sidewalks.

6. Driveways and Sidewalks

a. All permanent restoration of driveways and sidewalks shall conform to the manner of construction as originally placed and to the lines and grades as given by the City. Replacement of concrete shall be from joint to joint. No patching of concrete shall be permitted. One-half (½) inch expansion joint material shall be installed wherever new concrete is placed against any existing or newly-cured concrete surfaces (vertical concrete surfaces only).

b. New sidewalks shall be installed in minimum widths of 48 inches or of the same width as existing sidewalks and minimum lengths of 60 inches. The minimum width around obstructions (utility features, utility poles, signs, walls, or other obstructions) shall be four (4) feet.

c. Unless specified elsewhere, sidewalks constructed adjacent to curbs, gutters or street pavement shall be six (6) feet wide.

d. Unless specified elsewhere, sidewalks constructed with a utility strip separating the sidewalk from curbs, gutters or street pavement, shall be five (5) feet wide.

e. All new sidewalks shall be 4 inches thick using Class A concrete on 6 inches of compacted aggregate No. 53, except at driveways where the concrete shall be 6 inches thick. The new walk shall slope less than 2.0% (1.5% preferred) across the width of the walk toward the street unless otherwise noted and broom finished at right angles to the walkway. A ½ inch expansion joint and preformed joint filler material shall be installed at no more than 30-foot intervals. Tooled contraction joints shall be placed on the new sidewalk at 5-foot intervals.

f. Where sidewalks are replaced, the replacement sidewalk shall be installed the full width of the walk and from joint to joint. All sidewalk ramps to a public street or alley shall conform to the latest ADA regulations.

g. All ADA ramps shall be in conformance with the latest INDOTSS unless superseded by ADA (United States Access Board) regulations. All finished slopes exceeding maximum ADA slopes shall be considered unacceptable.

C. Subgrades

1. The construction of subgrades shall be outlined in the Contractor's Plan of Operation and is to be submitted to the Owner prior to initiation of the actual work.

2. The subgrade of roadways and parking areas shall be shaped either by cutting or filling as the plans may show or as directed by the City. The area between the lines shown on the plans or necessary for construction shall be cleared of all topsoil, vegetation, brush, logs or other perishable material. During construction, the subgrade shall be formed and maintained in such a manner that the surface water will readily flow off the surface. The subgrade shall be brought to the correct grade on cuts and to approximate grade on fills with the proper allowance for settlement and shall then be allowed to settle. The subgrade shall be brought to the true shape and grade before the surfacing is placed.

3. All subgrade areas to receive a compacted aggregate base shall first be brought to optimum moisture conditions and shall be compacted to an optimum condition as determined by results of soils testing by a geotechnical testing company provided by the contractor. Subgrades shall be compacted to a minimum of 95 percent of the maximum dry density as determined in accordance with ASTM D 1557 (Modified Proctor) using Method A for soil and Method C for granular materials.

4. The Contractor shall be responsible for compaction testing using a licensed geotechnical City or professional geologist.

5. Should weather conditions cause the subgrade to become wet and/or saturated, muddy, spongy or frozen or unusually dry for extremely dry conditions, the contractor shall again bring the subgrade up to optimum moisture conditions and retest the compacted subgrade. In frozen subgrades, the temporary pavement materials shall be used if the disturbed areas must remain open to traffic or will otherwise create a potential public hazard.

6. Soft and/or yielding or other unsuitable subgrade materials shall be removed if corrective measures are not effective. Proof rolling with the use of a pneumatic tire, two or three-axle tandem rollers or loaded dump truck shall be used to confirm if compacted subgrades exhibit soft and/or yielding properties.

7. Excavated materials to be later used for fill or topsoil shall be stockpiled and used to make the fills and embankments as shown on the plans and in compliance with the Workmanship and Materials Specifications. Backfilling shall be done in a manner to avoid any undue structural loading on structures. Stockpiles shall be located so as to avoid interference with access to project areas and to least interfere with other contractors performing work on behalf of the Owner in the same vicinity and as approved by the City.

3.02 Shoulders and Existing Traffic Areas Not Receiving Hard-Surfaced Pavements

A. Compacted aggregate No. 53 base is to be placed as a base and surface for shoulders and the permanent replacement for off-street parking, drives, parking lots and other areas not receiving hard-surfaced pavements. All existing off-street parking, drives, parking lots and other areas, etc., cut for sewers and pipelines will require a minimum 8-inch compacted aggregate base and surface replacement. The depth of shoulders shall be as shown on the plans.

3.03 Proof Rolling Before Final Paving

A. Before placement of any hard surfaced materials such as hot mix asphalt or concrete pavements, the compacted subbase shall be proof-rolled with the use of a pneumatic tire, two or three-axle tandem rollers or loaded dump truck to confirm if compacted subbases exhibit soft and/or yielding properties. If they exhibit soft and/ or yielding properties they shall be removed and the subgrade and aggregate base re-compacted and proof-rolled again until it is acceptable for final paving courses.

B. Use of Roadway During Construction

1. The Contractor may prepare the subgrade of the roads at the start of construction and use them throughout the construction period either with or without placing the surfacing material. If the aggregate is placed and the road used during construction period, then the Contractor shall perform all necessary patrol maintenance at frequent intervals and add any additional aggregate required to maintain the road. Before the final acceptance of the work, the roads and parking areas including shoulders shall be brought to the grade and cross section shown on the plans and left in a condition satisfactory to the City.

2. The prepared subgrade shall be protected by the Contractor to prevent undue rutting from truck or other equipment. If such damage does occur, the subgrade shall be reshaped and compacted prior to placing the aggregate courses.

C. Roadway Ditches

1. All open ditches and channel changes parallel to and adjacent to the road shall be performed as a part of the roadway work. Lines, grades and cross sections of ditches shall be as shown on the plans unless otherwise required by the City to obtain proper drainage.

3.04 Traffic Control

A. The CONTRACTOR shall carry out the WORK in a manner which will cause a minimum of interruption to traffic, and may close to through travel not more than two (2) consecutive blocks, including the cross street intersected. Where traffic must cross open trenches, the CONTRACTOR shall provide suitable bridges to street intersections and driveways. The CONTRACTOR shall post suitable signs indicating that a street is closed and necessary detour signs for the proper

maintenance of traffic. Prior to closing of any streets, the CONTRACTOR shall notify responsible municipal authorities.

B. The CONTRACTOR shall plan construction activities to minimize impact to traffic. Local traffic access must be maintained at all times. To maintain traffic movement, appropriate traffic control devices shall be used. Such traffic control devices shall comply with the latest edition of the Indiana Manual on Uniform Traffic Control Devices. The CONTRACTOR shall follow the requirements of the INDOTSS Traffic Control Plans when no other plan is submitted for review.

C. The Local Highway Department shall be notified no less than five (5) calendar days prior to any construction activities occurring within the right-of-way.

3.05 Testing

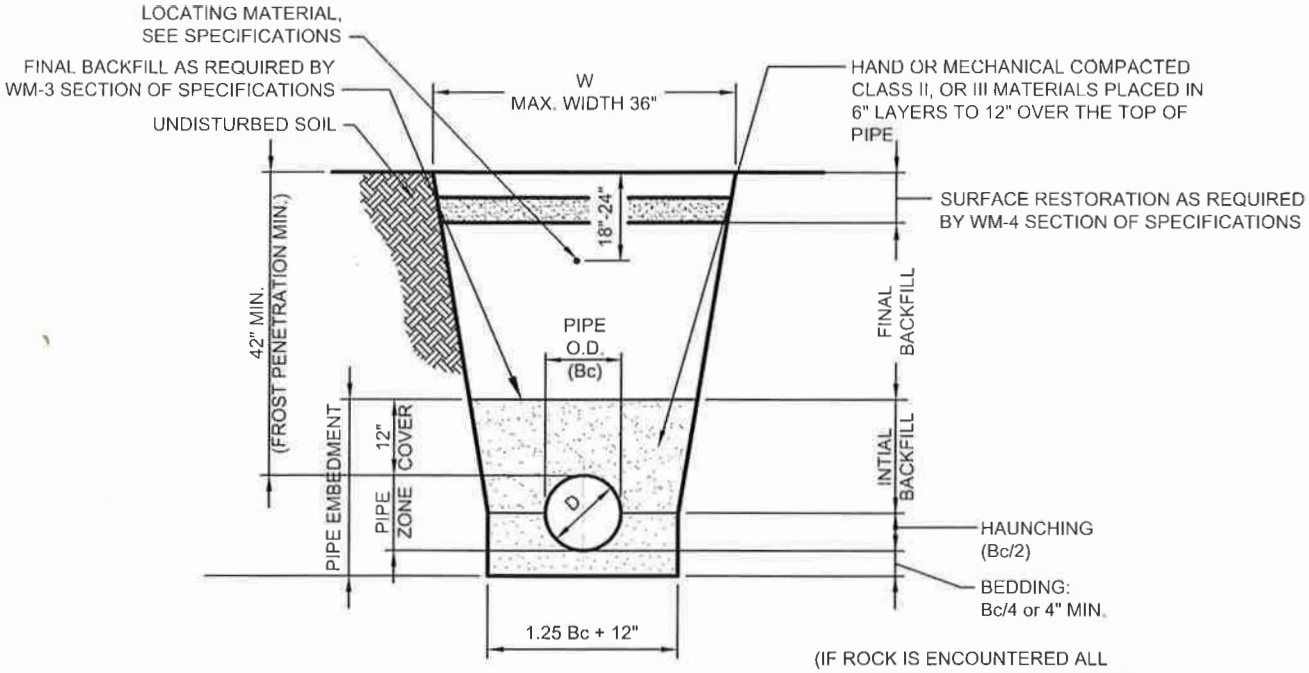
A. All materials provided under this Specification shall meet the requirements of the applicable standards of the INDOTSS, latest edition. The Contractor shall provide current certifications of such compliance, and the cost for such testing shall be borne by the Contractor.

B. Contractor's *Plan of Operation* indicating how work will be completed, what testing will be provided, what equipment will be used and what provisions will be made to protect existing property and utilities.

C. Soil compaction tests will be required for each 800 linear feet per lift of embankments constructed. The Contractor's licensed geotechnical City or professional geologist making these tests shall provide written reports with these tests. The contractor may only reduce the number of tests required based on a written quality control plan and performance-based test results from the geotechnical City or professional geologist who will also provide recommendations for the frequency of tests needed.

APPENDIX F

STANDARD DETAILS



W= MAX. ALLOWABLE TRENCH WIDTH FOR PIPE SHALL NOT TO EXCEED 30 INCHES 4" THOUGH 8" PIPE, 36" FOR 8" THROUGH 12" PIPE
D= PIPE DIAMETER (INTERNAL)
Bc= PIPE DIAMETER (EXTERNAL)

APPLICATION	BEDDING & HAUNCHING INITIAL BACKFILL	FINAL BACKFILL
GRASSY AREA OR NEW PAVED AREAS	CLASS I, OR II MATERIAL (REFER TO WORKMANSHIP & MATERIALS SPECIFICATIONS	SELECTED EXCAVATED MATERIAL
PAVEMENT AREA OR ANY AREA SUBJECT TO VEHICULAR TRAFFIC	CLASS I, II, OR III MATERIAL (REFER TO WORKMANSHIP & MATERIALS SPECIFICATIONS	COMPACTED GRANULAR MATERIAL

NOTES:

1. INITIAL BACKFILL STOPS AT A POINT 12" ABOVE THE TOP OF THE PIPS BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND AS REQUIRED BY HEREIN
2. BEDDING, HAUNCHING, AND INITIAL BACKFILL SHALL BE CLASS I, II, OR III MATERIALS ACCORDING TO THE THE WORKMANSHIP AND MATERIALS SPECIFICATIONS
3. WORK FALLING UNDER THE JURISDICTION OF THE INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 12 FEET OF THE EDGE OF PAVEMENT.
4. WORK NOT FALLING UNDER THE JURISDICTION OF INDOT SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 5 FEET OF THE EDGE OF PAVEMENT

TRENCH DETAIL FOR WATER MAIN

NO SCALE

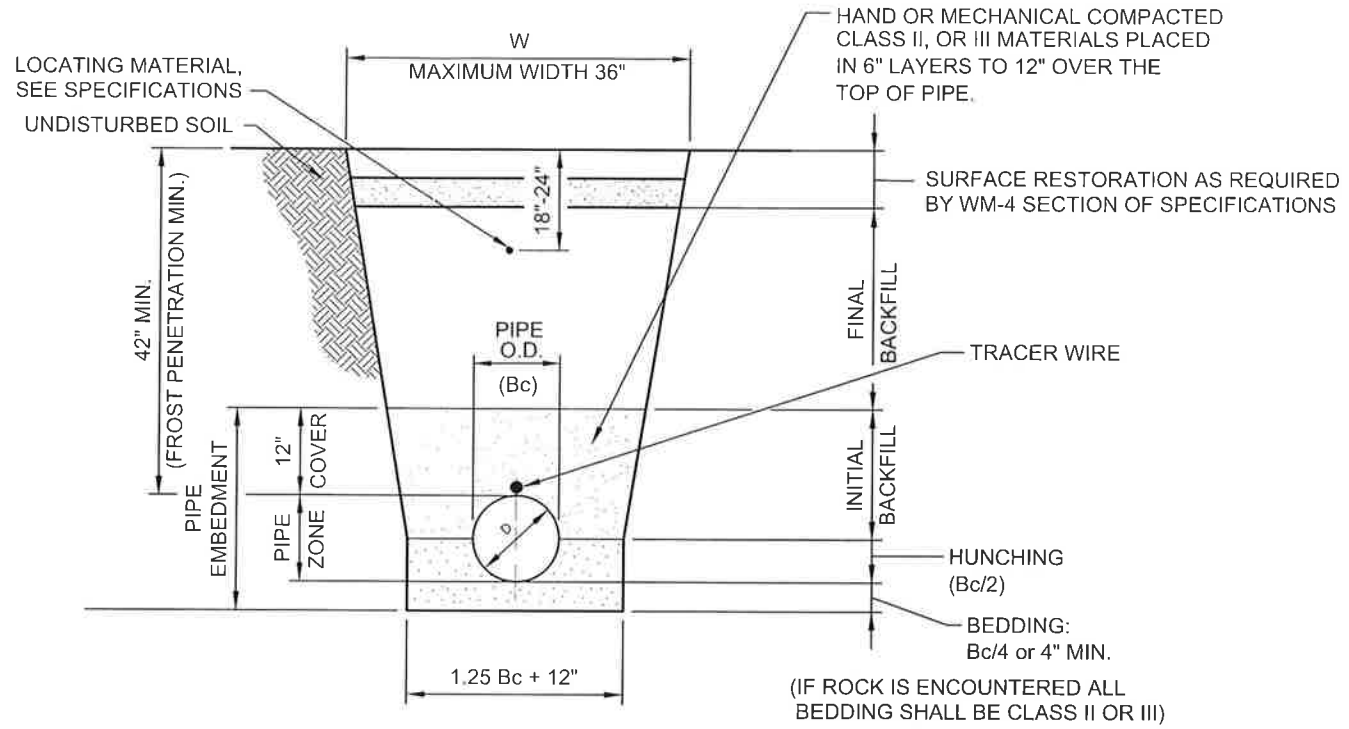
Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

WATER DETAIL

WATER-TRENCH DETAIL FOR WATER MAIN



W = MAX. ALLOWABLE TRENCH WIDTH FOR PIPE SHALL NOT TO EXCEED 30 INCHES FOR 4" THROUGH 8" PIPE, 36" FOR 8" THROUGH 12" PIPE.

D = PIPE DIAMETER (INTERNAL)

Bc = PIPE DIAMETER (EXTERNAL)

APPLICATION	BEDDING & HUNCHING INITIAL BACKFILL	FINAL BACKFILL
GRASSY AREA OR NEW PAVED AREAS	CLASS I, OR II MATERIAL (REFER TO WORKMANSHIP & MATERIALS SPECIFICATIONS	SELECTED EXCAVATED MATERIAL
PAVEMENT AREA OR ANY AREA SUBJECT TO VEHICULAR TRAFFIC	CLASS I, II OR III MATERIAL (REFER TO WORKMANSHIP & MATERIALS SPECIFICATIONS	COMPACTED GRANULAR MATERIAL

NOTES:

1. INITIAL BACKFILL STOPS AT A POINT 12" ABOVE THE TOP OF THE PIPE. BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDING WITH THE SPECIFICATIONS AND AS REQUIRED BY HEREIN.

2. BEDDING, HUNCHING AND INITIAL BACKFILL SHALL BE CLASS I, II, OR III MATERIALS ACCORDING TO THE WORKMANSHIP AND MATERIALS SPECIFICATIONS.

3. WORK FALLING UNDER THE JURISDICTION OF THE INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 12 FEET OF THE EDGE OF PAVEMENT.

4. WORK NOT FALLING UNDER THE JURISDICTION OF INDIANA DEPT. OF TRANSPORTATION SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 5 FEET OF THE EDGE OF PAVEMENT.

TRENCH DETAIL FOR WATER MAIN

NO SCALE

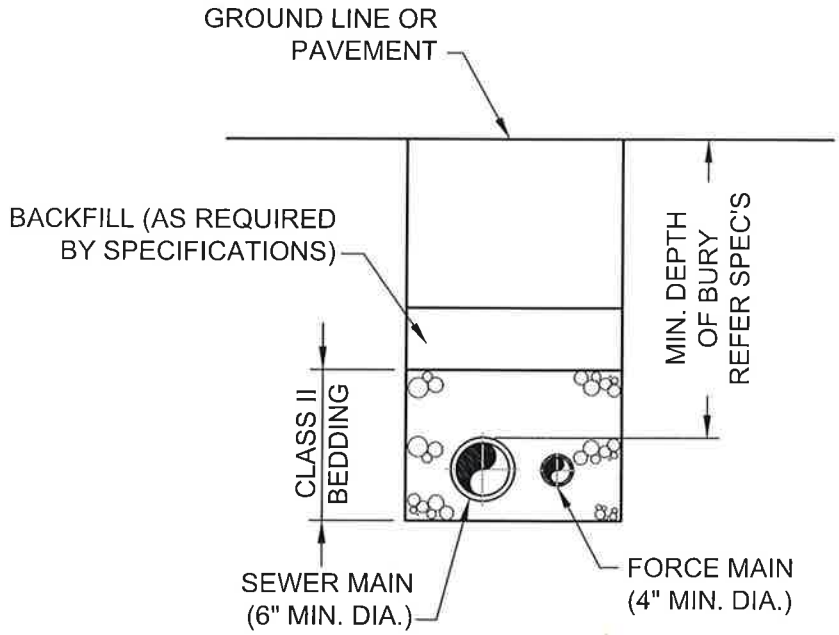
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

WATER DETAIL - W12

WATER-TRENCH DETAIL FOR WATER MAIN



DUAL FORCE MAIN AND FLEXIBLE GRAVITY SEWER DETAIL

NO SCALE

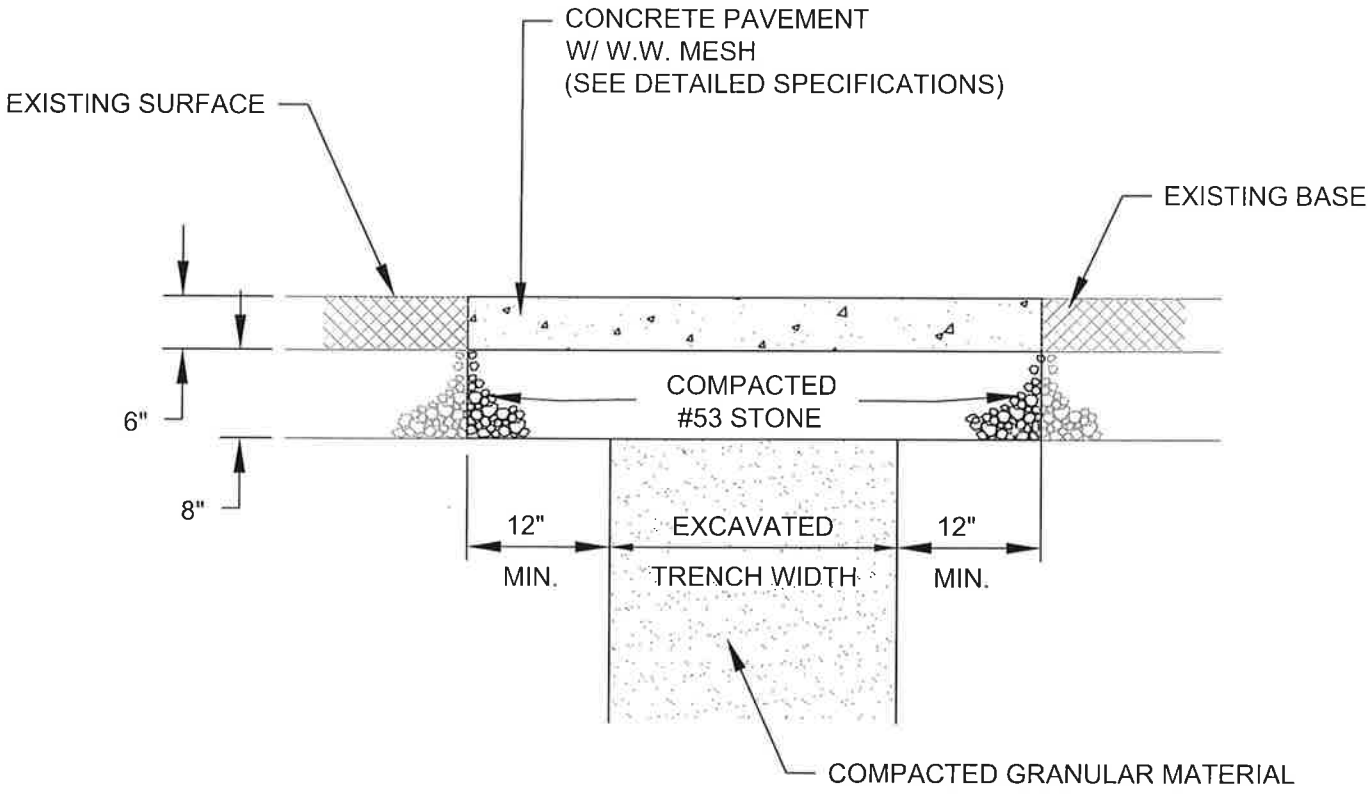
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

STORM DETAIL - S04

STORM-DUAL FORCE MAIN AND
FLEXIBLE GRAVITY SEWER DETAIL



SURFACE RESTORATION DETAIL FOR CONCRETE PAVEMENT - DRIVE

NO SCALE

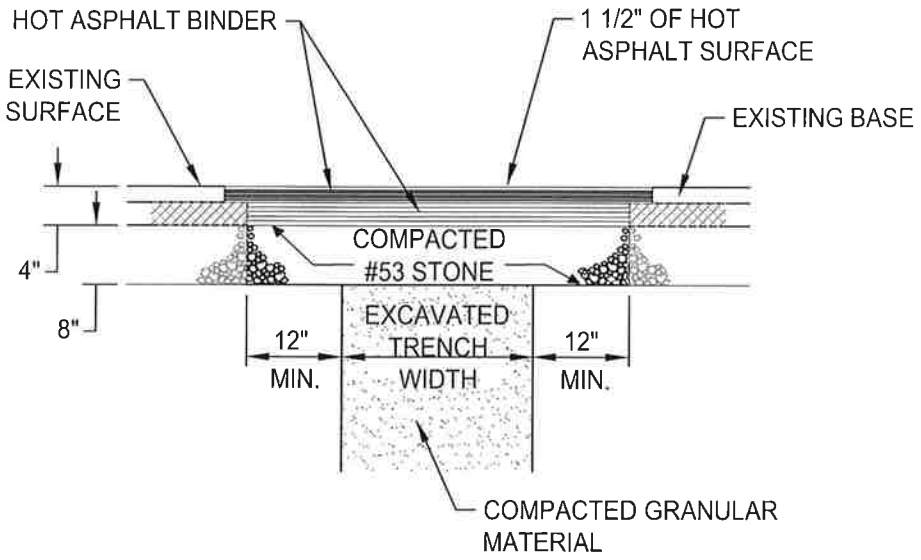
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V07

PAVEMENT-CONCRETE PAVEMENT DRIVE



SURFACE RESTORATION DETAIL FOR ASPHALT PAVEMENT- ROAD

NO SCALE

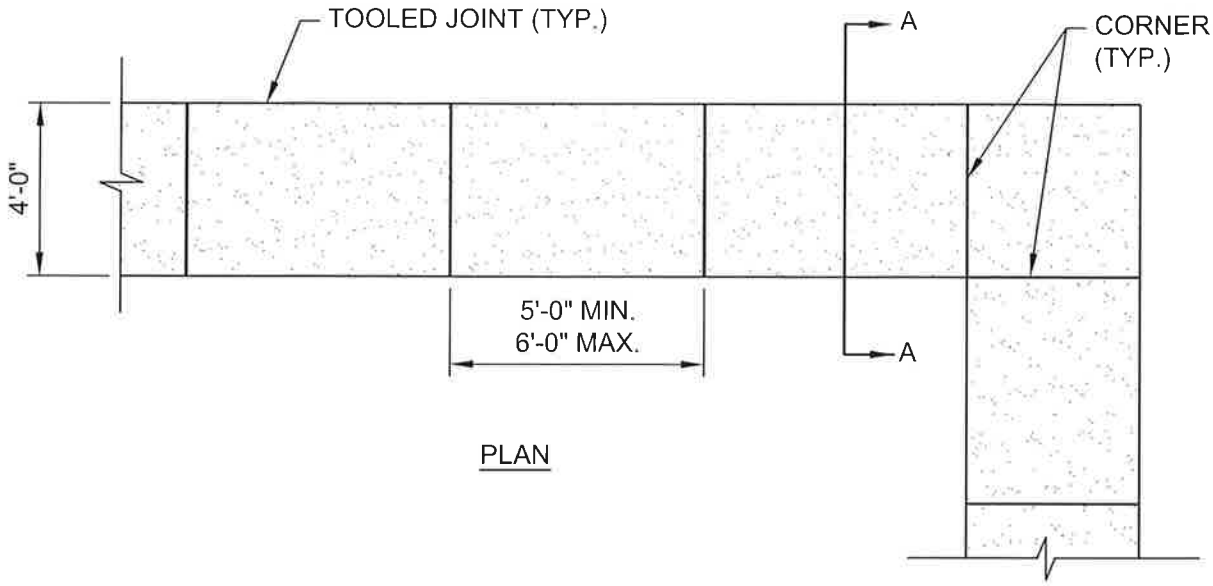
Date: 11-30-2022

MADISON Indiana

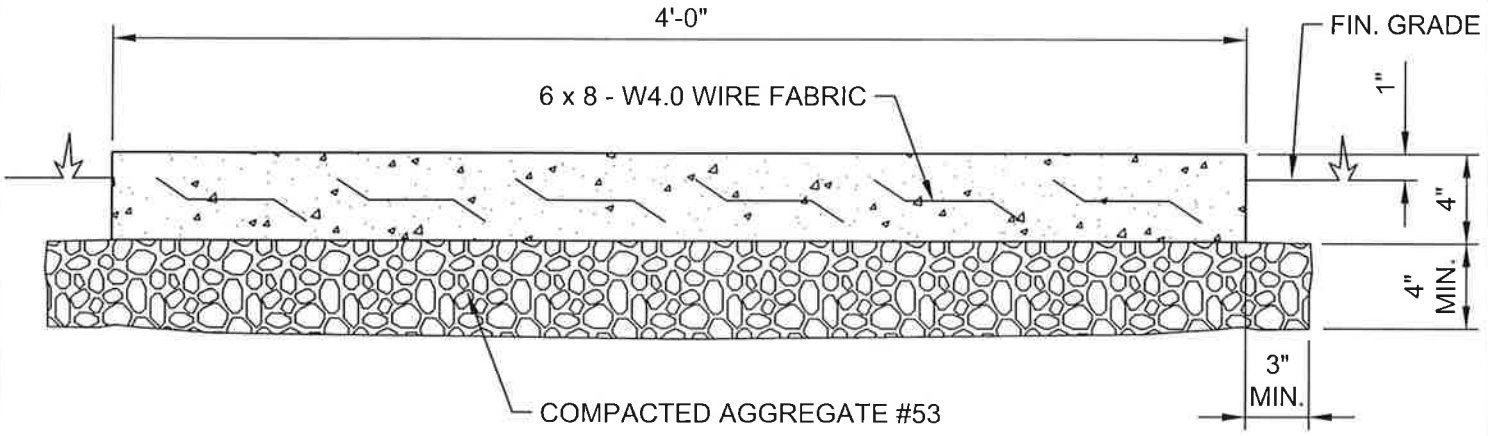
CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V08

PAVEMENT-ASPHALT PAVEMENT ROAD



PLAN



SECTION "A-A"

GENERAL NOTES:

1. TRANSVERSE JOINTS SHALL BE CUT WITH A JOINTER HAVING A RADIUS OF ¼" AT SPACING AT A MINIMUM OF 6'-0"
2. SIDEWALK SHALL BE 6" THICK WITH 8" OF COMPACTED AGGREGATE No. 53 AT ALL DRIVEWAY CROSSINGS
3. SIDE SLOPE SHALL BE ¼" / FT.

CONCRETE SIDEWALK DETAIL

NO SCALE

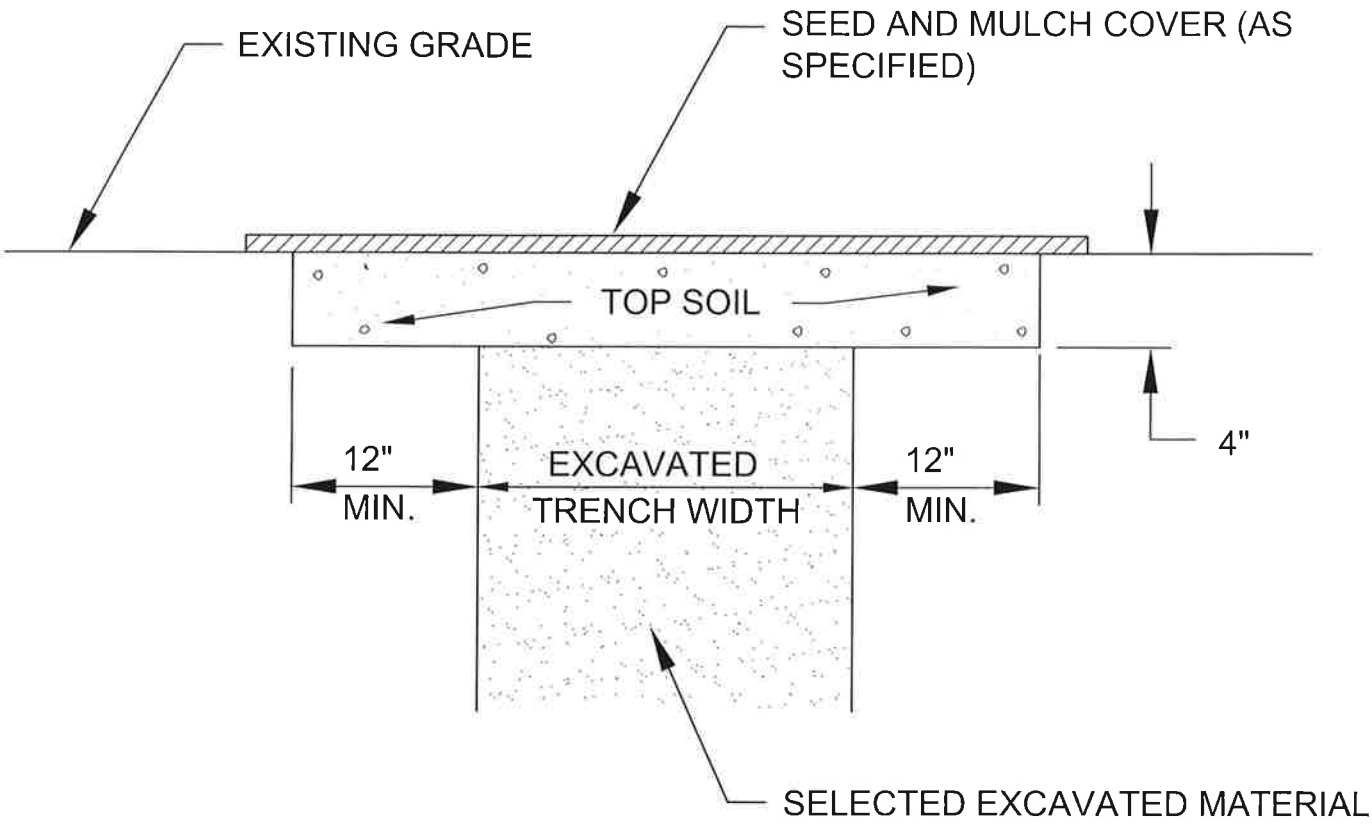
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V06

PAVEMENT-CONCRETE SIDEWALK DETAIL



SURFACE RESTORATION DETAIL FOR GRASS AREAS

NO SCALE

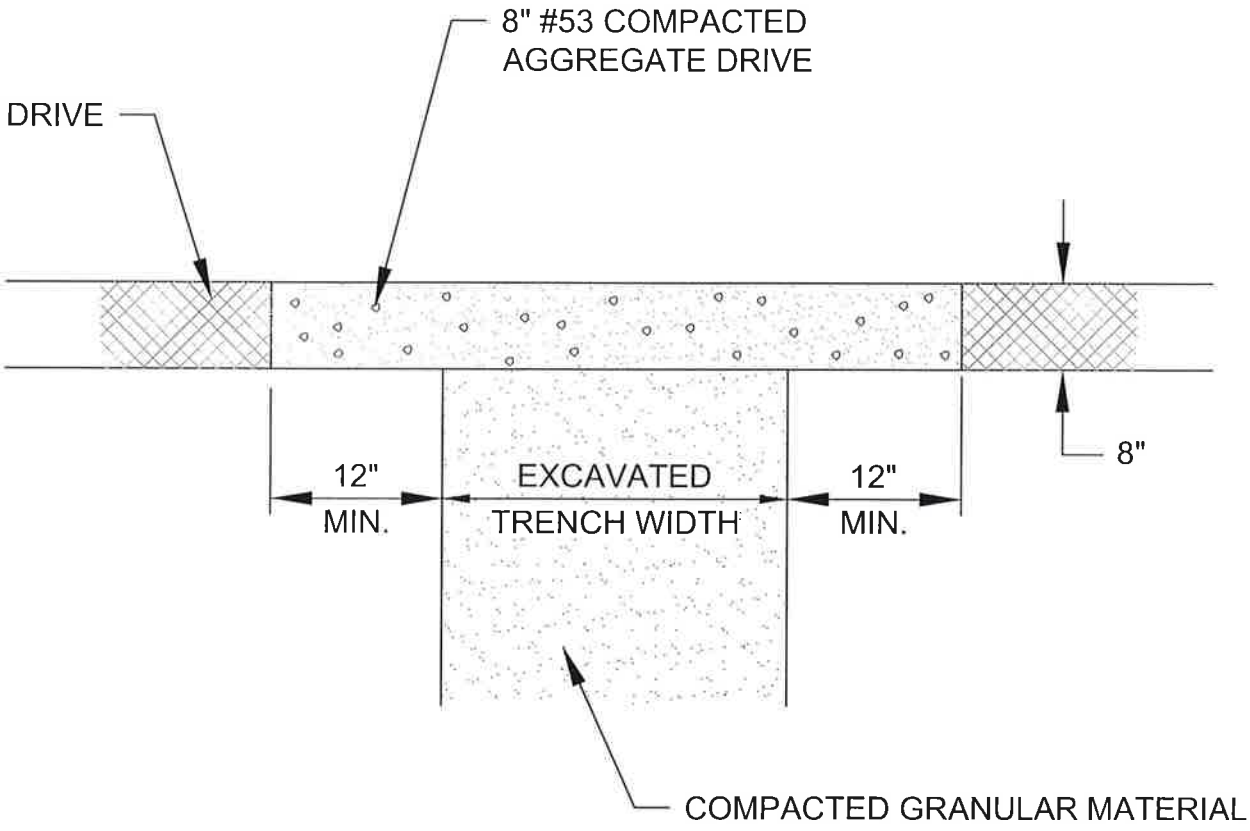
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V05

PAVEMENT-GRASS AREAS



SURFACE RESTORATION DETAIL FOR GRAVEL PAVEMENT- ROAD

NO SCALE

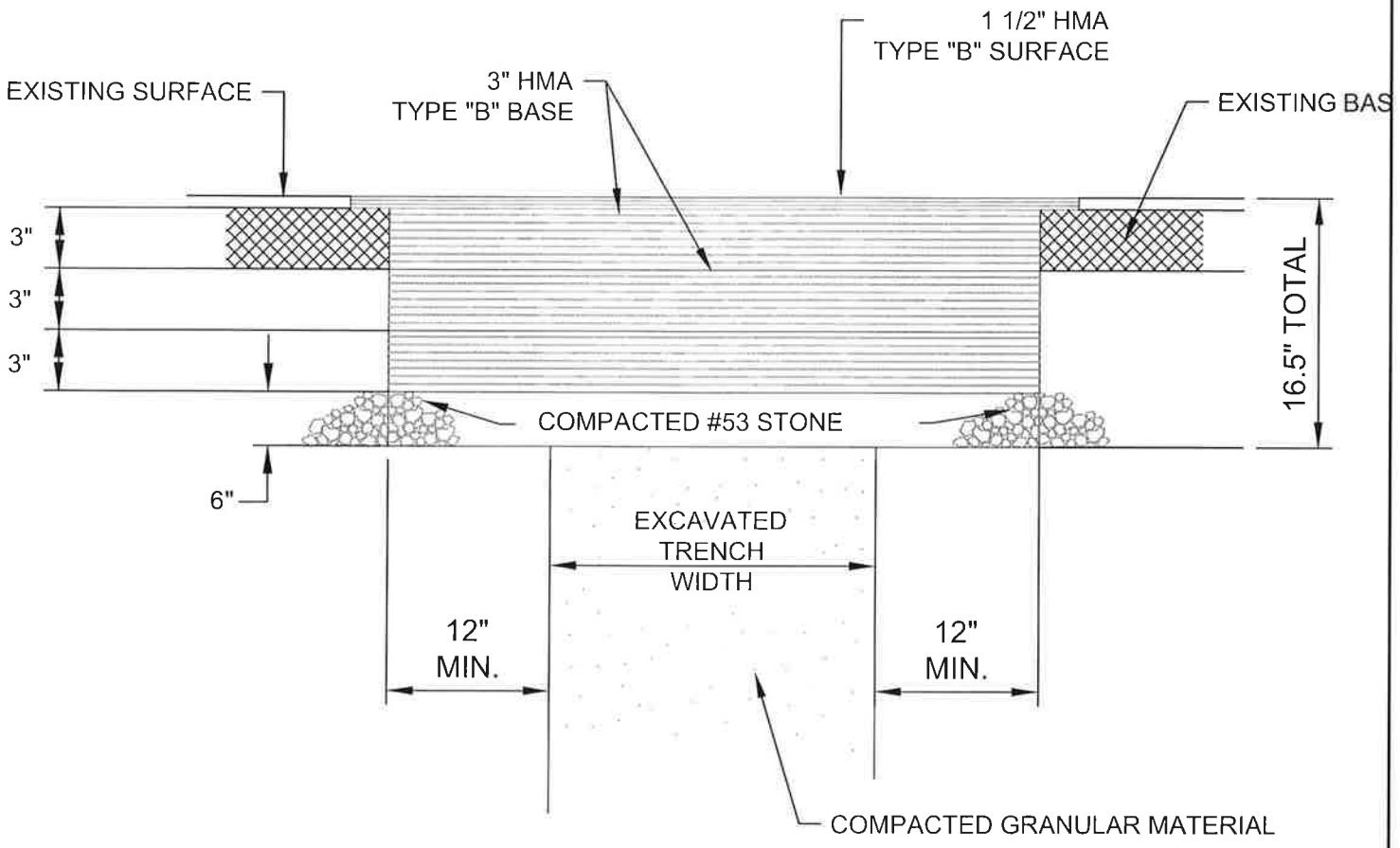
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V04

PAVEMENT-GRAVEL PAVEMENT ROAD



HIGHWAY REPLACEMENT DETAIL

NO SCALE

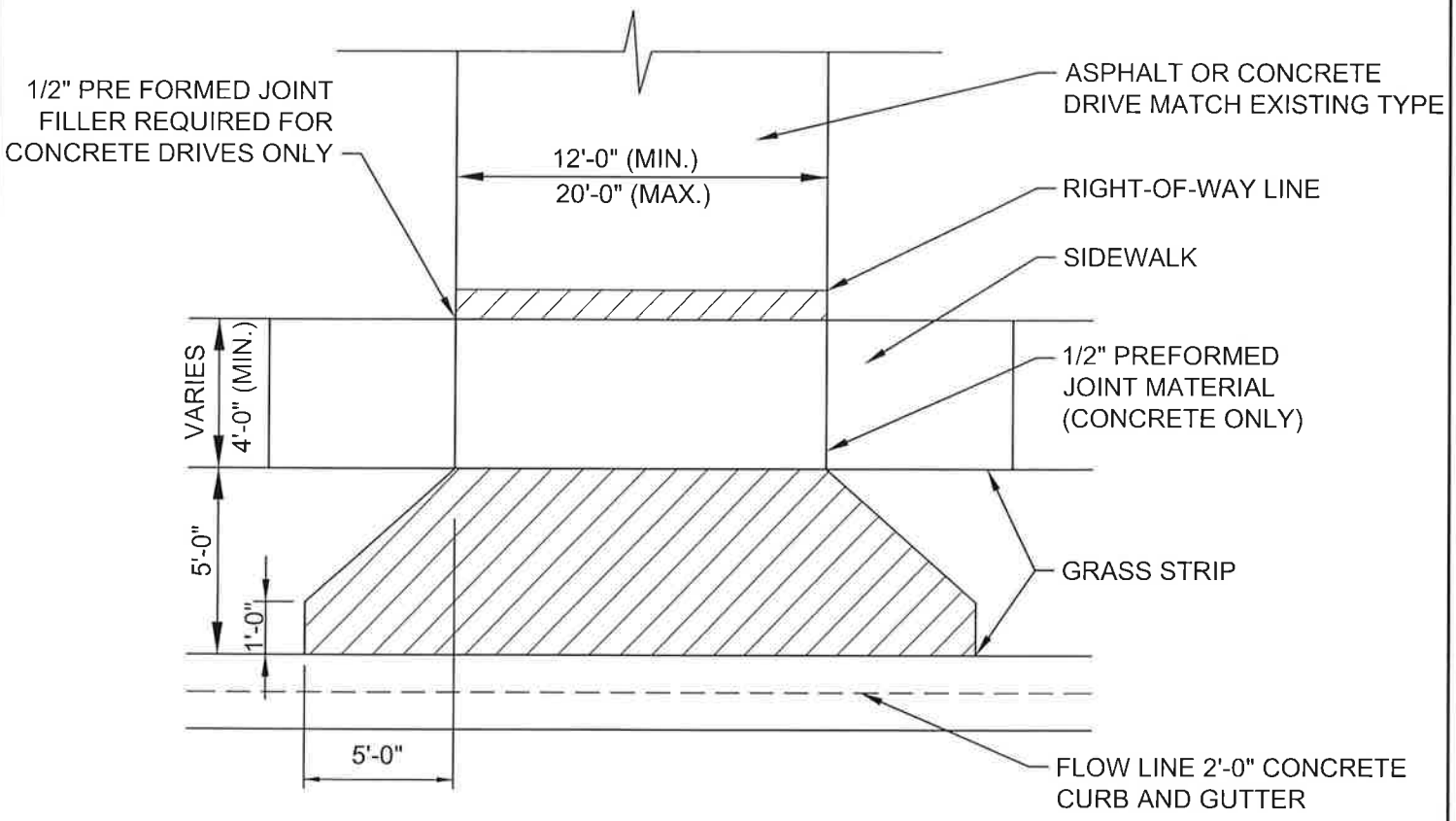
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V03

PAVEMENT-HIGHWAY REPLACEMENT DETAIL



1. CROSS HATCHED AREAS SHALL BE EITHER 6" CONCRETE ON COMPACTED AGGREGATE BASE No. 53 OR 1 1/2" HMA SURFACE TYPE 'A' ON 2 1/2" INTERMEDIATE TYPE 'A' ON 6" COMPACTED AGGREGATE BASE No. 53 EXTENDING TO THE SIDEWALK OR R/W LINE WHICHEVER IS NEAREST TO THE ROADWAY.

2. SUBGRADE UNDER ALL CURBS, SIDEWALKS AND DRIVES SHALL BE COMPACTED TO A MINIMUM 95%.

3. SIDEWALKS SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE APPROPRIATE STANDARD AND SHALL BE CONTINUOUS ACROSS DRIVEWAY.

RESIDENTIAL DRIVEWAY DETAIL

NO SCALE

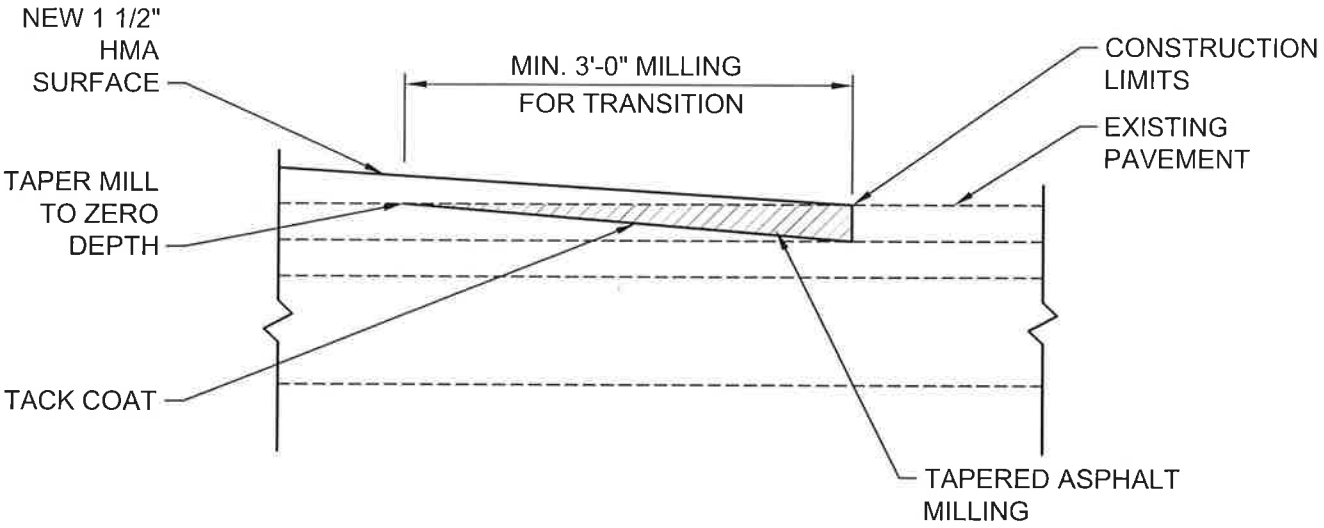
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

PAVEMENT - V02

PAVEMENT-RESIDENTIAL DRIVEWAY DETAIL



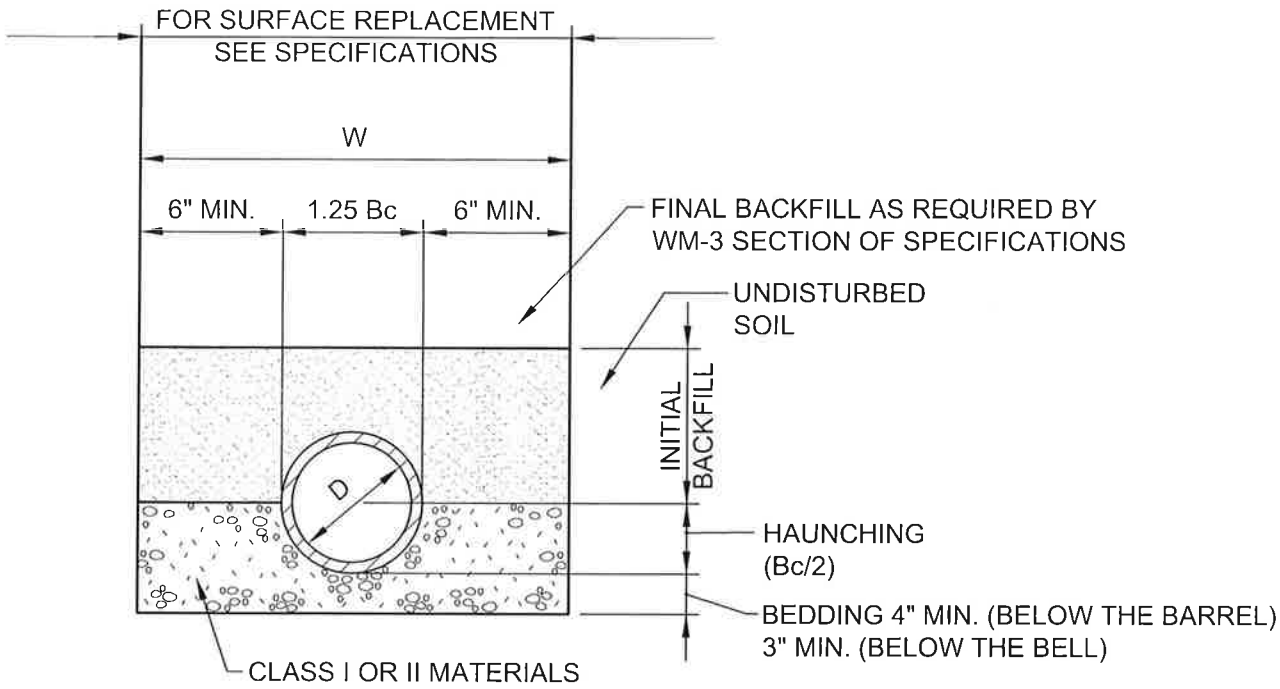
TRANSITION MILLING DETAIL

NO SCALE

Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA STANDARD DETAILS
PAVEMENT - V01
PAVEMENT-TRANSITION MILLING DETAIL



W= MAXIMUM ALLOWABLE TRENCH WIDTH FOR PIPE AS PER ASTM
NOT TO EXCEED FOUR (4) FEET FOR 6" THROUGH 24" PIPE NOT
SIX (6) FEET FOR 27" THROUGH 48" PIPE
D= PIPE DIAMETER (INTERNAL)
Bc= PIPE DIAMETER (EXTERNAL)

NOTES:

1. COMPACTED BEDDING STOPS AT SPRING-LINE OF THE PIPE. BACKFILLING ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND AS REQUIRED HEREIN.

2. WHEN CLASS I MATERIAL IS USED FOR BEDDING, COMPACTION MAY BE ACCOMPLISHED BY HAND OR MECHANICAL TAMPING.

3. WHEN CLASS II MATERIAL IS USED FOR BEDDING, COMPACTION SHALL BE ACCOMPLISHED ONLY BY HAND OR MECHANICAL TAMPING TO A MIN. OF 95% STANDARD PROCTOR DENSITY.

4. WORK FALLING UNDER THE JURISDICTION OF THE INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 12 FEET OF THE EDGE OF PAVEMENT. FOR ALL OTHER NON-INDOT PAVEMENT AREAS (INCLUDING BOTH HARD SURFACED AND COMPACTED AGGREGATE), COMPACTED GRANULAR BACKFILL MATERIAL SHALL BE USED WITHIN 5 FEET OF THE EDGE OF THE PAVEMENT.

5. TRENCH WIDTHS BELOW THE BOTTOM OF TRENCH BOX OR SHORING USED FOR TRENCH SUPPORT. BOTTOM OF TRENCH BOX OR SHORING SHALL BE PLACED NO LOWER THAN THE TOP OF PIPE.

TRENCH DETAIL FOR RIGID CONDUITS

NO SCALE

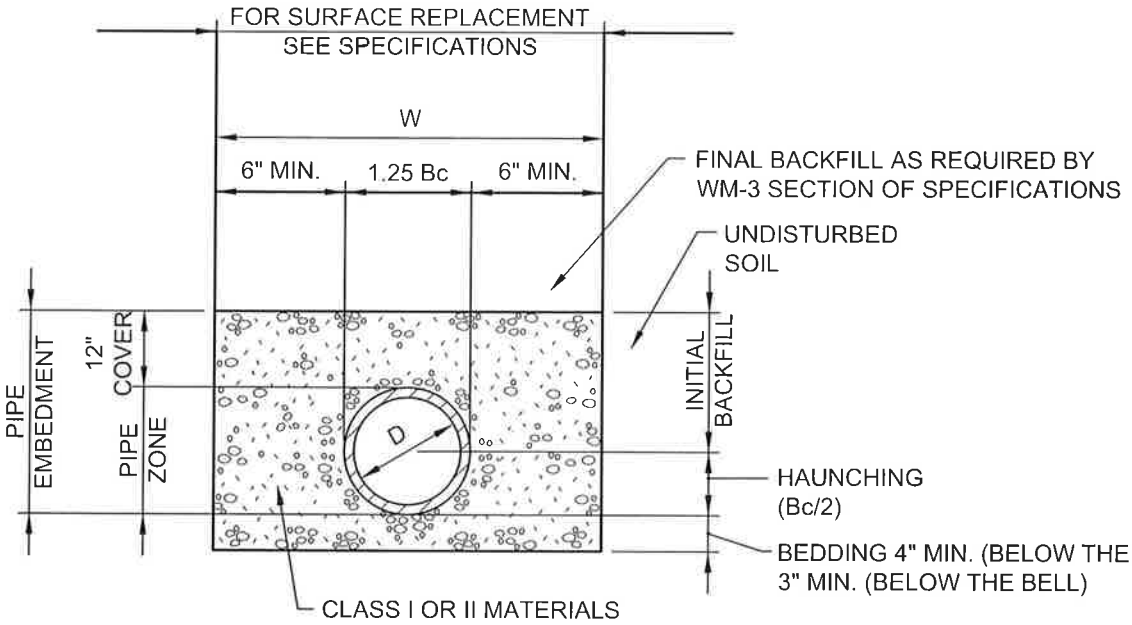
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

MISCELLANEOUS - M29

TRENCH-RIGID CONDUITS- NO TRAF



W= MAXIMUM ALLOWABLE TRENCH WIDTH FOR PIPE AS PER ASTM
NOT TO EXCEED FOUR (4) FEET FOR 6" THROUGH 24" PIPE NOT
SIX (6) FEET FOR 27" THROUGH 48" PIPE

D= PIPE DIAMETER (INTERNAL)

Bc= PIPE DIAMETER (EXTERNAL)

NOTES:

1. COMPACTED INITIAL BACKFILL SHALL EXTEND A MINIMUM OF 12" ABOVE THE TOP OF THE PIPE. FINAL BACKFILL ABOVE THIS POINT SHALL BE IN ACCORDANCE WITH THE SPECIFICATIONS AND AS REQUIRED HEREIN.

2. WHEN CLASS I MATERIAL IS USED FOR BEDDING, HAUNCHING AND INITIAL BACKFILL COMPACTION MAY BE ACCOMPLISHED BY HAND OR MECHANICAL TAMPING, OR BY WALKING, TO A MIN. OF 85% STANDARD PROCTOR DENSITY.

3. WHEN CLASS II MATERIAL IS USED FOR BEDDING, HAUNCHING AND INITIAL BACKFILL COMPACTION MAY BE ACCOMPLISHED BY HAND OR MECHANICAL TAMPING TO A MIN. OF 85% STANDARD PROCTOR DENSITY.

4. WORK FALLING UNDER THE JURISDICTION OF THE INDIANA DEPARTMENT OF TRANSPORTATION (INDOT) SHALL UTILIZE COMPACTED GRANULAR BACKFILL MATERIAL FOR INITIAL AND FINAL BACKFILL ANYWHERE WITHIN 21 FEET OF THE EDGE OF PAVEMENT. FOR ALL OTHER NON-INDOT PAVEMENT AREAS (INCLUDING BOTH HARD SURFACED AND COMPACTED AGGREGATE), COMPACTED GRANULAR BACKFILL MATERIAL SHALL BE USED WITHIN 5 FEET OF THE EDGE OF THE PAVEMENT.

5. TRENCH WIDTHS BELOW THE BOTTOM OF TRENCH BOX OR SHORING USED FOR TRENCH SUPPORT. BOTTOM OF TRENCH BOX OR SHORING SHALL BE PLACED NO LOWER THAN THE TOP OF PIPE.

TRENCH DETAIL FOR FLEXIBLE CONDUITS

NO SCALE

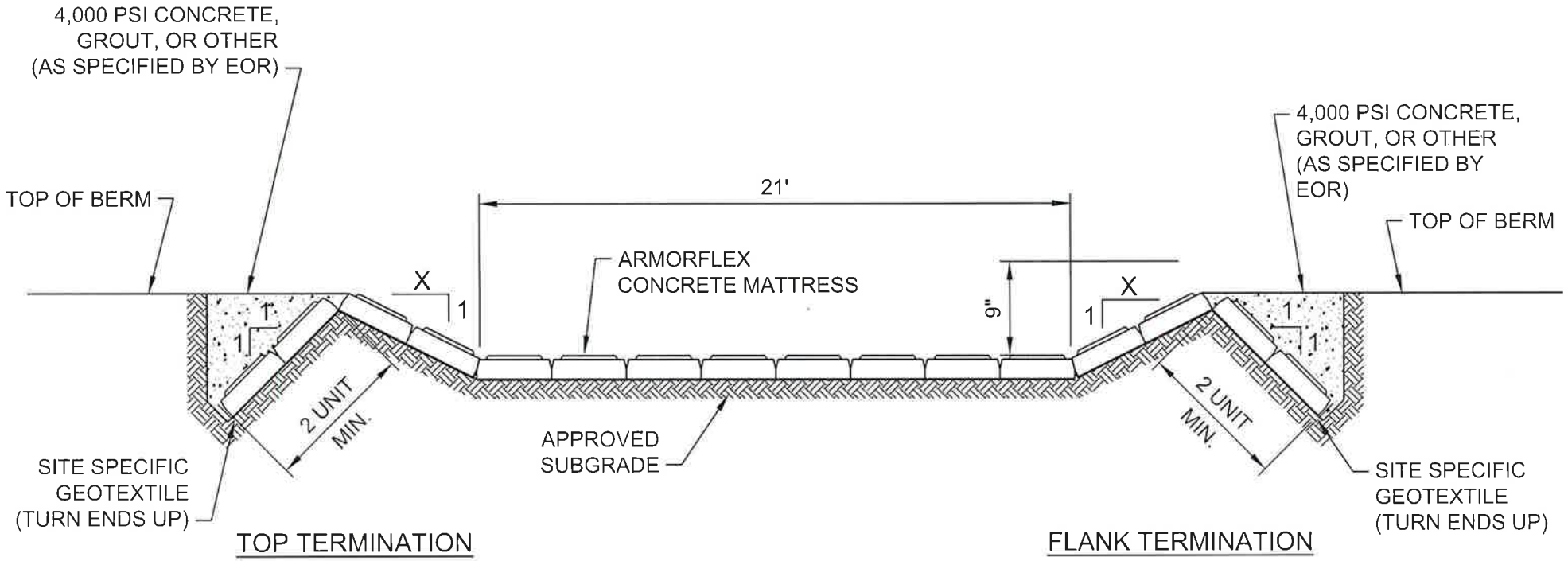
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

MISCELLANEOUS - M28

TRENCH- FLEXIBLE CONDUITS-TRAF



EMERGENCY OVERFLOW WEIR DETAIL

NOT TO SCALE

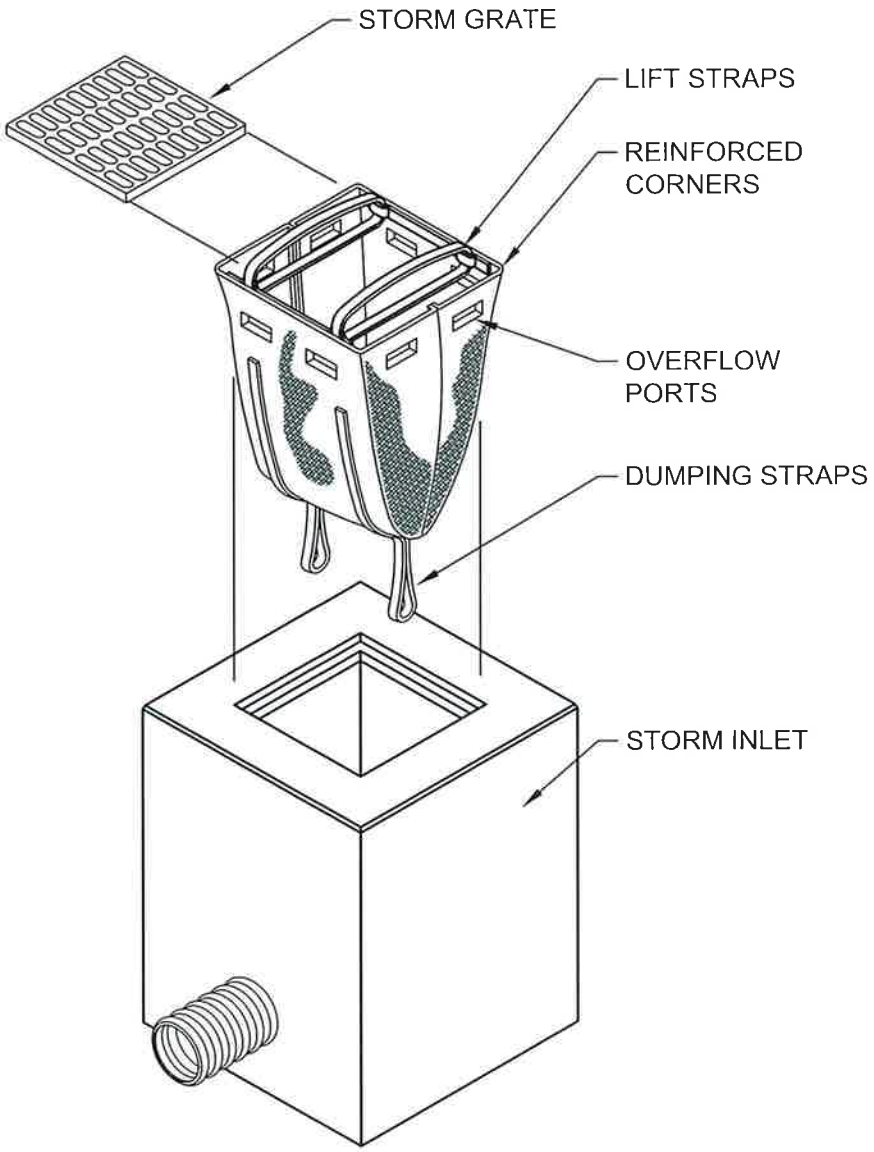
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

STORM DETAIL - S06

STORM-EMERGENCY OVERFLOW WEIR DETAIL



INSERT (BASKET) INLET PROTECTION DETAIL

NO SCALE

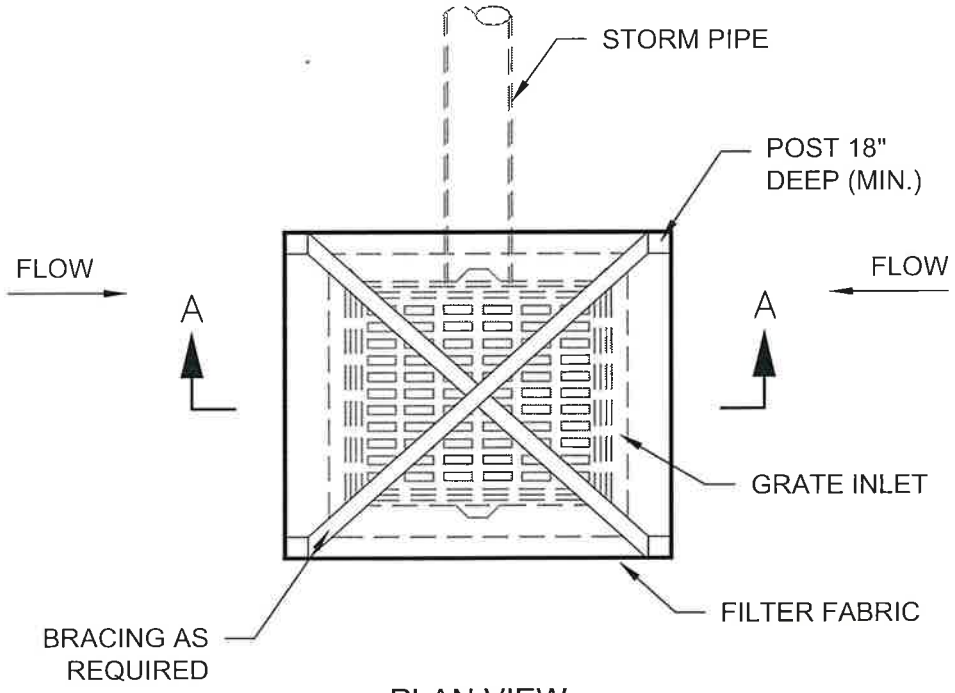
Date: 11-30-2022

MADISON Indiana

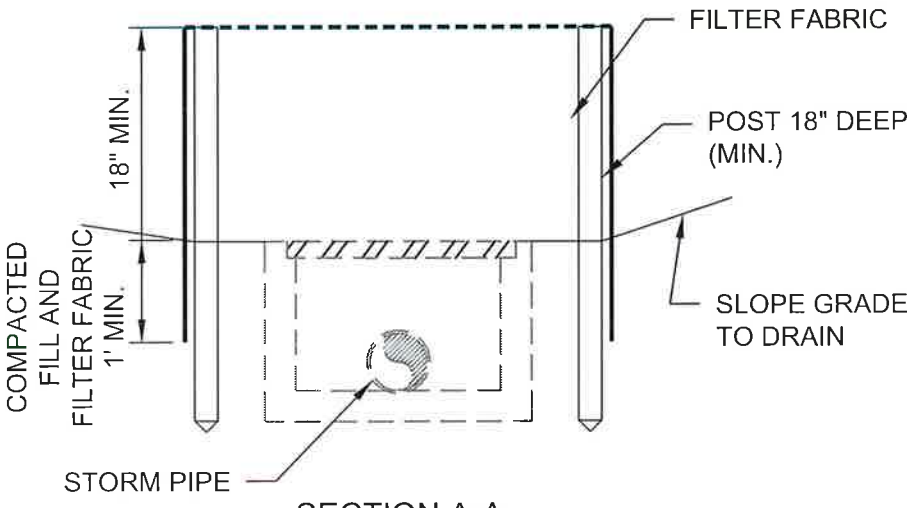
CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E15

EROSION-INSERT (BASKET) YARD INLET PROTECTION



PLAN VIEW



SECTION A-A

STORM INLET WITH SILT FENCE EROSION DETAIL

NOT TO SCALE

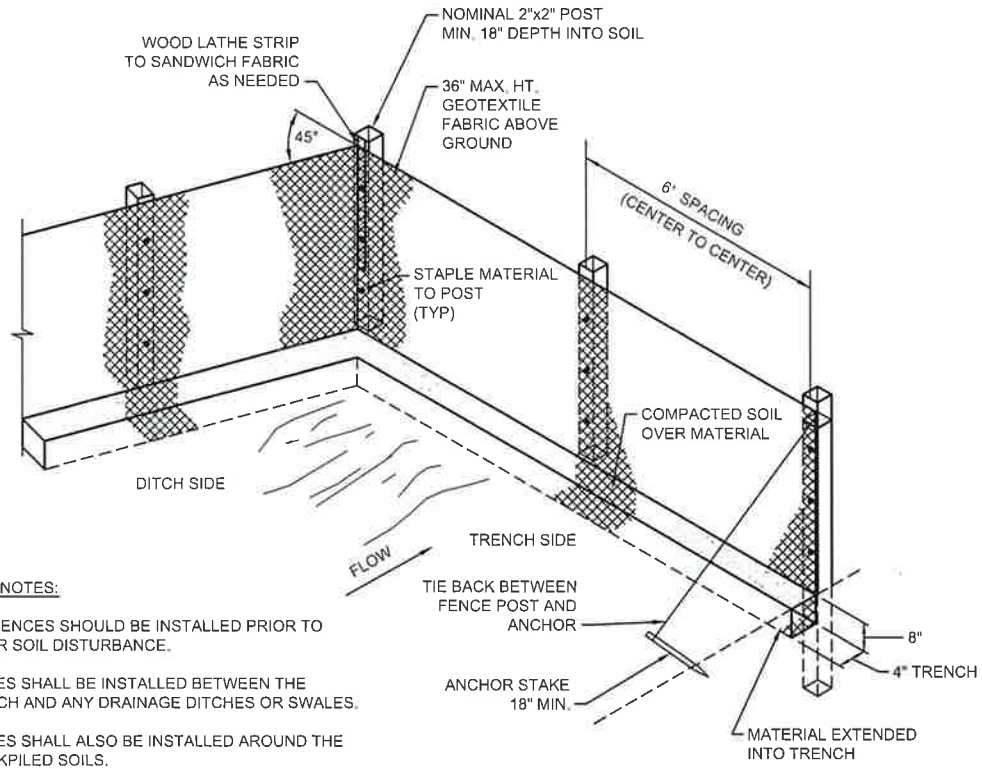
Date: 11-30-2022

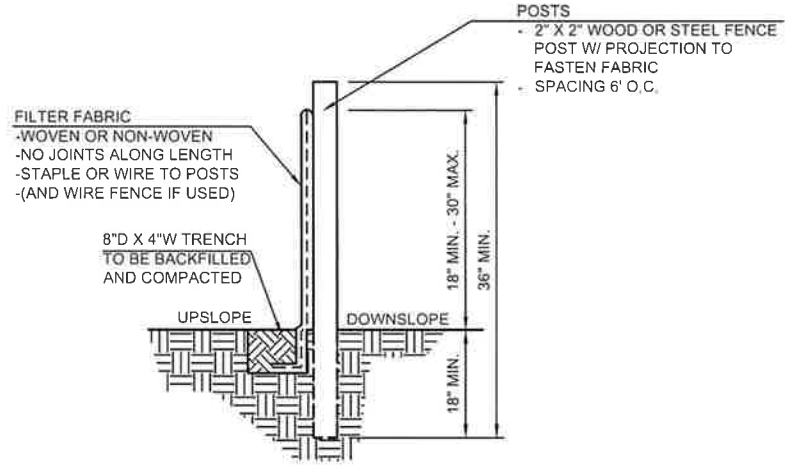
MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E14

EROSION-STORM INLET WITH SILT FENCE





GENERAL NOTES:

1. SILT FENCES SHOULD BE INSTALLED PRIOR TO MAJOR SOIL DISTURBANCE.
2. FENCES SHALL BE INSTALLED BETWEEN THE TRENCH AND ANY DRAINAGE DITCHES OR SWALES.
3. FENCES SHALL ALSO BE INSTALLED AROUND THE STOCKPILED SOILS.
4. THE GEOTEXTILE SHALL BE FREE FROM DEFECTS, TEARS, PUNCTURES, FLAWS, DETERIORATION OR DAMAGE INCURRED DURING MANUFACTURE, TRANSPORTATION, STORAGE, OR INSTALLATION.
5. TIE BACKS SHALL BE PLACED AS REQUIRED.

INSTALLATION:

1. THE BOTTOM 1' OF THE FENCE SHALL BE BURIED IN THE TRENCH ON THE UPSLOPE SIDE.
2. FENCE SHALL BE INSTALLED ALONG LEVEL GRADES, NOT ACROSS FLOW CHANNELS.
3. IF OPTIONAL SUPPORT WIRE FENCE IS USED, POST SPACING MAY BE EXTENDED TO 8' O.C.

MAINTENANCE:

1. INSPECT SILT FENCE PERIODICALLY (WEEKLY) AND AFTER EACH STORM EVENT.
2. IF FABRIC IS TORN OR DAMAGED OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED PORTION IMMEDIATELY.
3. REMOVE DEPOSITED SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE FENCE, OR IT IS CAUSING THE FABRIC TO BULGE.
4. TAKE CARE NOT TO UNDERMINE THE FENCE DURING SEDIMENT REMOVAL.
5. AFTER THE CONTRIBUTING AREA HAS BEEN STABILIZED, REMOVE THE FENCE AND REMAINING SEDIMENT, BRING THE DISTURBED AREA TO GRADE, AND STABILIZE.

SILT FENCE DETAIL

NOT TO SCALE

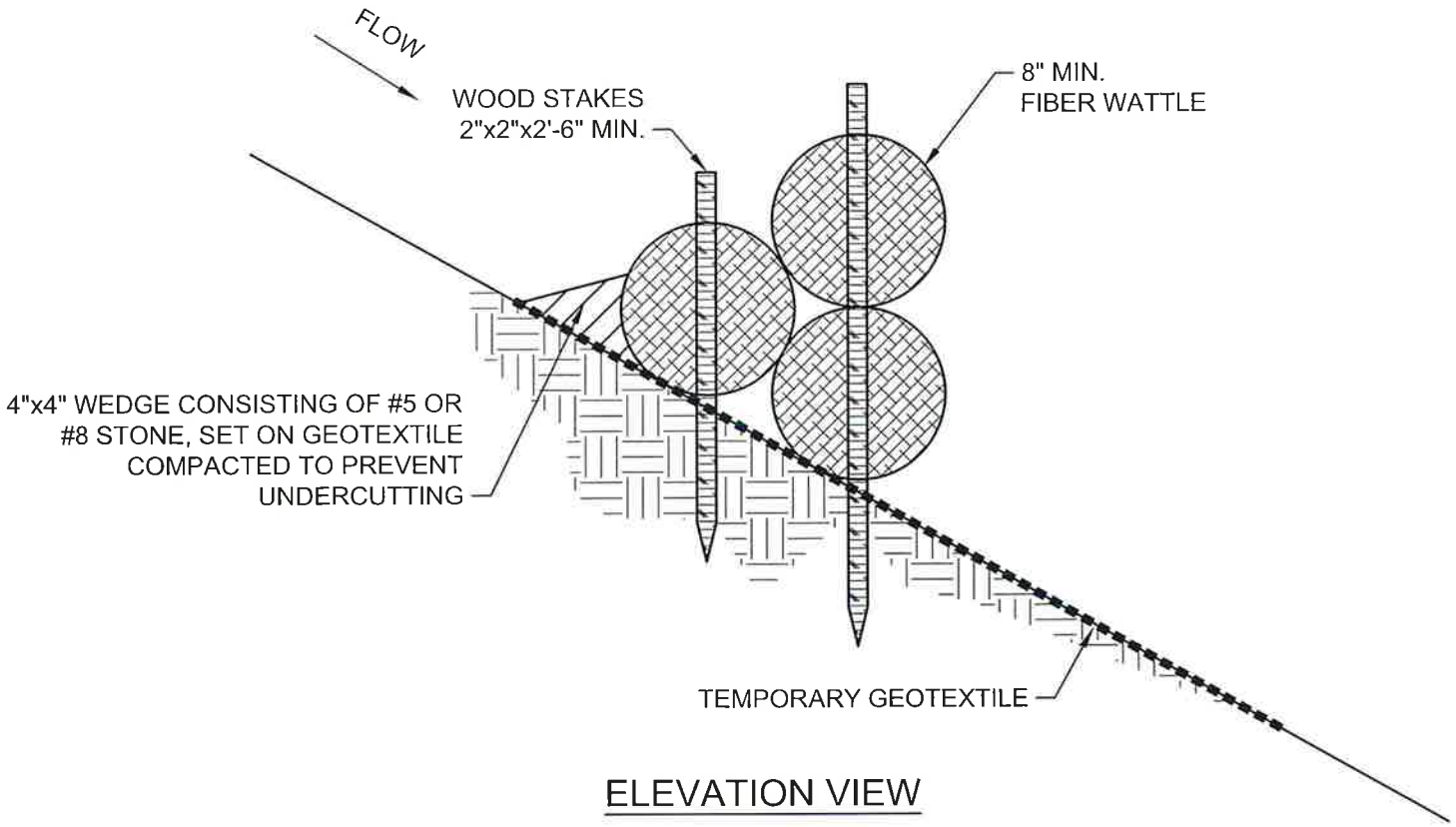
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E12

EROSION-SILT FENCE DETAIL



ELEVATION VIEW

ROLLED EROSION CONTROL PRODUCT DETAIL

NO SCALE

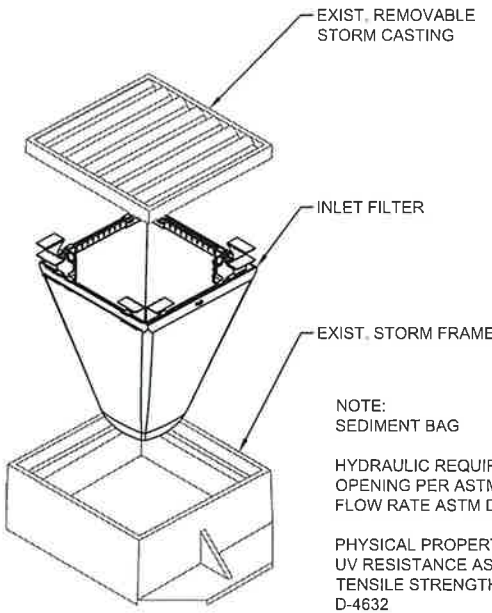
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E11

EROSION-ROLLED EROSION CONTROL

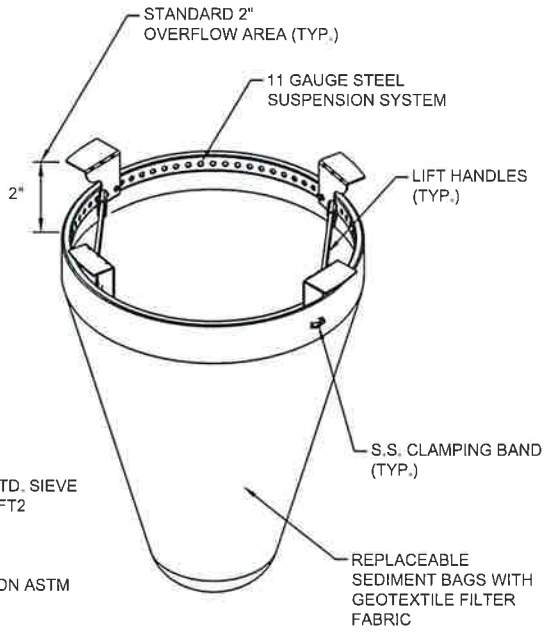


NOTE:
SEDIMENT BAG

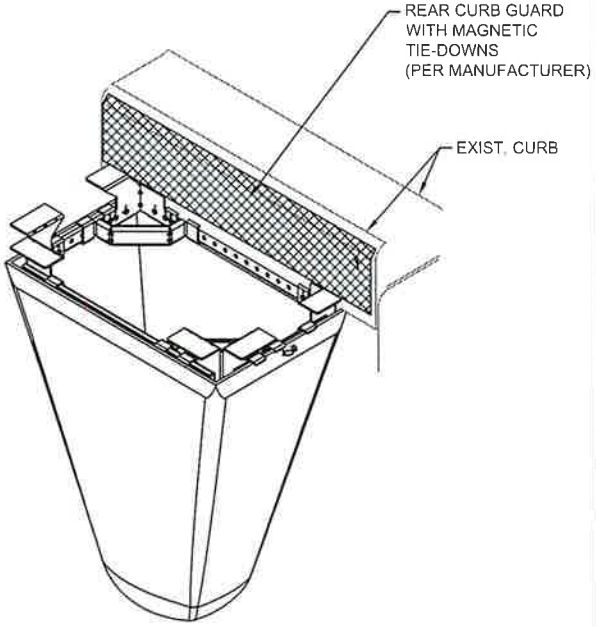
HYDRAULIC REQUIREMENTS:
OPENING PER ASTM D-4751 -20 US STD. SIEVE
FLOW RATE ASTM D-4491 - 200 GPM/FT2

PHYSICAL PROPERTIES:
UV RESISTANCE ASTM D-4355
TENSILE STRENGTH AND ELONGATION ASTM D-4632

TYPICAL INSTALLATION UNDER INLET



ROUND/SQUARE INLET FILTER SYSTEM



COMBINATION INLET FILTER
FOR CURB HOODS

GENERAL NOTES:

1. TO BE INSTALLED AT EXISTING STANDARD INLET GRATES IN PAVED AREAS DOWNSTREAM OF EXCAVATION.
2. INSTALL INLET FILTER ONTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE AND PER MANUFACTURER'S RECOMMENDATIONS.
3. FOR CURB BOX INLETS, CURB BACK MUST HAVE FILTER ATTACHED PER MANUFACTURER'S RECOMMENDATION OR CONTRACTOR MUST CREATE A DAM TO DIRECT RUNOFF INTO THE SEDIMENT BAG.

INLET FILTER EROSION CONTROL DETAIL FOR STANDARD SIZED STORM STRUCTURES

NOT TO SCALE

Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E08

EROSION-INLET FILTER FOR STANDARD SIZED STORM STRUCTURES

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN ACCORDANCE WITH THE INDIANA STORM WATER QUALITY MANUAL FROM THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND LOCAL EROSION AND SEDIMENT CONTROL ORDINANCE, OR SWCD.

2. THE NOTICE OF INTENT (NOI) AND PUBLIC NOTICE FOR THE PROJECT SHALL BE POSTED ON A SIGN INSTALLED AT OR NEAR THE SITE CONSTRUCTION TRAILER. THE NOI SHALL LIST THE CONTACT INFORMATION FOR THE SITE CONTACT PERSON. THE SIGN AND INFORMATION SHALL BE MAINTAINED AND REMAIN LEGIBLE THROUGHOUT CONSTRUCTION.

3. A COPY OF THIS EROSION AND SEDIMENT CONTROL PLAN AND THE EROSION AND SEDIMENT CONTROL REPORT SHALL BE AVAILABLE AT THE PROJECT SITE THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD.

4. THE CONTRACTOR SHALL CONTROL WASTE, GARBAGE, DEBRIS, WASTEWATER, AND OTHER SUBSTANCES ON THE SITE SO THEY WILL NOT BE TRANSPORTED FROM THE SITE BY THE ACTION OF WIND, STORM WATER RUNOFF, OR OTHER FORCES. PROPER DISPOSAL OR MANAGEMENT OF ALL WASTES AND UNUSED BUILDING MATERIAL APPROPRIATE TO THE NATURE OF THE WASTE OR MATERIAL IS REQUIRED.

5. PUBLIC OR PRIVATE ROADWAYS SHALL BE KEPT CLEAR OF ACCUMULATED SEDIMENT. ALL SEDIMENT THAT IS CLEARED MUST BE RETURNED TO THE LIKELY POINT OF ORIGIN OR OTHER SUITABLE LOCATION. CLEARING OF LARGE AMOUNTS OF SEDIMENT SHALL NOT INCLUDE FLUSHING THE AREA WITH WATER.

6. MINIMIZE THE EXPOSURE OF BARE EARTH BY LIMITING THE WORK AREA TO THAT NECESSARY TO PERFORM THE WORK, AND BY PROPER SCHEDULING OF MANPOWER AND EQUIPMENT.

7. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED, CLEANED, AND MAINTAINED FOLLOWING EACH STORM EVENT.

8. WHEREVER POSSIBLE, MAINTAIN EXISTING VEGETATIVE COVER. USE NON-VEGETATIVE MATERIAL INCLUDING MULCH, EROSION BLANKETS, OR STONE TO CONTROL EROSION FROM DISTURBED AREAS.

9. A LOG SHALL BE MAINTAINED OF ALL INSPECTIONS (WEEKLY, AND FOLLOWING STORM EVENTS), MAINTENANCE AND REPAIR OF EROSION AND SEDIMENT CONTROL MEASURES. THE LOG SHALL BE MAINTAINED ON SITE AND BE AVAILABLE UPON REQUEST TO THE OWNER'S REPRESENTATIVES AND THE OPERATING AUTHORITIES HAVING JURISDICTION OVER THE SITE.

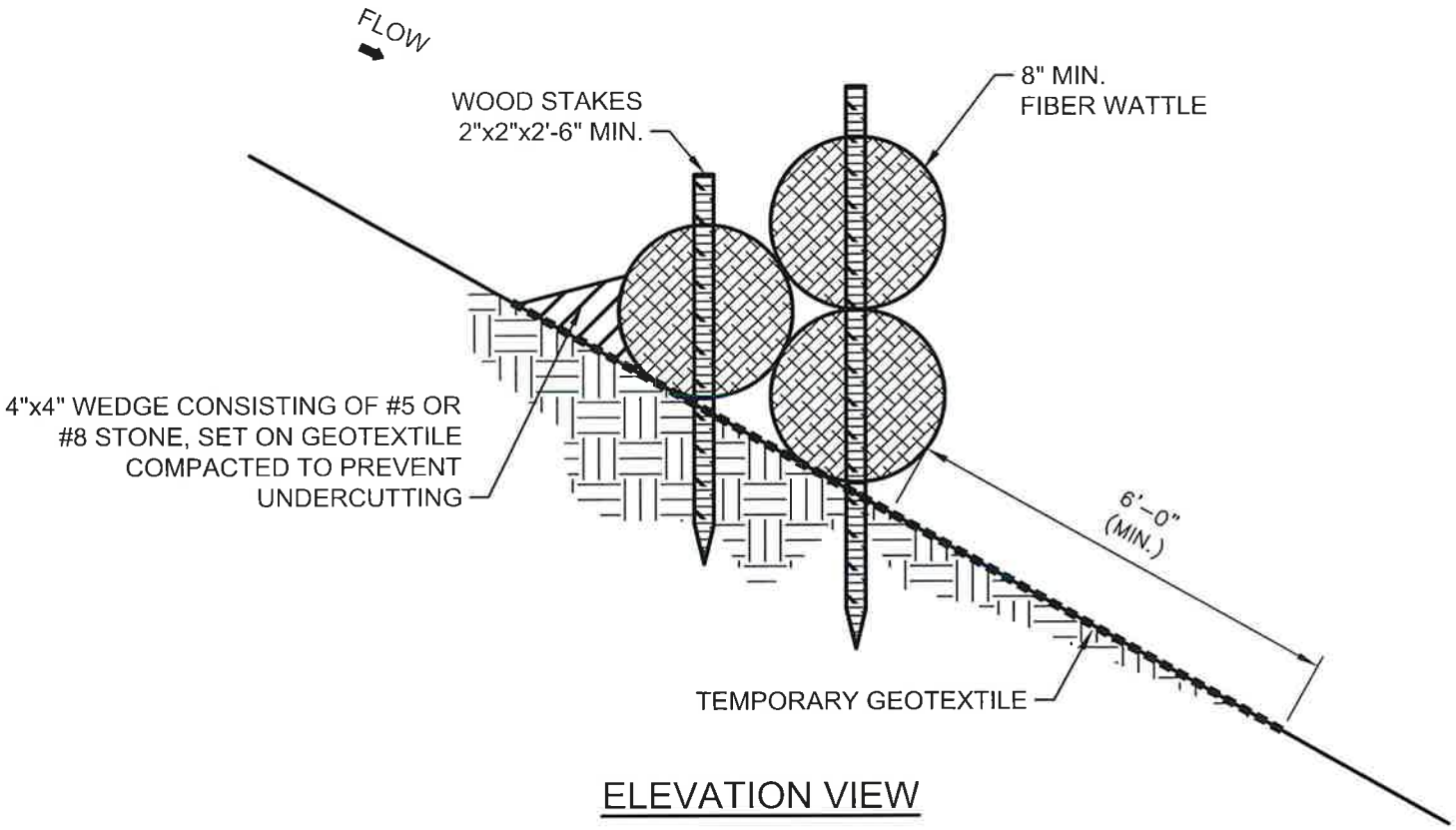
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E07

EROSION-GENERAL EROSION AND SEDIMENT CONTROL NOTES



ELEVATION VIEW

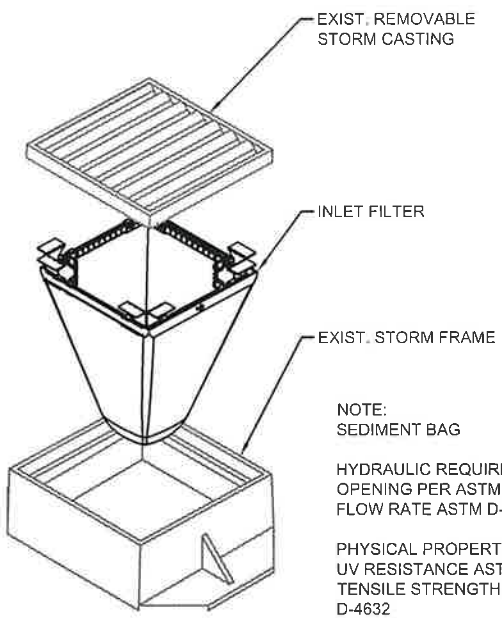
ROLLED EROSION CONTROL PRODUCT DETAIL

NO SCALE

Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA STANDARD DETAILS
EROSION CONTROL
ROLLED EROSION CONTROL PRODUCT DETAIL

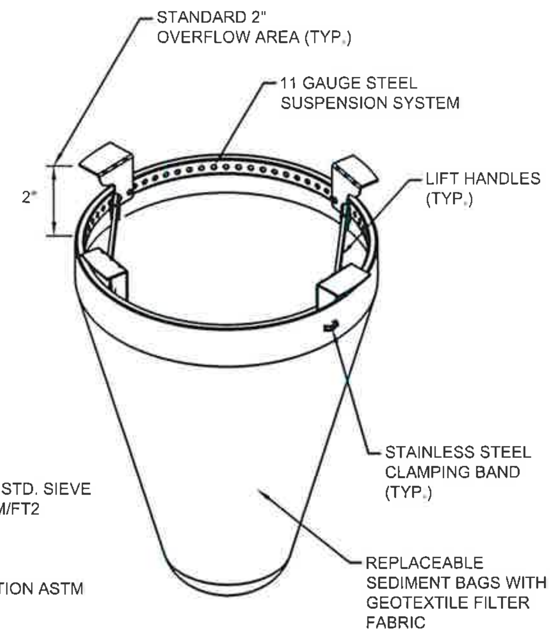


NOTE:
SEDIMENT BAG

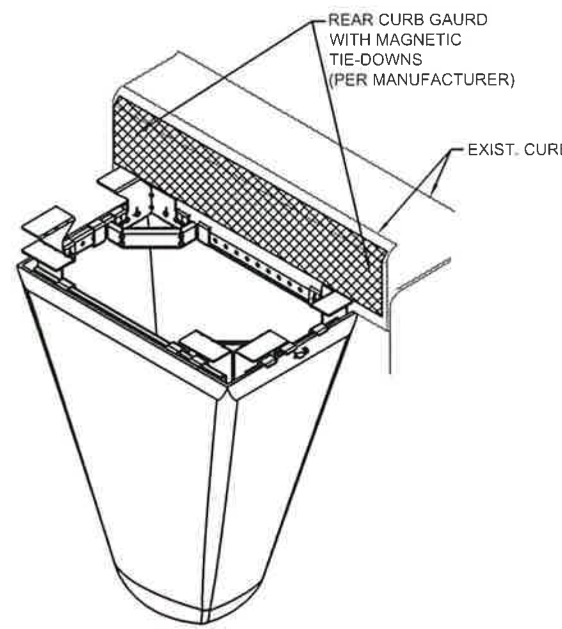
HYDRAULIC REQUIREMENTS:
OPENING PER ASTM D-4751 -20 US STD. SIEVE
FLOW RATE ASTM D-4491 - 200 GPM/FT2

PHYSICAL PROPERTIES:
UV RESISTANCE ASTM D-4355
TENSILE STRENGTH AND ELONGATION ASTM D-4632

TYPICAL INSTALLATION UNDER INLET



ROUND/SQUARE INLET FILTER SYSTEM



COMBINATION INLET FILTER
FOR CURB HOODS

GENERAL NOTES:

1. TO BE INSTALLED AT EXISTING STANDARD INLET GRATES IN PAVED AREAS DOWNSTREAM OF EXCAVATION.
2. INSTALL INLET FILTER ONTO LOAD BEARING LIP OF CASTING OR CONCRETE STRUCTURE AND PER MANUFACTURER'S RECOMMENDATIONS.
3. FOR CURB BOX INLETS, CURB BACK MUST HAVE FILTER ATTACHED PER MANUFACTURER'S RECOMMENDATION OR CONTRACTOR MUST CREATE A DAM TO DIRECT RUNOFF INDO THE SEDIMENT BAG.

INLET FILTER EROSION CONTROL DETAIL FOR STANDARD SIZED STORM STRUCTURES

NOT TO SCALE

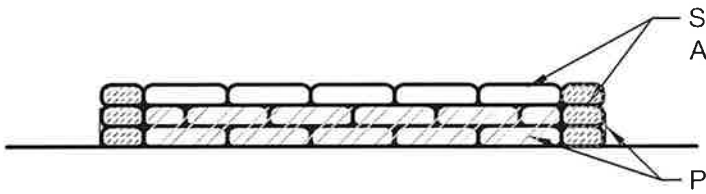
Date: Jun 05, 2023

MADISON Indiana

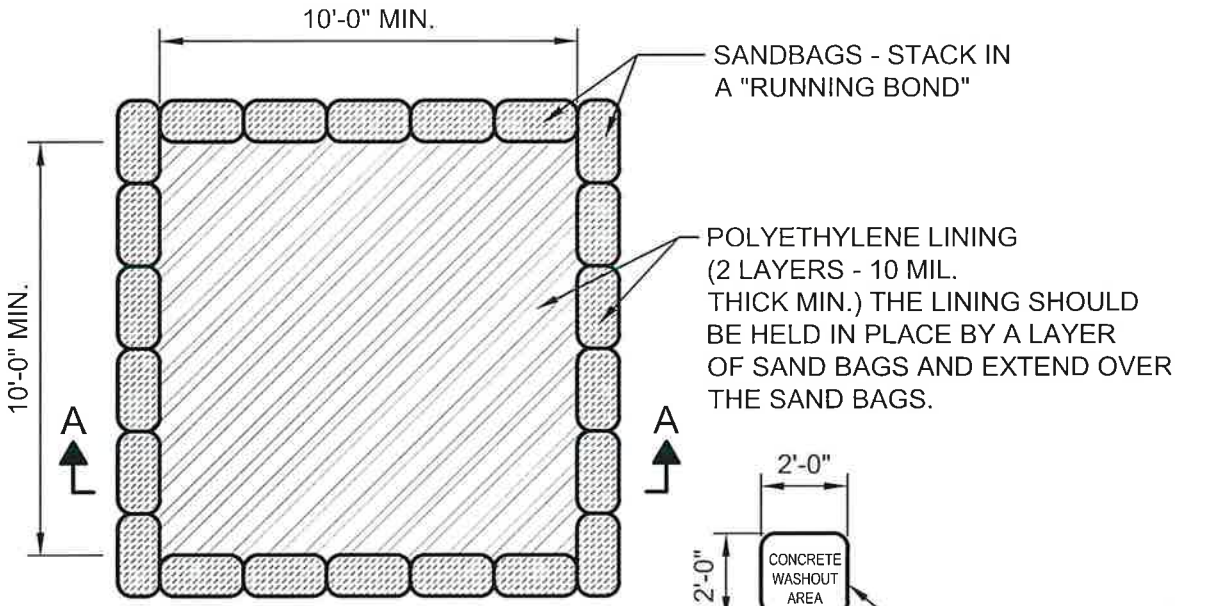
CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

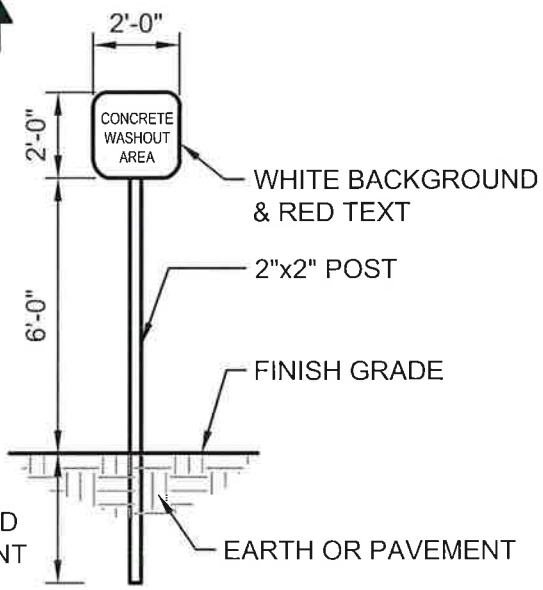
INLET FILTER FOR STANDARD
STORM STRUCTURES



SECTION A-A



PLAN VIEW



NOTE:
DUE TO SITE CONSTRAINTS THE MINIMUM INTERIOR DIMENSION MAY BE ADJUSTED TO FIT THE SITE. THE STRUCTURE'S INTERIOR FOOTAGE OF 100 S.F. MUST BE MAINTAINED AND THE CONTRACTOR SHALL SUBMIT ANY DESIGN ALTERATIONS TO THE ENGINEER. CONCRETE WASHOUT STRUCTURE SHALL BE RE-LOCATED CLOSE TO AREAS RECEIVING CONCRETE, AS CONSTRUCTION PROGRESSES.

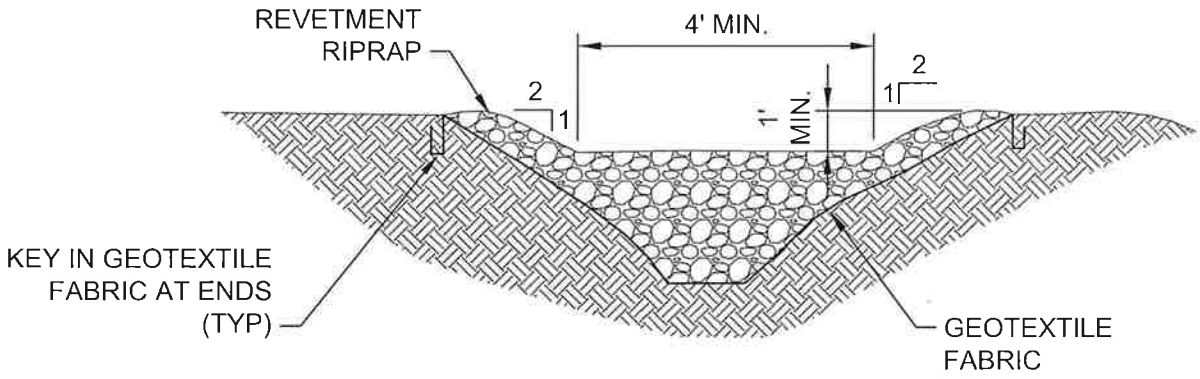
CONCRETE WASHOUT PIT DETAIL

NO SCALE

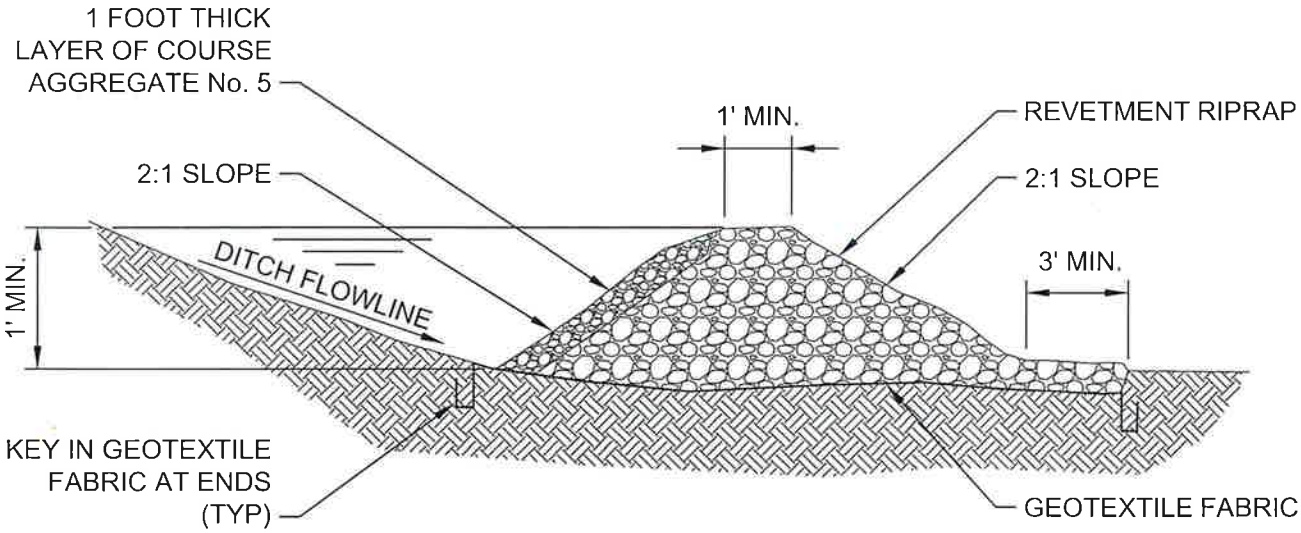
Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA STANDARD DETAILS
EROSION CONTROL
CONCRETE WASHOUT PIT DETAIL



SECTION PERPENDICULAR TO FLOWLINE



SECTION PARALLEL TO FLOWLINE

GENERAL NOTES:

1. RIPRAP DITCH CHECK DAMS SHALL BE PLACED SUCH THAT THE TOP OF THE DOWNSTREAM CHECK DAM IS AT THE SAME ELEVATION AS THE TOE OF THE ADJACENT UPSTREAM CHECK DAM.

2. AFTER COMPLETION OF CONTRACT, OR AS REQUESTED BY OWNER, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL ITEMS, REMOVE ALL ACCUMULATED DEPOSITS AND, AS REQUIRED, SEED AND MULCH OR SOD AS REQUIRED TO ESTABLISH AREA TO CONDITION PRIOR TO CONSTRUCTION.

ROCK CHECK DAM DETAIL

NO SCALE

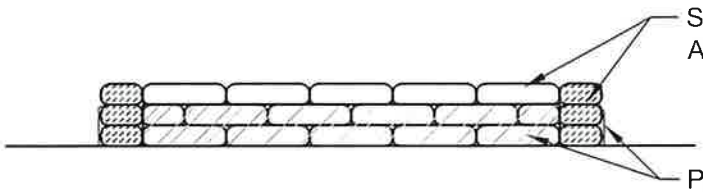
Date: 11-30-2022

MADISON Indiana

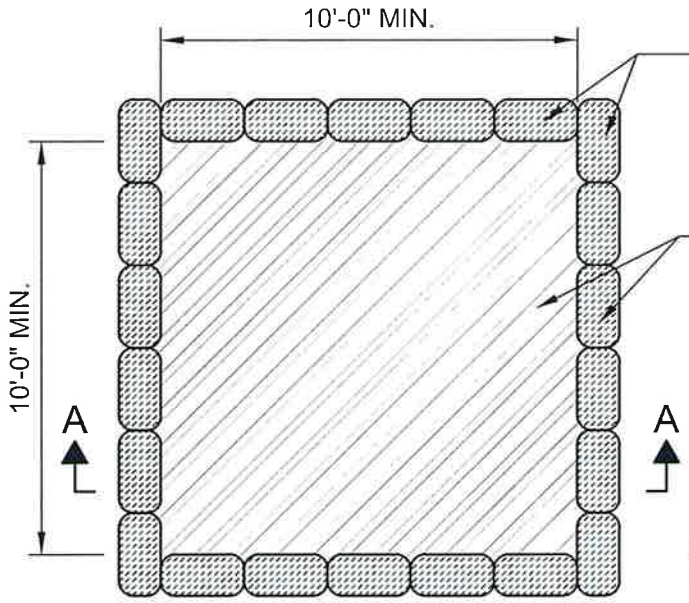
CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E01

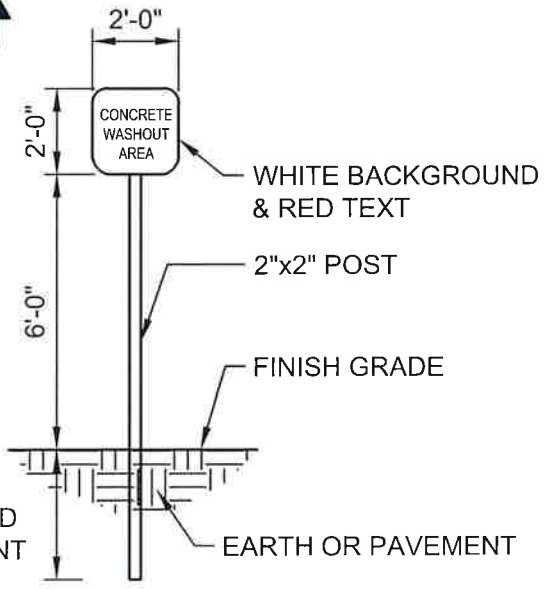
EROSION-CHECK DAM DETAIL



SECTION A-A



PLAN VIEW



NOTE:
DUE TO SITE CONSTRAINTS THE MINIMUM INTERIOR DIMENSION MAY BE ADJUSTED TO FIT THE SITE. THE STRUCTURE'S INTERIOR FOOTAGE OF 100 S.F. MUST BE MAINTAINED AND THE CONTRACTOR SHALL SUBMIT ANY DESIGN ALTERATIONS TO THE ENGINEER. CONCRETE WASHOUT STRUCTURE SHALL BE RELOCATED CLOSE TO AREAS RECEIVING CONCRETE, AS CONSTRUCTION PROGRESSES.

CONCRETE WASHOUT PIT DETAIL

NO SCALE

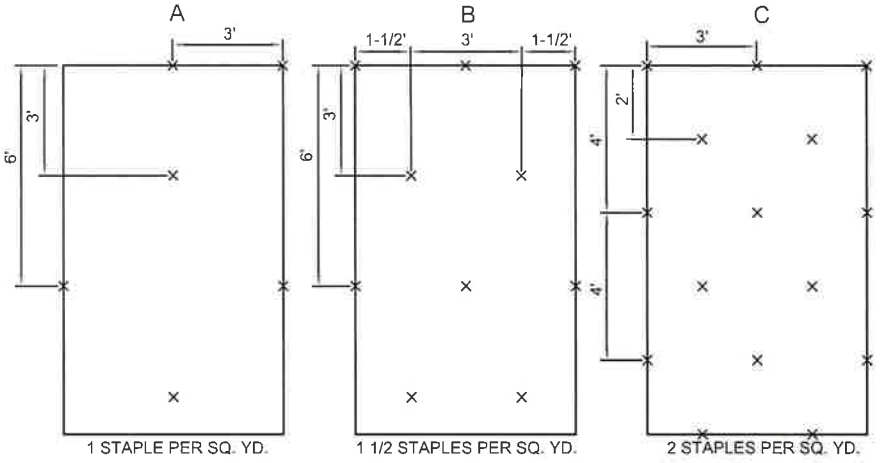
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E02

EROSION-CONCRETE WASHOUT PIT DETAIL



EROSION CONTROL BLANKET

NOT TO SCALE

SPECIFICATIONS

EFFECTIVE LIFE

- THE FUNCTIONAL LIFE OF AN EROSION CONTROL BLANKET IS DEPENDENT ON THE MATERIALS USED.

ANCHORING

- STAPLES, PINS OR STAKES USED TO PREVENT MOVEMENT OR DISPLACEMENT OF BLANKET. (FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR SPECIFIC APPLICATIONS.)

MATERIALS

- ORGANIC (STRAW, EXCELSIOR, WOVEN PAPER, COCONUT FIBER, ETC.) OR SYNTHETIC MULCH INCORPORATED WITH A POLYPROPYLENE, NATURAL FIBER OR SIMILAR NETTING MATERIAL. (THE NETTING MAY BE BIODEGRADABLE, PHOTODEGRADABLE OR PERMANENT.)

  NOTE: SOME EROSION CONTROL BLANKET NETTINGS MAY POSE A THREAT TO CERTAIN SPECIES OF WILDLIFE IF THEY BECOME ENTANGLED IN THE NETTING MATRIX.

- 6-12 INCH STAPLES, PINS, OR STAKES.

INSTALLATION

1. SELECT THE TYPE AND WEIGHT OF EROSION CONTROL BLANKET TO FIT THE SITE CONDITIONS (E.G., SLOPE, CHANNEL, FLOW VELOCITY) PER THE MANUFACTURER'S RECOMMENDATIONS.
2. PREPARE THE SEEDBED, ADD SOIL AMENDMENTS, AND PERMANENTLY SEED THE AREA IMMEDIATELY FOLLOWING SEEDBED PREPARATION.
3. LAY EROSION CONTROL BLANKETS ON THE SEEDED AREA SO THAT THEY ARE IN CONTINUOUS CONTACT WITH THE SOIL WITH EACH UP-SLOPE OR UP-STREAM BLANKET OVERLAPPING THE DOWN-SLOPE OR DOWN-STREAM BLANKET BY AT LEAST EIGHT INCHES, OR FOLLOW MANUFACTURER'S RECOMMENDATIONS.
4. TUCK THE UPPERMOST EDGE OF THE UPPER BLANKETS INTO A CHECK SLOT (SLIT TRENCH), BACKFILL WITH SOIL AND TAMP DOWN. IN CERTAIN APPLICATIONS, THE MANUFACTURER MAY REQUIRE ADDITION CHECK SLOTS AT SPECIFIC LOCATIONS DOWN SLOPE FROM THE UPPERMOST EDGE OF THE UPPER BLANKETS.
5. ANCHOR THE BLANKETS IN PLACE BY DRIVING STAPLES, PINS, OR STAKES THROUGH THE BLANKET AND INTO THE UNDERLYING SOIL. FOLLOW AN ANCHORING PATTERN APPROPRIATE FOR THE SITE CONDITIONS AND AS RECOMMENDED BY THE MANUFACTURER.

MAINTENANCE

- INSPECT WITHIN 24 HOURS OF EACH RAIN EVENT AND AT LEAST ONCE EVERY SEVEN CALENDAR DAYS.
- CHECK FOR EROSION OR DISPLACEMENT OF THE BLANKET.
- IF ANY AREA SHOWS EROSION, PULL BACK THAT PORTION OF THE BLANKET COVERING THE ERODED AREA, ADD SOIL AND TAMP, RESEED THE AREA, REPLACE AND STAPLE THE BLANKET.

NOTES

CHANNEL LININGS UTILIZE STAPLE PATTERN "C" WITH ADDITIONAL STAPLES ON SIDE SLOPES AT PROJECTED WATER LINE.

STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN GREEN EROSION CONTROL BLANKETS. STAPLE PATTERNS MAY VARY DEPENDING UPON SOIL TYPE AND AVERAGE RAINFALL.

AT SLOPE LENGTHS GREATER THAN 300 FEET OR WHERE DRAINAGE OVER LARGE AREAS IS DIRECTED ONTO THE BLANKETS, STAPLE PATTERN "C" SHOULD BE UTILIZED.

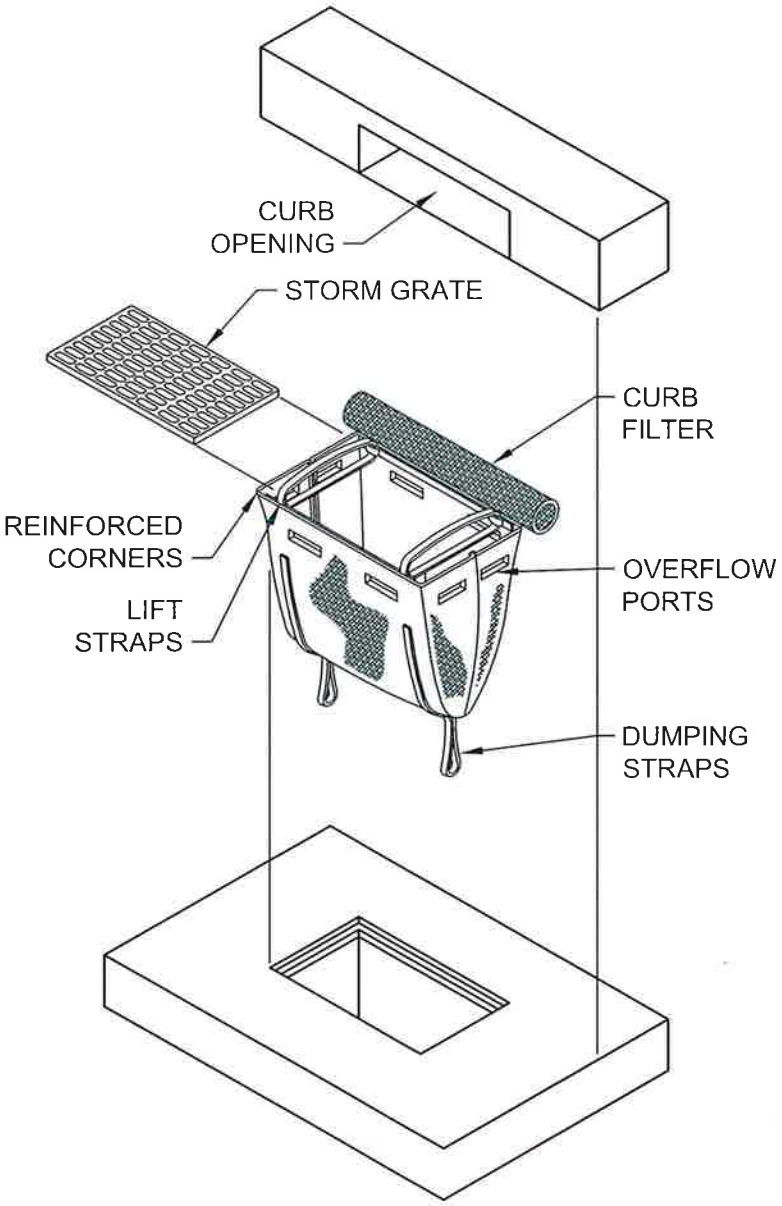
Date: 11-30-2022

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E03

EROSION-EROSION CONTROL BLANKET



INSERT (BASKET) CURB INLET PROTECTION DETAIL

NO SCALE

Date: 11-30-2022

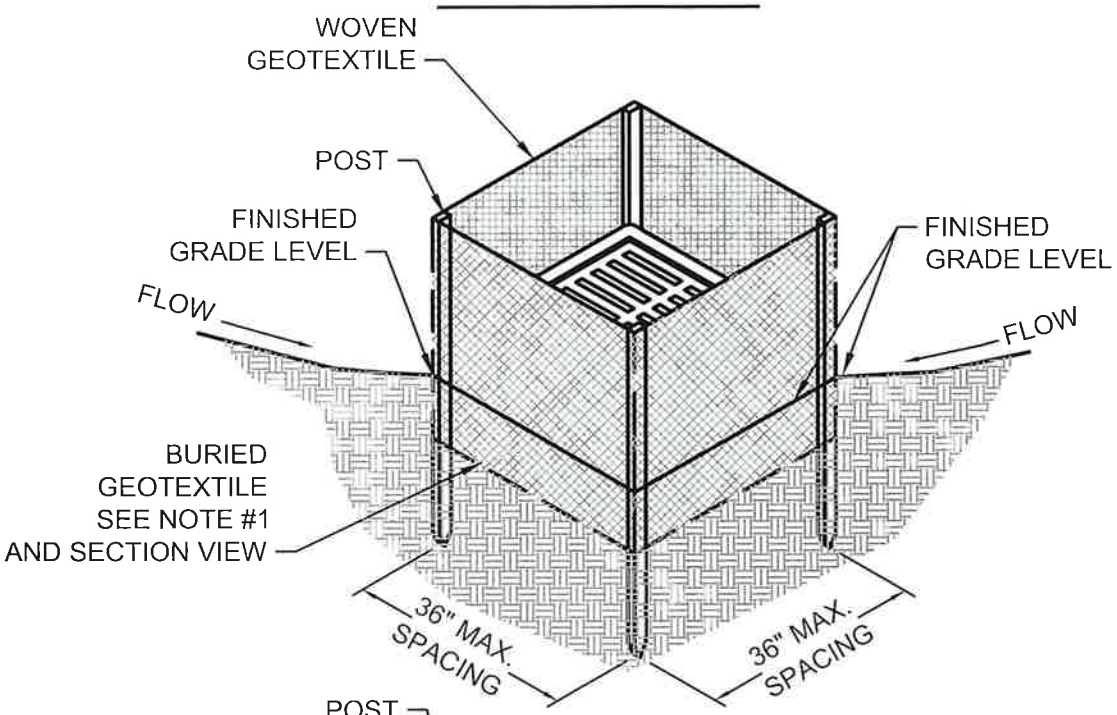
MADISON Indiana

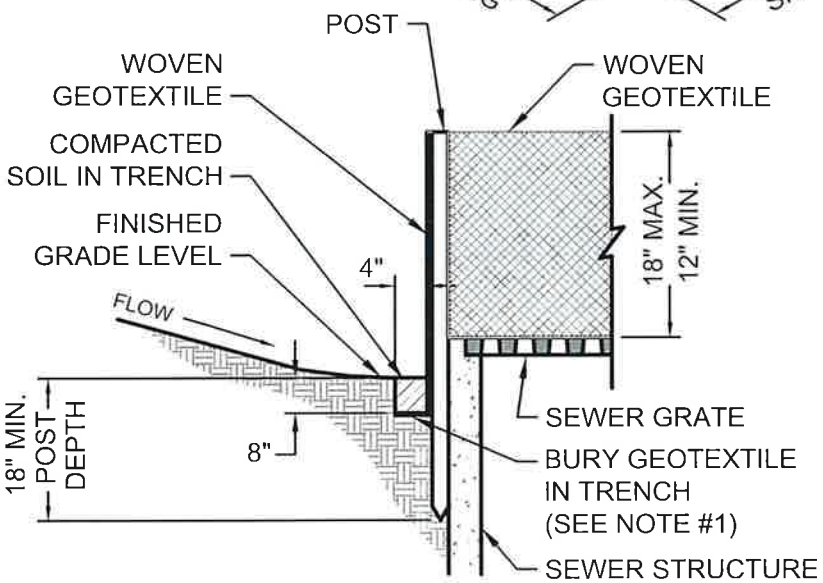
CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL - E05

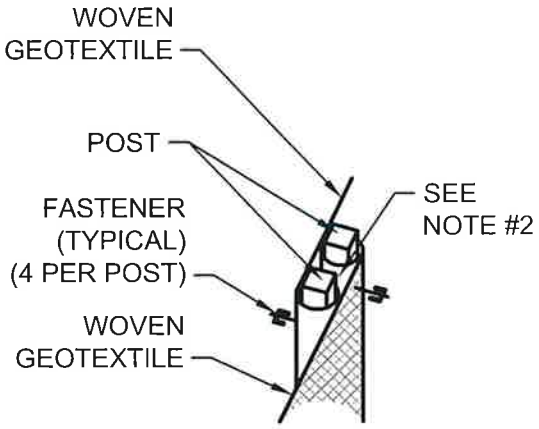
EROSION-INSERT (BASKET) CURB INLET PROTECTION DETAIL

PERSPECTIVE VIEW





SECTION VIEW



TYP. SPLICE DETAIL

NOTES:

1. GEOTEXTILE FABRIC LAID ON DOWN-SLOPE SIDE AND BOTTOM OF TRENCH ALONG FULL PERIMETER OF SEWER STRUCTURE. DURING EXCAVATION, MINIMIZE DISTURBING THE GROUND AROUND TRENCH AS MUCH AS IS FEASIBLE AND SMOOTH SURFACE FOLLOWING EXCAVATION TO AVOID CONCENTRATING FLOWS.
2. IF SPLICING IS NECESSARY, FENCE SECTIONS SHALL BE CLOSE ENOUGH TOGETHER TO CREATE A SEAMLESS JOINT AND PREVENT SILT-LADEN WATER FROM ESCAPING THROUGH THE FENCE AT THE OVERLAP. JOINING SECTIONS SHALL NOT BE PLACED IN LOW SPOTS OR IN SUMP LOCATIONS.
3. PREFABRICATED UNITS MAY BE USED WITH PRIOR APPROVAL FROM PROJECT ENGINEER.

YARD INLET PROTECTION DETAIL

NO SCALE

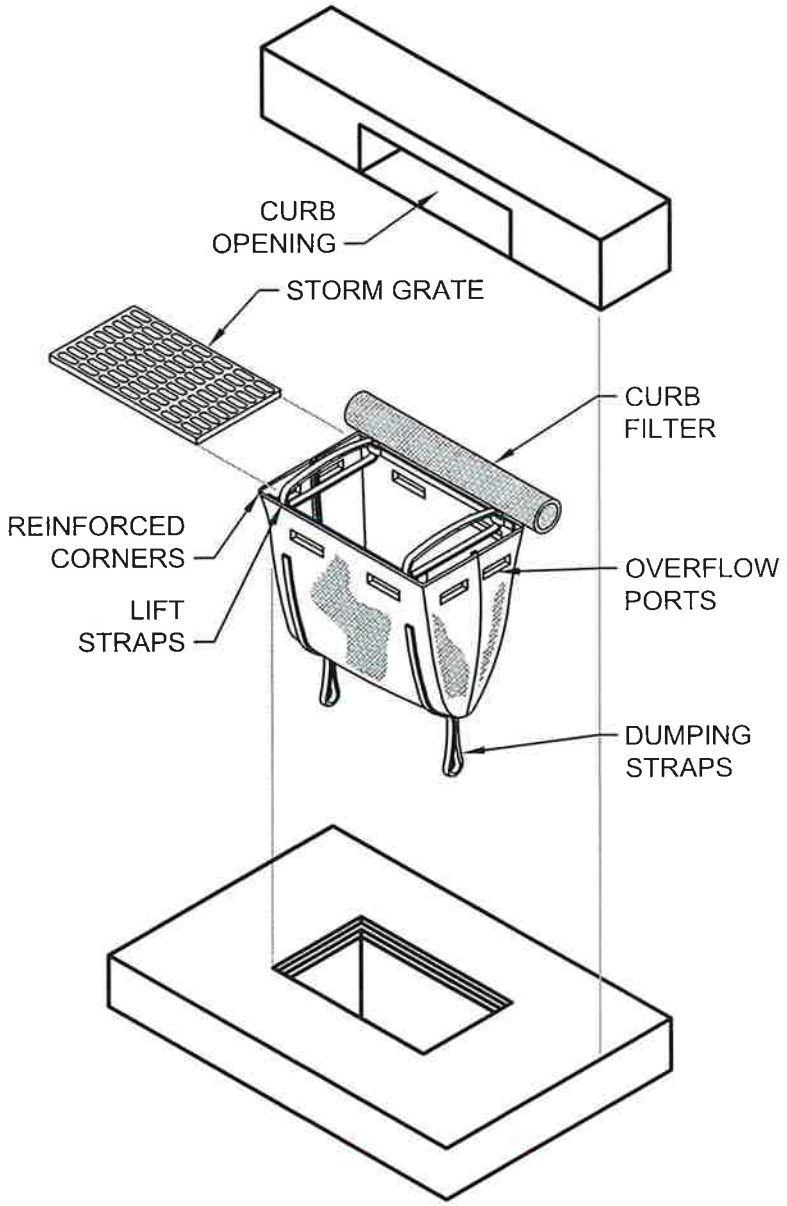
Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

YARD INLET PROTECTION DETAIL



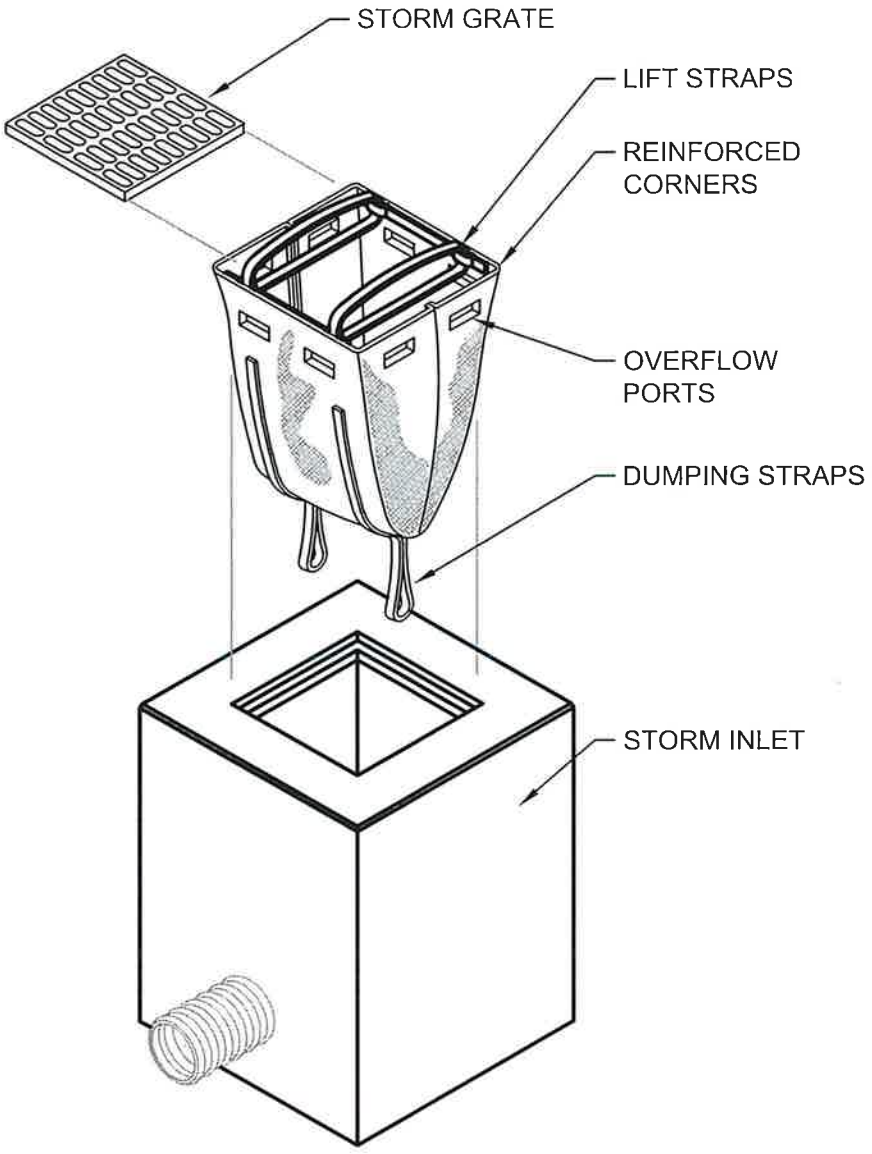
INSERT (BASKET) CURB INLET PROTECTION DETAIL

NO SCALE

Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA STANDARD DETAILS
EROSION CONTROL
INSERT (BASKET) CURB INLET PROTECTION DETAIL



INSERT (BASKET) INLET PROTECTION DETAIL

NO SCALE

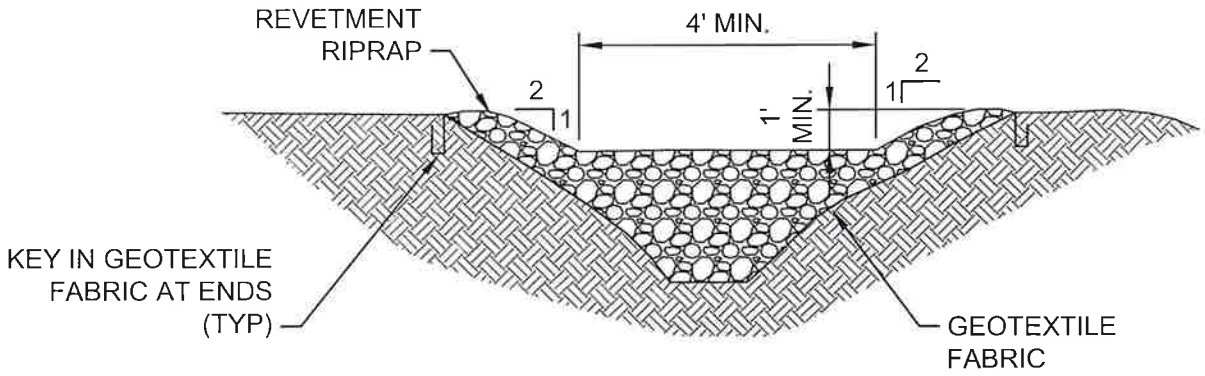
Date: Jun 05, 2023

MADISON Indiana

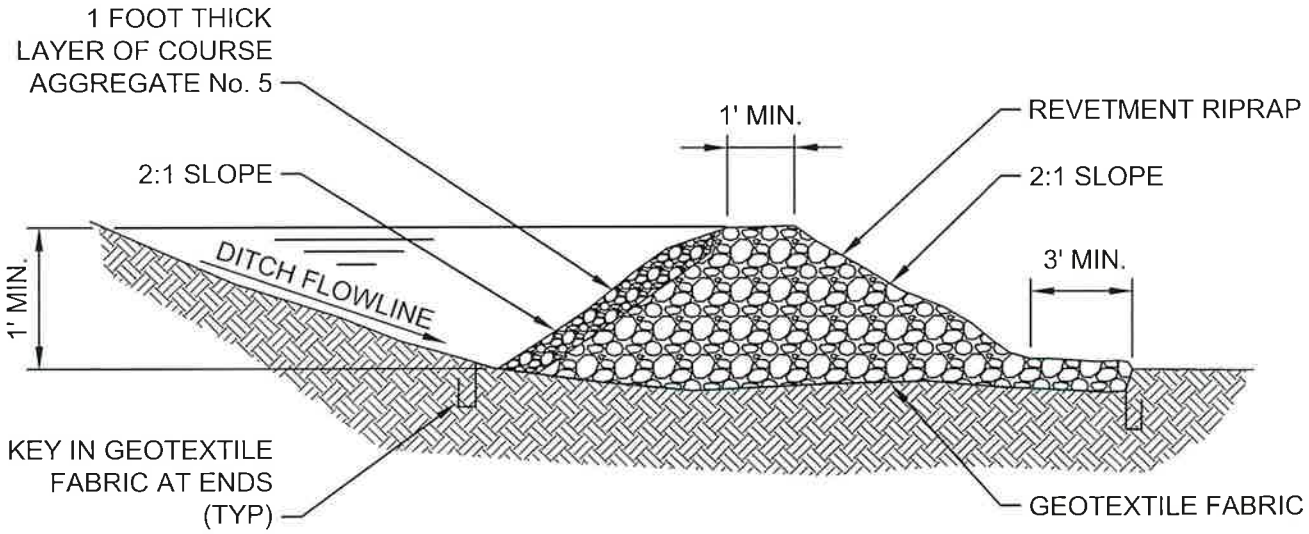
CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

INSERT (BASKET) INLET PROTECTION DETAIL



SECTION PERPENDICULAR TO FLOWLINE



SECTION PARALLEL TO FLOWLINE

GENERAL NOTES:

1. RIPRAP DITCH CHECK DAMS SHALL BE PLACED SUCH THAT THE TOP OF THE DOWNSTREAM CHECK DAM IS AT THE SAME ELEVATION AS THE TOE OF THE ADJACENT UPSTREAM CHECK DAM.

2. AFTER COMPLETION OF CONTRACT, OR AS REQUESTED BY OWNER, THE CONTRACTOR SHALL REMOVE ALL TEMPORARY EROSION CONTROL ITEMS, REMOVE ALL ACCUMULATED DEPOSITS AND, AS REQUIRED, SEED AND MULCH OR SOD AS REQUIRED TO ESTABLISH AREA TO CONDITION PRIOR TO CONSTRUCTION.

ROCK CHECK DAM DETAIL

NO SCALE

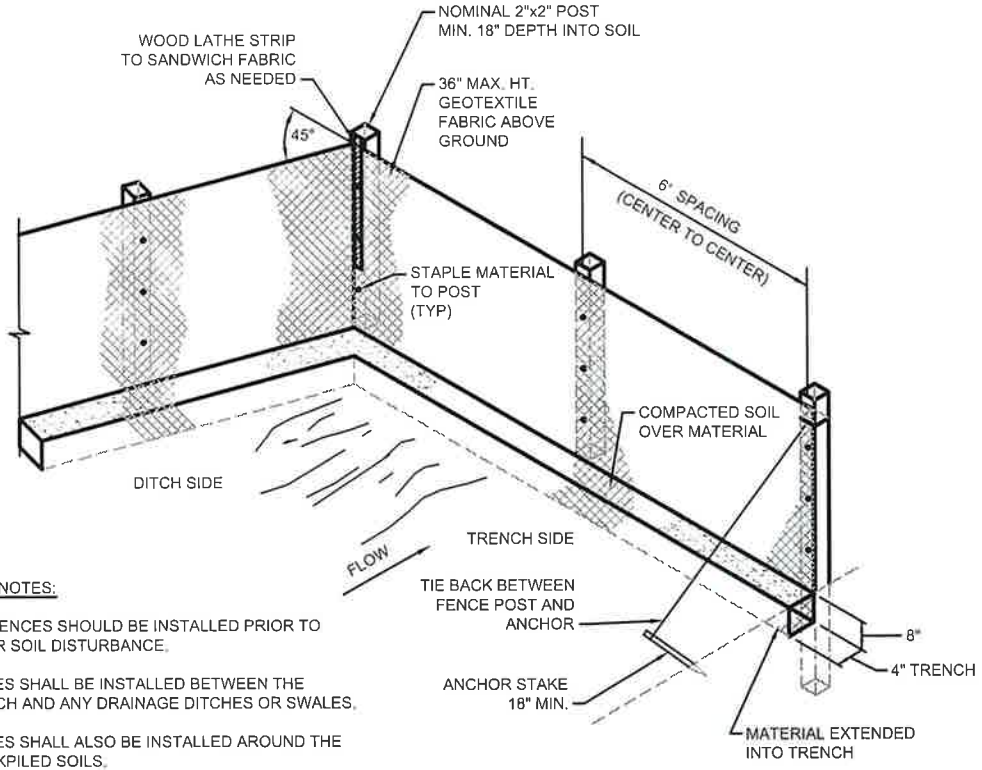
Date: Jun 05, 2023

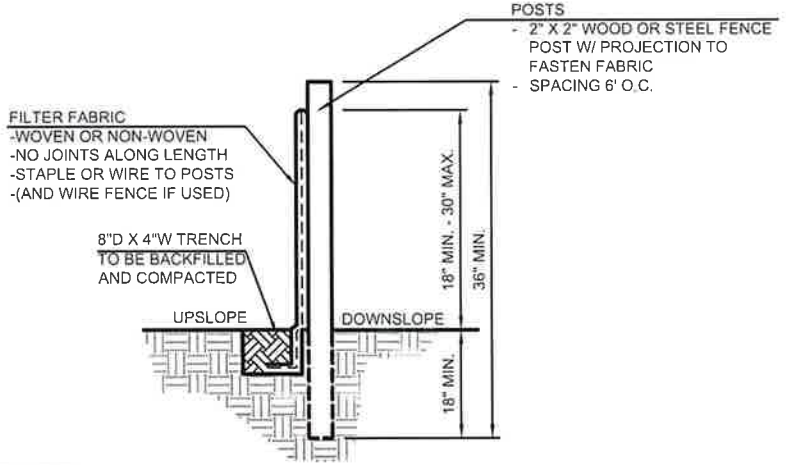
MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

CHECK DAM DETAIL





GENERAL NOTES:

1. SILT FENCES SHOULD BE INSTALLED PRIOR TO MAJOR SOIL DISTURBANCE.
2. FENCES SHALL BE INSTALLED BETWEEN THE TRENCH AND ANY DRAINAGE DITCHES OR SWALES.
3. FENCES SHALL ALSO BE INSTALLED AROUND THE STOCKPILED SOILS.
4. THE GEOTEXTILE SHALL BE FREE FROM DEFECTS, TEARS, PUNCTURES, FLAWS, DETERIORATION OR DAMAGE INCURRED DURING MANUFACTURE, TRANSPORTATION, STORAGE, OR INSTALLATION.
5. TIE BACKS SHALL BE PLACED AS REQUIRED.

INSTALLATION:

1. THE BOTTOM 1' OF THE FENCE SHALL BE BURIED IN THE TRENCH ON THE UPSLOPE SIDE.
2. FENCE SHALL BE INSTALLED ALONG LEVEL GRADES, NOT ACROSS FLOW CHANNELS.
3. IF OPTIONAL SUPPORT WIRE FENCE IS USED, POST SPACING MAY BE EXTENDED TO 8' O.C.

MAINTENANCE:

1. INSPECT SILT FENCE PERIODICALLY (WEEKLY) AND AFTER EACH STORM EVENT.
2. IF FABRIC IS TORN OR DAMAGED OR IN ANY WAY BECOMES INEFFECTIVE, REPLACE THE AFFECTED PORTION IMMEDIATELY.
3. REMOVE DEPOSITED SEDIMENT WHEN IT REACHES HALF THE HEIGHT OF THE FENCE, OR IT IS CAUSING THE FABRIC TO BULGE.
4. TAKE CARE NOT TO UNDERMINE THE FENCE DURING SEDIMENT REMOVAL.
5. AFTER THE CONTRIBUTING AREA HAS BEEN STABILIZED, REMOVE THE FENCE AND REMAINING SEDIMENT, BRING THE DISTURBED AREA TO GRADE, AND STABILIZE.

SILT FENCE DETAIL

NOT TO SCALE

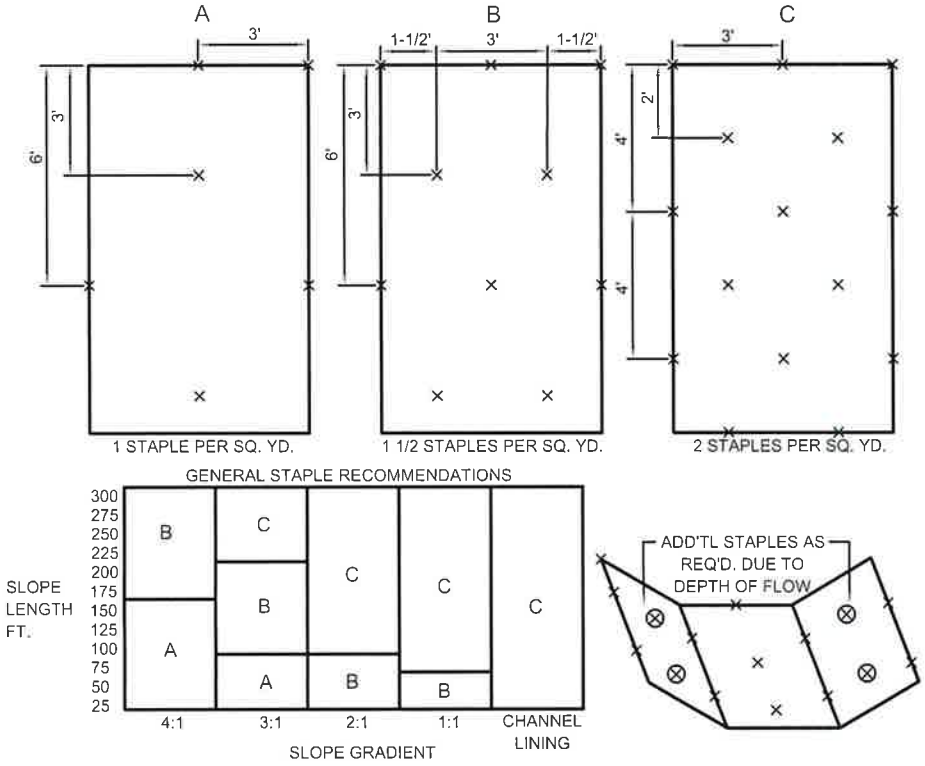
Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

SILT FENCE DETAIL



EROSION CONTROL BLANKET

NOT TO SCALE

SPECIFICATIONS

EFFECTIVE LIFE

- THE FUNCTIONAL LIFE OF AN EROSION CONTROL BLANKET IS DEPENDENT ON THE MATERIALS USED.

ANCHORING

- STAPLES, PINS OR STAKES USED TO PREVENT MOVEMENT OR DISPLACEMENT OF BLANKET. (FOLLOW MANUFACTURER'S RECOMMENDATIONS FOR SPECIFIC APPLICATIONS.)

MATERIALS

- ORGANIC (STRAW, EXCELSIOR, WOVEN PAPER, COCONUT FIBER, ETC.) OR SYNTHETIC MULCH INCORPORATED WITH A POLYPROPYLENE, NATURAL FIBER OR SIMILAR NETTING MATERIAL. (THE NETTING MAY BE BIODEGRADABLE, PHOTODEGRADABLE OR PERMANENT.)

  NOTE: SOME EROSION CONTROL BLANKET NETTINGS MAY POSE A THREAT TO CERTAIN SPECIES OF WILDLIFE IF THEY BECOME ENTANGLED IN THE NETTING MATRIX.

- SIX TO 12-INCH STAPLES, PINS, OR STAKES.

INSTALLATION

1. SELECT THE TYPE AND WEIGHT OF EROSION CONTROL BLANKET TO FIT THE SITE CONDITIONS (E.G., SLOPE, CHANNEL, FLOW VELOCITY) PER THE MANUFACTURER'S RECOMMENDATIONS.
2. PREPARE THE SEEDBED, ADD SOIL AMENDMENTS, AND PERMANENTLY SEED THE AREA IMMEDIATELY FOLLOWING SEEDBED PREPARATION.
3. LAY EROSION CONTROL BLANKETS ON THE SEEDED AREA SO THAT THEY ARE IN CONTINUOUS CONTACT WITH THE SOIL WITH EACH UP-SLOPE OR UP-STREAM BLANKET OVERLAPPING THE DOWN-SLOPE OR DOWN-STREAM BLANKET BY AT LEAST EIGHT INCHES, OR FOLLOW MANUFACTURER'S RECOMMENDATIONS.
4. TUCK THE UPPERMOST EDGE OF THE UPPER BLANKETS INTO A CHECK SLOT (SLIT TRENCH), BACKFILL WITH SOIL AND TAMP DOWN. IN CERTAIN APPLICATIONS, THE MANUFACTURER MAY REQUIRE ADDITION CHECK SLOTS AT SPECIFIC LOCATIONS DOWN SLOPE FROM THE UPPERMOST EDGE OF THE UPPER BLANKETS.
5. ANCHOR THE BLANKETS IN PLACE BY DRIVING STAPLES, PINS, OR STAKES THROUGH THE BLANKET AND INTO THE UNDERLYING SOIL. FOLLOW AN ANCHORING PATTERN APPROPRIATE FOR THE SITE CONDITIONS AND AS RECOMMENDED BY THE MANUFACTURER.

MAINTENANCE

- INSPECT WITHIN 24 HOURS OF EACH RAIN EVENT AND AT LEAST ONCE EVERY SEVEN CALENDAR DAYS.
- CHECK FOR EROSION OR DISPLACEMENT OF THE BLANKET.
- IF ANY AREA SHOWS EROSION, PULL BACK THAT PORTION OF THE BLANKET COVERING THE ERODED AREA, ADD SOIL AND TAMP, RESEED THE AREA, REPLACE AND STAPLE THE BLANKET.

NOTES

CHANNEL LININGS UTILIZE STAPLE PATTERN "C" WITH ADDITIONAL STAPLES ON SIDE SLOPES AT PROJECTED WATER LINE.

STAPLE PATTERNS APPLY TO ALL NORTH AMERICAN GREEN EROSION CONTROL BLANKETS. STAPLE PATTERNS MAY VARY DEPENDING UPON SOIL TYPE AND AVERAGE RAINFALL.

AT SLOPE LENGTHS GREATER THAN 300 FEET OR WHERE DRAINAGE OVER LARGE AREAS IS DIRECTED ONTO THE BLANKETS, STAPLE PATTERN "C" SHOULD BE UTILIZED.

Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

EROSION CONTROL BLANKET

GENERAL EROSION AND SEDIMENT CONTROL NOTES

1. ALL EROSION AND SEDIMENT CONTROL PRACTICES SHALL BE IN ACCORDANCE WITH THE INDIANA STORM WATER QUALITY MANUAL FROM THE INDIANA DEPARTMENT OF ENVIRONMENTAL MANAGEMENT AND LOCAL EROSION AND SEDIMENT CONTROL ORDINANCE, OR SWCD.

2. THE NOTICE OF INTENT (NOI) AND PUBLIC NOTICE FOR THE PROJECT SHALL BE POSTED ON A SIGN INSTALLED AT OR NEAR THE SITE CONSTRUCTION TRAILER. THE NOI SHALL LIST THE CONTACT INFORMATION FOR THE SITE CONTACT PERSON. THE SIGN AND INFORMATION SHALL BE MAINTAINED AND REMAIN LEGIBLE THROUGHOUT CONSTRUCTION.

3. A COPY OF THIS EROSION AND SEDIMENT CONTROL PLAN AND THE EROSION AND SEDIMENT CONTROL REPORT SHALL BE AVAILABLE AT THE PROJECT SITE THROUGHOUT THE ENTIRE CONSTRUCTION PERIOD.

4. THE CONTRACTOR SHALL CONTROL WASTE, GARBAGE, DEBRIS, WASTEWATER, AND OTHER SUBSTANCES ON THE SITE SO THEY WILL NOT BE TRANSPORTED FROM THE SITE BY THE ACTION OF WIND, STORM WATER RUNOFF, OR OTHER FORCES. PROPER DISPOSAL OR MANAGEMENT OF ALL WASTES AND UNUSED BUILDING MATERIAL APPROPRIATE TO THE NATURE OF THE WASTE OR MATERIAL IS REQUIRED.

5. PUBLIC OR PRIVATE ROADWAYS SHALL BE KEPT CLEAR OF ACCUMULATED SEDIMENT. ALL SEDIMENT THAT IS CLEARED MUST BE RETURNED TO THE LIKELY POINT OF ORIGIN OR OTHER SUITABLE LOCATION. CLEARING OF LARGE AMOUNTS OF SEDIMENT SHALL NOT INCLUDE FLUSHING THE AREA WITH WATER.

6. MINIMIZE THE EXPOSURE OF BARE EARTH BY LIMITING THE WORK AREA TO THAT NECESSARY TO PERFORM THE WORK, AND BY PROPER SCHEDULING OF MANPOWER AND EQUIPMENT.

7. ALL EROSION AND SEDIMENT CONTROL MEASURES SHALL BE INSPECTED, CLEANED, AND MAINTAINED FOLLOWING EACH STORM EVENT.

8. WHEREVER POSSIBLE, MAINTAIN EXISTING VEGETATIVE COVER. USE NON-VEGETATIVE MATERIAL INCLUDING MULCH, EROSION BLANKETS, OR STONE TO CONTROL EROSION FROM DISTURBED AREAS.

9. A LOG SHALL BE MAINTAINED OF ALL INSPECTIONS (WEEKLY, AND FOLLOWING STORM EVENTS), MAINTENANCE AND REPAIR OF EROSION AND SEDIMENT CONTROL MEASURES. THE LOG SHALL BE MAINTAINED ON SITE AND BE AVAILABLE UPON REQUEST TO THE OWNERS REPRESENTATIVES AND THE OPERATING AUTHORITIES HAVING JURISDICTION OVER THE SITE.

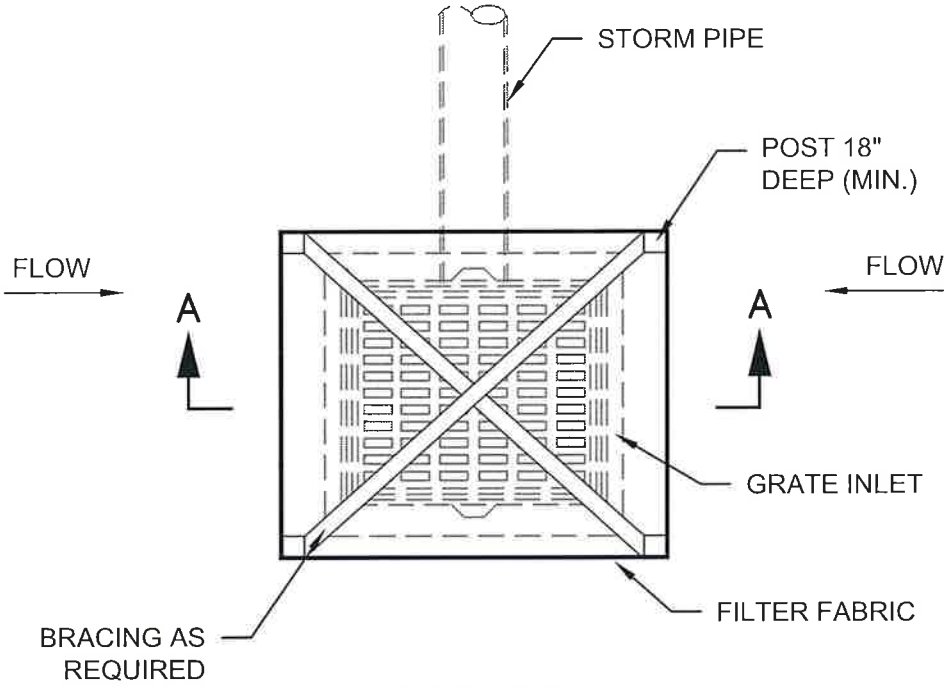
Date: Jun 05, 2023

MADISON Indiana

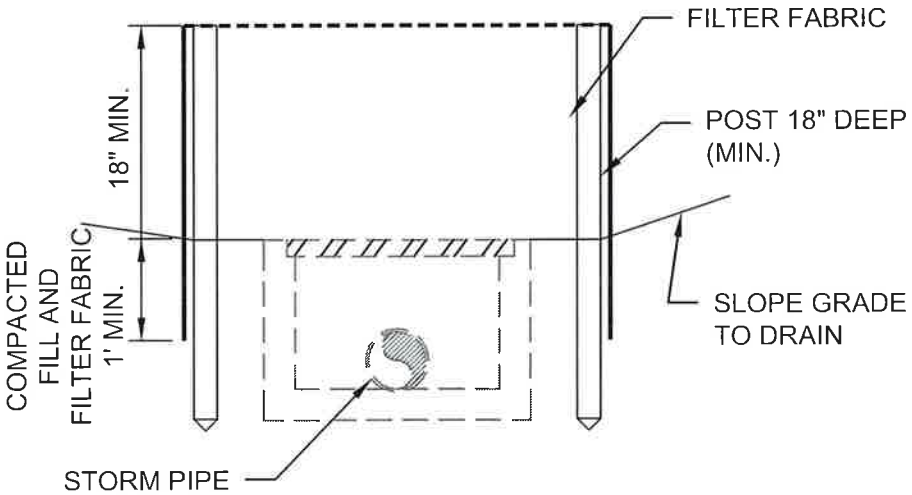
CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

GENERAL EROSION AND
SEDIMENT CONTROL NOTES



PLAN VIEW



SECTION A-A

STORM INLET WITH SILT FENCE EROSION DETAIL

NOT TO SCALE

Date: Jun 05, 2023

MADISON Indiana

CITY OF MADISON, INDIANA
STANDARD DETAILS

EROSION CONTROL

STORM INLET WITH SILT FENCE EROSION DETAIL